Base Load Power Hub (BLPH)

MATERIAL DATA BOOK (MDB) E&I SHELTERS

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None

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.



Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

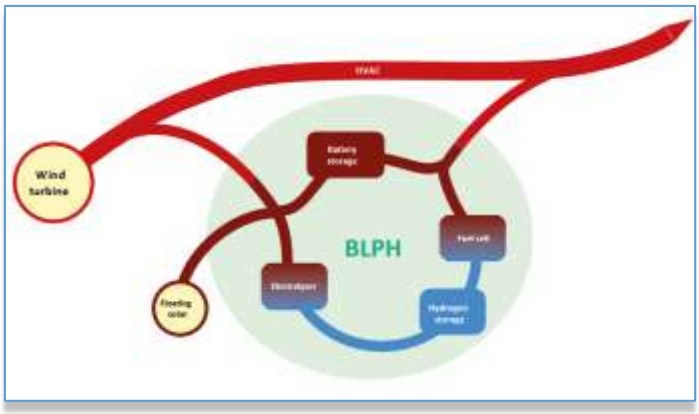


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document was created as a guideline in organizing the MRB in a structured and coherent way. It offers a framework for the preparation process, ensuring everyone the necessary criteria are met precisely.
This procedure applies to the supply of base load materials and equipment
Power Hub (BLPH) project for Crosswind. Outlines the steps and requirements needed for creation and submission of the Material Data Book (MDB) to ensure compliance with project specifications and quality standards.
This procedure does not apply to bulk supplies for which only material certificates are required.

2.1 REFERENCES

Doc. No.	Description
23A90-PML-QHSE-QP-00002	PROJECT QUALITY PLAN

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
VENDOR OR SUPPLIER	Any organization employed by Rosetti Marino to supply either products or services
MDB	Material Data Book

Table 2 - Definitions and Abbreviations

3 MANUFACTURING DATA RECORD INDEX

3.1 PART 1 – DESIGN DOSSIER

This section includes an in-depth collection of all design data, drawings and "As Built" documents.

documents.The documents are divided into subcategories as follows.

The documents listed below serve as examples and do not constitute a comprehensive list of requirements:

- List:
  - Documents register
  - Cables List
  - Load List
  - Electrical components List and DS
  - HVAC Components List and DS
  - HVAC IO List

- Diagrams
  - Structural Calculation
  - Interconnecting Wiring Diagrams
  - General Arrangement
  - Computer Systems Architectural Diagrams.

- Drawings :

  - General arrangement drawings
  - Foundation Drawing
  - Detailed drawings
  - HVAC and Lighting Panel Wiring Drawing and General Arrangement (Incl. Interconnecting)
  - Detail shop drawings (excluding detailed machining drawings).

- Project Procedures and Specification :

  - Project Management –
  - Engineering –
  - Procurement/Supply
  - Construction
  - Manufacturing and Testing procedures
  - Installation -Transportation
  - Commissioning Procedure
  - HVAC Syst Description (Management Logics)
  - Start-Up

- Piping Classes :

- Calculation Notes :

  - HVAC Calculation Report (incl. HVAC SYS Clc and Heat Dissipation Calc)
  - PID

- Equipment requisitions :
- Data Sheets :

3.2 PART 2 – CERTIFICATION DOSSIER

This section encompasses a thorough compilation of all Quality Records documents

It contains all evidence certifying that the required quality level has been attained (e.g., all Certifying Authority Reports/Certificates).
The documents are to be organized by "discipline section" as outlined in Part 1.
Documents should be sub-categorized as follows.
The documents listed below serve as examples and do not constitute a comprehensive list of requirements

- Acceptance :

  - Derogations and queries registers with signed copies
  - Internal and External Inspection certificates/reports (Vendors)
  - Conformity with technical specification certificates
  - Acceptance qualifications list (equipment/construction)
  - Documents confirming

- Manufacturing and testing Recor :

  - Authorities and Third parties' acceptance and release certificates/reports
  - Materials certificates (including consumables, such as electrodes and paint)
  - Warranty Surveyor's certificates.
  - Quality Control plan /Inspection & test Plan / Inspection Reports
  - Marking drawings and associated traceability
  - Non-Destructive Testing certificates/reports
  - Non-Destructive Testing procedure
  - Dimensional control certificates/reports
  - Painting certificates
  - NCR's and Waivers reports
  - Welding and preheating book/procedures
  - Painting procedures
  - Compliance with CE Marking, ATEX, and PED requirements as relevant to the scope of supply.
  - Relevant equipment Design IRCs (where applicable)
  - Pressure & Function Test Reports
  - FAT Procedure

- Test Record :

- Test records included any qualification testing that has been performed when applicable.
- Production test result records.
- Mechanical Completion records
- FAT reports

4 DESIGN DOSSIER

4.1.1 LIST

Contractor Document Number	Title	Notes
1724000049-MD-LIS-00001	Documents List (SMIR)	N.A.
1724000049-EL-LIS-00030	B-100 LOAD LISTS	N.A.
1724000049-EL-LIS-00031	B-200 LOAD LISTS	N.A.
1724000049-EL-LIS-00032	B-300 LOAD LISTS	N.A.
1724000049-EL-LIS-00033	B-400 LOAD LISTS	N.A.
1724000049-EL-LIS-00034	CABLES LIST	N.A.
1724000049-EL-LIS-00043	B-100 ELECTRICAL COMPONENTS LIST AND DS	N.A.
1724000049-EL-LIS-00044	B-200 ELECTRICAL COMPONENTS LIST AND DS	N.A.
1724000049-EL-LIS-00045	B-300 ELECTRICAL COMPONENTS LIST AND DS	N.A.
1724000049-EL-LIS-00046	B-400 ELECTRICAL COMPONENTS LIST AND DS	N.A.
1724000049-HV-LIS-00047	B-100 HV SWITCH ROOM - COMPONENTS LIST AND DS - E&I SHELTERS	N.A.
1724000049-HV-LIS-00048	B-200 LV SWITCH ROOM-COMPONENTS LIST AND DS - E&I SHELTERS	N.A.
1724000049-HV-LIS-00049	B-300 AC U PS SWITCH ROOM-COMPONENTS LIST AND DS	N.A.
1724000049-HV-LIS-00050	B-400 I&T EQUIPMENT ROOM-COMPONENTS LIST AND DS	N.A.
1724000049-HV-LIS-00051	B-100 HVAC IO LIST	N.A.
1724000049-HV-LIS-00052	B-200 HVAC IO LIST	N.A.

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Contractor Document Number	Title	Notes
1724000049-HV-LIS-00053	B-300 HVAC IO LIST	N.A.
1724000049-HV-LIS-00054	B-400 HVAC IO LIST	N.A.
1724000049-QC-LIS-00059	Material Data Book (MDB) - Index	N.A.
1724000049-COM-LIS-00060	Commissioning and Start-up and 2 Year Spares List	N.A.
1724000049-QC-LIS-00064	VENDOR ASSET TAG REGISTER	N.A.
1724000049-COM-LIS-00060	Two Year Spares List	N.A.

4.1.2 DIAGRAMS

Contractor Document Number	Title	Notes
1724000049-EL-DG-00022	B-100 INTERCONNECTING WIRING DIAGRAMS	N.A.
1724000049-EL-DG-00023	B-200 INTERCONNECTING WIRING DIAGRAMS	N.A.
1724000049-EL-DG-00024	B-300 INTERCONNECTING WIRING DIAGRAMS	N.A.
1724000049-EL-DG-00025	B-400 INTERCONNECTING WIRING DIAGRAMS	N.A.
1724000049-HV-DA-00026	B-100 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)	N.A.
1724000049-HV-DA-00027	B-200 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL NTERCONNECTING)	N.A.
1724000049-ST-CA-00006	B-100 STRUCTURAL CALCULATION	N.A.
1724000049-ST-CA-00007	B-200 STRUCTURAL CALCULATION	N.A.
1724000049-ST-CA-00008	B-300 STRUCTURAL CALCULATION	N.A.
1724000049-ST-CA-00009	B-400 STRUCTURAL CALCULATION	N.A.

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4.1.3 DRAWINGS

Contractor Document Number	Title	Notes
1724000049-AR-DA-00014	B-100 GENERAL ARRANGMENT DRAWINGS	N.A.
1724000049-AR-DA-00015	B-200 GENERAL ARRANGMENT DRAWINGS	N.A.
1724000049-AR-DA-00016	B-300 GENERAL ARRANGMENT DRAWINGS	N.A.
1724000049-AR-DA-00017	B-400 GENERAL ARRANGMENT DRAWINGS	N.A.
1724000049-AR-DD-00018	B-100 DETAILED DRAWINGS	N.A.
1724000049-AR-DD-00019	B-200 DETAILED DRAWINGS	N.A.
1724000049-AR-DD-00020	B-300 DETAILED DRAWINGS	N.A.
1724000049-AR-DD-00021	B-400 DETAILED DRAWINGS	N.A.
1724000049-AR-DD-00062	Lifting Drawings - E&I SHELTERS	N.A.
1724000049-HV-DA-00028	B-300 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)	N.A.
1724000049-HV-DA-00029	B-400 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)	N.A.
1724000049-HV-DA-00064	B-100 HVAC SYSTEM - G.A.AND DETAILS	N.A.
1724000049-HV-DA-00065	B-200 HVAC SYSTEM - G.A.AND DETAILS	N.A.
1724000049-HV-DA-00066	B-300 HVAC SYSTEM - G.A.AND DETAILS	N.A.
1724000049-HV-DA-00067	B-400 HVAC SYSTEM - G.A.AND DETAILS	N.A.
1724000049-HV-PID-00039	B-100 PID	N.A.
1724000049-HV-PID-00040	B-200 PID	N.A.
1724000049-HV-PID-00041	B-300 PID	N.A.
1724000049-HV-PID-00042	B-400 PID	N.A.
1724000049-ST-DD-00010	B-100 FOUNDATION DRAWING	N.A.
1724000049-ST-DD-00011	B-200 FOUNDATION DRAWING	N.A.
1724000049-ST-DD-00012	B-300 FOUNDATION DRAWING	N.A.

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1724000049-ST-DD-00013	B-400 FOUNDATION DRAWING	N.A.

4.1.4 PROJECT PROCEDURE AND SPECIFICATION

Contractor Document Number	Title	Notes
1724000049-COM-PRO-00057	COMMISSIONING PROCEDURE	N.A.
1724000049-HV-RE-00055	HVAC SYST DESCRIPTION (MANAGEMENT LOGICS)	N.A.
1724000049-MD-MAN-00061	Installation, Operating and Maintenance Manual	N.A.
1724000049-QC-PRO-00063	Packing, Shipping, Handling, Preservation and Storage Procedure	N.A.

4.1.5 PIPING CLASSES

Contractor Document Number	Title	Notes
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.

4.1.6 CALCULATION NOTES

Contractor Document Number	Title	Notes
1724000049-HV-CA-00035	B-100 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC)	N.A.
1724000049-HV-CA-00036	B-200 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC)	N.A.
1724000049-HV-CA-00037	B-300 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC)	N.A.
1724000049-HV-CA-00038	B-400 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC)	N.A.

4.1.7 EQUIPMENT REQUISITIONS

Contractor Document Number	Title	Notes
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.

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4.1.8 DATA SHEETS

Contractor Document Number	Title	Notes
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.

5 CERTIFICATION DOSSIER

5.1.1 ACCEPTANCE

Contractor Document Number	Title	Notes
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.

5.1.2 MANUFACTURING AND TESTING RECORD

Contractor Document Number	Title	Notes
1724000049-MAT-PRO-00004	Painting Procedure	N.A.
1724000049-NDT-PRO-00005	NDT Procedures	N.A.
1724000049-QC-ITP-00002	Inspection and Testing Plan	N.A.
1724000049-QC-PRO-00056	FAT PROCEDURE	N.A.
1724000049-WEL-RE-00003	Weld Procedure Specifications (WPS), Weld Procedure Qualification Report (WPQR), Welding Map and Welders Qualifications	N.A.

5.1.3 TEST RECORD

Contractor Document Number	Title	Notes
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.
N.A.	N.A.	N.A.

Base Load Power Hub (BLPH)

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SUPPLIER MASTER INFORMATION REGISTER

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Document Class: 3

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2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
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Sign	Date
R. Bossi	22-02-2024

Rev.	Date	Description	Prepared	Reviewed	Approved
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5	SMIR	X							

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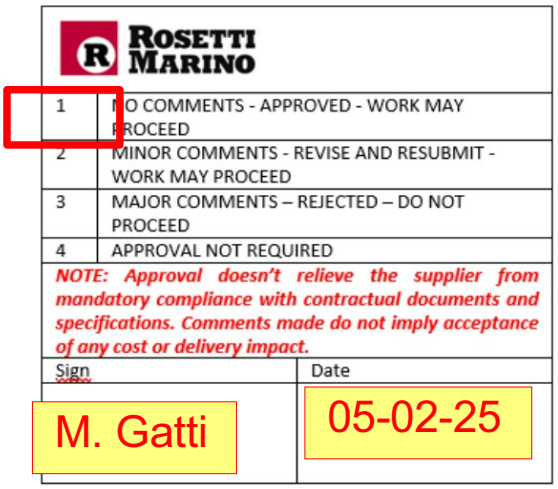
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1	1724000049-MD-LIS-00001	00	1724000049-MD-LIS-00001	00	TBD	00	Documents List (SMIR)	07/02/2024			A
2	1724000049-QC-ITP-00002	00	1724000049-QC-ITP-00002	00	TBD	00	Inspection and Testing Plan	23/02/2024			A
3	1724000049-WEL-RE-00003	00	1724000049-WEL-RE-00003	00	TBD	00	Weld Procedure Specifications (WPS), Weld Procedure Qualification Report (WPQR), Welding Map and Welders Qualifications	23/02/2024			A
4	1724000049-MAT-PRO-00004	00	1724000049-MAT-PRO-00004	00	TBD	00	Painting Procedure	23/02/2024			A
5	1724000049-NDT-PRO-00005	00	1724000049-NDT-PRO-00005	00	TBD	00	NDT Procedures	23/02/2024			A
6	1724000049-ST-CA-00006	00	1724000049-ST-CA-00006	00	TBD	00	B-100 STRUCTURAL CALCULATION	08/03/2024			A
7	1724000049-ST-CA-00007	00	1724000049-ST-CA-00007	00	TBD	00	B-200 STRUCTURAL CALCULATION	08/03/2024			A
8	1724000049-ST-CA-00008	00	1724000049-ST-CA-00008	00	TBD	00	B-300 STRUCTURAL CALCULATION	08/03/2024			A
9	1724000049-ST-CA-00009	00	1724000049-ST-CA-00009	00	TBD	00	B-400 STRUCTURAL CALCULATION	08/03/2024			A
10	1724000049-ST-DD-00010	00	1724000049-ST-DD-00010	00	TBD	00	B-100 FOUNDATION DRAWING	08/03/2024			A
11	1724000049-ST-DD-00011	00	1724000049-ST-DD-00011	00	TBD	00	B-200 FOUNDATION DRAWING	08/03/2024			A
12	1724000049-ST-DD-00012	00	1724000049-ST-DD-00012	00	TBD	00	B-300 FOUNDATION DRAWING	08/03/2024			A
13	1724000049-ST-DD-00013	00	1724000049-ST-DD-00013	00	TBD	00	B-400 FOUNDATION DRAWING	08/03/2024			A
14	1724000049-AR-DA-00014	00	1724000049-AR-DA-00014	00	TBD	00	B-100 GENERAL ARRANGMENT DRAWINGS	09/02/2024			A
15	1724000049-AR-DA-00015	00	1724000049-AR-DA-00015	00	TBD	00	B-200 GENERAL ARRANGMENT DRAWINGS	09/02/2024			A
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17	1724000049-AR-DA-00017	00	1724000049-AR-DA-00017	00	TBD	00	B-400 GENERAL ARRANGMENT DRAWINGS	09/02/2024			A
18	1724000049-AR-DD-00018	00	1724000049-AR-DD-00018	00	TBD	00	B-100 DETAILED DRAWINGS	05/04/2024			A
19	1724000049-AR-DD-00019	00	1724000049-AR-DD-00019	00	TBD	00	B-200 DETAILED DRAWINGS	05/04/2024			A
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22	1724000049-EL-DG-00022	00	1724000049-EL-DG-00022	00	TBD	00	B-100 INTERCONNECTING WIRING DIAGRAMS	09/04/2024			I
23	1724000049-EL-DG-00023	00	1724000049-EL-DG-00023	00	TBD	00	B-200 INTERCONNECTING WIRING DIAGRAMS	09/04/2024			I
24	1724000049-EL-DG-00024	00	1724000049-EL-DG-00024	00	TBD	00	B-300 INTERCONNECTING WIRING DIAGRAMS	09/04/2024			I
25	1724000049-EL-DG-00025	00	1724000049-EL-DG-00025	00	TBD	00	B-400 INTERCONNECTING WIRING DIAGRAMS	09/04/2024			I
26	1724000049-HV-DA-00026	00	1724000049-HV-DA-00026	00	TBD	00	B-100 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)	26/03/2024			A
27	1724000049-HV-DA-00027	00	1724000049-HV-DA-00027	00	TBD	00	B-200 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)	26/03/2024			A
28	1724000049-HV-DA-00028	00	1724000049-HV-DA-00028	00	TBD	00	B-300 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)	26/03/2024			A
29	1724000049-HV-DA-00029	00	1724000049-HV-DA-00029	00	TBD	00	B-400 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)	26/03/2024			A
30	1724000049-EL-LIS-00030	00	1724000049-EL-LIS-00030	00	TBD	00	B-100 LOAD LISTS	29/02/2024			I
31	1724000049-EL-LIS-00031	00	1724000049-EL-LIS-00031	00	TBD	00	B-200 LOAD LISTS	29/02/2024			I
32	1724000049-EL-LIS-00032	00	1724000049-EL-LIS-00032	00	TBD	00	B-300 LOAD LISTS	29/02/2024			I
33	1724000049-EL-LIS-00033	00	1724000049-EL-LIS-00033	00	TBD	00	B-400 LOAD LISTS	29/02/2024			I
34	1724000049-EL-LIS-00034	00	1724000049-EL-LIS-00034	00	TBD	00	CABLES LIST	24/04/2024			I
35	1724000049-HV-CA-00035	00	1724000049-HV-CA-00035	00	TBD	00	B-100 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC)	08/03/2024			A
36	1724000049-HV-CA-00036	00	1724000049-HV-CA-00036	00	TBD	00	B-200 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC)	08/03/2024			A
37	1724000049-HV-CA-00037	00	1724000049-HV-CA-00037	00	TBD	00	B-300 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC)	08/03/2024			A
38	1724000049-HV-CA-00038	00	1724000049-HV-CA-00038	00	TBD	00	B-400 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC)	08/03/2024			A
39	1724000049-HV-PID-00039	00	1724000049-HV-PID-00039	00	TBD	00	B-100 PID	23/04/2024			I
40	1724000049-HV-PID-00040	00	1724000049-HV-PID-00040	00	TBD	00	B-200 PID	23/04/2024			I
41	1724000049-HV-PID-00041	00	1724000049-HV-PID-00041	00	TBD	00	B-300 PID	23/04/2024			I
42	1724000049-HV-PID-00042	00	1724000049-HV-PID-00042	00	TBD	00	B-400 PID	23/04/2024			I
43	1724000049-EL-LIS-00043	00	1724000049-EL-LIS-00043	00	TBD	00	B-100 ELECTRICAL COMPONENTS LIST AND DS	10/04/2024			I
44	1724000049-EL-LIS-00044	00	1724000049-EL-LIS-00044	00	TBD	00	B-200 ELECTRICAL COMPONENTS LIST AND DS	10/04/2024			I
45	1724000049-EL-LIS-00045	00	1724000049-EL-LIS-00045	00	TBD	00	B-300 ELECTRICAL COMPONENTS LIST AND DS	10/04/2024			I
46	1724000049-EL-LIS-00046	00	1724000049-EL-LIS-00046	00	TBD	00	B-400 ELECTRICAL COMPONENTS LIST AND DS	10/04/2024			I
47	1724000049-HV-LIS-00047	00	1724000049-HV-LIS-00047	00	TBD	00	B-100 HVAC COMPONENTS LIST AND DS	23/04/2024			I
48	1724000049-HV-LIS-00048	00	1724000049-HV-LIS-00048	00	TBD	00	B-200 HVAC COMPONENTS LIST AND DS	23/04/2024			I
49	1724000049-HV-LIS-00049	00	1724000049-HV-LIS-00049	00	TBD	00	B-300 HVAC COMPONENTS LIST AND DS	23/04/2024			I
50	1724000049-HV-LIS-00050	00	1724000049-HV-LIS-00050	00	TBD	00	B-400 HVAC COMPONENTS LIST AND DS	23/04/2024			I
51	1724000049-HV-LIS-00051	00	1724000049-HV-LIS-00051	00	TBD	00	B-100 HVAC IO LIST	30/04/2024			I
52	1724000049-HV-LIS-00052	00	1724000049-HV-LIS-00052	00	TBD	00	B-200 HVAC IO LIST	30/04/2024			I
53	1724000049-HV-LIS-00053	00	1724000049-HV-LIS-00053	00	TBD	00	B-300 HVAC IO LIST	30/04/2024			I
54	1724000049-HV-LIS-00054	00	1724000049-HV-LIS-00054	00	TBD	00	B-400 HVAC IO LIST	30/04/2024			I
55	1724000049-HV-RE-00055	00	1724000049-HV-RE-00055	00	TBD	00	HVAC SYST DESCRIPTION (MANAGEMENT LOGICS)	30/04/2024			I
56	1724000049-QC-PRO-00056	00	1724000049-QC-PRO-00056	00	TBD	00	FAT PROCEDURE	23/02/2024			A
57	1724000049-COM-PRO-00057	00	1724000049-COM-PRO-00057	00	TBD	00	COMMISSIONING PROCEDURE	31/05/2024			A
58	1724000049-QC-DB-00058	00	1724000049-QC-DB-00058	00	TBD	00	Material Data Book (MDB)	27/09/2024			A
59	1724000049-QC-LIS-00059	00	1724000049-QC-LIS-00059	00	TBD	00	Material Data Book (MDB) - Index	15/03/2024			A
60	1724000049-COM-LIS-00060	00	1724000049-COM-LIS-00060	00	TBD	00	Commissioning and Start-up and 2 Year Spares List	21/06/2024			I
61	1724000049-MD-MAN-00061	00	1724000049-MD-MAN-00061	00	TBD	00	Installation, Operating and Maintenance Manual	28/06/2024			I
62	1724000049-AR-DD-00062	00	1724000049-AR-DD-00062	00	TBD	00	Lifting Drawings	07/06/2024			I
63	1724000049-QC-PRO-00063	00	1724000049-QC-PRO-00063	00	TBD	00	Packing, Shipping, Handling, Preservation and Storage Procedure	30/04/2024			I

Base Load Power Hub (BLPH)

B-100 LOAD LISTS - E&I SHELTERS

Document Number:1724000049-EL-LIS-00030

Document Class: 3



ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
M. Gatti	05-02-25

Rev.	Date	Description	Prepared	Reviewed	Approved
3	17/12/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
2	21/11/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
1	14/10/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
0	08/07/2024	Issue for Information (IFI)	P.C.	A.O.	A.C.

ALEXSISTEMI spa

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1	Cover	X	X	X	X				
2	Table of Contents	X	X	X	X				
3	Revision / Change Log	X	X	X	X				
4	B-100 HVAC ELECTRICAL LOAD LIST	X	X	X	X				

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Rev.	Description
00	ISSUE FOR INFORMATION (IFI)
01	ISSUE FOR INFORMATION (IFI)
02	ISSUE FOR INFORMATION (IFI)
03	ISSUE FOR INFORMATION (IFI)

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	B-100 LOAD LISTS - E&I SHELTERS	Sh. 4 of 4 Date: 17/12/2024 Rev. 3

B-100 HVAC ELECTRICAL LOAD LIST

NOTE	1	2	3	4	5	6	7	8	9		10	11	12						
NO. Pos.	TAG	DESCRIPTION	ITEM TAG	MANUFAC-	TYPE TYPE	STA Mode	RATED VOLTAGE (V)	RATED CURRENT (A)	RATED SPEED (RPM)	Efficiency	PH	POWER FACTOR	RATED POWER kW	ALL LOADS						REMARKS
														CONTINUOUS		ON DEMAND		STAND BY		
														KW	A	KW	A	KW	A	
01	HHU-77001	PRESSURIZING FAN	HFM-77-101	MORO	MIS	C	400	1,28	1450	74,7	3	0,85	0,75	0,75	1,28					VSD
		ELECTRICAL HEATER	HSS-77-101	DIAMANTI	N	OD	400	14,45	NA	100	3	1	10,00			10,00	14,43			--
02	HHU-77002	PRESSURIZING FAN	HFM-77-102	MORO	MIS	SB	400	1,28	1450	74,7	3	0,85	0,75					0,75	1,28	VSD
		ELECTRICAL HEATER	HSS-77-102	DIAMANTI	N	SB	400	14,45	NA	100	3	1	10,00					10,00	14,45	--
03	HHS-77-001	SPACE HEATER	HHS-77-001	KRAEMER & KRAUS	N	OD	230	8,70	NA	100	1	1	2,00			2,00	8,70			PHASE R - N
	HHS-77-002	SPACE HEATER	HHS-77-002	KRAEMER & KRAUS	N	OD	230	8,70	NA	100	1	1	2,00			2,00	8,70			PHASE S - N
	HHS-77-003	SPACE HEATER	HHS-77-003	KRAEMER & KRAUS	N	SB	230	8,70	NA	100	1	1	2,00					2,00	8,70	PHASE T - N
	PECW-B100H-F1-L1-01/02	SHELTER CIRCUITT LIGHT	PECW-B100H-F1-L1-01/02	DISANO	N	OD	230	2,17	NA	NA	1	0,8	0,50			0,40	1,74			PHASE R - N
	PESO-B100H-F2-L2-01	SHELTER CIRCUIT SOCKET	PESO-B100H-F2-L2-01	SCAME	N	OD	230	6,52	NA	NA	1	0,8	1,50			1,20	5,22			PHASE S - N
04	HHC-77-001	HEATING CABLE	HHC-77-001	ETELEC	N	OD	230	0,70	NA	NA	1	1	0,12			0,12	0,70			PHASE T - N
														CONTINUOUS		ON DEMAND		STAND BY		
				,										kW		kW		kW		
														0,75		13,22		12,75		TOTAL KW

CURRENT PICK LOAD		POWER PICK LOAD	
29,62	A	16,47	kW

TOTAL LOADS BY PHASE						
A	1,28	A	21,26	A	15,73	PHASE R - N
A	1,28	A	24,74	A	15,73	PHASE S - N
A	1,28	A	11,35	A	24,42	PHASE T - N

1 Short designation as per numbering system shall be recorded

2 The description of the equipment/consumer to be recorded

3 Location of the equipment/consumer to be installed shall be recorded

4 Maker of the equipment /consumer to be recorded

5 Type of the equipment /consumer, to be recorded

- Synchronous Type Motor: MS
- Induction Squirrel Cage Type Motor: MIS
- Induction Wound Type Motor: MIW
- Non motor: N

6 Operation mode of the equipment/consumer to be recorded

- Continuous operation : C
- Intermittent operation : I (CONSIDERE AT 75% OF TOTAL LOAD)
- Infrequent operation (Start up or maintenance, etc.) : IF
- On demand : OD
- Stand by operation : SB

7 Rated voltage of the equipment/consumer

8 Rated current for the motor to be recorded

9 Rated speed for the motor to be recorded

10 Phase for the equipment/consumer shall be recorded

11 Power factor of the equipment/consumer to be recorded

12 Rated output shall be recorded

C.S. CONSTRUCTOR STANDARD

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Base Load Power Hub (BLPH)

B-200 LOAD LISTS - E&I SHELTERS

Document Number:1724000049-EL-LIS-00031

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	05-02-25

Rev.	Date	Description	Prepared	Reviewed	Approved
3	17/12/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
2	21/11/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
1	14/10/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
0	08/07/2024	Issue for Information (IFI)	P.C.	A.O.	A.C.

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1	Cover	X	X	X	X				
2	Table of Contents	X	X	X	X				
3	Revision / Change Log	X	X	X	X				
4	B-200 HVAC ELECTRICAL LOAD LIST	X	X	X	X				

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Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)
01	ISSUE FOR INFORMATION (IFI)
02	ISSUE FOR INFORMATION (IFI)
03	ISSUE FOR INFORMATION (IFI)

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B-200 HVAC ELECTRICAL LOAD LIST

NOTE	1	2	3	4	5	6	7	8	9		10	11	12							
NO. Pos.	TAG	DESCRIPTION	ITEM TAG	MANUFAC-	TYPE TYPE	STA Mode	RATED VOLTAGE (V)	RATED CURRENT (A)	RATED SPEED (RPM)	Efficiency	PH	POWER FACTOR	RATED POWER kW	CONSUMED LOAD						REMARKS
														CONTINUOUS		ON DEMAND		STAND BY		
														kW	A	kW	A	kW	A	
01	HHU-77003	PRESSURIZING FAN	HFM-77-201	MORO	MIS	C	400	1,28	1450	74,7	3	0,85	0,75	0,75	1,28					VSD
		ELECTRICAL HEATER	HSS-77-201	DIAMANTI	N	OD	400	12,28	NA	100	3	1	8,50			8,50	12,27			--
02	HHU-77004	PRESSURIZING FAN	HFM-77-202	MORO	MIS	SB	400	1,28	1450	74,7	3	0,85	0,75					0,75	1,28	VSD
		ELECTRICAL HEATER	HSS-77-202	DIAMANTI	N	SB	400	12,28	NA	100	3	1	8,50					8,50	12,27	--
03	HHS-77-004	SPACE HEATER	HHS-77-004	KRAEMER & KRAUS	N	OD	230	8,70	NA	100	1	1	2,00			2,00	8,70			PHASE R - N
	HHS-77-005	SPACE HEATER	HHS-77-005	KRAEMER & KRAUS	N	OD	230	8,70	NA	100	1	1	2,00			2,00	8,70			PHASE S - N
	HHS-77-006	SPACE HEATER	HHS-77-006	KRAEMER & KRAUS	N	SB	230	8,70	NA	100	1	1	2,00					2,00	8,70	PHASE T - N
	PECW-B200H-F1-L1-01	SHELTER CIRCUITT LIGHT	PECW-B200H-F1-L1-01	DISANO	N	OD	230	2,17	NA	NA	1	0,8	0,50			0,40	1,74			PHASE R - N
	PESO-B200H-F2-L2-01	SHELTER CIRCUIT SOCKET	PESO-B200H-F2-L2-01	SCAME	N	OD	230	6,52	NA	NA	1	0,8	1,50			1,20	5,22			PHASE S - N
04	HHC-77-002	HEATING CABLE	HHC-77-002	ETELEC	N	OD	230	1,00	NA	NA	1	1	0,20			0,20	1,00			PHASE T - N
														CONTINUOUS		ON DEMAND		STAND BY		
														kW		kW		kW		
														0,75		14,30		11,25		TOTAL KW

CURRENT PICK LOAD		POWER PICK LOAD		TOTAL LOADS BY PHASE						
				A	1,28	A	19,64	A	13,55	PHASE R - N
27,46	A	15,05	kW	A	1,28	A	23,11	A	13,55	PHASE S - N
				A	1,28	A	9,95	A	22,24	PHASE T - N

1 Short designation as per numbering system shall be recorded

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4 Maker of the equipment /consumer to be recorded

5 Type of the equipment /consumer, to be recorded

- Synchronous Type Motor: MS
- Induction Squirrel Cage Type Motor: MIS
- Induction Wound Type Motor: MIW
- Non motor: N

6 Operation mode of the equipment/consumer to be recorded

- Continuous operation : C
- Intermittent operation : I (CONSIDERE AT 75% OF TOTAL LOAD)
- Infrequent operation (Start up or maintenance, etc.) : IF
- On demand : OD
- Stand by operation : SB

7 Rated voltage of the equipment/consumer

8 Rated current for the motor to be recorded

9 Rated speed for the motor to be recorded

10 Phase for the equipment/consumer shall be recorded

11 Power factor of the equipment/consumer to be recorded

12 Rated output shall be recorded

C.S. CONSTRUCTOR STANDARD

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Base Load Power Hub (BLPH)

B-300 LOAD LISTS - E&I SHELTERS

Document Number:1724000049-EL-LIS-00032

Document Class: 3

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
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M. Gatti	05-02-25

Rev.	Date	Description	Prepared	Reviewed	Approved
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1	14/10/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
0	08/07/2024	Issue for Information (IFI)	P.C.	A.O.	A.C.

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3	Revision / Change Log	X	X	X	X				
4	B-300 HVAC ELECTRICAL LOAD LIST	X	X	X	X				

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Revision / Change Log

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02	ISSUE FOR INFORMATION (IFI)
03	ISSUE FOR INFORMATION (IFI)

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B-300 HVAC ELECTRICAL LOAD LIST

NOTE	1	2	3	4	5	6	7	8	9		10	11	12							
NO. Pos.	TAG	DESCRIPTION	ITEM TAG	MANUFAC-	TYPE TYPE	STA Mode	RATED VOLTAGE (V)	RATED CURRENT (A)	RATED SPEED (RPM)	Efficiency	PH	POWER FACTOR	RATED POWER kW	CONSUMED LOAD						REMARKS
														CONTINUOUS		ON DEMAND		STAND BY		
														kW	A	kW	A	kW	A	
01	HHU-77005	PRESSURIZING FAN	HFM-77-301	MORO	MIS	C	400	0,85	1450	70,3	3	0,85	0,50	0,35	0,60					VSD
		COMPRESSOR	HCO-77-301	PANASONIC	MIS	C	400	9,86	3450	NA	3	0,85	5,80	3,80	7,30					
		SUPPLY FAN	HFM-77-302	NICOTRA	MIS	C	400	5,10	1465	82,6	3	0,85	3,00	2,48	4,22					
		ELECTRICAL HEATER	HSS-77-301	DIAMANTI	N	OD	400	8,67	NA	100	3	1	6,00			6,00	8,67			
		CONDENSER FAN 1	HFM-77-305	ELEKTROVENT	MIS	C	400	0,85	1500	70,3	3	0,85	0,50	0,35	0,60					VSD
		CONDENSER FAN 2	HFM-77-306	ELEKTROVENT	MIS	C	400	0,85	1500	70,3	3	0,85	0,50	0,35	0,60					VSD
		MOTORISED DAMPERS	HDZ-77-301/2/3	LUFBERG	N	C	230	1,30	NA	NA	1	1	0,30	0,25	0,63					
02	HHU-77006	PRESSURIZING FAN	HFM-77-303	MORO	MIS	SB	400	0,85	1450	70,3	3	0,85	0,50					0,35	0,60	VSD
		COMPRESSOR	HCO-77-302	PANASONIC	MIS	SB	400	9,86	3450	NA	3	0,85	5,80					3,80	7,30	
		SUPPLY FAN	HFM-77-304	NICOTRA	MIS	SB	400	5,10	1465	82,6	3	0,85	3,00					2,48	4,22	
		ELECTRICAL HEATER	HSS-77-305	DIAMANTI	N	SB	400	8,67	NA	100	3	1	6,00					6,00	8,67	
		CONDENSER FAN 1	HFM-77-307	ELEKTROVENT	MIS	SB	400	0,85	1500	70,3	3	0,85	0,50					0,35	0,60	VSD
		CONDENSER FAN 2	HFM-77-308	ELEKTROVENT	MIS	SB	400	0,85	1500	70,3	3	0,85	0,50					0,35	0,60	VSD
		MOTORISED DAMPERS	HDZ-77-304/5/6	LUFBERG	N	SB	230	1,30	NA	NA	1	1	0,30					0,25	0,63	
03	HHS-77-007	SPACE HEATER	HHS-77-007	KRAEMER & KRAUS	N	OD	230	8,70	NA	100	1	1	2,00			2,00	8,70			PHASE R - N
04	HHS-77-008	SPACE HEATER	HHS-77-008	KRAEMER & KRAUS	N	OD	230	2,89	NA	100	1	1	2,00			2,00	8,70			PHASE S - N
05	HHS-77-009	SPACE HEATER	HHS-77-009	KRAEMER & KRAUS	N	SB	230	2,89	NA	100	1	1	2,00					2,00	8,70	PHASE T - N
06	PECW-B300H-F1-L1-01	SHELTER CIRCUITT LIGHT	PECW-B300H-F1-L1-01	DISANO	N	OD	230	0,72	NA	NA	1	0,8	0,50			0,45	0,65			PHASE R - N
07	PESO-B300H-F2-L2-01	SHELTER CIRCUIT SOCKET	PESO-B300H-F2-L2-01	SCAME	N	OD	230	2,16	NA	NA	1	0,8	1,50			1,35	1,95			PHASE S - N
08	HHC-77-003	HEATING CABLE	HHC-77-003	ETELEC	N	OD	230	1,20	NA	NA	1	1	0,25			0,25	1,20			PHASE T - N
														CONTINUOUS		ON DEMAND		STAND BY		
														kW		kW		kW		
														7,58		10,55		15,58		

CURRENT PICK LOAD		POWER PICK LOAD		TOTAL LOADS BY PHASE						
				A	13,93	A	15,85	A	22,60	PHASE R - N
24,75	A	15,13	kW	A	13,93	A	17,15	A	22,60	PHASE S - N
				A	13,93	A	7,40	A	31,30	PHASE T - N

1 Short designation as per numbering system shall be recorded

2 The description of the equipment/consumer to be recorded

3 Location of the equipment/consumer to be installed shall be recorded

4 Maker of the equipment /consumer to be recorded

5 Type of the equipment /consumer, to be recorded

- Synchronous Type Motor: MS
- Induction Squirrel Cage Type Motor: MIS
- Induction Wound Type Motor: MIW
- Non motor: N

6 Operation mode of the equipment/consumer to be recorded

- Continuous operation : C
- Intermittent operation : I (CONSIDERE AT 75% OF TOTAL LOAD)
- Infrequent operation (Start up or maintenance, etc.) : IF
- On demand : OD
- Stand by operation : SB

7 Rated voltage of the equipment/consumer

8 Rated current for the motor to be recorded

9 Rated speed for the motor to be recorded

10 Phase for the equipment/consumer shall be recorded

11 Power factor of the equipment/consumer to be recorded

12 Rated output shall be recorded

C.S. CONSTRUCTOR STANDARD

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Base Load Power Hub (BLPH)

B-400 LOAD LISTS - E&I SHELTERS

Document Number:1724000049-EL-LIS-00033

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	05-02-25

Rev.	Date	Description	Prepared	Reviewed	Approved
3	17/12/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
2	21/11/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
1	14/10/2024	Issue for Information (IFI)	M.G.	A.O.	A.C.
0	08/07/2024	Issue for Information (IFI)	P.C.	A.O.	A.C.

ALEXSISTEMI spa

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1	Cover	X	X	X	X				
2	Table of Contents	X	X	X	X				
3	Revision / Change Log	X	X	X	X				
4	B-400 HVAC ELECTRICAL LOAD LIST	X	X	X	X				

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Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)
01	ISSUE FOR INFORMATION (IFI)
02	ISSUE FOR INFORMATION (IFI)
03	ISSUE FOR INFORMATION (IFI)

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	B-400 LOAD LISTS - E&I SHELTERS	Sh. 4 of 4 Date: 17/12/2024 Rev. 3

B-400 HVAC ELECTRICAL LOAD LIST

NOTE	1	2	3	4	5	6	7	8	9			10	11	12						
NO. Pos.	UNIT TAG	DESCRIPTION	ITEM TAG	MANUFAC-	TYPE TYPE	STA Mode	RATED VOLTAGE (V)	RATED CURRENT (A)	RATED SPEED (RPM)	Efficiency	PH	POWER FACTOR	RATED POWER kW	CONSUMED LOAD						REMARKS
														CONTINUOUS		ON DEMAND		STAND BY		
														kW	A	kW	A	kW	A	
1	HHU-77007	PRESSURIZING FAN	HFM-77-401	MORO	MIS	C	400	0,85	1450	70,3	3	0,85	0,5	0,35	0,6					VSD
		COMPRESSOR	HCO-77-401	PANASONIC	MIS	C	400	16,8	3450	NA	3	0,85	9,8	6,21	11,5					
		SUPPLY FAN	HFM-77-402	NICOTRA	MIS	C	400	5,1	1465	82,6	3	0,85	3	2,48	4,22					
		ELECTRICAL HEATER	HSS-77-401	DIAMANTI	N	OD	400	13,01	NA	100	3	1	9			9	13,01			
		CONDENSER FAN 1	HFM-77-405	ELEKTROVENT	MIS	C	400	0,85	1500	70,3	3	0,85	0,5	0,35	0,6					VSD
		CONDENSER FAN 2	HFM-77-406	ELEKTROVENT	MIS	C	400	0,85	1500	70,3	3	0,85	0,5	0,35	0,6					VSD
		MOTORISED DAMPERS	HDZ-77-401/2/3	LUFBERG	N	C	230	1,3	NA	NA	1	1	0,3	0,25	0,63					PHASE R - N
2	HHU-77008	PRESSURIZING FAN	HFM-77-403	MORO	MIS	SB	400	0,85	1450	70,3	3	0,85	0,5					0,35	0,6	VSD
		COMPRESSOR	HCO-77-402	PANASONIC	MIS	SB	400	16,8	3450	NA	3	0,85	9,8					6,21	11,5	
		SUPPLY FAN	HFM-77-404	NICOTRA	MIS	SB	400	5,1	1465	82,6	3	0,85	3					2,48	4,22	
		ELECTRICAL HEATER	HSS-77-405	DIAMANTI	N	SB	400	13,01	NA	100	3	1	9					9	13,01	
		CONDENSER FAN 1	HFM-77-407	ELEKTROVENT	MIS	SB	400	0,85	1500	70,3	3	0,85	0,5					0,35	0,6	VSD
		CONDENSER FAN 2	HFM-77-408	ELEKTROVENT	MIS	SB	400	0,85	1500	70,3	3	0,85	0,5					0,35	0,6	VSD
		MOTORISED DAMPERS	HDZ-77-404/5/6	LUFBERG	N	SB	230	1,3	NA	NA	1	1	0,3					0,25	0,63	PHASE R - N
3	HHS-77-010	SPACE HEATER	HHS-77-010	KRAEMER & KRAUS	N	OD	230	2,89	NA	100	1	1	2			2	8,7			PHASE R - N
4	HHS-77-011	SPACE HEATER	HHS-77-011	KRAEMER & KRAUS	N	OD	230	2,89	NA	100	1	1	2			2	8,7			PHASE S - N
5	HHS-77-012	SPACE HEATER	HHS-77-012	KRAEMER & KRAUS	N	SB	230	2,89	NA	100	1	1	2					2	8,7	PHASE T - N
6	PECW-B400H-F1-L1-01	SHELTER CIRCUITT LIGHT	PECW-B400H-F1-L1-01	DISANO	N	OD	230	0,72	NA	NA	1	0,8	0,5			0,45	0,65			PHASE R - N
7	PESO-B400H-F2-L2-01	SHELTER CIRCUIT SOCKET	PESO-B400H-F2-L2-01	SCAME	N	OD	230	2,16	NA	NA	1	0,8	1,5			1,35	1,95			PHASE S - N
8	HHC-77-004	HEATING CABLE	HHC-77-004	ETELEC	N	OD	230	1,1	NA	NA	1	1	0,2			0,2	1,1			PHASE T - N

	CONTINUOUS		ON DEMAND		STAND BY	
	kW		kW		kW	
	9,99		14,75		20,99	

CURRENT PICK LOAD		POWER PICK LOAD	
29,1	A	18,1	kW

TOTAL LOADS BY PHASE						
A	18,15	A	19,11	A	31,16	PHASE R - N
A	18,15	A	20,41	A	30,53	PHASE S - N
A	18,15	A	10,58	A	39,23	PHASE T - N

1 Short designation as per numbering system

2 The description of the equipment/consumer

3 Location of the equipment/consumer to be installed

4 Maker of the equipment /consumer

5 Type of the equipment /consumer

- Synchronous Type Motor: MS
- Induction Squirrel Cage Type Motor: MIS
- Induction Wound Type Motor: MIW
- Non motor: N

6 Operation mode of the equipment/consumer

- Continuous operation : C
- Intermittent operation : I (CONSIDERE AT 75% OF TOTAL LOAD)
- Infrequent operation (Start up or maintenance, etc.) : IF
- On demand : OD
- Stand by operation : SB

7 Rated voltage of the equipment/consumer

8 Rated current for the motor

9 Rated speed for the motor

10 Phase for the equipment/consumer

11 Power factor of the equipment/consumer

12 Rated output

C.S. CONSTRUCTOR STANDARD

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Base Load Power Hub (BLPH)

CABLE LIST - E&I SHELTERS

Document Number: 123A90-1724000049-EL-LIS-00034

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	14/07/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
3	18/06/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
2	28/11/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
1	31/10/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
0	04/07/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.

ALEXSISTEMI spa

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3	Revision / Change Log	X	X	X	X				
4	B-100 HVAC - CABLE LIST	X	X	X	X				
5	B-200 HVAC - CABLE LIST	X	X	X	X				
6	B-300 HVAC - CABLE LIST	X	X	X	X				
7	B-400 HVAC - CABLE LIST	X	X	X	X				

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B-100 HVAC - CABLE LIST

Pos.	n:° CABLE	CABLE CHARACTERISTICS				CABLE FROM:				CABLE TO:				JB TAG	CABLE LENGHT (m)	CABLE DIAMETER (mm)	CABLE TYPE	NOTE
		SECTION	TYPE	U_0/U (kV)	MATERIAL SHEAT	ITEM	CABLE GLAND	TAG	POSITION	ITEM	CABLE GLAND	TAG	POSITION					
a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	
1		5G16	Cu, EPR, Unarmoured	0,6/1,0	LSZH, Flame Retardant	by Client	by Client	by Client	by Client	HVAC PANEL	by Client	B100-HSB-001	inside B100	N.A.	by Client	24,00	LOW VOLTAGE	General power supply 400V 3ph+N+PE Cable supply by RM.
2		3G2.5	Cu, MGT, EPR, GSWB	0,6/1,0	LSZH, Fire Retardant	by Client	by Client	by Client	by Client	HVAC PANEL	by Client	B100-HSB-001	inside B100	N.A.	by Client	15,50	LOW VOLTAGE	UPS Power Supply 1ph+N+PE Cable supply by RM.
3	77101-CEL-L1	5G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	N.A.	B100-HSB-001	inside B100	BLINDO 1	M20	PECW-B100H-F1-L1-01	inside B100	N.A.	12,5	11,60	LOW VOLTAGE	
4	77102-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO 1	N.A.	PECW-B100H-F1-L1-01	inside B100	LAMP (E) 1	M20	PELF-B100H-F1-L1-01	inside B100	N.A.	0,5	10,80	LOW VOLTAGE	
5	77103-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO 1	N.A.	PECW-B100H-F1-L1-01	inside B100	LAMP 2	M20	PELF-B100H-F1-L1-02	inside B100	N.A.	0,5	9,80	LOW VOLTAGE	
6	77104-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO 1	N.A.	PECW-B100H-F1-L1-01	inside B100	LAMP 3	M20	PELF-B100H-F1-L1-03	inside B100	N.A.	0,5	9,80	LOW VOLTAGE	
7	77105-CEL-L1	5G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	N.A.	B100-HSB-001	inside B100	BLINDO 2	M20	PECW-B100H-F1-L1-02	inside B100	N.A.	16	11,60	LOW VOLTAGE	
8	77106-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO 2	N.A.	PECW-B100H-F1-L1-02	inside B100	LAMP 4	M20	PELF-B100H-F1-L1-04	inside B100	N.A.	0,5	9,80	LOW VOLTAGE	
9	77107-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO 2	N.A.	PECW-B100H-F1-L1-02	inside B100	LAMP 5	M20	PELF-B100H-F1-L1-05	inside B100	N.A.	0,5	9,80	LOW VOLTAGE	
10	77108-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO 2	N.A.	PECW-B100H-F1-L1-02	inside B100	LAMP 6	M20	PELF-B100H-F1-L1-06	inside B100	N.A.	0,5	9,80	LOW VOLTAGE	
11	77109-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO 2	N.A.	PECW-B100H-F1-L1-02	inside B100	LAMP (E) 7	M20	PELF-B100H-F1-L1-07	inside B100	N.A.	0,5	10,80	LOW VOLTAGE	
12	77110-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	MODULE SOCKET	M20	PESO-B100H-F2-L2-01	inside B100	N.A.	14	9,80	LOW VOLTAGE	
13	77101-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	MODULE SWITCH 1	M20	CELS-B100H-F1-L1-01	inside B100	N.A.	18,5	8,20	CONTROL	
14	77102-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	MODULE SWITCH 2	M20	CELS-B100H-F1-L1-02	inside B100	N.A.	16	8,20	CONTROL	
15	77111-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	SPACE HEATER 1	M20	HHS-77-001	inside B100	N.A.	13	9,80	LOW VOLTAGE	
16	77112-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	SPACE HEATER 2	M20	HHS-77-002	inside B100	N.A.	14,5	9,80	LOW VOLTAGE	
17	77113-CEL-L3	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	SPACE HEATER 3	M20	HHS-77-003	inside B100	N.A.	16	9,80	LOW VOLTAGE	
18	77114-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PRESSURIZING FAN 1	M20	HFM-77-101	HHU-77001	HJB-77001-A	7	10,80	LOW VOLTAGE	
19	77115-CEL-L1	4G6	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B100-HSB-001	inside B100	ELECTRICAL HEATER 1	M25	HSS-77-101	HHU-77001	HJB-77001-A	7	13,80	LOW VOLTAGE	
20	77116-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PRESSURIZING FAN 2	M20	HFM-77-102	HHU-77002	HJB-77002-A	10	10,80	LOW VOLTAGE	
21	77117-CEL-L1	4G6	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B100-HSB-001	inside B100	ELECTRICAL HEATER 2	M25	HSS-77-102	HHU-77002	HJB-77002-A	10	13,80	LOW VOLTAGE	
22		TBA	by Client	0,6/1,0	by Client	SIS	by Client	by Client	by Client	HVAC PANEL	by Client	B100-HSB-001	inside B100		by Client	0,00	by Client	Cable supply by RM.
23		TBA	by Client	0,6/1,0	by Client	SIS	by Client	by Client	by Client	HVAC PANEL	by Client	B100-HSB-001	inside B100		by Client	0,00	by Client	Cable supply by RM.
24		TBA	by Client	0,6/1,0	by Client	PCS	by Client	by Client	by Client	HVAC PANEL	by Client	B100-HSB-001	inside B100		by Client	0,00	by Client	Cable supply by RM.
25	77103-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PRESSURIZING FAN1 MOTOR PTC	M20	TE-77-101	HHU-77001	HJB-77001-B	7	8,20	CONTROL	
26	77104-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PRESSURIZING FAN 1 EMERGENCY BUTTON	M20	HPB-77-101	HHU-77001	HJB-77001-B	7	8,20	CONTROL	
27	77105-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	ELECTRICAL HEATER 1 PROTECTION THERMOSTATE	M20	TSH/TSHH-77-101	HHU-77001	HJB-77001-B	7	8,20	CONTROL	
28	77106-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PRESSURIZING FAN 1 MOTOR HEATER	M20	HSS-77-103	HHU-77001	HJB-77001-B	7	8,20	CONTROL	
29	77120-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PDT - FAN 1 FILTERS DIFFERENTIAL PRESSURE TRASMITTER	M20	PDT-77-101	HHU-77001	HJB-77001-B	7	11,10	CONTROL	
30	77121-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PDSL - FAN 1 DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	M20	PDSL-77-101	HHU-77001	HJB-77001-B	7	8,20	CONTROL	
31	77118-CEL-L2	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-101	HHU-77001	HJB-77001-A	7	9,80	LOW VOLTAGE	
32	77111-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	SIGNAL MOTORISED DAMPER	M20	HDZ-77-101	HHU-77001	HJB-77001-B	7	9,70	CONTROL	
33	77107-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PRESSURIZING FAN 2 MOTOR PTC	M20	TE-77-102	HHU-77002	HJB-77002-B	10	8,20	CONTROL	
34	77108-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PRESSURIZING FAN 2 EMERGENCY BUTTON	M20	HPB-77-102	HHU-77002	HJB-77002-B	10	8,20	CONTROL	
35	77109-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	ELECTRICAL HEATER 2 PROTECTION THERMOSTATE	M20	TSH/TSHH-77-102	HHU-77002	HJB-77002-B	10	8,20	CONTROL	
36	77110-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PRESSURIZING FAN 2 MOTOR HEATER	M20	HSS-77-104	HHU-77002	HJB-77002-B	10	8,20	CONTROL	
37	77122-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PDT - FAN 2 FILTERS DIFFERENTIAL PRESSURE TRASMITTER	M20	PDT-77-102	HHU-77002	HJB-77002-B	10	11,10	CONTROL	
38	77123-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	PDSL - FAN 2 DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	M20	PDSL-77-102	HHU-77002	HJB-77002-B	10	8,20	CONTROL	
39	77119-CEL-L2	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-102	HHU-77002	HJB-77002-A	10	9,80	LOW VOLTAGE	
40	77112-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	SIGNAL MOTORISED DAMPER	M20	HDZ-77-102	HHU-77002	HJB-77002-B	10	9,70	CONTROL	
41	77123-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	TEMPERATURE TRASMITTER 1	M20	77-TT-101	inside B100	N.A.	11,5	11,10	CONTROL	
42	77124-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	TEMPERATURE TRASMITTER 2	M20	77-TT-102	inside B100	N.A.	15,5	11,10	CONTROL	
43	77126-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	TEMPERATURE TRASMITTER 3	M20	77-TT-103	inside B100	N.A.	15	11,10	CONTROL	Mounted on internal sleeve
44	77127-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	TEMPERATURE TRASMITTER 4	M20	77-TT-104	inside B100	N.A.	18	11,10	CONTROL	Mounted on internal sleeve
45	77125-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	DIFFERENTIAL PRESSURE TRASMITTER	M20	77-TP-101	inside B100	N.A.	2	11,10	CONTROL	
46	77113-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	Fire and Gas Damper (included actuator)	M20	HFD-77001	inside B100	N.A.	12	9,70	CONTROL	
47	77114-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	Fire and Gas Damper (included actuator)	M20	HFD-77002	inside B100	N.A.	15	9,70	CONTROL	
48	77115-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	Fire and Gas Damper (included actuator)	M20	HFD-77003	inside B100	N.A.	18	9,70	CONTROL	
49	77160-CEC-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B100-HSB-001	inside B100	HEATING CABLE	M20	HHC-77-001	outside B100	HJB-77009	10	9,80	LOW VOLTAGE	

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B-200 HVAC - CABLE LIST

Posizione	n:° CABLE	CABLE CHARACTERISTICS				CABLE FROM:				CABLE TO:				JB TAG	CABLE LENGHT (m)	CABLE DIAMETER (mm)	CABLE TYPE	NOTE
		SECTION	TIPE	U_0/U (kV)	MATERIAL SHEAT	ITEM	CABLE GLAND	TAG	POSITION	ITEM	CABLE GLAND	TAG	POSITION					
a	a	a	a	a		a	a	a	a	a	a	a	a	a	a	a	a	
1		5G16	Cu, EPR, Unarmoured	0,6/1,0	LSZH, Flame Retardant	by Client	by Client	by Client	by Client	HVAC PANEL	by Client	B200-HSB-001	inside B200	N.A.	by Client	24,00	LOW VOLTAGE	General power supply 400V 3ph+N+PE Cable supply by RM.
2		3G2.5	Cu, MGT, EPR, GSWB	0,6/1,0	LSZH, Fire Retardant	by Client	by Client	by Client	by Client	HVAC PANEL	by Client	B200-HSB-001	inside B200	N.A.	by Client	15,50	LOW VOLTAGE	UPS Power Supply 1ph+N+PE Cable supply by RM
3	77201-CEL-L1	5G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	N.A.	B200-HSB-001	inside B200	BLINDO	M20	PECW-B200H-F1-L1-01	inside B200	N.A.	12,5	11,60	LOW VOLTAGE	
4	77202-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B200H-F1-L1-01	inside B200	LAMP (E) 2	M20	PELF-B200H-F1-L1-01	inside B200	N.A.	0,5	10,80	LOW VOLTAGE	
5	77203-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B200H-F1-L1-01	inside B200	LAMP 1	M20	PELF-B200H-F1-L1-02	inside B200	N.A.	0,5	9,80	LOW VOLTAGE	
6	77204-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B200H-F1-L1-01	inside B200	LAMP 3	M20	PELF-B200H-F1-L1-03	inside B200	N.A.	0,5	9,80	LOW VOLTAGE	
7	77205-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	MODULE SOCKET	M20	PESO-B200H-F2-L2-01	inside B200	N.A.	14,5	9,80	LOW VOLTAGE	
8	77201-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	MODULE SWITCH 1	M20	CELS-B200H-F1-L1-01	inside B200	N.A.	14,5	8,20	CONTROL	
9	77202-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	MODULE SWITCH 2	M20	CELS-B200H-F1-L1-02	inside B200	N.A.	14	8,20	CONTROL	
10	77206-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	SPACE HEATER	M20	HHS-77-004	inside B200	N.A.	11	9,80	LOW VOLTAGE	
11	77207-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	SPACE HEATER	M20	HHS-77-005	inside B200	N.A.	12,5	9,80	LOW VOLTAGE	
12	77208-CEL-L3	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	SPACE HEATER	M20	HHS-77-006	inside B200	N.A.	14	9,80	LOW VOLTAGE	
13	77209-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PRESSURIZING FAN1	M20	HFM-77-201	HHU-77003	HJB-77003-A	20	10,80	LOW VOLTAGE	
14	77210-CEL-L1	4G6	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B200-HSB-001	inside B200	ELECTRICAL HEATER	M25	HSS-77-201	HHU-77003	HJB-77003-A	20	13,80	LOW VOLTAGE	
15	77211-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PRESSURIZING FAN2	M20	HFM-77-202	HHU-77004	HJB-77004-A	15	10,80	LOW VOLTAGE	
16	77212-CEL-L1	4G6	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B200-HSB-001	inside B200	ELECTRICAL HEATER	M25	HSS-77-202	HHU-77004	HJB-77004-A	15	13,80	LOW VOLTAGE	
17		TBA	by Client	0,6/1,0	by Client	SIS	by Client	by Client	by Client	HVAC PANEL	by Client	B200-HSB-001	inside B200	N.A.	by Client	0,00	by Client	Cable supply by RM.
18		TBA	by Client	0,6/1,0	by Client	SIS	by Client	by Client	by Client	HVAC PANEL	by Client	B200-HSB-001	inside B200	N.A.	by Client	0,00	by Client	Cable supply by RM.
19		TBA	by Client	0,6/1,0	by Client	PCS	by Client	by Client	by Client	HVAC PANEL	by Client	B200-HSB-001	inside B200	N.A.	by Client	0,00	by Client	Cable supply by RM.
20	77203-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PRESSURIZING FAN1 MOTOR PTC	M20	TE-77-201	HHU-77003	HJB-77003-B	20	8,20	CONTROL	
21	77204-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PRESSURIZING FAN 1 EMERGENCY BUTTON	M20	HPB-77-201	HHU-77003	HJB-77003-B	20	8,20	CONTROL	
22	77205-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	ELECTRICAL HEATER 1 PROTECTION THERMOSTATE	M20	TSH/TSHH-77-201	HHU-77003	HJB-77003-B	20	8,20	CONTROL	
23	77206-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PRESSURIZING FAN 1 MOTOR HEATER	M20	HSS-77-203	HHU-77003	HJB-77003-B	20	8,20	CONTROL	
24	77221-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PDT - FAN 1 FILTERS DIFFERENTIAL PRESSURE TRASMITTER	M20	PDT-77-201	HHU-77003	HJB-77003-B	20	11,10	CONTROL	
25	77222-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PDSL - FAN 1 DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	M20	PDSL-77-201	HHU-77003	HJB-77003-B	20	8,20	CONTROL	
26	77207-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PRESSURIZING FAN 2 MOTOR PTC	M20	TE-77-202	HHU-77004	HJB-77004-B	15	8,20	CONTROL	
27	77208-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PRESSURIZING FAN 2 EMERGENCY BUTTON	M20	HPB-77-202	HHU-77004	HJB-77004-B	15	8,20	CONTROL	
28	77213-CEL-L2	3G1,5	XLPE/UNEL S2	by Client	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-201	HHU-77003	HJB-77003-A	20	9,80	LOW VOLTAGE	
29	77216-CEC-L2	4x1,5	XLPE/UNEL S2	by Client	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	SIGNAL MOTORISED DAMPER	M20	HDZ-77-201	HHU-77003	HJB-77003-B	20	9,70	CONTROL	
30	77209-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	ELECTRICAL HEATER 2 PROTECTION THERMOSTATE	M20	TSH/TSHH-77-202	HHU-77004	HJB-77004-B	15	8,20	CONTROL	
31	77210-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PRESSURIZING FAN 2 MOTOR HEATER	M20	HSS-77-204	HHU-77004	HJB-77004-B	15	8,20	CONTROL	
32	77223-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PDT - FAN 2 FILTERS DIFFERENTIAL PRESSURE TRASMITTER	M20	PDT-77-202	HHU-77004	HJB-77004-B	15	11,10	CONTROL	
33	77224-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	PDSL - FAN 2 DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	M20	PDSL-77-202	HHU-77004	HJB-77004-B	15	8,20	CONTROL	
34	77214-CEL-L2	3G1,5	XLPE/UNEL S2	by Client	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-202	HHU-77004	HJB-77004-A	15	9,80	LOW VOLTAGE	
35	77217-CEC-L2	4x1,5	XLPE/UNEL S2	by Client	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	SIGNAL MOTORISED DAMPER	M20	HDZ-77-202	HHU-77004	HJB-77004-B	15	9,70	CONTROL	
36	77225-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	TEMPERATURE TRASMITTER 1	M20	77-TT-201	inside B200	N.A.	11	11,10	CONTROL	
37	77226-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	TEMPERATURE TRASMITTER 2	M20	77-TT-202	inside B200	N.A.	14	11,10	CONTROL	
38	77227-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	TEMPERATURE TRASMITTER 3	M20	77-TT-203	inside B200	N.A.	11	11,10	CONTROL	Mounted on internal sleeve
39	77228-CEC-L2	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	TEMPERATURE TRASMITTER 4	M20	77-TT-204	inside B200	N.A.	12	11,10	CONTROL	Mounted on internal sleeve
40	C-77-TP-201/B100-HSB-001	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	DIFFERENTIAL PRESSURE TRASMITTER	M20	77-TP-201	inside B200	N.A.	11	11,10	CONTROL	
41	77218-CEC-L2	4x1,5	XLPE/UNEL S2	by Client	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	Fire and Gas Damper (included actuator)	M20	HFD-77004	inside B200	N.A.	15	9,70	CONTROL	
42	77219-CEC-L2	4x1,5	XLPE/UNEL S2	by Client	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	Fire and Gas Damper (included actuator)	M20	HFD-77005	inside B200	N.A.	12	9,70	CONTROL	
43	77220-CEC-L2	4x1,5	XLPE/UNEL S2	by Client	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	Fire and Gas Damper (included actuator)	M20	HFD-77006	inside B200	N.A.	11	9,70	CONTROL	
44	77260-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B200-HSB-001	inside B200	HEATING CABLE	M20	HHC-77-002	outside B200	HJB-77010	20	9,80	LOW VOLTAGE	

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B-300 HVAC - CABLE LIST

POS.	n:° CABLE	CABLE CHARACTERISTICS				CABLE FROM:				CABLE TO:				JB TAG	CABLE LENGHT (m)	CABLE DIAMETER (mm)	CABLE TYPE	NOTE
		SECTION	TIPE	U_0/U (kV)	MATERIAL SHEAT	ITEM	CABLE GLAND	TAG	POSITION	ITEM	CABLE GLAND	TAG	POSITION					
a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	
1		5G16	Cu, EPR, Unarmoured	0,6/1,0	LSZH, Flame Retardant	by Client	by Client	by Client	by Client	HVAC PANEL	by Client	B300-HSB-001	inside B300	N.A.	by Client	24,00	LOW VOLTAGE	General power supply 400V 3ph+N+PE Cable supply by RM.
2		3G2.5	Cu, MGT, EPR, GSWB	0,6/1,0	LSZH, Fire Retardant	by Client	by Client	by Client	by Client	HVAC PANEL	by Client	B300-HSB-001	inside B300	N.A.	by Client	15,50	LOW VOLTAGE	UPS Power Supply 230V 1ph+N+PE Cable supply by RM.
3	77301-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SPACE HEATER 1	M20	HHS-77-007	inside B300	N.A.	12,5	9,80	LOW VOLTAGE	
4	77302-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SPACE HEATER 2	M20	HHS-77-008	inside B300	N.A.	15	9,80	LOW VOLTAGE	
5	77303-CEL-L3	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SPACE HEATER 3	M20	HHS-77-009	inside B300	N.A.	19,5	9,80	LOW VOLTAGE	
6	77304-CEL-L1	5G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	BLINDO	M20	PECW-B300H-F1-L1-01	inside B300	N.A.	9	11,60	LOW VOLTAGE	
7	77305-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B300H-F1-L1-01	inside B300	LAMP (E) 2	M20	PELF-B300H-F1-L1-01	inside B300	N.A.	0,5	10,80	LOW VOLTAGE	
8	77306-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B300H-F1-L1-01	inside B300	LAMP 1	M20	PELF-B300H-F1-L1-02	inside B300	N.A.	0,5	9,80	LOW VOLTAGE	
9	77307-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B300H-F1-L1-01	inside B300	LAMP 3	M20	PELF-B300H-F1-L1-03	inside B300	N.A.	0,5	9,80	LOW VOLTAGE	
10	77308-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	MODULE SOCKET	M20	PESO-B300H-F2-L2-01	inside B300	N.A.	8,5	9,80	LOW VOLTAGE	
11	77301-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	MODULE SWITCH 1	M20	CELS-B300H-F1-L1-01	inside B300	N.A.	17	8,20	CONTROL	
12	77302-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	MODULE SWITCH 2	M20	CELS-B300H-F1-L1-02	inside B300	N.A.	12	8,20	CONTROL	
13		TBA	by Client	0,6/1,0	by Client	SIS	by Client	by Client	by Client	HVAC PANEL	by Client	B300-HSB-001	inside B300	N.A.	by Client	0,00	by Client	Cable supply by RM.
14		TBA	by Client	0,6/1,0	by Client	SIS	by Client	by Client	by Client	HVAC PANEL	by Client	B300-HSB-001	inside B300	N.A.	by Client	0,00	by Client	Cable supply by RM.
15		TBA	by Client	0,6/1,0	by Client	PCS	by Client	by Client	by Client	HVAC PANEL	by Client	B300-HSB-001	inside B300	N.A.	by Client	0,00	by Client	Cable supply by RM.
16	77353-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	TEMPERATURE TRANSMITTER 1	M20	77-TT-301	inside B300	N.A.	15,5	11,10	CONTROL	
17	77354-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	TEMPERATURE TRANSMITTER 2	M20	77-TT-302	inside B300	N.A.	19,5	11,10	CONTROL	
18	77351-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	TEMPERATURE TRANSMITTER 3	M20	77-TT-303	inside B300	N.A.	15,5	11,10	CONTROL	Mounted on internal sleeve
19	77352-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	TEMPERATURE TRANSMITTER 4	M20	77-TT-304	inside B300	N.A.	16,5	11,10	CONTROL	Mounted on internal sleeve
20	77355-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	DIFFERETIAL PRESSURE TRANSMITTER	M20	77-TP-301	inside B300	N.A.	15,5	11,10	CONTROL	
21	77309-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PRESSURIZING FAN	M20	HFM-77-301	HHU-77005	HJB-77005-A	20,5	10,80	LOW VOLTAGE	
22	77310-CEL-L1	4G4	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SUPPLY FAN	M20	HFM-77-302	HHU-77005	HJB-77005-A	20,5	12,10	LOW VOLTAGE	
23	77311-CEL-L1	4G10	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B300-HSB-001	inside B300	COMPRESSOR	M25	HCO-77-301	HHU-77005	HJB-77005-A	20,5	15,70	LOW VOLTAGE	
24	77312-CEL-L1	4G10	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B300-HSB-001	inside B300	ELECTRICAL HEATER	M25	HSS-77-301	HHU-77005	HJB-77005-A	20,5	15,70	LOW VOLTAGE	
25	77313-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	CONDENSER FAN 1	M20	HFM-77-305	HHU-77005	HJB-77005-A	20,5	10,80	LOW VOLTAGE	
26	77314-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	CONDENSER FAN 2	M20	HFM-77-306	HHU-77005	HJB-77005-A	20,5	10,80	LOW VOLTAGE	
27	77315-CEL-L2	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-301	HHU-77005	HJB-77005-A	20,5	9,80	LOW VOLTAGE	
28	77308-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SIGNAL MOTORISED DAMPER	M20	HDZ-77-301	HHU-77005	HJB-77005-B	20,5	9,70	CONTROL	
29	77316-CEL-L2	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-302	HHU-77005	HJB-77005-A	20,5	9,80	LOW VOLTAGE	
30	77309-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SIGNAL MOTORISED DAMPER	M20	HDZ-77-302	HHU-77005	HJB-77005-B	20,5	9,70	CONTROL	
31	77317-CEL-L2	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-303	HHU-77005	HJB-77005-A	20,5	9,80	LOW VOLTAGE	
32	77310-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SIGNAL MOTORISED DAMPER	M20	HDZ-77-303	HHU-77005	HJB-77005-B	20,5	9,70	CONTROL	
33	77311-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	LOW PRESSURE SWITCH	M20	PDSL-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
34	77312-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PRESSURIZING FAN MOTOR PTC	M20	TE-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
35	77313-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	EMERGENCY BUTTON	M20	HPB-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
36	77314-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SUPPLY FAN MOTOR HEATER	M20	HSS-77-303	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
37	77315-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PRESSURIZING FAN MOTOR HEATER	M20	HSS-77-302	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
38	77347-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PDSH - FILTER 1 DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE	M20	PDSH-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
39	77349-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PDSL - FAN LOW DIFFERENTIAL PRESSURE SWITCH	M20	PDSL-77-302	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
40	77316-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	COMPRESSOR OIL HEATER	M20	HSS-77-304	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
41	77317-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SOLENOID VALVE	M20	HSV-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
42	77319-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	CONDENSING PRESSURE SWITCH	M20	PC-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
43	77320-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	CONDENSING PRESSURE TRASDUCER	M20	PTH-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
44	77321-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	ELECTRICAL HEATER HIGH TEMP THERMOSTATE	M20	TSH-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
45	77322-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	ELECTRICAL HEATER VERI HIGH TEMP TRASMITTER	M20	TSHH-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
46	77323-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	LOW PRESSURE SWITCH	M20	PSL-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
47	77324-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	HIGH PRESSURE SWITCH	M20	PSH-77-301	HHU-77005	HJB-77005-B	20,5	8,20	CONTROL	
48	77318-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PRESSURIZING FAN	M20	HFM-77-303	HHU-77006	HJB-77006-A	20,5	10,80	LOW VOLTAGE	
49	77319-CEL-L1	4G4	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SUPPLY FAN	M20	HFM-77-304	HHU-77006	HJB-77006-A	20,5	12,10	LOW VOLTAGE	
50	77320-CEL-L1	4G10	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B300-HSB-001	inside B300	COMPRESSOR	M25	HCO-77-302	HHU-77006	HJB-77006-A	20,5	15,70	LOW VOLTAGE	
51	77321-CEL-L1	4G10	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B300-HSB-001	inside B300	ELECTRICAL HEATER	M25	HSS-77-305	HHU-77006	HJB-77006-A	20,5	15,70	LOW VOLTAGE	
52	77322-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	CONDENSER FAN 1	M20	HFM-77-307	HHU-77006	HJB-77006-A	20,5	10,80	LOW VOLTAGE	
53	77323-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	CONDENSER FAN 2	M20	HFM-77-308	HHU-77006	HJB-77006-A	20,5	10,80	LOW VOLTAGE	
54	77324-CEL-L2	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-304	HHU-77006	HJB-77006-A	20,5	9,80	LOW VOLTAGE	
55	77325-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SIGNAL MOTORISED DAMPER	M20	HDZ-77-304	HHU-77006	HJB-77006-B	20,5	9,70	CONTROL	
56	77325-CEL-L2	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-305	HHU-77006	HJB-77006-A	20,5	9,80	LOW VOLTAGE	
57	77326-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SIGNAL MOTORISED DAMPER	M20	HDZ-77-305	HHU-77006	HJB-77006-B	20,5	9,70	CONTROL	
58	77326-CEL-L2	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-306	HHU-77006	HJB-77006-A	20,5	9,80	LOW VOLTAGE	
59	77327-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SIGNAL MOTORISED DAMPER	M20	HDZ-77-306	HHU-77006	HJB-77006-B	20,5	9,70	CONTROL	
60	77328-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	LOW PRESSURE SWITCH	M20	PDSL-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
61	77329-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PRESSURIZING FAN MOTOR PTC	M20	TE-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
62	77330-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	EMERGENCY BUTTON	M20	HPB-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
63	77331-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SUPPLY FAN MOTOR HEATER	M20	HSS-77-307	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
64	77332-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PRESSURIZING FAN MOTOR HEATER	M20	HSS-77-306	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
65	77350-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PDSH - FILTER 1 DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE	M20	PDSH-77-303	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
66	77348-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	PDSL - FAN LOW DIFFERENTIAL PRESSURE SWITCH	M20	PDSL-77-304	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
67	77333-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	COMPRESSOR OIL HEATER	M20	HSS-77-308	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
68	77334-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	SOLENOID VALVE	M20	HSV-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
69	77336-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	CONDENSING PRESSURE SWITCH	M20	PC-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
70	77337-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	CONDENSING PRESSURE TRASDUCER	M20	PTH-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
71	77338-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	ELECTRICAL HEATER HIGH TEMP THERMOSTATE	M20	TSH-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
72	77339-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	ELECTRICAL HEATER VERI HIGH TEMP TRASMITTER	M20	TSHH-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
73	77340-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	LOW PRESSURE SWITCH	M20	PSL-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
74	77341-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	HIGH PRESSURE SWITCH	M20	PSH-77-302	HHU-77006	HJB-77006-B	20,5	8,20	CONTROL	
75	77342-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	Fire and Gas Damper (included actuator)	M20	HFD-77007	inside B300	N.A.	9	9,70	CONTROL	
76	77343-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	Fire and Gas Damper (included actuator)	M20	HFD-77008	inside B300	N.A.	8	9,70	CONTROL	
77	77344-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	Fire and Gas Damper (included actuator)	M20	HFD-77009	inside B300	N.A.	15,5	9,70	CONTROL	
78	77345-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	Fire and Gas Damper (included actuator)	M20	HFD-77010	inside B300	N.A.	16,5	9,70	CONTROL	
79	77346-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	Fire and Gas Damper (included actuator)	M20	HFD-77011	inside B300	N.A.	17	9,70	CONTROL	
80	77360-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B300-HSB-001	inside B300	HEATING CABLE	M20	HHC-77-003	outside B300	HJB-77011	20,5	9,80	LOW VOLTAGE	

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B-400 HVAC - CABLE LIST

Posizione	n:° CABLE	CABLE CHARACTERISTICS				CABLE FROM:				CABLE TO:				JB TAG	CABLE LENGHT (m)	CABLE DIAMETER (mm)	CABLE TYPE	NOTE
		SECTION	TIPE	U_0/U (kV)	MATERIAL SHEAT	ITEM	CABLE GLAND	TAG	POSITION	ITEM	CABLE GLAND	TAG	POSITION					
a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	
1		5G16	Cu, EPR, Unarmoured	0,6/1,0	LSZH, Flame Retardant	by Client	by Client	by Client	by Client	HVAC PANEL	by Client	B400-HSB-001	inside B400	N.A.	0	24,00	LOW VOLTAGE	General power supply 400V 3ph+N+PE Cable supply by RM.
2		3G2,5	Cu, MGT, EPR, GSWB	0,6/1,0	LSZH, Fire Retardant	by Client	by Client	by Client	by Client	HVAC PANEL	by Client	B400-HSB-001	inside B400	N.A.	0	15,50	LOW VOLTAGE	UPS Power Supply 230V 1ph+N+PE Cable supply by RM.
3	77401-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SPACE HEATER 1	M20	HHS-77-010	inside B400	N.A.	12,5	9,80	LOW VOLTAGE	
4	77402-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SPACE HEATER 2	M20	HHS-77-011	inside B400	N.A.	14,0	9,80	LOW VOLTAGE	
5	77403-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SPACE HEATER 3	M20	HHS-77-012	inside B400	N.A.	25,0	9,80	LOW VOLTAGE	
6	77404-CEL-L1	5G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	BLINDO	M20	PECW-B400H-F1-L1-01	inside B400	N.A.	8,5	11,60	LOW VOLTAGE	
7	77405-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B400H-F1-L1-01	inside B400	LAMP (E) 2	M20	PELF-B400H-F1-L1-01	inside B400	N.A.	0,5	10,80	LOW VOLTAGE	
8	77406-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B400H-F1-L1-01	inside B400	LAMP 1	M20	PELF-B400H-F1-L1-02	inside B400	N.A.	0,5	9,80	LOW VOLTAGE	
9	77407-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	BLINDO	N.A.	PECW-B400H-F1-L1-01	inside B400	LAMP 3	M20	PELF-B400H-F1-L1-03	inside B400	N.A.	0,5	9,80	LOW VOLTAGE	
10	77408-CEL-L1	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	MODULE SOCKET	M20	PESO-B400H-F2-L2-01	inside B400	N.A.	20,0	9,80	LOW VOLTAGE	
11	77401-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	MODULE SWITCH 1	M20	CELS-B400H-F1-L1-01	inside B400	N.A.	19,5	8,20	CONTROL	
12	77402-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	MODULE SWITCH 2	M20	CELS-B400H-F1-L1-02	inside B400	N.A.	8,5	8,20	CONTROL	
13		TBA	by Client	0,6/1,0	by Client	SIS	by Client	by Client	by Client	HVAC PANEL	by Client	B400-HSB-001	inside B400	N.A.	by Client	0,00	by Client	Cable supply by RM.
14		TBA	by Client	0,6/1,0	by Client	SIS	by Client	by Client	by Client	HVAC PANEL	by Client	B400-HSB-001	inside B400	N.A.	by Client	0,00	by Client	Cable supply by RM.
15		TBA	by Client	0,6/1,0	by Client	PCS	by Client	by Client	by Client	HVAC PANEL	by Client	B400-HSB-001	inside B400	N.A.	by Client	0,00	by Client	Cable supply by RM.
16	77453-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	TEMPERATURE TRANSMITTER 1	M20	77-TT-401	inside B400	N.A.	7,5	11,10	CONTROL	
17	77449-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	TEMPERATURE TRANSMITTER 2	M20	77-TT-402	inside B400	N.A.	9,5	11,10	CONTROL	
18	77454-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	TEMPERATURE TRANSMITTER 3	M20	77-TT-403	inside B400	N.A.	18,0	11,10	CONTROL	
19	77455-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	TEMPERATURE TRANSMITTER 4	M20	77-TT-404	inside B400	N.A.	19,0	11,10	CONTROL	
20	77450-CEC-L1	3x1,5+Sh	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	DIFFERETIAL PRESSURE TRANSMITTER	M20	77-TP-401	inside B400	N.A.	7,5	11,10	CONTROL	
21	77409-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PRESSURIZING FAN	M20	HFM-77-401	HHU-77007	HJB-77007-A	12	10,80	LOW VOLTAGE	
22	77410-CEL-L1	4G4	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SUPPLY FAN	M20	HFM-77-402	HHU-77007	HJB-77007-A	12	12,10	LOW VOLTAGE	
23	77411-CEL-L1	4G10	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B400-HSB-001	inside B400	COMPRESSOR	M25	HCO-77-401	HHU-77007	HJB-77007-A	12	15,70	LOW VOLTAGE	
24	77412-CEL-L1	4G10	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B400-HSB-001	inside B400	ELECTRICAL HEATER	M25	HSS-77-401	HHU-77007	HJB-77007-A	12	15,70	LOW VOLTAGE	
25	77413-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	CONDENSER FAN 1	M20	HFM-77-405	HHU-77007	HJB-77007-A	12	10,80	LOW VOLTAGE	
26	77414-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	CONDENSER FAN 2	M20	HFM-77-406	HHU-77007	HJB-77007-A	12	10,80	LOW VOLTAGE	
27	77415-CEL-L1	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-401	HHU-77007	HJB-77007-A	12	9,80	LOW VOLTAGE	
28	77408-CEC-L1	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SIGNAL MOTORISED DAMPER	M20	HDZ-77-401	HHU-77007	HJB-77007-B	12	9,70	CONTROL	
29	77416-CEL-L1	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-402	HHU-77007	HJB-77007-A	12	9,80	LOW VOLTAGE	
30	77409-CEC-L1	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SIGNAL MOTORISED DAMPER	M20	HDZ-77-402	HHU-77007	HJB-77007-B	12	9,70	CONTROL	
31	77417-CEL-L1	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-403	HHU-77007	HJB-77007-A	12	9,80	LOW VOLTAGE	
32	77410-CEC-L1	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SIGNAL MOTORISED DAMPER	M20	HDZ-77-403	HHU-77007	HJB-77007-B	12	9,70	CONTROL	
33	77411-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	LOW PRESSURE SWITCH	M20	PDSL-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
34	77412-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PRESSURIZING FAN MOTOR PTC	M20	TE-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
35	77413-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	EMERGENCY BUTTON	M20	HPB-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
36	77414-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SUPPLY FAN MOTOR HEATER	M20	HSS-77-402	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
37	77415-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PRESSURIZING FAN MOTOR HEATER	M20	HSS-77-403	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
38	77447-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PDSH - FILTER 1 DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE	M20	PDSH-77-401	HHU-77007	HJB-77007-B	20,5	8,20	CONTROL	
39	77451-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PDSL - FAN LOW DIFFERENTIAL PRESSURE SWITCH	M20	PDSL-77-402	HHU-77007	HJB-77007-B	20,5	8,20	CONTROL	
40	77416-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	COMPRESSOR OIL HEATER	M20	HSS-77-404	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
41	77417-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SOLENOID VALVE	M20	HSV-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
42	77419-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	CONDENSING PRESSURE SWITCH	M20	PC-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
43	77420-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	CONDENSING PRESSURE TRASDUCER	M20	PTH-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
44	77421-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	ELECTRICAL HEATER HIGH TEMP	M20	TSH-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
45	77422-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	ELECTRICAL HEATER VERI HIGH TEMP	M20	TSHH-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
46	77423-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	LOW PRESSURE SWITCH	M20	PSL-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
47	77424-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	HIGH PRESSURE SWITCH	M20	PSH-77-401	HHU-77007	HJB-77007-B	12	8,20	CONTROL	
48	77418-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PRESSURIZING FAN	M20	HFM-77-403	HHU-77008	HJB-77008-A	12	10,80	LOW VOLTAGE	
49	77419-CEL-L1	4G4	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SUPPLY FAN	M20	HFM-77-404	HHU-77008	HJB-77008-A	12	12,10	LOW VOLTAGE	
50	77420-CEL-L1	4G10	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B400-HSB-001	inside B400	COMPRESSOR	M25	HCO-77-402	HHU-77008	HJB-77008-A	12	15,70	LOW VOLTAGE	
51	77421-CEL-L1	4G10	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M25	B400-HSB-001	inside B400	ELECTRICAL HEATER	M25	HSS-77-405	HHU-77008	HJB-77008-A	12	15,70	LOW VOLTAGE	
52	77422-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	CONDENSER FAN 1	M20	HFM-77-407	HHU-77008	HJB-77008-A	12	10,80	LOW VOLTAGE	
53	77423-CEL-L1	4G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	CONDENSER FAN 2	M20	HFM-77-408	HHU-77008	HJB-77008-A	12	10,80	LOW VOLTAGE	
54	77424-CEL-L1	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-404	HHU-77008	HJB-77008-A	12	9,80	LOW VOLTAGE	
55	77425-CEC-L1	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SIGNAL MOTORISED DAMPER	M20	HDZ-77-404	HHU-77008	HJB-77008-B	12	9,70	CONTROL	
56	77425-CEL-L1	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-405	HHU-77008	HJB-77008-A	12	9,80	LOW VOLTAGE	
57	77426-CEC-L1	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SIGNAL MOTORISED DAMPER	M20	HDZ-77-405	HHU-77008	HJB-77008-B	12	9,70	CONTROL	
58	77426-CEL-L1	3G1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	POWER SUPPLY MOTORISED DAMPER	M20	HDZ-77-406	HHU-77008	HJB-77008-A	12	9,80	LOW VOLTAGE	
59	77427-CEC-L1	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SIGNAL MOTORISED DAMPER	M20	HDZ-77-406	HHU-77008	HJB-77008-B	12	9,70	CONTROL	
60	77428-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	LOW PRESSURE SWITCH	M20	PDSL-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
61	77429-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PRESSURIZING FAN MOTOR PTC	M20	TE-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
62	77430-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	EMERGENCY BUTTON	M20	HPB-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
63	77431-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SUPPLY FAN MOTOR HEATER	M20	HSS-77-406	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
64	77432-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PRESSURIZING FAN MOTOR HEATER	M20	HSS-77-407	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
65	77448-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PDSH - FILTER 1 DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE	M20	PDSH-77-403	HHU-77008	HJB-77008-B	20,5	8,20	CONTROL	
66	77452-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	PDSL - FAN LOW DIFFERENTIAL PRESSURE SWITCH	M20	PDSL-77-404	HHU-77008	HJB-77008-B	20,5	8,20	CONTROL	
67	77433-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	COMPRESSOR OIL HEATER	M20	HSS-77-408	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
68	77434-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	SOLENOID VALVE	M20	HSV-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
69	77436-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	CONDENSING PRESSURE SWITCH	M20	PC-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
70	77437-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	CONDENSING PRESSURE TRASDUCER	M20	PTH-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
71	77438-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	ELECTRICAL HEATER HIGH TEMP THERMOSTATE	M20	TSH-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
72	77439-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	ELECTRICAL HEATER VERI HIGH TEMP TRASMITTER	M20	TSHH-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
73	77440-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	LOW PRESSURE SWITCH	M20	PSL-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
74	77441-CEC-L1	2x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	HIGH PRESSURE SWITCH	M20	PSH-77-402	HHU-77008	HJB-77008-B	12	8,20	CONTROL	
75	77442-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	Fire and Gas Damper (included actuator)	M20	HFD-77012	inside B400	N.A.	11	9,70	CONTROL	
76	77443-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	Fire and Gas Damper (included actuator)	M20	HFD-77013	inside B400	N.A.	8	9,70	CONTROL	
77	77444-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	Fire and Gas Damper (included actuator)	M20	HFD-77014	inside B400	N.A.	7	9,70	CONTROL	
78	77445-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	Fire and Gas Damper (included actuator)	M20	HFD-77015	inside B400	N.A.	18	9,70	CONTROL	
79	77446-CEC-L2	4x1,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	Fire and Gas Damper (included actuator)	M20	HFD-77016	inside B400	N.A.	19	9,70	CONTROL	
80	77460-CEL-L2	3G2,5	XLPE/UNEL S2	0,6/1,0	PVC	HVAC PANEL	M20	B400-HSB-001	inside B400	HEATING CABLE	M20	HHC-77-004	outside B400	HJB-77012	12,0	9,80	LOW VOLTAGE	

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Base Load Power Hub (BLPH)

B-100 ELECTRICAL COMPONENTS LIST AND DS - E&I SHELTERS

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

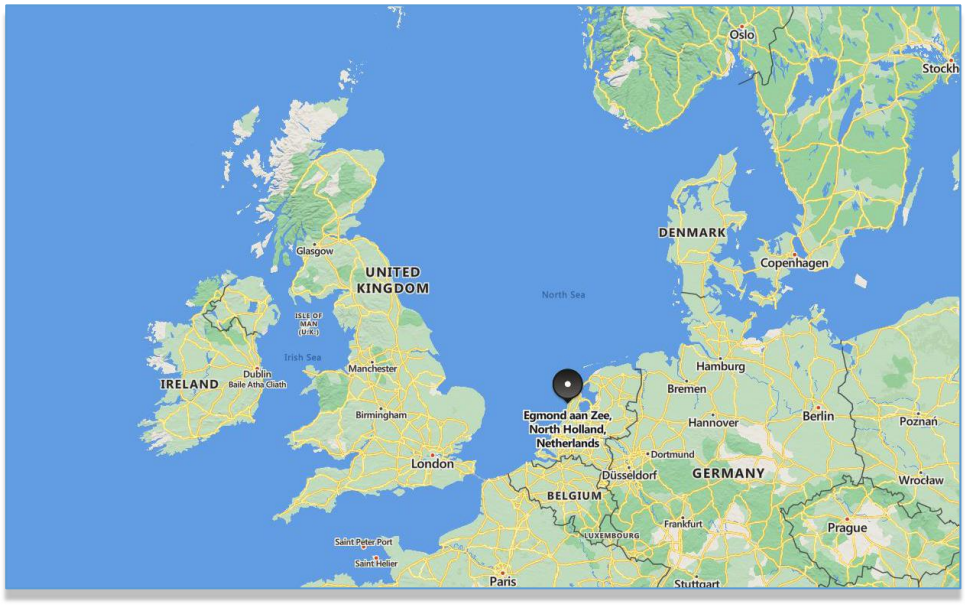


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

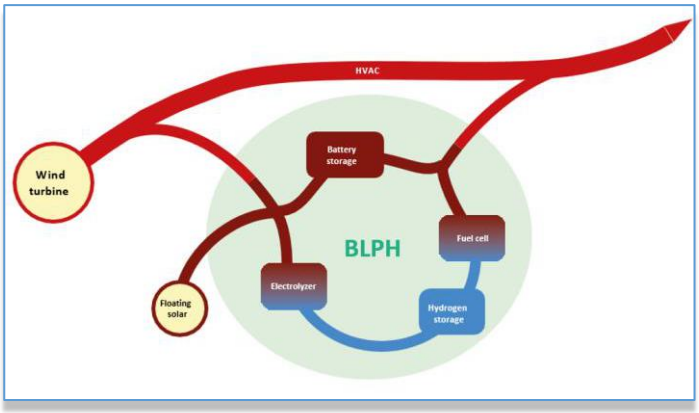


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting

wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document provides the data sheet and information of electrical components supplied by Alex Sistemi

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

3 ELECTRICAL COMPONENTS LIST

3.1 LIST

Item	Description	Grade	Manufacturer	Line	Model	B-100
1	Light switch 10A	IP66	Scame	Protecta	1.375.012	2
2	Socket schuko 16A	IP66	Scame	Protecta	1.376.404	1
3	Two lamp LED	IP66	Disano	Echo	164704-00	5
4	Two lamp LED + Energy Saving	IP66	Disano	Echo	164704-07	2
5	Feed unit 40A Left or Right mount	IP55	Schneider	Canalis	KBB40ABG44W	2
6	Straight distribution lenghts 25A - 3mt	IP55	Schneider	Canalis	KBB25ED42305W	5
7	Straight distribution lenghts 40A - 2mt	IP55	Schneider	Canalis	KBB40ED42203W	2
8	10A Tap-off unit	IP55	Schneider	Canalis	KBC10DCB40	7

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4 DATA SHEET

4.1 LIGHT SWITCH 10A

EN - 20 May 2024

SCAME

137.5012

SP ONE WAY SWITCH
SP ONE WAY SWITCH 20AX
M95(95x95mm)



DIRECTIVE RoHS 2011/65/EU

Commercial Series	PROTECTA Series
Synthetical description	SP ONE WAY SWITCH
Mounting version	SURFACE MOUNTING

TECHNICAL CHARACTERISTICS

Rated current	20AX
Rated voltage	250V

PHYSICAL CHARACTERISTICS

Mounting version	SURFACE MOUNTING
Protection degree	Splash proof
Protection degree IP	IP66
Material	THERMOPLASTIC
Working temperature	-20°C/+60°C
Protection degree IK	IK07
Warning light	WITH NEON

DIMENSIONAL CHARACTERISTICS

N.° modules	1 GANG
Dimensions	M95(95x95mm)

DOWNLOAD

Technical drawing [PDF]
Technical drawing [DWG]
Technical drawing [STP]
Instruction manual

www.scame.com
scame@scame.com

SCAME PARRE S.p.A
Via Costa Erta, 15 - 24020 Parre (BG) Italy - +39 035 705000

4.2 SOCKET SCHUKO 16A

EN - 20 May 2024

SCAME

137.6404

ITALIAN P30 STANDARD SOCKET ITALIAN P30 STANDARD SOCKET 16A M95(95x95mm)



EAC CE

CEI 23-50 (2006)
DIRECTIVE RoHS 2011/65/EU

Commercial Series	PROTECTA Series
Synthetical description	ITALIAN P30 STANDARD SOCKET
Type	ITALIAN P30
Mounting version	SURFACE MOUNTING

TECHNICAL CHARACTERISTICS

Rated current	16A
Rated voltage	250V

PHYSICAL CHARACTERISTICS

Mounting version	SURFACE MOUNTING
Protection degree	Splash proof
Protection degree IP	IP66
Material	THERMOPLASTIC
Working temperature	-20°C/+60°C
Protection degree IK	IK07

DIMENSIONAL CHARACTERISTICS

Dimensions	M95(95x95mm)

DOWNLOAD

Technical drawing [PDF]
Technical drawing [DWG]
Technical drawing [STP]
Instruction manual

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scame@scame.com

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Via Costa Erta, 15 - 24020 Parre (BG) Italy - +39 035 705000

4.3 TWO LAMP LED

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00





Disano's watertight fixtures are built from the company's extensive experience, skill and reliability as a global leader in the manufacturing of specialised lighting products. These basic features have contributed to the success of Disano's watertight fixtures over the years. The lamp's body is made of shatter-proof polycarbonate, with an IP66 protection, and high mechanical strength due to the structure reinforced by internal ribs. Installation is made easy thanks to the stainless steel bracket supplied as standard for ceiling mounting, while the spring hook allows quick attachment to any chain suspension system. Moreover, special toothed guides allow the perfect alignment of fixtures mounted in a continuous row.
In addition to these basic features you will find all the advantages of the LED technology, i.e. light sources with a very long service life, low power consumption and great light quality. The polycarbonate WATERTIGHT FIXTURES have an IP66IK08 rating when installed in environments with temperatures not exceeding 45 °C. Direct exposure to sunlight may exceed 45 °C, compromising the protection rating. However, it is advisable to use them appropriately without altering their mechanical and protective qualities (IP66IK08) and not to install them on surfaces subject to strong vibration, or exposed to atmospheric agents, outdoors on ropes or poles, on walls, under metal gratings or directly exposed to sunlight. If this is not possible, use the steel watertight fixturess instead.

GENERAL INFORMATION

Article	927 - Echo - two lamp LED - Energy Saving
Code	164704-00

DIMENSIONS AND WEIGHT

Length (mm)	1300 mm
Width (mm)	152 mm
Height (mm)	102 mm
Weight (Kg)	2.260 kg

ELECTRICAL CHARACTERISTICS AND CONTROLS

Voltage type	AC
Min Voltage (V)	220 V
Max Voltage (V)	240 V
Min Frequency (Hz)	50 Hz
Max Frequency (Hz)	60 Hz
Frequency (Hz)	50 Hz
Wiring name	CLD
Power factor	≥0.9
Insulation class	Class I
Controllability	None

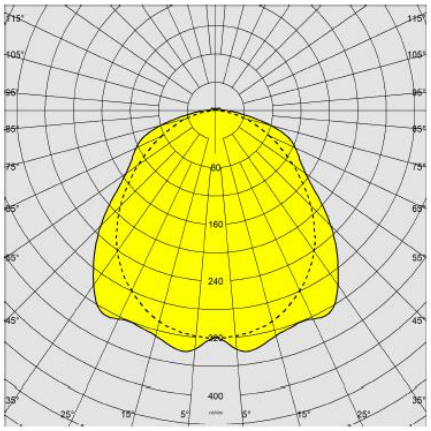
disano illuminazione

1

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00



PHOTOMETRIC DATA

Lighting source	LED
CRI	≥80
Luminous flux (output) (lm)	5737 lm
Power absorption (total) (W)	32 W
CCT	4000 K
Luminous efficacy (lm/W)	179 lm/W
Low Flicker	luminaire with very low flicker: evenly distributed light for greater visual safety.
Colour consistency	SDCM3
LED flux maintenance	80000 hr, L 80, B 20

MECHANICAL CHARACTERISTICS

Impact resistance rating (IK)	IK08
IP	66
Ambient temperature - min	-30 °C
Ambient temperature - max	40 °C

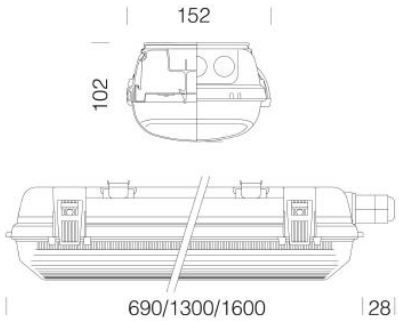
disano illuminazione

2

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00



DOWNLOAD

MOUNTS

AssemblyInstructions Echo 09-23.pdf

DESIGNS

TechnicalDrawing echobila.dxf

MATERIALS AND COLOURS

Housing	injection-moulded, made of grey RAL 7035 polycarbonate, shatterproof, UV-stabilised, with high mechanical strength thanks to the structure reinforced by internal ribs.
Optics	galvanised steel pre-painted in oven with white polyester resin, UV-stabilised. Fastened to the body with a quick coupling by means of a device machined directly on the body.
Diffuser	injection-moulded in polycarbonate with internal grooves for greater light control, self-extinguishing V2, UV-stabilised, smooth outer finish to enable easy cleaning for maximum light efficiency.
Colour	Grey
Equipment	- sealing gasket in eco-friendly, anti-aging expanded polyurethane foam - ceiling mounting brackets and suspension hook in stainless steel - plug-socket connector - snap hooks and safety screws in stainless steel
	ATTENTION ! Do not install on surfaces subject to strong vibrations, outdoors on hanging cables, or on walls under metallic grates, or on poles, and in any case, never expose the fixture to direct sunlight. Check the compatibility between the material constituting the product and the space where it will be installed. We recommend the use of fixtures made of steel with direct exposure to sunlight.

STANDARDS AND COMPLIANCE

Photobiological safety class	RG0
Markings and tests	CE, ENEC
Reference standards	EN60598-1. With degree of protection according to EN60529. The lighting fixture meets all IFS and BRC requirements, and the regulation of the HACCP Directive regarding lighting systems installed in food processing plants.
Laboratory Tests	- the UL 94 Standard is considered a reference for rating the ignition characteristics of plastic materials. The watertight fixtures are made of V2 class material that self-extinguishes in 25 seconds. - passes the Glow Wire Test at 850 °C.
Energy Label	C

GEAR

Upon request	- version with wire feedthrough, dimmable. - narrow beam version (subcode 22) - radar sensor, subcode -19 - Always On Emergency, subcode -07 (always on, 60 min charge)

WARRANTY

After sales warranty	5 yr

disano illuminazione

3

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

4.4 TWO LAMP LED + ENERGY SAVING

927 - Echo - two lamp LED - Energy Saving

Code: 164704-07





Disano's watertight fixtures are built from the company's extensive experience, skill and reliability as a global leader in the manufacturing of specialised lighting products. These basic features have contributed to the success of Disano's watertight fixtures over the years. The lamp's body is made of shatter-proof polycarbonate, with an IP66 protection, and high mechanical strength due to the structure reinforced by internal ribs. Installation is made easy thanks to the stainless steel bracket supplied as standard for ceiling mounting, while the spring hook allows quick attachment to any chain suspension system. Moreover, special toothed guides allow the perfect alignment of fixtures mounted in a continuous row.
In addition to these basic features you will find all the advantages of the LED technology, i.e. light sources with a very long service life, low power consumption and great light quality.
The polycarbonate WATERTIGHT FIXTURES have an IP66IK08 rating when installed in environments with temperatures not exceeding 45 °C. Direct exposure to sunlight may exceed 45 °C, compromising the protection rating. However, it is advisable to use them appropriately without altering their mechanical and protective qualities (IP66IK08) and not to install them on surfaces subject to strong vibration, or exposed to atmospheric agents, outdoors on ropes or poles, on walls, under metal gratings or directly exposed to sunlight. If this is not possible, use the steel watertight fixturess instead.

GENERAL INFORMATION

Article	927 - Echo - two lamp LED - Energy Saving
Code	164704-07

DIMENSIONS AND WEIGHT

Length (mm)	1300 mm
Width (mm)	152 mm
Height (mm)	102 mm
Weight (Kg)	2.940 kg

ELECTRICAL CHARACTERISTICS AND CONTROLS

Voltage type	AC
Min Voltage (V)	220 V
Max Voltage (V)	240 V
Min Frequency (Hz)	50 Hz
Max Frequency (Hz)	60 Hz
Frequency (Hz)	50 Hz
Wiring name	CLD-E
Power factor	≥0.9
Insulation class	Class I
Controllability	None

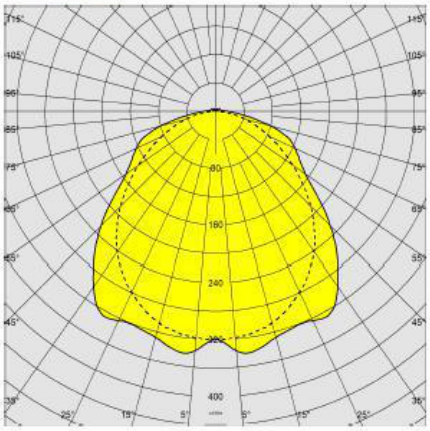
disano illuminazione

1

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-07



PHOTOMETRIC DATA

Lighting source	LED
CRI	≥80
Luminous flux (output) (lm)	5737 lm
Power absorption (total) (W)	32 W
CCT	4000 K
Luminous efficacy (lm/W)	179 lm/W
Low Flicker	luminaire with very low flicker: evenly distributed light for greater visual safety.
Colour consistency	SDCM3
LED flux maintenance	80000 hr, L 80, B 20

MECHANICAL CHARACTERISTICS

Impact resistance rating (IK)	IK08
IP	66
Ambient temperature - min	5 °C
Ambient temperature - max	40 °C

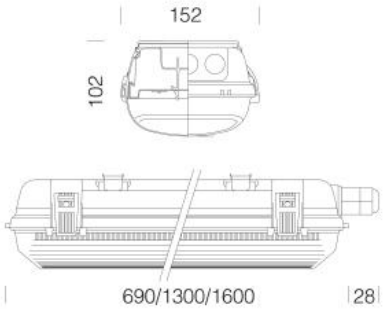
disano illuminazione

2

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

927 - Echo - two lamp LED - Energy Saving

Code: 164704-07



DOWNLOAD

MOUNTS

AssemblyInstructions Echo 09-23.pdf

DESIGNS

TechnicalDrawing echobila.dxf

MATERIALS AND COLOURS

Housing	injection-moulded, made of grey RAL 7035 polycarbonate, shatterproof, UV-stabilised, with high mechanical strength thanks to the structure reinforced by internal ribs.
Optics	galvanised steel pre-painted in oven with white polyester resin, UV-stabilised. Fastened to the body with a quick coupling by means of a device machined directly on the body.
Diffuser	injection-moulded in polycarbonate with internal grooves for greater light control, self-extinguishing V2, UV-stabilised, smooth outer finish to enable easy cleaning for maximum light efficiency.
Colour	Grey
Equipment	- sealing gasket in eco-friendly, anti-aging expanded polyurethane foam - ceiling mounting brackets and suspension hook in stainless steel - plug-socket connector - snap hooks and safety screws in stainless steel
	ATTENTION ! Do not install on surfaces subject to strong vibrations, outdoors on hanging cables, or on walls under metallic grates, or on poles, and in any case, never expose the fixture to direct sunlight. Check the compatibility between the material constituting the product and the space where it will be installed. We recommend the use of fixtures made of steel with direct exposure to sunlight.

EMERGENCY LIGHTING

Type of emergency	S.A.
Battery life-recharge	1h

STANDARDS AND COMPLIANCE

Photobiological safety class	RG0
Markings and tests	CE, ENEC
Reference standards	EN60598-1. With degree of protection according to EN60529. The lighting fixture meets all IFS and BRC requirements, and the regulation of the HACCP Directive regarding lighting systems installed in food processing plants.
Laboratory Tests	- the UL 94 Standard is considered a reference for rating the ignition characteristics of plastic materials. The watertight fixtures are made of V2 class material that self-extinguishes in 25 seconds. - passes the Glow Wire Test at 850 °C.
Energy Label	C

GEAR

Upon request	- version with wire feedthrough, dimmable. - narrow beam version (subcode 22) - radar sensor, subcode -19 - Always On Emergency, subcode -07 (always on, 60 min charge)

WARRANTY

After sales warranty	5 yr

disano illuminazione

3

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

4.5 FEED UNIT 40A LEFT OR RIGHT MOUNTING

Product datasheet

Specifications



FEED UNIT 40A LEFT OR RIGHT MOUNTING

Local distributor code:
23348079 KBB40ABG44W

EAN Code: 3606480001062

Main

Range of product	Canalis
Device short name	KBB
Product compatibility	Canalis KBB busbar trunking 25...40 A
Offer type	Classic Control system
product or component type	Feed unit
Conductors material	Aluminium
[Ie] rated operational current	40 A 25 A
[Ue] rated operational voltage	230...400 V
Number of circuits	2
busbar trunking polarity	3L + N + PE L + N + PE
Protection type	Without protection
Control type	Communicating
Communication port protocol	DALI
Colour	White (RAL 9003)

Complementary

Provided equipment	End cover
mounting location	Left
mounting mode	By clips
mounting support	Busbar
Connections - terminals	Terminal block - Pg 21 - screw clamp connector for 6...10 mm²
Width	244 mm
Depth	103.5 mm
Height	75.5 mm
net weight	400 g
Standards	IEC 61439-6

Environment

IP degree of protection	IP55 conforming to IEC 60529

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Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	8.0 cm
Package 1 Width	11.0 cm
Package 1 Length	27.0 cm
Package 1 Weight	700.0 g
Unit Type of Package 2	S03
Number of Units in Package 2	12
Package 2 Height	30.0 cm
Package 2 Width	30.0 cm
Package 2 Length	40.0 cm
Package 2 Weight	8.556 kg
Unit Type of Package 3	P06
Number of Units in Package 3	96
Package 3 Height	75.0 cm
Package 3 Width	60.0 cm
Package 3 Length	80.0 cm
Package 3 Weight	75.7 kg

Contractual warranty

Warranty	18 months

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Well-being performance

Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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4.6 STRAIGHT DISTRIBUTION LENGHTS 25A – 3METERS

Product datasheet

Specifications



Straight length, Canalis KBB, 25 A, 2 circuits 3L+N+PE and L+N+PE, 5 tap-off units, 3 m, white

Local distributor code:
23346767 KBB25ED42305W

EAN Code: 3606480000805

Main

Range of product	Canalis
Device short name	KBB
Offer type	Classic Control system
product or component type	Straight length
Busbar description	Distribution length
Device application	Lighting Power socket distribution
[Ie] rated operational current	25 A at 35 °C
[Ue] rated operational voltage	230...400 V
Network frequency	50/60 Hz
busbar trunking polarity	3L + N + PE L + N + PE
Number of circuits	2
Number of tap-off outlets	5
Control type	Communicating
Communication port protocol	DALI
mounting mode	By screws

Complementary

[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
[Icw] rated short-time withstand current	0.44 kA
[Ipk] rated peak withstand current	4.4 kA
Thermal stress limit	195 kA².s
Maximum radiated magnetic field	2 pT
THDI	0...15 % 25 A 15...33 % 20 A 33...100 % 16 A
Maximum voltage drop	<0.72 V with power factor = 1 at 50 Hz with 1A for 100 m long <0.67 V with power factor = 0.9 at 50 Hz with 1A for 100 m long <0.61 V with power factor = 0.8 at 50 Hz with 1A for 100 m long <0.55 V with power factor = 0.7 at 50 Hz with 1A for 100 m long
Standards	EN/IEC 61439-6 EN/IEC 61439-1

28 Jun 2024 Life Is On Schneider Electric 1

Width	30 mm
Height	46 mm
Length	3 m
Colour	White (RAL 9003)
net weight	4.7 kg

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529
IK degree of protection	IK06 conforming to EN/IEC 62262
Ambient air temperature for operation	0…35 °C (100 % of In) 35…40 °C (96 % of In) 40…45 °C (93 % of In) 45…50 °C (89 % of In) 50…55 °C (85 % of In)

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	5.000 cm
Package 1 Width	6.000 cm
Package 1 Length	310.000 cm
Package 1 Weight	5.000 kg
Unit Type of Package 2	BB1
Number of Units in Package 2	6
Package 2 Height	13.000 cm
Package 2 Width	16.500 cm
Package 2 Length	314.500 cm
Package 2 Weight	31.000 kg
Unit Type of Package 3	PAL
Number of Units in Package 3	72
Package 3 Height	52.000 cm
Package 3 Width	63.000 cm
Package 3 Length	318.000 cm
Package 3 Weight	430.500 kg

Contractual warranty

Warranty	18 months

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Guide to assess a product's sustainability >

Well-being performance

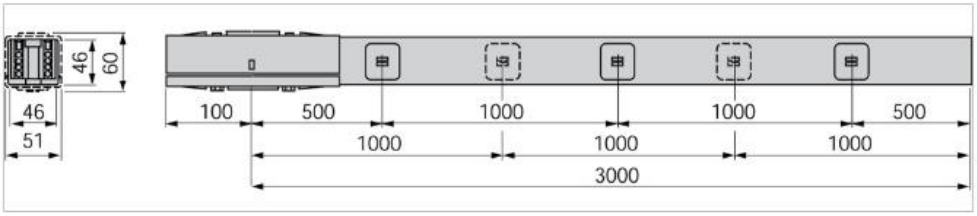
Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBB25ED42305W

Dimension Drawings



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4.7 STRAIGHT DISTRIBUTION LENGHTS 40A – 2METERS

Product datasheet

Specifications



Straight length, Canalis KBB, 25/40A, 2 circuits, 3L+N+PE/ L+N+PE, compatible DALI, 3 outlets, 2m, white RAL9003

KBB40ED42203W

Main

Range of product	Canalis
Device short name	KBB
Offer type	Classic Control system
product or component type	Straight length
Busbar description	Distribution length
Device application	Lighting Power socket distribution
[Ie] rated operational current	40 A at 35 °C 25 A at 35 °C
[Ue] rated operational voltage	230...400 V
Network frequency	50/60 Hz
busbar trunking polarity	3L + N + PE L + N + PE
Number of circuits	2
Number of tap-off outlets	3
Control type	Communicating
Communication port protocol	DALI
mounting mode	By screws

Complementary

[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
[Icw] rated short-time withstand current	0.94 kA
[Ipk] rated peak withstand current	9.6 kA
Thermal stress limit	900 kA².s
Maximum radiated magnetic field	2 pT
THDI	0...15 % 40 A 15...33 % 32 A 33...100 % 28 A
Maximum voltage drop	<0.3 V with power factor = 1 at 50 Hz with 1A for 100 m long <0.28 V with power factor = 0.9 at 50 Hz with 1A for 100 m long <0.25 V with power factor = 0.8 at 50 Hz with 1A for 100 m long <0.22 V with power factor = 0.7 at 50 Hz with 1A for 100 m long
Standards	EN/IEC 61439-6 EN/IEC 61439-1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Width	30 mm
Height	46 mm
Length	2 m
Colour	White (RAL 9003)
net weight	3.8 kg

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529
IK degree of protection	IK06 conforming to EN/IEC 62262
Ambient air temperature for operation	0…35 °C (100 % of In) 35…40 °C (96 % of In) 40…45 °C (93 % of In) 45…50 °C (89 % of In) 50…55 °C (85 % of In)

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	5.000 cm
Package 1 Width	210.000 cm
Package 1 Length	5.000 cm
Package 1 Weight	3.500 kg
Unit Type of Package 2	BB1
Number of Units in Package 2	6
Package 2 Height	13.500 cm
Package 2 Width	16.000 cm
Package 2 Length	215.000 cm
Package 2 Weight	24.000 kg
Unit Type of Package 3	PAL
Number of Units in Package 3	72
Package 3 Height	51.000 cm
Package 3 Width	220.000 cm
Package 3 Length	64.000 cm
Package 3 Weight	302.000 kg

Contractual warranty

Warranty	18 months

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Guide to assess a product's sustainability >

Well-being performance

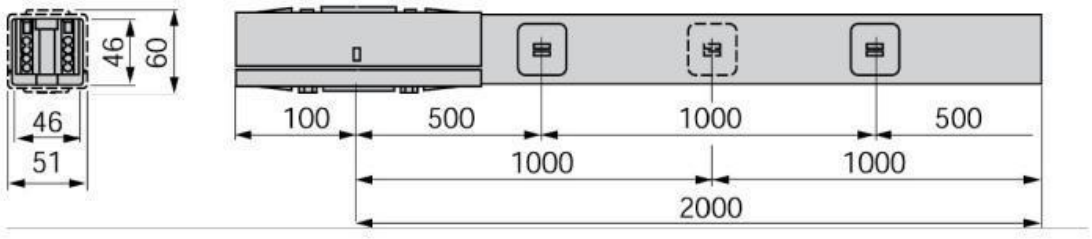
Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBB40ED42203W

Dimension Drawings



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4.8 10A TAP-OFF UNIT

Product datasheet

Specifications

10A TAPOFF UNITS

Local distributor code:

389342036 KBC10DCB40



EAN Code: 3606480002083

Main

Range	Canalis
Offer type	Classic Control system
product or component type	Connector
Device application	Lighting Power socket distribution
Range compatibility	Canalis KBA busbar trunking Canalis KBB busbar trunking
[Ie] rated operational current	10 A at 35 °C
[Ue] rated operational voltage	230...240 V
Network frequency	50/60 Hz
Communication port protocol	DALI
Tap-off unit polarity	3L+N+PE
Tap-off unit connector type	With phase selection

Complementary

Colour	Cream (RAL 9001)
[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
Protection type	Without protection
Width	1 m
Depth	62 mm
Height	60 mm
net weight	65 g
Quantity per set	Set of 10
Standards	EN/IEC 61439-1 EN/IEC 61439-6

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Package 1 Height	6.200 cm
Package 1 Width	6.000 cm
Package 1 Length	11.500 cm
Package 1 Weight	87.000 g
Unit Type of Package 2	BB1
Number of Units in Package 2	10
Package 2 Height	12.500 cm
Package 2 Width	14.000 cm
Package 2 Length	32.000 cm
Package 2 Weight	880.000 g
Unit Type of Package 3	P06
Number of Units in Package 3	300
Package 3 Height	77.000 cm
Package 3 Width	80.000 cm
Package 3 Length	60.000 cm
Package 3 Weight	34.900 kg

Contractual warranty

Warranty	18 months

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Sustainability

Green Premium™ label is Schneider Electric's commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO_2 products.

Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

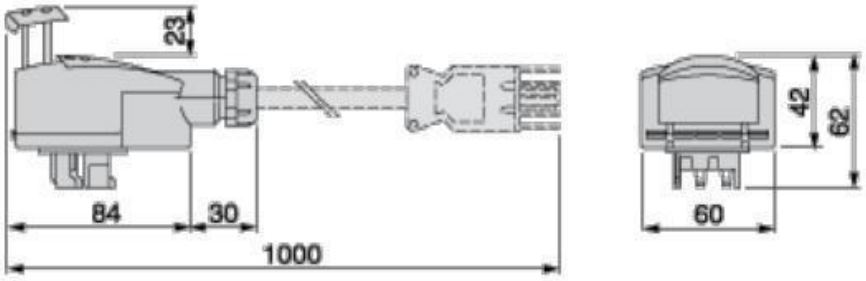
Reach Free Of Svhc	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Plastic Parts Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBC10DCB40

Dimension Drawings



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4.9 ELECTRICAL CABLE

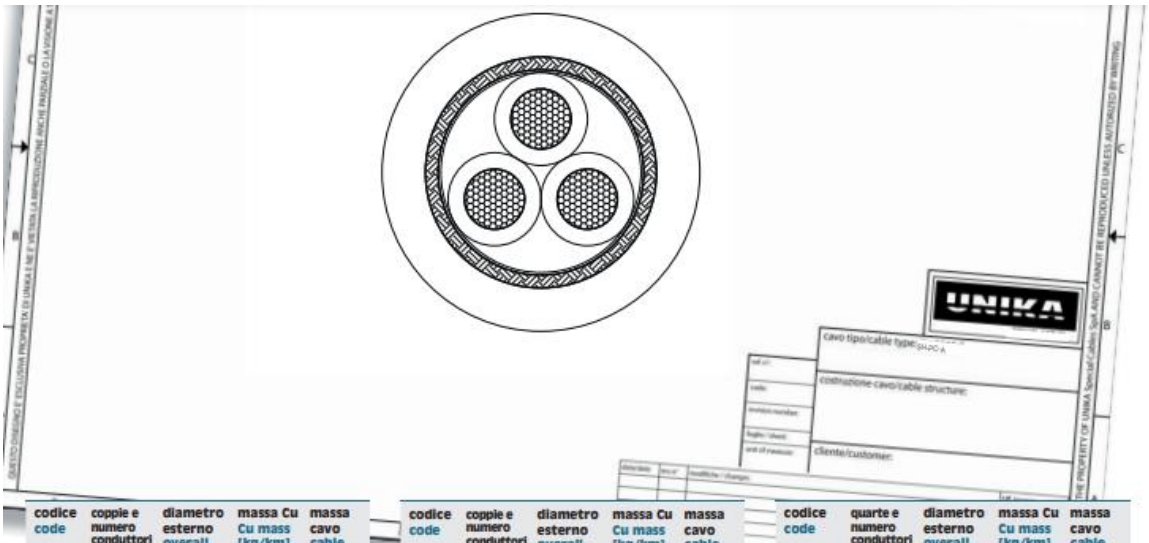
UNIKA

SH-PC-A

Cavi unipolari e multipolari, armati di potenza e controllo 0,6/1kV
Single and multicore, armoured power and control shipboard cables rated 0,6/1 kV



	Dati tecnici	Technical data
Conduttore **Conductor**	Rame rosso (opzionale stagnato) classe 5 in accordo alla IEC 60228	Bare (optional tinned copper) class 5 according to IEC 60228
Isolamento **Insulation**	Mescola HF XLPE in accordo alla IEC 60092-360 Spessori in accordo alla IEC 60092-353	HF XLPE compound according to IEC 60092-360 Thickness according to IEC 60092-353
Identificazione anime (preferenziale) **Core identification (preferential)**	1 anima: nera 2 anime: marrone, blu 3 anime: nera, grigia, marrone o (blu,marrone, giallo/verde) 4 anime: marrone, nera, grigia, blu o giallo/verde 5 anime: blu, marrone, nera, grigia, nera o giallo/verde da 5 anime: nero numerato (con o senza giallo/verde)	1 core: black 2 cores: brown, blue 3 cores: black, grey, brown or (blue, brown, green/yellow) 4 cores: brown, black, grey, blue or green/yellow 5 cores: blue, brown, black, grey, black or green/yellow From 5 cores: black numbered (with or without green/yellow)
Fasciatura **Bedding**	Filati riempitivi e nastro non igroscopico o guaina estrusa senza alogeni	Yarn fillers and non hygroscopic tape or extruded inner sheath without halogen
Armatura **Armouring**	Treccia di fili di rame rosso (su richiesta rame stagnato o acciaio zincato) copertura minima 90%	Bare copper wire braid (upon request tinned copper or galvanized steel wire braid). Minimum coverage 90%
Guaina esterna **Outer sheath**	Compound SHF1 in accordo alla IEC 60092-360 Spessore in accordo alla IEC 60092-353 Colore: nero (preferenziale) Diametro esterno in accordo alla IEC 60092-350 - Allegato D	SHF1 compound according to IEC 60092-360 Thickness according to IEC 60092-353 Colour: black (or other colour agreed) Outer diameter according to IEC 60092-350 annex D
Marcatura **Marking**	UNIKA (Italy) - SH-PC-A 0,6/1 KV 90°C (numero anime) x (sezione) IEC 60092-353 - IEC 60332 -3-22 – codice rintracciabilità	UNIKA (Italy) – SH-PC-A 0,6/1 kV 90°C (core number) x (cross-section) – IEC 60092-353 – IEC 60332-3-22 – traceability code
Temperatura per posa fissa **Rated conductor temperature for fixed installation**	90°C	90°C
Temperatura minima d'installazione **Minimum installation temperature**	- 15°C	- 15°C
Raggio minimo di curvatura **Minimum bending radius**	6D: D è il diametro esterno	6D: D is the overall diameter
Attenuazione schermante **Screening attenuation**	≥ 60 dB in accordo alla EN50289-1-6	≥ 60 dB according to EN50289-1-6
Comportamento al fuoco **Fire behaviour**	IEC 60332-3-22 non propagante il fuoco IEC 60332-1-2 non propagante la fiamma IEC 60754-1 assanza di alogeni IEC 60754-2 acicidità dei fumi IEC 60684-2 contenuto di fluoro IEC 61034 densità dei fumi	IEC 60332-3-22 not fire propagation IEC 60332-1-2 not flame propagation IEC 60754-1 halogen content IEC 60754-2 pH and conductivity IEC 60684-2 fluorine content IEC 61034 smoke emission



codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N1026	2x1	8,5	59	81
N1036	3x1	8,9	72	97
N1046	4x1	9,6	86	116
N1056	5x1	10,4	101	136
N1076	7x1	11,4	126	175
N1106	10x1	14,7	213	258
N1126	12x1	15,1	236	290
N1246	24x1	20,5	402	521
N1027	2x1,5	9,1	79	96
N1037	3x1,5	9,5	97	120
N1047	4x1,5	10,3	117	143
N1057	5x1,5	11,4	138	175
N1077	7x1,5	12,3	174	221
N1107	10x1,5	15,9	290	325
N1127	12x1,5	16,3	324	378
N1147	14x1,5	17,3	361	421
N1197	19x1,5	19,3	452	545
N1247	24x1,5	22,5	555	684
N1307	30x1,5	23,7	654	810
N1377	37x1,5	25,7	773	979
N1029	2x2,5	9,9	104	123
N1039	3x2,5	10,4	132	156
N1049	4x2,5	11,5	163	198
N1059	5x2,5	12,5	194	236
N1079	7x2,5	14,1	294	323
N1109	10x2,5	17,7	403	453

codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N1129	12x2,5	18,2	457	517
N1149	14x2,5	19,1	514	595
N1189	19x2,5	21,3	655	763
N1259	24x2,5	25,1	810	971
N1309	30x2,5	26,5	968	1165
N1379	37x2,5	28,7	1156	1409
N101A	1x4	6,9	73	89
N102A	2x4	11,3	142	169
N103A	3x4	11,9	185	220
N104A	4x4	12,9	232	273
N105A	5x4	14,7	324	349
N101B	1x6	7,4	96	112
N102B	2x6	12,3	188	218
N103B	3x6	13,0	251	290
N104B	4x6	14,7	364	384
N105B	5x6	16,0	435	465
N101D	1x10	8,6	142	163
N102D	2x10	14,9	327	332
N103D	3x10	15,7	432	445
N104D	4x10	17,4	544	573
N105D	5x10	18,9	657	692
N101E	1x16	9,7	208	231
N102E	2x16	17,3	466	481
N103E	3x16	18,3	631	658
N104E	4x16	20,2	803	848
N105E	5x16	22,3	976	1035

codice code	quarte e numero conduttori x sezione quad and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N101F	1x25	11,6	308	352
N102F	2x25	20,9	675	727
N103F	3x25	22,3	929	1018
N104F	4x25	24,7	1191	1314
N105F	5x25	27,1	1454	1618
N101G	1x35	12,9	414	469
N103G	3x35	25,3	1246	1377
N104G	4x35	28,0	1607	1792
N105G	5x35	31,0	1969	2213
N101H	1x50	15,1	617	640
N103H	3x50	29,0	1712	1841
N104H	4x50	32,1	2220	2400
N105H	5x50	36,1	2842	3054
N101J	1x70	17,1	829	872
N103J	3x70	33,2	2325	2536
N104J	4x70	37,2	3148	3355
N101K	1x95	19,8	1095	1157
N103K	3x95	39,4	3225	3433
N104K	4x95	43,9	4194	4505
N101L	1x120	22,1	1351	1427
N103L	3x120	44,3	3991	4270
N101M	1x150	23,5	1660	1765
N103M	3x150	50,1	4916	5300
N101N	1x185	25,9	2020	2101
N103N	3x185	52,7	5998	6308
N101P	1x240	28,9	2574	2629
N101Q	1x300	32,1	3175	3205

(*) Aggiungere la lettera G ai codice per i cavi con conduttore giallo/verde.
Nota: La portata di corrente è riferita ad una temperatura ambiente di 45°C e in accordo a IEC 60092-352. Per due o piu circuiti, i fattori di declassamento devono essere tenuti in considerazione. Ulteriori informazioni e sezioni sono disponibili su richiesta.

(*) Add letter G at the code for cables having green/yellow conductor
Note: For current ampacity see type SH-PC-U. The ampacity is referred to ambient temperature of 45°C and based upon IEC 60092-352.
Further formation and cross-section are available upon request

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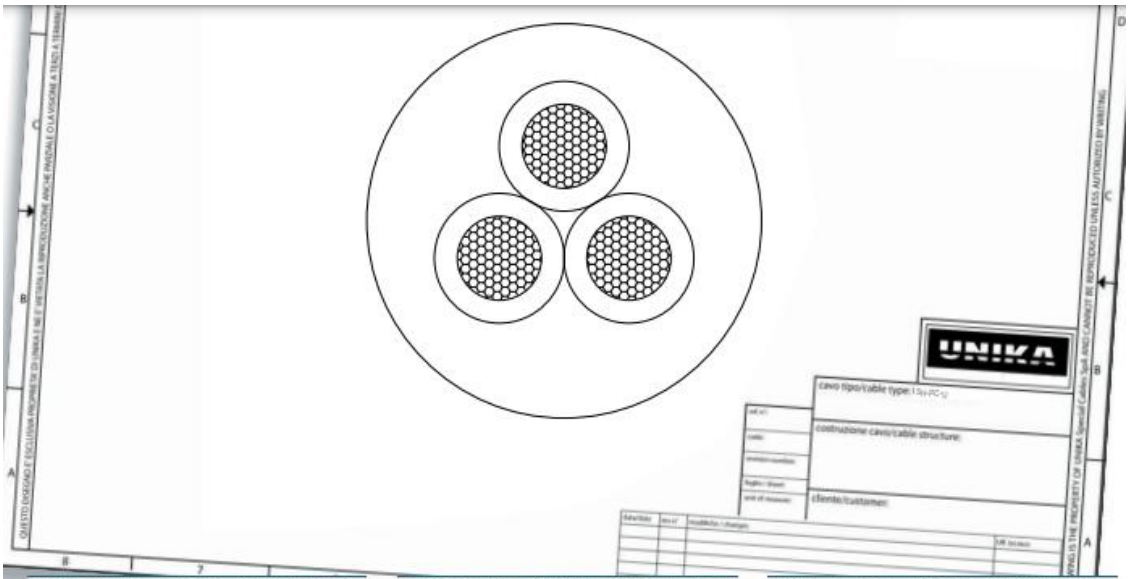
UNIKA

SH-PC-U

Cavi unipolari e multipolari, non armati, di potenza e controllo 0,6/1kV
Single and multicore, unarmoured power and control shipboard cables rated 0,6/1 kV



	Dati tecnici	Technical data
Conduttore **Conductor**	Rame rosso (opzionale stagnato) classe 5 in accordo alla IEC 60228	Bare (optional tinned copper) class 5 according to IEC 60228
Isolamento **Insulation**	Mescola HF XLPE in accordo alla IEC 60092-360 Spessori in accordo alla IEC 60092-353	HF XLPE compound according to IEC 60092-360 Thickness according to IEC 60092-353
Identificazione anime (preferenziale) **Core identification (preferential)**	1 anima: nera 2 anime: marrone, blu 3 anime: nera, grigia, marrone o (blu,marrone, giallo/verde) 4 anime: marrone, nera, grigia, blu o giallo/verde 5 anime: blu, marrone, nera, grigia, nera o giallo/verde da 5 anime: nero numerato (con o senza giallo/verde)	1 core: black 2 cores: brown, blue 3 cores: black, grey, brown or (blue, brown, green/yellow) 4 cores: brown, black, grey, blue or green/yellow 5 cores: blue, brown, black, grey, black or green/yellow From 5 cores: black numbered (with or without green/yellow)
Fasciatura **Bedding**	Filati riempitivi e nastro non igroscopico o guaina estrusa senza alogeni	Yarn fillers and non hygroscopic tape or extruded halogen-free inner sheath
Guaina esterna **Outer sheath**	SHF1 compound in accordo alla IEC 60092-360 Spessore in accordo alla IEC 60092-353 Colore: nero (o un altro colore in accordo) Diametro esterno in accordo alla IEC 60092-350 - Allegato D	SHF1 compound according to IEC 60092-360 Thickness according to IEC 60092-353 Colour: black (or other colour agreed) Outer diameter according to IEC 60092-350 annex D
Marcatura **Marking**	UNIKA (Italy) - SH-PC-U 0,6/1 KV 90°C Marking (numero anime) x (sezione) IEC 60092-353 - IEC 60332 -3-22 – codice rintracciabilità	UNIKA (Italy) - SH-PC-U 0,6/1 kV 90°C (core number) x (cross-section) - IEC 60092-353 - IEC 60332-3-22 - traceability code
Temperatura per posa fissa **Rated conductor temperature for fixed installation**	90°C	90°C
Temperatura minima d'installazione **Minimum installation temperature**	- 15°C	- 15°C
Raggio minimo di curvatura **Minimum bending radius**	(in accordo alla IEC 60092-352 tab. 4): 4D per cavi aventi diametro esterno non superiore a 25 mm 6D per cavi aventi diametro esterno non superiore a 25 mm dove D il diametro esterno	(according to IEC 60092-352 table 4): 4D for cables having overall diameter not above 25 mm 6D for cables having overall diameter above 25 mm with D the overall diameter
Comportamento al fuoco **Fire behaviour**	IEC 60332-3-22 non propagante il fuoco IEC 60332-1-2 non propagante la fiamma IEC 60754-1 assanza di alogeni IEC 60754-2 acicidità dei fumi IEC 60684-2 contenuto di fluoro IEC 61034 densità dei fumi	IEC 60332-3-22 not fire propagation IEC 60332-1-2 not flame propagation IEC 60754-1 halogen content IEC 60754-2 pH and conductivity IEC 60684-2 fluorine content IEC 61034 smoke emission



codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N2026	2x1	7,5	19	66
N2036	3x1	7,9	29	82
N2046	4x1	8,8	38	104
N2056	5x1	9,6	48	123
N2076	7x1	10,4	67	156
N2106	10x1	13,3	96	220
N2126	12x1	13,9	115	250
N2246	24x1	19,3	230	468
N2017	1x1,5	5,0	14	44
N2027	2x1,5	8,1	29	81
N2037	3x1,5	8,7	43	108
N2047	4x1,5	9,5	58	131
N2057	5x1,5	10,4	72	156
N2077	7x1,5	11,5	101	206
N2107	10x1,5	14,7	144	291
N2127	12x1,5	15,1	173	335
N2147	14x1,5	15,9	202	376
N2197	19x1,5	17,9	274	495
N2247	24x1,5	21,1	346	625
N2307	30x1,5	22,5	432	760
N2377	37x1,5	24,3	533	911
N2019	1x2,5	5,4	24	57
N2029	2x2,5	9,1	48	111
N2039	3x2,5	9,6	72	144
N2049	4x2,5	10,5	96	179
N2059	5x2,5	11,7	120	221
N2079	7x2,5	12,7	168	287

codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N2109	10x2,5	16,3	240	407
N2129	12x2,5	17,0	288	478
N2149	14x2,5	17,9	336	545
N2189	19x2,5	20,1	456	718
N2259	24x2,5	23,7	576	906
N2309	30x2,5	25,3	720	1108
N2379	37x2,5	27,5	888	1347
N201A	1x4	6,0	38	76
N202A	2x4	10,3	77	150
N203A	3x4	10,9	115	200
N204A	4x4	12,1	154	257
N205A	5x4	13,3	192	311
N201B	1x6	6,5	58	100
N202B	2x6	11,5	115	203
N203B	3x6	12,2	173	274
N204B	4x6	13,3	230	346
N205B	5x6	14,8	288	431
N201D	1x10	7,5	96	145
N202D	2x10	13,5	192	294
N203D	3x10	14,5	288	412
N204D	4x10	16,0	384	529
N205D	5x10	17,7	480	652
N201E	1x16	8,8	154	215
N202E	2x16	15,9	307	437
N203E	3x16	17,1	461	620
N204E	4x16	18,8	614	796
N205E	5x16	20,9	768	988

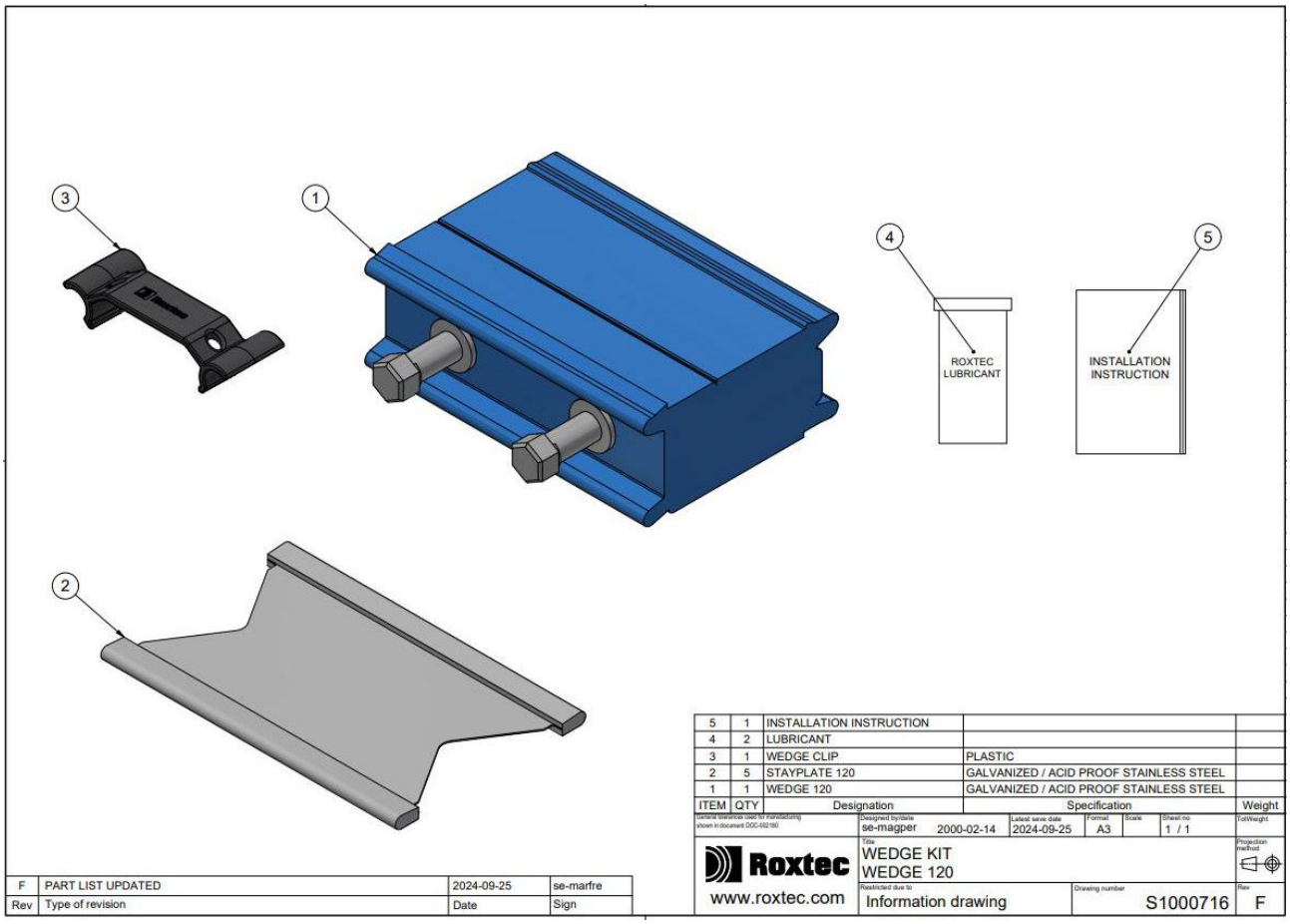
codice code	quarte e numero conduttori x sezione quad and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N201F	1x25	10,5	240	327
N202F	2x25	19,7	480	682
N203F	3x25	20,9	720	959
N204F	4x25	23,3	960	1249
N205F	5x25	25,9	1200	1546
N201G	1x35	12,0	336	448
N203G	3x35	23,9	1008	1311
N204G	4x35	26,6	1344	1718
N205G	5x35	29,6	1680	2131
N201H	1x50	13,6	480	594
N203H	3x50	27,8	1440	1778
N204H	4x50	30,9	1920	2331
N205H	5x50	34,3	2400	2887
N201J	1x70	15,6	672	819
N203J	3x70	31,8	2016	2448
N204J	4x70	35,6	2688	3265
N201K	1x95	18,3	912	1095
N203K	3x95	37,6	2736	3319
N204K	4x95	42,1	3648	4378
N201L	1x120	20,6	1152	1370
N203L	3x120	42,5	3456	2894
N201M	1x150	23,3	1440	1703
N203M	3x150	48,3	4320	5163
N201N	1x185	24,4	1776	2039
N203N	3x185	50,9	5328	6171
N201P	1x240	27,6	2304	2567
N201Q	1x300	30,8	2880	3143

(*) Aggiungere la lettera G al codice per i cavi con conduttore giallo/verde.
Nota: La portata di corrente è riferita ad una temperatura ambiente di 45°C e in accordo a IEC 60092-352. Per due o più circuiti, i fattori di declassamento devono essere tenuti in considerazione. Ulteriori informazioni e sezioni sono disponibili su richiesta.

(*) Add letter G at the code for cables having green/yellow conductor
Note: Current ampacity is referred to ambient temperature of 45 °C and based upon IEC 60092-352. For two or more circuits, derating factors should be taken into account. Further formation and cross-section are available upon request

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4.10 MCT



ITEM	QTY	Designation	Specification	Weight
5	1	INSTALLATION INSTRUCTION		
4	2	LUBRICANT		
3	1	WEDGE CLIP	PLASTIC	
2	5	STAYPLATE 120	GALVANIZED / ACID PROOF STAINLESS STEEL	
1	1	WEDGE 120	GALVANIZED / ACID PROOF STAINLESS STEEL	

Designed by/date	Latest save date	Format	Scale	Sheet no	TotWeight
se-magper 2000-02-14	2024-09-25	A3		1 / 1	

Roxtec
www.roxtec.com

File: WEDGE KIT WEDGE 120

Projection method

Restricted due to: Information drawing

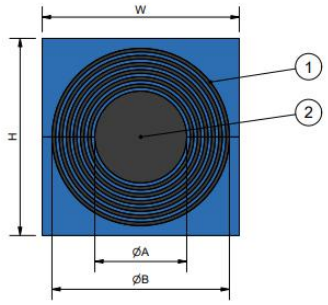
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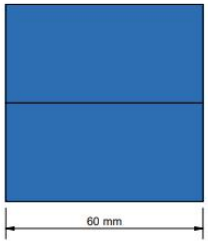
Rev: F

Rev	Type of revision	Date	Sign
F	PART LIST UPDATED	2024-09-25	se-marfre

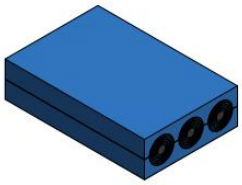
TYPE	CABLE/PIPE Ø (A-B) [mm]	H [mm]	W [mm]	C [QTY]
RM 15	3 - 11	15	15	1
RM 15w40	3.5 - 10.5	15	40	3
RM 20	4 - 14.5	20	20	1
RM 20w40	3.5 - 16.5	20	40	2
RM 30	10 - 25	30	30	1
RM 30 H90	10 - 25	30	90	1
RM 40	21.5 - 34.5	40	40	1
RM 40 H80	21.5 - 34.5	40	80	1
RM 40 10-32	9.5 - 32.5	40	40	1
RM 60*	28 - 54	60	60	1
RM 60 24-54	24 - 54	60	60	1
RM 80*	48 - 71	80	80	1
RM 90*	48 - 71	90	90	1
RM 120*	67.5 - 99	120	120	1

*ALSO AVAILABLE IN WOC VERSION DELIVERED WITHOUT CORE

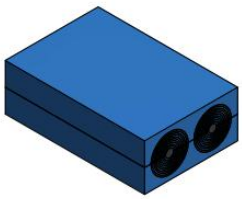




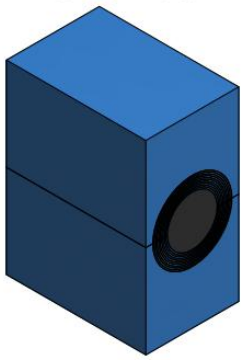
RM 15w40



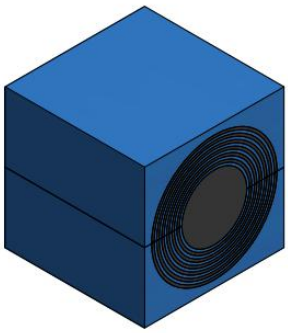
RM 20w40



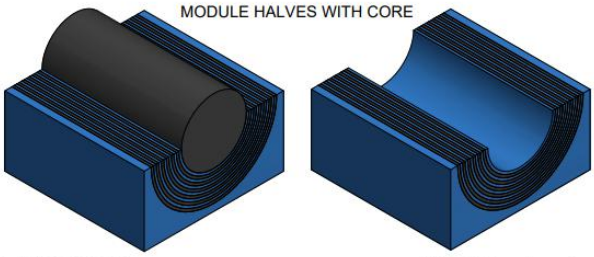
RM 30H90 & RM 40H80



RM 15-120



MODULE HALVES WITH CORE



F	LAYOUT CHANGED	2024-06-25	se-marfre
Rev	Type of revision	Date	Sign

2	C	CORE	ROXYLON	
1	2	RUBBER PROFILE	ROXYLON	
ITEM	QTY	Designation	Specification	Weight

Designed by/date: se-joahel 2003-12-12 | Latest save date: 2024-07-03 | Format: A3 | Scale: | Sheet no: 1 / 1 | TotWeight:

Roxtec
www.roxtec.com

Title: RM MODULES ASSEMBLY

Projection method:

Restricted due to: Information drawing

Drawing number: S1005711

Rev: F

4.11 CABLE GLAND

CEMBRE

1710921/E_0523

PRESSACAVI CABLE GLANDS
MAXIbrass®

INFORMAZIONI GENERALI:
- Materiale: ottone nichelato
- Guarnizione: NEOPRENE
- Griffe di serraggio: POLIAMMIDE PA 6.6
- O-Ring: NITRILE
- Grado di protezione: IP 68 - 5 bar / 30 min.
- Temperatura d'impiego:
  da - 40°C a +100°C (statica*)
  da - 25°C a +100°C (dinamica*)

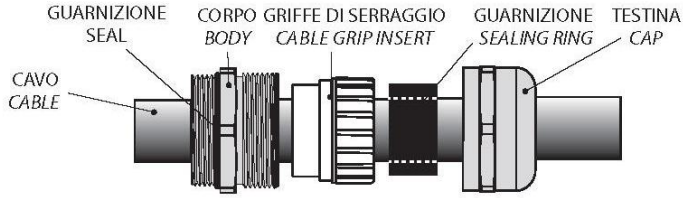
ISTRUZIONI PER L'INSTALLAZIONE:
1) Avvitare il pressacavo nella sede filettata corrispondente (A) o fissarlo con il controdado (B), senza eccedere nella chiusura.
2) Introdurre il cavo all'interno del pressacavo.
3) Avvitare la testina finché la guarnizione tocca completamente il cavo.
4) Serrare infine il pressacavo e la testina alla coppia di serraggio indicata in tabella.

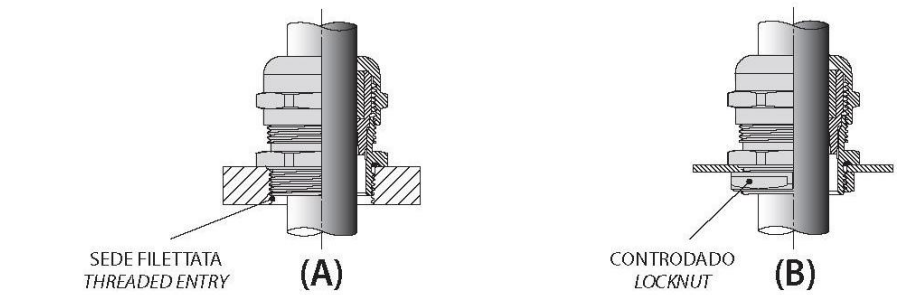
USO SENZA CONTRODADO: solo se avvitato a sedi filettate.

GENERAL INFORMATION:
- *Material: Nickel plated Brass*
- *Sealing ring: NEOPRENE*
- *Cable grip insert: POLYAMIDE PA 6.6*
- *O-ring: NITRILE*
- *Protection: IP 68 - 5 bar / 30 min. (LIQUID TIGHT)*
- *Temperature range:*
  -40°C to +100°C (static)*
  -25°C to +100°C (dynamic)*

INSTALLATION INSTRUCTIONS:
1) Screw the cable gland onto its relevant seat (A) or lock it by the locknut (B).
2) Introduce the cable inside the cable gland.
3) Screw the nut until the sealing ring fully touches the cable.
4) Finally, tighten the body and the nut up to the torque ratio listed in the table.

USAGE WITHOUT LOCKNUT: for securement to a threaded hubs only.





* STATICA: in questo intervallo di temperatura il pressacavo, correttamente installato in conformità ai requisiti tecnici, non deve essere ulteriormente sollecitato con carichi o tensioni (urti, vibrazioni, pressione, ecc.). Le stesse condizioni si applicano anche al cavo e alla sede di fissaggio a cui è fissato il pressacavo.
DINAMICA: in questo intervallo di temperatura il pressacavo resiste ad urti e sollecitazioni con un valore di energia equivalente alla categoria di impatto dichiarata in accordo alla norma EN 62444.

* *STATIC: in this temperature range the cable gland, properly installed in compliance with technical requirements, must not be further strained with stress or forces (shock, vibration, pressure, etc.). The same conditions also apply to both the enclosure and the wire to which the cable gland has been assembled.*
DYNAMIC: in this temperature range the cable gland withstands shocks and stresses with an energy value equivalent to the declared impact category according to EN 62444.

Tipo Type		Grandezza Nominale Thread	Nominale Nominal Ø		Raccomandata Recommended		UL 514B Ø		Valore trazione Pull Value				EN 62444 Ø	Categoria d'impatto impact category	MARCHIO
			[mm]		[Nm]	[in-lbs]	[mm]	[inches]	[kg]	[lb]	[Nm]	[in-lbs]	[mm]		
2900.M12N	2901.M12N	M12x1,5	3-7		6	53	3-7	0.11-0.28	2	4.4	6	53	3-7	5	USR-CNR / VDE
2900.M16N	2901.M16N	M16x1,5	4,5-10		6	53	6-10	0.24-0.39	2	4.4	6	53	4,5-10	6	USR-CNR / VDE
2900.M20N	2901.M20N	M20x1,5	7-13		8	71	8-13	0.31-0.51	15.9	35	8	71	7-13	6	USL-CNL / VDE
2900.M25N	2901.M25N	M25x1,5	10-17		8	71	13-17	0.51-0.67	15.9	35	8	71	11-17	6	USL-CNL / VDE
2900.M32N	2901.M32N	M32x1,5	11-21		18	159	13-21	0.51-0.83	15.9	35	18	159	13-21	6	USL-CNL / VDE
2900.M40N	2901.M40N	M40x1,5	19-28		18	159	21-28	0.83-1.10	15.9	35	18	159	19-28	6	USL-CNL / VDE
2900.M50N	2901.M50N	M50x1,5	26-35		18	159	27-35	1.06-1.38	15.9	35	18	159	26-35	6	USL-CNL / VDE
2900.M63N	-	M63x1,5	34-45		25	221	34-45	1.33-1.77	15.9	35	18	159	34-45	6	USL-CNL / VDE
2910.M12N	2911.M12N	M12x1,5	1-5		6	53	2-5	0.08-0.20	2	4.4	6	53	2-5	5	USR-CNR / VDE
2910.M16N	2911.M16N	M16x1,5	2,5-7		6	53	3,5-7	0.14-0.28	1	2.2	6	53	4-7	6	USR-CNR / VDE
2910.M20N	2911.M20N	M20x1,5	5-10		8	71	5-10	0.20-0.40	2	4.4	8	71	5,5-10	6	USR-CNR / VDE
2910.M25N	2911.M25N	M25x1,5	6-13		8	71	8-13	0.31-0.51	1	2.2	8	71	6-13	6	USR-CNR / VDE
2910.M32N	2911.M32N	M32x1,5	7-14		18	159	7-14	0.28-0.55	5	11	18	159	9-14	6	USR-CNR / VDE
2910.M40N	2911.M40N	M40x1,5	13-23		18	159	15-23	0.59-0.91	15.9	35	18	159	17-23	6	USL-CNL / VDE
2910.M50N	2911.M50N	M50x1,5	20-29		18	159	20-29	0.79-1.14	15.9	35	18	159	25-29	6	USL-CNL / VDE
2910.M63N	-	M63x1,5	27-39		25	221	28-39	1.10-1.54	15.9	35	18	159	31-39	6	USL-CNL / VDE
2940.M12N	-	M12x1,5	5-8		6	53	5-8	0.20-0.31	2	4.4	6	53	5-8	5	USR-CNR / VDE
2940.M16N	-	M16x1,5	7-12		6	53	8-12	0.31-0.47	2	4.4	6	53	8-12	6	USR-CNR / VDE
2940.M20N	-	M20x1,5	10-16		8	71	12-16	0.47-0.63	5	11	8	71	12-16	6	USR-CNR / VDE
2940.M25N	-	M25x1,5	13-21		8	71	14-21	0.55-0.83	15.9	35	18	159	13-21	6	USL-CNL / VDE
2940.M32N	-	M32x1,5	18-25		18	159	21-25	0.83-0.98	15.9	35	18	159	18-25	6	USL-CNL / VDE
2940.M40N	-	M40x1,5	25-32		18	159	25-32	0.98-1.26	15.9	35	25	221	25-32	6	USL-CNL / VDE
2940.M50N	-	M50x1,5	30-38		18	159	30-37	1.18-1.46	15.9	35	25	221	30-38	6	USL-CNL / VDE
2940E.M50N	-	M50x1,5	35-45		18	159	35-41	1.38-1.61	15.9	35	25	221	35-45	6	USL-CNL / VDE
2900.07N	2901.07N	Pg 7	3-7		6,25	55	3-7	0.11-0.28	1.2	2.65	6.25	55	-	-	USR-CNR
2900.09N	2901.09N	Pg 9	4-8		6,25	55	4-8	0.16-0.31	2	4.4	6.25	55	-	-	USR-CNR
2900.11N	2901.11N	Pg 11	4,5-10		6,25	55	6-10	0.24-0.40	2	4.4	6.25	55	-	-	USL-CNR
2900.13N	2901.13N	Pg 13,5	5-12		7,5	66	10-12	0.39-0.47	15.9	35	7,5	66	-	-	USL-CNL
2900.16N	2901.16N	Pg 16	7-13		7,5	66	10-13	0.39-0.51	15.9	35	7,5	66	-	-	USL-CNL
2900.21N	2901.21N	Pg 21	10-17		10	88,5	12-17	0.47-0.67	15.9	35	10	88,5	-	-	USL-CNL
2900.29N	2901.29N	Pg 29	18-25		15	133	18-25	0.71-0.99	15.9	35	15	133	-	-	USL-CNL
2900.36N	2901.36N	Pg 36	22-32		25	221	23-32	0.91-1.26	15.9	35	25	221	-	-	USL-CNL
2900.42N	2901.42N	Pg 42	28-38		25	221	28-35	1.10-1.38	15.9	35	25	221	-	-	USR-CNL
2900.48N	-	Pg 48	34-45		25	221	34-45	1.34-1.77	15.9	35	25	221	-	-	USR-CNL
2910.07N	2911.07N	Pg 7	1-5		6,25	55	2-5	0.08-0.20	1.2	2.65	6.25	55	-	-	USR-CNR
2910.09N	2911.09N	Pg 9	2-6		6,25	55	3-6	0.12-0.24	2	4.4	6.25	55	-	-	USR-CNR
2910.11N	2911.11N	Pg 11	2,5-7		6,25	55	3,5-7	0.14-0.28	2	1	6.25	55	-	-	USR-CNR
2910.13N	2911.13N	Pg 13,5	4-10		7,5	66	5,5-10	0.22-0.39	2	4.4	7.5	66	-	-	USL-CNR
2910.16N	2911.16N	Pg 16	5-10		7,5	66	6-10	0.24-0.39	2	4.4	7.5	66	-	-	USL-CNR
2910.21N	2911.21N	Pg 21	6-13		10	88,5	7-13	0.28-0.51	2.5	6.6	10	88,5	-	-	USL-CNR
2910.29N	2911.29N	Pg 29	12-20		15	133	12-20	0.47-0.79	10	22	15	133	-	-	USL-CNR
2910.36N	2911.36N	Pg 36	19-26		25	221	19-26	0.75-1.02	15.9	35	25	221	-	-	USR-CNL
2910.42N	2911.42N	Pg 42	24-31		25	221	24-31	0.95-1.22	15.9	35	25	221	-	-	USL-CNL
2910.48N	-	Pg 48	27-39		25	221	31-39	1.22-1.54	15.9	35	25	221	-	-	USL-CNL

VDE = LICENCE No. 40008475 and No. 40008476

USL-CNL = c UL us LISTED FILE No. E 220310, Control No. 48SB

USR-CNR = c UL us FILE No. E 220310
Con riduzione della forza di trazione.
With reduced pull force.

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www.cembre.com

CEMBRE S.p.A.
via Serenissima, 9
25135 Brescia
Italy
Ph +39 030 36921
ufficio.vendite@cembre.com
sales@cembre.com

CEMBRE Ltd.
Dunton Park,
Kingsbury Road,
Curdworth, Sutton Coldfield
West Midlands, B76 9EB
United Kingdom
Ph +44 01675 470440
sales@cembre.co.uk

CEMBRE S.a.r.l.
22 Avenue Ferdinand de Lesseps
91420 Morangis Cedex
France
Ph +33 01 60 49 11 90
info@cembre.fr

CEMBRE España S.L.U.
Calle Verano 6 y 8
Pl Las Monjas
28850 Torrejón de Ardoz
Madrid - Spain
Ph +34 91 4852580
comercial@cembre.com

CEMBRE GmbH
Geschäftsbereich Energie- und Bahntechnik
Heidemannstr. 166
80939 München
Germany
Ph + 49 89-3580676
info@cembre.de

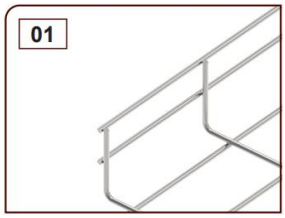
CEMBRE GmbH
Geschäftsbereich Industrie und Handel
Boschstraße 7
71384 Weinstadt
Germany
Ph +49 7151-20536-60
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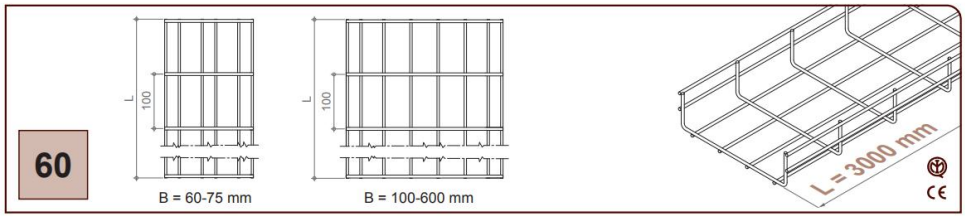
CEMBRE Inc.
Raritan Center Business Park
300 Columbus Circle-S.F,
Edison, NJ 08837 USA
Ph +1 (732) 225-7415
sales.us@cembre.com
Midwest Office
1051 Perimeter Dr. #470
Schaumburg, IL 60173

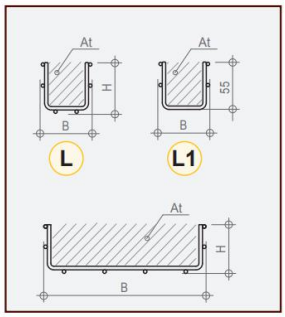
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4.12 CABLE TRAY

PASSERELLA A RETE CZ4 *Wire mesh cable tray*







E J N Codice/ Code	Ø mm	Δ kg/m	B mm	H mm	L mm	IEC 61537 1500 mm	At mm²	Δ kg/m	Ø mm	Z Codice/ Code
B4 ¤ 01A3H060L	3,9	0,76	60	60	3000	15 daN/m	2290	0,78	3,9	B4 Z 01A3H060L
B4 ¤ 01A3H060L1	3,9	0,56	60	55	3000	15 daN/m	2465	0,58	3,9	B4 Z 01A3H060L1
B4 ¤ 01A3H075L	3,9	0,77	75	60	3000	15 daN/m	3070	0,79	3,9	B4 Z 01A3H075L
B4 ¤ 01A3H100L	3,9	0,80	100	60	3000	26 daN/m	4370	0,82	3,9	B4 Z 01A3H100L
B4 ¤ 01A3H150L	3,9	0,85	150	60	3000	26 daN/m	6970	0,87	3,9	B4 Z 01A3H150L
B4 ¤ 01A3H200L	3,9	1,10	200	60	3000	28 daN/m	9570	1,12	3,9	B4 Z 01A3H200L
B4 ¤ 01A3H300L	3,9	1,40	300	60	3000	28 daN/m	14770	1,43	3,9	B4 Z 01A3H300L
B4 ¤ 01A3H300Q	4,4	1,68	300	60	3000	42 daN/m	14460	1,72	4,4	B4 Z 01A3H300Q
B4 ¤ 01A3H400Q	4,4	2,05	400	60	3000	44 daN/m	19580	2,10	4,4	B4 Z 01A3H400Q
B4 ¤ 01A3H500Q	4,4	2,41	500	60	3000	44 daN/m	24700	2,46	4,4	B4 Z 01A3H500Q
B4 ¤ 01A3H600Q	4,4	2,77	600	60	3000	44 daN/m	29820	2,83	4,4	B4 Z 01A3H600Q

¤ Scegli il materiale/ *Choose the material*

Base Load Power Hub (BLPH)

B-200 ELECTRICAL COMPONENTS LIST AND DS - E&I SHELTERS

Document Number: 1724000049-EL-LIS-00044

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	05-02-25

Document Class: 3

Rev.	Date	Description	Prepared	Reviewed	Approved
02	13/01/2025	Issue for Information (IFI)	MG	OA	CA
01	30/10/2024	Issue for Information (IFI)	MG	OA	CA
00	28/06/2024	Issue for Information (IFI)	FP	OA	CA

ALEXSISTEMI

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)
02	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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None

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

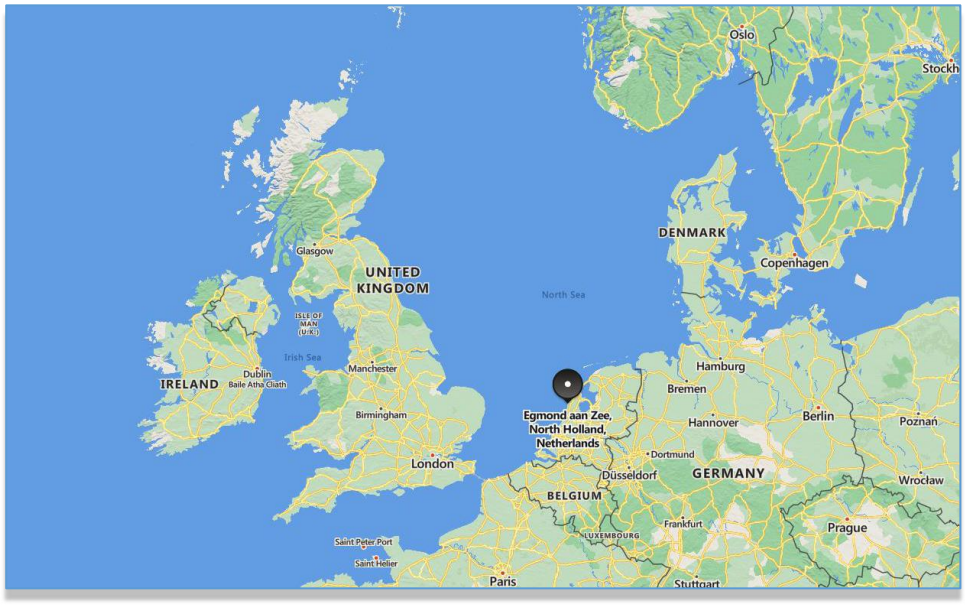


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

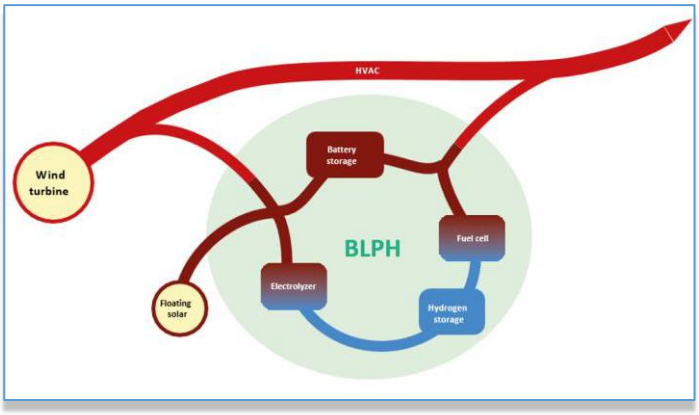


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting

wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document provides the data sheet and information of electrical components supplied by Alex Sistemi

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

3 ELECTRICAL COMPONENTS LIST

3.1 LIST

Item	Description	Grade	Manufacturer	Line	Model	B-200
1	Light switch 10A	IP66	Scame	Protecta	1.375.012	2
2	Socket schuko 16A	IP66	Scame	Protecta	1.376.404	1
3	Two lamp LED	IP66	Disano	Echo	164704-00	2
4	Two lamp LED + Energy Saving	IP66	Disano	Echo	164704-07	1
5	Feed unit 40A Left or Right mount	IP55	Schneider	Canalis	KBB40ABG44W	1
6	Straight distribution lenghts 25A - 3mt	IP55	Schneider	Canalis	KBB25ED42305W	1
7	Straight distribution lenghts 40A - 2mt	IP55	Schneider	Canalis	KBB40ED42203W	2
8	10A Tap-off unit	IP55	Schneider	Canalis	KBC10DCB40	3

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4 DATA SHEET

4.1 LIGHT SWITCH 10A

EN - 20 May 2024

SCAME

137.5012

SP ONE WAY SWITCH
SP ONE WAY SWITCH 20AX
M95(95x95mm)



DIRECTIVE RoHS 2011/65/EU

Commercial Series	PROTECTA Series
Synthetical description	SP ONE WAY SWITCH
Mounting version	SURFACE MOUNTING

TECHNICAL CHARACTERISTICS

Rated current	20AX
Rated voltage	250V

PHYSICAL CHARACTERISTICS

Mounting version	SURFACE MOUNTING
Protection degree	Splash proof
Protection degree IP	IP66
Material	THERMOPLASTIC
Working temperature	-20°C/+60°C
Protection degree IK	IK07
Warning light	WITH NEON

DIMENSIONAL CHARACTERISTICS

N.° modules	1 GANG
Dimensions	M95(95x95mm)

DOWNLOAD

Technical drawing [PDF]
Technical drawing [DWG]
Technical drawing [STP]
Instruction manual

www.scame.com
scame@scame.com

SCAME PARRE S.p.A
Via Costa Erta, 15 - 24020 Parre (BG) Italy - +39 035 705000

4.2 SOCKET SCHUKO 16A

EN - 20 May 2024

SCAME

137.6404

ITALIAN P30 STANDARD SOCKET ITALIAN P30 STANDARD SOCKET 16A M95(95x95mm)



CEI 23-50 (2006)
DIRECTIVE RoHS 2011/65/EU

Commercial Series	PROTECTA Series
Synthetical description	ITALIAN P30 STANDARD SOCKET
Type	ITALIAN P30
Mounting version	SURFACE MOUNTING

TECHNICAL CHARACTERISTICS

Rated current	16A
Rated voltage	250V

PHYSICAL CHARACTERISTICS

Mounting version	SURFACE MOUNTING
Protection degree	Splash proof
Protection degree IP	IP66
Material	THERMOPLASTIC
Working temperature	-20°C/+60°C
Protection degree IK	IK07

DIMENSIONAL CHARACTERISTICS

Dimensions	M95(95x95mm)

DOWNLOAD

Technical drawing [PDF]
Technical drawing [DWG]
Technical drawing [STP]
Instruction manual

www.scame.com
scame@scame.com

SCAME PARRE S.p.A
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4.3 TWO LAMP LED

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00





Disano's watertight fixtures are built from the company's extensive experience, skill and reliability as a global leader in the manufacturing of specialised lighting products. These basic features have contributed to the success of Disano's watertight fixtures over the years. The lamp's body is made of shatter-proof polycarbonate, with an IP66 protection, and high mechanical strength due to the structure reinforced by internal ribs. Installation is made easy thanks to the stainless steel bracket supplied as standard for ceiling mounting, while the spring hook allows quick attachment to any chain suspension system. Moreover, special toothed guides allow the perfect alignment of fixtures mounted in a continuous row.
In addition to these basic features you will find all the advantages of the LED technology, i.e. light sources with a very long service life, low power consumption and great light quality. The polycarbonate WATERTIGHT FIXTURES have an IP66IK08 rating when installed in environments with temperatures not exceeding 45 °C. Direct exposure to sunlight may exceed 45 °C, compromising the protection rating. However, it is advisable to use them appropriately without altering their mechanical and protective qualities (IP66IK08) and not to install them on surfaces subject to strong vibration, or exposed to atmospheric agents, outdoors on ropes or poles, on walls, under metal gratings or directly exposed to sunlight. If this is not possible, use the steel watertight fixturess instead.

GENERAL INFORMATION

Article	927 - Echo - two lamp LED - Energy Saving
Code	164704-00

DIMENSIONS AND WEIGHT

Length (mm)	1300 mm
Width (mm)	152 mm
Height (mm)	102 mm
Weight (Kg)	2.260 kg

ELECTRICAL CHARACTERISTICS AND CONTROLS

Voltage type	AC
Min Voltage (V)	220 V
Max Voltage (V)	240 V
Min Frequency (Hz)	50 Hz
Max Frequency (Hz)	60 Hz
Frequency (Hz)	50 Hz
Wiring name	CLD
Power factor	≥0.9
Insulation class	Class I
Controllability	None

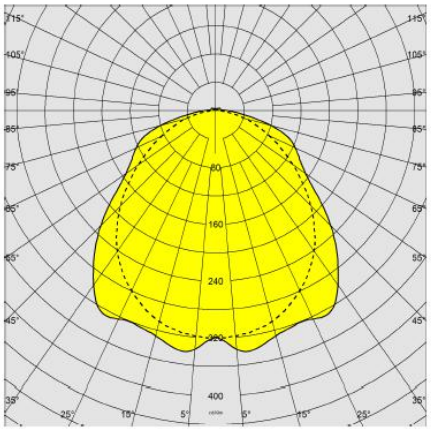
disano illuminazione

1

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00



PHOTOMETRIC DATA

Lighting source	LED
CRI	≥80
Luminous flux (output) (lm)	5737 lm
Power absorption (total) (W)	32 W
CCT	4000 K
Luminous efficacy (lm/W)	179 lm/W
Low Flicker	luminaire with very low flicker: evenly distributed light for greater visual safety.
Colour consistency	SDCM3
LED flux maintenance	80000 hr, L 80, B 20

MECHANICAL CHARACTERISTICS

Impact resistance rating (IK)	IK08
IP	66
Ambient temperature - min	-30 °C
Ambient temperature - max	40 °C

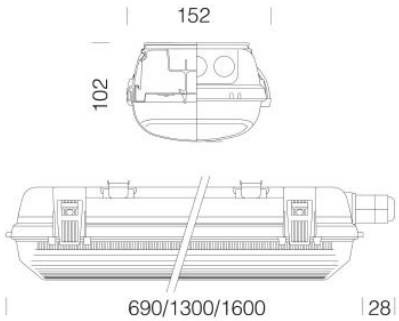
disano illuminazione

2

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-00



DOWNLOAD

MOUNTS

AssemblyInstructions Echo 09-23.pdf

DESIGNS

TechnicalDrawing echobila.dxf

MATERIALS AND COLOURS

Housing	injection-moulded, made of grey RAL 7035 polycarbonate, shatterproof, UV-stabilised, with high mechanical strength thanks to the structure reinforced by internal ribs.
Optics	galvanised steel pre-painted in oven with white polyester resin, UV-stabilised. Fastened to the body with a quick coupling by means of a device machined directly on the body.
Diffuser	injection-moulded in polycarbonate with internal grooves for greater light control, self-extinguishing V2, UV-stabilised, smooth outer finish to enable easy cleaning for maximum light efficiency.
Colour	Grey
Equipment	- sealing gasket in eco-friendly, anti-aging expanded polyurethane foam - ceiling mounting brackets and suspension hook in stainless steel - plug-socket connector - snap hooks and safety screws in stainless steel
	ATTENTION ! Do not install on surfaces subject to strong vibrations, outdoors on hanging cables, or on walls under metallic grates, or on poles, and in any case, never expose the fixture to direct sunlight. Check the compatibility between the material constituting the product and the space where it will be installed. We recommend the use of fixtures made of steel with direct exposure to sunlight.

STANDARDS AND COMPLIANCE

Photobiological safety class	RG0
Markings and tests	CE, ENEC
Reference standards	EN60598-1. With degree of protection according to EN60529. The lighting fixture meets all IFS and BRC requirements, and the regulation of the HACCP Directive regarding lighting systems installed in food processing plants.
Laboratory Tests	- the UL 94 Standard is considered a reference for rating the ignition characteristics of plastic materials. The watertight fixtures are made of V2 class material that self-extinguishes in 25 seconds. - passes the Glow Wire Test at 850 °C.
Energy Label	C

GEAR

Upon request	- version with wire feedthrough, dimmable. - narrow beam version (subcode 22) - radar sensor, subcode -19 - Always On Emergency, subcode -07 (always on, 60 min charge)

WARRANTY

After sales warranty	5 yr

disano illuminazione

3

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

4.4 TWO LAMP LED + ENERGY SAVING

927 - Echo - two lamp LED - Energy Saving

Code: 164704-07





Disano's watertight fixtures are built from the company's extensive experience, skill and reliability as a global leader in the manufacturing of specialised lighting products. These basic features have contributed to the success of Disano's watertight fixtures over the years. The lamp's body is made of shatter-proof polycarbonate, with an IP66 protection, and high mechanical strength due to the structure reinforced by internal ribs. Installation is made easy thanks to the stainless steel bracket supplied as standard for ceiling mounting, while the spring hook allows quick attachment to any chain suspension system. Moreover, special toothed guides allow the perfect alignment of fixtures mounted in a continuous row.
In addition to these basic features you will find all the advantages of the LED technology, i.e. light sources with a very long service life, low power consumption and great light quality.
The polycarbonate WATERTIGHT FIXTURES have an IP66IK08 rating when installed in environments with temperatures not exceeding 45 °C. Direct exposure to sunlight may exceed 45 °C, compromising the protection rating. However, it is advisable to use them appropriately without altering their mechanical and protective qualities (IP66IK08) and not to install them on surfaces subject to strong vibration, or exposed to atmospheric agents, outdoors on ropes or poles, on walls, under metal gratings or directly exposed to sunlight. If this is not possible, use the steel watertight fixturess instead.

GENERAL INFORMATION

Article	927 - Echo - two lamp LED - Energy Saving
Code	164704-07

DIMENSIONS AND WEIGHT

Length (mm)	1300 mm
Width (mm)	152 mm
Height (mm)	102 mm
Weight (Kg)	2.940 kg

ELECTRICAL CHARACTERISTICS AND CONTROLS

Voltage type	AC
Min Voltage (V)	220 V
Max Voltage (V)	240 V
Min Frequency (Hz)	50 Hz
Max Frequency (Hz)	60 Hz
Frequency (Hz)	50 Hz
Wiring name	CLD-E
Power factor	≥0.9
Insulation class	Class I
Controllability	None

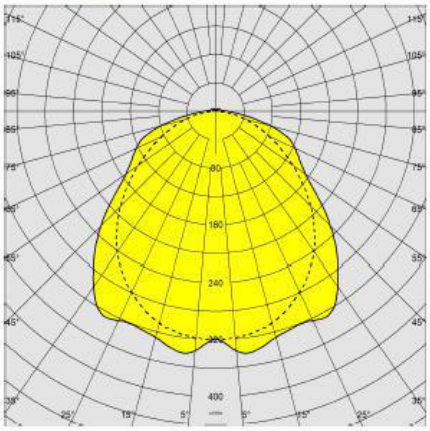
disano illuminazione

1

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-07



PHOTOMETRIC DATA

Lighting source	LED
CRI	≥80
Luminous flux (output) (lm)	5737 lm
Power absorption (total) (W)	32 W
CCT	4000 K
Luminous efficacy (lm/W)	179 lm/W
Low Flicker	luminaire with very low flicker: evenly distributed light for greater visual safety.
Colour consistency	SDCM3
LED flux maintenance	80000 hr, L 80, B 20

MECHANICAL CHARACTERISTICS

Impact resistance rating (IK)	IK08
IP	66
Ambient temperature - min	5 °C
Ambient temperature - max	40 °C

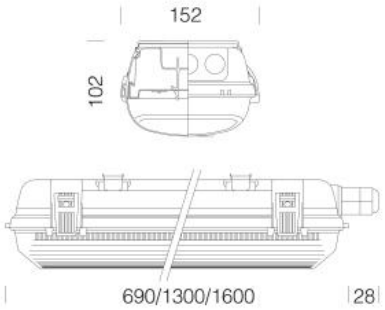
disano illuminazione

2

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

927 - Echo - two lamp LED - Energy Saving

Code: 164704-07



DOWNLOAD

MOUNTS

AssemblyInstructions Echo 09-23.pdf

DESIGNS

TechnicalDrawing echobila.dxf

MATERIALS AND COLOURS

Housing	injection-moulded, made of grey RAL 7035 polycarbonate, shatterproof, UV-stabilised, with high mechanical strength thanks to the structure reinforced by internal ribs.
Optics	galvanised steel pre-painted in oven with white polyester resin, UV-stabilised. Fastened to the body with a quick coupling by means of a device machined directly on the body.
Diffuser	injection-moulded in polycarbonate with internal grooves for greater light control, self-extinguishing V2, UV-stabilised, smooth outer finish to enable easy cleaning for maximum light efficiency.
Colour	Grey
Equipment	- sealing gasket in eco-friendly, anti-aging expanded polyurethane foam - ceiling mounting brackets and suspension hook in stainless steel - plug-socket connector - snap hooks and safety screws in stainless steel
	ATTENTION ! Do not install on surfaces subject to strong vibrations, outdoors on hanging cables, or on walls under metallic grates, or on poles, and in any case, never expose the fixture to direct sunlight. Check the compatibility between the material constituting the product and the space where it will be installed. We recommend the use of fixtures made of steel with direct exposure to sunlight.

EMERGENCY LIGHTING

Type of emergency	S.A.
Battery life-recharge	1h

STANDARDS AND COMPLIANCE

Photobiological safety class	RG0
Markings and tests	CE, ENEC
Reference standards	EN60598-1. With degree of protection according to EN60529. The lighting fixture meets all IFS and BRC requirements, and the regulation of the HACCP Directive regarding lighting systems installed in food processing plants.
Laboratory Tests	- the UL 94 Standard is considered a reference for rating the ignition characteristics of plastic materials. The watertight fixtures are made of V2 class material that self-extinguishes in 25 seconds. - passes the Glow Wire Test at 850 °C.
Energy Label	C

GEAR

Upon request	- version with wire feedthrough, dimmable. - narrow beam version (subcode 22) - radar sensor, subcode -19 - Always On Emergency, subcode -07 (always on, 60 min charge)

WARRANTY

After sales warranty	5 yr

disano illuminazione

3

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

4.5 FEED UNIT 40A LEFT OR RIGHT MOUNTING

Product datasheet

Specifications



FEED UNIT 40A LEFT OR RIGHT MOUNTING

Local distributor code:
23348079 KBB40ABG44W

EAN Code: 3606480001062

Main

Range of product	Canalis
Device short name	KBB
Product compatibility	Canalis KBB busbar trunking 25...40 A
Offer type	Classic Control system
product or component type	Feed unit
Conductors material	Aluminium
[Ie] rated operational current	40 A 25 A
[Ue] rated operational voltage	230...400 V
Number of circuits	2
busbar trunking polarity	3L + N + PE L + N + PE
Protection type	Without protection
Control type	Communicating
Communication port protocol	DALI
Colour	White (RAL 9003)

Complementary

Provided equipment	End cover
mounting location	Left
mounting mode	By clips
mounting support	Busbar
Connections - terminals	Terminal block - Pg 21 - screw clamp connector for 6...10 mm²
Width	244 mm
Depth	103.5 mm
Height	75.5 mm
net weight	400 g
Standards	IEC 61439-6

Environment

IP degree of protection	IP55 conforming to IEC 60529

28 Jun 2024 Life Is On Schneider Electric 1

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	8.0 cm
Package 1 Width	11.0 cm
Package 1 Length	27.0 cm
Package 1 Weight	700.0 g
Unit Type of Package 2	S03
Number of Units in Package 2	12
Package 2 Height	30.0 cm
Package 2 Width	30.0 cm
Package 2 Length	40.0 cm
Package 2 Weight	8.556 kg
Unit Type of Package 3	P06
Number of Units in Package 3	96
Package 3 Height	75.0 cm
Package 3 Width	60.0 cm
Package 3 Length	80.0 cm
Package 3 Weight	75.7 kg

Contractual warranty

Warranty	18 months

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Sustainability

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Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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4.6 STRAIGHT DISTRIBUTION LENGHTS 25A – 3METERS

Product datasheet

Specifications



Straight length, Canalis KBB, 25 A, 2 circuits 3L+N+PE and L+N+PE, 5 tap-off units, 3 m, white

Local distributor code:
23346767 KBB25ED42305W

EAN Code: 3606480000805

Main

Range of product	Canalis
Device short name	KBB
Offer type	Classic Control system
product or component type	Straight length
Busbar description	Distribution length
Device application	Lighting Power socket distribution
[Ie] rated operational current	25 A at 35 °C
[Ue] rated operational voltage	230...400 V
Network frequency	50/60 Hz
busbar trunking polarity	3L + N + PE L + N + PE
Number of circuits	2
Number of tap-off outlets	5
Control type	Communicating
Communication port protocol	DALI
mounting mode	By screws

Complementary

[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
[Icw] rated short-time withstand current	0.44 kA
[Ipk] rated peak withstand current	4.4 kA
Thermal stress limit	195 kA².s
Maximum radiated magnetic field	2 pT
THDI	0...15 % 25 A 15...33 % 20 A 33...100 % 16 A
Maximum voltage drop	<0.72 V with power factor = 1 at 50 Hz with 1A for 100 m long <0.67 V with power factor = 0.9 at 50 Hz with 1A for 100 m long <0.61 V with power factor = 0.8 at 50 Hz with 1A for 100 m long <0.55 V with power factor = 0.7 at 50 Hz with 1A for 100 m long
Standards	EN/IEC 61439-6 EN/IEC 61439-1

28 Jun 2024 Life Is On Schneider Electric 1

Width	30 mm
Height	46 mm
Length	3 m
Colour	White (RAL 9003)
net weight	4.7 kg

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529
IK degree of protection	IK06 conforming to EN/IEC 62262
Ambient air temperature for operation	0…35 °C (100 % of In) 35…40 °C (96 % of In) 40…45 °C (93 % of In) 45…50 °C (89 % of In) 50…55 °C (85 % of In)

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	5.000 cm
Package 1 Width	6.000 cm
Package 1 Length	310.000 cm
Package 1 Weight	5.000 kg
Unit Type of Package 2	BB1
Number of Units in Package 2	6
Package 2 Height	13.000 cm
Package 2 Width	16.500 cm
Package 2 Length	314.500 cm
Package 2 Weight	31.000 kg
Unit Type of Package 3	PAL
Number of Units in Package 3	72
Package 3 Height	52.000 cm
Package 3 Width	63.000 cm
Package 3 Length	318.000 cm
Package 3 Weight	430.500 kg

Contractual warranty

Warranty	18 months

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Sustainability

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Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

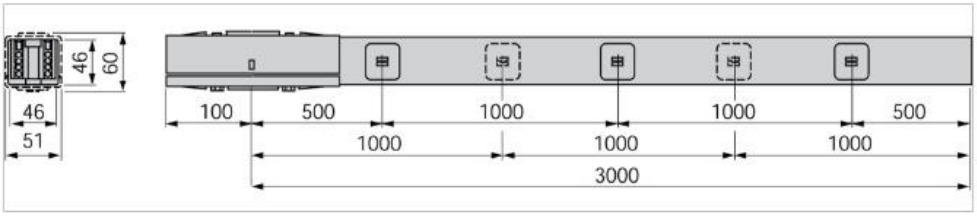
Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBB25ED42305W

Dimension Drawings



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4.7 STRAIGHT DISTRIBUTION LENGHTS 40A – 2METERS

Product datasheet

Specifications



Straight length, Canalis KBB, 25/40A, 2 circuits, 3L+N+PE/ L+N+PE, compatible DALI, 3 outlets, 2m, white RAL9003

KBB40ED42203W

Main

Range of product	Canalis
Device short name	KBB
Offer type	Classic Control system
product or component type	Straight length
Busbar description	Distribution length
Device application	Lighting Power socket distribution
[Ie] rated operational current	40 A at 35 °C 25 A at 35 °C
[Ue] rated operational voltage	230...400 V
Network frequency	50/60 Hz
busbar trunking polarity	3L + N + PE L + N + PE
Number of circuits	2
Number of tap-off outlets	3
Control type	Communicating
Communication port protocol	DALI
mounting mode	By screws

Complementary

[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
[Icw] rated short-time withstand current	0.94 kA
[Ipk] rated peak withstand current	9.6 kA
Thermal stress limit	900 kA².s
Maximum radiated magnetic field	2 pT
THDI	0...15 % 40 A 15...33 % 32 A 33...100 % 28 A
Maximum voltage drop	<0.3 V with power factor = 1 at 50 Hz with 1A for 100 m long <0.28 V with power factor = 0.9 at 50 Hz with 1A for 100 m long <0.25 V with power factor = 0.8 at 50 Hz with 1A for 100 m long <0.22 V with power factor = 0.7 at 50 Hz with 1A for 100 m long
Standards	EN/IEC 61439-6 EN/IEC 61439-1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Width	30 mm
Height	46 mm
Length	2 m
Colour	White (RAL 9003)
net weight	3.8 kg

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529
IK degree of protection	IK06 conforming to EN/IEC 62262
Ambient air temperature for operation	0…35 °C (100 % of In) 35…40 °C (96 % of In) 40…45 °C (93 % of In) 45…50 °C (89 % of In) 50…55 °C (85 % of In)

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	5.000 cm
Package 1 Width	210.000 cm
Package 1 Length	5.000 cm
Package 1 Weight	3.500 kg
Unit Type of Package 2	BB1
Number of Units in Package 2	6
Package 2 Height	13.500 cm
Package 2 Width	16.000 cm
Package 2 Length	215.000 cm
Package 2 Weight	24.000 kg
Unit Type of Package 3	PAL
Number of Units in Package 3	72
Package 3 Height	51.000 cm
Package 3 Width	220.000 cm
Package 3 Length	64.000 cm
Package 3 Weight	302.000 kg

Contractual warranty

Warranty	18 months

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Sustainability

Green Premium™ label is Schneider Electric's commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO_2 products.

Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

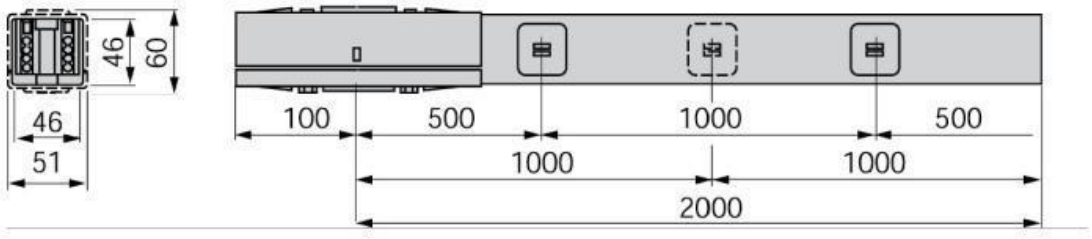
Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Product datasheet KBB40ED42203W

Dimension Drawings



This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

4.8 10A TAP-OFF UNIT

Product datasheet

Specifications

10A TAPOFF UNITS

Local distributor code:

389342036 KBC10DCB40



EAN Code: 3606480002083

Main

Range	Canalis
Offer type	Classic Control system
product or component type	Connector
Device application	Lighting Power socket distribution
Range compatibility	Canalis KBA busbar trunking Canalis KBB busbar trunking
[Ie] rated operational current	10 A at 35 °C
[Ue] rated operational voltage	230...240 V
Network frequency	50/60 Hz
Communication port protocol	DALI
Tap-off unit polarity	3L+N+PE
Tap-off unit connector type	With phase selection

Complementary

Colour	Cream (RAL 9001)
[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
Protection type	Without protection
Width	1 m
Depth	62 mm
Height	60 mm
net weight	65 g
Quantity per set	Set of 10
Standards	EN/IEC 61439-1 EN/IEC 61439-6

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Package 1 Height	6.200 cm
Package 1 Width	6.000 cm
Package 1 Length	11.500 cm
Package 1 Weight	87.000 g
Unit Type of Package 2	BB1
Number of Units in Package 2	10
Package 2 Height	12.500 cm
Package 2 Width	14.000 cm
Package 2 Length	32.000 cm
Package 2 Weight	880.000 g
Unit Type of Package 3	P06
Number of Units in Package 3	300
Package 3 Height	77.000 cm
Package 3 Width	80.000 cm
Package 3 Length	60.000 cm
Package 3 Weight	34.900 kg

Contractual warranty

Warranty	18 months

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Sustainability

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Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

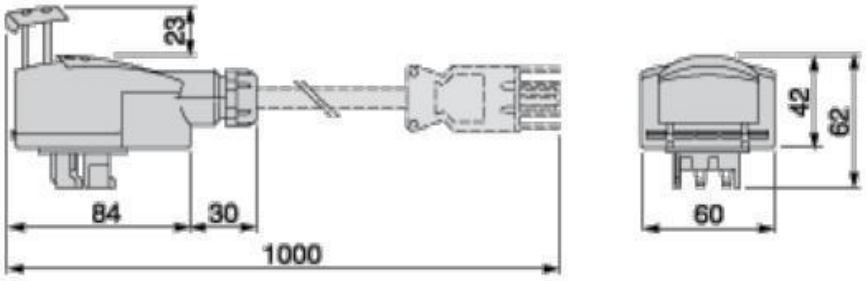
Reach Free Of Svhc	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Plastic Parts Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBC10DCB40

Dimension Drawings



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4.9 ELECTRICAL CABLE

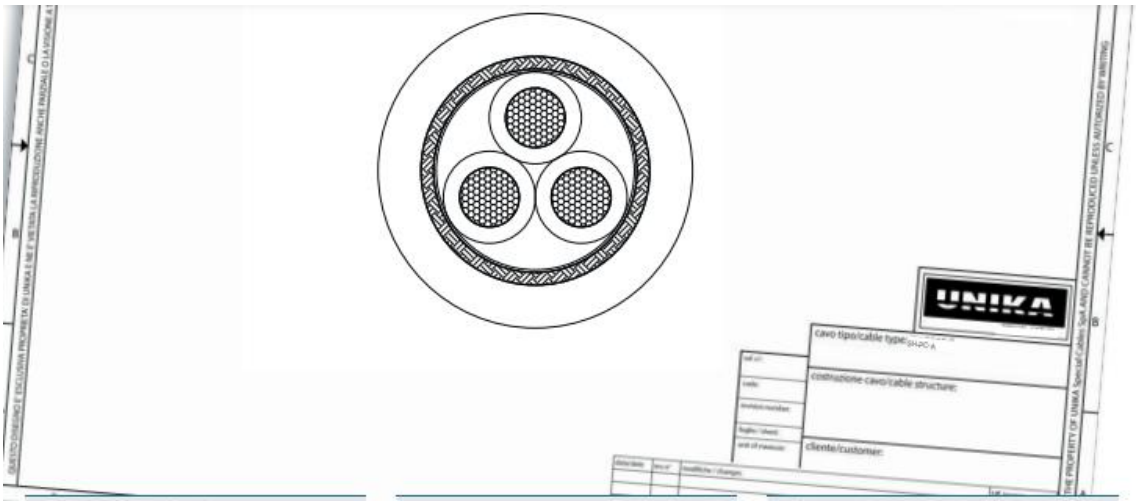
UNIKA

SH-PC-A

Cavi unipolari e multipolari, armati di potenza e controllo 0,6/1kV
Single and multicore, armoured power and control shipboard cables rated 0,6/1 kV



	Dati tecnici	Technical data
Conduttore **Conductor**	Rame rosso (opzionale stagnato) classe 5 in accordo alla IEC 60228	Bare (optional tinned copper) class 5 according to IEC 60228
Isolamento **Insulation**	Mescola HF XLPE in accordo alla IEC 60092-360 Spessori in accordo alla IEC 60092-353	HF XLPE compound according to IEC 60092-360 Thickness according to IEC 60092-355
Identificazione anime (preferenziale) **Core identification (preferential)**	1 anima: nera 2 anime: marrone, blu 3 anime: nera, grigia, marrone o (blu,marrone, giallo/verde) 4 anime: marrone, nera, grigia, blu o giallo/verde 5 anime: blu, marrone, nera, grigia, nera o giallo/verde da 5 anime: nero numerato (con o senza giallo/verde)	1 core: black 2 cores: brown, blue 3 cores: black, grey, brown or (blue, brown, green/yellow) 4 cores: brown, black, grey, blue or green/yellow 5 cores: blue, brown, black, grey, black or green/yellow From 5 cores: black numbered (with or without green/yellow)
Fasciatura **Bedding**	Filati riempitivi e nastro non igroscopico o guaina estrusa senza alogeni	Yarn fillers and non hygroscopic tape or extruded inner sheath without halogen
Armatura **Armouring**	Treccia di fili di rame rosso (su richiesta rame stagnato o acciaio zincato) copertura minima 90%	Bare copper wire braid (upon request tinned copper or galvanized steel wire braid). Minimum coverage 90%
Guaina esterna **Outer sheath**	Compound SHF1 in accordo alla IEC 60092-360 Spessore in accordo alla IEC 60092-353 Colore: nero (preferenziale) Diametro esterno in accordo alla IEC 60092-350 - Allegato D	SHF1 compound according to IEC 60092-360 Thickness according to IEC 60092-353 Colour: black (or other colour agreed) Outer diameter according to IEC 60092-350 annex D
Marcatura **Marking**	UNIKA (Italy) - SH-PC-A 0,6/1 KV 90°C (numero anime) x (sezione) IEC 60092-353 - IEC 60332 -3-22 – codice rintracciabilità	UNIKA (Italy) – SH-PC-A 0,6/1 kV 90°C (core number) x (cross-section) – IEC 60092-353 – IEC 60332-3-22 – traceability code
Temperatura per posa fissa **Rated conductor temperature for fixed installation**	90°C	90°C
Temperatura minima d'installazione **Minimum installation temperature**	- 15°C	- 15°C
Raggio minimo di curvatura **Minimum bending radius**	6D: D è il diametro esterno	6D: D is the overall diameter
Attenuazione schermante **Screening attenuation**	≥ 60 dB in accordo alla EN50289-1-6	≥ 60 dB according to EN50289-1-6
Comportamento al fuoco **Fire behaviour**	IEC 60332-3-22 non propagante il fuoco IEC 60332-1-2 non propagante la fiamma IEC 60754-1 assenza di alogeni IEC 60754-2 acicidità dei fumi IEC 60684-2 contenuto di fluoro IEC 61034 densità dei fumi	IEC 60332-3-22 not fire propagation IEC 60332-1-2 not flame propagation IEC 60754-1 halogen content IEC 60754-2 pH and conductivity IEC 60684-2 fluorine content IEC 61034 smoke emission



codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N1026	2x1	8,5	59	81
N1036	3x1	8,9	72	97
N1046	4x1	9,6	86	116
N1056	5x1	10,4	101	136
N1076	7x1	11,4	126	175
N1106	10x1	14,7	213	258
N1126	12x1	15,1	236	290
N1246	24x1	20,5	402	521
N1027	2x1,5	9,1	79	96
N1037	3x1,5	9,5	97	120
N1047	4x1,5	10,3	117	143
N1057	5x1,5	11,4	138	175
N1077	7x1,5	12,3	174	221
N1107	10x1,5	15,9	290	325
N1127	12x1,5	16,3	324	378
N1147	14x1,5	17,3	361	421
N1197	19x1,5	19,3	452	545
N1247	24x1,5	22,5	555	684
N1307	30x1,5	23,7	654	810
N1377	37x1,5	25,7	773	979
N1029	2x2,5	9,9	104	123
N1039	3x2,5	10,4	132	156
N1049	4x2,5	11,5	163	198
N1059	5x2,5	12,5	194	236
N1079	7x2,5	14,1	294	323
N1109	10x2,5	17,7	403	453

codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N1129	12x2,5	18,2	457	517
N1149	14x2,5	19,1	514	595
N1189	19x2,5	21,3	655	763
N1259	24x2,5	25,1	810	971
N1309	30x2,5	26,5	968	1165
N1379	37x2,5	28,7	1156	1409
N101A	1x4	6,9	73	89
N102A	2x4	11,3	142	169
N103A	3x4	11,9	185	220
N104A	4x4	12,9	232	273
N105A	5x4	14,7	324	349
N101B	1x6	7,4	96	112
N102B	2x6	12,3	188	218
N103B	3x6	13,0	251	290
N104B	4x6	14,7	364	384
N105B	5x6	16,0	435	465
N101D	1x10	8,6	142	163
N102D	2x10	14,9	327	332
N103D	3x10	15,7	432	445
N104D	4x10	17,4	544	573
N105D	5x10	18,9	657	692
N101E	1x16	9,7	208	231
N102E	2x16	17,3	466	481
N103E	3x16	18,3	631	658
N104E	4x16	20,2	803	848
N105E	5x16	22,3	976	1035

codice code	quarte e numero conduttori x sezione quad and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N101F	1x25	11,6	308	352
N102F	2x25	20,9	675	727
N103F	3x25	22,3	929	1018
N104F	4x25	24,7	1191	1314
N105F	5x25	27,1	1454	1618
N101G	1x35	12,9	414	469
N103G	3x35	25,3	1246	1377
N104G	4x35	28,0	1607	1792
N105G	5x35	31,0	1969	2213
N101H	1x50	15,1	617	640
N103H	3x50	29,0	1712	1841
N104H	4x50	32,1	2220	2400
N105H	5x50	36,1	2842	3054
N101J	1x70	17,1	829	872
N103J	3x70	33,2	2325	2536
N104J	4x70	37,2	3148	3355
N101K	1x95	19,8	1095	1157
N103K	3x95	39,4	3225	3433
N104K	4x95	43,9	4194	4505
N101L	1x120	22,1	1351	1427
N103L	3x120	44,3	3991	4270
N101M	1x150	23,5	1660	1765
N103M	3x150	50,1	4916	5300
N101N	1x185	25,9	2020	2101
N103N	3x185	52,7	5998	6308
N101P	1x240	28,9	2574	2629
N101Q	1x300	32,1	3175	3205

(*) Aggiungere la lettera G al codice per i cavi con conduttore giallo/verde.
Nota: La portata di corrente è riferita ad una temperatura ambiente di 45°C e in accordo a IEC 60092-352. Per due o più circuiti, i fattori di declassamento devono essere tenuti in considerazione. Ulteriori informazioni e sezioni sono disponibili su richiesta.

(*) Add letter G at the code for cables having green/yellow conductor
Note: For current ampacity see type SH-PC-U. The ampacity is referred to ambient temperature of 45°C and based upon IEC 60092-352.
Further formation and cross-section are available upon request

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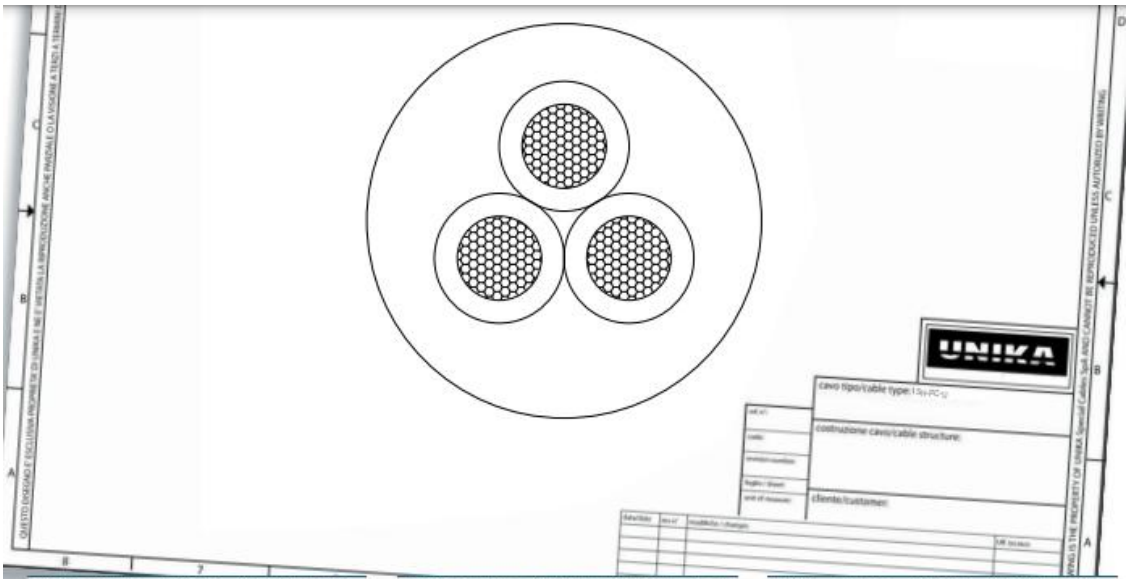
UNIKA

SH-PC-U

Cavi unipolari e multipolari, non armati, di potenza e controllo 0,6/1kV
Single and multicore, unarmoured power and control shipboard cables rated 0,6/1 kV



	Dati tecnici	Technical data
Conduttore **Conductor**	Rame rosso (opzionale stagnato) classe 5 in accordo alla IEC 60228	Bare (optional tinned copper) class 5 according to IEC 60228
Isolamento **Insulation**	Mescola HF XLPE in accordo alla IEC 60092-360 Spessori in accordo alla IEC 60092-353	HF XLPE compound according to IEC 60092-360 Thickness according to IEC 60092-353
Identificazione anime (preferenziale) **Core identification (preferential)**	1 anima: nera 2 anime: marrone, blu 3 anime: nera, grigia, marrone o (blu,marrone, giallo/verde) 4 anime: marrone, nera, grigia, blu o giallo/verde 5 anime: blu, marrone, nera, grigia, nera o giallo/verde da 5 anime: nero numerato (con o senza giallo/verde)	1 core: black 2 cores: brown, blue 3 cores: black, grey, brown or (blue, brown, green/yellow) 4 cores: brown, black, grey, blue or green/yellow 5 cores: blue, brown, black, grey, black or green/yellow From 5 cores: black numbered (with or without green/yellow)
Fasciatura **Bedding**	Filati riempitivi e nastro non igroscopico o guaina estrusa senza alogeni	Yarn fillers and non hygroscopic tape or extruded halogen-free inner sheath
Guaina esterna **Outer sheath**	SHF1 compound in accordo alla IEC 60092-360 Spessore in accordo alla IEC 60092-353 Colore: nero (o un altro colore in accordo) Diametro esterno in accordo alla IEC 60092-350 - Allegato D	SHF1 compound according to IEC 60092-360 Thickness according to IEC 60092-353 Colour: black (or other colour agreed) Outer diameter according to IEC 60092-350 annex D
Marcatura **Marking**	UNIKA (Italy) - SH-PC-U 0,6/1 KV 90°C Marking (numero anime) x (sezione) IEC 60092-353 - IEC 60332 -3-22 – codice rintracciabilità	UNIKA (Italy) - SH-PC-U 0,6/1 kV 90°C (core number) x (cross-section) - IEC 60092-353 - IEC 60332-3-22 - traceability code
Temperatura per posa fissa **Rated conductor temperature for fixed installation**	90°C	90°C
Temperatura minima d'installazione **Minimum installation temperature**	- 15°C	- 15°C
Raggio minimo di curvatura **Minimum bending radius**	(in accordo alla IEC 60092-352 tab. 4): 4D per cavi aventi diametro esterno non superiore a 25 mm 6D per cavi aventi diametro esterno non superiore a 25 mm dove D il diametro esterno	(according to IEC 60092-352 table 4): 4D for cables having overall diameter not above 25 mm 6D for cables having overall diameter above 25 mm with D the overall diameter
Comportamento al fuoco **Fire behaviour**	IEC 60332-3-22 non propagante il fuoco IEC 60332-1-2 non proparante la fiamma IEC 60754-1 assanza di alogeni IEC 60754-2 acicidità dei fumi IEC 60684-2 contenuto di fluoro IEC 61034 densità dei fumi	IEC 60332-3-22 not fire propagation IEC 60332-1-2 not flame propagation IEC 60754-1 halogen content IEC 60754-2 pH and conductivity IEC 60684-2 fluorine content IEC 61034 smoke emission



codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N2026	2x1	7,5	19	66
N2036	3x1	7,9	29	82
N2046	4x1	8,8	38	104
N2056	5x1	9,6	48	123
N2076	7x1	10,4	67	156
N2106	10x1	13,3	96	220
N2126	12x1	13,9	115	250
N2246	24x1	19,3	230	468
N2017	1x1,5	5,0	14	44
N2027	2x1,5	8,1	29	81
N2037	3x1,5	8,7	43	108
N2047	4x1,5	9,5	58	131
N2057	5x1,5	10,4	72	156
N2077	7x1,5	11,5	101	206
N2107	10x1,5	14,7	144	291
N2127	12x1,5	15,1	173	335
N2147	14x1,5	15,9	202	376
N2197	19x1,5	17,9	274	495
N2247	24x1,5	21,1	346	625
N2307	30x1,5	22,5	432	760
N2377	37x1,5	24,3	533	911
N2019	1x2,5	5,4	24	57
N2029	2x2,5	9,1	48	111
N2039	3x2,5	9,6	72	144
N2049	4x2,5	10,5	96	179
N2059	5x2,5	11,7	120	221
N2079	7x2,5	12,7	168	287

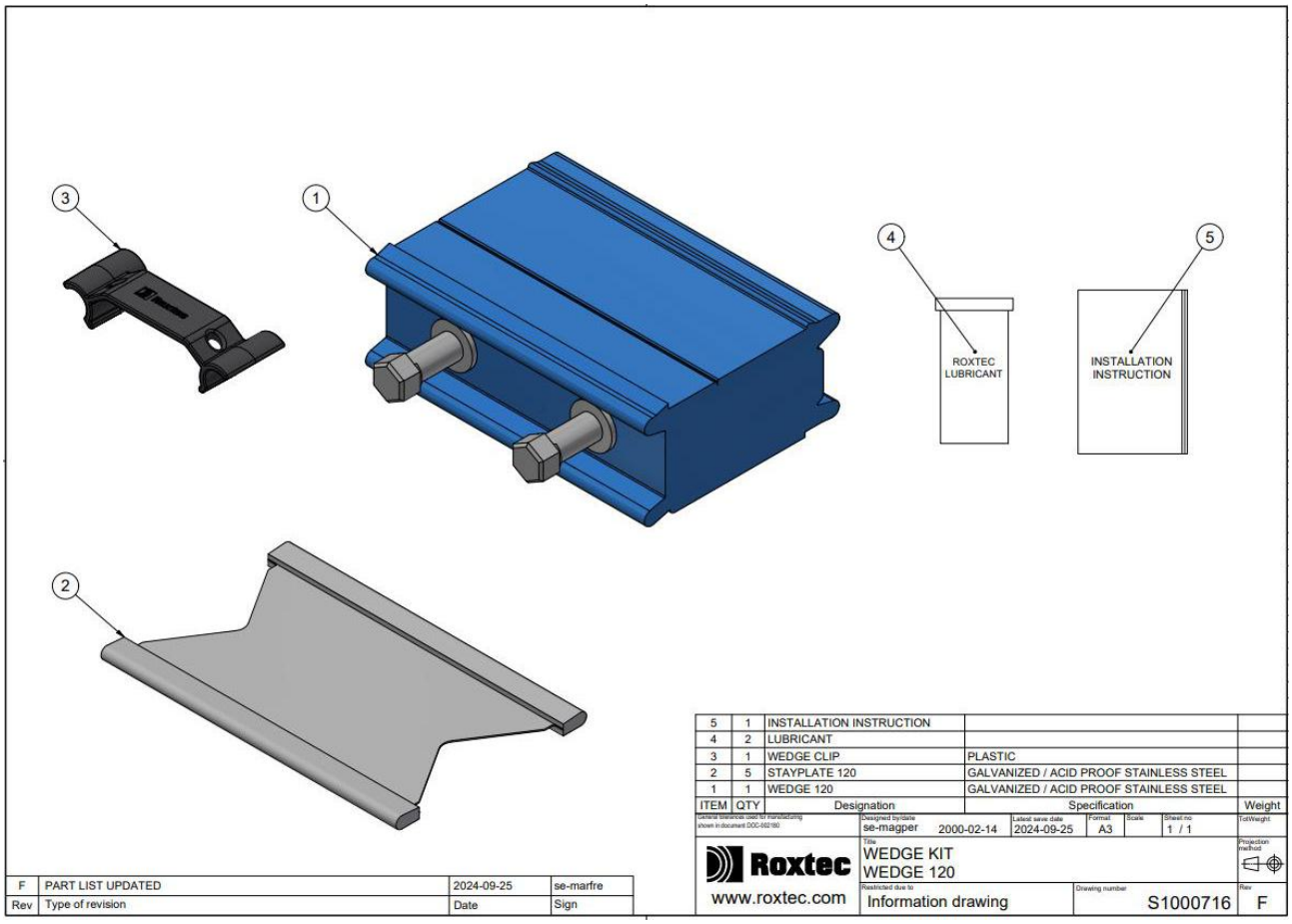
codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N2109	10x2,5	16,3	240	407
N2129	12x2,5	17,0	288	478
N2149	14x2,5	17,9	336	545
N2189	19x2,5	20,1	456	718
N2259	24x2,5	23,7	576	906
N2309	30x2,5	25,3	720	1108
N2379	37x2,5	27,5	888	1347
N201A	1x4	6,0	38	76
N202A	2x4	10,3	77	150
N203A	3x4	10,9	115	200
N204A	4x4	12,1	154	257
N205A	5x4	13,3	192	311
N201B	1x6	6,5	58	100
N202B	2x6	11,5	115	203
N203B	3x6	12,2	173	274
N204B	4x6	13,3	230	346
N205B	5x6	14,8	288	431
N201D	1x10	7,5	96	145
N202D	2x10	13,5	192	294
N203D	3x10	14,5	288	412
N204D	4x10	16,0	384	529
N205D	5x10	17,7	480	652
N201E	1x16	8,8	154	215
N202E	2x16	15,9	307	437
N203E	3x16	17,1	461	620
N204E	4x16	18,8	614	796
N205E	5x16	20,9	768	988

codice code	quarte e numero conduttori x sezione quad and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N201F	1x25	10,5	240	327
N202F	2x25	19,7	480	682
N203F	3x25	20,9	720	959
N204F	4x25	23,3	960	1249
N205F	5x25	25,9	1200	1546
N201G	1x35	12,0	336	448
N203G	3x35	23,9	1008	1311
N204G	4x35	26,6	1344	1718
N205G	5x35	29,6	1680	2131
N201H	1x50	13,6	480	594
N203H	3x50	27,8	1440	1778
N204H	4x50	30,9	1920	2331
N205H	5x50	34,3	2400	2887
N201J	1x70	15,6	672	819
N203J	3x70	31,8	2016	2448
N204J	4x70	35,6	2688	3265
N201K	1x95	18,3	912	1095
N203K	3x95	37,6	2736	3319
N204K	4x95	42,1	3648	4378
N201L	1x120	20,6	1152	1370
N203L	3x120	42,5	3456	2894
N201M	1x150	23,3	1440	1703
N203M	3x150	48,3	4320	5163
N201N	1x185	24,4	1776	2039
N203N	3x185	50,9	5328	6171
N201P	1x240	27,6	2304	2567
N201Q	1x300	30,8	2880	3143

(*) Aggiungere la lettera G al codice per i cavi con conduttore giallo/verde.
Nota: La portata di corrente è riferita ad una temperatura ambiente di 45°C e in accordo a IEC 60092-352. Per due o più circuiti, i fattori di declassamento devono essere tenuti in considerazione. Ulteriori informazioni e sezioni sono disponibili su richiesta.

(*) Add letter G at the code for cables having green/yellow conductor
Note: Current ampacity is referred to ambient temperature of 45 °C and based upon IEC 60092-352. For two or more circuits, derating factors should be taken into account. Further formation and cross-section are available upon request

4.10 MCT



ITEM	QTY	Designation	Specification	Weight
5	1	INSTALLATION INSTRUCTION		
4	2	LUBRICANT		
3	1	WEDGE CLIP	PLASTIC	
2	5	STAYPLATE 120	GALVANIZED / ACID PROOF STAINLESS STEEL	
1	1	WEDGE 120	GALVANIZED / ACID PROOF STAINLESS STEEL	

Designed by/date	Latest save date	Format	Scale	Sheet no	TotWeight
se-magper 2000-02-14	2024-09-25	A3		1 / 1	

Roxtec
www.roxtec.com

Title: WEDGE KIT WEDGE 120

Projection method

Restricted due to: Information drawing

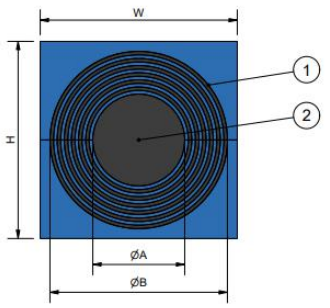
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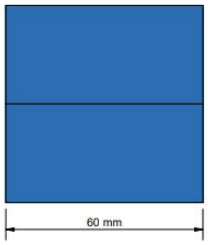
Rev: F

Rev	Type of revision	Date	Sign
F	PART LIST UPDATED	2024-09-25	se-marfre

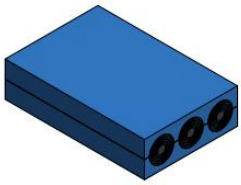
TYPE	CABLE/PIPE Ø (A-B) [mm]	H [mm]	W [mm]	C [QTY]
RM 15	3 - 11	15	15	1
RM 15w40	3.5 - 10.5	15	40	3
RM 20	4 - 14.5	20	20	1
RM 20w40	3.5 - 16.5	20	40	2
RM 30	10 - 25	30	30	1
RM 30 H90	10 - 25	30	90	1
RM 40	21.5 - 34.5	40	40	1
RM 40 H80	21.5 - 34.5	40	80	1
RM 40 10-32	9.5 - 32.5	40	40	1
RM 60*	28 - 54	60	60	1
RM 60 24-54	24 - 54	60	60	1
RM 80*	48 - 71	80	80	1
RM 90*	48 - 71	90	90	1
RM 120*	67.5 - 99	120	120	1

*ALSO AVAILABLE IN WOC VERSION DELIVERED WITHOUT CORE

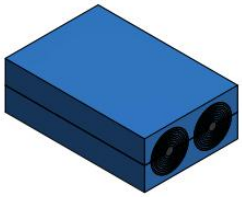




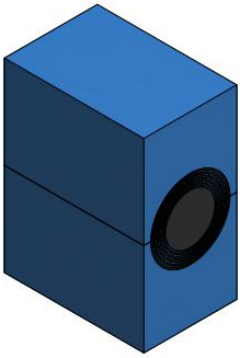
RM 15w40



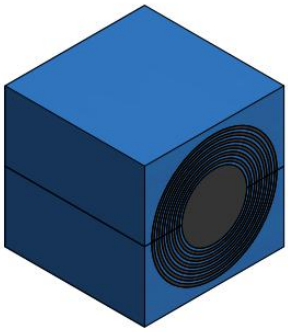
RM 20w40



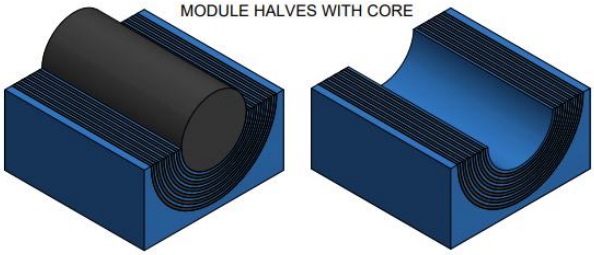
RM 30H90 & RM 40H80



RM 15-120



MODULE HALVES WITH CORE



F	LAYOUT CHANGED	2024-06-25	se-marfre
Rev	Type of revision	Date	Sign

2	C	CORE	ROXYLON	
1	2	RUBBER PROFILE	ROXYLON	
ITEM	QTY	Designation	Specification	Weight

Designed by/date: se-joahel 2003-12-12 | Latest save date: 2024-07-03 | Format: A3 | Scale: | Sheet no: 1 / 1

Roxtec
www.roxtec.com

Title: RM MODULES ASSEMBLY

Restricted due to: Information drawing | Drawing number: S1005711 | Rev: F

4.11 CABLE GLAND

CEMBRE

1710921/E_0523

PRESSACAVI CABLE GLANDS
MAXIbrass®

INFORMAZIONI GENERALI:
- Materiale: ottone nichelato
- Guarnizione: NEOPRENE
- Griffe di serraggio: POLIAMMIDE PA 6.6
- O-Ring: NITRILE
- Grado di protezione: IP 68 - 5 bar / 30 min.
- Temperatura d'impiego:
  da - 40°C a +100°C (statica*)
  da - 25°C a +100°C (dinamica*)

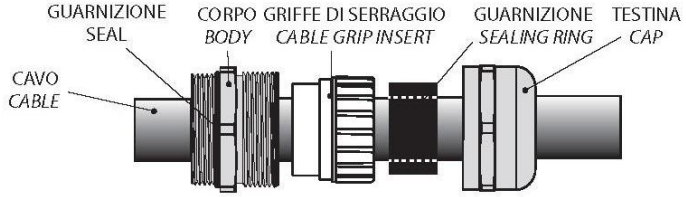
GENERAL INFORMATION:
- *Material: Nickel plated Brass*
- *Sealing ring: NEOPRENE*
- *Cable grip insert: POLYAMIDE PA 6.6*
- *O-ring: NITRILE*
- *Protection: IP 68 - 5 bar / 30 min. (LIQUID TIGHT)*
- *Temperature range:*
  - 40°C to +100°C (static)*
  - 25°C to +100°C (dynamic)*

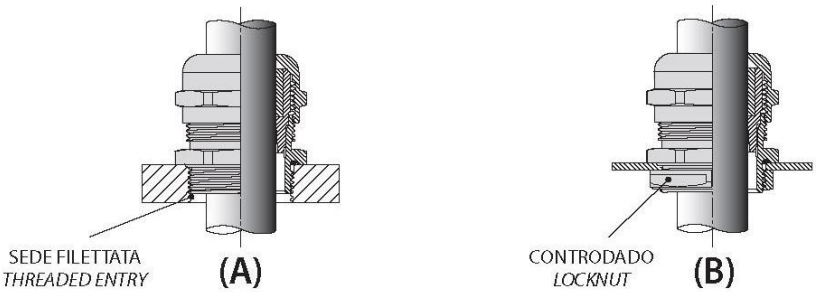
ISTRUZIONI PER L'INSTALLAZIONE:
1) Avvitare il pressacavo nella sede filettata corrispondente (A) o fissarlo con il controdado (B), senza eccedere nella chiusura.
2) Introdurre il cavo all'interno del pressacavo.
3) Avvitare la testina finché la guarnizione tocca completamente il cavo.
4) Serrare infine il pressacavo e la testina alla coppia di serraggio indicata in tabella.

USO SENZA CONTRODADO: solo se avvitato a sedi filettate.

INSTALLATION INSTRUCTIONS:
1) Screw the cable gland onto its relevant seat (A) or lock it by the locknut (B).
2) Introduce the cable inside the cable gland.
3) Screw the nut until the sealing ring fully touches the cable.
4) Finally, tighten the body and the nut up to the torque ratio listed in the table.

USAGE WITHOUT LOCKNUT: for securement to a threaded hubs only.





* STATICA: in questo intervallo di temperatura il pressacavo, correttamente installato in conformità ai requisiti tecnici, non deve essere ulteriormente sollecitato con carichi o tensioni (urti, vibrazioni, pressione, ecc.). Le stesse condizioni si applicano anche al cavo e alla sede di fissaggio a cui è fissato il pressacavo.
DINAMICA: in questo intervallo di temperatura il pressacavo resiste ad urti e sollecitazioni con un valore di energia equivalente alla categoria di impatto dichiarata in accordo alla norma EN 62444.

* *STATIC: in this temperature range the cable gland, properly installed in compliance with technical requirements, must not be further strained with stress or forces (shock, vibration, pressure, etc.). The same conditions also apply to both the enclosure and the wire to which the cable gland has been assembled.*
DYNAMIC: in this temperature range the cable gland withstands shocks and stresses with an energy value equivalent to the declared impact category according to EN 62444.

Tipo Type		Grandezza Nominale Thread	Nominale Nominal Ø		Raccomandata Recommended		UL 514B Ø		Valore trazione Pull Value		EN 62444 Ø		Categoria d'impatto impact category	MARCHIO
			[mm]	[Nm]	[in-lbs]	[mm]	[inches]	[kg]	[lb]	[Nm]	[in-lbs]	[mm]		
2900.M12N	**2901.M12N**	M12x1,5	3-7	6	53	3-7	0.11-0.28	2	4.4	6	53	3-7	5	USR-CNR / VDE
2900.M16N	**2901.M16N**	M16x1,5	4.5-10	6	53	6-10	0.24-0.39	2	4.4	6	53	4.5-10	6	USR-CNR / VDE
2900.M20N	**2901.M20N**	M20x1,5	7-13	8	71	8-13	0.31-0.51	15.9	35	8	71	7-13	6	USL-CNL / VDE
2900.M25N	**2901.M25N**	M25x1,5	10-17	8	71	13-17	0.51-0.67	15.9	35	8	71	11-17	6	USL-CNL / VDE
2900.M32N	**2901.M32N**	M32x1,5	11-21	18	159	13-21	0.51-0.83	15.9	35	18	159	13-21	6	USL-CNL / VDE
2900.M40N	**2901.M40N**	M40x1,5	19-28	18	159	21-28	0.83-1.10	15.9	35	18	159	19-28	6	USL-CNL / VDE
2900.M50N	**2901.M50N**	M50x1,5	26-35	18	159	27-35	1.06-1.38	15.9	35	18	159	26-35	6	USL-CNL / VDE
2900.M63N	-	M63x1,5	34-45	25	221	34-45	1.33-1.77	15.9	35	18	159	34-45	6	USL-CNL / VDE
2910.M12N	**2911.M12N**	M12x1,5	1-5	6	53	2-5	0.08-0.20	2	4.4	6	53	2-5	5	USR-CNR / VDE
2910.M16N	**2911.M16N**	M16x1,5	2.5-7	6	53	3.5-7	0.14-0.28	1	2.2	6	53	4-7	6	USR-CNR / VDE
2910.M20N	**2911.M20N**	M20x1,5	5-10	8	71	5-10	0.20-0.40	2	4.4	8	71	5.5-10	6	USR-CNR / VDE
2910.M25N	**2911.M25N**	M25x1,5	6-13	8	71	8-13	0.31-0.51	1	2.2	8	71	6-13	6	USR-CNR / VDE
2910.M32N	**2911.M32N**	M32x1,5	7-14	18	159	7-14	0.28-0.55	5	11	18	159	9-14	6	USR-CNR / VDE
2910.M40N	**2911.M40N**	M40x1,5	13-23	18	159	15-23	0.59-0.91	15.9	35	18	159	17-23	6	USL-CNL / VDE
2910.M50N	**2911.M50N**	M50x1,5	20-29	18	159	20-29	0.79-1.14	15.9	35	18	159	25-29	6	USL-CNL / VDE
2910.M63N	-	M63x1,5	27-39	25	221	28-39	1.10-1.54	15.9	35	18	159	31-39	6	USL-CNL / VDE
2940.M12N	-	M12x1,5	5-8	6	53	5-8	0.20-0.31	2	4.4	6	53	5-8	5	USR-CNR / VDE
2940.M16N	-	M16x1,5	7-12	6	53	8-12	0.31-0.47	2	4.4	6	53	8-12	6	USR-CNR / VDE
2940.M20N	-	M20x1,5	10-16	8	71	12-16	0.47-0.63	5	11	8	71	12-16	6	USR-CNR / VDE
2940.M25N	-	M25x1,5	13-21	8	71	14-21	0.55-0.83	15.9	35	18	159	13-21	6	USL-CNL / VDE
2940.M32N	-	M32x1,5	18-25	18	159	21-25	0.83-0.98	15.9	35	18	159	18-25	6	USL-CNL / VDE
2940.M40N	-	M40x1,5	25-32	18	159	25-32	0.98-1.26	15.9	35	25	221	25-32	6	USL-CNL / VDE
2940.M50N	-	M50x1,5	30-38	18	159	30-37	1.18-1.46	15.9	35	25	221	30-38	6	USL-CNL / VDE
2940E.M50N	-	M50x1,5	35-45	18	159	35-41	1.38-1.61	15.9	35	25	221	35-45	6	USL-CNL / VDE
2900.07N	**2901.07N**	Pg 7	3-7	6,25	55	3-7	0.11-0.28	1.2	2.65	6.25	55	-	-	USR-CNR
2900.09N	**2901.09N**	Pg 9	4-8	6,25	55	4-8	0.16-0.31	2	4.4	6.25	55	-	-	USR-CNR
2900.11N	**2901.11N**	Pg 11	4.5-10	6,25	55	6-10	0.24-0.40	2	4.4	6.25	55	-	-	USL-CNR
2900.13N	**2901.13N**	Pg 13,5	5-12	7,5	66	10-12	0.39-0.47	15.9	35	7,5	66	-	-	USL-CNL
2900.16N	**2901.16N**	Pg 16	7-13	7,5	66	10-13	0.39-0.51	15.9	35	7,5	66	-	-	USL-CNL
2900.21N	**2901.21N**	Pg 21	10-17	10	88,5	12-17	0.47-0.67	15.9	35	10	88,5	-	-	USL-CNL
2900.29N	**2901.29N**	Pg 29	18-25	15	133	18-25	0.71-0.99	15.9	35	15	133	-	-	USL-CNL
2900.36N	**2901.36N**	Pg 36	22-32	25	221	23-32	0.91-1.26	15.9	35	25	221	-	-	USL-CNL
2900.42N	**2901.42N**	Pg 42	28-38	25	221	28-35	1.10-1.38	15.9	35	25	221	-	-	USR-CNL
2900.48N	-	Pg 48	34-45	25	221	34-45	1.34-1.77	15.9	35	25	221	-	-	USR-CNL
2910.07N	**2911.07N**	Pg 7	1-5	6,25	55	2-5	0.08-0.20	1.2	2.65	6.25	55	-	-	USR-CNR
2910.09N	**2911.09N**	Pg 9	2-6	6,25	55	3-6	0.12-0.24	2	4.4	6.25	55	-	-	USR-CNR
2910.11N	**2911.11N**	Pg 11	2.5-7	6,25	55	3.5-7	0.14-0.28	2	1	6.25	55	-	-	USR-CNR
2910.13N	**2911.13N**	Pg 13,5	4-10	7,5	66	5.5-10	0.22-0.39	2	4.4	7.5	66	-	-	USL-CNR
2910.16N	**2911.16N**	Pg 16	5-10	7,5	66	6-10	0.24-0.39	2	4.4	7.5	66	-	-	USL-CNR
2910.21N	**2911.21N**	Pg 21	6-13	10	88,5	7-13	0.28-0.51	2.5	6.6	10	88,5	-	-	USL-CNR
2910.29N	**2911.29N**	Pg 29	12-20	15	133	12-20	0.47-0.79	10	22	15	133	-	-	USL-CNR
2910.36N	**2911.36N**	Pg 36	19-26	25	221	19-26	0.75-1.02	15.9	35	25	221	-	-	USR-CNL
2910.42N	**2911.42N**	Pg 42	24-31	25	221	24-31	0.95-1.22	15.9	35	25	221	-	-	USL-CNL
2910.48N	-	Pg 48	27-39	25	221	31-39	1.22-1.54	15.9	35	25	221	-	-	USL-CNL

VDE = LICENCE No. 40008475 and No. 40008476

USL-CNL = FILE No. E 220310, Control No. 48SB

USR-CNR = FILE No. E 220310
Con riduzione della forza di trazione.
With reduced pull force.

CEMBRE www.cembre.com

CEMBRE S.p.A.
via Serenissima, 9
25135 Brescia
Italy
Ph +39 030 36921
ufficio.vendite@cembre.com
sales@cembre.com

CEMBRE Ltd.
Dunton Park,
Kingsbury Road,
Curdworth, Sutton Coldfield
West Midlands, B76 9EB
United Kingdom
Ph +44 01675 470440
sales@cembre.co.uk

CEMBRE S.a.r.l.
22 Avenue Ferdinand de Lesseps
91420 Morangis Cedex
France
Ph +33 01 60 49 11 90
info@cembre.fr

CEMBRE España S.L.U.
Calle Verano 6 y 8
Pl Las Monjas
28850 Torrejón de Ardoz
Madrid - Spain
Ph +34 91 4852580
comercial@cembre.com

CEMBRE GmbH
Geschäftsbereich Energie- und Bahntechnik
Heidemannstr. 166
80939 München
Germany
Ph + 49 89-3580676
info@cembre.de

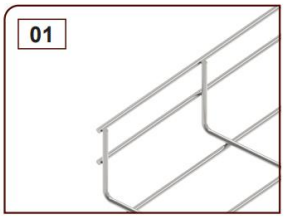
CEMBRE GmbH
Geschäftsbereich Industrie und Handel
Boschstraße 7
71384 Weinstadt
Germany
Ph +49 7151-20536-60
info-w@cembre.de

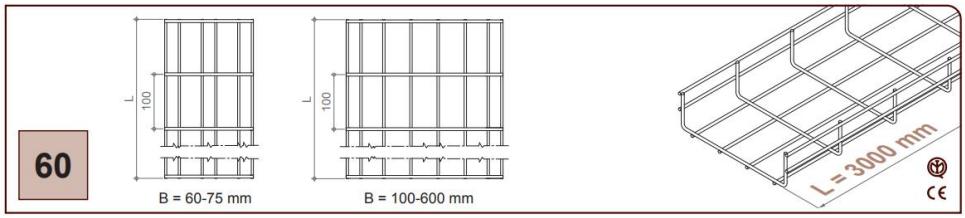
CEMBRE Inc.
Raritan Center Business Park
300 Columbus Circle-S.F.
Edison, NJ 08837 USA
Ph +1 (732) 225-7415
sales.us@cembre.com
Midwest Office
1051 Perimeter Dr. #470
Schaumburg, IL 60173

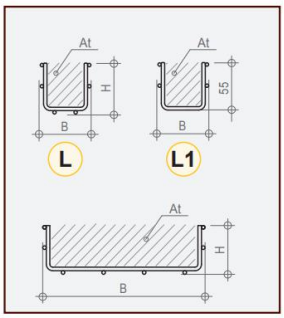
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4.12 CABLE TRAY

PASSERELLA A RETE CZ4 *Wire mesh cable tray*







E J N Codice/ Code	Ø mm	kg/m	B mm	H mm	L mm	IEC 61537 1500 mm	At mm²	kg/m	Ø mm	Z Codice/ Code
B4 ¤ 01A3H060L	3,9	0,76	60	60	3000	15 daN/m	2290	0,78	3,9	B4 Z 01A3H060L
B4 ¤ 01A3H060L1	3,9	0,56	60	55	3000	15 daN/m	2465	0,58	3,9	B4 Z 01A3H060L1
B4 ¤ 01A3H075L	3,9	0,77	75	60	3000	15 daN/m	3070	0,79	3,9	B4 Z 01A3H075L
B4 ¤ 01A3H100L	3,9	0,80	100	60	3000	26 daN/m	4370	0,82	3,9	B4 Z 01A3H100L
B4 ¤ 01A3H150L	3,9	0,85	150	60	3000	26 daN/m	6970	0,87	3,9	B4 Z 01A3H150L
B4 ¤ 01A3H200L	3,9	1,10	200	60	3000	28 daN/m	9570	1,12	3,9	B4 Z 01A3H200L
B4 ¤ 01A3H300L	3,9	1,40	300	60	3000	28 daN/m	14770	1,43	3,9	B4 Z 01A3H300L
B4 ¤ 01A3H300Q	4,4	1,68	300	60	3000	42 daN/m	14460	1,72	4,4	B4 Z 01A3H300Q
B4 ¤ 01A3H400Q	4,4	2,05	400	60	3000	44 daN/m	19580	2,10	4,4	B4 Z 01A3H400Q
B4 ¤ 01A3H500Q	4,4	2,41	500	60	3000	44 daN/m	24700	2,46	4,4	B4 Z 01A3H500Q
B4 ¤ 01A3H600Q	4,4	2,77	600	60	3000	44 daN/m	29820	2,83	4,4	B4 Z 01A3H600Q

¤ Scegli il materiale/ *Choose the material*

Base Load Power Hub (BLPH)

B-300 ELECTRICAL COMPONENTS LIST AND DS - E&I SHELTERS

Document Number: 1724000049-EL-LIS-00045

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	05-02-25

Document Class: 3

Rev.	Date	Description	Prepared	Reviewed	Approved
02	13/01/2025	Issue for Information (IFI)	MG	OA	CA
01	30/10/2024	Issue for Information (IFI)	MG	OA	CA
00	28/06/2024	Issue for Information (IFI)	FP	OA	CA

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)
02	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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None

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

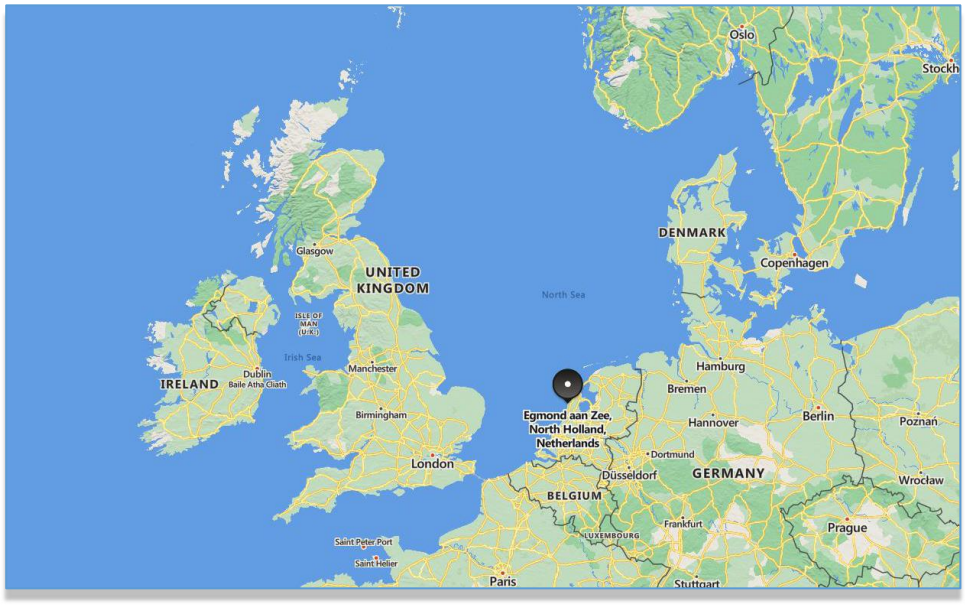


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

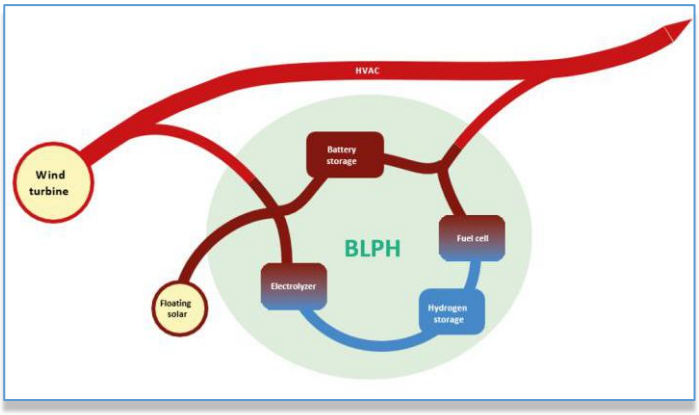


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting

wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document provides the data sheet and information of electrical components supplied by Alex Sistemi

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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3 ELECTRICAL COMPONENTS LIST

3.1 LIST

Item	Description	Grade	Manufacturer	Line	Model	B-300
1	Light switch 10A	IP66	Scame	Protecta	1.375.012	2
2	Socket schuko 16A	IP66	Scame	Protecta	1.376.404	1
3	Two lamp LED	IP66	Disano	Echo	164704-00	2
4	Two lamp LED + Energy Saving	IP66	Disano	Echo	164704-07	1
5	Feed unit 40A Left or Right mount	IP55	Schneider	Canalis	KBB40ABG44W	1
6	Straight distribution lenghts 25A - 3mt	IP55	Schneider	Canalis	KBB25ED42305W	3
7	Straight distribution lenghts 40A - 2mt	IP55	Schneider	Canalis	KBB40ED42203W	0
8	10A Tap-off unit	IP55	Schneider	Canalis	KBC10DCB40	3

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4 DATA SHEET

4.1 LIGHT SWITCH 10A

EN - 20 May 2024

SCAME

137.5012

SP ONE WAY SWITCH
SP ONE WAY SWITCH 20AX
M95(95x95mm)



DIRECTIVE RoHS 2011/65/EU

Commercial Series	PROTECTA Series
Synthetical description	SP ONE WAY SWITCH
Mounting version	SURFACE MOUNTING

TECHNICAL CHARACTERISTICS

Rated current	20AX
Rated voltage	250V

PHYSICAL CHARACTERISTICS

Mounting version	SURFACE MOUNTING
Protection degree	Splash proof
Protection degree IP	IP66
Material	THERMOPLASTIC
Working temperature	-20°C/+60°C
Protection degree IK	IK07
Warning light	WITH NEON

DIMENSIONAL CHARACTERISTICS

N.° modules	1 GANG
Dimensions	M95(95x95mm)

DOWNLOAD

Technical drawing [PDF]
Technical drawing [DWG]
Technical drawing [STP]
Instruction manual

www.scame.com
scame@scame.com

SCAME PARRE S.p.A
Via Costa Erta, 15 - 24020 Parre (BG) Italy - +39 035 705000

4.2 SOCKET SCHUKO 16A

EN - 20 May 2024

SCAME

137.6404

ITALIAN P30 STANDARD SOCKET ITALIAN P30 STANDARD SOCKET 16A M95(95x95mm)



CEI 23-50 (2006)
DIRECTIVE RoHS 2011/65/EU

Commercial Series	PROTECTA Series
Synthetical description	ITALIAN P30 STANDARD SOCKET
Type	ITALIAN P30
Mounting version	SURFACE MOUNTING

TECHNICAL CHARACTERISTICS

Rated current	16A
Rated voltage	250V

PHYSICAL CHARACTERISTICS

Mounting version	SURFACE MOUNTING
Protection degree	Splash proof
Protection degree IP	IP66
Material	THERMOPLASTIC
Working temperature	-20°C/+60°C
Protection degree IK	IK07

DIMENSIONAL CHARACTERISTICS

Dimensions	M95(95x95mm)

DOWNLOAD

Technical drawing [PDF]
Technical drawing [DWG]
Technical drawing [STP]
Instruction manual

www.scame.com
scame@scame.com

SCAME PARRE S.p.A
Via Costa Erta, 15 - 24020 Parre (BG) Italy - +39 035 705000

4.3 TWO LAMP LED

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00





Disano's watertight fixtures are built from the company's extensive experience, skill and reliability as a global leader in the manufacturing of specialised lighting products. These basic features have contributed to the success of Disano's watertight fixtures over the years. The lamp's body is made of shatter-proof polycarbonate, with an IP66 protection, and high mechanical strength due to the structure reinforced by internal ribs. Installation is made easy thanks to the stainless steel bracket supplied as standard for ceiling mounting, while the spring hook allows quick attachment to any chain suspension system. Moreover, special toothed guides allow the perfect alignment of fixtures mounted in a continuous row.
In addition to these basic features you will find all the advantages of the LED technology, i.e. light sources with a very long service life, low power consumption and great light quality.
The polycarbonate WATERTIGHT FIXTURES have an IP66IK08 rating when installed in environments with temperatures not exceeding 45 °C. Direct exposure to sunlight may exceed 45 °C, compromising the protection rating. However, it is advisable to use them appropriately without altering their mechanical and protective qualities (IP66IK08) and not to install them on surfaces subject to strong vibration, or exposed to atmospheric agents, outdoors on ropes or poles, on walls, under metal gratings or directly exposed to sunlight. If this is not possible, use the steel watertight fixturess instead.

GENERAL INFORMATION

Article	927 - Echo - two lamp LED - Energy Saving
Code	164704-00

DIMENSIONS AND WEIGHT

Length (mm)	1300 mm
Width (mm)	152 mm
Height (mm)	102 mm
Weight (Kg)	2.260 kg

ELECTRICAL CHARACTERISTICS AND CONTROLS

Voltage type	AC
Min Voltage (V)	220 V
Max Voltage (V)	240 V
Min Frequency (Hz)	50 Hz
Max Frequency (Hz)	60 Hz
Frequency (Hz)	50 Hz
Wiring name	CLD
Power factor	≥0.9
Insulation class	Class I
Controllability	None

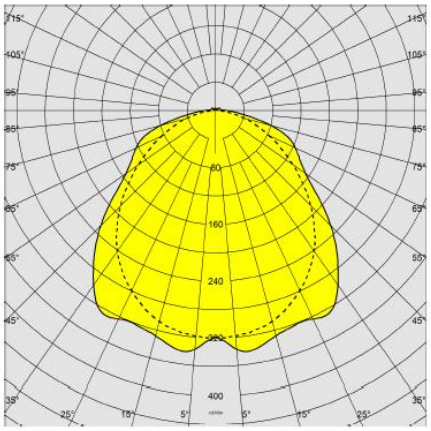
disano illuminazione

1

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00



PHOTOMETRIC DATA

Lighting source	LED
CRI	≥80
Luminous flux (output) (lm)	5737 lm
Power absorption (total) (W)	32 W
CCT	4000 K
Luminous efficacy (lm/W)	179 lm/W
Low Flicker	luminaire with very low flicker: evenly distributed light for greater visual safety.
Colour consistency	SDCM3
LED flux maintenance	80000 hr, L 80, B 20

MECHANICAL CHARACTERISTICS

Impact resistance rating (IK)	IK08
IP	66
Ambient temperature - min	-30 °C
Ambient temperature - max	40 °C

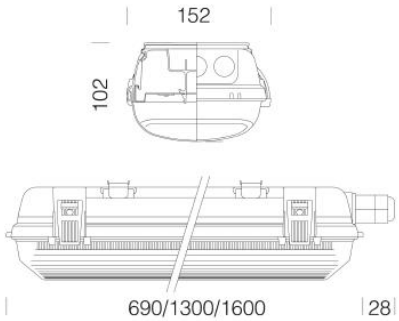
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2

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-00



DOWNLOAD

MOUNTS

AssemblyInstructions Echo 09-23.pdf

DESIGNS

TechnicalDrawing echobila.dxf

MATERIALS AND COLOURS

Housing	injection-moulded, made of grey RAL 7035 polycarbonate, shatterproof, UV-stabilised, with high mechanical strength thanks to the structure reinforced by internal ribs.
Optics	galvanised steel pre-painted in oven with white polyester resin, UV-stabilised. Fastened to the body with a quick coupling by means of a device machined directly on the body.
Diffuser	injection-moulded in polycarbonate with internal grooves for greater light control, self-extinguishing V2, UV-stabilised, smooth outer finish to enable easy cleaning for maximum light efficiency.
Colour	Grey
Equipment	- sealing gasket in eco-friendly, anti-aging expanded polyurethane foam - ceiling mounting brackets and suspension hook in stainless steel - plug-socket connector - snap hooks and safety screws in stainless steel
	ATTENTION ! Do not install on surfaces subject to strong vibrations, outdoors on hanging cables, or on walls under metallic grates, or on poles, and in any case, never expose the fixture to direct sunlight. Check the compatibility between the material constituting the product and the space where it will be installed. We recommend the use of fixtures made of steel with direct exposure to sunlight.

STANDARDS AND COMPLIANCE

Photobiological safety class	RG0
Markings and tests	CE, ENEC
Reference standards	EN60598-1. With degree of protection according to EN60529. The lighting fixture meets all IFS and BRC requirements, and the regulation of the HACCP Directive regarding lighting systems installed in food processing plants.
Laboratory Tests	- the UL 94 Standard is considered a reference for rating the ignition characteristics of plastic materials. The watertight fixtures are made of V2 class material that self-extinguishes in 25 seconds. - passes the Glow Wire Test at 850 °C.
Energy Label	C

GEAR

Upon request	- version with wire feedthrough, dimmable. - narrow beam version (subcode 22) - radar sensor, subcode -19 - Always On Emergency, subcode -07 (always on, 60 min charge)

WARRANTY

After sales warranty	5 yr

disano illuminazione

3

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

4.4 TWO LAMP LED + ENERGY SAVING

927 - Echo - two lamp LED - Energy Saving

Code: 164704-07





Disano's watertight fixtures are built from the company's extensive experience, skill and reliability as a global leader in the manufacturing of specialised lighting products. These basic features have contributed to the success of Disano's watertight fixtures over the years. The lamp's body is made of shatter-proof polycarbonate, with an IP66 protection, and high mechanical strength due to the structure reinforced by internal ribs. Installation is made easy thanks to the stainless steel bracket supplied as standard for ceiling mounting, while the spring hook allows quick attachment to any chain suspension system. Moreover, special toothed guides allow the perfect alignment of fixtures mounted in a continuous row.
In addition to these basic features you will find all the advantages of the LED technology, i.e. light sources with a very long service life, low power consumption and great light quality.
The polycarbonate WATERTIGHT FIXTURES have an IP66IK08 rating when installed in environments with temperatures not exceeding 45 °C. Direct exposure to sunlight may exceed 45 °C, compromising the protection rating. However, it is advisable to use them appropriately without altering their mechanical and protective qualities (IP66IK08) and not to install them on surfaces subject to strong vibration, or exposed to atmospheric agents, outdoors on ropes or poles, on walls, under metal gratings or directly exposed to sunlight. If this is not possible, use the steel watertight fixturess instead.

GENERAL INFORMATION

Article	927 - Echo - two lamp LED - Energy Saving
Code	164704-07

DIMENSIONS AND WEIGHT

Length (mm)	1300 mm
Width (mm)	152 mm
Height (mm)	102 mm
Weight (Kg)	2.940 kg

ELECTRICAL CHARACTERISTICS AND CONTROLS

Voltage type	AC
Min Voltage (V)	220 V
Max Voltage (V)	240 V
Min Frequency (Hz)	50 Hz
Max Frequency (Hz)	60 Hz
Frequency (Hz)	50 Hz
Wiring name	CLD-E
Power factor	≥0.9
Insulation class	Class I
Controllability	None

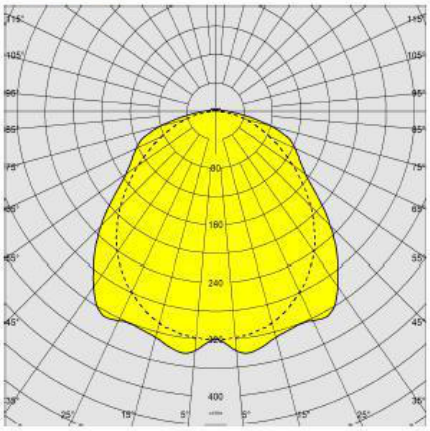
disano illuminazione

1

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-07



PHOTOMETRIC DATA

Lighting source	LED
CRI	≥80
Luminous flux (output) (lm)	5737 lm
Power absorption (total) (W)	32 W
CCT	4000 K
Luminous efficacy (lm/W)	179 lm/W
Low Flicker	luminaire with very low flicker: evenly distributed light for greater visual safety.
Colour consistency	SDCM3
LED flux maintenance	80000 hr, L 80, B 20

MECHANICAL CHARACTERISTICS

Impact resistance rating (IK)	IK08
IP	66
Ambient temperature - min	5 °C
Ambient temperature - max	40 °C

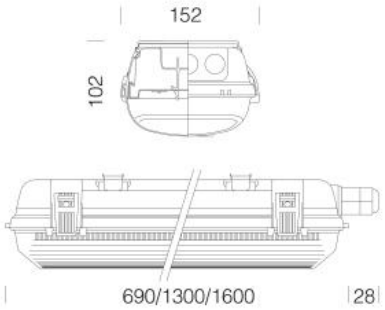
disano illuminazione

2

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-07



DOWNLOAD

MOUNTS

AssemblyInstructions Echo 09-23.pdf

DESIGNS

TechnicalDrawing echobila.dxf

MATERIALS AND COLOURS

Housing	injection-moulded, made of grey RAL 7035 polycarbonate, shatterproof, UV-stabilised, with high mechanical strength thanks to the structure reinforced by internal ribs.
Optics	galvanised steel pre-painted in oven with white polyester resin, UV-stabilised. Fastened to the body with a quick coupling by means of a device machined directly on the body.
Diffuser	injection-moulded in polycarbonate with internal grooves for greater light control, self-extinguishing V2, UV-stabilised, smooth outer finish to enable easy cleaning for maximum light efficiency.
Colour	Grey
Equipment	- sealing gasket in eco-friendly, anti-aging expanded polyurethane foam - ceiling mounting brackets and suspension hook in stainless steel - plug-socket connector - snap hooks and safety screws in stainless steel
	ATTENTION ! Do not install on surfaces subject to strong vibrations, outdoors on hanging cables, or on walls under metallic grates, or on poles, and in any case, never expose the fixture to direct sunlight. Check the compatibility between the material constituting the product and the space where it will be installed. We recommend the use of fixtures made of steel with direct exposure to sunlight.

EMERGENCY LIGHTING

Type of emergency	S.A.
Battery life-recharge	1h

STANDARDS AND COMPLIANCE

Photobiological safety class	RG0
Markings and tests	CE, ENEC
Reference standards	EN60598-1. With degree of protection according to EN60529. The lighting fixture meets all IFS and BRC requirements, and the regulation of the HACCP Directive regarding lighting systems installed in food processing plants.
Laboratory Tests	- the UL 94 Standard is considered a reference for rating the ignition characteristics of plastic materials. The watertight fixtures are made of V2 class material that self-extinguishes in 25 seconds. - passes the Glow Wire Test at 850 °C.
Energy Label	C

GEAR

Upon request	- version with wire feedthrough, dimmable. - narrow beam version (subcode 22) - radar sensor, subcode -19 - Always On Emergency, subcode -07 (always on, 60 min charge)

WARRANTY

After sales warranty	5 yr

disano illuminazione

3

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

4.5 FEED UNIT 40A LEFT OR RIGHT MOUNTING

Product datasheet

Specifications



FEED UNIT 40A LEFT OR RIGHT MOUNTING

Local distributor code:
23348079 KBB40ABG44W

EAN Code: 3606480001062

Main

Range of product	Canalis
Device short name	KBB
Product compatibility	Canalis KBB busbar trunking 25...40 A
Offer type	Classic Control system
product or component type	Feed unit
Conductors material	Aluminium
[Ie] rated operational current	40 A 25 A
[Ue] rated operational voltage	230...400 V
Number of circuits	2
busbar trunking polarity	3L + N + PE L + N + PE
Protection type	Without protection
Control type	Communicating
Communication port protocol	DALI
Colour	White (RAL 9003)

Complementary

Provided equipment	End cover
mounting location	Left
mounting mode	By clips
mounting support	Busbar
Connections - terminals	Terminal block - Pg 21 - screw clamp connector for 6...10 mm²
Width	244 mm
Depth	103.5 mm
Height	75.5 mm
net weight	400 g
Standards	IEC 61439-6

Environment

IP degree of protection	IP55 conforming to IEC 60529

28 Jun 2024 Life Is On Schneider Electric 1

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	8.0 cm
Package 1 Width	11.0 cm
Package 1 Length	27.0 cm
Package 1 Weight	700.0 g
Unit Type of Package 2	S03
Number of Units in Package 2	12
Package 2 Height	30.0 cm
Package 2 Width	30.0 cm
Package 2 Length	40.0 cm
Package 2 Weight	8.556 kg
Unit Type of Package 3	P06
Number of Units in Package 3	96
Package 3 Height	75.0 cm
Package 3 Width	60.0 cm
Package 3 Length	80.0 cm
Package 3 Weight	75.7 kg

Contractual warranty

Warranty	18 months

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Sustainability

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Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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4.6 STRAIGHT DISTRIBUTION LENGHTS 25A – 3METERS

Product datasheet

Specifications



Straight length, Canalis KBB, 25 A, 2 circuits 3L+N+PE and L+N+PE, 5 tap-off units, 3 m, white

Local distributor code:
23346767 KBB25ED42305W

EAN Code: 3606480000805

Main

Range of product	Canalis
Device short name	KBB
Offer type	Classic Control system
product or component type	Straight length
Busbar description	Distribution length
Device application	Lighting Power socket distribution
[Ie] rated operational current	25 A at 35 °C
[Ue] rated operational voltage	230...400 V
Network frequency	50/60 Hz
busbar trunking polarity	3L + N + PE L + N + PE
Number of circuits	2
Number of tap-off outlets	5
Control type	Communicating
Communication port protocol	DALI
mounting mode	By screws

Complementary

[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
[Icw] rated short-time withstand current	0.44 kA
[Ipk] rated peak withstand current	4.4 kA
Thermal stress limit	195 kA².s
Maximum radiated magnetic field	2 pT
THDI	0...15 % 25 A 15...33 % 20 A 33...100 % 16 A
Maximum voltage drop	<0.72 V with power factor = 1 at 50 Hz with 1A for 100 m long <0.67 V with power factor = 0.9 at 50 Hz with 1A for 100 m long <0.61 V with power factor = 0.8 at 50 Hz with 1A for 100 m long <0.55 V with power factor = 0.7 at 50 Hz with 1A for 100 m long
Standards	EN/IEC 61439-6 EN/IEC 61439-1

28 Jun 2024 Life Is On Schneider Electric 1

Width	30 mm
Height	46 mm
Length	3 m
Colour	White (RAL 9003)
net weight	4.7 kg

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529
IK degree of protection	IK06 conforming to EN/IEC 62262
Ambient air temperature for operation	0…35 °C (100 % of In) 35…40 °C (96 % of In) 40…45 °C (93 % of In) 45…50 °C (89 % of In) 50…55 °C (85 % of In)

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	5.000 cm
Package 1 Width	6.000 cm
Package 1 Length	310.000 cm
Package 1 Weight	5.000 kg
Unit Type of Package 2	BB1
Number of Units in Package 2	6
Package 2 Height	13.000 cm
Package 2 Width	16.500 cm
Package 2 Length	314.500 cm
Package 2 Weight	31.000 kg
Unit Type of Package 3	PAL
Number of Units in Package 3	72
Package 3 Height	52.000 cm
Package 3 Width	63.000 cm
Package 3 Length	318.000 cm
Package 3 Weight	430.500 kg

Contractual warranty

Warranty	18 months

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Sustainability

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Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

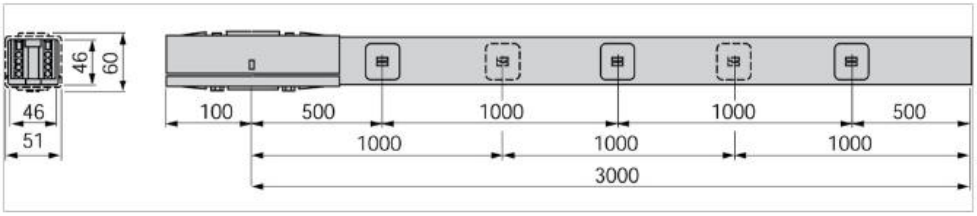
Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBB25ED42305W

Dimension Drawings



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4.7 STRAIGHT DISTRIBUTION LENGHTS 40A – 2METERS

Product datasheet

Specifications



Straight length, Canalis KBB, 25/40A, 2 circuits, 3L+N+PE/ L+N+PE, compatible DALI, 3 outlets, 2m, white RAL9003

KBB40ED42203W

Main

Range of product	Canalis
Device short name	KBB
Offer type	Classic Control system
product or component type	Straight length
Busbar description	Distribution length
Device application	Lighting Power socket distribution
[Ie] rated operational current	40 A at 35 °C 25 A at 35 °C
[Ue] rated operational voltage	230...400 V
Network frequency	50/60 Hz
busbar trunking polarity	3L + N + PE L + N + PE
Number of circuits	2
Number of tap-off outlets	3
Control type	Communicating
Communication port protocol	DALI
mounting mode	By screws

Complementary

[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
[Icw] rated short-time withstand current	0.94 kA
[Ipk] rated peak withstand current	9.6 kA
Thermal stress limit	900 kA².s
Maximum radiated magnetic field	2 pT
THDI	0...15 % 40 A 15...33 % 32 A 33...100 % 28 A
Maximum voltage drop	<0.3 V with power factor = 1 at 50 Hz with 1A for 100 m long <0.28 V with power factor = 0.9 at 50 Hz with 1A for 100 m long <0.25 V with power factor = 0.8 at 50 Hz with 1A for 100 m long <0.22 V with power factor = 0.7 at 50 Hz with 1A for 100 m long
Standards	EN/IEC 61439-6 EN/IEC 61439-1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Width	30 mm
Height	46 mm
Length	2 m
Colour	White (RAL 9003)
net weight	3.8 kg

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529
IK degree of protection	IK06 conforming to EN/IEC 62262
Ambient air temperature for operation	0…35 °C (100 % of In) 35…40 °C (96 % of In) 40…45 °C (93 % of In) 45…50 °C (89 % of In) 50…55 °C (85 % of In)

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	5.000 cm
Package 1 Width	210.000 cm
Package 1 Length	5.000 cm
Package 1 Weight	3.500 kg
Unit Type of Package 2	BB1
Number of Units in Package 2	6
Package 2 Height	13.500 cm
Package 2 Width	16.000 cm
Package 2 Length	215.000 cm
Package 2 Weight	24.000 kg
Unit Type of Package 3	PAL
Number of Units in Package 3	72
Package 3 Height	51.000 cm
Package 3 Width	220.000 cm
Package 3 Length	64.000 cm
Package 3 Weight	302.000 kg

Contractual warranty

Warranty	18 months

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Sustainability

Green Premium™ label is Schneider Electric's commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO_2 products.

Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

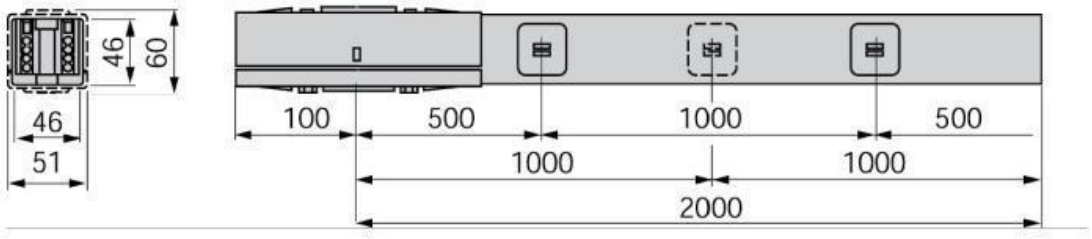
Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Product datasheet KBB40ED42203W

Dimension Drawings



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4.8 10A TAP-OFF UNIT

Product datasheet

Specifications

10A TAPOFF UNITS

Local distributor code:

389342036 KBC10DCB40



EAN Code: 3606480002083

Main

Range	Canalis
Offer type	Classic Control system
product or component type	Connector
Device application	Lighting Power socket distribution
Range compatibility	Canalis KBA busbar trunking Canalis KBB busbar trunking
[Ie] rated operational current	10 A at 35 °C
[Ue] rated operational voltage	230...240 V
Network frequency	50/60 Hz
Communication port protocol	DALI
Tap-off unit polarity	3L+N+PE
Tap-off unit connector type	With phase selection

Complementary

Colour	Cream (RAL 9001)
[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
Protection type	Without protection
Width	1 m
Depth	62 mm
Height	60 mm
net weight	65 g
Quantity per set	Set of 10
Standards	EN/IEC 61439-1 EN/IEC 61439-6

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Package 1 Height	6.200 cm
Package 1 Width	6.000 cm
Package 1 Length	11.500 cm
Package 1 Weight	87.000 g
Unit Type of Package 2	BB1
Number of Units in Package 2	10
Package 2 Height	12.500 cm
Package 2 Width	14.000 cm
Package 2 Length	32.000 cm
Package 2 Weight	880.000 g
Unit Type of Package 3	P06
Number of Units in Package 3	300
Package 3 Height	77.000 cm
Package 3 Width	80.000 cm
Package 3 Length	60.000 cm
Package 3 Weight	34.900 kg

Contractual warranty

Warranty	18 months

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Sustainability

Green Premium™ label is Schneider Electric's commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO_2 products.

Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

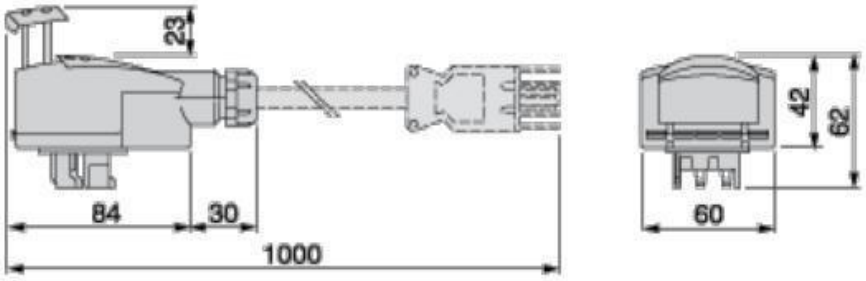
Reach Free Of Svhc	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Plastic Parts Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBC10DCB40

Dimension Drawings



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4.9 ELECTRICAL CABLE

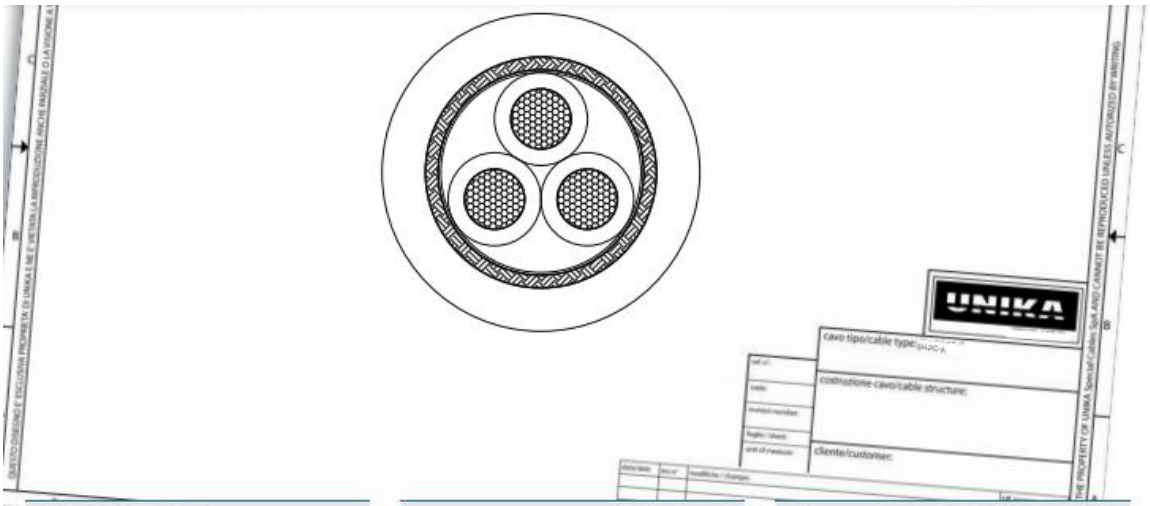
UNIKA

SH-PC-A

Cavi unipolari e multipolari, armati di potenza e controllo 0,6/1kV
Single and multicore, armoured power and control shipboard cables rated 0,6/1 kV



	Dati tecnici	Technical data
Conduttore **Conductor**	Rame rosso (opzionale stagnato) classe 5 in accordo alla IEC 60228	Bare (optional tinned copper) class 5 according to IEC 60228
Isolamento **Insulation**	Mescola HF XLPE in accordo alla IEC 60092-360 Spessori in accordo alla IEC 60092-353	HF XLPE compound according to IEC 60092-360 Thickness according to IEC 60092-353
Identificazione anime (preferenziale) **Core identification (preferential)**	1 anima: nera 2 anime: marrone, blu 3 anime: nera, grigia, marrone o (blu,marrone, giallo/verde) 4 anime: marrone, nera, grigia, blu o giallo/verde 5 anime: blu, marrone, nera, grigia, nera o giallo/verde da 5 anime: nero numerato (con o senza giallo/verde)	1 core: black 2 cores: brown, blue 3 cores: black, grey, brown or (blue, brown, green/yellow) 4 cores: brown, black, grey, blue or green/yellow 5 cores: blue, brown, black, grey, black or green/yellow From 5 cores: black numbered (with or without green/yellow)
Fasciatura **Bedding**	Filati riempitivi e nastro non igroscopico o guaina estrusa senza alogeni	Yarn fillers and non hygroscopic tape or extruded inner sheath without halogen
Armatura **Armouring**	Treccia di fili di rame rosso (su richiesta rame stagnato o acciaio zincato) copertura minima 90%	Bare copper wire braid (upon request tinned copper or galvanized steel wire braid). Minimum coverage 90%
Guaina esterna **Outer sheath**	Compound SHF1 in accordo alla IEC 60092-360 Spessore in accordo alla IEC 60092-353 Colore: nero (preferenziale) Diametro esterno in accordo alla IEC 60092-350 - Allegato D	SHF1 compound according to IEC 60092-360 Thickness according to IEC 60092-353 Colour: black (or other colour agreed) Outer diameter according to IEC 60092-350 annex D
Marcatura **Marking**	UNIKA (Italy) - SH-PC-A 0,6/1 KV 90°C (numero anime) x (sezione) IEC 60092-353 - IEC 60332 -3-22 – codice rintracciabilità	UNIKA (Italy) – SH-PC-A 0,6/1 kV 90°C (core number) x (cross-section) – IEC 60092-353 – IEC 60332-3-22 – traceability code
Temperatura per posa fissa **Rated conductor temperature for fixed installation**	90°C	90°C
Temperatura minima d'installazione **Minimum installation temperature**	- 15°C	- 15°C
Raggio minimo di curvatura **Minimum bending radius**	6D: D è il diametro esterno	6D: D is the overall diameter
Attenuazione schermante **Screening attenuation**	≥ 60 dB in accordo alla EN50289-1-6	≥ 60 dB according to EN50289-1-6
Comportamento al fuoco **Fire behaviour**	IEC 60332-3-22 non propagante il fuoco IEC 60332-1-2 non propagante la fiamma IEC 60754-1 assenza di alogeni IEC 60754-2 acidità dei fumi IEC 60684-2 contenuto di fluoro IEC 61034 densità dei fumi	IEC 60332-3-22 not fire propagation IEC 60332-1-2 not flame propagation IEC 60754-1 halogen content IEC 60754-2 pH and conductivity IEC 60684-2 fluorine content IEC 61034 smoke emission



codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N1026	2x1	8,5	59	81
N1036	3x1	8,9	72	97
N1046	4x1	9,6	86	116
N1056	5x1	10,4	101	136
N1076	7x1	11,4	126	175
N1106	10x1	14,7	213	258
N1126	12x1	15,1	236	290
N1246	24x1	20,5	402	521
N1027	2x1,5	9,1	79	96
N1037	3x1,5	9,5	97	120
N1047	4x1,5	10,3	117	143
N1057	5x1,5	11,4	138	175
N1077	7x1,5	12,3	174	221
N1107	10x1,5	15,9	290	325
N1127	12x1,5	16,3	324	378
N1147	14x1,5	17,3	361	421
N1197	19x1,5	19,3	452	545
N1247	24x1,5	22,5	555	684
N1307	30x1,5	23,7	654	810
N1377	37x1,5	25,7	773	979
N1029	2x2,5	9,9	104	123
N1039	3x2,5	10,4	132	156
N1049	4x2,5	11,5	163	198
N1059	5x2,5	12,5	194	236
N1079	7x2,5	14,1	294	323
N1109	10x2,5	17,7	403	453

codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N1129	12x2,5	18,2	457	517
N1149	14x2,5	19,1	514	595
N1189	19x2,5	21,3	655	763
N1259	24x2,5	25,1	810	971
N1309	30x2,5	26,5	968	1165
N1379	37x2,5	28,7	1156	1409
N101A	1x4	6,9	73	89
N102A	2x4	11,3	142	169
N103A	3x4	11,9	185	220
N104A	4x4	12,9	232	273
N105A	5x4	14,7	324	349
N101B	1x6	7,4	96	112
N102B	2x6	12,3	188	218
N103B	3x6	13,0	251	290
N104B	4x6	14,7	364	384
N105B	5x6	16,0	435	465
N101D	1x10	8,6	142	163
N102D	2x10	14,9	327	332
N103D	3x10	15,7	432	445
N104D	4x10	17,4	544	573
N105D	5x10	18,9	657	692
N101E	1x16	9,7	208	231
N102E	2x16	17,3	466	481
N103E	3x16	18,3	631	658
N104E	4x16	20,2	803	848
N105E	5x16	22,3	976	1035

codice code	quarte e numero conduttori x sezione quad and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N101F	1x25	11,6	308	352
N102F	2x25	20,9	675	727
N103F	3x25	22,3	929	1018
N104F	4x25	24,7	1191	1314
N105F	5x25	27,1	1454	1618
N101G	1x35	12,9	414	469
N103G	3x35	25,3	1246	1377
N104G	4x35	28,0	1607	1792
N105G	5x35	31,0	1969	2213
N101H	1x50	15,1	617	640
N103H	3x50	29,0	1712	1841
N104H	4x50	32,1	2220	2400
N105H	5x50	36,1	2842	3054
N101J	1x70	17,1	829	872
N103J	3x70	33,2	2325	2536
N104J	4x70	37,2	3148	3355
N101K	1x95	19,8	1095	1157
N103K	3x95	39,4	3225	3433
N104K	4x95	43,9	4194	4505
N101L	1x120	22,1	1351	1427
N103L	3x120	44,3	3991	4270
N101M	1x150	23,5	1660	1765
N103M	3x150	50,1	4916	5300
N101N	1x185	25,9	2020	2101
N103N	3x185	52,7	5998	6308
N101P	1x240	28,9	2574	2629
N101Q	1x300	32,1	3175	3205

(*) Aggiungere la lettera G al codice per i cavi con conduttore giallo/verde.
Nota: La portata di corrente è riferita ad una temperatura ambiente di 45°C e in accordo a IEC 60092-352. Per due o piu circuiti, i fattori di declassamento devono essere tenuti in considerazione. Ulteriori informazioni e sezioni sono disponibili su richiesta.

(*) Add letter G at the code for cables having green/yellow conductor
Note: For current ampacity see type SH-PC-U. The ampacity is referred to ambient temperature of 45°C and based upon IEC 60092-352.
Further formation and cross-section are available upon request

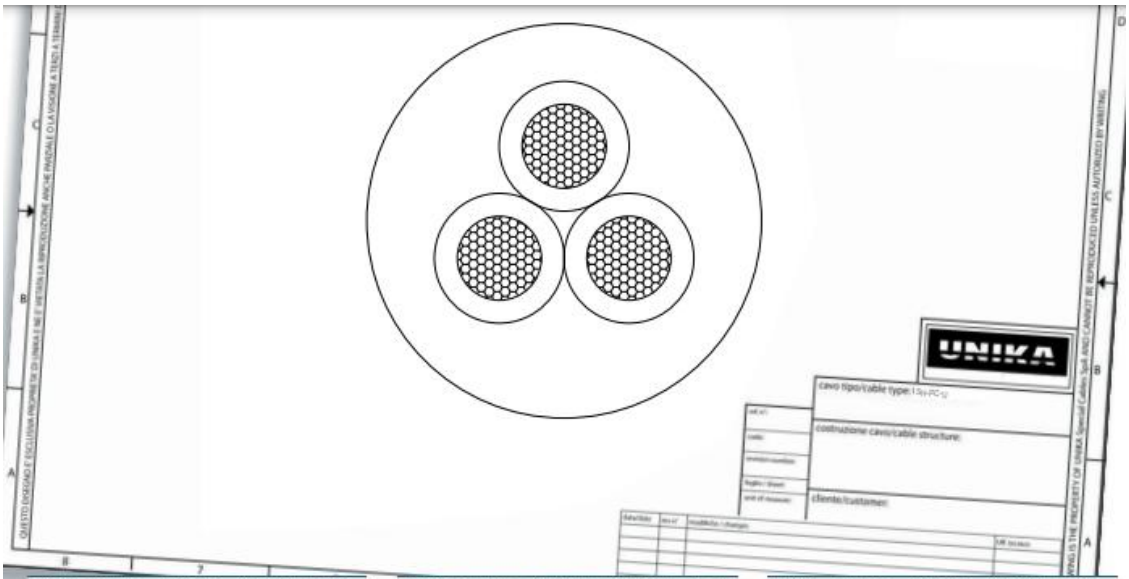
UNIKA

SH-PC-U

Cavi unipolari e multipolari, non armati, di potenza e controllo 0,6/1kV
Single and multicore, unarmoured power and control shipboard cables rated 0,6/1 kV



	Dati tecnici	Technical data
Conduttore **Conductor**	Rame rosso (opzionale stagnato) classe 5 in accordo alla IEC 60228	Bare (optional tinned copper) class 5 according to IEC 60228
Isolamento **Insulation**	Mescola HF XLPE in accordo alla IEC 60092-360 Spessori in accordo alla IEC 60092-353	HF XLPE compound according to IEC 60092-360 Thickness according to IEC 60092-353
Identificazione anime (preferenziale) **Core identification (preferential)**	1 anima: nera 2 anime: marrone, blu 3 anime: nera, grigia, marrone o (blu,marrone, giallo/verde) 4 anime: marrone, nera, grigia, blu o giallo/verde 5 anime: blu, marrone, nera, grigia, nera o giallo/verde da 5 anime: nero numerato (con o senza giallo/verde)	1 core: black 2 cores: brown, blue 3 cores: black, grey, brown or (blue, brown, green/yellow) 4 cores: brown, black, grey, blue or green/yellow 5 cores: blue, brown, black, grey, black or green/yellow From 5 cores: black numbered (with or without green/yellow)
Fasciatura **Bedding**	Filati riempitivi e nastro non igroscopico o guaina estrusa senza alogeni	Yarn fillers and non hygroscopic tape or extruded halogen-free inner sheath
Guaina esterna **Outer sheath**	SHF1 compound in accordo alla IEC 60092-360 Spessore in accordo alla IEC 60092-353 Colore: nero (o un altro colore in accordo) Diametro esterno in accordo alla IEC 60092-350 - Allegato D	SHF1 compound according to IEC 60092-360 Thickness according to IEC 60092-353 Colour: black (or other colour agreed) Outer diameter according to IEC 60092-350 annex D
Marcatura **Marking**	UNIKA (Italy) - SH-PC-U 0,6/1 KV 90°C Marking (numero anime) x (sezione) IEC 60092-353 - IEC 60332 -3-22 – codice rintracciabilità	UNIKA (Italy) - SH-PC-U 0,6/1 kV 90°C (core number) x (cross-section) - IEC 60092-353 - IEC 60332-3-22 - traceability code
Temperatura per posa fissa **Rated conductor temperature for fixed installation**	90°C	90°C
Temperatura minima d'installazione **Minimum installation temperature**	- 15°C	- 15°C
Raggio minimo di curvatura **Minimum bending radius**	(in accordo alla IEC 60092-352 tab. 4): 4D per cavi aventi diametro esterno non superiore a 25 mm 6D per cavi aventi diametro esterno non superiore a 25 mm dove D il diametro esterno	(according to IEC 60092-352 table 4): 4D for cables having overall diameter not above 25 mm 6D for cables having overall diameter above 25 mm with D the overall diameter
Comportamento al fuoco **Fire behaviour**	IEC 60332-3-22 non propagante il fuoco IEC 60332-1-2 non proparante la fiamma IEC 60754-1 assanza di alogeni IEC 60754-2 acicidità dei fumi IEC 60684-2 contenuto di fluoro IEC 61034 densità dei fumi	IEC 60332-3-22 not fire propagation IEC 60332-1-2 not flame propagation IEC 60754-1 halogen content IEC 60754-2 pH and conductivity IEC 60684-2 fluorine content IEC 61034 smoke emission



codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N2026	2x1	7,5	19	66
N2036	3x1	7,9	29	82
N2046	4x1	8,8	38	104
N2056	5x1	9,6	48	123
N2076	7x1	10,4	67	156
N2106	10x1	13,3	96	220
N2126	12x1	13,9	115	250
N2246	24x1	19,3	230	468
N2017	1x1,5	5,0	14	44
N2027	2x1,5	8,1	29	81
N2037	3x1,5	8,7	43	108
N2047	4x1,5	9,5	58	131
N2057	5x1,5	10,4	72	156
N2077	7x1,5	11,5	101	206
N2107	10x1,5	14,7	144	291
N2127	12x1,5	15,1	173	335
N2147	14x1,5	15,9	202	376
N2197	19x1,5	17,9	274	495
N2247	24x1,5	21,1	346	625
N2307	30x1,5	22,5	432	760
N2377	37x1,5	24,3	533	911
N2019	1x2,5	5,4	24	57
N2029	2x2,5	9,1	48	111
N2039	3x2,5	9,6	72	144
N2049	4x2,5	10,5	96	179
N2059	5x2,5	11,7	120	221
N2079	7x2,5	12,7	168	287

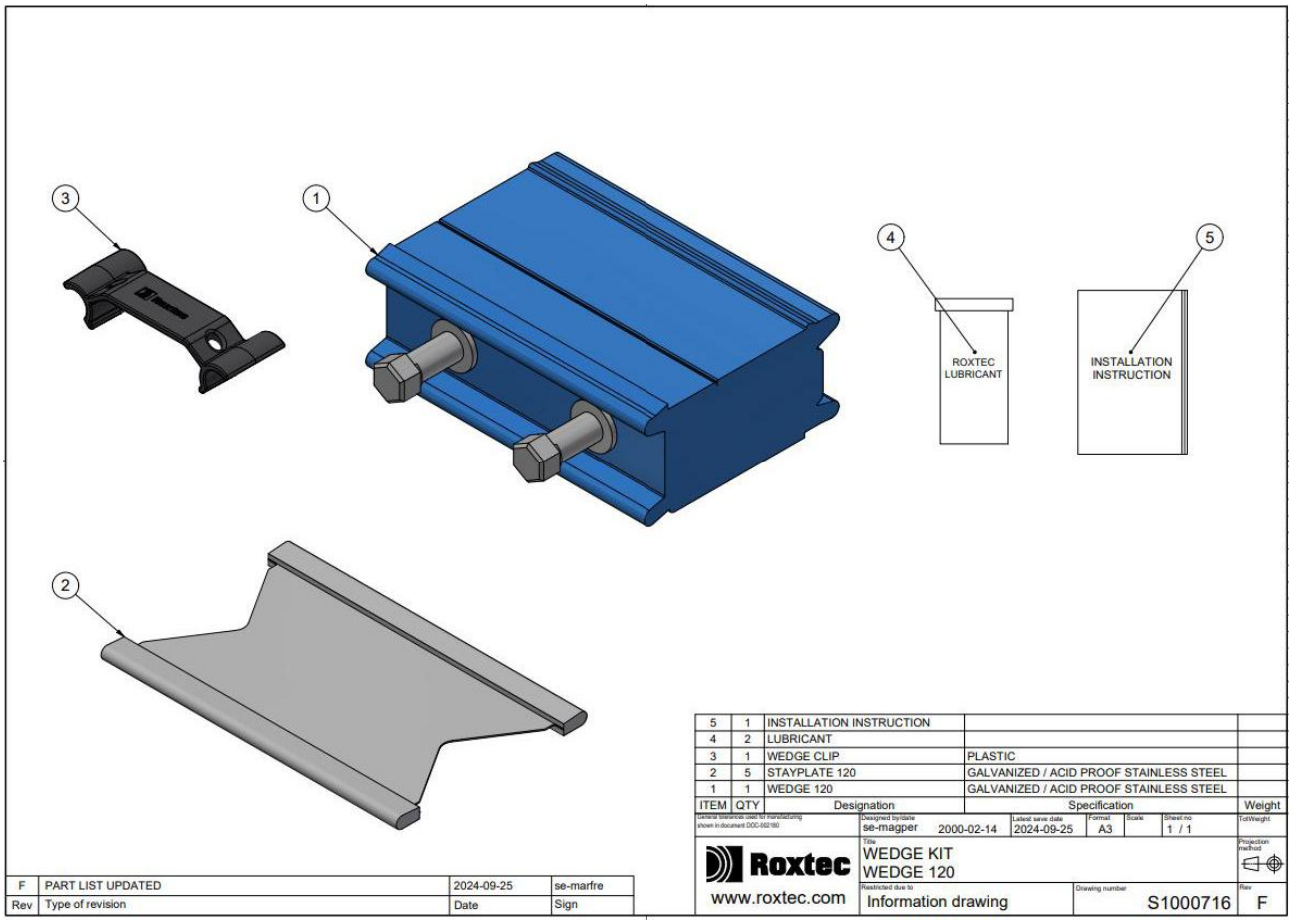
codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N2109	10x2,5	16,3	240	407
N2129	12x2,5	17,0	288	478
N2149	14x2,5	17,9	336	545
N2189	19x2,5	20,1	456	718
N2259	24x2,5	23,7	576	906
N2309	30x2,5	25,3	720	1108
N2379	37x2,5	27,5	888	1347
N201A	1x4	6,0	38	76
N202A	2x4	10,3	77	150
N203A	3x4	10,9	115	200
N204A	4x4	12,1	154	257
N205A	5x4	13,3	192	311
N201B	1x6	6,5	58	100
N202B	2x6	11,5	115	203
N203B	3x6	12,2	173	274
N204B	4x6	13,3	230	346
N205B	5x6	14,8	288	431
N201D	1x10	7,5	96	145
N202D	2x10	13,5	192	294
N203D	3x10	14,5	288	412
N204D	4x10	16,0	384	529
N205D	5x10	17,7	480	652
N201E	1x16	8,8	154	215
N202E	2x16	15,9	307	437
N203E	3x16	17,1	461	620
N204E	4x16	18,8	614	796
N205E	5x16	20,9	768	988

codice code	quarte e numero conduttori x sezione quad and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N201F	1x25	10,5	240	327
N202F	2x25	19,7	480	682
N203F	3x25	20,9	720	959
N204F	4x25	23,3	960	1249
N205F	5x25	25,9	1200	1546
N201G	1x35	12,0	336	448
N203G	3x35	23,9	1008	1311
N204G	4x35	26,6	1344	1718
N205G	5x35	29,6	1680	2131
N201H	1x50	13,6	480	594
N203H	3x50	27,8	1440	1778
N204H	4x50	30,9	1920	2331
N205H	5x50	34,3	2400	2887
N201J	1x70	15,6	672	819
N203J	3x70	31,8	2016	2448
N204J	4x70	35,6	2688	3265
N201K	1x95	18,3	912	1095
N203K	3x95	37,6	2736	3319
N204K	4x95	42,1	3648	4378
N201L	1x120	20,6	1152	1370
N203L	3x120	42,5	3456	2894
N201M	1x150	23,3	1440	1703
N203M	3x150	48,3	4320	5163
N201N	1x185	24,4	1776	2039
N203N	3x185	50,9	5328	6171
N201P	1x240	27,6	2304	2567
N201Q	1x300	30,8	2880	3143

(*) Aggiungere la lettera G al codice per i cavi con conduttore giallo/verde.
Nota: La portata di corrente è riferita ad una temperatura ambiente di 45°C e in accordo a IEC 60092-352. Per due o più circuiti, i fattori di declassamento devono essere tenuti in considerazione. Ulteriori informazioni e sezioni sono disponibili su richiesta.

(*) Add letter G at the code for cables having green/yellow conductor
Note: Current ampacity is referred to ambient temperature of 45 °C and based upon IEC 60092-352. For two or more circuits, derating factors should be taken into account. Further formation and cross-section are available upon request

4.10 MCT



ITEM	QTY	Designation	Specification	Weight
5	1	INSTALLATION INSTRUCTION		
4	2	LUBRICANT		
3	1	WEDGE CLIP	PLASTIC	
2	5	STAYPLATE 120	GALVANIZED / ACID PROOF STAINLESS STEEL	
1	1	WEDGE 120	GALVANIZED / ACID PROOF STAINLESS STEEL	

Designed by/date: se-magper 2000-02-14 | Latest save date: 2024-09-25 | Format: A3 | Scale: | Sheet no: 1 / 1

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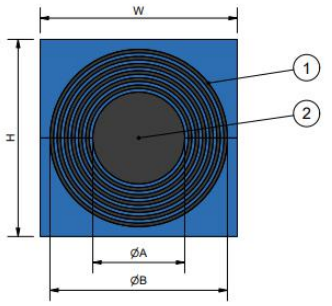
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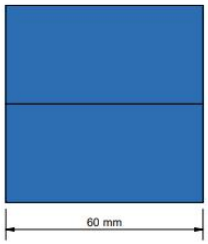
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Rev	Type of revision	Date	Sign
F	PART LIST UPDATED	2024-09-25	se-marfre

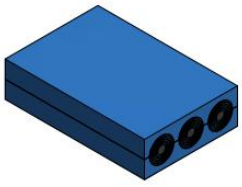
TYPE	CABLE/PIPE Ø (A-B) [mm]	H [mm]	W [mm]	C [QTY]
RM 15	3 - 11	15	15	1
RM 15w40	3.5 - 10.5	15	40	3
RM 20	4 - 14.5	20	20	1
RM 20w40	3.5 - 16.5	20	40	2
RM 30	10 - 25	30	30	1
RM 30 H90	10 - 25	30	90	1
RM 40	21.5 - 34.5	40	40	1
RM 40 H80	21.5 - 34.5	40	80	1
RM 40 10-32	9.5 - 32.5	40	40	1
RM 60*	28 - 54	60	60	1
RM 60 24-54	24 - 54	60	60	1
RM 80*	48 - 71	80	80	1
RM 90*	48 - 71	90	90	1
RM 120*	67.5 - 99	120	120	1

*ALSO AVAILABLE IN WOC VERSION DELIVERED WITHOUT CORE

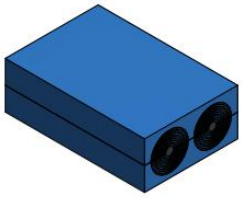




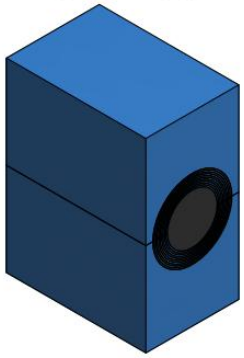
RM 15w40



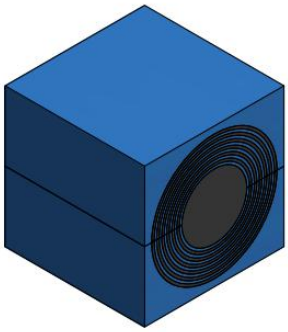
RM 20w40



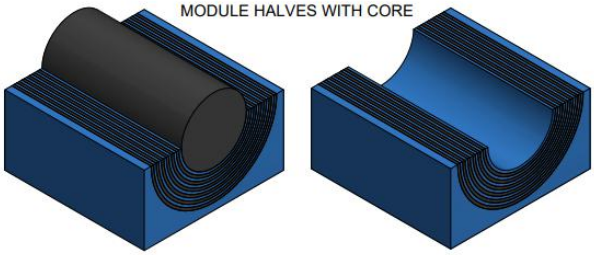
RM 30H90 & RM 40H80



RM 15-120



MODULE HALVES WITH CORE



Rev	Type of revision	Date	Sign
F	LAYOUT CHANGED	2024-06-25	se-marfre

ITEM	QTY	Designation	Specification	Weight
2	C	CORE	ROXYLON	
1	2	RUBBER PROFILE	ROXYLON	

Designed by/date: se-joahel 2003-12-12 | Latest save date: 2024-07-03 | Format: A3 | Sheet no: 1 / 1

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Title: RM MODULES ASSEMBLY

Restricted due to: Information drawing

Drawing number: S1005711

Rev: F

4.11 CABLE GLAND

CEMBRE

1710921/E_0523

PRESSACAVI CABLE GLANDS
MAXIbrass®

INFORMAZIONI GENERALI:
- Materiale: ottone nichelato
- Guarnizione: NEOPRENE
- Griffe di serraggio: POLIAMMIDE PA 6.6
- O-Ring: NITRILE
- Grado di protezione: IP 68 - 5 bar / 30 min.
- Temperatura d'impiego:
  da - 40°C a +100°C (statica*)
  da - 25°C a +100°C (dinamica*)

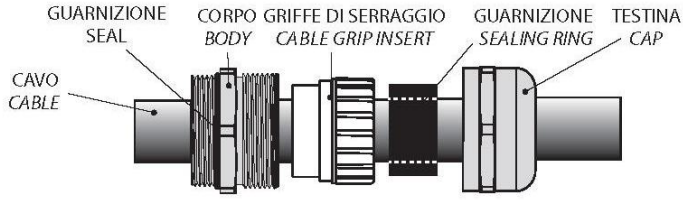
ISTRUZIONI PER L'INSTALLAZIONE:
1) Avvitare il pressacavo nella sede filettata corrispondente (A) o fissarlo con il controdado (B), senza eccedere nella chiusura.
2) Introdurre il cavo all'interno del pressacavo.
3) Avvitare la testina finché la guarnizione tocca completamente il cavo.
4) Serrare infine il pressacavo e la testina alla coppia di serraggio indicata in tabella.

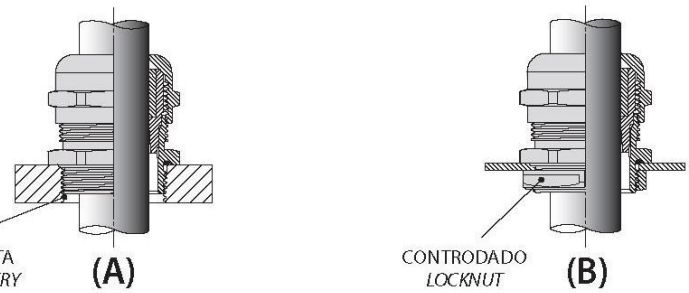
USO SENZA CONTRODADO: solo se avvitato a sedi filettate.

GENERAL INFORMATION:
- *Material: Nickel plated Brass*
- *Sealing ring: NEOPRENE*
- *Cable grip insert: POLYAMIDE PA 6.6*
- *O-ring: NITRILE*
- *Protection: IP 68 - 5 bar / 30 min. (LIQUID TIGHT)*
- *Temperature range:*
  -40°C to +100°C (static)*
  -25°C to +100°C (dynamic)*

INSTALLATION INSTRUCTIONS:
1) Screw the cable gland onto its relevant seat (A) or lock it by the locknut (B).
2) Introduce the cable inside the cable gland.
3) Screw the nut until the sealing ring fully touches the cable.
4) Finally, tighten the body and the nut up to the torque ratio listed in the table.

USAGE WITHOUT LOCKNUT: for securement to a threaded hubs only.





* STATICA: in questo intervallo di temperatura il pressacavo, correttamente installato in conformità ai requisiti tecnici, non deve essere ulteriormente sollecitato con carichi o tensioni (urti, vibrazioni, pressione, ecc.). Le stesse condizioni si applicano anche al cavo e alla sede di fissaggio a cui è fissato il pressacavo.
DINAMICA: in questo intervallo di temperatura il pressacavo resiste ad urti e sollecitazioni con un valore di energia equivalente alla categoria di impatto dichiarata in accordo alla norma EN 62444.

* *STATIC: in this temperature range the cable gland, properly installed in compliance with technical requirements, must not be further strained with stress or forces (shock, vibration, pressure, etc.). The same conditions also apply to both the enclosure and the wire to which the cable gland has been assembled.*
DYNAMIC: in this temperature range the cable gland withstands shocks and stresses with an energy value equivalent to the declared impact category according to EN 62444.

Tipo / Type		Grandezza Nominale Thread	Nominale Nominal Ø	Raccomandata Recommended		UL 514B Ø		Valore trazione Pull Value		EN 62444 Ø	Categoria d'impatto impact category	MARCHIO
			[mm]	[Nm]	[in-lbs]	[mm]	[inches]	[kg]	[lb]	[Nm]	[in-lbs]	[mm]		
2900.M12N	**2901.M12N**	M12x1,5	3-7	6	53	3-7	0.11-0.28	2	4.4	6	53	3-7	5	USR-CNR / VDE
2900.M16N	**2901.M16N**	M16x1,5	4.5-10	6	53	6-10	0.24-0.39	2	4.4	6	53	4,5-10	6	USR-CNR / VDE
2900.M20N	**2901.M20N**	M20x1,5	7-13	8	71	8-13	0.31-0.51	15.9	35	8	71	7-13	6	USL-CNL / VDE
2900.M25N	**2901.M25N**	M25x1,5	10-17	8	71	13-17	0.51-0.67	15.9	35	8	71	11-17	6	USL-CNL / VDE
2900.M32N	**2901.M32N**	M32x1,5	11-21	18	159	13-21	0.51-0.83	15.9	35	18	159	13-21	6	USL-CNL / VDE
2900.M40N	**2901.M40N**	M40x1,5	19-28	18	159	21-28	0.83-1.10	15.9	35	18	159	19-28	6	USL-CNL / VDE
2900.M50N	**2901.M50N**	M50x1,5	26-35	18	159	27-35	1.06-1.38	15.9	35	18	159	26-35	6	USL-CNL / VDE
2900.M63N	-	M63x1,5	34-45	25	221	34-45	1.33-1.77	15.9	35	18	159	34-45	6	USL-CNL / VDE
2910.M12N	**2911.M12N**	M12x1,5	1-5	6	53	2-5	0.08-0.20	2	4.4	6	53	2-5	5	USR-CNR / VDE
2910.M16N	**2911.M16N**	M16x1,5	2.5-7	6	53	3.5-7	0.14-0.28	1	2.2	6	53	4-7	6	USR-CNR / VDE
2910.M20N	**2911.M20N**	M20x1,5	5-10	8	71	5-10	0.20-0.40	2	4.4	8	71	5.5-10	6	USR-CNR / VDE
2910.M25N	**2911.M25N**	M25x1,5	6-13	8	71	8-13	0.31-0.51	1	2.2	8	71	6-13	6	USR-CNR / VDE
2910.M32N	**2911.M32N**	M32x1,5	7-14	18	159	7-14	0.28-0.55	5	11	18	159	9-14	6	USR-CNR / VDE
2910.M40N	**2911.M40N**	M40x1,5	13-23	18	159	15-23	0.59-0.91	15.9	35	18	159	17-23	6	USL-CNL / VDE
2910.M50N	**2911.M50N**	M50x1,5	20-29	18	159	20-29	0.79-1.14	15.9	35	18	159	25-29	6	USL-CNL / VDE
2910.M63N	-	M63x1,5	27-39	25	221	28-39	1.10-1.54	15.9	35	18	159	31-39	6	USL-CNL / VDE
2940.M12N	-	M12x1,5	5-8	6	53	5-8	0.20-0.31	2	4.4	6	53	5-8	5	USR-CNR / VDE
2940.M16N	-	M16x1,5	7-12	6	53	8-12	0.31-0.47	2	4.4	6	53	8-12	6	USR-CNR / VDE
2940.M20N	-	M20x1,5	10-16	8	71	12-16	0.47-0.63	5	11	8	71	12-16	6	USR-CNR / VDE
2940.M25N	-	M25x1,5	13-21	8	71	14-21	0.55-0.83	15.9	35	18	159	13-21	6	USL-CNL / VDE
2940.M32N	-	M32x1,5	18-25	18	159	21-25	0.83-0.98	15.9	35	18	159	18-25	6	USL-CNL / VDE
2940.M40N	-	M40x1,5	25-32	18	159	25-32	0.98-1.26	15.9	35	25	221	25-32	6	USL-CNL / VDE
2940.M50N	-	M50x1,5	30-38	18	159	30-37	1.18-1.46	15.9	35	25	221	30-38	6	USL-CNL / VDE
2940E.M50N	-	M50x1,5	35-45	18	159	35-41	1.38-1.61	15.9	35	25	221	35-45	6	USL-CNL / VDE
2900.07N	**2901.07N**	Pg 7	3-7	6,25	55	3-7	0.11-0.28	1.2	2.65	6.25	55	-	-	USR-CNR
2900.09N	**2901.09N**	Pg 9	4-8	6,25	55	4-8	0.16-0.31	2	4.4	6.25	55	-	-	USR-CNR
2900.11N	**2901.11N**	Pg 11	4.5-10	6,25	55	6-10	0.24-0.40	2	4.4	6.25	55	-	-	USL-CNR
2900.13N	**2901.13N**	Pg 13,5	5-12	7,5	66	10-12	0.39-0.47	15.9	35	7,5	66	-	-	USL-CNL
2900.16N	**2901.16N**	Pg 16	7-13	7,5	66	10-13	0.39-0.51	15.9	35	7,5	66	-	-	USL-CNL
2900.21N	**2901.21N**	Pg 21	10-17	10	88,5	12-17	0.47-0.67	15.9	35	10	88,5	-	-	USL-CNL
2900.29N	**2901.29N**	Pg 29	18-25	15	133	18-25	0.71-0.99	15.9	35	15	133	-	-	USL-CNL
2900.36N	**2901.36N**	Pg 36	22-32	25	221	23-32	0.91-1.26	15.9	35	25	221	-	-	USL-CNL
2900.42N	**2901.42N**	Pg 42	28-38	25	221	28-35	1.10-1.38	15.9	35	25	221	-	-	USR-CNL
2900.48N	-	Pg 48	34-45	25	221	34-45	1.34-1.77	15.9	35	25	221	-	-	USR-CNL
2910.07N	**2911.07N**	Pg 7	1-5	6,25	55	2-5	0.08-0.20	1.2	2.65	6.25	55	-	-	USR-CNR
2910.09N	**2911.09N**	Pg 9	2-6	6,25	55	3-6	0.12-0.24	2	4.4	6.25	55	-	-	USR-CNR
2910.11N	**2911.11N**	Pg 11	2.5-7	6,25	55	3.5-7	0.14-0.28	2	1	6.25	55	-	-	USR-CNR
2910.13N	**2911.13N**	Pg 13,5	4-10	7,5	66	5.5-10	0.22-0.39	2	4.4	7.5	66	-	-	USL-CNR
2910.16N	**2911.16N**	Pg 16	5-10	7,5	66	6-10	0.24-0.39	2	4.4	7.5	66	-	-	USL-CNR
2910.21N	**2911.21N**	Pg 21	6-13	10	88,5	7-13	0.28-0.51	2.5	6.6	10	88,5	-	-	USL-CNR
2910.29N	**2911.29N**	Pg 29	12-20	15	133	12-20	0.47-0.79	10	22	15	133	-	-	USL-CNR
2910.36N	**2911.36N**	Pg 36	19-26	25	221	19-26	0.75-1.02	15.9	35	25	221	-	-	USR-CNL
2910.42N	**2911.42N**	Pg 42	24-31	25	221	24-31	0.95-1.22	15.9	35	25	221	-	-	USL-CNL
2910.48N	-	Pg 48	27-39	25	221	31-39	1.22-1.54	15.9	35	25	221	-	-	USL-CNL

VDE = LICENCE No. 40008475 and No. 40008476

USL-CNL = FILE No. E 220310, Control No. 485B

USR-CNR = FILE No. E 220310
Con riduzione della forza di trazione.
With reduced pull force.

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www.cembre.com

CEMBRE S.p.A.
via Serenissima, 9
25135 Brescia
Italy
Ph +39 030 36921
ufficio.vendite@cembre.com
sales@cembre.com

CEMBRE Ltd.
Dunton Park,
Kingsbury Road,
Curdworth, Sutton Coldfield
West Midlands, B76 9EB
United Kingdom
Ph +44 01675 470440
sales@cembre.co.uk

CEMBRE S.a.r.l.
22 Avenue Ferdinand de Lesseps
91420 Morangis Cedex
France
Ph +33 01 60 49 11 90
info@cembre.fr

CEMBRE España S.L.U.
Calle Verano 6 y 8
Pl Las Monjas
28850 Torrejón de Ardoz
Madrid - Spain
Ph +34 91 4852580
comercial@cembre.com

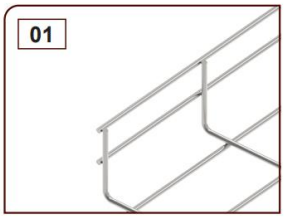
CEMBRE GmbH
Geschäftsbereich
Energie- und Bahntechnik
Heidemannstr. 166
80939 München
Germany
Ph + 49 89-3580676
info@cembre.de

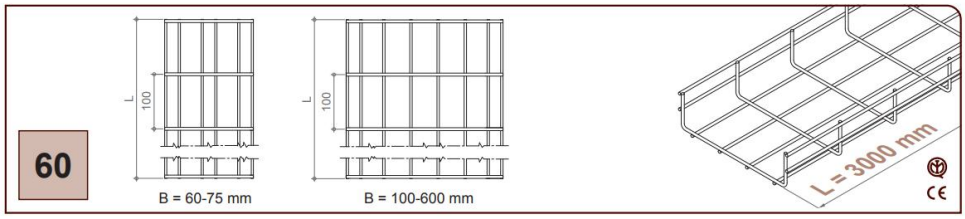
CEMBRE GmbH
Geschäftsbereich
Industrie und Handel
Boschstraße 7
71384 Weinstadt
Germany
Ph +49 7151-20536-60
info-w@cembre.de

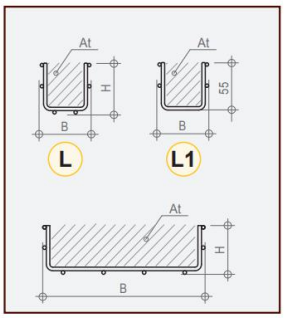
CEMBRE Inc.
Raritan Center Business Park
300 Columbus Circle-S.F.
Edison, NJ 08837 USA
Ph +1 (732) 225-7415
sales.us@cembre.com
Midwest Office
1051 Perimeter Dr. #470
Schaumburg, IL 60173

4.12 CABLE TRAY

PASSERELLA A RETE CZ4 *Wire mesh cable tray*







E J N Codice/ Code	Ø mm	A kg/m	B mm	H mm	L mm	IEC 61537 1500 mm	At mm²	A kg/m	Ø mm	Z Codice/ Code
B4 ¤ 01A3H060L	3,9	0,76	60	60	3000	15 daN/m	2290	0,78	3,9	B4 Z 01A3H060L
B4 ¤ 01A3H060L1	3,9	0,56	60	55	3000	15 daN/m	2465	0,58	3,9	B4 Z 01A3H060L1
B4 ¤ 01A3H075L	3,9	0,77	75	60	3000	15 daN/m	3070	0,79	3,9	B4 Z 01A3H075L
B4 ¤ 01A3H100L	3,9	0,80	100	60	3000	26 daN/m	4370	0,82	3,9	B4 Z 01A3H100L
B4 ¤ 01A3H150L	3,9	0,85	150	60	3000	26 daN/m	6970	0,87	3,9	B4 Z 01A3H150L
B4 ¤ 01A3H200L	3,9	1,10	200	60	3000	28 daN/m	9570	1,12	3,9	B4 Z 01A3H200L
B4 ¤ 01A3H300L	3,9	1,40	300	60	3000	28 daN/m	14770	1,43	3,9	B4 Z 01A3H300L
B4 ¤ 01A3H300Q	4,4	1,68	300	60	3000	42 daN/m	14460	1,72	4,4	B4 Z 01A3H300Q
B4 ¤ 01A3H400Q	4,4	2,05	400	60	3000	44 daN/m	19580	2,10	4,4	B4 Z 01A3H400Q
B4 ¤ 01A3H500Q	4,4	2,41	500	60	3000	44 daN/m	24700	2,46	4,4	B4 Z 01A3H500Q
B4 ¤ 01A3H600Q	4,4	2,77	600	60	3000	44 daN/m	29820	2,83	4,4	B4 Z 01A3H600Q

¤ Scegli il materiale/ *Choose the material*

Base Load Power Hub (BLPH)

B-400 ELECTRICAL COMPONENTS LIST AND DS - E&I SHELTERS

Document Number: 1724000049-EL-LIS-00046

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	05-02-25

Document Class: 3

Rev.	Date	Description	Prepared	Reviewed	Approved
2	13/01/2025	Issue for Information (IFI)	MG	OA	CA
1	30/10/2024	Issue for Information (IFI)	MG	OA	CA
0	28/06/2024	Issue for Information (IFI)	FP	OA	CA

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Information (IFI)
1	Issue for Information (IFI)
2	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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None

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

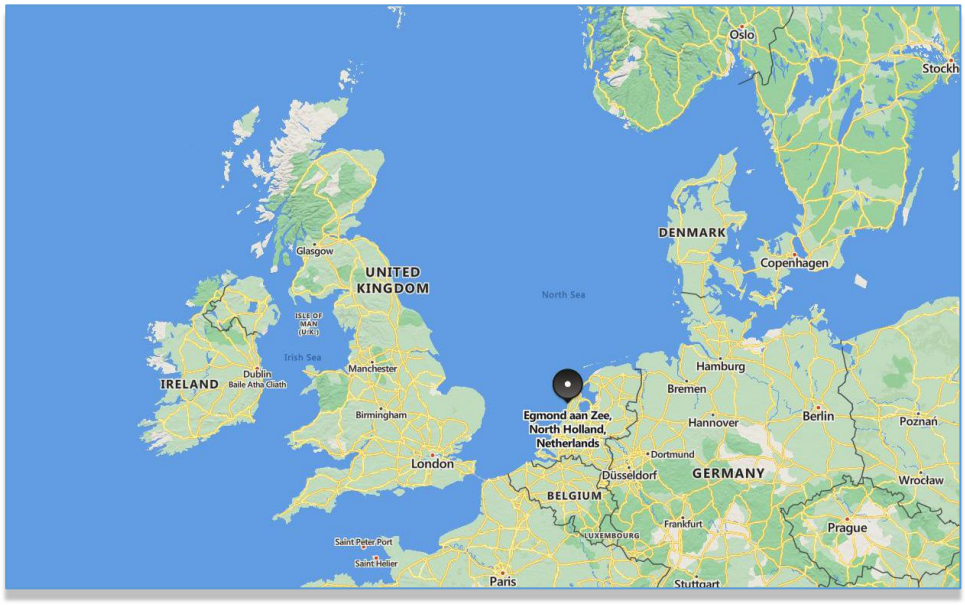


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

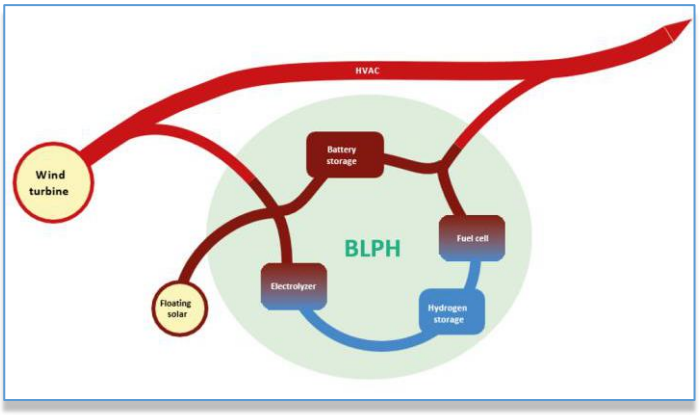


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting

wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document provides the data sheet and information of electrical components supplied by Alex Sistemi

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

3 ELECTRICAL COMPONENTS LIST

3.1 LIST

Item	Description	Grade	Manufacturer	Line	Model	B-400
1	Light switch 10A	IP66	Scame	Protecta	1.375.012	2
2	Socket schuko 16A	IP66	Scame	Protecta	1.376.404	1
3	Two lamp LED	IP66	Disano	Echo	164704-00	2
4	Two lamp LED + Energy Saving	IP66	Disano	Echo	164704-07	1
5	Feed unit 40A Left or Right mount	IP55	Schneider	Canalis	KBB40ABG44W	1
6	Straight distribution lenghts 25A - 3mt	IP55	Schneider	Canalis	KBB25ED42305W	2
7	Straight distribution lenghts 40A - 2mt	IP55	Schneider	Canalis	KBB40ED42203W	2
8	10A Tap-off unit	IP55	Schneider	Canalis	KBC10DCB40	3

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4 DATA SHEET

4.1 LIGHT SWITCH 10A

EN - 20 May 2024

SCAME

137.5012

SP ONE WAY SWITCH
SP ONE WAY SWITCH 20AX
M95(95x95mm)



DIRECTIVE RoHS 2011/65/EU

Commercial Series	PROTECTA Series
Synthetical description	SP ONE WAY SWITCH
Mounting version	SURFACE MOUNTING

TECHNICAL CHARACTERISTICS

Rated current	20AX
Rated voltage	250V

PHYSICAL CHARACTERISTICS

Mounting version	SURFACE MOUNTING
Protection degree	Splash proof
Protection degree IP	IP66
Material	THERMOPLASTIC
Working temperature	-20°C/+60°C
Protection degree IK	IK07
Warning light	WITH NEON

DIMENSIONAL CHARACTERISTICS

N.° modules	1 GANG
Dimensions	M95(95x95mm)

DOWNLOAD

Technical drawing [PDF]
Technical drawing [DWG]
Technical drawing [STP]
Instruction manual

www.scame.com
scame@scame.com

SCAME PARRE S.p.A
Via Costa Erta, 15 - 24020 Parre (BG) Italy - +39 035 705000

4.2 SOCKET SCHUKO 16A

EN - 20 May 2024

SCAME

137.6404

ITALIAN P30 STANDARD SOCKET ITALIAN P30 STANDARD SOCKET 16A M95(95x95mm)



CEI 23-50 (2006)
DIRECTIVE RoHS 2011/65/EU

Commercial Series	PROTECTA Series
Synthetical description	ITALIAN P30 STANDARD SOCKET
Type	ITALIAN P30
Mounting version	SURFACE MOUNTING

TECHNICAL CHARACTERISTICS

Rated current	16A
Rated voltage	250V

PHYSICAL CHARACTERISTICS

Mounting version	SURFACE MOUNTING
Protection degree	Splash proof
Protection degree IP	IP66
Material	THERMOPLASTIC
Working temperature	-20°C/+60°C
Protection degree IK	IK07

DIMENSIONAL CHARACTERISTICS

Dimensions	M95(95x95mm)

DOWNLOAD

Technical drawing [PDF]
Technical drawing [DWG]
Technical drawing [STP]
Instruction manual

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scame@scame.com

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4.3 TWO LAMP LED

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00





Disano's watertight fixtures are built from the company's extensive experience, skill and reliability as a global leader in the manufacturing of specialised lighting products. These basic features have contributed to the success of Disano's watertight fixtures over the years. The lamp's body is made of shatter-proof polycarbonate, with an IP66 protection, and high mechanical strength due to the structure reinforced by internal ribs. Installation is made easy thanks to the stainless steel bracket supplied as standard for ceiling mounting, while the spring hook allows quick attachment to any chain suspension system. Moreover, special toothed guides allow the perfect alignment of fixtures mounted in a continuous row.
In addition to these basic features you will find all the advantages of the LED technology, i.e. light sources with a very long service life, low power consumption and great light quality. The polycarbonate WATERTIGHT FIXTURES have an IP66IK08 rating when installed in environments with temperatures not exceeding 45 °C. Direct exposure to sunlight may exceed 45 °C, compromising the protection rating. However, it is advisable to use them appropriately without altering their mechanical and protective qualities (IP66IK08) and not to install them on surfaces subject to strong vibration, or exposed to atmospheric agents, outdoors on ropes or poles, on walls, under metal gratings or directly exposed to sunlight. If this is not possible, use the steel watertight fixturess instead.

GENERAL INFORMATION	
Article	927 - Echo - two lamp LED - Energy Saving
Code	164704-00
DIMENSIONS AND WEIGHT	
Length (mm)	1300 mm
Width (mm)	152 mm
Height (mm)	102 mm
Weight (Kg)	2.260 kg
ELECTRICAL CHARACTERISTICS AND CONTROLS	
Voltage type	AC
Min Voltage (V)	220 V
Max Voltage (V)	240 V
Min Frequency (Hz)	50 Hz
Max Frequency (Hz)	60 Hz
Frequency (Hz)	50 Hz
Wiring name	CLD
Power factor	≥0.9
Insulation class	Class I
Controllability	None

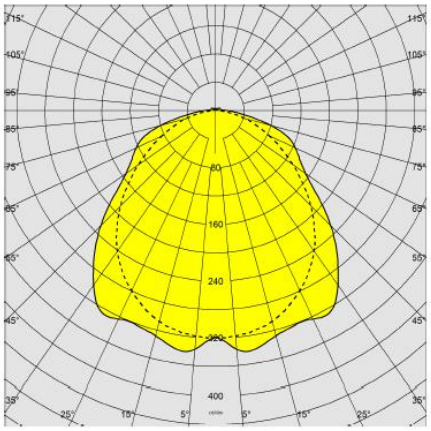
disano illuminazione

1

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

927 - Echo - two lamp LED - Energy Saving

Code: 164704-00



PHOTOMETRIC DATA

Lighting source	LED
CRI	≥80
Luminous flux (output) (lm)	5737 lm
Power absorption (total) (W)	32 W
CCT	4000 K
Luminous efficacy (lm/W)	179 lm/W
Low Flicker	luminaire with very low flicker: evenly distributed light for greater visual safety.
Colour consistency	SDCM3
LED flux maintenance	80000 hr, L 80, B 20

MECHANICAL CHARACTERISTICS

Impact resistance rating (IK)	IK08
IP	66
Ambient temperature - min	-30 °C
Ambient temperature - max	40 °C

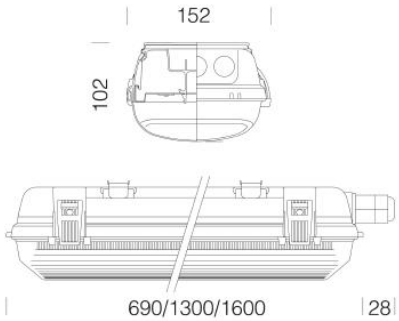
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2

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-00



DOWNLOAD

MOUNTS

AssemblyInstructions Echo 09-23.pdf

DESIGNS

TechnicalDrawing echobila.dxf

MATERIALS AND COLOURS

Housing	injection-moulded, made of grey RAL 7035 polycarbonate, shatterproof, UV-stabilised, with high mechanical strength thanks to the structure reinforced by internal ribs.
Optics	galvanised steel pre-painted in oven with white polyester resin, UV-stabilised. Fastened to the body with a quick coupling by means of a device machined directly on the body.
Diffuser	injection-moulded in polycarbonate with internal grooves for greater light control, self-extinguishing V2, UV-stabilised, smooth outer finish to enable easy cleaning for maximum light efficiency.
Colour	Grey
Equipment	- sealing gasket in eco-friendly, anti-aging expanded polyurethane foam - ceiling mounting brackets and suspension hook in stainless steel - plug-socket connector - snap hooks and safety screws in stainless steel
	ATTENTION ! Do not install on surfaces subject to strong vibrations, outdoors on hanging cables, or on walls under metallic grates, or on poles, and in any case, never expose the fixture to direct sunlight. Check the compatibility between the material constituting the product and the space where it will be installed. We recommend the use of fixtures made of steel with direct exposure to sunlight.

STANDARDS AND COMPLIANCE

Photobiological safety class	RG0
Markings and tests	CE, ENEC
Reference standards	EN60598-1. With degree of protection according to EN60529. The lighting fixture meets all IFS and BRC requirements, and the regulation of the HACCP Directive regarding lighting systems installed in food processing plants.
Laboratory Tests	- the UL 94 Standard is considered a reference for rating the ignition characteristics of plastic materials. The watertight fixtures are made of V2 class material that self-extinguishes in 25 seconds. - passes the Glow Wire Test at 850 °C.
Energy Label	C

GEAR

Upon request	- version with wire feedthrough, dimmable. - narrow beam version (subcode 22) - radar sensor, subcode -19 - Always On Emergency, subcode -07 (always on, 60 min charge)

WARRANTY

After sales warranty	5 yr

disano illuminazione

3

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

4.4 TWO LAMP LED + ENERGY SAVING

927 - Echo - two lamp LED - Energy Saving

Code: 164704-07





Disano's watertight fixtures are built from the company's extensive experience, skill and reliability as a global leader in the manufacturing of specialised lighting products. These basic features have contributed to the success of Disano's watertight fixtures over the years. The lamp's body is made of shatter-proof polycarbonate, with an IP66 protection, and high mechanical strength due to the structure reinforced by internal ribs. Installation is made easy thanks to the stainless steel bracket supplied as standard for ceiling mounting, while the spring hook allows quick attachment to any chain suspension system. Moreover, special toothed guides allow the perfect alignment of fixtures mounted in a continuous row.
In addition to these basic features you will find all the advantages of the LED technology, i.e. light sources with a very long service life, low power consumption and great light quality.
The polycarbonate WATERTIGHT FIXTURES have an IP66IK08 rating when installed in environments with temperatures not exceeding 45 °C. Direct exposure to sunlight may exceed 45 °C, compromising the protection rating. However, it is advisable to use them appropriately without altering their mechanical and protective qualities (IP66IK08) and not to install them on surfaces subject to strong vibration, or exposed to atmospheric agents, outdoors on ropes or poles, on walls, under metal gratings or directly exposed to sunlight. If this is not possible, use the steel watertight fixturess instead.

GENERAL INFORMATION

Article	927 - Echo - two lamp LED - Energy Saving
Code	164704-07

DIMENSIONS AND WEIGHT

Length (mm)	1300 mm
Width (mm)	152 mm
Height (mm)	102 mm
Weight (Kg)	2.940 kg

ELECTRICAL CHARACTERISTICS AND CONTROLS

Voltage type	AC
Min Voltage (V)	220 V
Max Voltage (V)	240 V
Min Frequency (Hz)	50 Hz
Max Frequency (Hz)	60 Hz
Frequency (Hz)	50 Hz
Wiring name	CLD-E
Power factor	≥0.9
Insulation class	Class I
Controllability	None

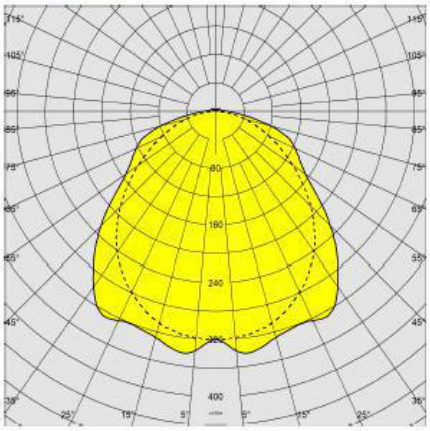
disano illuminazione

1

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-07



PHOTOMETRIC DATA

Lighting source	LED
CRI	≥80
Luminous flux (output) (lm)	5737 lm
Power absorption (total) (W)	32 W
CCT	4000 K
Luminous efficacy (lm/W)	179 lm/W
Low Flicker	luminaire with very low flicker: evenly distributed light for greater visual safety.
Colour consistency	SDCM3
LED flux maintenance	80000 hr, L 80, B 20

MECHANICAL CHARACTERISTICS

Impact resistance rating (IK)	IK08
IP	66
Ambient temperature - min	5 °C
Ambient temperature - max	40 °C

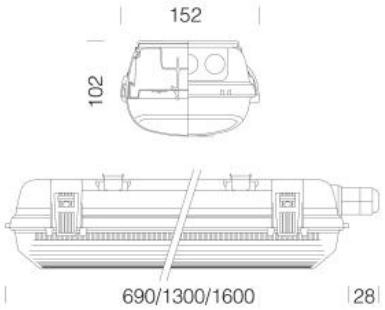
disano illuminazione

2

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927 - Echo - two lamp LED - Energy Saving

Code: 164704-07



DOWNLOAD

MOUNTS

AssemblyInstructions Echo 09-23.pdf

DESIGNS

TechnicalDrawing echobila.dxf

MATERIALS AND COLOURS

Housing	injection-moulded, made of grey RAL 7035 polycarbonate, shatterproof, UV-stabilised, with high mechanical strength thanks to the structure reinforced by internal ribs.
Optics	galvanised steel pre-painted in oven with white polyester resin, UV-stabilised. Fastened to the body with a quick coupling by means of a device machined directly on the body.
Diffuser	injection-moulded in polycarbonate with internal grooves for greater light control, self-extinguishing V2, UV-stabilised, smooth outer finish to enable easy cleaning for maximum light efficiency.
Colour	Grey
Equipment	- sealing gasket in eco-friendly, anti-aging expanded polyurethane foam - ceiling mounting brackets and suspension hook in stainless steel - plug-socket connector - snap hooks and safety screws in stainless steel
	ATTENTION ! Do not install on surfaces subject to strong vibrations, outdoors on hanging cables, or on walls under metallic grates, or on poles, and in any case, never expose the fixture to direct sunlight. Check the compatibility between the material constituting the product and the space where it will be installed. We recommend the use of fixtures made of steel with direct exposure to sunlight.

EMERGENCY LIGHTING

Type of emergency	S.A.
Battery life-recharge	1h

STANDARDS AND COMPLIANCE

Photobiological safety class	RG0
Markings and tests	CE, ENEC
Reference standards	EN60598-1. With degree of protection according to EN60529. The lighting fixture meets all IFS and BRC requirements, and the regulation of the HACCP Directive regarding lighting systems installed in food processing plants.
Laboratory Tests	- the UL 94 Standard is considered a reference for rating the ignition characteristics of plastic materials. The watertight fixtures are made of V2 class material that self-extinguishes in 25 seconds. - passes the Glow Wire Test at 850 °C.
Energy Label	C

GEAR

Upon request	- version with wire feedthrough, dimmable. - narrow beam version (subcode 22) - radar sensor, subcode -19 - Always On Emergency, subcode -07 (always on, 60 min charge)

WARRANTY

After sales warranty	5 yr

disano illuminazione

3

Please contact the Consulting and Design Centre for any technical information. The reported luminous flux is the flux emitted by the light source with a tolerance of ± 10% compared to the indicated value. The total wattage absorbed by the system will not exceed 10% of the reported value. Technical lighting data may be subject to changes and improvements due to the fast evolution of the technology. Saturday, June 15, 2024

4.5 FEED UNIT 40A LEFT OR RIGHT MOUNTING

Product datasheet

Specifications



FEED UNIT 40A LEFT OR RIGHT MOUNTING

Local distributor code:
23348079 KBB40ABG44W

EAN Code: 3606480001062

Main

Range of product	Canalis
Device short name	KBB
Product compatibility	Canalis KBB busbar trunking 25...40 A
Offer type	Classic Control system
product or component type	Feed unit
Conductors material	Aluminium
[Ie] rated operational current	40 A 25 A
[Ue] rated operational voltage	230...400 V
Number of circuits	2
busbar trunking polarity	3L + N + PE L + N + PE
Protection type	Without protection
Control type	Communicating
Communication port protocol	DALI
Colour	White (RAL 9003)

Complementary

Provided equipment	End cover
mounting location	Left
mounting mode	By clips
mounting support	Busbar
Connections - terminals	Terminal block - Pg 21 - screw clamp connector for 6...10 mm²
Width	244 mm
Depth	103.5 mm
Height	75.5 mm
net weight	400 g
Standards	IEC 61439-6

Environment

IP degree of protection	IP55 conforming to IEC 60529

28 Jun 2024 Life Is On Schneider Electric 1

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	8.0 cm
Package 1 Width	11.0 cm
Package 1 Length	27.0 cm
Package 1 Weight	700.0 g
Unit Type of Package 2	S03
Number of Units in Package 2	12
Package 2 Height	30.0 cm
Package 2 Width	30.0 cm
Package 2 Length	40.0 cm
Package 2 Weight	8.556 kg
Unit Type of Package 3	P06
Number of Units in Package 3	96
Package 3 Height	75.0 cm
Package 3 Width	60.0 cm
Package 3 Length	80.0 cm
Package 3 Weight	75.7 kg

Contractual warranty

Warranty	18 months

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Sustainability

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Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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4.6 STRAIGHT DISTRIBUTION LENGHTS 25A – 3METERS

Product datasheet

Specifications



Straight length, Canalis KBB, 25 A, 2 circuits 3L+N+PE and L+N+PE, 5 tap-off units, 3 m, white

Local distributor code:
23346767 KBB25ED42305W

EAN Code: 3606480000805

Main

Range of product	Canalis
Device short name	KBB
Offer type	Classic Control system
product or component type	Straight length
Busbar description	Distribution length
Device application	Lighting Power socket distribution
[Ie] rated operational current	25 A at 35 °C
[Ue] rated operational voltage	230...400 V
Network frequency	50/60 Hz
busbar trunking polarity	3L + N + PE L + N + PE
Number of circuits	2
Number of tap-off outlets	5
Control type	Communicating
Communication port protocol	DALI
mounting mode	By screws

Complementary

[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
[Icw] rated short-time withstand current	0.44 kA
[Ipk] rated peak withstand current	4.4 kA
Thermal stress limit	195 kA².s
Maximum radiated magnetic field	2 pT
THDI	0...15 % 25 A 15...33 % 20 A 33...100 % 16 A
Maximum voltage drop	<0.72 V with power factor = 1 at 50 Hz with 1A for 100 m long <0.67 V with power factor = 0.9 at 50 Hz with 1A for 100 m long <0.61 V with power factor = 0.8 at 50 Hz with 1A for 100 m long <0.55 V with power factor = 0.7 at 50 Hz with 1A for 100 m long
Standards	EN/IEC 61439-6 EN/IEC 61439-1

28 Jun 2024 Life Is On Schneider Electric 1

Width	30 mm
Height	46 mm
Length	3 m
Colour	White (RAL 9003)
net weight	4.7 kg

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529
IK degree of protection	IK06 conforming to EN/IEC 62262
Ambient air temperature for operation	0…35 °C (100 % of In) 35…40 °C (96 % of In) 40…45 °C (93 % of In) 45…50 °C (89 % of In) 50…55 °C (85 % of In)

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	5.000 cm
Package 1 Width	6.000 cm
Package 1 Length	310.000 cm
Package 1 Weight	5.000 kg
Unit Type of Package 2	BB1
Number of Units in Package 2	6
Package 2 Height	13.000 cm
Package 2 Width	16.500 cm
Package 2 Length	314.500 cm
Package 2 Weight	31.000 kg
Unit Type of Package 3	PAL
Number of Units in Package 3	72
Package 3 Height	52.000 cm
Package 3 Width	63.000 cm
Package 3 Length	318.000 cm
Package 3 Weight	430.500 kg

Contractual warranty

Warranty	18 months

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Sustainability

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Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

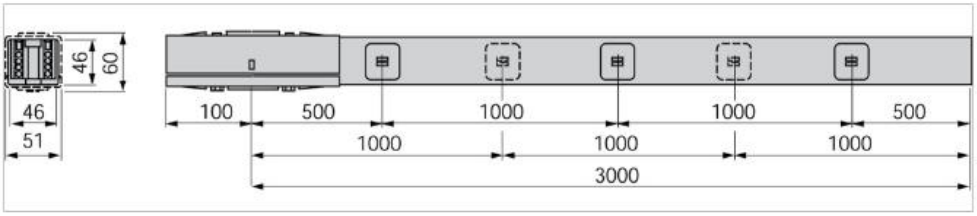
Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBB25ED42305W

Dimension Drawings



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4.7 STRAIGHT DISTRIBUTION LENGHTS 40A – 2METERS

Product datasheet

Specifications



Straight length, Canalis KBB, 25/40A, 2 circuits, 3L+N+PE/ L+N+PE, compatible DALI, 3 outlets, 2m, white RAL9003

KBB40ED42203W

Main

Range of product	Canalis
Device short name	KBB
Offer type	Classic Control system
product or component type	Straight length
Busbar description	Distribution length
Device application	Lighting Power socket distribution
[Ie] rated operational current	40 A at 35 °C 25 A at 35 °C
[Ue] rated operational voltage	230...400 V
Network frequency	50/60 Hz
busbar trunking polarity	3L + N + PE L + N + PE
Number of circuits	2
Number of tap-off outlets	3
Control type	Communicating
Communication port protocol	DALI
mounting mode	By screws

Complementary

[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
[Icw] rated short-time withstand current	0.94 kA
[Ipk] rated peak withstand current	9.6 kA
Thermal stress limit	900 kA².s
Maximum radiated magnetic field	2 pT
THDI	0...15 % 40 A 15...33 % 32 A 33...100 % 28 A
Maximum voltage drop	<0.3 V with power factor = 1 at 50 Hz with 1A for 100 m long <0.28 V with power factor = 0.9 at 50 Hz with 1A for 100 m long <0.25 V with power factor = 0.8 at 50 Hz with 1A for 100 m long <0.22 V with power factor = 0.7 at 50 Hz with 1A for 100 m long
Standards	EN/IEC 61439-6 EN/IEC 61439-1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Width	30 mm
Height	46 mm
Length	2 m
Colour	White (RAL 9003)
net weight	3.8 kg

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529
IK degree of protection	IK06 conforming to EN/IEC 62262
Ambient air temperature for operation	0…35 °C (100 % of In) 35…40 °C (96 % of In) 40…45 °C (93 % of In) 45…50 °C (89 % of In) 50…55 °C (85 % of In)

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	5.000 cm
Package 1 Width	210.000 cm
Package 1 Length	5.000 cm
Package 1 Weight	3.500 kg
Unit Type of Package 2	BB1
Number of Units in Package 2	6
Package 2 Height	13.500 cm
Package 2 Width	16.000 cm
Package 2 Length	215.000 cm
Package 2 Weight	24.000 kg
Unit Type of Package 3	PAL
Number of Units in Package 3	72
Package 3 Height	51.000 cm
Package 3 Width	220.000 cm
Package 3 Length	64.000 cm
Package 3 Weight	302.000 kg

Contractual warranty

Warranty	18 months

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Sustainability

Green Premium™ label is Schneider Electric's commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO_2 products.

Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

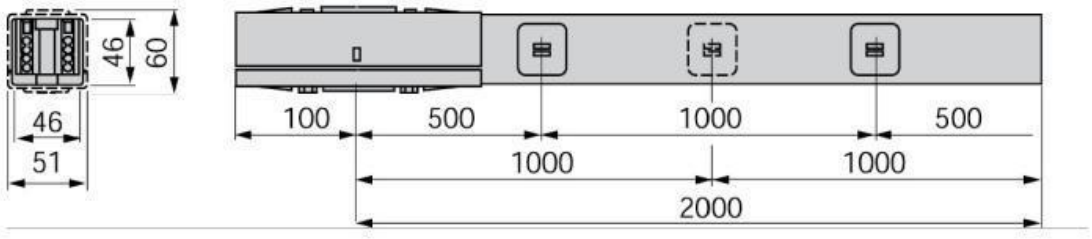
Reach Free Of Svhc	
Toxic Heavy Metal Free	
Mercury Free	
Rohs Exemption Information	Yes
Halogen Free Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Product datasheet KBB40ED42203W

Dimension Drawings



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4.8 10A TAP-OFF UNIT

Product datasheet

Specifications

10A TAPOFF UNITS

Local distributor code:

389342036 KBC10DCB40



EAN Code: 3606480002083

Main

Range	Canalis
Offer type	Classic Control system
product or component type	Connector
Device application	Lighting Power socket distribution
Range compatibility	Canalis KBA busbar trunking Canalis KBB busbar trunking
[Ie] rated operational current	10 A at 35 °C
[Ue] rated operational voltage	230...240 V
Network frequency	50/60 Hz
Communication port protocol	DALI
Tap-off unit polarity	3L+N+PE
Tap-off unit connector type	With phase selection

Complementary

Colour	Cream (RAL 9001)
[Uimp] rated impulse withstand voltage	4 kV
[Ui] rated insulation voltage	690 V
Protection type	Without protection
Width	1 m
Depth	62 mm
Height	60 mm
net weight	65 g
Quantity per set	Set of 10
Standards	EN/IEC 61439-1 EN/IEC 61439-6

Environment

IP degree of protection	IP55 conforming to EN/IEC 60529

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Package 1 Height	6.200 cm
Package 1 Width	6.000 cm
Package 1 Length	11.500 cm
Package 1 Weight	87.000 g
Unit Type of Package 2	BB1
Number of Units in Package 2	10
Package 2 Height	12.500 cm
Package 2 Width	14.000 cm
Package 2 Length	32.000 cm
Package 2 Weight	880.000 g
Unit Type of Package 3	P06
Number of Units in Package 3	300
Package 3 Height	77.000 cm
Package 3 Width	80.000 cm
Package 3 Length	60.000 cm
Package 3 Weight	34.900 kg

Contractual warranty

Warranty	18 months

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Sustainability

Green Premium™ label is Schneider Electric's commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO_2 products.

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Learn more about Green Premium >

Guide to assess a product's sustainability >

Well-being performance

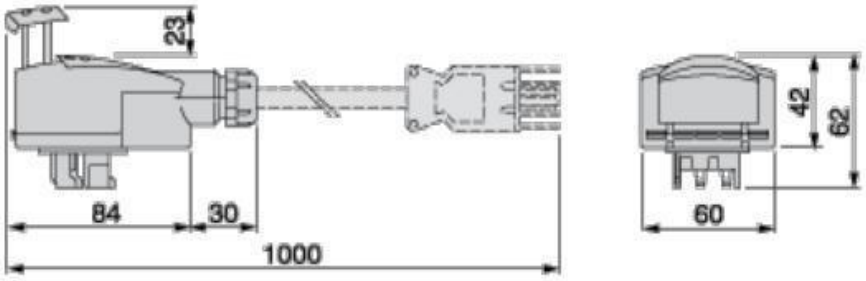
Reach Free Of Svhc	
Rohs Exemption Information	Yes
Pvc Free	
Halogen Free Plastic Parts Product	

Reach Regulation	REACh Declaration
Eu Rohs Directive	Compliant EU RoHS Declaration
China Rohs Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

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Product datasheet KBC10DCB40

Dimension Drawings



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4.9 ELECTRICAL CABLE

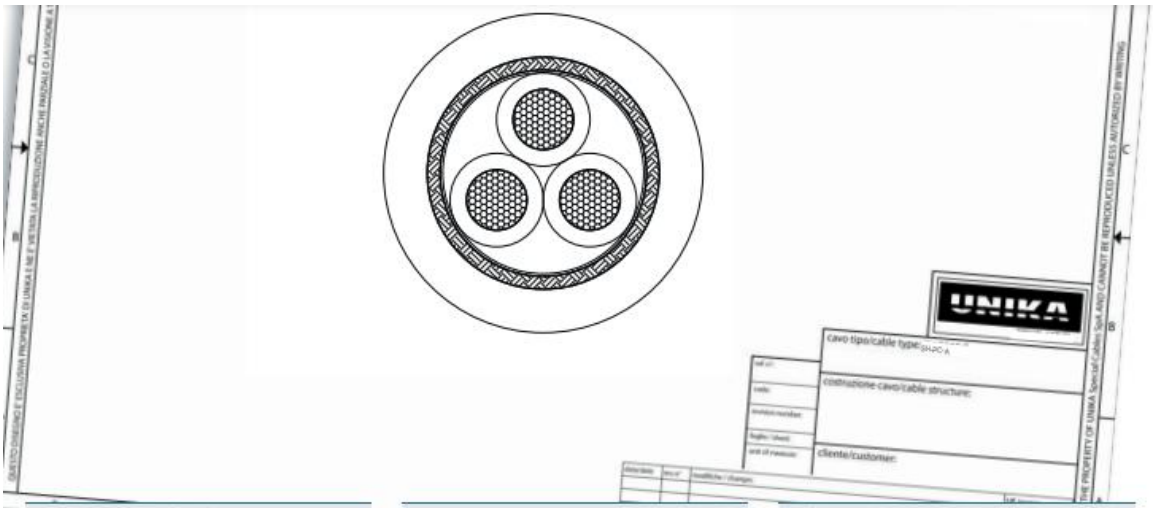
UNIKA

SH-PC-A

Cavi unipolari e multipolari, armati di potenza e controllo 0,6/1kV
Single and multicore, armoured power and control shipboard cables rated 0,6/1 kV



	Dati tecnici	Technical data
Conduttore **Conductor**	Rame rosso (opzionale stagnato) classe 5 in accordo alla IEC 60228	Bare (optional tinned copper) class 5 according to IEC 60228
Isolamento **Insulation**	Mescola HF XLPE in accordo alla IEC 60092-360 Spessori in accordo alla IEC 60092-353	HF XLPE compound according to IEC 60092-360 Thickness according to IEC 60092-353
Identificazione anime (preferenziale) **Core identification (preferential)**	1 anima: nera 2 anime: marrone, blu 3 anime: nera, grigia, marrone o (blu,marrone, giallo/verde) 4 anime: marrone, nera, grigia, blu o giallo/verde 5 anime: blu, marrone, nera, grigia, nera o giallo/verde da 5 anime: nero numerato (con o senza giallo/verde)	1 core: black 2 cores: brown, blue 3 cores: black, grey, brown or (blue, brown, green/yellow) 4 cores: brown, black, grey, blue or green/yellow 5 cores: blue, brown, black, grey, black or green/yellow From 5 cores: black numbered (with or without green/yellow)
Fasciatura **Bedding**	Filati riempitivi e nastro non igroscopico o guaina estrusa senza alogeni	Yarn fillers and non hygroscopic tape or extruded inner sheath without halogen
Armatura **Armouring**	Treccia di fili di rame rosso (su richiesta rame stagnato o acciaio zincato) copertura minima 90%	Bare copper wire braid (upon request tinned copper or galvanized steel wire braid). Minimum coverage 90%
Guaina esterna **Outer sheath**	Compound SHF1 in accordo alla IEC 60092-360 Spessore in accordo alla IEC 60092-353 Colore: nero (preferenziale) Diametro esterno in accordo alla IEC 60092-350 - Allegato D	SHF1 compound according to IEC 60092-360 Thickness according to IEC 60092-353 Colour: black (or other colour agreed) Outer diameter according to IEC 60092-350 annex D
Marcatura **Marking**	UNIKA (Italy) - SH-PC-A 0,6/1 KV 90°C (numero anime) x (sezione) IEC 60092-353 - IEC 60332 -3-22 – codice rintracciabilità	UNIKA (Italy) – SH-PC-A 0,6/1 kV 90°C (core number) x (cross-section) – IEC 60092-353 – IEC 60332-3-22 – traceability code
Temperatura per posa fissa **Rated conductor temperature for fixed installation**	90°C	90°C
Temperatura minima d'installazione **Minimum installation temperature**	- 15°C	- 15°C
Raggio minimo di curvatura **Minimum bending radius**	6D: D è il diametro esterno	6D: D is the overall diameter
Attenuazione schermante **Screening attenuation**	≥ 60 dB in accordo alla EN50289-1-6	≥ 60 dB according to EN50289-1-6
Comportamento al fuoco **Fire behaviour**	IEC 60332-3-22 non propagante il fuoco IEC 60332-1-2 non propagante la fiamma IEC 60754-1 assenza di alogeni IEC 60754-2 acicidità dei fumi IEC 60684-2 contenuto di fluoro IEC 61034 densità dei fumi	IEC 60332-3-22 not fire propagation IEC 60332-1-2 not flame propagation IEC 60754-1 halogen content IEC 60754-2 pH and conductivity IEC 60684-2 fluorine content IEC 61034 smoke emission



codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N1026	2x1	8,5	59	81
N1036	3x1	8,9	72	97
N1046	4x1	9,6	86	116
N1056	5x1	10,4	101	136
N1076	7x1	11,4	126	175
N1106	10x1	14,7	213	258
N1126	12x1	15,1	236	290
N1246	24x1	20,5	402	521
N1027	2x1,5	9,1	79	96
N1037	3x1,5	9,5	97	120
N1047	4x1,5	10,3	117	143
N1057	5x1,5	11,4	138	175
N1077	7x1,5	12,3	174	221
N1107	10x1,5	15,9	290	325
N1127	12x1,5	16,3	324	378
N1147	14x1,5	17,3	361	421
N1197	19x1,5	19,3	452	545
N1247	24x1,5	22,5	555	684
N1307	30x1,5	23,7	654	810
N1377	37x1,5	25,7	773	979
N1029	2x2,5	9,9	104	123
N1039	3x2,5	10,4	132	156
N1049	4x2,5	11,5	163	198
N1059	5x2,5	12,5	194	236
N1079	7x2,5	14,1	294	323
N1109	10x2,5	17,7	403	453

codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N1129	12x2,5	18,2	457	517
N1149	14x2,5	19,1	514	595
N1189	19x2,5	21,3	655	763
N1259	24x2,5	25,1	810	971
N1309	30x2,5	26,5	968	1165
N1379	37x2,5	28,7	1156	1409
N101A	1x4	6,9	73	89
N102A	2x4	11,3	142	169
N103A	3x4	11,9	185	220
N104A	4x4	12,9	232	273
N105A	5x4	14,7	324	349
N101B	1x6	7,4	96	112
N102B	2x6	12,3	188	218
N103B	3x6	13,0	251	290
N104B	4x6	14,7	364	384
N105B	5x6	16,0	435	465
N101D	1x10	8,6	142	163
N102D	2x10	14,9	327	332
N103D	3x10	15,7	432	445
N104D	4x10	17,4	544	573
N105D	5x10	18,9	657	692
N101E	1x16	9,7	208	231
N102E	2x16	17,3	466	481
N103E	3x16	18,3	631	658
N104E	4x16	20,2	803	848
N105E	5x16	22,3	976	1035

codice code	quarte e numero conduttori x sezione quad and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N101F	1x25	11,6	308	352
N102F	2x25	20,9	675	727
N103F	3x25	22,3	929	1018
N104F	4x25	24,7	1191	1314
N105F	5x25	27,1	1454	1618
N101G	1x35	12,9	414	469
N103G	3x35	25,3	1246	1377
N104G	4x35	28,0	1607	1792
N105G	5x35	31,0	1969	2213
N101H	1x50	15,1	617	640
N103H	3x50	29,0	1712	1841
N104H	4x50	32,1	2220	2400
N105H	5x50	36,1	2842	3054
N101J	1x70	17,1	829	872
N103J	3x70	33,2	2325	2536
N104J	4x70	37,2	3148	3355
N101K	1x95	19,8	1095	1157
N103K	3x95	39,4	3225	3433
N104K	4x95	43,9	4194	4505
N101L	1x120	22,1	1351	1427
N103L	3x120	44,3	3991	4270
N101M	1x150	23,5	1660	1765
N103M	3x150	50,1	4916	5300
N101N	1x185	25,9	2020	2101
N103N	3x185	52,7	5998	6308
N101P	1x240	28,9	2574	2629
N101Q	1x300	32,1	3175	3205

(*) Aggiungere la lettera G al codice per i cavi con conduttore giallo/verde.
Nota: La portata di corrente è riferita ad una temperatura ambiente di 45°C e in accordo a IEC 60092-352. Per due o piu circuiti, i fattori di declassamento devono essere tenuti in considerazione. Ulteriori informazioni e sezioni sono disponibili su richiesta.

(*) Add letter G at the code for cables having green/yellow conductor
Note: For current ampacity see type SH-PC-U. The ampacity is referred to ambient temperature of 45°C and based upon IEC 60092-352.
Further formation and cross-section are available upon request

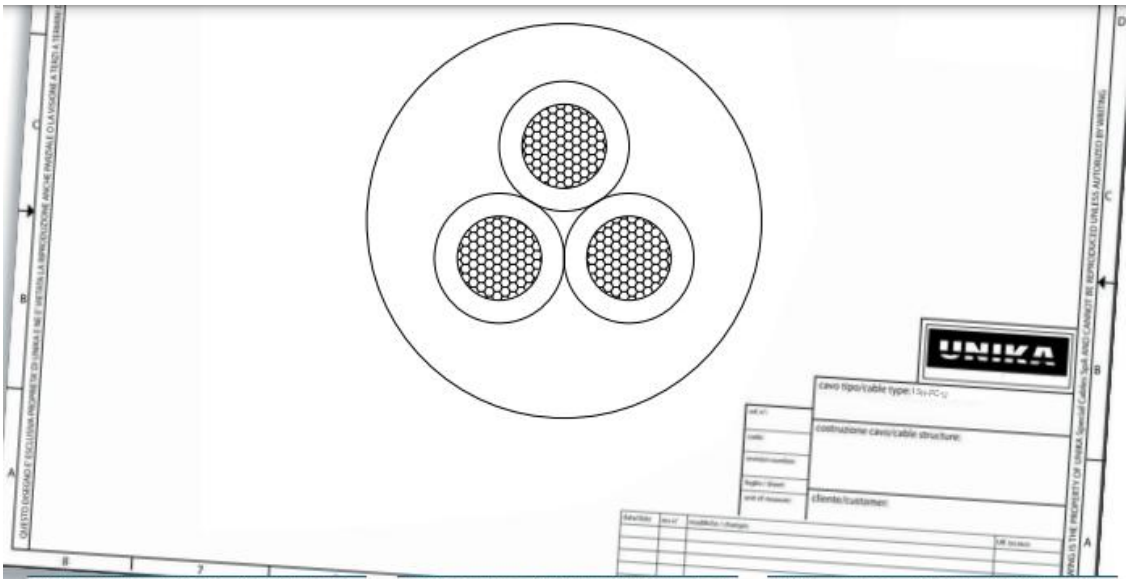
UNIKA

SH-PC-U

Cavi unipolari e multipolari, non armati, di potenza e controllo 0,6/1kV
Single and multicore, unarmoured power and control shipboard cables rated 0,6/1 kV



	Dati tecnici	Technical data
Conduttore **Conductor**	Rame rosso (opzionale stagnato) classe 5 in accordo alla IEC 60228	Bare (optional tinned copper) class 5 according to IEC 60228
Isolamento **Insulation**	Mescola HF XLPE in accordo alla IEC 60092-360 Spessori in accordo alla IEC 60092-353	HF XLPE compound according to IEC 60092-360 Thickness according to IEC 60092-353
Identificazione anime (preferenziale) **Core identification (preferential)**	1 anima: nera 2 anime: marrone, blu 3 anime: nera, grigia, marrone o (blu,marrone, giallo/verde) 4 anime: marrone, nera, grigia, blu o giallo/verde 5 anime: blu, marrone, nera, grigia, nera o giallo/verde da 5 anime: nero numerato (con o senza giallo/verde)	1 core: black 2 cores: brown, blue 3 cores: black, grey, brown or (blue, brown, green/yellow) 4 cores: brown, black, grey, blue or green/yellow 5 cores: blue, brown, black, grey, black or green/yellow From 5 cores: black numbered (with or without green/yellow)
Fasciatura **Bedding**	Filati riempitivi e nastro non igroscopico o guaina estrusa senza alogeni	Yarn fillers and non hygroscopic tape or extruded halogen-free inner sheath
Guaina esterna **Outer sheath**	SHF1 compound in accordo alla IEC 60092-360 Spessore in accordo alla IEC 60092-353 Colore: nero (o un altro colore in accordo) Diametro esterno in accordo alla IEC 60092-350 - Allegato D	SHF1 compound according to IEC 60092-360 Thickness according to IEC 60092-353 Colour: black (or other colour agreed) Outer diameter according to IEC 60092-350 annex D
Marcatura **Marking**	UNIKA (Italy) - SH-PC-U 0,6/1 KV 90°C Marking (numero anime) x (sezione) IEC 60092-353 - IEC 60332 -3-22 – codice rintracciabilità	UNIKA (Italy) - SH-PC-U 0,6/1 kV 90°C (core number) x (cross-section) - IEC 60092-353 - IEC 60332-3-22 - traceability code
Temperatura per posa fissa **Rated conductor temperature for fixed installation**	90°C	90°C
Temperatura minima d'installazione **Minimum installation temperature**	- 15°C	- 15°C
Raggio minimo di curvatura **Minimum bending radius**	(in accordo alla IEC 60092-352 tab. 4): 4D per cavi aventi diametro esterno non superiore a 25 mm 6D per cavi aventi diametro esterno non superiore a 25 mm dove D il diametro esterno	(according to IEC 60092-352 table 4): 4D for cables having overall diameter not above 25 mm 6D for cables having overall diameter above 25 mm with D the overall diameter
Comportamento al fuoco **Fire behaviour**	IEC 60332-3-22 non propagante il fuoco IEC 60332-1-2 non proparante la fiamma IEC 60754-1 assanza di alogeni IEC 60754-2 acicidità dei fumi IEC 60684-2 contenuto di fluoro IEC 61034 densità dei fumi	IEC 60332-3-22 not fire propagation IEC 60332-1-2 not flame propagation IEC 60754-1 halogen content IEC 60754-2 pH and conductivity IEC 60684-2 fluorine content IEC 61034 smoke emission



codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N2026	2x1	7,5	19	66
N2036	3x1	7,9	29	82
N2046	4x1	8,8	38	104
N2056	5x1	9,6	48	123
N2076	7x1	10,4	67	156
N2106	10x1	13,3	96	220
N2126	12x1	13,9	115	250
N2246	24x1	19,3	230	468
N2017	1x1,5	5,0	14	44
N2027	2x1,5	8,1	29	81
N2037	3x1,5	8,7	43	108
N2047	4x1,5	9,5	58	131
N2057	5x1,5	10,4	72	156
N2077	7x1,5	11,5	101	206
N2107	10x1,5	14,7	144	291
N2127	12x1,5	15,1	173	335
N2147	14x1,5	15,9	202	376
N2197	19x1,5	17,9	274	495
N2247	24x1,5	21,1	346	625
N2307	30x1,5	22,5	432	760
N2377	37x1,5	24,3	533	911
N2019	1x2,5	5,4	24	57
N2029	2x2,5	9,1	48	111
N2039	3x2,5	9,6	72	144
N2049	4x2,5	10,5	96	179
N2059	5x2,5	11,7	120	221
N2079	7x2,5	12,7	168	287

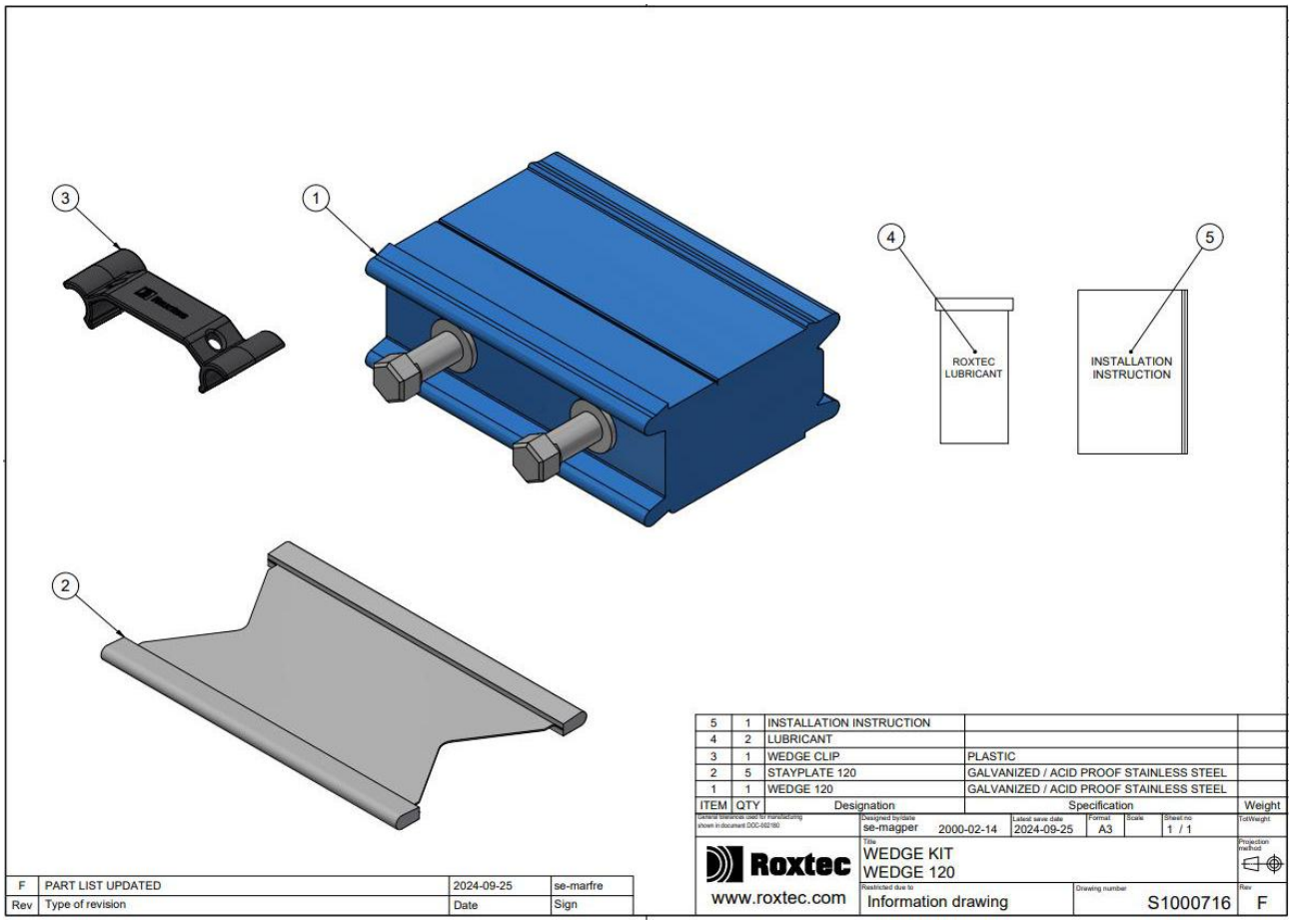
codice code	coppie e numero conduttori x sezione pair and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N2109	10x2,5	16,3	240	407
N2129	12x2,5	17,0	288	478
N2149	14x2,5	17,9	336	545
N2189	19x2,5	20,1	456	718
N2259	24x2,5	23,7	576	906
N2309	30x2,5	25,3	720	1108
N2379	37x2,5	27,5	888	1347
N201A	1x4	6,0	38	76
N202A	2x4	10,3	77	150
N203A	3x4	10,9	115	200
N204A	4x4	12,1	154	257
N205A	5x4	13,3	192	311
N201B	1x6	6,5	58	100
N202B	2x6	11,5	115	203
N203B	3x6	12,2	173	274
N204B	4x6	13,3	230	346
N205B	5x6	14,8	288	431
N201D	1x10	7,5	96	145
N202D	2x10	13,5	192	294
N203D	3x10	14,5	288	412
N204D	4x10	16,0	384	529
N205D	5x10	17,7	480	652
N201E	1x16	8,8	154	215
N202E	2x16	15,9	307	437
N203E	3x16	17,1	461	620
N204E	4x16	18,8	614	796
N205E	5x16	20,9	768	988

codice code	quarte e numero conduttori x sezione quad and conductor number x cross-section [nxmm²]	diametro esterno overall diameter [mm]	massa Cu Cu mass [kg/km]	massa cavo cable mass [kg/km]
N201F	1x25	10,5	240	327
N202F	2x25	19,7	480	682
N203F	3x25	20,9	720	959
N204F	4x25	23,3	960	1249
N205F	5x25	25,9	1200	1546
N201G	1x35	12,0	336	448
N203G	3x35	23,9	1008	1311
N204G	4x35	26,6	1344	1718
N205G	5x35	29,6	1680	2131
N201H	1x50	13,6	480	594
N203H	3x50	27,8	1440	1778
N204H	4x50	30,9	1920	2331
N205H	5x50	34,3	2400	2887
N201J	1x70	15,6	672	819
N203J	3x70	31,8	2016	2448
N204J	4x70	35,6	2688	3265
N201K	1x95	18,3	912	1095
N203K	3x95	37,6	2736	3319
N204K	4x95	42,1	3648	4378
N201L	1x120	20,6	1152	1370
N203L	3x120	42,5	3456	2894
N201M	1x150	23,3	1440	1703
N203M	3x150	48,3	4320	5163
N201N	1x185	24,4	1776	2039
N203N	3x185	50,9	5328	6171
N201P	1x240	27,6	2304	2567
N201Q	1x300	30,8	2880	3143

(*) Aggiungere la lettera G al codice per i cavi con conduttore giallo/verde.
Nota: La portata di corrente è riferita ad una temperatura ambiente di 45°C e in accordo a IEC 60092-352. Per due o più circuiti, i fattori di declassamento devono essere tenuti in considerazione. Ulteriori informazioni e sezioni sono disponibili su richiesta.

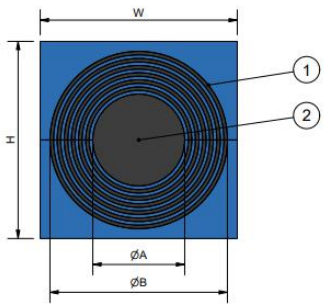
(*) Add letter G at the code for cables having green/yellow conductor
Note: Current ampacity is referred to ambient temperature of 45 °C and based upon IEC 60092-352. For two or more circuits, derating factors should be taken into account. Further formation and cross-section are available upon request

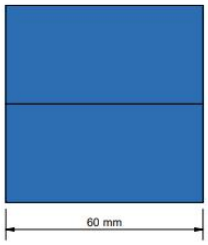
4.10 MCT


3
1
4
5
ROXTEC LUBRICANT
INSTALLATION INSTRUCTION
2
5 1 INSTALLATION INSTRUCTION
4 2 LUBRICANT
3 1 WEDGE CLIP PLASTIC
2 5 STAYPLATE 120 GALVANIZED / ACID PROOF STAINLESS STEEL
1 1 WEDGE 120 GALVANIZED / ACID PROOF STAINLESS STEEL
ITEM QTY Designation Specification Weight
se-magper 2000-02-14 2024-09-25 A3 1 / 1
Roxtec
www.roxtec.com
WEDGE KIT
WEDGE 120
Information drawing
S1000716
F
F PART LIST UPDATED 2024-09-25 se-marfre
Rev Type of revision Date Sign

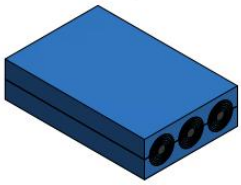
TYPE	CABLE/PIPE Ø (A-B) [mm]	H [mm]	W [mm]	C [QTY]
RM 15	3 - 11	15	15	1
RM 15w40	3.5 - 10.5	15	40	3
RM 20	4 - 14.5	20	20	1
RM 20w40	3.5 - 16.5	20	40	2
RM 30	10 - 25	30	30	1
RM 30 H90	10 - 25	30	90	1
RM 40	21.5 - 34.5	40	40	1
RM 40 H80	21.5 - 34.5	40	80	1
RM 40 10-32	9.5 - 32.5	40	40	1
RM 60*	28 - 54	60	60	1
RM 60 24-54	24 - 54	60	60	1
RM 80*	48 - 71	80	80	1
RM 90*	48 - 71	90	90	1
RM 120*	67.5 - 99	120	120	1

*ALSO AVAILABLE IN WOC VERSION DELIVERED WITHOUT CORE

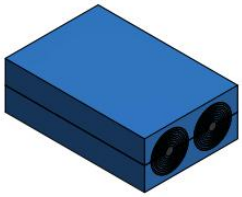




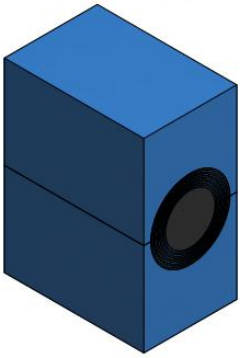
RM 15w40



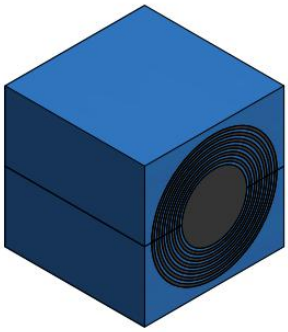
RM 20w40



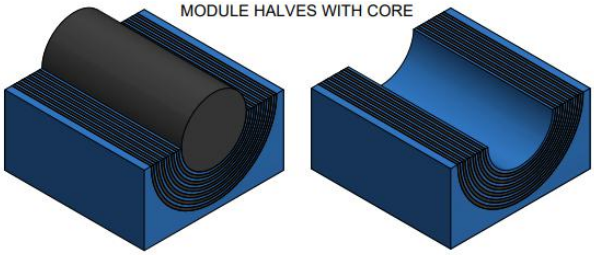
RM 30H90 & RM 40H80



RM 15-120



MODULE HALVES WITH CORE



F	LAYOUT CHANGED	2024-06-25	se-marfre
Rev	Type of revision	Date	Sign

2	C	CORE	ROXYLON	
1	2	RUBBER PROFILE	ROXYLON	
ITEM	QTY	Designation	Specification	Weight

Designed by/date: se-joahel 2003-12-12 | Latest save date: 2024-07-03 | Format: A3 | Scale: | Sheet no: 1 / 1

Roxtec
www.roxtec.com

Title: RM MODULES ASSEMBLY

Restricted due to: Information drawing | Drawing number: S1005711 | Rev: F

4.11 CABLE GLAND

CEMBRE

1710921/E_0523

PRESSACAVI CABLE GLANDS
MAXIbrass®

INFORMAZIONI GENERALI:
- Materiale: ottone nichelato
- Guarnizione: NEOPRENE
- Griffe di serraggio: POLIAMMIDE PA 6.6
- O-Ring: NITRILE
- Grado di protezione: IP 68 - 5 bar / 30 min.
- Temperatura d'impiego:
  da - 40°C a +100°C (statica*)
  da - 25°C a +100°C (dinamica*)

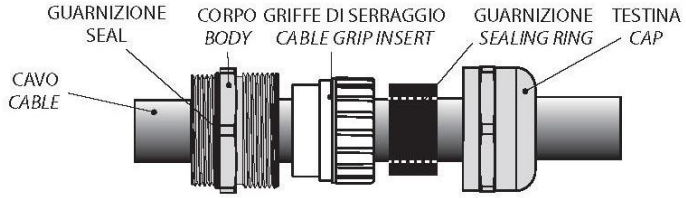
ISTRUZIONI PER L'INSTALLAZIONE:
1) Avvitare il pressacavo nella sede filettata corrispondente (A) o fissarlo con il controdado (B), senza eccedere nella chiusura.
2) Introdurre il cavo all'interno del pressacavo.
3) Avvitare la testina finché la guarnizione tocca completamente il cavo.
4) Serrare infine il pressacavo e la testina alla coppia di serraggio indicata in tabella.

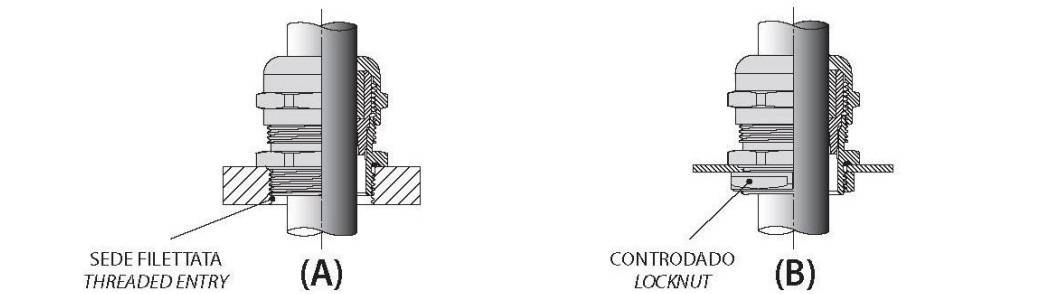
USO SENZA CONTRODADO: solo se avvitato a sedi filettate.

GENERAL INFORMATION:
- *Material: Nickel plated Brass*
- *Sealing ring: NEOPRENE*
- *Cable grip insert: POLYAMIDE PA 6.6*
- *O-ring: NITRILE*
- *Protection: IP 68 - 5 bar / 30 min. (LIQUID TIGHT)*
- *Temperature range:*
  - 40°C to +100°C (static)*
  - 25°C to +100°C (dynamic)*

INSTALLATION INSTRUCTIONS:
1) Screw the cable gland onto its relevant seat (A) or lock it by the locknut (B).
2) Introduce the cable inside the cable gland.
3) Screw the nut until the sealing ring fully touches the cable.
4) Finally, tighten the body and the nut up to the torque ratio listed in the table.

USAGE WITHOUT LOCKNUT: for securement to a threaded hubs only.





* STATICA: in questo intervallo di temperatura il pressacavo, correttamente installato in conformità ai requisiti tecnici, non deve essere ulteriormente sollecitato con carichi o tensioni (urti, vibrazioni, pressione, ecc.). Le stesse condizioni si applicano anche al cavo e alla sede di fissaggio a cui è fissato il pressacavo.
DINAMICA: in questo intervallo di temperatura il pressacavo resiste ad urti e sollecitazioni con un valore di energia equivalente alla categoria di impatto dichiarata in accordo alla norma EN 62444.

* *STATIC: in this temperature range the cable gland, properly installed in compliance with technical requirements, must not be further strained with stress or forces (shock, vibration, pressure, etc.). The same conditions also apply to both the enclosure and the wire to which the cable gland has been assembled.*
DYNAMIC: in this temperature range the cable gland withstands shocks and stresses with an energy value equivalent to the declared impact category according to EN 62444.

Tipo Type		Grandezza Nominale Thread	Nominale Nominal Ø		Raccomandata Recommended		UL 514B Ø		Valore trazione Pull Value		EN 62444 Ø	Categoria d'impatto impact category	MARCHIO
			[mm]	[Nm]	[in-lbs]	[mm]	[inches]	[kg]	[lb]	[Nm]	[in-lbs]	[mm]		
2900.M12N	**2901.M12N**	M12x1,5	3-7	6	53	3-7	0.11-0.28	2	4.4	6	53	3-7	5	USR-CNR / VDE
2900.M16N	**2901.M16N**	M16x1,5	4.5-10	6	53	6-10	0.24-0.39	2	4.4	6	53	4.5-10	6	USR-CNR / VDE
2900.M20N	**2901.M20N**	M20x1,5	7-13	8	71	8-13	0.31-0.51	15.9	35	8	71	7-13	6	USL-CNL / VDE
2900.M25N	**2901.M25N**	M25x1,5	10-17	8	71	13-17	0.51-0.67	15.9	35	8	71	11-17	6	USL-CNL / VDE
2900.M32N	**2901.M32N**	M32x1,5	11-21	18	159	13-21	0.51-0.83	15.9	35	18	159	13-21	6	USL-CNL / VDE
2900.M40N	**2901.M40N**	M40x1,5	19-28	18	159	21-28	0.83-1.10	15.9	35	18	159	19-28	6	USL-CNL / VDE
2900.M50N	**2901.M50N**	M50x1,5	26-35	18	159	27-35	1.06-1.38	15.9	35	18	159	26-35	6	USL-CNL / VDE
2900.M63N	-	M63x1,5	34-45	25	221	34-45	1.33-1.77	15.9	35	18	159	34-45	6	USL-CNL / VDE
2910.M12N	**2911.M12N**	M12x1,5	1-5	6	53	2-5	0.08-0.20	2	4.4	6	53	2-5	5	USR-CNR / VDE
2910.M16N	**2911.M16N**	M16x1,5	2.5-7	6	53	3.5-7	0.14-0.28	1	2.2	6	53	4-7	6	USR-CNR / VDE
2910.M20N	**2911.M20N**	M20x1,5	5-10	8	71	5-10	0.20-0.40	2	4.4	8	71	5.5-10	6	USR-CNR / VDE
2910.M25N	**2911.M25N**	M25x1,5	6-13	8	71	8-13	0.31-0.51	1	2.2	8	71	6-13	6	USR-CNR / VDE
2910.M32N	**2911.M32N**	M32x1,5	7-14	18	159	7-14	0.28-0.55	5	11	18	159	9-14	6	USR-CNR / VDE
2910.M40N	**2911.M40N**	M40x1,5	13-23	18	159	15-23	0.59-0.91	15.9	35	18	159	17-23	6	USL-CNL / VDE
2910.M50N	**2911.M50N**	M50x1,5	20-29	18	159	20-29	0.79-1.14	15.9	35	18	159	25-29	6	USL-CNL / VDE
2910.M63N	-	M63x1,5	27-39	25	221	28-39	1.10-1.54	15.9	35	18	159	31-39	6	USL-CNL / VDE
2940.M12N	-	M12x1,5	5-8	6	53	5-8	0.20-0.31	2	4.4	6	53	5-8	5	USR-CNR / VDE
2940.M16N	-	M16x1,5	7-12	6	53	8-12	0.31-0.47	2	4.4	6	53	8-12	6	USR-CNR / VDE
2940.M20N	-	M20x1,5	10-16	8	71	12-16	0.47-0.63	5	11	8	71	12-16	6	USR-CNR / VDE
2940.M25N	-	M25x1,5	13-21	8	71	14-21	0.55-0.83	15.9	35	18	159	13-21	6	USL-CNL / VDE
2940.M32N	-	M32x1,5	18-25	18	159	21-25	0.83-0.98	15.9	35	18	159	18-25	6	USL-CNL / VDE
2940.M40N	-	M40x1,5	25-32	18	159	25-32	0.98-1.26	15.9	35	25	221	25-32	6	USL-CNL / VDE
2940.M50N	-	M50x1,5	30-38	18	159	30-37	1.18-1.46	15.9	35	25	221	30-38	6	USL-CNL / VDE
2940E.M50N	-	M50x1,5	35-45	18	159	35-41	1.38-1.61	15.9	35	25	221	35-45	6	USL-CNL / VDE
2900.07N	**2901.07N**	Pg 7	3-7	6,25	55	3-7	0.11-0.28	1.2	2.65	6.25	55	-	-	USR-CNR
2900.09N	**2901.09N**	Pg 9	4-8	6,25	55	4-8	0.16-0.31	2	4.4	6.25	55	-	-	USR-CNR
2900.11N	**2901.11N**	Pg 11	4.5-10	6,25	55	6-10	0.24-0.40	2	4.4	6.25	55	-	-	USL-CNR
2900.13N	**2901.13N**	Pg 13,5	5-12	7,5	66	10-12	0.39-0.47	15.9	35	7,5	66	-	-	USL-CNL
2900.16N	**2901.16N**	Pg 16	7-13	7,5	66	10-13	0.39-0.51	15.9	35	7,5	66	-	-	USL-CNL
2900.21N	**2901.21N**	Pg 21	10-17	10	88,5	12-17	0.47-0.67	15.9	35	10	88,5	-	-	USL-CNL
2900.29N	**2901.29N**	Pg 29	18-25	15	133	18-25	0.71-0.99	15.9	35	15	133	-	-	USL-CNL
2900.36N	**2901.36N**	Pg 36	22-32	25	221	23-32	0.91-1.26	15.9	35	25	221	-	-	USL-CNL
2900.42N	**2901.42N**	Pg 42	28-38	25	221	28-35	1.10-1.38	15.9	35	25	221	-	-	USR-CNL
2900.48N	-	Pg 48	34-45	25	221	34-45	1.34-1.77	15.9	35	25	221	-	-	USR-CNL
2910.07N	**2911.07N**	Pg 7	1-5	6,25	55	2-5	0.08-0.20	1.2	2.65	6.25	55	-	-	USR-CNR
2910.09N	**2911.09N**	Pg 9	2-6	6,25	55	3-6	0.12-0.24	2	4.4	6.25	55	-	-	USR-CNR
2910.11N	**2911.11N**	Pg 11	2.5-7	6,25	55	3.5-7	0.14-0.28	2	1	6.25	55	-	-	USR-CNR
2910.13N	**2911.13N**	Pg 13,5	4-10	7,5	66	5.5-10	0.22-0.39	2	4.4	7.5	66	-	-	USL-CNR
2910.16N	**2911.16N**	Pg 16	5-10	7,5	66	6-10	0.24-0.39	2	4.4	7.5	66	-	-	USL-CNR
2910.21N	**2911.21N**	Pg 21	6-13	10	88,5	7-13	0.28-0.51	2.5	6.6	10	88,5	-	-	USL-CNR
2910.29N	**2911.29N**	Pg 29	12-20	15	133	12-20	0.47-0.79	10	22	15	133	-	-	USL-CNR
2910.36N	**2911.36N**	Pg 36	19-26	25	221	19-26	0.75-1.02	15.9	35	25	221	-	-	USR-CNL
2910.42N	**2911.42N**	Pg 42	24-31	25	221	24-31	0.95-1.22	15.9	35	25	221	-	-	USL-CNL
2910.48N	-	Pg 48	27-39	25	221	31-39	1.22-1.54	15.9	35	25	221	-	-	USL-CNL

VDE = LICENCE No. 40008475 and No. 40008476

USL-CNL = FILE No. E 220310, Control No. 48SB

USR-CNR = FILE No. E 220310
Con riduzione della forza di trazione.
With reduced pull force.

CEMBRE www.cembre.com

CEMBRE S.p.A.
via Serenissima, 9
25135 Brescia
Italy
Ph +39 030 36921
ufficio.vendite@cembre.com
sales@cembre.com

CEMBRE Ltd.
Dunton Park,
Kingsbury Road,
Curdworth, Sutton Coldfield
West Midlands, B76 9EB
United Kingdom
Ph +44 01675 470440
sales@cembre.co.uk

CEMBRE S.a.r.l.
22 Avenue Ferdinand de Lesseps
91420 Morangis Cedex
France
Ph +33 01 60 49 11 90
info@cembre.fr

CEMBRE España S.L.U.
Calle Verano 6 y 8
Pl Las Monjas
28850 Torrejón de Ardoz
Madrid - Spain
Ph +34 91 4852580
comercial@cembre.com

CEMBRE GmbH
Geschäftsbereich
Energie- und Bahntechnik
Heidemannstr. 166
80939 München
Germany
Ph + 49 89-3580676
info@cembre.de

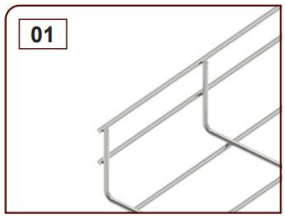
CEMBRE GmbH
Geschäftsbereich
Industrie und Handel
Boschstraße 7
71384 Weinstadt
Germany
Ph +49 7151-20536-60
info-w@cembre.de

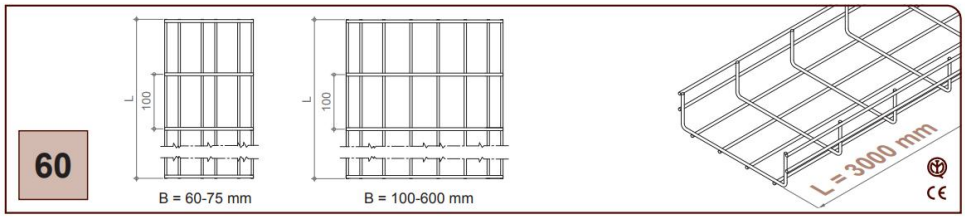
CEMBRE Inc.
Raritan Center Business Park
300 Columbus Circle-S.F,
Edison, NJ 08837 USA
Ph +1 (732) 225-7415
sales.us@cembre.com
Midwest Office
1051 Perimeter Dr. #470
Schaumburg, IL 60173

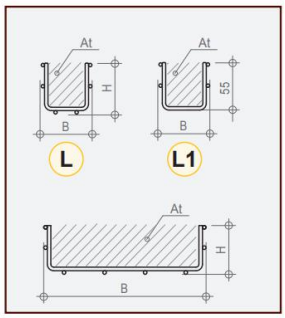
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4.12 CABLE TRAY

PASSERELLA A RETE CZ4 *Wire mesh cable tray*







E J N Codice/ Code	Ø mm	Δ kg/m	B mm	H mm	L mm	IEC 61537 1500 mm	At mm²	Δ kg/m	Ø mm	Z Codice/ Code
B4 ¤ 01A3H060L	3,9	0,76	60	60	3000	15 daN/m	2290	0,78	3,9	B4 Z 01A3H060L
B4 ¤ 01A3H060L1	3,9	0,56	60	55	3000	15 daN/m	2465	0,58	3,9	B4 Z 01A3H060L1
B4 ¤ 01A3H075L	3,9	0,77	75	60	3000	15 daN/m	3070	0,79	3,9	B4 Z 01A3H075L
B4 ¤ 01A3H100L	3,9	0,80	100	60	3000	26 daN/m	4370	0,82	3,9	B4 Z 01A3H100L
B4 ¤ 01A3H150L	3,9	0,85	150	60	3000	26 daN/m	6970	0,87	3,9	B4 Z 01A3H150L
B4 ¤ 01A3H200L	3,9	1,10	200	60	3000	28 daN/m	9570	1,12	3,9	B4 Z 01A3H200L
B4 ¤ 01A3H300L	3,9	1,40	300	60	3000	28 daN/m	14770	1,43	3,9	B4 Z 01A3H300L
B4 ¤ 01A3H300Q	4,4	1,68	300	60	3000	42 daN/m	14460	1,72	4,4	B4 Z 01A3H300Q
B4 ¤ 01A3H400Q	4,4	2,05	400	60	3000	44 daN/m	19580	2,10	4,4	B4 Z 01A3H400Q
B4 ¤ 01A3H500Q	4,4	2,41	500	60	3000	44 daN/m	24700	2,46	4,4	B4 Z 01A3H500Q
B4 ¤ 01A3H600Q	4,4	2,77	600	60	3000	44 daN/m	29820	2,83	4,4	B4 Z 01A3H600Q

¤ Scegli il materiale/ *Choose the material*

Base Load Power Hub (BLPH)

HVAC System
B-100 HV Switch Room
Component List and DS

Document Number:1724000049-HV-LIS-00047


ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	26/03/25

Document Class: 3

Rev.	Date	Description	Prepared	Reviewed	Approved
03	10/03/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
02	22/01/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
01	29/10/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.
00	20/07/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)
02	Issue for Information (IFI)
03	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1.3 Project Concept 6

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.2 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

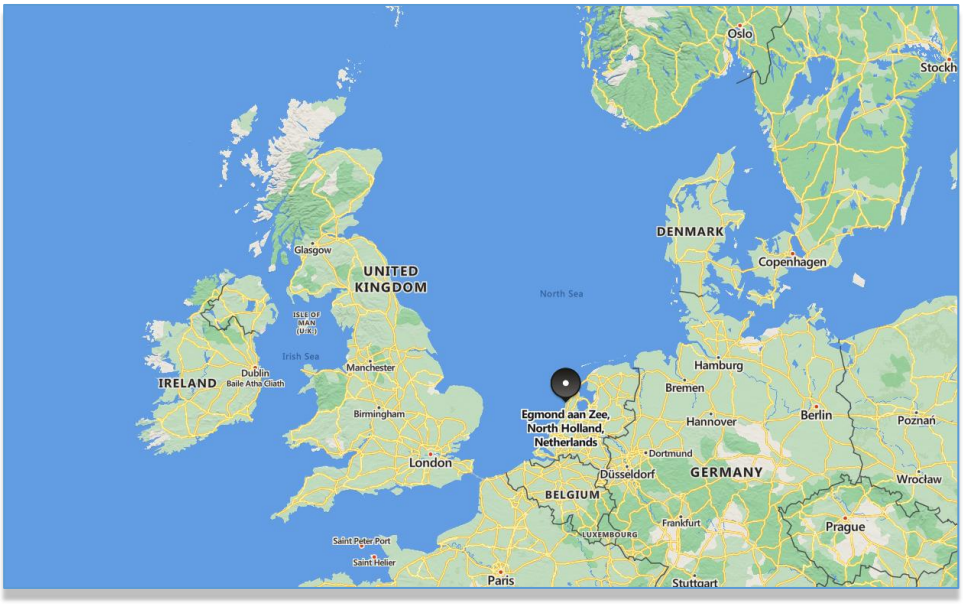


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

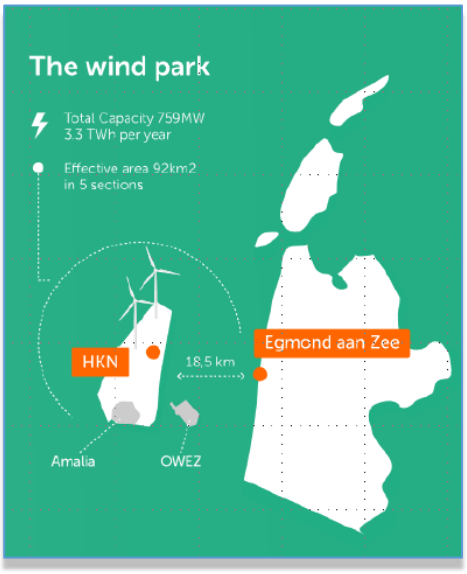


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.3 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

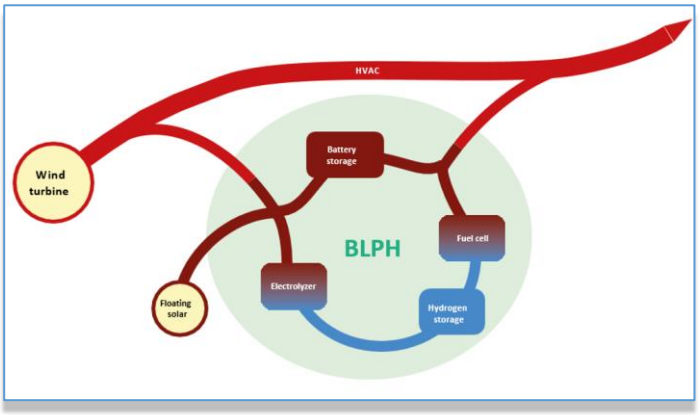


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

Scope of the document is to collect the main equipment technical data sheet relevant to the HVAC system provided for Hollandse Kust Noord Wind Park Project

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

3 INTRODUCTION

3.1 SCOPE OF WORK

Scope of the document is to collect the main equipment technical data sheet relevant to the HVAC system provided for Hollandse Kust Noord Wind Park Project

4 MAIN PACKAGE HVAC UNIT

Main unit data for HHU-77001 and HHU-77002

4.1 MAIN UNIT DATA

Description	Unit measure	Value
Type of unit	-	Pressurising Unit
Package unit model	-	4112-DMPD-400
Configuration	-	no.1 Duty + no.1 Stand-By
Total cooling capacity	kW	n.a.
Sensible cooling capacity	kW	n.a.
Heating capacity	kW	10
Outdoor design temperature & humidity	°C (D.B.)	Summer: +25°C (D.B.) Rh90%
	-	Winter: -8.4°C (D.B.) Rh 100%
Air flow rate - Supply	m^3/h	1402
Air flow rate - Return	m^3/h	n.a.
Air flow rate – Fresh air	m^3/h	1402
External static pressure	Pa	800
Refrigerant	-	n.a.
Length x Width x Height (external unit)	mm	1250x700x820
Weight	kg	155
Number of compressors	-	n.a.
Supply air duct connection (50mm flange)	mm	400x310
Fresh air duct connection (50mm flange)	mm	500x510
Return air open	mm	n.a.
Panel and thermal insulation (Material – Tk)	mm	n.a.
Materials on main base frame	-	Inox 316L
Materials on internal panel skin	-	n.a.
Materials on external panel skin	-	Inox 316L
Execution	-	Safe zone

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4.2 SUPPLY FAN & MOTOR DATA

Description	Unit measure	Value
Type	-	RM280
Manufacturer	-	Moro
Casing material	-	Galvanized steel
Weight	kg	30
Air flow rate	m^3/h	1405
Nominal static pressure	Pa	800
Nominal total pressure	Pa	835
Fan power consumption	kW	0.75
Fan speed	rpm	2820
Impeller type	-	Forward
Earthing boss	-	Yes
Drive arrangement	-	Direct
Fan pulley	Ø (mm)	n.a.
Motor fan pulley	Ø (mm)	n.a.
Belt type and quantity	-	n.a.
Manufacturer	-	Moro
Nominal motor power	kW	1.1
Winding configuration	-	DOL
Motor speed	Rpm	2820
Nominal current	A	2.3
Starting current	A	15
Electrical supply	V / Ph / Hz	400 / 3 / 60
IP rating	-	IP55
Execution	-	Safe zone

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4.3 ELECTRICAL HEATING COIL DATA

Description	Unit measure	Value
Frame	-	AISI 316 L
Dimension	mm	400 X 310
Heater depth	mm	150
Heating capacity – 1st step	kW	10
Absorbed current – 1st step	A	14.7
Heating capacity – 2nd step	kW	n.a.
Absorbed current – 2nd step	A	n.a.
Power supply	-	400 V 3 PH 50HZ
Safety accessories	-	THERMOSTATE ON BOARD
Manufacturer	-	Diamanti

4.4 FILTER DATA

Primary filter		
Filter type	-	G4 (EN779)
Filter section size (Q.ty - W x H x tkh)	no. / mm	1
		593x593x48
Pressure drop (clean filter)	Pa	65
Final pressure drop (dirty filter)	Pa	97
Manufacturer	-	F&F
Model	-	FCZ-OS4
Secondary filter		
Filter type	-	F7 (EN779)
Filter section size (Q.ty - W x H x THK)	no. / mm	1
		593x593x98
Pressure drops (clean filter)	Pa	85
Final pressure drops (dirty filter)	Pa	102
Manufacturer	-	F&F
Model	-	PFM4-8-23.23

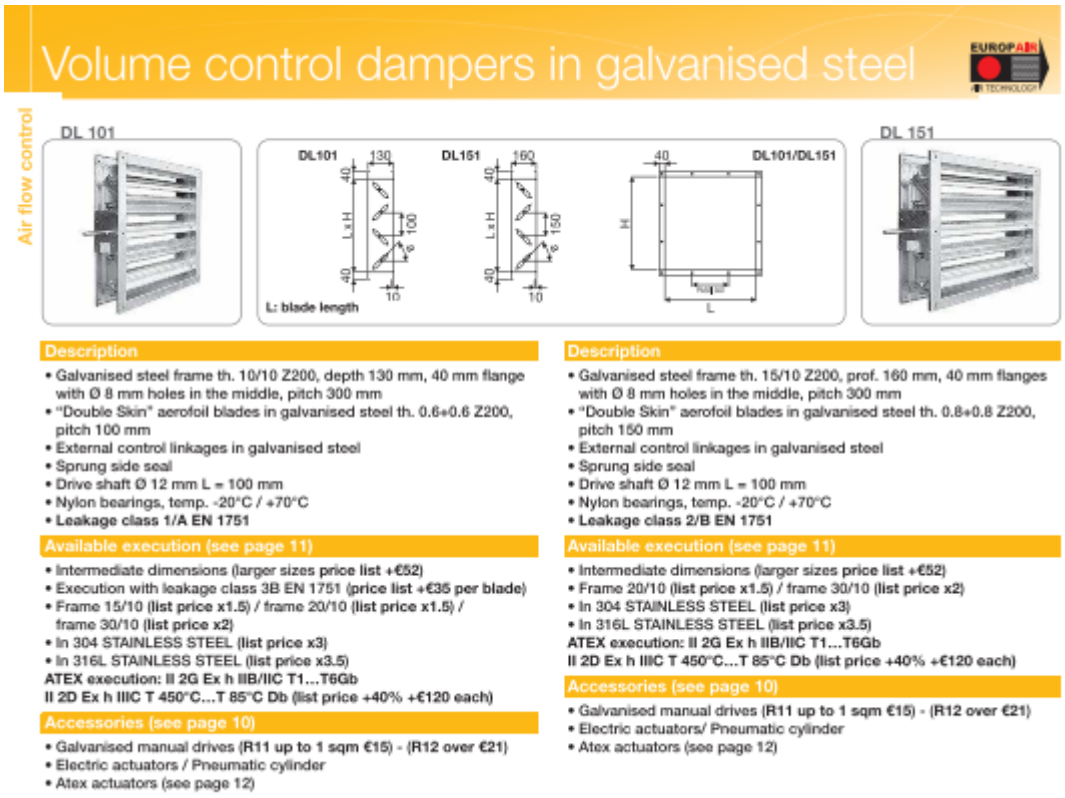
4.5 COALESCENT FILTER DATA

Coalescent filter		
Manufacturer		EuropAir
Model	-	SG41R-X
Filter section size (Q.ty - W x H x tkh)	no. / mm	1
		500x500x170
Pressure drop (clean filter)	Pa	50
Final pressure drop (dirty filter)	Pa	75

5 ATTACHMENTS

5.1 VOLUME CONTROL DAMPERS

Item TAG : HDB-77-NNN



Volume control dampers in galvanised steel

Air flow control

DL 101

DL 151

Description

- Galvanised steel frame th. 10/10 Z200, depth 130 mm, 40 mm flange with Ø 8 mm holes in the middle, pitch 300 mm
- "Double Skin" aerofoil blades in galvanised steel th. 0.6+0.6 Z200, pitch 100 mm
- External control linkages in galvanised steel
- Sprung side seal
- Drive shaft Ø 12 mm L = 100 mm
- Nylon bearings, temp. -20°C / +70°C
- **Leakage class 1/A EN 1751**

Available execution (see page 11)

- Intermediate dimensions (larger sizes price list +€52)
- Execution with leakage class 3B EN 1751 (price list +€35 per blade)
- Frame 15/10 (list price x1.5) / frame 20/10 (list price x1.5) / frame 30/10 (list price x2)
- In 304 STAINLESS STEEL (list price x3)
- In 316L STAINLESS STEEL (list price x3.5)

ATEX execution: II 2G Ex h IIB/IIC T1...T6Gb
II 2D Ex h IIIC T 450°C...T 85°C Db (list price +40% +€120 each)

Accessories (see page 10)

- Galvanised manual drives (R11 up to 1 sqm €15) - (R12 over €21)
- Electric actuators / Pneumatic cylinder
- Atex actuators (see page 12)

Description

- Galvanised steel frame th. 15/10 Z200, prof. 160 mm, 40 mm flanges with Ø 8 mm holes in the middle, pitch 300 mm
- "Double Skin" aerofoil blades in galvanised steel th. 0.8+0.8 Z200, pitch 150 mm
- External control linkages in galvanised steel
- Sprung side seal
- Drive shaft Ø 12 mm L = 100 mm
- Nylon bearings, temp. -20°C / +70°C
- **Leakage class 2/B EN 1751**

Available execution (see page 11)

- Intermediate dimensions (larger sizes price list +€52)
- Frame 20/10 (list price x1.5) / frame 30/10 (list price x2)
- In 304 STAINLESS STEEL (list price x3)
- In 316L STAINLESS STEEL (list price x3.5)

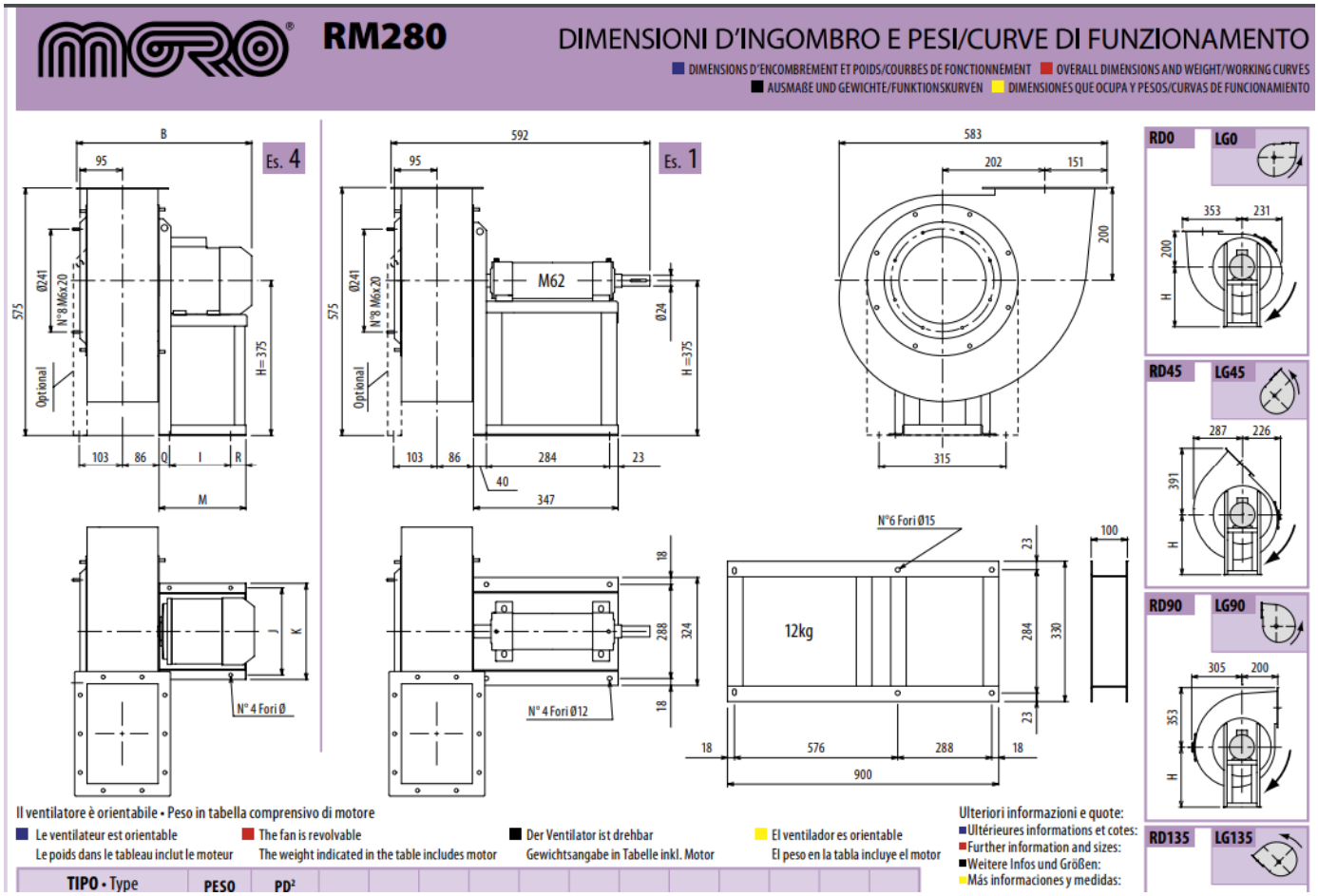
ATEX execution: II 2G Ex h IIB/IIC T1...T6Gb
II 2D Ex h IIIC T 450°C...T 85°C Db (list price +40% +€120 each)

Accessories (see page 10)

- Galvanised manual drives (R11 up to 1 sqm €15) - (R12 over €21)
- Electric actuators/ Pneumatic cylinder
- Atex actuators (see page 12)

5.2 PRESSURIZING FAN

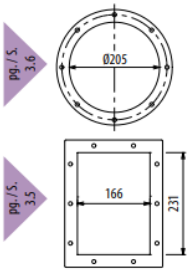
Item TAG: HFA-77-NNN

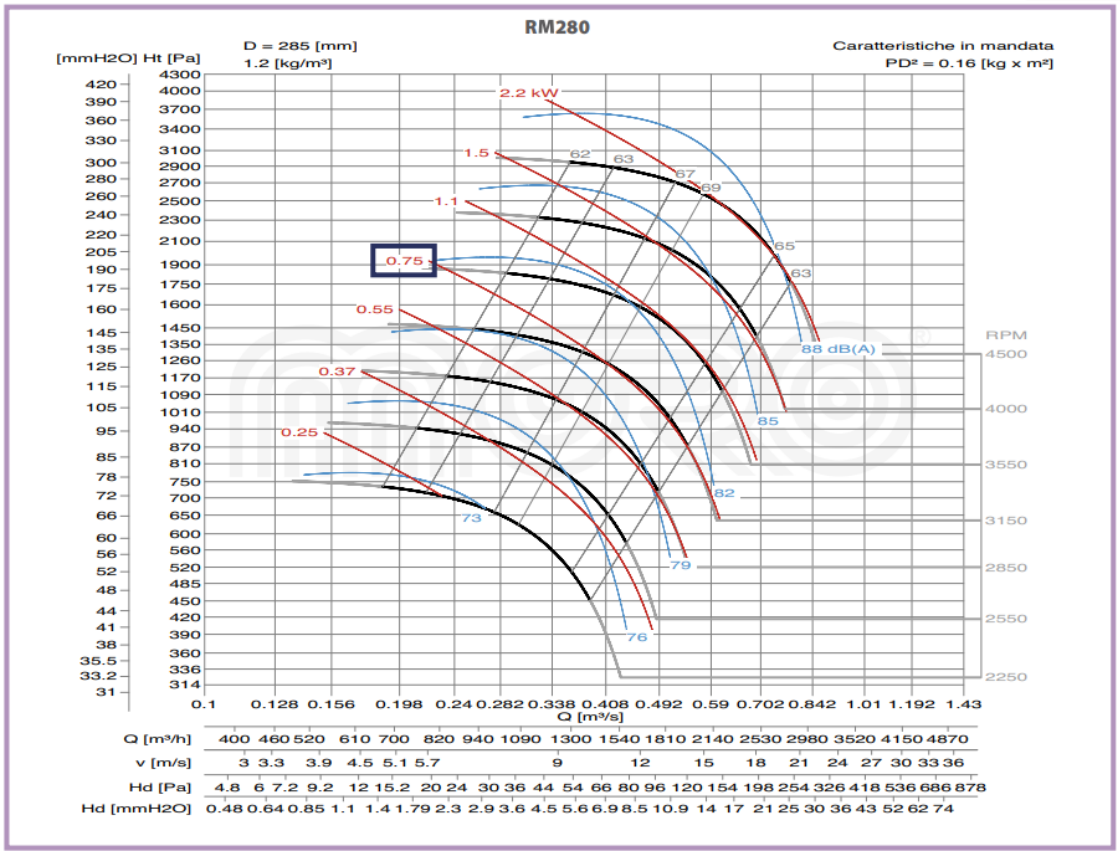


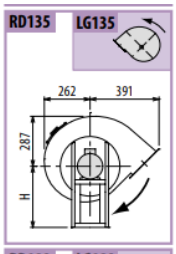
■ Le ventilateur est orientable — Le poids dans le tableau inclut le moteur
■ The fan is revolvable — The weight indicated in the table includes motor
■ Der Ventilator ist drehbar — Gewichtsangabe in Tabelle inkl. Motor
■ El ventilador es orientable — El peso en la tabla incluye el motor

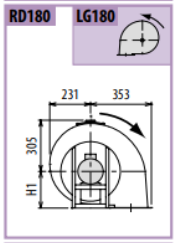
TIPO • Type		PESO Weight	PD²	B	I	H	H1	H2	J	K	M	Q	R	Ø
VENTILATORE Fan	MOTORE Motor	Kg	Kgf x m²											
RM280/2R	71 B2	30	0,15	414	121	375	200	375	203	225	196	49	26	10
RM280/2	80 A2	35	0,16	438	121	375	200	375	203	225	217	48	48	10
RM280/T		40	0,16			375	200	375						

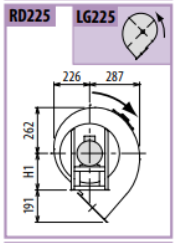
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■ Further information and sizes:
■ Weitere Infos und Größen:
■ Más informaciones y medidas:

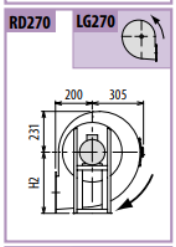


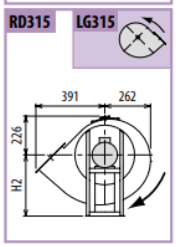












5.3 ACTUATORS WITH SPRING RETURN

Item TAG: HDZ-77-NNN

ACTUATOR WITH SPRING RETURN

| DA03S... |



TYPE OVERVIEW

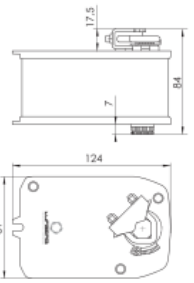
Torque	Controls	Damper surface	Voltage	Auxiliary switches	Weight	Type
3Nm	On/off	< 0,5 m² *	24V AC/DC	-	0,98 kg	DA03S24
				2SPDT**	1,08 kg	DA03S24S
	Modulating			-	1,02 kg	DA03S24P
				2 SPDT**	1,07 kg	DA03S24PS
	On/off		230V AC	-	0,99 kg	DA03S220
				2 SPDT**	1,09 kg	DA03S220S

TECHNICAL SPECIFICATION

Type	DA03S24 (S)	DA03S24P (S)	DA03S220 (S)
Torque	3 Nm		
Running time - motor/spring return	50 -70s / < 30s	50 -70s / < 30s	50 -70s / < 30s
Controls	on/off	0 -10V	on/off
Voltage	24V AC/DC	24V AC/DC	230V AC
Frequency	50/60Hz (AC)		
Power consumption			
- in operation	2,5W	2,5W	2,5W
- at rest	1,6W	1,6W	1,6W
- for wire sizing	10,0VA	7,0VA	10,0VA
Angle of rotation	-5°~90°		
- setting	45°~90° (5° step)		
Direction of rotation	can be selected by mounting L/R		
Sound power level - motor/spring return	<50 dB(A) / <65 dB(A)		
Position feedback	-	0 - 10V DC	-
Electrical connection	1m cable		
Auxiliary switches	3 (1.5)A, 230V		
Degree of protection	IP54		
Protection class	III low voltage	III low voltage	II
Ambient humidity	95% RH, without condensation		
Ambient temperature	-30~+50 °C		
Non-operating temperature	-40~+70 °C		
Service life	60 000 emergency positions		
Mechanical connection			
- round shaft	from ø6 to ø12mm		
- square shaft	from 5x5 to 8x8mm		
Manual override	not possible		
Norms and standards	Declaration of conformity, ISO, CE, EAC		

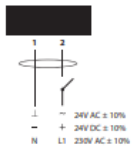
* Maximum damper surface is calculated for optimum conditions (without the influence of air flow, pressure difference, etc.).
** SPDT (Single-Pole Double-Throw)

DIMENSIONS (mm)

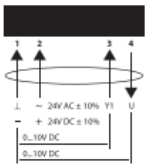


ELECTRIC INSTALATION

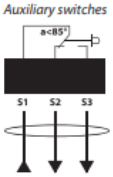
On/off



Modulating



Auxiliary switches



5.4 SUPPLY GRILLE

Item TAG: HSG-77-101/102

BMAI



CARATTERISTICHE:
Bocchette industriali a grande portata ad alette regolabili passo 50 mm.

COSTRUZIONE:
Alluminio anodizzato.

IMPIEGO:
A parete, in mandata.

FISSAGGIO:
Fissaggio con clips o viti frontali su richiesta.

ACCESSORI:
- Serranda di taratura in acciaio zincato con alette a movimento contrapposto.
- Controtelaio di montaggio in lamiera di acciaio zincata.
- Plenum in acciaio zincato standard o isolato.

CHARACTERISTICS:
High volume industrial grilles with adjustable blades 50 mm pitch.

CONSTRUCTION:
Anodized aluminium.

UTILIZATION:
For wall installation and for air delivery.

FIXING:
Fixing by clips or frontal screws on request.

- Calibration damper made of galvanized steel and fins with opposite movement.
- Mounting counterframes made of galvanized steel sheet.
- Galvanized steel plenum, standard or insulated.

PREZZI - PRICES

BxH	BMAIV	BMAIO	BMAIVO BMAIOV	SCAI SINGOLO FILARE SINGLE ROW	SCI DOPPIO FILARE DOUBLE ROW	CTP
mm	€	€	€	€	€	€
500x200						
600x200						
700x200						
800x200						
• 900x200						
• 1000x200						
• 1200x200						
• 1400x200						
• 1800x200						
500x300						
600x300						
700x300						
800x300						
• 900x300						
• 1000x300						
• 1200x300						
• 1400x300						
• 1500x300						
• 1800x300						
• 500x400						
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• 2000x400						
500x500						
600x500						
700x500						
• 800x500						
• 900x500						
• 1000x500						
• 1200x500						
• 1400x500						
• 1500x500						
• 1800x500						
• 2000x500						
600x600						
• 800x600						
• 900x600						
• 1000x600						

5.5 RETURN GRILLE

Item TAG: HEG-77-101

GRAI



CARATTERISTICHE:
Griglie di ripresa industriali ad alette fisse inclinate di 45° passo 60 mm.

COSTRUZIONE:
Alluminio anodizzato.

IMPIEGO:
A parete, per presa aria esterna o espulsione.

FISSAGGIO:
Fissaggio con clips o viti frontali a richiesta.

ACCESSORI:
- Serranda di taratura in acciaio zincato con alette a movimento contrapposto.
- Controtelaio di montaggio in lamiera di acciaio zincata.
- Rete antivolatile.
- Serranda di sovrappressione a gravità.

CHARACTERISTICS:
Industrial return grilles grilles with fixed and 45° inclined bars 60 mm pitch.

CONSTRUCTION:
Anodized aluminium.

UTILIZATION:
For wall installation and for external air intake or exhaust air flow.

FIXING:
Fixing by clips or frontal screws on request.

ACCESSORIES:
- Calibration damper made of galvanized steel and fins with opposite movement.
- Mounting counterframes made of galvanized steel sheet.
- Bird screen.
- Overpressure damper.

PREZZI - PRICES

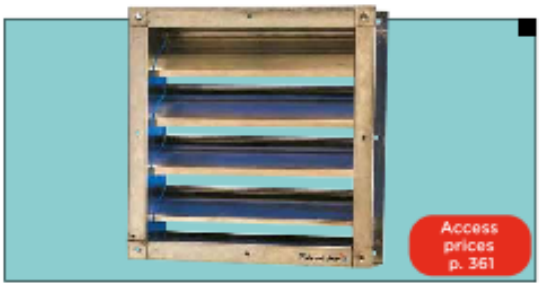
BxH	GRAI	GRAIR	GRAIRZ	GRAIRSS	SCAI	CTP
mm	€	€	€	€	€	€
400x400						
500x400						
600x400						
800x400						
1000x400						
• 1200x400						
• 1400x400						
• 1600x400						
• 1800x400						
• 2000x400						
400x500						
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• 2000x800						
400x1000						
600x1000						
800x1000						
1000x1000						
• 1200x1000						
• 1400x1000						
• 1600x1000						

5.6 NON RETURN DAMPERS

Item TAG: HDN-77-101

DIFFUSION

France Air



SPG

Pressure relief flap for rectangular ducts

MATERIAL	INSTALLATION	MOUNTING
Alu + steel	Rectangular duct	Visible screws

Espace Pro

Order online at www.espacepro.france-air.com

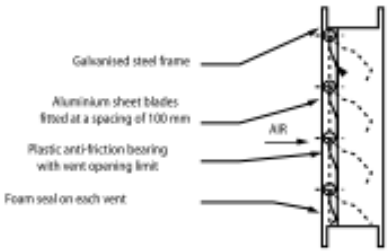
ADVANTAGES
- Excellent sealing.
- Low noise level.

RANGE
- SPG vent for rectangular duct.
- Standard dimensions from 200 x 200 mm to 2 000 x 2 000 mm:
  - in 100 mm intervals up to 1200 x 1200 mm,
  - then in steps of 200 mm.

APPLICATION/USE
- To maintain an overpressure or underpressure in a room with respect to the outside or to another adjoining room.
- Non-return flap.
- Use in air conditioning, ventilation or heating.

DESIGNATION
SPG — Pressure relief flap
400 x 200 — Length x height (mm)

CONSTRUCTION/COMPOSITION
- Ducted - Type SPG



OPTIONS
- Bronze bearings.
- Stainless steel construction.
- Non-standard dimensions (consult us).
- High speed version (up to 10 m/s): shaft through coupled blades and central reinforcement

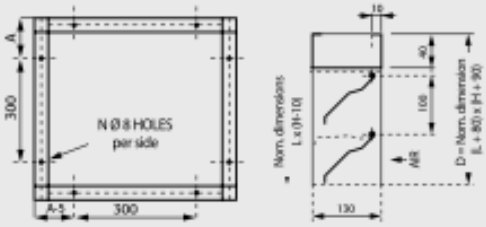
SPECIFICATION TEXT
- Available on www.france-air.com, Espace Pro area.

ASSEMBLY AND CONNECTION
- **Fitting in duct in a network**
  - Maximum flow speed = 6 m/s.
  - Above 4 m/s, the vent is fully open.
  - Max. temperature : + 50°C.

TECHNICAL DESCRIPTION
- Dimensions, cut-out

Dimension (mm)	Number of holes per side	Dimension A (mm)
200	0	-
300	0	-
400	1	245
500	1	295
600	1	345
700	2	245
800	2	295
900	2	345
1000	3	245
1100	3	295
1200	3	345
1400	4	295
1600	5	245
1800	5	345
2000	6	295

N. B.: above L = 1 200 mm, a central reinforcement is provided.



- Pressure drop/speed curve



Optimal selection values: from 2 m/s to 4 m/s*
* to 4 m/s: the flap is fully open.

Selection limit values at 6 m/s.

5.7 DUCT INSULATING MATERIAL

Technical datasheet
Felt CLIMCOVER ROLL ALU 1



DESCRIPTION
Blanket with grid alu foil. Made with glass and with a new generation of thermo-hardening resin that associates organic and vegetal components and minimizes emissions of pollutant substances, like formaldehyde and others volatile organic compounds (VOC).

APPLICATION
Product for use in technical applications, such as ventilation ducts and industrial equipments, with need thermal and acoustic insulation

BENEFITS
- Long life span
- Impact resistance
- Dimensional stability in case of temperature and humidity variation
- Thermal and acoustic insulation
- Certified according to EN 14303
- Easy workability

STORAGE
The product must be stocked inside, in ventilated areas and away from heat sources.

Characteristics	Value	Unit	According to
Declared thermal conductivity 10°C	0,032	W/(m·K)	EN 12667
Declared thermal conductivity 40°C	0,037	W/(m·K)	EN 12667
Declared thermal conductivity 100°C	0,049	W/(m·K)	EN 12667
Fire class EUROCLASS	A1	-	EN 13501-1
Maximum service temperature	125	°C	EN 14706
Width tolerance	+-10	mm	
Length tolerance	-0+excess	mm	

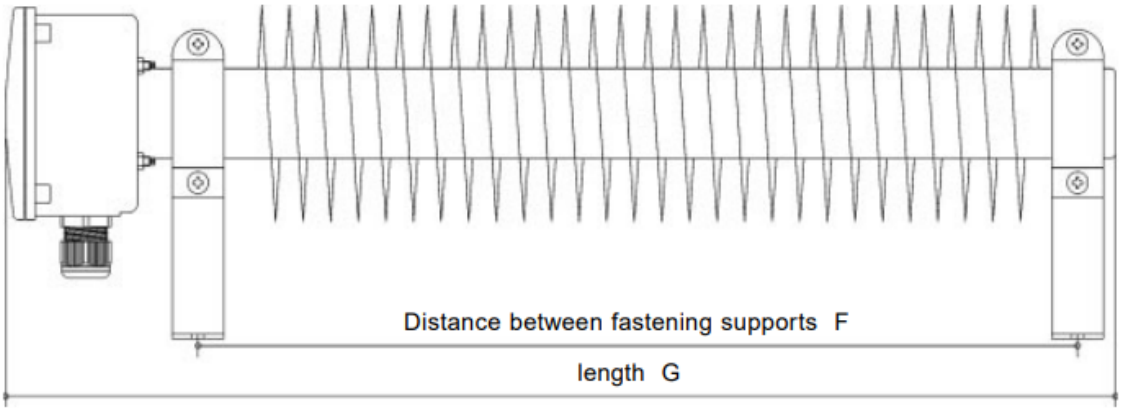
Thickness (mm)	Dimensions (m)	m²/pallet
25	1,15 x 10	345,00
50	1,15 x 5	172,50

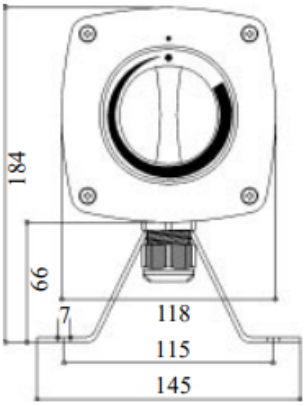
CODE: STC 255
REVISION: 00
DATE: March 2013

Product produced in France-Chalon Sur Saone plant
As regards the CE marking, this insulating product is in accordance with the standard 89/106/CE received by the DPR 246 of 21/4/1993 based on the standards EN 14303.
The CE data indicated on this datasheet are the ones required for the thermal insulation of industrial applications by the standard EN 14303 common to all applications.
The Quality Management System of Saint-Gobain PPC Italia S.p.A. has been assessed and found in accordance with the requirements of the EN ISO 9001:2008, EN ISO 14001:2004 and OHSAS 18001:2007.
The values stated in this datasheet, except for the values required by the CE marking, are not binding and Saint-Gobain PPC Italia S.p.A. may change them, without any notice.
Supplies are subjected to our production possibilities.
Saint-Gobain PPC Italia S.p.A. reserves the right to alter or amend product specification or stop the production without notice

5.8 SPACE HEATER

Item TAG: HHS-77-(001/002/003)





Typ	G mm	F mm
RRH TR 500	500	365
RRH TR 1000	700	565
RRH TR 1500	900	765
RRH TR 2000	1100	965
RRH TR 3000	1500	1365

Typ	G mm	F mm
RRH ST 1000	700	565
RRH ST 1500	900	765
RRH ST 2000	1100	965
RRH ST 3000	1500	1365

Kraemer & Kraus Wärmetechnik GmbH
Eiserntalstr. 374
57080 Siegen

Telefon (02 71) 3 93 70 26
Telefax (02 71) 3 93 70 27
Internet http:/www.Kraemer-Kraus.de
eMail Info@Kraemer-Kraus.de

5.9 PRESSURE RELIEF DAMPER

Item TAG: HDR-77-101

SagiCofim

Overpressure damper with combined blades and counterweight

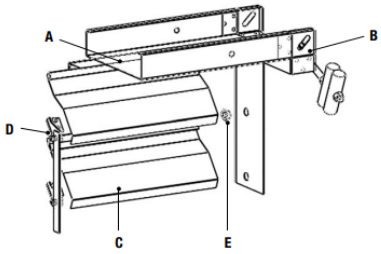
GP100KC-C



Duct overpressure damper with blades combined inside the air flow with return to closing position by own gravity and counterweight outside the flow. Vertical installation with single direction flow. In the case of counter-flow, the damper functions as a non-return element. The combination allows simultaneous opening of the blades, preventing an uneven air flow from creating high turbulence zones and low velocity zones.

MATERIAL AND FINISH

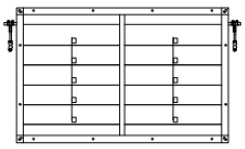
A Frame in galvanized steel Z140, duct-mounting.
B Flange 36 mm, thickness 1 mm.
C Galvanized blades combined internally, movement by gravity with counterweight that can be calibrated, anti-noise gasket.
D Through galvanized pins.
E NYLON bushes.



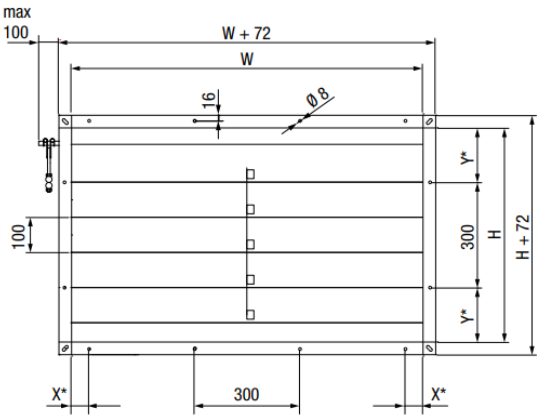
VERSIONS

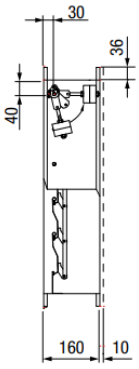
- AISI316 **(PRICES UPON REQUEST)**
- ATEX II 2 GD **+ 36** €

NB: For the prices of the intermediate sizes, consider the next size on the table.
Ex.: 650 x 410 mm = 700 x 410 mm
For basic sizes > 1000 mm, construction in double section with centre separator



*See tech data sheet





The damper is supplied with a counterweight made up of a threaded rod 200 mm long and 300 g of metal masses.
In vertical axis, the counterweight is irrelevant for increasing the opening pressure, minimum reference value 30 Pa.
By tilting the counterweight in the direction of the blade opening, the minimum opening pressure increases up to + 100% for a 45° angle
For pressures higher than 100 Pa, the oscillating masses have to be increased.

5.10 BACKDRAFT DAMPER

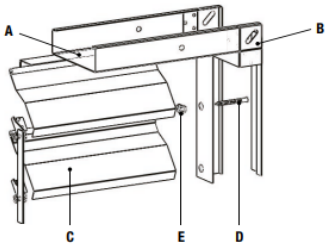
SagiCofim

Overpressure damper with combined blades

GP100KC



Overpressure damper with blades combined inside the air flow with return to closing position by gravity. Vertical installation with single direction flow. In the case of counter-flow, the damper functions as a non-return element. The combination allows simultaneous opening of the blades, preventing an uneven air flow from creating high turbulence zones and low velocity zones.
Minimum opening pressure 30 Pa



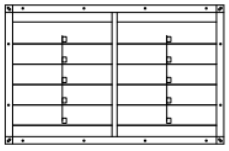
MATERIAL AND FINISH

A Frame in galvanized steel Z140, duct-mounting.
B Flange 36 mm, thickness 1 mm.
C Combined aluminum blades (series 5005), movement by gravity, anti-noise gasket, thickness 0.5 mm.
D Rotation pins.
E NYLON bushes.

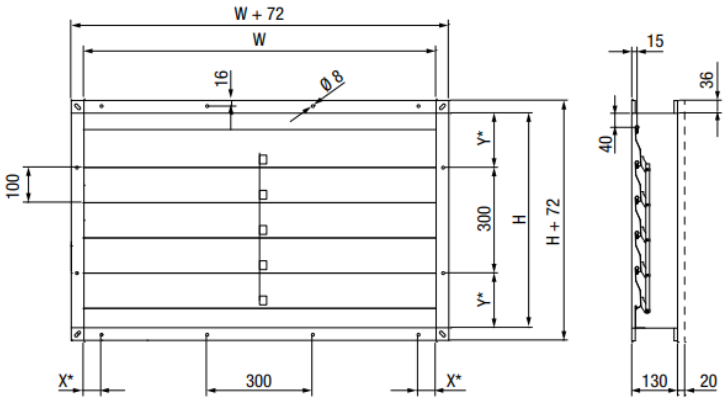
VERSIONS

- AISI316 **(PRICES UPON REQUEST)**
- ATEX II 2 GD **+ 36** €

NB: For the prices of the intermediate sizes, consider the next size on the table.
Ex.: 650 x 410 mm = 700 x 410 mm
For basic sizes > 1000 mm, construction in double section with centre separator

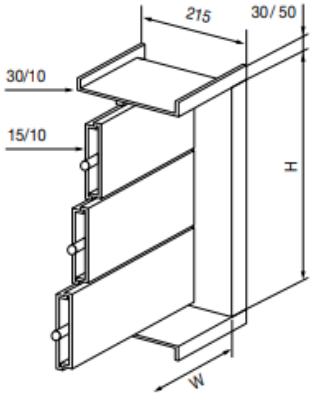


*See tech data sheet

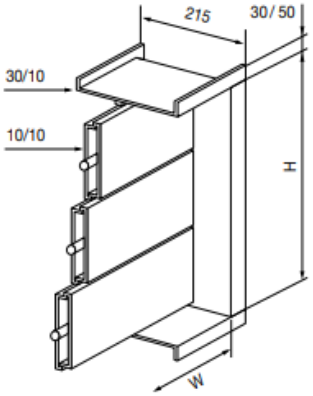


5.11 SHUT-OFF DAMPER

SDL - SDLT 0
dimensions in [mm]



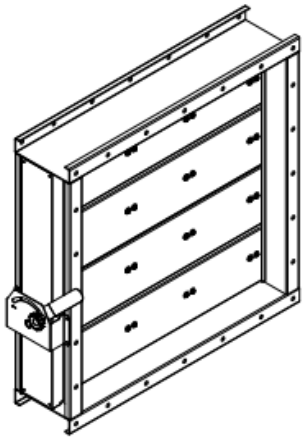
SDL - SDLT 2 - 6
dimensions in [mm]



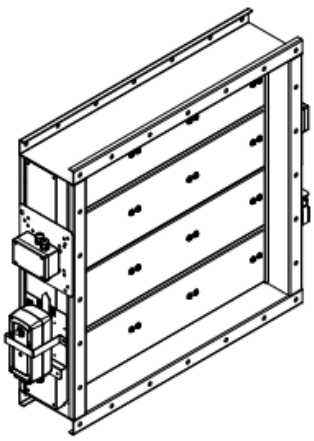
General features Shut-off dampers & Gas Shut-off dampers		
Models	**SDL**	**SDLT**
Gas leakage EN 1751 *Ambient temperature - Pressure: 2000 Pa*	Class B Class 1	**Class C** **Class 3**
Installation	Deck and bulkhead, duct, wall	
Maximum air inlet dimensions in single arrangement*	Width [W] and Height [H] from 150 to 2000 mm	
Standard flanges dimensions	30 mm (HVAC systems) or 50 mm (engine ventilation)	
Drilling	Standard Ø 12 or on demand	
Control types	Manual / Electrical / Electrical ATEX / Pneumatic / Pneumatic ATEX	
Accessories	Circular connections, junction box, quick connections, heating cable, box limit switch, ...	

* Dampers can be supplied on request with special dimensions by multiple welded arrangement.

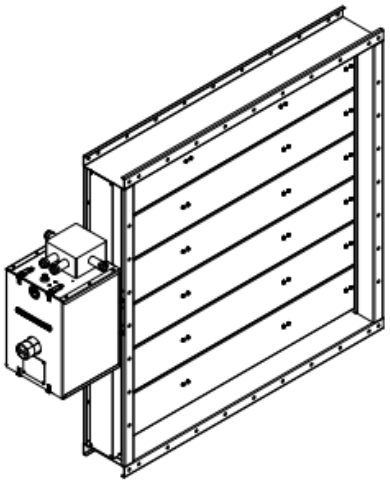
With manual control



With electrical control



With pneumatic control



SDL - SDLT



Damper operating range:

ATEX area $-20\,°C \le t \le +50\,°C$ - V_{max} 15 m/s - P_{max} 3000 Pa
SAFE area $-20\,°C \le t \le +70\,°C$ - V_{max} 25 m/s - P_{max} 3000 Pa

Damper components materials

		STANDARD		
	Type	0	2	6
A	**Casing** (depth 215 mm)	Hot bath galvanized steel, tk. 3 mm	Hot bath galvanized steel, tk. 3 mm	AISI 316 L, tk. 3 mm
B	**Blades** (parallel movement)	Galvanized steel, tk. 1.5 + 1.5 mm	AISI 316 L - tk. 1 + 1 mm	AISI 316 L - tk. 1 + 1 mm
C	**Shafts**	AISI 316 L, Ø 18,1 x 1.5 mm	AISI 316 L, Ø 18,1 x 1.5 mm	AISI 316 L, Ø 18,1 x 1.5 mm
D	**Levers**	Galvanized steel tk. 2 mm	AISI 316 L tk. 2 mm	AISI 316 L tk. 2 mm
E	**Bushes**	Self lubricating bronze, 9010	Self lubricating bronze, 9010	Self lubricating bronze, 9010
F	**Stops**	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm
G	**Lever protection carter**	Galvanized steel tk. 1 mm	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm
H	**Side sealing plates**	AISI 301	AISI 301	AISI 301
	Actuator support plate	Galvanized steel	AISI 316 L	AISI 316 L
	Position indicator	Galvanized steel	Galvanized steel	AISI 304

Silicone seals and thin blades only for models SDLT

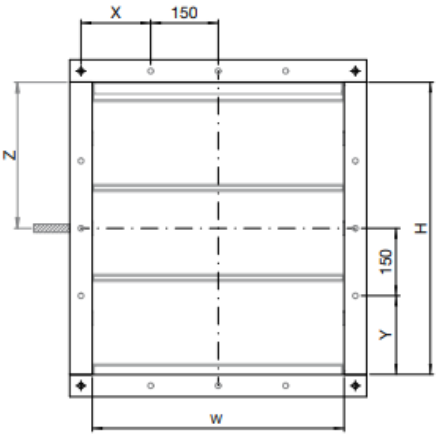
Shut-off - Gas Shut-off Damper Marine - Oil & Gas Industry SagiCofim

SDL - SDLT

Dimensions of flanges and drilling

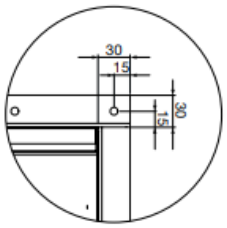
Models SDL - SDLT / 0 - 2 - 6

Air inlet size W / H [mm]	N° holes	flange 30 [mm]		flange 50 [mm]		0		2 / 6	
		X	Y	X	Y	Z	N° blades	Z	N° blades
150	1	90	75	100	75	75	1	75	1
200	1	115	100	125	100	100	1	100	1
250	1	140	125	150	125	125	1	125	1
300	1	165	150	175	150	50	2	75	2
350	3	40	175	50	175	75	2	100	2
400	3	65	50	75	50	100	2	100	2
450	3	90	75	100	75	125	2	225	3
500	3	115	100	125	100	250	3	250	3
550	3	140	125	150	125	275	3	275	3
600	3	165	150	175	150	300	3	300	3
650	5	40	175	50	175	325	3	325	3
700	5	65	50	75	50	450	4	350	3
750	5	90	75	100	75	475	4	375	5
800	5	115	100	125	100	500	4	500	4
850	5	140	125	150	125	525	4	525	4
900	5	165	150	175	150	450	5	375	6
950	7	40	175	50	175	475	5	400	6
1000	7	65	50	75	50	500	5	500	5
1050	7	90	75	100	75	525	5	525	7
1100	7	115	100	125	100	450	6	550	7
1150	7	140	125	150	125	475	6	575	7
1200	7	165	150	175	150	500	6	500	6
1250	9	40	175	50	175	525	6	525	6
1300	9	65	50	75	50	650	7	550	6
1350	9	90	75	100	75	675	7	675	9
1400	9	115	100	125	100	700	7	700	7
1450	9	140	125	150	125	725	7	725	7
1500	9	165	150	175	150	650	8	675	10
1550	11	40	175	50	175	675	8	700	10
1600	11	65	50	75	50	700	8	700	8
1650	11	90	75	100	75	725	8	825	11
1700	11	115	100	125	100	850	9	850	11
1750	11	140	125	150	125	875	9	875	11
1800	11	165	150	175	150	900	9	900	9
1850	13	40	175	50	175	925	9	925	9
1900	13	65	50	75	50	850	10	950	9
1950	13	90	75	100	75	875	10	975	13
2000	13	115	100	125	100	900	10	900	10

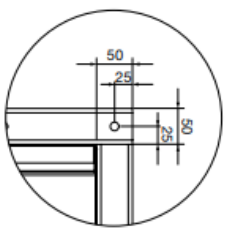


✦ Fixed holes at corner
○ Intermediate holes

SDL - SDLT flange 30



SDL - SDLT flange 50



Shut-off - Gas Shut-off Damper

Marine - Oil & Gas Industry

SagiCofim

SDL - SDLT

Damper weights [Kg]

Damper weights [Kg]

H [height]	W [width]																			
	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
150	9	11	13	16	18	21	24	26	29	32	34	37	40	42	45	47	50	53	55	58
200	11	12	15	18	21	24	27	30	32	35	38	41	44	47	50	53	56	58	61	64
300	13	15	18	21	25	28	31	34	38	41	44	47	50	54	57	60	63	67	70	73
400	16	18	22	25	29	33	36	40	44	47	51	54	58	62	65	69	73	76	80	84
500	19	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93
600	22	24	28	33	37	41	46	50	55	59	63	68	72	77	81	85	90	94	99	103
700	24	27	31	36	41	46	50	55	60	65	69	74	79	84	88	93	98	103	107	112
800	27	30	35	40	45	50	55	61	66	71	76	81	86	92	97	102	107	112	117	123
900	30	32	38	43	49	54	60	65	71	76	82	87	93	98	104	109	115	120	126	131
1000	32	35	41	47	53	59	65	71	77	83	89	95	101	106	112	118	124	130	136	142
1100	35	38	44	51	57	63	69	76	82	88	95	101	107	113	120	126	132	138	145	151
1200	38	41	48	54	61	68	75	81	88	95	101	108	115	121	128	135	141	148	155	162
1300	40	44	51	58	65	72	79	86	93	100	107	114	121	128	135	142	149	156	163	170
1400	43	47	54	62	69	77	84	92	99	106	114	121	129	136	144	151	159	166	174	181
1500	46	50	57	65	73	81	89	96	104	112	120	128	135	143	151	159	167	174	182	190
1600	49	53	61	69	77	85	94	102	110	118	127	135	143	151	159	168	176	184	192	201
1700	51	55	64	73	81	90	98	107	115	124	132	141	150	158	167	175	184	192	201	209
1800	54	58	67	76	85	94	103	112	121	130	139	148	157	166	175	184	193	202	211	220
1900	57	61	71	80	89	98	108	117	126	136	145	154	164	173	182	192	201	210	220	229
2000	59	64	74	84	93	103	113	123	132	142	152	162	171	181	191	201	210	220	230	239

Average values valid for all standard types (approx. ± 5%)
Values in the table refer to the standard material manufcturing types. Different material manufacturing does not have significant variance to the above mentioned values. Controls and actuators weights are not included.

Shut-off - Gas Shut-off Damper

Marine - Oil & Gas Industry

SagiCofim

SDL - SDLT

Torque requirements (Nm) for actuating systems selection

Damper torque

H [height]	W [width]																			
	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
150	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
200	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
300	7	7	7	7	7	7	7	7	7	7	7	7	7	8	8	9	9	10	10	11
400	7	7	7	7	7	7	7	7	7	7	8	9	9	10	11	12	12	13	14	14
500	7	7	7	7	7	7	7	7	8	9	10	11	12	13	14	14	15	16	17	18
600	7	7	7	7	7	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22
700	7	7	7	7	7	8	9	10	11	13	14	15	16	18	19	20	21	23	24	25
800	7	7	7	7	7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29
900	7	7	7	7	8	10	11	13	15	16	18	19	21	23	24	26	28	29	31	32
1000	7	7	7	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36
1100	7	7	7	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
1200	7	7	7	9	11	13	15	17	19	22	24	26	28	30	32	35	37	39	41	43
1300	7	7	7	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47
1400	7	7	8	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
1500	7	7	8	11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51	54
1600	7	7	9	12	14	17	20	23	26	29	32	35	37	40	43	46	49	52	55	58
1700	7	7	9	12	15	18	21	24	28	31	34	37	40	43	46	49	52	55	58	61
1800	7	7	10	13	16	19	23	26	29	32	36	39	42	45	49	52	55	58	62	65
1900	7	7	10	14	17	21	24	27	31	34	38	41	44	48	51	55	58	62	65	68
2000	7	7	11	14	18	22	25	29	32	36	40	43	47	50	54	58	61	65	68	72

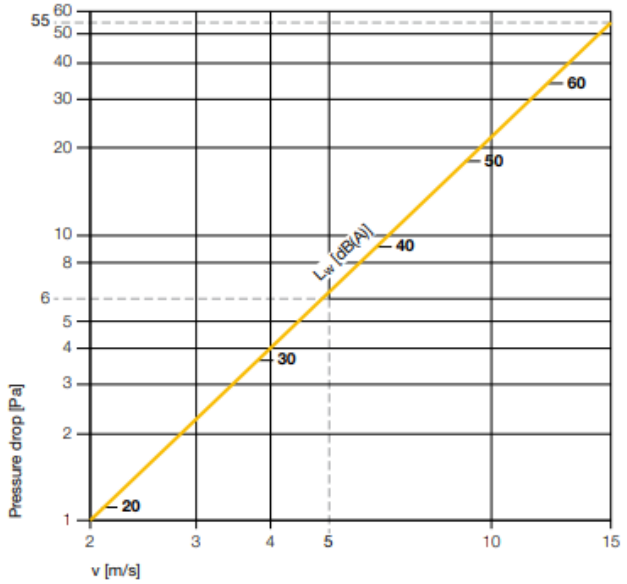
Note: for SDL model, actual required torque value can be up to 20% lower than the above mentioned values.

SDL - SDLT

Performances

Pressure drop and noise level

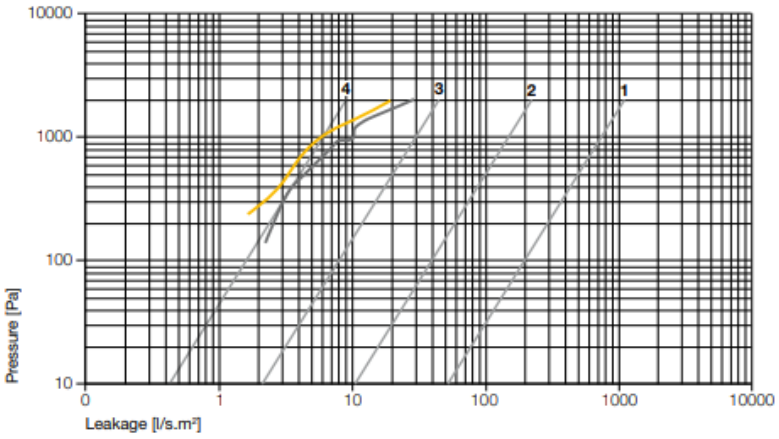
- Max noise level: 60 dB(A)
- Standard pressure drop: 6 Pa
  With damper fully open and air speed of 5 m/s at maximum rate.
- Max pressure drop: 55 Pa
  With damper fully open and air speed of 15 m/s at maximum rate.



SDLT gas leakage according to EN1751

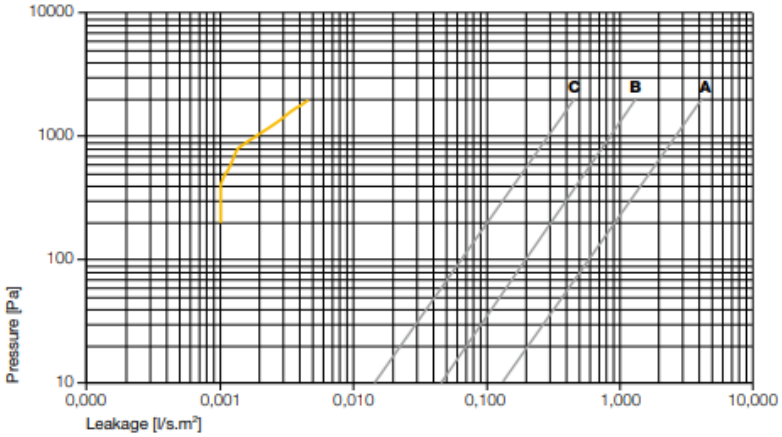
Leakage test across closed blades

Positive pressure
Negative pressure



Leakage test for casing

Positive pressure



Shut-off - Gas Shut-off Damper Marine - Oil & Gas Industry SagiCofim

SDL - SDLT

Damper controls

Type **C 22 - Manual drive**

This damper version is provided with a control handle (C22).
SDL or SDLT + C22 can be used also as a balancing damper; in fact the handle can be fixed in all different positions from fully open to fully closed.
A safety clamp blocks the handle in the selected position.



Manual command



Damper closed



Damper open

Maintenance procedures

Mechanical couplings and electrical connections are tested before shipping.
Maintenance cadence depends by the dampers features (material) and the location where they are installed (fresh air inlet or exhaust duct)
During the damper installation and working life the following advices should be considered:

- Do not distort the frame and blades alignment;
- Check the blades free movement (avoid any solid sediment on shafts near to the bushes);
- Check the presence of extraneous objects inside the damper;
- Only the external damper frame except levers can be painted;
- Do not use cleaning acid liquids or abrasive tools (the hot bath galvanized surface film can be damaged);
- Do not dismantle dampers components;
- Do not modify the electrical connections prearrangement.

Only for fresh air inlet location:

- Lubricate shafts, bushes and levers (use only spray grease, avoid any paste);
- Check sea water corrosion effects on exposed damper surfaces.

Actuator disassembling

- Switch-off the actuator voltage input;
- Screw-out carter protection (if there) front panel;
- Pull out additional limit switches (if there) from the auxiliary shaft;
- Screw-out the metal actuator fixing plate and the remaining parts of the protection carter (if there);
- Pull out the actuator from the drive shaft;
- Insert new actuator and fix it;
- Screw-in carter protection and mount additional limit switches (if there);
- Check damper conditions;
- Restore voltage input.

Shut-off - Gas Shut-off Damper

Marine - Oil & Gas Industry

SagiCofim

SDL - SDLT

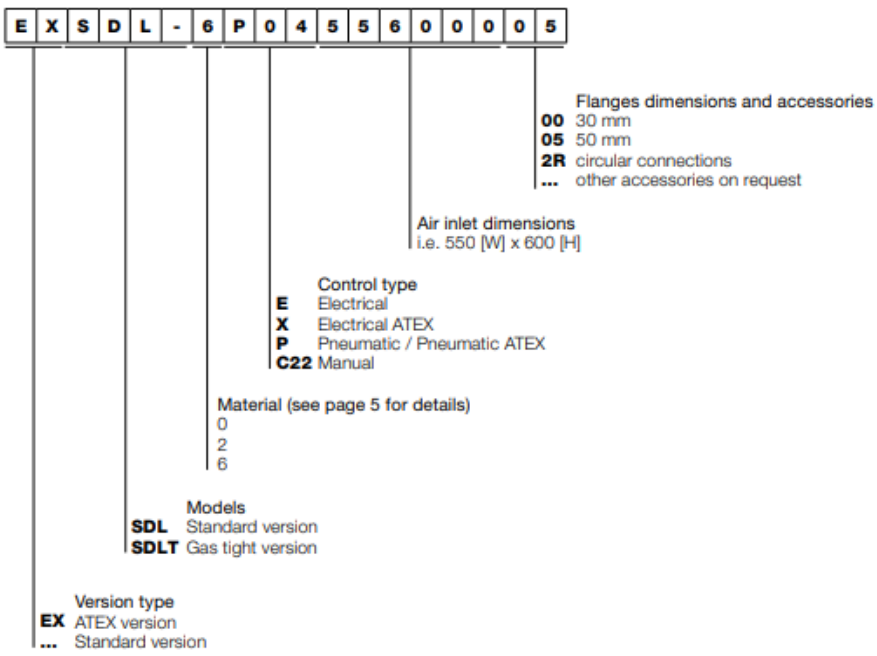
References

Shipyards
Barreras (Spain)
Cantieri Apuania (Italy)
Ferrol (Spain)
Fincantieri (Italy)
Flender Werft (Germany)
Jurong (Singapore)
Keppel Fels (Singapore)
Lloyd Werft (Germany)
Meyer Werft (Germany)
Navantia (Spain)
Rosetti Marino (Italy)
Sembawang (Singapore)
SMOE (Singapore)
STX France (France)
T. Mariotti (Italy)

Owners
Carnival
Corsica Ferries
Costa Crociere
Cunard
Finnlines
Grimaldi Group
Holland America Line
Marina Militare Italiana
Minoan Lines
Norwegian Cruise Line
P&O
Radisson Seven Seas
Renaissance Cruises
Royal Caribbean Cruise Line
Seabourn
Silversea Cruise
Tirrenia

Companies & Contractors
Agip KCO
ATP
Cocono Philips
Eni CONGO
Eni NORGE
ERSAI
Pearl
Petrobras
PTTEP
Saipem
Saudi Aramco
Shell
SOC
Total
Transocean
W.P.

Product code



5.12 DIFFERENTIAL PRESSURE TRANSMITTER

Item TAG: 77-PT-101



SDT
Differential pressure transmitter

Accuracy max ± 0.075%
Range 1 mbar ÷ 20 bar
Hart communication
LCD backlight display
Settings via display
Fast time responsive self-diagnostics
ATEX

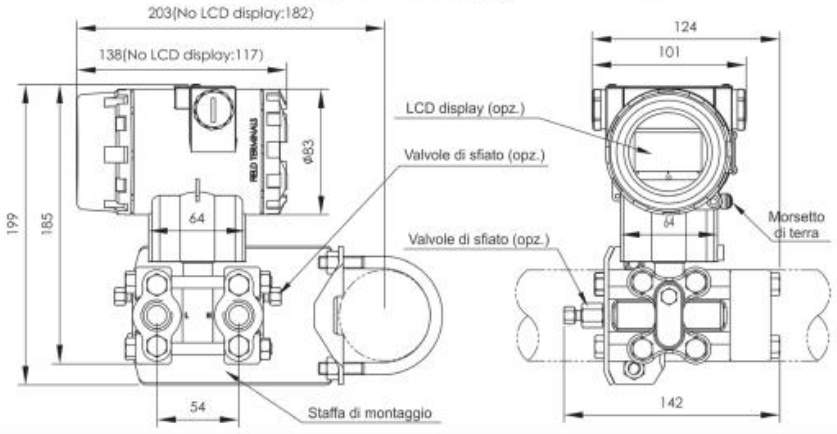
SDT is a differential pressure transmitter with performance at the top of the range and is designed for specific installations in processes where accuracy and stability over time are essential characteristics. Thanks to its technology it measures very low differential pressures from 1 mbar (10 mm H2O). The SDT is fully programmable by means of two external watertight buttons and a matrix backlight display. The programming or modification of the measurement parameters can be carried out in heavy duty ambient conditions without having access to the internal instrument parts thus maintaining the degree of protection IP67.

Technical Feature

Measure range
Differential pressure Max. 0÷20bar (0÷2Mpa); Min. 0÷0.001bar (0÷100Pa)
Accuracy
±0.075; ±0.1 for range A
Analog output resolution
15 bit

Power supply
12÷42Vdc (2-wires)
Communication protocol
HART
Zero and span calibration
onboard buttons
Data display
backlit alphanumeric display

IP rating
IP67
Stability
> ±0.1%FS
Working temperature
-40°÷+85°C
Certificazion
Atex



SDT Differential pressure transmitter

IP67 - Operation temperature: -40 ÷ +85°C
Power supply: 12÷42Vdc (2-wire)
4÷20mA HART

Accuracy	
H	± 0,075% (for range A ± 0,1%)
Measure range	
A	0 - 100Pa ÷ 1kPa (0 - 1 ÷ 10mbar) (0 - 10 ÷ 100 mmH²O) - accuracy ± 0,1%
B	0 - 200Pa ÷ 6kPa (0 - 2 ÷ 60mbar) (0 - 20 ÷ 600 mmH²O)
C	0 - 400Pa ÷ 40kPa (0 - 4 ÷ 400mbar) (0 - 40 ÷ 4000 mmH²O)
D	0 - 2,5kPa ÷ 250kPa (0 - 25 ÷ 2500mbar) (0 - 0,25 ÷ 25 mH²O)
E	0 - 20kPa ÷ 2MPa (0 - 0,2 ÷ 20bar) (0 - 2 ÷ 200 mH²O)
Membrane / filling liquid	
A	SS316L / silicone oil
B	SS316L / fluorinated oil
C	Hastelloy C / silicone oil
D	Hastelloy C / fluorinated oil
E	SS316L gold plated / silicone oil
F	SS316L gold plated/ fluorinated oil
G	SS316L EFP plated / silicone oil
T	Tantalum / silicone oil
Working pressure	
1	16MPa (range A = 7MPa)
2	25MPa (not for range A)
3	40MPa (not for range A)
Process connection	
B	¼" - 18 NPT female SS316 thread with relief valves at the end of the flange
D	¼" - 18 NPT female SS316 thread with relief valve on the lower part of the flange side
N	¼" - 18 NPT female SS316 thread without relief valves
U	¼" - 18 NPT female SS316 thread with relief valve on the upper part of the flange side
Z	Special
Sealed material	
F	Viton (FKM)
N	Perbunan (NBR)
P	Teflon (PTFE)
Special functions	
N	None
O	Degrease cleansing treatment (just with fluorinated oil and Viton seal, max 60°C)
P	Line noise filter
Fixing bracket for panel and pipe mounting (2")	
1	SS304
2	Galvanized carbon steel
N	None
Process connection accessories	
1	SS316 oval-shaped flange with ½" NPT female thread
2	SS316 D-shaped connector with M20x1.5 male thread (welded connection)
N	None
Display	
2	Backlit LCD
N	None
Certification	
A	Intrinsically Safe ATEX II 1/2G Ex ia IIC T4 Ga/Gb
D	Explosion proof ATEX II 2 G D Ex db IIC T4/T5/T6 Gb Ex tb IIIC T80°C/T90°C/T130°C - Ta = -40°C ÷ +60°C
N	None

5.13 TEMPERATURE TRANSMITTER TT

Item TAG: 77-TT-(101/102/103/104)

Product lines: temperature sensor

In order to get a precise temperature sensor in a wide range of different application, it's possible to choose between resistance thermometers and thermocouples. Temperature sensors are also available with temperature transmitter, thermowell and other options, in order to satisfy requirements of every industrial applications.



Resistance thermometers

Resistance thermometers have a platinum sensor element which changes it electrical resistance as a function of temperature.
In our products portfolio are available resistance thermometers with cable and with connection head.
A temperature transmitter can be installed directly in the connection head.
Resistance thermometers are available in classes A, 1/3 DIN, 1/5 DIN and 1/10 DIN in accordance with IEC 60751. They are available also the ATEX versions (Ex ia and Ex d)



Thermocouples (TC)

Thermocouples directly supply a temperature-dependent voltage.
They are particularly suitable for high temperatures.
In our products portfolio are available thermocouples with cable and with connection head.
For thermocouples, the accuracy classes in accordance with IEC 60584-1 or ASTM E230.
The type J, K, N, T, S, E are available in our products portfolio.
A temperature transmitter can be installed in the connection head.
They are available also the ATEX versions (Ex ia and Ex d)



Temperature transmitters

The transmitters for DIN/B head or for DIN rails convert a signal acquired by RTD (with 2, 3 and 4 wire connections) or Thermocouples into a 4 ... 20 mA signal (2 wires technology) or 0 ... 10 VDC signal (3 wires technology). These converters ensure high accuracy on the reading scale with 16-bit conversion and they are available with parameterization via NFC-smartphone App (Android) and with integrated datalogger. Available also the ATEX version (Ex ia) and with galvanic isolation.



Thermowells

Thermowells are available for different applications whether in aggressive or abrasive process media, to prevent direct exposure of their temperature probes to the medium.
Thermowells can be manufactured from solid-body material or from tube sections and can either be screw, weldor flange fitted.
They are available in standard and special versions (stainless steel 1.4571, 316L, Hastelloy® or titanium).

DTP 8180

Data sheet
www.trafag.com

The DTP 8180 is a temperature transmitter with analogue output, 2 switch points and display

Features

- Parameterization also via NFC-smartphone App (Android)
- Display and electrical connection are independently rotatable 335°/343°
- Analogue output switchable mA or V
- Integrated datalogger
- Temperature measuring range adjustable 50, ... 100% of the nominal range

Reference

- IEC 60751



Standard parameters	
Measuring principle	PT 1000, DIN EN 60751 class A, 2 conductors
Measuring range	-50°C ... +150°C / -58°F ... 302°F adjustable 50 ... 100% FS
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, switchable mA or V
Switching output	2 transistors PNP
Accuracy@25°C typ	0.5% FS typ + temperature sensor
Ambient temperature	-25°C ... +85°C
Unit for display	°C, °F, °K, user scale
Logger	Ring buffer: 3518 data points Sampling time: 0.1 ... 999.9 s, Off (0)

TCTT

Data sheet
www.trafag.com

The TCTT is a compact system used to measure liquid and gaseous fluid.
PC configuration allows the user to select range and units, without requiring calibration equipment.

Features

- PC programmable temperature range
- High sensibility
- Free configuration software
- Materials and surface finish quality in accordance with standards of hygenics design

Reference

- EN 60751
- EN 61326



Standard parameters	
Output	Analogue 4 ... 20 mA
Measuring range	-50 ... + 250°C
Ambient temperature	-40 ... +85°C
Protection	IP67
Accuracy	Class AA, 1/5 DIN, 1/10 DIN
Electrical connection	M12x1

T1

Data sheet

RTD and TC with connection head.

The resistance thermometers and thermocouples with connection head offers a wide range of options and features for different applications.

RTD Standard specifications	
Sensing element	PT100, PT1000, NI100, PTC, NTC
Connection wires	Single or Double element, 2, 3 or 4 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, PTFE (1)
Connection head	Mignon, DIN B, DIN A, DIN43650 A, M12x1, AD-PE (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female, CLAMP and other sanitary versions (1)
Stem diameter	From 3 to 12 mm (1)

1) Other RTD versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)

TC Standard specifications	
Sensing element	J, K, N, T, S, E (1)
Connection wires	Single or Double element, 2 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, Ceramic type 610, Alumina type 710, Hastelloy (1)
Connection head	Mignon, DIN B, DIN A, DIN43650 A, AD-PE (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female (1)
Stem diameter	From 1 to 12 mm (1)

1) Other TC versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)



RTD or TC for immersion with connection head, suitable for generical measurements and regulations on plant with low pressures. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD for immersion with AISI 316 sheath suitable for temperature measurement in chemical and food industry with sanitary clamp process connection. The immersed part of the stem have a mirror finishing surface.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC with mineral oxide insulation for immersion with connection head, suitable for generical measurements and regulations on plants with low pressures and with high vibrations. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC for immersion with exchangeble thermometric insert and orientable connection. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



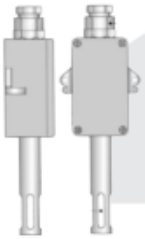
Immersion RTD or TC with exchangeable MgO insulated thermometric insert, orientable connection head and tapered protective sheath for fast response time. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC for immersion with exchangeble thermometric insert (available also in MgO) and orientable connection head. The process connection is realized by means of a 316SS flange and the electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD for immersion suitable for measurements in narrow space on plant with low pressures. The electrical connection is made by a connector EN 175301-803 standard. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges. The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD probe for the measurement of internal room temperatures realized in plastic material, aluminium (for external ambient) or 316SS. Available also with analogic output.



TC for high temperature with ceramic protective tube and connection head. It is possible to select between a 610 ceramic sheath type or a 710 (single or double) alumina sheath type. Available also with analogic output.



Mineral oxide MgO insulated thermocouples.

T2

Data sheet

RTD and TC with cable output.

The resistance thermometers and thermocouples with cable output offers a wide range of options and features for different applications.

RTD Standard specifications	
Sensing element	PT100, PT1000, NI100, PTC, NTC
Connection wires	Single or Double element, 2, 3 or 4 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, PTFE (1)
Type of cable	PVC, Kapton, PTFE / MFA, Silicone, Glass-Fiber (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female, CLAMP and other sanitary versions (1)
Stem diameter	From 3 to 12 mm (1)

1) Other RTD versions are available on request
2) They are available in the ATEX versions (Ex ia)

TC Standard specifications	
Sensing element	J, K, N, T, S, E (1)
Connection wires	Single or Double element, 2 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, Ceramic type 610, Alumina type 710, Hastelloy (1)
Type of cable	PVC, Kapton, PTFE / MFA, Silicone, Glass-Fiber (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female (1)
Stem diameter	From 1 to 12 mm (1)

1) Other TC versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)



Cylindrical RTD or TC with AISI 304 sheath or with AISI 316 sheath insulated with compact magnesium oxide (MgO) suitable for generical measurement.
The output of the cable from the tube is protected with a stainless steeel spring.



Cylindrical RTD or TC with AISI 304 sheath suitable for generical measurements. The probe fixing is realized by means of a threaded nipple welded on the sheath.



RTD or TC with stainless steel sheath suitable for generical measurements.
The probe fixing is realized by means of a brass ring soldered on the tip of the tube; it can be fixed on a surface with a normal screw.
The output cable is protected with a stainless steel spring.



Spring-loaded RTD or TC indicated for measurements into metallic plates; the fixing is by threaded connection with bayonet fitting.



Resistance thermometer suitable for the measurement of the pipe temperatures.
The special design of the aluminium body allow an high thermal exchange with the internal sensing element with a consirable reduction in measuring error. The fixing can be realized by means of a normal clamp.

9 Distributed by trafag sensors controls

Signal converters



The transmitters for DIN/B head convert a signal acquired by temperature probes PT100, PT1000 or Ni100 (with 2-, 3- and 4-wire connections) or Thermocouples into a 4 … 20 mA signal (2-wire technology), current-loop. These converters ensure high accuracy on the reading scale with 16-bit conversion and possibility to rescale the output 4 … 20mA basing on input range. Available also Atex version and with galvanic isolation



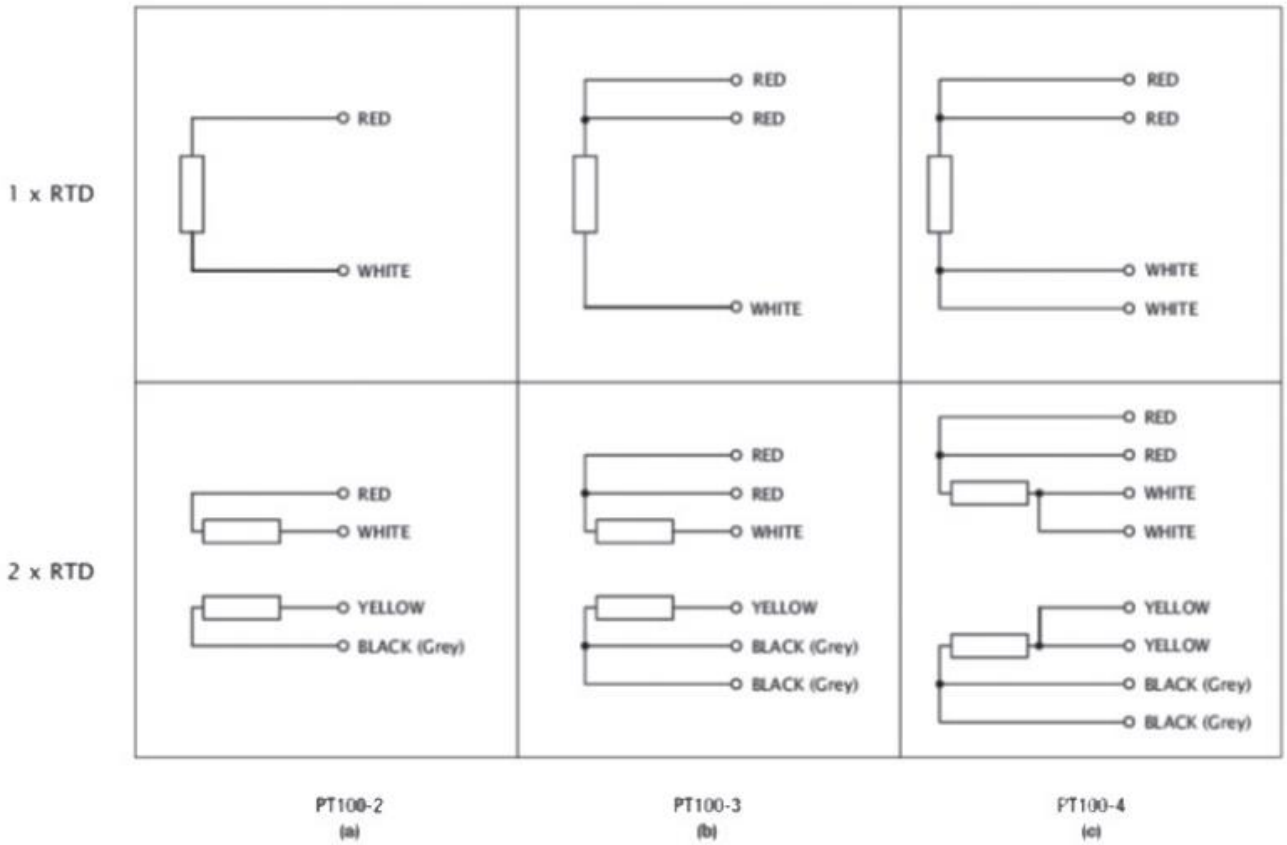
The signal transmitter from DIN rail converts a signal received through probes PT100, Ni100 (with 2-, 3- and 4-wire connections), thermocouples or process signals (0/4 … 20mA, 0 … 10V) into a normalised current signal 4 ... 20 mA (2-wire power loop). The characteristics of these converters ensure high precision on the reading scale with 16 bit conversion and the possibility to rescale the analogue output 4 ... 20 mA according to the input set. The RTD/TC input is galvanically isolated at 2500 V from the analogue output, which ensure safer cables in environment where they may be disturbed or in cases where there different voltages in the same system.

Type of connection for resistance thermometer

a) 2 wires - the two-wire technique is the least precise and is used only in cases where the connection of the thermoresistance is carried out with short and low resistivity wires

b) 3 wires - the three-wire technique is the most used in the industrial field.
With this measurement technique the errors caused by the resistance of the conductors used for the connection of the thermoresistance are eliminated.

c) 4 wires - the technique offers the greatest precision possible but it is almost exclusively used in laboratory applications.



Resistance thermometer type PT100 ohm 0°C (EN 60751)

The resistance thermometers and thermocouples with cable output offers a wide range of options and features for different applications.

Tolerance class	Temperature range of validity		RTD Standard specifications
	Wire wound resistors	Fil resistors	
1/5 DIN	-196 ÷ +600	-50 ÷ +600	(0,1 + 0,0017* |t|)
1/3 DIN	-196 ÷ +600	-50 ÷ +600	(0,15 + 0,002* |t|)
A	-196 ÷ +600	-50 ÷ +600	(0,3 + 0,005* |t|)
B	-196 ÷ +600	-50 ÷ +600	(0,6 + 0,01* |t|)

| t | = Moduls of temperature in °C without regards to the sign

Standard thermocouples

Type	Materials	Temperature range °C	Tolerance values °C
J	Fe-Co	-210 ÷ 800	± 2,5 o 0.0075* |t|
K	Cr-Al	-270 ÷ 1300	± 2,5 o 0.0075* |t|
T	Cu-Co	-270 ÷ 400	± 1 o 0.0075* |t|
S	Pt10%Rh - Pt	-50 ÷ 1800	± 1,5 o 0.0025* |t|

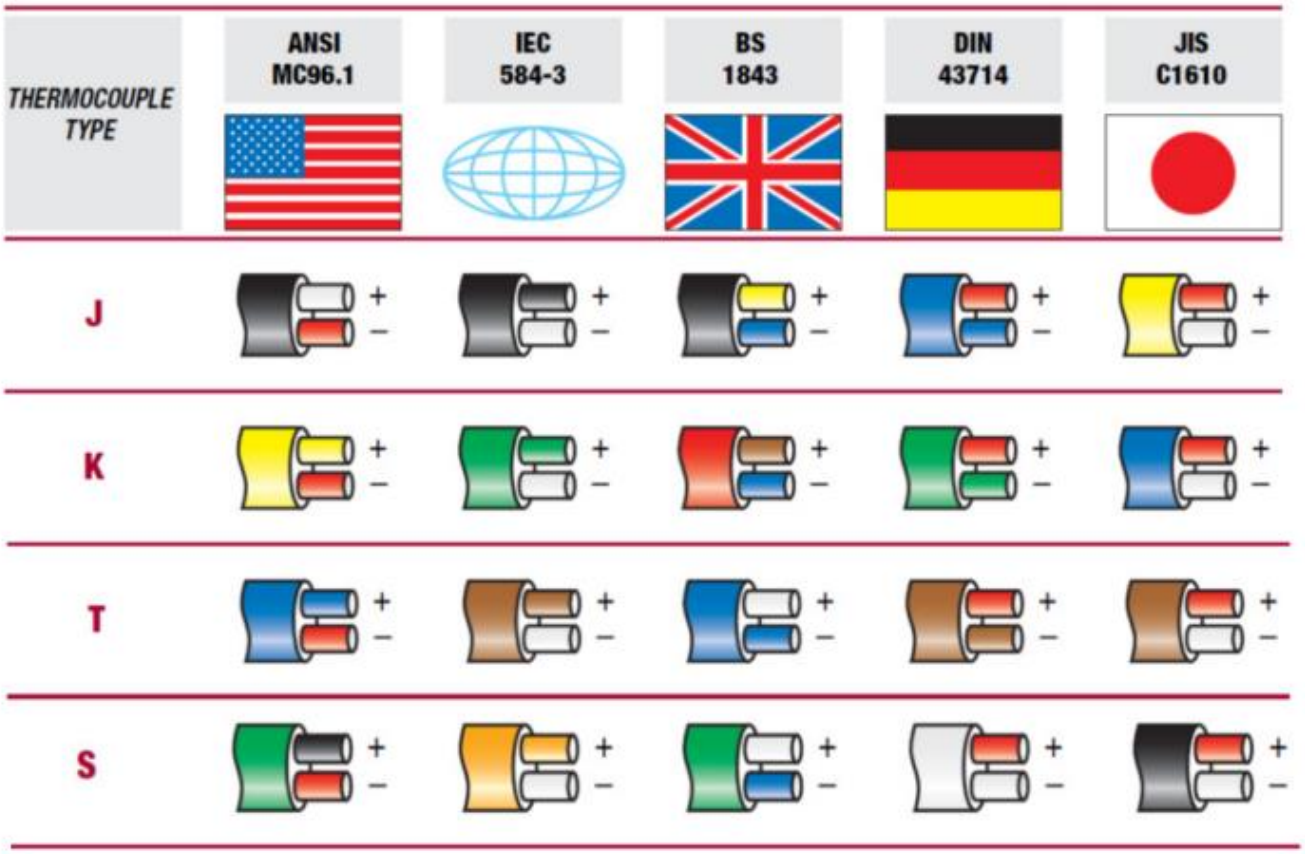
| t | = Moduls of temperature in °C without regards to the sign

Standard cables for temperature sensors

Type	Rh resistance	Temperature range °C	Abrasion resistance
Glass – Fiber	D	-50 ÷ 400	D
Silicone	C	-40 ÷ 200	B
PTFE/ MFA	A	-200 ÷ 250	A
PVC	B	-20 ÷ 105	B
Kapton	B	-200 ÷ 400	B

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Standard color coding of compensating cables



5.14 FIRE AND GAS DAMPER WITH ACTUATOR

Item TAG: HFD-(77001/77002/77003)

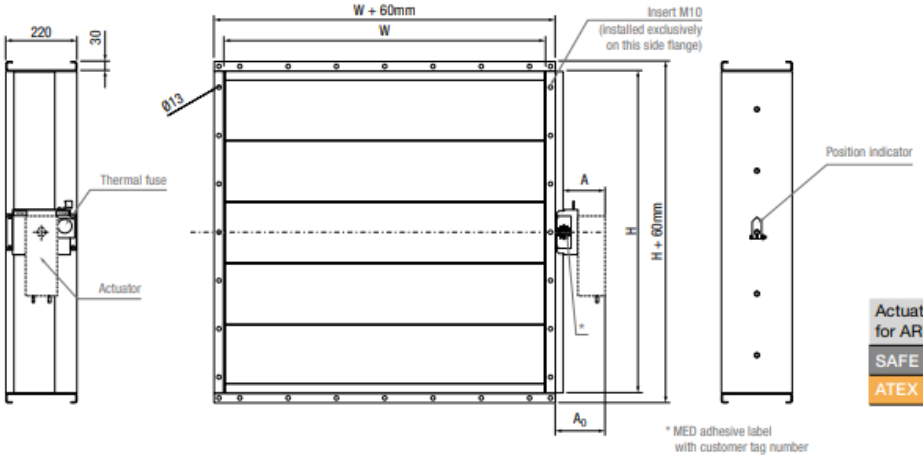
Technical data
SOLAS A0 frame 220mm
SAFE AREA - ATEX AREA

Features	
Dimensional range	from 150x150mm to 1000x1000mm step 50mm
Flange	Standard 30mm On request 50mm
Operating temperature range	-40°C / +50°C
Operating air velocity (damper in working condition)	12m/s max
Peak limits (sporadic and for a few seconds)	P=2500Pa, v=18m/s
Leakage Class acc. to EN 1751	Standard 2B On request 3C

		Version **3 (220GW)**	Version **4 (2206W)**
Description		**Material**	
Casing (riveted)		hot dip galv. steel - tk. 3mm	AISI316L - tk. 3mm
Blades		galv. steel Z200 double skin 1.2mm+1.2mm fiber glass gasket*	AISI316L double skin 1.2mm+1.2mm fiber glass gasket*
Shafts		AISI316 - Ø12mm	AISI316 - Ø12mm
Bushes		bronze self lub. - Ø12mm	bronze self lub. - Ø12mm
Actuator for	SAFE AREA	Belimo BF - Schischek InMax	Belimo BF - Schischek InMax
	ATEX AREA	Schischek ExMax - RedMax	Schischek ExMax - RedMax

** Non-classified SVF, 20x5mm*

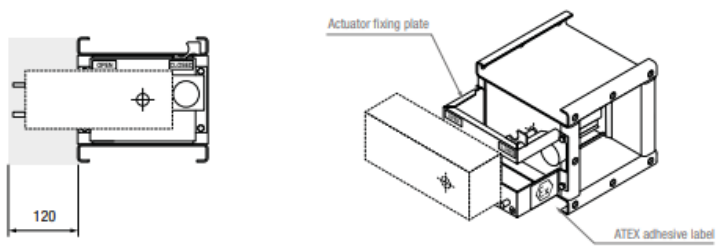
ACTUATOR MOUNTED VERTICALLY FOR H>250mm



Actuator for AREA	A [mm]	A_0 [mm]
SAFE	110	135
ATEX	130	155

Drilling scheme, see pag. 10

ACTUATOR MOUNTED HORIZONTALLY FOR H ≤250mm



S-LFD Fire and Gas-Fire Damper SOLAS A0-A60

SagiCofim

Dimensions and Weights

frame 220mm

H [mm]	W [mm]																	
	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
150	7,5	8,5	9,5	10,5	11,5	12,5	13,5	14,4	15,4	16,4	17,4	18,4	19,3	20,3	21,3	22,3	23,3	24,3
200	8,6	9,6	10,6	11,7	12,7	13,7	14,8	15,8	16,8	17,9	18,9	19,9	21,0	22,0	23,0	24,1	25,1	26,1
250	9,4	10,5	11,5	12,5	13,6	14,6	15,6	16,7	17,7	18,7	19,8	20,8	21,8	22,8	23,9	24,9	25,9	27,0
300	11,0	12,1	13,3	14,5	15,6	16,8	18,0	19,1	20,3	21,5	22,6	23,8	25,0	26,1	27,3	28,5	29,6	30,8
350	12,0	13,2	14,4	15,6	16,8	18,0	19,2	20,4	21,6	22,9	24,1	25,3	26,5	27,7	28,9	30,1	31,3	32,5
400	12,9	14,2	15,5	16,7	18,0	19,2	20,5	21,7	23,0	24,3	25,5	26,8	28,0	29,3	30,5	31,8	33,0	34,3
450	14,3	15,6	17,0	18,3	19,6	21,0	22,3	23,6	24,9	26,3	27,6	28,9	30,3	31,6	32,9	34,3	35,6	36,9
500	15,3	16,7	18,1	19,4	20,8	22,2	23,6	24,9	26,3	27,7	29,0	30,4	31,8	33,2	34,5	35,9	37,3	38,7
550	16,3	17,7	19,1	20,6	22,0	23,4	24,8	26,2	27,7	29,1	30,5	31,9	33,3	34,8	36,2	37,6	39,0	40,4
600	17,3	18,7	20,2	21,7	23,1	24,6	26,1	27,5	29,0	30,5	31,9	33,4	34,9	36,3	37,8	39,3	40,7	42,2
650	18,6	20,2	21,7	23,3	24,8	26,3	27,9	29,4	31,0	32,5	34,0	35,6	37,1	38,6	40,2	41,7	43,3	44,8
700	19,6	21,2	22,8	24,4	26,0	27,6	29,1	30,7	32,3	33,9	35,5	37,1	38,6	40,2	41,8	43,4	45,0	46,6
750	20,6	22,3	23,9	25,5	27,1	28,8	30,4	32,0	33,7	35,3	36,9	38,5	40,2	41,8	43,4	45,1	46,7	48,3
800	21,6	23,3	25,0	26,6	28,3	30,0	31,7	33,3	35,0	36,7	38,4	40,0	41,7	43,4	45,1	46,7	48,4	50,1
850	23,0	24,7	26,5	28,2	30,0	31,7	33,5	35,2	37,0	38,7	40,5	42,2	44,0	45,7	47,4	49,2	50,9	52,7
900	24,0	25,8	27,6	29,3	31,1	32,9	34,7	36,5	38,3	40,1	41,9	43,7	45,5	47,3	49,1	50,9	52,7	54,5
950	25,0	26,8	28,6	30,5	32,3	34,1	36,0	37,8	39,7	41,5	43,3	45,2	47,0	48,9	50,7	52,5	54,4	56,2
1000	25,9	27,8	29,7	31,6	33,5	35,4	37,2	39,1	41,0	42,9	44,8	46,7	48,6	50,4	52,3	54,2	56,1	58,0
	Weight* [Kg]																	

* tollerance ± 10%

Actuator weights:

- BELIMO BF... 18Nm = 3,1Kg
- SCHISCHEK ExMax 15Nm = 3,5Kg

Electrical actuator
SCHISCHEK

Description		On-off 3-pos., spring-return, 2 micro switches, IP66
Torque		15Nm
Power		24...240VAC/DC (at rest 5W)
Angle of rotation		95°
Running time	(M)	3s / 15s / 30s / 60s / 120s
		3s / 10s
Dimensions (LxWxH)		210x95x80mm
Shaft		square 12x12mm

..Pro-TT



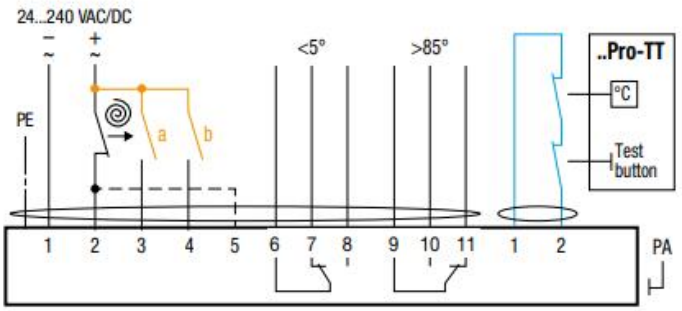
Safety temperature trigger
Thermal fuse
(Available for 72-95°C)

Model	InMax 15-BF	RedMax 15-BF	ExMax 15-BF
			
Zone	SAFE AREA	ATEX AREA ZONE 2, 22 GAS + DUST	ATEX AREA ZONE 1, 2, 21, 22 GAS + DUST

ELECTRICAL INSTALLATION

For 3-pos variation: add orange connection (a and b on 3 and 4)
For standard wiring: Spring return in 10s
For additional wiring on terminal 5: Spring return in 3s

On-off / 3 pos. - spring return + tripping circuit



5.15 JUNCTION BOXES

Casse di derivazione CDE
CDE junction boxes

Cieca
Blind



Struttura
lamiera d'acciaio sp. 10/10 verniciata RAL 7035 bucciato.

Coperchio o porta incernierata
verniciati RAL 7035 bucciato con guarnizione in colata continua.

Composizione
Struttura, porta o coperchio, confezione di viteria.

Grado di resistenza meccanica secondo IEC EN 62208: IK10

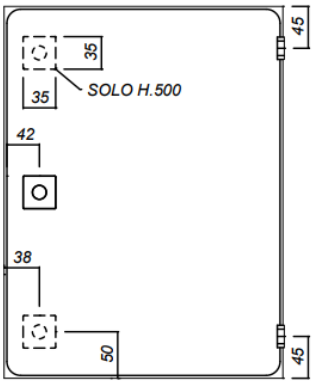
Structure
10/10 thick steel sheet, painted textured RAL 7035.

Cover or hinged door
Painted textured RAL 7035, provided with a gasket applied in continuous casting.

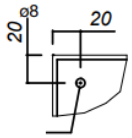
Composition
Structure, door or cover, set of accessories and screws for assembly.

Mechanical resistance degree as per IEC EN 62208: IK10

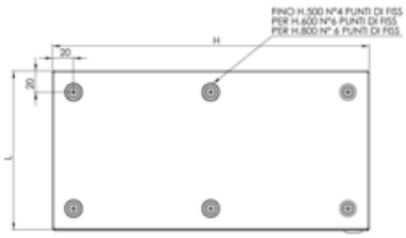
IP66 IP55

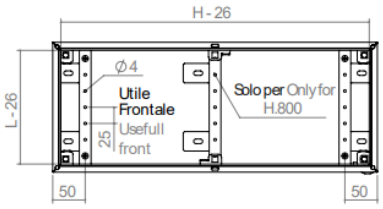


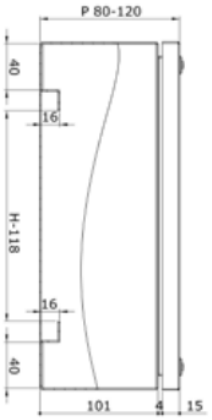
CASSA SENZA FLANGE IP 66 SODDISFA TYPE 4 BOX WITHOUT FLANGES IP 66 COMPLIES WITH TYPE 4	CASSA CON COPERCHIO INCERNERATO IP 55 SODDISFA TYPE 12 BOX WITH HINGED COVER IP 55 COMPLIES WITH TYPE 12	DIMENSIONE DIMENSIONS ALTEZZA, H HEIGHT, H	LARGHEZZA, L WIDTH, L	PROFONDITÀ, P DEPTH, P
R5CDE1180	-	150	150	80
R5CDE9180	-	180	150	80
R5CDE2980	-	200	180	80
R5CDE2280	R5CDE2280C	200	200	80
R5CDE3180	-	300	150	80
R5CDE3280	R5CDE3280C	300	200	80
R5CDE4280	R5CDE4280C	400	200	80
R5CDE6280	-	600	200	80
R5CDE8280	-	800	200	80
R5CDE11120	-	150	150	120
R5CDE22120	R5CDE22120C	200	200	120
R5CDE31120	-	300	150	120
R5CDE32120	R5CDE32120C	300	200	120
R5CDE33120	R5CDE33120C	300	300	120
R5CDE42120	R5CDE42120C	400	200	120
R5CDE43120	R5CDE43120C	400	300	120



R5CDE44120	-	400	400	120
R5CDE52120	**R5CDE52120C**	500	200	120
R5CDE53120	-	500	300	120
R5CDE62120	-	600	200	120
R5CDE63120	-	600	300	120
R5CDE64120	-	600	400	120
R5CDE82120	-	800	200	120
R5CDE84120	-	800	400	120







5.16 CAVO SCALDANTE

etelec electrical technology

SCHEDA TECNICA **HTC-P**



DESCRIZIONE ESTESA

Cavo scaldante a potenza autoregolante per tutte le applicazioni fino a 65°C per contatto continuo e fino a 85 °C per contatto intermittente.

Applicazioni:

- protezione antigelo di tubazioni e serbatoi industriali contenenti liquidi e gas;
- mantenimento in temperatura e riscaldamento di tubazioni e serbatoi industriali contenenti liquidi e gas;
- tracciamento di tetti e grondaie;
- tracciamento superfici non carrabili.

GAMMA DI PRODOTTO				
Famiglia		Cavi Scaldanti		
Serie		HTC-P		
Codice Metel		**HTC10P**	**HTC15P**	**HTC25P**
Nome commerciale		**HTC-10P**	**HTC-15P**	**HTC-25P**

INFORMAZIONI DIMENSIONALI		
Dimensioni sezione cavo	mm	11,5 x 6,3
Min. raggio di curvatura	mm	40
Sezione conduttori	mm^2 | AWG	0,8 | 18
Peso	kg/m	0,13

INFORMAZIONI FISICHE		
Materiale conduttori		Rame
Materiale matrice		Autoregolante
Materiale isolante primario		Poliolefina modificata
Materiale calza metallica		Rame stagnato
Materiale rivestimento esterno		Poliolefina reticolata
Halogen Free	(F), (Cl), (Br), (I), (At)	Si
Lead Free	Pb	Si

INFORMAZIONI TECNICHE				
		HTC10P	**HTC15P**	**HTC25P**
Potenza nominale a 10 °C	W/m	10	15	25
Potenza massima a 0°C	W/m	12	18	28
Temperatura massima di contatto	°C	65	Cavo alimentato	
Temperatura massima di contatto	°C	85	Cavo non alimentato	
Classe Temperatura		T6		
Temperatura minima di utilizzo	°C	- 40		
Alimentazione	V	230		
Resistenza elettrica della schermatura	Ω/m	0,018		
Resistenza all'acqua	%	100		

CONFORMITA' DI PRODOTTO E DI SISTEMA			
Norme di riferimento		EN 62395	
Conformità		EN 62395	
Comportamento al fuoco		n.a.	
Classificazione ETIM	Ver. 7.0	EC000339	
Grado di isolamento		IP66	EN60529

INFORMAZIONI DI SICUREZZA	
Prodotto tossico	No
Prodotto pericoloso	No
Conformità CLP (Regolamento 1272/2008/CE)	n.a.

INFORMAZIONI LOGISTICHE

Codice	Q.tà (m)	Dimensioni (m)	Peso (kg)	Barcode
HTC10P	300	0,45 x 0,45 x 0,45	40	8053323900085
HTC15P	300	0,45 x 0,45 x 0,45	40	8053323900092
HTC25P	300	0,45 x 0,45 x 0,45	40	8053323900115

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5.17 PIPE

DESCRIPTION	CHARACTERISTICS
PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 50 mm
	INTERNAL DIAMETER : 40,8 mm
	PN RATING : 20
	MAX OPERATIONAL PRESSURE (at 20°C) : 20 bar (290 psi)

PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 50 mm
	INTERNAL DIAMETER : 42,6 mm
	PN RATING : 16
	MAX OPERATIONAL PRESSURE (at 20°C) : 16 bar (232 psi)

PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 25 mm
	INTERNAL DIAMETER : 21,2 mm
	PN RATING : 16
	MAX OPERATIONAL PRESSURE (at 20°C) : 16 bar (232 psi)

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5.18 ELECTRICAL CLAMP

DESCRIPTION	CHARACTERISTICS
ELECTRICAL CLAMP	COD. : ETQ76290N
	MATERIAL : NYLON (PA6.6)
	COLOR : BLACK
	LENGTH : 300 mm
	WIDTH : 7,6 mm
	TENSILE STRENGTH : 54 daN
	SELF-EXTINGUISHING CLASS : UL 94 - V 2

ELECTRICAL CLAMP	COD. : ETQ25100N
	MATERIAL : NYLON (PA6.6)
	COLOR : BLACK
	LENGTH : 100 mm
	WIDTH : 2,5 mm
	TENSILE STRENGTH : 8 daN
	SELF-EXTINGUISHING CLASS : UL 94 - V 2

Base Load Power Hub (BLPH)

HVAC System

B-200 LV Switch Room

Component List and DS

Document Number:1724000049-HV-LIS-00048

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	26/03/25

Document Class: 3

03	10/03/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
02	22/01/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
01	29/10/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.
00	20/07/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.
Rev.	Date	Description	Prepared	Reviewed	Approved

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)
02	Issue for Information (IFI)
03	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.2 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

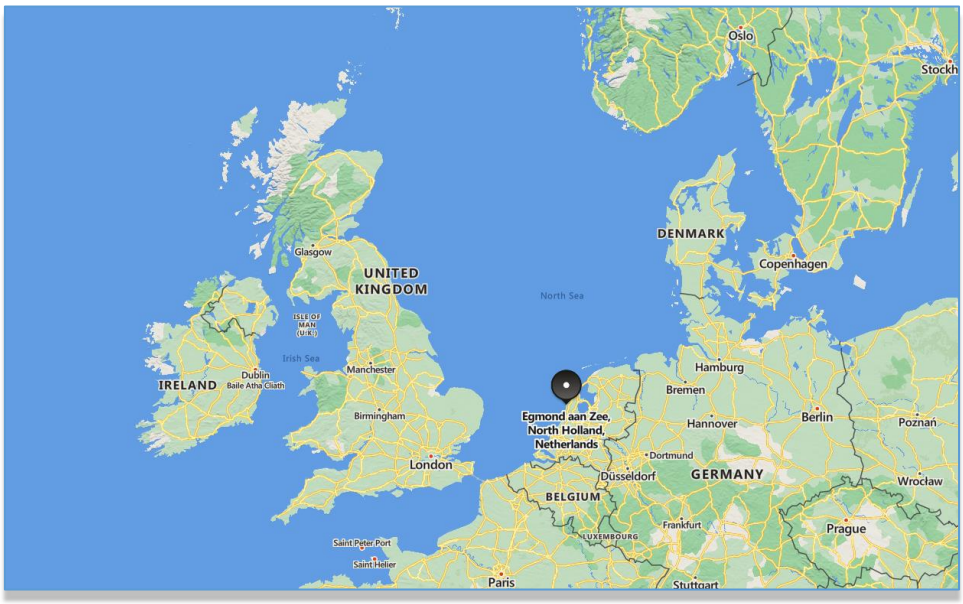


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

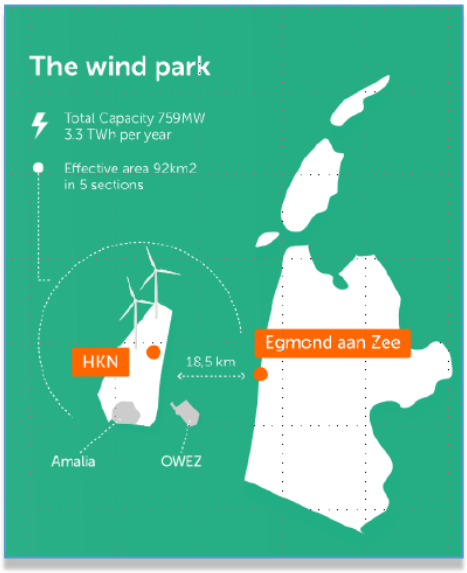


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.3 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

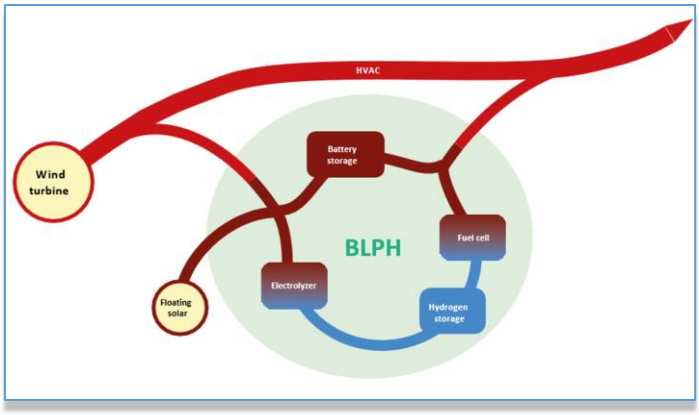


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own indepenent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

Scope of the document is to collect the main equipment technical data sheet relevant to the HVAC system provided for Hollandse Kust Noord Wind Park Project

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

3 INTRODUCTION

3.1 SCOPE OF WORK

Scope of the document is to collect the main equipment technical data sheet relevant to the HVAC system provided for Hollandse Kust Noord Wind Park Project

4 MAIN PACKAGE HVAC UNIT

Main unit data for HHU-77003 and HHU-77004

4.1 MAIN UNIT DATA

Description	Unit measure	Value
Type of unit	-	Pressurising Unit
Package unit model	-	4112-DMPD-300
Configuration	-	no.1 Duty + no.1 Stand-By
Total cooling capacity	kW	n.a.
Sensible cooling capacity	kW	n.a.
Heating capacity	kW	8.5
Outdoor design temperature & humidity	°C (D.B.)	Summer: +25°C (D.B.) Rh90%
	-	Winter: -8.4°C (D.B.) Rh 100%
Air flow rate - Supply	m^3/h	1226
Air flow rate - Return	m^3/h	n.a.
Air flow rate – Fresh air	m^3/h	1226
External static pressure	Pa	800
Refrigerant	-	n.a.
Length x Width x Height (external unit)	mm	1250x700x820
Weight	kg	155
Number of compressors	-	n.a.

Supply air duct connection (50mm flange)	mm	400x310
Fresh air duct connection (50mm flange)	mm	500x510
Return air open	mm	n.a.
Panel and thermal insulation (Material – Tk)	mm	n.a.
Materials on main base frame	-	Inox 316L
Materials on internal panel skin	-	n.a.
Materials on external panel skin	-	Inox 316L
Execution	-	Safe zone

4.2 SUPPLY FAN & MOTOR DATA

Description	Unit measure	Value
Type	-	RM280/2
Manufacturer	-	Moro
Casing material	-	Galvanized steel
Weight	kg	30
Air flow rate	m^3/h	1405
Nominal static pressure	Pa	800
Nominal total pressure	Pa	835
Fan power consumption	kW	1.1
Fan speed	rpm	2890
Impeller type	-	Forward
Earthing boss	-	Yes
Drive arrangement	-	Direct
Fan pulley	Ø (mm)	n.a.
Motor fan pulley	Ø (mm)	n.a.
Belt type and quantity	-	n.a.
Manufacturer	-	Moro
Nominal motor power	kW	1.1
Winding configuration	-	DOL
Motor speed	Rpm	2890
Nominal current	A	2.3

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Description	Unit measure	Value
Starting current	A	15
Electrical supply	V / Ph / Hz	400 / 3 / 60
IP rating	-	IP55
Execution	-	Safe zone

4.3 ELECTRICAL HEATING COIL DATA

Description	Unit measure	Value
Frame	-	AISI 316 L
Dimension	mm	400 X 310
Heater depth	mm	150
Heating capacity – 1st step	kW	8.5
Absorbed current – 1st step	A	13.2
Heating capacity – 2nd step	kW	n.a.
Absorbed current – 2nd step	A	n.a.
Power supply	-	400 V 3 PH 50HZ
Safety accessories	-	THERMOSTATE ON BOARD
Manufacturer	-	Diamanti

4.4 FILTER DATA

Primary filter		
Filter type	-	G4 (EN779)
Filter section size (Q.ty - W x H x tkh)	no. / mm	1
		593x593x48
Pressure drop (clean filter)	Pa	65
Final pressure drop (dirty filter)	Pa	97

Manufacturer	-	F&F
Model	-	FCZ-OS4
Secondary filter		
Filter type	-	F7 (EN779)
Filter section size (Q.ty - W x H x THK)	no. / mm	1 593x593x98
Pressure drops (clean filter)	Pa	85
Final pressure drops (dirty filter)	Pa	102
Manufacturer	-	F&F
Model	-	PFM4-8-23.23

4.5 COALESCENT FILTER DATA

Coalescent filter		
Manufacturer		EuropAir
Filter type	-	SG41R-X
Filter section size (Q.ty - W x H x tkh)	no. / mm	1 500x500x170
Pressure drop (clean filter)	Pa	50
Final pressure drop (dirty filter)	Pa	75

5 ATTACHMENTS

5.1 VOLUME CONTROL DAMPERS

Item TAG : HDB-77-NNN

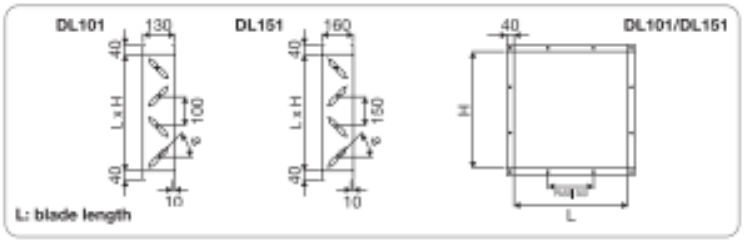
Volume control dampers in galvanised steel

EUROPAIR TECHNOLOGY

Air flow control

DL 101





DL 151



Description

- Galvanised steel frame th. 10/10 Z200, depth 130 mm, 40 mm flange with Ø 8 mm holes in the middle, pitch 300 mm
- "Double Skin" aerofoil blades in galvanised steel th. 0.6+0.6 Z200, pitch 100 mm
- External control linkages in galvanised steel
- Sprung side seal
- Drive shaft Ø 12 mm L = 100 mm
- Nylon bearings, temp. -20°C / +70°C
- **Leakage class 1/A EN 1751**

Available execution (see page 11)

- Intermediate dimensions (larger sizes price list +€52)
- Execution with leakage class 3B EN 1751 (price list +€35 per blade)
- Frame 15/10 (list price x1.5) / frame 20/10 (list price x1.5) / frame 30/10 (list price x2)
- In 304 STAINLESS STEEL (list price x3)
- In 316L STAINLESS STEEL (list price x3.5)

ATEX execution: II 2G Ex h IIB/IIC T1...T6Gb
II 2D Ex h IIIC T 450°C...T 85°C Db (list price +40% +€120 each)

Accessories (see page 10)

- Galvanised manual drives (R11 up to 1 sqm €15) - (R12 over €21)
- Electric actuators / Pneumatic cylinder
- Atex actuators (see page 12)

Description

- Galvanised steel frame th. 15/10 Z200, prof. 160 mm, 40 mm flanges with Ø 8 mm holes in the middle, pitch 300 mm
- "Double Skin" aerofoil blades in galvanised steel th. 0.8+0.8 Z200, pitch 150 mm
- External control linkages in galvanised steel
- Sprung side seal
- Drive shaft Ø 12 mm L = 100 mm
- Nylon bearings, temp. -20°C / +70°C
- **Leakage class 2/B EN 1751**

Available execution (see page 11)

- Intermediate dimensions (larger sizes price list +€52)
- Frame 20/10 (list price x1.5) / frame 30/10 (list price x2)
- In 304 STAINLESS STEEL (list price x3)
- In 316L STAINLESS STEEL (list price x3.5)

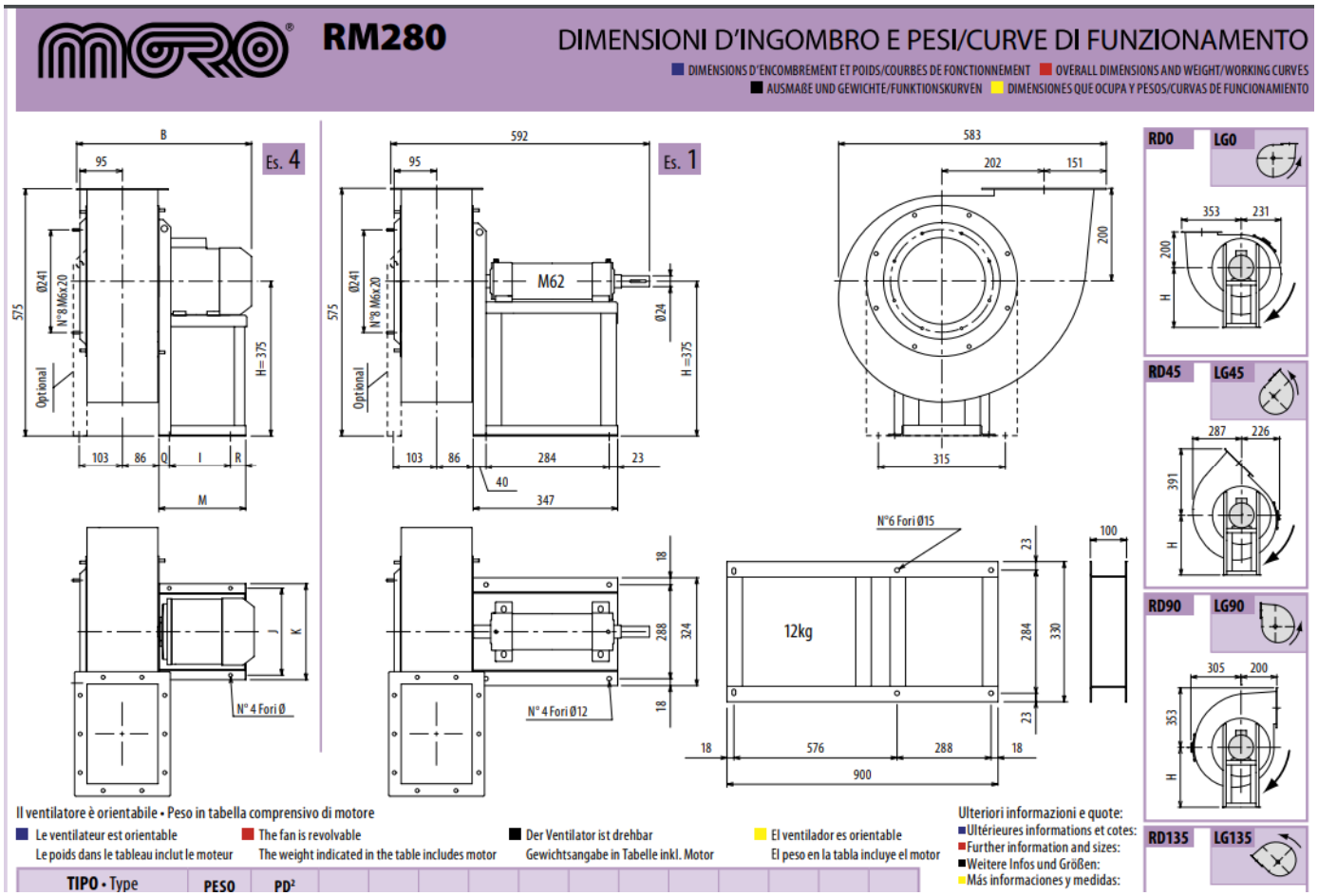
ATEX execution: II 2G Ex h IIB/IIC T1...T6Gb
II 2D Ex h IIIC T 450°C...T 85°C Db (list price +40% +€120 each)

Accessories (see page 10)

- Galvanised manual drives (R11 up to 1 sqm €15) - (R12 over €21)
- Electric actuators/ Pneumatic cylinder
- Atex actuators (see page 12)

5.2 PRESSURIZING FAN

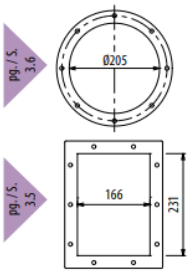
Item TAG: HFA-77-NNN

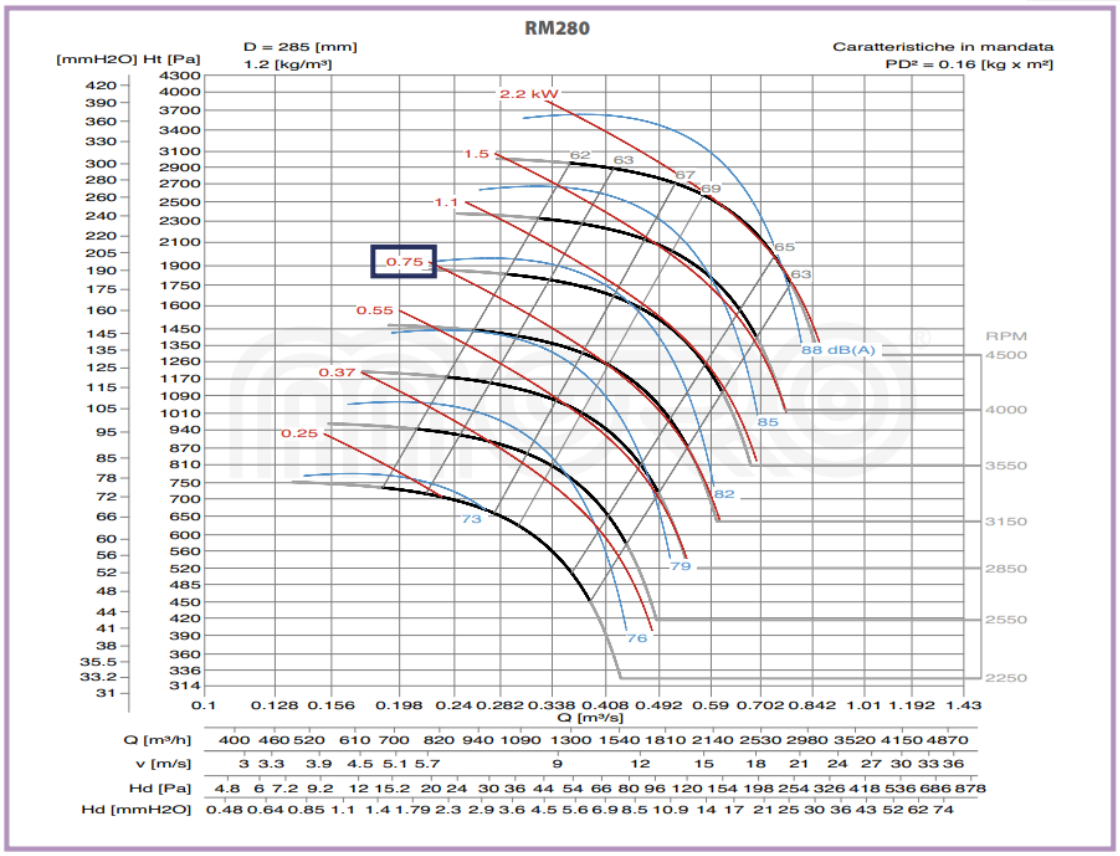


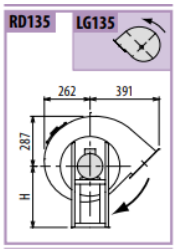
Le ventilateur est orientable — Le poids dans le tableau inclut le moteur
The fan is revolvable — The weight indicated in the table includes motor
Der Ventilator ist drehbar — Gewichtsangabe in Tabelle inkl. Motor
El ventilador es orientable — El peso en la tabla incluye el motor

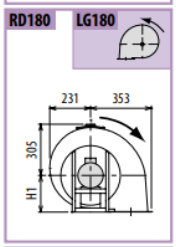
TIPO • Type		PESO Weight	PD²											
VENTILATORE Fan	MOTORE Motor	Kg	Kgf x m²	B	I	H	H1	H2	J	K	M	Q	R	Ø
RM280/2R	71 B2	30	0,15	414	121	375	200	375	203	225	196	49	26	10
RM280/2	80 A2	35	0,16	438	121	375	200	375	203	225	217	48	48	10
RM280/T		40	0,16			375	200	375						

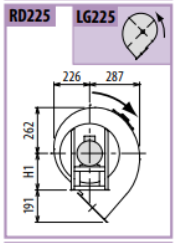
Ultérieures informations et cotes:
Further information and sizes:
Weitere Infos und Größen:
Más informaciones y medidas:

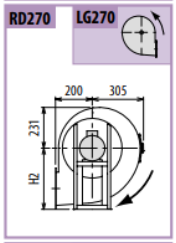


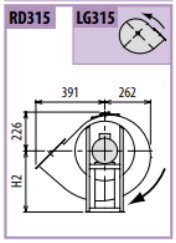












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5.3 ACTUATORS WITH SPRING RETURN

Item TAG: HDZ-77-NNN

ACTUATOR WITH SPRING RETURN

| DA03S... |



TYPE OVERVIEW

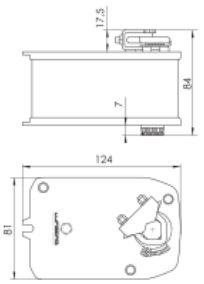
Torque	Controls	Damper surface	Voltage	Auxiliary switches	Weight	Type
3Nm	On/off	< 0,5 m² *	24V AC/DC	-	0,98 kg	DA03S24
				2SPDT**	1,08 kg	DA03S24S
	Modulating			-	1,02 kg	DA03S24P
				2 SPDT**	1,07 kg	DA03S24PS
	On/off		230V AC	-	0,99 kg	DA03S220
				2 SPDT**	1,09 kg	DA03S220S

TECHNICAL SPECIFICATION

Type	DA03S24 (S)	DA03S24P (S)	DA03S220 (S)
Torque	3 Nm		
Running time - motor/spring return	50 -70s / < 30s	50 -70s / < 30s	50 -70s / < 30s
Controls	on/off	0 -10V	on/off
Voltage	24V AC/DC	24V AC/DC	230V AC
Frequency	50/60Hz (AC)		
Power consumption			
- in operation	2,5W	2,5W	2,5W
- at rest	1,6W	1,6W	1,6W
- for wire sizing	10,0VA	7,0VA	10,0VA
Angle of rotation	-5°~90°		
- setting	45°~90° (5° step)		
Direction of rotation	can be selected by mounting L/R		
Sound power level - motor/spring return	<50 dB(A) / <65 dB(A)		
Position feedback	-	0 - 10V DC	-
Electrical connection	1m cable		
Auxiliary switches	3 (1.5)A, 230V		
Degree of protection	IP54		
Protection class	III low voltage	III low voltage	II
Ambient humidity	95% RH, without condensation		
Ambient temperature	-30~+50 °C		
Non-operating temperature	-40~+70 °C		
Service life	60 000 emergency positions		
Mechanical connection			
- round shaft	from ø6 to ø12mm		
- square shaft	from 5×5 to 8×8 mm		
Manual override	not possible		
Norms and standards	Declaration of conformity, ISO, CE, EAC		

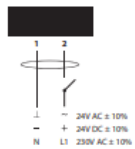
* Maximum damper surface is calculated for optimum conditions (without the influence of air flow, pressure difference, etc.).
** SPDT (Single-Pole Double-Throw)

DIMENSIONS (mm)

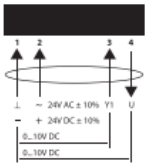


ELECTRIC INSTALATION

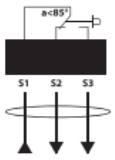
On/off



Modulating



Auxiliary switches



5.4 SUPPLY GRILLE

Item TAG: HSG-77-201/202

BMAI



CARATTERISTICHE:
Bocchette industriali a grande portata ad alette regolabili passo 50 mm.

COSTRUZIONE:
Alluminio anodizzato.

IMPIEGO:
A parete, in mandata.

FISSAGGIO:
Fissaggio con clips o viti frontali su richiesta.

ACCESSORI:
- Serranda di taratura in acciaio zincato con alette a movimento contrapposto.
- Controtelaio di montaggio in lamiera di acciaio zincata.
- Plenum in acciaio zincato standard o isolato.

CHARACTERISTICS:
High volume industrial grilles with adjustable blades 50 mm pitch.

CONSTRUCTION:
Anodized aluminium.

UTILIZATION:
For wall installation and for air delivery.

FIXING:
Fixing by clips or frontal screws on request.

- Calibration damper made of galvanized steel and fins with opposite movement.
- Mounting counterframes made of galvanized steel sheet.
- Galvanized steel plenum, standard or insulated.

PREZZI - PRICES

BxH	BMAIV	BMAIO	BMAIVO BMAIOV	SCAI SINGOLO FILARE SINGLE ROW	SCI DOPPIO FILARE DOUBLE ROW	CTP
mm	€	€	€	€	€	€
500x200						
600x200						
700x200						
800x200						
• 900x200						
• 1000x200						
• 1200x200						
• 1400x200						
• 1800x200						
500x300						
600x300						
700x300						
800x300						
• 900x300						
• 1000x300						
• 1200x300						
• 1400x300						
• 1500x300						
• 1800x300						
• 500x400						
600x400						
700x400						
• 800x400						
• 900x400						
• 1000x400						
• 1200x400						
• 1400x400						
• 1500x400						
• 1800x400						
• 2000x400						
500x500						
600x500						
700x500						
• 800x500						
• 900x500						
• 1000x500						
• 1200x500						
• 1400x500						
• 1500x500						
• 1800x500						
• 2000x500						
600x600						
• 800x600						
• 900x600						
• 1000x600						

5.5 RETURN GRILLE

Item TAG: HEG-77-201

GRAI



CARATTERISTICHE:
Griglie di ripresa industriali ad alette fisse inclinate di 45° passo 60 mm.

COSTRUZIONE:
Alluminio anodizzato.

IMPIEGO:
A parete, per presa aria esterna o espulsione.

FISSAGGIO:
Fissaggio con clips o viti frontali a richiesta.

ACCESSORI:
- Serranda di taratura in acciaio zincato con alette a movimento contrapposto.
- Controtelaio di montaggio in lamiera di acciaio zincata.
- Rete antivolatile.
- Serranda di sovrappressione a gravità.

CHARACTERISTICS:
Industrial return grilles grilles with fixed and 45° inclined bars 60 mm pitch.

CONSTRUCTION:
Anodized aluminium.

UTILIZATION:
For wall installation and for external air intake or exhaust air flow.

FIXING:
Fixing by clips or frontal screws on request.

ACCESSORIES:
- Calibration damper made of galvanized steel and fins with opposite movement.
- Mounting counterframes made of galvanized steel sheet.
- Bird screen.
- Overpressure damper.

PREZZI - PRICES

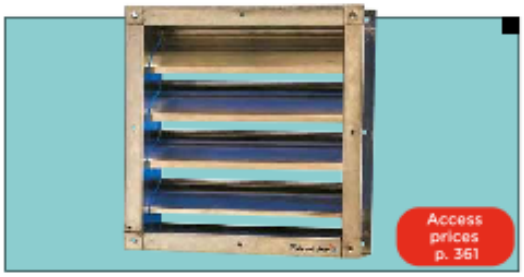
BxH	GRAI	GRAIR	GRAIRZ	GRAIRSS	SCAI	CTP
mm	€	€	€	€	€	€
400x400						
500x400						
600x400						
800x400						
1000x400						
• 1200x400						
• 1400x400						
• 1600x400						
• 1800x400						
• 2000x400						
400x500						
500x500						
600x500						
800x500						
1000x500						
• 1200x500						
• 1400x500						
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• 1600x800						
• 1800x800						
• 2000x800						
400x1000						
600x1000						
800x1000						
1000x1000						
• 1200x1000						
• 1400x1000						
• 1600x1000						

5.6 NON RETURN DAMPERS

Item TAG: HDN-77-201

DIFFUSION

France Air



SPG

Pressure relief flap for rectangular ducts

MATERIAL	INSTALLATION	MOUNTING
Alu + steel	Rectangular duct	Visible screws

Espace Pro

Order online at www.espacepro.france-air.com

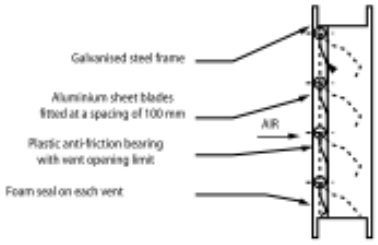
ADVANTAGES
- Excellent sealing.
- Low noise level.

RANGE
- SPG vent for rectangular duct.
- Standard dimensions from 200 x 200 mm to 2 000 x 2 000 mm:
  - in 100 mm intervals up to 1200 x 1200 mm,
  - then in steps of 200 mm.

APPLICATION/USE
- To maintain an overpressure or underpressure in a room with respect to the outside or to another adjoining room.
- Non-return flap.
- Use in air conditioning, ventilation or heating.

DESIGNATION
SPG — Pressure relief flap
400 x 200 — Length x height (mm)

CONSTRUCTION/COMPOSITION
- Ducted - Type SPG



OPTIONS
- Bronze bearings.
- Stainless steel construction.
- Non-standard dimensions (consult us).
- High speed version (up to 10 m/s): shaft through coupled blades and central reinforcement

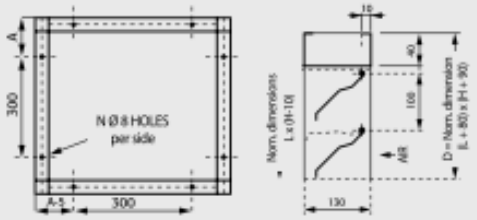
SPECIFICATION TEXT
- Available on www.france-air.com, Espace Pro area.

ASSEMBLY AND CONNECTION
- **Fitting in duct in a network**
  - Maximum flow speed = 6 m/s.
  - Above 4 m/s, the vent is fully open.
  - Max. temperature : + 50°C.

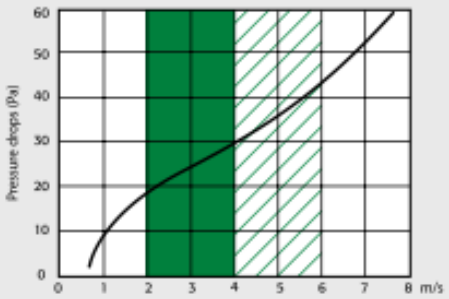
TECHNICAL DESCRIPTION
- Dimensions, cut-out

Dimension (mm)	Number of holes per side	Dimension A (mm)
200	0	-
300	0	-
400	1	245
500	1	295
600	1	345
700	2	245
800	2	295
900	2	345
1000	3	245
1100	3	295
1200	3	345
1400	4	295
1600	5	245
1800	5	345
2000	6	295

N. B.: above L = 1 200 mm, a central reinforcement is provided.



- Pressure drop/speed curve



Optimal selection values: from 2 m/s to 4 m/s*
* to 4 m/s: the flap is fully open.

Selection limit values at 6 m/s.

5.7 DUCT INSULATING MATERIAL

Technical datasheet
Felt CLIMCOVER ROLL ALU 1



DESCRIPTION
Blanket with grid alu foil. Made with glass and with a new generation of thermo-hardening resin that associates organic and vegetal components and minimizes emissions of pollutant substances, like formaldehyde and others volatile organic compounds (VOC).

APPLICATION
Product for use in technical applications, such as ventilation ducts and industrial equipments, with need thermal and acoustic insulation

BENEFITS
- Long life span
- Impact resistance
- Dimensional stability in case of temperature and humidity variation
- Thermal and acoustic insulation
- Certified according to EN 14303
- Easy workability

STORAGE
The product must be stocked inside, in ventilated areas and away from heat sources.

Characteristics		Value	Unit	According to
Declared thermal conductivity	10°C	0,032	W/(m·K)	EN 12667
Declared thermal conductivity	40°C	0,037	W/(m·K)	EN 12667
Declared thermal conductivity	100°C	0,049	W/(m·K)	EN 12667
Fire class EUROCLASS		A1	-	EN 13501-1
Maximum service temperature		125	°C	EN 14706
Width tolerance		+-10	mm	
Length tolerance		-0+excess	mm	

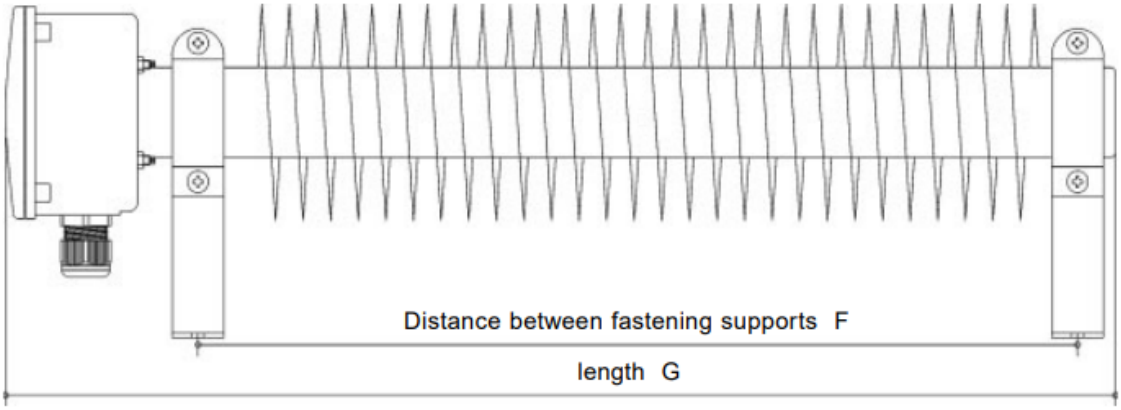
Thickness (mm)	Dimensions (m)	m²/pallet
25	1,15 x 10	345,00
50	1,15 x 5	172,50

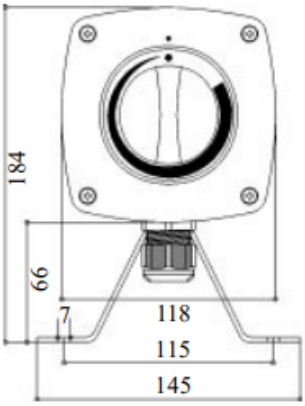
CODE: STC 255
REVISION: 00
DATE: March 2013

Product produced in France-Chalon Sur Saone plant
As regards the CE marking, this insulating product is in accordance with the standard 89/106/CE received by the DPR 246 of 21/4/1993 based on the standards EN 14303.
The CE data indicated on this datasheet are the ones required for the thermal insulation of industrial applications by the standard EN 14303 common to all applications.
The Quality Management System of Saint-Gobain PPC Italia S.p.A. has been assessed and found in accordance with the requirements of the EN ISO 9001:2008, EN ISO 14001:2004 and OHSAS 18001:2007.
The values stated in this datasheet, except for the values required by the CE marking, are not binding and Saint-Gobain PPC Italia S.p.A. may change them, without any notice.
Supplies are subjected to our production possibilities.
Saint-Gobain PPC Italia S.p.A. reserves the right to alter or amend product specification or stop the production without notice

5.8 SPACE HEATER

Item TAG: HHS-77-(004/005/006)





Typ	G mm	F mm
RRH TR 500	500	365
RRH TR 1000	700	565
RRH TR 1500	900	765
RRH TR 2000	1100	965
RRH TR 3000	1500	1365

Typ	G mm	F mm
RRH ST 1000	700	565
RRH ST 1500	900	765
RRH ST 2000	1100	965
RRH ST 3000	1500	1365

Kraemer & Kraus Wärmetechnik GmbH
Eiserntalstr. 374
57080 Siegen

Telefon (02 71) 3 93 70 26
Telefax (02 71) 3 93 70 27
Internet http:/www.Kraemer-Kraus.de
eMail Info@Kraemer-Kraus.de

5.9 PRESSURE RELIEF DAMPER

Item TAG: HDR-77-201

SagiCofim

Overpressure damper with combined blades and counterweight

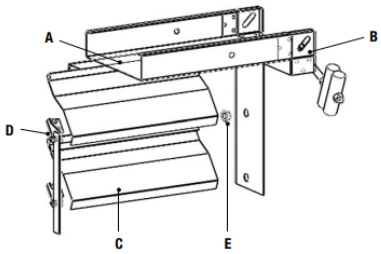
GP100KC-C



Duct overpressure damper with blades combined inside the air flow with return to closing position by own gravity and counterweight outside the flow. Vertical installation with single direction flow. In the case of counter-flow, the damper functions as a non-return element. The combination allows simultaneous opening of the blades, preventing an uneven air flow from creating high turbulence zones and low velocity zones.

MATERIAL AND FINISH

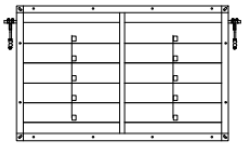
A Frame in galvanized steel Z140, duct-mounting.
B Flange 36 mm, thickness 1 mm.
C Galvanized blades combined internally, movement by gravity with counterweight that can be calibrated, anti-noise gasket.
D Through galvanized pins.
E NYLON bushes.



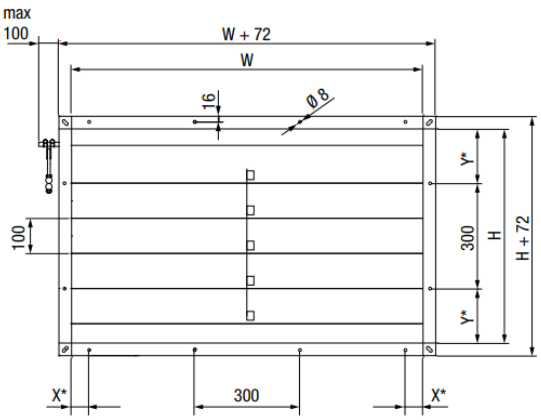
VERSIONS

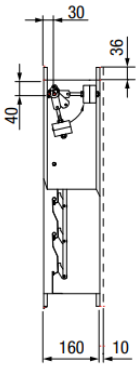
• AISI316	**(PRICES UPON REQUEST)**
• ATEX II 2 GD	**+ 36** €

NB: For the prices of the intermediate sizes, consider the next size on the table.
Ex.: 650 x 410 mm = 700 x 410 mm
For basic sizes > 1000 mm, construction in double section with centre separator



*See tech data sheet





The damper is supplied with a counterweight made up of a threaded rod 200 mm long and 300 g of metal masses.
In vertical axis, the counterweight is irrelevant for increasing the opening pressure, minimum reference value 30 Pa.
By tilting the counterweight in the direction of the blade opening, the minimum opening pressure increases up to + 100% for a 45° angle
For pressures higher than 100 Pa, the oscillating masses have to be increased.

5.10 BACKDRAFT DAMPER

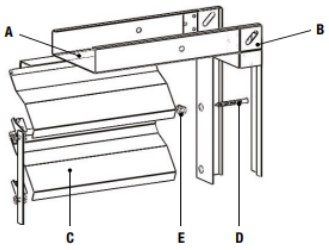
SagiCofim

Overpressure damper with combined blades

GP100KC



Overpressure damper with blades combined inside the air flow with return to closing position by gravity. Vertical installation with single direction flow. In the case of counter-flow, the damper functions as a non-return element. The combination allows simultaneous opening of the blades, preventing an uneven air flow from creating high turbulence zones and low velocity zones.
Minimum opening pressure 30 Pa



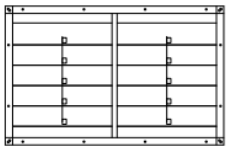
MATERIAL AND FINISH

A Frame in galvanized steel Z140, duct-mounting.
B Flange 36 mm, thickness 1 mm.
C Combined aluminum blades (series 5005), movement by gravity, anti-noise gasket, thickness 0.5 mm.
D Rotation pins.
E NYLON bushes.

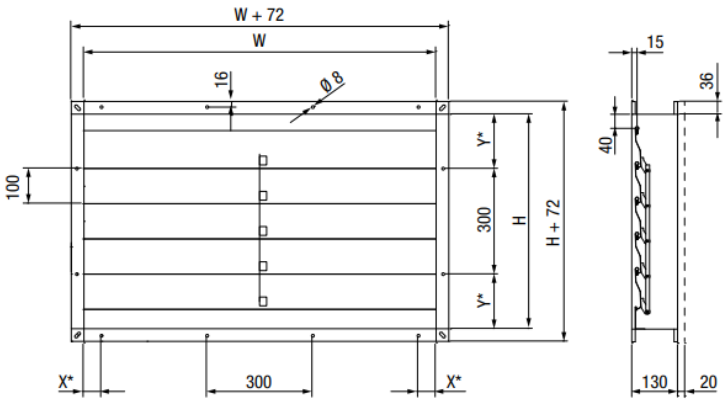
VERSIONS

• AISI316	**(PRICES UPON REQUEST)**
• ATEX II 2 GD	**+ 36** €

NB: For the prices of the intermediate sizes, consider the next size on the table.
Ex.: 650 x 410 mm = 700 x 410 mm
For basic sizes > 1000 mm, construction in double section with centre separator

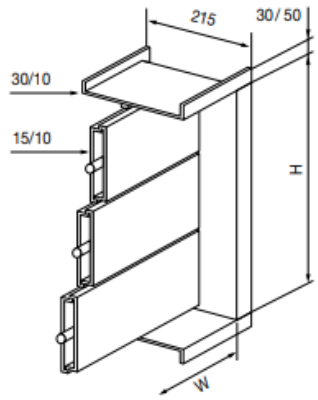


*See tech data sheet

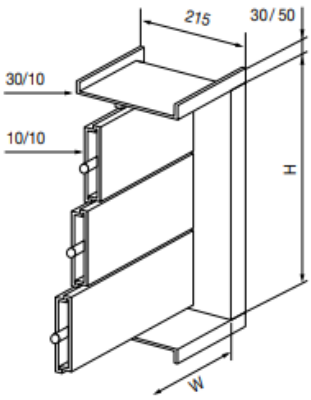


5.11 SHUT-OFF DAMPER

SDL - SDLT 0
dimensions in [mm]



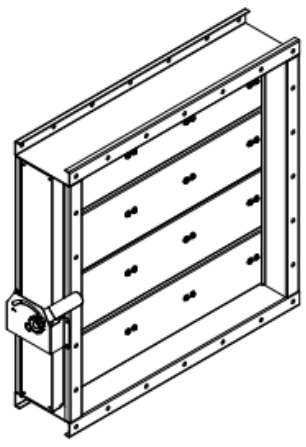
SDL - SDLT 2 - 6
dimensions in [mm]



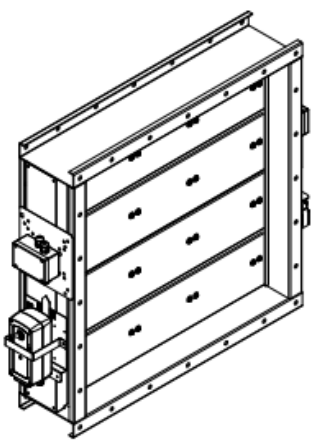
General features Shut-off dampers & Gas Shut-off dampers		
Models	**SDL**	**SDLT**
Gas leakage EN 1751 *Ambient temperature - Pressure: 2000 Pa*	Class B Class 1	**Class C** **Class 3**
Installation	Deck and bulkhead, duct, wall	
Maximum air inlet dimensions in single arrangement*	Width [W] and Height [H] from 150 to 2000 mm	
Standard flanges dimensions	30 mm (HVAC systems) or 50 mm (engine ventilation)	
Drilling	Standard Ø 12 or on demand	
Control types	Manual / Electrical / Electrical ATEX / Pneumatic / Pneumatic ATEX	
Accessories	Circular connections, junction box, quick connections, heating cable, box limit switch, ...	

* Dampers can be supplied on request with special dimensions by multiple welded arrangement.

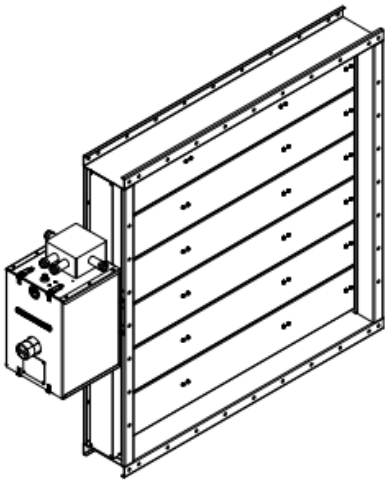
With manual control



With electrical control



With pneumatic control



SDL - SDLT



Damper operating range:

ATEX area $-20\,°C \le t \le +50\,°C$ - V_{max} 15 m/s - P_{max} 3000 Pa
SAFE area $-20\,°C \le t \le +70\,°C$ - V_{max} 25 m/s - P_{max} 3000 Pa

Damper components materials

		STANDARD		
	Type	0	2	6
A	**Casing** (depth 215 mm)	Hot bath galvanized steel, tk. 3 mm	Hot bath galvanized steel, tk. 3 mm	AISI 316 L, tk. 3 mm
B	**Blades** (parallel movement)	Galvanized steel, tk. 1.5 + 1.5 mm	AISI 316 L - tk. 1 + 1 mm	AISI 316 L - tk. 1 + 1 mm
C	**Shafts**	AISI 316 L, Ø 18,1 x 1.5 mm	AISI 316 L, Ø 18,1 x 1.5 mm	AISI 316 L, Ø 18,1 x 1.5 mm
D	**Levers**	Galvanized steel tk. 2 mm	AISI 316 L tk. 2 mm	AISI 316 L tk. 2 mm
E	**Bushes**	Self lubricating bronze, 9010	Self lubricating bronze, 9010	Self lubricating bronze, 9010
F	**Stops**	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm
G	**Lever protection carter**	Galvanized steel tk. 1 mm	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm
H	**Side sealing plates**	AISI 301	AISI 301	AISI 301
	Actuator support plate	Galvanized steel	AISI 316 L	AISI 316 L
	Position indicator	Galvanized steel	Galvanized steel	AISI 304

Silicone seals and thin blades only for models SDLT

Shut-off - Gas Shut-off Damper

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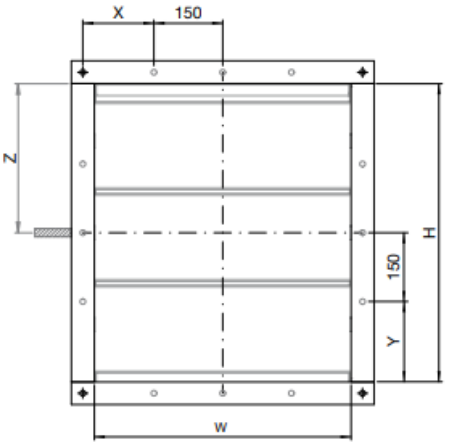
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SDL - SDLT

Dimensions of flanges and drilling

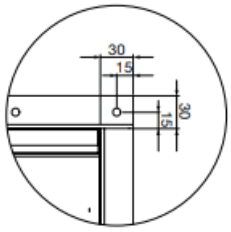
Models SDL - SDLT / 0 - 2 - 6

Air inlet size W / H [mm]	N° holes	flange 30 [mm]		flange 50 [mm]		0		2 / 6	
		X	Y	X	Y	Z	N° blades	Z	N° blades
150	1	90	75	100	75	75	1	75	1
200	1	115	100	125	100	100	1	100	1
250	1	140	125	150	125	125	1	125	1
300	1	165	150	175	150	50	2	75	2
350	3	40	175	50	175	75	2	100	2
400	3	65	50	75	50	100	2	100	2
450	3	90	75	100	75	125	2	225	3
500	3	115	100	125	100	250	3	250	3
550	3	140	125	150	125	275	3	275	3
600	3	165	150	175	150	300	3	300	3
650	5	40	175	50	175	325	3	325	3
700	5	65	50	75	50	450	4	350	3
750	5	90	75	100	75	475	4	375	5
800	5	115	100	125	100	500	4	500	4
850	5	140	125	150	125	525	4	525	4
900	5	165	150	175	150	450	5	375	6
950	7	40	175	50	175	475	5	400	6
1000	7	65	50	75	50	500	5	500	5
1050	7	90	75	100	75	525	5	525	7
1100	7	115	100	125	100	450	6	550	7
1150	7	140	125	150	125	475	6	575	7
1200	7	165	150	175	150	500	6	500	6
1250	9	40	175	50	175	525	6	525	6
1300	9	65	50	75	50	650	7	550	6
1350	9	90	75	100	75	675	7	675	9
1400	9	115	100	125	100	700	7	700	7
1450	9	140	125	150	125	725	7	725	7
1500	9	165	150	175	150	650	8	675	10
1550	11	40	175	50	175	675	8	700	10
1600	11	65	50	75	50	700	8	700	8
1650	11	90	75	100	75	725	8	825	11
1700	11	115	100	125	100	850	9	850	11
1750	11	140	125	150	125	875	9	875	11
1800	11	165	150	175	150	900	9	900	9
1850	13	40	175	50	175	925	9	925	9
1900	13	65	50	75	50	850	10	950	9
1950	13	90	75	100	75	875	10	975	13
2000	13	115	100	125	100	900	10	900	10

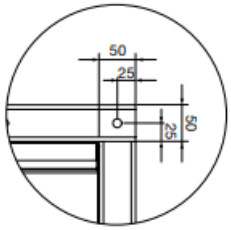


◆ Fixed holes at corner
○ Intermediate holes

SDL - SDLT flange 30



SDL - SDLT flange 50



Shut-off - Gas Shut-off Damper

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SDL - SDLT

Damper weights [Kg]

Damper weights [Kg]

H [height]	W [width]																			
	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
150	9	11	13	16	18	21	24	26	29	32	34	37	40	42	45	47	50	53	55	58
200	11	12	15	18	21	24	27	30	32	35	38	41	44	47	50	53	56	58	61	64
300	13	15	18	21	25	28	31	34	38	41	44	47	50	54	57	60	63	67	70	73
400	16	18	22	25	29	33	36	40	44	47	51	54	58	62	65	69	73	76	80	84
500	19	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93
600	22	24	28	33	37	41	46	50	55	59	63	68	72	77	81	85	90	94	99	103
700	24	27	31	36	41	46	50	55	60	65	69	74	79	84	88	93	98	103	107	112
800	27	30	35	40	45	50	55	61	66	71	76	81	86	92	97	102	107	112	117	123
900	30	32	38	43	49	54	60	65	71	76	82	87	93	98	104	109	115	120	126	131
1000	32	35	41	47	53	59	65	71	77	83	89	95	101	106	112	118	124	130	136	142
1100	35	38	44	51	57	63	69	76	82	88	95	101	107	113	120	126	132	138	145	151
1200	38	41	48	54	61	68	75	81	88	95	101	108	115	121	128	135	141	148	155	162
1300	40	44	51	58	65	72	79	86	93	100	107	114	121	128	135	142	149	156	163	170
1400	43	47	54	62	69	77	84	92	99	106	114	121	129	136	144	151	159	166	174	181
1500	46	50	57	65	73	81	89	96	104	112	120	128	135	143	151	159	167	174	182	190
1600	49	53	61	69	77	85	94	102	110	118	127	135	143	151	159	168	176	184	192	201
1700	51	55	64	73	81	90	98	107	115	124	132	141	150	158	167	175	184	192	201	209
1800	54	58	67	76	85	94	103	112	121	130	139	148	157	166	175	184	193	202	211	220
1900	57	61	71	80	89	98	108	117	126	136	145	154	164	173	182	192	201	210	220	229
2000	59	64	74	84	93	103	113	123	132	142	152	162	171	181	191	201	210	220	230	239

Average values valid for all standard types (approx. ± 5%)
Values in the table refer to the standard material manufcturing types. Different material manufacturing does not have significant variance to the above mentioned values. Controls and actuators weights are not included.

Shut-off - Gas Shut-off Damper

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SDL - SDLT

Torque requirements (Nm) for actuating systems selection

Damper torque

H [height]	W [width]																			
	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
150	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
200	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
300	7	7	7	7	7	7	7	7	7	7	7	7	7	8	8	9	9	10	10	11
400	7	7	7	7	7	7	7	7	7	7	8	9	9	10	11	12	12	13	14	14
500	7	7	7	7	7	7	7	7	8	9	10	11	12	13	14	14	15	16	17	18
600	7	7	7	7	7	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22
700	7	7	7	7	7	8	9	10	11	13	14	15	16	18	19	20	21	23	24	25
800	7	7	7	7	7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29
900	7	7	7	7	8	10	11	13	15	16	18	19	21	23	24	26	28	29	31	32
1000	7	7	7	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36
1100	7	7	7	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
1200	7	7	7	9	11	13	15	17	19	22	24	26	28	30	32	35	37	39	41	43
1300	7	7	7	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47
1400	7	7	8	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
1500	7	7	8	11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51	54
1600	7	7	9	12	14	17	20	23	26	29	32	35	37	40	43	46	49	52	55	58
1700	7	7	9	12	15	18	21	24	28	31	34	37	40	43	46	49	52	55	58	61
1800	7	7	10	13	16	19	23	26	29	32	36	39	42	45	49	52	55	58	62	65
1900	7	7	10	14	17	21	24	27	31	34	38	41	44	48	51	55	58	62	65	68
2000	7	7	11	14	18	22	25	29	32	36	40	43	47	50	54	58	61	65	68	72

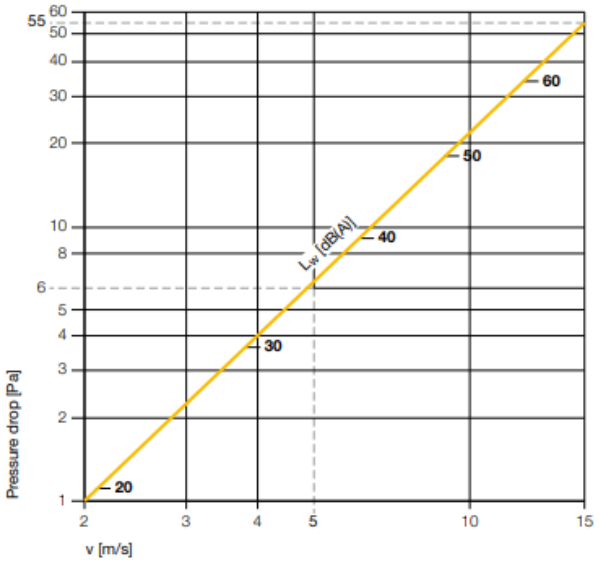
Note: for SDL model, actual required torque value can be up to 20% lower than the above mentioned values.

SDL - SDLT

Performances

Pressure drop and noise level

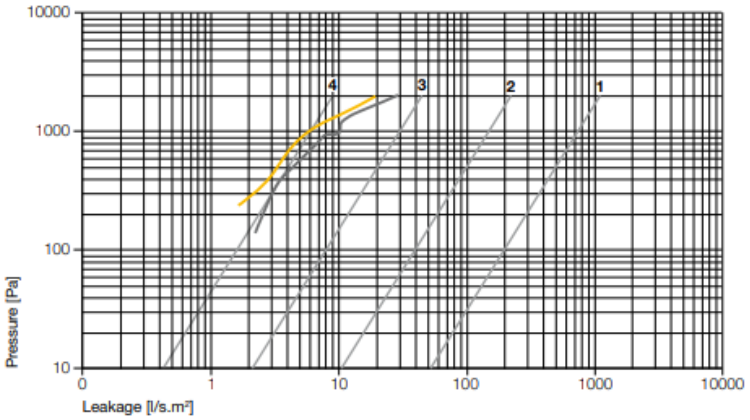
- Max noise level: **60 dB(A)**
- Standard pressure drop: **6 Pa**
  With damper fully open and air speed of 5 m/s at maximum rate.
- Max pressure drop: **55 Pa**
  With damper fully open and air speed of 15 m/s at maximum rate.



SDLT gas leakage according to EN1751

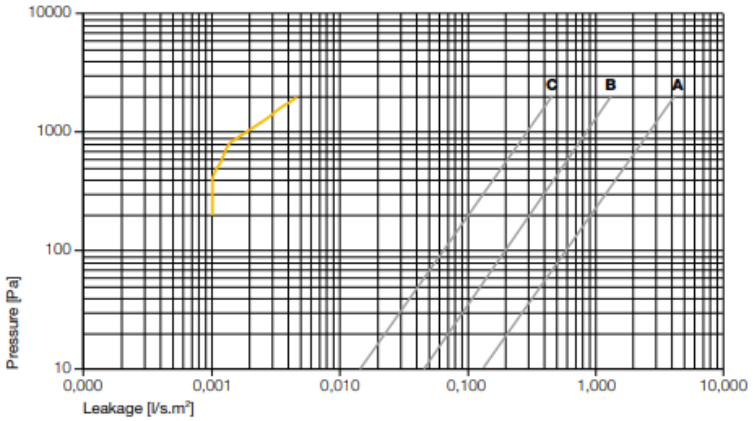
Leakage test across closed blades

Positive pressure
Negative pressure



Leakage test for casing

Positive pressure



Shut-off - Gas Shut-off Damper Marine - Oil & Gas Industry SagiCofim

SDL - SDLT

Damper controls Type **C 22 - Manual drive**

This damper version is provided with a control handle (C22).
SDL or SDLT + C22 can be used also as a balancing damper; in fact the handle can be fixed in all different positions from fully open to fully closed.
A safety clamp blocks the handle in the selected position.



Manual command



Damper closed



Damper open

Maintenance procedures

Mechanical couplings and electrical connections are tested before shipping.
Maintenance cadence depends by the dampers features (material) and the location where they are installed (fresh air inlet or exhaust duct)
During the damper installation and working life the following advices should be considered:

- Do not distort the frame and blades alignment;
- Check the blades free movement (avoid any solid sediment on shafts near to the bushes);
- Check the presence of extraneous objects inside the damper;
- Only the external damper frame except levers can be painted;
- Do not use cleaning acid liquids or abrasive tools (the hot bath galvanized surface film can be damaged);
- Do not dismantle dampers components;
- Do not modify the electrical connections prearrangement.

Only for fresh air inlet location:

- Lubricate shafts, bushes and levers (use only spray grease, avoid any paste);
- Check sea water corrosion effects on exposed damper surfaces.

Actuator disassembling

- Switch-off the actuator voltage input;
- Screw-out carter protection (if there) front panel;
- Pull out additional limit switches (if there) from the auxiliary shaft;
- Screw-out the metal actuator fixing plate and the remaining parts of the protection carter (if there);
- Pull out the actuator from the drive shaft;
- Insert new actuator and fix it;
- Screw-in carter protection and mount additional limit switches (if there);
- Check damper conditions;
- Restore voltage input.

Shut-off - Gas Shut-off Damper

Marine - Oil & Gas Industry

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SDL - SDLT

References

Shipyards
Barreras (Spain)
Cantieri Apuania (Italy)
Ferrol (Spain)
Fincantieri (Italy)
Flender Werft (Germany)
Jurong (Singapore)
Keppel Fels (Singapore)
Lloyd Werft (Germany)
Meyer Werft (Germany)
Navantia (Spain)
Rosetti Marino (Italy)
Sembawang (Singapore)
SMOE (Singapore)
STX France (France)
T. Mariotti (Italy)

Owners
Carnival
Corsica Ferries
Costa Crociere
Cunard
Finnlines
Grimaldi Group
Holland America Line
Marina Militare Italiana
Minoan Lines
Norwegian Cruise Line
P&O
Radisson Seven Seas
Renaissance Cruises
Royal Caribbean Cruise Line
Seabourn
Silversea Cruise
Tirrenia

Companies & Contractors
Agip KCO
ATP
Cocono Philips
Eni CONGO
Eni NORGE
ERSAI
Pearl
Petrobras
PTTEP
Saipem
Saudi Aramco
Shell
SOC
Total
Transocean
W.P.

Product code

E	X	S	D	L	-	6	P	0	4	5	5	6	0	0	0	0	5

Flanges dimensions and accessories
00 30 mm
05 50 mm
2R circular connections
... other accessories on request

Air inlet dimensions
i.e. 550 [W] x 600 [H]

Control type
E Electrical
X Electrical ATEX
P Pneumatic / Pneumatic ATEX
C22 Manual

Material (see page 5 for details)
0
2
6

Models
SDL Standard version
SDLT Gas tight version

Version type
EX ATEX version
... Standard version

5.12 DIFFERENTIAL PRESSURE TRANSMITTER

Item TAG: 77-PT-201



SDT
Differential pressure transmitter

Accuracy max ± 0.075%
Range 1 mbar ÷ 20 bar
Hart communication
LCD backlight display
Settings via display
Fast time responsive self-diagnostics
ATEX

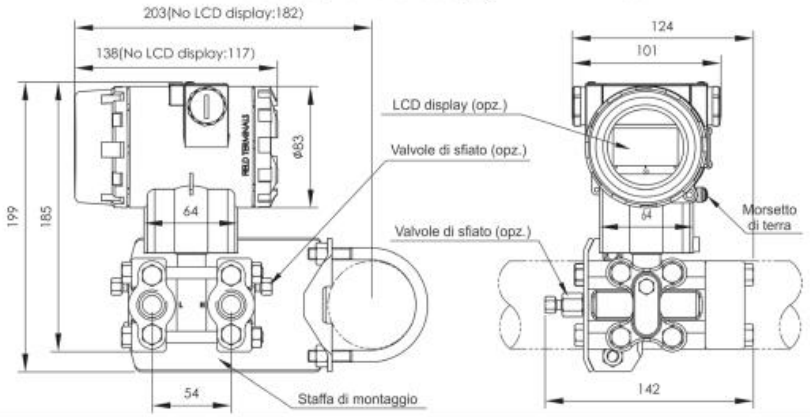
SDT is a differential pressure transmitter with performance at the top of the range and is designed for specific installations in processes where accuracy and stability over time are essential characteristics. Thanks to its technology it measures very low differential pressures from 1 mbar (10 mm H2O). The SDT is fully programmable by means of two external watertight buttons and a matrix backlight display. The programming or modification of the measurement parameters can be carried out in heavy duty ambient conditions without having access to the internal instrument parts thus maintaining the degree of protection IP67.

Technical Feature

Measure range
Differential pressure Max. 0÷20bar (0÷2Mpa); Min. 0÷0.001bar (0÷100Pa)
Accuracy
±0.075; ±0.1 for range A
Analog output resolution
15 bit

Power supply
12÷42Vdc (2-wires)
Communication protocol
HART
Zero and span calibration
onboard buttons
Data display
backlit alphanumeric display

IP rating
IP67
Stability
> ±0.1%FS
Working temperature
-40°÷+85°C
Certificazion
Atex



SDT Differential pressure transmitter

IP67 - Operation temperature: -40 ÷ +85°C
Power supply: 12÷42Vdc (2-wire)
4÷20mA HART

Accuracy	
H	± 0,075% (for range A ± 0,1%)
Measure range	
A	0 - 100Pa ÷ 1kPa (0 - 1 ÷ 10mbar) (0 - 10 ÷ 100 mmH²O) - accuracy ± 0,1%
B	0 - 200Pa ÷ 6kPa (0 - 2 ÷ 60mbar) (0 - 20 ÷ 600 mmH²O)
C	0 - 400Pa ÷ 40kPa (0 - 4 ÷ 400mbar) (0 - 40 ÷ 4000 mmH²O)
D	0 - 2,5kPa ÷ 250kPa (0 - 25 ÷ 2500mbar) (0 - 0,25 ÷ 25 mH²O)
E	0 - 20kPa ÷ 2MPa (0 - 0,2 ÷ 20bar) (0 - 2 ÷ 200 mH²O)
Membrane / filling liquid	
A	SS316L / silicone oil
B	SS316L / fluorinated oil
C	Hastelloy C / silicone oil
D	Hastelloy C / fluorinated oil
E	SS316L gold plated / silicone oil
F	SS316L gold plated/ fluorinated oil
G	SS316L EFP plated / silicone oil
T	Tantalum / silicone oil
Working pressure	
1	16MPa (range A = 7MPa)
2	25MPa (not for range A)
3	40MPa (not for range A)
Process connection	
B	¼" - 18 NPT female SS316 thread with relief valves at the end of the flange
D	¼" - 18 NPT female SS316 thread with relief valve on the lower part of the flange side
N	¼" - 18 NPT female SS316 thread without relief valves
U	¼" - 18 NPT female SS316 thread with relief valve on the upper part of the flange side
Z	Special
Sealed material	
F	Viton (FKM)
N	Perbunan (NBR)
P	Teflon (PTFE)
Special functions	
N	None
O	Degrease cleansing treatment (just with fluorinated oil and Viton seal, max 60°C)
P	Line noise filter
Fixing bracket for panel and pipe mounting (2")	
1	SS304
2	Galvanized carbon steel
N	None
Process connection accessories	
1	SS316 oval-shaped flange with ½" NPT female thread
2	SS316 D-shaped connector with M20x1.5 male thread (welded connection)
N	None
Display	
2	Backlit LCD
N	None
Certification	
A	Intrinsically Safe ATEX II 1/2G Ex ia IIC T4 Ga/Gb
D	Explosion proof ATEX II 2 G D Ex db IIC T4/T5/T6 Gb Ex tb IIIC T80°C/T90°C/T130°C - Ta = -40°C ÷ +60°C
N	None

5.13 TEMPERATURE TRANSMITTER TT

Item TAG: 77-TT-(201/202/203/204)

Product lines: temperature sensor

In order to get a precise temperature sensor in a wide range of different application, it's possible to choose between resistance thermometers and thermocouples. Temperature sensors are also available with temperature transmitter, thermowell and other options, in order to satisfy requirements of every industrial applications.



Resistance thermometers

Resistance thermometers have a platinum sensor element which changes it electrical resistance as a function of temperature.
In our products portfolio are available resistance thermometers with cable and with connection head.
A temperature transmitter can be installed directly in the connection head.
Resistance thermometers are available in classes A, 1/3 DIN, 1/5 DIN and 1/10 DIN in accordance with IEC 60751. They are available also the ATEX versions (Ex ia and Ex d)



Thermocouples (TC)

Thermocouples directly supply a temperature-dependent voltage.
They are particularly suitable for high temperatures.
In our products portfolio are available thermocouples with cable and with connection head.
For thermocouples, the accuracy classes in accordance with IEC 60584-1 or ASTM E230.
The type J, K, N, T, S, E are available in our products portfolio.
A temperature transmitter can be installed in the connection head.
They are available also the ATEX versions (Ex ia and Ex d)



Temperature transmitters

The transmitters for DIN/B head or for DIN rails convert a signal acquired by RTD (with 2, 3 and 4 wire connections) or Thermocouples into a 4 ... 20 mA signal (2 wires technology) or 0 ... 10 VDC signal (3 wires technology). These converters ensure high accuracy on the reading scale with 16-bit conversion and they are available with parameterization via NFC-smartphone App (Android) and with integrated datalogger. Available also the ATEX version (Ex ia) and with galvanic isolation.



Thermowells

Thermowells are available for different applications whether in aggressive or abrasive process media, to prevent direct exposure of their temperature probes to the medium.
Thermowells can be manufactured from solid-body material or from tube sections and can either be screw, weldor flange fitted.
They are available in standard and special versions (stainless steel 1.4571, 316L, Hastelloy® or titanium).

DTP 8180

Data sheet
www.trafag.com

The DTP 8180 is a temperature transmitter with analogue output, 2 switch points and display

Features

- Parameterization also via NFC-smartphone App (Android)
- Display and electrical connection are independently rotatable 335°/343°
- Analogue output switchable mA or V
- Integrated datalogger
- Temperature measuring range adjustable 50, ... 100% of the nominal range

Reference

- IEC 60751



Standard parameters	
Measuring principle	PT 1000, DIN EN 60751 class A, 2 conductors
Measuring range	-50°C ... +150°C / -58°F ... 302°F adjustable 50 ... 100% FS
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, switchable mA or V
Switching output	2 transistors PNP
Accuracy@25°C typ	0.5% FS typ + temperature sensor
Ambient temperature	-25°C ... +85°C
Unit for display	°C, °F, °K, user scale
Logger	Ring buffer: 3518 data points Sampling time: 0.1 ... 999.9 s, Off (0)

TCTT

Data sheet
www.trafag.com

The TCTT is a compact system used to measure liquid and gaseous fluid.
PC configuration allows the user to select range and units, without requiring calibration equipment.

Features

- PC programmable temperature range
- High sensibility
- Free configuration software
- Materials and surface finish quality in accordance with standards of hygenics design

Reference

- EN 60751
- EN 61326



Standard parameters	
Output	Analogue 4 ... 20 mA
Measuring range	-50 ... + 250°C
Ambient temperature	-40 ... +85°C
Protection	IP67
Accuracy	Class AA, 1/5 DIN, 1/10 DIN
Electrical connection	M12x1

T1

Data sheet

RTD and TC with connection head.

The resistance thermometers and thermocouples with connection head offers a wide range of options and features for different applications.

RTD Standard specifications	
Sensing element	PT100, PT1000, NI100, PTC, NTC
Connection wires	Single or Double element, 2, 3 or 4 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, PTFE (1)
Connection head	Mignon, DIN B, DIN A, DIN43650 A, M12x1, AD-PE (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female, CLAMP and other sanitary versions (1)
Stem diameter	From 3 to 12 mm (1)

1) Other RTD versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)

TC Standard specifications	
Sensing element	J, K, N, T, S, E (1)
Connection wires	Single or Double element, 2 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, Ceramic type 610, Alumina type 710, Hastelloy (1)
Connection head	Mignon, DIN B, DIN A, DIN43650 A, AD-PE (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female (1)
Stem diameter	From 1 to 12 mm (1)

1) Other TC versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)



RTD or TC for immersion with connection head, suitable for generical measurements and regulations on plant with low pressures. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD for immersion with AISI 316 sheath suitable for temperature measurement in chemical and food industry with sanitary clamp process connection.
The immersed part of the stem have a mirror finishing surface.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC with mineral oxide insulation for immersion with connection head, suitable for generical measurements and regulations on plants with low pressures and with high vibrations. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC for immersion with exchangeble thermometric insert and orientable connection. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



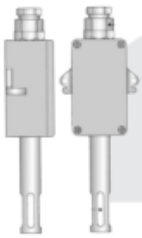
Immersion RTD or TC with exchangeable MgO insulated thermometric insert, orientable connection head and tapered protective sheath for fast response time. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC for immersion with exchangeble thermometric insert (available also in MgO) and orientable connection head. The process connection is realized by means of a 316SS flange and the electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD for immersion suitable for measurements in narrow space on plant with low pressures. The electrical connection is made by a connector EN 175301-803 standard. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges. The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD probe for the measurement of internal room temperatures realized in plastic material, aluminium (for external ambient) or 316SS. Available also with analogic output.



TC for high temperature with ceramic protective tube and connection head. It is possible to select between a 610 ceramic sheath type or a 710 (single or double) alumina sheath type. Available also with analogic output.



Mineral oxide MgO insulated thermocouples.

T2

Data sheet

RTD and TC with cable output.

The resistance thermometers and thermocouples with cable output offers a wide range of options and features for different applications.

RTD Standard specifications	
Sensing element	PT100, PT1000, NI100, PTC, NTC
Connection wires	Single or Double element, 2, 3 or 4 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, PTFE (1)
Type of cable	PVC, Kapton, PTFE / MFA, Silicone, Glass-Fiber (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female, CLAMP and other sanitary versions (1)
Stem diameter	From 3 to 12 mm (1)

1) Other RTD versions are available on request
2) They are available in the ATEX versions (Ex ia)

TC Standard specifications	
Sensing element	J, K, N, T, S, E (1)
Connection wires	Single or Double element, 2 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, Ceramic type 610, Alumina type 710, Hastelloy (1)
Type of cable	PVC, Kapton, PTFE / MFA, Silicone, Glass-Fiber (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female (1)
Stem diameter	From 1 to 12 mm (1)

1) Other TC versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)



Cylindrical RTD or TC with AISI 304 sheath or with AISI 316 sheath insulated with compact magnesium oxide (MgO) suitable for generical measurement.
The output of the cable from the tube is protected with a stainless steeel spring.



Cylindrical RTD or TC with AISI 304 sheath suitable for generical measurements. The probe fixing is realized by means of a threaded nipple welded on the sheath.



RTD or TC with stainless steel sheath suitable for generical measurements.
The probe fixing is realized by means of a brass ring soldered on the tip of the tube; it can be fixed on a surface with a normal screw.
The output cable is protected with a stainless steel spring.



Spring-loaded RTD or TC indicated for measurements into metallic plates; the fixing is by threaded connection with bayonet fitting.



Resistance thermometer suitable for the measurement of the pipe temperatures.
The special design of the aluminium body allow an high thermal exchange with the internal sensing element with a consirable reduction in measuring error. The fixing can be realized by means of a normal clamp.

9 Distributed by trafag sensors controls

Signal converters



The transmitters for DIN/B head convert a signal acquired by temperature probes PT100, PT1000 or Ni100 (with 2-, 3- and 4-wire connections) or Thermocouples into a 4 … 20 mA signal (2-wire technology), current-loop. These converters ensure high accuracy on the reading scale with 16-bit conversion and possibility to rescale the output 4 … 20mA basing on input range. Available also Atex version and with galvanic isolation



The signal transmitter from DIN rail converts a signal received through probes PT100, Ni100 (with 2-, 3- and 4-wire connections), thermocouples or process signals (0/4 … 20mA, 0 … 10V) into a normalised current signal 4 ... 20 mA (2-wire power loop). The characteristics of these converters ensure high precision on the reading scale with 16 bit conversion and the possibility to rescale the analogue output 4 ... 20 mA according to the input set. The RTD/TC input is galvanically isolated at 2500 V from the analogue output, which ensure safer cables in environment where they may be disturbed or in cases where there different voltages in the same system.

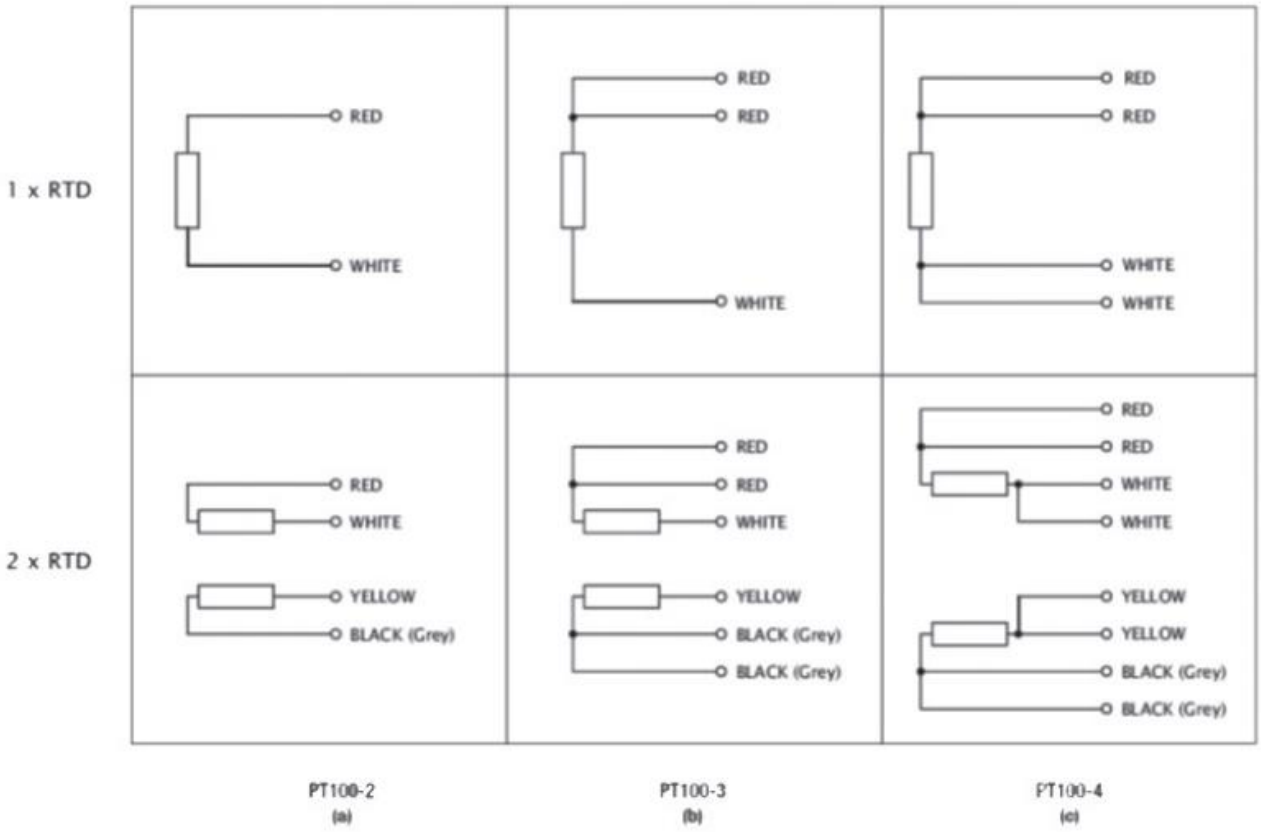
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Type of connection for resistance thermometer

a) 2 wires - the two-wire technique is the least precise and is used only in cases where the connection of the thermoresistance is carried out with short and low resistivity wires

b) 3 wires - the three-wire technique is the most used in the industrial field.
With this measurement technique the errors caused by the resistance of the conductors used for the connection of the thermoresistance are eliminated.

c) 4 wires - the technique offers the greatest precision possible but it is almost exclusively used in laboratory applications.



Resistance thermometer type PT100 ohm 0°C (EN 60751)

The resistance thermometers and thermocouples with cable output offers a wide range of options and features for different applications.

Tolerance class	Temperature range of validity		RTD Standard specifications
	Wire wound resistors	Fil resistors	
1/5 DIN	-196 ÷ +600	-50 ÷ +600	(0,1 + 0,0017* | t |)
1/3 DIN	-196 ÷ +600	-50 ÷ +600	(0,15 + 0,002* | t |)
A	-196 ÷ +600	-50 ÷ +600	(0,3 + 0,005* | t |)
B	-196 ÷ +600	-50 ÷ +600	(0,6 + 0,01* | t |)

| t | = Moduls of temperature in °C without regards to the sign

Standard thermocouples

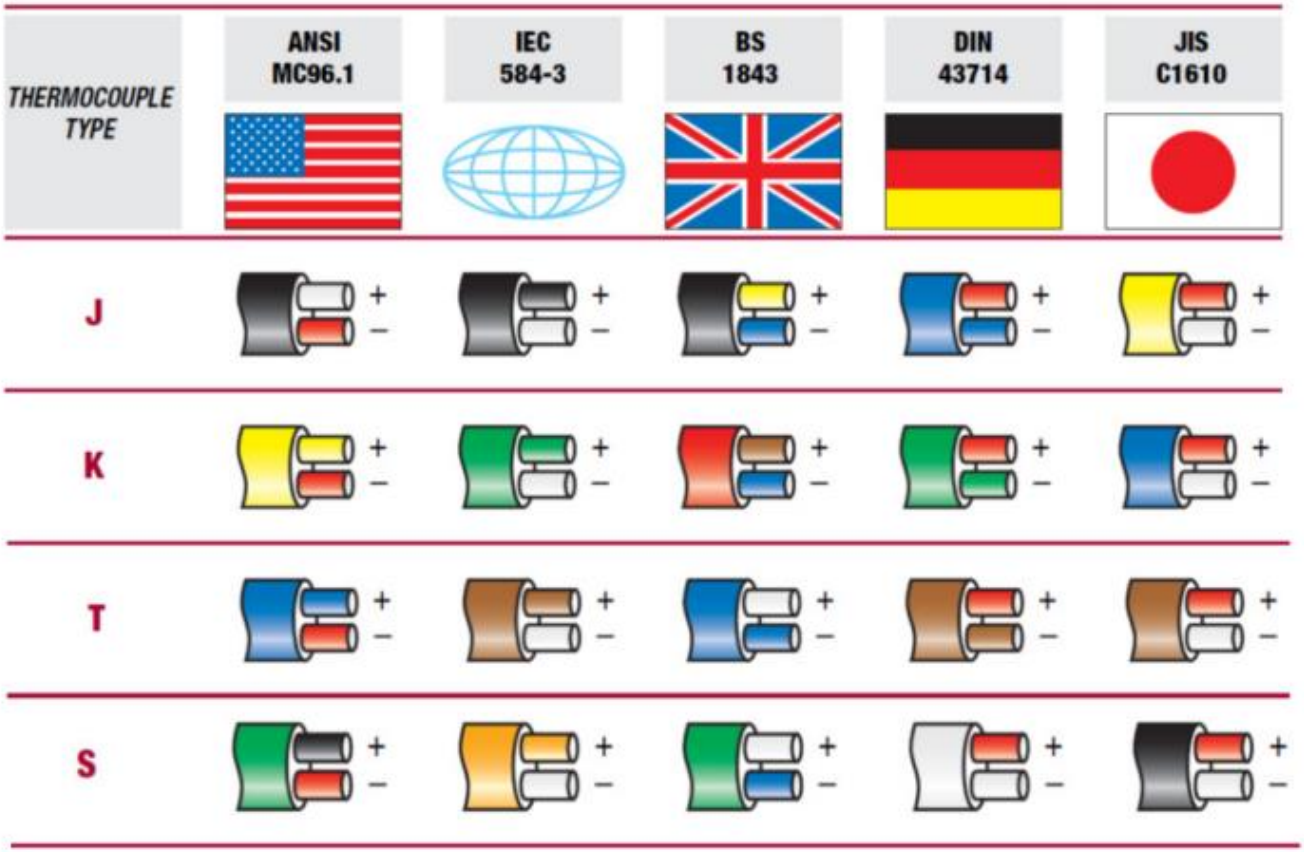
Type	Materials	Temperature range °C	Tolerance values °C
J	Fe-Co	-210 ÷ 800	± 2,5 o 0.0075* |t|
K	Cr-Al	-270 ÷ 1300	± 2,5 o 0.0075* |t|
T	Cu-Co	-270 ÷ 400	± 1 o 0.0075* |t|
S	Pt10%Rh - Pt	-50 ÷ 1800	± 1,5 o 0.0025* |t|

| t | = Moduls of temperature in °C without regards to the sign

Standard cables for temperature sensors

Type	Rh resistance	Temperature range °C	Abrasion resistance
Glass – Fiber	D	-50 ÷ 400	D
Silicone	C	-40 ÷ 200	B
PTFE/ MFA	A	-200 ÷ 250	A
PVC	B	-20 ÷ 105	B
Kapton	B	-200 ÷ 400	B

Standard color coding of compensating cables



5.14 FIRE AND GAS DAMPER WITH ACTUATOR

Item TAG: HFD-(77004/77005/77006)

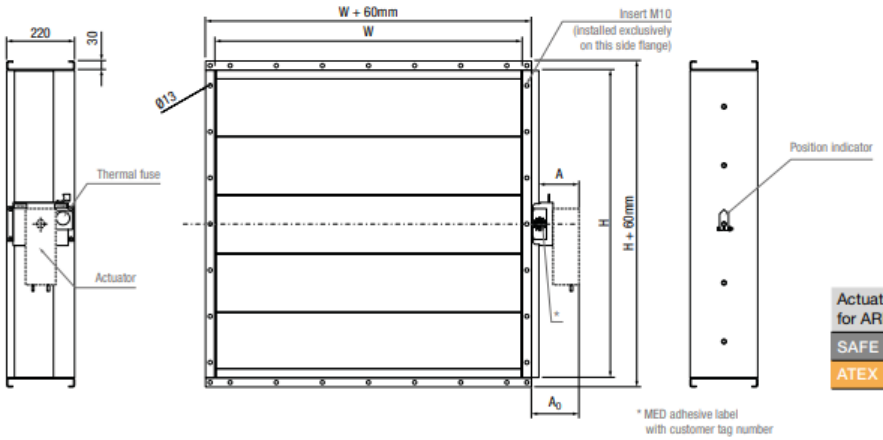
Technical data
SOLAS A0 frame 220mm
SAFE AREA - ATEX AREA

Features	
Dimensional range	from 150x150mm to 1000x1000mm step 50mm
Flange	Standard 30mm On request 50mm
Operating temperature range	-40°C / +50°C
Operating air velocity (damper in working condition)	12m/s max
Peak limits (sporadic and for a few seconds)	P=2500Pa, v=18m/s
Leakage Class acc. to EN 1751	Standard 2B On request 3C

		Version **3 (220GW)**	Version **4 (2206W)**
Description		**Material**	
Casing (riveted)		hot dip galv. steel - tk. 3mm	AISI316L - tk. 3mm
Blades		galv. steel Z200 double skin 1.2mm+1.2mm fiber glass gasket*	AISI316L double skin 1.2mm+1.2mm fiber glass gasket*
Shafts		AISI316 - Ø12mm	AISI316 - Ø12mm
Bushes		bronze self lub. - Ø12mm	bronze self lub. - Ø12mm
Actuator for	SAFE AREA	Belimo BF - Schischek InMax	Belimo BF - Schischek InMax
	ATEX AREA	Schischek ExMax - RedMax	Schischek ExMax - RedMax

** Non-classified SVF, 20x5mm*

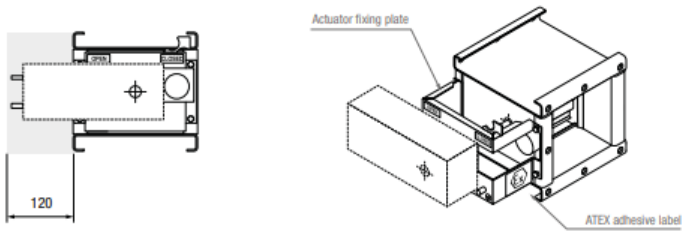
ACTUATOR MOUNTED VERTICALLY FOR H>250mm



Actuator for AREA	A [mm]	A_0 [mm]
SAFE	110	135
ATEX	130	155

Drilling scheme, see pag. 10

ACTUATOR MOUNTED HORIZONTALLY FOR H ≤250mm



S-LFD Fire and Gas-Fire Damper SOLAS A0-A60

SagiCofim

Dimensions and Weights

frame **220mm**

H [mm]	W [mm]																	
	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
150	7,5	8,5	9,5	10,5	11,5	12,5	13,5	14,4	15,4	16,4	17,4	18,4	19,3	20,3	21,3	22,3	23,3	24,3
200	8,6	9,6	10,6	11,7	12,7	13,7	14,8	15,8	16,8	17,9	18,9	19,9	21,0	22,0	23,0	24,1	25,1	26,1
250	9,4	10,5	11,5	12,5	13,6	14,6	15,6	16,7	17,7	18,7	19,8	20,8	21,8	22,8	23,9	24,9	25,9	27,0
300	11,0	12,1	13,3	14,5	15,6	16,8	18,0	19,1	20,3	21,5	22,6	23,8	25,0	26,1	27,3	28,5	29,6	30,8
350	12,0	13,2	14,4	15,6	16,8	18,0	19,2	20,4	21,6	22,9	24,1	25,3	26,5	27,7	28,9	30,1	31,3	32,5
400	12,9	14,2	15,5	16,7	18,0	19,2	20,5	21,7	23,0	24,3	25,5	26,8	28,0	29,3	30,5	31,8	33,0	34,3
450	14,3	15,6	17,0	18,3	19,6	21,0	22,3	23,6	24,9	26,3	27,6	28,9	30,3	31,6	32,9	34,3	35,6	36,9
500	15,3	16,7	18,1	19,4	20,8	22,2	23,6	24,9	26,3	27,7	29,0	30,4	31,8	33,2	34,5	35,9	37,3	38,7
550	16,3	17,7	19,1	20,6	22,0	23,4	24,8	26,2	27,7	29,1	30,5	31,9	33,3	34,8	36,2	37,6	39,0	40,4
600	17,3	18,7	20,2	21,7	23,1	24,6	26,1	27,5	29,0	30,5	31,9	33,4	34,9	36,3	37,8	39,3	40,7	42,2
650	18,6	20,2	21,7	23,3	24,8	26,3	27,9	29,4	31,0	32,5	34,0	35,6	37,1	38,6	40,2	41,7	43,3	44,8
700	19,6	21,2	22,8	24,4	26,0	27,6	29,1	30,7	32,3	33,9	35,5	37,1	38,6	40,2	41,8	43,4	45,0	46,6
750	20,6	22,3	23,9	25,5	27,1	28,8	30,4	32,0	33,7	35,3	36,9	38,5	40,2	41,8	43,4	45,1	46,7	48,3
800	21,6	23,3	25,0	26,6	28,3	30,0	31,7	33,3	35,0	36,7	38,4	40,0	41,7	43,4	45,1	46,7	48,4	50,1
850	23,0	24,7	26,5	28,2	30,0	31,7	33,5	35,2	37,0	38,7	40,5	42,2	44,0	45,7	47,4	49,2	50,9	52,7
900	24,0	25,8	27,6	29,3	31,1	32,9	34,7	36,5	38,3	40,1	41,9	43,7	45,5	47,3	49,1	50,9	52,7	54,5
950	25,0	26,8	28,6	30,5	32,3	34,1	36,0	37,8	39,7	41,5	43,3	45,2	47,0	48,9	50,7	52,5	54,4	56,2
1000	25,9	27,8	29,7	31,6	33,5	35,4	37,2	39,1	41,0	42,9	44,8	46,7	48,6	50,4	52,3	54,2	56,1	58,0
	Weight* [Kg]																	

* tollerance ± 10%

Actuator weights:

- BELIMO BF... 18Nm = 3,1Kg
- SCHISCHEK ExMax 15Nm = 3,5Kg

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Electrical actuator
SCHISCHEK

Description		On-off 3-pos., spring-return, 2 micro switches, IP66
Torque		15Nm
Power		24...240VAC/DC (at rest 5W)
Angle of rotation		95°
Running time	(M)	3s / 15s / 30s / 60s / 120s
		3s / 10s
Dimensions (LxWxH)		210x95x80mm
Shaft		square 12x12mm

..Pro-TT



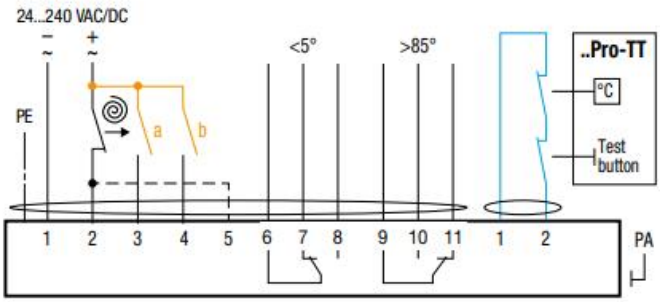
Safety temperature trigger
Thermal fuse
(Available for 72-95°C)

Model	InMax 15-BF	RedMax 15-BF	ExMax 15-BF
			
Zone	SAFE AREA	ATEX AREA ZONE 2, 22 GAS + DUST	ATEX AREA ZONE 1, 2, 21, 22 GAS + DUST

ELECTRICAL INSTALLATION

For 3-pos variation: add orange connection (a and b on 3 and 4)
For standard wiring: Spring return in 10s
For additional wiring on terminal 5: Spring return in 3s

On-off / 3 pos. - spring return + tripping circuit



5.15 JUNCTION BOXES

Casse di derivazione CDE
CDE junction boxes

Cieca
Blind



Struttura
lamiera d'acciaio sp. 10/10 verniciata RAL 7035 bucciato.

Coperchio o porta incernierata
verniciati RAL 7035 bucciato con guarnizione in colata continua.

Composizione
Struttura, porta o coperchio, confezione di viteria.

Grado di resistenza meccanica secondo IEC EN 62208: IK10

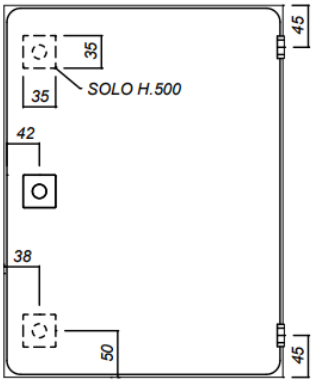
Structure
10/10 thick steel sheet, painted textured RAL 7035.

Cover or hinged door
Painted textured RAL 7035, provided with a gasket applied in continuous casting.

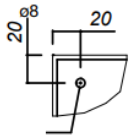
Composition
Structure, door or cover, set of accessories and screws for assembly.

Mechanical resistance degree as per IEC EN 62208: IK10

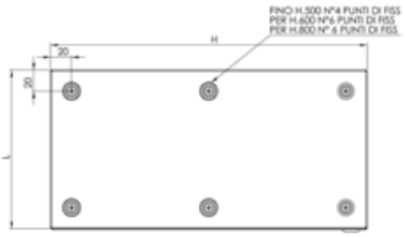
IP66 **IP55**

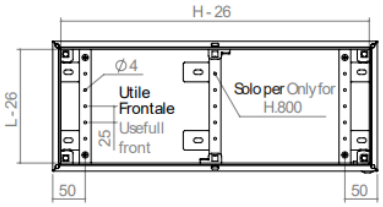


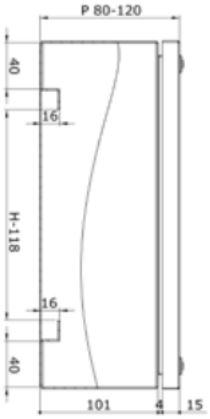
CASSA SENZA FLANGE IP 66 SODDISFA TYPE 4 BOX WITHOUT FLANGES IP 66 COMPLIES WITH TYPE 4	CASSA CON COPERCHIO INCERNERATO IP 55 SODDISFA TYPE 12 BOX WITH HINGED COVER IP 55 COMPLIES WITH TYPE 12	DIMENSIONE DIMENSIONS ALTEZZA, H HEIGHT, H	LARGHEZZA, L WIDTH, L	PROFONDITÀ, P DEPTH, P
R5CDE1180	-	150	150	80
R5CDE9180	-	180	150	80
R5CDE2980	-	200	180	80
R5CDE2280	R5CDE2280C	200	200	80
R5CDE3180	-	300	150	80
R5CDE3280	R5CDE3280C	300	200	80
R5CDE4280	R5CDE4280C	400	200	80
R5CDE6280	-	600	200	80
R5CDE8280	-	800	200	80
R5CDE11120	-	150	150	120
R5CDE22120	R5CDE22120C	200	200	120
R5CDE31120	-	300	150	120
R5CDE32120	R5CDE32120C	300	200	120
R5CDE33120	R5CDE33120C	300	300	120
R5CDE42120	R5CDE42120C	400	200	120
R5CDE43120	R5CDE43120C	400	300	120



R5CDE44120	-	400	400	120
R5CDE52120	**R5CDE52120C**	500	200	120
R5CDE53120	-	500	300	120
R5CDE62120	-	600	200	120
R5CDE63120	-	600	300	120
R5CDE64120	-	600	400	120
R5CDE82120	-	800	200	120
R5CDE84120	-	800	400	120







5.16 CAVO SCALDANTE

etelec electrical technology

SCHEDA TECNICA **HTC-P**



DESCRIZIONE ESTESA

Cavo scaldante a potenza autoregolante per tutte le applicazioni fino a 65°C per contatto continuo e fino a 85 °C per contatto intermittente.

Applicazioni:

- protezione antigelo di tubazioni e serbatoi industriali contenenti liquidi e gas;
- mantenimento in temperatura e riscaldamento di tubazioni e serbatoi industriali contenenti liquidi e gas;
- tracciamento di tetti e grondaie;
- tracciamento superfici non carrabili.

GAMMA DI PRODOTTO				
Famiglia		Cavi Scaldanti		
Serie		HTC-P		
Codice Metel		**HTC10P**	**HTC15P**	**HTC25P**
Nome commerciale		**HTC-10P**	**HTC-15P**	**HTC-25P**
INFORMAZIONI DIMENSIONALI				
Dimensioni sezione cavo	mm	11,5 x 6,3		
Min. raggio di curvatura	mm	40		
Sezione conduttori	mm^2 | AWG	0,8 | 18		
Peso	kg/m	0,13		
INFORMAZIONI FISICHE				
Materiale conduttori		Rame		
Materiale matrice		Autoregolante		
Materiale isolante primario		Poliolefina modificata		
Materiale calza metallica		Rame stagnato		
Materiale rivestimento esterno		Poliolefina reticolata		
Halogen Free	(F), (Cl), (Br), (I), (At)	Si		
Lead Free	Pb	Si		

INFORMAZIONI TECNICHE					
			HTC10P	**HTC15P**	**HTC25P**
Potenza nominale a 10 °C	W/m		10	15	25
Potenza massima a 0°C	W/m		12	18	28
Temperatura massima di contatto	°C	65		Cavo alimentato	
Temperatura massima di contatto	°C	85		Cavo non alimentato	
Classe Temperatura		T6			
Temperatura minima di utilizzo	°C	- 40			
Alimentazione	V	230			
Resistenza elettrica della schermatura	Ω/m	0,018			
Resistenza all'acqua	%	100			

CONFORMITA' DI PRODOTTO E DI SISTEMA			
Norme di riferimento		EN 62395	
Conformità		EN 62395	
Comportamento al fuoco		n.a.	
Classificazione ETIM	Ver. 7.0	EC000339	
Grado di isolamento		IP66	EN60529

INFORMAZIONI DI SICUREZZA	
Prodotto tossico	No
Prodotto pericoloso	No
Conformità CLP (Regolamento 1272/2008/CE)	n.a.

INFORMAZIONI LOGISTICHE				
Codice	Q.tà (m)	Dimensioni (m)	Peso (kg)	Barcode
HTC10P	300	0,45 x 0,45 x 0,45	40	8053323900085
HTC15P	300	0,45 x 0,45 x 0,45	40	8053323900092
HTC25P	300	0,45 x 0,45 x 0,45	40	8053323900115

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5.17 PIPE

DESCRIPTION	CHARACTERISTICS
PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 50 mm
	INTERNAL DIAMETER : 40,8 mm
	PN RATING : 20
	MAX OPERATIONAL PRESSURE (at 20°C) : 20 bar (290 psi)

PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 50 mm
	INTERNAL DIAMETER : 42,6 mm
	PN RATING : 16
	MAX OPERATIONAL PRESSURE (at 20°C) : 16 bar (232 psi)

PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 25 mm
	INTERNAL DIAMETER : 21,2 mm
	PN RATING : 16
	MAX OPERATIONAL PRESSURE (at 20°C) : 16 bar (232 psi)

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5.18 ELECTRICAL CLAMP

DESCRIPTION	CHARACTERISTICS
ELECTRICAL CLAMP	COD. : ETQ76290N
	MATERIAL : NYLON (PA6.6)
	COLOR : BLACK
	LENGTH : 300 mm
	WIDTH : 7,6 mm
	TENSILE STRENGTH : 54 daN
	SELF-EXTINGUISHING CLASS : UL 94 - V 2

ELECTRICAL CLAMP	COD. : ETQ25100N
	MATERIAL : NYLON (PA6.6)
	COLOR : BLACK
	LENGTH : 100 mm
	WIDTH : 2,5 mm
	TENSILE STRENGTH : 8 daN
	SELF-EXTINGUISHING CLASS : UL 94 - V 2

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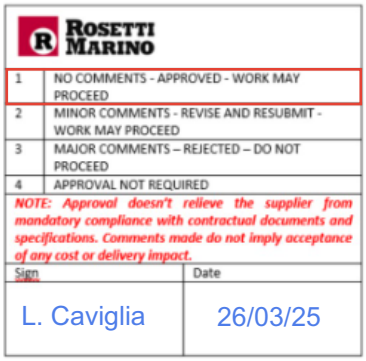
Base Load Power Hub (BLPH)

HVAC System

B-300 AC UPS Switch Room

Component List and DS

Document Number:1724000049-HV-LIS-00049


ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	26/03/25

Document Class: 3

03	10/03/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
02	22/01/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
01	29/10/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.
00	20/07/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.
Rev.	Date	Description	Prepared	Reviewed	Approved

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)
02	Issue for Information (IFI)
03	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.2 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

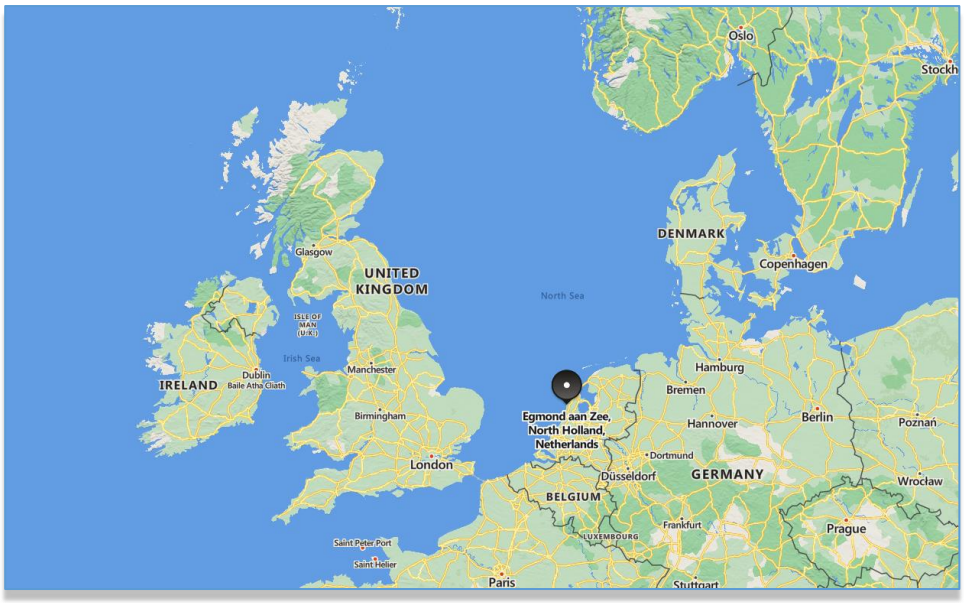


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

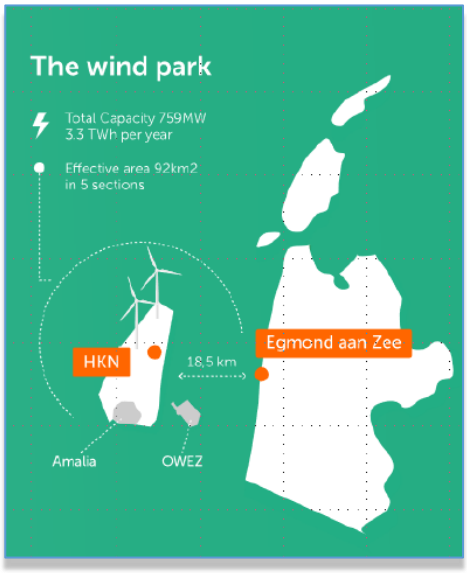


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.3 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

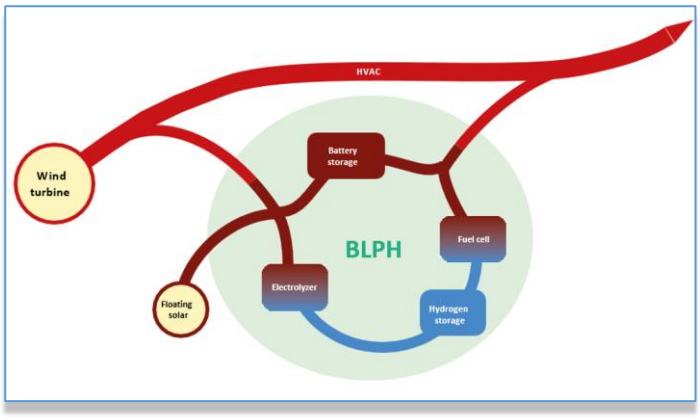


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting

wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

Scope of the document is to collect the main equipment technical data sheet relevant to the HVAC system provided for Hollandse Kust Noord Wind Park Project

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

3 INTRODUCTION

3.1 SCOPE OF WORK

Scope of the document is to collect the main equipment technical data sheet relevant to the HVAC system provided for Hollandse Kust Noord Wind Park Project

4 MAIN PACKAGE HVAC UNIT

Main unit data for HHU-77005 and HHU-77006

4.1 MAIN UNIT DATA

Description	Unit measure	Value
Type of unit	-	Rooftop Unit
Package unit model	-	4112-DMPD-200
Configuration	-	no.1 Duty + no.1 Stand-By
Total cooling capacity	kW	11.96
Sensible cooling capacity	kW	11.96
Heating capacity	kW	6
Outdoor design temperature & humidity	°C (D.B.)	Summer: +25°C (D.B.) Rh90%
	-	Winter: -8.4°C (D.B.) Rh 100%
Air flow rate - Supply	m^3/h	2700
Air flow rate - Return	m^3/h	1588
Air flow rate – Fresh air	m^3/h	1112
External static pressure	Pa	800
Refrigerant	-	R513a
Length x Width x Height (external unit)	mm	2100x1000x1550
Weight	kg	950
Number of compressors	-	1

Supply air duct connection (50mm flange)	mm	500x410
Fresh air duct connection (50mm flange)	mm	200x210
Return air duct connection	mm	300x310
Panel and thermal insulation (Material – Tk)	mm	Poliuretan / 20mm
Materials on main base frame	-	Inox 316L
Materials on internal panel skin	-	Inox 316L
Materials on external panel skin	-	Inox 316L
Execution	-	Safe zone

4.2 SUPPLY FAN & MOTOR DATA

Description	Unit measure	Value
Type	-	RDH E2-0250
Manufacturer	-	Nikotra
Casing material	-	Galvanized steel
Weight	kg	16
Air flow rate	m^3/h	3200
Nominal static pressure	Pa	750
Nominal total pressure	Pa	720
Fan power consumption	kW	2.1
Fan speed	rpm	3019
Impeller type	-	Forward
Earthing boss	-	Yes
Drive arrangement	-	Belt SPA
Fan pulley	Ø (mm)	90
Motor fan pulley	Ø (mm)	190
Belt type and quantity	-	A47-1227 2pc
Manufacturer	-	SMEM
Nominal motor power	kW	3
Winding configuration	-	DOL
Motor speed	Rpm	1420
Nominal current	A	6.3

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Description	Unit measure	Value
Starting current	A	25
Electrical supply	V / Ph / Hz	400 / 3 / 60
IP rating	-	IP55
Execution	-	Safe zone

4.3 ELECTRICAL HEATING COIL DATA

Description	Unit measure	Value
Frame	-	AISI 316 L
Dimension	mm	500x410
Heater depth	mm	200
Heating capacity – 1st step	kW	6
Absorbed current – 1st step	A	8.7
Heating capacity – 2nd step	kW	n.a.
Absorbed current – 2nd step	A	n.a.
Power supply	-	400 V 3 PH 50HZ
Safety accessories	-	THERMOSTATE ON BOARD
Manufacturer	-	Diamanti

4.4 FILTER DATA

Primary filter		
Filter type	-	G4 (EN779)
Filter section size (Q.ty - W x H x tkh)	no. / mm	1
		593x593x48
Pressure drop (clean filter)	Pa	65

Final pressure drop (dirty filter)	Pa	97
Manufacturer	-	F&F
Filter type	-	G4 (EN779)
Filter section size (Q.ty - W x H x tkh)	no. / mm	1
		287x593x48
Pressure drop (clean filter)	Pa	65
Final pressure drop (dirty filter)	Pa	97
Manufacturer	-	F&F
Model	-	FCZ-OS4
Secondary filter		
Filter type	-	F7 (EN779)
Filter section size (Q.ty - W x H x THK)	no. / mm	1
		593x593x98
Pressure drops (clean filter)	Pa	85
Final pressure drops (dirty filter)	Pa	102
Manufacturer	-	F&F
Model	-	PFM4-8-23.23
Filter type	-	F7 (EN779)
Filter section size (Q.ty - W x H x THK)	no. / mm	1
		287x593x98
Pressure drops (clean filter)	Pa	85
Final pressure drops (dirty filter)	Pa	102
Manufacturer	-	F&F
Model	-	PFM4-6-11.23

4.5 COALESCENT FILTER DATA

Coalescent filter		
Manufacturer		EuropAir
Filter type	-	SG41R-X
Filter section size (Q.ty - W x H x tkh)	no. / mm	1

		500x500x170
Pressure drop (clean filter)	Pa	50
Final pressure drop (dirty filter)	Pa	75

4.6 COOLING COIL DATA

Description	Unit measure	Value
Total cooling load (design)	kW	12
Number of refrigerant circuits	N°	1 x 100%
Evaporating temperature / Pressure	°C / kPa	+7 – 411
Design pressure	kPa	2100
On-coil air condition	°C (D.B. / W.B.)	+26 / +18.8
Off-coil air condition	°C (D.B. / W.B.)	+15.54 / 14.2
Air flow rate	m^3/h	2700
Air pressures drop	Pa	40 (Wet fins 92)
Coil face velocity	m/s	1.95
Number of rows	-	5
Fin thickness / Fin spacing	mm	0,10 / 2,5
Drop eliminators required	-	Included
Drain size / Type	Inch	1"
Weight	kg	41
Tube materials / Thickness	mm	CuSn/ 12.45 X 0.35
Fins material / Thickness	mm	CuSn / 0,25
Casing material / Thickness	mm	Inox 316 / 1.5
AISI 316 Drain pain	-	Required – 50mm

4.7 REFRIGERANT COMPRESSOR DATA

Description	Unit measure	Value
Type	-	Ermetic scroll compressor
Manufacturer	-	Panasonic
Electrical supply	V / Ph / Hz	400 / 3 / 50
Electrical supply - Auxiliary	V / Ph / Hz	230 / 1+N / 50
IP rating	-	IP54
Cooling capacity	kW	11.96
no. of compressors	no.	1
Steps capacity	no.	1
Nominal compressor power & Current	kW / A	5.8 / 9.8
Absorber power & Current at design conditions	kW / A	3.78 / 7.3
Starting method	-	DOL
Starting current	A	50
Oil heater power	W	50
Oil charge	L	1.7
Weight	kg	39
Safety accessories	-	

4.8 CONDENSING COIL DATA

Description	Unit measure	Value
Total heat rejection	kW	16
Number of refrigerant circuits	-	1
Condensing temperature / Pressure	°C / kPa	+54.40 / 1531
Refrigerant coil leaving temperature	°C	54.4
Design pressure	kPa	2100
No. Of coils / Sections	-	1

Description	Unit measure	Value
On-coil temperature / Wet bulb	°C / °C	35 / 24
Off-coil temperature / Wet bulb	°C / °C	41 / 25.5
Air flow rate	m^3/h	7300
Air pressure drop	Pa	71
Coil face velocity	m/s	2.94
Number of rows	-	4
Fin thickness / Fin spacing	mm	0,10 / 2,5
Weight	kg	64
Tube materials / Thickness	mm	CuSn 12.45 X 0.35
Fins material / Thickness	mm	CuSn 0.10
Casing material / Thickness	mm	INOX 316 / 1.5

4.9 CONDENSER FAN MOTOR DATA

Description	Unit measure	Value
Type	-	Axial
Fan diameter	mm	450
Quantity	no.	2
Casing material	-	AISI 316L
Weight	kg	35
Air flow rate	m^3/h	3650
Nominal static pressure	Pa	110
Fan speed	rpm	1.450
Earthing boss	-	Yes
Drive arrangement	-	Direct
Nominal motor power	kW	0.37
Winding configuration	-	DOL
Nominal current	A	1
Electrical supply	V / Ph / Hz	400 / 3 / 60
IP rating	-	IP66 - Tropicalized

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Description	Unit measure	Value
Max. operating temperature	°C	+55
Min. operating temperature	°C	-10
Lubrication	-	Self-lubricated bearing
Painting	-	n.a.
Finish color	-	RAL 7035

4.10 PRESSURIZING FAN DATA

1 Description	Unit measure	Value
Type	-	RM250/2
Manufacturer	-	Moro
Casing material	-	Galvanized steel
Weight	kg	26
Air flow rate	m^3/h	1112
Nominal static pressure	Pa	700
Nominal total pressure	Pa	600
Fan power consumption	kW	0.37
Fan speed	rpm	2980
Impeller type	-	Forward
Earthing boss	-	Yes
Drive arrangement	-	Direct
Fan pulley	Ø (mm)	n.a.
Motor fan pulley	Ø (mm)	n.a.
Belt type and quantity	-	n.a.
Manufacturer	-	Belk

Nominal motor power	kW	0.75
Winding configuration	-	DOL
Motor speed	Rpm	2980

Nominal current	A	1.5
Starting current	A	7
Electrical supply	V / Ph / Hz	400 / 3 / 60
IP rating	-	IP55
Execution	-	Safe zone
Max. operating temperature	°C	+50
Min. operating temperature	°C	-10
Lubrication	-	Self-lubricated bearing
Painting	-	Standard
Finish color	-	Green

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5 ATTACHMENTS

5.1 COMPRESSOR DATASHEET

SPECIFICATIONS OF COMPRESSOR

Model No: C-SBN453H8G

Output : 6 HP



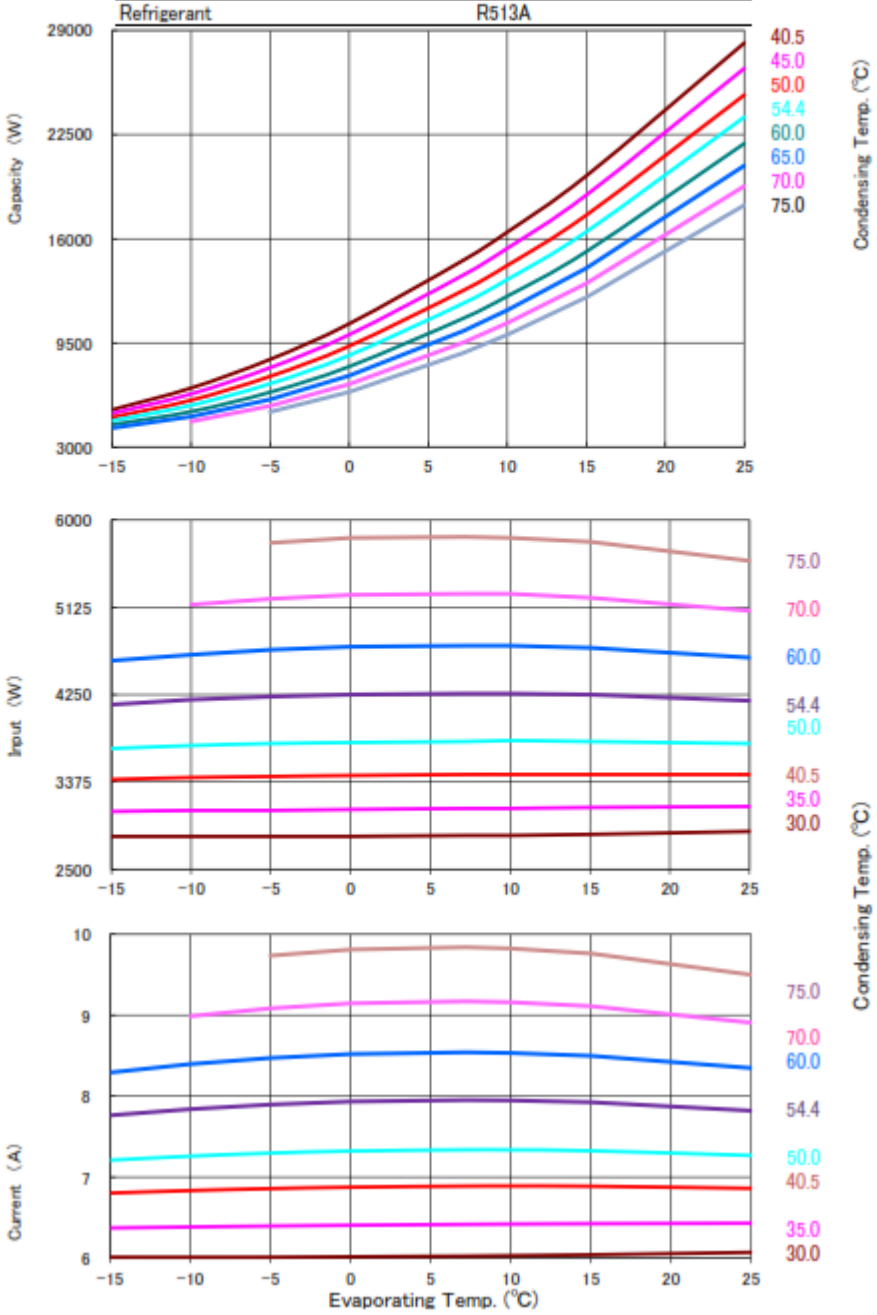
Temporary

Panasonic Appliances Compressor (Dalian) Co.,Ltd.

11/May/18

PERFORMANCE CURVE

Code No.	C-SBN453H8G
Power Source	3-PH 50Hz 380-415V
Condensing Temp.(℃)	40.5, 45, 50, 54.4, 60, 65, 70, 75
Super Heating (K)	11.1
Sub Cooled(K)	8.3
Compressor Cooling	Natural Cooling
Refrigerant	R513A



GENERAL SPECIFICATIONS

Model No:		C-SBN453H8G
Application		
Evaporating Temp Range	(℃)	-15 ~ 25
Refrigerant		R513A
Compressor Cooling		Natural Cooling
Rated Performance		
Capacity	(W)	11960/15040
Input	(W)	3780/4570
Current	(A)	7.3/7.3
Revolution	(min^{-1})	2950/3450
Sound Level	(dB(A))	62max / 67max
Rating Conditions		
Power Source		3-PH 50Hz 380V / 60Hz 440V
Evaporating Temp	(℃)	7.2
Condensing Temp	(℃)	54.4
Suction Gas Temp	(℃)	18.3
Liquid Temp	(℃)	46.1
Ambient Temp	(℃)	35.0
Measuring Point of Sound Level		
Distance from the Compressor	(m)	1.0
Compressor		
Design		Hermetic Scroll
Displacement	(cm3)	100.0
Suction Line Connection	(Φmm OD)	22.22
Discharge Line Connection	(Φmm OD)	12.7
Oil	(ml)	1700 (FV68S)
Mass(Incl.Oil)	(kg)	39
Motor		
Type		3-PH Induction Motor(3IR)
Pole		2
Rated Power Source		3-PH 50Hz 380-415V / 60Hz 440-460V
Voltage Range	(V)	342~456 / 396~506
Starting Current	(A)	-

Panasonic Appliances Compressor (Dalian) Co.,Ltd.

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PERFORMANCE DATA

Code No.	C-SBN453H8G
Power Source	3-PH 50Hz 380-415V
Condensing Temp.(℃)	40.5, 45, 50, 54.4, 60, 65, 70, 75
Super Heating (K)	11.1
Sub Cooled(K)	8.3
Compressor Cooling	Natural Cooling
Refrigerant	R513A

Capacity (W)

Condensing Temp.(℃) \ Evaporating Temp.(℃)	-15	-10	-5	0	7.2	10	15	25
40.5	5,320	6,680	8,470	10,690	14,640	16,410	19,920	28,210
45.0	5,090	6,310	7,950	10,010	13,720	15,400	18,720	26,630
50.0	4,850	5,920	7,410	9,300	12,760	14,330	17,470	24,970
54.4	4,640	5,600	6,950	8,720	11,960	13,450	16,430	23,590
60.0	4,390	5,210	6,420	8,020	11,020	12,410	15,190	21,940
65.0	4,180	4,890	5,970	7,450	10,240	11,540	14,160	20,560
70.0		4,590	5,560	6,920	9,520	10,740	13,210	19,280
75.0			5,190	6,430	8,860	10,010	12,340	18,090

Input (W)

Condensing Temp.(℃) \ Evaporating Temp.(℃)	-15	-10	-5	0	7.2	10	15	25
40.5	2,830	2,830	2,830	2,830	2,840	2,840	2,850	2,880
45.0	3,080	3,090	3,090	3,100	3,110	3,110	3,120	3,130
50.0	3,400	3,420	3,430	3,440	3,450	3,450	3,450	3,450
54.4	3,710	3,740	3,760	3,770	3,780	3,790	3,780	3,760
60.0	4,150	4,200	4,230	4,250	4,260	4,260	4,250	4,190
65.0	4,590	4,650	4,700	4,730	4,740	4,740	4,720	4,620
70.0		5,150	5,210	5,250	5,260	5,260	5,220	5,090
75.0			5,770	5,820	5,830	5,820	5,780	5,590

Current (A)

Condensing Temp.(℃) \ Evaporating Temp.(℃)	-15	-10	-5	0	7.2	10	15	25
40.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.1
45.0	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
50.0	6.8	6.8	6.9	6.9	6.9	6.9	6.9	6.9
54.4	7.2	7.3	7.3	7.3	7.3	7.3	7.3	7.3
60.0	7.8	7.8	7.9	7.9	8.0	7.9	7.9	7.8
65.0	8.3	8.4	8.5	8.5	8.5	8.5	8.5	8.3
70.0		9.0	9.1	9.1	9.2	9.2	9.1	8.9
75.0			9.7	9.8	9.8	9.8	9.8	9.5

Coefficients of Polynominal Formula

380V-50Hz	Capacity (W)	Input (W)	Current (A)
C1	1.837469E+04	1.974348E+03	3.820386E+00
C2	8.553049E+02	1.143672E+00	-6.418516E-04
C3	-2.256596E+02	-1.407106E+01	2.401665E-02
C4	1.011283E+01	7.487938E-01	1.121369E-03
C5	-1.086156E+01	-1.088724E-01	-8.245470E-05
C6	8.851898E-01	8.682915E-01	7.428248E-04
C7	-5.444298E-04	-5.254716E-04	-1.043913E-06
C8	-3.766916E-02	-1.675745E-02	-2.574407E-05
C9	4.342613E-02	2.435254E-03	3.099436E-06
C10	-3.486738E-09	2.780799E-09	-7.716818E-13

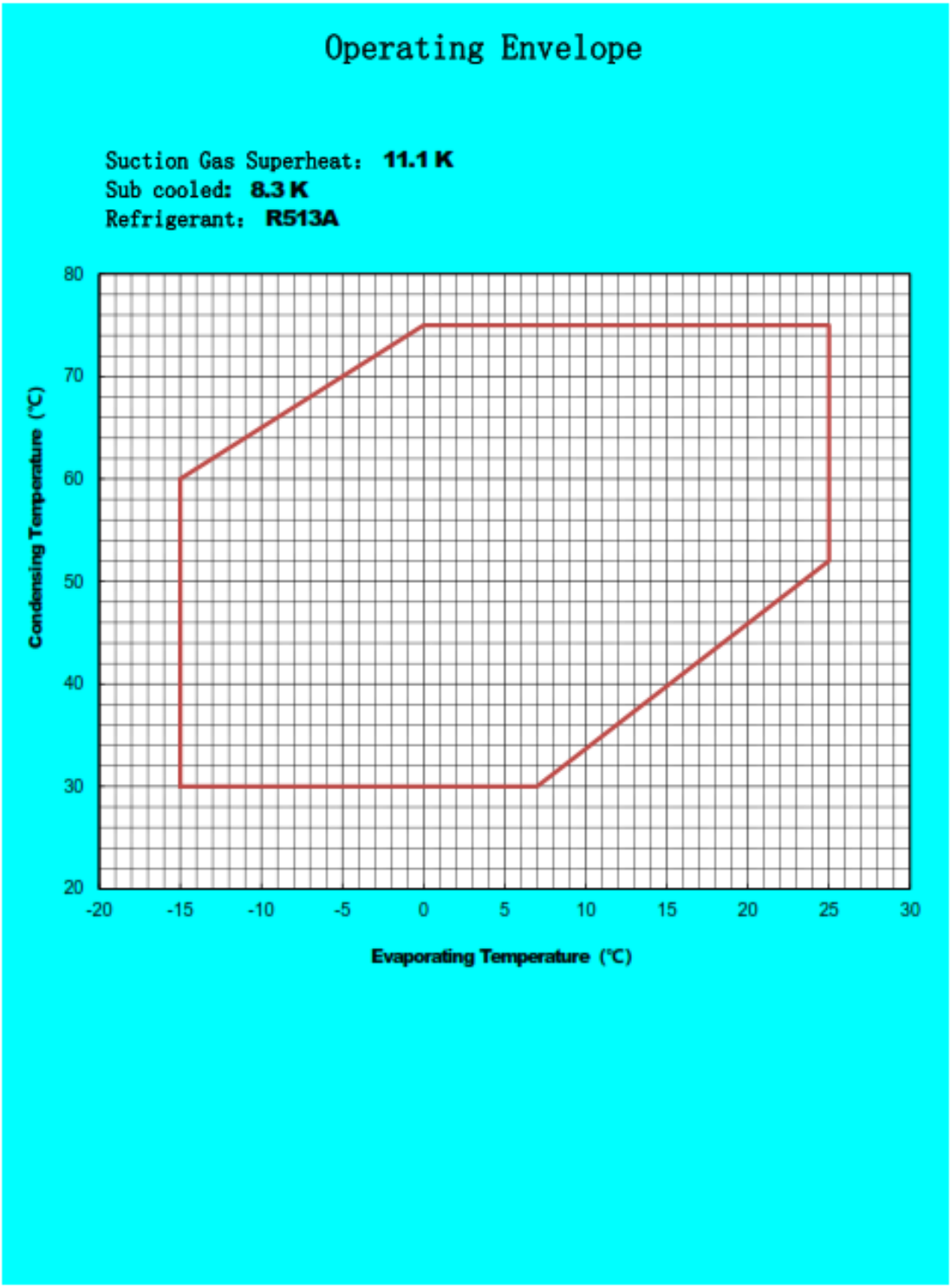
Note:The polynomial coefficients subject to change without notice.

$X=C1+C2*(S)+C3*D+C4*(S^2)+C5*(S*D)+C6*(D^2)+C7*(S^3)+C8*(D*S^2)+C9*(S*D^2)+C10*(D^3)$

X——CAPACITY(W) OR POWER(W) OR CURRENT(A)

S——EVAPORATING TEMP, ℃

D——CONDENSING TEMP, ℃


Operating Envelope
Suction Gas Superheat: 11.1 K
Sub cooled: 8.3 K
Refrigerant: R513A
Condensing Temperature (℃)
80
70
60
50
40
30
20
-20
-15
-10
-5
0
5
10
15
20
25
30
Evaporating Temperature (℃)

Application Standard for B、C fixed speed with R513A

The following requirements apply to vertical type hermetic scroll compressors:

Standard: Applicable to ordinary conditions in Japan JIS B8616 or equivalent conditons, such as standard rating conditions, maximum operating conditions, low temperature conditions, etc.

No.	Item	Standard	Note
1	Refrigerant	R513A	
2	Evaporating Temp.	-15~25℃(5~77 ° F) 0.08~0.61MPa(G)(12~89psig)	Comp. Suction Pressure
3	Condensing Temp.	30~75℃(86~167° F) 0.72~2.33MPa(G)(104~338psig)	Comp.Discharge Pressure
4	Compression Ratio	2 ~ 9.5	
5	Winding Temp.	115℃(240 °F) Max.	
6	Shell Bottom Temp.	Upper Limit:90℃(194 °F) Max. Lower Limit:Evaporating Temp.+12℃(21 °F) Min.	When compressor is running
		Lower Limit:Ambient Temp.+11℃(20 °F) Min.	When compressor shuts off
7	Discharge Gas Temp.	120℃(248 °F) Max.	Temp. within 100mm(4in) of the discharge fitting.
			Temp. inside of the well pipe on the top of compressor
8	Suction Gas Temp.	Superheat: 5K(10 °F)Min.	It should meet the requirement of item 5, 6, 7 and 14 within 30cm of the suction fitting.
9	Abnormal Pressure Rise/Drop	Pressure Rise: 2.5MPa(G) (362psig) Max.	By high pressure switch
		Pressure Drop: 0.03MPa(G) (4.35psig) Min.	By low pressure switch
10	Discharge Thermostat	130±5℃(266 ±10 °F)	Trip Temperature
		95±11℃ (205 ± 20 °F)	Reset Temperature

Operation beyond the above limits must be approved by Panasonic Appliances Compressor (Dalian) Co., Ltd.

(G): Gauge Pressure

5.2 EVAPORATING COIL

D.B.M. SpA a Socio Unico
Via Ugo La Malfa 10 – 28040 Varallo Pombia (NO) – Italy
Tel. +39 0321 956794 – E mail: sales@dbmcoils.com

FRIGOTERMICA S.r.l.
Sig. Matteo Grassi

4112 RDA 100-002PD

NOTE

Offer	**OF03691-24**
Contact	Francesco Travaini
Delivery Schedule	5/6 weeks da order
Goods rendered	FCA
Packing	Eventuale al costo
Payment	Solito in uso
Offer validity	30 GG

24 months guarantee according to DBM sales terms

DESIGN DATA — CC fi-104736-54699/2 3 128 — Rel. 6.5.0.5 18-02-2(

EXTERNAL FLUID:	**Air**				
Ambient pressure	mmHg	760			
Capacity	**kW**	**12.00**			
Gas quantity	**Sm³/h**	**2700**			
Air treated weight	kg/h	3251	Sensible heat factor		0.80
Inlet temperature	**°C**	**26.00**	Condensed water	kg/h	3.30
Relative humidity	%	50.00	Actual velocity	m/s	1.95
Outlet temperature	**°C**	**15.54**	Pressure drop	Pa	92
Outlet relative humidity	%	86.51	Dry fin pressure drop	Pa	40
INTERNAL FLUID:	**R513A**				
Evaporating pressure	**bar(a)**	**4.11**	**Evaporating temperature**	**°C**	**7.00**
Condensing pressure	bar(a)	15.30	Liquid temperature	°C	54.40
Superheating	°C	5.00	Subcooling	°C	2.00
Liquid weight	kg/h	392	Pressure drop	bar	0.10
Distributor diameter	mm	22.00	Distributors pressure drop	bar	0.63
Capillars Ø 5 lenght 550 mm			Capillars pressure drop	bar	0.87

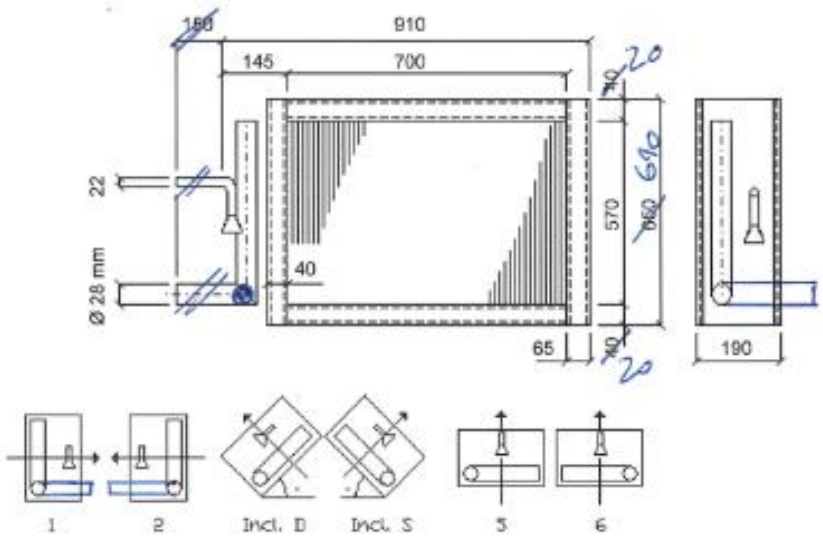
N°2 Coils CuSn-CuSn-Inox316 P3012ED 5R-19T-700A-2.5pa 9C 28 mm €

TECHNICAL FEATURES

Tubes	CuSn	12.45 x 0.35	mm	Weight	41 Kg
Fins	CuSn	0.10	mm	Internal volume	10 dm3
Frame	Inox316	1.50 / 1.50	mm	Total exchange surface	37.41 m2
Manifolds material	Cu			**PED 2014/68/UE Cat.**	**Article 4.3**
				Maximum allowable pressur	21.0 bar
				Min/Max allowable temp	-10/80 °C

ACCESSORIES
Curvette e collottori non stagnati

Certified calculation - Counterflow



5.3 CONDENSING COIL

D.B.M. SpA a Socio Unico
Via Ugo La Malfa 10 – 28040 Varallo Pombia (NO) – Italy
Tel. +39 0321 956794 – E mail: sales@dbmcoils.com

14/06/2024

FRIGOTERMICA S.r.l.
Sig. Matteo Grassi

4112 RDA 100-002PD

NOTE

Offer	**OF03691-24**
Contact	Francesco Travaini
Delivery Schedule	5/6 weeks da order
Goods rendered	FCA
Packing	Eventuale al costo
Payment	Solito in uso
Offer validity	30 GG

24 months guarantee according to DBM sales terms

DESIGN DATA — CC fi-104737-36579/3 20 128 — Rel. 6.5.0.5 18-02-2023

Safety on surface 35%

EXTERNAL FLUID:	**Air**				
Ambient pressure	mmHg	760			
Capacity	**kW**	**16.00**			
Gas quantity	**Sm³/h**	**7300**			
Air treated weight	kg/h	8791	Sensible heat factor		1.00
Inlet temperature	**°C**	**35.00**	Condensed water	kg/h	0.00
Relative humidity	%	40.00	Actual velocity	m/s	2.94
Outlet temperature	**°C**	**41.15**	Pressure drop	Pa	71
Outlet relative humidity	%	28.68			
INTERNAL FLUID:	**R513A**				
Condensing pressure	**bar(a)**	**15.31**	**Condensing temperature**	**°C**	**54.40**
Superheating	°C	0.00	Subcooling	°C	2.00
Liquid weight	kg/h	444	Outlet temperature	°C	51.68
Pressure drop	bar	0.12	Pressure drop	°C	0.31
Vapour velocity inside tubes	m/s	2.65			

N°2 Coils CuSn-CuSn-Inox316 P3012COND 4R-45T-550A-2.5pa 5C 28 mm 22 mm €

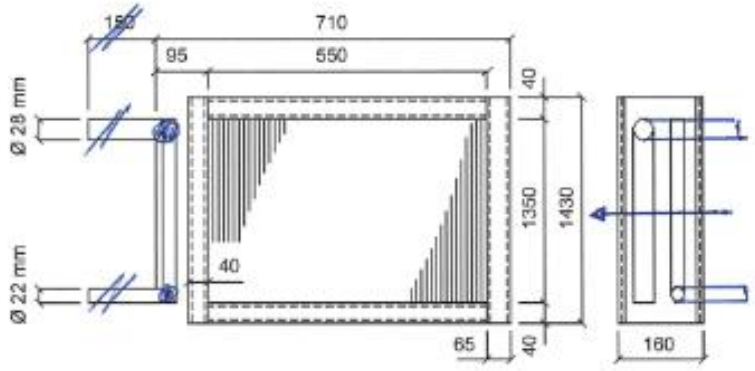
TECHNICAL FEATURES

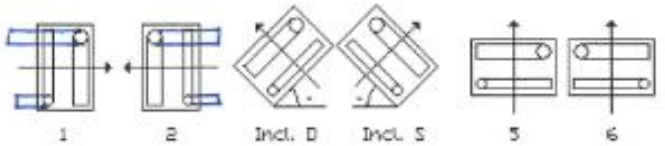
Tubes	CuSn	12.45 x 0.35	mm	Weight	64 kg
Fins	CuSn	0.10	mm	Internal volume	16 dm3
Frame	Inox316	1.50 / 1.50	mm	Total exchange surface	55.69 m2
Manifolds material	Cu			PED 2014/68/UE Cat.	Article 4.3
				Maximum allowable pressure	21.0 bar
				Min/Max allowable temp.	-10/60 °C

ACCESSORIES

Curvette e collottori non stagnati

Certified calculation - Counterflow





5.4 ACTUATOR WITH SPRING RETURN

Item TAG: HDZ-77-NNN

ACTUATOR WITH SPRING RETURN

| DA03S... |



TYPE OVERVIEW

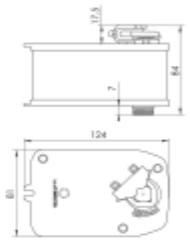
Torque	Controls	Damper surface	Voltage	Auxiliary switches	Weight	Type
3Nm	On/off	< 0,5 m² *	24V AC/DC	-	0,98 kg	DA03S24
				2SPDT**	1,08 kg	DA03S24S
	Modulating			-	1,02 kg	DA03S24P
				2 SPDT**	1,07 kg	DA03S24PS
	On/off		230V AC	-	0,99 kg	DA03S220
				2 SPDT**	1,09 kg	DA03S220S

TECHNICAL SPECIFICATION

Type	DA03S24 (S)	DA03S24P (S)	DA03S220 (S)
Torque	3Nm		
Running time - motor/spring return	50 -70s / < 30s	50 -70s / < 30s	50 -70s / < 30s
Controls	on/off	0 -10V	on/off
Voltage	24V AC/DC	24V AC/DC	230V AC
Frequency	50/60Hz (AC)		
Power consumption			
- in operation	2,5W	2,5W	2,5W
- at rest	1,6W	1,6W	1,6W
- for wire sizing	10,0VA	7,0VA	10,0VA
Angle of rotation	-5°~90°		
- setting	45°~90° (5° step)		
Direction of rotation	can be selected by mounting L/R		
Sound power level - motor/spring return	<50 dB(A) / <65 dB(A)		
Position feedback	-	0 - 10V DC	-
Electrical connection	1m cable		
Auxiliary switches	3 (1.5)A, 230V		
Degree of protection	IP54		
Protection class	III low voltage	III low voltage	II
Ambient humidity	95% RH, without condensation		
Ambient temperature	-30~+50 °C		
Non-operating temperature	-40~+70 °C		
Service life	60 000 emergency positions		
Mechanical connection			
- round shaft	from ø6 to ø12mm		
- square shaft	from 5x5 to 8x8mm		
Manual override	not possible		
Norms and standards	Declaration of conformity, ISO, CE, EAC		

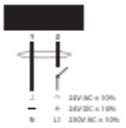
* Maximum damper surface is calculated for optimum conditions (without the influence of air flow, pressure difference, etc.).
** SPDT (Single-Pole Double-Throw)

DIMENSIONS (mm)

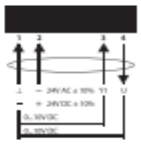


ELECTRIC INSTALATION

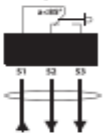
On/off



Modulating



Auxiliary switches



LUFBERG CONSTRUCTIVE DECISIONS

5.5 MANUAL VOLUME CONTROL DAMPERS

Item TAG: HDB-77-NNN

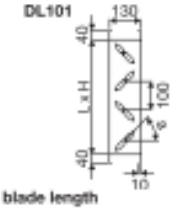
Volume control dampers in galvanised steel

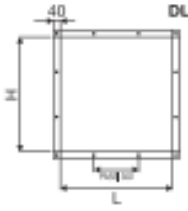
EUROPAIR TECHNOLOGY

Air flow control

DL 101







L: blade length

DL 151



Description

- Galvanised steel frame th. 10/10 Z200, depth 130 mm, 40 mm flange with Ø 8 mm holes in the middle, pitch 300 mm
- "Double Skin" aerofoil blades in galvanised steel th. 0.6+0.6 Z200, pitch 100 mm
- External control linkages in galvanised steel
- Sprung side seal
- Drive shaft Ø 12 mm L = 100 mm
- Nylon bearings, temp. -20°C / +70°C
- **Leakage class 1/A EN 1751**

Available execution (see page 11)

- Intermediate dimensions (larger sizes price list +€52)
- Execution with leakage class 3B EN 1751 (price list +€35 per blade)
- Frame 15/10 (list price x1.5) / frame 20/10 (list price x1.5) / frame 30/10 (list price x2)
- In 304 STAINLESS STEEL (list price x3)
- In 316L STAINLESS STEEL (list price x3.5)

ATEX execution: II 2G Ex h IIB/IIC T1...T6Gb
II 2D Ex h IIIC T 450°C...T 85°C Db (list price +40% +€120 each)

Accessories (see page 10)

- Galvanised manual drives (R11 up to 1 sqm €15) - (R12 over €21)
- Electric actuators / Pneumatic cylinder
- Atex actuators (see page 12)

Description

- Galvanised steel frame th. 15/10 Z200, prof. 160 mm, 40 mm flanges with Ø 8 mm holes in the middle, pitch 300 mm
- "Double Skin" aerofoil blades in galvanised steel th. 0.8+0.8 Z200, pitch 150 mm
- External control linkages in galvanised steel
- Sprung side seal
- Drive shaft Ø 12 mm L = 100 mm
- Nylon bearings, temp. -20°C / +70°C
- **Leakage class 2/B EN 1751**

Available execution (see page 11)

- Intermediate dimensions (larger sizes price list +€52)
- Frame 20/10 (list price x1.5) / frame 30/10 (list price x2)
- In 304 STAINLESS STEEL (list price x3)
- In 316L STAINLESS STEEL (list price x3.5)

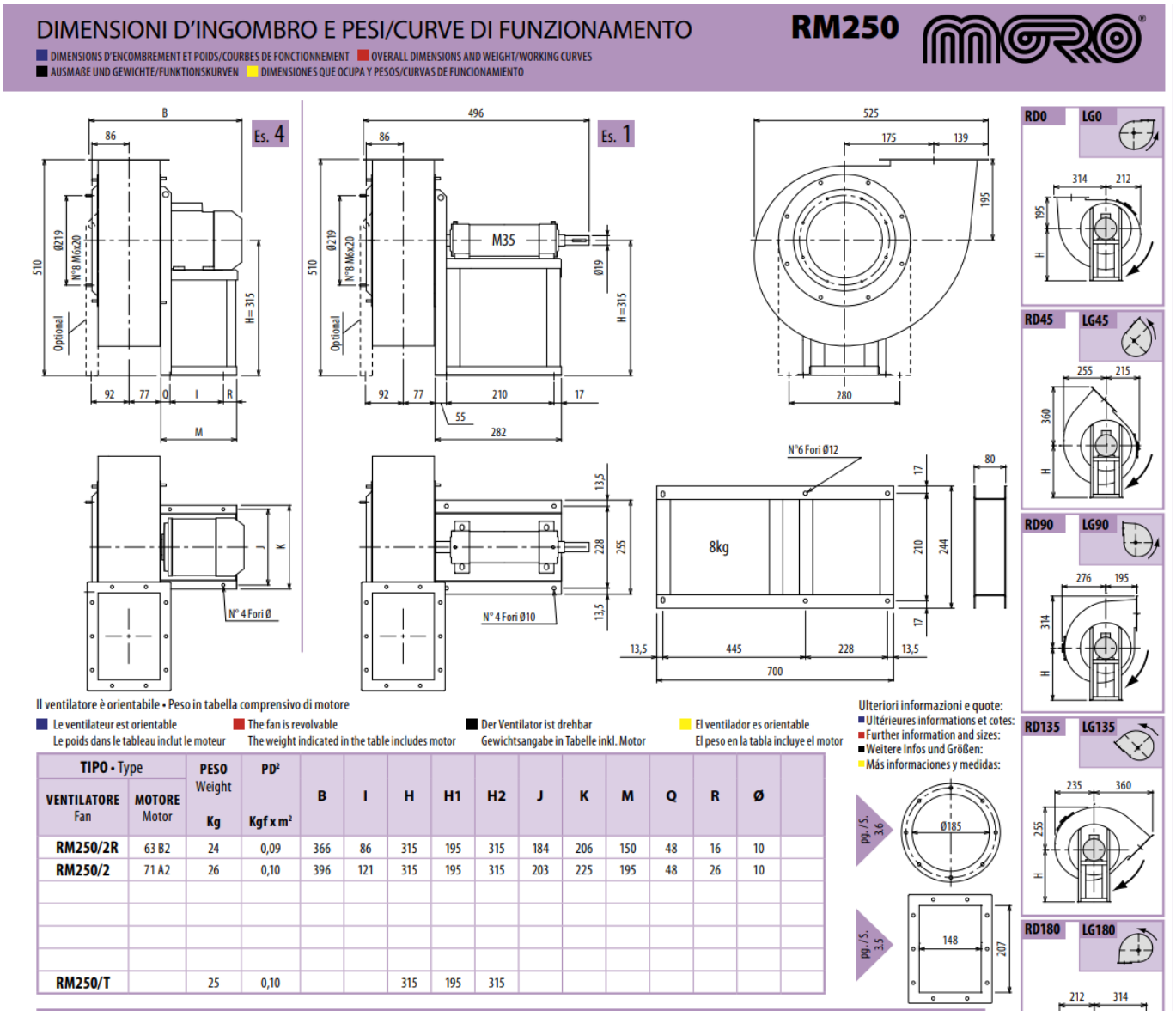
ATEX execution: II 2G Ex h IIB/IIC T1...T6Gb
II 2D Ex h IIIC T 450°C...T 85°C Db (list price +40% +€120 each)

Accessories (see page 10)

- Galvanised manual drives (R11 up to 1 sqm €15) - (R12 over €21)
- Electric actuators/ Pneumatic cylinder
- Atex actuators (see page 12)

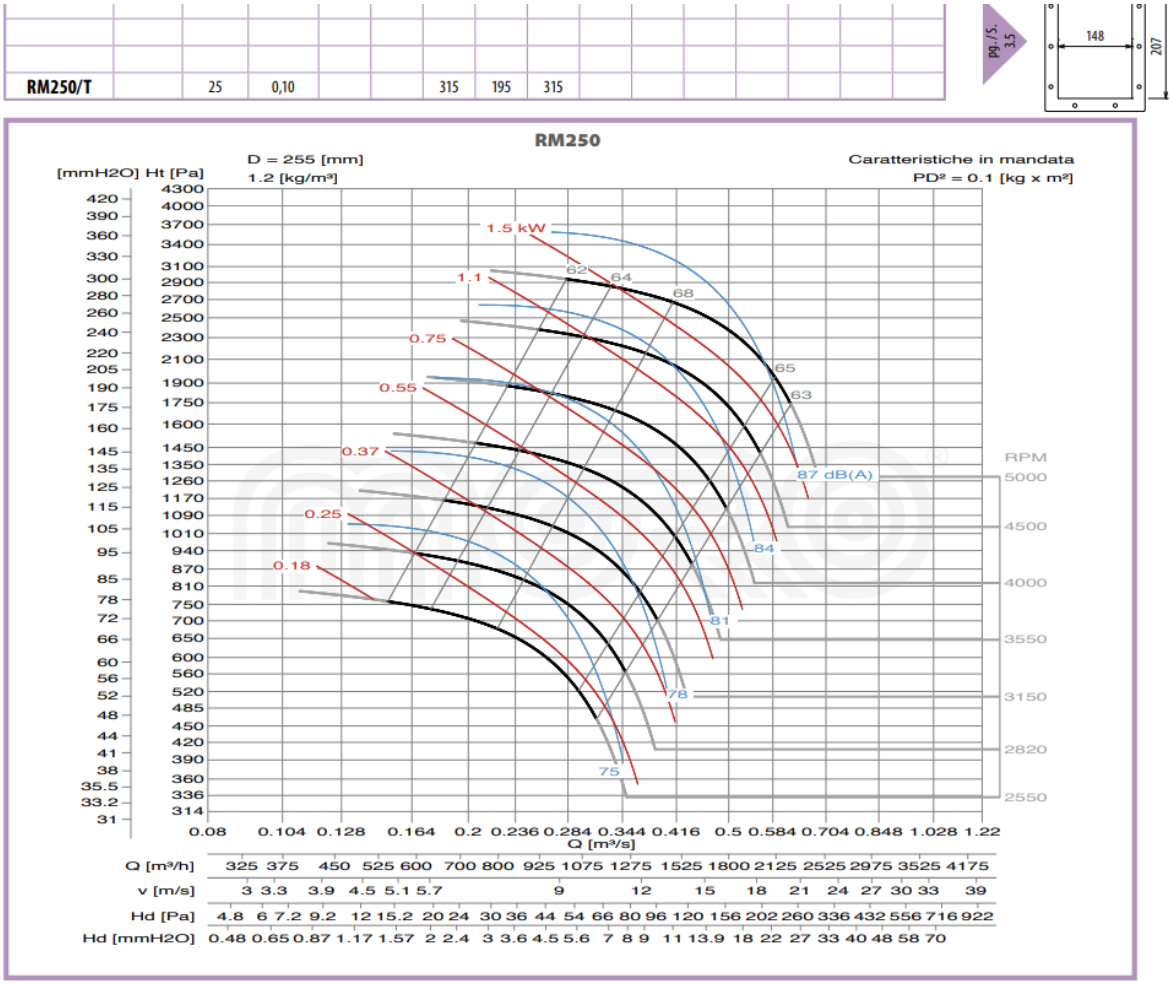
5.6 PRESSURIZING FAN

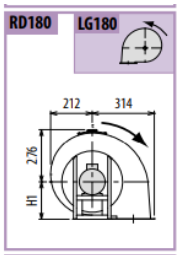
Item TAG: HFM-77-NNN

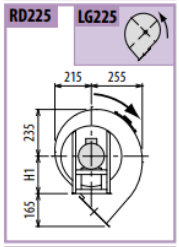


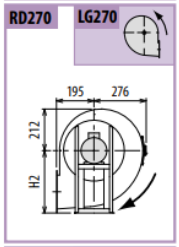
TIPO • Type		PESO Weight	PD²	B	I	H	H1	H2	J	K	M	Q	R	Ø
VENTILATORE Fan	MOTORE Motor	Kg	Kgf x m²											
RM250/2R	63 B2	24	0,09	366	86	315	195	315	184	206	150	48	16	10
RM250/2	71 A2	26	0,10	396	121	315	195	315	203	225	195	48	26	10
RM250/T		25	0,10			315	195	315						

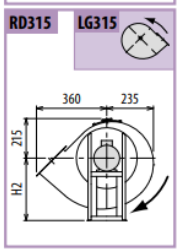
RM250/T		25	0,10		315	195	315











5.7 SUPPLY FAN

Item TAG: HFA-77-NNN

NICOTRA Gebhardt — Ventilatori centrifughi per trasmissione a cinghia / RDH / Dati tecnici

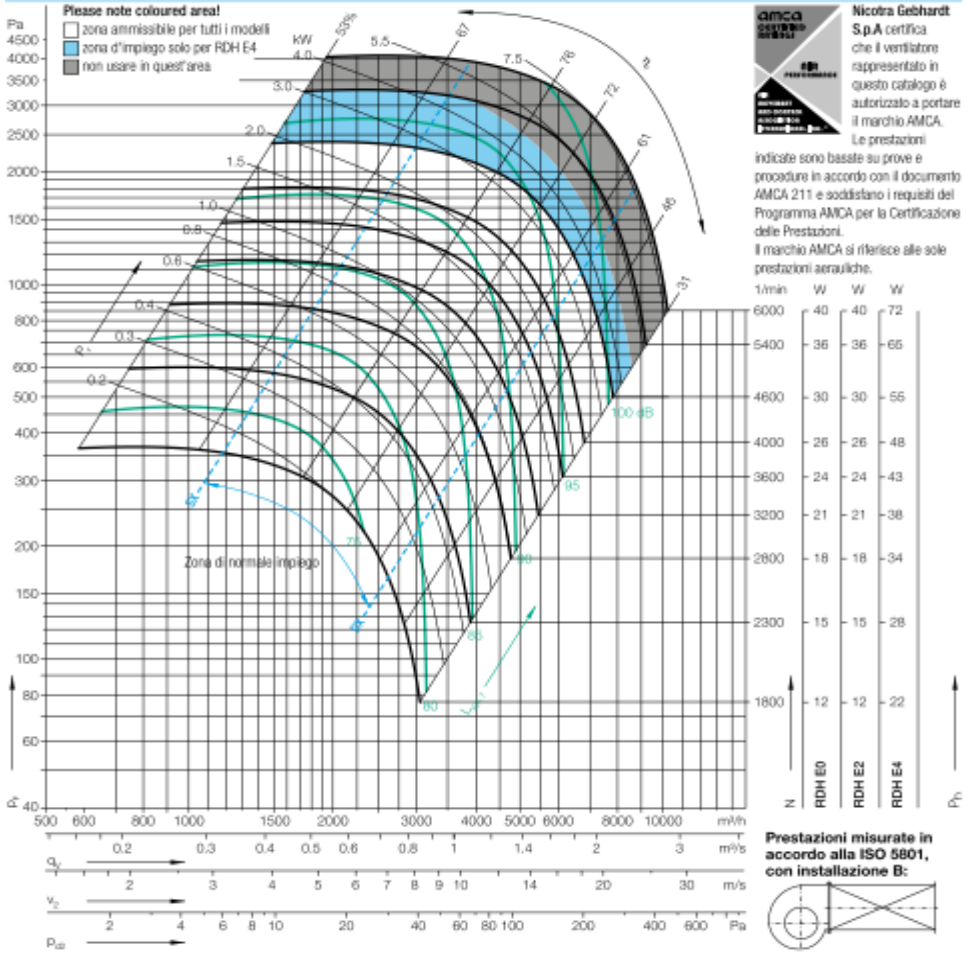
RDH E_-0250

Le prestazioni certificate si riferiscono ad installazione B, aspirazione libera – mandata canalizzata.
La potenza assorbita non include le perdite nella trasmissione.
Le prestazioni indicate non tengono conto di eventuali accessori nel flusso d'aria.

Dati tecnici

Dati ventola				Dati ventola			
Diametro ventola	D_2	252	mm	Peso ventola	m	4,87	kg
Numero di pale	z	11		Densità della sostanza estratta	ρ_1	1,2	kg/m³
Momento d'inerzia	J	0,044	kgm²	Classe di precisione (DIN 24166)		2	

Performance Curves



Nicotra Gebhardt S.p.A certifica che il ventilatore rappresentato in questo catalogo è autorizzato a portare il marchio AMCA. Le prestazioni indicate sono basate su prove e procedure in accordo con il documento AMCA 211 e soddisfano i requisiti del Programma AMCA per la Certificazione delle Prestazioni. Il marchio AMCA si riferisce alle sole prestazioni aerauliche.

Prestazioni misurate in accordo alla ISO 5801, con installazione B:

$\Delta L_{Wrel(A)}$

Punto di lavoro	Velocità 1/min	dB
SX	4600	3
SX	3200	3
SX	2300	2
$q_{V\,opt}$	4600	4
$q_{V\,opt}$	3200	4
$q_{V\,opt}$	2300	3
DX	4600	3
DX	3200	3
DX	2300	3

Fattori di correzione per determinare la rumorosità relativa all'aspirazione L_{WrelO}, per bande d'ottava f_c

63	125	250	500	1000	2000	4000	8000	Hz
-8	-7	-5	-4	-4	-9	-13	-18	dB
-7	-3	-4	0	-8	-9	-13	-19	dB
-4	-3	-3	-1	-6	-10	-15	-20	dB
-10	-10	-8	-8	-3	-7	-10	-17	dB
-9	-8	-7	-1	-7	-7	-12	-19	dB
-8	-6	-7	-1	-5	-8	-15	-21	dB
-10	-9	-9	-7	-5	-6	-9	-15	dB
-7	-8	-8	-3	-6	-6	-10	-19	dB
-7	-7	-8	-3	-4	-7	-13	-21	dB

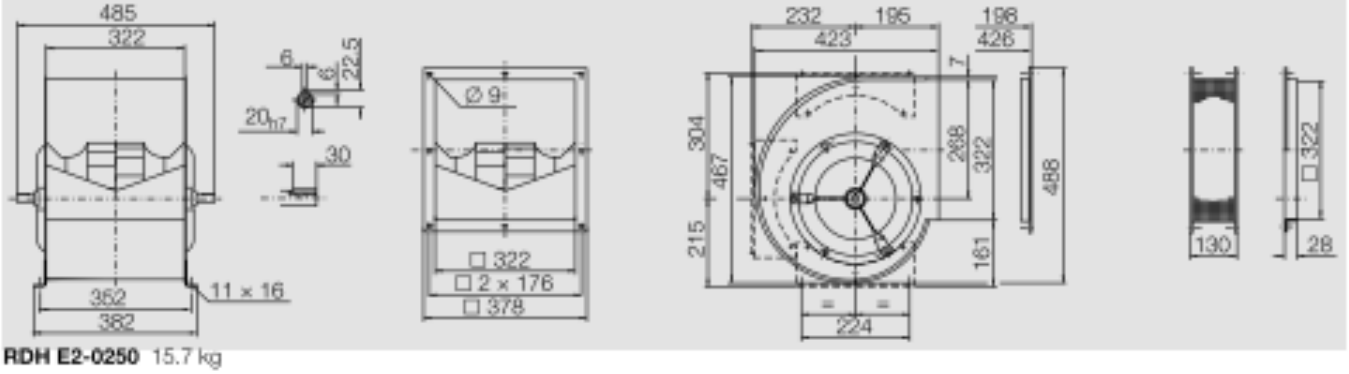
Fattori di correzione per determinare la rumorosità relativa alla mandata L_{WrelE}, per bande d'ottava f_c

63	125	250	500	1000	2000	4000	8000	Hz
6	7	3	-2	-4	-6	-8	-16	dB
9	7	3	0	-7	-4	-11	-18	dB
10	6	2	-1	-3	-5	-13	-19	dB
6	5	0	-5	-4	-3	-5	-15	dB
7	4	-1	-2	-5	-1	-9	-18	dB
6	2	-2	-2	-1	-3	-13	-20	dB
5	4	-2	-4	-4	-2	-4	-13	dB
7	3	-2	-2	-5	-1	-8	-16	dB
6	1	-2	-3	-1	-3	-11	-19	dB

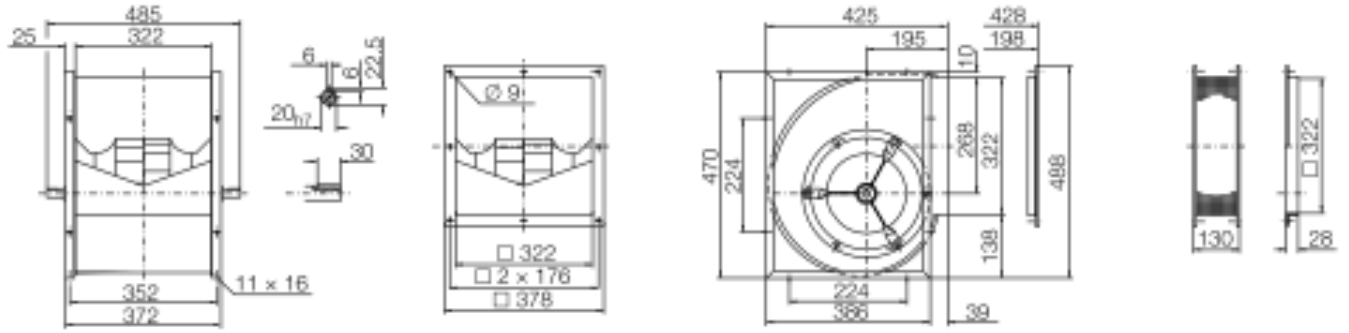
RDH E_-0250

Dimensioni in mm, salvo modifiche

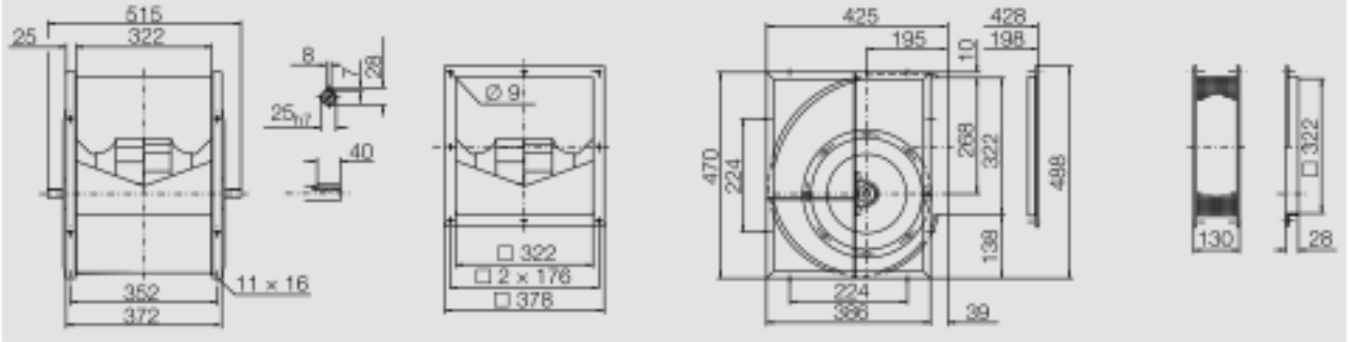
RDH E0-0250 13.3 kg



RDH E2-0250 15.7 kg



RDH E4-0250 21 kg



5.8 SUPPLY GRILLE

Item TAG: HSG-77-NNN

BMA



CARATTERISTICHE:
Bocchette di mandata ad alette orientabili passo 20 mm.

COSTRUZIONE:
Alluminio anodizzato.

IMPIEGO:
A parete, in mandata.
Altezza di installazione: 2,5-3,5 m.

FISSAGGIO:
- Fissaggio standard con clips.
- Fori per viti a richiesta.
- Calamite a richiesta (CL).
- Morsetti a richiesta (KC).

ACCESSORI:
- Plenum in acciaio zincato standard o isolato.
- Serranda di taratura in acciaio zincato con alette a movimento contrapposto.
- Controtelaio di montaggio in lamiera di acciaio zincata.

CHARACTERISTICS:
Supply grilles with adjustable blades 20 mm pitch.

CONSTRUCTION:
Anodized aluminium.

UTILIZATION:
For wall installation and for air delivery.
Installation height: 2,53,5 m.

FIXING:
- Standard fixing by clips.
- Holes for screws upon request.
- Magnets on request (CL).
- Clamps upon request (KC).

ACCESSORIES:
- Galvanized steel plenum, standard or insulated.
- Calibration damper made of galvanized steel and fins with opposite movement.
- Mounting counterframes made of galvanized steel sheet.

PREZZI - PRICES — STOCK

BxH	BMAV BMAO	BMAVO BMAOV	SC	CT CTKC	PBZ1	PBZI1	PBZ2	PBZI2
mm	€	€	€	€	€	€	€	€
200x100		■	■					
300x100		■	■					
400x100		■	■					
500x100		■	■					
• 600x100		■						
• 700x100								
• 800x100								
•1000x100								
200x150		■	■					
300x150		■	■					
400x150		■	■					
500x150		■	■					
• 600x150		■	■					
• 700x150								
• 800x150								
•1000x150								
200x200								
300x200		■	■					
400x200		■	■					
500x200		■	■					
• 600x200		■	■					
• 700x200								
• 800x200								
•1000x200								
300x300								
400x300								
500x300		■	■					
• 600x300		■	■					
• 700x300								
• 800x300								
•1000x300								
400x400								
500x400								
• 600x400								
• 700x400								
• 800x400								
•1000x400								
500x500								
• 600x500								
• 800x500								
•1000x500								

Per misure fuori tabella prezzi a richiesta - For bigger sizes prices on request
• **Rinforzo intermedio** - Intermediate reinforcing

VERNICIATURA - PAINTING:
Colori RAL 9010: + 15% - Color RAL 9010: + 15%
Altri colori: prezzi a richiesta - Different colors: prices on request

5.9 RETURN GRILLE

Item TAG: HEG-77-NNN

GRAI



CARATTERISTICHE:
Griglie di ripresa industriali ad alette fisse inclinate di 45° passo 60 mm.

COSTRUZIONE:
Alluminio anodizzato.

IMPIEGO:
A parete, per presa aria esterna o espulsione.

FISSAGGIO:
Fissaggio con clips o viti frontali a richiesta.

ACCESSORI:
- Serranda di taratura in acciaio zincato con alette a movimento contrapposto.
- Controtelaio di montaggio in lamiera di acciaio zincata.
- Rete antivolatile.
- Serranda di sovrappressione a gravità.

CHARACTERISTICS:
Industrial return grilles grilles with fixed and 45° inclined bars 60 mm pitch.

CONSTRUCTION:
Anodized aluminium.

UTILIZATION:
For wall installation and for external air intake or exhaust air flow.

FIXING:
Fixing by clips or frontal screws on request.

ACCESSORIES:
- Calibration damper made of galvanized steel and fins with opposite movement.
- Mounting counterframes made of galvanized steel sheet.
- Bird screen.
- Overpressure damper.

PREZZI - PRICES

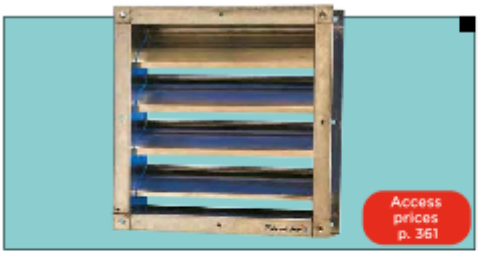
BxH	GRAI	GRAIR	GRAIRZ	GRAIRSS	SCAI	CTP
mm	€	€	€	€	€	€
400x400						
500x400						
600x400						
800x400						
1000x400						
• 1200x400						
• 1400x400						
• 1600x400						
• 1800x400						
• 2000x400						
400x500						
500x500						
600x500						
800x500						
1000x500						
• 1200x500						
• 1400x500						
• 1600x500						
• 1800x500						
• 2000x500						
400x600						
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• 1200x800						
• 1400x800						
• 1600x800						
• 1800x800						
• 2000x800						
400x1000						
600x1000						
800x1000						
1000x1000						
• 1200x1000						
• 1400x1000						
• 1600x1000						

5.10 NOT REURN DAMPER

Item TAG: HDN-77-NNN

DIFFUSION

France Air



SPG

Pressure relief flap for rectangular ducts

MATERIAL	INSTALLATION	MOUNTING
Al/u + steel	Rectangular duct	Visible screws

Espace Pro

Order online at www.espacepro.france-air.com

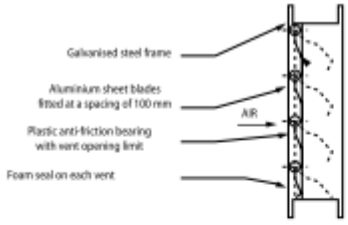
ADVANTAGES
- Excellent sealing.
- Low noise level.

RANGE
- SPG vent for rectangular duct.
- Standard dimensions from 200 x 200 mm to 2 000 x 2 000 mm:
  - in 100 mm intervals up to 1200 x 1200 mm,
  - then in steps of 200 mm.

APPLICATION/USE
- To maintain an overpressure or underpressure in a room with respect to the outside or to another adjoining room.
- Non-return flap.
- Use in air conditioning, ventilation or heating.

DESIGNATION
SPG (Pressure relief flap) **400 x 200** (Length x height (mm))

CONSTRUCTION/COMPOSITION
- Ducted - Type SPG



OPTIONS
- Bronze bearings.
- Stainless steel construction.
- Non-standard dimensions (consult us).
- High speed version (up to 10 m/s): shaft through coupled blades and central reinforcement

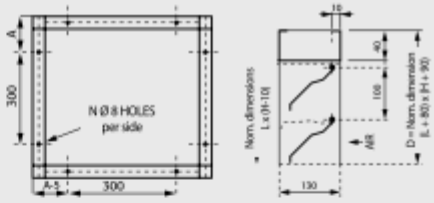
SPECIFICATION TEXT
- Available on www.france-air.com, Espace Pro area.

ASSEMBLY AND CONNECTION
- **Fitting in duct in a network**
  - Maximum flow speed = 6 m/s.
  - Above 4 m/s, the vent is fully open.
  - Max. temperature : + 50°C.

TECHNICAL DESCRIPTION
- Dimensions, cut-out

Dimension (mm)	Number of holes per side	Dimension A (mm)
200	0	-
300	0	-
400	1	245
500	1	295
600	1	345
700	2	245
800	2	295
900	2	345
1000	3	245
1100	3	295
1200	3	345
1400	4	295
1600	5	245
1800	5	345
2000	6	295

N. B.: above L = 1 200 mm, a central reinforcement is provided.



- Pressure drop/speed curve



Optimal selection values: from 2 m/s to 4 m/s*
* to 4 m/s: the flap is fully open.

Selection limit values at 6 m/s.

5.11 DUCT INSULATING MATERIAL

Technical datasheet
Felt CLIMCOVER ROLL ALU 1



DESCRIPTION
Blanket with grid alu foil. Made with glass and with a new generation of thermo-hardening resin that associates organic and vegetal components and minimizes emissions of pollutant substances, like formaldehyde and others volatile organic compounds (VOC).

APPLICATION
Product for use in technical applications, such as ventilation ducts and industrial equipments, with need thermal and acoustic insulation

BENEFITS
- Long life span
- Impact resistance
- Dimensional stability in case of temperature and humidity variation
- Thermal and acoustic insulation
- Certified according to EN 14303
- Easy workability

STORAGE
The product must be stocked inside, in ventilated areas and away from heat sources.

Characteristics		Value	Unit	According to
Declared thermal conductivity	10°C	0,032	W/(m·K)	EN 12667
Declared thermal conductivity	40°C	0,037	W/(m·K)	EN 12667
Declared thermal conductivity	100°C	0,049	W/(m·K)	EN 12667
Fire class EUROCLASS		A1	-	EN 13501-1
Maximum service temperature		125	°C	EN 14706
Width tolerance		+-10	mm	
Length tolerance		-0+excess	mm	

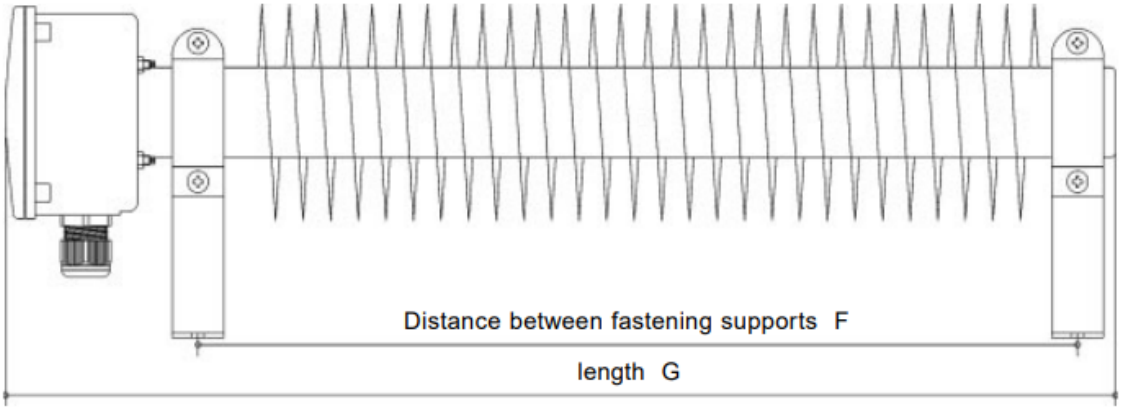
Thickness (mm)	Dimensions (m)	m²/pallet
25	1,15 x 10	345,00
50	1,15 x 5	172,50

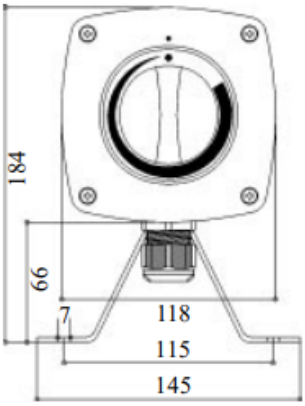
CODE: STC 255
REVISION: 00
DATE: March 2013

Product produced in France-Chalon Sur Saone plant
As regards the CE marking, this insulating product is in accordance with the standard 89/106/CE received by the DPR 246 of 21/4/1993 based on the standards EN 14303.
The CE data indicated on this datasheet are the ones required for the thermal insulation of industrial applications by the standard EN 14303 common to all applications.
The Quality Management System of Saint-Gobain PPC Italia S.p.A. has been assessed and found in accordance with the requirements of the EN ISO 9001:2008, EN ISO 14001:2004 and OHSAS 18001:2007.
The values stated in this datasheet, except for the values required by the CE marking, are not binding and Saint-Gobain PPC Italia S.p.A. may change them, without any notice.
Supplies are subjected to our production possibilities.
Saint-Gobain PPC Italia S.p.A. reserves the right to alter or amend product specification or stop the production without notice

5.12 SPACE HEATER

Item TAG: HHS-77-(007/008/009)





Typ	G mm	F mm
RRH TR 500	500	365
RRH TR 1000	700	565
RRH TR 1500	900	765
RRH TR 2000	1100	965
RRH TR 3000	1500	1365

Typ	G mm	F mm
RRH ST 1000	700	565
RRH ST 1500	900	765
RRH ST 2000	1100	965
RRH ST 3000	1500	1365

Kraemer & Kraus Wärmetechnik GmbH
Eiserntalstr. 374
57080 Siegen

Telefon (02 71) 3 93 70 26
Telefax (02 71) 3 93 70 27
Internet http:/www.Kraemer-Kraus.de
eMail Info@Kraemer-Kraus.de

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5.13 PRESSURE RELIEF DAMPER

Item TAG: HDR-77-301

SagiCofim

Overpressure damper with combined blades and counterweight

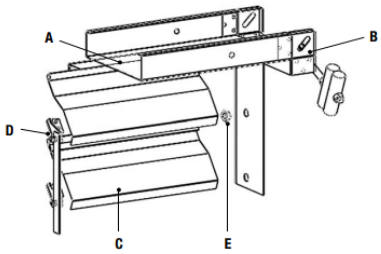
GP100KC-C



Duct overpressure damper with blades combined inside the air flow with return to closing position by own gravity and counterweight outside the flow. Vertical installation with single direction flow. In the case of counter-flow, the damper functions as a non-return element. The combination allows simultaneous opening of the blades, preventing an uneven air flow from creating high turbulence zones and low velocity zones.

MATERIAL AND FINISH

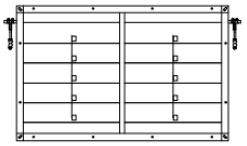
A Frame in galvanized steel Z140, duct-mounting.
B Flange 36 mm, thickness 1 mm.
C Galvanized blades combined internally, movement by gravity with counterweight that can be calibrated, anti-noise gasket.
D Through galvanized pins.
E NYLON bushes.



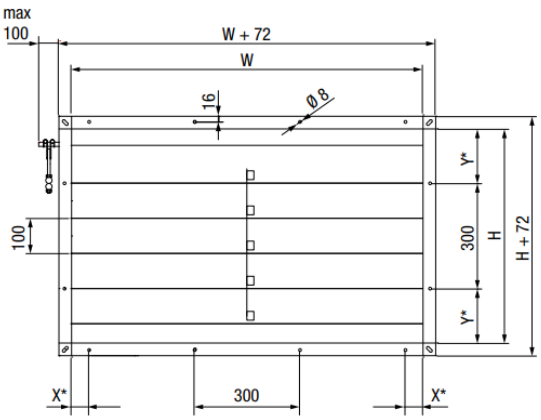
VERSIONS

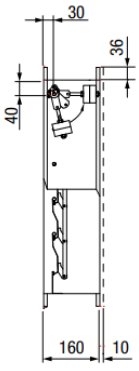
• AISI316	**(PRICES UPON REQUEST)**
• ATEX II 2 GD	**+ 36** €

NB: For the prices of the intermediate sizes, consider the next size on the table.
Ex.: 650 x 410 mm = 700 x 410 mm
For basic sizes > 1000 mm, construction in double section with centre separator



*See tech data sheet





The damper is supplied with a counterweight made up of a threaded rod 200 mm long and 300 g of metal masses.
In vertical axis, the counterweight is irrelevant for increasing the opening pressure, minimum reference value 30 Pa.
By tilting the counterweight in the direction of the blade opening, the minimum opening pressure increases up to + 100% for a 45° angle
For pressures higher than 100 Pa, the oscillating masses have to be increased.

5.14 BACKDRAFT DAMPER

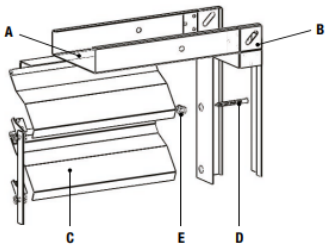
SagiCofim

Overpressure damper with combined blades

GP100KC



Overpressure damper with blades combined inside the air flow with return to closing position by gravity. Vertical installation with single direction flow. In the case of counter-flow, the damper functions as a non-return element. The combination allows simultaneous opening of the blades, preventing an uneven air flow from creating high turbulence zones and low velocity zones.
Minimum opening pressure 30 Pa



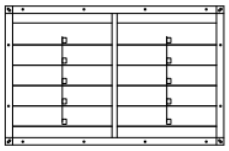
MATERIAL AND FINISH

A Frame in galvanized steel Z140, duct-mounting.
B Flange 36 mm, thickness 1 mm.
C Combined aluminum blades (series 5005), movement by gravity, anti-noise gasket, thickness 0.5 mm.
D Rotation pins.
E NYLON bushes.

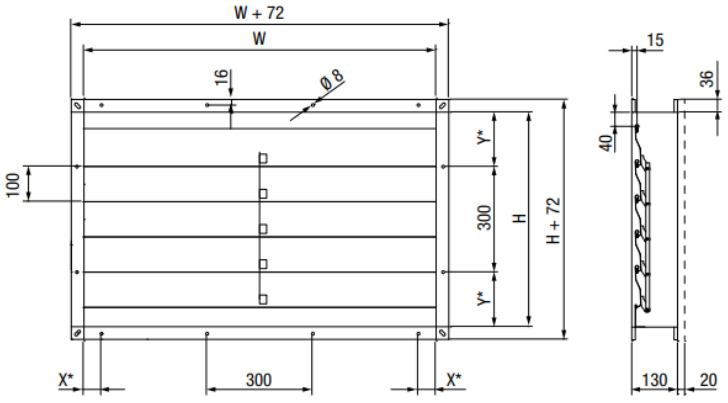
VERSIONS

• AISI316	(PRICES UPON REQUEST)
• ATEX II 2 GD	**+ 36** €

NB: For the prices of the intermediate sizes, consider the next size on the table.
Ex.: 650 x 410 mm = 700 x 410 mm
For basic sizes > 1000 mm, construction in double section with centre separator

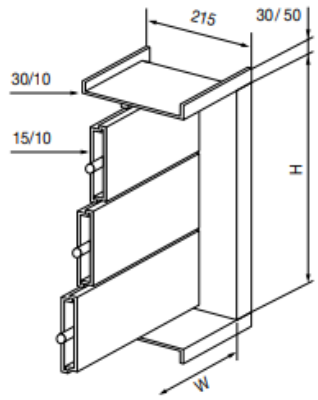


*See tech data sheet

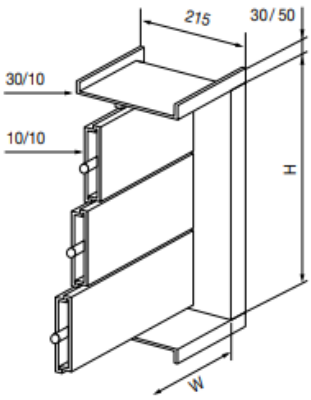


5.15 SHUT-OFF DAMPER

SDL - SDLT 0
dimensions in [mm]



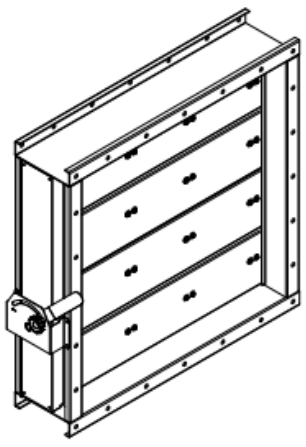
SDL - SDLT 2 - 6
dimensions in [mm]



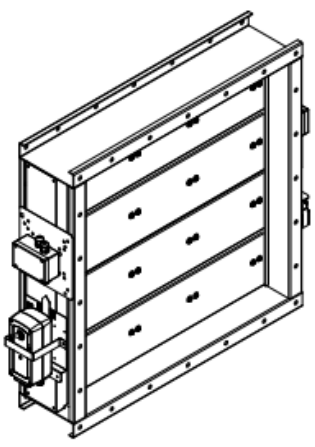
General features Shut-off dampers & Gas Shut-off dampers		
Models	**SDL**	**SDLT**
Gas leakage EN 1751 *Ambient temperature - Pressure: 2000 Pa*	Class B Class 1	**Class C** **Class 3**
Installation	Deck and bulkhead, duct, wall	
Maximum air inlet dimensions in single arrangement*	Width [W] and Height [H] from 150 to 2000 mm	
Standard flanges dimensions	30 mm (HVAC systems) or 50 mm (engine ventilation)	
Drilling	Standard Ø 12 or on demand	
Control types	Manual / Electrical / Electrical ATEX / Pneumatic / Pneumatic ATEX	
Accessories	Circular connections, junction box, quick connections, heating cable, box limit switch, ...	

* Dampers can be supplied on request with special dimensions by multiple welded arrangement.

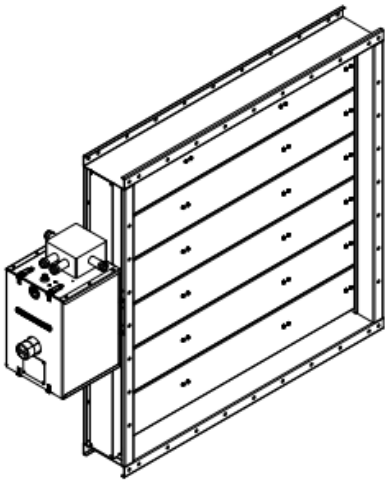
With manual control



With electrical control



With pneumatic control



SDL - SDLT



Damper operating range:

ATEX area	$-20\,°C \le t \le +50\,°C$ - V_{max} 15 m/s - P_{max} 3000 Pa
SAFE area	$-20\,°C \le t \le +70\,°C$ - V_{max} 25 m/s - P_{max} 3000 Pa

Damper components materials

		STANDARD		
	Type	0	2	6
A	**Casing** (depth 215 mm)	Hot bath galvanized steel, tk. 3 mm	Hot bath galvanized steel, tk. 3 mm	AISI 316 L, tk. 3 mm
B	**Blades** (parallel movement)	Galvanized steel, tk. 1.5 + 1.5 mm	AISI 316 L - tk. 1 + 1 mm	AISI 316 L - tk. 1 + 1 mm
C	**Shafts**	AISI 316 L, Ø 18,1 x 1.5 mm	AISI 316 L, Ø 18,1 x 1.5 mm	AISI 316 L, Ø 18,1 x 1.5 mm
D	**Levers**	Galvanized steel tk. 2 mm	AISI 316 L tk. 2 mm	AISI 316 L tk. 2 mm
E	**Bushes**	Self lubricating bronze, 9010	Self lubricating bronze, 9010	Self lubricating bronze, 9010
F	**Stops**	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm
G	**Lever protection carter**	Galvanized steel tk. 1 mm	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm
H	**Side sealing plates**	AISI 301	AISI 301	AISI 301
	Actuator support plate	Galvanized steel	AISI 316 L	AISI 316 L
	Position indicator	Galvanized steel	Galvanized steel	AISI 304

Silicone seals and thin blades only for models SDLT

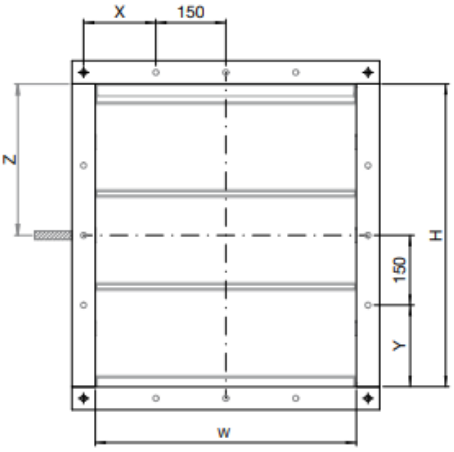
Shut-off - Gas Shut-off Damper Marine - Oil & Gas Industry SagiCofim

SDL - SDLT

Dimensions of flanges and drilling

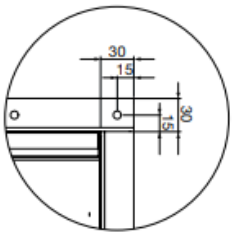
Models SDL - SDLT / 0 - 2 - 6

Air inlet size W / H [mm]	N° holes	flange 30 [mm]		flange 50 [mm]		0		2 / 6	
		X	Y	X	Y	Z	N° blades	Z	N° blades
150	1	90	75	100	75	75	1	75	1
200	1	115	100	125	100	100	1	100	1
250	1	140	125	150	125	125	1	125	1
300	1	165	150	175	150	50	2	75	2
350	3	40	175	50	175	75	2	100	2
400	3	65	50	75	50	100	2	100	2
450	3	90	75	100	75	125	2	225	3
500	3	115	100	125	100	250	3	250	3
550	3	140	125	150	125	275	3	275	3
600	3	165	150	175	150	300	3	300	3
650	5	40	175	50	175	325	3	325	3
700	5	65	50	75	50	450	4	350	3
750	5	90	75	100	75	475	4	375	5
800	5	115	100	125	100	500	4	500	4
850	5	140	125	150	125	525	4	525	4
900	5	165	150	175	150	450	5	375	6
950	7	40	175	50	175	475	5	400	6
1000	7	65	50	75	50	500	5	500	5
1050	7	90	75	100	75	525	5	525	7
1100	7	115	100	125	100	450	6	550	7
1150	7	140	125	150	125	475	6	575	7
1200	7	165	150	175	150	500	6	500	6
1250	9	40	175	50	175	525	6	525	6
1300	9	65	50	75	50	650	7	550	6
1350	9	90	75	100	75	675	7	675	9
1400	9	115	100	125	100	700	7	700	7
1450	9	140	125	150	125	725	7	725	7
1500	9	165	150	175	150	650	8	675	10
1550	11	40	175	50	175	675	8	700	10
1600	11	65	50	75	50	700	8	700	8
1650	11	90	75	100	75	725	8	825	11
1700	11	115	100	125	100	850	9	850	11
1750	11	140	125	150	125	875	9	875	11
1800	11	165	150	175	150	900	9	900	9
1850	13	40	175	50	175	925	9	925	9
1900	13	65	50	75	50	850	10	950	9
1950	13	90	75	100	75	875	10	975	13
2000	13	115	100	125	100	900	10	900	10

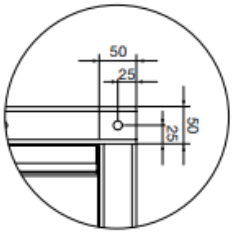


◆ Fixed holes at corner
○ Intermediate holes

SDL - SDLT flange 30



SDL - SDLT flange 50



Shut-off - Gas Shut-off Damper **Marine - Oil & Gas Industry** SagiCofim

SDL - SDLT

Damper weights [Kg]

Damper weights [Kg]

H [height]	W [width]																			
	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
150	9	11	13	16	18	21	24	26	29	32	34	37	40	42	45	47	50	53	55	58
200	11	12	15	18	21	24	27	30	32	35	38	41	44	47	50	53	56	58	61	64
300	13	15	18	21	25	28	31	34	38	41	44	47	50	54	57	60	63	67	70	73
400	16	18	22	25	29	33	36	40	44	47	51	54	58	62	65	69	73	76	80	84
500	19	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93
600	22	24	28	33	37	41	46	50	55	59	63	68	72	77	81	85	90	94	99	103
700	24	27	31	36	41	46	50	55	60	65	69	74	79	84	88	93	98	103	107	112
800	27	30	35	40	45	50	55	61	66	71	76	81	86	92	97	102	107	112	117	123
900	30	32	38	43	49	54	60	65	71	76	82	87	93	98	104	109	115	120	126	131
1000	32	35	41	47	53	59	65	71	77	83	89	95	101	106	112	118	124	130	136	142
1100	35	38	44	51	57	63	69	76	82	88	95	101	107	113	120	126	132	138	145	151
1200	38	41	48	54	61	68	75	81	88	95	101	108	115	121	128	135	141	148	155	162
1300	40	44	51	58	65	72	79	86	93	100	107	114	121	128	135	142	149	156	163	170
1400	43	47	54	62	69	77	84	92	99	106	114	121	129	136	144	151	159	166	174	181
1500	46	50	57	65	73	81	89	96	104	112	120	128	135	143	151	159	167	174	182	190
1600	49	53	61	69	77	85	94	102	110	118	127	135	143	151	159	168	176	184	192	201
1700	51	55	64	73	81	90	98	107	115	124	132	141	150	158	167	175	184	192	201	209
1800	54	58	67	76	85	94	103	112	121	130	139	148	157	166	175	184	193	202	211	220
1900	57	61	71	80	89	98	108	117	126	136	145	154	164	173	182	192	201	210	220	229
2000	59	64	74	84	93	103	113	123	132	142	152	162	171	181	191	201	210	220	230	239

Average values valid for all standard types (approx. ± 5%)
Values in the table refer to the standard material manufcturing types. Different material manufacturing does not have significant variance to the above mentioned values. Controls and actuators weights are not included.

Shut-off - Gas Shut-off Damper Marine - Oil & Gas Industry SagiCofim

SDL - SDLT

Torque requirements (Nm) for actuating systems selection

Damper torque

H [height]	W [width]																			
	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
150	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
200	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
300	7	7	7	7	7	7	7	7	7	7	7	7	7	8	8	9	9	10	10	11
400	7	7	7	7	7	7	7	7	7	7	8	9	9	10	11	12	12	13	14	14
500	7	7	7	7	7	7	7	7	8	9	10	11	12	13	14	14	15	16	17	18
600	7	7	7	7	7	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22
700	7	7	7	7	7	8	9	10	11	13	14	15	16	18	19	20	21	23	24	25
800	7	7	7	7	7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29
900	7	7	7	7	8	10	11	13	15	16	18	19	21	23	24	26	28	29	31	32
1000	7	7	7	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36
1100	7	7	7	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
1200	7	7	7	9	11	13	15	17	19	22	24	26	28	30	32	35	37	39	41	43
1300	7	7	7	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47
1400	7	7	8	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
1500	7	7	8	11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51	54
1600	7	7	9	12	14	17	20	23	26	29	32	35	37	40	43	46	49	52	55	58
1700	7	7	9	12	15	18	21	24	28	31	34	37	40	43	46	49	52	55	58	61
1800	7	7	10	13	16	19	23	26	29	32	36	39	42	45	49	52	55	58	62	65
1900	7	7	10	14	17	21	24	27	31	34	38	41	44	48	51	55	58	62	65	68
2000	7	7	11	14	18	22	25	29	32	36	40	43	47	50	54	58	61	65	68	72

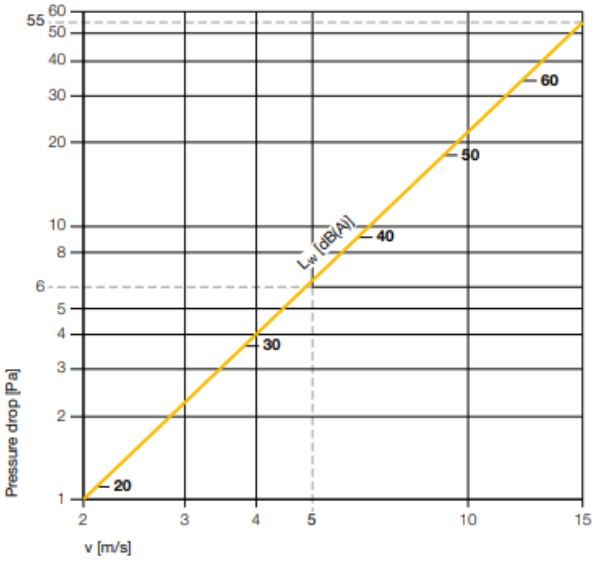
Note: for SDL model, actual required torque value can be up to 20% lower than the above mentioned values.

SDL - SDLT

Performances

Pressure drop and noise level

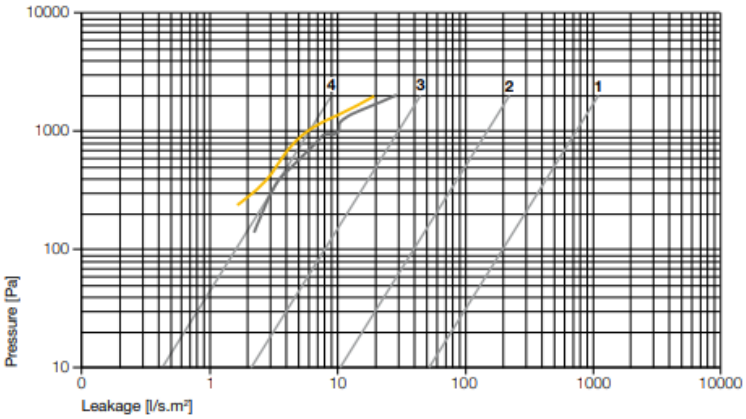
- Max noise level: **60 dB(A)**
- Standard pressure drop: **6 Pa**
  With damper fully open and air speed of 5 m/s at maximum rate.
- Max pressure drop: **55 Pa**
  With damper fully open and air speed of 15 m/s at maximum rate.



SDLT gas leakage according to EN1751

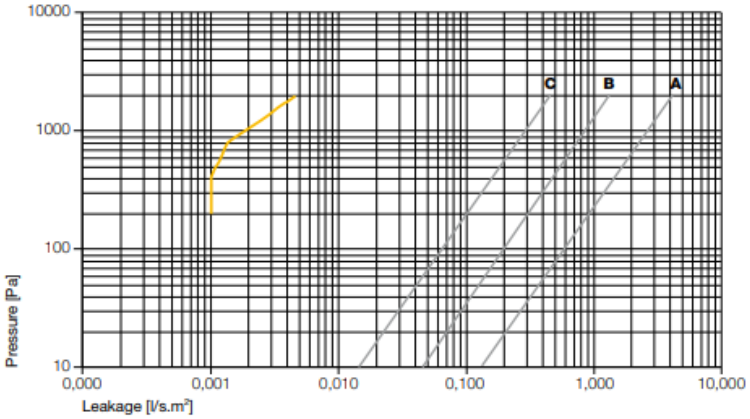
Leakage test across closed blades

Positive pressure
Negative pressure



Leakage test for casing

Positive pressure



Shut-off - Gas Shut-off Damper Marine - Oil & Gas Industry SagiCofim

SDL - SDLT

Damper controls Type **C 22 - Manual drive**

This damper version is provided with a control handle (C22).
SDL or SDLT + C22 can be used also as a balancing damper; in fact the handle can be fixed in all different positions from fully open to fully closed.
A safety clamp blocks the handle in the selected position.



Manual command



Damper closed



Damper open

Maintenance procedures

Mechanical couplings and electrical connections are tested before shipping.
Maintenance cadence depends by the dampers features (material) and the location where they are installed (fresh air inlet or exhaust duct)
During the damper installation and working life the following advices should be considered:

- Do not distort the frame and blades alignment;
- Check the blades free movement (avoid any solid sediment on shafts near to the bushes);
- Check the presence of extraneous objects inside the damper;
- Only the external damper frame except levers can be painted;
- Do not use cleaning acid liquids or abrasive tools (the hot bath galvanized surface film can be damaged);
- Do not dismantle dampers components;
- Do not modify the electrical connections prearrangement.

Only for fresh air inlet location:

- Lubricate shafts, bushes and levers (use only spray grease, avoid any paste);
- Check sea water corrosion effects on exposed damper surfaces.

Actuator disassembling

- Switch-off the actuator voltage input;
- Screw-out carter protection (if there) front panel;
- Pull out additional limit switches (if there) from the auxiliary shaft;
- Screw-out the metal actuator fixing plate and the remaining parts of the protection carter (if there);
- Pull out the actuator from the drive shaft;
- Insert new actuator and fix it;
- Screw-in carter protection and mount additional limit switches (if there);
- Check damper conditions;
- Restore voltage input.

Shut-off - Gas Shut-off Damper **Marine - Oil & Gas Industry** SagiCofim

SDL - SDLT

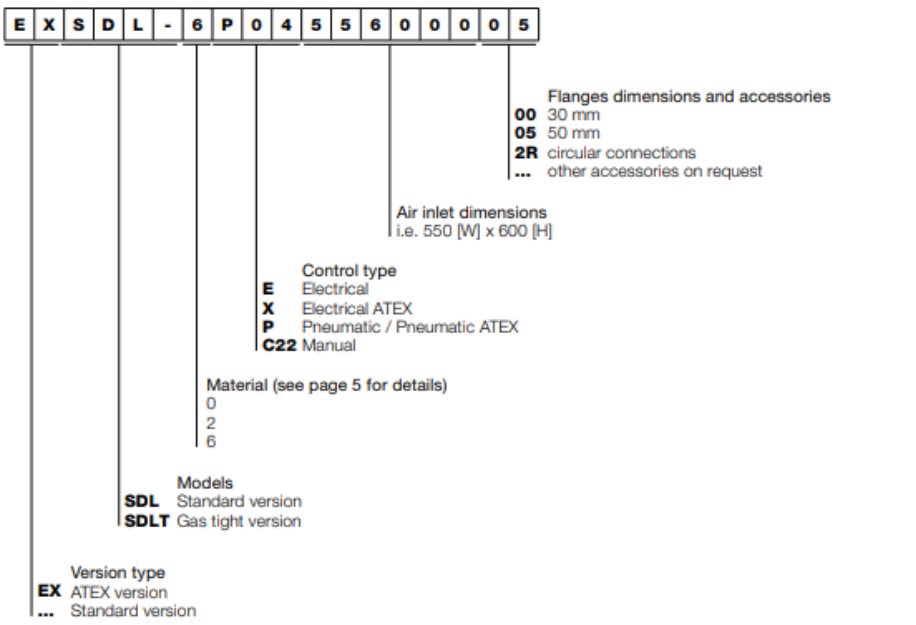
References

Shipyards
Barreras (Spain)
Cantieri Apuania (Italy)
Ferrol (Spain)
Fincantieri (Italy)
Flender Werft (Germany)
Jurong (Singapore)
Keppel Fels (Singapore)
Lloyd Werft (Germany)
Meyer Werft (Germany)
Navantia (Spain)
Rosetti Marino (Italy)
Sembawang (Singapore)
SMOE (Singapore)
STX France (France)
T. Mariotti (Italy)

Owners
Carnival
Corsica Ferries
Costa Crociere
Cunard
Finnlines
Grimaldi Group
Holland America Line
Marina Militare Italiana
Minoan Lines
Norwegian Cruise Line
P&O
Radisson Seven Seas
Renaissance Cruises
Royal Caribbean Cruise Line
Seabourn
Silversea Cruise
Tirrenia

Companies & Contractors
Agip KCO
ATP
Cocono Philips
Eni CONGO
Eni NORGE
ERSAI
Pearl
Petrobras
PTTEP
Saipem
Saudi Aramco
Shell
SOC
Total
Transocean
W.P.

Product code



5.16 DIFFERENTIAL PRESSURE TRANSMITTER

Item TAG: 77-PT-301



SDT
Differential pressure transmitter

Accuracy max ± 0.075%
Range 1 mbar ÷ 20 bar
Hart communication
LCD backlight display
Settings via display
Fast time responsive self-diagnostics
ATEX

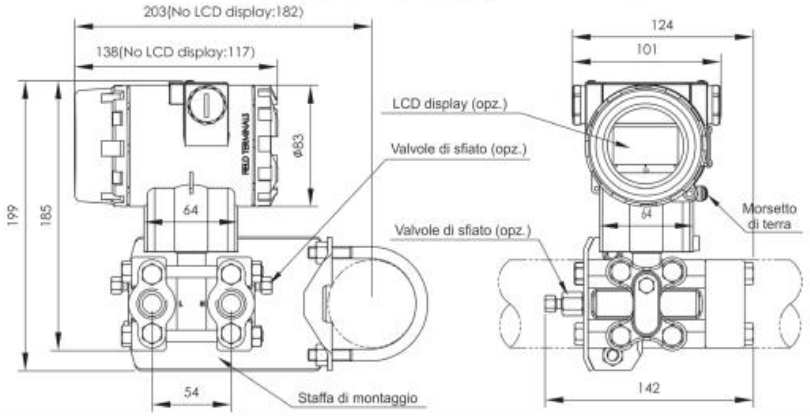
SDT is a differential pressure transmitter with performance at the top of the range and is designed for specific installations in processes where accuracy and stability over time are essential characteristics. Thanks to its technology it measures very low differential pressures from 1 mbar (10 mm H2O). The SDT is fully programmable by means of two external watertight buttons and a matrix backlight display. The programming or modification of the measurement parameters can be carried out in heavy duty ambient conditions without having access to the internal instrument parts thus maintaining the degree of protection IP67.

Technical Feature

Measure range
Differential pressure Max. 0÷20bar (0÷2Mpa); Min. 0÷0.001bar (0÷100Pa)
Accuracy
±0.075; ±0.1 for range A
Analog output resolution
15 bit

Power supply
12÷42Vdc (2-wires)
Communication protocol
HART
Zero and span calibration
onboard buttons
Data display
backlit alphanumeric display

IP rating
IP67
Stability
> ±0.1%FS
Working temperature
-40°÷+85°C
Certificazion
Atex



SDT Differential pressure transmitter

IP67 - Operation temperature: -40 ÷ +85°C
Power supply: 12÷42Vdc (2-wire)
4÷20mA HART

Accuracy	
H	± 0,075% (for range A ± 0,1%)
Measure range	
A	0 - 100Pa ÷ 1kPa (0 - 1 ÷ 10mbar) (0 - 10 ÷ 100 mmH²O) - accuracy ± 0,1%
B	0 - 200Pa ÷ 6kPa (0 - 2 ÷ 60mbar) (0 - 20 ÷ 600 mmH²O)
C	0 - 400Pa ÷ 40kPa (0 - 4 ÷ 400mbar) (0 - 40 ÷ 4000 mmH²O)
D	0 - 2,5kPa ÷ 250kPa (0 - 25 ÷ 2500mbar) (0 - 0,25 ÷ 25 mH²O)
E	0 - 20kPa ÷ 2MPa (0 - 0,2 ÷ 20bar) (0 - 2 ÷ 200 mH²O)
Membrane / filling liquid	
A	SS316L / silicone oil
B	SS316L / fluorinated oil
C	Hastelloy C / silicone oil
D	Hastelloy C / fluorinated oil
E	SS316L gold plated / silicone oil
F	SS316L gold plated/ fluorinated oil
G	SS316L EFP plated / silicone oil
T	Tantalum / silicone oil
Working pressure	
1	16MPa (range A = 7MPa)
2	25MPa (not for range A)
3	40MPa (not for range A)
Process connection	
B	¼" - 18 NPT female SS316 thread with relief valves at the end of the flange
D	¼" - 18 NPT female SS316 thread with relief valve on the lower part of the flange side
N	¼" - 18 NPT female SS316 thread without relief valves
U	¼" - 18 NPT female SS316 thread with relief valve on the upper part of the flange side
Z	Special
Sealed material	
F	Viton (FKM)
N	Perbunan (NBR)
P	Teflon (PTFE)
Special functions	
N	None
O	Degrease cleansing treatment (just with fluorinated oil and Viton seal, max 60°C)
P	Line noise filter
Fixing bracket for panel and pipe mounting (2")	
1	SS304
2	Galvanized carbon steel
N	None
Process connection accessories	
1	SS316 oval-shaped flange with ½" NPT female thread
2	SS316 D-shaped connector with M20x1.5 male thread (welded connection)
N	None
Display	
2	Backlit LCD
N	None
Certification	
A	Intrinsically Safe ATEX II 1/2G Ex ia IIC T4 Ga/Gb
D	Explosion proof ATEX II 2 G D Ex db IIC T4/T5/T6 Gb Ex tb IIIC T80°C/T90°C/T130°C - Ta = -40°C ÷ +60°C
N	None

5.17 TEMPERATURE TRANSMITTER TT

Item TAG: 77-TT-(301/302/303/304)

Product lines: temperature sensor

In order to get a precise temperature sensor in a wide range of different application, it's possible to choose between resistance thermometers and thermocouples. Temperature sensors are also available with temperature transmitter, thermowell and other options, in order to satisfy requirements of every industrial applications.



Resistance thermometers

Resistance thermometers have a platinum sensor element which changes it electrical resistance as a function of temperature.
In our products portfolio are available resistance thermometers with cable and with connection head.
A temperature transmitter can be installed directly in the connection head.
Resistance thermometers are available in classes A, 1/3 DIN, 1/5 DIN and 1/10 DIN in accordance with IEC 60751. They are available also the ATEX versions (Ex ia and Ex d)



Thermocouples (TC)

Thermocouples directly supply a temperature-dependent voltage.
They are particularly suitable for high temperatures.
In our products portfolio are available thermocouples with cable and with connection head.
For thermocouples, the accuracy classes in accordance with IEC 60584-1 or ASTM E230.
The type J, K, N, T, S, E are available in our products portfolio.
A temperature transmitter can be installed in the connection head.
They are available also the ATEX versions (Ex ia and Ex d)



Temperature transmitters

The transmitters for DIN/B head or for DIN rails convert a signal acquired by RTD (with 2, 3 and 4 wire connections) or Thermocouples into a 4 ... 20 mA signal (2 wires technology) or 0 ... 10 VDC signal (3 wires technology). These converters ensure high accuracy on the reading scale with 16-bit conversion and they are available with parameterization via NFC-smartphone App (Android) and with integrated datalogger. Available also the ATEX version (Ex ia) and with galvanic isolation.



Thermowells

Thermowells are available for different applications whether in aggressive or abrasive process media, to prevent direct exposure of their temperature probes to the medium.
Thermowells can be manufactured from solid-body material or from tube sections and can either be screw, weldor flange fitted.
They are available in standard and special versions (stainless steel 1.4571, 316L, Hastelloy® or titanium).

DTP 8180

Data sheet
www.trafag.com

The DTP 8180 is a temperature transmitter with analogue output, 2 switch points and display

Features

- Parameterization also via NFC-smartphone App (Android)
- Display and electrical connection are independently rotatable 335°/343°
- Analogue output switchable mA or V
- Integrated datalogger
- Temperature measuring range adjustable 50, ... 100% of the nominal range

Reference

- IEC 60751



Standard parameters	
Measuring principle	PT 1000, DIN EN 60751 class A, 2 conductors
Measuring range	-50°C ... +150°C / -58°F ... 302°F adjustable 50 ... 100% FS
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, switchable mA or V
Switching output	2 transistors PNP
Accuracy@25°C typ	0.5% FS typ + temperature sensor
Ambient temperature	-25°C ... +85°C
Unit for display	°C, °F, °K, user scale
Logger	Ring buffer: 3518 data points Sampling time: 0.1 ... 999.9 s, Off (0)

TCTT

Data sheet
www.trafag.com

The TCTT is a compact system used to measure liquid and gaseous fluid.
PC configuration allows the user to select range and units, without requiring calibration equipment.

Features

- PC programmable temperature range
- High sensibility
- Free configuration software
- Materials and surface finish quality in accordance with standards of hygenics design

Reference

- EN 60751
- EN 61326



Standard parameters	
Output	Analogue 4 ... 20 mA
Measuring range	-50 ... + 250°C
Ambient temperature	-40 ... +85°C
Protection	IP67
Accuracy	Class AA, 1/5 DIN, 1/10 DIN
Electrical connection	M12x1

T1

Data sheet

RTD and TC with connection head.

The resistance thermometers and thermocouples with connection head offers a wide range of options and features for different applications.

RTD Standard specifications	
Sensing element	PT100, PT1000, NI100, PTC, NTC
Connection wires	Single or Double element, 2, 3 or 4 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, PTFE (1)
Connection head	Mignon, DIN B, DIN A, DIN43650 A, M12x1, AD-PE (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female, CLAMP and other sanitary versions (1)
Stem diameter	From 3 to 12 mm (1)

1) Other RTD versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)

TC Standard specifications	
Sensing element	J, K, N, T, S, E (1)
Connection wires	Single or Double element, 2 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, Ceramic type 610, Alumina type 710, Hastelloy (1)
Connection head	Mignon, DIN B, DIN A, DIN43650 A, AD-PE (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female (1)
Stem diameter	From 1 to 12 mm (1)

1) Other TC versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)



RTD or TC for immersion with connection head, suitable for generical measurements and regulations on plant with low pressures. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD for immersion with AISI 316 sheath suitable for temperature measurement in chemical and food industry with sanitary clamp process connection. The immersed part of the stem have a mirror finishing surface.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC with mineral oxide insulation for immersion with connection head, suitable for generical measurements and regulations on plants with low pressures and with high vibrations. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC for immersion with exchangeble thermometric insert and orientable connection. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



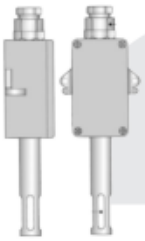
Immersion RTD or TC with exchangeable MgO insulated thermometric insert, orientable connection head and tapered protective sheath for fast response time. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC for immersion with exchangeble thermometric insert (available also in MgO) and orientable connection head. The process connection is realized by means of a 316SS flange and the electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD for immersion suitable for measurements in narrow space on plant with low pressures. The electrical connection is made by a connector EN 175301-803 standard. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges. The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD probe for the measurement of internal room temperatures realized in plastic material, aluminium (for external ambient) or 316SS. Available also with analogic output.



TC for high temperature with ceramic protective tube and connection head. It is possible to select between a 610 ceramic sheath type or a 710 (single or double) alumina sheath type. Available also with analogic output.



Mineral oxide MgO insulated thermocouples.

T2

Data sheet

RTD and TC with cable output.

The resistance thermometers and thermocouples with cable output offers a wide range of options and features for different applications.

RTD Standard specifications	
Sensing element	PT100, PT1000, NI100, PTC, NTC
Connection wires	Single or Double element, 2, 3 or 4 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, PTFE (1)
Type of cable	PVC, Kapton, PTFE / MFA, Silicone, Glass-Fiber (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female, CLAMP and other sanitary versions (1)
Stem diameter	From 3 to 12 mm (1)

1) Other RTD versions are available on request
2) They are available in the ATEX versions (Ex ia)

TC Standard specifications	
Sensing element	J, K, N, T, S, E (1)
Connection wires	Single or Double element, 2 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, Ceramic type 610, Alumina type 710, Hastelloy (1)
Type of cable	PVC, Kapton, PTFE / MFA, Silicone, Glass-Fiber (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female (1)
Stem diameter	From 1 to 12 mm (1)

1) Other TC versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)



Cylindrical RTD or TC with AISI 304 sheath or with AISI 316 sheath insulated with compact magnesium oxide (MgO) suitable for generical measurement.
The output of the cable from the tube is protected with a stainless steeel spring.



Cylindrical RTD or TC with AISI 304 sheath suitable for generical measurements. The probe fixing is realized by means of a threaded nipple welded on the sheath.



RTD or TC with stainless steel sheath suitable for generical measurements.
The probe fixing is realized by means of a brass ring soldered on the tip of the tube; it can be fixed on a surface with a normal screw.
The output cable is protected with a stainless steel spring.



Spring-loaded RTD or TC indicated for measurements into metallic plates; the fixing is by threaded connection with bayonet fitting.



Resistance thermometer suitable for the measurement of the pipe temperatures.
The special design of the aluminium body allow an high thermal exchange with the internal sensing element with a consirable reduction in measuring error. The fixing can be realized by means of a normal clamp.

9 Distributed by trafag sensors controls

Signal converters



The transmitters for DIN/B head convert a signal acquired by temperature probes PT100, PT1000 or Ni100 (with 2-, 3- and 4-wire connections) or Thermocouples into a 4 … 20 mA signal (2-wire technology), current-loop. These converters ensure high accuracy on the reading scale with 16-bit conversion and possibility to rescale the output 4 … 20mA basing on input range. Available also Atex version and with galvanic isolation



The signal transmitter from DIN rail converts a signal received through probes PT100, Ni100 (with 2-, 3- and 4-wire connections), thermocouples or process signals (0/4 … 20mA, 0 … 10V) into a normalised current signal 4 ... 20 mA (2-wire power loop). The characteristics of these converters ensure high precision on the reading scale with 16 bit conversion and the possibility to rescale the analogue output 4 ... 20 mA according to the input set. The RTD/TC input is galvanically isolated at 2500 V from the analogue output, which ensure safer cables in environment where they may be disturbed or in cases where there different voltages in the same system.

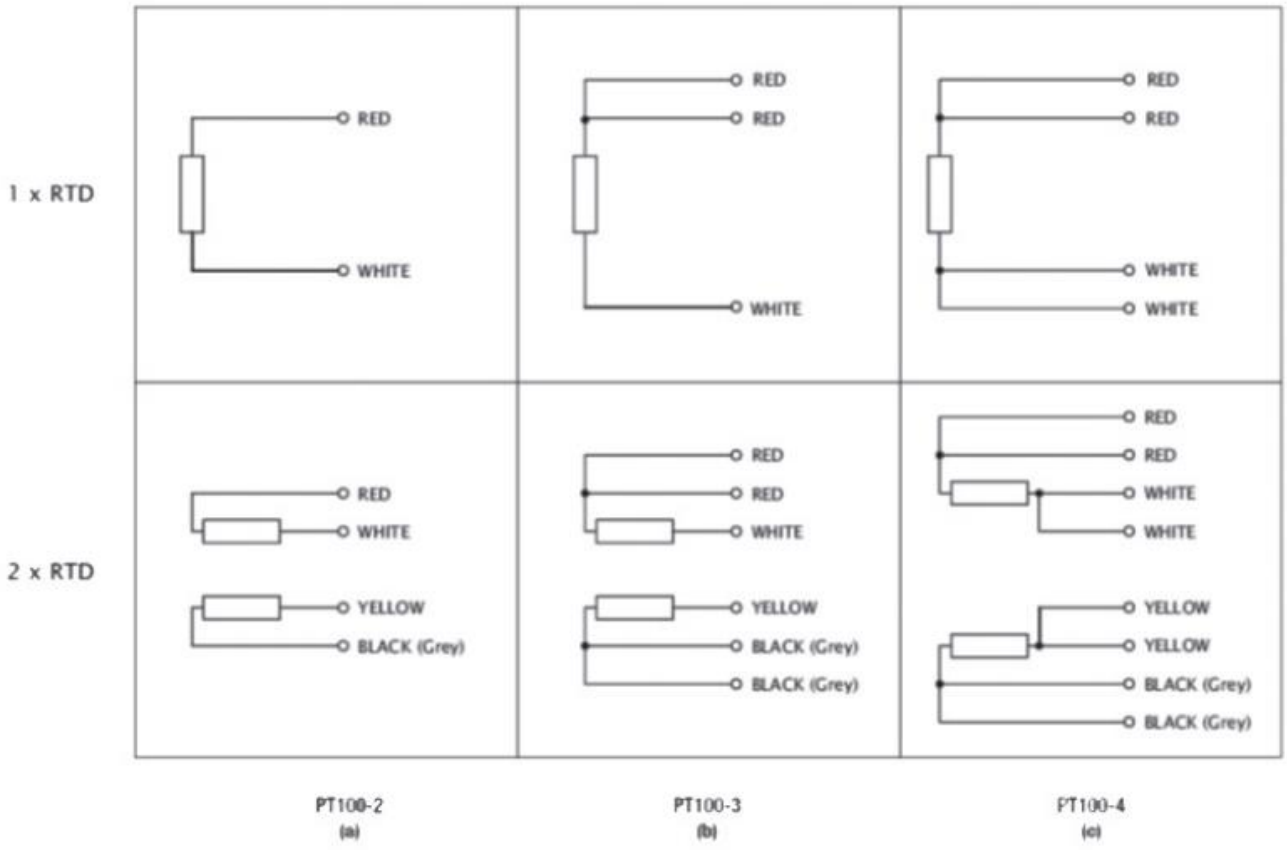
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Type of connection for resistance thermometer

a) 2 wires - the two-wire technique is the least precise and is used only in cases where the connection of the thermoresistance is carried out with short and low resistivity wires

b) 3 wires - the three-wire technique is the most used in the industrial field.
With this measurement technique the errors caused by the resistance of the conductors used for the connection of the thermoresistance are eliminated.

c) 4 wires - the technique offers the greatest precision possible but it is almost exclusively used in laboratory applications.



Resistance thermometer type PT100 ohm 0°C (EN 60751)

The resistance thermometers and thermocouples with cable output offers a wide range of options and features for different applications.

Tolerance class	Temperature range of validity		RTD Standard specifications
	Wire wound resistors	Fil resistors	
1/5 DIN	-196 ÷ +600	-50 ÷ +600	(0,1 + 0,0017* | t |)
1/3 DIN	-196 ÷ +600	-50 ÷ +600	(0,15 + 0,002* | t |)
A	-196 ÷ +600	-50 ÷ +600	(0,3 + 0,005* | t |)
B	-196 ÷ +600	-50 ÷ +600	(0,6 + 0,01* | t |)

| t | = Moduls of temperature in °C without regards to the sign

Standard thermocouples

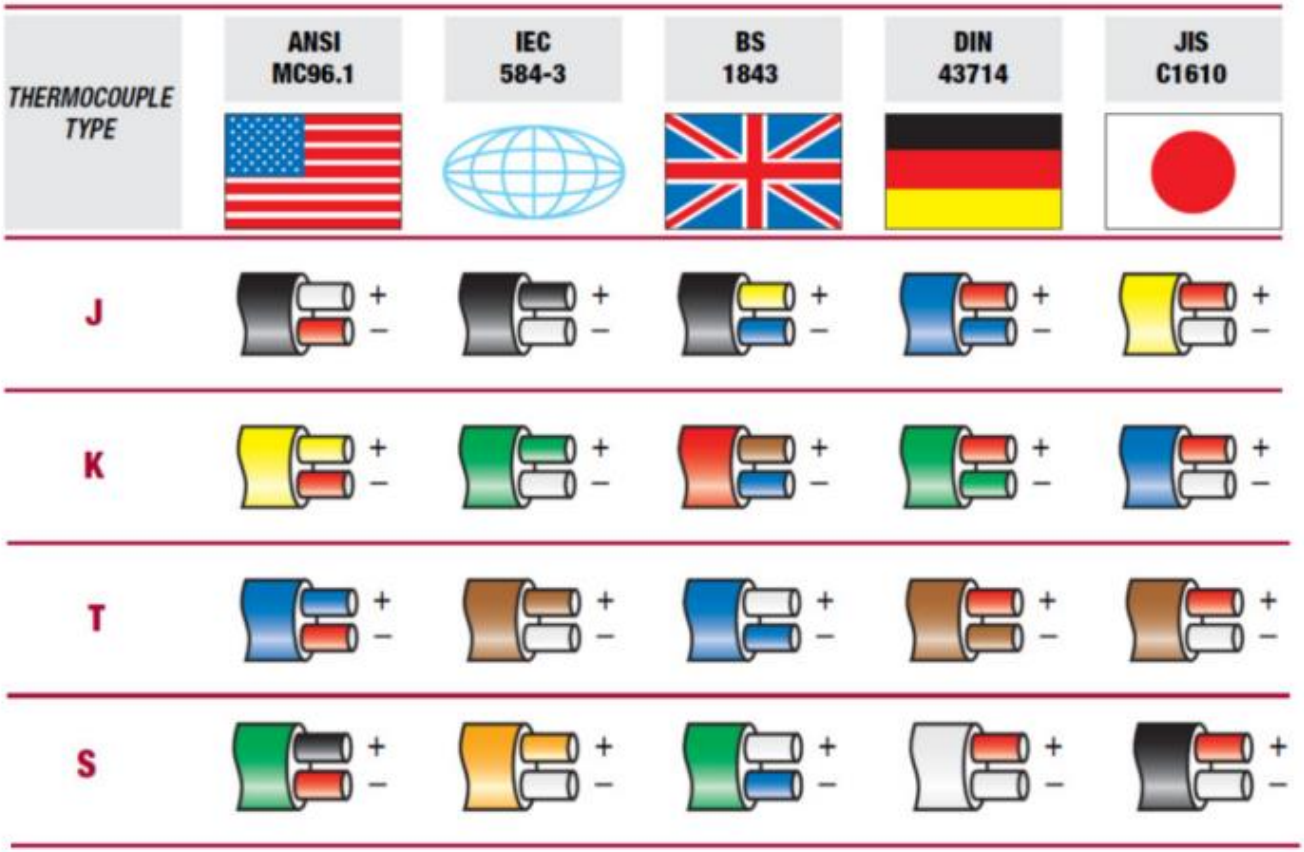
Type	Materials	Temperature range °C	Tolerance values °C
J	Fe-Co	-210 ÷ 800	± 2,5 o 0.0075* |t|
K	Cr-Al	-270 ÷ 1300	± 2,5 o 0.0075* |t|
T	Cu-Co	-270 ÷ 400	± 1 o 0.0075* |t|
S	Pt10%Rh - Pt	-50 ÷ 1800	± 1,5 o 0.0025* |t|

| t | = Moduls of temperature in °C without regards to the sign

Standard cables for temperature sensors

Type	Rh resistance	Temperature range °C	Abrasion resistance
Glass – Fiber	D	-50 ÷ 400	D
Silicone	C	-40 ÷ 200	B
PTFE/ MFA	A	-200 ÷ 250	A
PVC	B	-20 ÷ 105	B
Kapton	B	-200 ÷ 400	B

Standard color coding of compensating cables



5.18 FIRE AND GAS DAMPER WITH ACTUATOR

Item TAG: HFD-(77007/77008/77009/77010/77011)

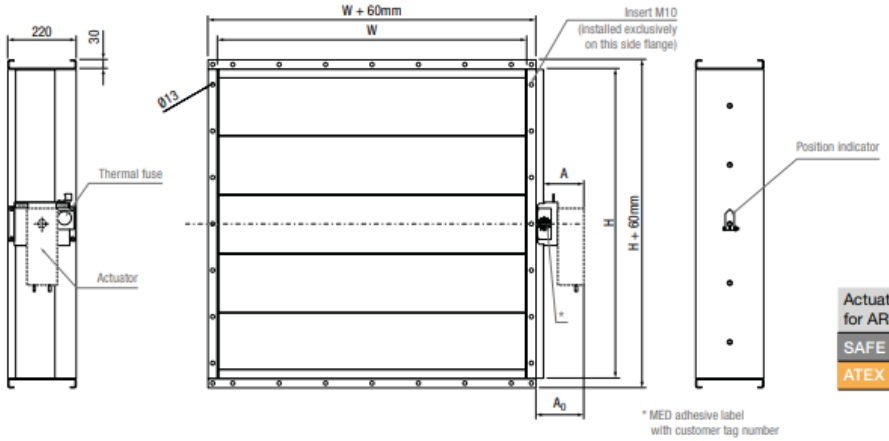
Technical data
SOLAS A0 frame 220mm
SAFE AREA - ATEX AREA

Features	
Dimensional range	from 150x150mm to 1000x1000mm step 50mm
Flange	Standard 30mm On request 50mm
Operating temperature range	-40°C / +50°C
Operating air velocity (damper in working condition)	12m/s max
Peak limits (sporadic and for a few seconds)	P=2500Pa, v=18m/s
Leakage Class acc. to EN 1751	Standard 2B On request 3C

		Version **3** (220GW)	Version **4** (2206W)
Description		**Material**	
Casing (riveted)		hot dip galv. steel - tk. 3mm	AISI316L - tk. 3mm
Blades		galv. steel Z200 double skin 1.2mm+1.2mm fiber glass gasket*	AISI316L double skin 1.2mm+1.2mm fiber glass gasket*
Shafts		AISI316 - Ø12mm	AISI316 - Ø12mm
Bushes		bronze self lub. - Ø12mm	bronze self lub. - Ø12mm
Actuator for	SAFE AREA	Belimo BF - Schischek InMax	Belimo BF - Schischek InMax
	ATEX AREA	Schischek ExMax - RedMax	Schischek ExMax - RedMax

** Non-classified SVF, 20x5mm*

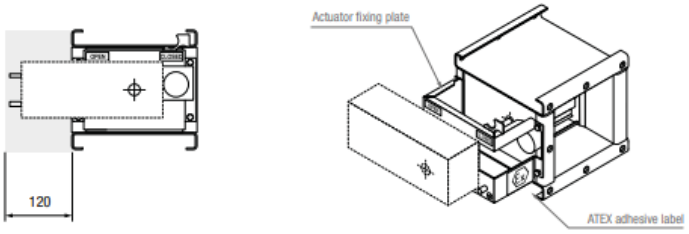
ACTUATOR MOUNTED VERTICALLY FOR H>250mm



Actuator for AREA	A [mm]	A_0 [mm]
SAFE	110	135
ATEX	130	155

ACTUATOR MOUNTED HORIZONTALLY FOR H≤250mm

Drilling scheme, see pag. 10



S-LFD Fire and Gas-Fire Damper SOLAS A0-A60

SagiCofim

Dimensions and Weights

frame 220mm

H [mm]	W [mm]																	
	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
150	7,5	8,5	9,5	10,5	11,5	12,5	13,5	14,4	15,4	16,4	17,4	18,4	19,3	20,3	21,3	22,3	23,3	24,3
200	8,6	9,6	10,6	11,7	12,7	13,7	14,8	15,8	16,8	17,9	18,9	19,9	21,0	22,0	23,0	24,1	25,1	26,1
250	9,4	10,5	11,5	12,5	13,6	14,6	15,6	16,7	17,7	18,7	19,8	20,8	21,8	22,8	23,9	24,9	25,9	27,0
300	11,0	12,1	13,3	14,5	15,6	16,8	18,0	19,1	20,3	21,5	22,6	23,8	25,0	26,1	27,3	28,5	29,6	30,8
350	12,0	13,2	14,4	15,6	16,8	18,0	19,2	20,4	21,6	22,9	24,1	25,3	26,5	27,7	28,9	30,1	31,3	32,5
400	12,9	14,2	15,5	16,7	18,0	19,2	20,5	21,7	23,0	24,3	25,5	26,8	28,0	29,3	30,5	31,8	33,0	34,3
450	14,3	15,6	17,0	18,3	19,6	21,0	22,3	23,6	24,9	26,3	27,6	28,9	30,3	31,6	32,9	34,3	35,6	36,9
500	15,3	16,7	18,1	19,4	20,8	22,2	23,6	24,9	26,3	27,7	29,0	30,4	31,8	33,2	34,5	35,9	37,3	38,7
550	16,3	17,7	19,1	20,6	22,0	23,4	24,8	26,2	27,7	29,1	30,5	31,9	33,3	34,8	36,2	37,6	39,0	40,4
600	17,3	18,7	20,2	21,7	23,1	24,6	26,1	27,5	29,0	30,5	31,9	33,4	34,9	36,3	37,8	39,3	40,7	42,2
650	18,6	20,2	21,7	23,3	24,8	26,3	27,9	29,4	31,0	32,5	34,0	35,6	37,1	38,6	40,2	41,7	43,3	44,8
700	19,6	21,2	22,8	24,4	26,0	27,6	29,1	30,7	32,3	33,9	35,5	37,1	38,6	40,2	41,8	43,4	45,0	46,6
750	20,6	22,3	23,9	25,5	27,1	28,8	30,4	32,0	33,7	35,3	36,9	38,5	40,2	41,8	43,4	45,1	46,7	48,3
800	21,6	23,3	25,0	26,6	28,3	30,0	31,7	33,3	35,0	36,7	38,4	40,0	41,7	43,4	45,1	46,7	48,4	50,1
850	23,0	24,7	26,5	28,2	30,0	31,7	33,5	35,2	37,0	38,7	40,5	42,2	44,0	45,7	47,4	49,2	50,9	52,7
900	24,0	25,8	27,6	29,3	31,1	32,9	34,7	36,5	38,3	40,1	41,9	43,7	45,5	47,3	49,1	50,9	52,7	54,5
950	25,0	26,8	28,6	30,5	32,3	34,1	36,0	37,8	39,7	41,5	43,3	45,2	47,0	48,9	50,7	52,5	54,4	56,2
1000	25,9	27,8	29,7	31,6	33,5	35,4	37,2	39,1	41,0	42,9	44,8	46,7	48,6	50,4	52,3	54,2	56,1	58,0
	Weight* [Kg]																	

* tollerance ± 10%

Actuator weights:

- BELIMO BF... 18Nm = 3,1Kg
- SCHISCHEK ExMax 15Nm = 3,5Kg

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Electrical actuator
SCHISCHEK

Description		On-off 3-pos., spring-return, 2 micro switches, IP66
Torque		15Nm
Power		24...240VAC/DC (at rest 5W)
Angle of rotation		95°
Running time	(M)	3s / 15s / 30s / 60s / 120s
		3s / 10s
Dimensions (LxWxH)		210x95x80mm
Shaft		square 12x12mm

..Pro-TT



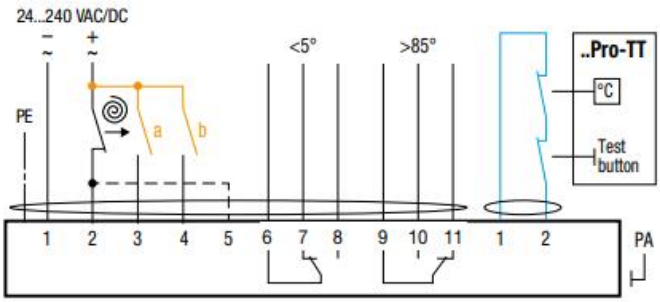
Safety temperature trigger
Thermal fuse
(Available for 72-95°C)

Model	InMax 15-BF	RedMax 15-BF	ExMax 15-BF
			
Zone	SAFE AREA	ATEX AREA ZONE 2, 22 GAS + DUST	ATEX AREA ZONE 1, 2, 21, 22 GAS + DUST

ELECTRICAL INSTALLATION

For 3-pos variation: add orange connection (a and b on 3 and 4)
For standard wiring: Spring return in 10s
For additional wiring on terminal 5: Spring return in 3s

On-off / 3 pos. - spring return + tripping circuit



5.19 JUNCTION BOXES

Casse di derivazione CDE
CDE junction boxes

Cieca
Blind



Struttura
lamiera d'acciaio sp. 10/10 verniciata RAL 7035 bucciato.

Coperchio o porta incernierata
verniciati RAL 7035 bucciato con guarnizione in colata continua.

Composizione
Struttura, porta o coperchio, confezione di viteria.

Grado di resistenza meccanica secondo IEC EN 62208: IK10

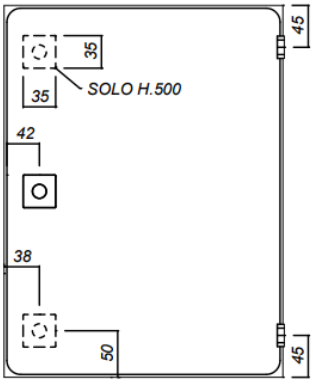
Structure
10/10 thick steel sheet, painted textured RAL 7035.

Cover or hinged door
Painted textured RAL 7035, provided with a gasket applied in continuous casting.

Composition
Structure, door or cover, set of accessories and screws for assembly.

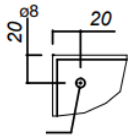
Mechanical resistance degree as per IEC EN 62208: IK10

IP66 IP55

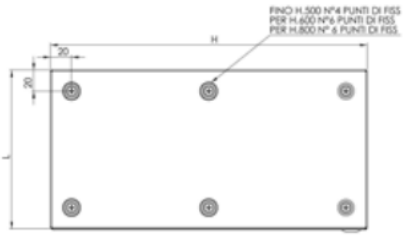


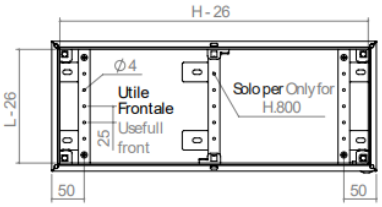
CASSA SENZA FLANGE IP 66 SODDISFA TYPE 4 BOX WITHOUT FLANGES IP 66 COMPLIES WITH TYPE 4	CASSA CON COPERCHIO INCERNERATO IP 55 SODDISFA TYPE 12 BOX WITH HINGED COVER IP 55 COMPLIES WITH TYPE 12	DIMENSIONE DIMENSIONS ALTEZZA, H HEIGHT, H	LARGHEZZA, L WIDTH, L	PROFONDITÀ, P DEPTH, P
R5CDE1180	-	150	150	80
R5CDE9180	-	180	150	80
R5CDE2980	-	200	180	80
R5CDE2280	R5CDE2280C	200	200	80
R5CDE3180	-	300	150	80
R5CDE3280	R5CDE3280C	300	200	80
R5CDE4280	R5CDE4280C	400	200	80
R5CDE6280	-	600	200	80
R5CDE8280	-	800	200	80
R5CDE11120	-	150	150	120
R5CDE22120	R5CDE22120C	200	200	120
R5CDE31120	-	300	150	120
R5CDE32120	R5CDE32120C	300	200	120
R5CDE33120	R5CDE33120C	300	300	120
R5CDE42120	R5CDE42120C	400	200	120
R5CDE43120	R5CDE43120C	400	300	120

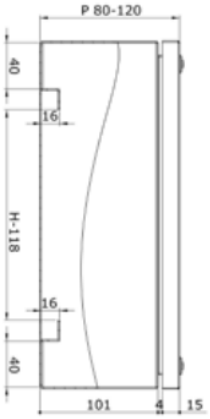
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R5CDE44120	-	400	400	120
R5CDE52120	**R5CDE52120C**	500	200	120
R5CDE53120	-	500	300	120
R5CDE62120	-	600	200	120
R5CDE63120	-	600	300	120
R5CDE64120	-	600	400	120
R5CDE82120	-	800	200	120
R5CDE84120	-	800	400	120







5.20 CAVO SCALDANTE

etelec electrical technology

SCHEDA TECNICA **HTC-P**



DESCRIZIONE ESTESA

Cavo scaldante a potenza autoregolante per tutte le applicazioni fino a 65°C per contatto continuo e fino a 85 °C per contatto intermittente.

Applicazioni:

- protezione antigelo di tubazioni e serbatoi industriali contenenti liquidi e gas;
- mantenimento in temperatura e riscaldamento di tubazioni e serbatoi industriali contenenti liquidi e gas;
- tracciamento di tetti e grondaie;
- tracciamento superfici non carrabili.

GAMMA DI PRODOTTO				
Famiglia		Cavi Scaldanti		
Serie		HTC-P		
Codice Metel		**HTC10P**	**HTC15P**	**HTC25P**
Nome commerciale		**HTC-10P**	**HTC-15P**	**HTC-25P**

INFORMAZIONI DIMENSIONALI		
Dimensioni sezione cavo	mm	11,5 x 6,3
Min. raggio di curvatura	mm	40
Sezione conduttori	mm^2 | AWG	0,8 | 18
Peso	kg/m	0,13

INFORMAZIONI FISICHE		
Materiale conduttori		Rame
Materiale matrice		Autoregolante
Materiale isolante primario		Poliolefina modificata
Materiale calza metallica		Rame stagnato
Materiale rivestimento esterno		Poliolefina reticolata
Halogen Free	(F), (Cl), (Br), (I), (At)	Si
Lead Free	Pb	Si

INFORMAZIONI TECNICHE					
			HTC10P	HTC15P	HTC25P
Potenza nominale a 10 °C	W/m		10	15	25
Potenza massima a 0°C	W/m		12	18	28
Temperatura massima di contatto	°C	65		Cavo alimentato	
Temperatura massima di contatto	°C	85		Cavo non alimentato	
Classe Temperatura		T6			
Temperatura minima di utilizzo	°C	- 40			
Alimentazione	V	230			
Resistenza elettrica della schermatura	Ω/m	0,018			
Resistenza all'acqua	%	100			

CONFORMITA' DI PRODOTTO E DI SISTEMA			
Norme di riferimento		EN 62395	
Conformità		EN 62395	
Comportamento al fuoco		n.a.	
Classificazione ETIM	Ver. 7.0	EC000339	
Grado di isolamento		IP66	EN60529

INFORMAZIONI DI SICUREZZA	
Prodotto tossico	No
Prodotto pericoloso	No
Conformità CLP (Regolamento 1272/2008/CE)	n.a.

INFORMAZIONI LOGISTICHE				
Codice	Q.tà (m)	Dimensioni (m)	Peso (kg)	Barcode
HTC10P	300	0,45 x 0,45 x 0,45	40	8053323900085
HTC15P	300	0,45 x 0,45 x 0,45	40	8053323900092
HTC25P	300	0,45 x 0,45 x 0,45	40	8053323900115

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5.21 PIPE

DESCRIPTION	CHARACTERISTICS
PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 50 mm
	INTERNAL DIAMETER : 40,8 mm
	PN RATING : 20
	MAX OPERATIONAL PRESSURE (at 20°C) : 20 bar (290 psi)

PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 50 mm
	INTERNAL DIAMETER : 42,6 mm
	PN RATING : 16
	MAX OPERATIONAL PRESSURE (at 20°C) : 16 bar (232 psi)

PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 25 mm
	INTERNAL DIAMETER : 21,2 mm
	PN RATING : 16
	MAX OPERATIONAL PRESSURE (at 20°C) : 16 bar (232 psi)

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5.22 ELECTRICAL CLAMP

DESCRIPTION	CHARACTERISTICS
ELECTRICAL CLAMP	COD. : ETQ76290N
	MATERIAL : NYLON (PA6.6)
	COLOR : BLACK
	LENGTH : 300 mm
	WIDTH : 7,6 mm
	TENSILE STRENGTH : 54 daN
	SELF-EXTINGUISHING CLASS : UL 94 - V 2

ELECTRICAL CLAMP	COD. : ETQ25100N
	MATERIAL : NYLON (PA6.6)
	COLOR : BLACK
	LENGTH : 100 mm
	WIDTH : 2,5 mm
	TENSILE STRENGTH : 8 daN
	SELF-EXTINGUISHING CLASS : UL 94 - V 2

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Base Load Power Hub (BLPH)

HVAC System
B-400 I&T Equipment Room
Component List and DS

Document Number:1724000049-HV-LIS-00050

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	26/03/25

Document Class: 3

03	10/03/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
02	22/01/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
01	29/10/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.
00	20/07/2024	Issue for Information (IFI)	F.M.	S.Z.	M.G.
Rev.	Date	Description	Prepared	Reviewed	Approved

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)
02	Issue for Information (IFI)
03	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.2 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

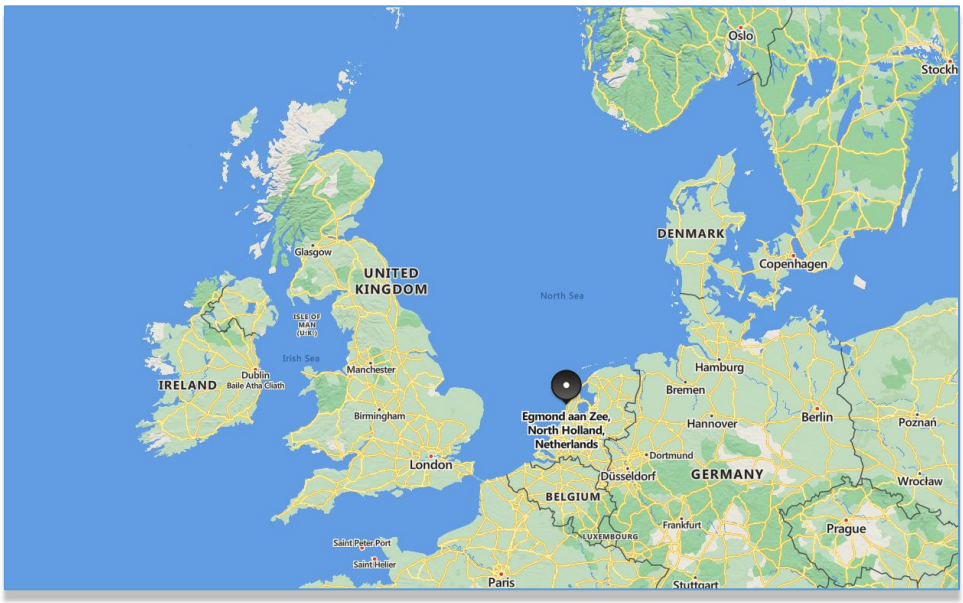


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

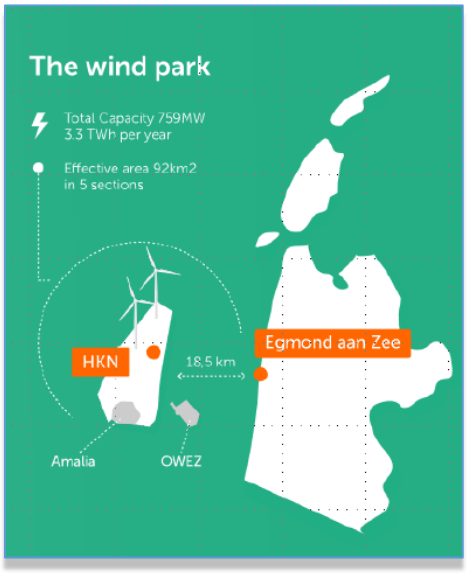


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.3 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

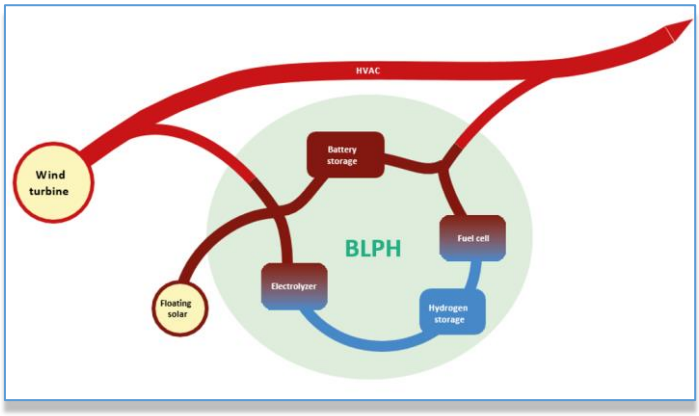


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will

be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

Scope of the document is to collect the main equipment technical data sheet relevant to the HVAC system provided for Hollandse Kust Noord Wind Park Project

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

3 INTRODUCTION

3.1 SCOPE OF WORK

Scope of the document is to collect the main equipment technical data sheet relevant to the HVAC system provided for Hollandse Kust Noord Wind Park Project

4 MAIN PACKAGE HVAC UNIT

Main unit data for HHU-77007 and HHU-77008

4.1 MAIN UNIT DATA

Description	Unit measure	Value
Type of unit	-	Rooftop Unit
Package unit model	-	4112-DMPD-100
Configuration	-	no.1 Duty + no.1 Stand-By
Total cooling capacity	kW	20.46
Sensible cooling capacity	kW	20.46
Heating capacity	kW	9
Outdoor design temperature & humidity	°C (D.B.)	Summer: +25°C (D.B.) Rh90%
	-	Winter: -8.4°C (D.B.) Rh 100%
Air flow rate - Supply	m^3/h	3050
Air flow rate - Return	m^3/h	2244
Air flow rate – Fresh air	m^3/h	806
External static pressure	Pa	800
Refrigerant	-	R513a
Length x Width x Height (external unit)	mm	2100x1000x1550
Weight	kg	950
Number of compressors	-	1

Supply air duct connection (50mm flange)	mm	500x410
Fresh air duct connection (50mm flange)	mm	200x210
Return air duct connection	mm	300x310
Panel and thermal insulation (Material – Tk)	mm	Poliuretan / 20mm
Materials on main base frame	-	Inox 316L
Materials on internal panel skin	-	Inox 316L
Materials on external panel skin	-	Inox 316L
Execution	-	Safe zone

4.2 SUPPLY FAN & MOTOR DATA

Description	Unit measure	Value
Type	-	RDH E2-0250
Manufacturer	-	Nikotra
Casing material	-	Galvanized steel
Weight	kg	16
Air flow rate	m^3/h	3200
Nominal static pressure	Pa	750
Nominal total pressure	Pa	720
Fan power consumption	kW	2.1
Fan speed	rpm	3019
Impeller type	-	Forward
Earthing boss	-	Yes
Drive arrangement	-	Belt SPA
Fan pulley	Ø (mm)	90
Motor fan pulley	Ø (mm)	190
Belt type and quantity	-	A47-1227 2pc
Manufacturer	-	Smem
Nominal motor power	kW	3
Winding configuration	-	DOL
Motor speed	Rpm	1420
Nominal current	A	6.3

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Description	Unit measure	Value
Starting current	A	25
Electrical supply	V / Ph / Hz	400 / 3 / 60
IP rating	-	IP55
Execution	-	Safe zone

4.3 ELECTRICAL HEATING COIL DATA

Description	Unit measure	Value
Frame	-	AISI 316 L
Dimension	mm	500x410
Heater depth	mm	200
Heating capacity – 1st step	kW	9
Absorbed current – 1st step	A	13
Heating capacity – 2nd step	kW	n.a.
Absorbed current – 2nd step	A	n.a.
Power supply	-	400 V 3 PH 50HZ
Safety accessories	-	THERMOSTATE ON BOARD
Manufacturer	-	Diamanti

4.4 FILTER DATA

Primary filter		
Filter type	-	G4 (EN779)
Filter section size (Q.ty - W x H x tkh)	no. / mm	1
		593x593x48
Pressure drop (clean filter)	Pa	65
Final pressure drop (dirty filter)	Pa	97

Manufacturer	-	F&F
Filter type	-	G4 (EN779)
Filter section size (Q.ty - W x H x tkh)	no. / mm	1
		287x593x48
Pressure drop (clean filter)	Pa	65
Final pressure drop (dirty filter)	Pa	97
Manufacturer	-	F&F
Model	-	FCZ-OS4
Secondary filter		
Filter type	-	F7 (EN779)
Filter section size (Q.ty - W x H x THK)	no. / mm	1
		593x593x98
Pressure drops (clean filter)	Pa	85
Final pressure drops (dirty filter)	Pa	102
Manufacturer	-	F&F
Model	-	PFM4-8-23.23
Filter type	-	F7 (EN779)
Filter section size (Q.ty - W x H x THK)	no. / mm	1
		287x593x98
Pressure drops (clean filter)	Pa	85
Final pressure drops (dirty filter)	Pa	102
Manufacturer	-	F&F
Model	-	PFM4-6-11.23

4.5 COALESCENT FILTER DATA

Coalescent filter		
Manufacturer		EuropAir
Filter type	-	SG41R-X
Filter section size (Q.ty - W x H x tkh)	no. / mm	1
		500x500x170

Pressure drop (clean filter)	Pa	50
Final pressure drop (dirty filter)	Pa	75

4.6 COOLING COIL DATA

Description	Unit measure	Value
Total cooling load (design)	kW	20
Number of refrigerant circuits	N°	1 x 100%
Evaporating temperature / Pressure	°C / kPa	+7 – 411
Design pressure	kPa	2100
On-coil air condition	°C (D.B. / W.B.)	+26 / +18.8
Off-coil air condition	°C (D.B. / W.B.)	+12.38 / 12.1
Air flow rate	m^3/h	3200
Air pressures drop	Pa	95 (Wet fins 199)
Coil face velocity	m/s	2.31
Number of rows	-	8
Fin thickness / Fin spacing	mm	0,20 / 2,5
Drop eliminators required	-	Included
Drain size / Type	mm	n.a.
Weight	kg	93
Tube materials / Thickness	mm	CuSn/ 12.45 X 0.35
Fins material / Thickness	mm	CuSn / 0,20
Casing material / Thickness	mm	Inox 316 / 1.5
AISI 316 Drain pain	-	Required – 50mm

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4.7 REFRIGERANT COMPRESSOR DATA

Description	Unit measure	Value
Type	-	Ermetic scroll compressor
Manufacturer	-	Panasonic
Electrical supply	V / Ph / Hz	400 / 3 / 50
Electrical supply - Auxiliary	V / Ph / Hz	230 / 1+N / 50
IP rating	-	IP54
Cooling capacity	kW	20.46
no. of compressors	no.	1
Steps capacity	no.	1
Nominal compressor power & Current	kW / A	8.9 / 15.4
Absorber power & Current at design conditions	kW / A	6.21 / 11.5
Starting method	-	DOL
Starting current	A	50
Oil heater power	W	50
Oil charge	L	2.8
Weight	kg	69.5
Safety accessories	-	

4.8 CONDENSING COIL DATA

Description	Unit measure	Value
Total heat rejection	kW	28.15
Number of refrigerant circuits	-	1
Condensing temperature / Pressure	°C / kPa	+54.40 / 1531
Refrigerant coil leaving temperature	°C	54.4
Design pressure	kPa	4200
No. Of coils / Sections	-	1
On-coil temperature / Wet bulb	°C / °C	35 / 24

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Description	Unit measure	Value
Off-coil temperature / Wet bulb	°C / °C	46 / 26.8
Air flow rate	m^3/h	7300
Air pressure drop	Pa	89
Coil face velocity	m/s	2.94
Number of rows	-	5
Fin thickness / Fin spacing	mm	0,10 / 2,5
Weight	kg	88
Tube materials / Thickness	mm	CuSn 12.45 X 0.6
Fins material / Thickness	mm	CuSn 0.10
Casing material / Thickness	mm	INOX 316 / 1.5

4.9 CONDENSER FAN MOTOR DATA

Description	Unit measure	Value
Type	-	Axial
Fan diameter	mm	450
Quantity	no.	2
Casing material	-	AISI 316L
Weight	kg	35
Air flow rate	m^3/h	3650
Nominal static pressure	Pa	110
Fan speed	rpm	1.450
Earthing boss	-	Yes
Drive arrangement	-	Direct
Nominal motor power	kW	0.37
Winding configuration	-	DOL
Nominal current	A	2.9
Electrical supply	V / Ph / Hz	400 / 3 / 60
IP rating	-	IP66 - Tropicalized
Max. operating temperature	°C	+55

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Description	Unit measure	Value
Min. operating temperature	°C	-10
Lubrication	-	Self-lubricated bearing
Painting	-	n.a.
Finish color	-	RAL 7035

4.10 PRESSURIZING FAN DATA

1 Description	Unit measure	Value
Type	-	RM250/2
Manufacturer	-	Moro
Casing material	-	Galvanized steel
Weight	kg	26
Air flow rate	m^3/h	806
Nominal static pressure	Pa	700
Nominal total pressure	Pa	600
Fan power consumption	kW	0.37
Fan speed	rpm	2980
Impeller type	-	Forward
Earthing boss	-	Yes
Drive arrangement	-	Direct
Fan pulley	Ø (mm)	n.a.
Motor fan pulley	Ø (mm)	n.a.
Belt type and quantity	-	n.a.
Manufacturer	-	Belk

Nominal motor power	kW	0.75
Winding configuration	-	DOL
Motor speed	Rpm	2980
Nominal current	A	1.5
Starting current	A	7

Electrical supply	V / Ph / Hz	400 / 3 / 60
IP rating	-	IP55
Execution	-	Safe zone
Max. operating temperature	°C	+50
Min. operating temperature	°C	-10
Lubrication	-	Self-lubricated bearing
Painting	-	Standard
Finish color	-	Green

5 ATTACHMENTS

5.1 COMPRESSOR DATASHEET

SPECIFICATIONS OF COMPRESSOR

Model No: C-SCN753H8H

Output : 10 HP



Temporary

Panasonic Appliances Compressor (Dalian) Co.,Ltd.

29/May/18

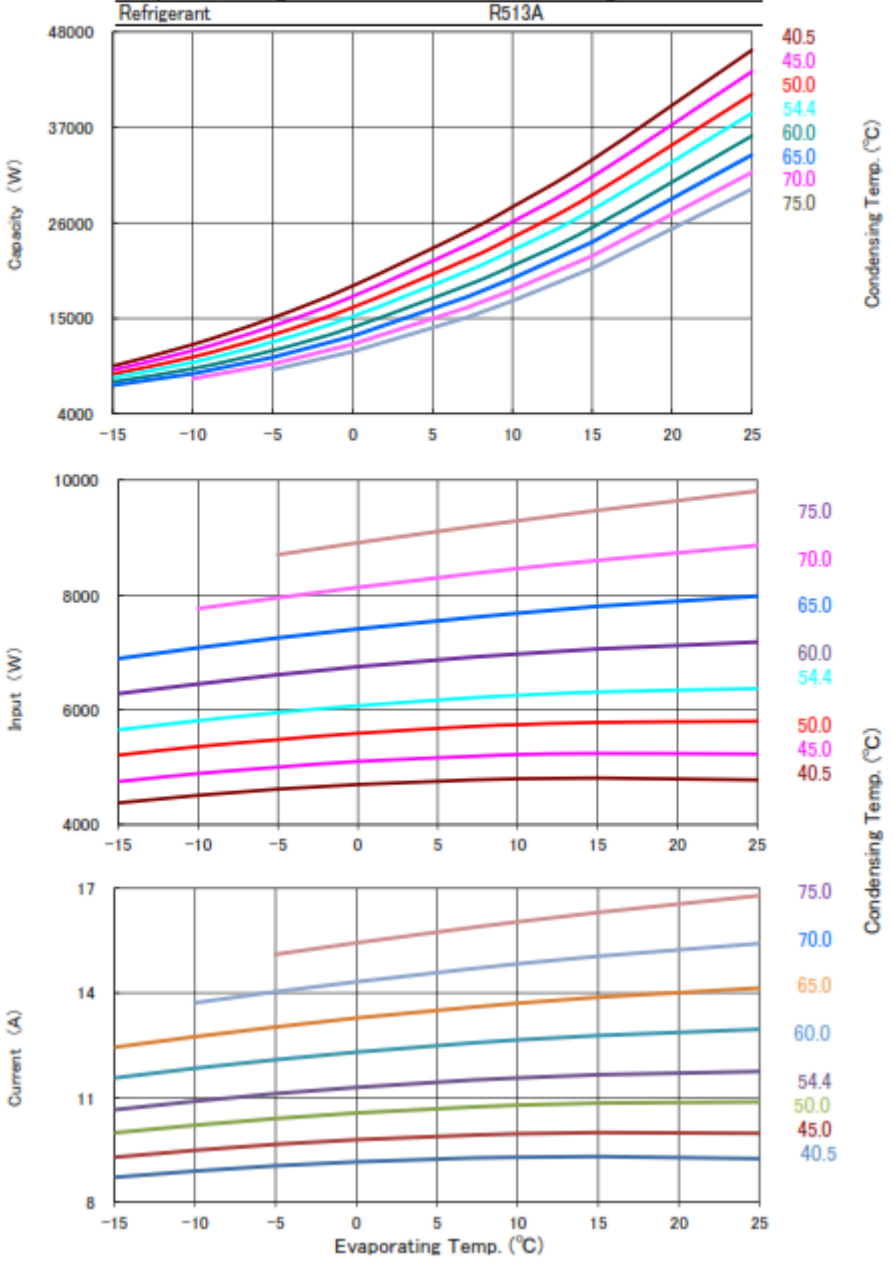
GENERAL SPECIFICATIONS

Model No:		C-SCN753H8H
Application		
Evaporating Temp Range	(°C)	-15 ~ 25
Refrigerant		R513A
Compressor Cooling		Natural Cooling
Rated Performance		
Capacity	(W)	20460 / 24000
Input	(W)	6210 / 7550
Current	(A)	11.5 / 11.8
Revolution	(min^{-1})	2950 / 3450
Sound Level	(dB(A))	72max / 74max
Rating Conditions		
Power Source		3-PH 50Hz 380-415V / 60Hz 440-460V
Evaporating Temp	(°C)	7.2
Condensing Temp	(°C)	54.4
Suction Gas Temp	(°C)	18.3
Liquid Temp	(°C)	46.1
Ambient Temp	(°C)	35.0
Measuring Point of Sound Level		
Distance from the Compressor	(m)	1.0
Compressor		
Design		Hermetic Scroll
Displacement	(cm3)	171.2
Suction Line Connection	(Φmm OD)	25.4
Discharge Line Connection	(Φmm OD)	19.05
Oil	(ml)	2800(FV68S)
Mass(Incl.Oil)	(kg)	69.5
Motor		
Type		3-PH Induction Motor(3IR)
Pole		2
Rated Power Source		3-PH 50Hz 380-415V / 60Hz 440-460V
Voltage Range	(V)	342~456 / 396~506
Starting Current	(A)	-

Panasonic Appliances Compressor (Dalian) Co.,Ltd.

PERFORMANCE CURVE

Code No.	C-SCN753H8H
Power Source	3-PH 50Hz 380-415V
Condensing Temp.(℃)	40.5, 45, 50, 54.4, 60, 65, 70, 75
Super Heating (K)	11.1
Sub Cooled(K)	8.3
Compressor Cooling	Natural Cooling
Refrigerant	R513A



PERFORMANCE DATA

Code No.	C-SCN753H8H
Power Source	3-PH 50Hz 380-415V
Condensing Temp.(°C)	40.5、45、50、54.4、60、65、70、75
Super Heating (K)	11.1
Sub Cooled(K)	8.3
Compressor Cooling	Natural Cooling
Refrigerant	R513A

Capacity (W)

Condensing Temp. (°C) \ Evaporating Temp. (°C)	-15	-10	-5	0	7.2	10	15	25
40.5	9,510	11,990	15,060	18,730	25,040	27,820	33,260	45,890
45.0	9,060	11,290	14,110	17,520	23,470	26,110	31,290	43,420
50.0	8,590	10,550	13,110	16,260	21,820	24,310	29,220	40,810
54.4	8,180	9,940	12,280	15,210	20,460	22,820	27,500	38,630
60.0	7,700	9,210	11,300	13,970	18,840	21,050	25,460	36,010
65.0	7,290	8,610	10,500	12,960	17,500	19,590	23,770	33,830
70.0		8,050	9,750	12,020	16,270	18,240	22,200	31,790
75.0			9,070	11,160	15,140	17,000	20,750	29,900

Input (W)

Condensing Temp. (°C) \ Evaporating Temp. (°C)	-15	-10	-5	0	7.2	10	15	25
40.5	4,380	4,510	4,620	4,700	4,780	4,800	4,810	4,780
45.0	4,750	4,890	5,000	5,100	5,190	5,220	5,240	5,230
50.0	5,210	5,360	5,480	5,590	5,710	5,740	5,780	5,800
54.4	5,650	5,810	5,950	6,070	6,210	6,250	6,310	6,370
60.0	6,280	6,450	6,610	6,750	6,920	6,970	7,060	7,180
65.0	6,890	7,080	7,250	7,410	7,610	7,680	7,800	7,980
70.0		7,760	7,950	8,130	8,370	8,460	8,600	8,860
75.0			8,700	8,910	9,190	9,290	9,470	9,810

Current (A)

Condensing Temp. (°C) \ Evaporating Temp. (°C)	-15	-10	-5	0	7.2	10	15	25
40.5	8.7	8.9	9.0	9.2	9.3	9.3	9.3	9.2
45.0	9.3	9.5	9.7	9.8	9.9	10.0	10.0	10.0
50.0	10.0	10.2	10.4	10.6	10.7	10.8	10.8	10.9
54.4	10.7	10.9	11.1	11.3	11.5	11.6	11.7	11.7
60.0	11.6	11.8	12.1	12.3	12.6	12.6	12.8	13.0
65.0	12.4	12.7	13.0	13.3	13.6	13.7	13.9	14.1
70.0		13.7	14.0	14.3	14.7	14.8	15.0	15.4
75.0			15.1	15.4	15.9	16.0	16.3	16.8

Coefficients of Polynominal Formula

380V-50Hz	Capacity (W)	Input (W)	Current (A)
C1	3.236391E+04	3.272777E+03	6.030077E+00
C2	1.371279E+03	1.364745E+01	1.422772E-02
C3	-4.001618E+02	-1.153071E+01	2.057119E-02
C4	1.257955E+01	-7.843619E-01	-9.046444E-04
C5	-1.705423E+01	-3.758758E-01	-4.842404E-04
C6	1.562635E+00	1.156707E+00	1.398814E-03
C7	-2.582598E-03	9.574157E-04	6.409064E-07
C8	-1.762708E-02	7.586826E-03	5.782724E-06
C9	6.790749E-02	9.656730E-03	1.534904E-05
C10	-4.025329E-09	2.937461E-09	-2.863875E-12

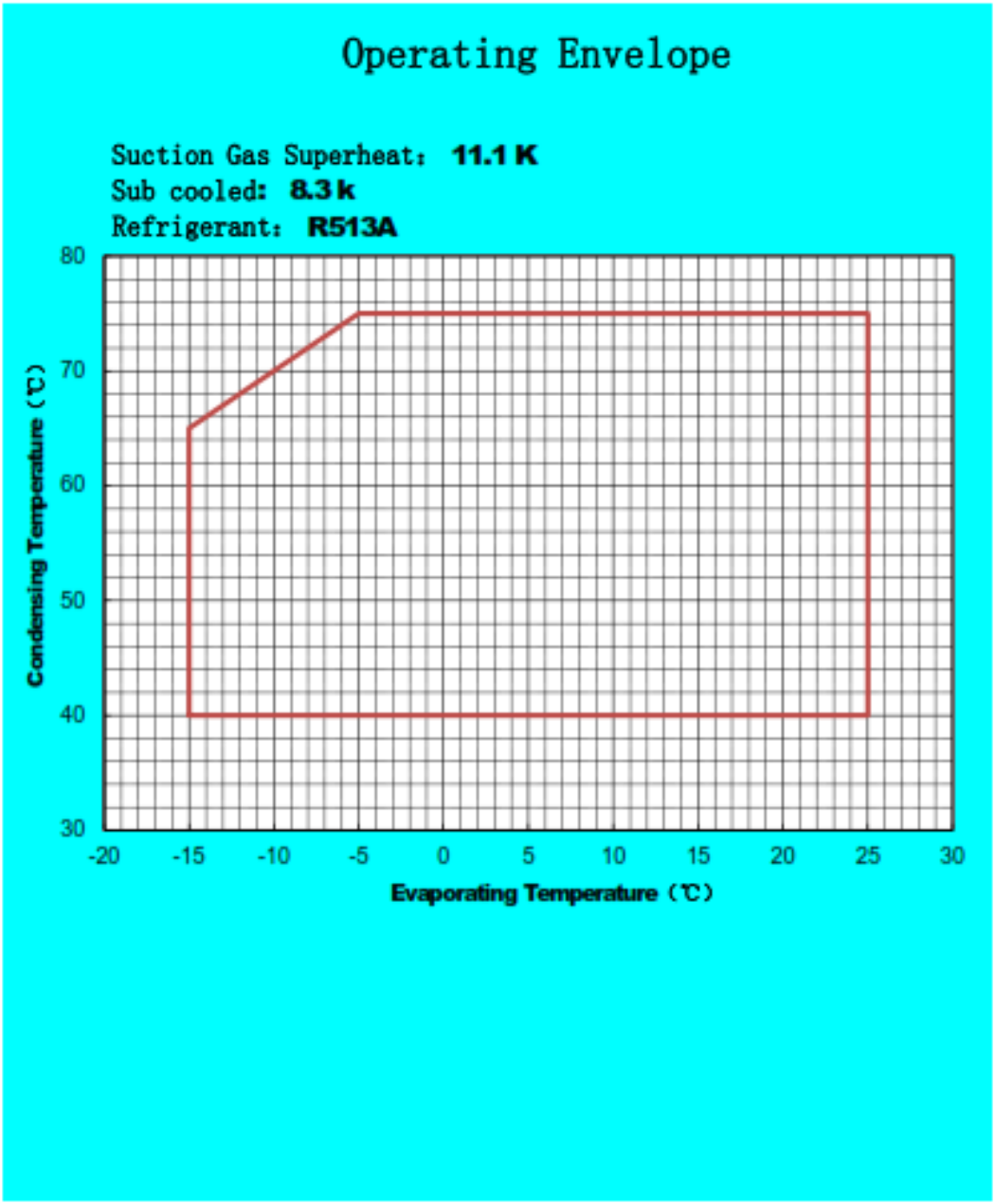
Note:The polynomial coefficients subject to change without notice.

$X=C1+C2*(S)+C3*D+C4*(S^2)+C5*(S*D)+C6*(D^2)+C7*(S^3)+C8*(D*S^2)+C9*(S*D^2)+C10*(D^3)$

X——CAPACITY(W) OR POWER(W) OR CURRENT(A)

S——EVAPORATING TEMP, °C

D——CONDENSING TEMP, °C


Operating Envelope
Suction Gas Superheat: 11.1 K
Sub cooled: 8.3 k
Refrigerant: R513A
Condensing Temperature (℃)
80
70
60
50
40
30
-20
-15
-10
-5
0
5
10
15
20
25
30
Evaporating Temperature (℃)

5.2 EVAPORATING COIL

D.B.M. SpA a Socio Unico
Via Ugo La Malfa 10 – 28040 Varallo Pombia (NO) – Italy
Tel. +39 0321 956794 – E mail: sales@dbmcoils.com

13/06/2

FRIGOTERMICA S.r.l.
Sig.ra Teresa Steri

100-002PD

NOTE

OFFERTA N° 03507-24R2
Redatta da Francesco Travaini
Consegna 5/6 weeks da order
Merce resa FCA
Imballo Eventuale al costo
Pagamento Solito in uso
Validita' offerta 30 GG
24 mesi di garanzia secondo condizioni generali DBM

DATI DI PROGETTO

CC fi-104563-64693/2 -1 128 *Rel. 6.5.0.5 18-02-2(*

FLUIDO ESTERNO: Aria					
Pressione Ambiente	mmHg	760			
Potenza	**kW**	**20.00**			
Portata gas	**Sm³/h**	**3200**			
Portata in peso	kg/h	3854	Fattore Calore Sensibile		0.74
Temperatura Ingresso	**°C**	**26.00**	Condensa	kg/h	7.20
Umidita' Relativa	%	50.00	Velocità Effettiva	m/s	2.31
Temperatura Uscita	**°C**	**12.38**	Perdita di carico	Pa	199
Umidità Relativa Uscita	%	96.88	Perdita di carico aria secca	Pa	95
FLUIDO INTERNO: R513A					
Pressione evaporazione	bar(a)	**4.11**	**Temperatura evaporazione**	°C	**7.00**
Pressione condensazione	bar(a)	15.31	Temperatura liquido	°C	54.40
Surriscaldamento	°C	5.00	Sottoraffreddamento	°C	2.00
Portata in Peso	kg/h	653	Perdita di carico	bar	0.12
Ø attacco distributore	mm	28.00	Perdita di carico distributore	bar	0.63
Capillari Ø 5 lunghezza 550 mm			Perdita di carico capillare	bar	0.87

N°2 BATTERIE CuSn-CuSn-Inox316 P3012ED 8R-19T-700A-2.5pa 15C 28 mm €

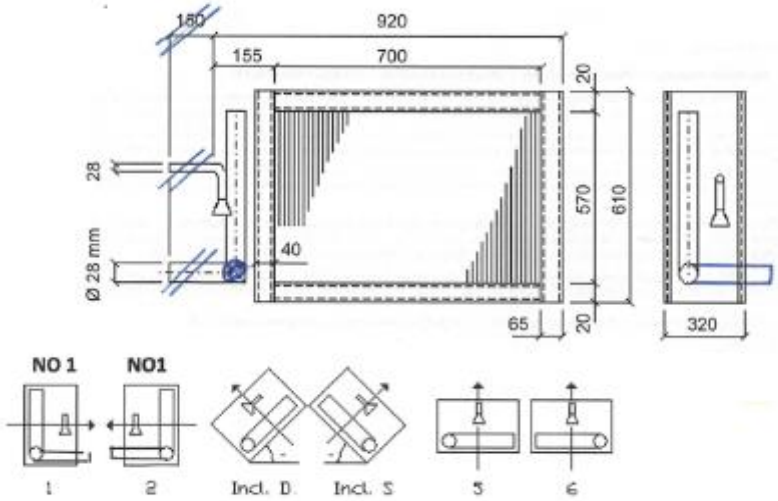
CARATTERISTICHE TECNICHE

Tubi	CuSn	12.45 x 0.35	mm	Peso	93 Kg
Alette	CuSn	0.20	mm	Volume interno	15 dm3
Telaio	Inox316	2.00 / 2.00	mm	Sup. totale di scambio	59.52 m2
Materiale collettore	Cu			PED 2014/68/UE	Articolo 4.3
				Pressione max ammissibile	21.0 bar
				Temp. min/max di funz.	-10/80 °C

ACCESSORI

CURVETTE E COLLETTORI NON STAGNATI

Certified calculation - Counterflow



5.3 CONDENSING COIL

D.B.M. SpA a Socio Unico
Via Ugo La Malfa 10 – 28040 Varallo Pombia (NO) – Italy
Tel. +39 0321 956794 – E mail: sales@dbmcoils.com

13/06/2024

FRIGOTERMICA S.r.l.
Sig.ra Teresa Steri

100-002PD

NOTE

OFFERTA N°	**03507-24R2**
Redatta da	Francesco Travaini
Consegna	5/6 weeks da order
Merce resa	FCA
Imballo	Eventuale al costo
Pagamento	Solito in uso
Validita' offerta	30 GG

24 mesi di garanzia secondo condizioni generali DBM

DATI DI PROGETTO — CC ft-104621-36577/3 9 128 — *Rel. 6.5.0.5 18-02-2023*

FLUIDO ESTERNO: Aria

Pressione Ambiente	mmHg	760			
Potenza	**kW**	**28.15**			
Portata gas	**Sm³/h**	**7300**			
Portata in peso	kg/h	8791	Fattore Calore Sensibile		1.00
Temperatura Ingresso	**°C**	**35.00**	Condensa	kg/h	0.00
Umidita' Relativa	%	40.00	Velocità Effettiva	m/s	2.94
Temperatura Uscita	**°C**	**46.15**	Perdita di carico	Pa	89
Umidità Relativa Uscita	%	22.14			

FLUIDO INTERNO: R513A

Pressione condensazione	**bar(a)**	**15.31**	**Temperatura condensazione**	**°C**	**54.40**
Surriscaldamento	°C	0.00	Sottoraffreddamento	°C	0.00
Portata in Peso	kg/h	801	Temperatura Uscita	°C	53.47
Perdita di carico	bar	0.16	Perdita di carico	°C	0.41
Velocità vapore nei tubi	m/s	3.26			

N°2 BATTERIE CuSn-CuSn-FeZn P3012COND 5R-45T-550A-2.5pa 8C 35 mm 22 mm €

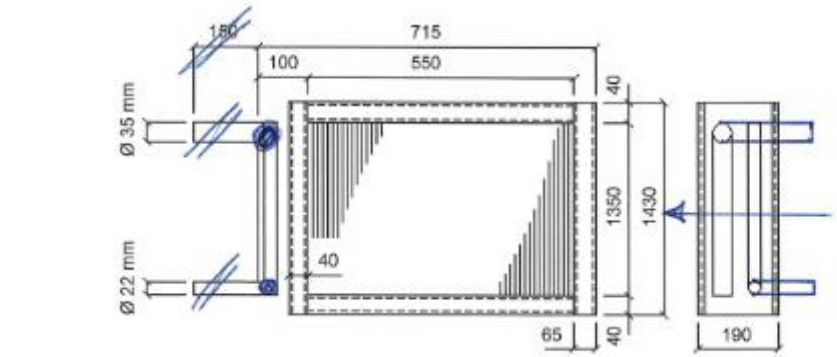
CARATTERISTICHE TECNICHE

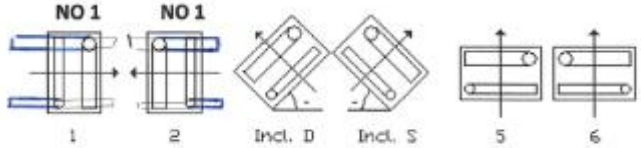
Tubi	CuSn	12.45 x 0.60	mm	Peso	88 Kg
Alette	CuSn	0.10	mm	Volume interno	18 dm3
Telaio	FeZn	1.50 / 1.50	mm	Sup. totale di scambio	69.62 m2
Materiale collettore	Cu R			**PED 2014/68/UE**	**Articolo 4.3**
				Pressione max ammissibile	42.0 bar
				Temp. min/max di funz.	-10/60 °C

ACCESSORI

CURVETTE E COLLETTORI NON STAGNATI

Certified calculation - Counterflow





Thu Jun 13 16:13:08 2024 1/1

5.4 ACTUATOR WITH SPRING RETURN

Item TAG: HDZ-77-NNN

ACTUATOR WITH SPRING RETURN

| DA03S... |



TYPE OVERVIEW

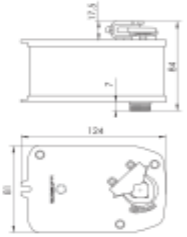
Torque	Controls	Damper surface	Voltage	Auxiliary switches	Weight	Type
3Nm	On/off	< 0,5 m² *	24V AC/DC	-	0,98 kg	DA03S24
				2SPDT**	1,08 kg	DA03S24S
	Modulating			-	1,02 kg	DA03S24P
				2 SPDT**	1,07 kg	DA03S24PS
	On/off		230V AC	-	0,99 kg	DA03S220
				2 SPDT**	1,09 kg	DA03S220S

TECHNICAL SPECIFICATION

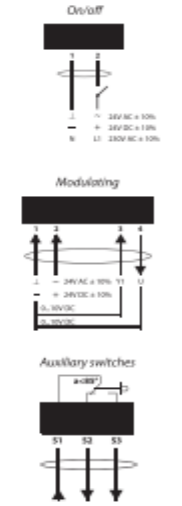
Type	DA03S24 (S)	DA03S24P (S)	DA03S220 (S)
Torque	3Nm		
Running time - motor/spring return	50 -70s / < 30s	50 -70s / < 30s	50 -70s / < 30s
Controls	on/off	0 -10V	on/off
Voltage	24V AC/DC	24V AC/DC	230V AC
Frequency	50/60Hz (AC)		
Power consumption			
- in operation	2,5W	2,5W	2,5W
- at rest	1,6W	1,6W	1,6W
- for wire sizing	10,0VA	7,0VA	10,0VA
Angle of rotation	-5°~90°		
- setting	45°~90° (5° step)		
Direction of rotation	can be selected by mounting L/R		
Sound power level - motor/spring return	<50 dB(A) / <65 dB(A)		
Position feedback	-	0 - 10V DC	-
Electrical connection	1m cable		
Auxiliary switches	3 (1.5)A, 230V		
Degree of protection	IP54		
Protection class	III low voltage	III low voltage	II
Ambient humidity	95% RH, without condensation		
Ambient temperature	-30~+50 °C		
Non-operating temperature	-40~+70 °C		
Service life	60 000 emergency positions		
Mechanical connection			
- round shaft	from ø6 to ø12mm		
- square shaft	from 5x5 to 8x8mm		
Manual override	not possible		
Norms and standards	Declaration of conformity, ISO, CE, EAC		

* Maximum damper surface is calculated for optimum conditions (without the influence of air flow, pressure difference, etc.).
** SPDT (Single-Pole Double-Throw)

DIMENSIONS (mm)



ELECTRIC INSTALATION



LUFBERG CONSTRUCTIVE DECISIONS

5.5 MANUAL VOLUME CONTROL DAMPERS

Item TAG: HDB-77-NNN

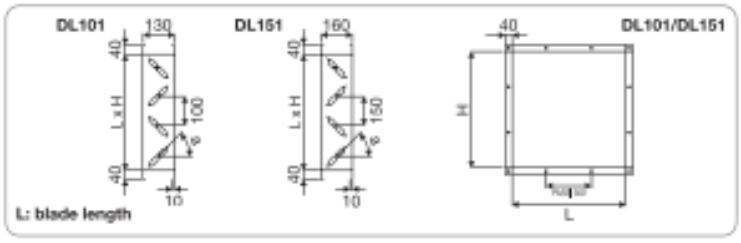
Volume control dampers in galvanised steel

EUROPAIR TECHNOLOGY

Air flow control

DL 101





DL 151



Description

- Galvanised steel frame th. 10/10 Z200, depth 130 mm, 40 mm flange with Ø 8 mm holes in the middle, pitch 300 mm
- "Double Skin" aerofoil blades in galvanised steel th. 0.6+0.6 Z200, pitch 100 mm
- External control linkages in galvanised steel
- Sprung side seal
- Drive shaft Ø 12 mm L = 100 mm
- Nylon bearings, temp. -20°C / +70°C
- **Leakage class 1/A EN 1751**

Available execution (see page 11)

- Intermediate dimensions (larger sizes price list +€52)
- Execution with leakage class 3B EN 1751 (price list +€35 per blade)
- Frame 15/10 (list price x1.5) / frame 20/10 (list price x1.5) / frame 30/10 (list price x2)
- In 304 STAINLESS STEEL (list price x3)
- In 316L STAINLESS STEEL (list price x3.5)

ATEX execution: II 2G Ex h IIB/IIC T1...T6Gb
II 2D Ex h IIIC T 450°C...T 85°C Db (list price +40% +€120 each)

Accessories (see page 10)

- Galvanised manual drives (R11 up to 1 sqm €15) - (R12 over €21)
- Electric actuators / Pneumatic cylinder
- Atex actuators (see page 12)

Description

- Galvanised steel frame th. 15/10 Z200, prof. 160 mm, 40 mm flanges with Ø 8 mm holes in the middle, pitch 300 mm
- "Double Skin" aerofoil blades in galvanised steel th. 0.8+0.8 Z200, pitch 150 mm
- External control linkages in galvanised steel
- Sprung side seal
- Drive shaft Ø 12 mm L = 100 mm
- Nylon bearings, temp. -20°C / +70°C
- **Leakage class 2/B EN 1751**

Available execution (see page 11)

- Intermediate dimensions (larger sizes price list +€52)
- Frame 20/10 (list price x1.5) / frame 30/10 (list price x2)
- In 304 STAINLESS STEEL (list price x3)
- In 316L STAINLESS STEEL (list price x3.5)

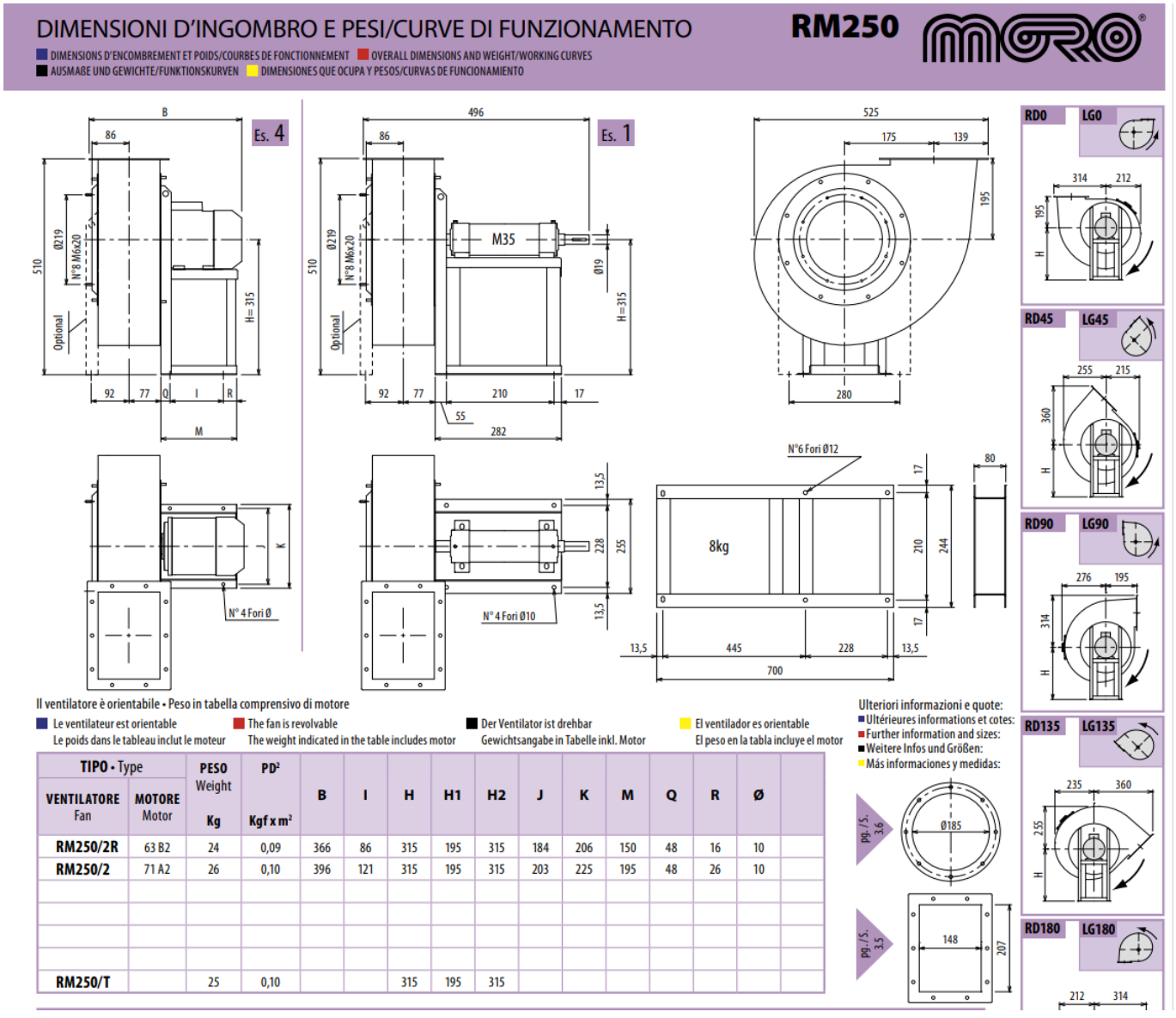
ATEX execution: II 2G Ex h IIB/IIC T1...T6Gb
II 2D Ex h IIIC T 450°C...T 85°C Db (list price +40% +€120 each)

Accessories (see page 10)

- Galvanised manual drives (R11 up to 1 sqm €15) - (R12 over €21)
- Electric actuators/ Pneumatic cylinder
- Atex actuators (see page 12)

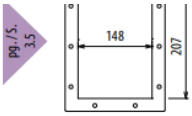
5.6 PRESSURIZING FAN

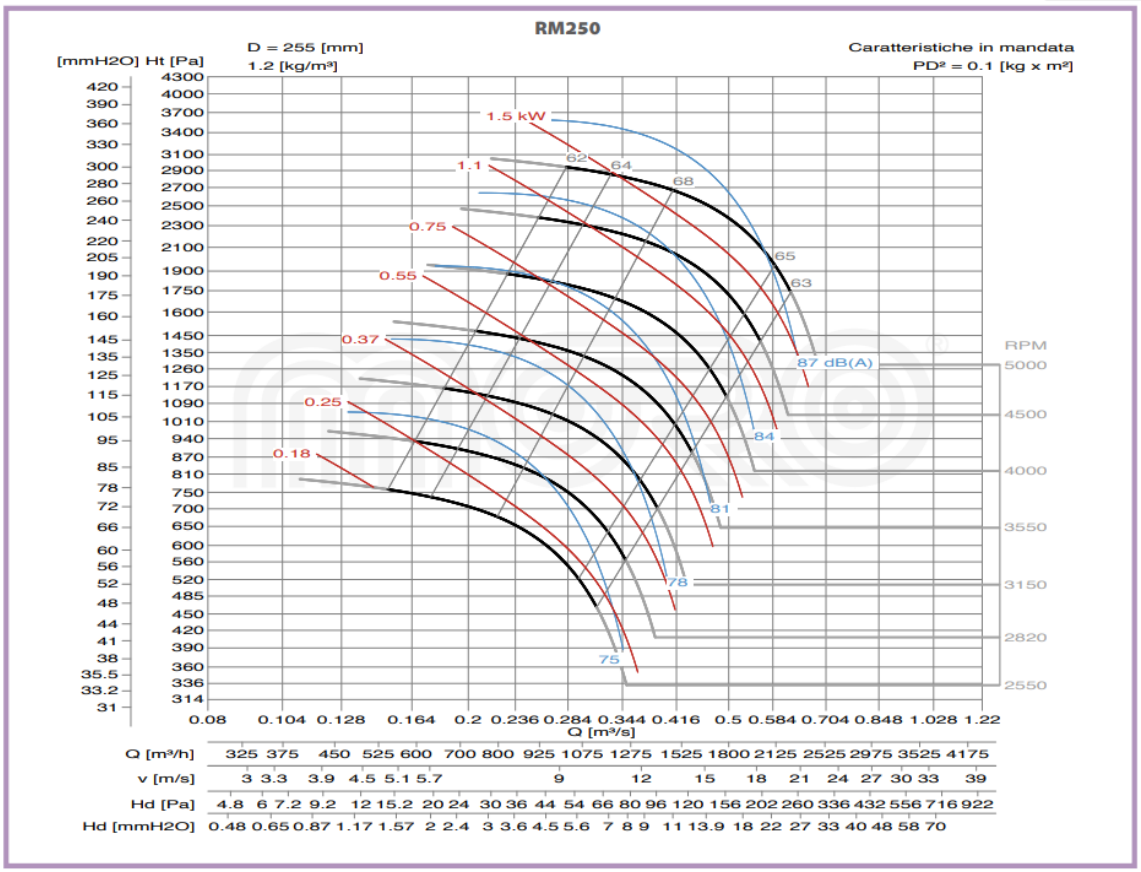
Item TAG: HFM-77-NNN

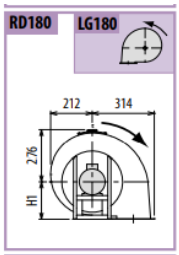


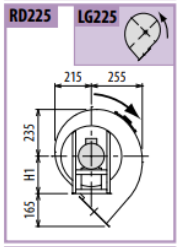
TIPO • Type		PESO Weight	PD²	B	I	H	H1	H2	J	K	M	Q	R	Ø
VENTILATORE Fan	MOTORE Motor	Kg	Kgf x m²											
RM250/2R	63 B2	24	0,09	366	86	315	195	315	184	206	150	48	16	10
RM250/2	71 A2	26	0,10	396	121	315	195	315	203	225	195	48	26	10
RM250/T		25	0,10			315	195	315						

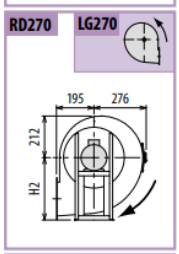
RM250/T		25	0,10		315	195	315	

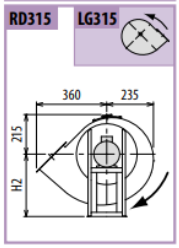












5.7 SUPPLY FAN

Item TAG: HFA-77-NNN

NICOTRA Gebhardt — Ventilatori centrifughi per trasmissione a cinghia / RDH / Dati tecnici

RDH E_-0250

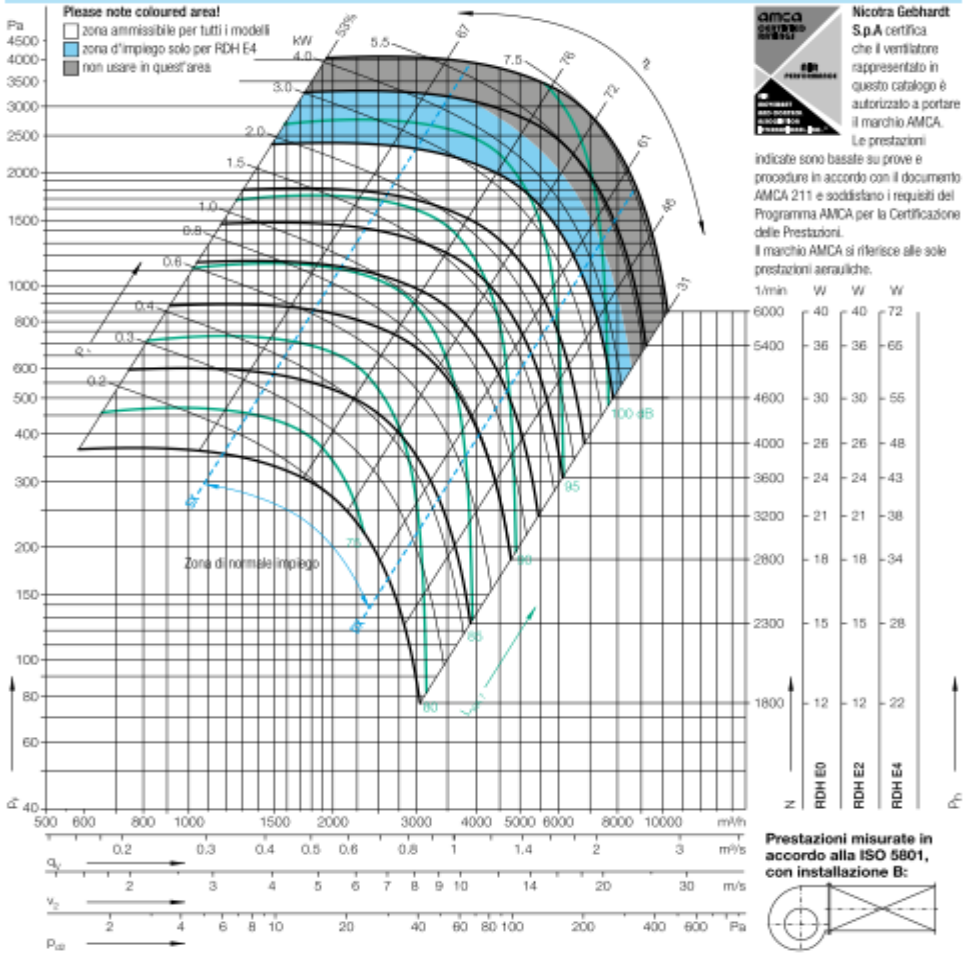
Le prestazioni certificate si riferiscono ad installazione B, aspirazione libera – mandata canalizzata.
La potenza assorbita non include le perdite nella trasmissione.
Le prestazioni indicate non tengono conto di eventuali accessori nel flusso d'aria.

Dati tecnici

Dati ventola			
Diametro ventola	D_2	252	mm
Numero di pale	z	11	
Momento d'inerzia	J	0,044	kgm²

Dati ventola			
Peso ventola	m	4,87	kg
Densità della sostanza estratta	ρ_1	1,2	kg/m³
Classe di precisione (DIN 24166)		2	

Performance Curves



Nicotra Gebhardt S.p.A certifica che il ventilatore rappresentato in questo catalogo è autorizzato a portare il marchio AMCA. Le prestazioni indicate sono basate su prove e procedure in accordo con il documento AMCA 211 e soddisfano i requisiti del Programma AMCA per la Certificazione delle Prestazioni.
Il marchio AMCA si riferisce alle sole prestazioni aerauliche.

Prestazioni misurate in accordo alla ISO 5801, con installazione B:

$\Delta L_{dB(A)}$

Punto di lavoro	Velocità 1/min	dB
SX	4600	3
SX	3200	3
SX	2300	2
$q_{v\,opt}$	4600	4
$q_{v\,opt}$	3200	4
$q_{v\,opt}$	2300	3
DX	4600	3
DX	3200	3
DX	2300	3

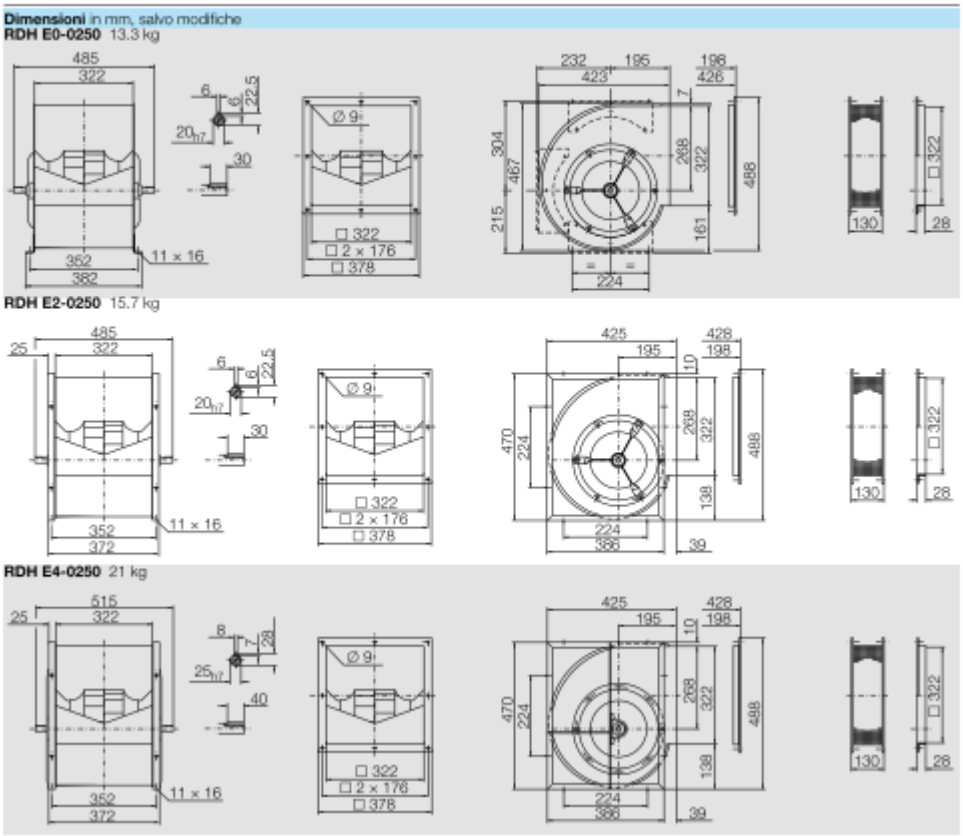
Fattori di correzione per determinare la rumorosità relativa all'aspirazione L_{WreiS}, per bande d'ottava f_c

63	125	250	500	1000	2000	4000	8000	Hz
-8	-7	-5	-4	-4	-9	-13	-18	dB
-7	-3	-4	0	-8	-9	-13	-19	dB
-4	-3	-3	-1	-6	-10	-15	-20	dB
-10	-10	-8	-8	-3	-7	-10	-17	dB
-9	-8	-7	-1	-7	-7	-12	-19	dB
-8	-6	-7	-1	-5	-8	-15	-21	dB
-10	-9	-9	-7	-5	-6	-9	-15	dB
-7	-8	-8	-3	-6	-6	-10	-19	dB
-7	-7	-8	-3	-4	-7	-13	-21	dB

Fattori di correzione per determinare la rumorosità relativa alla mandata L_{WreiA}, per bande d'ottava f_c

63	125	250	500	1000	2000	4000	8000	Hz
6	7	3	-2	-4	-6	-8	-16	dB
9	7	3	0	-7	-4	-11	-18	dB
10	6	2	-1	-3	-5	-13	-19	dB
6	5	0	-5	-4	-3	-5	-15	dB
7	4	-1	-2	-5	-1	-9	-18	dB
6	2	-2	-2	-1	-3	-13	-20	dB
5	4	-2	-4	-4	-2	-4	-13	dB
7	3	-2	-2	-5	-1	-8	-16	dB
6	1	-2	-3	-1	-3	-11	-19	dB

RDH E_-0250


Dimensioni in mm, salvo modifiche
RDH E0-0250 13.3 kg
RDH E2-0250 15.7 kg
RDH E4-0250 21 kg

5.8 SUPPLY GRILLE

Item TAG: HSG-77-NNN

BMA



CARATTERISTICHE:
Bocchette di mandata ad alette orientabili passo 20 mm.

COSTRUZIONE:
Alluminio anodizzato.

IMPIEGO:
A parete, in mandata.
Altezza di installazione: 2,5-3,5 m.

FISSAGGIO:
- Fissaggio standard con clips.
- Fori per viti a richiesta.
- Calamite a richiesta (CL).
- Morsetti a richiesta (KC).

ACCESSORI:
- Plenum in acciaio zincato standard o isolato.
- Serranda di taratura in acciaio zincato con alette a movimento contrapposto.
- Controtelaio di montaggio in lamiera di acciaio zincata.

CHARACTERISTICS:
Supply grilles with adjustable blades 20 mm pitch.

CONSTRUCTION:
Anodized aluminium.

UTILIZATION:
For wall installation and for air delivery.
Installation height: 2,53,5 m.

FIXING:
- Standard fixing by clips.
- Holes for screws upon request.
- Magnets on request (CL).
- Clamps upon request (KC).

ACCESSORIES:
- Galvanized steel plenum, standard or insulated.
- Calibration damper made of galvanized steel and fins with opposite movement.
- Mounting counterframes made of galvanized steel sheet.

PREZZI - PRICES

STOCK

BxH	BMAV BMAO	BMAVO BMAOV	SC	CT CTKC	PBZ1	PBZI1	PBZ2	PBZI2
mm	€	€	€	€	€	€	€	€
200x100		■	■					
300x100		■	■					
400x100		■	■					
500x100		■	■					
• 600x100		■						
• 700x100								
• 800x100								
•1000x100								
200x150		■	■					
300x150		■	■					
400x150		■	■					
500x150		■	■					
• 600x150		■	■					
• 700x150								
• 800x150								
•1000x150								
200x200								
300x200		■	■					
400x200		■	■					
500x200		■	■					
• 600x200		■	■					
• 700x200								
• 800x200								
•1000x200								
300x300								
400x300								
500x300		■	■					
• 600x300		■	■					
• 700x300								
• 800x300								
•1000x300								
400x400								
500x400								
• 600x400								
• 700x400								
• 800x400								
•1000x400								
500x500								
• 600x500								
• 800x500								
•1000x500								

Per misure fuori tabella prezzi a richiesta - For bigger sizes prices on request

• Rinforzo intermedio - Intermediate reinforcing

VERNICIATURA - PAINTING:
Colori RAL 9010: + 15% - Color RAL 9010: + 15%
Altri colori: prezzi a richiesta - Different colors: prices on request

5.9 RETURN GRILLE

Item TAG: HEG-77-NNN

GRAI



CARATTERISTICHE:
Griglie di ripresa industriali ad alette fisse inclinate di 45° passo 60 mm.

COSTRUZIONE:
Alluminio anodizzato.

IMPIEGO:
A parete, per presa aria esterna o espulsione.

FISSAGGIO:
Fissaggio con clips o viti frontali a richiesta.

ACCESSORI:
- Serranda di taratura in acciaio zincato con alette a movimento contrapposto.
- Controtelaio di montaggio in lamiera di acciaio zincata.
- Rete antivolatile.
- Serranda di sovrappressione a gravità.

CHARACTERISTICS:
Industrial return grilles grilles with fixed and 45° inclined bars 60 mm pitch.

CONSTRUCTION:
Anodized aluminium.

UTILIZATION:
For wall installation and for external air intake or exhaust air flow.

FIXING:
Fixing by clips or frontal screws on request.

ACCESSORIES:
- Calibration damper made of galvanized steel and fins with opposite movement.
- Mounting counterframes made of galvanized steel sheet.
- Bird screen.
- Overpressure damper.

PREZZI - PRICES

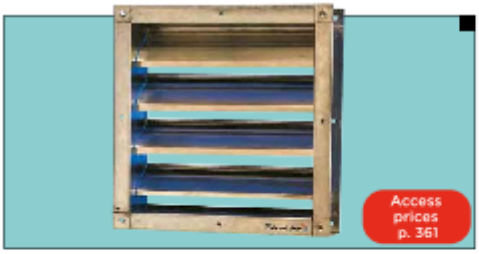
BxH	GRAI	GRAIR	GRAIRZ	GRAIRSS	SCAI	CTP
mm	€	€	€	€	€	€
400x400						
500x400						
600x400						
800x400						
1000x400						
• 1200x400						
• 1400x400						
• 1600x400						
• 1800x400						
• 2000x400						
400x500						
500x500						
600x500						
800x500						
1000x500						
• 1200x500						
• 1400x500						
• 1600x500						
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• 1400x800						
• 1600x800						
• 1800x800						
• 2000x800						
400x1000						
600x1000						
800x1000						
1000x1000						
• 1200x1000						
• 1400x1000						
• 1600x1000						

5.10 NOT REURN DAMPER

Item TAG: HDN-77-NNN

DIFFUSION

France Air



Access prices p. 361

SPG

Pressure relief flap for rectangular ducts

MATERIAL	INSTALLATION	MOUNTING
Alu + steel	Rectangular duct	Visible screws

Espace Pro

Order online at www.espacepro.france-air.com

ADVANTAGES

- Excellent sealing.
- Low noise level.

RANGE

- SPG vent for rectangular duct.
- Standard dimensions from 200 x 200 mm to 2 000 x 2 000 mm:
  - in 100 mm intervals up to 1200 x 1200 mm,
  - then in steps of 200 mm.

APPLICATION/USE

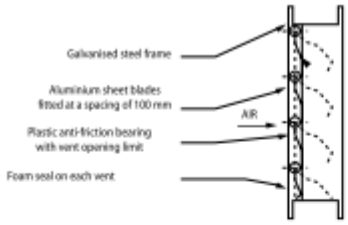
- To maintain an overpressure or underpressure in a room with respect to the outside or to another adjoining room.
- Non-return flap.
- Use in air conditioning, ventilation or heating.

DESIGNATION

SPG (Pressure relief flap) **400 x 200** (Length x height (mm))

CONSTRUCTION/COMPOSITION

- Ducted - Type SPG



OPTIONS

- Bronze bearings.
- Stainless steel construction.
- Non-standard dimensions (consult us).
- High speed version (up to 10 m/s): shaft through coupled blades and central reinforcement

SPECIFICATION TEXT

- Available on www.france-air.com, Espace Pro area.

ASSEMBLY AND CONNECTION

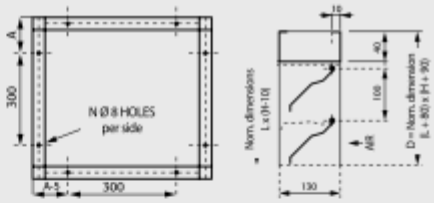
- **Fitting in duct in a network**
  - Maximum flow speed = 6 m/s.
  - Above 4 m/s, the vent is fully open.
  - Max. temperature : + 50°C.

TECHNICAL DESCRIPTION

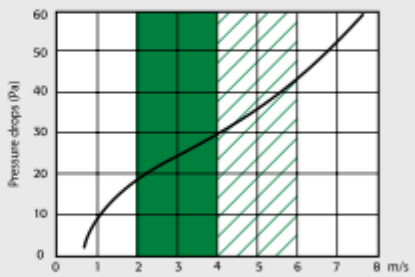
- Dimensions, cut-out

Dimension (mm)	Number of holes per side	Dimension A (mm)
200	0	-
300	0	-
400	1	245
500	1	295
600	1	345
700	2	245
800	2	295
900	2	345
1000	3	245
1100	3	295
1 200	3	345
1400	4	295
1600	5	245
1800	5	345
2000	6	295

N. B.: above L = 1 200 mm, a central reinforcement is provided.



- Pressure drop/speed curve



Optimal selection values: from 2 m/s to 4 m/s*
* to 4 m/s: the flap is fully open.

Selection limit values at 6 m/s.

5.11 DUCT INSULATING MATERIAL

Technical datasheet
Felt CLIMCOVER ROLL ALU 1



DESCRIPTION
Blanket with grid alu foil. Made with glass and with a new generation of thermo-hardening resin that associates organic and vegetal components and minimizes emissions of pollutant substances, like formaldehyde and others volatile organic compounds (VOC).

APPLICATION
Product for use in technical applications, such as ventilation ducts and industrial equipments, with need thermal and acoustic insulation

BENEFITS
- Long life span
- Impact resistance
- Dimensional stability in case of temperature and humidity variation
- Thermal and acoustic insulation
- Certified according to EN 14303
- Easy workability

STORAGE
The product must be stocked inside, in ventilated areas and away from heat sources.

Characteristics		Value	Unit	According to
Declared thermal conductivity	10°C	0,032	W/(m·K)	EN 12667
Declared thermal conductivity	40°C	0,037	W/(m·K)	EN 12667
Declared thermal conductivity	100°C	0,049	W/(m·K)	EN 12667
Fire class EUROCLASS		A1	-	EN 13501-1
Maximum service temperature		125	°C	EN 14706
Width tolerance		+-10	mm	
Length tolerance		-0+excess	mm	

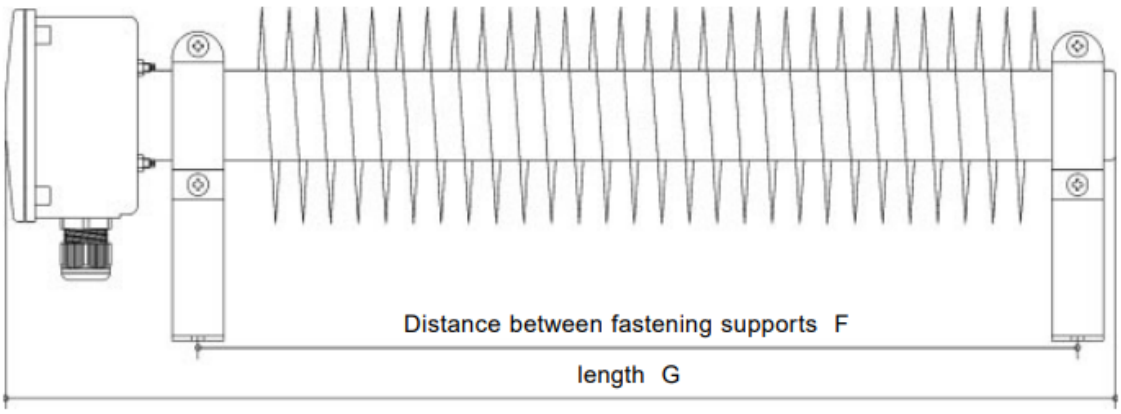
Thickness (mm)	Dimensions (m)	m²/pallet
25	1,15 x 10	345,00
50	1,15 x 5	172,50

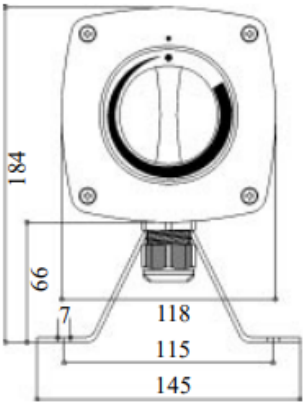
CODE: STC 255
REVISION: 00
DATE: March 2013

Product produced in France-Chalon Sur Saone plant
As regards the CE marking, this insulating product is in accordance with the standard 89/106/CE received by the DPR 246 of 21/4/1993 based on the standards EN 14303.
The CE data indicated on this datasheet are the ones required for the thermal insulation of industrial applications by the standard EN 14303 common to all applications.
The Quality Management System of Saint-Gobain PPC Italia S.p.A. has been assessed and found in accordance with the requirements of the EN ISO 9001:2008, EN ISO 14001:2004 and OHSAS 18001:2007.
The values stated in this datasheet, except for the values required by the CE marking, are not binding and Saint-Gobain PPC Italia S.p.A. may change them, without any notice.
Supplies are subjected to our production possibilities.
Saint-Gobain PPC Italia S.p.A. reserves the right to alter or amend product specification or stop the production without notice

5.12 SPACE HEATER

Item TAG: HHS-77-(010/011/012)





Typ	G mm	F mm
RRH TR 500	500	365
RRH TR 1000	700	565
RRH TR 1500	900	765
RRH TR 2000	1100	965
RRH TR 3000	1500	1365

Typ	G mm	F mm
RRH ST 1000	700	565
RRH ST 1500	900	765
RRH ST 2000	1100	965
RRH ST 3000	1500	1365

Kraemer & Kraus Wärmetechnik GmbH
Eiserntalstr. 374
57080 Siegen

Telefon (02 71) 3 93 70 26
Telefax (02 71) 3 93 70 27
Internet http:/www.Kraemer-Kraus.de
eMail Info@Kraemer-Kraus.de

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5.13 PRESSURE RELIEF DAMPER

Item TAG: HDR-77-401

SagiCofim

Overpressure damper with combined blades and counterweight

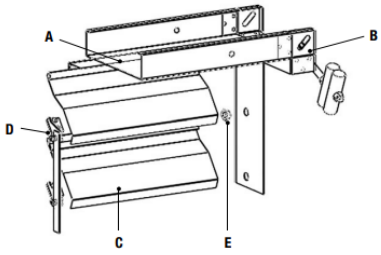
GP100KC-C



Duct overpressure damper with blades combined inside the air flow with return to closing position by own gravity and counterweight outside the flow. Vertical installation with single direction flow. In the case of counter-flow, the damper functions as a non-return element. The combination allows simultaneous opening of the blades, preventing an uneven air flow from creating high turbulence zones and low velocity zones.

MATERIAL AND FINISH

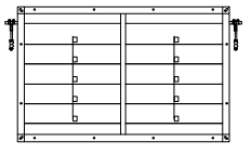
A Frame in galvanized steel Z140, duct-mounting.
B Flange 36 mm, thickness 1 mm.
C Galvanized blades combined internally, movement by gravity with counterweight that can be calibrated, anti-noise gasket.
D Through galvanized pins.
E NYLON bushes.



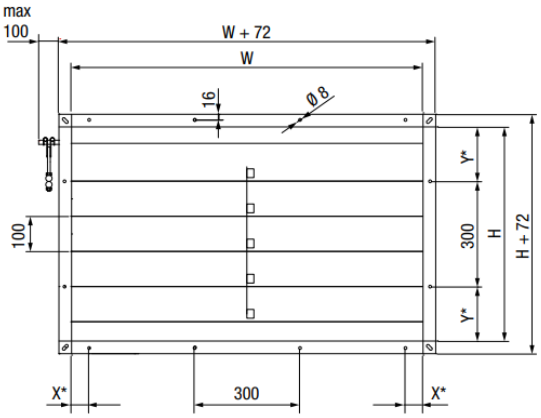
VERSIONS

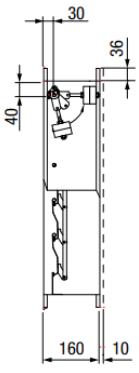
- AISI316 **(PRICES UPON REQUEST)**
- ATEX II 2 GD **+ 36** €

NB: For the prices of the intermediate sizes, consider the next size on the table.
Ex.: 650 x 410 mm = 700 x 410 mm
For basic sizes > 1000 mm, construction in double section with centre separator



*See tech data sheet





The damper is supplied with a counterweight made up of a threaded rod 200 mm long and 300 g of metal masses.
In vertical axis, the counterweight is irrelevant for increasing the opening pressure, minimum reference value 30 Pa.
By tilting the counterweight in the direction of the blade opening, the minimum opening pressure increases up to + 100% for a 45° angle
For pressures higher than 100 Pa, the oscillating masses have to be increased.

5.14 BACKDRAFT DAMPER

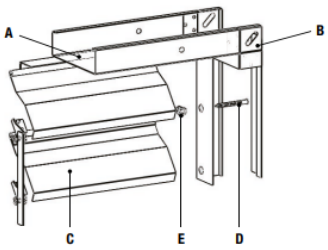
SagiCofim

Overpressure damper with combined blades

GP100KC



Overpressure damper with blades combined inside the air flow with return to closing position by gravity. Vertical installation with single direction flow. In the case of counter-flow, the damper functions as a non-return element. The combination allows simultaneous opening of the blades, preventing an uneven air flow from creating high turbulence zones and low velocity zones.
Minimum opening pressure 30 Pa



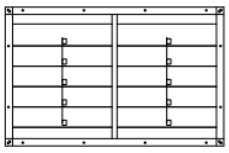
MATERIAL AND FINISH

A Frame in galvanized steel Z140, duct-mounting.
B Flange 36 mm, thickness 1 mm.
C Combined aluminum blades (series 5005), movement by gravity, anti-noise gasket, thickness 0.5 mm.
D Rotation pins.
E NYLON bushes.

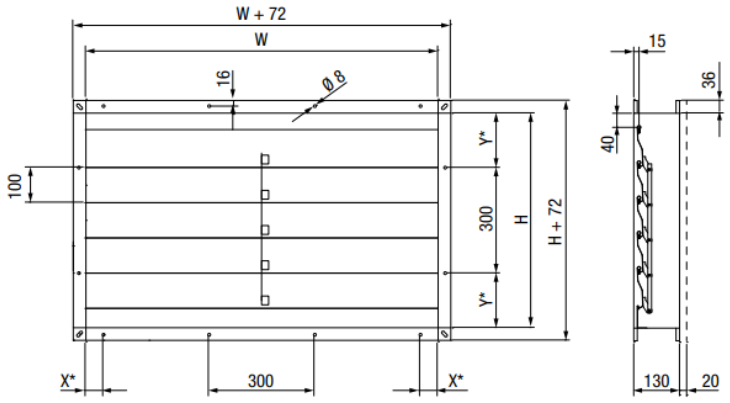
VERSIONS

• AISI316	(PRICES UPON REQUEST)
• ATEX II 2 GD	**+ 36** €

NB: For the prices of the intermediate sizes, consider the next size on the table.
Ex.: 650 x 410 mm = 700 x 410 mm
For basic sizes > 1000 mm, construction in double section with centre separator

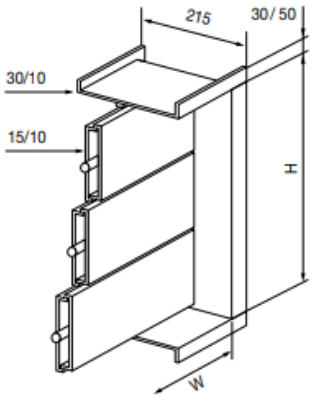


*See tech data sheet

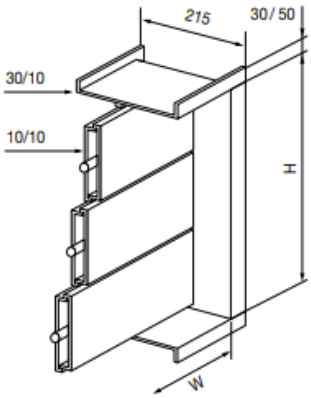


5.15 SHUT-OFF DAMPER

SDL - SDLT 0
dimensions in [mm]



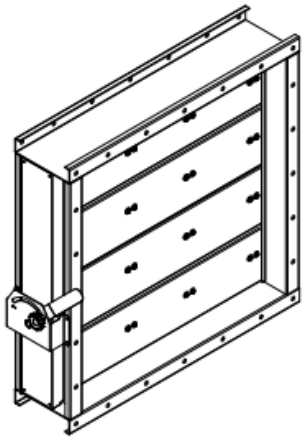
SDL - SDLT 2 - 6
dimensions in [mm]



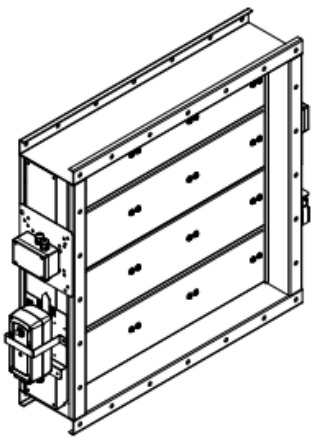
General features Shut-off dampers & Gas Shut-off dampers		
Models	**SDL**	**SDLT**
Gas leakage EN 1751 *Ambient temperature - Pressure: 2000 Pa*	Class B Class 1	**Class C** **Class 3**
Installation	Deck and bulkhead, duct, wall	
Maximum air inlet dimensions in single arrangement*	Width [W] and Height [H] from 150 to 2000 mm	
Standard flanges dimensions	30 mm (HVAC systems) or 50 mm (engine ventilation)	
Drilling	Standard Ø 12 or on demand	
Control types	Manual / Electrical / Electrical ATEX / Pneumatic / Pneumatic ATEX	
Accessories	Circular connections, junction box, quick connections, heating cable, box limit switch, ...	

* Dampers can be supplied on request with special dimensions by multiple welded arrangement.

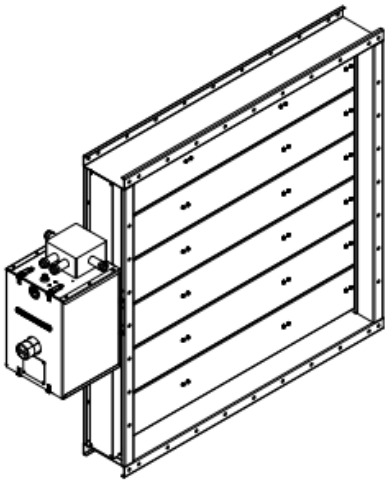
With manual control



With electrical control



With pneumatic control



SDL - SDLT



Damper operating range:

ATEX area	$-20\,°C \le t \le +50\,°C$ - V_{max} 15 m/s - P_{max} 3000 Pa
SAFE area	$-20\,°C \le t \le +70\,°C$ - V_{max} 25 m/s - P_{max} 3000 Pa

Damper components materials

		STANDARD		
	Type	0	2	6
A	**Casing** (depth 215 mm)	Hot bath galvanized steel, tk. 3 mm	Hot bath galvanized steel, tk. 3 mm	AISI 316 L, tk. 3 mm
B	**Blades** (parallel movement)	Galvanized steel, tk. 1.5 + 1.5 mm	AISI 316 L - tk. 1 + 1 mm	AISI 316 L - tk. 1 + 1 mm
C	**Shafts**	AISI 316 L, Ø 18,1 x 1.5 mm	AISI 316 L, Ø 18,1 x 1.5 mm	AISI 316 L, Ø 18,1 x 1.5 mm
D	**Levers**	Galvanized steel tk. 2 mm	AISI 316 L tk. 2 mm	AISI 316 L tk. 2 mm
E	**Bushes**	Self lubricating bronze, 9010	Self lubricating bronze, 9010	Self lubricating bronze, 9010
F	**Stops**	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm
G	**Lever protection carter**	Galvanized steel tk. 1 mm	AISI 316 L tk. 1 mm	AISI 316 L tk. 1 mm
H	**Side sealing plates**	AISI 301	AISI 301	AISI 301
	Actuator support plate	Galvanized steel	AISI 316 L	AISI 316 L
	Position indicator	Galvanized steel	Galvanized steel	AISI 304

Silicone seals and thin blades only for models SDLT

Shut-off - Gas Shut-off Damper

Marine - Oil & Gas Industry

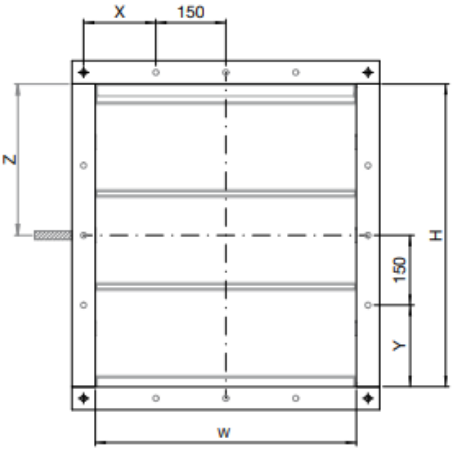
SagiCofim

SDL - SDLT

Dimensions of flanges and drilling

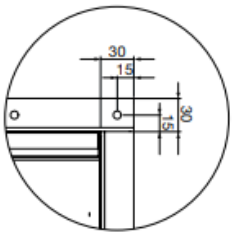
Models SDL - SDLT / 0 - 2 - 6

Air inlet size W / H [mm]	N° holes	flange 30 [mm]		flange 50 [mm]		0		2 / 6	
		X	Y	X	Y	Z	N° blades	Z	N° blades
150	1	90	75	100	75	75	1	75	1
200	1	115	100	125	100	100	1	100	1
250	1	140	125	150	125	125	1	125	1
300	1	165	150	175	150	50	2	75	2
350	3	40	175	50	175	75	2	100	2
400	3	65	50	75	50	100	2	100	2
450	3	90	75	100	75	125	2	225	3
500	3	115	100	125	100	250	3	250	3
550	3	140	125	150	125	275	3	275	3
600	3	165	150	175	150	300	3	300	3
650	5	40	175	50	175	325	3	325	3
700	5	65	50	75	50	450	4	350	3
750	5	90	75	100	75	475	4	375	5
800	5	115	100	125	100	500	4	500	4
850	5	140	125	150	125	525	4	525	4
900	5	165	150	175	150	450	5	375	6
950	7	40	175	50	175	475	5	400	6
1000	7	65	50	75	50	500	5	500	5
1050	7	90	75	100	75	525	5	525	7
1100	7	115	100	125	100	450	6	550	7
1150	7	140	125	150	125	475	6	575	7
1200	7	165	150	175	150	500	6	500	6
1250	9	40	175	50	175	525	6	525	6
1300	9	65	50	75	50	650	7	550	6
1350	9	90	75	100	75	675	7	675	9
1400	9	115	100	125	100	700	7	700	7
1450	9	140	125	150	125	725	7	725	7
1500	9	165	150	175	150	650	8	675	10
1550	11	40	175	50	175	675	8	700	10
1600	11	65	50	75	50	700	8	700	8
1650	11	90	75	100	75	725	8	825	11
1700	11	115	100	125	100	850	9	850	11
1750	11	140	125	150	125	875	9	875	11
1800	11	165	150	175	150	900	9	900	9
1850	13	40	175	50	175	925	9	925	9
1900	13	65	50	75	50	850	10	950	9
1950	13	90	75	100	75	875	10	975	13
2000	13	115	100	125	100	900	10	900	10

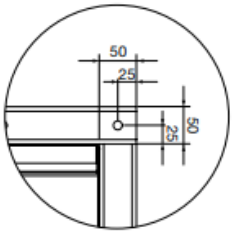


◆ Fixed holes at corner
○ Intermediate holes

SDL - SDLT flange 30



SDL - SDLT flange 50



Shut-off - Gas Shut-off Damper

Marine - Oil & Gas Industry

SagiCofim

SDL - SDLT

Damper weights [Kg]

Damper weights [Kg]

H [height]	W [width]																			
	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
150	9	11	13	16	18	21	24	26	29	32	34	37	40	42	45	47	50	53	55	58
200	11	12	15	18	21	24	27	30	32	35	38	41	44	47	50	53	56	58	61	64
300	13	15	18	21	25	28	31	34	38	41	44	47	50	54	57	60	63	67	70	73
400	16	18	22	25	29	33	36	40	44	47	51	54	58	62	65	69	73	76	80	84
500	19	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93
600	22	24	28	33	37	41	46	50	55	59	63	68	72	77	81	85	90	94	99	103
700	24	27	31	36	41	46	50	55	60	65	69	74	79	84	88	93	98	103	107	112
800	27	30	35	40	45	50	55	61	66	71	76	81	86	92	97	102	107	112	117	123
900	30	32	38	43	49	54	60	65	71	76	82	87	93	98	104	109	115	120	126	131
1000	32	35	41	47	53	59	65	71	77	83	89	95	101	106	112	118	124	130	136	142
1100	35	38	44	51	57	63	69	76	82	88	95	101	107	113	120	126	132	138	145	151
1200	38	41	48	54	61	68	75	81	88	95	101	108	115	121	128	135	141	148	155	162
1300	40	44	51	58	65	72	79	86	93	100	107	114	121	128	135	142	149	156	163	170
1400	43	47	54	62	69	77	84	92	99	106	114	121	129	136	144	151	159	166	174	181
1500	46	50	57	65	73	81	89	96	104	112	120	128	135	143	151	159	167	174	182	190
1600	49	53	61	69	77	85	94	102	110	118	127	135	143	151	159	168	176	184	192	201
1700	51	55	64	73	81	90	98	107	115	124	132	141	150	158	167	175	184	192	201	209
1800	54	58	67	76	85	94	103	112	121	130	139	148	157	166	175	184	193	202	211	220
1900	57	61	71	80	89	98	108	117	126	136	145	154	164	173	182	192	201	210	220	229
2000	59	64	74	84	93	103	113	123	132	142	152	162	171	181	191	201	210	220	230	239

Average values valid for all standard types (approx. ± 5%)
Values in the table refer to the standard material manufcturing types. Different material manufacturing does not have significant variance to the above mentioned values. Controls and actuators weights are not included.

Shut-off - Gas Shut-off Damper

Marine - Oil & Gas Industry

SagiCofim

SDL - SDLT

Torque requirements (Nm) for actuating systems selection

Damper torque

H [height]	W [width]																			
	150	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
150	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
200	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
300	7	7	7	7	7	7	7	7	7	7	7	7	7	8	8	9	9	10	10	11
400	7	7	7	7	7	7	7	7	7	7	8	9	9	10	11	12	12	13	14	14
500	7	7	7	7	7	7	7	7	8	9	10	11	12	13	14	14	15	16	17	18
600	7	7	7	7	7	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22
700	7	7	7	7	7	8	9	10	11	13	14	15	16	18	19	20	21	23	24	25
800	7	7	7	7	7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29
900	7	7	7	7	8	10	11	13	15	16	18	19	21	23	24	26	28	29	31	32
1000	7	7	7	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36
1100	7	7	7	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
1200	7	7	7	9	11	13	15	17	19	22	24	26	28	30	32	35	37	39	41	43
1300	7	7	7	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47
1400	7	7	8	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
1500	7	7	8	11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51	54
1600	7	7	9	12	14	17	20	23	26	29	32	35	37	40	43	46	49	52	55	58
1700	7	7	9	12	15	18	21	24	28	31	34	37	40	43	46	49	52	55	58	61
1800	7	7	10	13	16	19	23	26	29	32	36	39	42	45	49	52	55	58	62	65
1900	7	7	10	14	17	21	24	27	31	34	38	41	44	48	51	55	58	62	65	68
2000	7	7	11	14	18	22	25	29	32	36	40	43	47	50	54	58	61	65	68	72

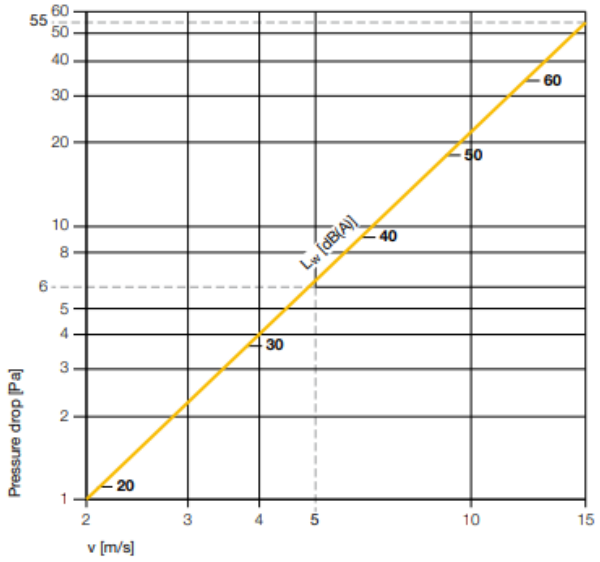
Note: for SDL model, actual required torque value can be up to 20% lower than the above mentioned values.

SDL - SDLT

Performances

Pressure drop and noise level

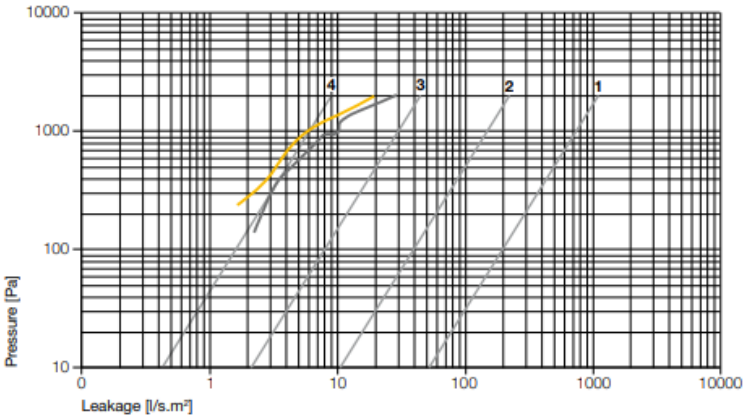
- Max noise level: **60 dB(A)**
- Standard pressure drop: **6 Pa**
  With damper fully open and air speed of 5 m/s at maximum rate.
- Max pressure drop: **55 Pa**
  With damper fully open and air speed of 15 m/s at maximum rate.



SDLT gas leakage according to EN1751

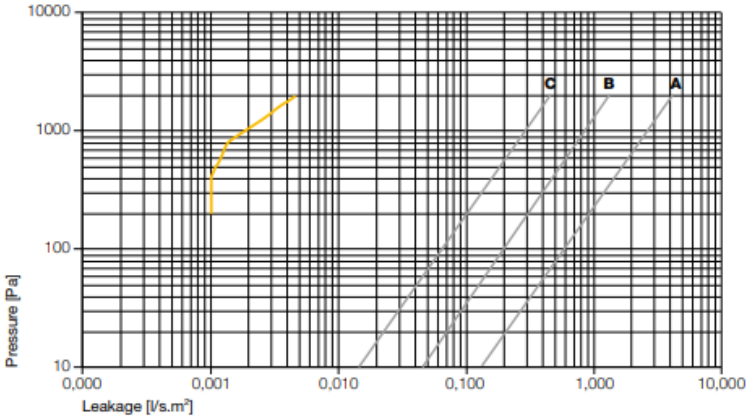
Leakage test across closed blades

Positive pressure
Negative pressure



Leakage test for casing

Positive pressure



Shut-off - Gas Shut-off Damper Marine - Oil & Gas Industry SagiCofim

SDL - SDLT

Damper controls Type **C 22 - Manual drive**

This damper version is provided with a control handle (C22).
SDL or SDLT + C22 can be used also as a balancing damper; in fact the handle can be fixed in all different positions from fully open to fully closed.
A safety clamp blocks the handle in the selected position.



Manual command



Damper closed



Damper open

Maintenance procedures

Mechanical couplings and electrical connections are tested before shipping.
Maintenance cadence depends by the dampers features (material) and the location where they are installed (fresh air inlet or exhaust duct)
During the damper installation and working life the following advices should be considered:

- Do not distort the frame and blades alignment;
- Check the blades free movement (avoid any solid sediment on shafts near to the bushes);
- Check the presence of extraneous objects inside the damper;
- Only the external damper frame except levers can be painted;
- Do not use cleaning acid liquids or abrasive tools (the hot bath galvanized surface film can be damaged);
- Do not dismantle dampers components;
- Do not modify the electrical connections prearrangement.

Only for fresh air inlet location:

- Lubricate shafts, bushes and levers (use only spray grease, avoid any paste);
- Check sea water corrosion effects on exposed damper surfaces.

Actuator disassembling

- Switch-off the actuator voltage input;
- Screw-out carter protection (if there) front panel;
- Pull out additional limit switches (if there) from the auxiliary shaft;
- Screw-out the metal actuator fixing plate and the remaining parts of the protection carter (if there);
- Pull out the actuator from the drive shaft;
- Insert new actuator and fix it;
- Screw-in carter protection and mount additional limit switches (if there);
- Check damper conditions;
- Restore voltage input.

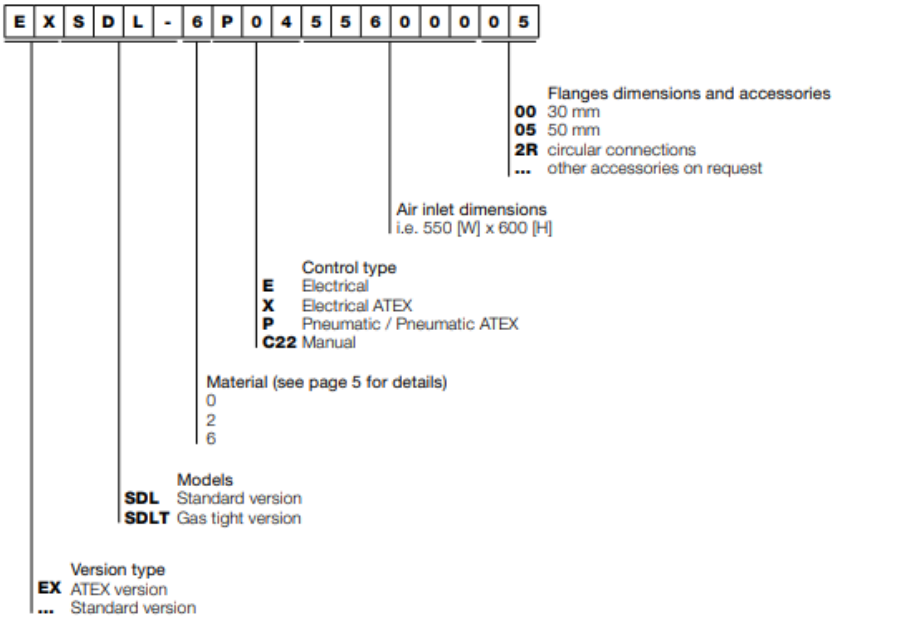
Shut-off - Gas Shut-off Damper **Marine - Oil & Gas Industry** SagiCofim

SDL - SDLT

References

Shipyards	Owners	Companies & Contractors
Barreras (Spain)	Carnival	Agip KCO
Cantieri Apuania (Italy)	Corsica Ferries	ATP
Ferrol (Spain)	Costa Crociere	Cocono Philips
Fincantieri (Italy)	Cunard	Eni CONGO
Flender Werft (Germany)	Finnlines	Eni NORGE
Jurong (Singapore)	Grimaldi Group	ERSAI
Keppel Fels (Singapore)	Holland America Line	Pearl
Lloyd Werft (Germany)	Marina Militare Italiana	Petrobras
Meyer Werft (Germany)	Minoan Lines	PTTEP
Navantia (Spain)	Norwegian Cruise Line	Saipem
Rosetti Marino (Italy)	P&O	Saudi Aramco
Sembawang (Singapore)	Radisson Seven Seas	Shell
SMOE (Singapore)	Renaissance Cruises	SOC
STX France (France)	Royal Caribbean Cruise Line	Total
T. Mariotti (Italy)	Seabourn	Transocean
	Silversea Cruise	W.P.
	Tirrenia	

Product code



5.16 DIFFERENTIAL PRESSURE TRANSMITTER

Item TAG: 77-PT-401



SDT
Differential pressure transmitter

Accuracy max ± 0.075%
Range 1 mbar ÷ 20 bar
Hart communication
LCD backlight display
Settings via display
Fast time responsive self-diagnostics
ATEX

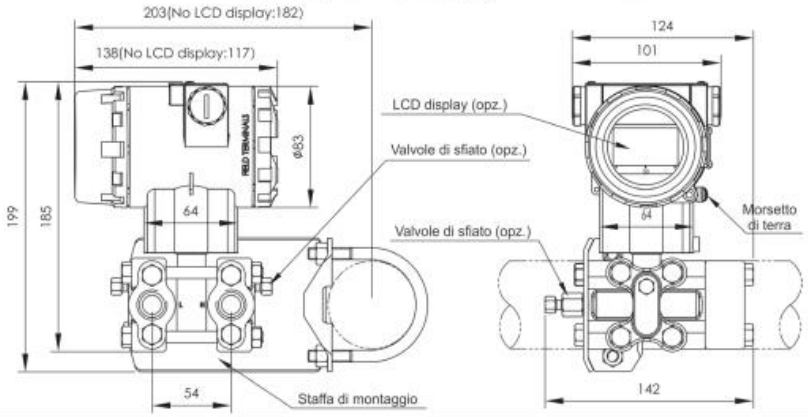
SDT is a differential pressure transmitter with performance at the top of the range and is designed for specific installations in processes where accuracy and stability over time are essential characteristics. Thanks to its technology it measures very low differential pressures from 1 mbar (10 mm H2O). The SDT is fully programmable by means of two external watertight buttons and a matrix backlight display. The programming or modification of the measurement parameters can be carried out in heavy duty ambient conditions without having access to the internal instrument parts thus maintaining the degree of protection IP67.

Technical Feature

Measure range
Differential pressure Max. 0÷20bar (0÷2Mpa); Min. 0÷0.001bar (0÷100Pa)
Accuracy
±0.075; ±0.1 for range A
Analog output resolution
15 bit

Power supply
12÷42Vdc (2-wires)
Communication protocol
HART
Zero and span calibration
onboard buttons
Data display
backlit alphanumeric display

IP rating
IP67
Stability
> ±0.1%FS
Working temperature
-40°÷+85°C
Certificazion
Atex



SDT Differential pressure transmitter

IP67 - Operation temperature: -40 ÷ +85°C
Power supply: 12÷42Vdc (2-wire)
4÷20mA HART

Accuracy	
H	± 0,075% (for range A ± 0,1%)
Measure range	
A	0 - 100Pa ÷ 1kPa (0 - 1 ÷ 10mbar) (0 - 10 ÷ 100 mmH²O) - accuracy ± 0,1%
B	0 - 200Pa ÷ 6kPa (0 - 2 ÷ 60mbar) (0 - 20 ÷ 600 mmH²O)
C	0 - 400Pa ÷ 40kPa (0 - 4 ÷ 400mbar) (0 - 40 ÷ 4000 mmH²O)
D	0 - 2,5kPa ÷ 250kPa (0 - 25 ÷ 2500mbar) (0 - 0,25 ÷ 25 mH²O)
E	0 - 20kPa ÷ 2MPa (0 - 0,2 ÷ 20bar) (0 - 2 ÷ 200 mH²O)
Membrane / filling liquid	
A	SS316L / silicone oil
B	SS316L / fluorinated oil
C	Hastelloy C / silicone oil
D	Hastelloy C / fluorinated oil
E	SS316L gold plated / silicone oil
F	SS316L gold plated/ fluorinated oil
G	SS316L EFP plated / silicone oil
T	Tantalum / silicone oil
Working pressure	
1	16MPa (range A = 7MPa)
2	25MPa (not for range A)
3	40MPa (not for range A)
Process connection	
B	¼" - 18 NPT female SS316 thread with relief valves at the end of the flange
D	¼" - 18 NPT female SS316 thread with relief valve on the lower part of the flange side
N	¼" - 18 NPT female SS316 thread without relief valves
U	¼" - 18 NPT female SS316 thread with relief valve on the upper part of the flange side
Z	Special
Sealed material	
F	Viton (FKM)
N	Perbunan (NBR)
P	Teflon (PTFE)
Special functions	
N	None
O	Degrease cleansing treatment (just with fluorinated oil and Viton seal, max 60°C)
P	Line noise filter
Fixing bracket for panel and pipe mounting (2")	
1	SS304
2	Galvanized carbon steel
N	None
Process connection accessories	
1	SS316 oval-shaped flange with ½" NPT female thread
2	SS316 D-shaped connector with M20x1.5 male thread (welded connection)
N	None
Display	
2	Backlit LCD
N	None
Certification	
A	Intrinsically Safe ATEX II 1/2G Ex ia IIC T4 Ga/Gb
D	Explosion proof ATEX II 2 G D Ex db IIC T4/T5/T6 Gb Ex tb IIIC T80°C/T90°C/T130°C - Ta = -40°C ÷ +60°C
N	None

5.17 TEMPERATURE TRANSMITTER TT

Item TAG: 77-TT-(401/402/403/404)

Product lines: temperature sensor

In order to get a precise temperature sensor in a wide range of different application, it's possible to choose between resistance thermometers and thermocouples. Temperature sensors are also available with temperature transmitter, thermowell and other options, in order to satisfy requirements of every industrial applications.



Resistance thermometers

Resistance thermometers have a platinum sensor element which changes it electrical resistance as a function of temperature.
In our products portfolio are available resistance thermometers with cable and with connection head.
A temperature transmitter can be installed directly in the connection head.
Resistance thermometers are available in classes A, 1/3 DIN, 1/5 DIN and 1/10 DIN in accordance with IEC 60751. They are available also the ATEX versions (Ex ia and Ex d)



Thermocouples (TC)

Thermocouples directly supply a temperature-dependent voltage.
They are particularly suitable for high temperatures.
In our products portfolio are available thermocouples with cable and with connection head.
For thermocouples, the accuracy classes in accordance with IEC 60584-1 or ASTM E230.
The type J, K, N, T, S, E are available in our products portfolio.
A temperature transmitter can be installed in the connection head.
They are available also the ATEX versions (Ex ia and Ex d)



Temperature transmitters

The transmitters for DIN/B head or for DIN rails convert a signal acquired by RTD (with 2, 3 and 4 wire connections) or Thermocouples into a 4 ... 20 mA signal (2 wires technology) or 0 ... 10 VDC signal (3 wires technology). These converters ensure high accuracy on the reading scale with 16-bit conversion and they are available with parameterization via NFC-smartphone App (Android) and with integrated datalogger. Available also the ATEX version (Ex ia) and with galvanic isolation.



Thermowells

Thermowells are available for different applications whether in aggressive or abrasive process media, to prevent direct exposure of their temperature probes to the medium.
Thermowells can be manufactured from solid-body material or from tube sections and can either be screw, weldor flange fitted.
They are available in standard and special versions (stainless steel 1.4571, 316L, Hastelloy® or titanium).

DTP 8180

Data sheet
www.trafag.com

The DTP 8180 is a temperature transmitter with analogue output, 2 switch points and display

Features

- Parameterization also via NFC-smartphone App (Android)
- Display and electrical connection are independently rotatable 335°/343°
- Analogue output switchable mA or V
- Integrated datalogger
- Temperature measuring range adjustable 50, ... 100% of the nominal range

Reference

- IEC 60751



Standard parameters	
Measuring principle	PT 1000, DIN EN 60751 class A, 2 conductors
Measuring range	-50°C ... +150°C / -58°F ... 302°F adjustable 50 ... 100% FS
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, switchable mA or V
Switching output	2 transistors PNP
Accuracy@25°C typ	0.5% FS typ + temperature sensor
Ambient temperature	-25°C ... +85°C
Unit for display	°C, °F, °K, user scale
Logger	Ring buffer: 3518 data points Sampling time: 0.1 ... 999.9 s, Off (0)

TCTT

Data sheet
www.trafag.com

The TCTT is a compact system used to measure liquid and gaseous fluid.
PC configuration allows the user to select range and units, without requiring calibration equipment.

Features

- PC programmable temperature range
- High sensibility
- Free configuration software
- Materials and surface finish quality in accordance with standards of hygenics design

Reference

- EN 60751
- EN 61326



Standard parameters	
Output	Analogue 4 ... 20 mA
Measuring range	-50 ... + 250°C
Ambient temperature	-40 ... +85°C
Protection	IP67
Accuracy	Class AA, 1/5 DIN, 1/10 DIN
Electrical connection	M12x1

T1

Data sheet

RTD and TC with connection head.

The resistance thermometers and thermocouples with connection head offers a wide range of options and features for different applications.

RTD Standard specifications	
Sensing element	PT100, PT1000, NI100, PTC, NTC
Connection wires	Single or Double element, 2, 3 or 4 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, PTFE (1)
Connection head	Mignon, DIN B, DIN A, DIN43650 A, M12x1, AD-PE (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female, CLAMP and other sanitary versions (1)
Stem diameter	From 3 to 12 mm (1)

1) Other RTD versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)

TC Standard specifications	
Sensing element	J, K, N, T, S, E (1)
Connection wires	Single or Double element, 2 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, Ceramic type 610, Alumina type 710, Hastelloy (1)
Connection head	Mignon, DIN B, DIN A, DIN43650 A, AD-PE (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female (1)
Stem diameter	From 1 to 12 mm (1)

1) Other TC versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)



RTD or TC for immersion with connection head, suitable for generical measurements and regulations on plant with low pressures. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD for immersion with AISI 316 sheath suitable for temperature measurement in chemical and food industry with sanitary clamp process connection. The immersed part of the stem have a mirror finishing surface.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC with mineral oxide insulation for immersion with connection head, suitable for generical measurements and regulations on plants with low pressures and with high vibrations. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC for immersion with exchangeble thermometric insert and orientable connection. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



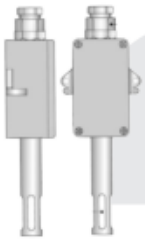
Immersion RTD or TC with exchangeable MgO insulated thermometric insert, orientable connection head and tapered protective sheath for fast response time. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges.
The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD or TC for immersion with exchangeble thermometric insert (available also in MgO) and orientable connection head. The process connection is realized by means of a 316SS flange and the electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD for immersion suitable for measurements in narrow space on plant with low pressures. The electrical connection is made by a connector EN 175301-803 standard. The process connection is realized by means of an under-head threaded nipple (fix) or by means of a compression fittings or a slidable flanges. The electrical connection is made by a ceramic terminal block situated inside the connection head. Available also with analogic output.



RTD probe for the measurement of internal room temperatures realized in plastic material, aluminium (for external ambient) or 316SS. Available also with analogic output.



TC for high temperature with ceramic protective tube and connection head. It is possible to select between a 610 ceramic sheath type or a 710 (single or double) alumina sheath type. Available also with analogic output.



Mineral oxide MgO insulated thermocouples.

T2

Data sheet

RTD and TC with cable output.

The resistance thermometers and thermocouples with cable output offers a wide range of options and features for different applications.

RTD Standard specifications	
Sensing element	PT100, PT1000, NI100, PTC, NTC
Connection wires	Single or Double element, 2, 3 or 4 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, PTFE (1)
Type of cable	PVC, Kapton, PTFE / MFA, Silicone, Glass-Fiber (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female, CLAMP and other sanitary versions (1)
Stem diameter	From 3 to 12 mm (1)

1) Other RTD versions are available on request
2) They are available in the ATEX versions (Ex ia)

TC Standard specifications	
Sensing element	J, K, N, T, S, E (1)
Connection wires	Single or Double element, 2 wires
Construction types	Traditional insulation or mineral MgO insulation
Material	AISI304, AISI316 L, Ceramic type 610, Alumina type 710, Hastelloy (1)
Type of cable	PVC, Kapton, PTFE / MFA, Silicone, Glass-Fiber (1)
Process connection	From 1/8" to 1", BSP or NPT, male or female (1)
Stem diameter	From 1 to 12 mm (1)

1) Other TC versions are available on request
2) They are available in the ATEX versions (Ex ia and Ex d)

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Cylindrical RTD or TC with AISI 304 sheath or with AISI 316 sheath insulated with compact magnesium oxide (MgO) suitable for generical measurement.
The output of the cable from the tube is protected with a stainless steeel spring.



Cylindrical RTD or TC with AISI 304 sheath suitable for generical measurements. The probe fixing is realized by means of a threaded nipple welded on the sheath.



RTD or TC with stainless steel sheath suitable for generical measurements.
The probe fixing is realized by means of a brass ring soldered on the tip of the tube; it can be fixed on a surface with a normal screw.
The output cable is protected with a stainless steel spring.



Spring-loaded RTD or TC indicated for measurements into metallic plates; the fixing is by threaded connection with bayonet fitting.



Resistance thermometer suitable for the measurement of the pipe temperatures.
The special design of the aluminium body allow an high thermal exchange with the internal sensing element with a consirable reduction in measuring error. The fixing can be realized by means of a normal clamp.

9 Distributed by trafag sensors controls

Signal converters



The transmitters for DIN/B head convert a signal acquired by temperature probes PT100, PT1000 or Ni100 (with 2-, 3- and 4-wire connections) or Thermocouples into a 4 … 20 mA signal (2-wire technology), current-loop. These converters ensure high accuracy on the reading scale with 16-bit conversion and possibility to rescale the output 4 … 20mA basing on input range. Available also Atex version and with galvanic isolation



The signal transmitter from DIN rail converts a signal received through probes PT100, Ni100 (with 2-, 3- and 4-wire connections), thermocouples or process signals (0/4 … 20mA, 0 … 10V) into a normalised current signal 4 ... 20 mA (2-wire power loop). The characteristics of these converters ensure high precision on the reading scale with 16 bit conversion and the possibility to rescale the analogue output 4 ... 20 mA according to the input set. The RTD/TC input is galvanically isolated at 2500 V from the analogue output, which ensure safer cables in environment where they may be disturbed or in cases where there different voltages in the same system.

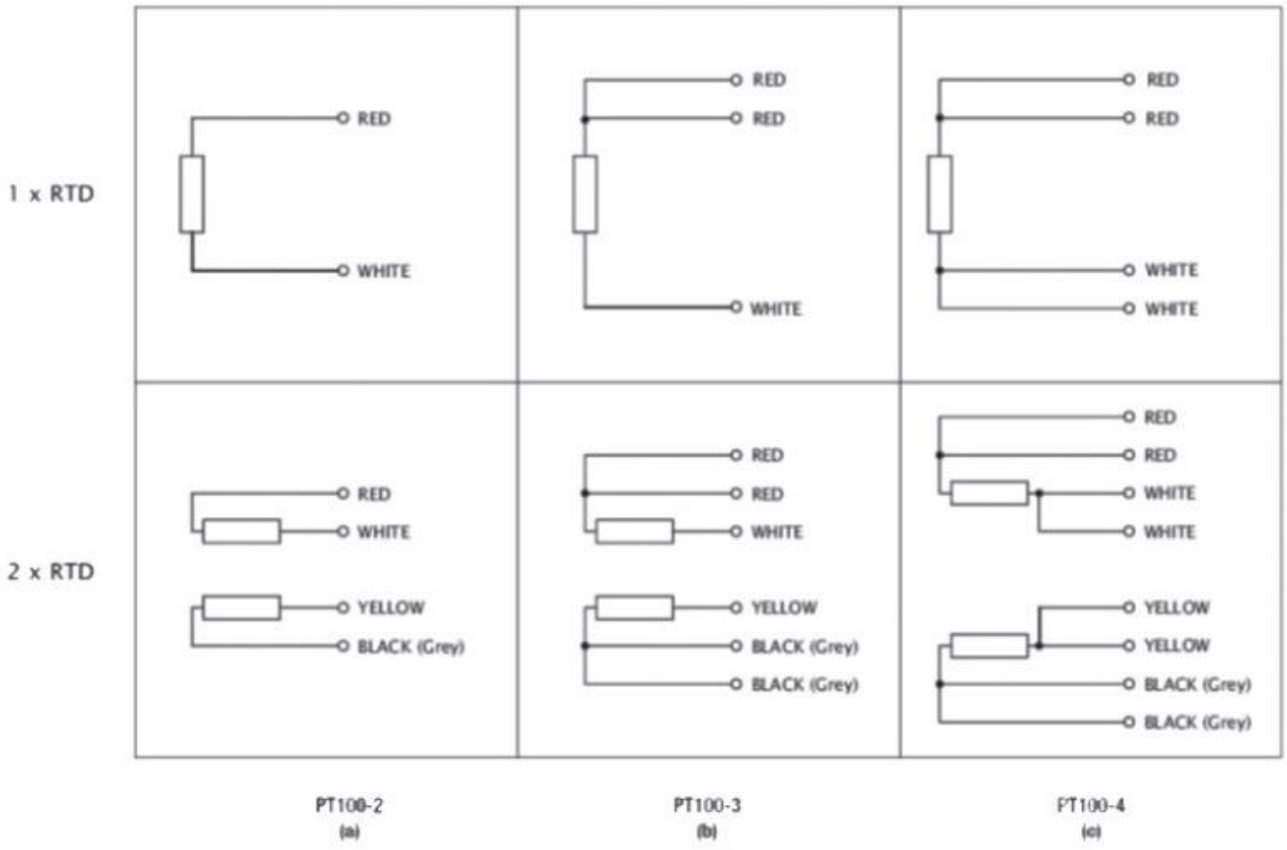
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Type of connection for resistance thermometer

a) 2 wires - the two-wire technique is the least precise and is used only in cases where the connection of the thermoresistance is carried out with short and low resistivity wires

b) 3 wires - the three-wire technique is the most used in the industrial field.
With this measurement technique the errors caused by the resistance of the conductors used for the connection of the thermoresistance are eliminated.

c) 4 wires - the technique offers the greatest precision possible but it is almost exclusively used in laboratory applications.



Resistance thermometer type PT100 ohm 0°C (EN 60751)

The resistance thermometers and thermocouples with cable output offers a wide range of options and features for different applications.

Tolerance class	Temperature range of validity		RTD Standard specifications
	Wire wound resistors	Fil resistors	
1/5 DIN	-196 ÷ +600	-50 ÷ +600	(0,1 + 0,0017* | t |)
1/3 DIN	-196 ÷ +600	-50 ÷ +600	(0,15 + 0,002* | t |)
A	-196 ÷ +600	-50 ÷ +600	(0,3 + 0,005* | t |)
B	-196 ÷ +600	-50 ÷ +600	(0,6 + 0,01* | t |)

| t | = Moduls of temperature in °C without regards to the sign

Standard thermocouples

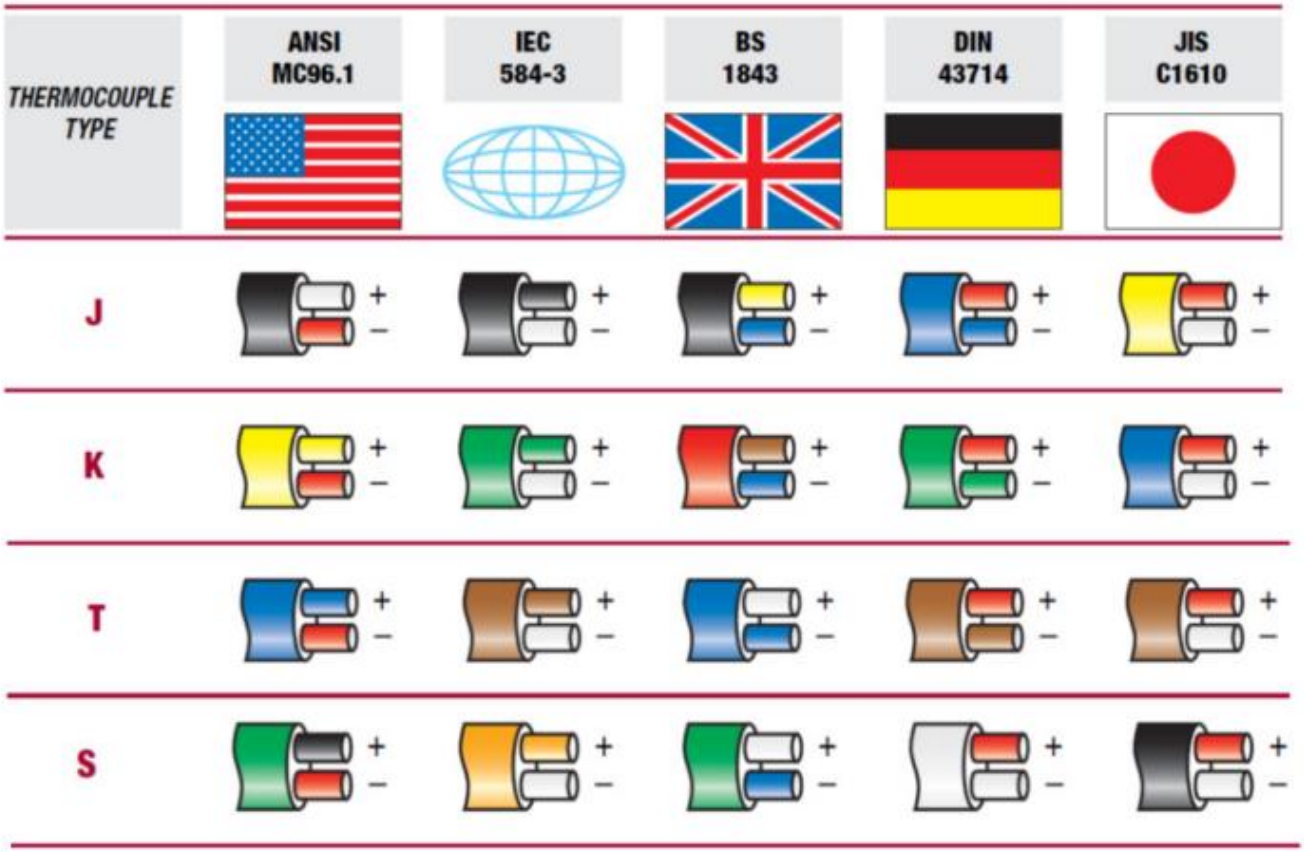
Type	Materials	Temperature range °C	Tolerance values °C
J	Fe-Co	-210 ÷ 800	± 2,5 o 0.0075* |t|
K	Cr-Al	-270 ÷ 1300	± 2,5 o 0.0075* |t|
T	Cu-Co	-270 ÷ 400	± 1 o 0.0075* |t|
S	Pt10%Rh - Pt	-50 ÷ 1800	± 1,5 o 0.0025* |t|

| t | = Moduls of temperature in °C without regards to the sign

Standard cables for temperature sensors

Type	Rh resistance	Temperature range °C	Abrasion resistance
Glass – Fiber	D	-50 ÷ 400	D
Silicone	C	-40 ÷ 200	B
PTFE/ MFA	A	-200 ÷ 250	A
PVC	B	-20 ÷ 105	B
Kapton	B	-200 ÷ 400	B

Standard color coding of compensating cables



5.18 FIRE AND GAS DAMPER WITH ACTUATOR

Item TAG: HFD-(77012/77013/77014/77015/77016)

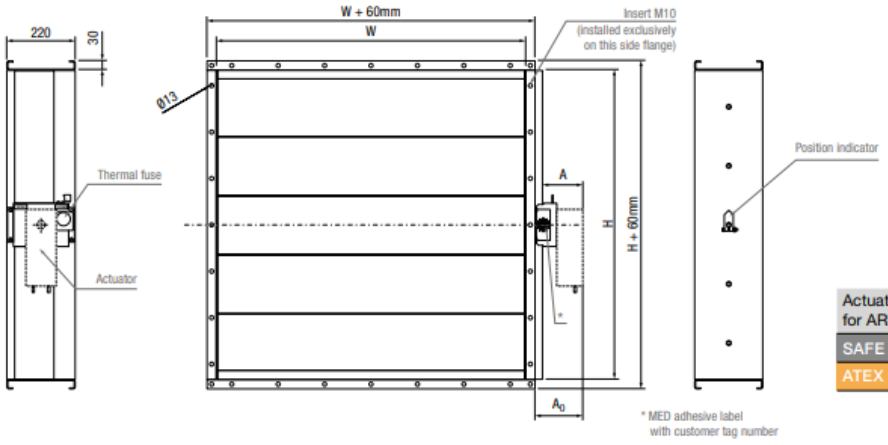
Technical data
SOLAS A0 frame 220mm
SAFE AREA - ATEX AREA

Features	
Dimensional range	from 150x150mm to 1000x1000mm step 50mm
Flange	Standard 30mm On request 50mm
Operating temperature range	-40°C / +50°C
Operating air velocity (damper in working condition)	12m/s max
Peak limits (sporadic and for a few seconds)	P=2500Pa, v=18m/s
Leakage Class acc. to EN 1751	Standard 2B On request 3C

		Version 3 (220GW)	Version 4 (2206W)
Description		Material	
Casing (riveted)		hot dip galv. steel - tk. 3mm	AISI316L - tk. 3mm
Blades		galv. steel Z200 double skin 1.2mm+1.2mm fiber glass gasket*	AISI316L double skin 1.2mm+1.2mm fiber glass gasket*
Shafts		AISI316 - Ø12mm	AISI316 - Ø12mm
Bushes		bronze self lub. - Ø12mm	bronze self lub. - Ø12mm
Actuator for	SAFE AREA	Belimo BF - Schischek InMax	Belimo BF - Schischek InMax
	ATEX AREA	Schischek ExMax - RedMax	Schischek ExMax - RedMax

** Non-classified SVF, 20x5mm*

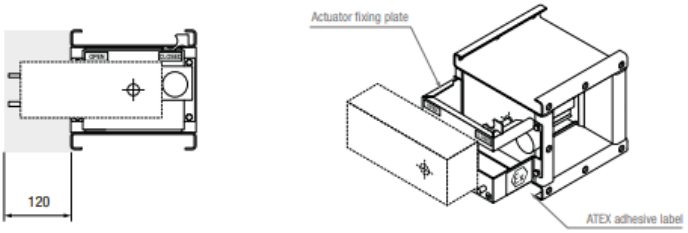
ACTUATOR MOUNTED VERTICALLY FOR H>250mm



Actuator for AREA	A [mm]	A_0 [mm]
SAFE	110	135
ATEX	130	155

Drilling scheme, see pag. 10

ACTUATOR MOUNTED HORIZONTALLY FOR H ≤250mm



S-LFD Fire and Gas-Fire Damper SOLAS A0-A60

SagiCofim

Dimensions and Weights

frame **220mm**

H [mm]	W [mm]																	
	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
150	7,5	8,5	9,5	10,5	11,5	12,5	13,5	14,4	15,4	16,4	17,4	18,4	19,3	20,3	21,3	22,3	23,3	24,3
200	8,6	9,6	10,6	11,7	12,7	13,7	14,8	15,8	16,8	17,9	18,9	19,9	21,0	22,0	23,0	24,1	25,1	26,1
250	9,4	10,5	11,5	12,5	13,6	14,6	15,6	16,7	17,7	18,7	19,8	20,8	21,8	22,8	23,9	24,9	25,9	27,0
300	11,0	12,1	13,3	14,5	15,6	16,8	18,0	19,1	20,3	21,5	22,6	23,8	25,0	26,1	27,3	28,5	29,6	30,8
350	12,0	13,2	14,4	15,6	16,8	18,0	19,2	20,4	21,6	22,9	24,1	25,3	26,5	27,7	28,9	30,1	31,3	32,5
400	12,9	14,2	15,5	16,7	18,0	19,2	20,5	21,7	23,0	24,3	25,5	26,8	28,0	29,3	30,5	31,8	33,0	34,3
450	14,3	15,6	17,0	18,3	19,6	21,0	22,3	23,6	24,9	26,3	27,6	28,9	30,3	31,6	32,9	34,3	35,6	36,9
500	15,3	16,7	18,1	19,4	20,8	22,2	23,6	24,9	26,3	27,7	29,0	30,4	31,8	33,2	34,5	35,9	37,3	38,7
550	16,3	17,7	19,1	20,6	22,0	23,4	24,8	26,2	27,7	29,1	30,5	31,9	33,3	34,8	36,2	37,6	39,0	40,4
600	17,3	18,7	20,2	21,7	23,1	24,6	26,1	27,5	29,0	30,5	31,9	33,4	34,9	36,3	37,8	39,3	40,7	42,2
650	18,6	20,2	21,7	23,3	24,8	26,3	27,9	29,4	31,0	32,5	34,0	35,6	37,1	38,6	40,2	41,7	43,3	44,8
700	19,6	21,2	22,8	24,4	26,0	27,6	29,1	30,7	32,3	33,9	35,5	37,1	38,6	40,2	41,8	43,4	45,0	46,6
750	20,6	22,3	23,9	25,5	27,1	28,8	30,4	32,0	33,7	35,3	36,9	38,5	40,2	41,8	43,4	45,1	46,7	48,3
800	21,6	23,3	25,0	26,6	28,3	30,0	31,7	33,3	35,0	36,7	38,4	40,0	41,7	43,4	45,1	46,7	48,4	50,1
850	23,0	24,7	26,5	28,2	30,0	31,7	33,5	35,2	37,0	38,7	40,5	42,2	44,0	45,7	47,4	49,2	50,9	52,7
900	24,0	25,8	27,6	29,3	31,1	32,9	34,7	36,5	38,3	40,1	41,9	43,7	45,5	47,3	49,1	50,9	52,7	54,5
950	25,0	26,8	28,6	30,5	32,3	34,1	36,0	37,8	39,7	41,5	43,3	45,2	47,0	48,9	50,7	52,5	54,4	56,2
1000	25,9	27,8	29,7	31,6	33,5	35,4	37,2	39,1	41,0	42,9	44,8	46,7	48,6	50,4	52,3	54,2	56,1	58,0
	Weight* [Kg]																	

* tollerance ± 10%

Actuator weights:

- BELIMO BF... 18Nm = 3,1Kg
- SCHISCHEK ExMax 15Nm = 3,5Kg

Electrical actuator
SCHISCHEK

Description		On-off 3-pos., spring-return, 2 micro switches, IP66
Torque		15Nm
Power		24...240VAC/DC (at rest 5W)
Angle of rotation		95°
Running time	(M)	3s / 15s / 30s / 60s / 120s
		3s / 10s
Dimensions (LxWxH)		210x95x80mm
Shaft		square 12x12mm

..Pro-TT



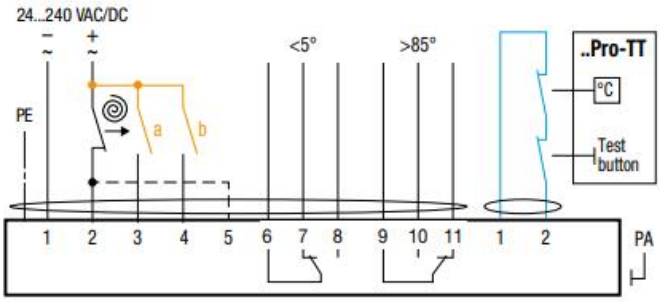
Safety temperature trigger
Thermal fuse
(Available for 72-95°C)

Model	InMax 15-BF	RedMax 15-BF	ExMax 15-BF
			
Zone	SAFE AREA	ATEX AREA ZONE 2, 22 GAS + DUST	ATEX AREA ZONE 1, 2, 21, 22 GAS + DUST

ELECTRICAL INSTALLATION

For 3-pos variation: add orange connection (a and b on 3 and 4)
For standard wiring: Spring return in 10s
For additional wiring on terminal 5: Spring return in 3s

On-off / 3 pos. - spring return + tripping circuit



5.19 JUNCTION BOXES

Casse di derivazione CDE
CDE junction boxes

Cieca
Blind



Struttura
lamiera d'acciaio sp. 10/10 verniciata RAL 7035 bucciato.

Coperchio o porta incernierata
verniciati RAL 7035 bucciato con guarnizione in colata continua.

Composizione
Struttura, porta o coperchio, confezione di viteria.

Grado di resistenza meccanica secondo IEC EN 62208: IK10

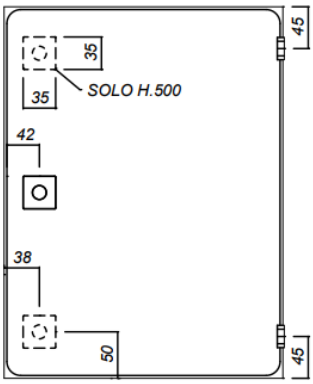
Structure
10/10 thick steel sheet, painted textured RAL 7035.

Cover or hinged door
Painted textured RAL 7035, provided with a gasket applied in continuous casting.

Composition
Structure, door or cover, set of accessories and screws for assembly.

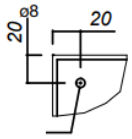
Mechanical resistance degree as per IEC EN 62208: IK10

IP66 IP55

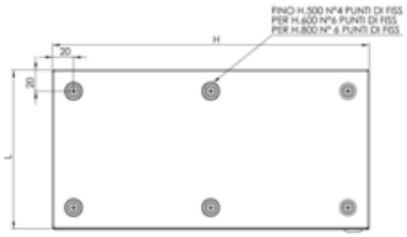


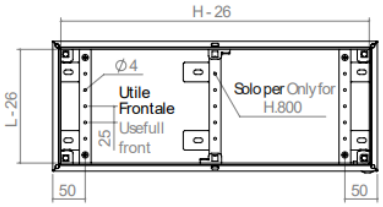
CASSA SENZA FLANGE IP 66 SODDISFA TYPE 4 BOX WITHOUT FLANGES IP 66 COMPLIES WITH TYPE 4	CASSA CON COPERCHIO INCERNERATO IP 55 SODDISFA TYPE 12 BOX WITH HINGED COVER IP 55 COMPLIES WITH TYPE 12	DIMENSIONE DIMENSIONS ALTEZZA, H HEIGHT, H	LARGHEZZA, L WIDTH, L	PROFONDITÀ, P DEPTH, P
R5CDE1180	-	150	150	80
R5CDE9180	-	180	150	80
R5CDE2980	-	200	180	80
R5CDE2280	R5CDE2280C	200	200	80
R5CDE3180	-	300	150	80
R5CDE3280	R5CDE3280C	300	200	80
R5CDE4280	R5CDE4280C	400	200	80
R5CDE6280	-	600	200	80
R5CDE8280	-	800	200	80
R5CDE11120	-	150	150	120
R5CDE22120	R5CDE22120C	200	200	120
R5CDE31120	-	300	150	120
R5CDE32120	R5CDE32120C	300	200	120
R5CDE33120	R5CDE33120C	300	300	120
R5CDE42120	R5CDE42120C	400	200	120
R5CDE43120	R5CDE43120C	400	300	120

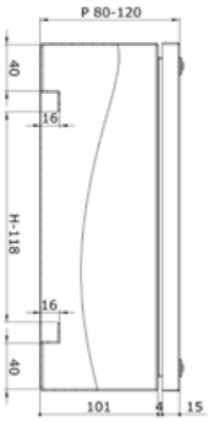
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R5CDE44120	-	400	400	120
R5CDE52120	**R5CDE52120C**	500	200	120
R5CDE53120	-	500	300	120
R5CDE62120	-	600	200	120
R5CDE63120	-	600	300	120
R5CDE64120	-	600	400	120
R5CDE82120	-	800	200	120
R5CDE84120	-	800	400	120







5.20 CAVO SCALDANTE

etelec electrical technology

SCHEDA TECNICA **HTC-P**



DESCRIZIONE ESTESA

Cavo scaldante a potenza autoregolante per tutte le applicazioni fino a 65°C per contatto continuo e fino a 85 °C per contatto intermittente.

Applicazioni:

- protezione antigelo di tubazioni e serbatoi industriali contenenti liquidi e gas;
- mantenimento in temperatura e riscaldamento di tubazioni e serbatoi industriali contenenti liquidi e gas;
- tracciamento di tetti e grondaie;
- tracciamento superfici non carrabili.

GAMMA DI PRODOTTO				
Famiglia		Cavi Scaldanti		
Serie		HTC-P		
Codice Metel		**HTC10P**	**HTC15P**	**HTC25P**
Nome commerciale		**HTC-10P**	**HTC-15P**	**HTC-25P**

INFORMAZIONI DIMENSIONALI		
Dimensioni sezione cavo	mm	11,5 x 6,3
Min. raggio di curvatura	mm	40
Sezione conduttori	mm^2 | AWG	0,8 | 18
Peso	kg/m	0,13

INFORMAZIONI FISICHE		
Materiale conduttori		Rame
Materiale matrice		Autoregolante
Materiale isolante primario		Poliolefina modificata
Materiale calza metallica		Rame stagnato
Materiale rivestimento esterno		Poliolefina reticolata
Halogen Free	(F), (Cl), (Br), (I), (At)	Si
Lead Free	Pb	Si

INFORMAZIONI TECNICHE					
			HTC10P	**HTC15P**	**HTC25P**
Potenza nominale a 10 °C	W/m		10	15	25
Potenza massima a 0°C	W/m		12	18	28
Temperatura massima di contatto	°C	65		Cavo alimentato	
Temperatura massima di contatto	°C	85		Cavo non alimentato	
Classe Temperatura		T6			
Temperatura minima di utilizzo	°C	- 40			
Alimentazione	V	230			
Resistenza elettrica della schermatura	Ω/m	0,018			
Resistenza all'acqua	%	100			

CONFORMITA' DI PRODOTTO E DI SISTEMA			
Norme di riferimento		EN 62395	
Conformità		EN 62395	
Comportamento al fuoco		n.a.	
Classificazione ETIM	Ver. 7.0	EC000339	
Grado di isolamento		IP66	EN60529

INFORMAZIONI DI SICUREZZA	
Prodotto tossico	No
Prodotto pericoloso	No
Conformità CLP (Regolamento 1272/2008/CE)	n.a.

INFORMAZIONI LOGISTICHE				
Codice	Q.tà (m)	Dimensioni (m)	Peso (kg)	Barcode
HTC10P	300	0,45 x 0,45 x 0,45	40	8053323900085
HTC15P	300	0,45 x 0,45 x 0,45	40	8053323900092
HTC25P	300	0,45 x 0,45 x 0,45	40	8053323900115

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5.21 PIPE

DESCRIPTION	CHARACTERISTICS
PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 50 mm
	INTERNAL DIAMETER : 40,8 mm
	PN RATING : 20
	MAX OPERATIONAL PRESSURE (at 20°C) : 20 bar (290 psi)

PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 50 mm
	INTERNAL DIAMETER : 42,6 mm
	PN RATING : 16
	MAX OPERATIONAL PRESSURE (at 20°C) : 16 bar (232 psi)

PIPE	MATERIAL : PVC
	EXTERNAL DIAMETER : 25 mm
	INTERNAL DIAMETER : 21,2 mm
	PN RATING : 16
	MAX OPERATIONAL PRESSURE (at 20°C) : 16 bar (232 psi)

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5.22 ELECTRICAL CLAMP

DESCRIPTION	CHARACTERISTICS
ELECTRICAL CLAMP	COD. : ETQ76290N
	MATERIAL : NYLON (PA6.6)
	COLOR : BLACK
	LENGTH : 300 mm
	WIDTH : 7,6 mm
	TENSILE STRENGTH : 54 daN
	SELF-EXTINGUISHING CLASS : UL 94 - V 2

ELECTRICAL CLAMP	COD. : ETQ25100N
	MATERIAL : NYLON (PA6.6)
	COLOR : BLACK
	LENGTH : 100 mm
	WIDTH : 2,5 mm
	TENSILE STRENGTH : 8 daN
	SELF-EXTINGUISHING CLASS : UL 94 - V 2

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Base Load Power Hub (BLPH)

B-100 HVAC I/O LIST - E&I SHELTERS

Document Number: 1724000049-HV-LIS-00051

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	04/02/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
05	28/01/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
04	19/12/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
03	11/11/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
02	17/10/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
01	26/09/2024	Issue for Information (IFI)	F.M.	S.S.	M.G.
00	07/06/2024	Issue for Information (IFI)	F.M.	S.S.	M.G.

ALEXSISTEMI spa

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Table of Contents

SH.	DESCRIPTION	REVISIONS							
		00	01	02	03	04	05		
1	Cover	X	X	X	X	X	X		
2	Table of Contents	X	X	X	X	X	X		
3	Revision / Change Log	X	X	X	X	X	X		
4	I/O List	X	X	X	X	X	X		

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Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)
01	ISSUE FOR INFORMATION (IFI)
02	ISSUE FOR INFORMATION (IFI)
03	ISSUE FOR INFORMATION (IFI)
04	ISSUE FOR INFORMATION (IFI)
05	ISSUE FOR INFORMATION (IFI)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
Document Titel:	B-100 HVAC IO LIST - E&I SHELTERS	Sh. 4 of 6 Date: 28/01/2025 Rev: 5

Rev	Item	P&ID	PLC I / O	Service Description	Terminal Block I/O	SIGNAL TAG	Equipment	IO Type	Location		Logic State		Range		E.U.	Alarms				Ex	Red	Mon	Signal Type	Power	Note
									From	To	State 0	State 1	Min	Max		LL	L	H	HH						
Outside system signals																									
2	1	123A90-1724000049HV-PID-00039	I 2,4	SHUT DOWN	XC - 100 / 101	77-XS-001	B100-HSB-001	DI	SIS	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From SIS, Free voltage contact for HVAC system
2	2	123A90-1724000049HV-PID-00039	Q0,2	HVAC CRITICAL FAULT	XC - 102 / 103	77XA-001	B100-HSB-001	DO	HVAC UCP	SIS	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for SIS system
3	3	123A90-1724000049HV-PID-00039	I 4,7	F&G DAMPER HDF-77001 CLOSE SIGNAL	XFD/S - 800 / 801	77-ZSL-001	HDF-77001	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	4	123A90-1724000049HV-PID-00039	I 5,1	F&G DAMPER HDF-77002 CLOSE SIGNAL	XFD/S - 804 / 805	77-ZSL-002	HDF-77002	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	5	123A90-1724000049HV-PID-00039	I 5,3	F&G DAMPER HDF-77003 CLOSE SIGNAL	XFD/S - 808 / 809	77-ZSL-003	HDF-77003	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
HVAC system signals																									
4	6	123A90-1724000049HV-PID-00039	I 0,0	MOTORISED DAMPER CLOSED			HDZ-77-101	DI	HDS-77001	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	7	123A90-1724000049HV-PID-00039	I 0,1	MOTORISED DAMPER OPEN			HDZ-77-101	DI	HDS-77001	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	8	123A90-1724000049HV-PID-00039	I 0,4	MAIN BRAKER TRIP SIGNAL			HVAC UCP	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	9	123A90-1724000049HV-PID-00039	I 0,5	PRESSURIZING FAN UNIT HHU-77001 THERMIC PROTECTION			TE-77-101	DI	TE-77-101	HVAC UCP	RUNNING	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	10	123A90-1724000049HV-PID-00039	I 0,6	HHU-77001 ELECTRICAL HEATER HIGH/VERY HIGH TEMPERATURE THERMOSTATE			TSH/HH-77-101	DI	TSH/HH-77-101	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	11	123A90-1724000049HV-PID-00039	I 0,7	PRESSURIZING FAN UNIT HHU-77001 TRIP			HFM-77-101	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	12	123A90-1724000049HV-PID-00039	I 1,0	PRESSURIZING FAN UNIT HHU-77001 VSD MALFUNCTION			HFM-77-101	DI	HVAC UCP	HVAC UCP	RUNNING	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	13	123A90-1724000049HV-PID-00039	I 1,1	PRESSURIZING FAN UNIT HHU-77002 THERMIC PROTECTION			TE-77-102	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	14	123A90-1724000049HV-PID-00039	I 1,2	HHU-77002 ELECTRICAL HEATER HIGH/VERY HIGH TEMPERATURE THERMOSTATE			TSH/HH-77-102	DI	TSH/HH-77-102	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	15	123A90-1724000049HV-PID-00039	I 1,3	PRESSURIZING FAN UNIT HHU-77002 TRIP			HFM-77-102	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	16	123A90-1724000049HV-PID-00039	I 1,4	PRESSURIZING FAN UNIT HHU-77002 VSD MALFUNCTION			HFM-77-102	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	17	123A90-1724000049HV-PID-00039	I1.5	ELECTRICAL HEATER HHU-77001 TRIP			HSS-77-103	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
2	18	123A90-1724000049HV-PID-00039	I 1,6	ELECTRICAL HEATER HHU-77002 TRIP			HSS-77-104	DI	HVAC UCP	HVAC UCP	RUNNING	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	19	123A90-1724000049HV-PID-00039	I 1,7	HHU-77001 ELECTRICAL HEATER MODULATION FAULT			HSS-77-103	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	20	123A90-1724000049HV-PID-00039	I 2,0	HHU-77002 ELECTRICAL HEATER MODULATION FAULT			HSS-77-104	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	21	123A90-1724000049HV-PID-00039	I 2,1	TRIP SIGNAL AUX			B100-HSB-001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	22	123A90-1724000049HV-PID-00039	I 2,2	TRIP SIGNAL LIGHT POWER SUPPLY			B100-HSB-001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	23	123A90-1724000049HV-PID-00039	I 2,3	TRIP SIGNAL MODULE SOCKET			B100-HSB-001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	24	123A90-1724000049HV-PID-00039	I 2,5	MOTORISED DAMPER CLOSED			HDZ-77-102	DI	HDZ-77-102	HVAC UCP	NOT CLOSED	CLOSED											VFC 24 Vdc		-
4	25	123A90-1724000049HV-PID-00039	I 2,6	MOTORISED DAMPER OPEN			HDZ-77-102	DI	HDZ-77-102	HVAC UCP	NOT OPEN	OPEN											VFC 24 Vdc		-
4	26	123A90-1724000049HV-PID-00039	I 2,7	HHU-77001 AUTOMATIC SELECTOR			HHU-77001	DI	HHU-77001	HVAC UCP	NOT AUTOMATIC	AUTOMATIC	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	27	123A90-1724000049HV-PID-00039	I 3,0	TRIP AUX SECTION HHU-77001			HHU-77001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	28	123A90-1724000049HV-PID-00039	I 3,1	GENERAL PANEL AUX TRIP			B100-HSB-001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	29	123A90-1724000049HV-PID-00039	I 3,2	HHU-77001 SECTION MAIN BRAKER TRIP			HHU-77001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	30	123A90-1724000049HV-PID-00039	I 3,3	HHU-77002 SECTION MAIN BRAKER TRIP			HHU-77002	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	31	123A90-1724000049HV-PID-00039	I 3,4	SPACE HEATER TRIP			HHS-77-001/2/3	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	32	123A90-1724000049HV-PID-00039	I 3,6	SPACE HEATER RUN			HHS-77-001/2/3	DI	HVAC UCP	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	33	123A90-1724000049HV-PID-00039	I 4,0	HHU-77002 AUTOMATIC SELECTOR			HHU-77002	DI	HVAC UCP	HVAC UCP	NOT AUTOMATIC	AUTOMATIC	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	34	123A90-1724000049HV-PID-00039	I 4,1	HHU-77001 FAN LOW PRESSURE			PDSL-77-101	DI	HVAC UCP	HHU-77001	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	35	123A90-1724000049HV-PID-00039	I 4,2	HHU-77001 FILTER FLOW SWITCH HIGH PRESSURE			PDT-77-101	DI	HVAC UCP	HHU-77001	NORMAL	DIRTY	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	36	123A90-1724000049HV-PID-00039	I 4,3	HHU-77002 FAN LOW PRESSURE			PDSL-77-102	DI	HVAC UCP	HHU-77002	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	37	123A90-1724000049HV-PID-00039	I 4,4	HHU-77002 FILTER FLOW SWITCH HIGH PRESSURE			PDT-77-102	DI	HVAC UCP	HHU-77002	NORMAL	DIRTY	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	38	123A90-1724000049HV-PID-00039	I 4,5	HHU-77001 MANUAL SELECTOR			HHU-77001	DI	HVAC UCP	HVAC UCP	NOT MANUAL	MANUAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	39	123A90-1724000049HV-PID-00039	I 4,6	HHU-77002 MANUAL SELECTOR			HHU-77002	DI	HVAC UCP	HVAC UCP	NOT MANUAL	MANUAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	40	123A90-1724000049HV-PID-00039	I 4,7	HFD-77001 CLOSED SIGNAL		77-ZSL-001	HFD-77001	DI	HFD-77001	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	41	123A90-1724000049HV-PID-00039	I 5,0	HFD-77001 OPEN SIGNAL		77-ZSH-001	HFD-77001	DI	HFD-77001	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	42	123A90-1724000049HV-PID-00039	I 5,1	HFD-77002 CLOSED SIGNAL		77-ZSL-002	HFD-77002	DI	HFD-77002	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	43	123A90-1724000049HV-PID-00039	I 5,2	HFD-77002 OPEN SIGNAL		77-ZSH-002	HFD-77002	DI	HFD-77002	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	44	123A90-1724000049HV-PID-00039	I 5,3	HFD-77003 CLOSED SIGNAL		77-ZSL-003	HFD-77003	DI	HFD-77003	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	45	123A90-1724000049HV-PID-00039	I 5,4	HFD-77003 OPEN SIGNAL		77-ZSH-003	HFD-77003	DI	HFD-77003	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	46	123A90-1724000049HV-PID-00039	I 0,2	HEATING CABLE TRIP			HHC-77-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	47	123A90-1724000049HV-PID-00039	Q 0,0	PRESSURIZING FAN UNIT HHU-77001 VSD START			HFM-77-101	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	48	123A90-1724000049HV-PID-00039	Q 0,1	PRESSURIZING FAN UNIT HHU-77002 VSD START			HFM-77-102	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	49	123A90-1724000049HV-PID-00039	Q 0,3	DAMPER OPEN COMMAND			HDZ-77-101	DO	HVAC UCP	HDZ-77001	CLOSE	OPEN	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	50	123A90-1724000049HV-PID-00039	Q 0,4	PRESSURIZING FAN UNIT HHU-77001 HEATER START			HSS-77-102	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	51	123A90-1724000049HV-PID-00039	Q 0,5	PRESSURIZING FAN UNIT HHU-77002 HEATER START			HSS-77-103	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	52	123A90-1724000049HV-PID-00039	Q 0,6	SPACE HEATER START			HHS-77-001/2/3	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	53	123A90-1724000049HV-PID-00039	Q 0,7	DAMPER OPEN COMMAND			HDZ-77-102	DO	HVAC UCP	HDZ-77002	CLOSE	OPEN	-	-	-	-	-	-	-	-	-	-	24 V DC		-

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
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Rev	Item	P&ID	PLC I / O	Service Description	SIGNAL TAG	Equipment	IO Type	Location		Logic State		Range		E.U.	Alarms				Ex	Red	Mon	Signal Type	Power	Note
								From	To	State 0	State 1	Min	Max		LL	L	H	HH						
4	54	123A90-1724000049HV-PID-00039	AQ 0,0	PRESSURIZING FAN UNIT HHU-77001 VSD MODULATION		HFM-77-101	AO	HVAC UCP	HVAC UCP	-	-	4	20mA	-	-	-	-	-	-	-	-	4-20mA		-
4	55	123A90-1724000049HV-PID-00039	AQ 0,1	PRESSURIZING FAN UNIT HHU-77002 VSD MODULATION		HFM-77-102	AO	HVAC UCP	HVAC UCP	-	-	4	20mA	-	-	-	-	-	-	-	-	4-20mA		-
4	56	123A90-1724000049HV-PID-00039	AQ 0,2	HHU-77001 ELECTRICAL HEATER MODULATION		HSS-77-103	AO	HVAC UCP	HVAC UCP	-	-	4	20mA	-	-	-	-	-	-	-	-	4-20mA		-
4	57	123A90-1724000049HV-PID-00039	AQ 0,3	HHU-77002 ELECTRICAL HEATER MODULATION		HSS-77-104	AO	HVAC UCP	HVAC UCP	-	-	4	20mA	-	-	-	-	-	-	-	-	4-20mA		-
4	58	123A90-1724000049HV-PID-00039	AI 0,0	TEMPERATURE TRASMITTER 001		77-TT-101	AI	77-TT-101	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20mA		-
4	59	123A90-1724000049HV-PID-00039	AI 0,1	TEMPERATURE TRASMITTER 002		77-TT-102	AI	77-TT-102	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20mA		-
4	60	123A90-1724000049HV-PID-00039	AI 0,3	TEMPERATURE TRASMITTER 003		77-TT-103	AI	77-TT-103	HVAC UCP	-	-	-10	60	°C								4-20mA		
4	61	123A90-1724000049HV-PID-00039	AI 1,0	TEMPERATURE TRASMITTER 004		77-TT-104	AI	77-TT-104	HVAC UCP	-	-	-10	60	°C								4-20mA		
4	62	123A90-1724000049HV-PID-00039	AI 0,2	DIFFERENTIAL PRESSURE TRASMITTER PDIT-001		77-PT-101	AI	77-PT-101	HVAC UCP	-	-	0	500	Pa	-	-	-	-	-	-	-	4-20mA		-

HVAC ModBUs Signal

Rev	Item	P&ID	PLC I / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE		READ (R) WRITE (W)		Note
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN	MAX			
Rev	Item	P&ID	PLC I / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE		READ (R) WRITE (W)		Note
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN	MAX			
4	67	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFD-77001 NOT OPEN	HFD-77001	HFD-77001-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	0	NOT OPEN	OK				R		
4	68	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFD-77001 NOT CLOSE	HFD-77001	HFD-77001-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	1	NOT CLOSE	OK				R		
4	69	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFD-77002 NOT OPEN	HFD-77002	HFD-77002-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	2	NOT OPEN	OK				R		
4	70	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFD-77002 NOT CLOSE	HFD-77002	HFD-77002-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	3	NOT CLOSE	OK				R		
4	71	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFD-77003 NOT OPEN	HFD-77003	HFD-77003-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	4	NOT OPEN	OK				R		
4	72	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFD-77003 NOT CLOSE	HFD-77003	HFD-77003-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	5	NOT CLOSE	OK				R		
4	73	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HDZ-77-101 NOT OPEN	HDZ-77-101	HDZ-77-101-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	6	NOT OPEN	OK				R		
4	74	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HDZ-77-101 NOT CLOSE	HDZ-77-101	HDZ-77-101-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	7	NOT CLOSE	OK				R		
4	75	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HDZ-77-102 NOT OPEN	HDZ-77-102	HDZ-77-102-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	8	NOT OPEN	OK				R		
4	76	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HDZ-77-102 NOT CLOSE	HDZ-77-102	HDZ-77-102-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	9	NOT CLOSE	OK				R		
4	77	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFM-77-101 PTC Protection	HFM-77-101	HFM-77-101-PTCP	ModBus TCP/IP	BOOL	DIGITAL		40001	10	FAULT	OK				R		
4	78	123A90-1724000049HV-PID-00039	Modbus TCP/IP	TSH/HH-77-101 Electrical heater protection thermostate	TSH-HH-77-101	HSS-77-101-TSPH	ModBus TCP/IP	BOOL	DIGITAL		40001	11	FAULT	OK				R		
4	79	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFM-77-101 TRIP SIGNAL	HFM-77-101	HFM-77-101-TRIP	ModBus TCP/IP	BOOL	DIGITAL		40001	12	FAULT	OK				R		
4	80	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFM-77-101 VSD MALFUNCTION	HFM-77-101	HFM-77-101-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40001	13	FAULT	OK				R		
4	81	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HSS-77-103 TRIP	HSS-77-103	HSS-77-103-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	14	FAULT	OK				R		
4	82	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HSS-77-103 MODULATION FAULT	HSS-77-103	HSS-77-103-MF	ModBus TCP/IP	BOOL	DIGITAL		40001	15	FAULT	OK				R		
4	83	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77001 AUX TRIP	HHU-77001	HHU-77001-ATRP	ModBus TCP/IP	BOOL	DIGITAL		40002	0	FAULT	OK				R		
4	84	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77001 MAIN BRAKER TRIP	HHU-77001	HHU-77001-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	1	FAULT	OK				R		
4	85	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77001 NO FLOW	HHU-77001	HHU-77001-NF	ModBus TCP/IP	BOOL	DIGITAL		40002	2	FAULT	OK				R		
4	86	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFM-77-102 Ptc Protection	HFM-77-102	HFM-77-102-PTCP	ModBus TCP/IP	BOOL	DIGITAL		40002	3	FAULT	OK				R		
4	87	123A90-1724000049HV-PID-00039	Modbus TCP/IP	TSH/HH-77-102	TSH/HH-77-102	TSH/HH-77-102-TSPH	ModBus TCP/IP	BOOL	DIGITAL		40002	4	FAULT	OK				R		
4	88	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFM-77-102 trip	HFM-77-102	HFM-77-102-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	5	FAULT	OK				R		
4	89	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HFM-77-102 VSD Malfunction	HFM-77-102	HFM-77-102-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40002	6	FAULT	OK				R		
4	90	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HSS-77-104 TRIP	HSS-77-104	HSS-77-104-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	7	FAULT	OK				R		
4	91	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HSS-77-104 Modulation Fault	HSS-77-104	HSS-77-104-MF	ModBus TCP/IP	BOOL	DIGITAL		40002	8	FAULT	OK				R		
4	92	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77002 aux Trip	HHU-77002	HHU-77002-ATRP	ModBus TCP/IP	BOOL	DIGITAL		40002	9	FAULT	OK				R		
4	93	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77002 Main Braker Trip	HHU-77002	HHU-77002-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	10	FAULT	OK				R		
4	94	123A90-1724000049HV-PID-00039	Modbus TCP/IP	B100-HSB-001 Main Braker Trip	B100-HSB-001	B100-HSB-001-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	11	FAULT	OK				R		
4	95	123A90-1724000049HV-PID-00039	Modbus TCP/IP	B100-HSB-001 Module LIght Trip	B100-HSB-001	B100-HSB-001-MLTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	12	FAULT	OK				R		
4	96	123A90-1724000049HV-PID-00039	Modbus TCP/IP	B100-HSB-001 Module Socket Trip	B100-HSB-001	B100-HSB-001-MSTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	13	FAULT	OK				R		
4	97	123A90-1724000049HV-PID-00039	Modbus TCP/IP	B100-HSB-001 AuX Trip	B100-HSB-001	B100-HSB-001-ATRP	ModBus TCP/IP	BOOL	DIGITAL		40002	14	FAULT	OK				R		
4	98	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHS-77-001/2/3 Space Heater trip	HHS-77-001/2/3	HHS-77-001/2/3-SHTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	15	FAULT	OK				R		
4	99	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHS-77-001/2/3 Fault	HHS-77-001/2/3	HHS-77-001/2/3-SHF	ModBus TCP/IP	BOOL	DIGITAL		40003	0	FAULT	OK				R		
4	100	123A90-1724000049HV-PID-00039	Modbus TCP/IP	77-TT-101 Fault	77-TT-101	77-TT-101-F	ModBus TCP/IP	BOOL	DIGITAL		40003	1	FAULT	OK				R		
4	101	123A90-1724000049HV-PID-00039	Modbus TCP/IP	77-TT-102 Fault	77-TT-102	77-TT-102-F	ModBus TCP/IP	BOOL	DIGITAL		40003	2	FAULT	OK				R		
4	102	123A90-1724000049HV-PID-00039	Modbus TCP/IP	77-TT-103 Fault	77-TT-103	77-TT-103-F	ModBus TCP/IP	BOOL	DIGITAL		40003	3	FAULT	OK				R		
4	103	123A90-1724000049HV-PID-00039	Modbus TCP/IP	77-TT-104 Fault	77-TT-104	77-TT-104-F	ModBus TCP/IP	BOOL	DIGITAL		40003	4	FAULT	OK				R		
4	104	123A90-1724000049HV-PID-00039	Modbus TCP/IP	77-PT-101 Fault	77-PT-101	77-PT-101-F	ModBus TCP/IP	BOOL	DIGITAL		40003	5	FAULT	OK				R		
4	105	123A90-1724000049HV-PID-00039	Modbus TCP/IP	Major Fault	B100-HSB-001	B100-HSB-001-MJF	ModBus TCP/IP	BOOL	DIGITAL		40003	6	FAULT	OK				R		

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
Document Titel:	B-100 HVAC IO LIST - E&I SHELTERS	Sh. 6 of 6 Date: 28/01/2025 Rev: 5

Rev	Item	P&ID	PLC I / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE				READ (R) WRITE (W)		Note
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN		MAX				
4	106	123A90-1724000049HV-PID-00039	Modbus TCP/IP	Module Low Pressure	B100-HSB-001	B100-HSB-001-LP	ModBus TCP/IP	BOOL	DIGITAL		40003	7	FAULT	OK						R		
4	107	123A90-1724000049HV-PID-00039	Modbus TCP/IP	ModBUS Fault	B100-HSB-001	B100-HSB-001-MODBUSF	ModBus TCP/IP	BOOL	DIGITAL		40003	8	FAULT	OK						R		
4	108	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77002 NO FLOW	HHU-77002-NF	HHU-77002-NF	ModBus TCP/IP	BOOL	DIGITAL		40003	9	FAULT	OK						R		
4	109	123A90-1724000049HV-PID-00039	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	10										
4	110	123A90-1724000049HV-PID-00039	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	11										
4	111	123A90-1724000049HV-PID-00039	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	12										
4	112	123A90-1724000049HV-PID-00039	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	13										
4	113	123A90-1724000049HV-PID-00039	Modbus TCP/IP	ModBus Server Error	B100-HSB-001	B100-HSB-001-MSE	ModBus TCP/IP	BOOL	DIGITAL		40003	14	OK	FAULT						R		
4	114	123A90-1724000049HV-PID-00039	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	15								W		
4	115	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77001 Status	HHU-77001	HHU-77001-S	ModBus TCP/IP	INT	ANALOG		40004				NA					R		1=AVAILABLE 2=RUN 3=FAULT
4	116	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77002 Status	HHU-77002	HHU-77002-S	ModBus TCP/IP	INT	ANALOG		40005				NA					R		1=AVAILABLE 2=RUN 3=FAULT
4	117	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHS-77001/2/3 Status	HHS-77001/2/3	HHS-77001/2/3-S	ModBus TCP/IP	INT	ANALOG		40006				NA					R		1=AVAILABLE 2=RUN 3=FAULT
4	118	123A90-1724000049HV-PID-00039	Modbus TCP/IP	B 100 Medium Internal Temperature	B100-HSB-001	B100-HSB-001-IT	ModBus TCP/IP	INt	ANALOG		40007				°C					R		DIVIDE THE NUMBER BY TEN TO GET THE CORRECT VALUE
4	119	123A90-1724000049HV-PID-00039	Modbus TCP/IP	B100 internal pressure	B100-HSB-001	B100-HSB-001-IP	ModBus TCP/IP	INT	ANALOG		40008				Pa					R		DIVIDE THE NUMBER BY TEN TO GET THE CORRECT VALUE
4	120	123A90-1724000049HV-PID-00039	Modbus TCP/IP	ModBus WatchDog	B100-HSB-001	B100-HSB-001-WD	ModBus TCP/IP	BOOL	DIGITAL		40009				NA					W		PULSATING HIGH/LOW SIGNAL WITH FREQUENCI UNDER 15S
4	121	123A90-1724000049HV-PID-00039	Modbus TCP/IP	System Start From PCS	B100-HSB-001	B100-HSB-001-SSTART	ModBus TCP/IP	BOOL	DIGITAL		40010		START	NONE	NA					W		SART SIGNAL FROM PCS
4	122	123A90-1724000049HV-PID-00039	Modbus TCP/IP	System Stop From PCS	B100-HSB-001	B100-HSB-001-SSTOP	ModBus TCP/IP	BOOL	DIGITAL		40011		STOP	NONE	NA					W		STOP SIGNAL FROM PCS
4	123	123A90-1724000049HV-PID-00039	Modbus TCP/IP	Resel Alarm From PCS	B100-HSB-001	B100-HSB-001-RA	ModBus TCP/IP	BOOL	DIGITAL		40012		RESET	NONE	NA					W		SIGNAL FOR RESET ALARM
5	124	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77001 VSD Percentage of capacity utilisation	B100-HSB-001	B100-HSB-001-HFM1P	ModBus TCP/IP	INT	ANALOG		40013				NA					R		
5	125	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77002 VSD Percentage of capacity utilisation	B100-HSB-001	B100-HSB-001-HFM2P	ModBus TCP/IP	INT	ANALOG		40014				NA					R		
5	126	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77001 SELECTOR STATUS	B100-HSB-001	B100-HSB-001-SS	ModBus TCP/IP	INT	ANALOG		40015				NA					R		1= AUTO 2= MANUAL 3=OFF
5	127	123A90-1724000049HV-PID-00039	Modbus TCP/IP	HHU-77002 SELECTOR STATUS	B100-HSB-001	B100-HSB-002-SS	ModBus TCP/IP	INT	ANALOG		40016				NA					R		1= AUTO 2= MANUAL 3=OFF

Base Load Power Hub (BLPH)

B-200 HVAC I/O LIST - E&I SHELTERS

Document Number: 1724000049-HV-LIS-00052

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	04/02/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
05	28/01/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
04	19/12/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
03	11/11/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
02	17/10/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
01	28/06/2024	Issue for Information (IFI)	F.M.	S.S.	M.G.
00	07/06/2024	Issue for Information (IFI)	F.M.	S.S.	M.G.

ALEXSISTEMI spa

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		00	01	02	03	04			
1	Cover	X	X	X	X	X			
2	Table of Contents	X	X	X	X	X			
3	Revision / Change Log	X	X	X	X	X			
4	I/O List	X	X	X	X	X			
5	I/O List	X	X	X	X	X			
6	I/O List	X	X	X	X	X			

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Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)
01	ISSUE FOR INFORMATION (IFI)
02	ISSUE FOR INFORMATION (IFI)
03	ISSUE FOR INFORMATION (IFI)
04	ISSUE FOR INFORMATION (IFI)
05	ISSUE FOR INFORMATION (IFI)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
Document Titel:	B-200 HVAC IO LIST - E&I SHELTERS	Sh. 4 of 6 Date: 28/01/2025 Rev: 5

Rev	Item	P&ID	PLC I / O	Service Description	Terminal Block I/O	SIGNAL TAG	Equipment	IO Type	Location		Logic State		Range		E.U.	Alarms				Ex	Red	Mon	Signal Type	Power	Note
									From	To	State 0	State 1	Min	Max		LL	L	H	HH						
Outside system signals																									
3	1	123A90-1724000049HV-PID-00040	I 2,4	SHUT DOWN	XC - 100 / 101	77-XS-002	B200-HSB-001	DI	FGS	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From SIS, Free voltage contact for HVAC system
3	2	123A90-1724000049HV-PID-00040	Q0,2	HVAC CRITICAL FAULT	XC - 102 / 103	77XA-002	B200-HSB-001	DO	FGS	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for SIS system
3	3	123A90-1724000049HV-PID-00040	I 4,7	F&G DAMPER HDF-77004 CLOSE SIGNAL	XFD/S - 800 / 801	77-ZSL-004	HDF-77004	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	4	123A90-1724000049HV-PID-00040	I 5,1	F&G DAMPER HDF-77005 CLOSE SIGNAL	XFD/S - 804 / 805	77-ZSL-005	HDF-77005	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	5	123A90-1724000049HV-PID-00040	I 5,3	F&G DAMPER HDF-77006 CLOSE SIGNAL	XFD/S - 808 / 809	77-ZSL-006	HDF-77006	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
HVAC system signals																									
4	6	123A90-1724000049HV-PID-00040	I 0,0	MOTORISED DAMPER CLOSED			HDZ-77-201	DI	HDZ-77-201	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	7	123A90-1724000049HV-PID-00040	I 0,1	MOTORISED DAMPER OPEN			HDZ-77-201	DI	HDZ-77-201	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	8	123A90-1724000049HV-PID-00040	I 0,4	MAIN BRAKER TRIP SIGNAL			HVAC UCP	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	9	123A90-1724000049HV-PID-00040	I 0,5	PRESSURIZING FAN UNIT HHU-77003 THERMIC PROTECTION			TE-77-201	DI	TE-77-201	HVAC UCP	RUNNING	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	10	123A90-1724000049HV-PID-00040	I 0,6	HHU-77003 ELECTRICAL HEATER HIGH/VERY HIGH THERMOSTATE TRIP			TSH-HH-77-201	DI	TSH-HH-77-201	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	11	123A90-1724000049HV-PID-00040	I 0,7	PRESSURIZING FAN UNIT HHU-77003 TRIP			HFM-77-201	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	12	123A90-1724000049HV-PID-00040	I 1,0	PRESSURIZING FAN UNIT HHU-77003 VSD MALFUNCTION			HFM-77-201	DI	HVAC UCP	HVAC UCP	RUNNING	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	13	123A90-1724000049HV-PID-00040	I 1,1	PRESSURIZING FAN UNIT HHU-77004 THERMIC PROTECTION			TE-77-202	DI	TE-77-202	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	14	123A90-1724000049HV-PID-00040	I 1,2	HHU-77004 ELECTRICAL HEATER HIGH/VERY HIGH THERMOSTATE TRIP			TSH/HH-77-202	DI	TSH/HH-77-202	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	15	123A90-1724000049HV-PID-00040	I 1,3	PRESSURIZING FAN UNIT HHU-77004 TRIP			HFM-77-202	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	16	123A90-1724000049HV-PID-00040	I 1,4	PRESSURIZING FAN UNIT HHU-77004 VSD MALFUNCTION			HFM-77-202	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	17	123A90-1724000049HV-PID-00040	I1.5	ELECTRICAL HEATER HHU-77003 TRIP			HSS-77-201	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	18	123A90-1724000049HV-PID-00040	I 1,6	ELECTRICAL HEATER HHU-77004 TRIP			HSS-77-202	DI	HVAC UCP	HVAC UCP	RUNNING	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	19	123A90-1724000049HV-PID-00040	I 1,7	HHU-77003 ELECTRICAL HEATER MODULATION FAULT			HSS-77-201	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	20	123A90-1724000049HV-PID-00040	I 2,0	HHU-77004 ELECTRICAL HEATER MODULATION FAULT			HSS-77-202	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	21	123A90-1724000049HV-PID-00040	I 2,1	TRIP SIGNAL AUX			B200-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	22	123A90-1724000049HV-PID-00040	I 2,2	TRIP SIGNAL LIGHT POWER SUPPLY			B200-HSB-001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	23	123A90-1724000049HV-PID-00040	I 2,3	TRIP SIGNAL MODULE SOCKET			B200-HSB-001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	24	123A90-1724000049HV-PID-00040	I 2,5	MOTORISED DAMPER CLOSED			HDZ-77-202	DI	HDZ-77-202	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	25	123A90-1724000049HV-PID-00040	I 2,6	MOTORISED DAMPER OPEN			HDZ-77-202	DI	HDZ-77-202	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	26	123A90-1724000049HV-PID-00040	I 2,7	HHU-77003 AUTOMATIC SELECTOR			HHU-77003	DI	HVAC UCP	HVAC UCP	NOT AUTOMATIC	AUTOMATIC	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	27	123A90-1724000049HV-PID-00040	I 3,0	TRIP AUX SECTION HHU-77003			HHU-77003	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	28	123A90-1724000049HV-PID-00040	I 3,1	GENERAL PANEL AUX TRIP			B200-HSB-001	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	29	123A90-1724000049HV-PID-00040	I 3,2	HHU-77003 SECTION MAIN BRAKER TRIP			HHU-77003	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	30	123A90-1724000049HV-PID-00040	I 3,3	HHU-77004 SECTION MAIN BRAKER TRIP			HHU-77004	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	31	123A90-1724000049HV-PID-00040	I 3,4	SPACE HEATER TRIP			HHS-77004/5/6	DI	HVAC UCP	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	32	123A90-1724000049HV-PID-00040	I 3,6	SPACE HEATER RUN			HHS-77004/5/6	DI	HVAC UCP	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	33	123A90-1724000049HV-PID-00040	I 4,0	HHU-77004 AUTOMATIC SELECTOR			HHU-77004	DI	HVAC UCP	HVAC UCP	NOT AUTOMATIC	AUTOMATIC	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	34	123A90-1724000049HV-PID-00040	I 4,1	HHU-77003 FAN LOW PRESSURE			PDSL-77-201	DI	PDSL-77-201	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	35	123A90-1724000049HV-PID-00040	I 4,2	HHU-77003 FILTER FLOW SWITCH HIGH PRESSURE			PDT-77-201	DI	PDT-77-201	HVAC UCP	NORMAL	DIRTY	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	36	123A90-1724000049HV-PID-00040	I 4,3	HHU-77004 FAN LOW PRESSURE			PDSL-77-202	DI	PDSL-77-202	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	37	123A90-1724000049HV-PID-00040	I 4,4	HHU-77004 FILTER FLOW SWITCH HIGH PRESSURE			PDT-77-202	DI	PDT-77-202	HVAC UCP	NORMAL	DIRTY	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	38	123A90-1724000049HV-PID-00040	I 4,5	HHU-77003 MANUAL MODE			HHU-77003	DI	HHU-77003	HVAC UCP	NOT MANUAL	MANUAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	39	123A90-1724000049HV-PID-00040	I 4,6	HHU-77004 MANUAL MODE			HHU-77004	DI	HHU-77004	HVAC UCP	NOT MANUAL	MANUAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	40	123A90-1724000049HV-PID-00040	I 4,7	HFD-77004 CLOSE FEEDBACK		77-ZSL-004	HFD-77004	DI	HFD-77004	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	41	123A90-1724000049HV-PID-00040	I 5,0	HFD-77004 OPEN FEEDBACK		77-ZSH-004	HFD-77004	DI	HFD-77004	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	42	123A90-1724000049HV-PID-00040	I 5,1	HFD-77005 CLOSE FEEDBACK		77-ZSL-005	HFD-77005	DI	HFD-77005	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	43	123A90-1724000049HV-PID-00040	I 5,2	HFD-77005 OPEN FEEDBACK		77-ZSH-005	HFD-77005	DI	HFD-77005	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	44	123A90-1724000049HV-PID-00040	I 5,3	HFD-77006 CLOSE FEEDBACK		77-ZSL-006	HFD-77006	DI	HFD-77006	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	45	123A90-1724000049HV-PID-00040	I 5,4	HFD-77006 OPEN FEEDBACK		77-ZSH-006	HFD-77006	DI	HFD-77006	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	46	123A90-1724000049HV-PID-00040	I 0,2	HEAING CABLE TRIP			HHC-77-002	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	47	123A90-1724000049HV-PID-00040	Q 0,0	PRESSURIZING FAN UNIT HHU-77003 VSD START			HFM-77-201	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	48	123A90-1724000049HV-PID-00040	Q 0,1	PRESSURIZING FAN UNIT HHU-77004 VSD START			HFM-77-202	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	49	123A90-1724000049HV-PID-00040	Q 0,3	DAMPER OPEN COMMAND			HDZ-77-201	DO	HVAC UCP	HDZ-77001	CLOSE	OPEN	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	50	123A90-1724000049HV-PID-00040	Q 0,4	PRESSURIZING FAN UNIT HHU-77003 HEATER START			HSS-77-203	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-
4	51	123A90-1724000049HV-PID-00040	Q 0,5	PRESSURIZING FAN UNIT HHU-77004 HEATER START			HSS-77-204	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24 V DC		-

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
Document Titel:	B-200 HVAC IO LIST - E&I SHELTERS	Sh.5 of 6 Date: 28/01/2025 Rev: 5

Rev	Item	P&ID	PLC I / O	Service Description	SIGNAL TAG	Equipment	IO Type	Location		Logic State		Range		E.U.	Alarms				Ex	Red	Mon	Signal Type	Power	Note
								From	To	State 0	State 1	Min	Max		LL	L	H	HH						
4	52	123A90-1724000049HV-PID-00040	Q 0,6	SPACE HEATER START		HHS-77004/5/6	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	-	24 V DC	-
4	53	123A90-1724000049HV-PID-00040	Q 0,7	DAMPER OPEN COMMAND		HDZ-77-202	DO	HVAC UCP	HDZ-77002	CLOSE	OPEN	-	-	-	-	-	-	-	-	-	-	-	24 V DC	-
4	54	123A90-1724000049HV-PID-00040	AQ 0,0	PRESSURIZING FAN UNIT HHU-77003 VSD MODULATION		HFM-77-201	AO	HVAC UCP	HVAC UCP	-	-	4	20mA	-	-	-	-	-	-	-	-	4-20mA		-
4	55	123A90-1724000049HV-PID-00040	AQ 0,1	PRESSURIZING FAN UNIT HHU-77004 VSD MODULATION		HFM-77-202	AO	HVAC UCP	HVAC UCP	-	-	4	20mA	-	-	-	-	-	-	-	-	4-20mA		-
4	56	123A90-1724000049HV-PID-00040	AQ 0,2	HHU-77003 ELECTRICAL HEATER MODULATION		HSS-77-201	AO	HVAC UCP	HVAC UCP	-	-	4	20mA	-	-	-	-	-	-	-	-	4-20mA	-	-
4	57	123A90-1724000049HV-PID-00040	AQ 0,3	HHU-77004 ELECTRICAL HEATER MODULATION		HSS-77-202	AO	HVAC UCP	HVAC UCP	-	-	4	20mA	-	-	-	-	-	-	-	-	4-20mA	-	-
4	58	123A90-1724000049HV-PID-00040	AI 0,0	TEMPERATURE TRASMITTER 001		77-TT-201	AI	77-TT-201	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20mA	-	-
4	59	123A90-1724000049HV-PID-00040	AI 0,1	TEMPERATURE TRASMITTER 002		77-TT-202	AI	77-TT-202	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20mA	-	-
4	60	123A90-1724000049HV-PID-00040	AI 0,3	TEMPERATURE TRASMITTER 003		77-TT-203	AI	77-TT-203	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20mA	-	-
4	61	123A90-1724000049HV-PID-00040	AI 1,0	TEMPERATURE TRASMITTER 004		77-TT-204	AI	77-TT-204	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20mA	-	-
4	62	123A90-1724000049HV-PID-00040	AI 0,2	DIFFERENTIAL PRESSURE TRASMITTER PDIT-001		77-PT-201	AI	77-PT-201	HVAC UCP	-	-	0	500	Pa	-	-	-	-	-	-	-	4-20mA	-	-

HVAC ModBUs Signal

Rev	Item	P&ID	PLC I / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE				READ (R) WRITE (W)		Note
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN		MAX				
4	67	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFD-77004 NOT OPEN	HFD-77004	HFD-77004-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	0	NOT OPEN	OK						R		
4	68	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFD-77004 NOT CLOSE	HFD-77004	HFD-77004-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	1	NOT CLOSE	OK						R		
4	69	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFD-77005 NOT OPEN	HFD-77005	HFD-77-005-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	2	NOT OPEN	OK						R		
4	70	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFD-77005 NOT CLOSE	HFD-77005	HFD-77-005-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	3	NOT CLOSE	OK						R		
4	71	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFD-77006 NOT OPEN	HFD-77006	HFD-77-006-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	4	NOT OPEN	OK						R		
4	72	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFD-77006 NOT CLOSE	HFD-77006	HFD-77-006-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	5	NOT CLOSE	OK						R		
4	73	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HDZ-77-201 NOT OPEN	HDZ-77-201	HDZ-77-201-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	6	NOT OPEN	OK						R		
4	74	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HDZ-77-201 NOT CLOSE	HDZ-77-201	HDZ-77-201-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	7	NOT CLOSE	OK						R		
4	75	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HDZ-77-202 NOT OPEN	HDZ-77-202	HDZ-77-202-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40001	8	NOT OPEN	OK						R		
4	76	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HDZ-77-202 NOT CLOSE	HDZ-77-202	HDZ-77-202-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40001	9	NOT CLOSE	OK						R		
4	77	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFM-77-201 PTC Protection	HFM-77-201	HFM-77-201-PTCP	ModBus TCP/IP	BOOL	DIGITAL		40001	10	FAULT	OK						R		
4	78	123A90-1724000049HV-PID-00040	Modbus TCP/IP	TSH/HH-77-201 Electrical heater Protection thermostate	TSH/HH-77-201	TSH/HH-77-201-TSPH	ModBus TCP/IP	BOOL	DIGITAL		40001	11	FAULT	OK						R		
4	79	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFM-77-201 TRIP SIGNAL	HFM-77-201	HFM-77-201-TRIP	ModBus TCP/IP	BOOL	DIGITAL		40001	12	FAULT	OK						R		
4	80	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFM-77-201 VSD MALFUNCTION	HFM-77-201	HFM-77-201-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40001	13	FAULT	OK						R		
4	81	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HSS-77-201 TRIP	HSS-77-201	HSS-77-201-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	14	FAULT	OK						R		
4	82	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HSS-77-201 MODULATION FAULT	HSS-77-201	HSS-77-201-MF	ModBus TCP/IP	BOOL	DIGITAL		40001	15	FAULT	OK						R		
4	83	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77003 AUX TRIP	HHU-77003	HHU-77003-ATRP	ModBus TCP/IP	BOOL	DIGITAL		40002	0	FAULT	OK						R		
4	84	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77003 MAIN BRAKER TRIP	HHU-77003	HHU-77003-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	1	FAULT	OK						R		
4	85	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77003 NO FLOW	HHU-77003	HHU-77003-NF	ModBus TCP/IP	BOOL	DIGITAL		40002	2	FAULT	OK						R		
4	86	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFM-77-202 Ptc Protection	HFM-77-202	HFM-77-202-PTCP	ModBus TCP/IP	BOOL	DIGITAL		40002	3	FAULT	OK						R		
4	87	123A90-1724000049HV-PID-00040	Modbus TCP/IP	TSH/HH-77-202	TSH/HH-77-202	TSH/HH-77-202-TSPH	ModBus TCP/IP	BOOL	DIGITAL		40002	4	FAULT	OK						R		
4	88	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFM-77-202 trip	HFM-77-202	HFM-77-202-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	5	FAULT	OK						R		
4	89	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HFM-77-202 VSD Malfunction	HFM-77-202	HFM-77-202-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40002	6	FAULT	OK						R		
4	90	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HSS-77-202 trip	HSS-77-202	HSS-77-202-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	7	FAULT	OK						R		
4	91	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HSS-77-202 Modulation Fault	HSS-77-202	HSS-77-202-MF	ModBus TCP/IP	BOOL	DIGITAL		40002	8	FAULT	OK						R		
4	92	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77004 aux Trip	HHU-77004	HHU-77004-ATRP	ModBus TCP/IP	BOOL	DIGITAL		40002	9	FAULT	OK						R		
4	93	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77004 Main Braker Trip	HHU-77004	HHU-77004-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	10	FAULT	OK						R		
4	94	123A90-1724000049HV-PID-00040	Modbus TCP/IP	B200-HSB-001 Main Braker Trip	B200-HSB-001	B200-HSB-001-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	11	FAULT	OK						R		
4	95	123A90-1724000049HV-PID-00040	Modbus TCP/IP	B200-HSB-001 Module LIght Trip	B200-HSB-001	B200-HSB-001-MLTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	12	FAULT	OK						R		
4	96	123A90-1724000049HV-PID-00040	Modbus TCP/IP	B200-HSB-001 Module Socket Trip	B200-HSB-001	B200-HSB-001-MSTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	13	FAULT	OK						R		
4	97	123A90-1724000049HV-PID-00040	Modbus TCP/IP	B200-HSB-001 Aux Trip	B200-HSB-001	B200-HSB-001-ATRP	ModBus TCP/IP	BOOL	DIGITAL		40002	14	FAULT	OK						R		
4	98	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHS-77-004/5/6 Space heater Trip	HHS-77-004/5/6	HHS-77-004/5/6-SHTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	15	FAULT	OK						R		
4	99	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHS-77-004/5/6 Fault	HSS-77-004/5/6	HHS-77-004/5/6-SHF	ModBus TCP/IP	BOOL	DIGITAL		40003	0	FAULT	OK						R		
4	100	123A90-1724000049HV-PID-00040	Modbus TCP/IP	77-TT-201 Fault	77-TT-201	77-TT-201-F	ModBus TCP/IP	BOOL	DIGITAL		40003	1	FAULT	OK						R		
4	101	123A90-1724000049HV-PID-00040	Modbus TCP/IP	77-TT-202 Fault	77-TT-202	77-TT-202-F	ModBus TCP/IP	BOOL	DIGITAL		40003	2	FAULT	OK						R		
4	102	123A90-1724000049HV-PID-00040	Modbus TCP/IP	77-TT-203 Fault	77-TT-203	77-TT-203-F	ModBus TCP/IP	BOOL	DIGITAL		40003	3	FAULT	OK						R		
4	103	123A90-1724000049HV-PID-00040	Modbus TCP/IP	77-TT-204 Fault	77-TT-201	77-TT-201-F	ModBus TCP/IP	BOOL	DIGITAL		40003	4	FAULT	OK						R		
4	104	123A90-1724000049HV-PID-00040	Modbus TCP/IP	77-PT-201 Fault	77-PT-201	77-PT-201-F	ModBus TCP/IP	BOOL	DIGITAL		40003	5	FAULT	OK						R		
4	105	123A90-1724000049HV-PID-00040	Modbus TCP/IP	MajorFault	B200-HSB-001	B200-HSB-001-MJF	ModBus TCP/IP	BOOL	DIGITAL		40003	6	FAULT	OK						R		

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
Document Titel:	B-200 HVAC IO LIST - E&I SHELTERS	Sh.6 of 6 Date: 28/01/2025 Rev: 5

Rev	Item	P&ID	PLC I / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE				READ (R) WRITE (W)		Note
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN		MAX				
4	106	123A90-1724000049HV-PID-00040	Modbus TCP/IP	Module Low Pressure	B200-HSB-001	B200-HSB-001-MLP	ModBus TCP/IP	BOOL	DIGITAL		40003	7	FAULT	OK						R		
4	107	123A90-1724000049HV-PID-00040	Modbus TCP/IP	ModBUS Fault	B200-HSB-001	B200-HSB-001-MODBUSF	ModBus TCP/IP	BOOL	DIGITAL		40003	8	FAULT	OK						R		
4	108	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77004 No Flow	HHU-77004	HHU-77004-NF	ModBus TCP/IP	BOOL	DIGITAL		40003	9	FAULT	OK						R		
4	109	123A90-1724000049HV-PID-00040	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	10										
4	110	123A90-1724000049HV-PID-00040	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	11										
4	111	123A90-1724000049HV-PID-00040	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	12										
4	112	123A90-1724000049HV-PID-00040	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	13										
4	113	123A90-1724000049HV-PID-00040	Modbus TCP/IP	ModBus Server Error	B200-HSB-001	B200-HSB-001-MSE	ModBus TCP/IP	BOOL	DIGITAL		40003	14	OK	FAULT						R		
4	114	123A90-1724000049HV-PID-00040	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40003	15								W		
4	115	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77003 Status	HHU-77003	HHU-77003-S	ModBus TCP/IP	INT	ANALOG		40004				NA					R		1=AVAILABLE 2=RUN 3=FAULT
4	116	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77004 Status	HHU-77004	HHU-77004-S	ModBus TCP/IP	INT	ANALOG		40005				NA					R		1=AVAILABLE 2=RUN 3=FAULT
4	117	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHS-77005/6/7 Status	HHS-77005/6/7	HHS-77005/6/7-S	ModBus TCP/IP	INT	ANALOG		40006				NA					R		1=AVAILABLE 2=RUN 3=FAULT
4	118	123A90-1724000049HV-PID-00040	Modbus TCP/IP	B 200 Medium Internal Temperature	B200-HSB-001	B200-HSB-001-IT	ModBus TCP/IP	INT	ANALOG		40007				°C					R		DIVIDE THE NUMBER BY TEN TO GET THE CORRECT VALUE
4	119	123A90-1724000049HV-PID-00040	Modbus TCP/IP	B200 internal pressure	B200-HSB-001	B200-HSB-001-IP	ModBus TCP/IP	INT	ANALOG		40008				Pa					R		DIVIDE THE NUMBER BY TEN TO GET THE CORRECT VALUE
4	120	123A90-1724000049HV-PID-00040	Modbus TCP/IP	ModBus WatchDog	B200-HSB-001	B200-HSB-001-WD	ModBus TCP/IP	BOOL	DIGITAL		40009				NA					W		PULSATING HIGH/LOW SIGNAL WITH FREQUENCI UNDER 15S
4	121	123A90-1724000049HV-PID-00040	Modbus TCP/IP	System Start From PCS	B200-HSB-001	B200-HSB-001-SSTART	ModBus TCP/IP	BOOL	DIGITAL		40010		START	NONE	NA					W		SART SIGNAL FROM PCS
4	122	123A90-1724000049HV-PID-00040	Modbus TCP/IP	System Stop From PCS	B200-HSB-001	B200-HSB-001-SSTOP	ModBus TCP/IP	BOOL	DIGITAL		40011		STOP	NONE	NA					W		STOP SIGNAL FROM PCS
4	123	123A90-1724000049HV-PID-00040	Modbus TCP/IP	Resel Alarm From PCS	B200-HSB-001	B200-HSB-001-RA	ModBus TCP/IP	BOOL	DIGITAL		40012		RESET	NONE	NA					W		SIGNAL FOR RESET ALARM
4	124	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77003 Percentage of Capacity Utilisation	B200-HSB-001	B200-HSB-001-HFM1P	ModBus TCP/IP	INT	DIGITAL		40013		RESET	NONE	NA					W		
4	125	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77004 Percentage of Capacity Utilisation	B200-HSB-001	B200-HSB-001-HFM2P	ModBus TCP/IP	INT	DIGITAL		40014				NA					W		
5	126	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77003 SELECTOR STATUS	B200-HSB-001	B200-HSB-001-SS	ModBus TCP/IP	INT	ANALOG		40015				NA					R		1= AUTO 2= MANUAL 3=OFF
5	127	123A90-1724000049HV-PID-00040	Modbus TCP/IP	HHU-77004 SELECTOR STATUS	B200-HSB-001	B200-HSB-002-SS	ModBus TCP/IP	INT	ANALOG		40016				NA					R		1= AUTO 2= MANUAL 3=OFF

Base Load Power Hub (BLPH)

B-300 HVAC I/O LIST - E&I SHELTERS

Document Number: 1724000049-HV-LIS-00053

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	04/02/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
05	28/01/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
04	19/12/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
03	11/11/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
02	17/10/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
01	28/06/2024	Issue for Information (IFI)	F.M.	S.S.	M.G.
00	07/06/2024	Issue for Information (IFI)	F.M.	S.S.	M.G.

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2	Table of Contents	X	X	X	X	X	X		
3	Revision / Change Log	X	X	X	X	X	X		
4	I/O List	X	X	X	X	X	X		
5	I/O List	X	X	X	X	X	X		
6	I/O List	X	X	X	X	X	X		
7	I/O List	X	X	X	X	X	X		

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Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)
01	ISSUE FOR INFORMATION (IFI)
02	ISSUE FOR INFORMATION (IFI)
03	ISSUE FOR INFORMATION (IFI)
04	ISSUE FOR INFORMATION (IFI)
05	ISSUE FOR INFORMATION (IFI)

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
Document Titel:	B-300 HVAC IO LIST - E&I SHELTERS	Sh.4 of 7 28/01/2025 Rev: 5

Rev	Item	P&ID	Tag Number	Service Description	Terminal Block I/O	SIGNAL TAG	Equipment	IO Type	Location		Logic State		Range		E.U.	Alarms				Ex	Red	Mon	Signal Type	Power	Note
									From	To	State 0	State 1	Min	Max		LL	L	H	HH						
Outside system signals																									
3	1	123A90-1724000049HV-PID-00041	I 0,0	SHUT DOWN	XC - 500 / 501	77-XS-003	B300-HSB-001	DI	SIS	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From SIS, Free voltage contact for HVAC system
3	2	123A90-1724000049HV-PID-00041	Q 0,0	HVAC CRITICAL FAULT	XC - 502 / 503	77XA-003	B300-HSB-001	DO	HVAC UCP	SIS	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for SIS system
3	4	123A90-1724000049HV-PID-00041	I 7,2	F&G DAMPER HDF-77007 CLOSE SIGNAL	XFD/S - 800 / 801	77-ZSL-007	HDF-77007	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	5	123A90-1724000049HV-PID-00041	I 7,4	F&G DAMPER HDF-77008 CLOSE SIGNAL	XFD/S - 804 / 805	77-ZSL-008	HDF-77008	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	6	123A90-1724000049HV-PID-00041	I 7,6	F&G DAMPER HDF-77009 CLOSE SIGNAL	XFD/S - 808 / 809	77-ZSL-009	HDF-77009	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	7	123A90-1724000049HV-PID-00041	I 8,1	F&G DAMPER HDF-77010 CLOSE SIGNAL	XFD/S - 812 / 813	77-ZSL-010	HDF-77010	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	8	123A90-1724000049HV-PID-00041	I 8,3	F&G DAMPER HDF-77011 CLOSE SIGNAL	XFD/S - 816 / 817	77-ZSL-011	HDF-77011	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
HVAC system signals																									
4	9	123A90-1724000049HV-PID-00041	I0,2	MAIN BRAKER TRIP			B300-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	10	123A90-1724000049HV-PID-00041	I0,3	AUTOMATIC MODE			HHU-77005	DI	HVAC UCP	HVAC UCP	NOT AUTOMATIC	AUTOMATIC	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	11	123A90-1724000049HV-PID-00041	I0,4	AUTOMATIC MODE			HHU-77006	DI	HVAC UCP	HVAC UCP	NOT AUTOMATIC	AUTOMATIC	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	12	123A90-1724000049HV-PID-00041	AI 0,0	TEMPERATURE TRASMITTER 1			77-TT-301	AI	77-TT-301	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20 Ma		-
4	13	123A90-1724000049HV-PID-00041	AI 0,1	TEMPERATURE TRASMITTER 2			77-TT-302	AI	77-TT-302	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20 Ma		-
4	14	123A90-1724000049HV-PID-00041	AI 0,2	DIFFERNTIAL PRESSURE TRASMITTER			77-PT-301	AI	77-PT-301	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20 Ma		-
4	15	123A90-1724000049HV-PID-00041	AI 0,3	TEMPERATURE TRASMITTER 3			77-TT-303	AI	77-TT-303	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20 Ma		-
4	16	123A90-1724000049HV-PID-00041	AI 1,0	TEMPERATURE TRASMITTER 4			77-TT-304	AI	77-TT-304	HVAC UCP	-	-	0	500	Pa	-	-	-	-	-	-	-	4-20 Ma		-
4	17	123A90-1724000049HV-PID-00041	I 0,5	PANEL EMERGENCY POWER BUTTON			HPB-77-303	DI	HPB-77-303	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	18	123A90-1724000049HV-PID-00041	I 0,6	MODULE LIGHT TRIP			B300-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	19	123A90-1724000049HV-PID-00041	I 0,7	MODULE SOCKET TRIP			B300-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	20	123A90-1724000049HV-PID-00041	I 1,0	SPACE HEATER TRIP			HHS-77007/8/9	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	21	123A90-1724000049HV-PID-00041	I 1,1	SPACE HEATER START FEEDBACK			HHS-77007/8/9	DI	HVAC UCP	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	22	123A90-1724000049HV-PID-00041	Q0,2	SPACE HEATER ASTART COMMAND			HHS-77007/8/9	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24V DC		-
4	23	123A90-1724000049HV-PID-00041	I 1,4	AUX SECTION TRIP			B300-HSB-001	DI	HVAC UCP	HVAC UCP	NORMAL	TRIP	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	24	123A90-1724000049HV-PID-00041	Q1,2	RESET CONTACT			B300-HSB-001	DO	HVAC UCP	HVAC UCP	NORMAL	RESET	-	-	-	-	-	-	-	-	-	-	24V DC		-
4	25	123A90-1724000049HV-PID-00041	I 6,7	MANUAL MODE			HHU-77005	DI	HVAC UCP	HVAC UCP	NOT MANUAL	MANUAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	26	123A90-1724000049HV-PID-00041	I 7,0	MANUAL MODE			HHU-77006	DI	HVAC UCP	HVAC UCP	NOT MANUAL	MANUAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	27	123A90-1724000049HV-PID-00041	I 7,1	HFD-77007 OPEN SIGNAL		77-ZSH-007	HFD-77007	DI	HFD-77007	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	28	123A90-1724000049HV-PID-00041	I 7,2	HFD-77007 CLOSED SIGNAL		77-ZSL-007	HFD-77007	DI	HFD-77007	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	29	123A90-1724000049HV-PID-00041	I 7,3	HFD-77008 OPEN SIGNAL		77-ZSH-008	HFD-77008	DI	HFD-77008	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	30	123A90-1724000049HV-PID-00041	I 7,4	HFD-77008 CLOSED SIGNAL		77-ZSL-008	HFD-77008	DI	HFD-77008	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	31	123A90-1724000049HV-PID-00041	I 7,5	HFD-77009 OPEN SIGNAL		77-ZSH-009	HFD-77009	DI	HFD-77009	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	32	123A90-1724000049HV-PID-00041	I 7,6	HFD-77009 CLOSED SIGNAL		77-ZSL-009	HFD-77009	DI	HFD-77009	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	33	123A90-1724000049HV-PID-00041	I 8.0	HFD-77010 OPEN SIGNAL		77-ZSH-010	HFD-77010	DI	HFD-77010	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	34	123A90-1724000049HV-PID-00041	I 8.1	HFD-77010 CLOSED SIGNAL		77-ZSL-010	HFD-77010	DI	HFD-77010	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	35	123A90-1724000049HV-PID-00041	I 8.2	HFD-77011 OPEN SIGNAL		77-ZSH-011	HFD-77011	DI	HFD-77011	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	36	123A90-1724000049HV-PID-00041	I 8.3	HFD-77011 CLOSED SIGNAL		77-ZSL-011	HFD-77011	DI	HFD-77011	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	37	123A90-1724000049HV-PID-00041	I 9,7	TRIP SIGNAL HEATING CABLE			HHC-77003	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	38			**UNIT A**																					-
4	39	123A90-1724000049HV-PID-00041	Q0,4	HHU-77005 START			HHU-77005	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24V DC		-
4	40	123A90-1724000049HV-PID-00041	I1,5	MOTORISED DAMPER NOT OPEN			HDZ-77-301/2/3	DI	HHU-77005	HVAC UCP	NORMAL	FAULT	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	41	123A90-1724000049HV-PID-00041	I 1,6	MOTORISED DAMPER CLOSED			HDZ-77-301/2/3	DI	HHU-77005	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	42	123A90-1724000049HV-PID-00041	I 1,7	MOTORISED DAMPER OPEN			HDZ-77-301/2/3	DI	HHU-77005	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	43	123A90-1724000049HV-PID-00041	Q 0,5	PRESSURIZING FAN UNIT HHU-77005 HEATER			HSS-77-303	DO	HHU-77005	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	24V DC		-
4	44	123A90-1724000049HV-PID-00041	I 2,0	PRESSURIZING FAN UNIT HHU-77005 THERMIC PROTECTION			TE-77-301	DI	HHU-77005	HVAC UCP	NORMAL	FAULT	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	45	123A90-1724000049HV-PID-00041	I 2,1	PRESSURIZING FAN UNIT HHU-77005 VSD MALFUNCTION			HFM-77301	DI	HHU-77005	HVAC UCP	NORMAL	FAULT	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	46	123A90-1724000049HV-PID-00041	AQ 0,0	PRESSURIZING FAN MODULATION			HFM-77301	AO	HVAC UCP	HHU-77005			4	20mA	-	-	-	-	-	-	-	-	4-20mA		-
4	47	123A90-1724000049HV-PID-00041	I 2,2	PRESSURISING FAN TRIP			HFM-77-301	DI	HHU-77005	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	48	123A90-1724000049HV-PID-00041	I 2,3	SUPPLY FAN RUN			HFM-77-302	DI	HHU-77005	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	49	123A90-1724000049HV-PID-00041	I 2,4	SUPPLY FAN BROKEN BELT ALARM			PDSL-77-301	DI	HHU-77005	HVAC UCP	NORMAL	FAULT	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	50	123A90-1724000049HV-PID-00041	I 2,5	SUPPLY FAN TRIP			HFM-77-302	DI	HHU-77005	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	51	123A90-1724000049HV-PID-00041	Q 0,6	COMPRESSOR START			HCO-77-301	DO	HVAC UCP	HHU-77005	STOP	START	-	-	-	-	-	-	-	-	-	-	24V DC		-
4	52	123A90-1724000049HV-PID-00041	I 2,6	COMPRESSOR RUNNING			HCO-77-301	DI	HHU-77005	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-

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Rev	Item	P&ID	Tag Number	Service Description	SIGNAL TAG	Equipment	IO Type	Location		Logic State		Range		E.U.	Alarms				Ex	Red	Mon	Signal Type	Power	Note
								From	To	State 0	State 1	Min	Max		LL	L	H	HH						
4	53	123A90-1724000049HV-PID-00041	I 2,7	COMPRESSOR TRIP		HCO-77-301	DI	HHU-77005	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	54	123A90-1724000049HV-PID-00041	I 3,0	COMPRESSOR HIGH PRESSURE		PSH-77-301	DI	HHU-77005	HVAC UCP	NORMAL	FAULT	-	-											
4	55	123A90-1724000049HV-PID-00041	I 3,1	COMPRESSOR LOW PRESSURE		PSL-77-301	DI	HHU-77005	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	56	123A90-1724000049HV-PID-00041	I 3,2	CONDENSER FAN TRIP		HFM-77-305/6	DI	HHU-77005	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	57	123A90-1724000049HV-PID-00041	I 3,3	CONDENSER FAN VSD MALFUNCTION		HFM-77-305/6	DI	HHU-77005	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	58	123A90-1724000049HV-PID-00041	I 3,4	FILTER CLOGGED		PDSH-77-301	DI	HHU-77005	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	59	123A90-1724000049HV-PID-00041	I 3,5	ELECTRICAL HEATE RTHERMOSTATE TRIP		TSH/HH-77-301	DI	HHU-77005	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	60	123A90-1724000049HV-PID-00041	I 3,6	ELECTRICAL HEATER TRIP		HSS-77-301	DI	HHU-77005	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	61	123A90-1724000049HV-PID-00041	AQ 0,2	ELECTRICAL HEATER MODULATION		HSS-77-301	AO	HVAC UCP	HVAC UCP	-	-	4	20mA									4-20mA		
4	62	123A90-1724000049HV-PID-00041	I 3,7	ELECTRICAL HEATER MODULATION FAULT		HSS-77-301	DI	HHU-77005	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	63	123A90-1724000049HV-PID-00041	I 4,0	EMERGENCY STOP BUTTON		HPB-77-301	DI	HHU-77005	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	64	123A90-1724000049HV-PID-00041	I 4,1	SECTION SEZ HHU-77005 OPEN		B300-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	65	123A90-1724000049HV-PID-00041	I 0.1	PRESSURIZING FAN LOW PRESSURE		PDSL-77-302	DI	HHU-77005	HVAC UCP	NORMAL	CLOGGED											VFC 24 Vdc		
4	66			UNIT B																				-
4	67	123A90-1724000049HV-PID-00041	Q 0,7	HHU-77006 START		HHU-77006	DO	HVAC UCP	HVAC UCP	STOP	START	-	-			-	-	-	-	-	-	24V DC		-
4	68	123A90-1724000049HV-PID-00041	I 4,2	MOTORISED DAMPER NOT OPEN		HDZ-77-304/5/6	DI	HHU-77006	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	69	123A90-1724000049HV-PID-00041	I 4,3	MOTORISED DAMPER CLOSED		HDZ-77-304/5/6	DI	HHU-77006	HVAC UCP	NOT CLOSED	CLOSED	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	70	123A90-1724000049HV-PID-00041	I 4,4	MOTORISED DAMPER OPEN		HDZ-77-304/5/6	DI	HHU-77006	HVAC UCP	NOT OPEN	OPEN	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	71	123A90-1724000049HV-PID-00041	Q 1,0	PRESSURIZING FAN UNIT HHU-77006 HEATER		HSS-77-306	DO	HHU-77006	HVAC UCP	STOP	RUN	-	-			-	-	-	-	-	-	24V DC		-
4	72	123A90-1724000049HV-PID-00041	I 4,5	PRESSURIZING FAN UNIT HHU-77006 THERMIC PROTECTION		TE-77-302	DI	HHU-77006	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	73	123A90-1724000049HV-PID-00041	I 4,6	PRESSURIZING FAN UNIT HHU-77006 VSD MALFUNCTION		HFM-77-303	DI	HHU-77006	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	74	123A90-1724000049HV-PID-00041	AQ 0,1	PRESSURIZING FAN MODULATION		HFM-77-303	AO	HVAC UCP	AHHU-77003B			4	20mA			-	-	-	-	-	-	4-20mA		-
4	75	123A90-1724000049HV-PID-00041	I 4,7	PRESSURISING FAN TRIP		HFM-77-303	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	76	123A90-1724000049HV-PID-00041	I 5,0	SUPPLY FAN RUN		HMF-77-304	DI	HHU-77006	HVAC UCP	STOP	RUN	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	77	123A90-1724000049HV-PID-00041	I 5,1	SUPPLY FAN BROKEN BELT ALARM		PDSL-77-302	DI	HHU-77006	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	78	123A90-1724000049HV-PID-00041	I 5,2	SUPPLY FAN TRIP		HMF-77-304	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	79	123A90-1724000049HV-PID-00041	Q 1,1	COMPRESSOR START		HCO-77-302	DO	HHU-77006	HVAC UCP	STOP	START	-	-			-	-	-	-	-	-	24V DC		-
4	80	123A90-1724000049HV-PID-00041	I 5,3	COMPRESSOR RUNNING		HCO-77-302	DI	HHU-77006	HVAC UCP	STOP	RUN	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	81	123A90-1724000049HV-PID-00041	I 5,4	COMPRESSOR TRIP		HCO-77-302	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	82	123A90-1724000049HV-PID-00041	I 5,5	COMPRESSOR HIGH PRESSURE		PSH-77-302	DI	HHU-77006	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	83	123A90-1724000049HV-PID-00041	I 5,6	COMPRESSOR LOW PRESSURE		PSL-77-302	DI	HHU-77006	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	84	123A90-1724000049HV-PID-00041	I 5,7	CONDENSER FAN TRIP		HFM-77-307/8	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	85	123A90-1724000049HV-PID-00041	I 6,0	CONDENSER FAN VSD MALFUNCTION		HFM-77-307/8	DI	HHU-77006	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	86	123A90-1724000049HV-PID-00041	I 6,1	FILTER CLOGGED		PDSH-77-303	DI	HHU-77006	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	87	123A90-1724000049HV-PID-00041	I 6,2	ELECTRICAL HEATE RTHERMOSTATE TRIP		TSH/HH-77-302	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	88	123A90-1724000049HV-PID-00041	I 6,3	ELECTRICAL HEATER TRIP		HSS-77-305	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	89	123A90-1724000049HV-PID-00041	AQ 0,3	ELECTRICAL HEATER MODULATION		HSS-77-305	AO	HHU-77006	HVAC UCP	TRIP	NORMAL	4	20mA									4-20mA		
4	90	123A90-1724000049HV-PID-00041	I 6,4	ELECTRICAL HEATER MODULATION FAULT		HSS-77-305	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	91	123A90-1724000049HV-PID-00041	I6,5	EMERGENCY STOP BUTTON		HPB-77-302	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	92	123A90-1724000049HV-PID-00041	I6,6	SECTIONE SEZ HHU-77006 OPEN		B300-HSB-001	DI	HHU-77006	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	93	123A90-1724000049HV-PID-00041	I 7.7	PRESSURIZING FAN LOW PRESSURE		PDSL-77-304	DI	HHU-77006	HVAC UCP	NORMAL	CLOGGED	-	-									VFC 24 Vdc		

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HVAC ModBUs Signal

Rev	Item	P&ID	PLC I / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE		READ (R) WRITE (W)	
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN	MAX		
4	94	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40001	0						R	
4	95	123A90-1724000049HV-PID-00041	Modbus TCP/IP	B300-HSB-100 Main Braker Trip	B300-HSB-001	B300-HSB-001-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40001	1	TRIP	OK				R	
4	96	123A90-1724000049HV-PID-00041	Modbus TCP/IP	B300-HSB-100 Panel emergency Button	B300-HSB-001	B300-HSB-001-PEB	ModBus TCP/IP	BOOL	DIGITAL		40001	2	TRIP	OK				R	
4	97	123A90-1724000049HV-PID-00041	Modbus TCP/IP	B300-HSB-100 Module Light Trip	B300-HSB-001	B300-HSB-001-MLTRP	ModBus TCP/IP	BOOL	DIGITAL		40001	3	TRIP	OK				R	
4	98	123A90-1724000049HV-PID-00041	Modbus TCP/IP	B300-HSB-100 Module Socket Trip	B300-HSB-001	B300-HSB-001-MSTRP	ModBus TCP/IP	BOOL	DIGITAL		40001	4	TRIP	OK				R	
4	99	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHS-77-007/8/9 Space Heater Trip	HHS-77-007/8/9	HHS-77-007/8/9-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	5	TRIP	OK				R	
4	100	123A90-1724000049HV-PID-00041	Modbus TCP/IP	B300-HSB-100 Main Panel Aux Section Trip	B300-HSB-001	B300-HSB-001-ATRP	ModBus TCP/IP	BOOL	DIGITAL		40001	6	TRIP	OK				R	
4	101	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHS-77-007/8/9 Space Heater Fault	HHS-77-007/8/9	HHS-77-007/8/9-F	ModBus TCP/IP	BOOL	DIGITAL		40001	7	TRIP	OK				R	
4	102	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 Press Fan Low Pressure	HHU-77005	HHU-77005-PFFC	ModBus TCP/IP	BOOL	DIGITAL		40001	8	TRIP	OK				R	
4	103	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 motorised dampers Fault	HHU-77005	HHU-77005-MDF	ModBus TCP/IP	BOOL	DIGITAL		40001	9	TRIP	OK				R	-
4	104	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 press fan PTC protection	HFM-77-301	HFM-77-301-PTCP	ModBus TCP/IP	BOOL	DIGITAL		40001	10	TRIP	OK				R	-
4	105	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 press fan VSD fault	HFM-77-301	HFM-77-301-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40001	11	TRIP	OK				R	-
4	106	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 press fan trip	HFM-77-301	HFM-77-301-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	12	TRIP	OK				R	-
4	107	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 broken belt alarm	HFM-77-302	HFM-77-302-BBA	ModBus TCP/IP	BOOL	DIGITAL		40001	13	TRIP	OK				R	-
4	108	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 supply fan trip	HFM-77-302	HFM-77-302-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	14	TRIP	OK				R	-
4	109	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 compressor trip	HCO-77-301	HCO-77-301-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	15	TRIP	OK				R	-
4	110	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 high pressure alarm	HCO-77-301	HCO-77-301-HPA	ModBus TCP/IP	BOOL	DIGITAL		40002	0	TRIP	OK				R	-
4	111	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 low pressure alarm	HCO-77-301	HCO-77-301-LPA	ModBus TCP/IP	BOOL	DIGITAL		40002	1	TRIP	OK				R	-
4	112	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 condenser fan trip	HFM-77-305/306	HFM-77-305/306-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	2	TRIP	OK				R	-
4	113	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 condenser fan VSD fault	HFM-77-305/306	HFM-77-305/306-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40002	3	TRIP	OK				R	-
4	114	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 electrical heater Protection thermostate	HSS-77-301	HSS-77-301-TSPH	ModBus TCP/IP	BOOL	DIGITAL		40002	4	TRIP	OK				R	-
4	115	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 electrical heater trip	HSS-77-301	HSS-77-301-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	5	TRIP	OK				R	-
4	116	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 electrical heater modulation fault	HSS-77-301	HSS-77-301-MF	ModBus TCP/IP	BOOL	DIGITAL		40002	6	TRIP	OK				R	-
4	117	123A90-1724000049HV-PID-00041	Modbus TCP/IP	Spare			ModBus TCP/IP	BOOL	DIGITAL		40002	7						R	-
4	118	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 main braker trip	HHU-77005	HHU-77005-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40002	8	TRIP	OK				R	-
4	119	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 filter clogged	HHU-77005	HHU-77005-PFFC	ModBus TCP/IP	BOOL	DIGITAL		40002	9	CLOGGED	OK				R	-
4	120	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 motorise dampers fault	HHU-77006	HHU-77006-MDF	ModBus TCP/IP	BOOL	DIGITAL		40002	10	TRIP	OK				R	-
4	121	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 press fan PTC protection	HFM-77-303	HFM-77-303-PTCP	ModBus TCP/IP	BOOL	DIGITAL		40002	11	TRIP	OK				R	-
4	122	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 press fan VSD fault	HFM-77-303	HFM-77-303-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40002	12	TRIP	OK				R	
4	123	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 press fan trip	HFM-77-303	HFM-77-303-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	13	TRIP	OK				R	
4	124	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 broken belt alarm	HFM-77-304	HFM-77-304-BBA	ModBus TCP/IP	BOOL	DIGITAL		40002	14	TRIP	OK				R	
4	125	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 supply fan trip	HFM-77-304	HFM-77-304-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	15	TRIP	OK				R	
4	126	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 compressor trip	HCO-77-302	HCO-77-302-TRP	ModBus TCP/IP	BOOL	DIGITAL		40003	0	TRIP	OK				R	
4	127	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 high pressure alarm	HCO-77-302	HCO-77-302-HPA	ModBus TCP/IP	BOOL	DIGITAL		40003	1	TRIP	OK				R	
4	128	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 low pressure alarm	HCO-77-302	HCO-77-302-LPA	ModBus TCP/IP	BOOL	DIGITAL		40003	2	TRIP	OK				R	-
4	129	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 condenser fan trip	HFM-77-307/308	HFM-77-307/308-TRP	ModBus TCP/IP	BOOL	DIGITAL		40003	3	TRIP	OK				R	-
4	130	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 condenser fan VSD fault	HFM-77-307/308	HFM-77-307/308-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40003	4	TRIP	OK				R	
4	131	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 filter clogged	HHU-77006	HHU-77006-FC	ModBus TCP/IP	BOOL	DIGITAL		40003	5	CLOGGED	OK				R	
4	132	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 electrical heater Protection termostate	HSS-77-305	HSS-77-305-TSPH	ModBus TCP/IP	BOOL	DIGITAL		40003	6	TRIP	OK				R	
4	133	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 electrical heater trip	HSS-77-305	HSS-77-305-TRP	ModBus TCP/IP	BOOL	DIGITAL		40003	7	TRIP	OK				R	
4	134	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 electrical heater modulation fault	HSS-77-305	HSS-77-305-MF	ModBus TCP/IP	BOOL	DIGITAL		40003	8	TRIP	OK				R	
4	135	123A90-1724000049HV-PID-00041	Modbus TCP/IP	Spare			ModBus TCP/IP	BOOL	DIGITAL		40003	9						R	
4	136	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 main braker open	HHU-77006	HHU-77006-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40003	10	TRIP	OK				R	
4	137	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77007 Not Close	HFD-77007	HFD-77007-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40003	11	FAULT	OK				R	
4	138	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77007 Not Open	HFD-77007	HFD-77007-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40003	12	FAULT	OK				R	
4	139	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77008 Not Close	HFD-77008	HFD-77008-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40003	13	FAULT	OK				R	
4	140	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77008 Not Open	HFD-77008	HFD-77008-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40003	14	FAULT	OK				R	

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
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HVAC ModBUs Signal

Rev	Item	P&ID	PLC 1 / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE				READ (R) WRITE (W)	
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN		MAX			
4	141	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77009 Not Close	HFD-77009	HFD-77009-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40003	15	FAULT	OK						R	
4	142	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77009 Not Open	HFD-77009	HFD-77009-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40004	0	FAULT	OK						R	
4	143	123A90-1724000049HV-PID-00041	Modbus TCP/IP	Modbus Server Error	B300-HSB-001	B300-HSB-001-MSE	ModBus TCP/IP	BOOL	DIGITAL		40004	1	FAULT	OK						R	
4	144	123A90-1724000049HV-PID-00041	Modbus TCP/IP	ModbusFault	B300-HSB-001	B300-HSB-001-MODBUSF	ModBus TCP/IP	BOOL	DIGITAL		40004	2	FAULT	OK						R	
4	145	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 press fan low pressure	HHU-77006	HHU-77006-PFFC	ModBus TCP/IP	BOOL	DIGITAL		40004	3	FAULT	OK						R	
4	146	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77010 Not Close	HFD-77010	HFD-77010-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40004	4	FAULT	OK						R	
4	147	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77010 Not Open	HFD-77010	HFD-77010-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40004	5	FAULT	OK						R	
4	148	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77011 Not Close	HFD-77011	HFD-77011-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40004	6	FAULT	OK						R	
4	149	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFD-77011 Not Open	HFD-77011	HFD-77011-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40004	7	FAULT	OK						R	
4	150	123A90-1724000049HV-PID-00041	Modbus TCP/IP	77-TT-301 Fault	77-TT-301	77-TT-301-F	ModBus TCP/IP	BOOL	DIGITAL		40004	8	FAULT	OK						R	
4	151	123A90-1724000049HV-PID-00041	Modbus TCP/IP	77-TT-302 Fault	77-TT-302	77-TT-302-F	ModBus TCP/IP	BOOL	DIGITAL		40004	9	FAULT	OK						R	
4	152	123A90-1724000049HV-PID-00041	Modbus TCP/IP	77-TT-303 Fault	77-TT-303	77-TT-303-F	ModBus TCP/IP	BOOL	DIGITAL		40004	10	FAULT	OK						R	
4	153	123A90-1724000049HV-PID-00041	Modbus TCP/IP	77-TT-304 Fault	77-TT-304	77-TT-304-F	ModBus TCP/IP	BOOL	DIGITAL		40004	11	FAULT	OK						R	
4	154	123A90-1724000049HV-PID-00041	Modbus TCP/IP	77-PT-301 Fault	77-PT-301	77-PT-301-F	ModBus TCP/IP	BOOL	DIGITAL		40004	12	FAULT	OK						R	
4	155	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40004	13								R	
4	156	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40004	14								R	
4	157	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40004	15								R	
4	158	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	0								R	
4	159	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	1								R	
4	160	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	2								R	
4	161	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	3								R	
4	162	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	4								R	
4	163	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	5								R	
4	164	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	6								R	
4	165	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	7								R	
4	166	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	8								R	
4	167	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HVAC System Major Fault	B300-HSB-001	B300-HSB-001-MF	ModBus TCP/IP	BOOL	DIGITAL		40005	9	FAULT	OK						R	
4	168	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	10								R	
4	169	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	11								R	
4	170	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	12								R	
4	171	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	13								R	
4	172	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	14								R	
4	173	123A90-1724000049HV-PID-00041	Modbus TCP/IP	SPARE		R	ModBus TCP/IP	BOOL	DIGITAL		40005	15								R	
4	174	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 STATUS	HHU-77005	HHU-77005-S	ModBus TCP/IP	INT	DIGITAL		40006				NA					R	1=AVAILABLE 2=RUN 3=FAULT
4	175	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 STATUS	HHU-77006	HHU-77006-S	ModBus TCP/IP	INT	DIGITAL		40007				NA					R	1=AVAILABLE 2=RUN 3=FAULT
4	176	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHS-77-007/8/9 STATUS	HHS-77-007/8/9	HHS-77-007/8/9-S	ModBus TCP/IP	INT	DIGITAL		40008				NA					R	1=AVAILABLE 2=RUN 3=FAULT
4	177	123A90-1724000049HV-PID-00041	Modbus TCP/IP	B300 Medium Internal Temperature	B300-HSB-001	B300-HSB-001-MT	ModBus TCP/IP	INT	DIGITAL		40009				NA					R	DIVIDE THE NUMBER BY TEN TO GET THE CORRECT VALUE
4	178	123A90-1724000049HV-PID-00041	Modbus TCP/IP	System Start From PCS	B300-HSB-001	B300-HSB-001-SSTART	ModBus TCP/IP	BOOL	DIGITAL		40010		START	NONE	°C					W	SART SIGNAL FROM PCS
4	179	123A90-1724000049HV-PID-00041	Modbus TCP/IP	System Stop From PCS	B300-HSB-001	B300-HSB-001-SSTOP	ModBus TCP/IP	BOOL	DIGITAL		40011		STOP	NONE	NA					W	STOP SIGNAL FROM PCS
4	180	123A90-1724000049HV-PID-00041	Modbus TCP/IP	B300 Internal Pressure	B300-HSB-001	B300-HSB-001-MP	ModBus TCP/IP	INT	DIGITAL		40012				Pa					R	DIVIDE THE NUMBER BY TEN TO GET THE CORRECT VALUE
4	181	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFM-77-301 Percentage of Capacity Utilisation	B300-HSB-001	B300-HSB-001-HFM1P	ModBus TCP/IP	INT	DIGITAL		40013									R	
4	182	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HFM-77-303 Percentage of Capacity Utilisation	B300-HSB-001	B300-HSB-001-HFM2P	ModBus TCP/IP	INT	DIGITAL		40014									R	
4	183	123A90-1724000049HV-PID-00041	Modbus TCP/IP	System Reset Fault	B300-HSB-001	B300-HSB-001-SR	ModBus TCP/IP	BOOL	DIGITAL		40015		RESET	NONE						W	SIGNAL FOR RESET ALARM
4	184	123A90-1724000049HV-PID-00041	Modbus TCP/IP	WatchDog	B300-HSB-001	B300-HSB-001-WD	ModBus TCP/IP	BOOL	DIGITAL		40016									W	PULSATING HIGH/LOW SIGNAL WITH FREQUENCI UNDER 15S
5	185	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77005 SELECTOR STATUS	B300-HSB-001	B300-HSB-001-SS	ModBus TCP/IP	INT	ANALOG		40017				NA					R	1= AUTO 2= MANUAL 3=OFF
5	186	123A90-1724000049HV-PID-00041	Modbus TCP/IP	HHU-77006 SELECTOR STATUS	B300-HSB-001	B300-HSB-002-SS	ModBus TCP/IP	INT	ANALOG		40018				NA					R	1= AUTO 2= MANUAL 3=OFF

Base Load Power Hub (BLPH)

B-400 HVAC I/O LIST - E&I SHELTERS

Document Number:1724000049-HV-LIS-00054

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	04/02/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
05	28/01/2025	Issue for Information (IFI)	M.G.	O.A.	C.A.
04	19/12/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
03	11/11/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
02	17/10/2024	Issue for Information (IFI)	M.G.	O.A.	C.A.
01	28/06/2024	Issue for Information (IFI)	F.M.	S.S.	M.G.
00	07/06/2024	Issue for Information (IFI)	F.M.	S.S.	M.G.

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2	Table of Contents	X	X	X	X	X	X		
3	Revision / Change Log	X	X	X	X	X	X		
4	I/O List	X	X	X	X	X	X		
5	I/O List	X	X	X	X	X	X		
6	I/O List	X	X	X	X	X	X		
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Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)
01	ISSUE FOR INFORMATION (IFI)
02	ISSUE FOR INFORMATION (IFI)
03	ISSUE FOR INFORMATION (IFI)
04	ISSUE FOR INFORMATION (IFI)
05	ISSUE FOR INFORMATION (IFI)

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
Document Titel:	B-400 HVAC IO LIST - E&I SHELTERS	Sh. 4 of 7 28/01/2025 Rev: 5

Rev	Item	P&ID	PLC I / O	Service Description	Terminal Block I/O	SIGNAL TAG	Equipment	IO Type	Location		Logic State		Range		E.U.	Alarms				Ex	Red	Mon	Signal Type	Power	Note
									From	To	State 0	State 1	Min	Max		LL	L	H	HH						
Outside system signals																									
3	1	123A90-1724000049HV-PID-00042	I 0,0	SHUT DOWN	XC - 500 / 501	77-XS-004	B400-HSB-001	DI	SIS	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From SIS, Free voltage contact for HVAC system
3	2	123A90-1724000049HV-PID-00042	Q 0,0	HVAC CRITICAL FAULT	XC - 502 / 503	77XA-004	B400-HSB-001	DO	HVAC UCP	SIS	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for SIS system
3	4	123A90-1724000049HV-PID-00042	I 7,2	F&G DAMPER HDF-77012 CLOSE SIGNAL	XFD/S - 800 / 801	77-ZSL-012	HDF-77012	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	5	123A90-1724000049HV-PID-00042	I 7,4	F&G DAMPER HDF-77013 CLOSE SIGNAL	XFD/S - 804 / 805	77-ZSL-013	HDF-77013	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	6	123A90-1724000049HV-PID-00042	I 7,6	F&G DAMPER HDF-77014 CLOSE SIGNAL	XFD/S - 808 / 809	77-ZSL-014	HDF-77014	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	7	123A90-1724000049HV-PID-00042	I 8,1	F&G DAMPER HDF-77015 CLOSE SIGNAL	XFD/S - 812 / 813	77-ZSL-015	HDF-77015	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
3	8	123A90-1724000049HV-PID-00042	I 8,3	F&G DAMPER HDF-77016 CLOSE SIGNAL	XFD/S - 816 / 817	77-ZSL-016	HDF-77016	DO	HVAC UCP	F&G	NOT CLOSE	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		24 Vdc From HVAC & Lighting Panel, Free voltage contact for F&G system
HVAC system signals																									
4	9	123A90-1724000049HV-PID-00042	I0,2	MAIN BRAKER TRIP			B400-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	10	123A90-1724000049HV-PID-00042	I0,3	AUTOMATIC MODE			HHU-77007	DI	HVAC UCP	HVAC UCP	NOT AUTOMATIC	AUTOMATIC	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	11	123A90-1724000049HV-PID-00042	I0,4	AUTOMATIC MODE			HHU-77008	DI	HVAC UCP	HVAC UCP	NOT AUTOMATIC	AUTOMATIC	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	12	123A90-1724000049HV-PID-00042	AI 0,0	TEMPERATURE TRASMITTER 1			77-TT-401	AI	77-TT-401	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20 Ma		
4	13	123A90-1724000049HV-PID-00042	AI 0,1	TEMPERATURE TRASMITTER 2			77-TT-402	AI	77-TT-402	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20 Ma		
4	14	123A90-1724000049HV-PID-00042	AI 0,2	DIFFERNTIAL PRESSURE TRASMITTER			77-PT-401	AI	77-PT-401	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20 Ma		
4	15	123A90-1724000049HV-PID-00042	AI 0,3	TEMPERATURE TRASMITTER 3			77-TT-403	AI	77-TT-403	HVAC UCP	-	-	-10	60	°C	-	-	-	-	-	-	-	4-20 Ma		
4	16	123A90-1724000049HV-PID-00042	AI 1,0	TEMPERATURE TRASMITTER 4			77-TT-404	AI	77-TT-404	HVAC UCP	-	-	0	500	Pa	-	-	-	-	-	-	-	4-20 Ma		
4	17	123A90-1724000049HV-PID-00042	I 0,5	PANEL EMERGENCY POWER BUTTON			HPB-77-403	DI	HPB-77-403	HVAC UCP	ALARM	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	18	123A90-1724000049HV-PID-00042	I 0,6	MODULE LIGHT TRIP			B400-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	19	123A90-1724000049HV-PID-00042	I 0,7	MODULE SOCKET TRIP			B400-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	20	123A90-1724000049HV-PID-00042	I 1,0	SPACE HEATER TRIP			HSS-77010/11/12	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	21	123A90-1724000049HV-PID-00042	I 1,1	SPACE HEATER START FEEDBACK			HSS-77010/11/12	DI	HVAC UCP	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	22	123A90-1724000049HV-PID-00042	Q0,2	SPACE HEATER ASTART COMMAND			HSS-77010/11/12	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24V DC		
4	23	123A90-1724000049HV-PID-00042	I 1,4	AUX SECTION TRIP			B400-HSB-001	DI	HVAC UCP	HVAC UCP	NORMAL	TRIP	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	24	123A90-1724000049HV-PID-00042	Q1,2	RESET CONTACT			B400-HSB-001	DO	HVAC UCP	HVAC UCP	NORMAL	RESET	-	-	-	-	-	-	-	-	-	-	24V DC		
4	25	123A90-1724000049HV-PID-00042	I 6,7	MANUAL MODE			HHU-77007	DI	HVAC UCP	HVAC UCP	NOT MANUAL	MANUAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	26	123A90-1724000049HV-PID-00042	I 7,0	MANUAL MODE			HHU-77008	DI	HVAC UCP	HVAC UCP	NOT MANUAL	MANUAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	27	123A90-1724000049HV-PID-00042	I 7,1	HFD-77012 OPEN SIGNAL		77-ZSH-012	HFD-77012	DI	HFD-77012	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	28	123A90-1724000049HV-PID-00042	I 7,2	HFD-77012 CLOSED SIGNAL		77-ZSL-012	HFD-77012	DI	HFD-77012	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	29	123A90-1724000049HV-PID-00042	I 7,3	HFD-77013 OPEN SIGNAL		77-ZSH-013	HFD-77013	DI	HFD-77013	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	30	123A90-1724000049HV-PID-00042	I 7,4	HFD-77013 CLOSED SIGNAL		77-ZSL-013	HFD-77013	DI	HFD-77013	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	31	123A90-1724000049HV-PID-00042	I 7,5	HFD-77014 OPEN SIGNAL		77-ZSH-014	HFD-77014	DI	HFD-77014	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	32	123A90-1724000049HV-PID-00042	I 7,6	HFD-77014 CLOSED SIGNAL		77-ZSL-014	HFD-77014	DI	HFD-77014	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	33	123A90-1724000049HV-PID-00042	I 8.0	HFD-77015 OPEN SIGNAL		77-ZSH-015	HFD-77015	DI	HFD-77015	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	34	123A90-1724000049HV-PID-00042	I 8.1	HFD-77015 CLOSED SIGNAL		77-ZSL-015	HFD-77015	DI	HFD-77015	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	35	123A90-1724000049HV-PID-00042	I 8.2	HFD-77016 OPEN SIGNAL		77-ZSH-016	HFD-77016	DI	HFD-77016	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	36	123A90-1724000049HV-PID-00042	I 8.3	HFD-77016 CLOSED SIGNAL		77-ZSL-016	HFD-77016	DI	HFD-77016	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	37	123A90-1724000049HV-PID-00042	I 9,7	TRIP SIGNAL HEATING CABLE			HHC-77-004	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	38			**UNIT A**																					
4	39	123A90-1724000049HV-PID-00042	Q0,4	HHU-77007 START			HHU-77007	DO	HVAC UCP	HVAC UCP	STOP	START	-	-	-	-	-	-	-	-	-	-	24V DC		
4	40	123A90-1724000049HV-PID-00042	I1,5	MOTORISED DAMPER NOT OPEN			HDZ-77-401/2/3	DI	HHU-77007	HVAC UCP	NORMAL	FAULT	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	41	123A90-1724000049HV-PID-00042	I 1,6	MOTORISED DAMPER CLOSED			HDZ-77-401/2/3	DI	HHU-77007	HVAC UCP	NOT CLOSED	CLOSED	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	42	123A90-1724000049HV-PID-00042	I 1,7	MOTORISED DAMPER OPEN			HDZ-77-401/2/3	DI	HHU-77007	HVAC UCP	NOT OPEN	OPEN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	43	123A90-1724000049HV-PID-00042	Q 0,5	PRESSURIZING FAN UNIT HHU-77007 HEATER			HSS-77-403	DO	HHU-77007	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	24V DC		
4	44	123A90-1724000049HV-PID-00042	I 2,0	PRESSURIZING FAN UNIT HHU-77007 THERMIC PROTECTION			TE-77-401	DI	HHU-77007	HVAC UCP	NORMAL	FAULT	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	45	123A90-1724000049HV-PID-00042	I 2,1	PRESSURIZING FAN UNIT HHU-77007 VSD MALFUNCTION			HFM-77-401	DI	HHU-77007	HVAC UCP	NORMAL	FAULT	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	46	123A90-1724000049HV-PID-00042	AQ 0,0	PRESSURIZING FAN MODULATION			HFM-77-401	AO	HVAC UCP	HHU-77007			4	20mA	-	-	-	-	-	-	-	-	4-20mA		
4	47	123A90-1724000049HV-PID-00042	I 2,2	PRESSURISING FAN TRIP			HFM-77-401	DI	HHU-77007	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	48	123A90-1724000049HV-PID-00042	I 2,3	SUPPLY FAN RUN			HFM-77-402	DI	HHU-77007	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	49	123A90-1724000049HV-PID-00042	I 2,4	SUPPLY FAN BROKEN BELT ALARM			PDSL-77-401	DI	HHU-77007	HVAC UCP	NORMAL	FAULT	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	50	123A90-1724000049HV-PID-00042	I 2,5	SUPPLY FAN TRIP			HFM-77-402	DI	HHU-77007	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	51	123A90-1724000049HV-PID-00042	Q 0,6	COMPRESSOR START			HCO-77-401	DO	HVAC UCP	HHU-77007	STOP	START	-	-	-	-	-	-	-	-	-	-	24V DC		

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Rev	Item	P&ID	PLC I / O	Service Description	Equipment	IO Type	Location		Logic State		Range		E.U.	Alarms				Ex	Red	Mon	Signal Type	Power	Note
							From	To	State 0	State 1	Min	Max		LL	L	H	HH						
4	52	123A90-1724000049HV-PID-00042	I 2,6	COMPRESSOR RUNNING	HCO-77-401	DI	HHU-77007	HVAC UCP	HHU-77007	HVAC UCP	STOP	RUN	-	-	-	-	-	-	-	-	VFC 24 Vdc		
4	53	123A90-1724000049HV-PID-00042	I 2,7	COMPRESSOR TRIP	HCO-77-401	DI	HHU-77007	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	54	123A90-1724000049HV-PID-00042	I 3,0	COMPRESSOR HIGH PRESSURE	PSH-77-401	DI	HHU-77007	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	55	123A90-1724000049HV-PID-00042	I 3,1	COMPRESSOR LOW PRESSURE	PSL-77-401	DI	HHU-77007	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	56	123A90-1724000049HV-PID-00042	I 3,2	CONDENSER FAN TRIP	HFM-77-405/6	DI	HHU-77007	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	57	123A90-1724000049HV-PID-00042	I 3,3	CONDENSER FAN VSD MALFUNCTION	HFM-77-405/6	DI	HHU-77007	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	58	123A90-1724000049HV-PID-00042	I 3,4	FILTER CLOGGED	PDSH-77-401	DI	HHU-77007	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	59	123A90-1724000049HV-PID-00042	I 3,5	ELECTRICAL HEATE RTHERMOSTATE TRIP	HSS-77-401	DI	HHU-77007	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	60	123A90-1724000049HV-PID-00042	I 3,6	ELECTRICAL HEATER TRIP	HSS-77-401	DI	HHU-77007	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	61	123A90-1724000049HV-PID-00042	AQ 0,2	ELECTRICAL HEATER MODULATION	HSS-77-401	AO	HVAC UCP	HVAC UCP	-	-	4	20mA									4-20mA		
4	62	123A90-1724000049HV-PID-00042	I 3,7	ELECTRICAL HEATER MODULATION FAULT	HSS-77-401	DI	HHU-77007	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	63	123A90-1724000049HV-PID-00042	I 4,0	EMERGENCY STOP BUTTON	HPB-77-401	DI	HHU-77007	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	64	123A90-1724000049HV-PID-00042	I 4,1	SECTION HHU-77007 MAIN BRAKER OPEN	B400-HSB-001	DI	HVAC UCP	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	65	123A90-1724000049HV-PID-00042	I 0,1	PRESSURIZING FAN LOW PRESSURE	PDSL-77-402	DI	HHU-77007	HVAC UCP	NORMAL	CLOGGED											VFC 24 Vdc		
4	66			UNIT B																			-
4	67	123A90-1724000049HV-PID-00042	Q 0,7	HHU-77008 START	HHU-77008	DO	HHU-77008	HVAC UCP	STOP	START	-	-			-	-	-	-	-	-	24V DC		-
4	68	123A90-1724000049HV-PID-00042	I 4,2	MOTORISED DAMPER NOT OPEN	HDZ-77-404/5/6	DI	HHU-77008	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	69	123A90-1724000049HV-PID-00042	I 4,3	MOTORISED DAMPER CLOSED	HDZ-77-404/5/6	DI	HHU-77008	HVAC UCP	NOT CLOSED	CLOSED	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	70	123A90-1724000049HV-PID-00042	I 4,4	MOTORISED DAMPER OPEN	HDZ-77-404/5/6	DI	HHU-77008	HVAC UCP	NOT OPEN	OPEN	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	71	123A90-1724000049HV-PID-00042	Q 1,0	PRESSURIZING FAN UNIT HHU-77008 HEATER	HSS-77-407	DO	HHU-77008	HVAC UCP	STOP	RUN	-	-			-	-	-	-	-	-	24V DC		-
4	72	123A90-1724000049HV-PID-00042	I 4,5	PRESSURIZING FAN UNIT HHU-77008 THERMIC PROTECTION	TE-77-402	DI	HHU-77008	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	73	123A90-1724000049HV-PID-00042	I 4,6	PRESSURIZING FAN UNIT HHU-77008 VSD MALFUNCTION	HFM-77-403	DI	HHU-77008	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	74	123A90-1724000049HV-PID-00042	AQ 0,1	PRESSURIZING FAN MODULATION	HFM-77-403	AO	HVAC UCP	HHU-77008			4	20mA			-	-	-	-	-	-	4-20mA		-
4	75	123A90-1724000049HV-PID-00042	I 4,7	PRESSURISING FAN TRIP	HFM-77-403	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	76	123A90-1724000049HV-PID-00042	I 5,0	SUPPLY FAN RUN	HMF-77-404	DI	HHU-77008	HVAC UCP	STOP	RUN	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	77	123A90-1724000049HV-PID-00042	I 5,1	SUPPLY FAN BROKEN BELT ALARM	PDSL-77-402	DI	HHU-77008	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	78	123A90-1724000049HV-PID-00042	I 5,2	SUPPLY FAN TRIP	HMF-77-404	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	79	123A90-1724000049HV-PID-00042	Q 1,1	COMPRESSOR START	HCO-77-402	DO	HHU-77008	HVAC UCP	STOP	START	-	-			-	-	-	-	-	-	24V DC		-
4	80	123A90-1724000049HV-PID-00042	I 5,3	COMPRESSOR RUNNING	HCO-77-402	DI	HHU-77008	HVAC UCP	STOP	RUN	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	81	123A90-1724000049HV-PID-00042	I 5,4	COMPRESSOR TRIP	HCO-77-402	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	82	123A90-1724000049HV-PID-00042	I 5,5	COMPRESSOR HIGH PRESSURE	PSH-77-402	DI	HHU-77008	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	83	123A90-1724000049HV-PID-00042	I 5,6	COMPRESSOR LOW PRESSURE	PSL-77-402	DI	HHU-77008	HVAC UCP	NORMAL	FAULT	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	84	123A90-1724000049HV-PID-00042	I 5,7	CONDENSER FAN TRIP	HFM-77-407/8	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-			-	-	-	-	-	-	VFC 24 Vdc		-
4	85	123A90-1724000049HV-PID-00042	I 6,0	CONDENSER FAN VSD MALFUNCTION	HFM-77-407/8	DI	HHU-77008	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	86	123A90-1724000049HV-PID-00042	I 6,1	FILTER CLOGGED	PDSH-77-403	DI	HHU-77008	HVAC UCP	NORMAL	FAULT	-	-									VFC 24 Vdc		
4	87	123A90-1724000049HV-PID-00042	I 6,2	ELECTRICAL HEATE RTHERMOSTATE TRIP	TSH/HH-77-402	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	88	123A90-1724000049HV-PID-00042	I 6,3	ELECTRICAL HEATER TRIP	HSS-77-405	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	89	123A90-1724000049HV-PID-00042	AQ 0,3	ELECTRICAL HEATER MODULATION	HSS-77-405	AO	HHU-77008	HVAC UCP	TRIP	NORMAL	4	20mA									4-20mA		
4	90	123A90-1724000049HV-PID-00042	I 6,4	ELECTRICAL HEATER MODULATION FAULT	HSS-77-405	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-									VFC 24 Vdc		
4	91	123A90-1724000049HV-PID-00042	I6,5	EMERGENCY STOP BUTTON	HPB-77-402	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	92	123A90-1724000049HV-PID-00042	I6,6	SECTION HHU-77008 MAIN BRAKER OPEN	B400-HSB-001	DI	HHU-77008	HVAC UCP	TRIP	NORMAL	-	-	-	-	-	-	-	-	-	-	VFC 24 Vdc		-
4	93	123A90-1724000049HV-PID-00042	I 7,7	PRESSURIZING FAN LOW PRESSURE	PDSL-77-404	DI	HHU-77008	HVAC UCP	NORMAL	CLOGGED	-	-									VFC 24 Vdc		

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HVAC ModBUs Signal

Rev	Item	P&ID	PLC I / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE				READ (R) WRITE (W)	
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN		MAX			
4	94	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40001	0								R	
4	95	123A90-1724000049HV-PID-00042	Modbus TCP/IP	B400-HSB-100 Main Braker Trip	B400-HSB-001	B400-HSB-001-MBT	ModBus TCP/IP	BOOL	DIGITAL		40001	1	TRIP	OK						R	
4	96	123A90-1724000049HV-PID-00042	Modbus TCP/IP	B400-HSB-100 Panel emergency Button	B400-HSB-001	B400-HSB-001-PEB	ModBus TCP/IP	BOOL	DIGITAL		40001	2	TRIP	OK						R	
4	97	123A90-1724000049HV-PID-00042	Modbus TCP/IP	B400-HSB-100 Module Light Trip	B400-HSB-001	B400-HSB-001-MLT	ModBus TCP/IP	BOOL	DIGITAL		40001	3	TRIP	OK						R	
4	98	123A90-1724000049HV-PID-00042	Modbus TCP/IP	B400-HSB-100 Module Socket Trip	B400-HSB-001	B400-HSB-001-MST	ModBus TCP/IP	BOOL	DIGITAL		40001	4	TRIP	OK						R	
4	99	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHS-77-0010/11/12 Space Heater Trip	HHS-77-0010/11/12	HHS-77-0010/11/12-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	5	TRIP	OK						R	
4	100	123A90-1724000049HV-PID-00042	Modbus TCP/IP	B400-HSB-100 Main Panel Aux Section Trip	B400-HSB-001	B400-HSB-001-ATRP	ModBus TCP/IP	BOOL	DIGITAL		40001	6	TRIP	OK						R	
4	101	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHS-77-0010/11/12 Space Heater Fault	HHS-77-0010/11/12	HHS-77-0010/11/12-F	ModBus TCP/IP	BOOL	DIGITAL		40001	7	TRIP	OK						R	
4	102	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 Press Fan Low Pressure	HHU-77007	HHU-77007-PFFC	ModBus TCP/IP	BOOL	DIGITAL		40001	8	TRIP	OK						R	
4	103	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 motorised dampers Fault	HHU-77007	HHU-77007-MDF	ModBus TCP/IP	BOOL	DIGITAL		40001	9	TRIP	OK						R	-
4	104	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 press fan PTC protection	HFM-77-401	HFM-77-401-PTCP	ModBus TCP/IP	BOOL	DIGITAL		40001	10	TRIP	OK						R	-
4	105	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 press fan VSD fault	HFM-77-401	HFM-77-401-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40001	11	TRIP	OK						R	-
4	106	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 press fan trip	HFM-77-401	HFM-77-401-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	12	TRIP	OK						R	-
4	107	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 broken belt alarm	HFM-77-402	HFM-77-402-BBA	ModBus TCP/IP	BOOL	DIGITAL		40001	13	TRIP	OK						R	-
4	108	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 supply fan trip	HFM-77-402	HFM-77-402-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	14	TRIP	OK						R	-
4	109	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 compressor trip	HCO-77-401	HCO-77-401-TRP	ModBus TCP/IP	BOOL	DIGITAL		40001	15	TRIP	OK						R	-
4	110	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 high pressure alarm	HCO-77-401	HCO-77-401-HPA	ModBus TCP/IP	BOOL	DIGITAL		40002	0	TRIP	OK						R	-
4	111	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 low pressure alarm	HCO-77-401	HCO-77-401-LPA	ModBus TCP/IP	BOOL	DIGITAL		40002	1	TRIP	OK						R	-
4	112	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 condenser fan trip	HFM-77-405/406	HFM-77-405/406-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	2	TRIP	OK						R	-
4	113	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 condenser fan VSD fault	HFM-77-405/406	HFM-77-405/406-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40002	3	TRIP	OK						R	-
4	114	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 electrical heater Protection thermostate	HSS-77-401	HSS-77-401-TSPH	ModBus TCP/IP	BOOL	DIGITAL		40002	4	TRIP	OK						R	-
4	115	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 electrical heater trip	HSS-77-401	HSS-77-401-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	5	TRIP	OK						R	-
4	116	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 electrical heater modulation fault	HSS-77-401	HSS-77-401-MF	ModBus TCP/IP	BOOL	DIGITAL		40002	6	TRIP	OK						R	-
4	117	123A90-1724000049HV-PID-00042	Modbus TCP/IP	Spare			ModBus TCP/IP	BOOL	DIGITAL		40002	7								R	-
4	118	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 main braker open	HHU-77007	HHU-77007-MBT	ModBus TCP/IP	BOOL	DIGITAL		40002	8	TRIP	OK						R	-
4	119	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 filter clogged	HHU-77007	HHU-77007-FC	ModBus TCP/IP	BOOL	DIGITAL		40002	9	CLOGGED	OK						R	-
4	120	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 motorise dampers fault	HHU-77008	HHU-77008-MDF	ModBus TCP/IP	BOOL	DIGITAL		40002	10	TRIP	OK						R	-
4	121	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 press fan PTC protection	HFM-77-403	HFM-77-403-PTCP	ModBus TCP/IP	BOOL	DIGITAL		40002	11	TRIP	OK						R	-
4	122	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 press fan VSD fault	HFM-77-403	HFM-77-403-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40002	12	TRIP	OK						R	
4	123	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 press fan trip	HFM-77-403	HFM-77-403-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	13	TRIP	OK						R	
4	124	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 broken belt alarm	HFM-77-404	HFM-77-404-BBA	ModBus TCP/IP	BOOL	DIGITAL		40002	14	TRIP	OK						R	
4	125	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 supply fan trip	HFM-77-404	HFM-77-404-TRP	ModBus TCP/IP	BOOL	DIGITAL		40002	15	TRIP	OK						R	
4	126	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 compressor trip	HCO-77-402	HCO-77-402-TRP	ModBus TCP/IP	BOOL	DIGITAL		40003	0	TRIP	OK						R	
4	127	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 high pressure alarm	HCO-77-402	HCO-77-402-HPA	ModBus TCP/IP	BOOL	DIGITAL		40003	1	TRIP	OK						R	
4	128	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 low pressure alarm	HCO-77-402	HCO-77-402-LPA	ModBus TCP/IP	BOOL	DIGITAL		40003	2	TRIP	OK						R	-
4	129	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 condenser fan trip	HFM-77-407/408	HFM-77-407/408-TRP	ModBus TCP/IP	BOOL	DIGITAL		40003	3	TRIP	OK						R	-
4	130	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 condenser fan VSD fault	HFM-77-407/408	HFM-77-407/408-VSDF	ModBus TCP/IP	BOOL	DIGITAL		40003	4	TRIP	OK						R	
4	131	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 filter clogged	HHU-77008	HHU-77008-FC	ModBus TCP/IP	BOOL	DIGITAL		40003	5	CLOGGED	OK						R	
4	132	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 electrical heater Protection termostate	HSS-77-405	HSS-77-405-TSPH	ModBus TCP/IP	BOOL	DIGITAL		40003	6	TRIP	OK						R	
4	133	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 electrical heater trip	HSS-77-405	HSS-77-405-TRP	ModBus TCP/IP	BOOL	DIGITAL		40003	7	TRIP	OK						R	
4	134	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 electrical heater modulation fault	HSS-77-405	HSS-77-405-MF	ModBus TCP/IP	BOOL	DIGITAL		40003	8	TRIP	OK						R	
4	135	123A90-1724000049HV-PID-00042	Modbus TCP/IP	Spare			ModBus TCP/IP	BOOL	DIGITAL		40003	9								R	
4	136	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 main braker trip	HHU-77008	HHU-77008-MBTRP	ModBus TCP/IP	BOOL	DIGITAL		40003	10	TRIP	OK						R	
4	137	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77012 Not Close	HFD-77012	HFD-77012-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40003	11	FAULT	OK						R	
4	138	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77012 Not Open	HFD-77012	HFD-77012-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40003	12	FAULT	OK						R	
4	139	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77013 Not Close	HFD-77013	HFD-77013-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40003	13	FAULT	OK						R	
4	140	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77013 Not Open	HFD-77013	HFD-77013-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40003	14	FAULT	OK						R	

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-WP4-2023-05	ROSETTI MARINO
Document Titel:	B-400 HVAC IO LIST - E&I SHELTERS	Sh. 7 of 7 28/01/2025 Rev: 5

HVAC ModBUs Signal

Rev	Item	P&ID	PLC I / O	Service Description	EQUIPMENT TAG	SIGNAL TAG	SIGNAL TYPE		SIGNAL TO PCS	MODBUS			STATUS		E.U.	RANGE				READ (R) WRITE (W)	
							PROTOCOL	TYPE		SLAVE ADDRESS	REGISTER	BIT NO.	HIGH - 1	LOW - 0		MIN		MAX			
4	141	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77014 Not Close	HFD-77014	HFD-77014-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40003	15	FAULT	OK						R	
4	142	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77014 Not Open	HFD-77014	HFD-77014-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40004	0	FAULT	OK						R	
4	143	123A90-1724000049HV-PID-00042	Modbus TCP/IP	Modbus Server Error	B400-HSB-001	B400-HSB-001-MSE	ModBus TCP/IP	BOOL	DIGITAL		40004	1	FAULT	OK						R	
4	144	123A90-1724000049HV-PID-00042	Modbus TCP/IP	ModbusFault	B400-HSB-001	B400-HSB-001-MODBUSF	ModBus TCP/IP	BOOL	DIGITAL		40004	2	FAULT	OK						R	
4	145	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 press fan Low Pressure	HHU-77008	HHU-77008-PFFC	ModBus TCP/IP	BOOL	DIGITAL		40004	3	FAULT	OK						R	
4	146	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77015 Not Close	HFD-77015	HFD-77015-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40004	4	FAULT	OK						R	
4	147	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77015 Not Open	HFD-77015	HFD-77015-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40004	5	FAULT	OK						R	
4	148	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77016 Not Close	HFD-77016	HFD-77016-ZSL	ModBus TCP/IP	BOOL	DIGITAL		40004	6	FAULT	OK						R	
4	149	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFD-77016 Not Open	HFD-77016	HFD-77016-ZSH	ModBus TCP/IP	BOOL	DIGITAL		40004	7	FAULT	OK						R	
4	150	123A90-1724000049HV-PID-00042	Modbus TCP/IP	77-TT-401 Fault	77-TT-401	77-TT-401-F	ModBus TCP/IP	BOOL	DIGITAL		40004	8	FAULT	OK						R	
4	151	123A90-1724000049HV-PID-00042	Modbus TCP/IP	77-TT-402 Fault	77-TT-402	77-TT-402-F	ModBus TCP/IP	BOOL	DIGITAL		40004	9	FAULT	OK						R	
4	152	123A90-1724000049HV-PID-00042	Modbus TCP/IP	77-TT-403 Fault	77-TT-403	77-TT-403-F	ModBus TCP/IP	BOOL	DIGITAL		40004	10	FAULT	OK						R	
4	153	123A90-1724000049HV-PID-00042	Modbus TCP/IP	77-TT-404 Fault	77-TT-404	77-TT-404-F	ModBus TCP/IP	BOOL	DIGITAL		40004	11	FAULT	OK						R	
4	154	123A90-1724000049HV-PID-00042	Modbus TCP/IP	77-PT-401 Fault	77-PT-401	77-PT-401-F	ModBus TCP/IP	BOOL	DIGITAL		40004	12	FAULT	OK						R	
4	155	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40004	13								R	
4	156	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40004	14								R	
4	157	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40004	15								R	
4	158	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	0								R	
4	159	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	1								R	
4	160	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	2								R	
4	161	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	3								R	
4	162	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	4								R	
4	163	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	5								R	
4	164	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	6								R	
4	165	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	7								R	
4	166	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	8								R	
4	167	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HVAC System Major Fault	B400-HSB-001	B400-HSB-001-MF	ModBus TCP/IP	BOOL	DIGITAL		40005	9	FAULT	OK						R	
4	168	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	10								R	
4	169	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	11								R	
4	170	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	12								R	
4	171	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	13								R	
4	172	123A90-1724000049HV-PID-00042	Modbus TCP/IP	SPARE			ModBus TCP/IP	BOOL	DIGITAL		40005	14								R	
4	173	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 STATUS	HHU-77007	HHU-77007-S	ModBus TCP/IP	INT	DIGITAL		40006				NA					R	1=AVAILABLE 2=RUN 3=FAULT
4	174	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 STATUS	HHU-77008	HHU-77008-S	ModBus TCP/IP	INT	DIGITAL		40007				NA					R	1=AVAILABLE 2=RUN 3=FAULT
4	175	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHS-77-0010/11/12 STATUS	HHS-77-0010/11/12	HHS-77-0010/11/12-S	ModBus TCP/IP	INT	DIGITAL		40008				NA					R	1=AVAILABLE 2=RUN 3=FAULT
4	176	123A90-1724000049HV-PID-00042	Modbus TCP/IP	B400 Medium Internal Temperature	B400-HSB-001	B400-HSB-001-MT	ModBus TCP/IP	INT	DIGITAL		40009				°C					R	DIVIDE THE NUMBER BY TEN TO GET THE CORRECT VALUE
4	177	123A90-1724000049HV-PID-00042	Modbus TCP/IP	System Start From PCS	B400-HSB-001	B400-HSB-001-SSTART	ModBus TCP/IP	BOOL	DIGITAL		400010		START	NONE	NA					W	SART SIGNAL FROM PCS
4	178	123A90-1724000049HV-PID-00042	Modbus TCP/IP	System Stop From PCS	B400-HSB-001	B400-HSB-001-SSTOP	ModBus TCP/IP	BOOL	DIGITAL		400011		STOP	NONE	Pa					W	STOP SIGNAL FROM PCS
4	179	123A90-1724000049HV-PID-00042	Modbus TCP/IP	B400 Internal Pressure	B400-HSB-001	B400-HSB-001-MP	ModBus TCP/IP	INT	DIGITAL		40012				NA					R	DIVIDE THE NUMBER BY TEN TO GET THE CORRECT VALUE
4	180	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFM-77-401 Percentage of capacity Utilisation	B400-HSB-001	B400-HSB-001-HFM1P	ModBus TCP/IP	INT	DIGITAL		40013				NA					R	
4	181	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HFM-77-403 Percentage of capacity Utilisation	B400-HSB-001	B400-HSB-001-HFM2P	ModBus TCP/IP	INT	DIGITAL		40014				NA					R	
4	182	123A90-1724000049HV-PID-00042	Modbus TCP/IP	System Reset Fault	B400-HSB-001	B300-HSB-001-SR	ModBus TCP/IP	BOOL	DIGITAL		40015		RESET	NONE	NA					W	SIGNAL FOR RESET ALARM
4	183	123A90-1724000049HV-PID-00042	Modbus TCP/IP	WatchDog	B400-HSB-001	B300-HSB-001-WD	ModBus TCP/IP	BOOL	DIGITAL		40016				NA					W	PULSATING HIGH/LOW SIGNAL WITH FREQUENCI UNDER 15S
5	184	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77007 SELECTOR STATUS	B400-HSB-001	B400-HSB-001-SS	ModBus TCP/IP	INT	ANALOG		40017				NA					R	1= AUTO 2= MANUAL 3=OFF
5	185	123A90-1724000049HV-PID-00042	Modbus TCP/IP	HHU-77008 SELECTOR STATUS	B400-HSB-001	B400-HSB-002-SS	ModBus TCP/IP	INT	ANALOG		40018				NA					R	1= AUTO 2= MANUAL 3=OFF

Base Load Power Hub (BLPH)

MATERIAL DATA BOOK (MDB) Index

Document Number: 1724000049-QC-LIS-00059

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
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NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
ROSETTI MARINO SpA Quality Control Dept.	09/07/2024

Note: please reply to CRS sent to you by our DC

Rev.	Date	Description	Prepared	Reviewed	Approved
01	14/06/2024	Accepted for Construction (AFC)	AD	SK	CA
0	20/05/2024	Issue for Review (IFR)	AD	SK	CA

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Rev.	Description
0	Issue for Review (IFR)
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1	
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None

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

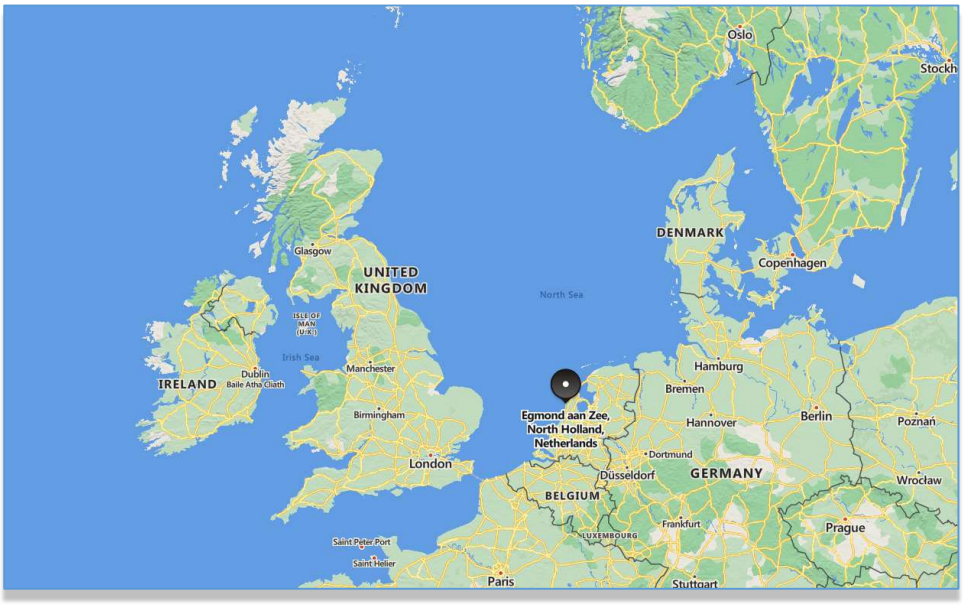


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

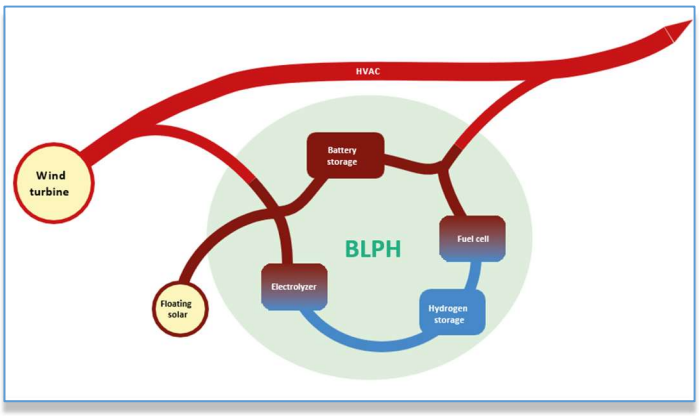


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document was created as a guideline in organizing the MRB in a structured and coherent way. It offers a framework for the preparation process, ensuring everyone the necessary criteria are met precisely.
This procedure applies to the supply of base load materials and equipment
Power Hub (BLPH) project for Crosswind. Outlines the steps and requirements needed for creation and submission of the Material Data Book (MDB) to ensure compliance with project specifications and quality standards.
This procedure does not apply to bulk supplies for which only material certificates are required.

2.1 REFERENCES

Doc. No.	Description
23A90-PML-QHSE-QP-00002	PROJECT QUALITY PLAN

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
VENDOR OR SUPPLIER	Any organization employed by Rosetti Marino to supply either products or services
MDB	Material Data Book

Table 2 - Definitions and Abbreviations

3 MANUFACTURING DATA RECORD INDEX

3.1 PART 1 – DESIGN DOSSIER

This section includes an in-depth collection of all design data, drawings and "As Built" documents.

documents.The documents are divided into subcategories as follows.

The documents listed below serve as examples and do not constitute a comprehensive list of requirements:

- List:
  - Documents register
  - Cables List
  - Load List
  - Electrical components List and DS
  - HVAC Components List and DS
  - HVAC IO List

- Diagrams
  - Structural Calculation
  - Interconnecting Wiring Diagrams
  - General Arrangement
  - Computer Systems Architectural Diagrams.

- Drawings :

  - General arrangement drawings
  - Foundation Drawing
  - Detailed drawings
  - HVAC and Lighting Panel Wiring Drawing and General Arrangement (Incl. Interconnecting)
  - Detail shop drawings (excluding detailed machining drawings).

- Project Procedures and Specification :

  - Project Management –
  - Engineering –
  - Procurement/Supply
  - Construction
  - Manufacturing and Testing procedures
  - Installation -Transportation
  - Commissioning Procedure
  - HVAC Syst Description (Management Logics)
  - Start-Up

- Piping Classes :

- Calculation Notes :

  - HVAC Calculation Report (incl. HVAC SYS Clc and Heat Dissipation Calc)
  - PID

- Equipment requisitions :
- Data Sheets :

3.2 PART 2 – CERTIFICATION DOSSIER

This section encompasses a thorough compilation of all Quality Records documents

It contains all evidence certifying that the required quality level has been attained (e.g., all Certifying Authority Reports/Certificates).
The documents are to be organized by "discipline section" as outlined in Part 1.
Documents should be sub-categorized as follows.
The documents listed below serve as examples and do not constitute a comprehensive list of requirements

- Acceptance :

  - Derogations and queries registers with signed copies
  - Internal and External Inspection certificates/reports (Vendors)
  - Conformity with technical specification certificates
  - Acceptance qualifications list (equipment/construction)
  - Documents confirming

- Manufacturing and testing Recor :

  - Authorities and Third parties' acceptance and release certificates/reports
  - Materials certificates (including consumables, such as electrodes and paint)
  - Warranty Surveyor's certificates.
  - Quality Control plan /Inspection & test Plan / Inspection Reports
  - Marking drawings and associated traceability
  - Non-Destructive Testing certificates/reports
  - Non-Destructive Testing procedure
  - Dimensional control certificates/reports
  - Painting certificates
  - NCR's and Waivers reports
  - Welding and preheating book/procedures
  - Painting procedures
  - Compliance with CE Marking, ATEX, and PED requirements as relevant to the scope of supply.
  - Relevant equipment Design IRCs (where applicable)
  - Pressure & Function Test Reports
  - FAT Procedure

- Test Record :

- Test records included any qualification testing that has been performed when applicable.
- Production test result records.
- Mechanical Completion records
- FAT reports

4 DESIGN DOSSIER

4.1.1 LIST

Contractor Document Number	Title	Notes

4.1.2 DIAGRAMS

Contractor Document Number	Title	Notes

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4.1.3 DRAWINGS

Contractor Document Number	Title	Notes

4.1.4 PROJECT PROCEDURE AND SPECIFICATION

Contractor Document Number	Title	Notes

4.1.5 PIPING CLASSES

Contractor Document Number	Title	Notes

4.1.6 CALCULATION NOTES

Contractor Document Number	Title	Notes

4.1.7 EQUIPMENT REQUISITIONS

Contractor Document Number	Title	Notes

4.1.8 DATA SHEETS

Contractor Document Number	Title	Notes

5 CERTIFICATION DOSSIER

5.1.1 ACCEPTANCE

Contractor Document Number	Title	Notes

5.1.2 MANUFACTURING AND TESTING RECORD

Contractor Document Number	Title	Notes

5.1.3 TEST RECORD

Contractor Document Number	Title	Notes

Base Load Power Hub (BLPH)

HVAC System

Commissioning and Start-Up and 2 Year Spares List

Document Number: 123A90-1724000049-COM-LIS-00060

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NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
C.Giunchi	04/07/2025

Document Class: 3

00	26/02/2025	Issue for information (IFI)	A.T.	O.A.	C.A.
Rev.	Date	Description	Prepared	Reviewed	Approved

ALEXSISTEMI spa

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SH.	DESCRIPTION	REVISIONS							
		00							
1	Cover	X							
2	Table of Contents	X							
3	Commissioning Spare Parts List	X							
4	2 Years Spare Parts List	X							

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sheet 3 of 4 Date : 26/02/2025 Rev: 0
Document Title:	**HVAC System** **Commissioning and Start-Up and 2 Year Spares List**	**Commissioning**

Pos	Codice/Code	Descrizione/Description	Rif./Ref.	Qtà/Qty	Costo unit./Unit price	Costo tot./Tot. price
	B100					
1	592x592x48	Air filter G4		2	€ 84.36	€ 168.72
2	592x592x48	Air filter F7		2	€ 252.08	€ 504.16
	B200					
3	592x592x48	Air filter G4		2	€ 84.36	€ 168.72
4	592x592x48	Air filter F7		2	€ 252.08	€ 504.16
	B300					
5	592x592x48	Air filter G4		2	€ 84.36	€ 168.72
6	288x593x48	Air filter G4		2	€ 84.36	€ 168.72
7	592x592x48	Air filter F7		2	€ 252.08	€ 504.16
8	288x593x48	Air filter F7		2	€ 199.53	€ 399.06
9	A47	Fan belt		2	€ 84.36	€ 168.72
	B400					
10	592x592x48	Air filter G4		2	€ 84.36	€ 168.72
11	288x593x48	Air filter G4		2	€ 84.36	€ 168.72
12	592x592x48	Air filter F7		2	€ 252.08	€ 504.16
13	288x593x48	Air filter F7		2	€ 199.53	€ 399.06
14	A47	Fan belt		2	€ 84.36	€ 168.72
					TOTAL PAGE €	***€ 2.586.42***

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sheet 4 of 4 Date : 26/02/2025 Rev: 0
Document Title:	HVAC System Commissioning and Start-Up and 2 Year Spares List	2 Year Spare Parts

Pos	Codice/Code	Descrizione/Description	Rif./Ref.	Qtà/Qty	Costo unit./Unit price	Costo tot./Tot. price
	B100					
1	592x592x48	Air filter G4		16	€ 84.36	€ 1.349.76
2	592x592x48	Air filter F7		16	€ 252.08	€ 4.033.28
3	DA03S220S	Damper actuator		1	€ 790.41	€ 790.41
4	PS 600	Pressure switch		2	€ 217.29	€ 434.58
5	RM280	Fan with motor		1	€ 2.156.96	€ 2.156.96
6	55340240040	Relay 24v DC		5	€ 84.36	€ 421.80
7	6SL3210-5BE22-2CV0	2,2 Kw Inverter		1	€ 1.540.96	€ 1.540.96
8	GRP-H-25-48-D-1-0000	Static power slave unit		1	€ 629.96	€ 629.96
9	GRM-H-25-48-AN-OL-00000	Static power master unit		1	€ 1.002.13	€ 1.002.13
10	6ES7155-6BH01-0BA0	Digital imput module		1	€ 447.55	€ 447.55
11	6ES7132-6BH01-0BA0	Digital output module		1	€ 494.07	€ 494.07
12	6ES7134-6HD01-0BA1	Analog input module		1	€ 804.76	€ 804.76
13	6ES7513-1RM03-0BA0	CPU 1513-R		1	€ 6.273.83	€ 6.273.83
14	5SY7410-7	Circuit braker 400v 15kA 10A		1	€ 319.34	€ 319.34
15	3RV2011-1EA10	Circuit braker for motor protection 2,8 / 4 A		1	€ 199.53	€ 199.53
	B200					
16	592x592x48	Air filter G4		16	€ 84.36	€ 1.349.76
17	592x592x48	Air filter F7		16	€ 252.08	€ 4.033.28
18	DA03S220S	Damper actuator		1	€ 790.41	€ 790.41
19	PS 600	Pressure switch		2	€ 217.29	€ 434.58
20	RM280	Fan with motor		1	€ 2.156.96	€ 2.156.96
21	55340240040	Relay 24v DC		5	€ 84.36	€ 421.80
22	6SL3210-5BE22-2CV0	2,2 Kw Inverter		1	€ 1.540.96	€ 1.540.96
23	GRP-H-25-48-D-1-0000	Static power slave unit		1	€ 629.96	€ 629.96
24	GRM-H-25-48-AN-OL-00000	Static power master unit		1	€ 1.002.13	€ 1.002.13
25	6ES7155-6BH01-0BA0	Digital imput module		1	€ 447.55	€ 447.55
26	6ES7132-6BH01-0BA0	Digital output module		1	€ 494.07	€ 494.07
27	6ES7134-6HD01-0BA1	Analog input module		1	€ 804.76	€ 804.76
28	6ES7513-1RM03-0BA0	CPU 1513-R		1	€ 6.273.83	€ 6.273.83
29	5SY7410-7	Circuit braker 400v 15kA 10A		1	€ 319.34	€ 319.34
30	3RV2011-1EA10	Circuit braker for motor protection 2,8 / 4 A		1	€ 199.53	€ 199.53
	B300					
31	592x592x48	Air filter G4		16	€ 84.36	€ 1.349.76
32	288x593x48	Air filter G4		16	€ 84.36	€ 1.349.76
33	592x592x48	Air filter F7		16	€ 252.08	€ 4.033.28
34	288x593x48	Air filter F7		16	€ 199.53	€ 3.192.48
35	DA03S220S	Damper actuator		2	€ 790.41	€ 1.580.82
36	PS 600	Pressure switch		4	€ 217.29	€ 869.16
37	55340240040	Relay 24v DC		5	€ 84.36	€ 421.80
38	5.53482E+11	Relay 230V AC		10	€ 84.36	€ 843.60
39	DTMSMM1	Temporrized relay		4	€ 163.08	€ 652.32
40	6SL3210-5BE15-5CV0	0,55kW Inverter		1	€ 1.112.48	€ 1.112.48
41	6SL3210-5BE21-1CV0	1,1kW Inverter		1	€ 1.275.33	€ 1.275.33
42	GRP-H-25-48-D-1-0000	Static power slave unit		1	€ 629.96	€ 629.96
43	GRM-H-25-48-AN-OL-00000	Static power master unit		1	€ 1.002.13	€ 1.002.13
44	6ES7155-6BH01-0BA0	Digital imput module		1	€ 447.55	€ 447.55
45	6ES7132-6BH01-0BA0	Digital output module		1	€ 494.07	€ 494.07
46	6ES7134-6HD01-0BA1	Analog input module		1	€ 804.76	€ 804.76
47	6ES7513-1RM03-0BA0	CPU 1513-R		1	€ 6.273.83	€ 6.273.83
48	5SY7410-7	Circuit braker 400v 15kA 10A		1	€ 319.34	€ 319.34
49	3RV2011-1AA10	Circuit braker for motor protection 1,1 / 1,6 A		1	€ 199.53	€ 199.53
50	3RV2011-1GA10	Circuit braker for motor protection 4,5 / 6,3 A		1	€ 199.53	€ 199.53
51	3RV2011-1JA10	Circuit braker for motor protection 7 / 10 A		1	€ 234.80	€ 234.80
52	3RT2015-1AP01	Power contactor 230V		1	€ 144.29	€ 144.29
53	A47	Fan belt		8	€ 84.36	€ 674.88
54	C-SBN453H8G	Compressor		1	€ 1.775.04	€ 1.775.04
55	T3A 100LB4	Supply fan motor		1	€ 1.194.28	€ 1.194.28
56	SR454T	Condenser fan		1	€ 2.727.31	€ 2.727.31
	B400					
57	592x592x48	Air filter G4		16	€ 84.36	€ 1.349.76
58	288x593x48	Air filter G4		16	€ 84.36	€ 1.349.76
59	592x592x48	Air filter F7		16	€ 252.08	€ 4.033.28
60	288x593x48	Air filter F7		16	€ 199.53	€ 3.192.48
61	DA03S220S	Damper actuator		2	€ 790.41	€ 1.580.82
62	PS 600	Pressure switch		4	€ 217.29	€ 869.16
63	55340240040	Relay 24v DC		5	€ 84.36	€ 421.80
64	5.53482E+11	Relay 230V AC		10	€ 84.36	€ 843.60
65	DTMSMM1	Temporrized relay		4	€ 163.08	€ 652.32
66	6SL3210-5BE15-5CV0	0,55kW Inverter		1	€ 1.112.48	€ 1.112.48
67	6SL3210-5BE21-1CV0	1,1kW Inverter		1	€ 1.275.33	€ 1.275.33
68	GRP-H-25-48-D-1-0000	Static power slave unit		1	€ 629.96	€ 629.96
69	GRM-H-25-48-AN-OL-00000	Static power master unit		1	€ 1.002.13	€ 1.002.13
70	6ES7155-6BH01-0BA0	Digital imput module		1	€ 447.55	€ 447.55
71	6ES7132-6BH01-0BA0	Digital output module		1	€ 494.07	€ 494.07
72	6ES7134-6HD01-0BA1	Analog input module		1	€ 804.76	€ 804.76
73	6ES7513-1RM03-0BA0	CPU 1513-R		1	€ 6.273.83	€ 6.273.83
74	5SY7410-7	Circuit braker 400v 15kA 10A		1	€ 319.34	€ 319.34
75	3RV2011-1AA10	Circuit braker for motor protection 1,1 / 1,6 A		1	€ 199.53	€ 199.53
76	3RV2011-1GA10	Circuit braker for motor protection 4,5 / 6,3 A		1	€ 199.53	€ 199.53
77	3RV2011-1BA10	Circuit braker for motor protection 14 / 20 A		1	€ 199.53	€ 199.53
78	3RT2015-1AP01	Power contactor 230V		1	€ 144.29	€ 144.29
79	A47	Fan belt		8	€ 84.36	€ 674.88
80	C-SBN753H8H	Compressor		1	€ 2.727.31	€ 2.727.31
81	T3A 100LB4	Supply fan motor		1	€ 1.194.28	€ 1.194.28
82	SR454T	Condenser fan		1	€ 2.727.31	€ 2.727.31
					TOTAL PAGE €	***€ 110.319.02***

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VENDOR ASSET TAG REGISTER

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1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. PERFETTO	**27/08/2025**

Rev.	Date	Description	Prepared	Reviewed	Approved
01	30/05/2025	Accepted for Construction (AFC)	T.A.	A.O.	A.C.
00	08/04/2025	Issue for Review (IFR)	T.A.	A.O.	A.C.

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1	Cover	X	X						
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4 - 6	VENDOR ASSET TAG REGISTER	X	X						

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Revision / Change Log

Rev.	Description
00	ISSUED FOR REVIEW (IFR)
01	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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CROSSWIND

Document Title:

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

VENDOR ASSET TAG REGISTER
E&I SHELTERS E&I SHELTERS

ROSETTI MARINO

Date: 30/05/2025
Rev. 01

Item	Tag Number	Tag Description	Class Name	Physical Class Name	Parent Tag	P&ID	P.O.	Vendor	Manufacturer	Model Type Catalogue Number	Serial Number	Model Part No	Hazardous Area Equip Relevant	Hazardous Area Classification	3D Location	Hazardous Area Certificate Standard	Hazardous Area Certifying Authority	ATEX Certificate Number	3D Object	Diagram	Installation Zone	Vendor Reference Document	Layout Drawing	Datasheet	Assembly/Dimensional Drawing	General Arrangement	Operating & Maintenance Manual	Wiring Diagram	Spare Part List	Lubricant Document Reference	Criticality	Remarks	Linked 2D	Linked 3D
1	77-HDZ-001	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77001	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
2	77-HDZ-002	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77002	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
3	77-HDZ-003	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77003	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
4	77-HDZ-004	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77004	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
5	77-HDZ-005	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77005	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
6	77-HDZ-006	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77006	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
7	77-HDZ-007	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77007	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
8	77-HDZ-008	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77008	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
9	77-HDZ-009	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77009	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
10	77-HDZ-010	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77010	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
11	77-HDZ-011	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77011	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
12	77-HDZ-012	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77012	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
13	77-HDZ-013	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77013	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
14	77-HDZ-014	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77014	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
15	77-HDZ-015	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77015	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
16	77-HDZ-016	F&G Damper close signal - Electrical Actuator	Limit switch closed	Instrument	HFD-77016	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SCHISCHEK	InMax	N.A.	15-BF	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
17	B-100	Shelter HV-MV (66 kV / 6,6 kV) Switchroom B-100	Shelter	Shelter	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Alex-Sistemi	176-24X B-100	N.A.	B-100	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-MD-LIS-00001	1724000049-AR-DA-00014	N.A.	1724000049-AR-DD-00018	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	N.A.	N/A	False	False
18	B100-HSB-001	HVAC panels & Lighting & SP - HV Room	HVAC Panel	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	FRIGOTERMICA	B100-HSB-001	N.A.	N.A.	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-DA-00026 B-100 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
19	B-200	Shelter LV (400V) Switchroom B-200	Shelter	Shelter	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Alex-Sistemi	176-24X B-200	N.A.	B-200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-MD-LIS-00001	1724000049-AR-DA-00015	N.A.	1724000049-AR-DD-00019	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	N.A.	N/A	False	False
20	B200-HSB-001	HVAC panels & Lighting & SP - LV Room	HVAC Panel	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	FRIGOTERMICA	B200-HSB-001	N.A.	N.A.	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-DA-00027 B-200 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
21	B-300	Shelter AC UPS Fitted with UPS System Equipment Room B-300	Shelter	Shelter	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRIGOTERMICA	176-24X B-300	N.A.	B-300	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-MD-LIS-00001	1724000049-AR-DA-00016	N.A.	1724000049-AR-DD-00020	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	N.A.	N/A	False	False
22	B300-HSB-001	HVAC panels & Lighting & SP- UPS Room	HVAC Panel	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRIGOTERMICA	B300-HSB-001	N.A.	N.A.	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-DA-00028 B-300 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
23	B-400	I&T Equipment Room B-400	Shelter	Shelter	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRIGOTERMICA	176-24X B-400	N.A.	B-400	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-MD-LIS-00001	1724000049-AR-DA-00017	N.A.	1724000049-AR-DD-00021	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	N.A.	N/A	False	False
24	B400-HSB-001	HVAC panels & Lighting & SP - ITER	HVAC Panel	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRIGOTERMICA	B400-HSB-001	N.A.	N.A.	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-DA-00029 B-400 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
25	CELS-B100H-F1-L1-01	Lighting Push Button inside HV Room	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SCAME	Protecta	N.A.	1.375.012	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
26	CELS-B100H-F1-L1-02	Lighting Push Button inside HV Room	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SCAME	Protecta	N.A.	1.375.012	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
27	CELS-B200H-F1-L1-01	Lighting Push Button inside LV Room	ElectricalLightingEquipment	ElectricalLightingEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SCAME	Protecta	N.A.	1.375.012	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20123 - Lighting & Socket Layout - LV Switchroom	1724000049-AR-DA-00015	1724000049-EL-LIS-00044	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
28	CELS-B200H-F1-L1-02	Lighting Push Button inside LV Room	ElectricalLightingEquipment	ElectricalLightingEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SCAME	Protecta	N.A.	1.375.012	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20123 - Lighting & Socket Layout - LV Switchroom	1724000049-AR-DA-00015	1724000049-EL-LIS-00044	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
29	CELS-B300H-F1-L1-01	Lighting Push Button inside UPS Room	ElectricalLightingEquipment	ElectricalLightingEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCAME	Protecta	N.A.	1.375.012	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20124 - Lighting & Socket Layout - UPS & Battery Switchroom	1724000049-AR-DA-00016	1724000049-EL-LIS-00045	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
30	CELS-B300H-F1-L1-02	Lighting Push Button inside UPS Room	ElectricalLightingEquipment	ElectricalLightingEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCAME	Protecta	N.A.	1.375.012	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20124 - Lighting & Socket Layout - UPS & Battery Switchroom	1724000049-AR-DA-00016	1724000049-EL-LIS-00045	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
31	CELS-B400H-F1-L1-01	Lighting Push Button inside UPS Room	ElectricalLightingEquipment	ElectricalLightingEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCAME	Protecta	N.A.	1.375.012	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20124 - Lighting & Socket Layout - UPS & Battery Switchroom	1724000049-AR-DA-00016	1724000049-EL-LIS-00045	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
32	CELS-B400H-F1-L1-02	Lighting Push Button inside UPS Room	ElectricalLightingEquipment	ElectricalLightingEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCAME	Protecta	N.A.	1.375.012	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20124 - Lighting & Socket Layout - UPS & Battery Switchroom	1724000049-AR-DA-00016	1724000049-EL-LIS-00045	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
33	PECW-B100H-F1-L1-01	Blindo 1	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SCHNEIDER Electric	KBB25ED42305W	N.A.	KBB25ED42305W	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
34	PELF-B100H-F1-L1-01	Lamp (E) 1	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-07	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
35	PELF-B100H-F1-L1-02	Lamp 2	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
36	PELF-B100H-F1-L1-03	Lamp 3	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
37	PECW-B100H-F1-L1-02	Blindo 2	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SCHNEIDER Electric	KBB40ED42203W	N.A.	KBB40ED42203W	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
38	PELF-B100H-F1-L1-04	Lamp 4	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
39	PELF-B100H-F1-L1-05	Lamp 5	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
40	PELF-B100H-F1-L1-06	Lamp 6	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
41	PELF-B100H-F1-L1-07	Lamp (E) 2	ElectricalLightingEquipment	ElectricalLightingEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-07	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20122 - Lighting & Socket Layout - HV Switchroom	1724000049-AR-DA-00014	1724000049-EL-LIS-00043	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
42	PECW-B200H-F1-L1-01	Blindo	ElectricalLightingEquipment	ElectricalLightingEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SCHNEIDER Electric	KBB25ED42305W	N.A.	KBB25ED42305W	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
43	PELF-B200H-F1-L1-01	Lamp (E) 2	ElectricalLightingEquipment	ElectricalLightingEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-07	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
44	PELF-B200H-F1-L1-02	Lamp 1	ElectricalLightingEquipment	ElectricalLightingEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
45	PELF-B200H-F1-L1-03	Lamp 3	ElectricalLightingEquipment	ElectricalLightingEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
46	PECW-B300H-F1-L1-01	Blindo	ElectricalLightingEquipment	ElectricalLightingEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SCHNEIDER Electric	KBB25ED42305W	N.A.	KBB25ED42305W	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20124 - Lighting & Socket Layout - UPS & Battery Switchroom	1724000049-AR-DA-00016	1724000049-EL-LIS-00045	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
47	PELF-B300H-F1-L1-01	Lamp (E) 2	ElectricalLightingEquipment	ElectricalLightingEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-07	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20124 - Lighting & Socket Layout - UPS & Battery Switchroom	1724000049-AR-DA-00016	1724000049-EL-LIS-00045	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
48	PELF-B300H-F1-L1-02	Lamp 1	ElectricalLightingEquipment	ElectricalLightingEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20124 - Lighting & Socket Layout - UPS & Battery Switchroom	1724000049-AR-DA-00016	1724000049-EL-LIS-00045	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
49	PELF-B300H-F1-L1-03	Lamp 3	ElectricalLightingEquipment	ElectricalLightingEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20124 - Lighting & Socket Layout - UPS & Battery Switchroom	1724000049-AR-DA-00016	1724000049-EL-LIS-00045	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
50	PECW-B400H-F1-L1-01	Blindo	ElectricalLightingEquipment	ElectricalLightingEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SCHNEIDER Electric	KBB25ED42305W	N.A.	KBB25ED42305W	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
51	PELF-B400H-F1-L1-01	Lamp (E) 2	ElectricalLightingEquipment	ElectricalLightingEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-07	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
52	PELF-B400H-F1-L1-02	Lamp 1	ElectricalLightingEquipment	ElectricalLightingEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
53	PELF-B400H-F1-L1-03	Lamp 3	ElectricalLightingEquipment	ElectricalLightingEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DISANO	Echo	N.A.	164704-00	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
54	E-MCT-101	MCT S 6X2 AISI316	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-EL-LIS-00043	1724000049-AR-DD-00018	1724000049-AR-DD-00018	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
55	E-MCT-102	MCT S 6X2 AISI316	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-EL-LIS-00043	1724000049-AR-DD-00018	1724000049-AR-DD-00018	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
56	E-MCT-103	MCT S 6X2 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-EL-LIS-00043	1724000049-AR-DD-00018	1724000049-AR-DD-00018	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
57	E-MCT-104	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-EL-LIS-00043	1724000049-AR-DD-00018	1724000049-AR-DD-00018	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
58	E-MCT-105	MCT S 6X2 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-EL-LIS-00043	1724000049-AR-DD-00018	1724000049-AR-DD-00018	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
59	E-MCT-106	MCT S 6X2 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-EL-LIS-00043	1724000049-AR-DD-00018	1724000049-AR-DD-00018	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
60	I-MCT-101	MCT S 4X2 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-EL-LIS-00043	1724000049-AR-DD-00018	1724000049-AR-DD-00018	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
61	I-MCT-102	MCT S 4X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S4X1	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-HV-LIS-00047	1724000049-AR-DD-00018	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
62	I-MCT-103	MCT S 4X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S4X1	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-HV-LIS-00047	1724000049-AR-DD-00018	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
63	H-MCT-101	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-HV-LIS-00047	1724000049-AR-DD-00018	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
64	H-MCT-102	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00018	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00018	1724000049-HV-LIS-00047	1724000049-AR-DD-00018	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
65	E-MCT-201	MCT S-6X4 PRIMED-60	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S6X4	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-EL-LIS-00044	1724000049-AR-DD-00019	1724000049-AR-DD-00019	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
66	E-MCT-202	MCT S 6X2 AISI316	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-EL-LIS-00044	1724000049-AR-DD-00019	1724000049-AR-DD-00019	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
67	E-MCT-203	MCT S 6X2 AISI316	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-EL-LIS-00044	1724000049-AR-DD-00019	1724000049-AR-DD-00019	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
68	E-MCT-204	MCT S 6X2 PRIMED-60	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-EL-LIS-00044	1724000049-AR-DD-00019	1724000049-AR-DD-00019	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
69	E-MCT-205	MCT S 6X2 AISI316	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-EL-LIS-00044	1724000049-AR-DD-00019	1724000049-AR-DD-00019	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
70	E-MCT-206	MCT S 6X2 AISI316	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-EL-LIS-00044	1724000049-AR-DD-00019	1724000049-AR-DD-00019	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
71	I-MCT-201	MCT S 4X2 PRIMED	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S4X2	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-HV-LIS-00048	1724000049-AR-DD-00019	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
72	I-MCT-202	MCT S 4X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S4X1	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-HV-LIS-00048	1724000049-AR-DD-00019	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
73	I-MCT-203	MCT S 4X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S4X1	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-HV-LIS-00048	1724000049-AR-DD-00019	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
74	H-MCT-201	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-HV-LIS-00048	1724000049-AR-DD-00019	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
75	H-MCT-202	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00019	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00019	1724000049-HV-LIS-00048	1724000049-AR-DD-00019	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
76	E-MCT-301	MCT S 6X1 PRIMED-60	ElectricalEquipment	ElectricalEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00020	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00020	1724000049-EL-LIS-00045	1724000049-AR-DD-00020	1724000049-AR-DD-00020	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
77	E-MCT-302	MCT S 6X2 PRIMED-60	ElectricalEquipment	ElectricalEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00020	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00020	1724000049-EL-LIS-00045	1724000049-AR-DD-00020	1724000049-AR-DD-00020	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
78	I-MCT-301	MCT S 4X2 PRIMED	ElectricalEquipment	ElectricalEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	ROXTEC	S4X2	N.A.	1724000049-AR-DD-00020	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00020	1724000049-HV-LIS-00049	1724000049-AR-DD-00020	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
79	I-MCT-302	MCT S 4X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	ROXTEC	S4X1	N.A.	1724000049-AR-DD-00020	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00020	1724000049-HV-LIS-00049	1724000049-AR-DD-00020	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
80	I-MCT-303	MCT S 4X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	ROXTEC	S4X1	N.A.	1724000049-AR-DD-00020	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00020	1724000049-HV-LIS-00049	1724000049-AR-DD-00020	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
81	H-MCT-301	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00020	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00020	1724000049-HV-LIS-00049	1724000049-AR-DD-00020	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
82	H-MCT-302	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00020	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00020	1724000049-HV-LIS-00049	1724000049-AR-DD-00020	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
83	E-MCT-401	MCT S 6X1 PRIMED-60	ElectricalEquipment	ElectricalEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00021	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00021	1724000049-EL-LIS-00046	1724000049-AR-DD-00021	1724000049-AR-DD-00021	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
84	E-MCT-402	MCT S 6X2 PRIMED-60	ElectricalEquipment	ElectricalEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	ROXTEC	S6X2	N.A.	1724000049-AR-DD-00021	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00021	1724000049-EL-LIS-00046	1724000049-AR-DD-00021	1724000049-AR-DD-00021	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
85	I-MCT-401	MCT S 6X6 PRIMED	ElectricalEquipment	ElectricalEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	ROXTEC	S6X6	N.A.	1724000049-AR-DD-00021	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00021	1724000049-HV-LIS-00050	1724000049-AR-DD-00021	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
86	I-MCT-402	MCT S 4X2 PRIMED	ElectricalEquipment	ElectricalEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	ROXTEC	S4X2	N.A.	1724000049-AR-DD-00021	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00021	1724000049-HV-LIS-00050	1724000049-AR-DD-00021	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
87	I-MCT-403	MCT S 6X3 PRIMED	ElectricalEquipment	ElectricalEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	ROXTEC	S6X3	N.A.	1724000049-AR-DD-00021	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00021	1724000049-HV-LIS-00050	1724000049-AR-DD-00021	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
88	H-MCT-401	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00021	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00021	1724000049-HV-LIS-00050	1724000049-AR-DD-00021	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
89	H-MCT-402	MCT S 6X1 PRIMED	ElectricalEquipment	ElectricalEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	ROXTEC	S6X1	N.A.	1724000049-AR-DD-00021	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	123A90-DDL-EL-DL-20115 - Electrical MCT Layout-Lower Deck	1724000049-AR-DD-00021	1724000049-HV-LIS-00050	1724000049-AR-DD-00021	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	N.A.	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
90	HFD-77001	B-100 Fire Damper	Fire damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
91	HFD-77002	B-100 Fire Damper	Fire damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
92	HFD-77003	B-100 Fire Damper	Fire damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
93	HFD-77004	B-200 Fire Damper	Fire damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
94	HFD-77005	B-200 Fire Damper	Fire damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
95	HFD-77006	B-200 Fire Damper	Fire damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
96	HFD-77007	B-300 Fire Damper	Fire damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
97	HFD-77008	B-300 Fire Damper	Fire damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
98	HFD-77009	B-300 Fire Damper	Fire damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
99	HFD-77010	B-300 Fire Damper	Fire damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
100	HFD-77011	B-300 Fire Damper	Fire damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
101	HFD-77012	B-400 Fire Damper	Fire damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
102	HFD-77013	B-400 Fire Damper	Fire damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
103	HFD-77014	B-400 Fire Damper	Fire damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
104	HFD-77015	B-400 Fire Damper	Fire damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
105	HFD-77016	B-400 Fire Damper	Fire damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SagiCofim	Solas A0	N.A.	Solas A fram 220mm	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
106	77-TT-101	B-100 Temperature Transmitter	Temperature Transmitter	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
107	77-TT-102	B-100 Temperature Transmitter	Temperature Transmitter	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
108	77-TT-103	B-100 Temperature Transmitter	Temperature Transmitter	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
109	77-TT-104	B-100 Temperature Transmitter	Temperature Transmitter	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
110	77-TT-201	B-200 Temperature Transmitter	Temperature Transmitter	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
111	77-TT-202	B-200 Temperature Transmitter	Temperature Transmitter	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
112	77-TT-203	B-200 Temperature Transmitter	Temperature Transmitter	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
113	77-TT-204	B-200 Temperature Transmitter	Temperature Transmitter	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
114	77-TT-301	B-300 Temperature Transmitter	Temperature Transmitter	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
115	77-TT-302	B-300 Temperature Transmitter	Temperature Transmitter	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
116	77-TT-303	B-300 Temperature Transmitter	Temperature Transmitter	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
117	77-TT-304	B-300 Temperature Transmitter	Temperature Transmitter	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
118	77-TT-401	B-400 Temperature Transmitter	Temperature Transmitter	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
119	77-TT-402	B-400 Temperature Transmitter	Temperature Transmitter	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
120	77-TT-403	B-400 Temperature Transmitter	Temperature Transmitter	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
121	77-TT-404	B-400 Temperature Transmitter	Temperature Transmitter	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Trafag	DTP	N.A.	8180	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
122	77-PT-101	B-100 Differential Pressure Transmitter	Differential Pressure Transmitter	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Alex-Sistemi	SDT	N.A.	HAA1BFNNN2N	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
123	77-PT-201	B-200 Differential Pressure Transmitter	Differential Pressure Transmitter	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Alex-Sistemi	SDT	N.A.	HAA1BFNNN2N	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
124	77-PT-301	B-300 Differential Pressure Transmitter	Differential Pressure Transmitter	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Alex-Sistemi	SDT	N.A.	HAA1BFNNN2N	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
125	77-PT-401	B-400 Differential Pressure Transmitter	Differential Pressure Transmitter	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Alex-Sistemi	SDT	N.A.	HAA1BFNNN2N	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
126	HDR-77-101	B-100 Pressure Relief Damper	Pressure Relief Damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SagiCofim	GP	N.A.	100KC-C	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
127	HDR-77-201	B-200 Pressure Relief Damper	Pressure Relief Damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SagiCofim	GP	N.A.	100KC-C	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
128	HDR-77-301	B-300 Pressure Relief Damper	Pressure Relief Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SagiCofim	GP	N.A.	100KC-C	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
129	HDR-77-401	B-400 Pressure Relief Damper	Pressure Relief Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SagiCofim	GP	N.A.	100KC-C	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
130	HHS-77-001	B-100 Space Heater	Space Heater	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
131	HHS-77-002	B-100 Space Heater	Space Heater	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
132	HHS-77-003	B-100 Space Heater	Space Heater	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
133	HHS-77-004	B-200 Space Heater	Space Heater	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
134	HHS-77-005	B-200 Space Heater	Space Heater	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
135	HHS-77-006	B-200 Space Heater	Space Heater	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
136	HHS-77-007	B-300 Space Heater	Space Heater	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
137	HHS-77-008	B-300 Space Heater	Space Heater	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
138	HHS-77-009	B-300 Space Heater	Space Heater	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
139	HHS-77-010	B-400 Space Heater	Space Heater	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
140	HHS-77-011	B-400 Space Heater	Space Heater	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
141	HHS-77-012	B-400 Space Heater	Space Heater	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Kraemer&Kraus	RRH	N.A.	TR 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
142	HDN-77-101	B-100 Non Return Damper	Non Return Damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	FranceAir	SPG	N.A.	400X200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
143	HDN-77-102	B-100 Non Return Damper	Non Return Damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	FranceAir	SPG	N.A.	400X200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
144	HDN-77-201	B-200 Non Return Damper	Non Return Damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	FranceAir	SPG	N.A.	400X200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
145	HDN-77-202	B-200 Non Return Damper	Non Return Damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	FranceAir	SPG	N.A.	400X200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
146	HDN-77-301	B-300 Non Return Damper	Non Return Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FranceAir	SPG	N.A.	400X200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
147	HDN-77-302	B-300 Non Return Damper	Non Return Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FranceAir	SPG	N.A.	400X200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
148	HDN-77-401	B-400 Non Return Damper	Non Return Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FranceAir	SPG	N.A.	400X200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
149	HDN-77-402	B-400 Non Return Damper	Non Return Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FranceAir	SPG	N.A.	400X200	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
150	HDB-77-101	B-100 Volume Control Damper	Volume Control Damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Europair	DL	N.A.	101	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
151	HDB-77-201	B-200 Volume Control Damper	Volume Control Damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Europair	DL	N.A.	101	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
152	HDB-77-301	B-300 Volume Control Damper	Volume Control Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Europair	DL	N.A.	101	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
153	HDB-77-302	B-300 Volume Control Damper	Volume Control Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Europair	DL	N.A.	101	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
154	HDB-77-303	B-300 Volume Control Damper	Volume Control Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Europair	DL	N.A.	101	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
155	HDB-77-401	B-400 Volume Control Damper	Volume Control Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Europair	DL	N.A.	101	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
156	HDB-77-402	B-400 Volume Control Damper	Volume Control Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Europair	DL	N.A.	101	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
157	HDB-77-403	B-400 Volume Control Damper	Volume Control Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Europair	DL	N.A.	101	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
158	HSG-77-101	B-100 Supply Grille	Supply Grille	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
159	HSG-77-102	B-100 Supply Grille	Supply Grille	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
160	HSG-77-201	B-200 Supply Grille	Supply Grille	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
161	HSG-77-202	B-200 Supply Grille	Supply Grille	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
162	HSG-77-301	B-300 Supply Grille	Supply Grille	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
163	HSG-77-302	B-300 Supply Grille	Supply Grille	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
164	HSG-77-303	B-300 Supply Grille	Supply Grille	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
165	HSG-77-401	B-400 Supply Grille	Supply Grille	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
166	HSG-77-402	B-400 Supply Grille	Supply Grille	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
167	HSG-77-403	B-400 Supply Grille	Supply Grille	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Europair	BMAI	N.A.	BMAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
168	HEG-77-101	B-100 Return Grille	Return Grille	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Europair	GRAI	N.A.	GRAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
169	HEG-77-201	B-200 Return Grille	Return Grille	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Europair	GRAI	N.A.	GRAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
170	HEG-77-301	B-300 Return Grille	Return Grille	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Europair	GRAI	N.A.	GRAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
171	HEG-77-401	B-400 Return Grille	Return Grille	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Europair	GRAI	N.A.	GRAI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
172	HHU-77001	Pressurization Fan	Pressurization Fan	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Frigotermica	4112-DMPD-400	N.A.	10kW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
173	HHU-77002	Pressurization Fan	Pressurization Fan	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Frigotermica	4112-DMPD-400	N.A.	10kW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
174	HHU-77003	Pressurization Fan	Pressurization Fan	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Frigotermica	4112-DMPD-300	N.A.	8,5kW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
175	HHU-77004	Pressurization Fan	Pressurization Fan	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Frigotermica	4112-DMPD-300	N.A.	8,5kW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
176	HHU-77005	HVAC Unit	HVAC Unit	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Frigotermica	4112-DMPD-200	N.A.	6kW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
177	HHU-77006	HVAC Unit	HVAC Unit	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Frigotermica	4112-DMPD-200	N.A.	6kW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False

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ROSETTI MARINO

Document Title: VENDOR ASSET TAG REGISTER
E&I SHELTERS E&I SHELTERS

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Rev. 01

Item	Tag Number	Tag Description	Class Name	Physical Class Name	Parent Tag	P&ID	P.O.	Vendor	Manufacturer	Model Type Catalogue Number	Serial Number	Model Part No	Hazardous Area Equip Relevant	Hazardous Area Classification	3D Location	Hazardous Area Certificate Standard	Hazardous Area Certifying Authority	ATEX Certificate Number	3D Object	Diagram	Installation Zone	Vendor Reference Document	Layout Drawing	Datasheet	Assembly/Dimensional Drawing	General Arrangement	Operating & Maintenance Manual	Wiring Diagram	Spare Part List	Lubricant Document Reference	Criticality	Remarks	Linked 2D	Linked 3D
178	HHU-77007	HVAC Unit	HVAC Unit	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Frigotermica	4112-DMPD-100	N.A.	8,6kW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
179	HHU-77008	HVAC Unit	HVAC Unit	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Frigotermica	4112-DMPD-100	N.A.	8,6kW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
180	HCC-77-301	CONDENSING COIL	Condensing Coil	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DBM	P3012COND 4R-45T-550A-2,5PA 5C	N.A.	P3012COND 4R-45T-550A-2,5PA 5C	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
181	HCC-77-302	CONDENSING COIL	Condensing Coil	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DBM	P3012COND 4R-45T-550A-2,5PA 5C	N.A.	P3012COND 4R-45T-550A-2,5PA 5C	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
182	HCC-77-401	CONDENSING COIL	Condensing Coil	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DBM	P3012COND 5R-45T-550A-2,5PA 5C	N.A.	P3012COND 5R-45T-550A-2,5PA 5C	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
183	HCC-77-402	CONDENSING COIL	Condensing Coil	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DBM	P3012COND 5R-45T-550A-2,5PA 5C	N.A.	P3012COND 5R-45T-550A-2,5PA 5C	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	1	N/A	False	False
184	HCF-77-101	CAOLESCENT FILTER	Filter	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Europair	SG41R-X	N.A.	SG41R-X	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
185	HCF-77-102	PLAN FILTER F7	Filter	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	F&F	PFM4-8-23,23	N.A.	PFM4-8-23,23	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
186	HCF-77-103	PLAN FILTER F7	Filter	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	F&F	PFM4-8-23,23	N.A.	PFM4-8-23,23	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
187	HCF-77-104	PLAN FILTER G4	Filter	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	F&F	G4 - FCZ-OS4	N.A.	G4 - FCZ-OS4	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
188	HCF-77-105	PLAN FILTER G4	Filter	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	F&F	G4 - FCZ-OS4	N.A.	G4 - FCZ-OS4	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
189	HCF-77-201	CAOLESCENT FILTER	Filter	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Europair	SG41R-X	N.A.	SG41R-X	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
190	HCF-77-202	PLAN FILTER F7	Filter	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	F&F	PFM4-8-23,23	N.A.	PFM4-8-23,23	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
191	HCF-77-203	PLAN FILTER F7	Filter	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	F&F	PFM4-8-23,23	N.A.	PFM4-8-23,23	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
192	HCF-77-204	PLAN FILTER G4	Filter	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	F&F	G4 - FCZ-OS4	N.A.	G4 - FCZ-OS4	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
193	HCF-77-205	PLAN FILTER G4	Filter	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	F&F	G4 - FCZ-OS4	N.A.	G4 - FCZ-OS4	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
194	HCF-77-301	CAOLESCENT FILTER	Filter	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Europair	SG41R-X	N.A.	SG41R-X	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
195	HCF-77-302	AIR FILTER G4	Filter	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	F&F	G4 - FCZ-OS4	N.A.	G4 - FCZ-OS4	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
196	HCF-77-303	AIR FILTER G4	Filter	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	F&F	G4 - FCZ-OS4	N.A.	G4 - FCZ-OS4	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
197	HCF-77-306	BAG FILTER F8	Filter	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	F&F	PFM-4-6-11,23	N.A.	PFM-4-6-11,23	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
198	HCF-77-308	BAG FILTER F8	Filter	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	F&F	PFM-4-6-11,23	N.A.	PFM-4-6-11,23	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
199	HCF-77-401	CAOLESCENT FILTER	Filter	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Europair	SG41R-X	N.A.	SG41R-X	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
200	HCF-77-402	AIR FILTER G4	Filter	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	F&F	G4 - FCZ-OS4	N.A.	G4 - FCZ-OS4	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
201	HCF-77-403	AIR FILTER G4	Filter	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	F&F	G4 - FCZ-OS4	N.A.	G4 - FCZ-OS4	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
202	HCF-77-405	BAG FILTER F8	Filter	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	F&F	PFM-4-6-11,23	N.A.	PFM-4-6-11,23	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
203	HCF-77-407	BAG FILTER F8	Filter	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	F&F	PFM-4-6-11,23	N.A.	PFM-4-6-11,23	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
204	HCO-77-301	REFRIGERANT COMPRESSOR	Refrigerant Compressor	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Panasonic	Ermetic Scroll compressor	N.A.	Ermetic Scroll compressor	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
205	HCO-77-302	REFRIGERANT COMPRESSOR	Refrigerant Compressor	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Panasonic	Ermetic Scroll compressor	N.A.	Ermetic Scroll compressor	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
206	HCO-77-401	REFRIGERANT COMPRESSOR	Refrigerant Compressor	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Panasonic	Ermetic Scroll compressor	N.A.	Ermetic Scroll compressor	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
207	HCO-77-402	REFRIGERANT COMPRESSOR	Refrigerant Compressor	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Panasonic	Ermetic Scroll compressor	N.A.	Ermetic Scroll compressor	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
208	HDB-77-307	MANUAL VOLUME CONTROL DAMPERS	Manual Volume Control Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 450210	N.A.	DL101/XX/T4 450210	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
209	HDB-77-308	MANUAL VOLUME CONTROL DAMPERS	Manual Volume Control Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 450210	N.A.	DL101/XX/T4 450210	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
210	HDB-77-407	MANUAL VOLUME CONTROL DAMPERS	Manual Volume Control Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 450210	N.A.	DL101/XX/T4 450210	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
211	HDB-77-408	MANUAL VOLUME CONTROL DAMPERS	Manual Volume Control Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 450210	N.A.	DL101/XX/T4 450210	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	4	N/A	False	False
212	HDS-77-101	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 500X510	N.A.	DL101/XX/T4 500X510	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
213	HDS-77-102	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 500X510	N.A.	DL101/XX/T4 500X510	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
214	HDS-77-201	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 500X510	N.A.	DL101/XX/T4 500X510	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
215	HDS-77-202	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 500X510	N.A.	DL101/XX/T4 500X510	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
216	HDS-77-301	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 500X410	N.A.	DL101/XX/T4 500X410	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
217	HDS-77-302	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 300X310	N.A.	DL101/XX/T4 300X310	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
218	HDS-77-303	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 200X210	N.A.	DL101/XX/T4 200X210	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
219	HDS-77-304	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 500X410	N.A.	DL101/XX/T4 500X410	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
220	HDS-77-305	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 300X310	N.A.	DL101/XX/T4 300X310	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
221	HDS-77-306	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 200X210	N.A.	DL101/XX/T4 200X210	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
222	HDS-77-401	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 500X410	N.A.	DL101/XX/T4 500X410	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
223	HDS-77-402	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 300X310	N.A.	DL101/XX/T4 300X310	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
224	HDS-77-403	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 200X210	N.A.	DL101/XX/T4 200X210	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
225	HDS-77-404	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 500X410	N.A.	DL101/XX/T4 500X410	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
226	HDS-77-405	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 300X310	N.A.	DL101/XX/T4 300X310	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
227	HDS-77-406	MOTORIZED DAMPER WITH SPRING RETURN	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	FRANCE AIR	DL101/XX/T4 200X210	N.A.	DL101/XX/T4 200X210	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
228	HDZ-77-101	MOTORIZED DAMPER	Motorized Damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
229	HDZ-77-102	MOTORIZED DAMPER	Motorized Damper	Instrument	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
230	HDZ-77-201	MOTORIZED DAMPER	Motorized Damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
231	HDZ-77-202	MOTORIZED DAMPER	Motorized Damper	Instrument	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
232	HDZ-77-301	MOTORIZED DAMPER	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
233	HDZ-77-302	MOTORIZED DAMPER	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
234	HDZ-77-303	MOTORIZED DAMPER	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
235	HDZ-77-304	MOTORIZED DAMPER	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
236	HDZ-77-305	MOTORIZED DAMPER	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
237	HDZ-77-306	MOTORIZED DAMPER	Motorized Damper	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
238	HDZ-77-401	MOTORIZED DAMPER	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
239	HDZ-77-402	MOTORIZED DAMPER	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
240	HDZ-77-403	MOTORIZED DAMPER	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
241	HDZ-77-404	MOTORIZED DAMPER	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
242	HDZ-77-405	MOTORIZED DAMPER	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
243	HDZ-77-406	MOTORIZED DAMPER	Motorized Damper	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	LUFBERG	DA035220	N.A.	DA035220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
244	HFA-77-101	SUPPLY FAN	Supply Fan	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Moro	RM280	N.A.	RM280	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
245	HFA-77-102	SUPPLY FAN	Supply Fan	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Moro	RM280	N.A.	RM280	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
246	HFA-77-201	SUPPLY FAN	Supply Fan	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Moro	RM280/2	N.A.	RM280/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
247	HFA-77-202	SUPPLY FAN	Supply Fan	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Moro	RM280/2	N.A.	RM280/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
248	HFA-77-301	SUPPLY FAN	Supply Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
249	HFA-77-302	SUPPLY FAN	Supply Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
250	HFA-77-303	SUPPLY FAN	Supply Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
251	HFA-77-304	SUPPLY FAN	Supply Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
252	HFA-77-305	SUPPLY FAN	Supply Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
253	HFA-77-306	SUPPLY FAN	Supply Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
254	HFA-77-307	SUPPLY FAN	Supply Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
255	HFA-77-308	SUPPLY FAN	Supply Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
256	HFA-77-401	SUPPLY FAN	Supply Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
257	HFA-77-402	SUPPLY FAN	Supply Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
258	HFA-77-403	SUPPLY FAN	Supply Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
259	HFA-77-404	SUPPLY FAN	Supply Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
260	HFA-77-405	SUPPLY FAN	Supply Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
261	HFA-77-406	SUPPLY FAN	Supply Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
262	HFA-77-407	SUPPLY FAN	Supply Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
263	HFA-77-408	SUPPLY FAN	Supply Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Nikotra	RDH E2-0250	N.A.	RDH E2-0250	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
264	HFM-77-101	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
265	HFM-77-102	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
266	HFM-77-201	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
267	HFM-77-202	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
268	HFM-77-301	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
269	HFM-77-302	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
270	HFM-77-303	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
271	HFM-77-304	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
272	HFM-77-305	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
273	HFM-77-306	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
274	HFM-77-307	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
275	HFM-77-308	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
276	HFM-77-401	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
277	HFM-77-402	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
278	HFM-77-403	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
279	HFM-77-404	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
280	HFM-77-405	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
281	HFM-77-406	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
282	HFM-77-407	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
283	HFM-77-408	PRESSURIZING FAN	Pressurizing Fan	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Moro	RM250/2	N.A.	RM250/2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
284	HHC-77-001	HEATING CABLE	Heating Cable	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	Etelec	HTC-15P	N.A.	HTC-15P	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
285	HHC-77-002	HEATING CABLE	Heating Cable	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	Etelec	HTC-15P	N.A.	HTC-15P	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
286	HHC-77-003	HEATING CABLE	Heating Cable	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Etelec	HTC-15P	N.A.	HTC-15P	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
287	HHC-77-004	HEATING CABLE	Heating Cable	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Etelec	HTC-15P	N.A.	HTC-15P	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
288	HHS-77-304	SPACE HEATER	Space Heater	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Kraemer & Kraus Warmetchnik GmbH	RRH ST 2000	N.A.	RRH ST 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
289	HHS-77-308	SPACE HEATER	Space Heater	Instrument	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	Kraemer & Kraus Warmetchnik GmbH	RRH ST 2000	N.A.	RRH ST 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
290	HHS-77-404	SPACE HEATER	Space Heater	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Kraemer & Kraus Warmetchnik GmbH	RRH ST 2000	N.A.	RRH ST 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
291	HHS-77-408	SPACE HEATER	Space Heater	Instrument	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	Kraemer & Kraus Warmetchnik GmbH	RRH ST 2000	N.A.	RRH ST 2000	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
292	HPB-77-101	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SIEMENS	3SU1801-0NA00-2AC2	N.A.	3SU1801-0NA00-2AC2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
293	HPB-77-102	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SIEMENS	3SU1801-0NA00-2AC2	N.A.	3SU1801-0NA00-2AC2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
294	HPB-77-103	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	SIEMENS	3SU1001-41HB20-0AA0	N.A.	3SU1001-41HB20-0AA0	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
295	HPB-77-201	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SIEMENS	3SU1801-0NA00-2AC2	N.A.	3SU1801-0NA00-2AC2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
296	HPB-77-202	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SIEMENS	3SU1801-0NA00-2AC2	N.A.	3SU1801-0NA00-2AC2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
297	HPB-77-203	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	SIEMENS	3SU1001-41HB20-0AA0	N.A.	3SU1001-41HB20-0AA0	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
298	HPB-77-301	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SIEMENS	3SU1801-0NA00-2AC2	N.A.	3SU1801-0NA00-2AC2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
299	HPB-77-302	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SIEMENS	3SU1801-0NA00-2AC2	N.A.	3SU1801-0NA00-2AC2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
300	HPB-77-303	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	SIEMENS	3SU1001-41HB20-0AA0	N.A.	3SU1001-41HB20-0AA0	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
301	HPB-77-401	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SIEMENS	3SU1801-0NA00-2AC2	N.A.	3SU1801-0NA00-2AC2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
302	HPB-77-402	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SIEMENS	3SU1801-0NA00-2AC2	N.A.	3SU1801-0NA00-2AC2	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
303	HPB-77-403	EMERGENCY PUSH BUTTON	Emergency Push Button	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	SIEMENS	3SU1001-41HB20-0AA0	N.A.	3SU1001-41HB20-0AA0	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
304	HSS-77-101	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
305	HSS-77-102	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
306	HSS-77-103	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DIAMANTI	FTA 400X310 10KW	N.A.	FTA 400X310 10KW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
307	HSS-77-104	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	DIAMANTI	FTA 400X310 10KW	N.A.	FTA 400X310 10KW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
308	HSS-77-201	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
309	HSS-77-202	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
310	HSS-77-203	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	DIAMANTI	FTA 400X310 8,5KW	N.A.	FTA 400X310 8,5KW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
311	HSS-77-204	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	DIAMANTI	FTA 400X310 8,5KW	N.A.	FTA 400X310 8,5KW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
312	HSS-77-301	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DIAMANTI	FTA 410X500 6KW	N.A.	FTA 410X500 6KW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
313	HSS-77-302	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
314	HSS-77-303	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
315	HSS-77-305	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DIAMANTI	FTA 410X500 6KW	N.A.	FTA 410X500 6KW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
316	HSS-77-306	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
317	HSS-77-307	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
318	HSS-77-401	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DIAMANTI	FTA 410X500 9KW	N.A.	FTA 410X500 9KW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
319	HSS-77-402	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
320	HSS-77-403	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
321	HSS-77-405	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DIAMANTI	FTA 410X500 9KW	N.A.	FTA 410X500 9KW	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
322	HSS-77-406	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
323	HSS-77-407	ELECTRICAL HEATER	Electrical Heater	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	N/A	N/A	N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
324	HSV-77-301	SOLENOID VALVE	Solenoid Valve	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	CASTEL	1078N/M12S	N.A.	1078N/M12S	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
325	HSV-77-302	SOLENOID VALVE	Solenoid Valve	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	CASTEL	1078N/M12S	N.A.	1078N/M12S	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
326	HSV-77-401	SOLENOID VALVE	Solenoid Valve	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	CASTEL	1098N/5S	N.A.	1098N/5S	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
327	HSV-77-402	SOLENOID VALVE	Solenoid Valve	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	CASTEL	1098N/5S	N.A.	1098N/5S	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	2	N/A	False	False
328	PC-77-301	CONDENSING PRESSURE SWITCH	Condensing Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DANFOS	060-117366	N.A.	060-117366	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
329	PC-77-302	CONDENSING PRESSURE SWITCH	Condensing Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DANFOS	060-117366	N.A.	060-117366	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
330	PC-77-401	CONDENSING PRESSURE SWITCH	Condensing Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DANFOS	060-117366	N.A.	060-117366	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
331	PC-77-402	CONDENSING PRESSURE SWITCH	Condensing Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DANFOS	060-117366	N.A.	060-117366	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
332	PDSH-77-301	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE	Differential Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
333	PDSH-77-303	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE	Differential Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
334	PDSH-77-401	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE	Differential Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
335	PDSH-77-403	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE	Differential Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
336	PDSL-77-101	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
337	PDSL-77-102	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
338	PDSL-77-201	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
339	PDSL-77-202	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
340	PDSL-77-301	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
341	PDSL-77-302	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
342	PDSL-77-304	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
343	PDSL-77-401	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
344	PDSL-77-402	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
345	PDSL-77-404	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE	Differential Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
346	PDT-77-101	DIFFERENTIAL PRESSURE SWITCH FOR FILTER	Differential Pressure Switch	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
347	PDT-77-102	DIFFERENTIAL PRESSURE SWITCH FOR FILTER	Differential Pressure Switch	HVACEquipment	B-100	1724000049-HV-PID-00039	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00047	1724000049-HV-PID-00039	1724000049-HV-LIS-00047	1724000049-AR-DA-00014	1724000049-AR-DA-00014	1724000049-MD-MAN-00061	1724000049-HV-DA-00026	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
348	PDT-77-201	DIFFERENTIAL PRESSURE SWITCH FOR FILTER	Differential Pressure Switch	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
349	PDT-77-202	DIFFERENTIAL PRESSURE SWITCH FOR FILTER	Differential Pressure Switch	HVACEquipment	B-200	1724000049-HV-PID-00040	1724000049	Alex Sistemi	PRODUAL	PS600	N.A.	PS600	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00048	1724000049-HV-PID-00040	1724000049-HV-LIS-00048	1724000049-AR-DA-00015	1724000049-AR-DA-00015	1724000049-MD-MAN-00061	1724000049-HV-DA-00027	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
350	PSH-77-301	HIGH PRESSURE SWITCH	Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DANFOSS	KP5	N.A.	KP5	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
351	PSH-77-302	HIGH PRESSURE SWITCH	Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DANFOSS	KP5	N.A.	KP5	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
352	PSH-77-401	HIGH PRESSURE SWITCH	Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DANFOSS	KP5	N.A.	KP5	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
353	PSH-77-402	HIGH PRESSURE SWITCH	Pressure Switch	HVACEquipment	B-400	1724000049-HV-PID-00042	1724000049	Alex Sistemi	DANFOSS	KP5	N.A.	KP5	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00050	1724000049-HV-PID-00042	1724000049-HV-LIS-00050	1724000049-AR-DA-00017	1724000049-AR-DA-00017	1724000049-MD-MAN-00061	1724000049-HV-DA-00029	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False
354	PSL-77-301	LOW PRESSURE SWITCH	Pressure Switch	HVACEquipment	B-300	1724000049-HV-PID-00041	1724000049	Alex Sistemi	DANFOSS	KP1	N.A.	KP1	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1724000049-HV-LIS-00049	1724000049-HV-PID-00041	1724000049-HV-LIS-00049	1724000049-AR-DA-00016	1724000049-AR-DA-00016	1724000049-MD-MAN-00061	1724000049-HV-DA-00028	1724000049-COM-LIS-00060	N.A.	3	N/A	False	False

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355	PTA-77-702	LOW PRESSURE SWITCH	Pressure Switch	HVACEquipment	B-400	1124000649-HYV-PID-00041	124000649	New Screens	HANFOSS	BPI		N.A.	BPI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-IL-00041	1124000649-HYV-PID-00041	1124000649-HYV-DS-00002	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
356	PTA-77-401	LOW PRESSURE SWITCH	Pressure Switch	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	HANFOSS	BPI		N.A.	BPI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-PID-00042	1124000649-HYV-DS-00002	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
357	PTA-77-402	LOW PRESSURE SWITCH	Pressure Switch	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	HANFOSS	BPI		N.A.	BPI	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-PID-00042	1124000649-HYV-DS-00002	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
358	PTH-77-301	HIGH PRESSURE TRASDUCER	Pressure Trasducer	HVACEquipment	B-300	1124000649-HYV-PID-00041	124000649	New Screens	CAREL	SPKT0031C0		N.A.	SPKT0031C0	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00041	1124000649-HYV-IL-00049	1124000649-AR-DA-00016	1124000649-AR-DA-00016	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
359	PTH-77-302	HIGH PRESSURE TRASDUCER	Pressure Trasducer	HVACEquipment	B-300	1124000649-HYV-PID-00041	124000649	New Screens	CAREL	SPKT0031C0		N.A.	SPKT0031C0	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-IL-00049	1124000649-HYV-PID-00041	1124000649-HYV-IL-00049	1124000649-AR-DA-00016	1124000649-AR-DA-00016	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
360	PTH-77-401	HIGH PRESSURE TRASDUCER	Pressure Trasducer	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	CAREL	SPKT0031C0		N.A.	SPKT0031C0	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-PID-00042	1124000649-HYV-DS-00002	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
361	PTH-77-402	HIGH PRESSURE TRASDUCER	Pressure Trasducer	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	CAREL	SPKT0031C0		N.A.	SPKT0031C0	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-PID-00042	1124000649-HYV-DS-00002	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
362	TE-77-101	PRESSURIZING FAN UNIT THERMIC PROTECTION	Pressurizing Fan Unit Thermic Protection	HVACEquipment	B-100	1124000649-HYV-PID-00039	124000649	New Screens	N/A	N/A		N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00039	1124000649-HYV-IL-00047	1124000649-AR-DA-00014	1124000649-AR-DA-00014	1124000649-MAN-00061	1124000649-HYV-DA-00026	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
363	TE-77-102	PRESSURIZING FAN UNIT THERMIC PROTECTION	Pressurizing Fan Unit Thermic Protection	HVACEquipment	B-100	1124000649-HYV-PID-00039	124000649	New Screens	N/A	N/A		N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00039	1124000649-HYV-IL-00047	1124000649-AR-DA-00014	1124000649-AR-DA-00014	1124000649-MAN-00061	1124000649-HYV-DA-00026	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
364	TE-77-201	PRESSURIZING FAN UNIT THERMIC PROTECTION	Pressurizing Fan Unit Thermic Protection	HVACEquipment	B-200	1124000649-HYV-PID-00040	124000649	New Screens	N/A	N/A		N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00040	1124000649-HYV-IL-00048	1124000649-AR-DA-00015	1124000649-AR-DA-00015	1124000649-MAN-00061	1124000649-HYV-DA-00027	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
365	TE-77-202	PRESSURIZING FAN UNIT THERMIC PROTECTION	Pressurizing Fan Unit Thermic Protection	HVACEquipment	B-200	1124000649-HYV-PID-00040	124000649	New Screens	N/A	N/A		N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00040	1124000649-HYV-IL-00048	1124000649-AR-DA-00015	1124000649-AR-DA-00015	1124000649-MAN-00061	1124000649-HYV-DA-00027	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
366	TE-77-301	PRESSURIZING FAN UNIT THERMIC PROTECTION	Pressurizing Fan Unit Thermic Protection	HVACEquipment	B-300	1124000649-HYV-PID-00041	124000649	New Screens	N/A	N/A		N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00041	1124000649-HYV-IL-00049	1124000649-AR-DA-00016	1124000649-AR-DA-00016	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
367	TE-77-302	PRESSURIZING FAN UNIT THERMIC PROTECTION	Pressurizing Fan Unit Thermic Protection	HVACEquipment	B-300	1124000649-HYV-PID-00041	124000649	New Screens	N/A	N/A		N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00041	1124000649-HYV-IL-00049	1124000649-AR-DA-00016	1124000649-AR-DA-00016	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
368	TE-77-401	PRESSURIZING FAN UNIT THERMIC PROTECTION	Pressurizing Fan Unit Thermic Protection	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	N/A	N/A		N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-IL-00050	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00029	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
369	TE-77-402	PRESSURIZING FAN UNIT THERMIC PROTECTION	Pressurizing Fan Unit Thermic Protection	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	N/A	N/A		N.A.	N/A	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-IL-00050	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00029	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
370	TSH-77-101	HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-100	1124000649-HYV-PID-00039	124000649	New Screens	SHIMANTI	TR711-M4G220		N.A.	TR711-M4G220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00039	1124000649-HYV-IL-00047	1124000649-AR-DA-00014	1124000649-AR-DA-00014	1124000649-MAN-00061	1124000649-HYV-DA-00026	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
371	TSH-77-102	HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-100	1124000649-HYV-PID-00039	124000649	New Screens	SHIMANTI	TR711-M4G220		N.A.	TR711-M4G220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00039	1124000649-HYV-IL-00047	1124000649-AR-DA-00014	1124000649-AR-DA-00014	1124000649-MAN-00061	1124000649-HYV-DA-00026	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
372	TSH-77-201	HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-200	1124000649-HYV-PID-00040	124000649	New Screens	SHIMANTI	TR711-M4G220		N.A.	TR711-M4G220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00040	1124000649-HYV-IL-00048	1124000649-AR-DA-00015	1124000649-AR-DA-00015	1124000649-MAN-00061	1124000649-HYV-DA-00027	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
373	TSH-77-202	HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-200	1124000649-HYV-PID-00040	124000649	New Screens	SHIMANTI	TR711-M4G220		N.A.	TR711-M4G220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00040	1124000649-HYV-IL-00048	1124000649-AR-DA-00015	1124000649-AR-DA-00015	1124000649-MAN-00061	1124000649-HYV-DA-00027	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
374	TSH-77-301	HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-300	1124000649-HYV-PID-00041	124000649	New Screens	SHIMANTI	TR711-M4G220		N.A.	TR711-M4G220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00041	1124000649-HYV-IL-00049	1124000649-AR-DA-00016	1124000649-AR-DA-00016	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
375	TSH-77-302	HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-300	1124000649-HYV-PID-00041	124000649	New Screens	SHIMANTI	TR711-M4G220		N.A.	TR711-M4G220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00041	1124000649-HYV-IL-00049	1124000649-AR-DA-00016	1124000649-AR-DA-00016	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
376	TSH-77-401	HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	SHIMANTI	TR711-M4G220		N.A.	TR711-M4G220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-IL-00050	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00029	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
377	TSH-77-402	HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	SHIMANTI	TR711-M4G220		N.A.	TR711-M4G220	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-IL-00050	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00029	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
378	TSHH-77-101	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-100	1124000649-HYV-PID-00039	124000649	New Screens	SHIMANTI	SPDB3-120		N.A.	SPDB3-120	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00039	1124000649-HYV-IL-00047	1124000649-AR-DA-00014	1124000649-AR-DA-00014	1124000649-MAN-00061	1124000649-HYV-DA-00026	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
379	TSHH-77-102	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-100	1124000649-HYV-PID-00039	124000649	New Screens	SHIMANTI	SPDB3-120		N.A.	SPDB3-120	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00039	1124000649-HYV-IL-00047	1124000649-AR-DA-00014	1124000649-AR-DA-00014	1124000649-MAN-00061	1124000649-HYV-DA-00026	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
380	TSHH-77-201	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-200	1124000649-HYV-PID-00040	124000649	New Screens	SHIMANTI	SPDB3-120		N.A.	SPDB3-120	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00040	1124000649-HYV-IL-00048	1124000649-AR-DA-00015	1124000649-AR-DA-00015	1124000649-MAN-00061	1124000649-HYV-DA-00027	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
381	TSHH-77-202	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-200	1124000649-HYV-PID-00040	124000649	New Screens	SHIMANTI	SPDB3-120		N.A.	SPDB3-120	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00040	1124000649-HYV-IL-00048	1124000649-AR-DA-00015	1124000649-AR-DA-00015	1124000649-MAN-00061	1124000649-HYV-DA-00027	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
382	TSHH-77-301	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-300	1124000649-HYV-PID-00041	124000649	New Screens	SHIMANTI	SPDB3-120		N.A.	SPDB3-120	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00041	1124000649-HYV-IL-00049	1124000649-AR-DA-00016	1124000649-AR-DA-00016	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
383	TSHH-77-302	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-300	1124000649-HYV-PID-00041	124000649	New Screens	SHIMANTI	SPDB3-120		N.A.	SPDB3-120	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00041	1124000649-HYV-IL-00049	1124000649-AR-DA-00016	1124000649-AR-DA-00016	1124000649-MAN-00061	1124000649-HYV-DA-00028	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
384	TSHH-77-401	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	SHIMANTI	SPDB3-120		N.A.	SPDB3-120	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-IL-00050	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00029	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False
385	TSHH-77-402	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	Thermostate	HVACEquipment	B-400	1124000649-HYV-PID-00042	124000649	New Screens	SHIMANTI	SPDB3-120		N.A.	SPDB3-120	False	SAFE AREA	N.A.	SAFE AREA	SAFE AREA	SAFE AREA	N.A.	N.A.	SAFE	1124000649-HYV-PID-00042	1124000649-HYV-IL-00050	1124000649-AR-DA-00017	1124000649-AR-DA-00017	1124000649-MAN-00061	1124000649-HYV-DA-00029	1124000640-COM-LS-00000	N.A.	3	N.A.	False	False

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Markup Details	Annotations	Comments
Consolidated Jun 18 11:05 PM Michele Perfetto 27/08/25 16:07:19 (GMT +02:00)	Stamp 19 Jun, 2025 15:35:55 Page: 1	Stamp Template: Vendor template Michele Perfetto 19 Jun, 2025 15:35:55
	Text 19 Jun, 2025 15:36:47 Page: 1	M. PERFETTO Michele Perfetto 19 Jun, 2025 15:36:47
	Text 19 Jun, 2025 15:37:00 Page: 1	27/08/2025 Michele Perfetto 19 Jun, 2025 15:37:00
	Rectangle 19 Jun, 2025 15:38:08 Page: 1	

Base Load Power Hub (BLPH)

E&I SHELTERS
Two Year Spares List

Document Number: 1724000049-COM-LIS-00060

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	15/10/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
01	08/10/2025	Issue for information (IFI)	M. GATTI	M. RONCORONI	C. GIUNCHI
00	26/02/2025	Issue for information (IFI)	A.T.	O.A.	C.A.

ALEXSISTEMI spa

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	E&I SHELTERS Two Year Spares List	Sheet: 2 of 3 Date: 08/10/2025 Rev. 01

Table of Contents

SH.	DESCRIPTION	REVISIONS							
		00	01						
1	Cover	X	X						
2	Table of Contents	X	X						
3	Two Years Spare Parts List	X	X						

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sheet 3 of 3 Date : 08/10/2025 Rev: 01
Document Title:	**E&I SHELTERS** **Two Year Spares List**	**Two Year Spare Parts**

Pos	Codice/Code	Descrizione/Description	Rif./Ref.	Qtà/Qty	Costo unit./Unit price	Costo tot./Tot. price
	MODULE "B100"					
1		First Aid Kit		2		
2		FILTER G4		6		
3		FILTER F7		6		
4		NTERNAL FIXTURE LIGHT		4		
5		CONVENIENCE SOCKET 16A		2		
6		LIGHT SWITCH		2		
7		SINGLE DOOR EXTERNAL HANDLE		2		
8		DOUBLE DOOR EXTERNAL HANDLE		2		
9		DOOR CLOSING PUMP		2		
10						
11						
12						
13						
14						
15						
	MODULE "B200"					
16		First Aid Kit		2		
17		FILTER G4		6		
18		FILTER F7		6		
19		NTERNAL FIXTURE LIGHT		4		
20		CONVENIENCE SOCKET 16A		2		
21		LIGHT SWITCH		2		
22		SINGLE DOOR EXTERNAL HANDLE		2		
23		DOUBLE DOOR EXTERNAL HANDLE		2		
24		DOOR CLOSING PUMP		2		
25						
26						
27						
28						
29						
30						
	MODULE "B300"					
31		First Aid Kit		2		
32		FILTER G4		6		
33		FILTER F7		6		
34		NTERNAL FIXTURE LIGHT		4		
35		CONVENIENCE SOCKET 16A		2		
36		LIGHT SWITCH		2		
37		SINGLE DOOR EXTERNAL HANDLE		2		
38		DOUBLE DOOR EXTERNAL HANDLE		2		
39		DOOR CLOSING PUMP		2		
40						
41						
42						
43						
44						
45						
	MODULE "B400"					
46		First Aid Kit		2		
47		FILTER G4		6		
48		FILTER F7		6		
49		NTERNAL FIXTURE LIGHT		4		
50		CONVENIENCE SOCKET 16A		2		
51		LIGHT SWITCH		2		
52		SINGLE DOOR EXTERNAL HANDLE		2		
53		DOUBLE DOOR EXTERNAL HANDLE		2		
54		DOOR CLOSING PUMP		2		
55						
56						
57						
58						
59						
60						

BASE LOAD POWER HUB (BLPH)

B-100

INTERCONNECTION WIRING DIAGRAM

B100-HSB-001

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	08/04/2

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	14/03/25	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
03	13/11/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
02	15/10/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
01	04/09/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
00	10/07/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)

TITLE : BASE LOAD POWER HUB (BLPH)
INTERCONNECTION WIRING DIAGRAM
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724000049-EL-DG-00022 | SHEET 001 | REV. 04

CROSSWIND | ROSETTI MARINO

REV.	MOD.	DATE	SIGN
04	ISSUE FOR INFORMATION (IFI)	19/12/24	
03	ISSUE FOR INFORMATION (IFI)	13/11/24	
02	ISSUE FOR INFORMATION (IFI)	15/10/24	

DATE	01/07/24
DRN	F.M.
CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100
COVER

ROSETTI MARINO

1724000049-EL-DG-00022

F.G. 1
F.S. 2

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9
1	COVER	X	X	X	X					
2	INDEX	X	X	X	X					
3	SIMBOL LIST	X	X	X	X					
4	INTERCONNECTION	X	X	X	X					
5	INTERCONNECTION	X	X	X	X					
6	INTERCONNECTION	X	X	X	X					
7	INTERCONNECTION	X	X	X	X					
8	INTERCONNECTION	X	X	X	X					

Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9

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04	ISSUE FOR INFORMATION (IFI)	19/12/24	
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APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100

INDEX

ROSETTI MARINO

1724000049-EL-DG-00022

F.G. 2
F.S. 3

Symbol	Description	Symbol	Description	Symbol	Description
TR	VOLTAGE TRANSFORMER		SONIC INDICATOR	F.	FUSE
TA	CURRENT TRANSFORMER	*	INDICATOR INSTRUMENT		CONTACT N.O.
M ~	MOTOR IN C.A.		SELECTOR SWITCH		CONTACT N.C.
	GROUND : GENERAL SYMBOL	52.	SWITCH		COMMUTATION CONTACT
L..	SIGNAL LAMP	52.	AUTOMATIC CIRCUIT BREAKER	P	CONTACT ACTUATED BY A PRESSURE
L..	SIGNAL LAMP + HEATER	52. Id	DIFFERENTIAL AUTOMATIC BREAKER		CONTACT ACTUATED BY A FLOW
L..	SIGNAL LAMP + VOLTAGE TRANSF.	89.	DISCONNECTING SWITCH		CONTACT ACTUATED BY A LEVEL
E	SIGNAL LAMP–PUSH BUTTON	89.	LOADED CIRCUIT BREAKER		CONTACT ACTUATED BY A TEMPERATURE
E	CLOSING BUTTON	89.	FUSE DISCONNECTING SWITCH	2 3 4	TERMINAL STRIP
E	OPENING BUTTON	6. d	CONTACTOR		SQUARE POWER TERMINAL CLAMP
	ROTARY SWITCH	6..	CONTACTOR COIL		SQUARE AUX. TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.O.		AUXILIARY RELAY COIL		REMOTE TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.C.	T..	TIMER WITH DELAY TO THE ATTRACTION		ONE–PHASE SYSTEM + NEUTRAL
T..	CONTACT DELAYED TO THE RE–DROP N.O.	T..	TIMER WITH DELAY TO THE RE–DROP		THREE–PHASE SYSTEM
T..	CONTACT DELAYED TO THE RE–DROP N.C.	49..	THERMAL RELAY		THREE–PHASE SYSTEM + NEUTRAL
79.	LIMIT SWITCH N.O.		HEATING ELEMENT		
79.	LIMIT SWITCH N.C.		ELECTROVALVE		

REV.	MOD.	DATE	SIGN		
04	ISSUE FOR INFORMATION (IFI)	19/12/24		DATE	01/07/24
03	ISSUE FOR INFORMATION (IFI)	13/11/24		DRN	F.M.
02	ISSUE FOR INFORMATION (IFI)	15/10/24		CHKD	S.S.
				APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100

SIMBOL LIST

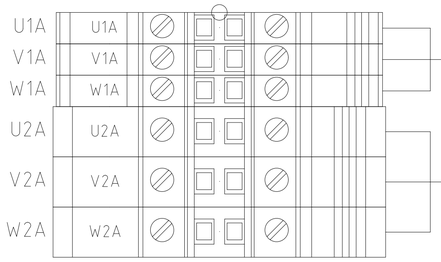
ROSETTI MARINO

1724000049-EL-DG-00022

F.G. 3
F.S. 4

B100-HSB-01
PANEL SIDE

+QG - XM1
POWER PRESS FAN 1

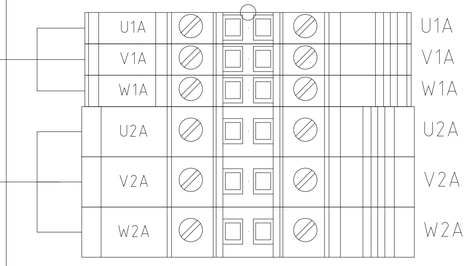


+QG - XPF1
AUX PRES FAN 1

77114-CEL-L1	4G2.5	XLPE/UNEL S2
77115-CEL-L1	4G6	XLPE/UNEL S2
77103-CEC-L1	2X1.5	XLPE/UNEL S2
77104-CEC-L1	2X1.5	XLPE/UNEL S2
77105-CEC-L1	2X1.5	XLPE/UNEL S2
77106-CEC-L1	2X1.5	XLPE/UNEL S2
77121-CEC-L1	2X1.5	XLPE/UNEL S2
77120-CEC-L1	2X1.5	XLPE7UNEL S2
77118-CEL-L2	3G1.5	XLPE/UNEL S2
77111-CEC-L2	4X1.5	XLPE/UNEL S2

HHU-77001 UNIT
HJB-77001-A

+QG - XM1
POWER PRESS FAN 1



HHU-77001 UNIT
HJB-77001-B

+QG - XPF1
AUX PRES FAN 1

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CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100

INTERCONNECTION

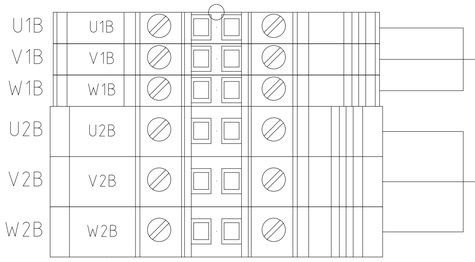
ROSETTI MARINO

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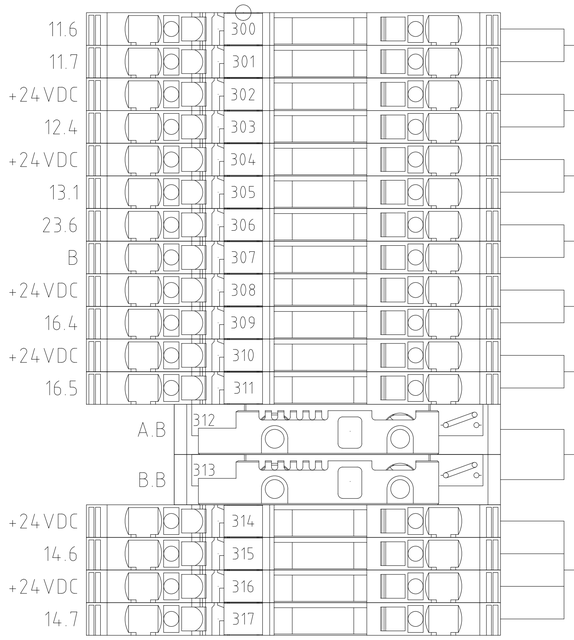
FG. 4
F.S. 5

B100-HSB-01
PANEL SIDE

+QG - XM2
POWER PRESS FAN 2



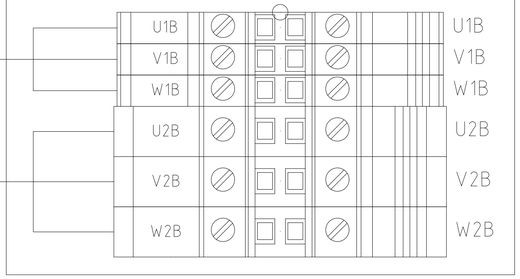
+QG - XPF2
AUX PRES FAN 2



77116-CEL-L1	4G2.5	XLPE/UNEL S2
77117-CEL-L1	4G6	XLPE/UNEL S2
77107-CEC-L1	2X1.5	XLPE/UNEL S2
77108-CEC-L1	2x1.5	XLPE7UNEL S2
77109-CEC-L1	2X1.5	XLPE7UNEL S2
77110-CEC-L1	2X1.5	XLPE/UNEL S2
77123-CEC-L1	2X1.5	XLPE/UNEL S2
77122-CEC-L1	2X1.5	XLPE/UNEL S2
77119-CEL-L2	3G1.5	XLPE/UNEL S2
77112-CEC-L2	4X1.5	XLPE/UNEL S2

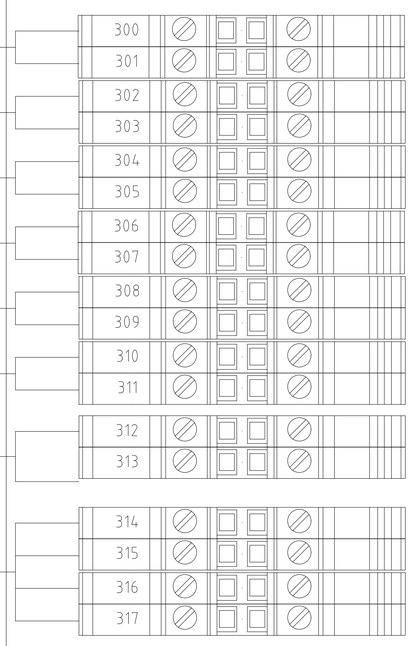
HHU-77002 UNIT
HJB-77002-A

+QG - XM2
POWER PRESS FAN 2



HHU-77002 UNIT
HJB-77002-B

+QG - XPF2
AUX PRES FAN 2



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APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100
INTERCONNECTION

ROSETTI MARINO

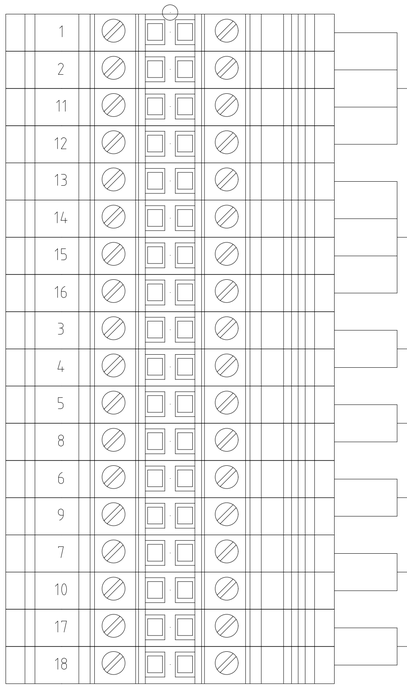
1724000049-EL-DG-00022

FG. 5
F.S. 6

B100-HSB-01
PANEL SIDE

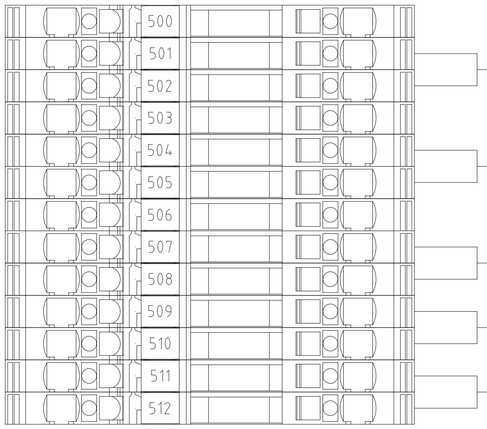
+QG - XAC

ACCESSORIES



77101-CEL-L1	5G2.5	XLPE/UNEL S2	PECW-B100H-F1-L1-01 (BROWN, BLACK, GREY, Y/G → L1, L2, N, GND)
77105-CEL-L1	5G2.5	XLPE/UNEL S2	PECW-B100H-F1-L1-02 (BROWN, BLACK, GREY, Y/G → L1, L2, N, GND)
77110-CEL-L2	3G2.5	XLPE/UNEL S2	PESO-B100H-F2-L2-01 (L1, N)
77111-CEL-L1	3G2.5	XLPE/UNEL S2	HHS-77-001 (L, N)
77112-CEL-L2	3G2.5	XLPE/UNEL S2	HHS-77-002 (L, N)
77113-CEL-L3	3G2.5	XLPE/UNEL S2	HHS-77-003 (L, N)
HEATING CABLE	2X1.5	XLPE/UNEL S2	HJB-7700XXX (22, 23)

+QG - XT



77123-CEC-L2	3X1.5+Sh	XLPE/UNEL S2	77-TT-101 (+Vdc, Out mA → 1, 2)
77124-CEC-L2	3X1.5+Sh	XLPE/UNEL S2	77-TT-102 (+Vdc, Out mA → 1, 2)
77125-CEC-L2	3X1.5+Sh	XLPE/UNEL S2	77-TP-101 (BROWN, BLACK → 1, 2)
77126-CEC-L2	3X1.5+Sh	XLPE/UNEL S2	77-TT-103 (+Vdc, Out mA → 1, 2)
77127-CEC-L2	3X1.5+Sh	XLPE/UNEL S2	77-TT-104 (+Vdc, Out mA → 1, 2)

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DATE	01/07/24
DRN	F.M.
CHKD	S.S.
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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100

INTERCONNECTION

ROSETTI MARINO

1724000049-EL-DG-00022

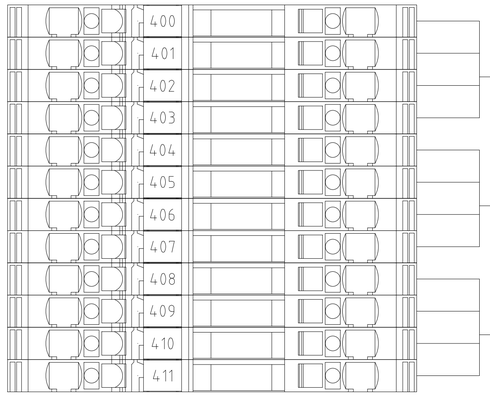
FG. 6

F.S. 7

B100-HSB-01
PANEL SIDE

+QG - XFD

FIRE DAMPER



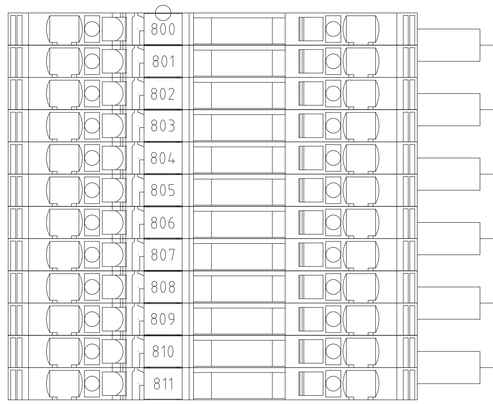
77113-CEC-L2 4X1.5 XLPE/UNEL S2 → + / – / PE → HFD-77001

77114-CEC-L2 4X1.5 XLPE/UNEL S2 → + / – / PE → HFD-77002

77115-CEC-L2 4X1.5 XLPE/UNEL S2 → + / – / PE → HFD-77003

+QG - XFD/S

FIRE DAMPER SIGNAL



4 / 5 → HFD-77001 CLOSED SIGNAL

7 / 8 → HFD-77001 OPEN SIGNAL

4 / 5 → HFD-77002 CLOSED SIGNAL

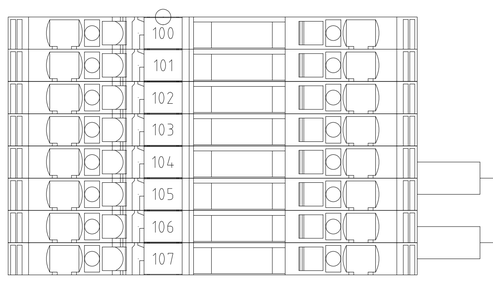
7 / 8 → HFD-77002 OPEN SIGNAL

4 / 5 → HFD-77003 CLOSED SIGNAL

7 / 8 → HFD-77003 OPEN SIGNAL

+QG - XC

Client



77101-CEC-L1 2X1.5 XLPE/UNEL S2 → BROWN / BLUE → 1 / 2 → CELS-B100H-F1-L1-01

77102-CEC-L1 2X1.5 XLPE/UNEL S2 → BROWN / BLUE → 1 / 2 → CELS-B100H-F1-L1-02

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02	ISSUE FOR INFORMATION (IFI)	15/10/24	

DATE	01/07/24
DRN	F.M.
CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100

INTERCONNECTION

ROSETTI MARINO

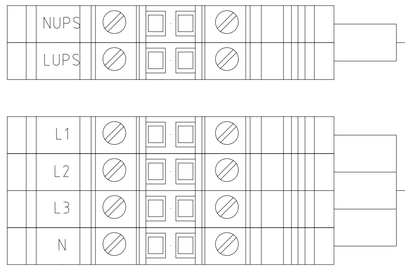
1724000049-EL-DG-00022

FG. 7
F.S. 8

B100-HSB-01
PANEL SIDE

+QG - XPS

POWER SUPPLY



UPS POWER SUPPLY 3G2.5 FROM CLIENT

POWER SUPPLY 5G16 FROM CLIENT

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DATE	01/07/24
DRN	F.M.
CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100

INTERCONNECTION

ROSETTI MARINO

1724000049-EL-DG-00022

FG. 8
F.S. //

BASE LOAD POWER HUB (BLPH)

B-200

INTERCONNECTION WIRING DIAGRAM

B200-HSB-001

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	14/07/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
06	18/06/25	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION
05	29/04/25	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION
04	14/03/25	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION
03	14/11/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION
02	15/10/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION
01	04/09/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION
00	10/07/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION

TITLE : BASE LOAD POWER HUB (BLPH)
INTERCONNECTION WIRING DIAGRAM
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724000049-EL-DG-00023 | SHEET 001 | REV. 06

CROSSWIND

ROSETTI MARINO

REV.	MOD.	DATE	SIGN
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02	ISSUE FOR INFORMATION (IFI)	15/10/24	

DATE	15/04/24
DRN	F.M.
CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200
COVER

ROSETTI MARINO

1724000049-EL-DG-00023 | F.G. 1 | F.S. 2

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9
1	COVER	X	X	X	X	X	X			
2	INDEX	X	X	X	X	X	X			
3	SIMBOL LIST	X	X	X	X	X	X			
4	INTERCONNECTION	X	X	X	X	X	X			
5	INTERCONNECTION	X	X	X	X	X	X			
6	INTERCONNECTION	X	X	X	X	X	X			
7	INTERCONNECTION	X	X	X	X	X	X			

Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9

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APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200

INDEX

ROSETTI MARINO

1724000049-EL-DG-00023

FG. 2
F.S. 3

Symbol	Description	Symbol	Description	Symbol	Description
TR	VOLTAGE TRANSFORMER		SONIC INDICATOR	F.	FUSE
TA	CURRENT TRANSFORMER	*	INDICATOR INSTRUMENT		CONTACT N.O.
M ~	MOTOR IN C.A.		SELECTOR SWITCH		CONTACT N.C.
	GROUND : GENERAL SYMBOL	52.	SWITCH		COMMUTATION CONTACT
L..	SIGNAL LAMP	52.	AUTOMATIC CIRCUIT BREAKER	P	CONTACT ACTUATED BY A PRESSURE
L..	SIGNAL LAMP + HEATER	52. Id	DIFFERENTIAL AUTOMATIC BREAKER		CONTACT ACTUATED BY A FLOW
L..	SIGNAL LAMP + VOLTAGE TRANSF.	89.	DISCONNECTING SWITCH		CONTACT ACTUATED BY A LEVEL
E	SIGNAL LAMP–PUSH BUTTON	89.	LOADED CIRCUIT BREAKER		CONTACT ACTUATED BY A TEMPERATURE
E	CLOSING BUTTON	89.	FUSE DISCONNECTING SWITCH	2 3 4	TERMINAL STRIP
E	OPENING BUTTON	6. d	CONTACTOR		SQUARE POWER TERMINAL CLAMP
	ROTARY SWITCH	6..	CONTACTOR COIL		SQUARE AUX. TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.O.		AUXILIARY RELAY COIL		REMOTE TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.C.	T..	TIMER WITH DELAY TO THE ATTRACTION		ONE–PHASE SYSTEM + NEUTRAL
T..	CONTACT DELAYED TO THE RE–DROP N.O.	T..	TIMER WITH DELAY TO THE RE–DROP		THREE–PHASE SYSTEM
T..	CONTACT DELAYED TO THE RE–DROP N.C.	49..	THERMAL RELAY		THREE–PHASE SYSTEM + NEUTRAL
79.	LIMIT SWITCH N.O.		HEATING ELEMENT		
79.	LIMIT SWITCH N.C.		ELECTROVALVE		

REV.	MOD.	DATE	SIGN		
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				APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200

SIMBOL LIST

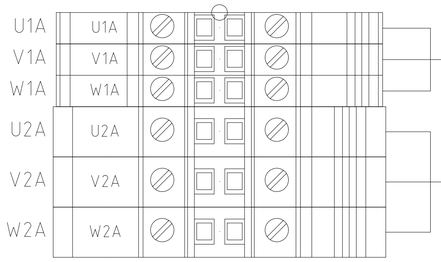
ROSETTI MARINO

1724000049-EL-DG-00023

F.G. 3
F.S. 4

B200-HSB-01
PANEL SIDE

+QG - XM1
POWER PRESS FAN 1

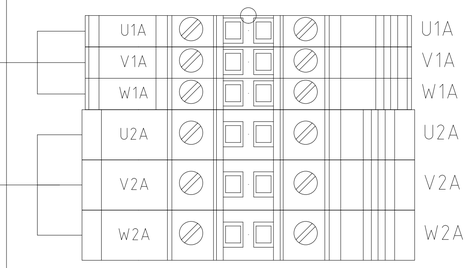


+QG - XPF1
AUX PRES FAN 1

77209-CEL-L1	4G2.5	XLPE/UNEL S2
77210-CEL-L1	4G6	XLPE/UNEL S2
77203-CEC-L1	2X1.5	XLPE/UNEL S2
77204-CEC-L1	2X1.5	XLPE/UNEL S2
77205-CEC-L1	2X1.5	XLPE/UNEL S2
77206-CEC-L1	2X1.5	XLPE/UNEL S2
77222-CEC-L1	2X1.5	XLPE/UNEL S2
77221-CEC-L1	2X1.5	XLPE7UNEL S2
77213-CEL-L2	3G1.5	XLPE/UNEL S2
77216-CEC-L2	4X1.5	XLPE/UNEL S2

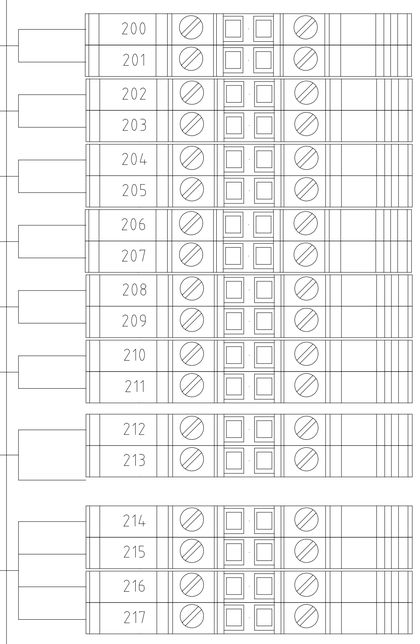
HHU-77003 UNIT
HJB-77003-A

+QG - XM1
POWER PRESS FAN 1



HHU-77003 UNIT
HJB-77003-B

+QG - XPF1
AUX PRES FAN 1



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02	ISSUE FOR INFORMATION (IFI)	15/10/24		CHKD	S.S.
				APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200

INTERCONNECTION

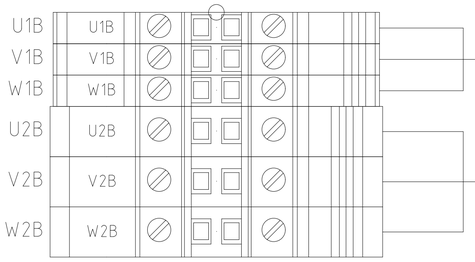
ROSETTI MARINO

1724000049-EL-DG-00023

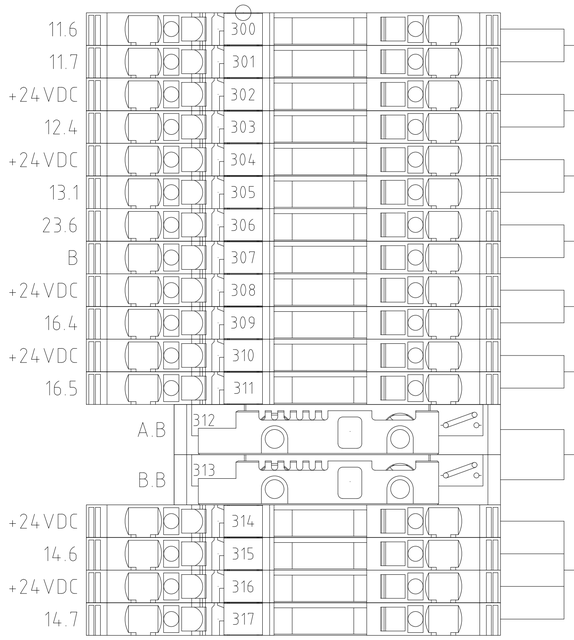
FG. 4
F.S. 5

B200-HSB-01
PANEL SIDE

+QG - XM2
POWER PRESS FAN 2



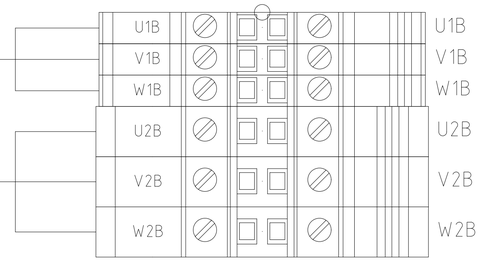
+QG - XPF2
AUX PRES FAN 2



77211-CEL-L1	4G2.5	XLPE/UNEL S2
77212-CEL-L1	4G6	XLPE/UNEL S2
77207-CEC-L1	2X1.5	XLPE/UNEL S2
77208-CEC-L1	2x1.5	XLPE7UNEL S2
77209-CEC-L1	2X1.5	XLPE7UNEL S2
77210-CEC-L1	2X1.5	XLPE/UNEL S2
77224-CEC-L1	2X1.5	XLPE/UNEL S2
77223-CEC-L1	2X1.5	XLPE/UNEL S2
77214-CEL-L2	3G1.5	XLPE/UNEL S2
77217-CEC-L2	4X1.5	XLPE/UNEL S2

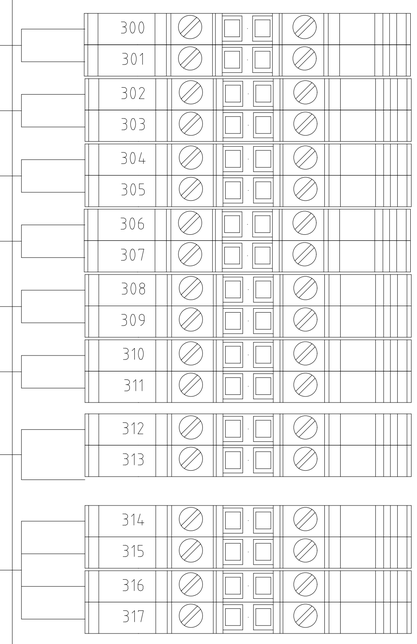
HHU-77004 UNIT
HJB-77004-A

+QG - XM2
POWER PRESS FAN 2



HHU-77004 UNIT
HJB-77004-B

+QG - XPF2
AUX PRES FAN 2



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APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

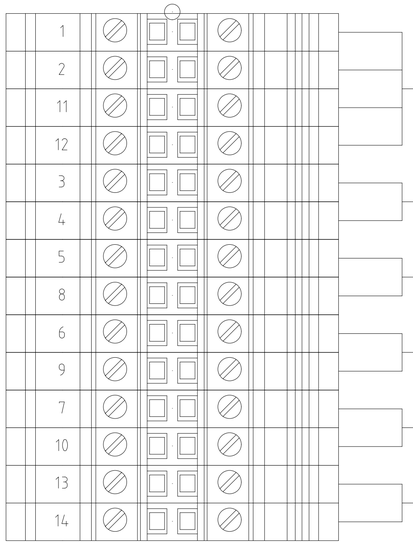
BASE LOAD POWER HUB (BLPH)
B-200
INTERCONNECTION

ROSETTI MARINO

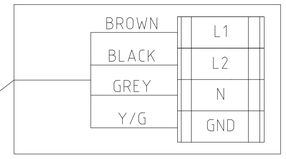
1724000049-EL-DG-00023

F.G. 5
F.S. 6

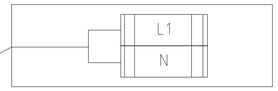
B200-HSB-01
PANEL SIDE
+QG - XAC
ACCESSORIES



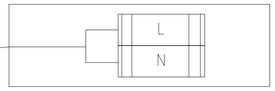
77201-CEL-L1	5G2.5	XLPE/UNEL S2
77205-CEL-L2	3G2.5	XLPE/UNEL S2
77206-CEL-L1	3G2.5	XLPE/UNEL S2
77207-CEL-L2	3G2.5	XLPE/UNEL S2
77208-CEL-L3	3G2.5	XLPE/UNEL S2
HEATING CABLE	3G2.5	XLPE/UNEL S2



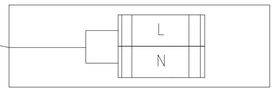
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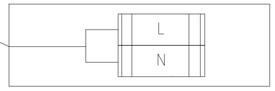
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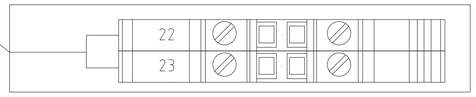
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HHS-77-005

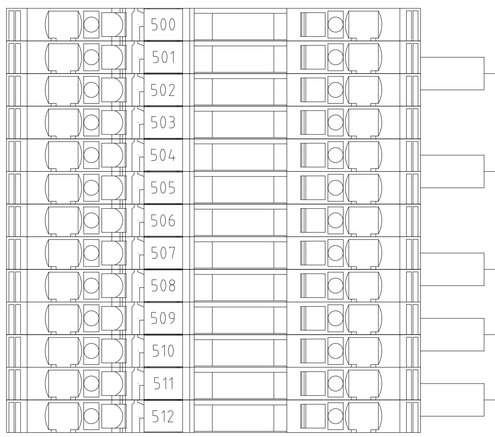


HHS-77-006

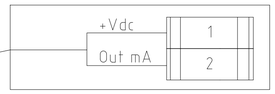


HJB-77010

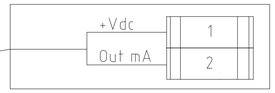
+QG - XT



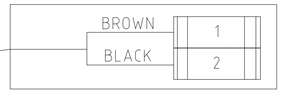
77225-CEC-L2	3X1.5+Sh	XLPE/UNEL S2
77226-CEC-L2	3X1.5+Sh	XLPE/UNEL S2
C-77-TP-201/B200-HSB-001	3X1.5+Sh	XLPE/UNEL S2
77227-CEC-L2	3X1.5+Sh	XLPE/UNEL S2
77228-CEC-L2	3X1.5+Sh	XLPE/UNEL S2



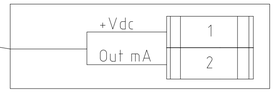
77-TT-201



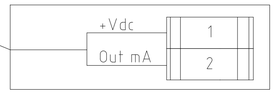
77-TT-202



77-TP-201



77-TT-203



77-TT-204

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DRN	F.M.
CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200

INTERCONNECTION

ROSETTI MARINO

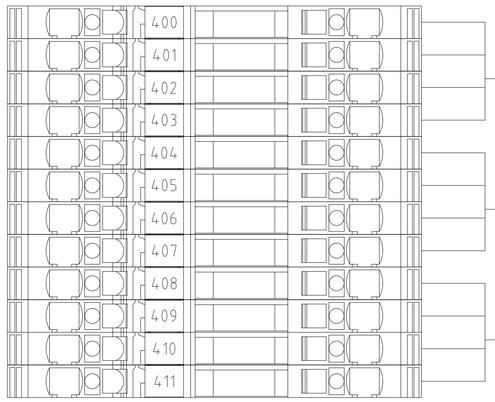
1724000049-EL-DG-00023

FG. 6
F.S. 7

B200-HSB-01
PANEL SIDE

+QG - XFD

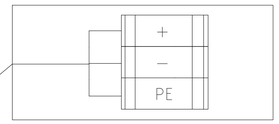
FIRE DAMPER



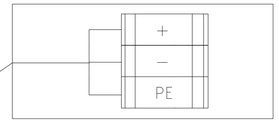
77218-CEC-L2 4X1.5 XLPE/UNEL S2

77219-CEC-L2 4X1.5 XLPE/UNEL S2

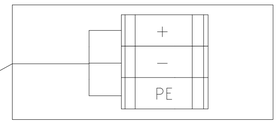
77220-CEC-L2 4X1.5 XLPE/UNEL S2



HFD-77004



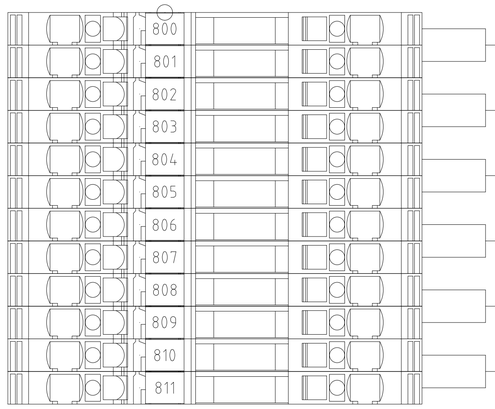
HFD-77005

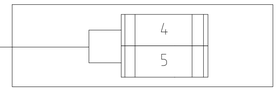


HFD-77006

+QG - XFD/S

FIRE DAMPER SIGNAL





HFD-77004 CLOSED SIGNAL

HFD-77005 CLOSED SIGNAL

HFD-77006 CLOSED SIGNAL



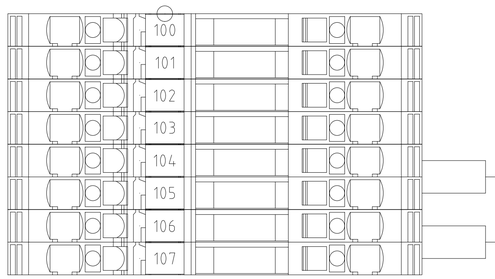
HFD-77004 OPEN SIGNAL

HFD-77005 OPEN SIGNAL

HFD-77006 OPEN SIGNAL

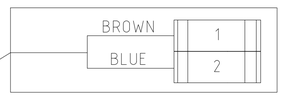
+QG - XC

Client

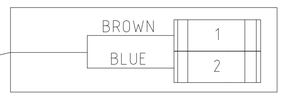


77201-CEC-L1 2X1.5 XLPE/UNEL S2

77202-CEC-L1 2X1.5 XLPE/UNEL S2



CELS-B200H-F1-L1-01



CELS-B200H-F1-L1-02

REV.	MOD.	DATE	SIGN
04	ISSUE FOR INFORMATION (IFI)	19/12/24	
03	ISSUE FOR INFORMATION (IFI)	13/11/24	
02	ISSUE FOR INFORMATION (IFI)	15/10/24	

DATE	05/07/24
DRN	F.M.
CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200

INTERCONNECTION

ROSETTI MARINO

1724000049-EL-DG-00023

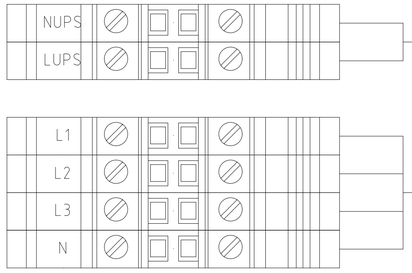
FG. 7

F.S. 8

B200-HSB-01
PANEL SIDE

+QG - XPS

POWER SUPPLY



UPS POWER SUPPLY	3G2.5	FROM CLIENT
POWER SUPPLY	5G16	FROM CLIENT

REV.	MOD.	DATE	SIGN
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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200

INTERCONNECTION

ROSETTI MARINO

1724000049-EL-DG-00023

FG. 8
F.S. //

BASE LOAD POWER HUB (BLPH)

B-300

INTERCONNECTION WIRING DIAGRAM

B300-HSB-001

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	08/04/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	14/03/25	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
03	14/11/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
02	15/10/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
01	04/09/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
00	10/07/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)

TITLE : BASE LOAD POWER HUB (BLPH)
WIRING DIAGRAM
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724000049-EL-DG-00024 | SHEET 001 | REV. 04

CROSSWIND

ROSETTI MARINO

REV.	MOD.	DATE	SIGN		
04	ISSUE FOR INFORMATION (IFI)	19/12/24		DATE	02/07/2024
03	ISSUE FOR INFORMATION (IFI)	14/11/24		DRN	F.M.
02	ISSUE FOR INFORMATION (IFI)	15/10/24	F.M.	CHKD	S.S.
				APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300
COVER

ROSETTI MARINO

1724000049-HV-DG-00024 | F.G. 1 | F.S. 2

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9
1	COVER	X	X	X	X					
2	INDEX	X	X	X	X					
3	SIMBOL LIST	X	X	X	X					
4	EXTERNAL VIEW	X	X	X	X					
5	INTERCONNECTION	X	X	X	X					
6	INTERCONNECTION	X	X	X	X					
7	INTERCONNECTION	X	X	X	X					
8	INTERCONNECTION	X	X	X	X					
9	INTERCONNECTION	X	X	X	X					
10	INTERCONNECTION	X	X	X	X					
11	INTERCONNECTION	X	X	X	X					
12	INTERCONNECTION	X	X	X	X					

Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9

REV.	MOD.	DATE	SIGN
04	ISSUE FOR INFORMATION (IFI)	19/12/24	
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APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

INDEX

ROSETTI MARINO

1724000049-HV-DG-00024

FG. 2
F.S. 3

Symbol	Description	Symbol	Description	Symbol	Description
TR	VOLTAGE TRANSFORMER		SONIC INDICATOR	F.	FUSE
TA	CURRENT TRANSFORMER	*	INDICATOR INSTRUMENT		CONTACT N.O.
M ~	MOTOR IN C.A.		SELECTOR SWITCH		CONTACT N.C.
	GROUND : GENERAL SYMBOL	52.	SWITCH		COMMUTATION CONTACT
L..	SIGNAL LAMP	52.	AUTOMATIC CIRCUIT BREAKER	P	CONTACT ACTUATED BY A PRESSURE
L..	SIGNAL LAMP + HEATER	52. Id	DIFFERENTIAL AUTOMATIC BREAKER		CONTACT ACTUATED BY A FLOW
L..	SIGNAL LAMP + VOLTAGE TRANSF.	89.	DISCONNECTING SWITCH		CONTACT ACTUATED BY A LEVEL
E	SIGNAL LAMP–PUSH BUTTON	89.	LOADED CIRCUIT BREAKER		CONTACT ACTUATED BY A TEMPERATURE
E	CLOSING BUTTON	89.	FUSE DISCONNECTING SWITCH	2 3 4	TERMINAL STRIP
E	OPENING BUTTON	6.	CONTACTOR		SQUARE POWER TERMINAL CLAMP
	ROTARY SWITCH	6..	CONTACTOR COIL		SQUARE AUX. TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.O.		AUXILIARY RELAY COIL		REMOTE TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.C.	T..	TIMER WITH DELAY TO THE ATTRACTION		ONE–PHASE SYSTEM + NEUTRAL
T..	CONTACT DELAYED TO THE RE–DROP N.O.	T..	TIMER WITH DELAY TO THE RE–DROP		THREE–PHASE SYSTEM
T..	CONTACT DELAYED TO THE RE–DROP N.C.	49..	THERMAL RELAY		THREE–PHASE SYSTEM + NEUTRAL
79.	LIMIT SWITCH N.O.		HEATING ELEMENT		
79.	LIMIT SWITCH N.C.		ELECTROVALVE		

REV.	MOD.	DATE	SIGN		
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				APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

SIMBOL LIST

ROSETTI MARINO

1724000049-HV-DG-00024

F.G. 3

F.S. 4

B300-HSB-001
PANEL SIDE

+QG - XM1

MOTOR 1

HHU-77005
HJB-77005A

+QG - XM1

MOTOR 1

U1A	1	77309-CEL-L1	4G2.5	XLPE/UNEL S2	1 U1A
V1A	2				2 V1A
W1A	3				3 W1A
U2A	4	77310-CEL-L1	4G4	XLPE/UNEL S2	4 U2A
V2A	5				5 V2A
W2A	6				6 W2A
U3A	7	77311-CEL-L1	4G10	XLPE/UNEL S2	7 U3A
V3A	8				8 V3A
W3A	9				9 W3A
U4A	10	77312-CEL-L1	4G10	XLPE/UNEL S2	10 U4A
V4A	11				11 V4A
W4A	12				12 W4A
U5A.1	13	77313-CEL-L1	4G2.5	XLPE/UNEL S2	13 U5A.1
V5A.1	14				14 V5A.1
W5A.1	15				15 W5A.1
U5A.1	16	77314-CEL-L1	4G2.5	XLPE/UNEL S2	16 U5A.1
V5A.1	17				17 V5A.1
W5A.1	18				18 W5A.1

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APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

EXTERNAL VIEW

ROSETTI MARINO

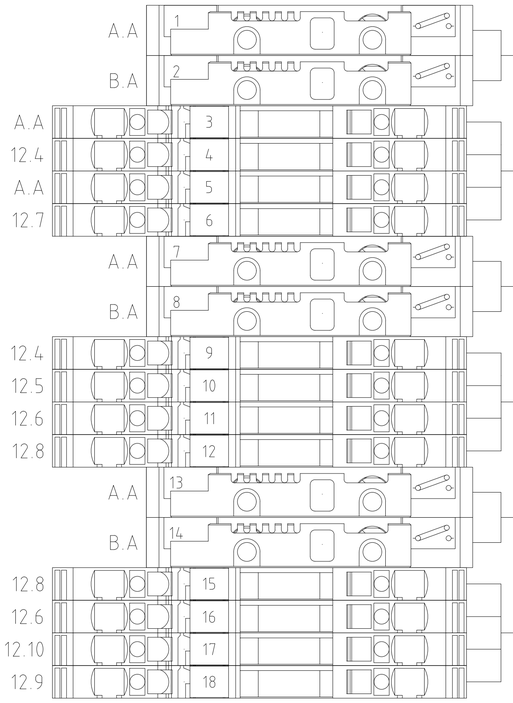
1724000049-HV-DG-00024

F.G. 4

F.S. 5

B300-HSB-001
PANEL SIDE

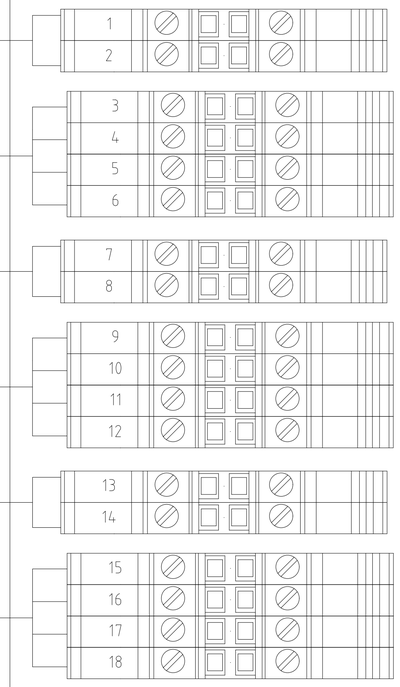
+QG - XMD1
MOTORISED DAMPER 1



77315-CEL-L2	3G1.5	XLPE/UNEL S2
77308-CEC-L2	4X1.5	XLPE/UNEL S2
77316-CEL-L2	3G1.5	XLPE/UNEL S2
77309-CEC-L2	4X1.5	XLPE/UNEL S2
77317-CEL-L2	3G1.5	XLPE/UNEL S2
77310-CEC-L2	4X1.5	XLPE/UNEL S2

HHU-77005
HJB-77005B

+QG - XMD1
MOTORISED DAMPER 1



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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

INTERCONNECTION

ROSETTI MARINO

1724000049-HV-DG-00024

FG. 5
F.S. 6

B300-HSB-001
PANEL SIDE

+QG - XA1
AUXILIARY 1

A.A	100	77311-CEC-L1	2X1.5	XLPE/UNEL S2	100
13.10	101				101
13.7	102	77312-CEC-L1	2X1.5	XLPE/UNEL S2	102
13.8	103				103
+24VDC	104	77313-CEC-L1	2X1.5	XLPE/UNEL S2	104
26.6	105				105
13.6	106	77314-CEC-L1	2X1.5	XLPE/UNEL S2	106
B.A	107				107
14.1	108	77315-CEC-L1	2X1.5	XLPE/UNEL S2	108
B.A	109				109
14.13	110	77316-CEC-L1	2X1.5	XLPE/UNEL S2	110
B.A	111				111
15.1	112	77317-CEC-L1	2X1.5	XLPE/UNEL S2	112
B.A	113				113
A.A	114	77347-CEC-L1	2X1.5	XLPE/UNEL S2	114
15.2	115				115
A.A	116	77319-CEC-L1	2X1.5	XLPE/UNEL S2	116
15.3	117				117
11.9	118	77320-CEC-L1	2X1.5	XLPE/UNEL S2	118
11.11	119				119
A.A	120	77321-CEC-L1	2X1.5	XLPE/UNEL S2	120
15.8	121				121
15.10	122	77322-CEC-L1	2X1.5	XLPE/UNEL S2	122
15.12	123				123
A.A	124	77323-CEC-L1	2X1.5	XLPE/UNEL S2	124
14.7	125				125
A.A	126	77324-CEC-L1	2X1.5	XLPE/UNEL S2	126
14.9	127				127
A.A	128	77349-CEC-L1	2X1.5	XLPE/UNEL S2	128
15.6	129				129

HHU-77005
HJB-77005B

+QG - XA1
AUXILIARY 1

100	
101	
102	
103	
104	
105	
106	
107	
108	
109	
110	
111	
112	
113	
114	
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129	

REV.	MOD.	DATE	SIGN
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APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

INTERCONNECTION

ROSETTI MARINO

1724000049-HV-DG-00024

FG. 6
F.S. 7

B300-HSB-001
PANEL SIDE

+QG - XM2

MOTOR 2

HHU-77006
HJB-77006A

U1B	1	77318-CEL-L1	4G2.5	XLPE/UNEL S2	1 U1B
V1B	2				2 V1B
W1B	3				3 W1B
U2B	4	77319-CEL-L1	4G4	XLPE/UNEL S2	4 U2B
V2B	5				5 V2B
W2B	6				6 W2B
U3B	7	77320-CEL-L1	4G10	XLPE/UNEL S2	7 U3B
V3B	8				8 V3B
W3B	9				9 W3B
U4B	10	77321-CEL-L1	4G10	XLPE/UNEL S2	10 U4B
V4B	11				11 V4B
W4B	12				12 W4B
U5B	13	77322-CEL-L1	4G2.5	XLPE/UNEL S2	13 U5B
V5B	14				14 V5B
W5B	15				15 W5B
U5B	16	77323-CEL-L1	4G2.5	XLPE/UNEL S2	16 U5B
V5B	17				17 V5B
W5B	18				18 W5B

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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

INTERCONNECTION

ROSETTI MARINO

1724000049-HV-DG-00024

FG. 7
F.S. 8

B300-HSB-001
PANEL SIDE

+QG - XMD2
MOTORISED DAMPER 2

20.3	200	
B.B	201	
A.B	202	
20.5	203	
A.B	204	
20.8	205	
20.3	206	
B.B	207	
20.5	208	
20.6	209	
20.8	210	
20.9	211	
20.3	212	
B.B	213	
20.6	214	
20.7	215	
20.9	216	
20.10	217	

77324-CEL-L2	3G1.5	XLPE/UNEL S2
77325-CEC-L2	4X1.5	XLPE/UNEL S2
77326-CEL-L2	3G1.5	XLPE/UNEL S2
77327-CEC-L2	4X1.5	XLPE/UNEL S2
77328-CEL-L2	3G1.5	XLPE/UNEL S2
77329-CEC-L2	4X1.5	XLPE/UNEL S2

HHU-77006
HJB-77006B

+QG - XMD2
MOTORISED DAMPER 2

200	
201	
202	
203	
204	
205	
206	
207	
208	
209	
210	
211	
212	
213	
214	
215	
216	
217	

REV.	MOD.	DATE	SIGN
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ALEXSISTEMI spa

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

INTERCONNECTION

ROSETTI MARINO

1724000049-HV-DG-00024

F.G. 8
F.S. 9

B300-HSB-001
PANEL SIDE

+QG - XA2
AUXILIARY 2

HHU-77006
HJB-77006B

+QG - XA2
AUXILIARY 2

A.B	300	77328-CEC-L1	2X1.5	XLPE/UNEL S2	300
13.11	301				301
21.6	302	77329-CEC-L1	2X1.5	XLPE/UNEL S2	302
21.7	303				303
+24VDC	304	77330-CEC-L1	2X1.5	XLPE/UNEL S2	304
26.7	305				305
21.5	306	77331-CEC-L1	2X1.5	XLPE/UNEL S2	306
B.B	307				307
22.1	308	77332-CEC-L1	2X1.5	XLPE/UNEL S2	308
B.A	309				309
22.13	310	77333-CEC-L1	2X1.5	XLPE/UNEL S2	310
B.A	311				311
23.1	312	77334-CEC-L1	2X1.5	XLPE/UNEL S2	312
B.A	313				313
A.B	314	77350-CEC-L1	2X1.5	XLPE/UNEL S2	314
15.2	315				315
A.B	316	77336-CEC-L1	2X1.5	XLPE/UNEL S2	316
15.3	317				317
19.3	318	77337-CEC-L1	2X1.5	XLPE/UNEL S2	318
19.4	319				319
A.B	320	77338-CEC-L1	2X1.5	XLPE/UNEL S2	320
15.9	321				321
23.4	322	77339-CEC-L1	2X1.5	XLPE/UNEL S2	322
15.13	323				323
A.B	324	77340-CEC-L1	2X1.5	XLPE/UNEL S2	324
14.7	325				325
A.B	326	77341-CEC-L1	2X1.5	XLPE/UNEL S2	326
14.9	327				327
A.B	328	77348-CEC-L1	2X1.5	XLPE/UNEL S2	328
23.6	329				329

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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

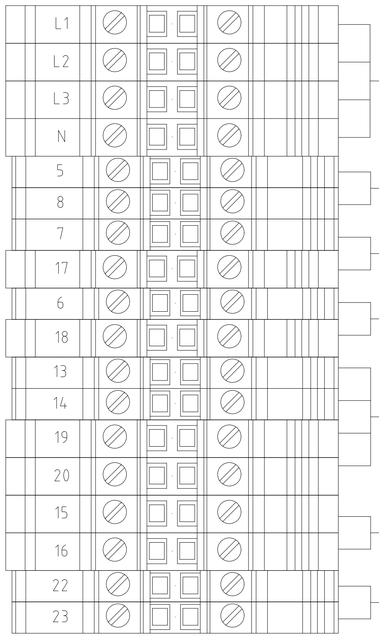
INTERCONNECTION

ROSETTI MARINO

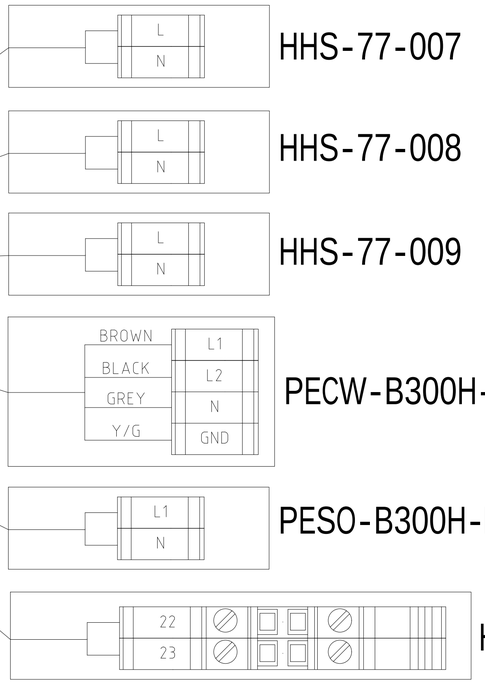
1724000049-HV-DG-00024

FG. 9
F.S. 10

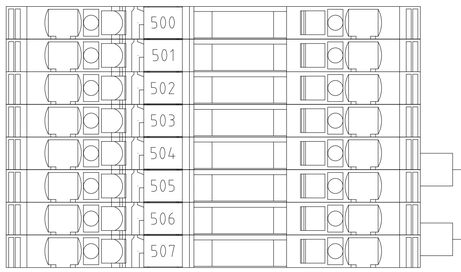
B300-HSB-001
PANEL SIDE
+QG - XP1
POWER SUPPLY 1



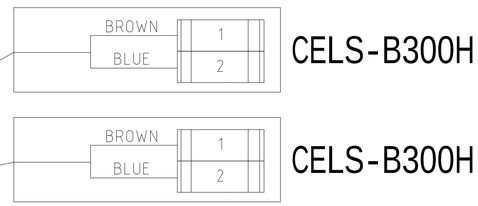
POWER SUPPLY	5G16	FROM CLIENT	HHS-77-007
77301-CEL-L1	3G2.5	XLPE/UNEL S2	HHS-77-008
77302-CEL-L2	3G2.5	XLPE/UNEL S2	HHS-77-009
77303-CEL-L3	3G2.5	XLPE/UNEL S2	
77304-CEL-L1	5G2.5	XLPE/UNEL S2	PECW-B300H-F1-L1-02
77308-CEL-L2	3G2.5	XLPE/UNEL S2	
HEATING CABLE	2X1.5	XLPE/UNEL S2	PESO-B300H-F2-L2-01
			HJB-7700XXX



+QG - XC
COMMAND



77301-CEC-L1	2X1.5	XLPE/UNEL S2	CELS-B300H-F1-L1-01
77302-CEC-L1	2X1.5	XLPE/UNEL S2	CELS-B300H-F1-L1-02



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DRN	F.M.
CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300
INTERCONNECTION

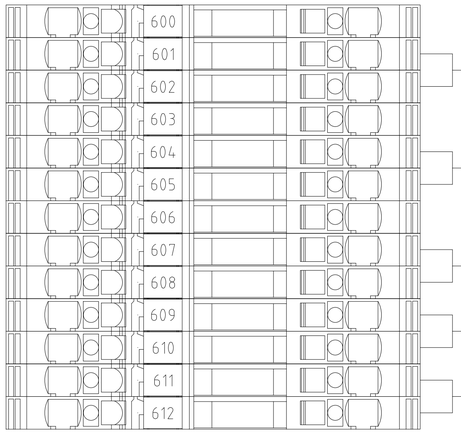
ROSETTI MARINO

1724000049-HV-DG-00024

FG. 10
F.S. 11

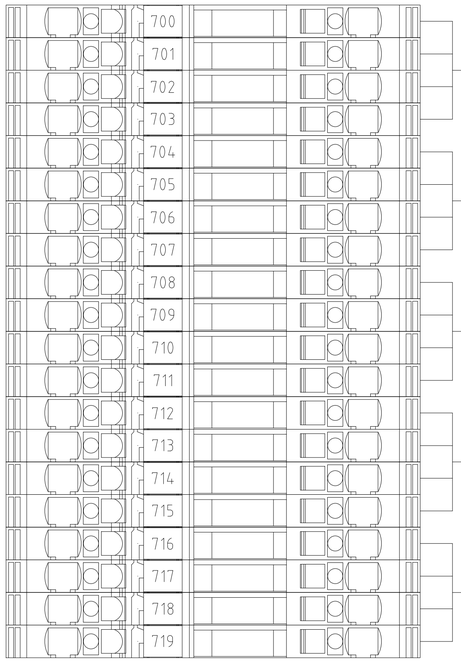
B300-HSB-001
PANEL SIDE

+QG - XT
TRASMITTER



77353-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TT-301 (+Vdc, Out mA; 1, 2)
77354-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TT-302 (+Vdc, Out mA; 1, 2)
77355-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TP-301 (BROWN, BLACK; 1, 2)
77351-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TT-303 (+Vdc, Out mA; 1, 2)
77352-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TT-304 (+Vdc, Out mA; 1, 2)

+QG - XFD
FIRE DAMPER



77342-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77007 (+, –, PE)
77343-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77008 (+, –, PE)
77344-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77009 (+, –, PE)
77345-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77010 (+, –, PE)
77346-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77011 (+, –, PE)

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				APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

INTERCONNECTION

ROSETTI MARINO

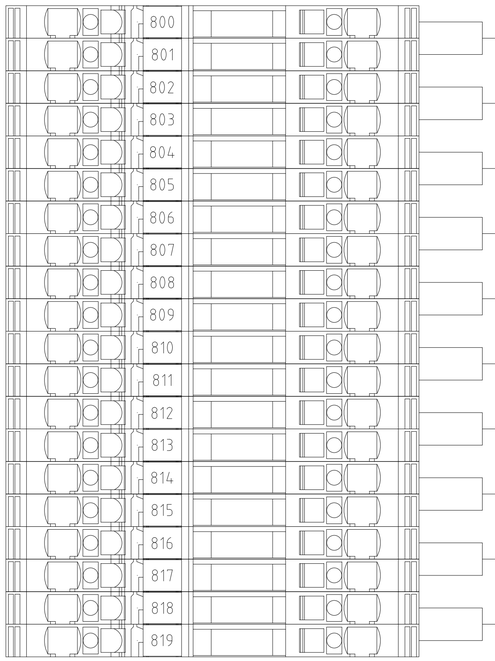
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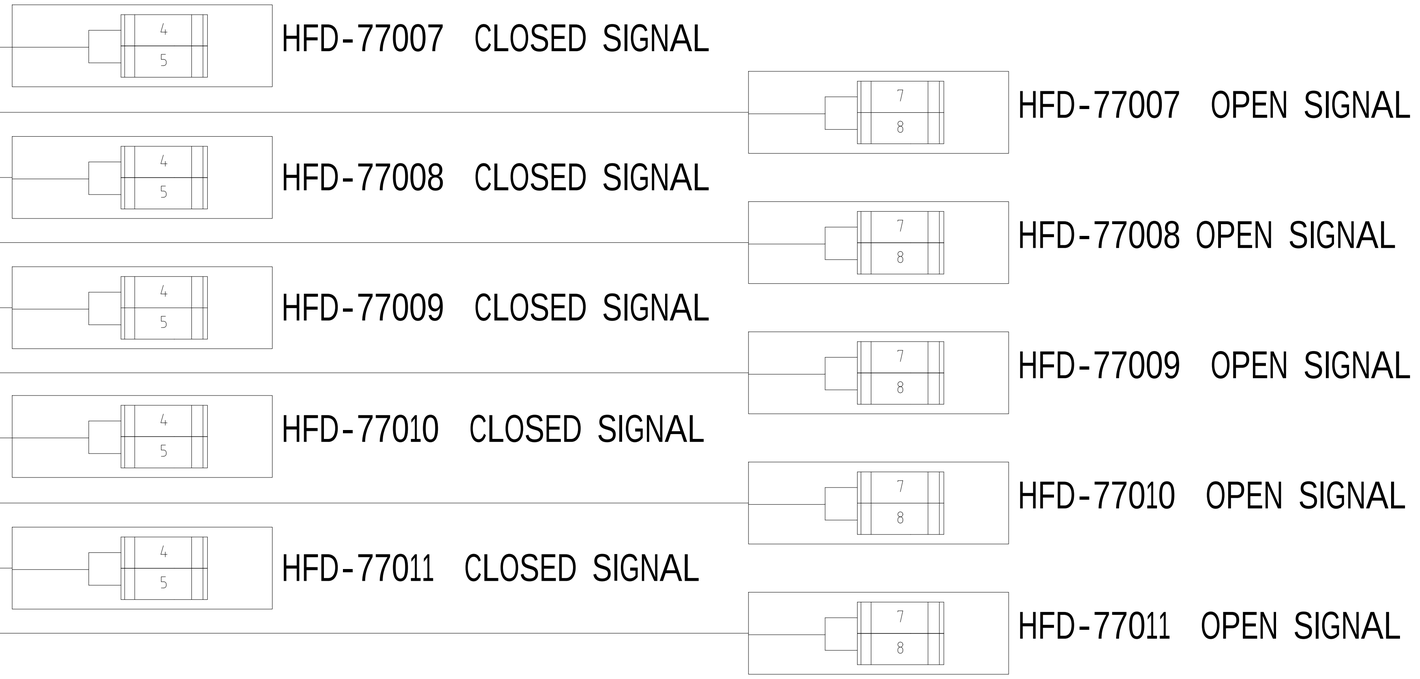
F.G. 11
F.S. 12

B300-HSB-001
PANEL SIDE

+QG - XFD/S

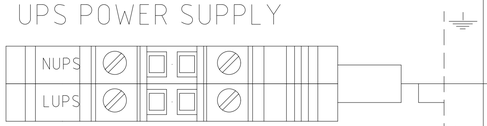
FIRE DAMPERS SIGNAL TO SIS





+QG - XUPS

UPS POWER SUPPLY



UPS POWER SUPPLY 3G2.5 FROM CLIENT

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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300

INTERCONNECTION

ROSETTI MARINO

1724000049-HV-DG-00024

FG. 12
F.S. /

BASE LOAD POWER HUB (BLPH)

B-400

INTERCONNECTION WIRING DIAGRAM

B400-HSB-001

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
M. Gatti	08/04/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	14/03/25	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
03	14/11/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
02	15/10/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
01	04/09/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)
00	10/07/24	G.M.	A.O.	A.C.	ISSUE FOR INFORMATION (IFI)

TITLE : BASE LOAD POWER HUB (BLPH)
INTERCONNECTION WIRING DIAGRAM
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724000049-EL-DG-00025

SHEET 001

REV. 04

CROSSWIND

ROSETTI MARINO

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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400
COVER

ROSETTI MARINO

1724000049-EL-DG-00025

F.G. 1

F.S. 2

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9
1	COVER	X	X	X	X					
2	INDEX	X	X	X	X					
2A	INDEX	X	X	X	X					
3	SIMBOL LIST	X	X	X	X					
4	INTRCONNECTION	X	X	X	X					
5	INTRCONNECTION	X	X	X	X					
6	INTRCONNECTION	X	X	X	X					
7	INTRCONNECTION	X	X	X	X					
8	INTRCONNECTION	X	X	X	X					
9	INTERCONNECTION	X	X	X	X					
10	INTERCONNECTION	X	X	X	X					
11	INTERCONNECTION	X	X	X	X					
12	INTERCONNECTION	X	X	X	X					

Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9

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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

INDEX

ROSETTI MARINO

1724000049-EL-DG-00025

FG. 2
F.S. 3

Symbol	Description	Symbol	Description	Symbol	Description
TR	VOLTAGE TRANSFORMER		SONIC INDICATOR	F.	FUSE
TA	CURRENT TRANSFORMER	*	INDICATOR INSTRUMENT		CONTACT N.O.
M ~	MOTOR IN C.A.		SELECTOR SWITCH		CONTACT N.C.
	GROUND : GENERAL SYMBOL	52.	SWITCH		COMMUTATION CONTACT
L..	SIGNAL LAMP	52.	AUTOMATIC CIRCUIT BREAKER	P	CONTACT ACTUATED BY A PRESSURE
L..	SIGNAL LAMP + HEATER	52. Id	DIFFERENTIAL AUTOMATIC BREAKER		CONTACT ACTUATED BY A FLOW
L..	SIGNAL LAMP + VOLTAGE TRANSF.	89.	DISCONNECTING SWITCH		CONTACT ACTUATED BY A LEVEL
	SIGNAL LAMP–PUSH BUTTON	89.	LOADED CIRCUIT BREAKER	θ	CONTACT ACTUATED BY A TEMPERATURE
E	CLOSING BUTTON	89.	FUSE DISCONNECTING SWITCH	2 3 4	TERMINAL STRIP
E	OPENING BUTTON	6. d	CONTACTOR		SQUARE POWER TERMINAL CLAMP
	ROTARY SWITCH	6..	CONTACTOR COIL		SQUARE AUX. TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.O.		AUXILIARY RELAY COIL		REMOTE TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.C.	T..	TIMER WITH DELAY TO THE ATTRACTION		ONE–PHASE SYSTEM + NEUTRAL
T..	CONTACT DELAYED TO THE RE–DROP N.O.	T..	TIMER WITH DELAY TO THE RE–DROP		THREE–PHASE SYSTEM
T..	CONTACT DELAYED TO THE RE–DROP N.C.	49..	THERMAL RELAY		THREE–PHASE SYSTEM + NEUTRAL
79.	LIMIT SWITCH N.O.		HEATING ELEMENT		
79.	LIMIT SWITCH N.C.		ELECTROVALVE		

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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

SIMBOL LIST

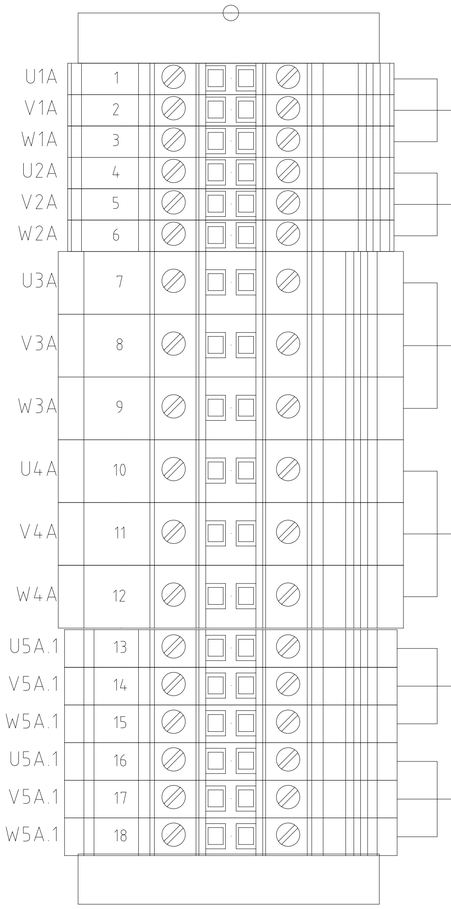
ROSETTI MARINO

1724000049-EL-DG-00025

F.G. 3
F.S. 4

B400-HSB-001
PANEL SIDE

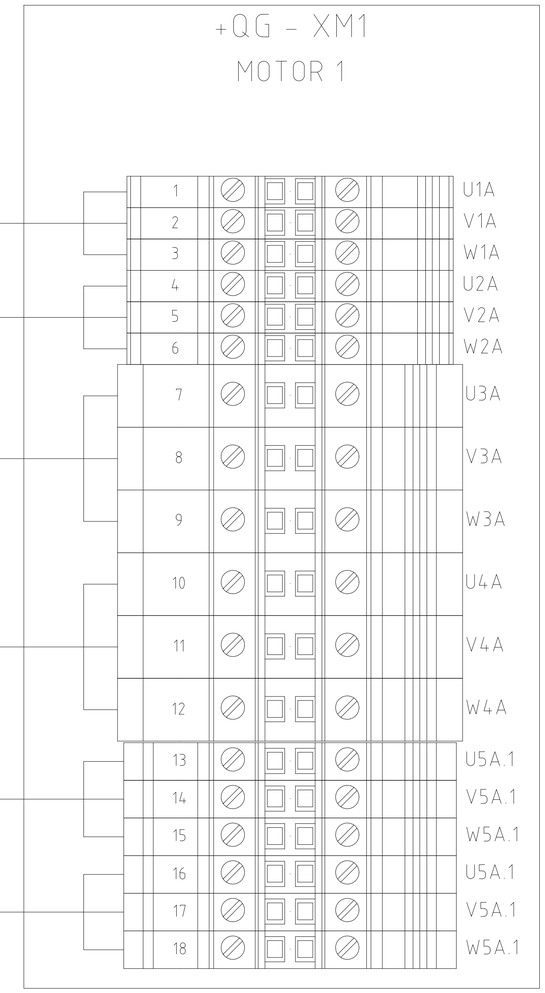
+QG - XM1
MOTOR 1



77409-CEL-L1	4G2.5	XLPE/UNEL S2
77410-CEL-L1	4G4	XLPE/UNEL S2
77411-CEL-L1	4G10	XLPE/UNEL S2
77412-CEL-L1	4G10	XLPE/UNEL S2
77413-CEL-L1	4G2.5	XLPE/UNEL S2
77414-CEL-L1	4G2.5	XLPE/UNEL S2

HHU-77007
HJB-77007A

+QG - XM1
MOTOR 1



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APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

INTRCONNECTION

ROSETTI MARINO

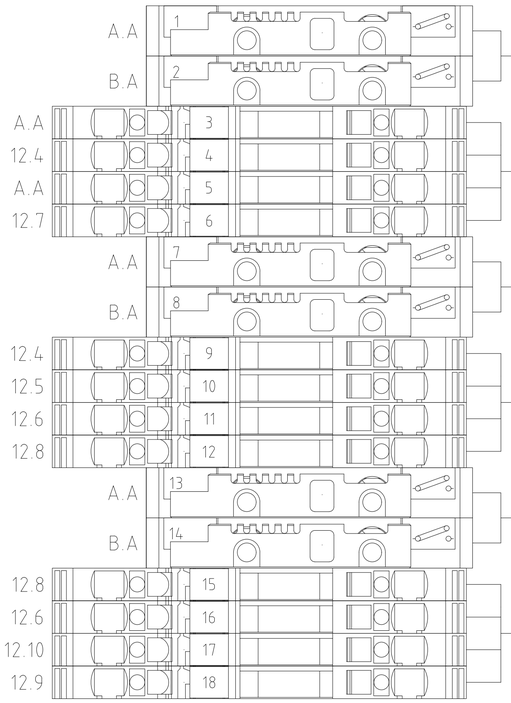
1724000049-EL-DG-00025

FG. 4
F.S. 5

B400-HSB-001
PANEL SIDE

+QG - XMD1

MOTORISED DAMPER 1

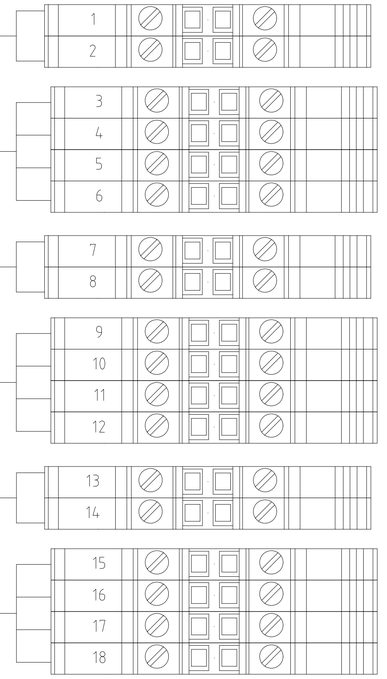


77415-CEL-L1	3G1.5	XLPE/UNEL S2
77408-CEC-L2	4X1.5	XLPE/UNEL S2
77416-CEL-L2	3G1.5	XLPE/UNEL S2
77409-CEC-L2	4X1.5	XLPE/UNEL S2
77417-CEL-L2	3G1.5	XLPE/UNEL S2
77410-CEC-L2	4X1.5	XLPE/UNEL S2

HHU-77007
HJB-77007B

+QG - XMD1

MOTORISED DAMPER 1



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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

INTRCONNECTION

ROSETTI MARINO

1724000049-EL-DG-00025

F.G. 5

F.S. 6

B400-HSB-001
PANEL SIDE

+QG - XA1
AUXILIARY 1

A.A	100	77411-CEC-L1	2X1.5	XLPE/UNEL S2	100
13.10	101				101
13.7	102	77412-CEC-L1	2X1.5	XLPE/UNEL S2	102
13.8	103				103
+24VDC	104	77413-CEC-L1	2X1.5	XLPE/UNEL S2	104
26.6	105				105
13.6	106	77414-CEC-L1	2X1.5	XLPE/UNEL S2	106
B.A	107				107
14.1	108	77415-CEC-L1	2X1.5	XLPE/UNEL S2	108
B.A	109				109
14.13	110	77416-CEC-L1	2X1.5	XLPE/UNEL S2	110
B.A	111				111
15.1	112	77417-CEC-L1	2X1.5	XLPE/UNEL S2	112
B.A	113				113
A.A	114	77347-CEC-L1	2X1.5	XLPE/UNEL S2	114
15.2	115				115
A.A	116	77419-CEC-L1	2X1.5	XLPE/UNEL S2	116
15.3	117				117
11.9	118	77420-CEC-L1	2X1.5	XLPE/UNEL S2	118
11.11	119				119
A.A	120	77421-CEC-L1	2X1.5	XLPE/UNEL S2	120
15.8	121				121
15.10	122	77422-CEC-L1	2X1.5	XLPE/UNEL S2	122
15.12	123				123
A.A	124	77423-CEC-L1	2X1.5	XLPE/UNEL S2	124
14.7	125				125
A.A	126	77424-CEC-L1	2X1.5	XLPE/UNEL S2	126
14.9	127				127
A.A	128	77449-CEC-L1	2X1.5	XLPE/UNEL S2	128
15.6	129				129

HHU-77007
HJB-77007B

+QG - XA1
AUXILIARY 1

100	
101	
102	
103	
104	
105	
106	
107	
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109	
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111	
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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

INTRCONNECTION

ROSETTI MARINO

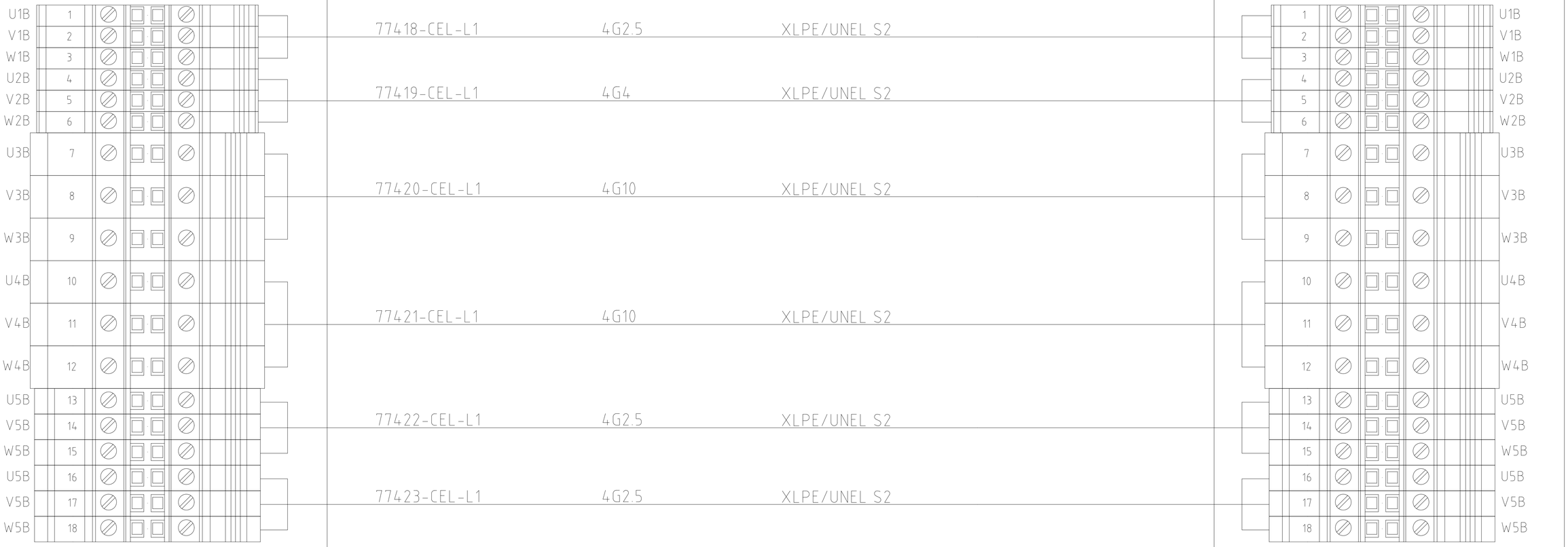
1724000049-EL-DG-00025

F.G. 6
F.S. 7

B400-HSB-001
PANEL SIDE

+QG - XM2
MOTOR 2

HHU-77008
HJB-77008A



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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

INTRCONNECTION

ROSETTI MARINO

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FG. 7
F.S. 8

B400-HSB-001
PANEL SIDE

+QG - XMD2
MOTORISED DAMPER 2

20.3 — 200
B.B — 201
A.B — 202
20.5 — 203
A.B — 204
20.8 — 205
20.3 — 206
B.B — 207
20.5 — 208
20.6 — 209
20.8 — 210
20.9 — 211
20.3 — 212
B.B — 213
20.6 — 214
20.7 — 215
20.9 — 216
20.10 — 217

77424-CEL-L2	3G1.5	XLPE/UNEL S2	200, 201
77425-CEC-L2	4X1.5	XLPE/UNEL S2	202, 203, 204, 205
77426-CEL-L2	3G1.5	XLPE/UNEL S2	206, 207
77427-CEC-L2	4X1.5	XLPE/UNEL S2	208, 209, 210, 211
77428-CEL-L2	3G1.5	XLPE/UNEL S2	212, 213
77442-CEC-L2	4X1.5	XLPE/UNEL S2	214, 215, 216, 217

HHU-77008
HJB-77008B

+QG - XMD2
MOTORISED DAMPER 2

200
201
202
203
204
205
206
207
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211
212
213
214
215
216
217

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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

INTRCONNECTION

ROSETTI MARINO

1724000049-EL-DG-00025

FG. 8
F.S. 9

B400-HSB-001
PANEL SIDE

+QG - XA2
AUXILIARY 2

A.B	300	77428-CEC-L1	2X1.5	XLPE/UNEL S2	300
13.11	301				301
21.6	302	77429-CEC-L1	2X1.5	XLPE/UNEL S2	302
21.7	303				303
+24VDC	304	77430-CEC-L1	2X1.5	XLPE/UNEL S2	304
26.7	305				305
21.5	306	77431-CEC-L1	2X1.5	XLPE/UNEL S2	306
B.B	307				307
22.1	308	77432-CEC-L1	2X1.5	XLPE/UNEL S2	308
B.A	309				309
22.13	310	77433-CEC-L1	2X1.5	XLPE/UNEL S2	310
B.A	311				311
23.1	312	77434-CEC-L1	2X1.5	XLPE/UNEL S2	312
B.A	313				313
A.B	314	77450-CEC-L1	2X1.5	XLPE/UNEL S2	314
15.2	315				315
A.B	316	77436-CEC-L1	2X1.5	XLPE/UNEL S2	316
15.3	317				317
19.3	318	77437-CEC-L1	2X1.5	XLPE/UNEL S2	318
19.4	319				319
A.B	320	77438EC-L1	2X1.5	XLPE/UNEL S2	320
15.9	321				321
23.4	322	77439-CEC-L1	2X1.5	XLPE/UNEL S2	322
15.13	323				323
A.B	324	77440-CEC-L1	2X1.5	XLPE/UNEL S2	324
14.7	325				325
A.B	326	77441-CEC-L1	2X1.5	XLPE/UNEL S2	326
14.9	327				327
A.B	328	77448-CEC-L1	2X1.5	XLPE/UNEL S2	328
23.6	329				329

HHU-77008
HJB-77008B

+QG - XA2
AUXILIARY 2

300	
301	
302	
303	
304	
305	
306	
307	
308	
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311	
312	
313	
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ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

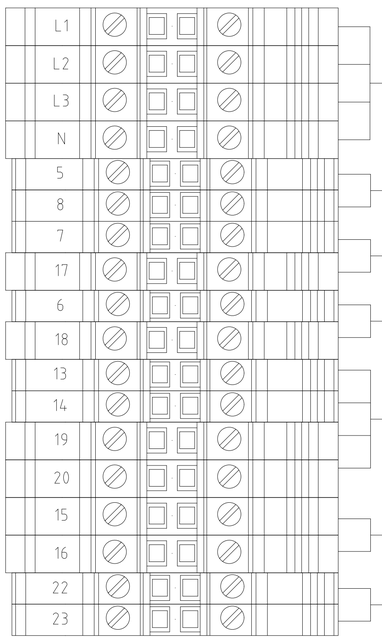
INTERCONNECTION

ROSETTI MARINO

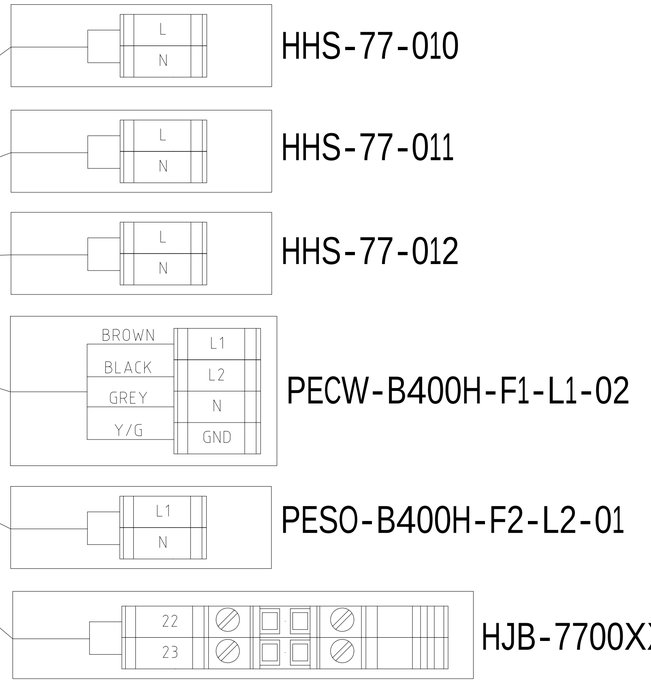
1724000049-EL-DG-00025

FG. 9
F.S. 10

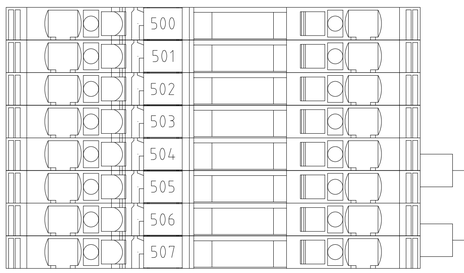
B400-HSB-001
PANEL SIDE
+QG - XP1
POWER SUPPLY 1



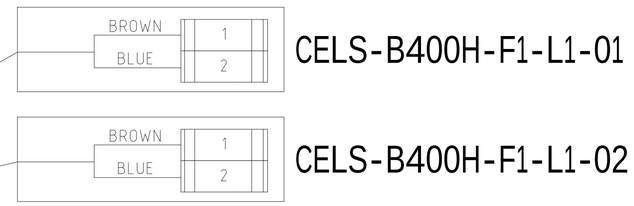
POWER SUPPLY	5G16	FROM CLIENT
77401-CEL-L1	3G2.5	XLPE/UNEL S2
77402-CEL-L1	3G2.5	XLPE/UNEL S2
77403-CEL-L1	3G2.5	XLPE/UNEL S2
77404-CEL-L1	5G2.5	XLPE/UNEL S2
77408-CEL-L2	3G2.5	XLPE/UNEL S2
HEATING CSBLE TBA	2X1.5	XLPE/UNEL S2



+QG - XC
COMMAND



77401-CEC-L1	2X1.5	XLPE/UNEL S2
77402-CEC-L1	2X1.5	XLPE/UNEL S2



REV.	MOD.	DATE	SIGN
04	ISSUE FOR INFORMATION (IFI)	19/12/24	
03	ISSUE FOR INFORMATION (IFI)	14/11/24	
02	ISSUE FOR INFORMATION (IFI)	15/10/24	F.M.

DATE	05/07/2024
DRN.	F.M.
CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400
INTERCONNECTION

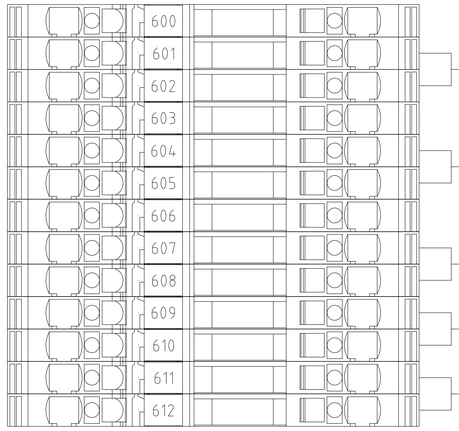
ROSETTI MARINO

1724000049-EL-DG-00025

FG. 10
F.S. 11

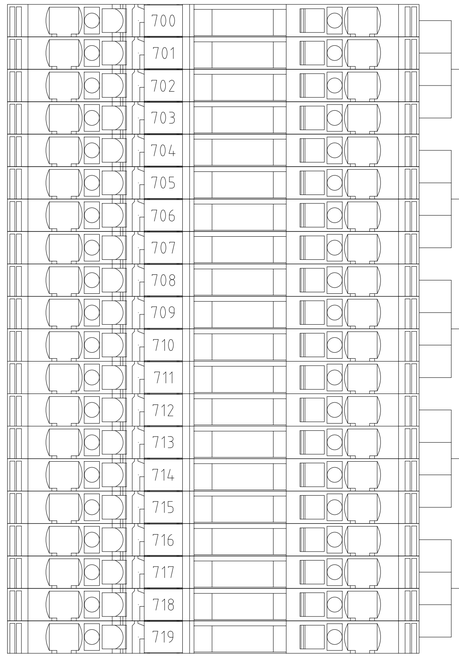
B400-HSB-001
PANEL SIDE

+QG - XT
TRASMITTER



77453-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TT-401 (+Vdc, Out mA; 1, 2)
77449-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TT-402 (+Vdc, Out mA; 1, 2)
77450-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TP-401 (BROWN, BLACK; 1, 2)
77454-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TT-403 (+Vdc, Out mA; 1, 2)
77455-CEC-L1	3X1.5+Sh	XLPE/UNEL S2	77-TT-404 (+Vdc, Out mA; 1, 2)

+QG - XFD
FIRE DAMPER



77442-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77012 (+, –, PE)
77443-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77013 (+, –, PE)
77444-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77014 (+, –, PE)
77445-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77015 (+, –, PE)
77446-CEC-L2	4X1.5	XLPE/UNEL S2	HFD-77016 (+, –, PE)

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CHKD	S.S.
APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

INTERCONNECTION

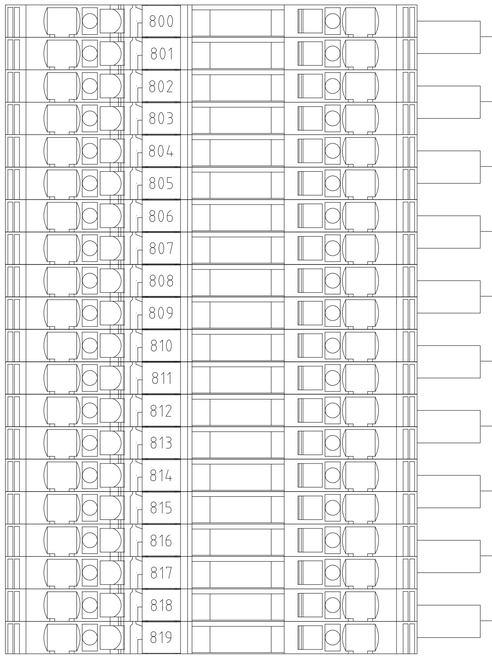
ROSETTI MARINO

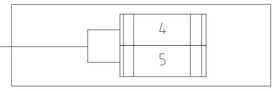
1724000049-EL-DG-00025

FG. 11
F.S. 12

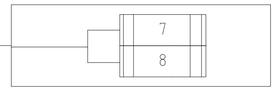
B400-HSB-001
PANEL SIDE

+QG - XFD/S
FIRE DAMPERS SIGNAL TO SIS

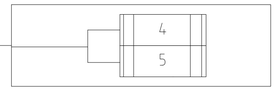




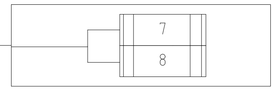
HFD-77012 CLOSED SIGNAL



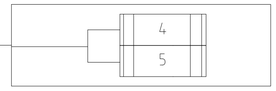
HFD-77012 OPEN SIGNAL



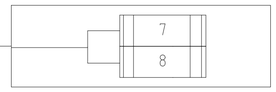
HFD-77013 CLOSED SIGNAL



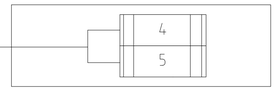
HFD-77013 OPEN SIGNAL



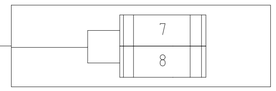
HFD-77014 CLOSED SIGNAL



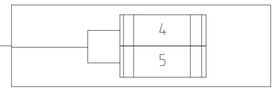
HFD-77014 OPEN SIGNAL



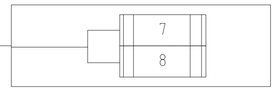
HFD-77015 CLOSED SIGNAL



HFD-77015 OPEN SIGNAL

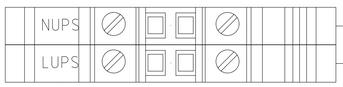


HFD-77016 CLOSED SIGNAL



HFD-77016 OPEN SIGNAL

+QG - XUPS
UPS POWER SUPPLY



UPS POWER SUPPLY 3G2.5 FROM CLIENT

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03	ISSUE FOR INFORMATION (IFI)	14/11/24		DRN.	F.M.
02	ISSUE FOR INFORMATION (IFI)	15/10/24	F.M.	CHKD	S.S.
				APPD	M.G.

ALEXSISTEMI spa

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400

INTERCONNECTION

ROSETTI MARINO

1724000049-EL-DG-00025

FG. 12
F.S. /

BASE LOAD POWER HUB (BLPH)

B-100 HVAC and LIGHTING PANELWIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTION) - E&I SHELTERS

B100-HSB-001

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	03/02/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
05	24/01/25				ACCEPT FOR CONSTRUCTION (AFC)
04	10/12/24				ACCEPT FOR CONSTRUCTION (AFC)
03	05/09/24				ISSUE FOR REVIEW (IFR)
02	13/06/24				ISSUE FOR REVIEW (IFR)
01	15/04/24				ISSUE FOR REVIEW (IFR)
00	15/04/24				ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
WIRING DIAGRAM
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724000049-HV-DA-00026

SHEET 001

REV. 05

CROSSWIND

ROSETTI MARINO

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
COVER

ROSETTI MARINO ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 1

F.S. 2

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
1	COVER	X	X	X	X	X				
2	INDEX	X	X	X	X	X				
3	SIMBOL LIST	X	X	X	X	X				
4	EXTERNAL VIEW	X	X	X	X	X				
5	INTERNAL VIEW	X	X	X	X	X				
6	POWER SECTION	X	X	X	X	X				
6A	POWER SECTION	X	X	X	X	X				
6B	POWER SECTION	X	X	X	X	X				
7	POWER SECTION	X	X	X	X	X				
8	POWER SECTION	X	X	X	X	X				
9	POWER SECTION	X	X	X	X	X				
9A	POWER SECTION	X	X	X	X	X				
10	AUX SECTION	X	X	X	X	X				
11	AUX SECTION	X	X	X	X	X				
11A	AUX SECTION	X	X	X	X	X				
12	AUX SECTION	X	X	X	X	X				
13	AUX SECTION	X	X	X	X	X				
14	AUX SECTION	X	X	X	X	X				
15	AUX SECTION	X	X	X	X	X				
16	AUX SECTION	X	X	X	X	X				
17	AUX SECTION	X	X	X	X	X				
18	AUX SECTION	X	X	X	X	X				
19	AUX SECTION	X	X	X	X	X				
20	AUX SECTION	X	X	X	X	X				
20A	AUX SECTION	X	X	X	X	X				
20B	AUX SECTION	X	X	X	X	X				
20C	PLC ARCHITECTURE	X	X	X	X	X				
20D	PLC ARCHITECTURE	X	X	X	X	X				

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
21	ELECTRICAL HEATER MODULATION	X	X	X	X	X				
22	ELECTRICAL HEATER MODULATION	X	X	X	X	X				
23	AVAILABLE SIGNAL	X	X	X	X	X				
24	TERMINAL STRIP	X	X	X	X	X				
25	TERMINAL STRIP	X	X	X	X	X				
26	MATERIAL LIST	X	X	X	X	X				
27	MATERIAL LIST	X	X	X	X	X				
28	MATERIAL LIST	X	X	X	X	X				
29	MATERIAL LIST	X	X	X	X	X				
30	MATERIAL LIST	X	X	X	X	X				
31	MATERIAL LIST	X	X	X	X	X				

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
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frigotermica
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tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

INDEX

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 2
F.S. 3

Symbol	Description	Symbol	Description	Symbol	Description
TR	VOLTAGE TRANSFORMER		SONIC INDICATOR	F.	FUSE
TA	CURRENT TRANSFORMER	*	INDICATOR INSTRUMENT		CONTACT N.O.
M ~	MOTOR IN C.A.		SELECTOR SWITCH		CONTACT N.C.
	GROUND : GENERAL SYMBOL	52.	SWITCH		COMMUTATION CONTACT
L..	SIGNAL LAMP	52.	AUTOMATIC CIRCUIT BREAKER	P	CONTACT ACTUATED BY A PRESSURE
L..	SIGNAL LAMP + HEATER	52. Id	DIFFERENTIAL AUTOMATIC BREAKER		CONTACT ACTUATED BY A FLOW
L..	SIGNAL LAMP + VOLTAGE TRANSF.	89.	DISCONNECTING SWITCH		CONTACT ACTUATED BY A LEVEL
E	SIGNAL LAMP–PUSH BUTTON	89.	LOADED CIRCUIT BREAKER	θ	CONTACT ACTUATED BY A TEMPERATURE
E	CLOSING BUTTON	89.	FUSE DISCONNECTING SWITCH	2 3 4	TERMINAL STRIP
E	OPENING BUTTON	6.	CONTACTOR		SQUARE POWER TERMINAL CLAMP
	ROTARY SWITCH	6..	CONTACTOR COIL		SQUARE AUX. TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.O.		AUXILIARY RELAY COIL		REMOTE TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.C.	T..	TIMER WITH DELAY TO THE ATTRACTION		ONE–PHASE SYSTEM + NEUTRAL
T..	CONTACT DELAYED TO THE RE–DROP N.O.	T..	TIMER WITH DELAY TO THE RE–DROP		THREE–PHASE SYSTEM
T..	CONTACT DELAYED TO THE RE–DROP N.C.	49..	THERMAL RELAY		THREE–PHASE SYSTEM + NEUTRAL
79.	LIMIT SWITCH N.O.		HEATING ELEMENT		
79.	LIMIT SWITCH N.C.		ELECTROVALVE		

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
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CLIENT: CROSSWIND

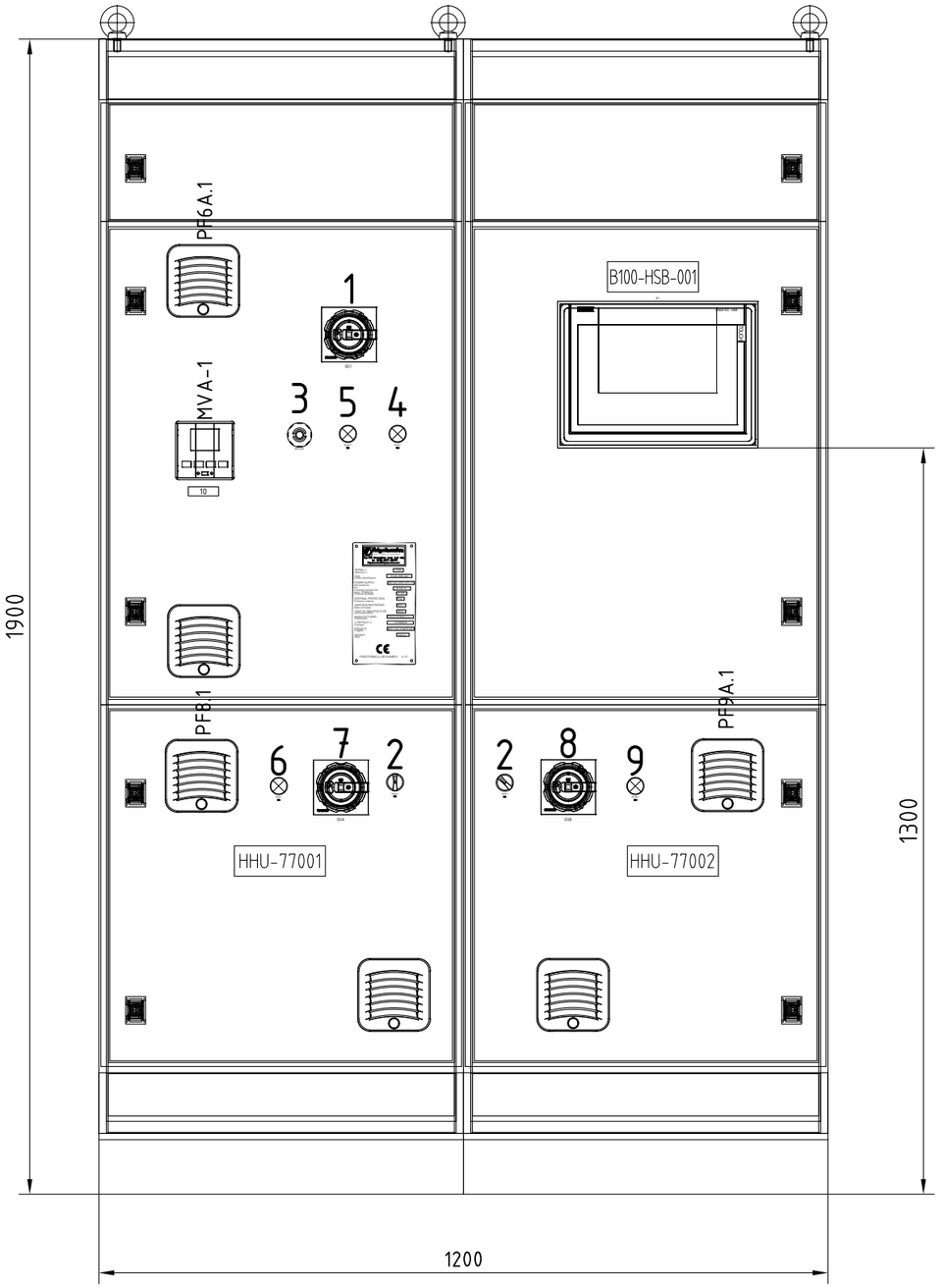
BASE LOAD POWER HUB (BLPH)
B–100 HV SWITCH ROOM
SIMBOL LIST

ROSETTI MARINO | ALEXSISTEMI spa

1724000049–HV–DA–00026

FG. 3
F.S. 4

EXTERNAL VIEW



LABEL	
1	MAIN SWITCH
2	AUTO-0-MANUAL
3	HPB-003
4	24VDC VOLTAGEPRESENCE
5	230V VOLTAGE PRESENCE
6	230V VOLTAGE PRESENCE
7	HHU-77001 MAIN SWITH
8	HHU-77002 MAIN SWITCH
9	230V VOLTAGE PRESENCE
10	MULTIMETER

CABINET QUOTE:
LENGHT 1200 mm
HEIGHT 1900 mm
DEPT 600mm

frigotermica
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tel. 0039–0371–69076
frigotermica@frigotermica.com

SERIAL n.: *Matricola n.:*	1626
TAG: *Codice identificativo:*	B100-HSB-001
POWER SUPPLY: *Alimenatzione:*	400 Vac 50Hz 3Ph+N
Icc: *Coorente cortocircuito:*	25 kA/1s
AUX. TENSION: *Tensione ausiliaria:*	24 Vdc
INTERNAL PROTECTION: *Protezione interna:*	IP54
MAIN BUS BAR RATING: *Barra principale:*	40 A
YEAR OF MANUFACTURE: *Anno produzione:*	2024
MANUFACTURER: *Costruzione:*	FRIGOTERMICA s.r.l.
CONTRACT n.: *Contratto:*	51/240554
PROJECT: *Progetto:*	BASE LOAD POWER HUB
WEIGHT: *Peso:*	700 Kg

CE

FRIGOTERMICA JOB NUMBER: 4112

SCALA 1:10

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
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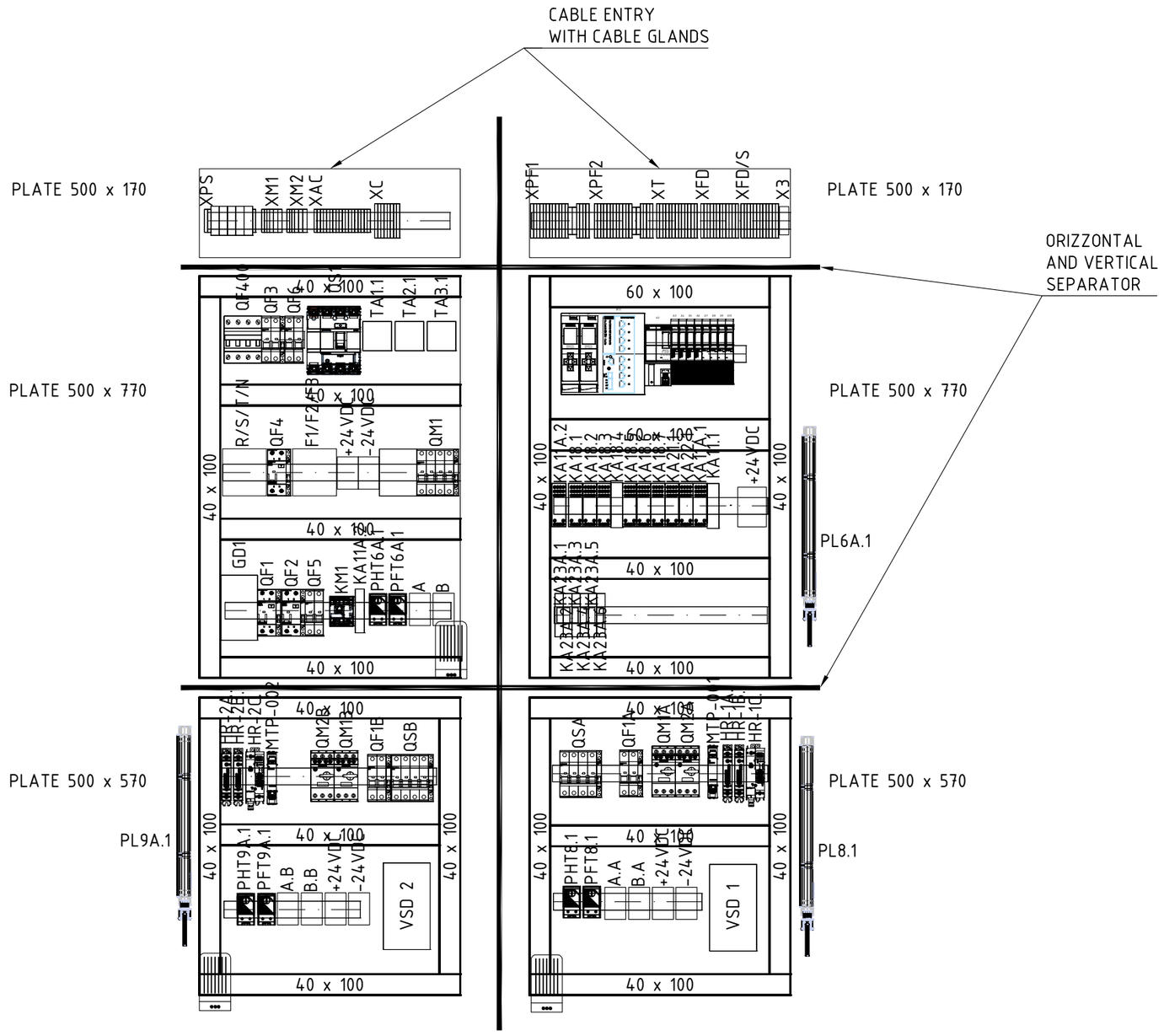
BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
EXTERNAL VIEW

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00026

FG. 4
F.S. 5

INTERNAL VIEW



SCALA 1:10

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24		DISEGN.	F.M.
03	ISSUE FOR APPROVAL	05/09/24		VISTO	S.S.
				APPR.	M.G.

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CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

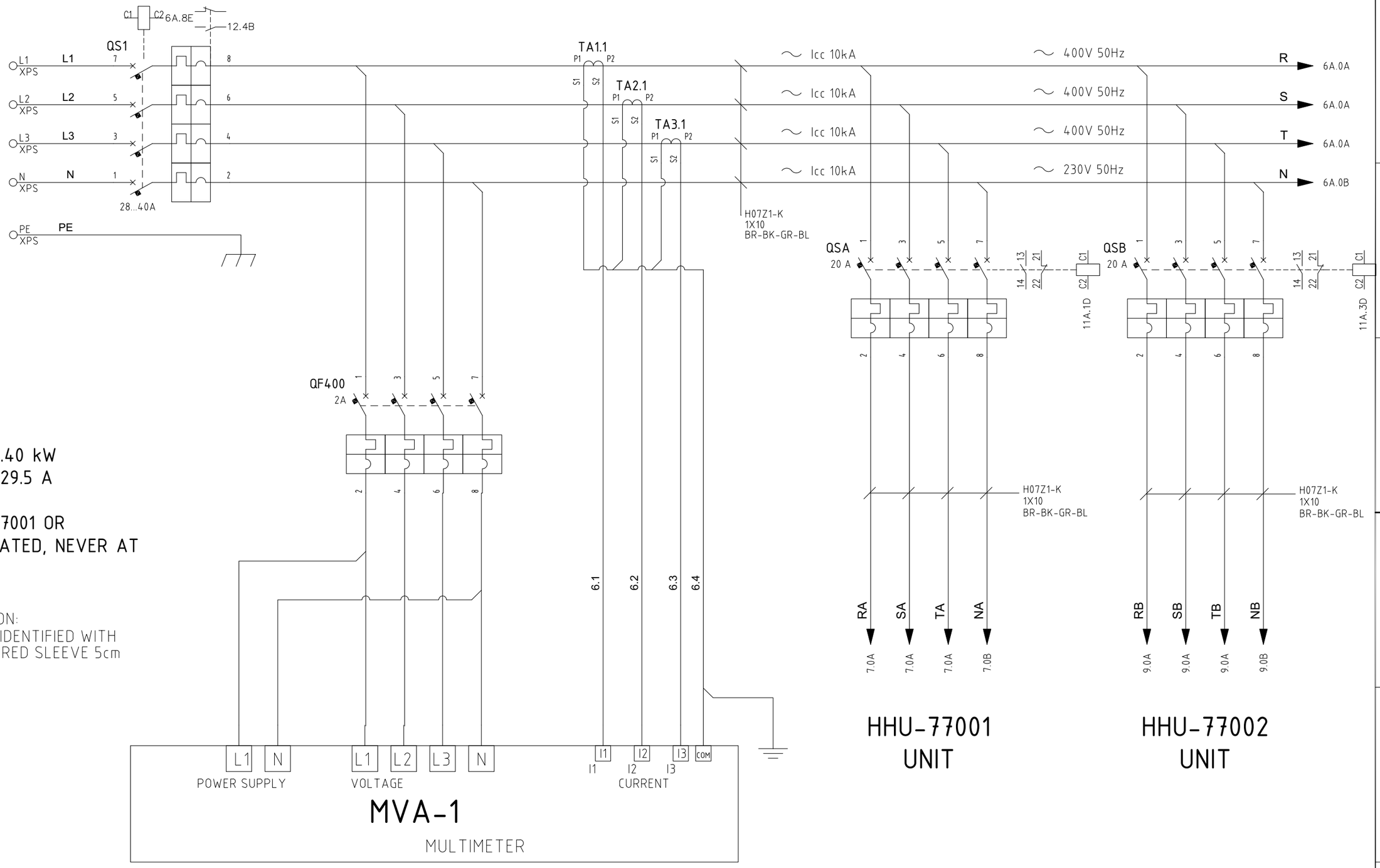
INTERNAL VIEW

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 5
F.S. 6

POWER SUPPLY
FROM
LV SWITCHGEAR
3PH + N + PE
400V 50Hz
5G25
TAG SG-200N1



RATED POWER: 16.40 kW
RATED CURRENT: 29.5 A

ONLY UNIT HHU-77001 OR
HHU-77002 ACTIVATED, NEVER AT
SAME TIME

COLOR IDENTIFICATION:
COLORED CABLE OR IDENTIFIED WITH
HEAT SHRINK COLOURED SLEEVE 5cm

400V 3P + N
- ⟶ BROWN
- ⟶ BLACK
- ⟶ GRAY
- ⟶ BLU

230V 1P + N
- ⟶ BROWN
- ⟶ BLU

24Vdc
- ⟶ RED
- ⟶ BLACK

PANEL INTERNAL CABLES TYPE: H07Z1-K OR FG17
UNIT INTERNAL CABLES TYPE: FG16OM16 GREEN SHEATH NOT ARMOURED

REV.	MODIFICA	DATA	FIRMA
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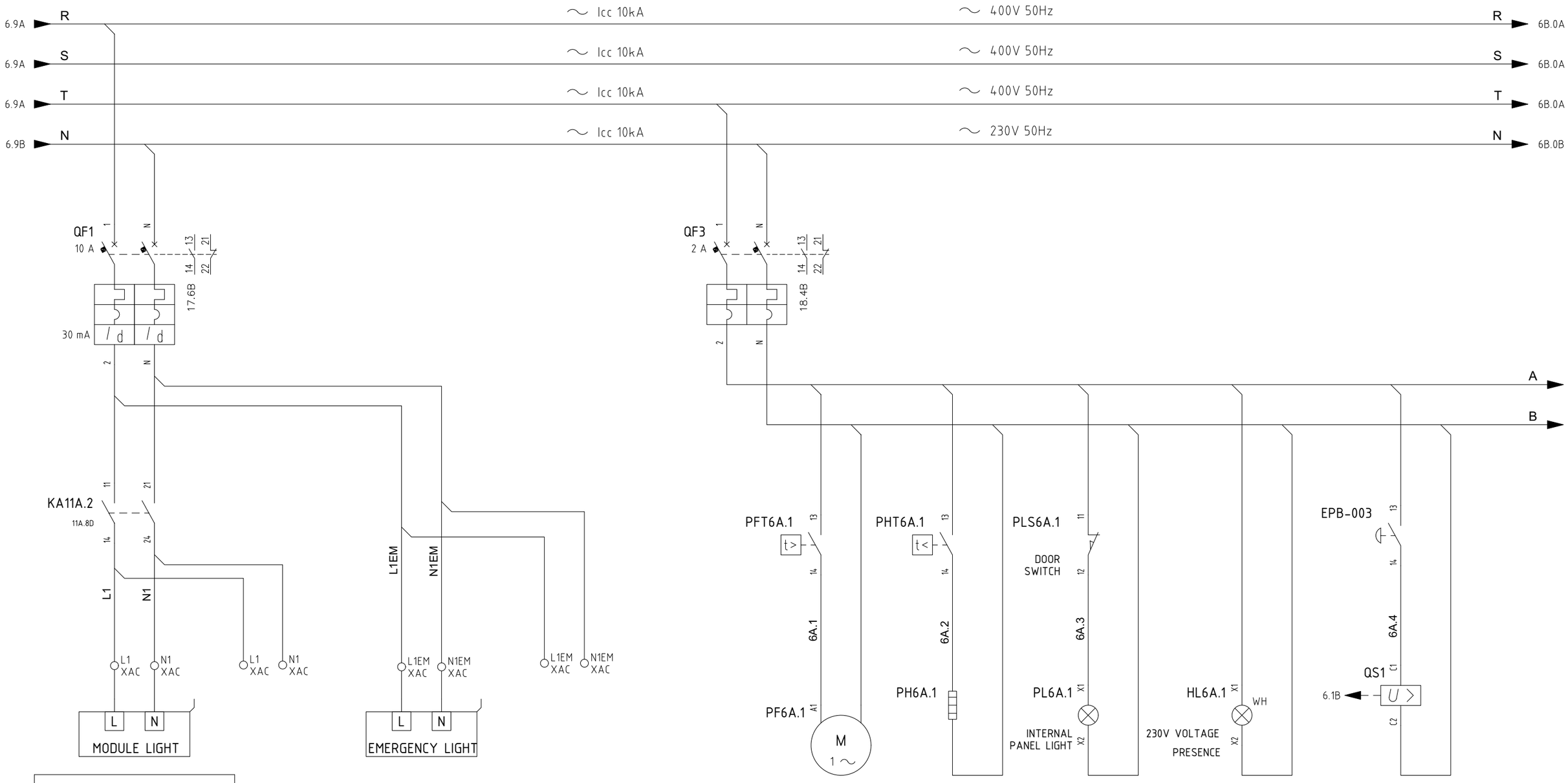
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 6
F.S. 6A



MODULE INTERNAL LIGHT	
RATED	ABSORBED
1 kW	0.9
4.35 A	3.9 A

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24		DISEGN.	F.M.
03	ISSUE FOR APPROVAL	05/09/24		VISTO	S.S.
				APPR.	M.G.

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CLIENT: CROSSWIND

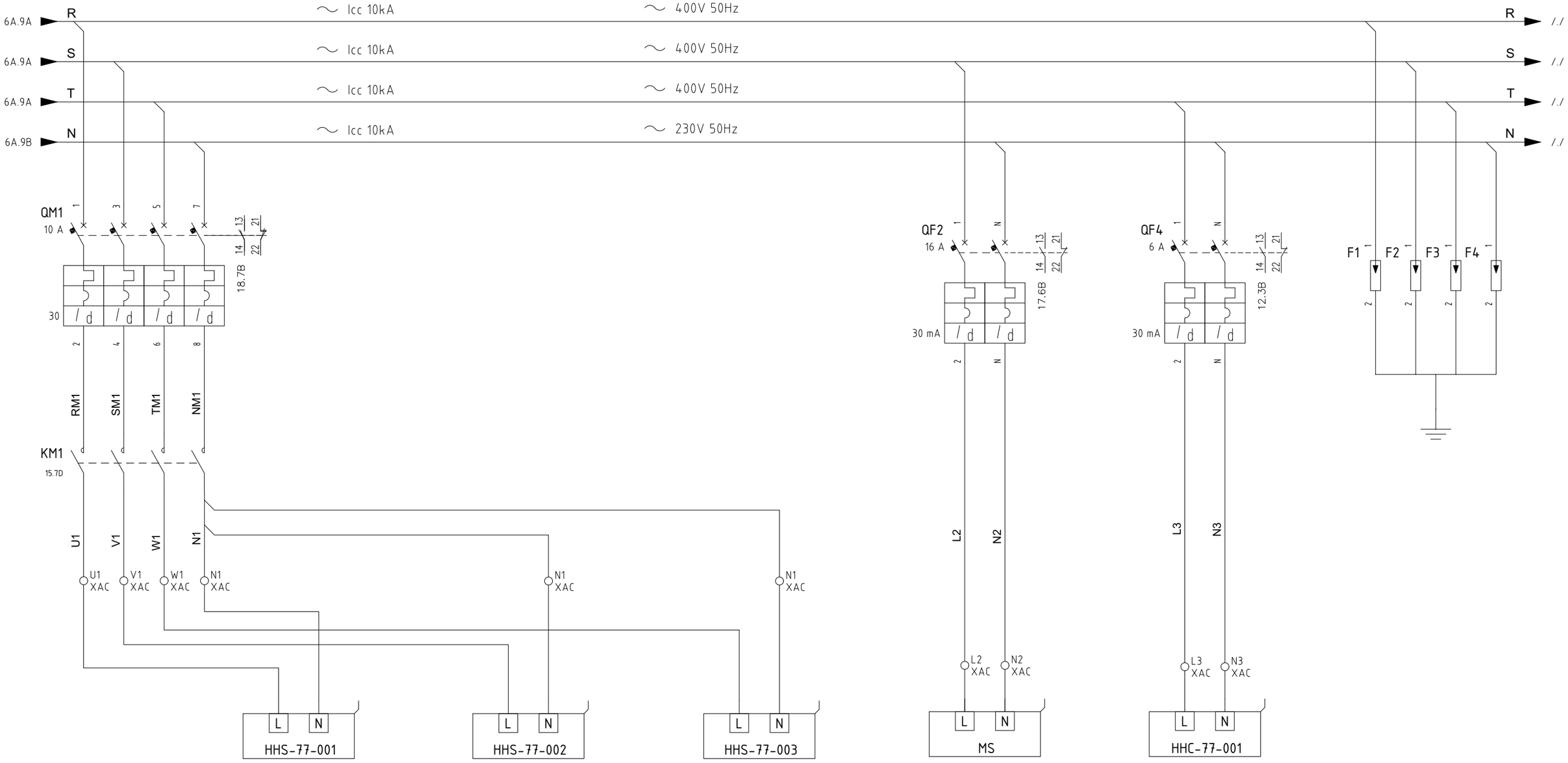
BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 6A
F.S. 6B



HSS-77-001	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HSS-77-002	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HSS-77-003	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

MODULE INTERNAL SOCKET	
RATED	ABSORBED
2 kW	1.8 kW
8.7 A	7.83 A

HHC-77-001	
HEATING CABLE	
RATED	ABSORBED
0.12 kW	0.12 kW
0.7 A	0.7 A

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
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03	ISSUE FOR APPROVAL	05/09/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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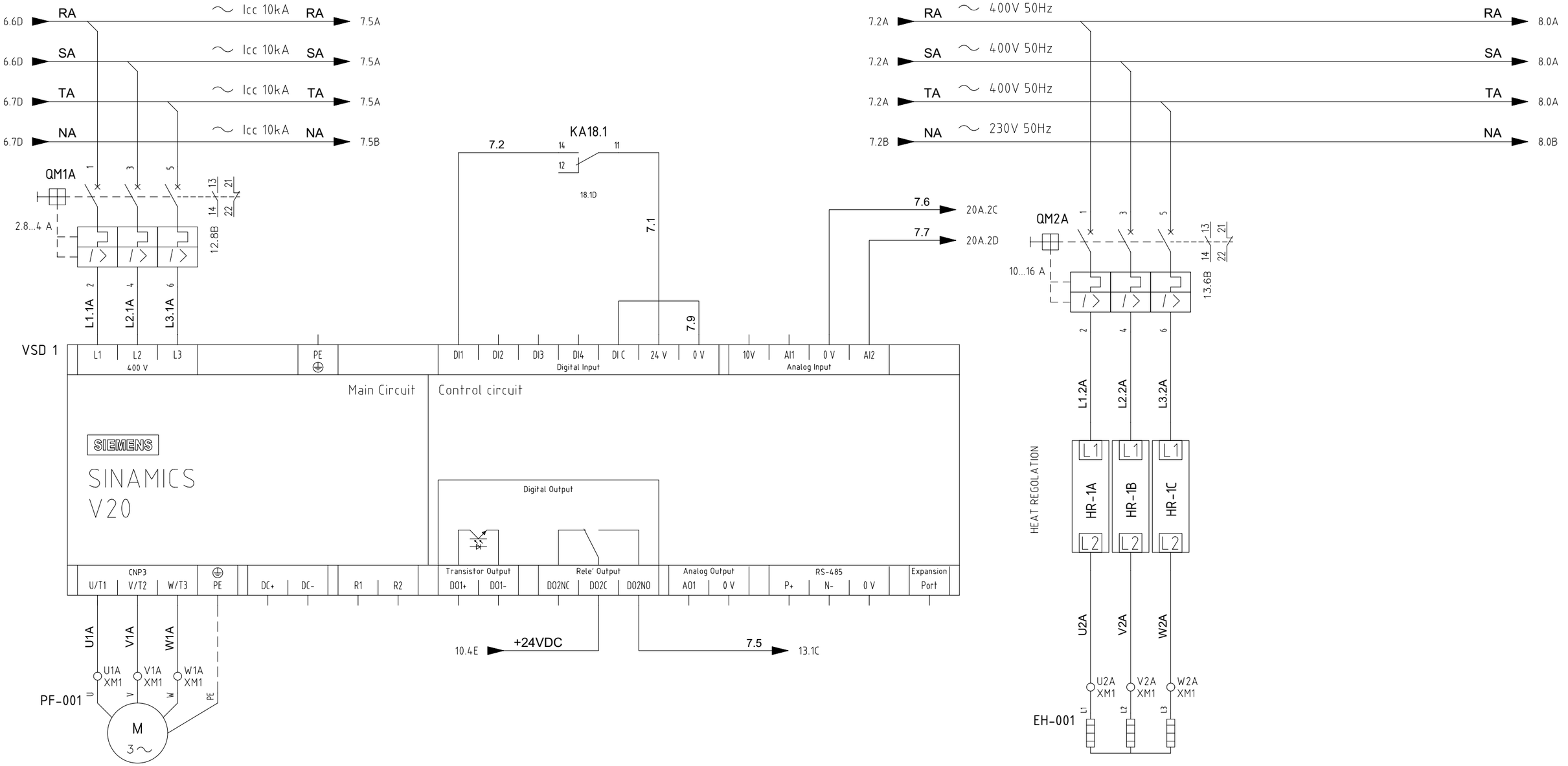
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 6B
F.S. 7



HFM-77-101	
PRESSURIZING FAN 1	
RATED	ABSORBED
1.1 kW	1 kW
2.3 A	2 A

HSS-77-103	
ELECTRICA HEATER	
RATED	ABSORBED
10 kW	10 kW
14.5 A	14.5 A

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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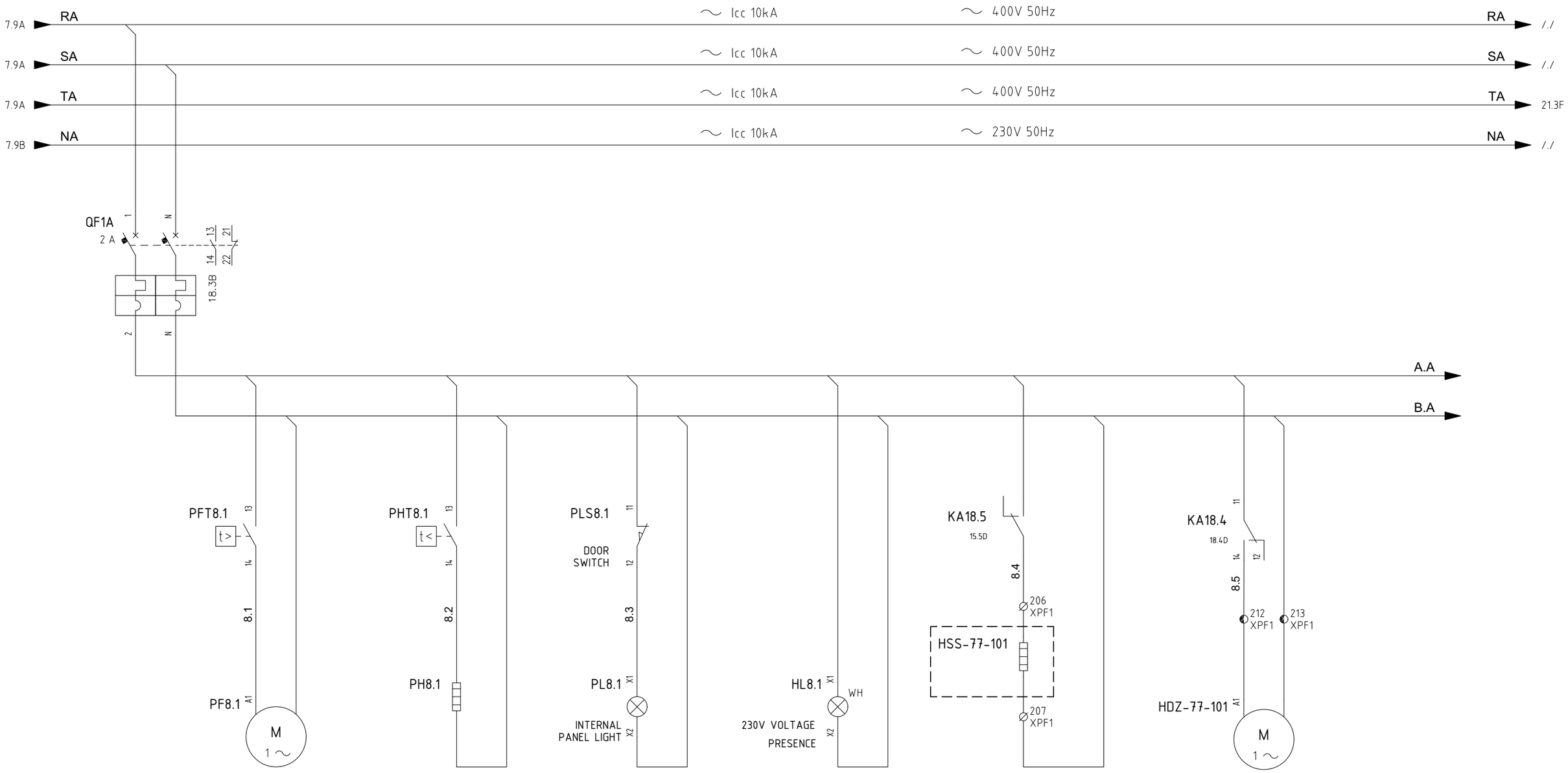
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 7
F.S. 8



PF-001
MOTOR HEATER

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
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DATA	15/04/2024
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VISTO	S.S.
APPR.	M.G.

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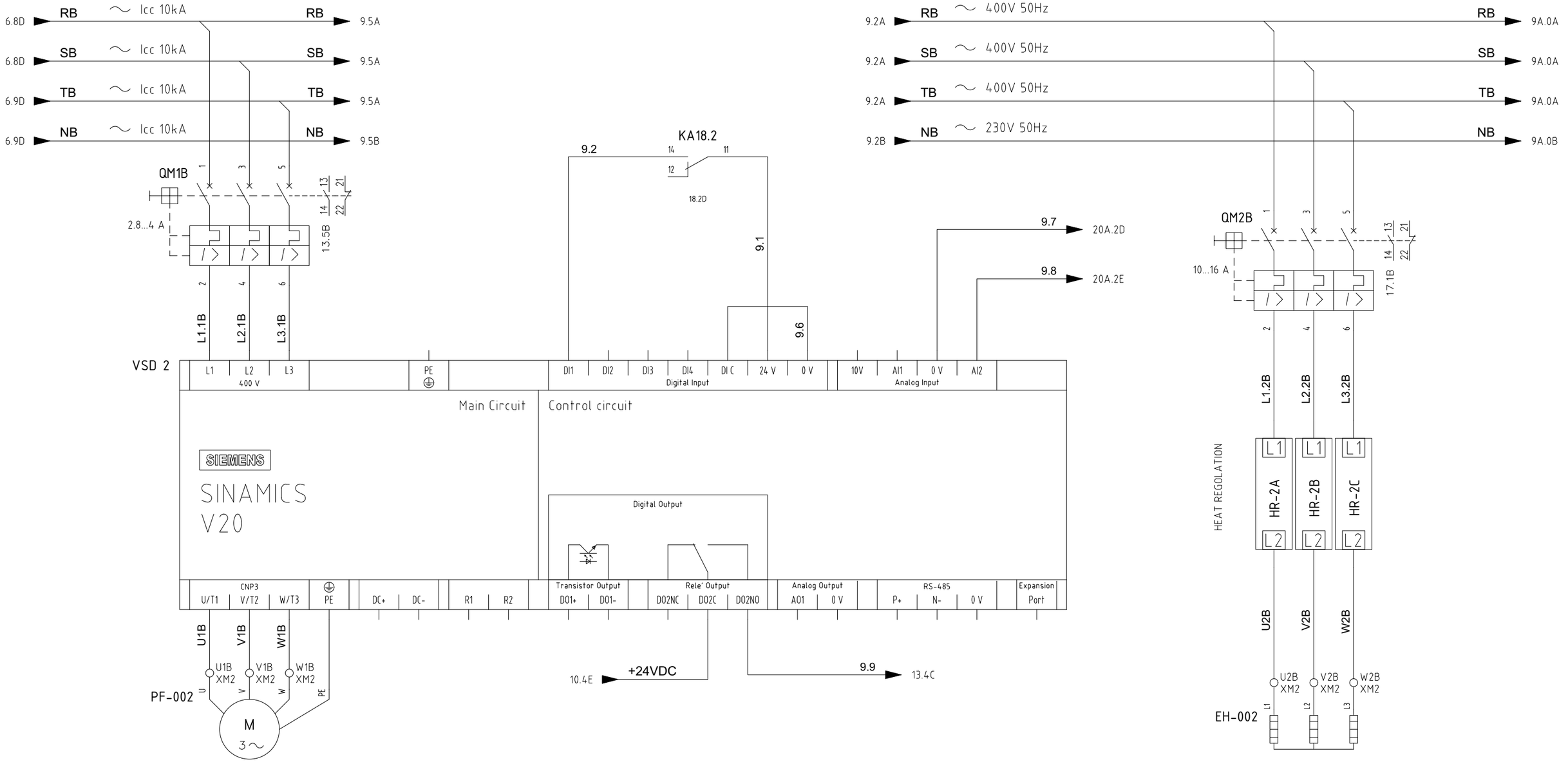
CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
POWER SECTION

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 8
F.S. 9



HFM-77-102	
PRESSURIZING FAN 2	
RATED	ABSORBED
1.1 kW	1 kW
2.3 A	2 A

HHS-77-104	
ELECTRICAL HEATER	
RATED	ABSORBED
10 kW	10 kW
14.5 A	14.5 A

REV.	MODIFICA	DATA	FIRMA
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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 9
F.S. 9A

9.9A RB ~ Icc 10kA ~ 400V 50Hz RB /./

9.9A SB ~ Icc 10kA ~ 400V 50Hz SB /./

9.9A TB ~ Icc 10kA ~ 400V 50Hz TB 22.3F

9.9B NB ~ Icc 10kA ~ 230V 50Hz NB /./

QF1B
2 A
1 N
2 N
13 21
14 22
17.3B

A.B

B.B

PFT9A.1
13
t>
14
9A.1
A1
PF9A.1
M
1 ~

PHT9A.1
13
t<
14
9A.2
PH9.1

PLS9A.1
11
DOOR SWITCH
12
9A.3
PL9A.1
X1
X2

HL9A.1
X1
WH
230V VOLTAGE PRESENCE
X2

KA18.6
15.7D
9A.4
306 XPF2
HSS-77-102
307 XPF2

KA18.7
18.7D
11
14
12
9A.5
312 XPF2
313 XPF2
HDZ-77-102
A1
M
1 ~

PF-002
MOTOR HEATER

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

DATA	15/04/2024
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VISTO	S.S.
APPR.	M.G.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

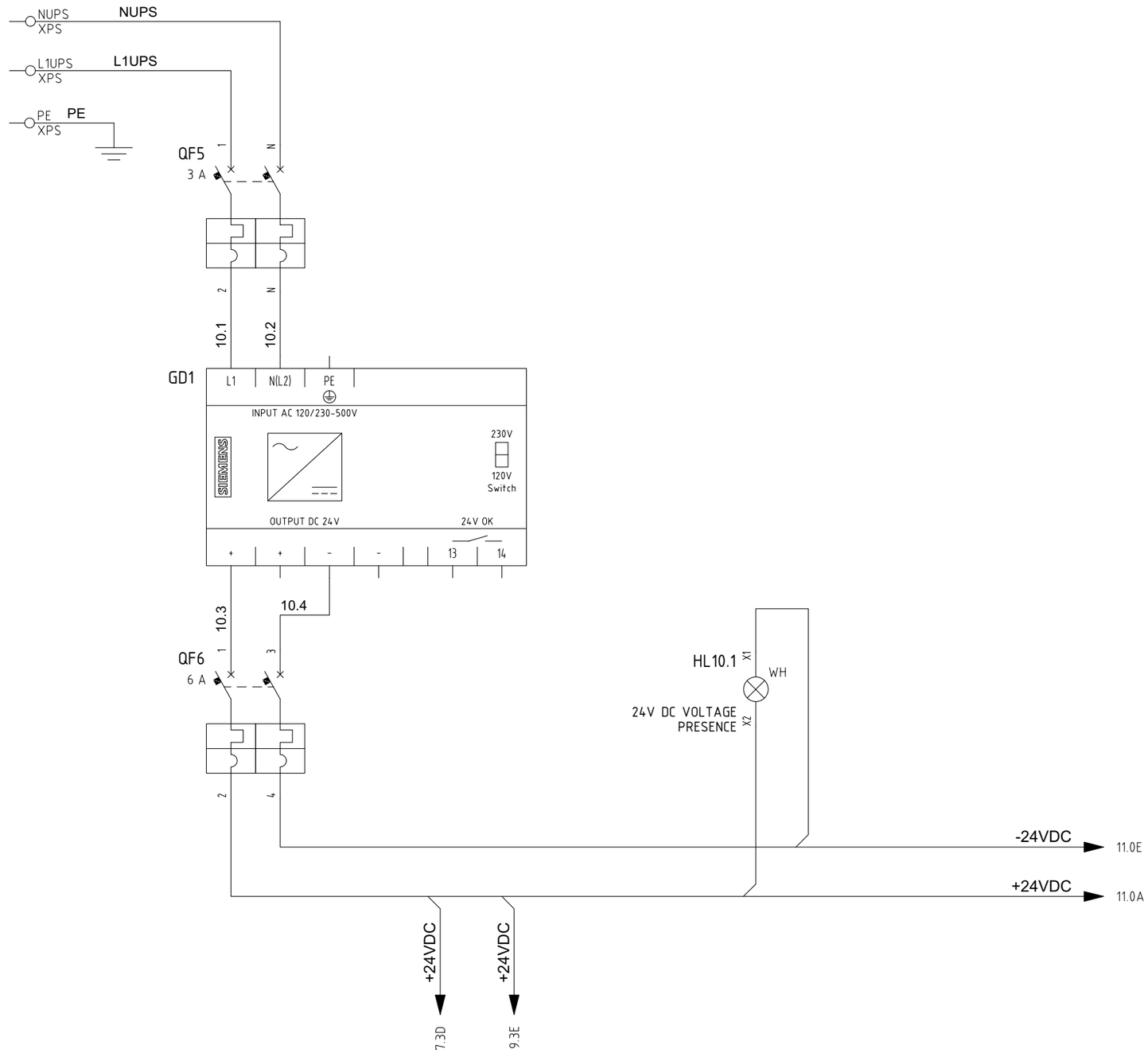
1724000049-HV-DA-00026

FG. 9A
F.S. 10

UPS POWER SUPPLY
FROM
AC UPS - PAS DB
1PH + N + PE 230V
50Hz
3G4
TAG DP-200F3

RATED POWER: 0.7 kW
RATED CURRENT: 3 A

ABSORBED POWER: 0.5 kW
ABSORBED CURRENT: 2 A



REV.	MODIFICA	DATA	FIRMA
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VISTO	S.S.
APPR.	M.G.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 10
F.S. 11

SHUT DOWN
FROM
CUSTOMER SIS

PF-001
PRESSURIZING FAN
THERMIC PROTECTION
PTC-001

PF-002
PRESSURIZING FAN
THERMIC PROTECTION
PTC-002

10.7E +24VDC

+24VDC 11A.0A

24V DC
FROM SIS
B400-SIS-0901
1= OK
0= SHUT
DOWN

100 XC
11.1
KA11.1 A1
A2
101 XC
11.2

14.4B
11 12 14
21 22 24
31 32 34
41 42 44

A1/11

MTP-001
SIEMENS
MOTOR THERMIC PROTECTION
TRIPPED
T1 T2 A2 NC 12 NO 14
11.3 11.4
200 XPF1 201 XPF1
11.5 12.5B

MTP-002
SIEMENS
MOTOR THERMIC PROTECTION
TRIPPED
T1 T2 A2 NC 12 NO 14
11.6 11.7
300 XPF2 301 XPF2
11.8 13.2C

10.7E -24VDC

-24VDC 11A.0E

REV.	MODIFICA	DATA	FIRMA
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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00026
FG. 11
F.S. 11A

HPB-77-101
EMERGENCY POWER
BUTTON
HHU-77001

HPB-77-102
EMERGENCY POWER
BUTTON
HHU-77002

LIGHT SWITCH

11.9A +24VDC

+24VDC 12.0A

202
XPF1

HPB-77-101
11
12

203
XPF1

11A.3

302
XPF2

HPB-77-102
11
12

303
XPF2

11A.4

QSA
C1
6.6B U >
C2

QSB
C1
6.8B U >
C2

104
XC

106
XC

LIGHT
PUSH BUTTON

105
XC

107
XC

11A.6

KA11A.1
A1
A2

A A

KA11A.1
11
11A.6D
14
12

11A.5

KA11A.2
A1
A2

B B

6A.0C 14 11
6A.0C 24 21

11.9E -24VDC

-24VDC 12.0A

11A.8C
11 12
14
21 22
24
31 32
34
41 42
44

REV.	MODIFICA	DATA	FIRMA
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04	ACCEPT FOR CONSTRUCTION	10/12/24	
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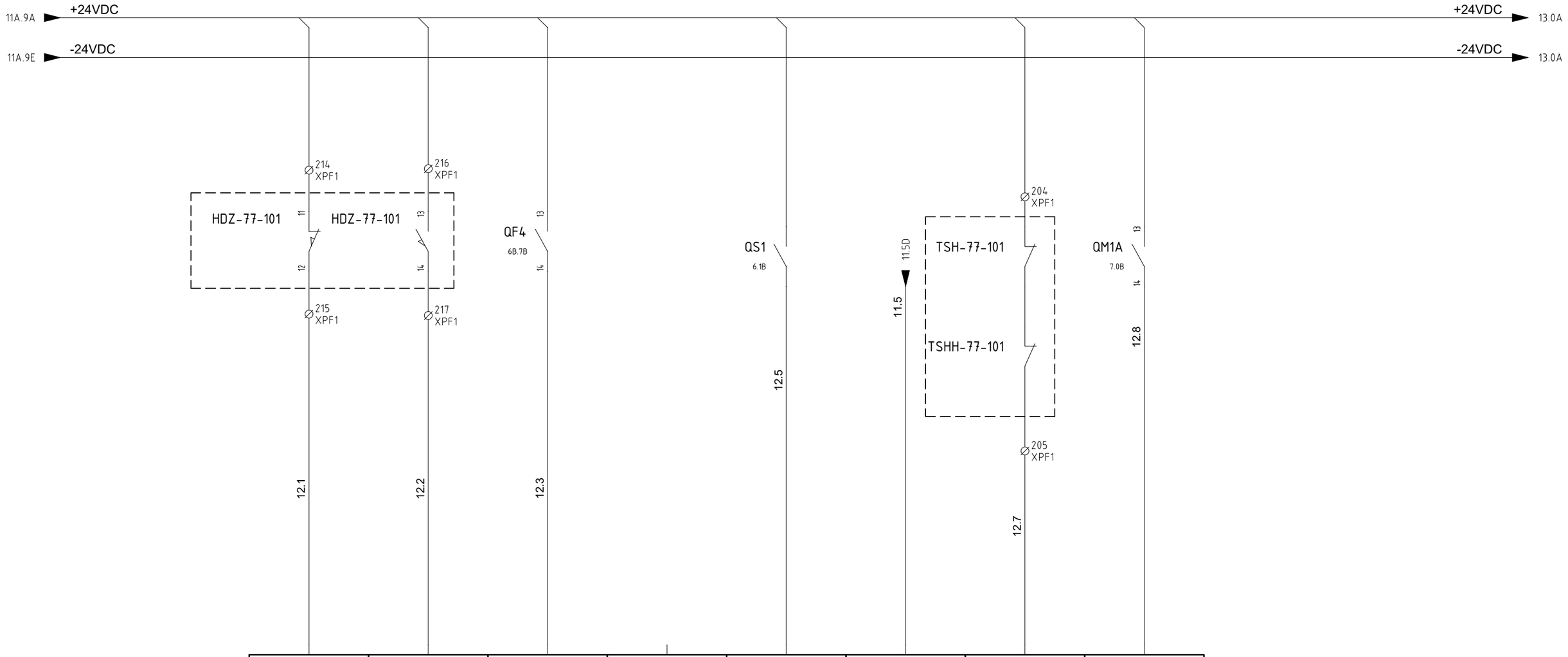
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 11A
F.S. 12



1	2	3	4	5	6	7	8
I0.0	I0.1	I0.2	I0.3	I0.4	I0.5	I0.6	I0.7
CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4
Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:
HDZ-77-101 CLOSE FEEDBACK 1= CLOSE 0= NOT CLOSE	HDZ-77-101 OPEN FEEDBACK 1= OPEN 0= NOT OPEN	HHC-77-001 HETING CABLE TRIP	SPARE	MAIN BRAKER TRIP SIGNAL	TE-77-101 MOTOR. TERM.PROT 0=MALFUNC. 1=NORMAL	TSH/HH-77-101 EL.HEATER THERM. 0=MALFUNC. 1=NORMAL	TRIP SIGNAL HFM-77-101 0=MALFUNC. 1=NORMAL

REV.	MODIFICA	DATA	FIRMA
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04	ACCEPT FOR CONSTRUCTION	10/12/24	
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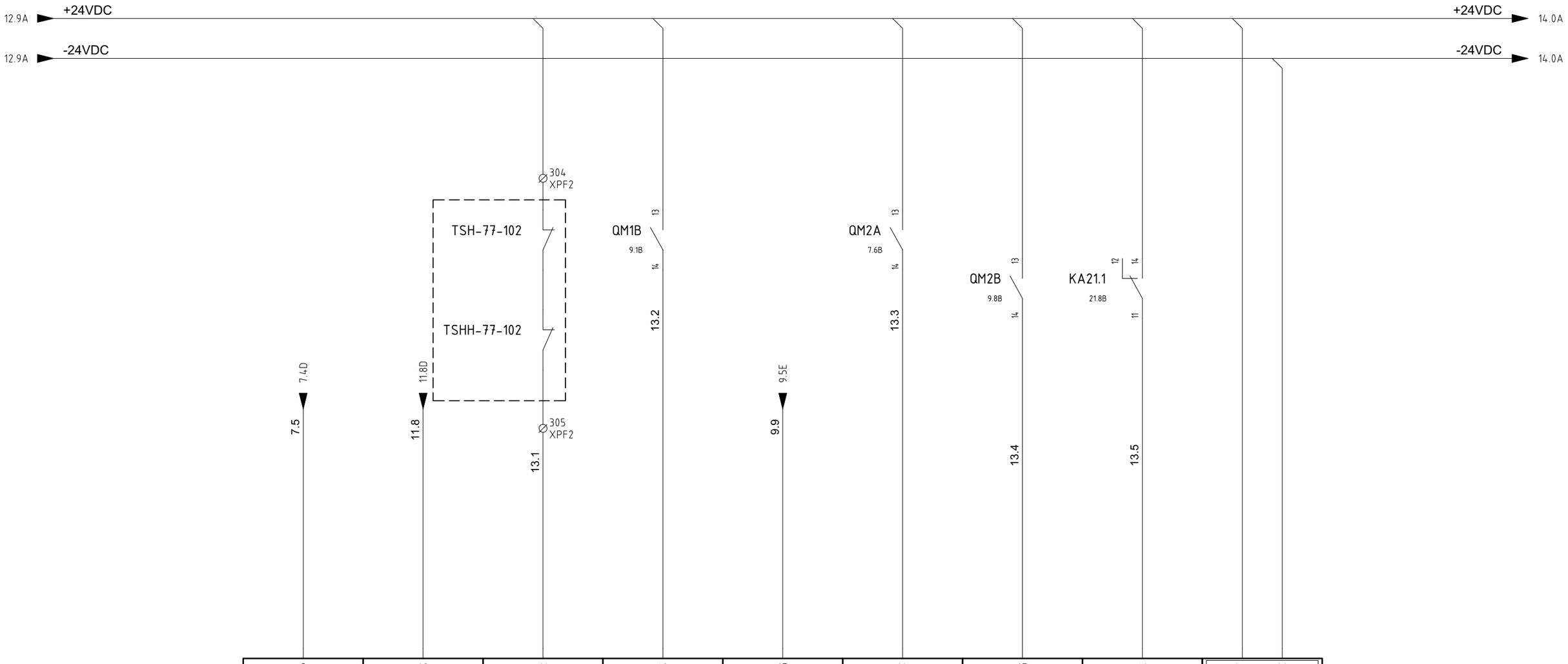
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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 12
F.S. 13



9	10	11	12	13	14	15	16	L+ M
I1.0	I1.1	I1.2	I1.3	I1.4	I1.5	I1.6	I1.7	
CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4
Name: A3 / Sheet:	Name: A3 / Sheet:	Name: A3 / Sheet:	Name: A3 / Sheet:	Name: A3 / Sheet:	Name: A3 / Sheet:	Name: A3 / Sheet:	Name: A3 / Sheet:	Name: A3 / Sheet:
VSD-1 MALFUN. SIGNAL 0=MALFUNC. 1=NORMAL	TE-77-102 MOTOR. TERM.PROT 0=MALFUNC. 1=NORMAL	TSH/HH-77-102 EL.HEATER THERM. 0=MALFUNC. 1=NORMAL	TRIP SIGNAL HFM-77-102 0=MALFUNC. 1=NORMAL	VSD-2 MALFUN. SIGNAL 0=MALFUNC. 1=NORMAL	HSS-77-101 TRIP SIGNAL 0=MALFUNC. 1=NORMAL	HSS-77-102 TRIP SIGNAL 0=MALFUNC. 1=NORMAL	HSS-77-101 MALFUNCTION 0=MALFUNC. 1=NORMAL	

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24		DISEGN.	F.M.
03	ISSUE FOR APPROVAL	05/09/24		VISTO	S.S.
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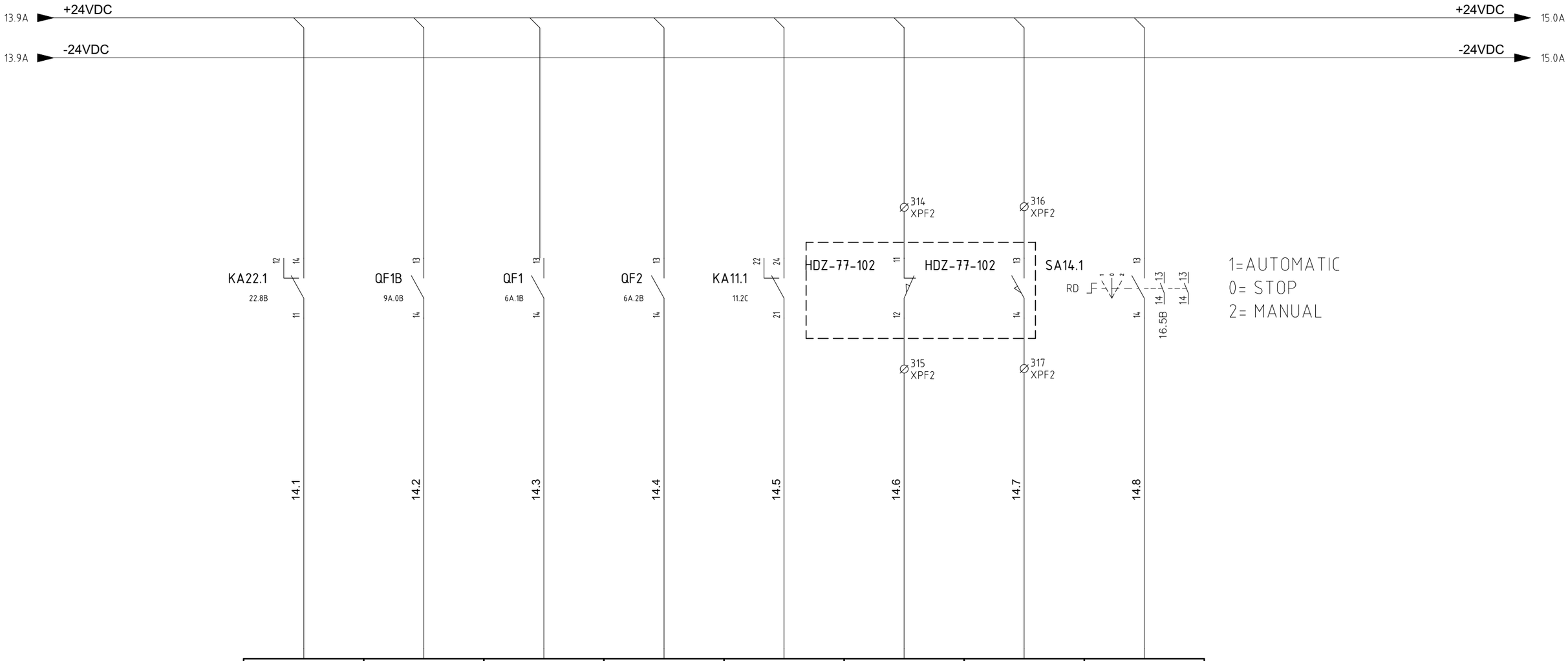
CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 13
F.S. 14



1	2	3	4	5	6	7	8
12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7
CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5
Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:
HSS-77-102 MALFUNCTION 0=MALFUNC. 1=NORMAL	TRIP AUX SECTION HHU-77002 PF-002 SECTION	TRIP SIGNAL MODULE LIGHT	TRIP SIGNAL MODULE SOCKET	HVAC SHUT DOWN FROM SIS 0=SHUTDOWN 1=NORMAL	HDZ-77-102 CLOSE FEEDBACK 1= CLOSE 0= NOT CLOSE	HDZ-77-102 OPEN FEEDBACK 1= OPEN 0= NOT OPEN	HHU-77001 SELECTOR AUTOMATIC 0= NOT AUTOMATIC 1= AUTOMATIC

REV.	MODIFICA	DATA	FIRMA
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FG. 14
F.S. 15

14.9A +24VDC → +24VDC 16.0A

14.9A -24VDC → -24VDC 16.0A

QF1A	QF3	QSA	QSB	QM1	KM1
8.0B	6A.4B	6.6B	6.8B	6B.1B	15.7D
				13 / 14	
15.1	15.2	15.3	15.4	15.5	15.7

9	10	11	12	13	14	15	16	L+ M
13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	
CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5
Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:
TRIP AUX SECTION HHU-77001 Trip Aux Section PF-001	GENERAL PANEL AUX TRIP General Panel Aux Trip	HHU-77001 MAIN BRAKER TRIP	HHU-77002 MAIN BRAKER TRIP	HSS-77-001/2/3 SPACE HEATER TRIP	SPARE	HSS-77-001/2/3 SPACE HEATER RUN	SPARE	

REV.	MODIFICA	DATA	FIRMA
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B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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F.G. 15
F.S. 16

15.9A +24VDC → +24VDC 17.0A

15.9A -24VDC → -24VDC 17.0A

1=AUTOMATIC
0= STOP
2= MANUAL

SA16.1 RD — 13 / 14 — 16.6B 24 23 / 34 33

208 XPF1 — 13 — p> — 14 — PDSL-77-101 — 209 XPF1

210 XPF1 — 13 — p> — 14 — PDT-77-101 — 211 XPF1

308 XPF2 — 13 — p> — 14 — PDSL-77-102 — 309 XPF2

310 XPF2 — 13 — p> — 14 — PDT-77-102 — 311 XPF2

SA14.1 — 13 / 14 — 14.7B

SA16.1 — 23 / 24 — 16.1B

KA23A.1 — 11 / 14 — 12 — 23A.1E

16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8
9	10	11	12	13	14	15	16
14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7
CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6
Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:
HHU-77002 AUTOMATIC SELECTOR 0=NOT AUTOMATIC 1=AUTOMATIC	HHU-77001 FAN FLOW SWITCH 0=NO FLOW 1= FLOW	HHU-77001 FILTER DIFF SWITCH 0=NORMAL 1=CLOGGED	HHU-77002 FAN FLOW SWITCH 0=NO FLOW 1=FLOW	HHU-77002 FILTER DIFF SWITCH 0=NORMAL 1=CLOGGED	HHU-77001 MANUAL SELECTOR 0=NOT MANUAL 1= MANUAL	HHU-77002 MANUAL SELECTOR 0=NOT MANUAL 1= MANUAL	HFD-77001 CLOSE CONTACT 0= NOT CLOSE 1= CLOSE

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO — ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 16
F.S. 17

16.9A +24VDC

16.9A -24VDC

+24VDC 18.0C

-24VDC 18.0D

KA23A.2 — 11 — 23A.2E — 14 — 12 — 17.1

KA23A.3 — 11 — 23A.3E — 14 — 12 — 17.2

KA23A.4 — 11 — 23A.4E — 14 — 12 — 17.3

KA23A.5 — 11 — 23A.6E — 14 — 12 — 17.4

KA23A.6 — 11 — 23A.7E — 14 — 12 — 17.5

9	10	11	12	13	14	15	16	L+ M
15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	
CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6
Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:
HFD-77001 OPEN CONTACT 0=NOT OPEN 1=OPEN	HFD-77002 CLOSE CONTACT 0= NOT CLOSE 1= CLOSE	HFD-77002 OPEN CONTACT 0=NOT OPEN 1= OPEN	HFD-77003 CLOSE CONTACT 0= NOT CLOSE 1= CLOSE	HFD-77003 OPEN CONTACT 0= NOT OPEN 1= OPNE	SPARE	SPARE	SPARE	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
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B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO — ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 17
F.S. 18

VSD 1 START COMMAND vsd 1 start command		VSD 2 START COMMAND vsd 2 start command		HVAC MALFUNCTION SIGNAL TO SIS 0=MALFUNC. 1=NORMAL		HDZ-77-101 OPEN COMMAND		PF-001 MOTOR HEATER PF-001 Motor Heater		PF-002 MOTOR HEATER PF-002 Motor Heater		HHS-77001 SPACE HEAER START		HDZ-77-102 OPEN COMMAND	
Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:
CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7	
Q0.0		Q0.1		Q0.2		Q0.3		Q0.4		Q0.5		Q0.6		Q0.7	
1		2		3		4		5		6		7		8	

18.1 18.2 18.3 18.5 18.6 18.7

17.9A +24VDC → 19.0D +24VDC

17.9A -24VDC → 19.0D -24VDC

KA18.1 A1 A2 | KA18.2 A1 A2 | KA18.3 A1 A2 | KA18.4 A1 A2 | KA18.5 A1 A2 | KA18.6 A1 A2 | KM1 A1 A2 | KA18.7 A1 A2

7.3A 11 12 14 21 22 24 31 32 34 41 42 44

9.4A 11 12 14 21 22 24 31 32 34 41 42 44

23.1B 11 12 14 21 22 24 31 32 34 41 42 44

8.7D 11 12 14 21 22 24 31 32 34 41 42 44

8.6D 23.4B 11 12 14 21 22 24 31 32 34 41 42 44

9A.6D 23.5B 11 12 14 21 22 24 31 32 34 41 42 44

6B.1C
6B.1C
6B.1C
6B.1C
20A.2B

9A.8D 11 12 14 21 22 24 31 32 34 41 42 44

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
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B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 18
F.S. 19

SPARE		SPARE		SPARE		SPARE		SPARE		SPARE		SPARE		SPARE		
Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	
CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		
Q1.0		Q1.1		Q1.2		Q1.3		Q1.4		Q1.5		Q1.6		Q1.7		
9		10		11		12		13		14		15		16		L+ M

18.9C +24VDC → +24VDC 20.0A

18.9D -24VDC → -24VDC 20.0A

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24		DISEGN.	F.M.
03	ISSUE FOR APPROVAL	05/09/24		VISTO	S.S.
				APPR.	M.G.

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B-100 HV SWITCH ROOM

AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 19
F.S. 20

19.9D +24VDC

19.9D -24VDC

+24VDC 20A.0A

-24VDC 20A.0A

TEMPERATURE TRANSM.
4-20ma
77-TT-101

500 XT
501 XT
502 XT

TEMPERATURE TRANSM.
4-20mA
77-TT-102

503 XT
504 XT
505 XT

DIFFER. PRESSURE
TRANSM. 4-20mA
77-TP-101

506 XT
507 XT
508 XT

TEMPERATURE TRASM.
4-20mA
77-TT-103

- + T

509 XT
510 XT

20.1 20.2 20.3

1 5 9 13	2 6 10 14	3 7 11 15	4 8 12 16	L+ M
AI0.0	AI0.1	AI0.2	AI0.3	
CPU: QUADRO GENERALE MOD. : 8	CPU: QUADRO GENERALE MOD. : 8	CPU: QUADRO GENERALE MOD. : 8	CPU: QUADRO GENERALE MOD. : 8	CPU: QUADRO GENERALE MOD. : 8
Name: A7 / Sheet:	Name: A7 / Sheet:	Name: A7 / Sheet:	Name: A7 / Sheet:	Name: A7 / Sheet:
77-TT-101 TEMPERATURE TRANSMITTER	77-TT-102 TEMPERATURE TRANSMITTER	77-PT-101 DIFFERENTIAL PRESSURE TRANSMITTER SIGNAL	77-TT-103 DUCT TEMPERATURE TRASMITTER	

REV.	MODIFICA	DATA	FIRMA
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B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 20
F.S. 20A

20.9A +24VDC

20.9A -24VDC

+24VDC 20B.0A

-24VDC 20B.0A

VSD 1 MODULATION VSD 1 modulation		VSD 2 MODULATION VSD 2 modulation		HSS-77-101 MODULATION SIGNAL EH-001 Modulation Signal		HSS-77-102 MODULATION SIGNAL EH-002 Modulation Signal			
Name: A8	Sheet:	Name: A8	Sheet:	Name: A8	Sheet:	Name: A8	Sheet:	Name: A8	Sheet:
CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10	
AQ0.0		AQ0.1		AQ0.2		AQ0.3			
9 1 5 13		10 2 6 14		11 3 7 15		12 4 8 16		L+ M	

7.5B 7.6

7.5B 7.7

9.6B 9.7

9.6B 9.8

20A.1 21.7B

20A.2 21.7B

20A.3 22.7C

20A.4 22.7C

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
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B-100 HV SWITCH ROOM

AUX SECTION

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1724000049-HV-DA-00026

F.G. 20A

F.S. 20B

20A.9A +24VDC

20A.9A -24VDC

+24VDC 20C.0A

-24VDC 20C.0A

SPARE	SPARE	SPARE	SPARE	
Name: A9 / Sheet:	Name: A9 / Sheet:	Name: A9 / Sheet:	Name: A9 / Sheet:	Name: A9 / Sheet:
CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11
AQ1.0	AQ1.1	AQ1.2	AQ1.3	
9 1 5 13	10 2 6 14	11 3 7 15	12 4 8 16	L+ M

REV.	MODIFICA	DATA	FIRMA
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B-100 HV SWITCH ROOM

AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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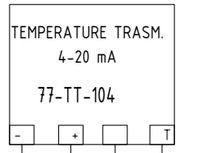
FG. 20B
F.S. 20C

20B.9A +24VDC

20B.9A -24VDC

+24VDC 20D.0E

-24VDC 20D.0F



1 5 9 13	2 6 10 14	3 7 11 15	4 8 12 16	L+ M
AI1.0	AI1.1	AI1.2	AI1.3	
CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12
Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:
77-TT-104 DUCT TEMPERATURE TRANSMITTER	SPARE	SPARE	SPARE	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

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CLIENT: CROSSWIND

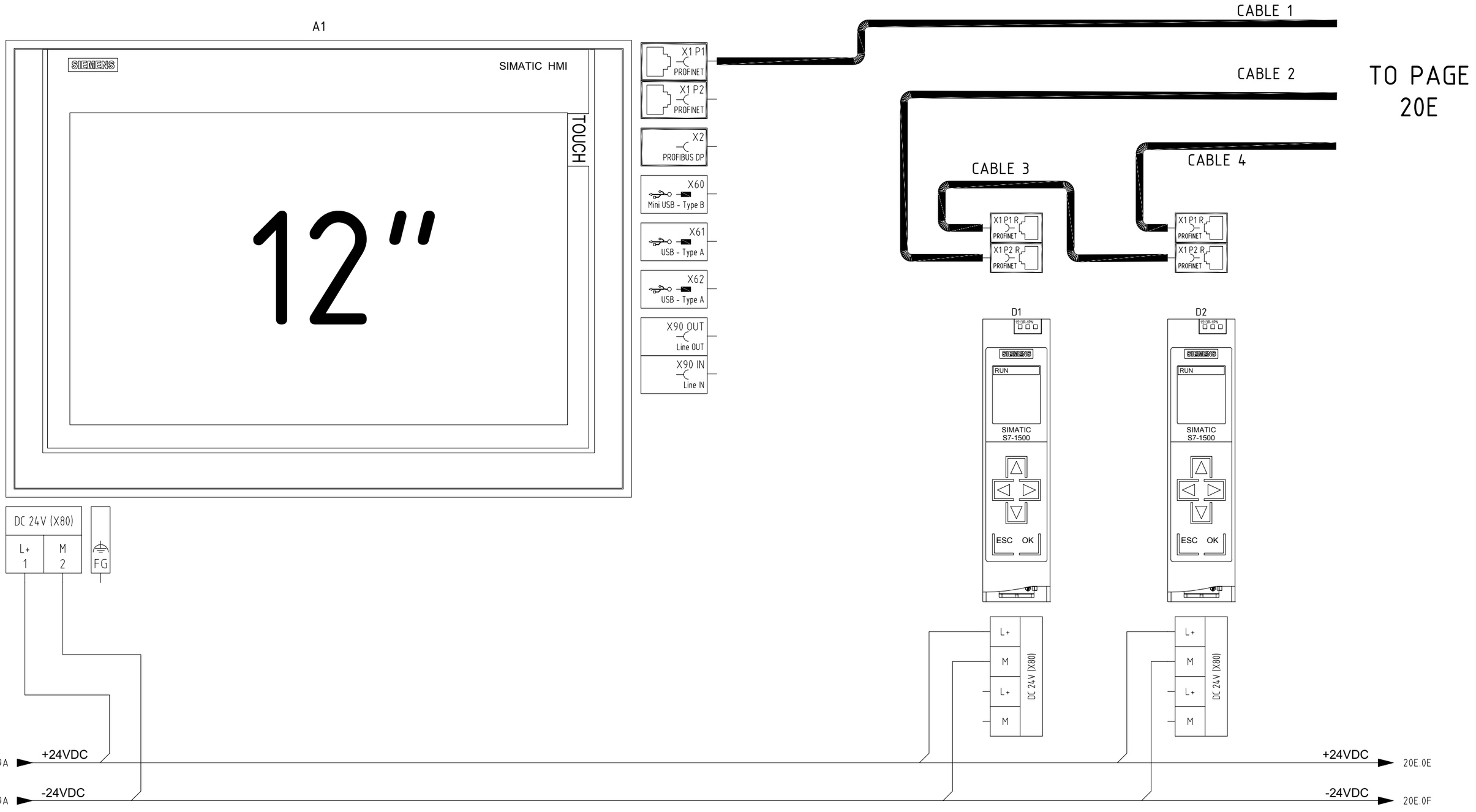
BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 20C

F.S. 20D



REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24		DISEGN.	F.M.
03	ISSUE FOR APPROVAL	05/09/24		VISTO	S.S.
				APPR.	M.G.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

PLC ARCHITECTURE

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 20D
F.S. 20E

FROM PAGE 40

CABLE 4

CABLE 1

CABLE 2

MODBUS TCP/P TO CLIENT

RJ45 CONNECTION IN TERMINAL STRIP

1	TD
2	TD N
3	RD
4	GND
5	GND
6	RD N
7	GND
8	GND

PROFINET IO - Port 1 RJ45

PROFINET IO - Port 2 RJ45

1L+	
2L+	
1M	DC 24V
2M	

P1	LAN
P2	LAN
P3	LAN
P4	LAN
P5	LAN
P6	LAN
P7	LAN
P8	LAN

1	F1
2	F2

1	L1+
2	M1
3	M2
4	L2+

DC 24V

A11

SIEMENS

SCALANCE XC208

P1 P2 P3 P4 P5 P6 P7 P8

SELECT/SET

CONSOLE

FAULT F1 F2

L1+ M1 M2 L2+

208-0BA00-2AC2

A2 A3 A4 A5 A6 A7 A8 A9 A10

BA 2xRJ45

SIEMENS

RN ER MT

SIMATIC ET 200SP

IM 155-6 PN/2 HF

6ES7155-6AU01-0CN0

DI 16x24VDC ST	DI 16x24VDC ST	DI 16x24VDC ST	DQ 16x24VDC/0,5A ST	AI 4xU/I 2-wire ST	AQ 4xU/I ST	AQ 4xU/I ST	AI 4xU/I 2-wire ST	
DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	
6ES7131-6BH01-0BA0	6ES7131-6BH01-0BA0	6ES7131-6BH01-0BA0	6ES7132-6BH01-0BA0	6ES7134-6HD01-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HD00-0BA1	6ES7134-6HD01-0BA1	

MAC ADDRESS

X80 24VDC

20D.9E +24VDC → +24VDC 21.0A

20D.9F -24VDC → -24VDC 21.0A

REV.	MODIFICA	DATA	FIRMA
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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

PLC ARCHITECTURE

ROSETTI MARINO ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 20E

F.S. 21

EH-001
MODULATION

20E.9E +24VDC → +24VDC 22.0A

20E.9F -24VDC → -24VDC 22.0A

21.1

21.2

20A.1

20A.2

20A.5E

20A.5E

KA21.1 A1 / A2

17.2B 11 12 14 21 22 24 31 32 34 41 42 44

1/L1

HR-1A.

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-1B.

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-1C.

19 AL
18 AL
17 D17
16 A2
15 A-
14 A+
13 D13
12 US
11 A2

GRM 1

2/T1

3/L2

21.4

F21.1 1 2

8.9A RA

REV.	MODIFICA	DATA	FIRMA
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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

ELECTRICAL HEATER MODULATION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 21
F.S. 22

EH-002
MODULATION

21.9A +24VDC → +24VDC /./

21.9A -24VDC → -24VDC /./

22.1

22.2

1/L1

HR-2A.

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-2B.

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-2C.

19 AL
18 AL
17 D17
16 A2
15 A-
14 A+
13 D13
12 US
11 A2

GRM 1

2/T1

20A.6E

20A.7E

20A.3

20A.4

KA22.1 A1 A2

17.3B 11 12 14 21 22 24 31 32 34 41 42 44

3/L2

22.20

FU22.1 1 2

9A.9A RB

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

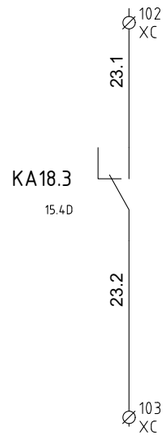
ELECTRICAL HEATER MODULATION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 22
F.S. 23

AVAILABLE SIGNAL
GENERAL FAULT
TO SIS



CLOSE= NORMAL
OPEN= MALFUNCTION

SIGNAL TO SIS
B400-SIS-0901

REV.	MODIFICA	DATA	FIRMA
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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

AVAILABLE SIGNAL

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 23
F.S. 23A

HFD-77001
CLOSED FEEDBACK

HFD-77002
CLOSED FEEDBACK

HFD-77003
CLOSED FEEDBACK

HFD-77001
OPEN FEEDBACK

HFD-77002
OPEN FEEDBACK

HFD-77003
OPEN FEEDBACK

+24VDC

+24VDC

400 XFD
402 XFD
404 XFD
406 XFD
408 XFD
410 XFD

HFD-77001 11 12
HFD-77001 13 14
HFD-77002 11 12
HFD-77002 13 14
HFD-77003 11 12
HFD-77003 13 14

401 XFD
403 XFD
405 XFD
407 XFD
409 XFD
411 XFD

KA23A.1 A1 A2
KA23A.2 A1 A2
KA23A.3 A1 A2
KA23A.4 A1 A2
KA23A.5 A1 A2
KA23A.6 A1 A2

-24VDC

-24VDC

16.7B 11 12 14
23.2B 21 22 24
17.1B 11 12 14
23.4B 21 22 24
17.2B 11 12 14
23.5B 21 22 24
17.3B 11 12 14
23.7B 21 22 24
17.4B 11 12 14
23.4D 21 22 24
17.4B 11 12 14
23.5D 21 22 24

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

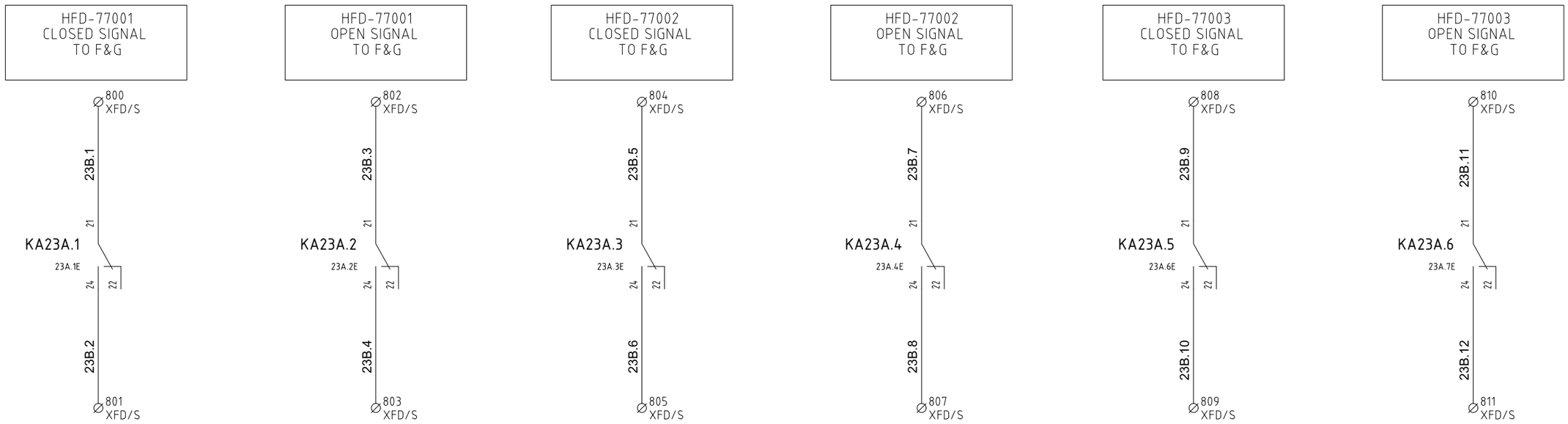
BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

FIRE DAMPER

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00026

F.G. 23A
F.S. 23B



REV.	MODIFICA	DATA	FIRMA
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04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

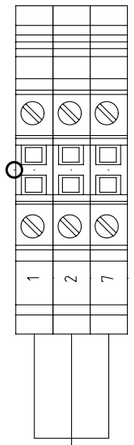
FIRE DAMPER

ROSETTI MARINO
ALEXSISTEMI spa

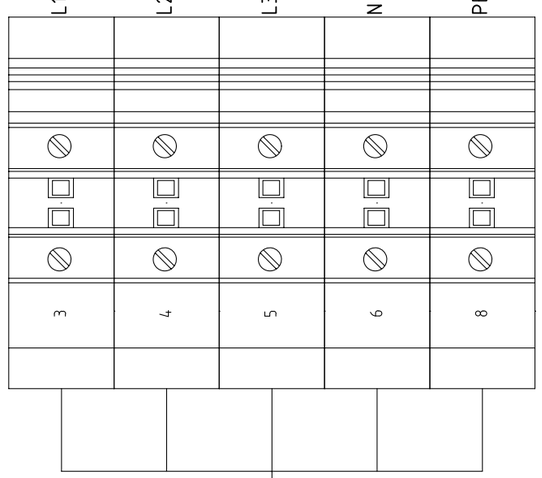
1724000049-HV-DA-00026

FG. 23B
F.S. 24

+QG - XPS
POWER SUPPLY

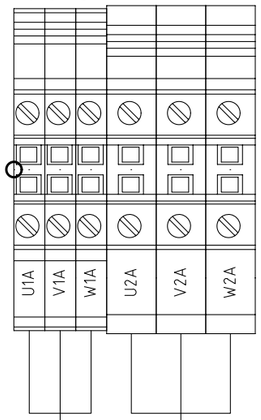


230V 1F + N + PE
50Hz
FROM
AC UPS-PAS DB
3G4
DP-200F3



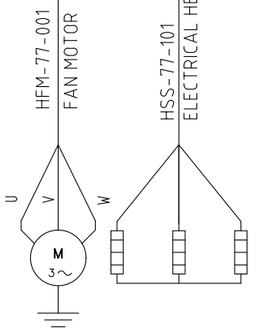
400V 3F +N + PE
50Hz
FROM
LV SWITCHGEAR
5G25
SG-200N1

+QG - XM1
POWER PRESS FAN 1

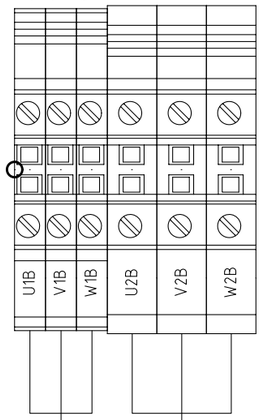


4G2.5
FG160M16
HFM-77-001
FAN MOTOR

4G6
FG160M16
HSS-77-101
ELECTRICAL HEATER

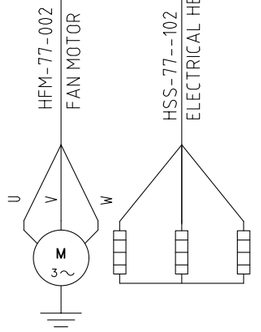


+QG - XM2
POWER PRESS FAN 2

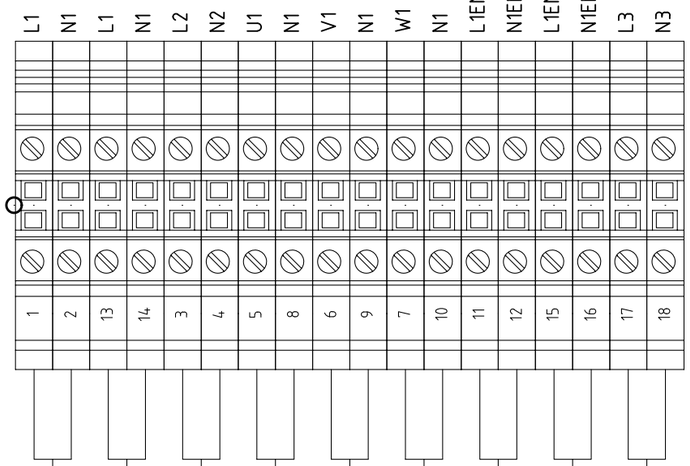


4G2.5
FG160M16
HFM-77-002
FAN MOTOR

4G6
FG160M16
HSS-77--102
ELECTRICAL HEATER



+QG - XAC
ACCESSORIES



3G2.5 — MODULE LIGHT — LIGHT
3G2.5 — MODULE LIGHT — LIGHT
3G3 — MODULE SOCKET — SOCKET
3G2.5 — SPACE HEATER — HSS-77-001
3G2.5 — SPACE HEATER — HSS-77-002
3G2.5 — SPACE HEATER — HSS-77-003
3G2.5 — MODULE EM LIGHT — EM. LIGHT
3G2.5 — MODULE EM LIGHT — EM. LIGHT
3G2.5 — HEATING CABLE — HHT-77-001

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24		DISEGN.	F.M.
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				APPR.	M.G.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

TERMINAL STRIP

ROSETTI MARINO — ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 24
F.S. 25

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

	DATA	
DISEGN.	F.M.	15/04/2024
VISTO	S.S.	
APPR.	M.G.	

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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
TERMINAL STRIP

ROSETTI MARINO
ALEXSISTEMI spa

172400049-HV-DA-00026

F.G. 25
F.S. 25A

+QG - XC
Client

SHUTDOWN FROM SIS	100	+24VDC
	101	11.1
HVAC MALF. SIGNAL TO SIS	102	23.3
	103	23.2
LIGHT BUTTON	104	+24VDC
	105	6C.4
LIGHT BUTTON	106	+24VDC
	107	6C.4

+QG - XPF1
AUX PRES FAN 1

TE-77-101	PTC MOTOR PROTECTION	3G1.5 FG16OM16	200	11.3
			201	11.4
HPB-77-101	EMERGENCY STOP BUTTON	3G1.5 FG16OM16	202	+24VDC
			203	12.3
TSH/HH-77-101	ELECTRICAL HEATER THERMOSTATE PROTECTION	3G1.5 FG16OM16	204	+24VDC
			205	12.7
HSS-77-103	MOTOR FAN ELECTRICAL HEATER	3G1.5 FG16OM16	206	23.5
			207	B
PDSL-77-101	FAN FLOW SWITCH	2X1.5 FG16OM16	208	+24VDC
			209	16.2
PDT-77-101	FILTER FLOW SWITCH	2X1.5 FG16OM16	210	+24VDC
			211	16.3
HDZ-77-101 (240V, 1, 2)	POWER SUPPLY	3G2.5	212	A.A
			213	B.A
HDZ-77-101 (S1 S2 S3 S4 S5 S6, ZSC <5°, ZSO >85°)	SIGNAL FEEDBACK	4X1.5	214	+24VDC
			215	12.1
			216	+24VDC
			217	12.2

+QG - XPF2
AUX PRES FAN 2

TE-77-102	PTC MOTOR PROTECTION	3G1.5 FG16OM16	300	11.6
			301	11.7
HPB-77-102	EMERGENCY STOP BUTTON	3G1.5 FG16OM16	302	+24VDC
			303	12.4
TSH/HH-77-102	ELECTRICAL HEATER THERMOSTATE PROTECTION	3G1.5 FG16OM16	304	+24VDC
			305	13.1
HSS-77-104	MOTOR FAN ELECTRICAL HEATER	3G1.5 FG16OM16	306	23.6
			307	B
PDSL-77-102	FAN FLOW SWITCH	2X1.5 FG16OM16	308	+24VDC
			309	16.4
PDT-77-102	FILTER FLOW SWITCH	2X1.5 FG16OM16	310	+24VDC
			311	16.5
HDZ-77-102 (240V, 1, 2)	POWER SUPPLY	3G2.5	312	A.B
			313	B.B
HDZ-77-102 (S1 S2 S3 S4 S5 S6, ZSC <5°, ZSO >85°)	SIGNAL FEEDBACK	4X1.5	314	+24VDC
			315	14.6
			316	+24VDC
			317	14.7

+QG - XT

77-TT-101	TEMPERATURE TRANSMITTER BY CLIENT	3X1.5+Sh	500	+24VDC
			501	-24VDC
77-TT-102	TEMPERATURE TRANSMITTER BY CLIENT	3X1.5+Sh	502	20.1
			503	+24VDC
77-TP-101	DIFFERENTIAL PRESSURE TRANSM BY CLIENT	3X1.5+Sh	504	-24VDC
			505	20.2
			506	+24VDC
			507	-24VDC
77-TT-103	DUCT TEMPERATURE TRASMITTER	2X1.5+Sh TBA	508	20.3
			509	20.13
77-TT-104	DUCT TEMPERATURE TRASMITTER	2X1.5+Sh TBA	510	20.15
			511	20C.17
			512	20C.19

+QG - XFD
FIRE DAMPER

+24VDC 16.8 | +24VDC 17.1 | +24VDC 17.2 | +24VDC 17.3 | +24VDC 17.4 | +24VDC 17.5

400 401 402 403 | 404 405 406 407 | 408 409 410 411

4X1.5 FEEDBACK SIGNAL

HFD-77001 — 240V, S1 S2 S3 S4 S5 S6, ZSC <5°, ZSO >85°

HFD-77002 — 240V, S1 S2 S3 S4 S5 S6, ZSC <5°, ZSO >85°

HFD-77003 — 240V, S1 S2 S3 S4 S5 S6, ZSC <5°, ZSO >85°

+QG - XFD/S
FIRE DAMPER SIGNAL

23B.1 23B.6 23B.3 23B.10 23B.5 23B.14 23B.7 23B.18 23B.9 23B.22 23B.11 23B.26

800 801 802 803 804 805 806 807 808 809 810 811

HFD-77001 CLOSED SIGNAL
HFD-77002 CLOSED SIGNAL
HFD-77003 CLOSED SIGNAL

HFD-77001 OPEN SIGNAL
HFD-77002 OPEN SIGNAL
HFD-77003 OPEN SIGNAL

X3 RJ45

RJ45 CLIENT CONNECTION

MODBUS TCP/IP
CONNECTION
FROM
B400-NET-001

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24		DISEGN.	F.M.
03	ISSUE FOR APPROVAL	05/09/24		VISTO	S.S.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

TERMINAL STRIP

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 25A
F.S. 26

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
				Hq	4	2
	R5CPFE6100	Compensation panel for modular cabinet height 100 width 600	dkc	Hq	4	2
	R5CPME6200	Solid modular door for cabinet width 600, door height 200	dkc	Hq	4	2
	RZPCE6200	modular wiring panel L.600 H.200	dkc			2
	R5CPME6600	Solid modular cabinet door 600 width, 600 door height	dkc	Hq	4	2
	RZPCE6600	Modular wiring panel L.600 H.600	dkc			2
	R5CPME6800	Solid modular cabinet door width 600, door height 800	dkc	Hq	4	2
	RZPCE6800	Modular wiring panel L.600 H.800	dkc			2
	R5CQE1866R	Cabinet comp. 1800x600x600 back	dkc	Hq	4	2
	R5LE1862	SIDE DOOR FOR CQE PANEL DEPTH 600 HEIGHT 1800	dkc			2
	R1ZCOR1	Modular plinth corner H100 4pcs	dkc			2
	R1ZPRO601	Front/side flange H100 length 600	dkc			3
	R5TOE60	Rebate crossbar for modular doors, width 600	dkc			5
	RZMVE18	Vertical support height 1800	dkc			2
	RZA33	Lifting Ring	dkc			3
	RZKE65	CQE cabinet union kit	dkc			2
	rzkre65	Flat Cooling Kit for CQE Cabinets	dkc			2
	rzksre65	L-shaped union reinforcement kit for CQE cabinets	dkc			2
	RZSOE545	HORIZONTAL SUPPORT TOTAL CABINET DEPTH 600	dkc			5
	RZDOE6545	HORIZONTAL PARTITION TOTAL CABINET WIDTH 600 DEPTH 600	dkc			5
	RZDVE1860	Vertical partition for CQE 1800x600	dkc			2
32 x 15	534-2	DIN rail EN60715 32x15x1.5 closed	Arnocanali	Hq	5	3.98
32 x 15	PD32Z	Sendzimir rail 32x15x9 closed	Canloplast	Hq	5	0.41
40 x 100	E35	can.cabl.40x100 sg	Canloplast	Hq	5	9.79
60 x 100	E184	Can.Cabl.60x100 SG S/4	Canloplast	Hq	5	0.84
77-TT-103				Hq		1
77-TT-104				Hq		1
A1	6AV2124-0MC01-0AX0	SIMATIC HMI TP1200 Comfort. Touch control, 12" widescreen display	siemens	Hq	20d	1
A2	6ES7155-6AU01-0CN0	IM 155-6 PN HF/2 V4.2 Interface Module	siemens	Hq	20th	1
	6ES7193-6AR00-0AA0	BA 2×RJ45 (PROFINET busadapter with standard Ethernet socket for IM-PN)	siemens			1
A3	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	20th	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A4	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	20th	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A5	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	20th	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A6	6ES7132-6BH01-0BA0	Digital Output Module: DQ 16x24VDC/0.5A ST	siemens	Hq	20th	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A7	6ES7134-6HD01-0BA1	Analog Input Module: AI 4XU/I 2-Wire ST	siemens	Hq	20th	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A8	6ES7135-6HD00-0BA1	Analog Output Module: AQ 4XU/I ST	siemens	Hq	20th	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A9	6ES7135-6HD00-0BA1	Analog Output Module: AQ 4XU/I ST	siemens	Hq	20th	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A10	6ES7134-6HD01-0BA1	Analog Input Module: AI 4XU/I 2-Wire ST	siemens	Hq	20th	1

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DATA 15/04/2024
DISEGN. F.M.
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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 26
F.S. 27

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
A10	*6ES7193-6BP00-0DA0*	*Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)*	*siemens*	*Hq*	*20th*	1
A11	*6GK5208-0BA00-2AC2*	*XC208 Managed Switch with 8 RJ45 100Mbit/s Ports*	*siemens*	*Hq*	*20th*	1
D1	*6ES7513-1RM03-0AB0*	*CPU 1513R-1PN*	*siemens*	*Hq*	*20d*	1
	6ES7954-8LF02-0AA0	*Memory card, 24 MB*	*siemens*			1
	6ES7590-1AB60-0AA0	*Profile rail S7-1500, 160 mm*	*siemens*			1
D2	*6ES7513-1RM03-0AB0*	*CPU 1513R-1PN*	*siemens*	*Hq*	*20d*	1
	6ES7954-8LF02-0AA0	*Memory card, 24 MB*	*siemens*			1
	6ES7590-1AB60-0AA0	*Profile rail S7-1500, 160 mm*	*siemens*			1
EM. LIGHT				*Hq*		1
EM. LIGHT				*Hq*		1
EPB-003	*3su1900-0dy30-0aa0*	*Protective collar for merge button, plastic, yellow, 22mm hole*	*siemens*	*Hq*	*6th*	1
	3SU1001-1HB20-0AA0	*Emergency stop mushroom pushbutton, illuminatable, twist release, 40 mm diameter, 2 positions*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
F1		*docker*		*Hq*	*6b*	1
F2		*docker*		*Hq*	*6b*	1
F3		*docker*		*Hq*	*6b*	1
F4		*docker*		*Hq*	*6b*	1
F21.1		*Single-pole fuse*		*Hq*	21	1
FU22.1		*Single-pole fuse*		*Hq*	22	1
GD1	*6EP1333-3BA10*	*Sitop PSU200M single-phase and two-phase, DC 24V/5A. Stabilized power supply Input: 120-230/230-500V AC, Output: DC 24V/5A*	*siemens*	*Hq*	10	1
HDZ-77-101		*Single-phase alternating current motor*		*Hq*	8	1
HDZ-77-101		*NC Limit Switch*		*Hq*	12	1
HDZ-77-101		*Limit Switch: No*		*Hq*	12	1
HDZ-77-102		*Single-phase alternating current motor*		*Hq*	*9a*	1
HDZ-77-102		*NC Limit Switch*		*Hq*	14	1
HDZ-77-102		*Limit Switch: No*		*Hq*	14	1
HFD-77001		*NC Limit Switch*		*Hq*	*23rd*	1
HFD-77001		*Limit Switch: No*		*Hq*	*23rd*	1
HFD-77001				*Hq*	*25th*	1
HFD-77002		*NC Limit Switch*		*Hq*	*23rd*	1
HFD-77002		*Limit Switch: No*		*Hq*	*23rd*	1
HFD-77002				*Hq*	*25th*	1
HFD-77003		*NC Limit Switch*		*Hq*	*23rd*	1
HFD-77003		*Limit Switch: No*		*Hq*	*23rd*	1
HFD-77003				*Hq*	*25th*	1
HHT-77-001				*Hq*		1
HL6A.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	*6th*	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL8.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	8	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL9A.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	*9a*	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1

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DATA	15/04/2024
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B-100 HV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 27
F.S. 28

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
HL9A.1	*3su1500-0aa10-0aa0*	*Support without module. plastic*	*siemens*	*Hq*	*9a*	1
HL10.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	10	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HR-1A				*Hq*	7	1
HR-1A.	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	21	1
HR-1B				*Hq*	7	1
HR-1B.	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	21	1
HR-1C				*Hq*	7	1
HR-1C.	*GRM-H-25-48-AN-OL-00000*	*Static power master unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	21	1
HR-2A				*Hq*	9	1
HR-2A.	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	22	1
HR-2B				*Hq*	9	1
HR-2B.	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	22	1
HR-2C				*Hq*	9	1
HR-2C.	*GRM-H-25-48-AN-OL-00000*	*Static power master unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	22	1
HSS-77-001				*Hq*		1
HSS-77-002				*Hq*		1
HSS-77-003				*Hq*		1
KA11.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	11	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA11A.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	*11th*	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA11A.2	202290244000	*Modular Pulse Relay No. of contacts: 2 Contact configuration: No Contact material: AGSNo2 Mounting: DIN rail Function: Mechanical Sizing current: 16 A. Width in subdivision units: 1 Type of supply voltage*	*Finder*	*Hq*	*11th*	1
KA18.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.2	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

DATA 15/04/2024
DISEGN. F.M.
VISTO S.S.
APPR. M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH) B-100 HV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 28
F.S. 29

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA18.2	094913	*Latching and unhooking jumper*	*Finder*	*Hq*	18	1
KA18.3	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.4	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	18	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.5	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.6	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.7	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	18	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA21.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	21	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA22.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	22	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1

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DATA	15/04/2024
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B-100 HV SWITCH ROOM

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1724000049-HV-DA-00026

FG. 29
F.S. 30

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA23A.1	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*23rd*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA23A.2	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*23rd*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA23A.3	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*23rd*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA23A.4	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*23rd*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA23A.5	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*23rd*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA23A.6	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*23rd*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KM1	*3RT2316-1BB40*	*Contactor, 4 NO, AC-1: 18 to 24 V DC, 4-pole, 4 NO, size S00, screw terminals*	*siemens*	*Hq*	18	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
LIGHT				*Hq*		1
LIGHT				*Hq*		1
MTP-001	*3RN2000-1AW30*	*Motor protection relay for PTC thermistor supervision 24/240 V AC/DC 1 changeover contact*	*siemens*	*Hq*	11	1
MTP-002	*3RN2000-1AW30*	*Motor protection relay for PTC thermistor supervision 24/240 V AC/DC 1 changeover contact*	*siemens*	*Hq*	11	1
MVA-1	*DMG600*	*multimeter with icon-based LCD*	*Lovato*	*Hq*	6	1
PDSL-77-101		*Pressure-controlled (pressure switch) No*		*Hq*	16	1
PDSL-77-101				*Hq*		1
PDSL-77-102		*Pressure-controlled (pressure switch) No*		*Hq*	16	1
PDSL-77-102				*Hq*		1
PDT-77-101		*Pressure-controlled (pressure switch) No*		*Hq*	16	1
PDT-77-101				*Hq*		1
PDT-77-102		*Pressure-controlled (pressure switch) No*		*Hq*	16	1
PDT-77-102				*Hq*		1

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FG. 30
F.S. 31

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
PF6A.1	*GSF10*	*air intake filter 100x100*	*Cosmotec*	*Hq*	*6th*	1
	GSV1000220	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*			1
PF8.1	*GSV1000220*	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*	*Hq*	8	1
	GSF10	*air intake filter 100x100*	*Cosmotec*			1
PF9A.1	*GSV1000220*	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*	*Hq*	*9a*	1
	GSF10	*air intake filter 100x100*	*Cosmotec*			1
PFT6A.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	*6th*	1
PFT8.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	8	1
PFT9A.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	*9a*	1
PH6A.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	*6th*	1
PH8.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	8	1
PH9.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	*9a*	1
PHT6A.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	*6th*	1
PHT8.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	8	1
PHT9A.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	*9a*	1
PL6A.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	*6th*	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL8.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	8	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL9A.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	*9a*	1
	050kfm	*Magnet kit*	*New Elfin*			1
PLS6A.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	*6th*	1
PLS8.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	8	1
PLS9A.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	*9a*	1
QF1	*5SU1354-1KK10*	*Residual current circuit breaker, 10 kA, 1P N, AC type, 30 mA, C, IN: 10 A, UN AC: 230 V*	*siemens*	*Hq*	*6th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF1A	*5SY4502-7*	*Circuit breaker 230 V 10KA, 1P N, C, 2A, D=70 mm*	*siemens*	*Hq*	8	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF1B	*5SY4502-7*	*Circuit breaker 230 V 10KA, 1P N, C, 2A, D=70 mm*	*siemens*	*Hq*	*9a*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF2	*5SU1354-1KK16*	*RCD, 10 kA, 1P N, AC type, 30 mA, C, IN: 16 A, UN AC: 230 V*	*siemens*	*Hq*	*6b*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF3	*5SY7502-7*	*Circuit breaker 230 V 15KA, 1P N, C, 2 A, D=70 mm*	*siemens*	*Hq*	*6th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF4	*5su1354-1kk06*	*RCD, 10 kA, 1P N, AC Type, 30 mA, C, In: 6 A, One AC: 230 V*	*siemens*	*Hq*	*6b*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF5	*5SY7503-7*	*Circuit breaker 230 V 15Ka, 1P N, C, 3 A, D=70 mm*	*siemens*	*Hq*	10	1
QF6	*5SY5206-7*	*Universal current circuit breaker 440 V DC - 400 V AC 10Ka, 2P, C, 6 A*	*siemens*	*Hq*	10	1
QF400	*5SY74027*	*Int. MT 4P C2 ICN 15KA, ICU 50KA*	*siemens*	*Hq*	6	1
QM1	*5SY7410-7*	*Circuit breaker 400 V 15kA, 4P, C, 10 A, D=70 mm*	*siemens*	*Hq*	*6b*	1
	5SM23420	*Block diff. 4P 40A 30mA Type AC x 5sy*	*siemens*			1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QM1A	*3RV2011-1EA10*	*Circuit breaker size S00 for motor protection, class 10, trip A 2.8...4 A, trip N 52 A, screw terminal*	*siemens*	*Hq*	7	1
	3RV2901-1E	*Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers*	*siemens*			1

REV.	MODIFICA	DATA	FIRMA
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MATERIAL LIST
LISTA METERIALI

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1724000049-HV-DA-00026

FG. 31
F.S. 32

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
QM1B	*3RV2011-1EA10*	*Circuit breaker size S00 for motor protection, class 10, trip A 2.8...4 A, trip N 52 A, screw terminal*	*siemens*	*Hq*	9	1
	3RV2901-1E	*Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers*	*siemens*			1
QM2A	*3RV2011-4AA10*	*Circuit breaker size S00 for motor protection, class 10, trip A 10...16 A, trip N 208 A, screw terminal*	*siemens*	*Hq*	7	1
	3RV2901-1E	*Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers*	*siemens*			1
QM2B	*3RV2011-4AA10*	*Circuit breaker size S00 for motor protection, class 10, trip A 10...16 A, trip N 208 A, screw terminal*	*siemens*	*Hq*	9	1
	3RV2901-1E	*Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers*	*siemens*			1
QS1	*3VA1140-3GE42-0AA0*	*3VA1 switch IEC chassis 160 switching capacity class n ICU=25 KA 415 V 4-pole, TM220 system protection, ATFM, IN=40 A Overload protection IR=28 A... 40 A Short-Circuit Protection II=10 x in N-Conductor Protection 100% LUG terminal*	*siemens*	*Hq*	6	1
	3VA9988-0BL30	*bobsleigh. Launch SIN 24VAC 50/60 Hz/12-30 VDC*	*siemens*			1
	3VA9988-0AA11	*Cont. HP-type status*	*siemens*			1
	3VA9157-0FK21	*com. rinv. Door Lock x 3VA10/1 STD*	*siemens*			1
	3VA9111-0WD40	*Cover x 3VA10/1 4P 1pcs.*	*siemens*			2
QSA	*5SY4420-7*	*Circuit breaker 400 V 10Ka, 4P, C, 20A, D=70 mm*	*siemens*	*Hq*	6	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
	5st3060	*Rotary control padlockable door lock IP65 black*	*siemens*			1
	5st3031	*24-48 V DC opening trip, for 5SL4, 5SY, 5SP, RCBO 5SU1, FI 5SV circuit breaker*	*siemens*			1
QSB	*5SY4420-7*	*Circuit breaker 400 V 10Ka, 4P, C, 20A, D=70 mm*	*siemens*	*Hq*	6	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
	5st3060	*Rotary control padlockable door lock IP65 black*	*siemens*			1
	5st3031	*24-48 V DC opening trip, for 5SL4, 5SY, 5SP, RCBO 5SU1, FI 5SV circuit breaker*	*siemens*			1
SA14.1	*3su1002-2bl10-0aa0*	*Black selector 3 positions (I or II), illuminable. permanent, 2 x 45°*	*siemens*	*Hq*	14	1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
	3SU1400-1AA10-1BA0	*Module of contacts for fixing on the front plate. 1 NO, screw terminals*	*siemens*			2
SA16.1	*3su1002-2bl10-0aa0*	*Black selector 3 positions (I or II), illuminable. permanent, 2 x 45°*	*siemens*	*Hq*	16	1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
	3SU1400-1AA10-1BA0	*Module of contacts for fixing on the front plate. 1 NO, screw terminals*	*siemens*			2
SOCKET				*Hq*		1
TA1.1	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
TA2.1	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
TA3.1	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
VSD 1	*6SL3210-5BE22-2CV0*	*SinamiCs V20 3AC380-480V 2.2KW with C3 Filter*	*siemens*	*Hq*	7	1
VSD 2	*6SL3210-5BE22-2CV0*	*SinamiCs V20 3AC380-480V 2.2KW with C3 Filter*	*siemens*	*Hq*	9	1
X3		*RJ45 port per panel*		*Hq*	*25th*	1
XAC	*CBC04GR*	*CBC.4/GR Feed-through clamp*	*Cabur*	*Hq*		18
XC	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		8
XFD	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		12
XFD/S	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		12
XM1	*CBC02GR*	*CBC.2/GR Thru-Clamp*	*Cabur*	*Hq*		3
	CBC06GR	*CBC.6/GR Thru-Clamp*	*Cabur*			3
XM2	*CBC02GR*	*CBC.2/GR Thru-Clamp*	*Cabur*	*Hq*		3
	CBC06GR	*CBC.6/GR Thru-Clamp*	*Cabur*			3

REV.	MODIFICA	DATA	FIRMA
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04	ACCEPT FOR CONSTRUCTION	10/12/24	
03	ISSUE FOR APPROVAL	05/09/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 32
F.S. 33

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
XPF1	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		16
	SF900GR	*SFR.4/GR Sectionable clamp*	*Cabur*			2
XPF2	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		16
	SF900GR	*SFR.4/GR Sectionable clamp*	*Cabur*			2
XPS	*CBC04GR*	*CBC.4/GR Feed-through clamp*	*Cabur*	*Hq*		3
	CBC35gr	*CBC.35/GR Feed-through clamp*	*Cabur*			5
XT	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		13

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BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM

Distinta Materiali
Bill of Materials

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00026

FG. 33
F.S. //

BASE LOAD POWER HUB (BLPH)

B-200 HVAC and LIGHTING PANEL WIRING DRAWING and GENERAL ARRANGEMENT (INC INTERCONNECTING) - E&I SHELTERS

B200-HSB-001

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	03/02/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
05	24/01/25				ACCEPT FOR CONSTRUCTION (AFC)
04	10/12/24				ACCEPT FOR CONSTRUCTION (AFC)
03	06/07/24				ISSUE FOR REVIEW (IFR)
02	13/06/24				ISSUE FOR REVIEW (IFR)
01	15/04/24				ISSUE FOR REVIEW (IFR)
00	15/04/24				ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH) WIRING DIAGRAM FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1724000049-HV-DA-0027 | SHEET 001 | REV. 05

CROSSWIND

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REV.	MODIFICA	DATA	FIRMA
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S.p.186–Cornegliano Laud. (Lo) Italy
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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
COVER

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027 | FG. 1 | F.S. 2

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
1	COVER	X	X	X	X	X				
2	INDEX	X	X	X	X	X				
3	SIMBOL LIST	X	X	X	X	X				
4	EXTERNAL VIEW	X	X	X	X	X				
5	INTERNAL VIEW	X	X	X	X	X				
6	POWER SECTION	X	X	X	X	X				
6A	POWER SECTION	X	X	X	X	X				
6B	POWER SECTION	X	X	X	X	X				
7	POWER SECTION	X	X	X	X	X				
8	POWER SECTION	X	X	X	X	X				
9	POWER SECTION	X	X	X	X	X				
9A	POWER SECTION	X	X	X	X	X				
10	AUX SECTION	X	X	X	X	X				
11	AUX SECTION	X	X	X	X	X				
11A	AUX SECTION	X	X	X	X	X				
12	AUX SECTION	X	X	X	X	X				
13	AUX SECTION	X	X	X	X	X				
14	AUX SECTION	X	X	X	X	X				
15	AUX SECTION	X	X	X	X	X				
16	AUX SECTION	X	X	X	X	X				
17	AUX SECTION	X	X	X	X	X				
18	AUX SECTION	X	X	X	X	X				
19	AUX SECTION	X	X	X	X	X				
20	AUX SECTION	X	X	X	X	X				
20A	AUX SECTION	X	X	X	X	X				
20B	AUX SECTION	X	X	X	X	X				
20C	PLC ARCHITECTURE	X	X	X	X	X				
20D	PLC ARCHITECTURE	X	X	X	X	X				

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
21	ELECTRICAL HEATER MODULATION	X	X	X	X	X				
22	ELECTRICAL HEATER MODULATION	X	X	X	X	X				
23	AVAILABLE SIGNAL	X	X	X	X	X				
24	TERMINAL STRIP	X	X	X	X	X				
25	TERMINAL STRIP	X	X	X	X	X				
26	MATERIAL LIST	X	X	X	X	X				
27	MATERIAL LIST	X	X	X	X	X				
28	MATERIAL LIST	X	X	X	X	X				
29	MATERIAL LIST	X	X	X	X	X				
30	MATERIAL LIST	X	X	X	X	X				
31	MATERIAL LIST	X	X	X	X	X				

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S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

INDEX

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 2
F.S. 3

Symbol	Description	Symbol	Description	Symbol	Description
TR	VOLTAGE TRANSFORMER		SONIC INDICATOR	F.	FUSE
TA	CURRENT TRANSFORMER	*	INDICATOR INSTRUMENT		CONTACT N.O.
M ~	MOTOR IN C.A.		SELECTOR SWITCH		CONTACT N.C.
	GROUND : GENERAL SYMBOL	52.	SWITCH		COMMUTATION CONTACT
L..	SIGNAL LAMP	52.	AUTOMATIC CIRCUIT BREAKER	P	CONTACT ACTUATED BY A PRESSURE
L..	SIGNAL LAMP + HEATER	52. Id	DIFFERENTIAL AUTOMATIC BREAKER		CONTACT ACTUATED BY A FLOW
L..	SIGNAL LAMP + VOLTAGE TRANSF.	89.	DISCONNECTING SWITCH		CONTACT ACTUATED BY A LEVEL
	SIGNAL LAMP–PUSH BUTTON	89.	LOADED CIRCUIT BREAKER	θ	CONTACT ACTUATED BY A TEMPERATURE
	CLOSING BUTTON	89.	FUSE DISCONNECTING SWITCH	2 3 4	TERMINAL STRIP
	OPENING BUTTON	6.	CONTACTOR		SQUARE POWER TERMINAL CLAMP
	ROTARY SWITCH	6..	CONTACTOR COIL		SQUARE AUX. TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.O.		AUXILIARY RELAY COIL		REMOTE TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.C.	T..	TIMER WITH DELAY TO THE ATTRACTION		ONE–PHASE SYSTEM + NEUTRAL
T..	CONTACT DELAYED TO THE RE–DROP N.O.	T..	TIMER WITH DELAY TO THE RE–DROP		THREE–PHASE SYSTEM
T..	CONTACT DELAYED TO THE RE–DROP N.C.	49..	THERMAL RELAY		THREE–PHASE SYSTEM + NEUTRAL
79.	LIMIT SWITCH N.O.		HEATING ELEMENT		
79.	LIMIT SWITCH N.C.		ELECTROVALVE		

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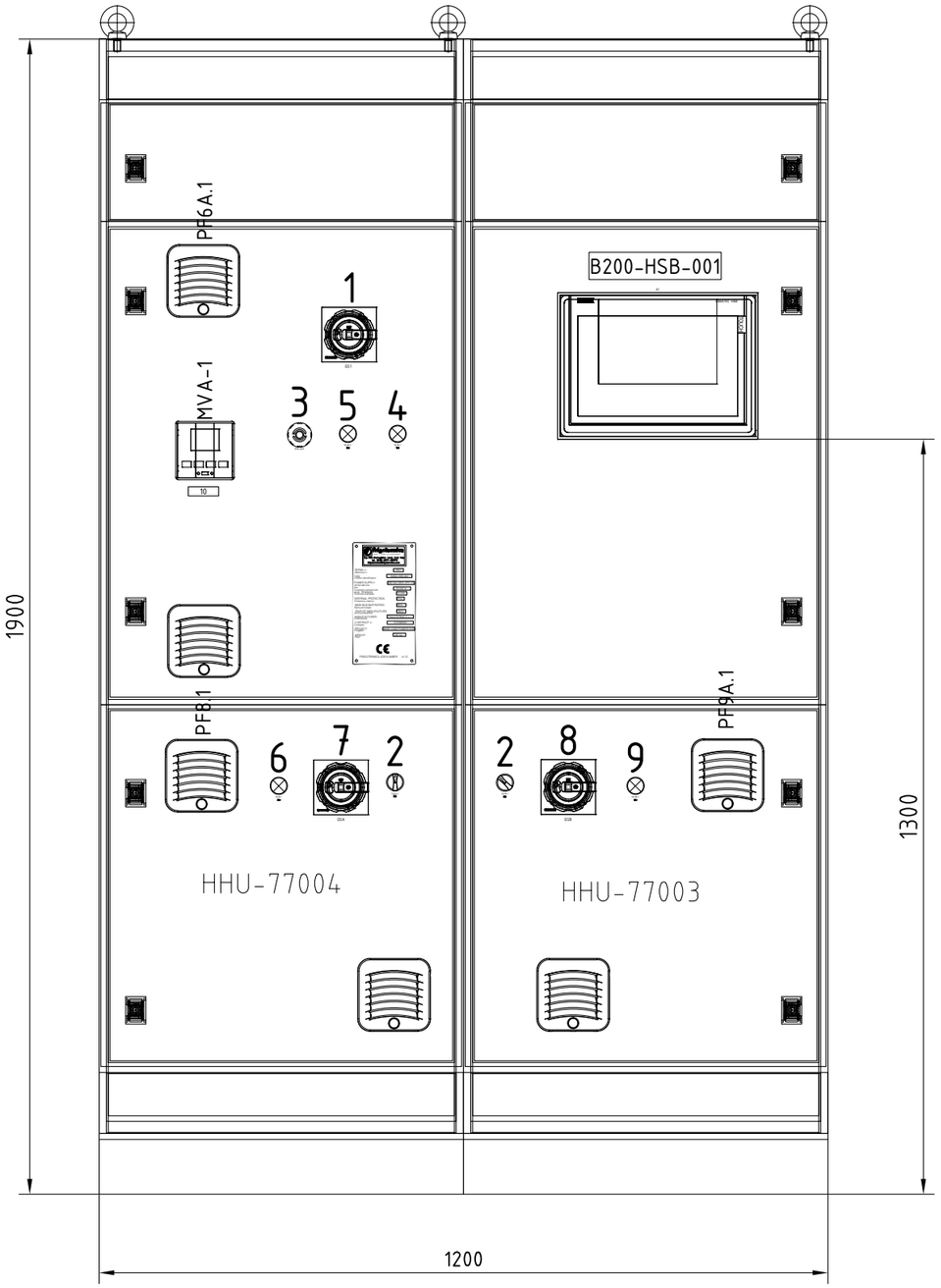
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
SIMBOL LIST

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 3
F.S. 4

EXTERNAL VIEW



LABEL	
1	MAIN SWITCH
2	AUTO-0-MANUAL
3	HPB-003
4	24VDC VOLTAGEPRESENCE
5	230V VOLTAGE PRESENCE
6	230V VOLTAGE PRESENCE
7	HHU-77004 MAIN SWITH
8	HHU-77003 MAIN SWITH
9	230V VOLTAGE PRESENCE
10	MULTIMETER

CABINET QUOTE:
LENGHT 1200 mm
HEIGHT 1900 mm
DEPT 600mm

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SERIAL n.: *Matricola n.:*	1627
TAG: *Codice identificativo:*	B200-HSB-001
POWER SUPPLY: *Alimenatzione:*	400 Vac 50Hz 3Ph+N
Icc: *Coorente cortocircuito:*	25 kA/1s
AUX. TENSION: *Tensione ausiliaria:*	24 Vdc
INTERNAL PROTECTION: *Protezione interna:*	IP54
MAIN BUS BAR RATING: *Barra principale:*	40 A
YEAR OF MANUFACTURE: *Anno produzione:*	2024
MANUFACTURER: *Costruzione:*	FRIGOTERMICA s.r.l.
CONTRACT n.: *Contratto:*	51/240554
PROJECT: *Progetto:*	BASE LOAD POWER HUB
WEIGHT: *Peso:*	700 Kg

CE

FRIGOTERMICA JOB NUMBER: 4112

SCALA 1:10

REV.	MODIFICA	DATA	FIRMA
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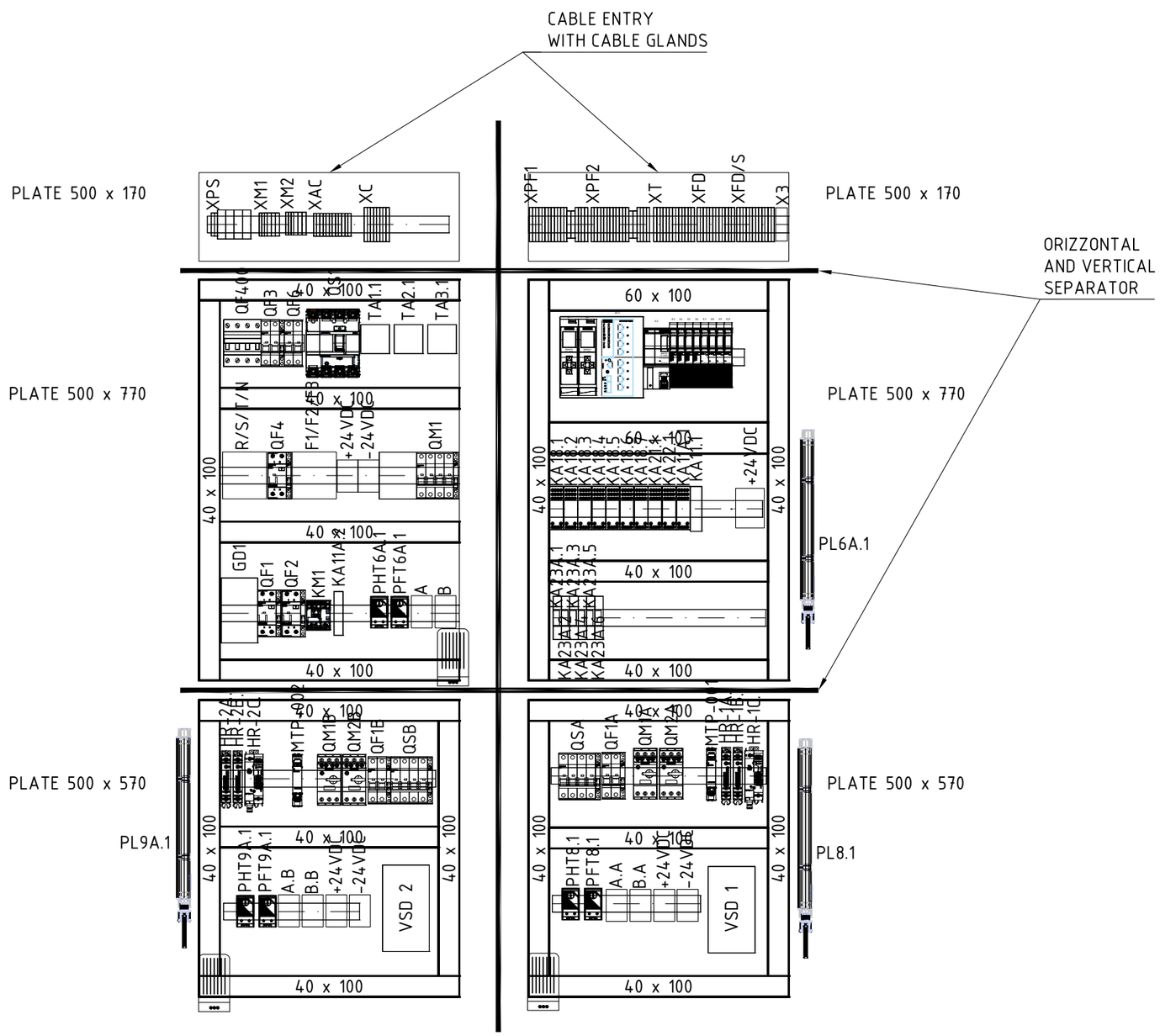
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
EXTERNAL VIEW

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 4
F.S. 5

INTERNAL VIEW



SCALA 1:10

REV.	MODIFICA	DATA	FIRMA
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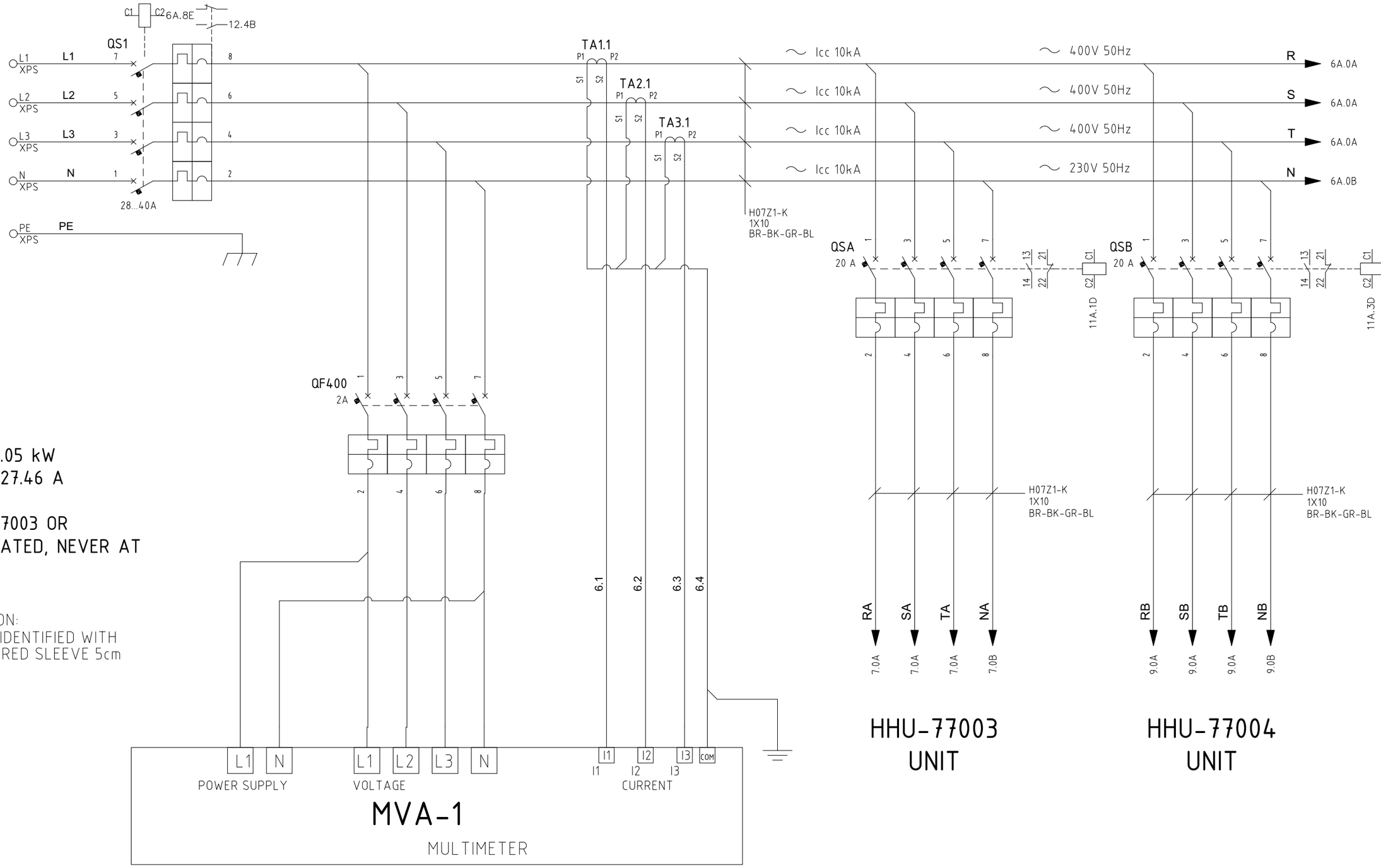
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
INTERNAL VIEW

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 5
F.S. 6

POWER SUPPLY
FROM
LV SWITCHGEAR
3PH + N + PE
400V 50Hz
TAG SG-200N1
5G25



RATED POWER: 15.05 kW
RATED CURRENT: 27.46 A

ONLY UNIT HHU-77003 OR
HHU-77004 ACTIVATED, NEVER AT
SAME TIME

COLOR IDENTIFICATION:
COLORED CABLE OR IDENTIFIED WITH
HEAT SHRINK COLOURED SLEEVE 5cm

400V 3P + N
- ⟶ BROWN
- ⟶ BLACK
- ⟶ GRAY
- ⟶ BLU

230V 1P + N
- ⟶ BROWN
- ⟶ BLU

24Vdc
- ⟶ RED
- ⟶ BLACK

PANEL INTERNAL CABLES TYPE: H07Z1-K OR FG17
UNIT INTERNAL CABLES TYPE: FG16OM16 GREEN SHEATH NOT ARMOURED

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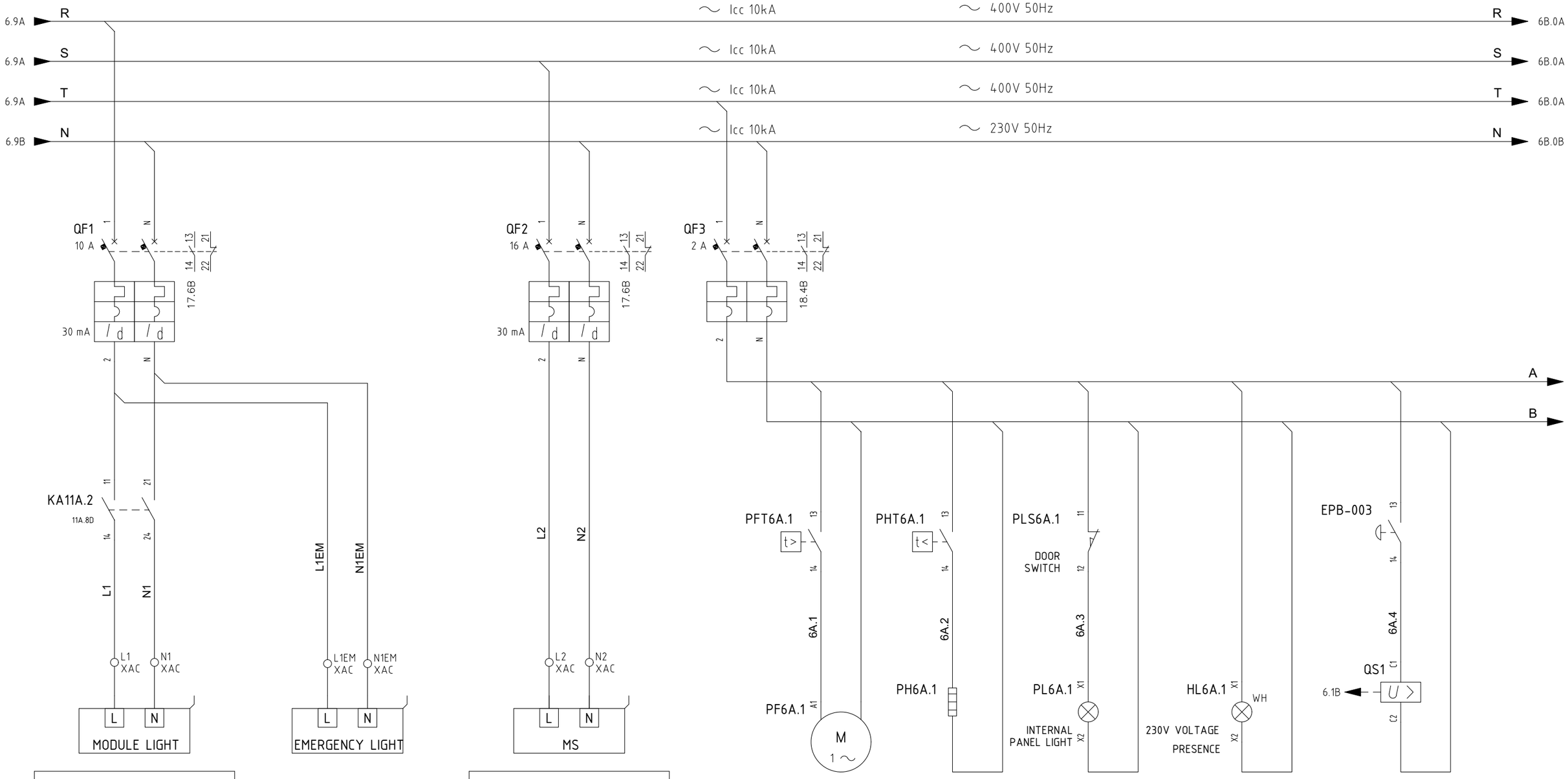
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 6
F.S. 6A



MODULE INTERNAL LIGHT	
RATED	ABSORBED
1 kW	0.9
4.35 A	3.9 A

MODULE INTERNAL SOCKET	
RATED	ABSORBED
2 kW	1.8 kW
8.7 A	7.83 A

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
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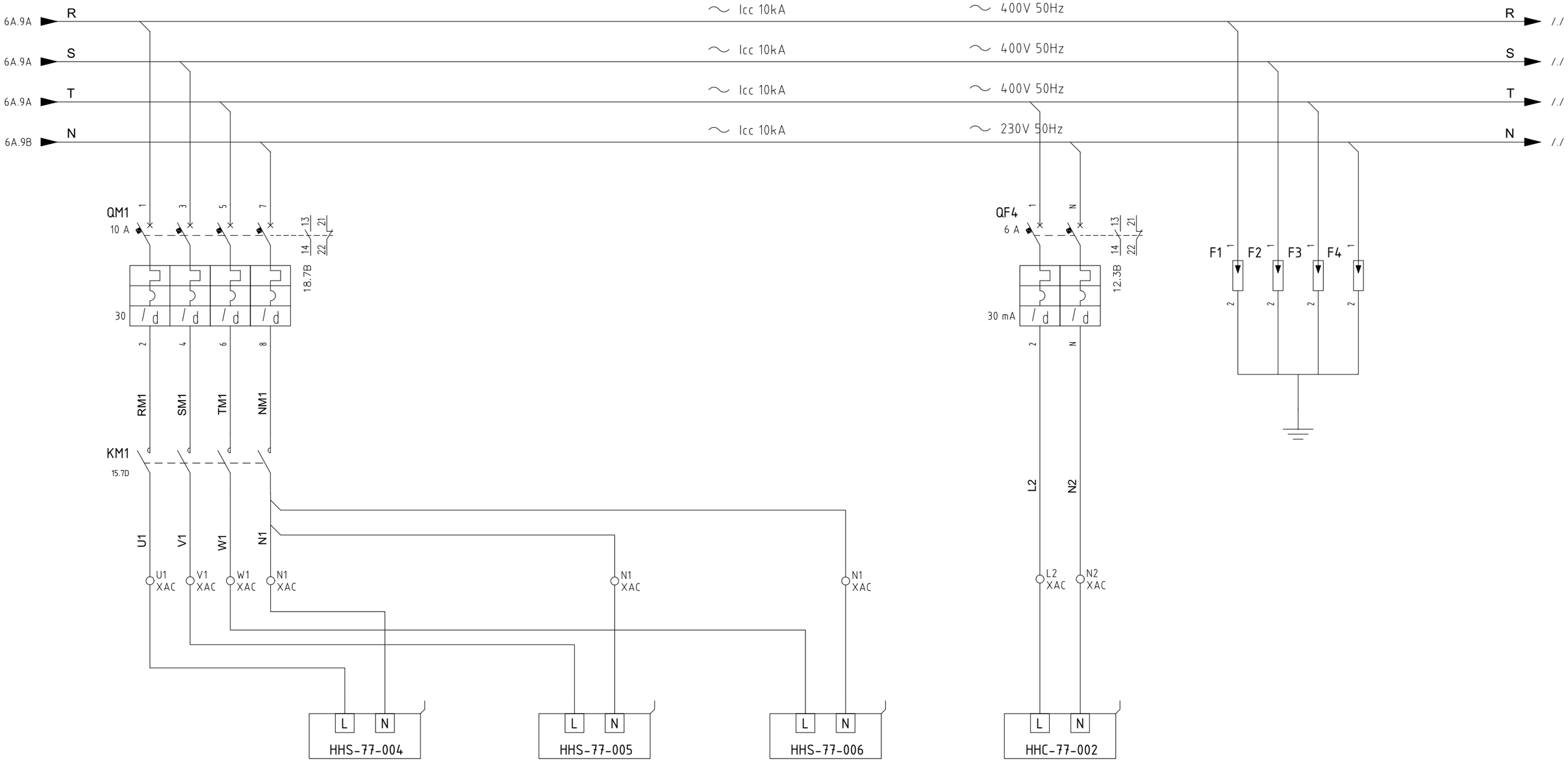
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 6A
F.S. 6B



HSS-77-004	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HSS-77-005	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HSS-77-006	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HHC-77-002	
HEATING CABLE	
RATED	ABSORBED
0,2 kW	0.2 kW
1 A	1 A

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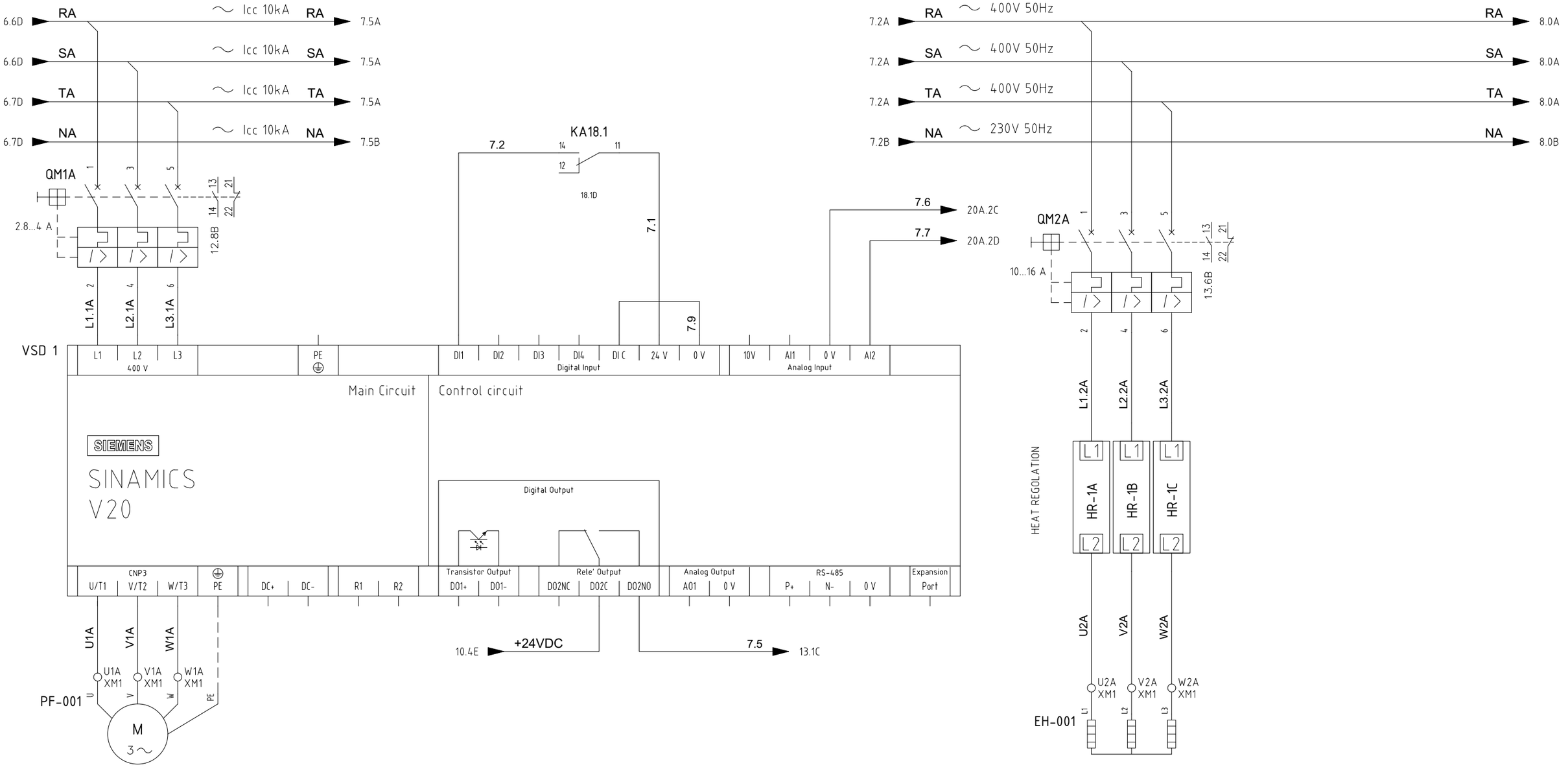
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 6B
F.S. 7



HFM-77-201	
PRESSURIZING FAN 1	
RATED	ABSORBED
1.1 kW	1 kW
2.3 A	2 A

HSS-77-201	
ELECTRICA HEATER	
RATED	ABSORBED
10 kW	10 kW
14.5 A	14.5 A

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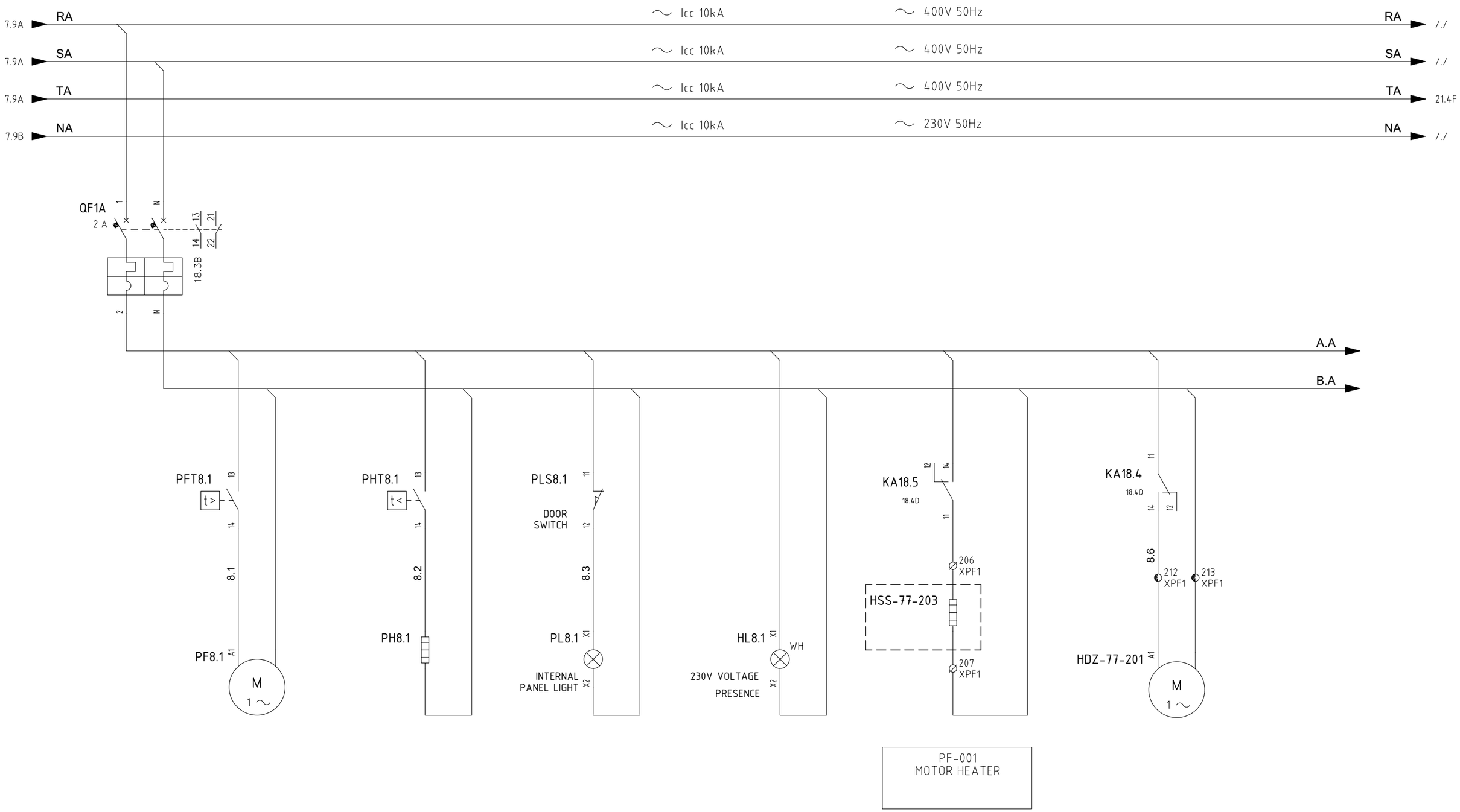
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 7
F.S. 8



PF-001
MOTOR HEATER

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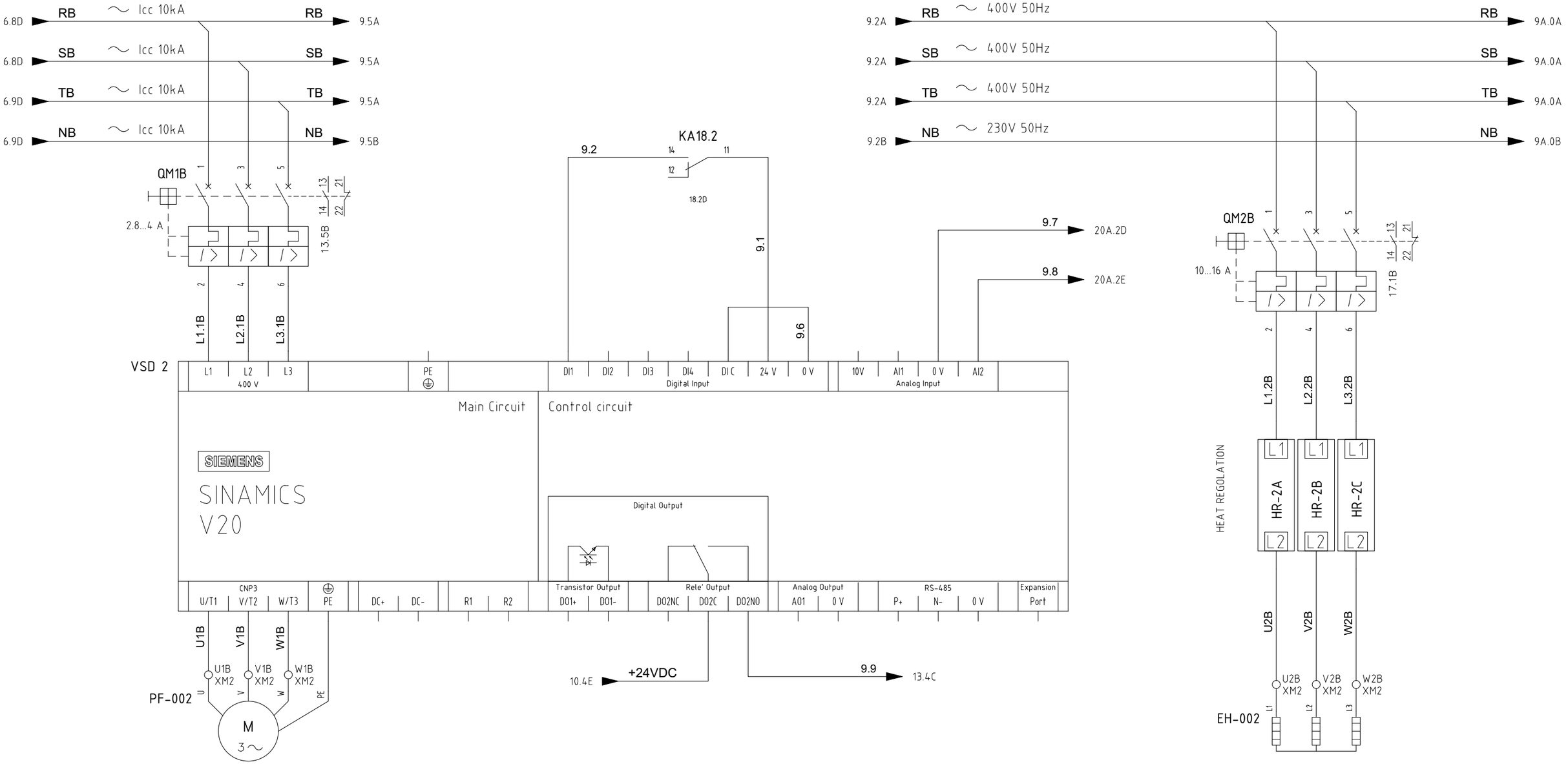
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

POWER SECTION

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 8
F.S. 9



HFM-77-202	
PRESSURIZING FAN 2	
RATED	ABSORBED
1.1 kW	1 kW
2.3 A	2 A

HSS-77-202	
ELECTRICAL HEATER	
RATED	ABSORBED
10 kW	10 kW
14.5 A	14.5 A

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DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 9
F.S. 9A

9.9A RB ~ Icc 10kA ~ 400V 50Hz RB /./

9.9A SB ~ Icc 10kA ~ 400V 50Hz SB /./

9.9A TB ~ Icc 10kA ~ 400V 50Hz TB 22.4F

9.9B NB ~ Icc 10kA ~ 230V 50Hz NB /./

QF1B
2 A
1 N 13 21
14 22
17.3B
2 N

A.B

B.B

PFT9A.1
t>
13 14
8.1
PF9A.1 A1
M
1 ~

PHT9A.1
t<
13 14
8.2
PH9.1

PLS9A.1
11 12
DOOR SWITCH
8.3
PL9A.1 X1 X2

HL9A.1 X1 X2 WH
230V VOLTAGE PRESENCE

KA18.6
18.5D
12 14
11
306 XPF2
HSS-77-204
307 XPF2

KA18.7
18.7D
11 14
12
9A.7
312 XPF2
313 XPF2
HDZ-77-202 A1
M
1 ~

PF-002
MOTOR HEATER

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
POWER SECTION

ROSETTI MARINO
ALEXSISTEMI spa

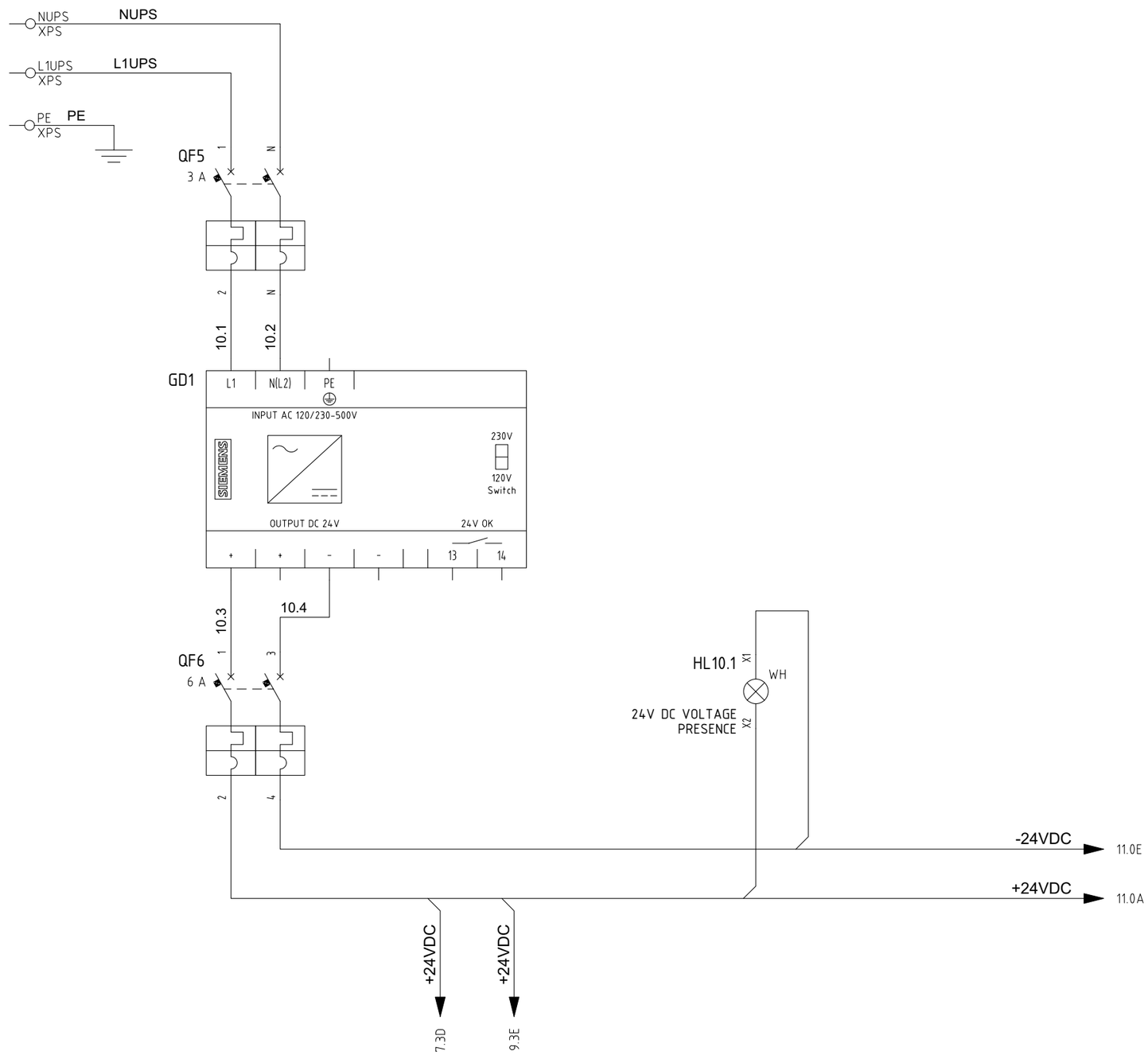
1724000049-HV-DA-00027

FG. 9A
F.S. 10

UPS POWER SUPPLY
FROM AC UPS-PAS DB
1PH + N + PE 230V
50Hz
TAG DP-200F3
3G4

RATED POWER: 0.7 kW
RATED CURRENT: 3 A

ABSORBED POWER: 0.5 kW
ABSORBED CURRENT: 2 A



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B-200 LV SWITCH ROOM
AUX SECTION

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00027

F.G. 10
F.S. 11

SHUT DOWN
FROM
CUSTOMER SIS

PF-001
PRESSURIZING FAN
THERMIC PROTECTION
PTC-001

PF-002
PRESSURIZING FAN
THERMIC PROTECTION
PTC-002

10.7E +24VDC

+24VDC 11A.0A

24V DC
FROM SIS
B400-SIS-0901
1= OK
0= SHUT
DOWN

100
XC

101
XC

KA11.1
A1
A2

14.4B
11 12 14
21 22 24
31 32 34
41 42 44

A1/11

MTP-001
SIEMENS
MOTOR THERMIC
PROTECTION
TRIPPED
T1 T2 A2 NC NO 12 14
11.3 11.4 11.5 12.5B
200 XPF1 201 XPF1

MTP-002
SIEMENS
MOTOR THERMIC
PROTECTION
TRIPPED
T1 T2 A2 NC NO 12 14
11.6 11.7 11.8 13.2C
300 XPF2 301 XPF2

10.7E -24VDC

-24VDC 11A.0E

REV.	MODIFICA	DATA	FIRMA
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ALEXSISTEMI

1724000049-HV-DA-00027
FG. 11
F.S. 11A

HPB-77-201
EMERGENCY POWER
BUTTON
HHU-77003

HPB-77-202
EMERGENCY POWER
BUTTON
HHU-77004

LIGHT COMMAND

11.9A +24VDC

+24VDC 12.0A

202 XPF1

302 XPF2

104 XC

106 XC

HPB-77-201

HPB-77-202

LIGHT
PUSH BUTTON

203 XPF1

303 XPF2

105 XC

107 XC

A

A

KA11A.1 11 / 11A.5D / 14 / 12

11A.3

11A.4

11A.5

QSA C1 / C2 — 6.6B

QSB C1 / C2 — 6.8B

KA11A.1 A1 / A2

KA11A.2 A1 / A2

B

B

6A.0C 14 / 11

6A.0C 24 / 21

11.9E -24VDC

-24VDC 12.0A

11A.8C 11 / 12 / 14 / 21 / 22 / 24 / 31 / 32 / 34 / 41 / 42 / 44

REV.	MODIFICA	DATA	FIRMA
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

AUX SECTION

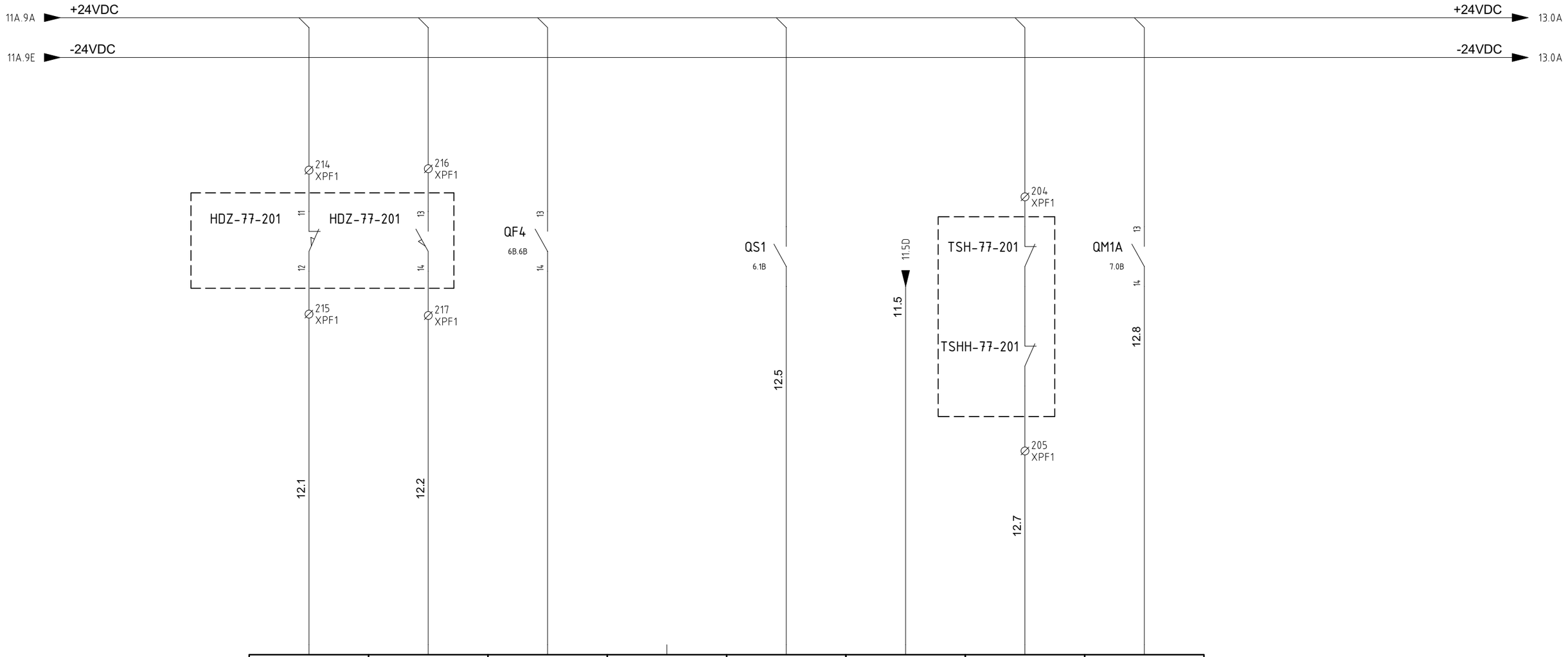
ROSETTI MARINO

ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 11A

F.S. 12



1	2	3	4	5	6	7	8
I0.0	I0.1	I0.2	I0.3	I0.4	I0.5	I0.6	I0.7
CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4
Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:
HDZ-77-201 CLOSE FEEDBACK 0=NOT CLOSE 1=CLOSE	HDZ-77-201 OPEN FEEDBACK 0=NOT OPEN 1=OPEN	HHC-77-0002 HEATING CABLE TRIP	SPARE	MAIN BRAKER TRIP SIGNAL 0=TRIP 1=NORMAL	ET-77-201 MOTOR. TERM.PROT 0=MALFUNC. 1=NORMAL	TSH/HH-77-201 EL.HEATER THERM. 0=MALFUNC. 1=NORMAL	HFM-77-201 TRIP SIGNAL 0=TRIP 1=NORMAL

REV.	MODIFICA	DATA	FIRMA
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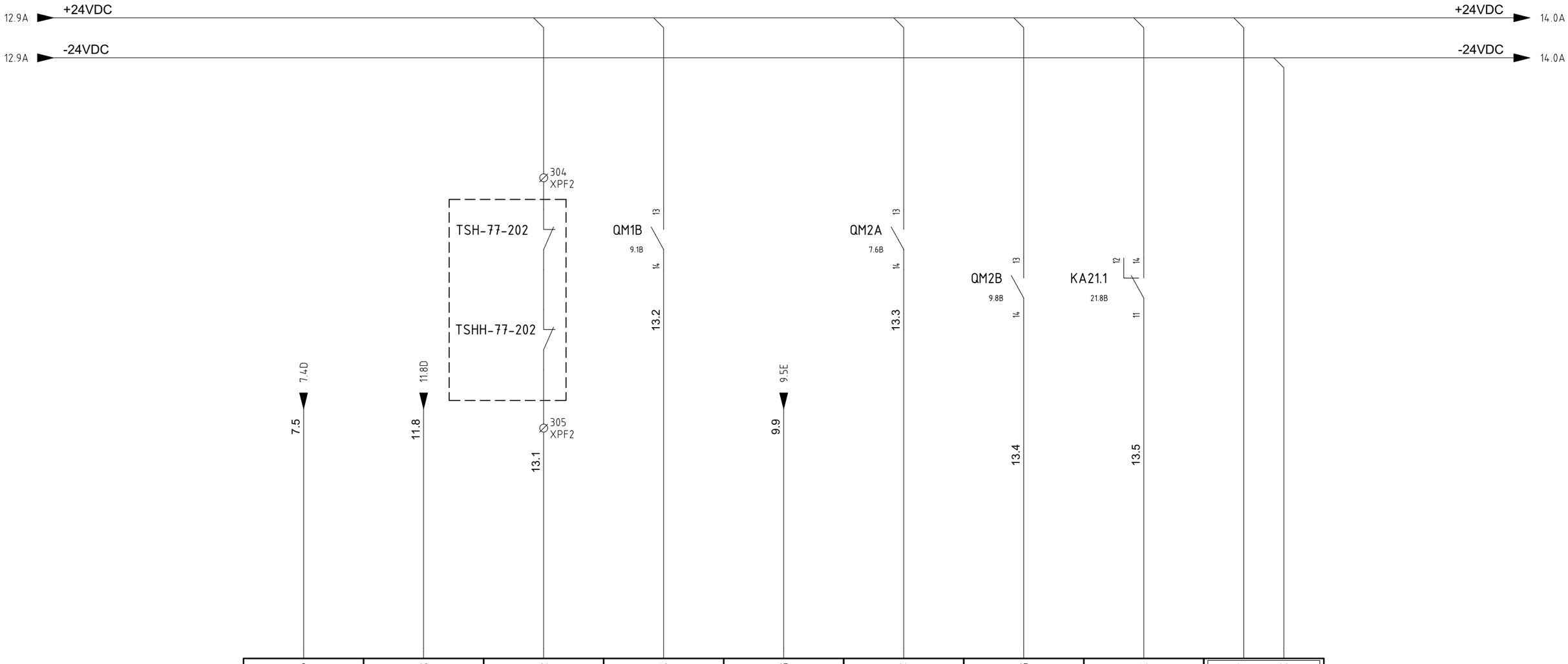
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 12
F.S. 13



9	10	11	12	13	14	15	16	L+ M
I1.0	I1.1	I1.2	I1.3	I1.4	I1.5	I1.6	I1.7	
CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4
Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:	Name: A3 Sheet:
VSD-1 MALFUN. SIGNAL 0=MALFUNC. 1=NORMAL	ET-77-202 MOTOR. TERM.PROT 0=MALFUNC. 1=NORMAL	TSH/HH-77-202 EL.HEATER THERM. 0=MALFUNC. 1=NORMAL	HFM-77-202 TRIP SIGNAL 0=MALFUNC. 1=NORMAL	VSD-2 MALFUN. SIGNAL 0=MALFUNC. 1=NORMAL	HSS-77-201 TRIP SIGNAL 0=MALFUNC. 1=NORMAL	HSS-77-202 TRIP SIGNAL 0=MALFUNC. 1=NORMAL	HSS-77-201 MODULATION FAULT 0=MALFUNC. 1=NORMAL	

REV.	MODIFICA	DATA	FIRMA
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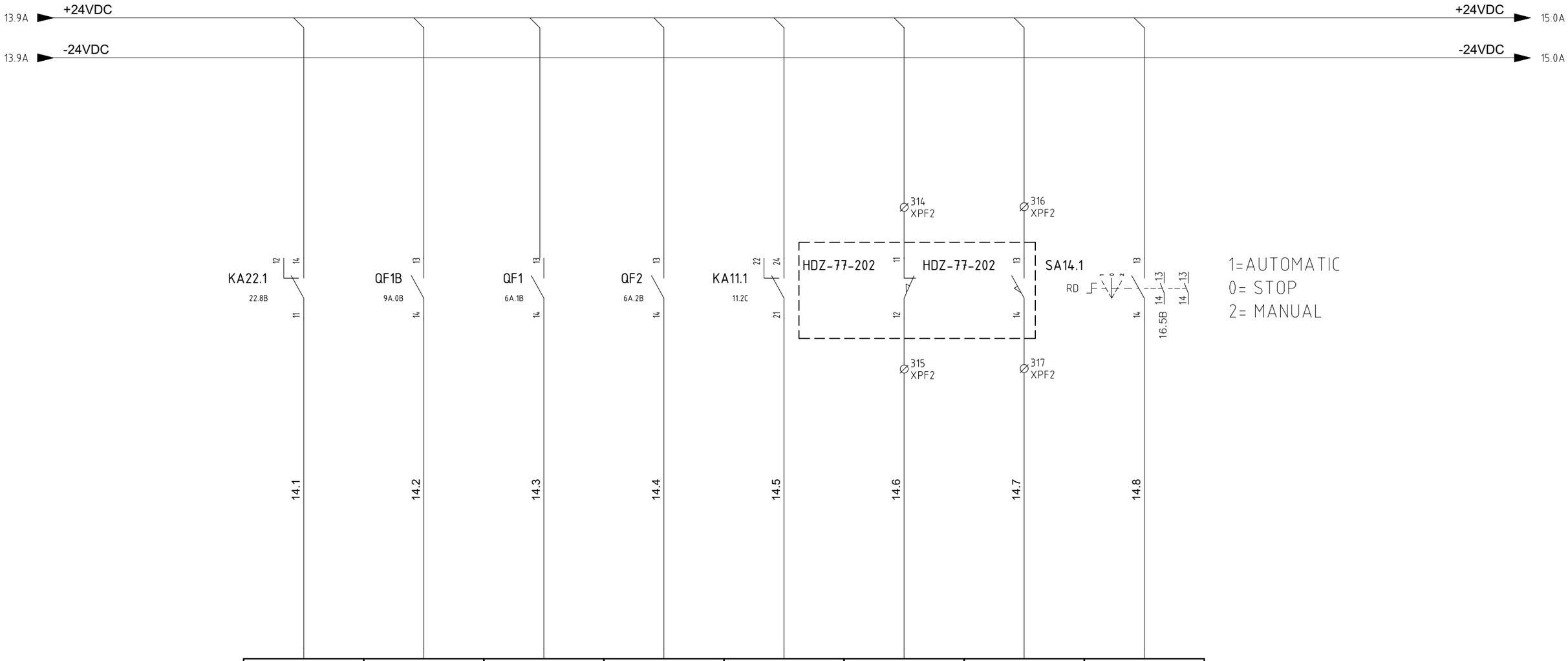
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 13
F.S. 14



1	2	3	4	5	6	7	8
12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7
CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5
Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:
HSS-77-202 MODULATION FAULT 0=MALFUNC. 1=NORMAL	HHU-77004 TRIP AUX SECTION	TRIP SIGNAL MODULE LIGHT	TRIP SIGNAL MODULE SOCKET	HVAC SHUT DOWN FROM SIS 0=SHUTDOWN 1=NORMAL	HDZ-77-202 CLOSE FEEDBACK 0=NOT CLOSE 1=CLOSE	HDZ-77-202 OPEN FEEDBACK 0=NOT OPEN 1=OPEN	HHU-77003 AUTO MODE 0=NOT AUTO 1= AUTOMATIC

REV.	MODIFICA	DATA	FIRMA
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 14
F.S. 15

14.9A +24VDC → +24VDC 16.0A

14.9A -24VDC → -24VDC 16.0A

QF1A	QF3	QSA	QSB	QM1	KM1
8.0B	6A.4B	6.6B	6.8B	6B.1B	15.7D
				13 / 14	
15.1	15.2	15.3	15.4	15.5	15.7

9	10	11	12	13	14	15	16	L+ M
I3.0	I3.1	I3.2	I3.3	I3.4	I3.5	I3.6	I3.7	
CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5
Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:
HHU-77003 TRIP AUX SECTION	GENERAL PANEL AUX TRIP	HHU-77003 MAIN BRAKER TRIP	HHU-77004 MAIN BRAKER TRIP	HSS-77004/5/6 SPACE HEATER TRIP	SPARE	HSS-77004/5/6 SPACE HEATER RUN	SPARE	

REV.	MODIFICA	DATA	FIRMA
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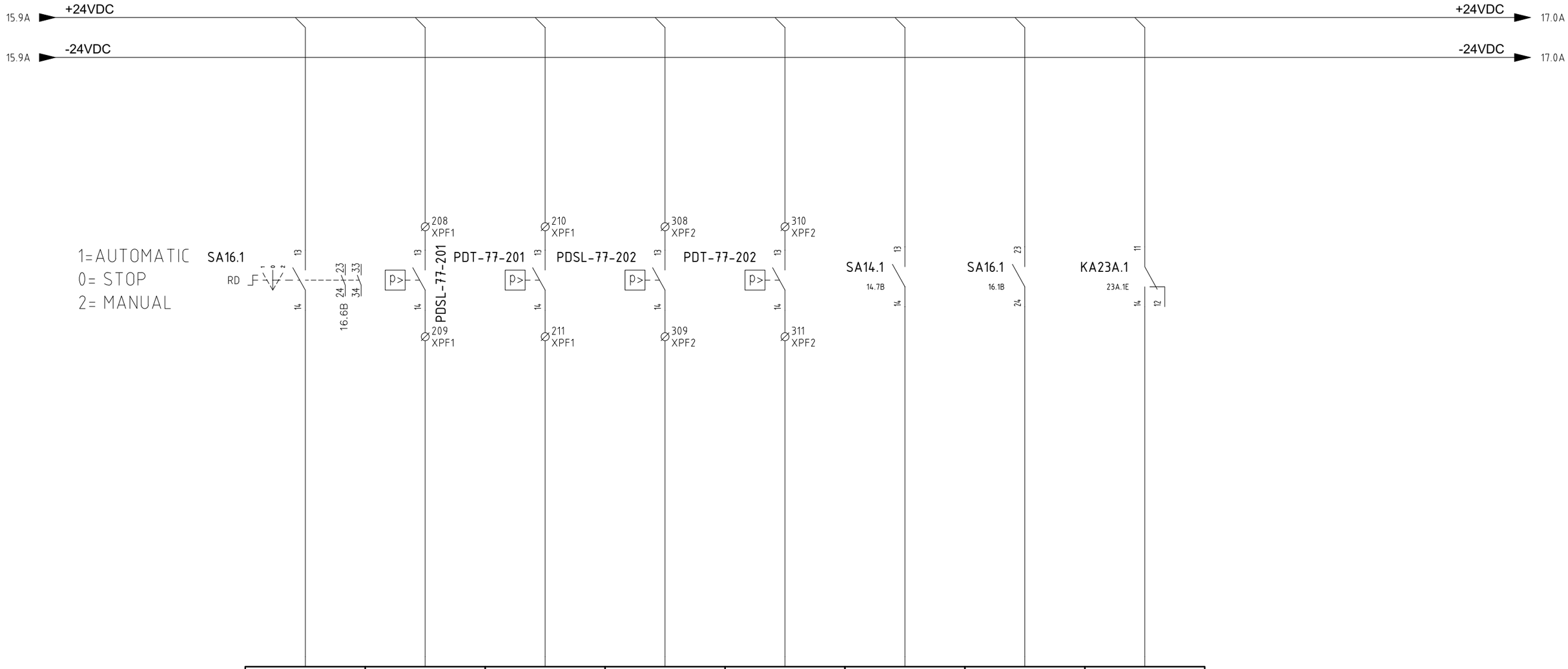
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 15
F.S. 16



9	10	11	12	13	14	15	16
14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7
CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6
Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:	Name: A5 Sheet:
HHU-77004 AUTO MODE 0=NOT AUTO 1= AUTOMATIC	PDSL-77-201 FAN FLOW SWITCH 0=NO FLOW 1=FLOW	PDT-77-201 FILTER DIFF SWITCH 0=NORMAL 1=CLOGGED	PDSL-77-202 FAN FLOW SWITCH 0=NO FLOW 1=FLOW	PDT-77-202 FILTER DIFF SWITCH 0=NORMAL 1=CLOGGED	HHU-77003 MANUAL MODE 0=NOT MANUAL 1=MANUAL	HHU-77004 MANUAL MODE 0=NOT MANUAL 1=MANUAL	HFD-77004 CLOSE CONTACT 0=NOT CLOSE 1=CLOSE

REV.	MODIFICA	DATA	FIRMA
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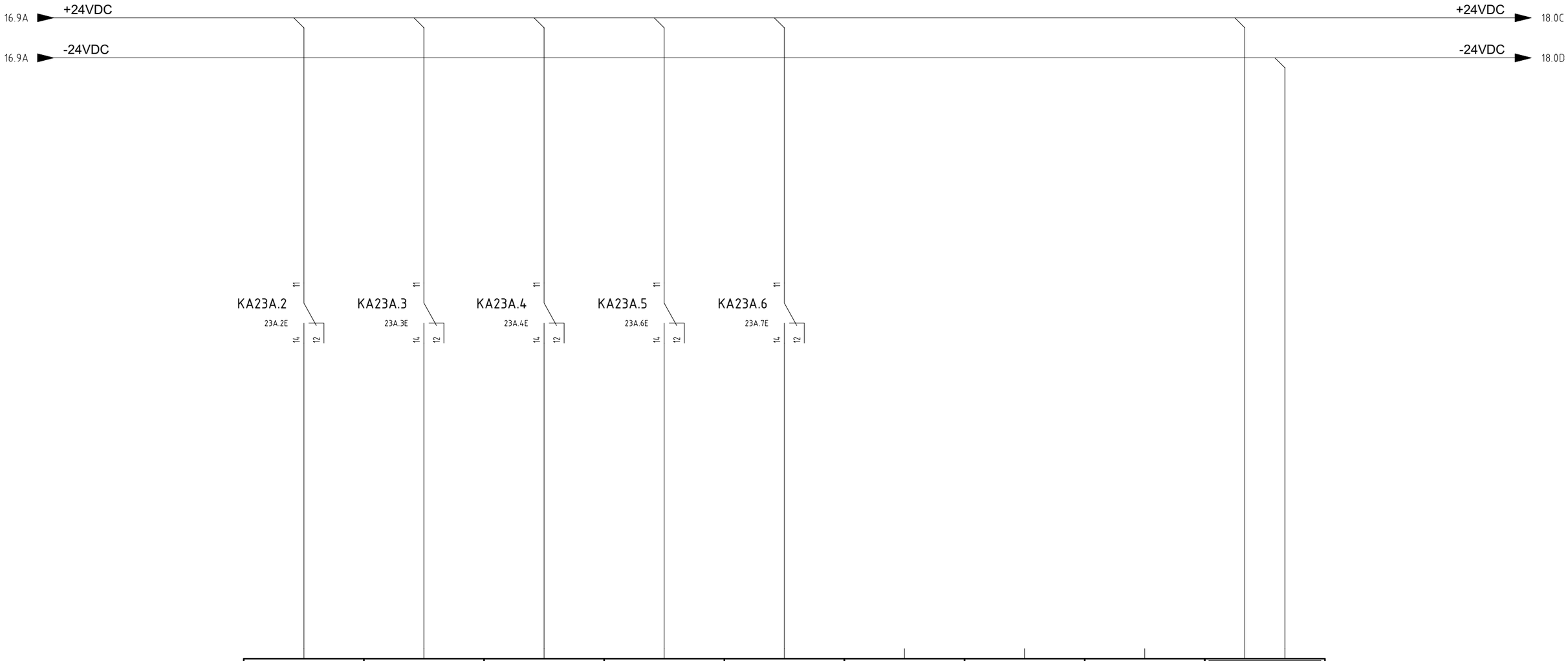
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 16
F.S. 17



9	10	11	12	13	14	15	16	L+ M
I5.0	I5.1	I5.2	I5.3	I5.4	I5.5	I5.6	I5.7	
CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6
Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:	Name: A5 / Sheet:
HFD-77004 OPEN CONTACT 0=NOT OPEN 1=OPEN	HFD-77005 CLOSE CONTACT 0=NOT CLOSE 1=CLOSE	HFD-77005 OPEN CONTACT 0=NOT OPEN 1=OPEN	HFD-77006 CLOSE CONTACT 0=NOT CLOSE 1=CLOSE	HFD-77006 OPEN CONTACT 0=NOT OPEN 1=OPEN	SPARE	SPARE	SPARE	

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AUX SECTION

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FG. 17
F.S. 18

VSD 1 START COMMAND vsd 1 start command		VSD 2 START COMMAND vsd 2 start command		HVAC MALFUNCTION SIGNAL TO SIS 0=MALFUNC. 1=NORMAL		HDZ-77-201 OPEN COMMAND 0=OFF 1=OPEN		HSS-77-203 MOTOR HEATER		HSS-77-204 MOTOR HEATER		HSS-77004/5/6 SPACE HEATER START		HDZ-77-202 OPEN COMMAND 0=OFF 1=OPEN	
Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:
CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7	
Q0.0		Q0.1		Q0.2		Q0.3		Q0.4		Q0.5		Q0.6		Q0.7	
1		2		3		4		5		6		7		8	

18.1 18.2 18.3 18.5 18.6 18.7

17.9A +24VDC → 19.0D +24VDC

17.9A -24VDC → 19.0D -24VDC

KA18.1 A1 A2 | KA18.2 A1 A2 | KA18.3 A1 A2 | KA18.4 A1 A2 | KA18.5 A1 A2 | KA18.6 A1 A2 | KM1 A1 A2 | KA18.7 A1 A2

7.3A 11 12 14 21 22 24 31 32 34 41 42 44

9.4A 11 12 14 21 22 24 31 32 34 41 42 44

23.1B 11 12 14 21 22 24 31 32 34 41 42 44

8.7D 11 12 14 21 22 24 31 32 34 41 42 44

8.6D 11 12 14 21 22 24 31 32 34 41 42 44

9A.6D 11 12 14 21 22 24 31 32 34 41 42 44

6B.1C
6B.1C
6B.1C
6B.1C
20A.2B

9A.8D 11 12 14 21 22 24 31 32 34 41 42 44

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B-200 LV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 18
F.S. 19

SPARE		SPARE		SPARE		SPARE		SPARE		SPARE		SPARE		SPARE		
Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	Name: A6	Sheet:	
CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		CPU: QUADRO GENERALE MOD. : 7		
Q1.0		Q1.1		Q1.2		Q1.3		Q1.4		Q1.5		Q1.6		Q1.7		
9		10		11		12		13		14		15		16		L+ M

18.9C +24VDC

18.9D -24VDC

+24VDC 20.0A

-24VDC 20.0A

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03	ISSUE FOR APPROVAL	06/07/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

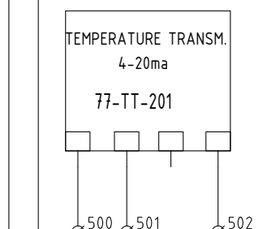
FG. 19
F.S. 20

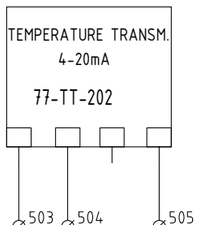
19.9D +24VDC

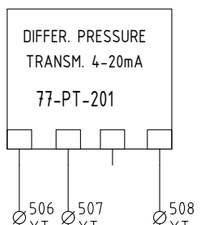
19.9D -24VDC

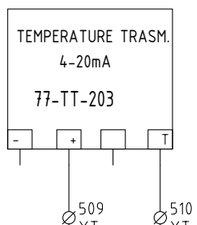
+24VDC 20A.0A

-24VDC 20A.0A









20.1 20.2 20.3

1 5 9 13	2 6 10 14	3 7 11 15	4 8 12 16	L+ M
AI0.0	AI0.1	AI0.2	AI0.3	
CPU: QUADRO GENERALE MOD. : 8	CPU: QUADRO GENERALE MOD. : 8	CPU: QUADRO GENERALE MOD. : 8	CPU: QUADRO GENERALE MOD. : 8	CPU: QUADRO GENERALE MOD. : 8
Name: A7 / Sheet:	Name: A7 / Sheet:	Name: A7 / Sheet:	Name: A7 / Sheet:	Name: A7 / Sheet:
77-TT-201 TEMPERATURE TRASMITTER	77-TT-202 TEMPERATURE TRASMITTER	77-PT-201 DIFFERENTIAL PRESSURE TRASMITTER SIGNAL	77-TT-203 TEMPERATURE TRASMITTER	

REV.	MODIFICA	DATA	FIRMA
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B-200 LV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 20
F.S. 20A

20.9A +24VDC

20.9A -24VDC

+24VDC 20B.0A

-24VDC 20B.0A

VSD 1 MODULATION VSD 1 modulation		VSD 2 MODULATION VSD 2 modulation		EH-001 MODULATION SIGNAL EH-001 Modulation Signal		EH-002 MODULATION SIGNAL EH-002 Modulation Signal			
Name: A8	Sheet:	Name: A8	Sheet:	Name: A8	Sheet:	Name: A8	Sheet:	Name: A8	Sheet:
CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10	
AQ0.0		AQ0.1		AQ0.2		AQ0.3			
9 1 5 13		10 2 6 14		11 3 7 15		12 4 8 16		L+ M	

7.5B 7.6

7.5B 7.7

9.6B 9.7

9.6B 9.8

20A.1 21.7B

20A.2 21.7B

20A.3 22.7C

20A.4 22.7C

REV.	MODIFICA	DATA	FIRMA
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F.G. 20A

F.S. 20B

20A.9A +24VDC

20A.9A -24VDC

+24VDC 20C.0A

-24VDC 20C.0A

SPARE	SPARE	SPARE	SPARE	
Name: A9 / Sheet:	Name: A9 / Sheet:	Name: A9 / Sheet:	Name: A9 / Sheet:	Name: A9 / Sheet:
CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11
AQ1.0	AQ1.1	AQ1.2	AQ1.3	
9 1 5 13	10 2 6 14	11 3 7 15	12 4 8 16	L+ M

REV.	MODIFICA	DATA	FIRMA		
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AUX SECTION

ROSETTI MARINO | ALEXSISTEMI

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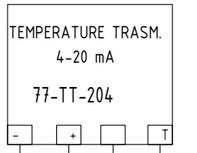
FG. 20B
F.S. 20C

20B.9A +24VDC

20B.9A -24VDC

+24VDC 20D.0E

-24VDC 20D.0F



1 5 9 13	2 6 10 14	3 7 11 15	4 8 12 16	L+ M
AI1.0	AI1.1	AI1.2	AI1.3	
CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12
Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:
77-TT-204 TEMPERATURE TRANSMITTER	SPARE	SPARE	SPARE	

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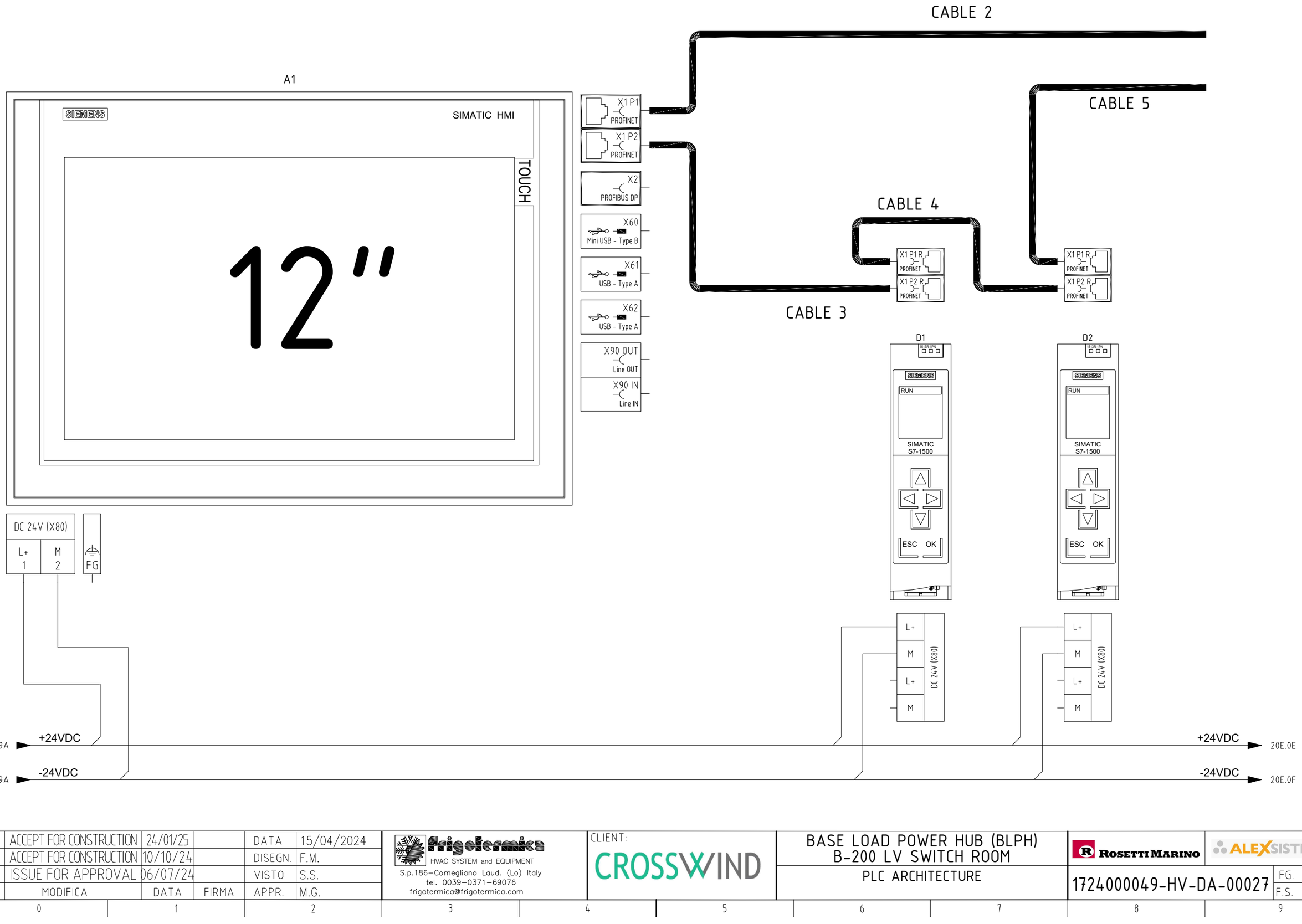
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
AUX SECTION

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

F.G. 20C
F.S. 20D



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CLIENT:
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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

PLC ARCHITECTURE

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 20D
F.S. 20E

CABLE 2

CABLE 1

CABLE 5

1	TD
2	TD N
3	RD
4	GND
5	GND
6	RD N
7	GND
8	GND

PROFINET IO - Port 1 RJ45

PROFINET IO - Port 2 RJ45

1	1L+
2	2L+
3	1M
4	2M

DC 24V

A2 A3 A4 A5 A6 A7 A8 A9 A10

BA 2xRJ45

SIEMENS

SIMATIC ET 200SP

IM 155-6 PN/2 HF

6ES7155-6AU01-0CN0

X1 PROFINET (LAN)

6ES7193-6RA00-0AA0

MAC ADDRESS

X80 24VDC

A2	6ES7155-6AU01-0CN0	
A3	6ES7131-6BH01-0BA0	DI 16x24VDC ST
A4	6ES7131-6BH01-0BA0	DI 16x24VDC ST
A5	6ES7131-6BH01-0BA0	DI 16x24VDC ST
A6	6ES7132-6BH01-0BA0	DQ 16x24VDC/0,5A ST
A7	6ES7134-6HD01-0BA1	AI 4xU/I 2-wire ST
A8	6ES7135-6HD00-0BA1	AQ 4xU/I ST
A9	6ES7135-6HD00-0BA1	AQ 4xU/I ST
A10	6ES7134-6HD01-0BA1	AI 4xU/I 2-wire ST

A11

SIEMENS

SCALANCE XC208

208-0BA00-2AC2

P1	LAN
P2	LAN
P3	LAN
P4	LAN
P5	LAN
P6	LAN
P7	LAN
P8	LAN

1	F1
2	F2

1	L1+
2	M1
3	M2
4	L2+

DC 24V

MODBUS TCP/IP TO CLIENT

RJ45 CONNECTION IN TERMINAL STRIP

20D.9E +24VDC → +24VDC 21.0A

20D.9F -24VDC → -24VDC 21.0A

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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

PLC ARCHITECTURE

ROSETTI MARINO ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 20E
F.S. 21

EH-001
MODULATION

20E.9E +24VDC → +24VDC 22.0A

20E.9F -24VDC → -24VDC 22.0A

21.1

21.2

20A.1 20A.5E

20A.2 20A.5E

KA21.1 A1 / A2

17.2B 11 12 14 21 22 24 31 32 34 41 42 44

1/L1

HR-1A.

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-1B.

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-1C.

19 AL
18 AL
17 D17
16 A2
15 A-
14 A+
13 D13
12 US
11 A2

GRM 1

2/T1

3/L2

FU21.1 1 2

8.9A RA

REV.	MODIFICA	DATA	FIRMA
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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
ELECTRICAL HEATER MODULATION

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 21
F.S. 22

EH-002
MODULATION

21.9A +24VDC → +24VDC /./

21.9A -24VDC → -24VDC /./

22.1

22.2

1/L1

HR-2A.

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-2B.

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-2C.

19 AL
18 AL
17 D17
16 A2
15 A-
14 A+
13 D13
12 US
11 A2

GRM 1

2/T1

20A.6E

20A.7E

20A.3

20A.4

KA22.1 A1 A2

17.3B 11 12 14 21 22 24 31 32 34 41 42 44

3/L2

FU22.1

2

9A.9A RB

REV.	MODIFICA	DATA	FIRMA
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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

ELECTRICAL HEATER MODULATION

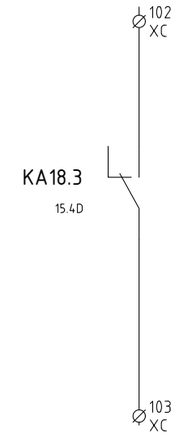
ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

F.G. 22
F.S. 23

AVAILABLE FREE
VOLTAGE SIGNAL
GENERAL FAULT
TO SIS

HVAC
MALFUNCTION
SIGNAL



CLOSE= NORMAL
OPEN= MALFUNCTION

SIGNAL TO SIS
B400-SIS-0901

REV.	MODIFICA	DATA	FIRMA
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CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
AVAILABLE SIGNAL

ROSETTI MARINO
ALEXSISTEMI S.p.A.

1724000049-HV-DA-00027

FG. 23
F.S. 23A

HFD-77004
CLOSED FEEDBACK

HFD-77005
CLOSED FEEDBACK

HFD-77006
CLOSED FEEDBACK

HFD-77004
OPEN FEEDBACK

HFD-77005
OPEN FEEDBACK

HFD-77006
OPEN FEEDBACK

+24VDC

+24VDC

402 XFD
404 XFD
HFD-77004
11
12
13
14
HFD-77004
403 XFD
405 XFD

408 XFD
410 XFD
HFD-77005
11
12
13
14
HFD-77005
409 XFD
411 XFD

414 XFD
416 XFD
HFD-77006
11
12
13
14
HFD-77006
415 XFD
417 XFD

KA23A.1 A1 A2
KA23A.2 A1 A2
KA23A.3 A1 A2
KA23A.4 A1 A2
KA23A.5 A1 A2
KA23A.6 A1 A2

-24VDC

-24VDC

16.7B 11 12 14 22 21 24 23B.1C
17.1B 11 12 14 22 21 24 23B.2C
17.2B 11 12 14 22 21 24 23B.4C
17.3B 11 12 14 22 21 24 23B.5C
17.4B 11 12 14 22 21 24 23B.7C
17.4B 11 12 14 22 21 24 23B.8C

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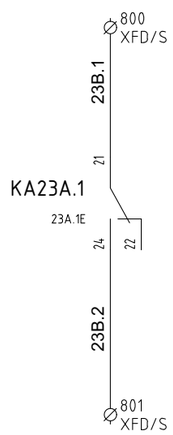
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
AVAILABLE SIGNAL

ROSETTI MARINO
ALEXSISTEMI spa

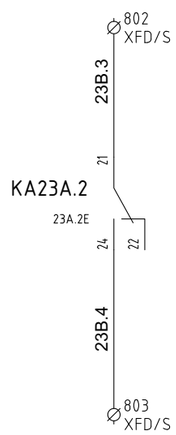
1724000049-HV-DA-00027

FG. 23A
F.S. 23B

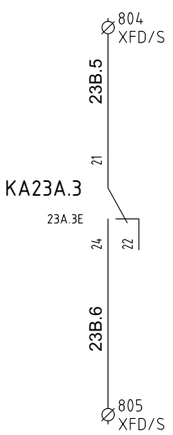
HFD-77004
CLOSED SIGNAL
TO F&G



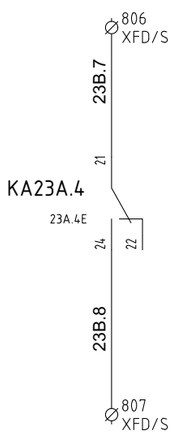
HFD-77004
OPEN SIGNAL
TO F&G



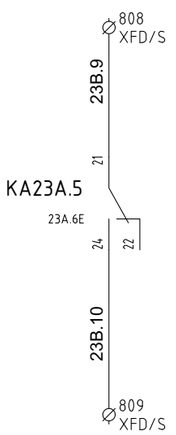
HFD-77005
CLOSED SIGNAL
TO F&G



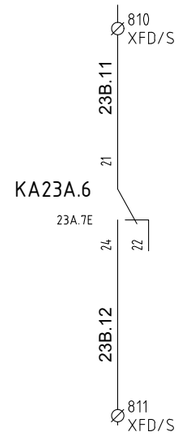
HFD-77005
OPEN SIGNAL
TO F&G



HFD-77006
CLOSED SIGNAL
TO F&G



HFD-77006
OPEN SIGNAL
TO F&G



REV.	MODIFICA	DATA	FIRMA
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B-200 LV SWITCH ROOM

AVAILABLE SIGNAL

ROSETTI MARINO
ALEXSISTEMI spa

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FG. 23B
F.S. 24

+QG - XPS
POWER SUPPLY

NUPS L1UPS PE

1 2 7

L1 L2 L3 N PE

3 4 5 6 8

230V 1F + N + PE
50Hz
FROM
AC UPS-PAS DB
3G4
DP-200F3

400V 3F +N + PE
50Hz
FROM LV
SWITCHGEAR
5G25
SG-200N1

+QG - XM1
POWER PRESS FAN 1

U1A V1A W1A U2A V2A W2A

U1A V1A W1A U2A V2A W2A

4G2.5 FG16OM16 HFM-77-201 FAN MOTOR

4G6 FG16OM16 HSS-77-201 ELECTRICAL HEATER

U V W M 3~

+QG - XM2
POWER PRESS FAN 2

U1B V1B W1B U2B V2B W2B

U1B V1B W1B U2B V2B W2B

4G2.5 FG16OM16 HFM-77-202 FAN MOTOR

4G6 FG16OM16 HSS-77-202 ELECTRICAL HEATER

U V W M 3~

+QG - XAC
ACCESSORIES

L1 N1 | L2 N2 | U1 N1 | V1 N1 | W1 N1 | L2 N2

1 2 | 3 4 | 5 8 | 6 9 | 7 10 | 11 12

3G2.5 MODULE LIGHT LIGHT

3G3 MODULE SOCKET SOCKET

3G2.5 SPACE HEATER HSS-77-004

3G2.5 SPACE HEATER HSS-77-005

3G2.5 SPACE HEATER HSS-77-006

3G2.5 HEATING CABLE HHC-77-002

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tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

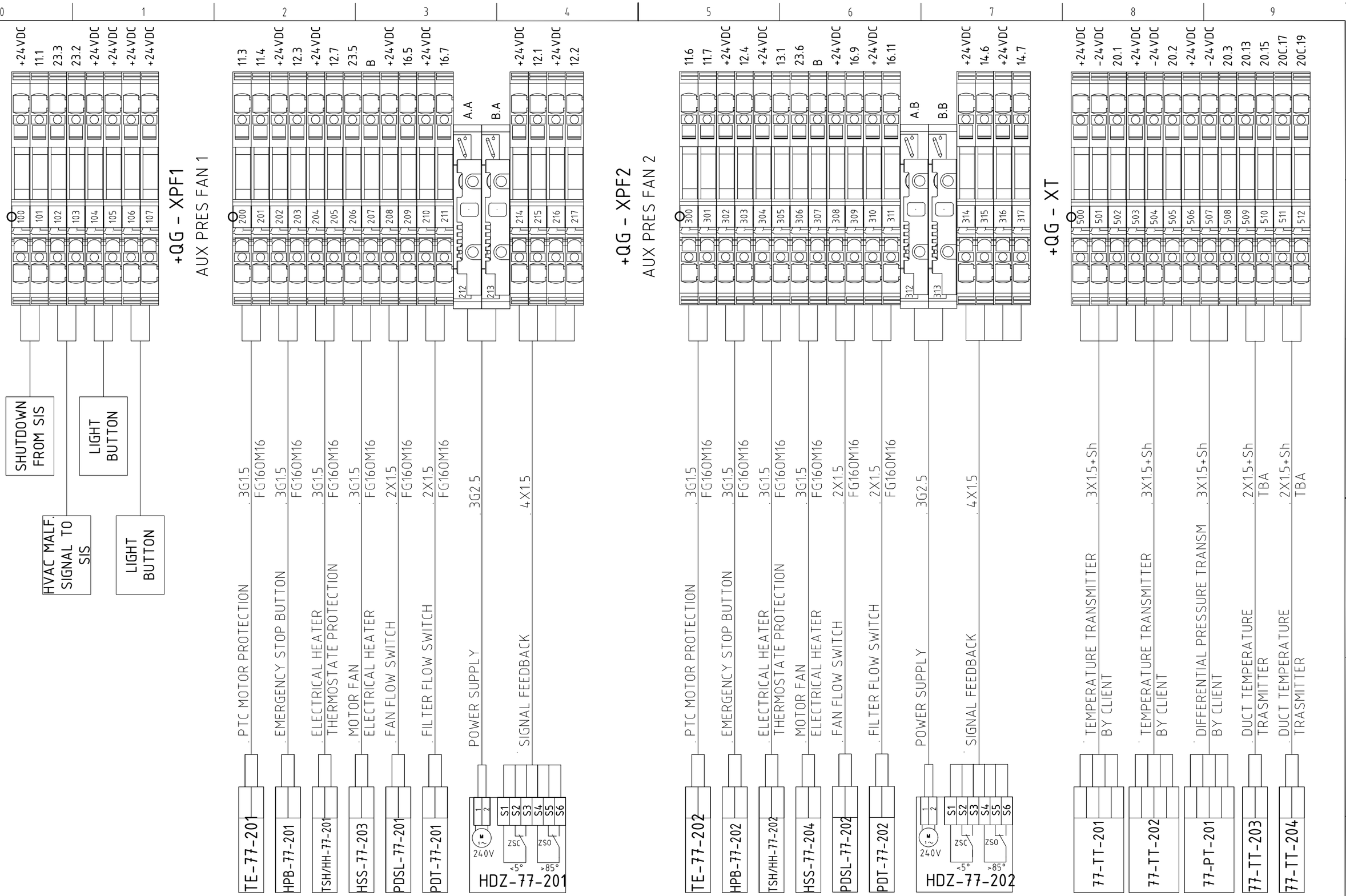
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

TERMINAL STRIP

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00027

FG. 24
F.S. 25



REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	24/01/25	
04	ACCEPT FOR CONSTRUCTION	10/10/24	
03	ISSUE FOR APPROVAL	06/07/24	

DATA	15/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
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frigotermica@frigotermica.com

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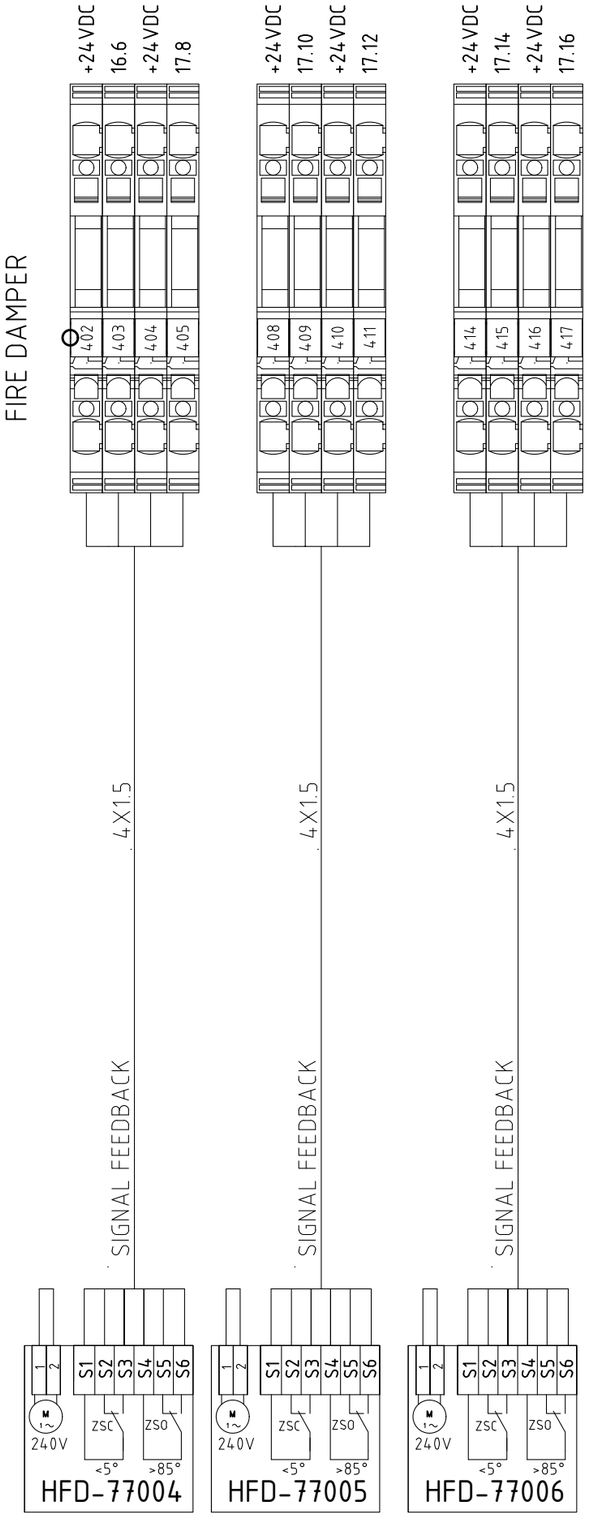
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
TERMINAL STRIP

ROSETTI MARINO | ALEXSISTEMI spa

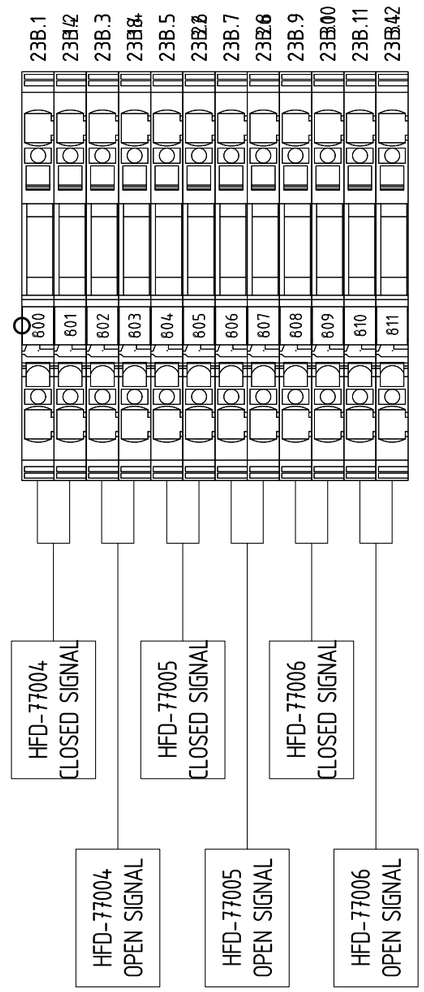
1724000049-HV-DA-00027

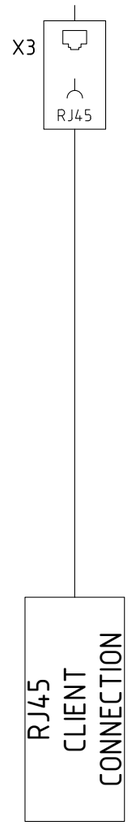
FG. 25
F.S. 25A

+QG - XFD
FIRE DAMPER



+QG - XFD/S
FIRE DAMPER SIGNALS





MODBUS TCP/IP
CONNECTION
FROM
B400-NET-001

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	24/01/25		DATA	15/04/2024
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03	ISSUE FOR APPROVAL	06/07/24		VISTO	S.S.

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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

TERMINAL STRIP

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 25A
F.S. 26

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
				Hq	4	2
	R5CPFE6100	Compensation panel for modular cabinet height 100 width 600	dkc	Hq	4	2
	R5CPME6200	Solid modular door for cabinet width 600, door height 200	dkc	Hq	4	2
	RZPCE6200	modular wiring panel L.600 H.200	dkc			2
	R5CPME6600	Solid modular cabinet door 600 width, 600 door height	dkc	Hq	4	2
	RZPCE6600	Modular wiring panel L.600 H.600	dkc			2
	R5CPME6800	Solid modular cabinet door width 600, door height 800	dkc	Hq	4	2
	RZPCE6800	Modular wiring panel L.600 H.800	dkc			2
	R5CQE1866R	Cabinet comp. 1800x600x600 back	dkc	Hq	4	2
	R5LE1862	SIDE DOOR FOR CQE PANEL DEPTH 600 HEIGHT 1800	dkc			2
	R1ZCOR1	Modular plinth corner H100 4pcs	dkc			2
	R1ZPRO601	Front/side flange H100 length 600	dkc			3
	R5TOE60	Rebate crossbar for modular doors, width 600	dkc			5
	RZMVE18	Vertical support height 1800	dkc			2
	RZA33	Lifting Ring	dkc			3
	RZKE65	CQE cabinet union kit	dkc			2
	rzkre65	Flat Cooling Kit for CQE Cabinets	dkc			2
	rzksre65	L-shaped union reinforcement kit for CQE cabinets	dkc			2
	RZSOE545	HORIZONTAL SUPPORT TOTAL CABINET DEPTH 600	dkc			5
	RZDOE6545	HORIZONTAL PARTITION TOTAL CABINET WIDTH 600 DEPTH 600	dkc			5
	RZDVE1860	Vertical partition for CQE 1800x600	dkc			2
32 x 15	534-2	DIN rail EN60715 32x15x1.5 closed	Arnocanali	Hq	5	4.01
32 x 15	PD32Z	Sendzimir rail 32x15x9 closed	Canloplast	Hq	5	0.41
40 x 100	E35	can.cabl.40x100 sg	Canloplast	Hq	5	9.79
60 x 100	E184	Can.Cabl.60x100 SG S/4	Canloplast	Hq	5	0.84
77-TT-203				Hq		1
77-TT-204				Hq		1
A1	6AV2124-0MC01-0AX0	SIMATIC HMI TP1200 Comfort. Touch control, 12" widescreen display	siemens	Hq	20d	1
A2	6ES7155-6AU01-0CN0	IM 155-6 PN HF/2 V4.2 Interface Module	siemens	Hq	20th	1
	6ES7193-6AR00-0AA0	BA 2×RJ45 (PROFINET busadapter with standard Ethernet socket for IM-PN)	siemens			1
A3	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	20th	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A4	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	20th	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A5	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	20th	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A6	6ES7132-6BH01-0BA0	Digital Output Module: DQ 16x24VDC/0.5A ST	siemens	Hq	20th	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A7	6ES7134-6HD01-0BA1	Analog Input Module: AI 4XU/I 2-Wire ST	siemens	Hq	20th	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A8	6ES7135-6HD00-0BA1	Analog Output Module: AQ 4XU/I ST	siemens	Hq	20th	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A9	6ES7135-6HD00-0BA1	Analog Output Module: AQ 4XU/I ST	siemens	Hq	20th	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A10	6ES7134-6HD01-0BA1	Analog Input Module: AI 4XU/I 2-Wire ST	siemens	Hq	20th	1

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BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 26
F.S. 27

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
A10	*6ES7193-6BP00-0DA0*	*Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)*	*siemens*	*Hq*	*20th*	1
A11	*6GK5208-0BA00-2AC2*	*XC208 Managed Switch with 8 RJ45 100Mbit/s Ports*	*siemens*	*Hq*	*20th*	1
D1	*6ES7513-1RM03-0AB0*	*CPU 1513R-1PN*	*siemens*	*Hq*	*20d*	1
	6ES7954-8LF02-0AA0	*Memory card, 24 MB*	*siemens*			1
	6ES7590-1AB60-0AA0	*Profile rail S7-1500, 160 mm*	*siemens*			1
D2	*6ES7513-1RM03-0AB0*	*CPU 1513R-1PN*	*siemens*	*Hq*	*20d*	1
	6ES7954-8LF02-0AA0	*Memory card, 24 MB*	*siemens*			1
	6ES7590-1AB60-0AA0	*Profile rail S7-1500, 160 mm*	*siemens*			1
EPB-003	*3su1900-0dy30-0aa0*	*Protective collar for merge button, plastic, yellow, 22mm hole*	*siemens*	*Hq*	*6th*	1
	3SU1001-1HB20-0AA0	*Emergency stop mushroom pushbutton, illuminatable, twist release, 40 mm diameter, 2 positions*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
F1		*docker*		*Hq*	*6b*	1
F2		*docker*		*Hq*	*6b*	1
F3		*docker*		*Hq*	*6b*	1
F4		*docker*		*Hq*	*6b*	1
FU21.1		*Single-pole fuse*		*Hq*	21	1
FU22.1		*Single-pole fuse*		*Hq*	22	1
GD1	*6EP1333-3BA10*	*Sitop PSU200M single-phase and two-phase, DC 24V/5A. Stabilized power supply Input: 120-230/230-500V AC, Output: DC 24V/5A*	*siemens*	*Hq*	10	1
HDZ-77-201		*Single-phase alternating current motor*		*Hq*	8	1
HDZ-77-201		*NC Limit Switch*		*Hq*	12	1
HDZ-77-201		*Limit Switch: No*		*Hq*	12	1
HDZ-77-202		*Single-phase alternating current motor*		*Hq*	*9a*	1
HDZ-77-202		*NC Limit Switch*		*Hq*	14	1
HDZ-77-202		*Limit Switch: No*		*Hq*	14	1
HFD-77004		*NC Limit Switch*		*Hq*	*23rd*	1
HFD-77004		*Limit Switch: No*		*Hq*	*23rd*	1
HFD-77004				*Hq*	*25th*	1
HFD-77005		*NC Limit Switch*		*Hq*	*23rd*	1
HFD-77005		*Limit Switch: No*		*Hq*	*23rd*	1
HFD-77005				*Hq*	*25th*	1
HFD-77006		*NC Limit Switch*		*Hq*	*23rd*	1
HFD-77006		*Limit Switch: No*		*Hq*	*23rd*	1
HFD-77006				*Hq*	*25th*	1
HHC-77-002				*Hq*		1
HL6A.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	*6th*	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL8.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	8	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL9A.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	*9a*	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL10.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	10	1

REV.	MODIFICA	DATA	FIRMA
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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 27
F.S. 28

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
HL10.1	*3SU1401-1BH60-1AA0*	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*	*Hq*	10	1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HR-1A				*Hq*	7	1
HR-1A.	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	21	1
HR-1B				*Hq*	7	1
HR-1B.	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	21	1
HR-1C				*Hq*	7	1
HR-1C.	*GRM-H-25-48-AN-OL-00000*	*Static power master unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	21	1
HR-2A				*Hq*	9	1
HR-2A.	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	22	1
HR-2B				*Hq*	9	1
HR-2B.	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	22	1
HR-2C				*Hq*	9	1
HR-2C.	*GRM-H-25-48-AN-OL-00000*	*Static power master unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	22	1
HSS-77-004				*Hq*		1
HSS-77-005				*Hq*		1
HSS-77-006				*Hq*		1
KA11.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	11	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA11A.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	*11th*	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA11A.2	202290244000	*Modular Pulse Relay No. of contacts: 2 Contact configuration: No Contact material: AGSNo2 Mounting: DIN rail Function: Mechanical Sizing current: 16 A. Width in subdivision units: 1 Type of supply voltage*	*Finder*	*Hq*	*11th*	1
KA18.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.2	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1

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B-200 LV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 28
F.S. 29

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA18.3	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.4	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	18	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.5	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.6	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	18	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA18.7	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	18	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA21.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	21	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA22.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	22	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA23A.1	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*23rd*	1

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FG. 29
F.S. 30

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA23A.1	*9702spa*	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*	*Hq*	*23rd*	1
KA23A.2	465290240040 *9702spa*	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU* *Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder* *Finder*	*Hq*	*23rd*	1 1
KA23A.3	465290240040 *9702spa*	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU* *Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder* *Finder*	*Hq*	*23rd*	1 1
KA23A.4	465290240040 *9702spa*	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU* *Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder* *Finder*	*Hq*	*23rd*	1 1
KA23A.5	465290240040 *9702spa*	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU* *Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder* *Finder*	*Hq*	*23rd*	1 1
KA23A.6	465290240040 *9702spa*	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU* *Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder* *Finder*	*Hq*	*23rd*	1 1
KM1	*3RT2316-1BB40* *3RH29111HA22*	*contactor, 4 NO, AC-1: 18 to 24 V DC, 4-pole, 4 NO, size S00, screw terminals* *Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens* *siemens*	*Hq*	18	1 1
LIGHT				*Hq*		1
MTP-001	*3RN2000-1AW30*	*Motor protection relay for PTC thermistor supervision 24/240 V AC/DC 1 changeover contact*	*siemens*	*Hq*	11	1
MTP-002	*3RN2000-1AW30*	*Motor protection relay for PTC thermistor supervision 24/240 V AC/DC 1 changeover contact*	*siemens*	*Hq*	11	1
MVA-1	*DMG600*	*multimeter with icon-based LCD*	*Lovato*	*Hq*	6	1
PDSL-77-201		*Pressure-controlled (pressure switch) No*		*Hq*	16	1
PDSL-77-201				*Hq*		1
PDSL-77-202		*Pressure-controlled (pressure switch) No*		*Hq*	16	1
PDSL-77-202				*Hq*		1
PDT-77-201		*Pressure-controlled (pressure switch) No*		*Hq*	16	1
PDT-77-201				*Hq*		1
PDT-77-202		*Pressure-controlled (pressure switch) No*		*Hq*	16	1
PDT-77-202				*Hq*		1
PF6A.1	*GSF10* *GSV1000220*	*air intake filter 100x100* *Panel Fan 100x100 230V 24m³/h*	*Cosmotec* *Cosmotec*	*Hq*	*6th*	1 1
PF8.1	*GSV1000220* *GSF10*	*Panel Fan 100x100 230V 24m³/h* *air intake filter 100x100*	*Cosmotec* *Cosmotec*	*Hq*	8	1 1

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tel. 0039–0371–69076
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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

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FG. 30
F.S. 31

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
PF9A.1	*GSV1000220*	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*	*Hq*	*9a*	1
	GSF10	*air intake filter 100x100*	*Cosmotec*			1
PFT6A.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	*6th*	1
PFT8.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	8	1
PFT9A.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	*9a*	1
PH6A.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	*6th*	1
PH8.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	8	1
PH9.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	*9a*	1
PHT6A.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	*6th*	1
PHT8.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	8	1
PHT9A.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	*9a*	1
PL6A.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	*6th*	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL8.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	8	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL9A.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	*9a*	1
	050kfm	*Magnet kit*	*New Elfin*			1
PLS6A.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	*6th*	1
PLS8.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	8	1
PLS9A.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	*9a*	1
QF1	*5SU1354-1KK10*	*Residual current circuit breaker, 10 kA, 1P N, AC type, 30 mA, C, IN: 10 A, UN AC: 230 V*	*siemens*	*Hq*	*6th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF1A	*5SY4502-7*	*Circuit breaker 230 V 10KA, 1P N, C, 2A, D=70 mm*	*siemens*	*Hq*	8	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF1B	*5SY4502-7*	*Circuit breaker 230 V 10KA, 1P N, C, 2A, D=70 mm*	*siemens*	*Hq*	*9a*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF2	*5SU1354-1KK16*	*RCD, 10 kA, 1P N, AC type, 30 mA, C, IN: 16 A, UN AC: 230 V*	*siemens*	*Hq*	*6th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF3	*5SY7502-7*	*Circuit breaker 230 V 15KA, 1P N, C, 2 A, D=70 mm*	*siemens*	*Hq*	*6th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF4	*5su1354-1kk06*	*RCD, 10 kA, 1P N, AC Type, 30 mA, C, In: 6 A, One AC: 230 V*	*siemens*	*Hq*	*6b*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF5	*5SY7503-7*	*Circuit breaker 230 V 15Ka, 1P N, C, 3 A, D=70 mm*	*siemens*	*Hq*	10	1
QF6	*5SY5206-7*	*Universal current circuit breaker 440 V DC - 400 V AC 10Ka, 2P, C, 6 A*	*siemens*	*Hq*	10	1
QF400	*5SY74027*	*Int. MT 4P C2 ICN 15KA, ICU 50KA*	*siemens*	*Hq*	6	1
QM1	*5SY7410-7*	*Circuit breaker 400 V 15kA, 4P, C, 10 A, D=70 mm*	*siemens*	*Hq*	*6b*	1
	5SM23420	*Block diff. 4P 40A 30mA Type AC x 5sy*	*siemens*			1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QM1A	*3RV2011-1EA10*	*Circuit breaker size S00 for motor protection, class 10, trip A 2.8...4 A, trip N 52 A, screw terminal*	*siemens*	*Hq*	7	1
	3RV2901-1E	*Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers*	*siemens*			1
QM1B	*3RV2011-1EA10*	*Circuit breaker size S00 for motor protection, class 10, trip A 2.8...4 A, trip N 52 A, screw terminal*	*siemens*	*Hq*	9	1
	3RV2901-1E	*Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers*	*siemens*			1

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Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

MATERIAL LIST
LISTA METERIALI

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1724000049-HV-DA-00027

FG. 31
F.S. 32

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
QM2A	*3RV2011-4AA10*	*Circuit breaker size S00 for motor protection, class 10, trip A 10...16 A, trip N 208 A, screw terminal*	*siemens*	*Hq*	7	1
	3RV2901-1E	*Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers*	*siemens*			1
QM2B	*3RV2011-4AA10*	*Circuit breaker size S00 for motor protection, class 10, trip A 10...16 A, trip N 208 A, screw terminal*	*siemens*	*Hq*	9	1
	3RV2901-1E	*Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers*	*siemens*			1
QS1	*3VA1140-3GE42-0AA0*	*3VA1 switch IEC chassis 160 switching capacity class n ICU=25 KA 415 V 4-pole, TM220 system protection, ATFM, IN=40 A Overload protection IR=28 A... 40 A Short-Circuit Protection II=10 x in N-Conductor Protection 100% LUG terminal*	*siemens*	*Hq*	6	1
	3VA9988-0BL30	*bobsleigh. Launch SIN 24VAC 50/60 Hz/12-30 VDC*	*siemens*			1
	3VA9988-0AA11	*Cont. HP-type status*	*siemens*			1
	3VA9157-0FK21	*com. rinv. Door Lock x 3VA10/1 STD*	*siemens*			1
	3VA9111-0WD40	*Cover x 3VA10/1 4P 1pcs.*	*siemens*			2
QSA	*5SY4420-7*	*Circuit breaker 400 V 10Ka, 4P, C, 20A, D=70 mm*	*siemens*	*Hq*	6	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
	5st3060	*Rotary control padlockable door lock IP65 black*	*siemens*			1
	5st3031	*24-48 V DC opening trip, for 5SL4, 5SY, 5SP, RCBO 5SU1, FI 5SV circuit breaker*	*siemens*			1
QSB	*5SY4420-7*	*Circuit breaker 400 V 10Ka, 4P, C, 20A, D=70 mm*	*siemens*	*Hq*	6	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
	5st3060	*Rotary control padlockable door lock IP65 black*	*siemens*			1
	5st3031	*24-48 V DC opening trip, for 5SL4, 5SY, 5SP, RCBO 5SU1, FI 5SV circuit breaker*	*siemens*			1
SA14.1	*3su1002-2bl10-0aa0*	*Black selector 3 positions (I or II), illuminable. permanent, 2 x 45°*	*siemens*	*Hq*	14	1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
	3SU1400-1AA10-1BA0	*Module of contacts for fixing on the front plate. 1 NO, screw terminals*	*siemens*			2
SA16.1	*3su1002-2bl10-0aa0*	*Black selector 3 positions (I or II), illuminable. permanent, 2 x 45°*	*siemens*	*Hq*	16	1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
	3SU1400-1AA10-1BA0	*Module of contacts for fixing on the front plate. 1 NO, screw terminals*	*siemens*			2
SOCKET				*Hq*		1
TA1.1	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
TA2.1	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
TA3.1	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
VSD 1	*6SL3210-5BE22-2CV0*	*SinamiCs V20 3AC380-480V 2.2KW with C3 Filter*	*siemens*	*Hq*	7	1
VSD 2	*6SL3210-5BE22-2CV0*	*SinamiCs V20 3AC380-480V 2.2KW with C3 Filter*	*siemens*	*Hq*	9	1
X3		*RJ45 port per panel*		*Hq*	*25th*	1
XAC	*CBC04GR*	*CBC.4/GR Feed-through clamp*	*Cabur*	*Hq*		12
	CBC02GR	*CBC.2/GR Thru-Clamp*	*Cabur*			2
XC	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		8
XFD	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		12
XFD/S	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		12
XM1	*CBC02GR*	*CBC.2/GR Thru-Clamp*	*Cabur*	*Hq*		3
	CBC06GR	*CBC.6/GR Thru-Clamp*	*Cabur*			3
XM2	*CBC02GR*	*CBC.2/GR Thru-Clamp*	*Cabur*	*Hq*		3
	CBC06GR	*CBC.6/GR Thru-Clamp*	*Cabur*			3
XPF1	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		16
	SF900GR	*SFR.4/GR Sectionable clamp*	*Cabur*			2

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Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186-Cornegliano Laud. (Lo) Italy
tel. 0039-0371-69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM

Distinta Materiali
Bill of Materials

ROSETTI MARINO | ALEXSISTEMI

1724000049-HV-DA-00027

FG. 32
F.S. 33

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
XPF2	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		16
	SF900GR	*SFR.4/GR Sectionable clamp*	*Cabur*			2
XPS	*CBC04GR*	*CBC.4/GR Feed-through clamp*	*Cabur*	*Hq*		3
	CBC35gr	*CBC.35/GR Feed-through clamp*	*Cabur*			5
XT	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		13

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frigotermica
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FG. 33
F.S. 71_GS_LI

Base Load Power Hub (BLPH)

B-100 STRUCTURAL CALCULATION - E&I SHELTERS

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	31/07/2024

Document Number:

1724000049-ST-CA-00006

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
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2	26/06/2024	Issue for Review (IFR)	FB	SKV	OA
1	15/04/2024	Issue for Review (IFR)	FB	SKV	OA
0	13/03/2024	Issue for Review (IFR)	FB	SKV	OA

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
1	Issue for Review (IFA)
2	Issue for Review (IFA)
3	Accepted for Contruction (AFC)

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1 INTRODUCTION

1.2 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.2.1 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

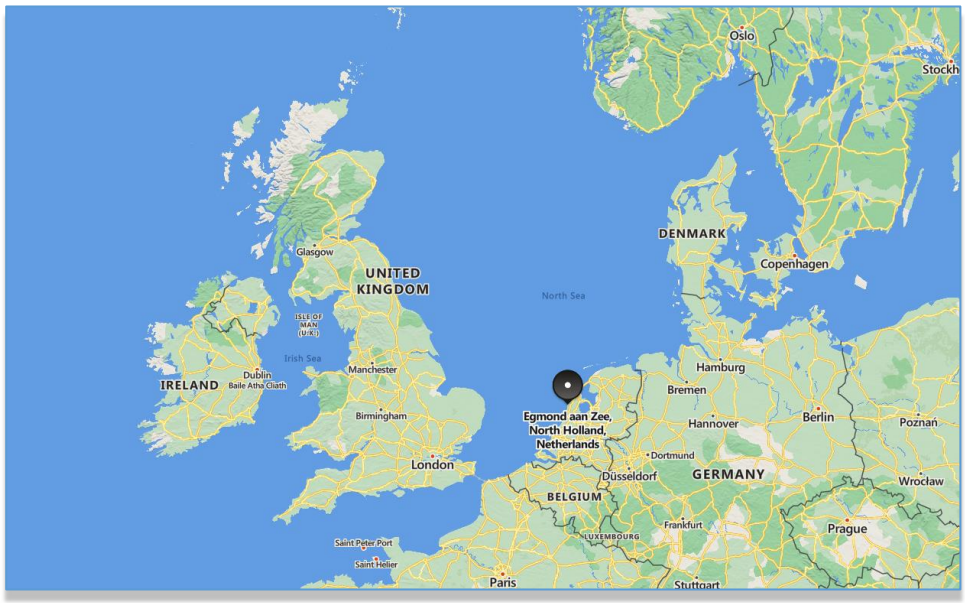


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.2.2 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

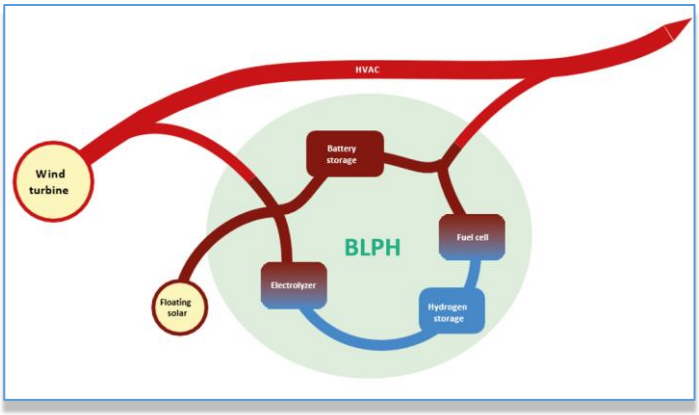


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

Structural report.

2.2 REFERENCES

Doc. No.	Description
123A90-DDL-ST-SP-90017 Rev.01	Structural design basis
123A90-DDL-IN-DL-40012 Rev.01_OPEN	BLPH off-shore iter equipment layout

Table 1 - Reference Documents

2.3 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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3 PURPOSE OF WORK

The B100 (HV switchgear room), which is the object of the following report, has been design and build by Alex Sistemi S.p.A.

This calculation report describes the structural analysis of steel room, that will be placed off the coast of Netherlands near the town of Egmond aan Zee. This report summarizes the results of the analyses performed to evaluate the actual stress path and strength verification on the cabin in the worst condition among those feasible.

The following conditions have been considered for the analyses:

- Dead load;
- Live load;
- Wind load;
- Sea transport;
- Lifting.

The structure has been diagrammed so as to allow calculation by use of a computer program for finite element analysis. The structure has been calculated using SAP2000 v.25 for the finished elements (FEM) and Femap Nastran 2401 for solid models of lifting lug and corrugated panel.

1.1 CODES AND STANDARDS

For structural ULS, SLS and lifting design of has been used Eurocodes.

- EN 1993-1-1 2005 Eurocode specifications for steel building;
- 0027 ND rev. 11 Guideline for lifting Noble Denton.

1.2 UNITS

- Density [kg/m³];
- Length [m], [mm];
- Mass [kg], [ton]= 1000 [kg];
- Force [N], [kN] = 1000 [N];
- Area Load [kN/m^2];
- Temperature [°C];
- Stress [MPa] = [N/mm^2];

1.3 MATERIALS

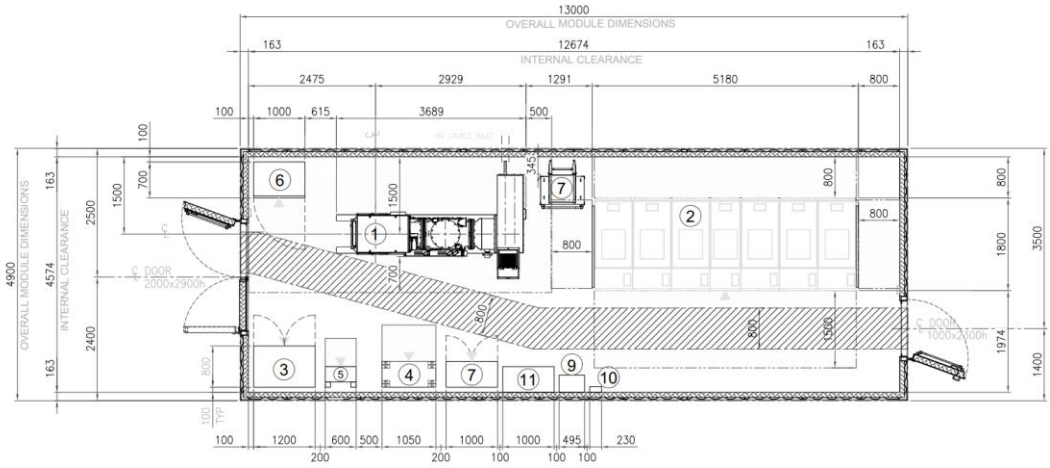
- **Framing structure and panelling EN S355J0:**
  - Modulus of elasticity E=210000 N/mm^2
  - Modulus of rigidity G=81000 N/mm^2
  - Tensile stress breakage fr>=470 N/mm^2
  - Yield stress fy=355 N/mm^2
  - Ultimate elongation percentage A=22%

- **Welding steel dependent of welded section material:**
  - Structural steel with a yield stress of at least 300 MPa matching electrode ultimate tensile strength X_u=490 N/mm^2.
- **Bolting ASTM A325:**
  - Tensile ultimate stress fu=830 N/mm^2
  - Yield stress fy=660 N/mm^2

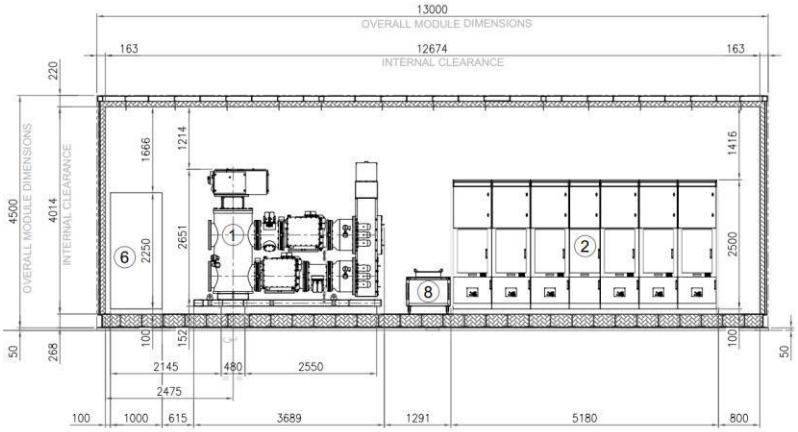
1.4 GENERAL DESCRIPTION

The structure has finished dimensions:

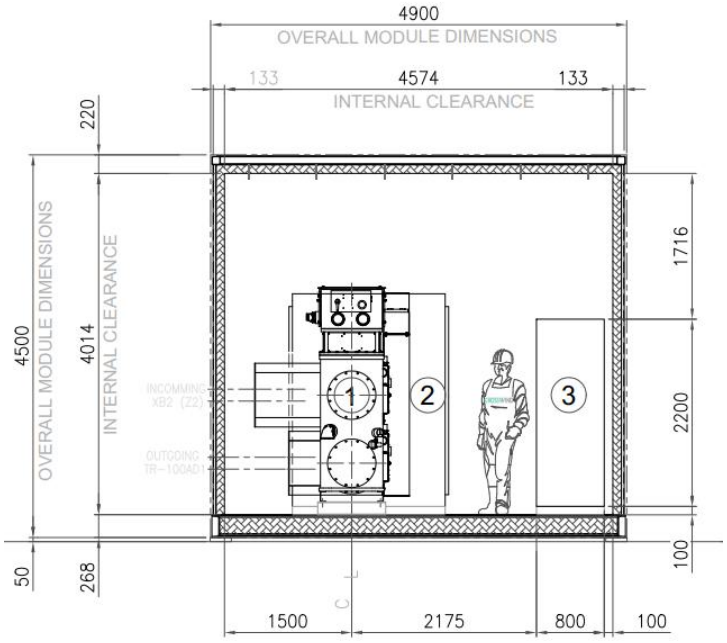
- Maximum lenght: 13000 mm;
- Maximum width: 4500 mm;
- Height: 4500 mm.



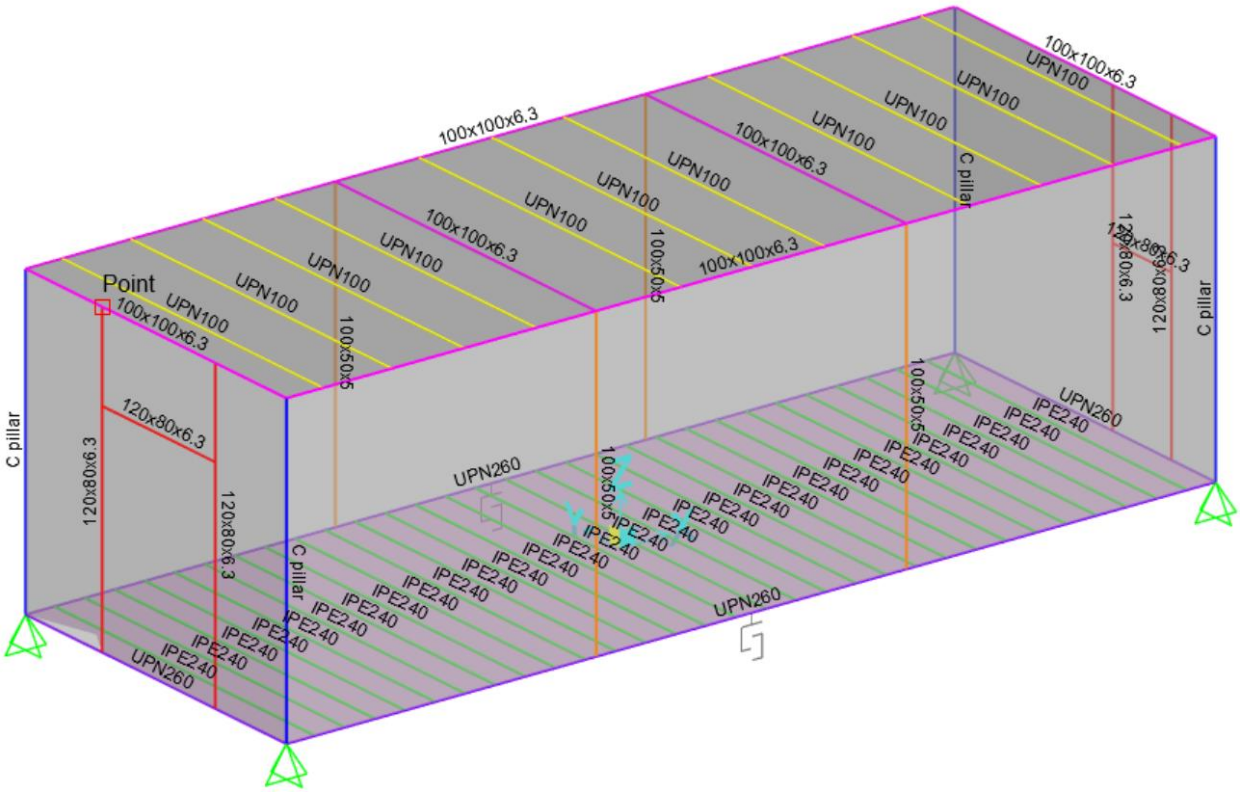
PLAN VIEW

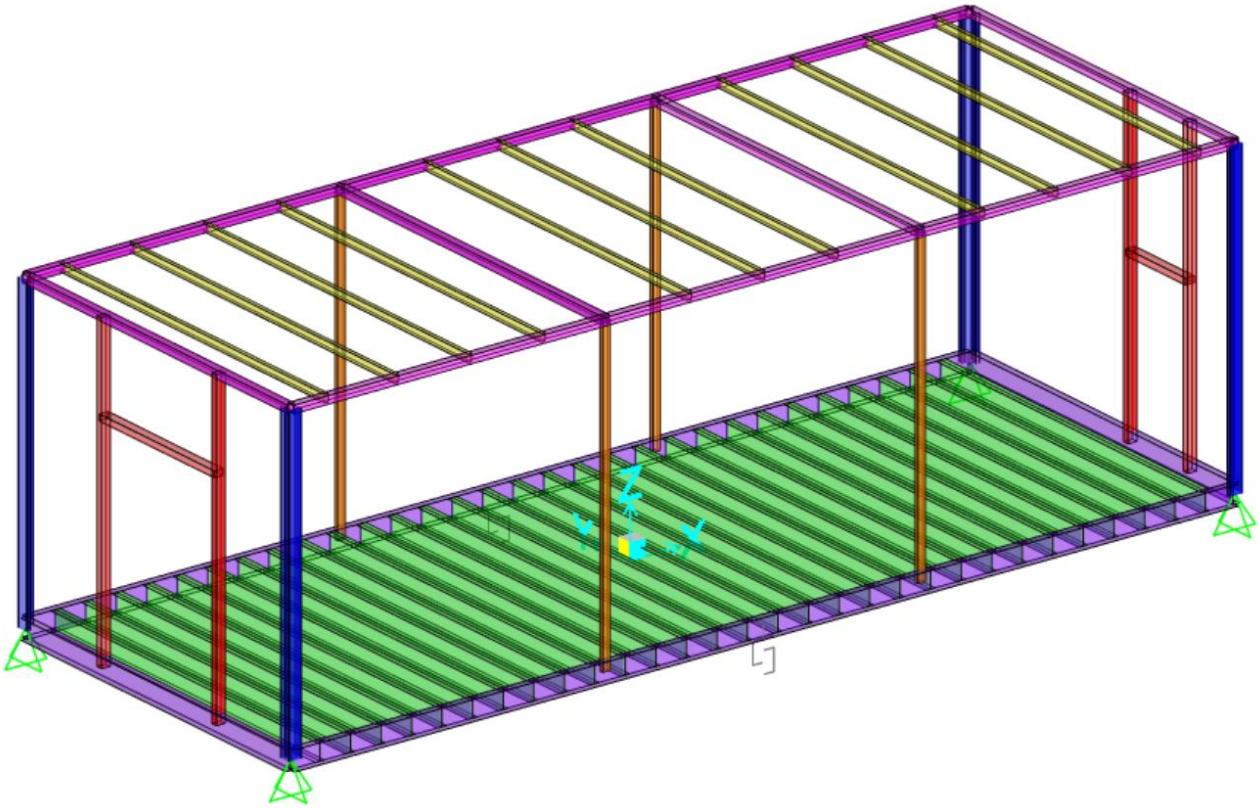


LONG SIDE VIEW



Below is shown the summary of all sections, also identified by color.





- Corrugated wall sheet thickness 3 mm;
- Roof sheet stave thickness 6 mm;
- Floor metal sheet thickness 6 mm.

TABLE: Area Section Properties

Section	Material	MatAngle	AreaType	Type	DrillDOF	Thickness	BendThick	Color	TotalWt	TotalMass
Text	Text	Degrees	Text	Text	Yes/No	m	m	Text	KN	KN-s2/m
Corrugate 3mm	S355	0	Shell	Shell-Thin	Yes	0.003	0.003	Gray	50.47	5.15
Metal sheet 6mm	S355	0	Shell	Shell-Thin	Yes	0.006	0.006	Gray	34.227	3.49
Roof stave 6mm	S355	0	Shell	Shell-Thin	Yes	0.006	0.006	Gray	37.079	3.78

TABLE: Area Section Properties

Section	F11Mod	F22Mod	F12Mod	M11Mod	M22Mod	M12Mod	V13Mod	V23Mod	MMod	WMod
Text	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless
Corrugate 3mm	1	1	1	1	261	1	1	1	1.5	1.5
Metal sheet 6mm	1	1	1	1	1	1	1	1	1.2	1.2
Roof stave 6mm	1	1	1	1	613	1	1	1	1.3	1.3

The mass and weight multiplier for the flat sheet representing the C-stave wall, is evaluated about 90% more than the equivalent flat sheet of the same thickness (4 mm of thickness) as is possible to see on the following pages.

The structural skeleton is made with combinations of different types of section, listed below:

TABLE: Frame Section Properties 01 - General

SectionName	Material	Shape	t3	t2	tf	tw	t2b	tfb	FilletRadius	Area	TorsConst
Text	Text	Text	m	m	m	m	m	m	m	m2	m4
100x100x6.3	S355	Box/Tube	0.10	0.10	0.01	0.01			0.00	0.00	0.00
100x50x5	S355	Box/Tube	0.10	0.05	0.01	0.01			0.00	0.00	0.00
120x80x6.3	S355	Box/Tube	0.12	0.08	0.01	0.01			0.00	0.00	0.00
C pillar	S355	SD Section								0.00	0.00
IPE240	S355	I/Wide Flange	0.24	0.12	0.01	0.01	0.12	0.01	0.02	0.00	0.00
UPN100	S355	Channel	0.10	0.05	0.01	0.01			0.01	0.00	0.00
UPN260	S355	Channel	0.26	0.09	0.01	0.01			0.01	0.00	0.00

TABLE: Frame Section Properties 01 - General

SectionName	I33	I22	I23	AS2	AS3	S33Top	S33Bot	S22Left	S22Right	Z33	Z22
Text	m4	m4	m4	m2	m2	m3	m3	m3	m3	m3	m3
100x100x6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100x50x5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120x80x6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C pillar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IPE240	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPN100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPN260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

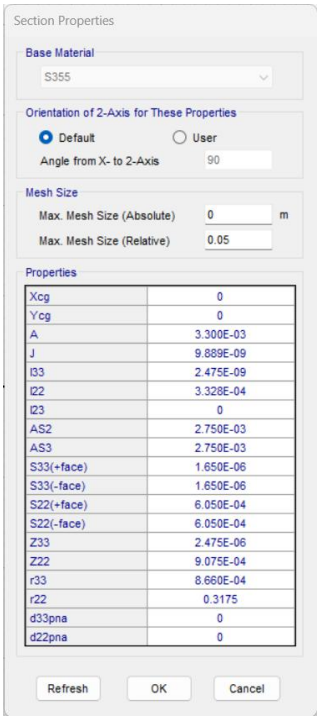
TABLE: Frame Section Properties 01 - General

SectionName	R33	R22	CGOffset3	CGOffset2	EccV2	EccV3	Cw	IncludeSCAn	ConcCol	ConcBeam	Color
Text	m	m	m	m	m	m	m6	Yes/No	Yes/No	Yes/No	Text
100x100x6.3	0.04	0.04	0.00	0.00	0.00	0.00	0.00		No	No	Magenta
100x50x5	0.04	0.02	0.00	0.00	0.00	0.00	0.00		No	No	Orange
120x80x6.3	0.04	0.03	0.00	0.00	0.00	0.00	0.00		No	No	Red
C pillar	0.06	0.06	0.02	0.02	0.00	0.00	0.00		No	No	Blue
IPE240	0.10	0.03	0.00	0.00	0.00	0.00	0.00		No	No	Green
UPN100	0.04	0.01	0.01	0.00	0.03	0.00	0.00	Yes	No	No	Yellow
UPN260	0.10	0.03	0.02	0.00	0.05	0.00	0.00	Yes	No	No	Purple

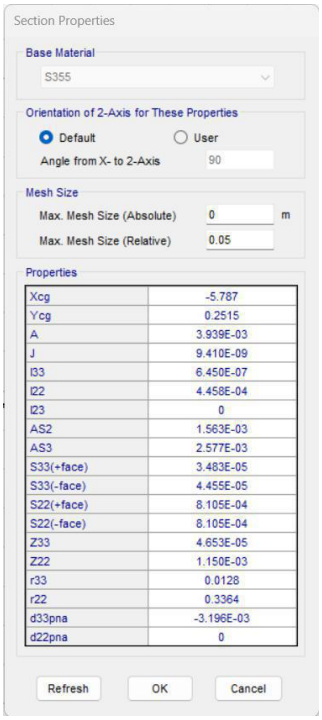
TABLE: Frame Section Properties 01 - General

SectionName	TotalWt	TotalMass	FromFile	AMod	A2Mod	A3Mod	JMod	I2Mod	I3Mod	MMod	WMod
Text	KN	KN-s2/m	Yes/No	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless
100x100x6.3	8.168	0.83	No	1	1	1	1	1	1	1	1
100x50x5	1.777	0.18	No	1	1	1	1	1	1	1	1
120x80x6.3	3.571	0.36	No	1	1	1	1	1	1	1	1
C pillar	3.644	0.37	No	1	1	1	1	1	1	1	1
IPE240	43.296	4.41	Yes	1	1	1	1	1	1	1	1
UPN100	5.465	0.56	Yes	1	1	1	1	1	1	1	1
UPN260	13.134	1.34	Yes	1	1	1	1	1	1	1	1

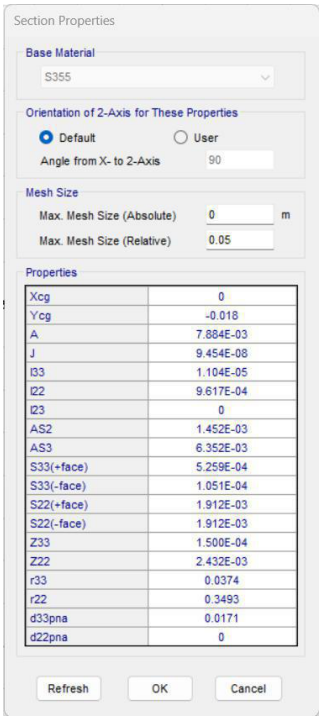
The roof and wall assembly C profile modules is modelled with a flat plate with flexural stiffness calibrated on a specific FEM comparative model and consequently increased weight by a multiplier in the property (see column MMOD and WMOD in the previous tables → I33 ration between the real section and flat section).



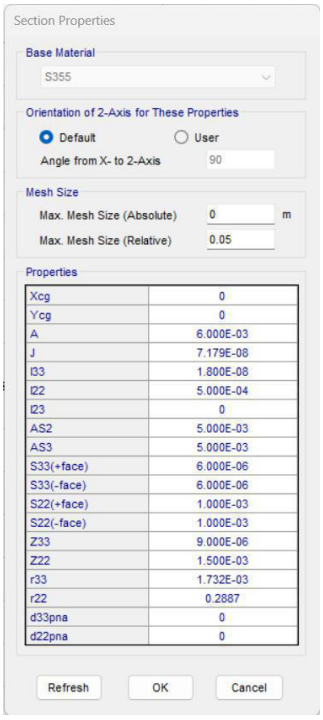
REAL MODELS FOR WALL



CALIBRATED MODELS FOR WALL



REAL MODELS FOR ROOF

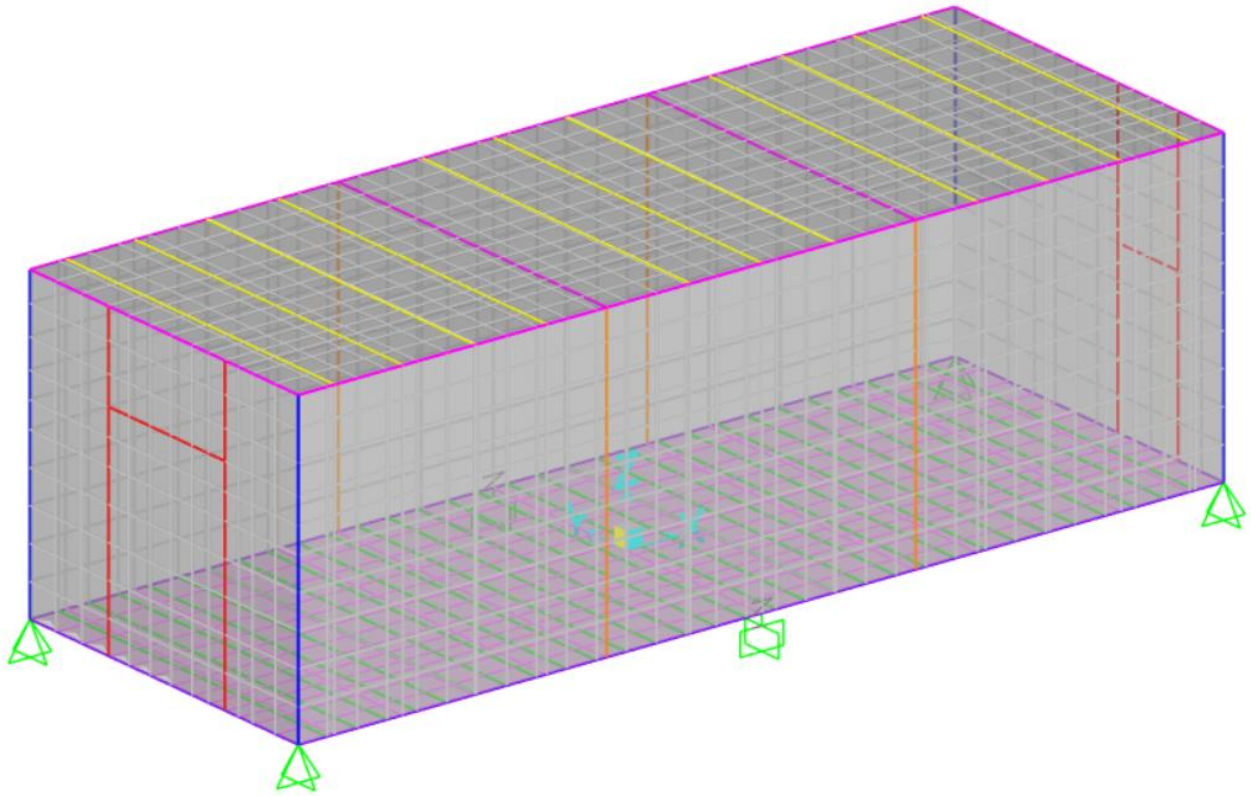


CALIBRATED MODELS FOR ROOF

4 NUMERICAL MODEL

The analyses were performed using SAP2000 v25 Advanced.

Mono-dimensional (beam) and bi-dimensional (shell) elements were used to create the model.



ANALYSIS MESHED MODEL

The model was developed to analyse the components of steel structure, in particular:

- The C module panel sheet was modelled as equivalent shell with specific stiffness;
- The frame was modelled using mono-dimensional elements with cross section.

The wall and roof sheet forming the cover, is simplified as element flat shell but was given a stiffness, in the direction of the warping of the ribs, equivalent to the ratio between the inertia of the real section and the inertia of flat sheet. In this way it was possible to obtain a realistic displacement of the material under loads. In tensional terms it was necessary to evaluate the effective bound (considered by the software on the inertia of the flat section) as the ratio between the moment on linear meter, agent in the warping direction of the rib and the section modulus W of the real section, obtaining a maximum bound in line with the results of the software tension for orthogonal plate direction (Jcorrugated/Jflat). This aspect can be bypassed by analyzing detailed models for walls and cover including ribs. This approach also allows to consider the structural behavior of the wall together with the elements constituting the frame like a sort of compound section.

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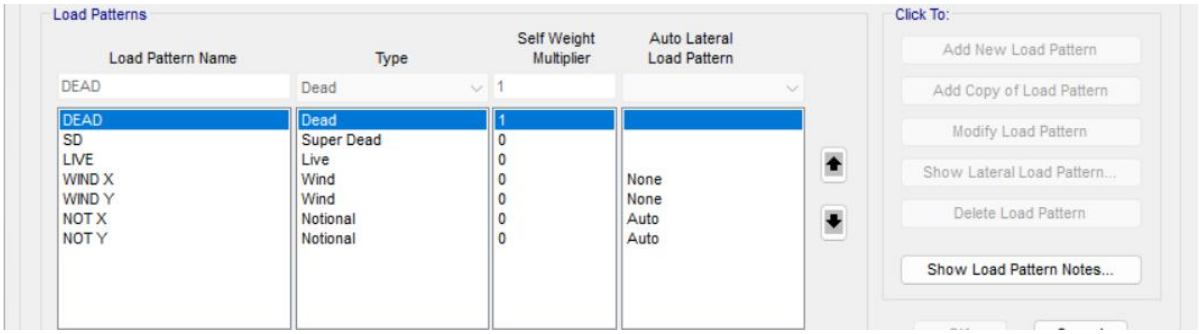
In order to apply the increase of stiffness on the shells so that it can be correctly distributed also on the surrounding frames, it is necessary to discretize the flat elements with a certain mesh and Sap will provide appropriate automation for the frames. The loads are applied as uniform to shell (meshed) for panels with structural function in order to also consider the contribution of the latter in the distribution and as uniform to frames for floor and deck where the plate area have only function as load distributors.

As regards the middle supports for perimeter beam UPN260, they are represented with GAP links and therefore all load combinations are converted into non-linear in order to take into account the contribution to only compression given from them (non-linear geometry analysis).

4.2 DESIGN LOADING

4.2.1 Dead load

The DEAD LOADS or permanent structural loads of steel FAR are calculated automatically (is considered an additional 3% for connections and NOTIONAL as 0.002 ratio of DEAD).



4.2.2 Super dead load

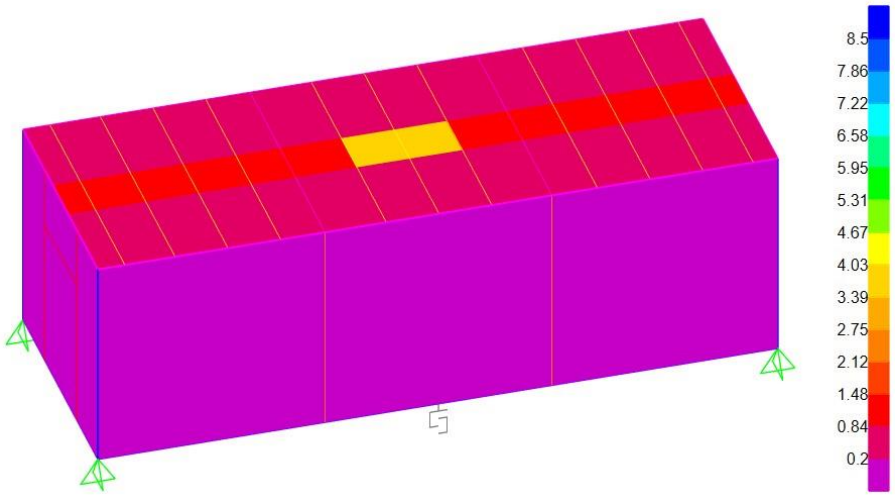
All non structural or SUPER DEAD LOADS on walls 20 kg/m² on roof 50 kg/m² load and floor 50 kg/m² (included panels and extra minus equipment).

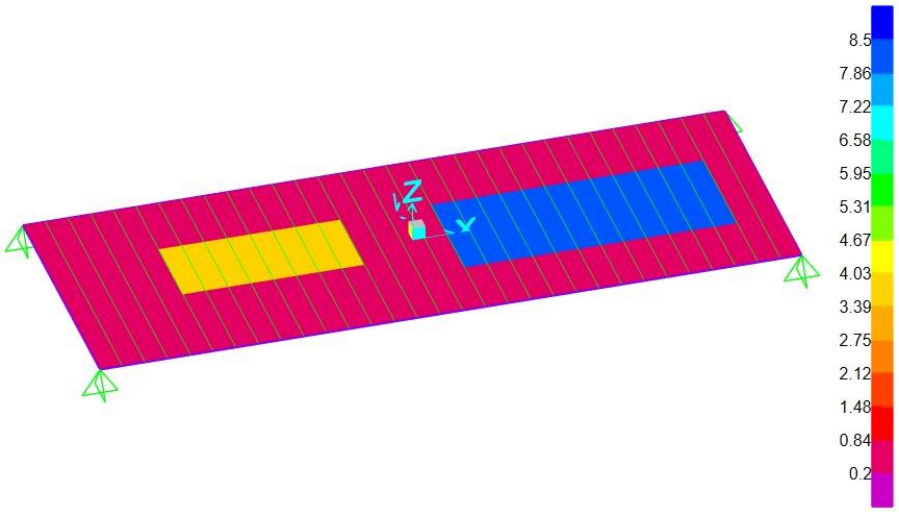
The weight of internal racks is calculated by data provided by customer and their overall dimensions, therefore simplified in favor of safety with a loading area in the model. The relevant equipments are switchgear and its GIS for two imprint respectively 9.4 m² and 7.4 m² for two distributed loads 8 kN/m² for switchgear and 3.5 kN/m² for GIS. For other equipment is in favor of safety to consider the live load instead of SD load.

In particular for HVAC units of roof, considering the worst condition 4 kN/m² for the foot-print 2 m² and 1 kN/m² for the conducts in extra areas. In these areas isn't applied live load.

	B100 [kg]
Metal structure	20392
Insulating panels wall roof	4338
Insulating panels floor	1152
Insulating door A5	23
Insulating door A6	55
Insulating door C4	/
Insulating door D4	/
Total DEAD + INSULATION	**25960**

EQUIPMENT LIST						
REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (kg)
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	2600
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	7400
3	BA-200F1	DC UPS PANEL	1200	800	2100	500
4	UP-200E2	DC UPS BATTERY RACK	1050	500	1314	522
5	CB-200F1	ISOLATOR FOR DC UPS	600	300	800	100
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	700	1000	2250	850
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1550	900	850	560
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	70
9	-	TOOL BOX	495	335	920	60
10	-	ELECTRIC SAFETY KIT	230	110	280	50
11	-	TABLE	1000	500	750	50

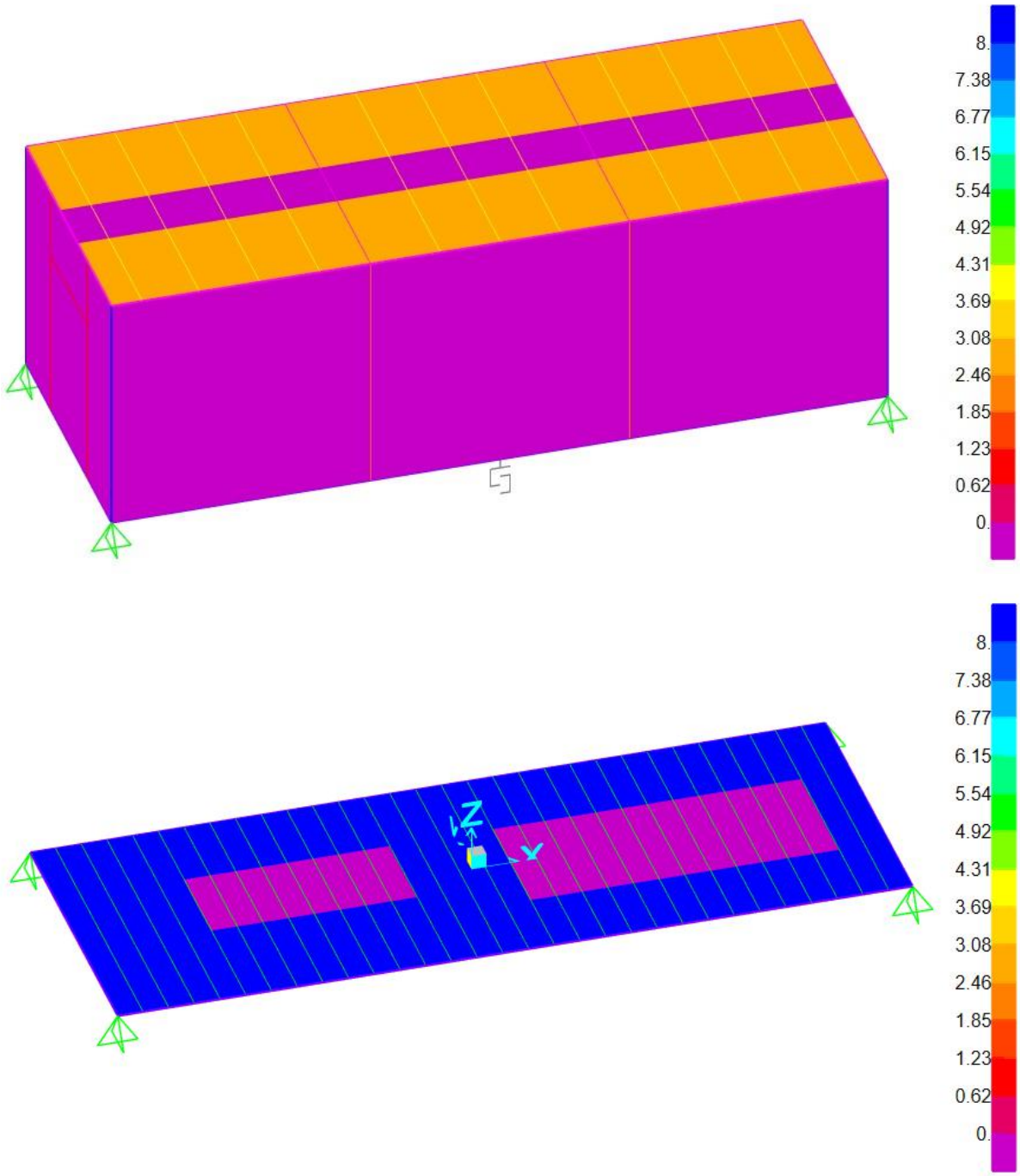




SUPER DEAD LOADS APPLIED IN MODEL [kN/m²]

4.2.3 Live load

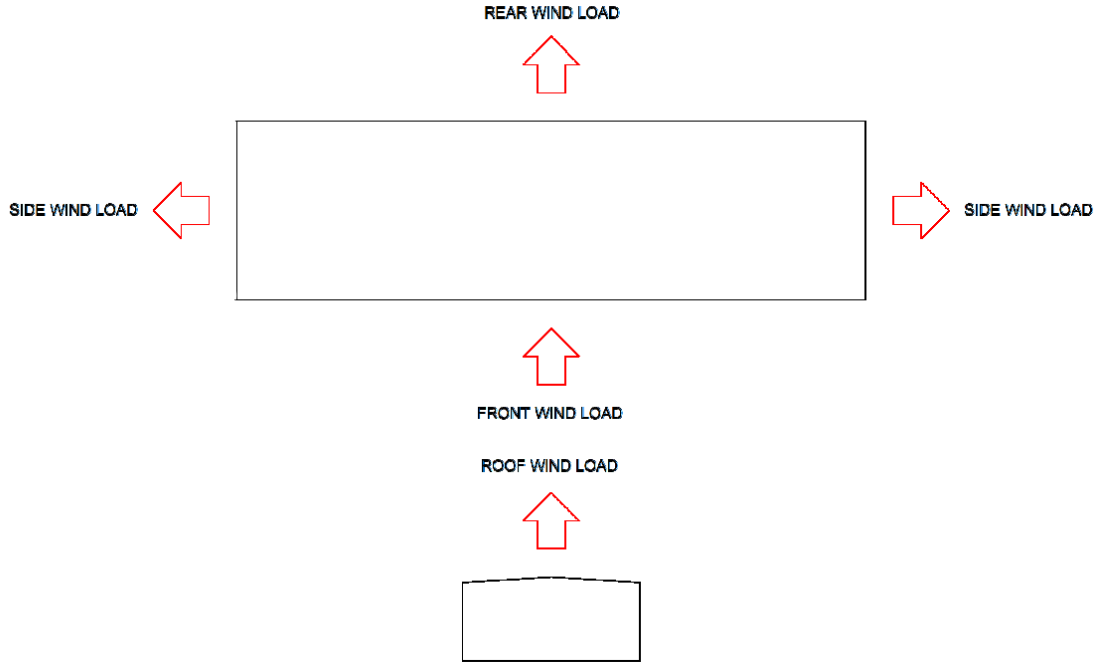
The LIVE LOADS are distributed in areas not loaded with cabinets or internal components. All loads are rounded up and equal to 2.5 kN/m^2 for roof and 8 kN/m² for internal floor.

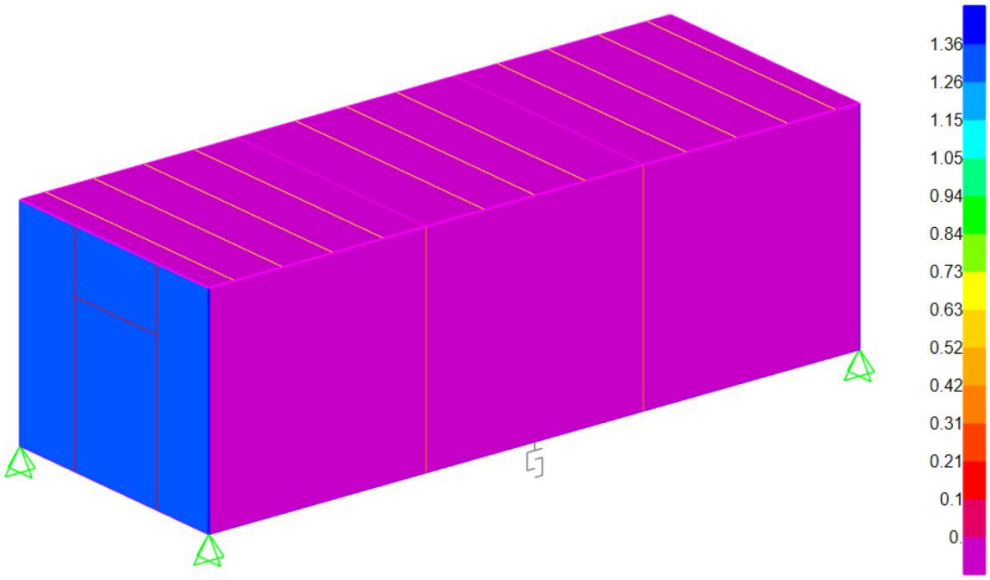


LIVE LOAD APPLIED IN MODEL [kN/m²]

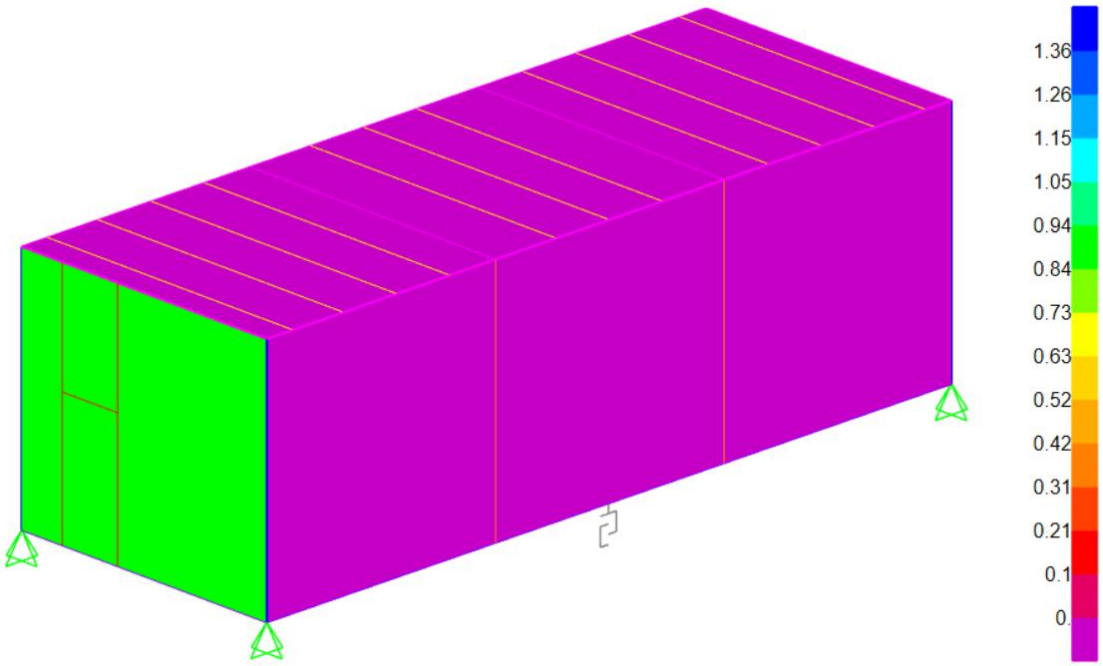
4.2.4 Wind load

The design wind loads shall be automatically calculated for the worst condition of wind speed 41 m/s and exposure category D with importance factor 1.15 (Eurocode's worst condition for off-shore and in accordance with the specifics of customer WIND TABLE). The actions on walls and roof are automatically calculated by Sap by setting the parameters and applying the appropriate exposure coefficient to the plate elements (peak velocity pressure 1.69 kN/m² → pressure coefficient Cp front 0.8, Cp side, rear and roof 0.5).

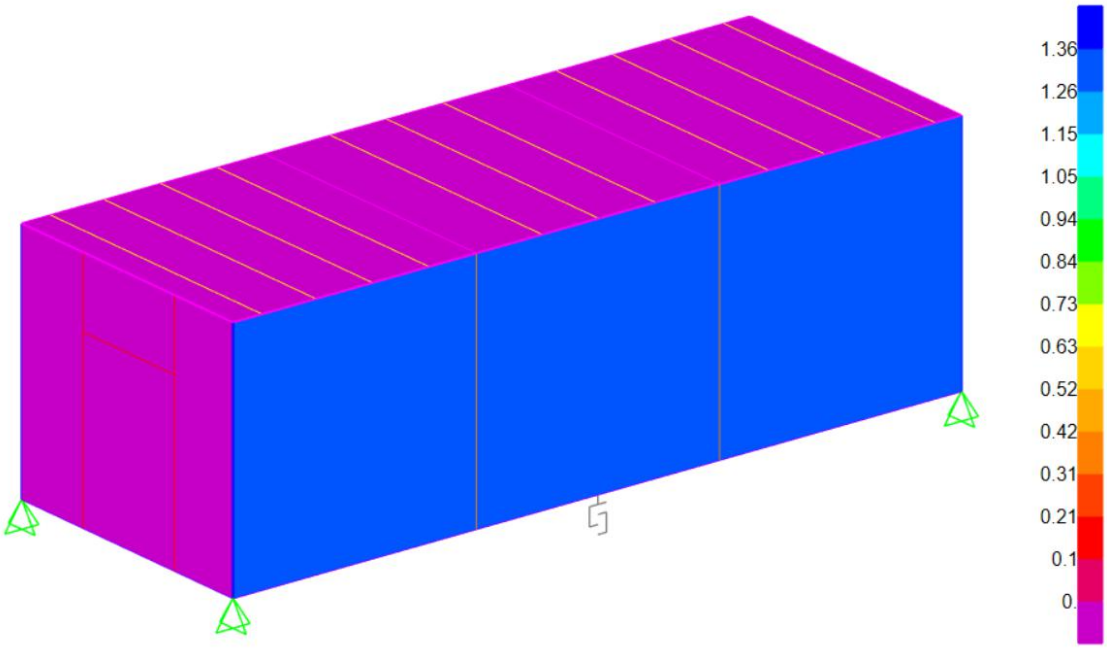




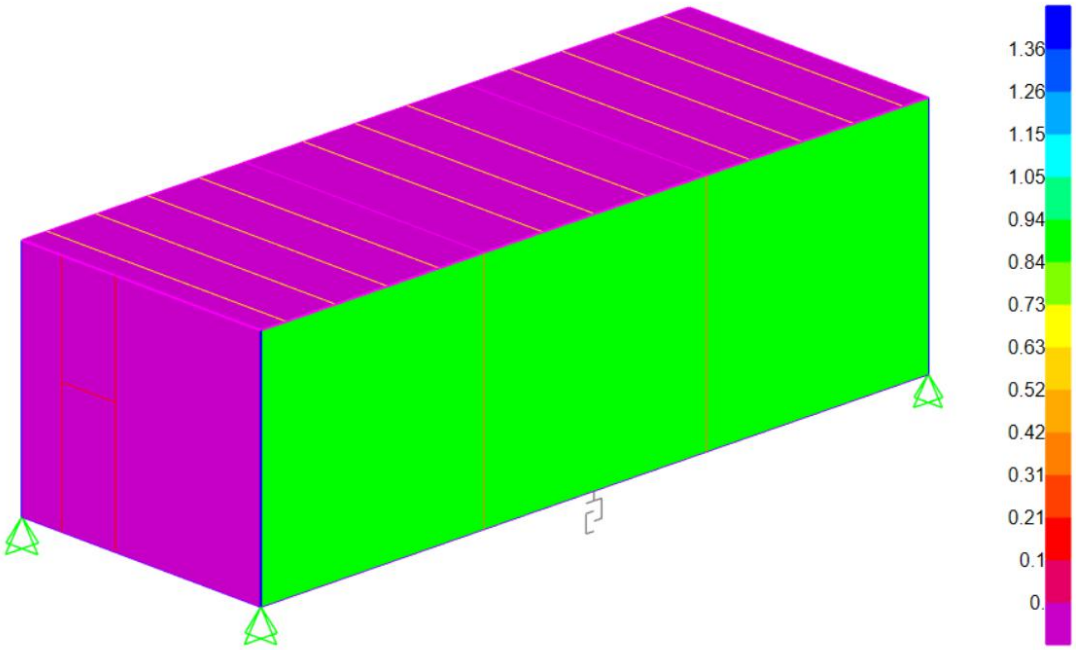
WIND X PRESSURE FRONT [kN/m²]



WIND X PRESSURE REAR [kN/m²]



WIND Y PRESSURE FRONT [kN/m²]



WIND Y PRESSURE REAR [kN/m²]

4.3 LOAD COMBINATIONS

TABLE: Combination Definitions						
ComboName	**ComboType**	**AutoDesign**	**CaseType**	**CaseName**	**ScaleFactor**	**SteelDesign**
Text	Text	Yes/No	Text	Text	Unitless	Text
ULS LIVE	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.5	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
ULS WIND X	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.05	
			NonLin Static	WIND X	1.5	
			NonLin Static	WIND Y	0.3	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
ULS WIND Y	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.05	
			NonLin Static	WIND X	0.3	
			NonLin Static	WIND Y	1.5	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
SLS LIVE	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	LIVE	1	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
SLS WIND X	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	WIND X	1	
			NonLin Static	WIND Y	0.3	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
SLS WIND Y	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	WIND X	0.3	
			NonLin Static	WIND Y	1	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
LLC2 lifting	Linear Add	No	NonLin Static	DEAD	1.5	Strength
			NonLin Static	SD	1.5	
LLC3 lifting	Linear Add	No	NonLin Static	DEAD	2	Lifting point
			NonLin Static	SD	2	

TABLE: Combination Definitions

ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
SEA COMB 1	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	1	
SEA COMB 2	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	1	
SEA COMB 3	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	-1	
SEA COMB 4	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	-1	
SEA COMB 5	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	1	
SEA COMB 6	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	1	
SEA COMB 7	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	-1	
SEA COMB 8	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	-1	

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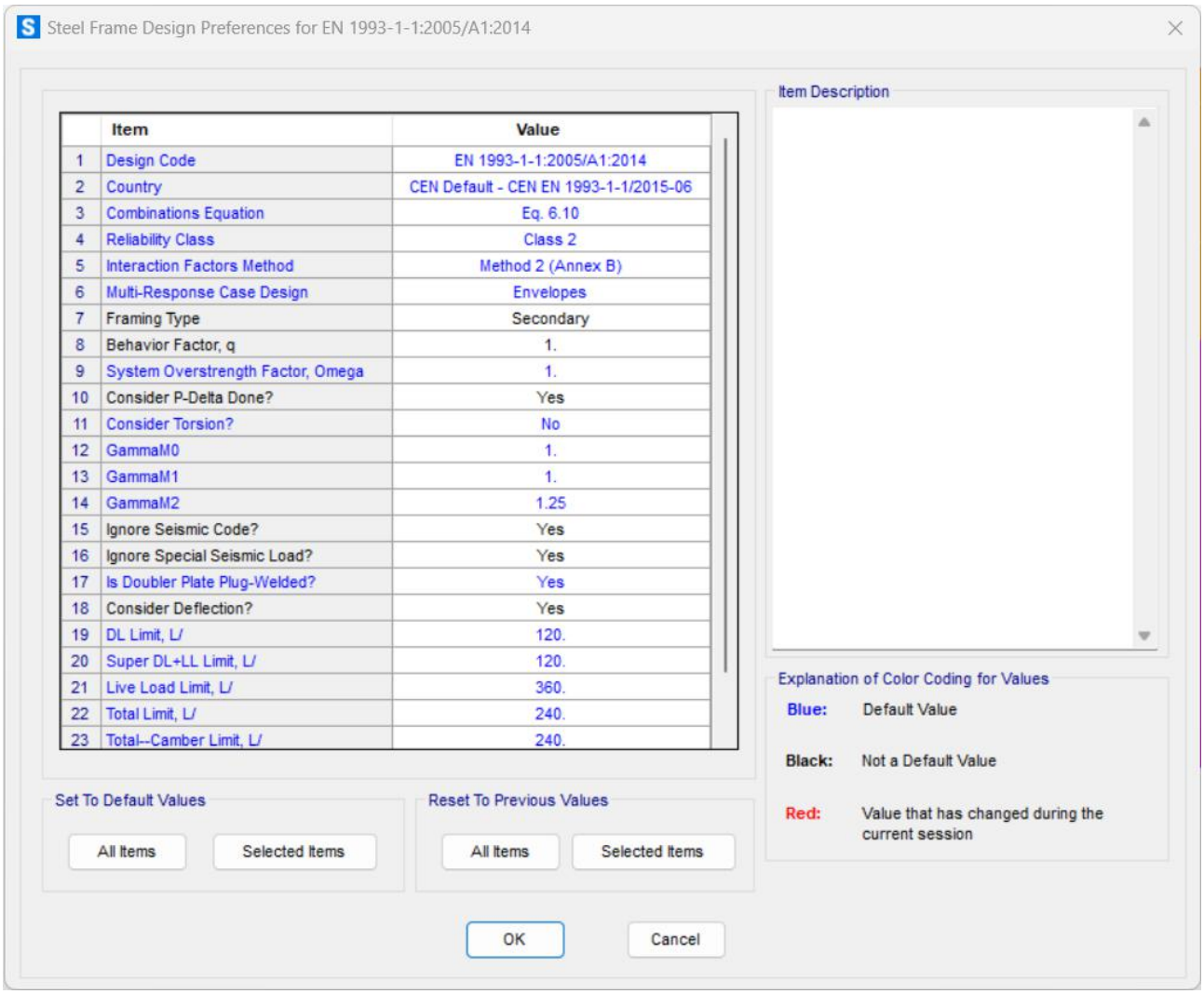
TABLE: Combination Definitions

ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
SEA COMB 9	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	1	
SEA COMB 10	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	1	
SEA COMB 11	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	-1	
SEA COMB 12	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	-1	
SEA COMB 13	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	1	
SEA COMB 14	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	1	
SEA COMB 15	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	-1	
SEA COMB 16	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	-1	

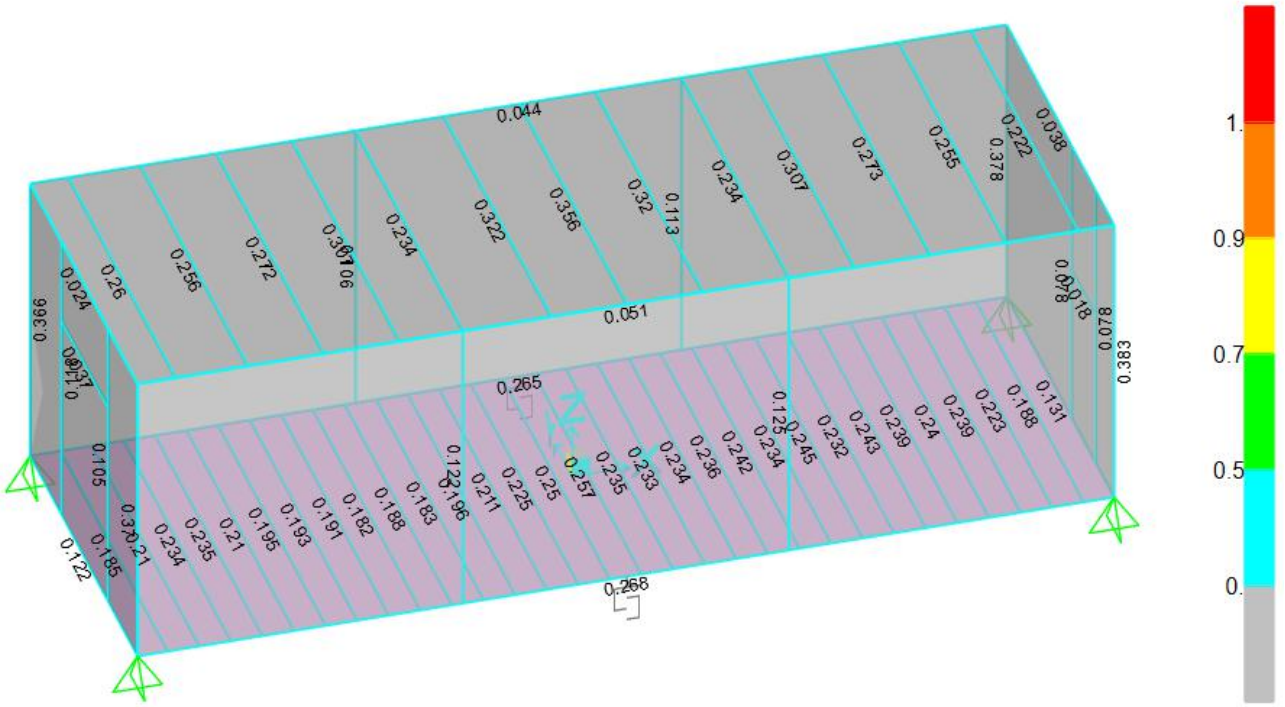
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4.4 STRESS CHECK IN PLACE

All sections are check and verified in according with EN 1993 combinations ULS LIVE and WIND, SLS LIVE and WIND. Showed below the detailed printout for each type of section in its combination of maximum stress and the force diagrams with values for roof frames.

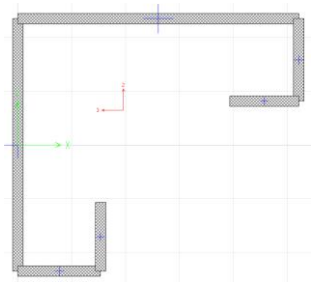


For in-place condition is automatically calculated also the relative deflection and compared with the limite L/240 (for beams). For beams in compression is calculated the lateral torsion buckling limit from code.



CHECK DESIGN FOR ULS LOADS (ORANGE < 1 RATIO)

4.4.1 C PILLAR



EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame :	188	X Mid:	6.44	Combo:	ULS LIVE	Design Type:	Column
Length:	4.122	Y Mid:	2.398	Shape:	C pillar	Frame Type:	Secndry
Loc :	4.122	Z Mid:	2.061	Class:	Class 3	Rolled :	No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10 Reliability = Class 2 Interaction = Method 2 (Annex B)
MultiResponse = Envelopes P-Delta Done? Yes Consider Torsion? No

GammaM0=1.	GammaM1=1.	GammaM2=1.25		
An/Ag=1.	RLLF=1.	PLLF=0.75	D/C Lim=0.95	Prin. Axis Angle = 90. deg

Aeff=0.003	Av,2=0.001	Av,3=0.001	eNy=0.	eNz=0.
A=0.003	Iy=8.703E-06	iy=0.055	Wel,y=8.999E-05	Weff,y=8.999E-05
It=3.406E-08	Iz=1.075E-05	iz=0.061	Wel,z=1.027E-04	Weff,z=1.027E-04
Iw=0.	Iyz=0.	h=0.153	Wpl,y=1.342E-04	
E=210000000.	fy=355000.	fu=510000.	Wpl,z=1.489E-04	

STRESS CHECK FORCES & MOMENTS

Location	Ned	My,Ed	Mz,Ed	V2,Ed	V3,Ed	TEd
4.122	-111.243	0.305	3.431	0.857	7.947	0.001

PMM DEMAND/CAPACITY RATIO (Governing Equation EC3 6.3.1.1(1)-6.46)
D/C Ratio: 0.378 = 0.378 < 0.95 OK
= (NEd/Nb,Rd) (EC3 6.3.1.1(1)-6.46)

AXIAL FORCE DESIGN

	NEd Force	Nc,Rd Capacity	Nt,Rd Capacity
Axial	-111.243	1019.205	1019.205

Npl,Rd	Nu,Rd	Ncr,T	Ncr,TF	An/Ag
1019.205	1054.231	406.117	406.117	1.

	Curve	Alpha	Ncr	LambdaBar	Phi	Chi	Nb,Rd
Y-Y	c	0.49	1061.594	0.98	1.171	0.552	562.323
Y-Y Braced	c	0.49	2013.826	0.711	0.878	0.718	731.395
Z-Z	c	0.49	1310.964	0.882	1.056	0.611	622.834

Z-Z Braced	c	0.49	1894.249	0.734	0.9	0.704	717.359
Torsional TF	c	0.49	406.117	1.584	2.094	0.289	294.293

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.305	0.305	31.947	31.947	31.947	23.328
Z-Z	3.431	3.431	36.446	36.446	36.446	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.571	0.804	0.73	0.	98.132

Factors	kw	C1	C2	C3		
	1.	2.711	0.43	1.12		
	za	zs	zg	zz	zj	
	0.056	0.	0.056	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.426	0.427	0.962	0.427

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.857	249.477	0.003	1.
3-Axis	7.947	259.256	0.031	1.

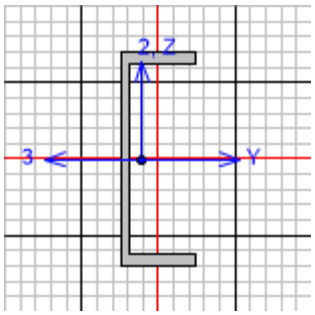
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.857	0.001	249.477	0.003	OK
3-Axis	7.947	0.001	259.256	0.031	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	249.477	1.2	0.	1.
3-Axis	259.256	1.2	0.	1.

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4.4.2 UPN260




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  215      X Mid:  -4.885E-15Combo:  ULS LIVE        Design Type:  Beam
Length:  12.879   Y Mid:  -2.398    Shape:  UPN260          Frame Type:  Secndry
Loc   :  6.427    Z Mid:  1.404E-07 Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.005        Av,2=0.003        Av,3=0.003        eNy=0.             eNz=0.
A=0.005           Iy=4.821E-05      iy=0.1            Wel,y=3.708E-04    Weff,y=3.708E-04
It=2.420E-07      Iz=3.178E-06      iz=0.026          Wel,z=4.784E-05    Weff,z=4.784E-05
Iw=3.850E-08      Iyz=0.            h=0.26            Wpl,y=4.531E-04
E=210000000.      fy=355000.        fu=510000.        Wpl,z=1.025E-04


STRESS CHECK FORCES & MOMENTS
    Location            Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    6.427           -54.038     -21.174       3.813      76.542      32.879       0.122

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.1(7))
    D/C Ratio:      0.268 = 0.032 + 0.132 + 0.105   <         0.95          OK
                        = (NEd/NRd) + (My,Ed/My,Rd) + (Mz,Ed/Mz,Rd)       (EC3 6.2.1(7))

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial           -54.038    1713.585    1713.585

                      Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                    1713.585    1772.474   35722.072    5219.656          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49    5404.043       0.563       0.748       0.807    1382.911
    Y-Y Braced    c    0.49    5404.043       0.563       0.748       0.807    1382.911
    Z-Z           c    0.49   37939.914       0.213       0.526       0.994    1702.647
```

Z-Z Braced	c	0.49	37939.914	0.213	0.526	0.994	1702.647
Torsional TF	c	0.49	5219.656	0.573	0.756	0.801	1373.074

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-21.174	-21.284	160.851	160.851	160.851	156.323
Z-Z	3.813	3.813	36.388	36.388	36.388	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.236	0.542	0.972	3.850E-08	2886.941

Factors	kw	C1	C2	C3	
	1.	1.237	0.553	1.73	
	za	zs	zg	zz	zj
	0.13	0.	0.13	-6.539E-18	6.539E-18

	kyy	kyz	kzy	kzz
Factors	0.913	0.494	0.813	0.824

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	76.542	541.707	0.141	1.
3-Axis	32.879	513.833	0.064	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	76.542	0.122	541.707	0.141	OK
3-Axis	32.879	0.122	513.833	0.064	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	541.707	1.2	0.33	1.2
3-Axis	513.833	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

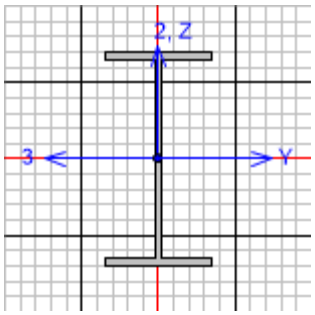
	V2 Left	V2 Right
2-2 (V2)	24.791	24.552

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	0.003	0.107	0.026	OK
Super DL+LL	Yes	0.003	0.107	0.027	OK
Live Load	Yes	0.003	0.036	0.079	OK
Total Load	Yes	0.003	0.054	0.056	OK
Total-Camber	Yes	0.003	0.054	0.056	OK

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4.4.3 IPE240




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  29       X Mid:  0.208     Combo:  ULS LIVE        Design Type:  Beam
Length:  4.795    Y Mid:  0.        Shape:  IPE240          Frame Type:  Secndry
Loc   :  4.326    Z Mid:  1.404E-07 Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2               Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                   Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95      Prin. Axis Angle = 0. deg

Aeff=0.004        Av,2=0.002        Av,3=0.003        eNy=0.            eNz=0.
A=0.004           Iy=3.892E-05      iy=0.1            Wel,y=3.243E-04   Weff,y=3.243E-04
It=1.300E-07      Iz=2.840E-06      iz=0.027          Wel,z=4.733E-05   Weff,z=4.733E-05
Iw=3.739E-08      Iyz=0.            h=0.24            Wpl,y=3.670E-04
E=210000000.      fy=355000.        fu=510000.        Wpl,z=7.390E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    4.326          31.341      11.199       0.809      11.157       1.695       0.009

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.62)
    D/C Ratio:     0.257 = 0. + 0.244 + 0.012   <         0.95          OK
                         = NEd/(Chi_z NRk/GammaM1) + kzy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kzz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)       (EC3 6.3.3(4)-6.62)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                        Force    Capacity    Capacity
    Axial            31.341     1388.05     1388.05

                       Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                      1388.05    1435.752    1298.677    1298.676          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             a    0.21    3508.063       0.629       0.743       0.879    1219.609
    Y-Y Braced      a    0.21    3508.063       0.629       0.743       0.879    1219.609
    Z-Z             b    0.34     255.984       2.329       3.573       0.159     220.917
    Z-Z Braced      b    0.34     255.984       2.329       3.573       0.159     220.917
```

Torsional TF	b	0.34	1298.676	1.034	1.176	0.576	799.108

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	3.259	11.199	130.285	130.285	130.285	45.857
Z-Z	0.409	0.809	26.235	26.235	26.235	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	a	0.21	1.55	1.844	0.352	3.739E-08	54.206

Factors	kw	C1	C2	C3	
	1.	1.133	0.43	1.12	
	za	zs	zg	zz	zj
	0.12	0.	0.12	0.	0.

	kyy	kyz	kzy	kzz
Factors	0.89	0.24	1.	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	11.157	392.038	0.028	1.
3-Axis	1.695	521.318	0.003	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	11.157	0.009	392.038	0.028	OK
3-Axis	1.695	0.009	521.318	0.003	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	392.038	1.2	0.506	1.2
3-Axis	521.318	1.2	0.	1.

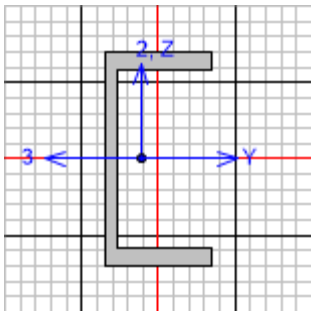
CONNECTION SHEAR FORCES FOR BEAMS

	V2 Left	V2 Right
2-2 (V2)	13.416	12.957

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	5.955E-04	0.04	0.015	OK
Super DL+LL	Yes	0.002	0.04	0.048	OK
Live Load	Yes	0.002	0.013	0.123	OK
Total Load	Yes	0.002	0.02	0.112	OK
Total-Camber	Yes	0.002	0.02	0.112	OK

4.4.4 UPN100




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  130      X Mid:  0.013     Combo:  ULS LIVE        Design Type:  Beam
Length:  4.795    Y Mid:  0.        Shape:  UPN100          Frame Type:  Secndry
Loc   :  4.326    Z Mid:  4.122     Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.001        Av,2=6.193E-04    Av,3=8.480E-04    eNy=0.             eNz=0.
A=0.001           Iy=2.053E-06      iy=0.039          Wel,y=4.106E-05    Weff,y=4.106E-05
It=2.645E-08      Iz=2.929E-07      iz=0.015          Wel,z=8.478E-06    Weff,z=8.478E-06
Iw=4.853E-10      Iyz=0.            h=0.1             Wpl,y=5.033E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=1.800E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed        TEd
    4.326          21.791       1.799       0.016       1.732       0.042       0.01

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.62)
    D/C Ratio:     0.356 = 0. + 0.355 + 0.001   <         0.95          OK
                         = NEd/(Chi_z NRk/GammaM1) + kzy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kzz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)       (EC3 6.3.3(4)-6.62)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial             21.791      477.83      477.83

                      Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                      477.83     494.251     769.198     167.172          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49     185.048       1.607       2.136       0.282     134.877
    Y-Y Braced    c    0.49     185.048       1.607       2.136       0.282     134.877
```

Z-Z	c	0.49	26.401	4.254	10.543	0.05	23.667
Z-Z Braced	c	0.49	26.401	4.254	10.543	0.05	23.667
Torsional TF	c	0.49	167.172	1.691	2.294	0.26	124.259

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.427	1.799	17.867	17.867	17.867	5.071
Z-Z	0.01	0.016	6.39	6.39	6.39	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	1.474	2.07	0.284	4.853E-10	8.228

Factors	kw	C1	C2	C3		
	1.	1.169	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	1.598E-18	-1.598E-18	

	kyy	kyz	kzy	kzz
Factors	0.891	0.24	1.	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	1.732	126.921	0.014	1.
3-Axis	0.042	173.805	2.410E-04	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	1.732	0.01	126.921	0.014	OK
3-Axis	0.042	0.01	173.805	0.	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	126.921	1.2	0.197	1.2
3-Axis	173.805	1.2	0.	1.

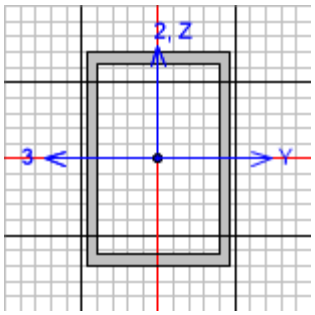
CONNECTION SHEAR FORCES FOR BEAMS

	V2 Left	V2 Right
2-2 (V2)	1.689	1.863

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	0.004	0.04	0.093	OK
Super DL+LL	Yes	0.005	0.04	0.133	OK
Live Load	Yes	0.003	0.013	0.211	OK
Total Load	Yes	0.007	0.02	0.327	OK
Total-Camber	Yes	0.007	0.02	0.327	OK

4.4.5 120x80x6.3




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  198      X Mid:  -6.44     Combo:  ULS WIND X      Design Type:  Column
Length:  4.122    Y Mid:  0.99      Shape:  120x80x6.3      Frame Type:  Secndry
Loc   :  1.792    Z Mid:  2.061     Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2               Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                   Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95      Prin. Axis Angle = 0. deg

Aeff=0.002        Av,2=0.002        Av,3=0.001        eNy=0.            eNz=0.
A=0.002           Iy=4.562E-06      iy=0.044          Wel,y=7.603E-05   Weff,y=7.603E-05
It=4.721E-06      Iz=2.380E-06      iz=0.032          Wel,z=5.949E-05   Weff,z=5.949E-05
Iw=0.             Iyz=0.            h=0.12            Wpl,y=9.364E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=7.003E-05


STRESS CHECK FORCES & MOMENTS
    Location            Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    1.792            -5.226      -3.729       0.173       1.166       0.629       0.084

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.61)
    D/C Ratio:     0.118 = 0.015 + 0.101 + 0.002   <         0.95          OK
                         = NEd/(Chi_y NRk/GammaM1) + kyy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kyz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)      (EC3 6.3.3(4)-6.61)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial             -5.226      838.24      838.24

                      Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                      838.24     867.047  129713.748     556.477          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49     556.477       1.227       1.505       0.421     352.846
    Y-Y Braced      c    0.49     556.477       1.227       1.505       0.421     352.846
```

Z-Z	c	0.49	570.612	1.212	1.482	0.428	358.824
Z-Z Braced	c	0.49	570.612	1.212	1.482	0.428	358.824
Torsional TF	c	0.49	556.477	1.227	1.505	0.421	352.846

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-3.225	-3.729	33.242	33.242	33.242	33.242
Z-Z	0.107	0.173	24.86	24.86	24.86	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.235	0.541	0.973	0.	603.183

	kw	C1	C2	C3		
Factors	1.	1.347	0.553	1.73		
	za	zs	zg	zz	zj	
	0.06	0.	0.06	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.875	0.293	0.525	0.488

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	1.166	332.831	0.004	1.
3-Axis	0.629	206.599	0.003	1.

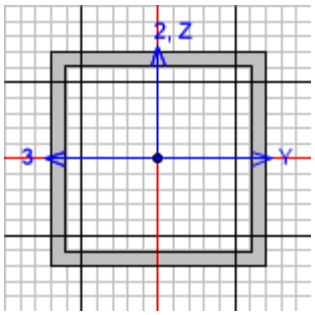
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	1.166	0.084	332.831	0.004	OK
3-Axis	0.629	0.084	206.599	0.003	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	332.831	1.2	0.243	1.2
3-Axis	206.599	1.2	0.	1.

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4.4.6 100x100x6.3




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  121      X Mid:  -2.15     Combo:  ULS LIVE       Design Type:  Beam
Length:  4.795    Y Mid:  0.        Shape:  100x100x6.3    Frame Type:  Secndry
Loc   :  1.908    Z Mid:  4.122     Class:  Class 1        Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75        D/C Lim=0.95        Prin. Axis Angle = 0. deg

Aeff=0.002        Av,2=0.001        Av,3=0.001       eNy=0.              eNz=0.
A=0.002           Iy=3.471E-06      iy=0.038         Wel,y=6.942E-05     Weff,y=6.942E-05
It=5.183E-06      Iz=3.471E-06      iz=0.038         Wel,z=6.942E-05     Weff,z=6.942E-05
Iw=0.             Iyz=0.            h=0.1            Wpl,y=8.309E-05
E=210000000.      fy=355000.        fu=510000.       Wpl,z=8.309E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    1.908          46.386       2.069      -0.024       0.712       0.096       0.002

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.9.1(6y))
    D/C Ratio:      0.07 = 0.07   <         0.95          OK
                         = (My,Ed/Mn,y,Rd)       (EC3 6.2.9.1(6y))

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                     Force    Capacity    Capacity
    Axial           46.386      838.24      838.24

                    Npl,Rd       Nu,Rd       Ncr,T       Ncr,TF       An/Ag
                    838.24     867.047  142392.944      312.839          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49     312.839       1.637       2.192       0.274     229.699
    Y-Y Braced    c    0.49     312.839       1.637       2.192       0.274     229.699
    Z-Z           c    0.49     312.839       1.637       2.192       0.274     229.699
```

Z-Z Braced	c	0.49	312.839	1.637	2.192	0.274	229.699
Torsional TF	c	0.49	312.839	1.637	2.192	0.274	229.699

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	2.069	2.069	29.498	29.498	29.498	29.498
Z-Z	-0.024	-0.042	29.498	29.498	29.498	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.27	0.563	0.946	0.	404.959

	kw	C1	C2	C3		
Factors	1.	1.14	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.891	0.24	0.534	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.712	270.851	0.003	1.
3-Axis	0.096	258.249	3.729E-04	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.712	0.002	270.851	0.003	OK
3-Axis	0.096	0.002	258.249	0.	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	270.851	1.2	0.197	1.2
3-Axis	258.249	1.2	0.	1.

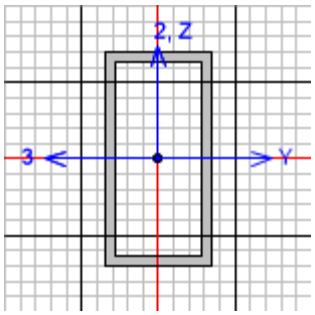
CONNECTION SHEAR FORCES FOR BEAMS

	V2 Left	V2 Right
2-2 (V2)	2.599	2.48

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	0.002	0.04	0.057	OK
Super DL+LL	Yes	0.004	0.04	0.089	OK
Live Load	Yes	0.002	0.013	0.181	OK
Total Load	Yes	0.005	0.02	0.234	OK
Total-Camber	Yes	0.005	0.02	0.234	OK

4.4.7 100x50x5




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  216      X Mid:  2.15      Combo:  ULS WIND Y      Design Type:  Column
Length:  4.122    Y Mid:  -2.398    Shape:  100x50x5        Frame Type:  Secndry
Loc   :  0.       Z Mid:  2.061     Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.001        Av,2=0.001        Av,3=5.000E-04    eNy=0.             eNz=0.
A=0.001           Iy=1.737E-06      iy=0.035          Wel,y=3.473E-05    Weff,y=3.473E-05
It=1.305E-06      Iz=5.617E-07      iz=0.02           Wel,z=2.247E-05    Weff,z=2.247E-05
Iw=0.             Iyz=0.            h=0.1             Wpl,y=4.400E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=2.650E-05


STRESS CHECK FORCES & MOMENTS
    Location            Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    0.                -0.634       0.045      -1.178        0.17       1.255       0.002

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.9.1(6z))
    D/C Ratio:     0.125 = 0.125   <         0.95          OK
                         = (Mz,Ed/Mn,z,Rd)       (EC3 6.2.9.1(6z))

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                        Force    Capacity    Capacity
    Axial             -0.634        497.        497.

                       Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                         497.      514.08   64225.156      68.514          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49     211.845       1.532       1.999       0.304     151.329
    Y-Y Braced      c    0.49     211.845       1.532       1.999       0.304     151.329
    Z-Z             c    0.49      68.514       2.693       4.738       0.116      57.552
```

Z-Z Braced	c	0.49	119.509	2.039	3.03	0.19	94.29
Torsional TF	c	0.49	68.514	2.693	4.738	0.116	57.552

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.045	0.045	15.62	15.62	15.62	15.62
Z-Z	-1.178	-1.178	9.408	9.408	9.408	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.263	0.558	0.952	0.	226.499

Factors	kw	C1	C2	C3		
	1.	2.711	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.401	0.241	0.241	0.402

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.17	221.356	7.669E-04	1.
3-Axis	1.255	102.48	0.012	1.

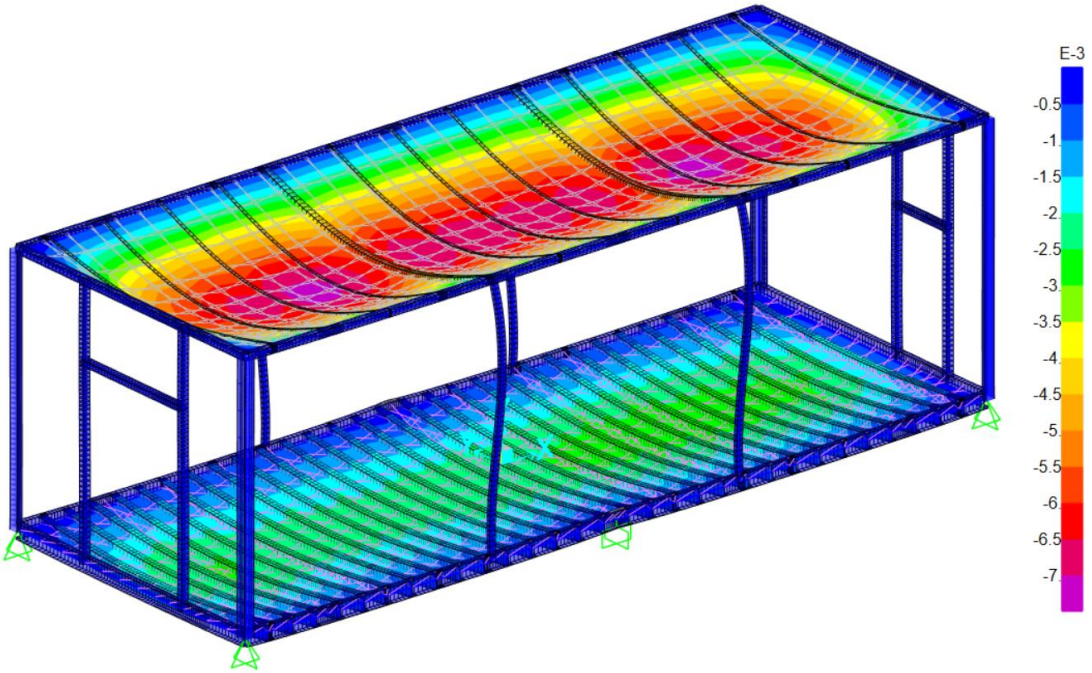
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.17	0.002	221.356	0.001	OK
3-Axis	1.255	0.002	102.48	0.012	OK

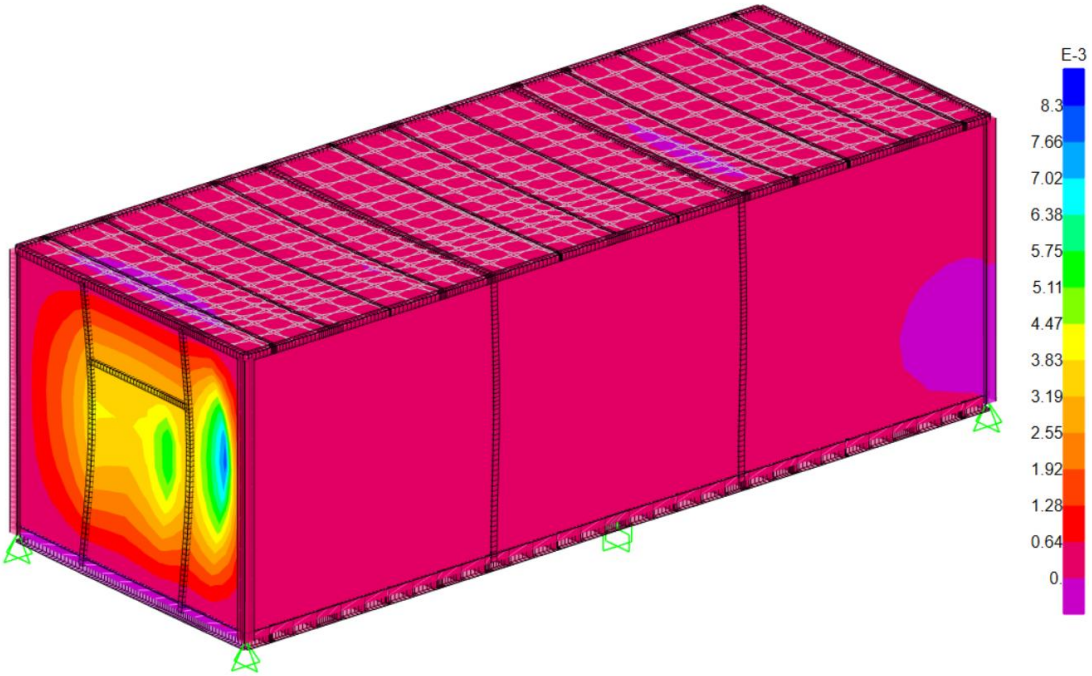
	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	221.356	1.2	0.256	1.2
3-Axis	102.48	1.2	0.	1.

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5 DISPLACEMENT CHECK

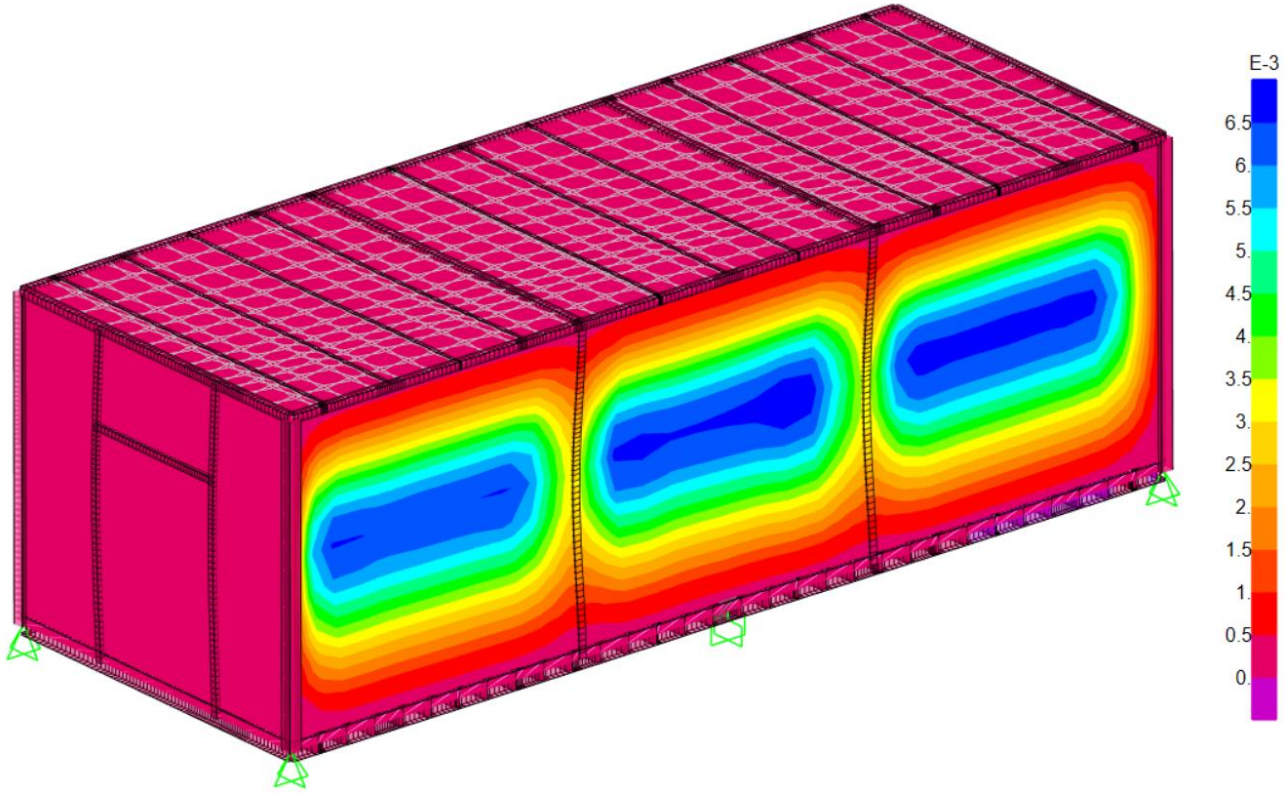


Uz SLE LIVE = 7 mm < 4500/240 = 18.75 mm



Ux SLE WIND X = 8.4 mm < 4500/240 = 18.75 mm

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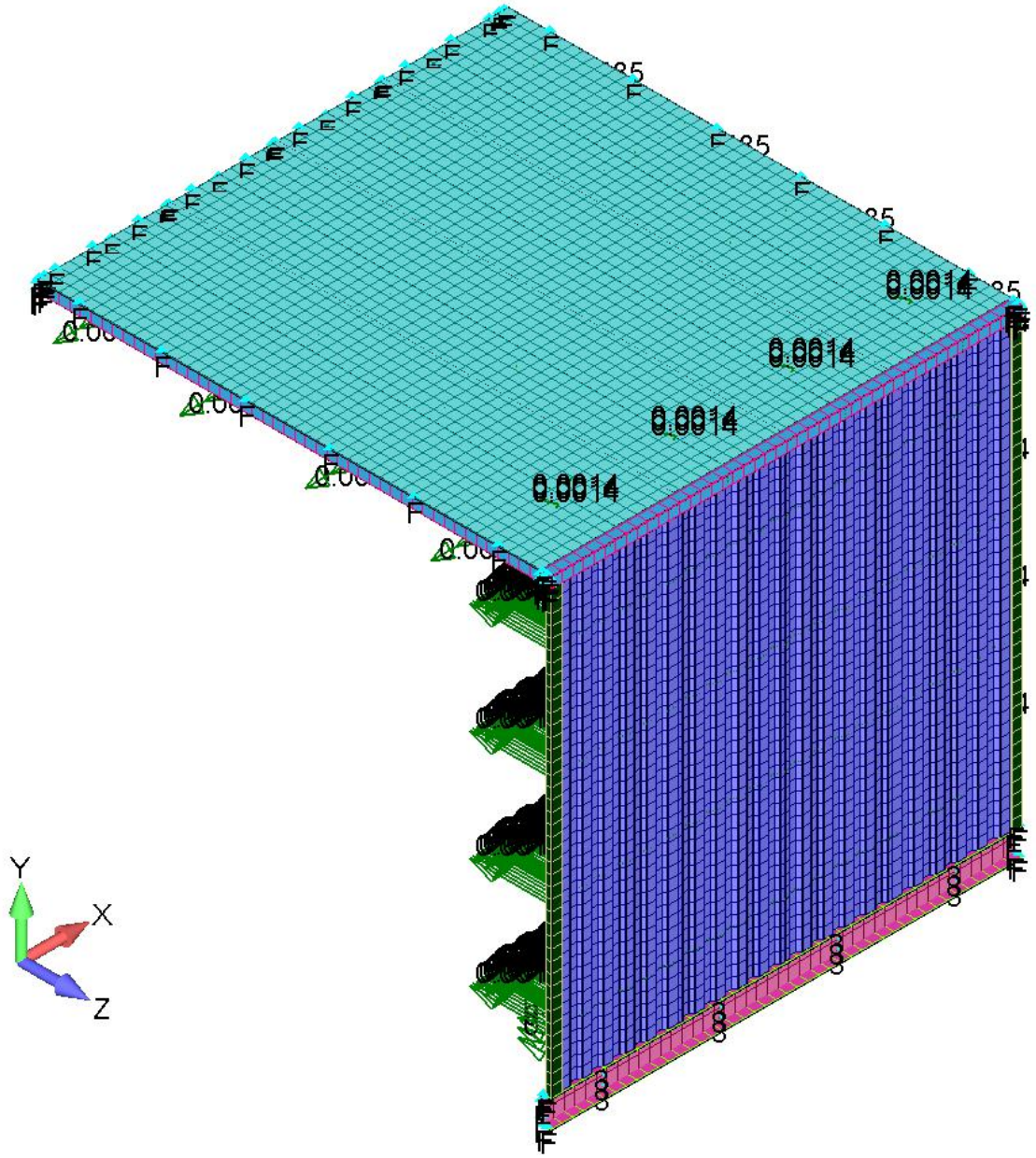
Uy SLE WIND Y = 6.5 mm < 4500/240 = 18.75 mm

6 METAL SHEET CHECK

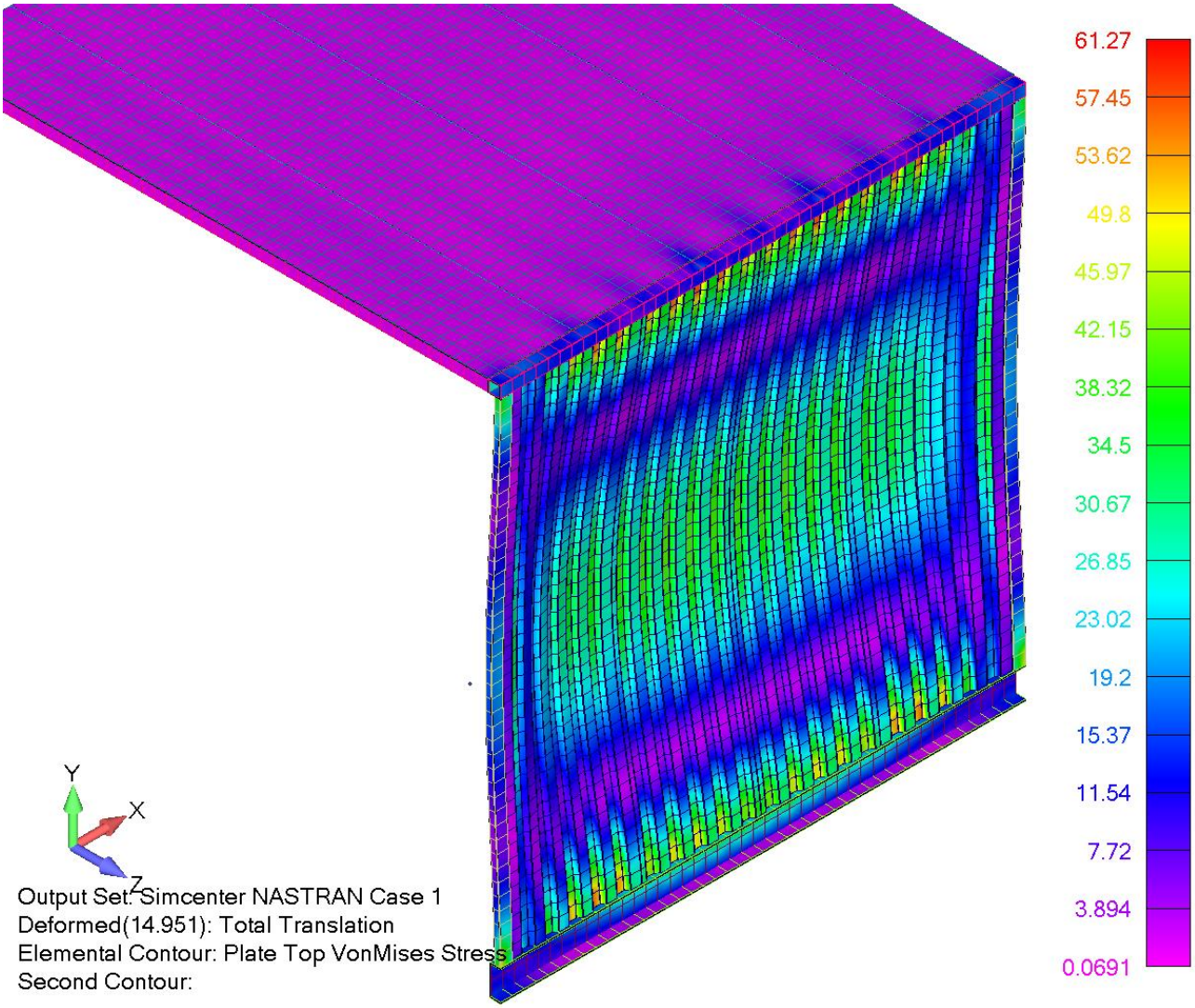
A detailed analysis of the corrugated wall and stave roof is carried out. The structure is modeled taking into account all the metal sheets constituting the geometry of metal sheet.

The front is loaded with 1.69 kN/m² wind pressure and Cp = 0.8. For the roof is applied 1.69 kN/m² with Cp = 0.5 and 45 degree (worst case).

The analysis is performed with FEMAP NASTRAN finite element software and post-processor.



MODEL WITH 8211 ELEMENTS AND 8805 NODES, LOADED AND FIXED AT THE ENDS



MAXIMUM VM STRESS 61 MPA AND 15 MM LATERAL DISPLACEMENT

Displacement value is lower than sap2000 simplified model for global analysis.

The maximum Von Mises stress is lower than yield limit reduced by safety factor 1.15 → 275/1.15 = 239 MPa.

7 BASE REACTIONS

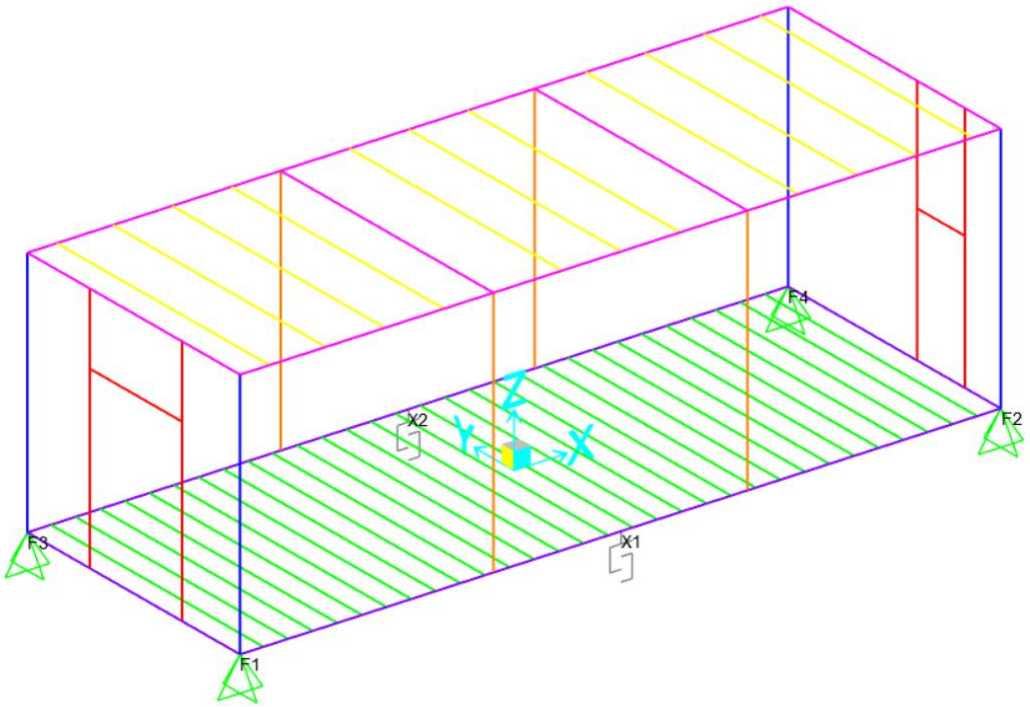


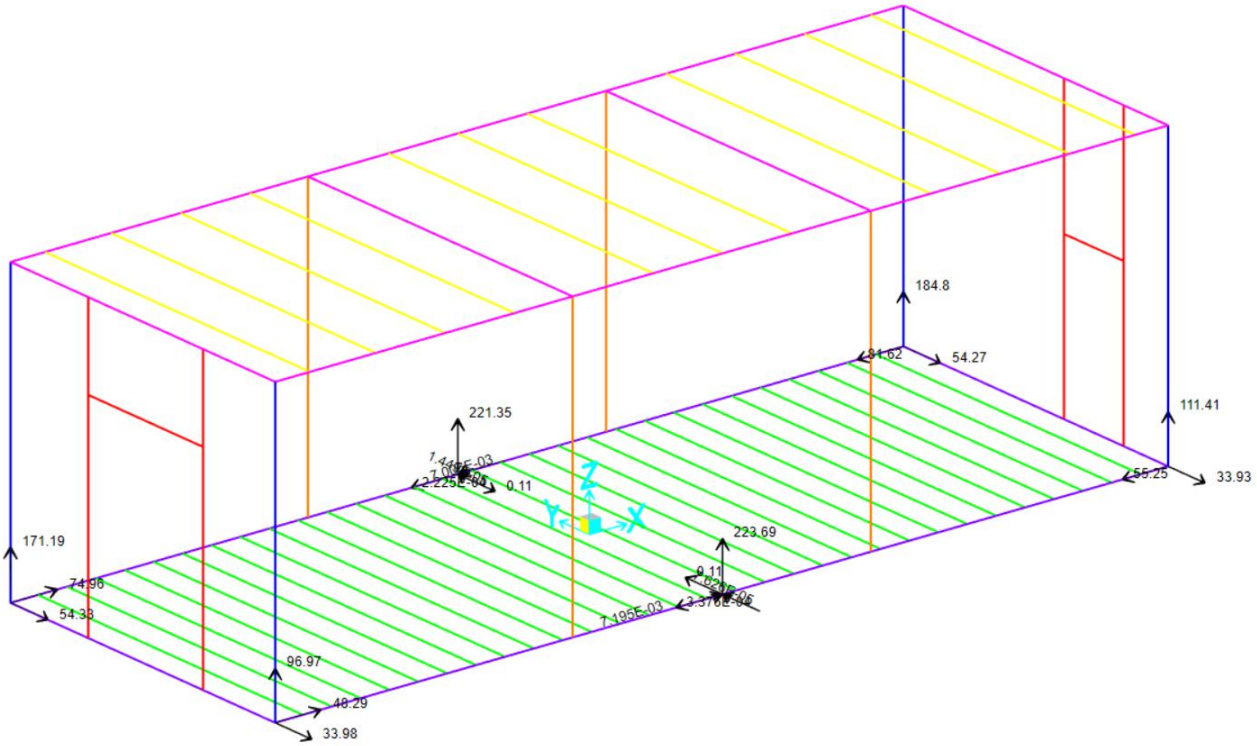
TABLE: Joint Reactions

Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F1	DEAD	NonStatic	Last Step	12.82	4.16	31.39	0.00	0.00	0.00
F1	SD	NonStatic	Last Step	16.38	5.33	21.73	0.00	0.00	0.00
F1	LIVE	NonStatic	Last Step	35.09	-0.18	78.19	0.00	0.00	0.00
F1	WIND X	NonStatic	Last Step	-19.31	1.03	-16.62	0.00	0.00	0.00
F1	WIND Y	NonStatic	Last Step	-16.35	-34.39	-38.28	0.00	0.00	0.00
F1	NOT X	NonStatic	Last Step	-0.10	-0.02	-0.03	0.00	0.00	0.00
F1	NOT Y	NonStatic	Last Step	-0.04	-0.10	-0.07	0.00	0.00	0.00
F1	SLU LIVE	Combination		93.68	12.99	190.55	0.00	0.00	0.00
F1	SLU WIND X	Combination		44.02	4.30	118.95	0.00	0.00	0.00
F1	SLU WIND Y	Combination		47.58	-38.21	92.96	0.00	0.00	0.00
F1	SLE LIVE	Combination		64.15	9.20	131.20	0.00	0.00	0.00
F1	SLE WIND X	Combination		4.84	0.09	24.91	0.00	0.00	0.00
F1	SLE WIND Y	Combination		6.92	-24.71	9.75	0.00	0.00	0.00
F2	DEAD	NonStatic	Last Step	-12.89	4.23	31.70	0.00	0.00	0.00
F2	SD	NonStatic	Last Step	-16.73	4.65	38.99	0.00	0.00	0.00
F2	LIVE	NonStatic	Last Step	-34.60	2.23	65.52	0.00	0.00	0.00
F2	WIND X	NonStatic	Last Step	-2.48	-2.84	-9.63	0.00	0.00	0.00
F2	WIND Y	NonStatic	Last Step	16.10	-35.47	-38.40	0.00	0.00	0.00
F2	NOT X	NonStatic	Last Step	-0.10	0.02	0.03	0.00	0.00	0.00
F2	NOT Y	NonStatic	Last Step	0.04	-0.10	-0.07	0.00	0.00	0.00
F2	SLU LIVE	Combination		-93.82	15.71	197.91	0.00	0.00	0.00
F2	SLU WIND X	Combination		-77.15	-0.20	142.47	0.00	0.00	0.00
F2	SLU WIND Y	Combination		-54.85	-39.35	107.95	0.00	0.00	0.00
F2	SLE LIVE	Combination		-64.28	11.02	136.16	0.00	0.00	0.00
F2	SLE WIND X	Combination		-27.33	-4.69	49.50	0.00	0.00	0.00
F2	SLE WIND Y	Combination		-14.32	-27.53	29.36	0.00	0.00	0.00

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TABLE: Joint Reactions									
Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F3	DEAD	NonStatic	Last Step	12.94	-4.19	31.46	0.00	0.00	0.00
F3	SD	NonStatic	Last Step	16.46	-5.46	21.91	0.00	0.00	0.00
F3	LIVE	NonStatic	Last Step	34.14	0.36	76.92	0.00	0.00	0.00
F3	WIND X	NonStatic	Last Step	-19.52	-1.01	-16.62	0.00	0.00	0.00
F3	WIND Y	NonStatic	Last Step	2.37	-24.36	12.03	0.00	0.00	0.00
F3	NOT X	NonStatic	Last Step	-0.10	0.02	-0.03	0.00	0.00	0.00
F3	NOT Y	NonStatic	Last Step	0.04	-0.10	0.07	0.00	0.00	0.00
F3	SLU LIVE	Combination		92.65	-13.21	189.20	0.00	0.00	0.00
F3	SLU WIND X	Combination		48.71	-22.20	133.26	0.00	0.00	0.00
F3	SLU WIND Y	Combination		74.98	-50.22	167.64	0.00	0.00	0.00
F3	SLE LIVE	Combination		63.49	-9.37	130.33	0.00	0.00	0.00
F3	SLE WIND X	Combination		10.53	-18.05	40.41	0.00	0.00	0.00
F3	SLE WIND Y	Combination		25.85	-34.40	60.46	0.00	0.00	0.00
F4	DEAD	NonStatic	Last Step	-12.88	-4.20	30.83	0.00	0.00	0.00
F4	SD	NonStatic	Last Step	-16.11	-4.52	37.51	0.00	0.00	0.00
F4	LIVE	NonStatic	Last Step	-34.62	-2.41	65.64	0.00	0.00	0.00
F4	WIND X	NonStatic	Last Step	-2.36	2.82	-9.63	0.00	0.00	0.00
F4	WIND Y	NonStatic	Last Step	-2.12	-23.11	12.15	0.00	0.00	0.00
F4	NOT X	NonStatic	Last Step	-0.10	-0.02	0.03	0.00	0.00	0.00
F4	NOT Y	NonStatic	Last Step	-0.04	-0.10	0.07	0.00	0.00	0.00
F4	SLU LIVE	Combination		-93.03	-16.01	194.92	0.00	0.00	0.00
F4	SLU WIND X	Combination		-81.63	-17.62	154.59	0.00	0.00	0.00
F4	SLU WIND Y	Combination		-81.34	-48.74	180.72	0.00	0.00	0.00
F4	SLE LIVE	Combination		-63.76	-11.25	134.07	0.00	0.00	0.00
F4	SLE WIND X	Combination		-32.13	-12.95	62.45	0.00	0.00	0.00
F4	SLE WIND Y	Combination		-31.96	-31.10	77.70	0.00	0.00	0.00
X1	DEAD	NonStatic	Last Step	0.00	0.00	37.72	0.00	0.00	0.00
X1	SD	NonStatic	Last Step	0.00	0.00	44.32	0.00	0.00	0.00
X1	LIVE	NonStatic	Last Step	0.00	0.00	103.90	0.00	0.00	0.00
X1	WIND X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	WIND Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	NOT X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	NOT Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	SLU LIVE	Combination		0.00	0.00	271.37	0.00	0.00	0.00
X1	SLU WIND X	Combination		0.00	0.00	224.62	0.00	0.00	0.00
X1	SLU WIND Y	Combination		0.00	0.00	224.62	0.00	0.00	0.00
X1	SLE LIVE	Combination		0.00	0.00	185.94	0.00	0.00	0.00
X1	SLE WIND X	Combination		0.00	0.00	82.05	0.00	0.00	0.00
X1	SLE WIND Y	Combination		0.00	0.00	82.05	0.00	0.00	0.00
X2	DEAD	NonStatic	Last Step	0.00	0.00	37.74	0.00	0.00	0.00
X2	SD	NonStatic	Last Step	0.00	0.00	43.58	0.00	0.00	0.00
X2	LIVE	NonStatic	Last Step	0.00	0.00	102.92	0.00	0.00	0.00
X2	WIND X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	WIND Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	NOT X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	NOT Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	SLU LIVE	Combination		0.00	0.00	268.80	0.00	0.00	0.00
X2	SLU WIND X	Combination		0.00	0.00	222.49	0.00	0.00	0.00
X2	SLU WIND Y	Combination		0.00	0.00	222.49	0.00	0.00	0.00
X2	SLE LIVE	Combination		0.00	0.00	184.23	0.00	0.00	0.00
X2	SLE WIND X	Combination		0.00	0.00	81.32	0.00	0.00	0.00
X2	SLE WIND Y	Combination		0.00	0.00	81.32	0.00	0.00	0.00

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BASE REACTIONS FOR WORST ULS WIND Y CASE (F1 = FX, F2 = FY and F3 = FZ)



MAX FY reaction (SHEAR) = 95 kN

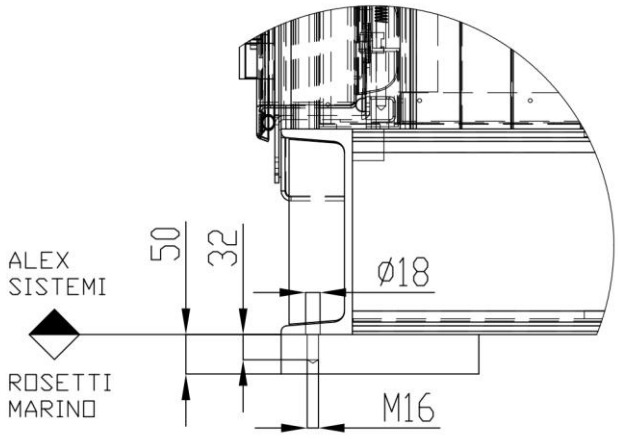
M1 and M2 in the image are values close to zero in according with the boundary conditions and concern only gaps non-linear link elements (as non-linear elements with imposed zero stiffness, the software calculate the value to the limit of zero).

For the fixing at the ground will be considered two M18 bar class 8.8 for hinge.

CORNER ANCHOR BOLT CHECK						
Nc=	0	kN				
Nt=	0	kN				
Vx=	41	kN	Vmax=(Vx^2+Vy^2)^0.5=			
Vy=	27.5	kN			49	kN
Φb=	18	mm				
SIF*DIF=	1					
fu=	860	Mpa				
Ω blast=	1					
Ab=(π*(Φb-3)^2)/4=		176.715	mm^2			
Abn=0.78*Ab=		137.837	mm^2			
Tension check	Nbu=Nt/2=		0.000	kN		
	Nbn=DIF*fu*Abn=		118.540	kN		
	Nbu/(Ω*Nbn)=		0.000	**<1**	**OK**	
Shear check	Vbu=Vmax/2=		24.684	kN		
	Vbn=0.6*DIF*fu*Abn=		71.124	kN		
	Vbu/(Ω*Vbn)=		0.347	**<1**	**OK**	
Combined	(Nbu/1.4/Nbn)+(Vbu/Vbn)=		0.347	**<1**	**OK**	

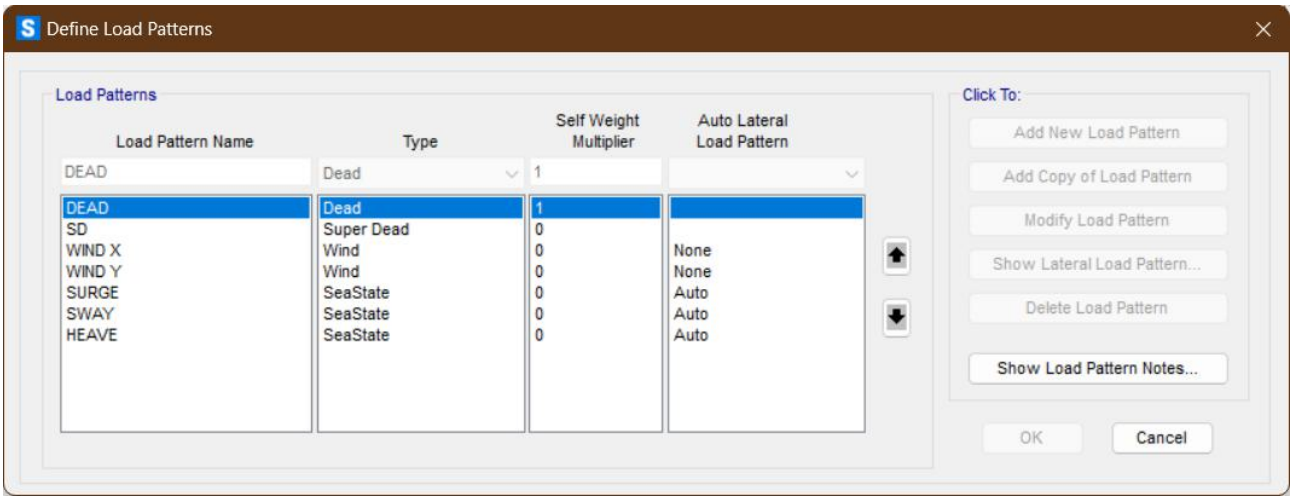
The vertical reactions in model are always compression on the ground but in favour of safety is considered tension Nt on bolt.

M18 bar **verified** **(worst ULS WIND Y case)**

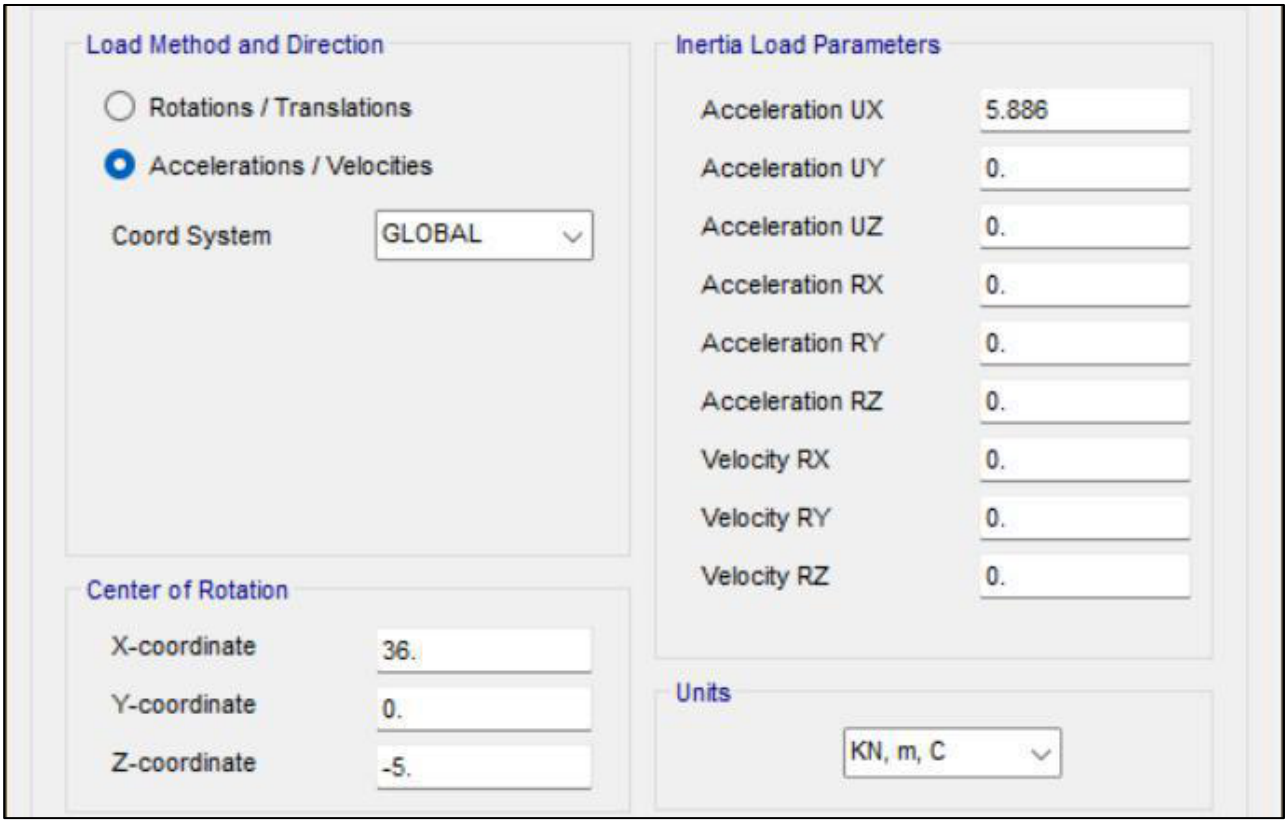


8 SEA TRANSPORT ANALYSIS

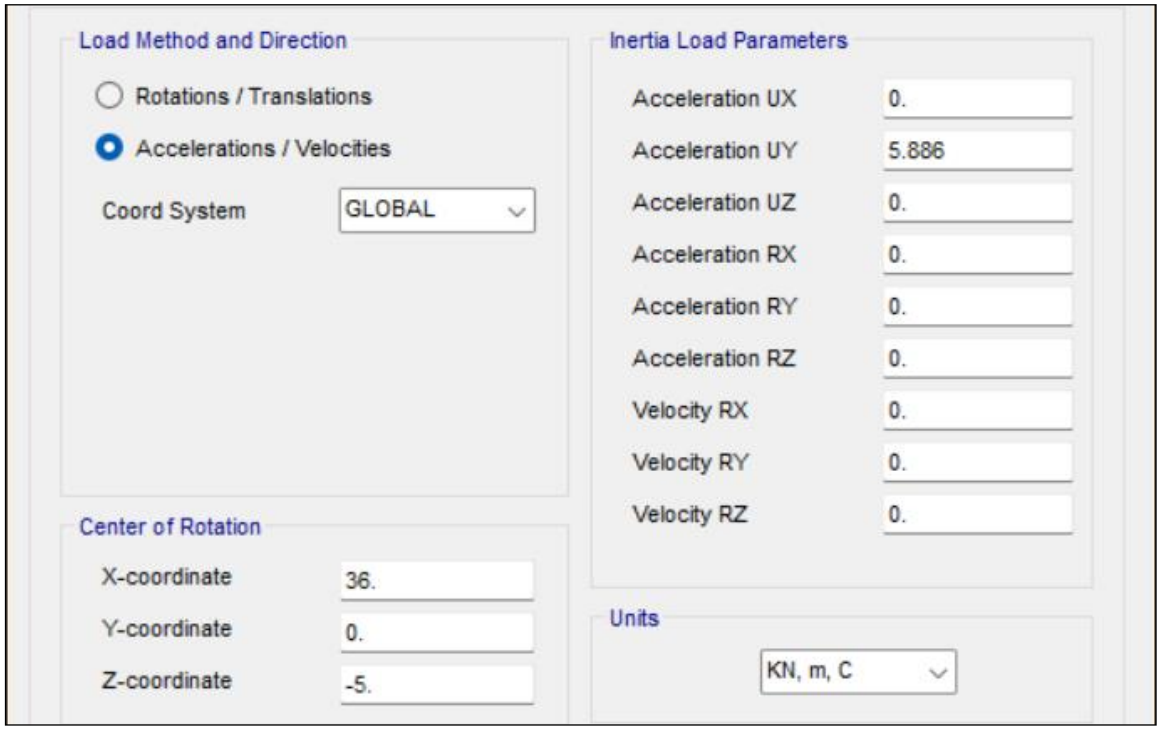
For the sea transport analysis are considered the three translational acceleration as 0.6g for Surge and Sway and 0.5g for Heave. The three accelerations are applied as sea-state loads considering also the center of rotation that is the distances between cog of structure and cog of barge.



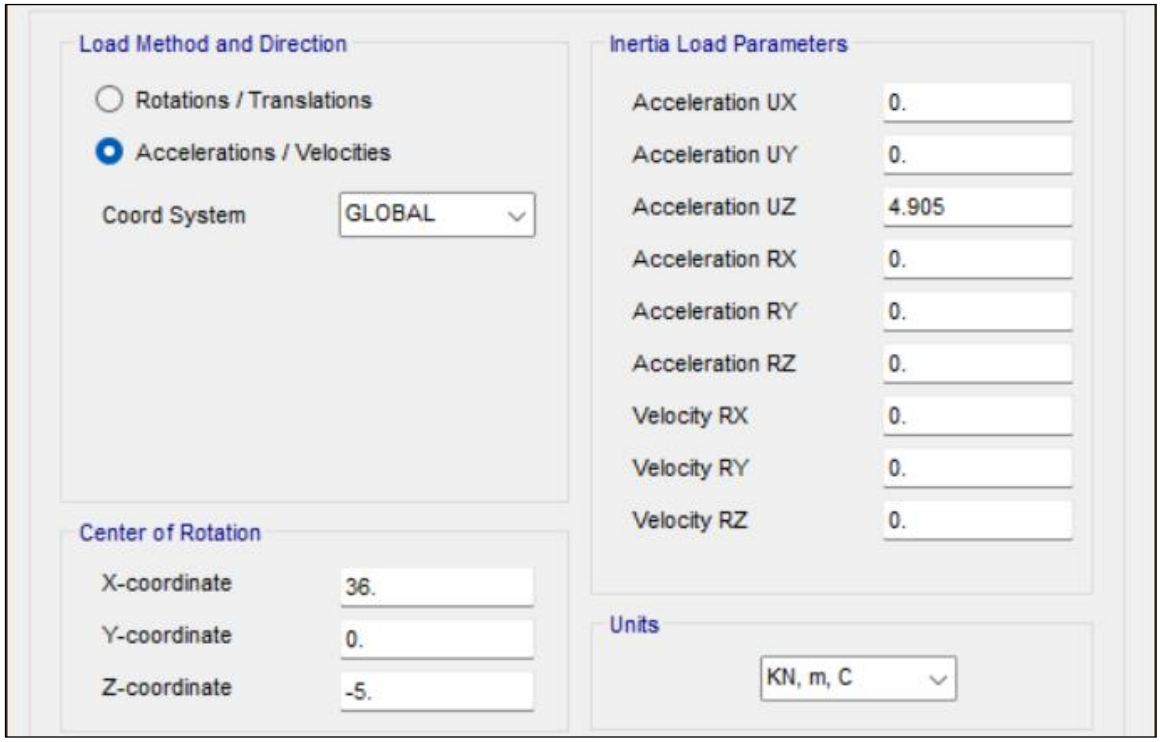
SURGE LONGITUDINAL ACCELERATION

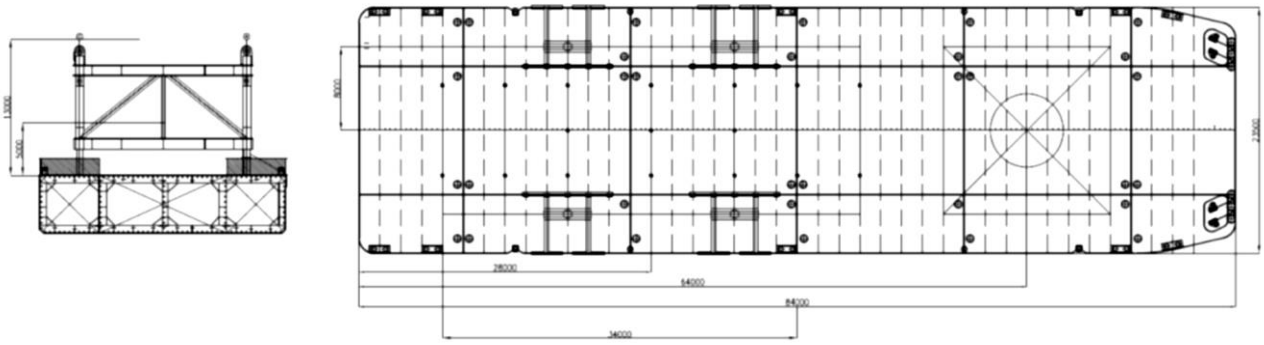


SWAY TRANSVERSAL ACCELERATION



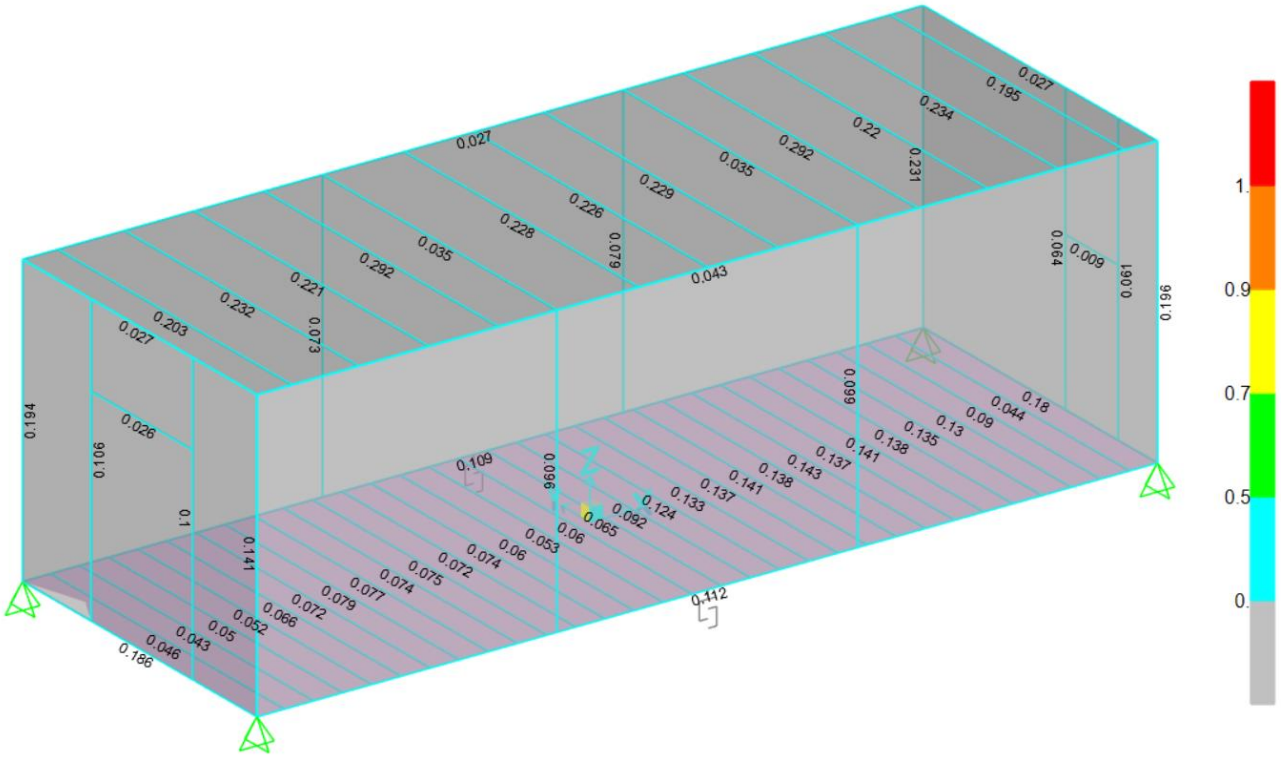
HEAVE VERTICAL ACCELERATION





8.2 STRESS CHECK SEA TRANSPORT

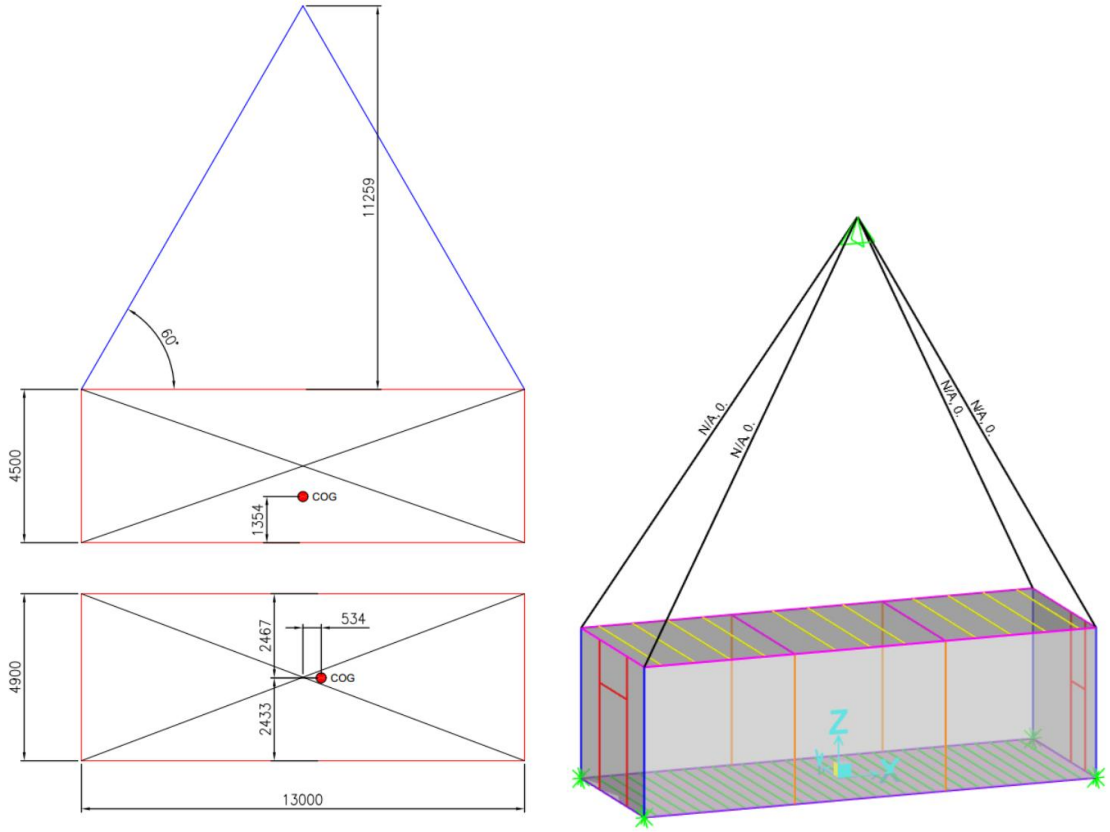
The loads are combined as explained in chapter 4.3 and verified in according with EN 1993.



9 LIFTING ANALYSIS

For lifting analysis, only the weight of shelter (DEAD LOAD AND NO STRUCTURAL LOAD SD in LLC 2 combinations) are considered.

Total weight of shelter is about 40 ton including equipment. Lifting cables are modeled with non-linear elements cables tension-only connected to the top corner points (lifting points) of model in non-linear geometry analysis.



LIFTING SCHEME AND MODEL

TABLE: Base Reactions

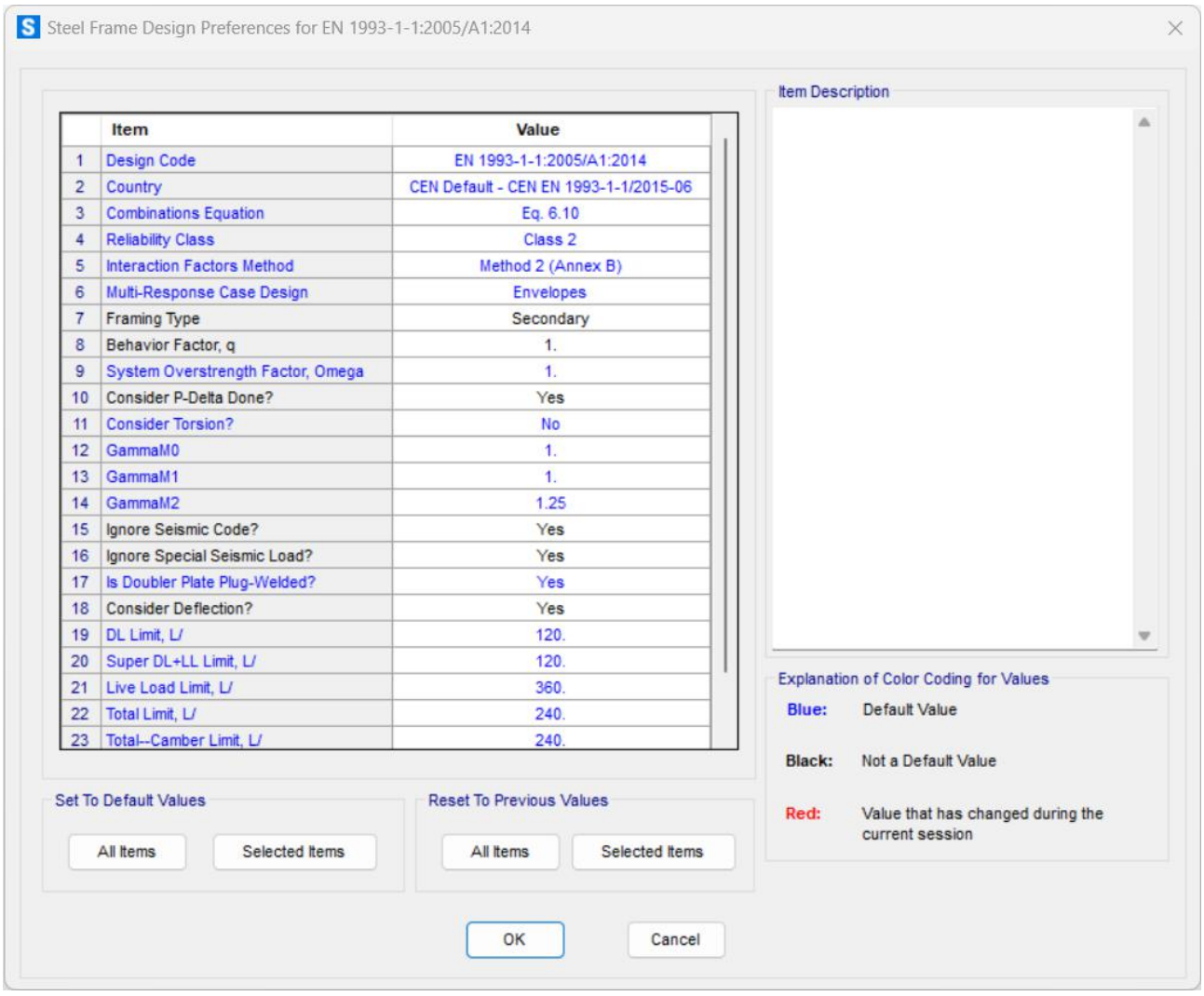
OutputCase	CaseType	GlobalFX	GlobalFY	GlobalFZ	GlobalMX	GlobalMY	GlobalMZ	XCentroidFZ	YCentroidFZ	ZCentroidFZ
Text	Text	KN	KN	KN	KN-m	KN-m	KN-m	m	m	m
DEAD	NonStatic	0.000	0.000	200.830	-1.873	1.103	0.000	-0.005	-0.009	1.658
SD	NonStatic	0.000	0.000	195.600	-4.755	-212.653	0.000	1.087	-0.024	1.042
DEAD+SD	Combination	0.000	0.000	396.430	-6.629	-211.550	0.000	0.534	-0.017	1.354

The total weight DEAD + SD was estimated in favor of safety about 40 ton. For the real values refer to the 4.2.1 and 4.2.2 chapters. The red numbers represent the shift in horizontal place for the shackle pin restraints at the top of cables.

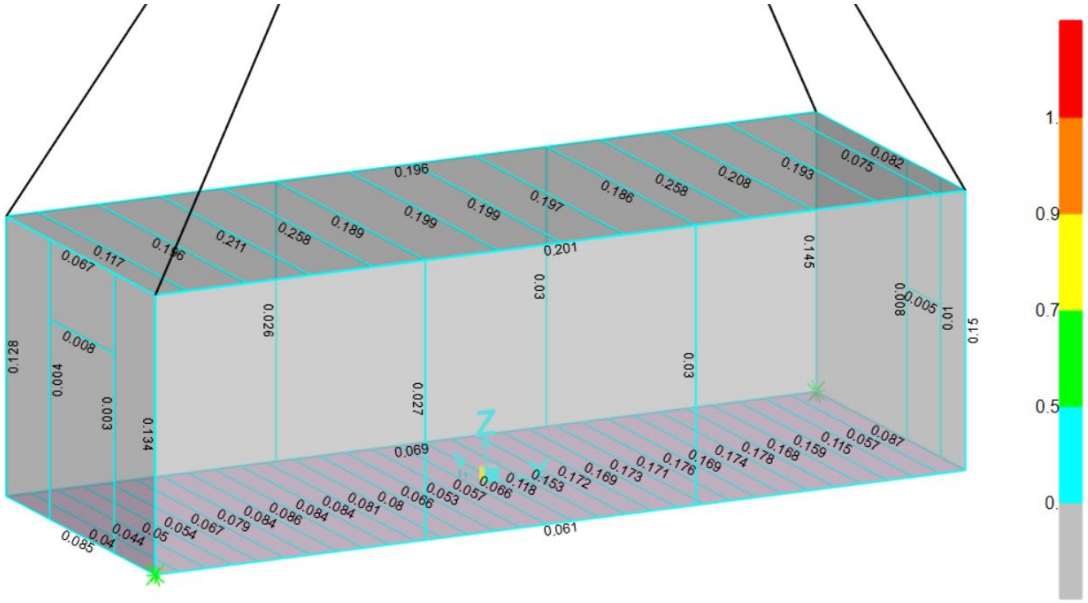
To converge the non-linear analysis results (tension only cables elements) translational XY restrains are added at the bottom corners. These restrains act only against torsional effects on the whole structure acting around the vertical Z axis.

9.2 STRESS CHECK LIFTING

All sections are check and verified in according with EN 1993 combination LLC2. Showed below the detailed printout for each type of section in its combination of maximum stress and the force diagrams with values for roof frames.



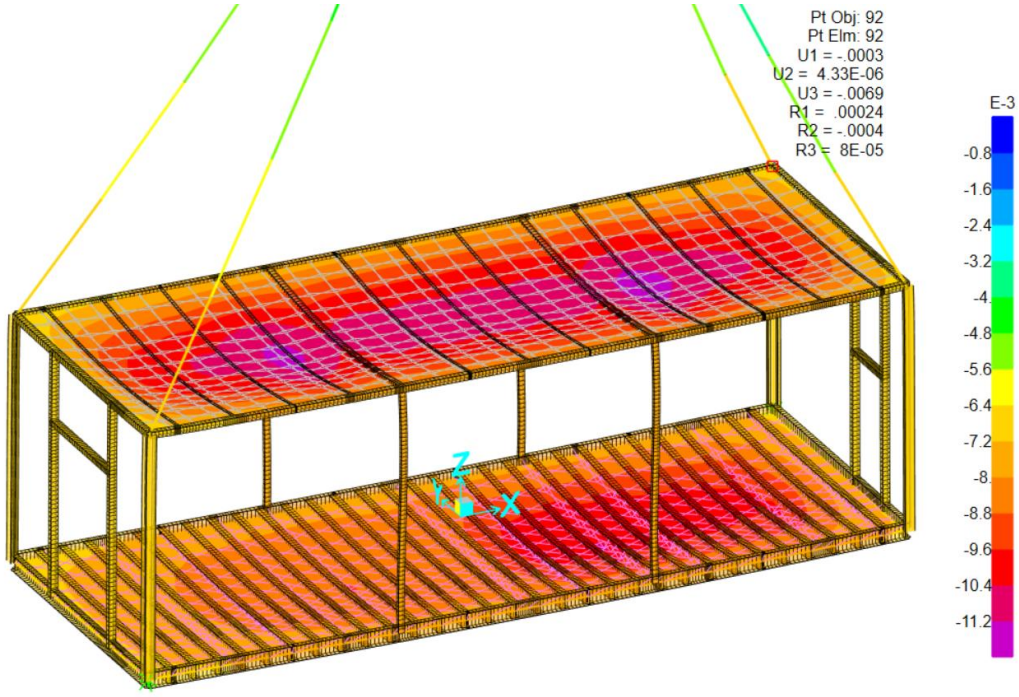
For lifting condition is automatically calculated also the relative deflection and compared with the limit L/240 (for beams). For beams in compression is calculated the lateral torsion buckling limit from code.



CHECK DESIGN FOR ULS LOADS (ORANGE < 1 RATIO)

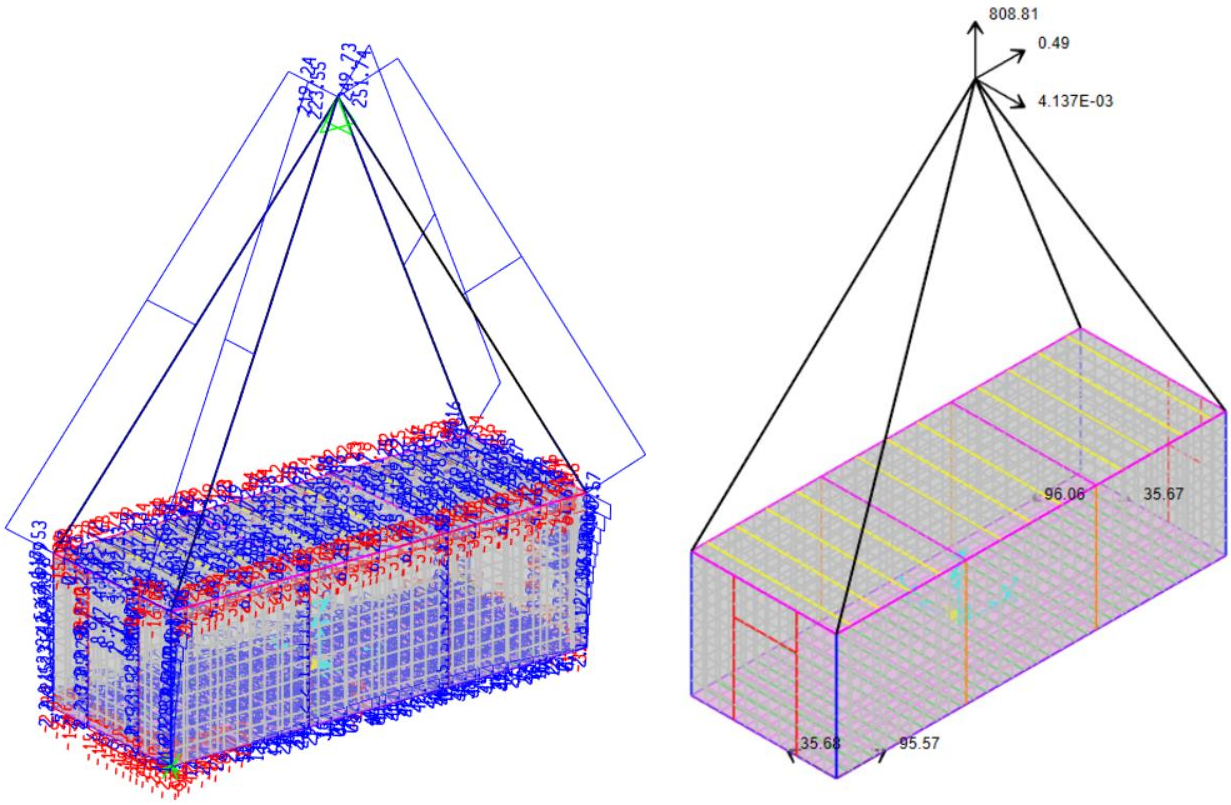
9.3 DISPLACEMENT CHECK LIFTING

For the graphic visualization of absolute displacement is necessary to remove the elongation of cables taken at its connection end with the shelter.



MAX UZ ABSOLUTE DISPLACEMENT FOR LIFTING ROOF BEAM 11.2-6.9 = 4.3 mm < 13000/360 = 36 mm

10 LIFTING HOOK DETAIL CHECK



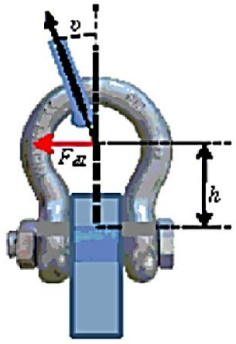
The maximum tension force on cable for lifting stress combination LLC3 (factor 2) is 252 kN.

In the model is applied also the sling load due to the transversal component of tension force. Is added an extra lateral load of 5% 252 kN = 13 kN in the X and Z directions (horizontal in Femap).

This force is applied on the spider node represented the surface contact between shackle and lifting lug. The model is characterized by solid hexahedral elements for a total of 33704 (20218 nodes).

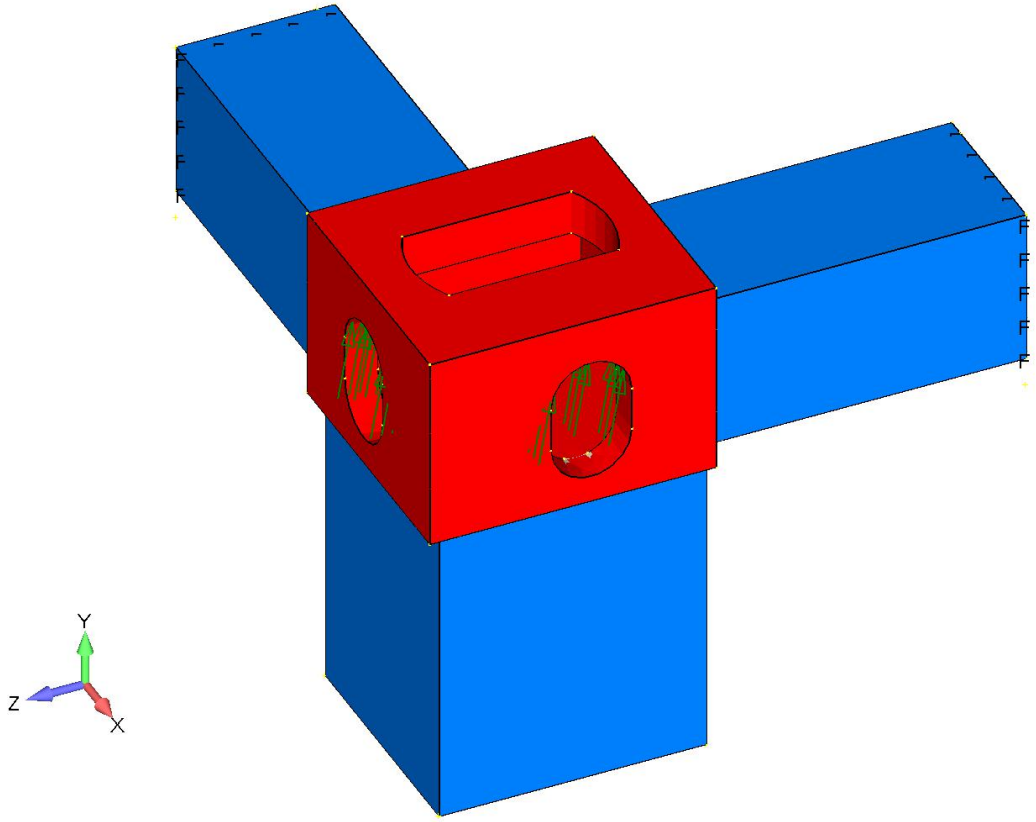
P.2.6.1

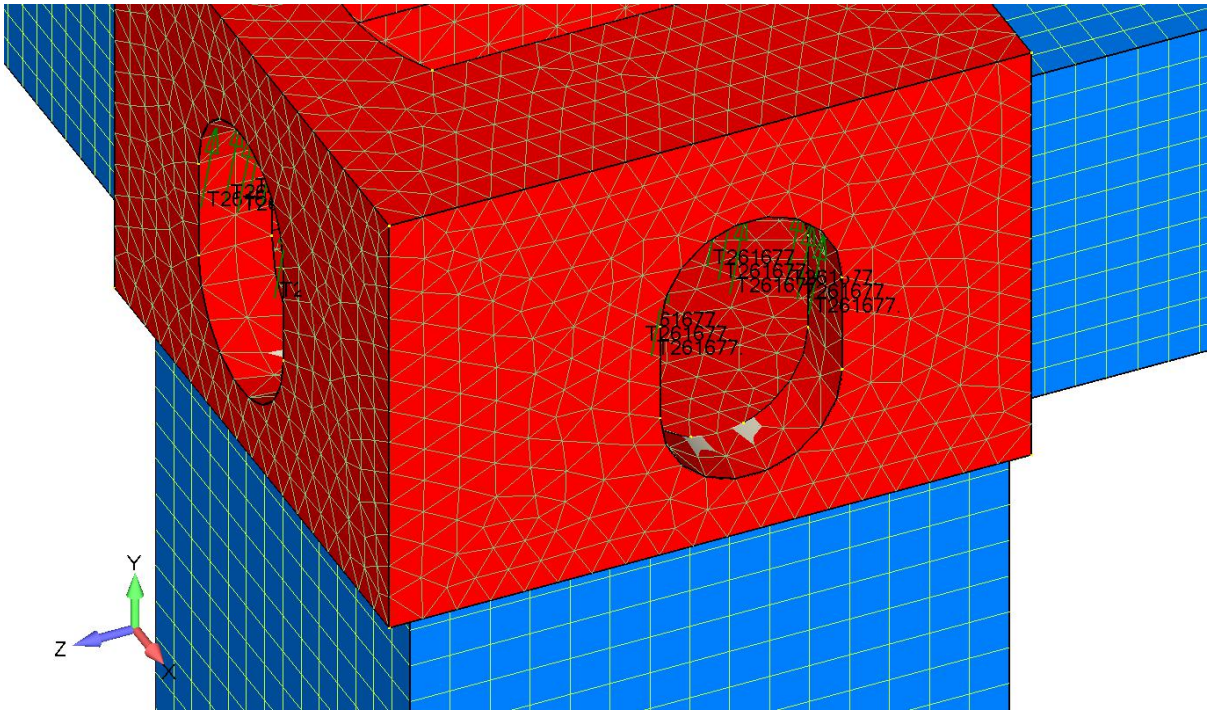
The design loads on the padeye may be calculated as indicated below. The following assumptions apply:

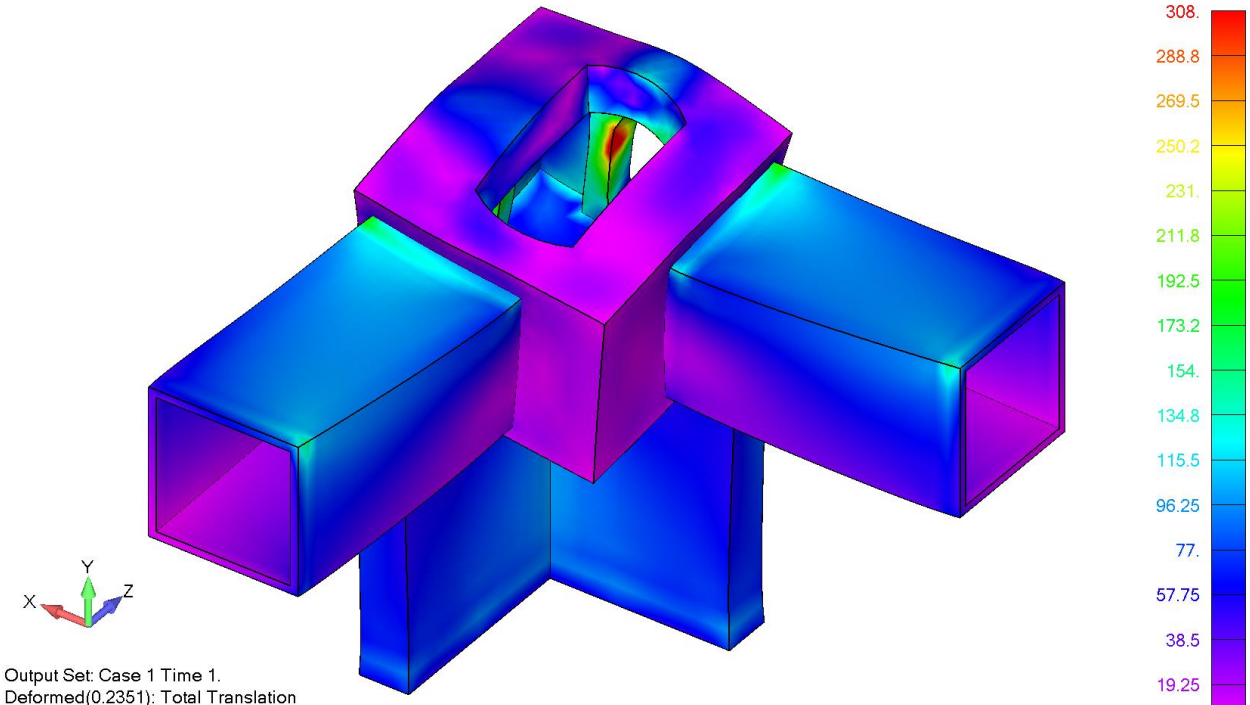


- The sling design load (FSD) is transferred to the padeye through a shackle as indicated on the sketch.
- No friction between sling and shackle.
- The shackle is positioned centric in the padeye.
- Lateral load (F_{dl}) is transferred to the padeye through contact pressure between shackle body and padeye and/or as friction force between pin and padeye. Load resultant is assumed to work at top of pin.
- Moment (M_e) is transferred to the padeye through contact pressure between shackle pin and padeye.

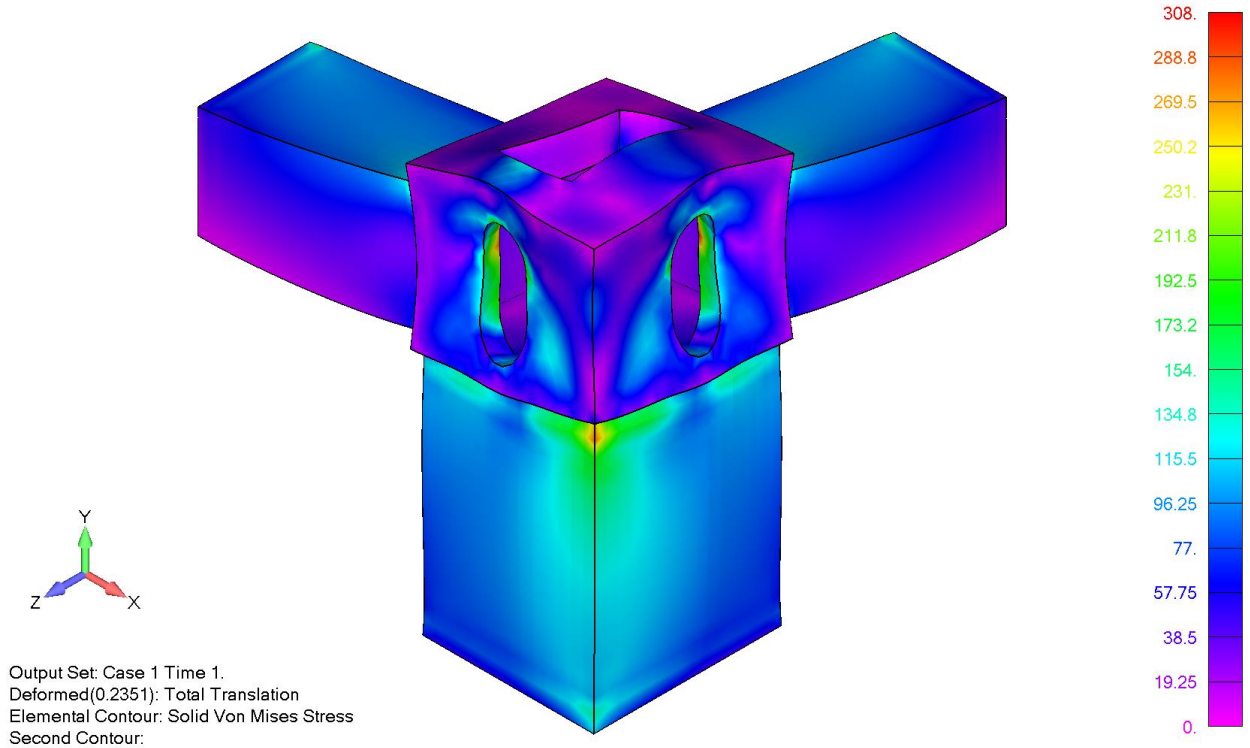
F_d=FSD × cos(v)	F_{dl}=FSD × sin(v)	M_e=F_{dl} × h


Y
Z
X


Y
Z
X

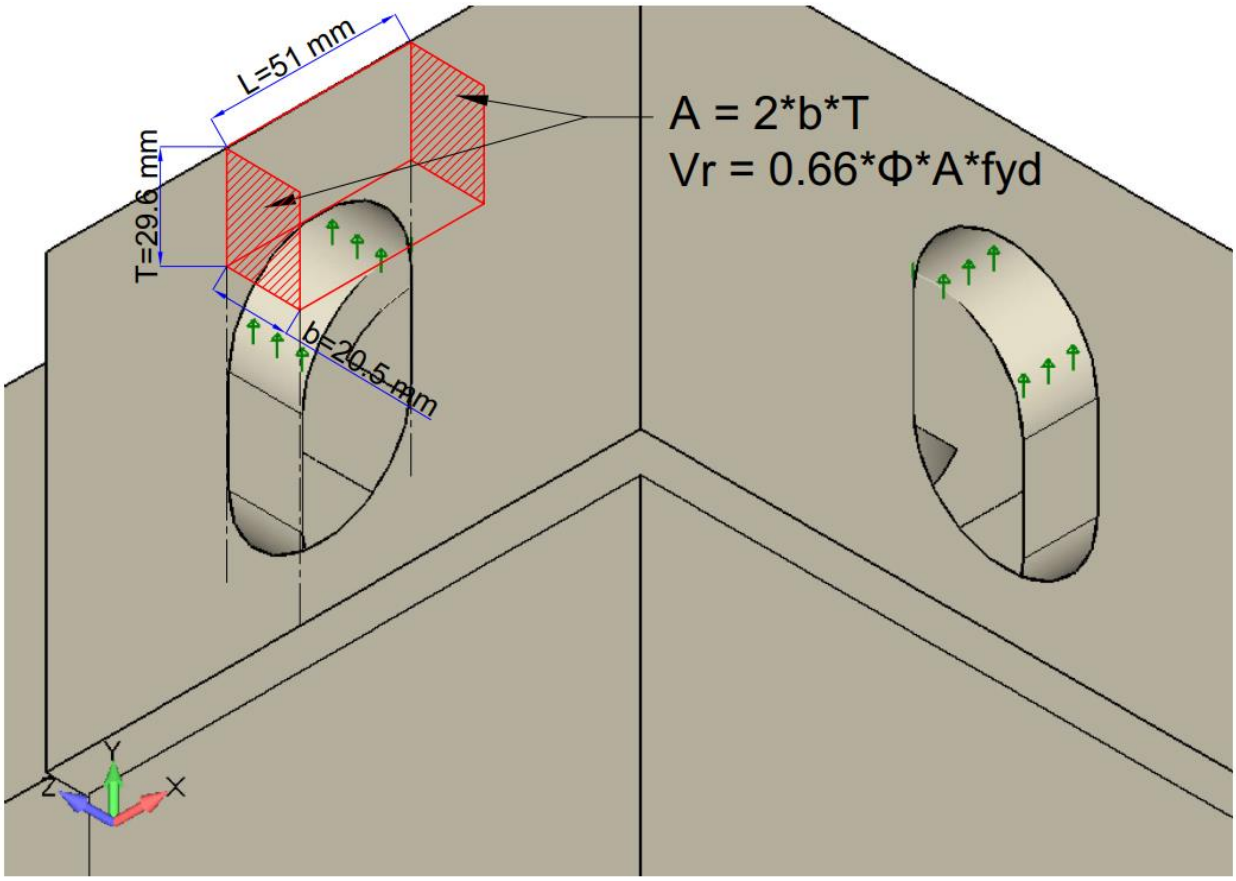


Output Set: Case 1 Time 1.
Deformed(0.2351): Total Translation
Elemental Contour: Solid Von Mises Stress
Second Contour:



Output Set: Case 1 Time 1.
Deformed(0.2351): Total Translation
Elemental Contour: Solid Von Mises Stress
Second Contour:

*MAXIMUM STRESS 304 MPA < 355*0.9 = 320 MPA*



For shear check of the lifting point subjected to tension from lifting cables, the shear stress is manually checked and compared with the limit value of the steel.

A = 2*b*T = 2*20.5*29.6 = 1213.6 mm²

Vr = 0.66*Φ*A*fyd = 0.66*0.9*1213.6*355 = 255912 N = 256 kN > 252 kN **(Verified)**

11 CONCLUSIONS

All structural components of cabin are verified. The stresses and displacements are compatible with the real behaviour and the structure is capable of supporting of assigned load.

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ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
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NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
R. Bossi	01/07/2024

Base Load Power Hub (BLPH)

B-200 STRUCTURAL CALCULATION - E&I SHELTERS

Document Number:

1724000049-ST-CA-00007

Document Class: 2

2	11/06/2024	Accepted for Construction (AFC)	FB	SKV	OA
1	21/05/2024	Accepted for Construction (AFC)	FB	SKV	OA
0	22/04/2024	Issue for Review (IFR)	FB	SKV	OA
Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
1	Accepted for Construction (AFC)
2	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
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1 INTRODUCTION

1.2 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.2.1 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

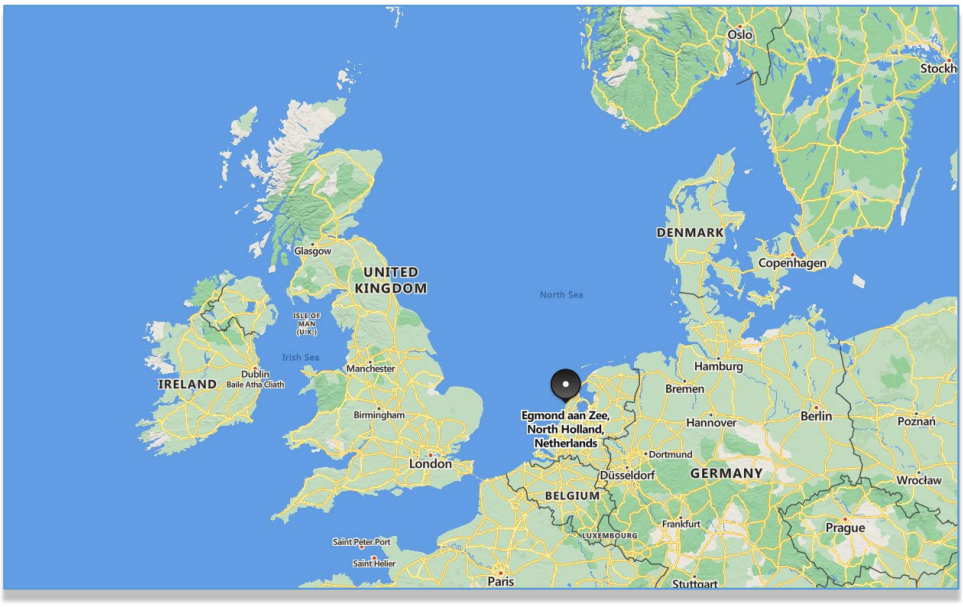


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.2.2 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

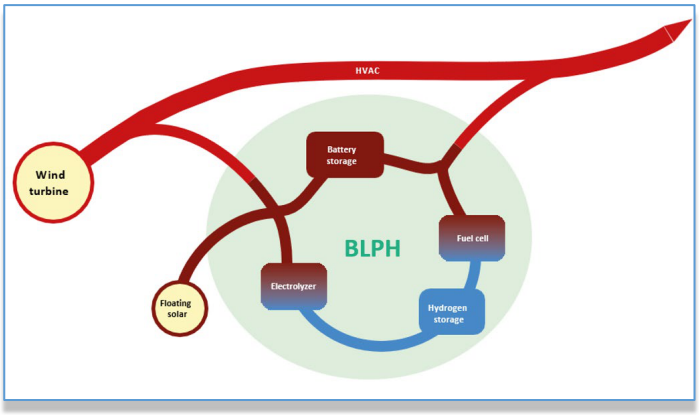


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

Structural report.

2.2 REFERENCES

Doc. No.	Description
123A90-DDL-ST-SP-90017 Rev.01	Structural design basis
123A90-DDL-IN-DL-40012 Rev.01_OPEN	BLPH off-shore iter equipment layout

Table 1 - Reference Documents

2.3 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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3 PURPOSE OF WORK

The B200 (LV switchgear room), which is the object of the following report, has been design and build by Alex Sistemi S.p.A.

This calculation report describes the structural analysis of steel room, that will be placed off the coast of Netherlands near the town of Egmond aan Zee. This report summarizes the results of the analyses performed to evaluate the actual stress path and strength verification on the cabin in the worst condition among those feasible.

The following conditions have been considered for the analyses:

- Dead load;
- Live load;
- Wind load;
- Sea transport;
- Lifting.

The structure has been diagrammed so as to allow calculation by use of a computer program for finite element analysis. The structure has been calculated using SAP2000 v.25 for the finished elements (FEM) and Femap Nastran 2401 for solid models of lifting lug and corrugated panel.

1.1 CODES AND STANDARDS

For structural ULS, SLS and lifting design of has been used Eurocodes.

- EN 1993-1-1 2005 Eurocode specifications for steel building;
- 0027 ND rev. 11 Guideline for lifting Noble Denton.

1.2 UNITS

- Density [kg/m^3];
- Length [m], [mm];
- Mass [kg], [ton]= 1000 [kg];
- Force [N], [kN] = 1000 [N];
- Area Load [kN/m^2];
- Temperature [°C];
- Stress [MPa] = [N/mm^2];

1.3 MATERIALS

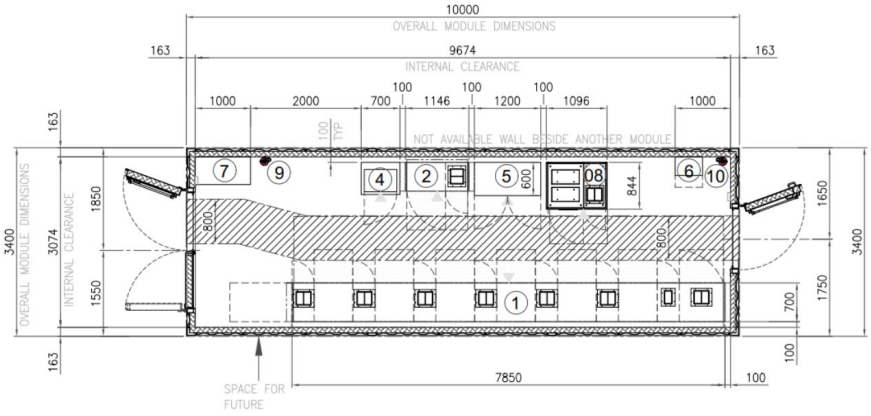
- Framing structure and panelling EN S355J0:
  - Modulus of elasticity E=210000 N/mm^2
  - Modulus of rigidity G=81000 N/mm^2
  - Tensile stress breakage fr>=470 N/mm^2
  - Yield stress fy=355 N/mm^2
  - Ultimate elongation percentage A=22%

- Welding steel dependent of welded section material:
  - Structural steel with a yield stress of at least 300 MPa matching electrode ultimate tensile strength X_u=490 N/mm^2.
- Bolting ASTM A325:
  - Tensile ultimate stress fu=830 N/mm^2
  - Yield stress fy=660 N/mm^2

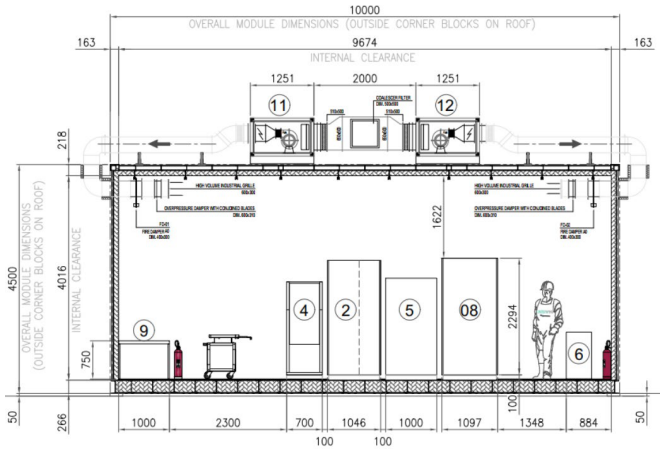
1.4 GENERAL DESCRIPTION

The structure has finished dimensions:

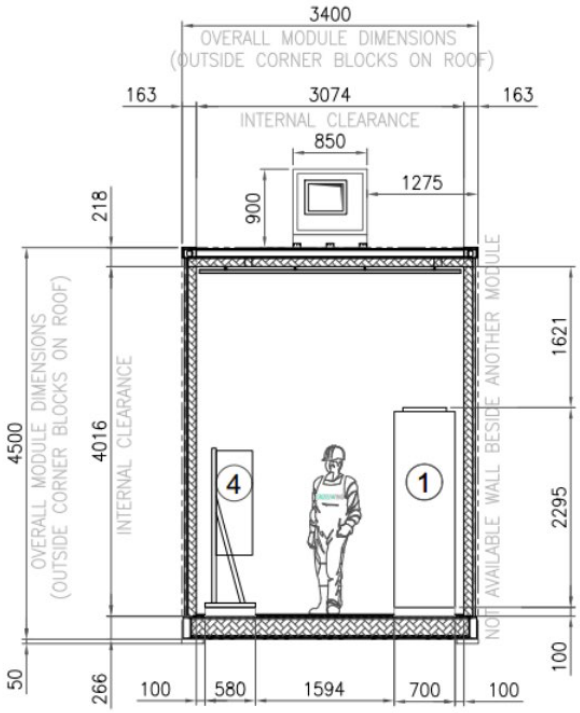
- Maximum lenght: 10000 mm;
- Maximum width: 3400 mm;
- Height: 4500 mm.



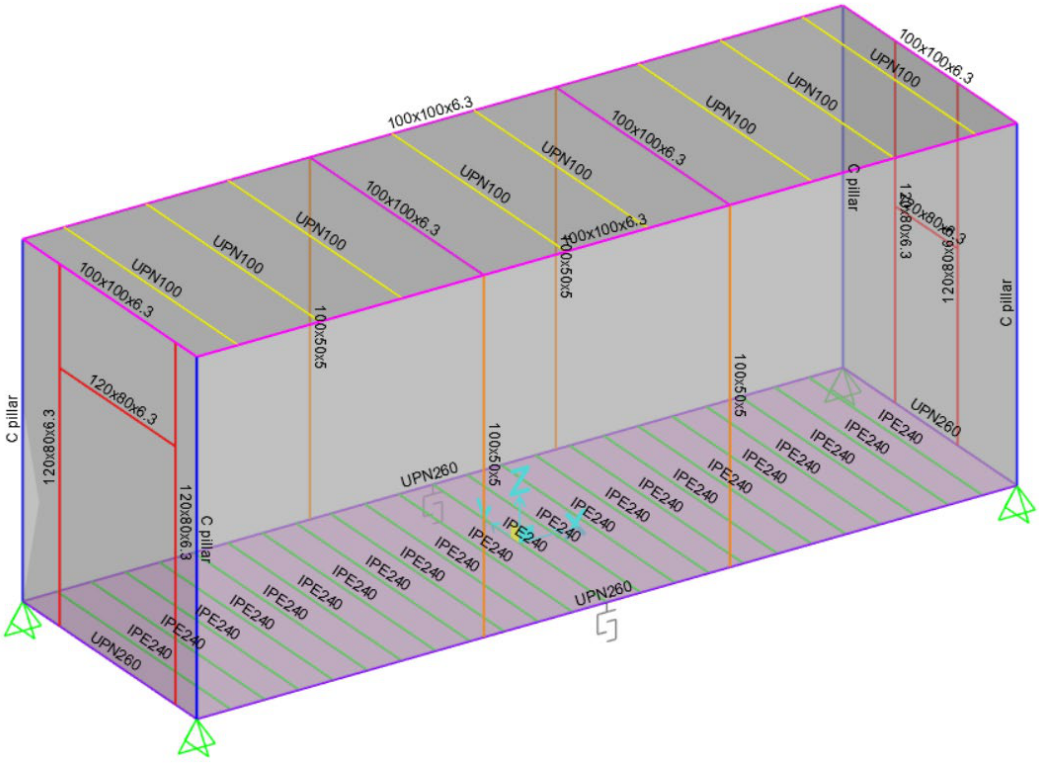
PLAN VIEW

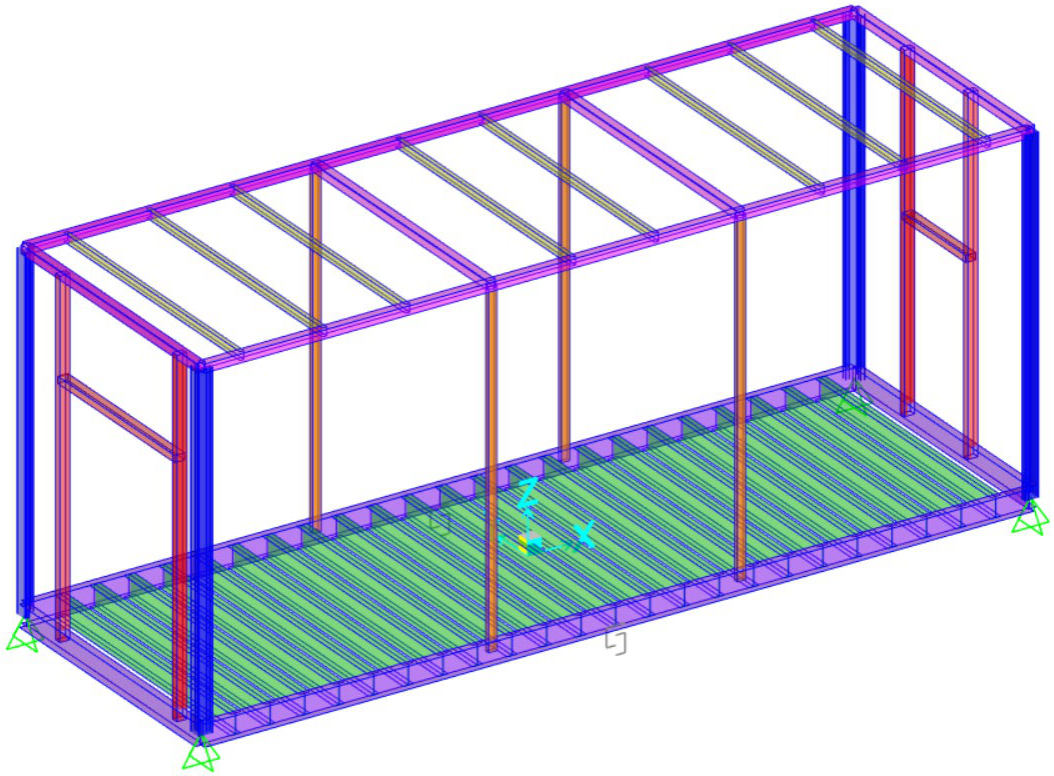


LONG SIDE VIEW



Below is shown the summary of all sections, also identified by color.





- Corrugated wall sheet thickness 3 mm;
- Roof sheet stave thickness 6 mm;
- Floor metal sheet thickness 6 mm.

TABLE: Area Section Properties

Section	Material	MatAngle	AreaType	Type	DrillDOF	Thickness	BendThick	Color	TotalWt	TotalMass
Text	Text	Degrees	Text	Text	Yes/No	m	m	Text	KN	KN-s2/m
Corrugate 3mm	S355	0	Shell	Shell-Thin	Yes	0.003	0.003	Gray	37.893	3.86
Metal sheet 6mm	S355	0	Shell	Shell-Thin	Yes	0.006	0.006	Gray	18.122	1.85
Roof stave 6mm	S355	0	Shell	Shell-Thin	Yes	0.006	0.006	Gray	19.632	2

TABLE: Area Section Properties

Section	F11Mod	F22Mod	F12Mod	M11Mod	M22Mod	M12Mod	V13Mod	V23Mod	MMod	WMod
Text	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless
Corrugate 3mm	1	1	1	1	261	1	1	1	1.5	1.5
Metal sheet 6mm	1	1	1	1	1	1	1	1	1.2	1.2
Roof stave 6mm	1	1	1	1	613	1	1	1	1.3	1.3

The mass and weight multiplier for the flat sheet representing the C-stave wall, is evaluated about 90% more than the equivalent flat sheet of the same thickness (4 mm of thickness) as is possible to see on the following pages.

The structural skeleton is made with combinations of different types of section, listed below:

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TABLE: Frame Section Properties 01 - General

SectionName	Material	Shape	t3	t2	tf	tw	t2b	tfb	FilletRadius	Area	TorsConst
Text	Text	Text	m	m	m	m	m	m	m	m2	m4
100x100x6.3	S355	Box/Tube	0.10	0.10	0.01	0.01			0.00	0.00	0.00
100x50x5	S355	Box/Tube	0.10	0.05	0.01	0.01			0.00	0.00	0.00
120x80x6.3	S355	Box/Tube	0.12	0.08	0.01	0.01			0.00	0.00	0.00
C pillar	S355	SD Section								0.00	0.00
IPE240	S355	I/Wide Flange	0.24	0.12	0.01	0.01	0.12	0.01	0.02	0.00	0.00
UPN100	S355	Channel	0.10	0.05	0.01	0.01			0.01	0.00	0.00
UPN260	S355	Channel	0.26	0.09	0.01	0.01			0.01	0.00	0.00

TABLE: Frame Section Properties 01 - General

SectionName	I33	I22	I23	AS2	AS3	S33Top	S33Bot	S22Left	S22Right	Z33	Z22
Text	m4	m4	m4	m2	m2	m3	m3	m3	m3	m3	m3
100x100x6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100x50x5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120x80x6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C pillar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IPE240	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPN100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPN260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE: Frame Section Properties 01 - General

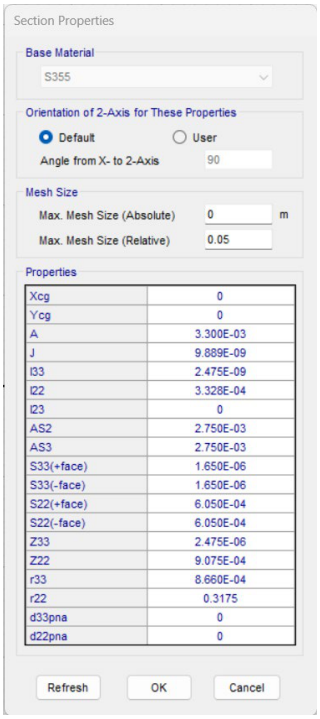
SectionName	R33	R22	CGOffset3	CGOffset2	EccV2	EccV3	Cw	IncludeSCAn	ConcCol	ConcBeam	Color
Text	m	m	m	m	m	m	m6	Yes/No	Yes/No	Yes/No	Text
100x100x6.3	0.04	0.04	0.00	0.00	0.00	0.00	0.00		No	No	Magenta
100x50x5	0.04	0.02	0.00	0.00	0.00	0.00	0.00		No	No	Orange
120x80x6.3	0.04	0.03	0.00	0.00	0.00	0.00	0.00		No	No	Red
C pillar	0.06	0.06	0.02	0.02	0.00	0.00	0.00		No	No	Blue
IPE240	0.10	0.03	0.00	0.00	0.00	0.00	0.00		No	No	Green
UPN100	0.04	0.01	0.01	0.00	0.03	0.00	0.00	Yes	No	No	Yellow
UPN260	0.10	0.03	0.02	0.00	0.05	0.00	0.00	Yes	No	No	Purple

TABLE: Frame Section Properties 01 - General

SectionName	TotalWt	TotalMass	FromFile	AMod	A2Mod	A3Mod	JMod	I2Mod	I3Mod	MMod	WMod
Text	KN	KN-s2/m	Yes/No	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless
100x100x6.3	6.012	0.61	No	1	1	1	1	1	1	1	1
100x50x5	1.777	0.18	No	1	1	1	1	1	1	1	1
120x80x6.3	3.606	0.37	No	1	1	1	1	1	1	1	1
C pillar	3.644	0.37	No	1	1	1	1	1	1	1	1
IPE240	22.635	2.31	Yes	1	1	1	1	1	1	1	1
UPN100	2.71	0.28	Yes	1	1	1	1	1	1	1	1
UPN260	9.861	1.01	Yes	1	1	1	1	1	1	1	1

The roof and wall assembly C profile modules is modelled with a flat plate with flexural stiffness calibrated on a specific FEM comparative model and consequently increased weight by a multiplier in the property (see column MMOD and WMOD in the previous tables → I33 ration between the real section and flat section).

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Section Properties

Base Material: S355

Orientation of 2-Axis for These Properties: Default / User; Angle from X- to 2-Axis: 90

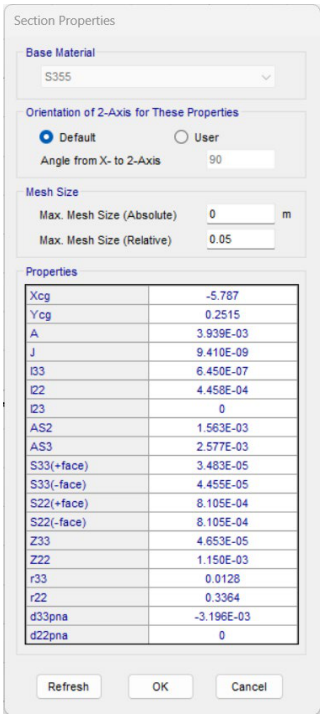
Mesh Size: Max. Mesh Size (Absolute): 0 m; Max. Mesh Size (Relative): 0.05

Properties

Xcg	0
Ycg	0
A	3.300E-03
J	9.889E-09
I33	2.475E-09
I22	3.328E-04
I23	0
AS2	2.750E-03
AS3	2.750E-03
S33(+face)	1.650E-06
S33(-face)	1.650E-06
S22(+face)	6.050E-04
S22(-face)	6.050E-04
Z33	2.475E-06
Z22	9.075E-04
r33	8.660E-04
r22	0.3175
d33pna	0
d22pna	0

Refresh OK Cancel

REAL MODELS FOR WALL


Section Properties

Base Material: S355

Orientation of 2-Axis for These Properties: Default / User; Angle from X- to 2-Axis: 90

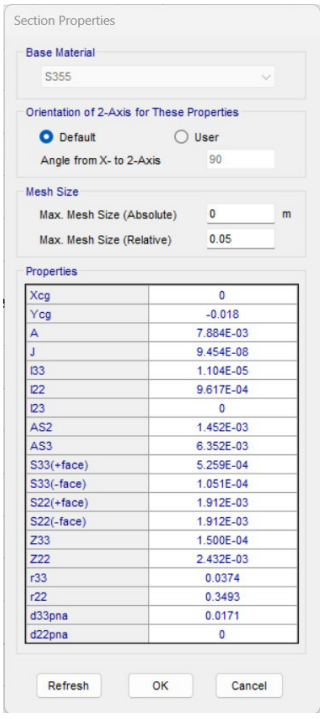
Mesh Size: Max. Mesh Size (Absolute): 0 m; Max. Mesh Size (Relative): 0.05

Properties

Xcg	-5.787
Ycg	0.2515
A	3.939E-03
J	9.410E-09
I33	6.450E-07
I22	4.458E-04
I23	0
AS2	1.563E-03
AS3	2.577E-03
S33(+face)	3.483E-05
S33(-face)	4.455E-05
S22(+face)	8.105E-04
S22(-face)	8.105E-04
Z33	4.653E-05
Z22	1.150E-03
r33	0.0128
r22	0.3364
d33pna	-3.196E-03
d22pna	0

Refresh OK Cancel

CALIBRATED MODELS FOR WALL


Section Properties

Base Material: S355

Orientation of 2-Axis for These Properties: Default / User; Angle from X- to 2-Axis: 90

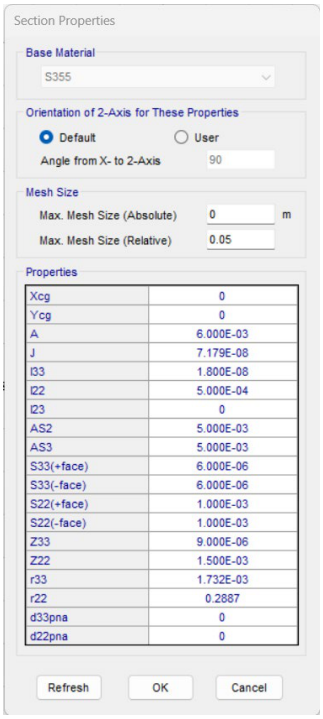
Mesh Size: Max. Mesh Size (Absolute): 0 m; Max. Mesh Size (Relative): 0.05

Properties

Xcg	0
Ycg	-0.018
A	7.884E-03
J	9.454E-08
I33	1.104E-05
I22	9.617E-04
I23	0
AS2	1.452E-03
AS3	6.352E-03
S33(+face)	5.259E-04
S33(-face)	1.051E-04
S22(+face)	1.912E-03
S22(-face)	1.912E-03
Z33	1.500E-04
Z22	2.432E-03
r33	0.0374
r22	0.3493
d33pna	0.0171
d22pna	0

Refresh OK Cancel

REAL MODELS FOR ROOF


Section Properties

Base Material: S355

Orientation of 2-Axis for These Properties: Default / User; Angle from X- to 2-Axis: 90

Mesh Size: Max. Mesh Size (Absolute): 0 m; Max. Mesh Size (Relative): 0.05

Properties

Xcg	0
Ycg	0
A	6.000E-03
J	7.179E-08
I33	1.800E-08
I22	5.000E-04
I23	0
AS2	5.000E-03
AS3	5.000E-03
S33(+face)	6.000E-06
S33(-face)	6.000E-06
S22(+face)	1.000E-03
S22(-face)	1.000E-03
Z33	9.000E-06
Z22	1.500E-03
r33	1.732E-03
r22	0.2887
d33pna	0
d22pna	0

Refresh OK Cancel

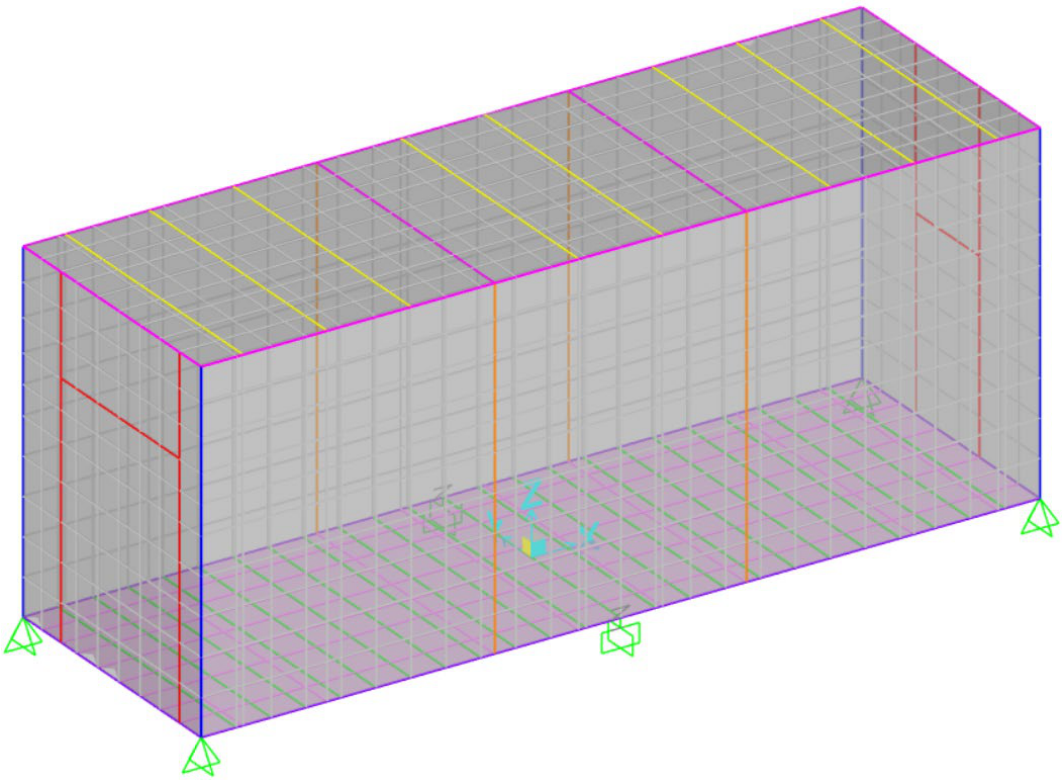
CALIBRATED MODELS FOR ROOF

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4 NUMERICAL MODEL

The analyses were performed using SAP2000 v25 Advanced.

Mono-dimensional (beam) and bi-dimensional (shell) elements were used to create the model.



ANALYSIS MESHED MODEL

The model was developed to analyse the components of steel structure, in particular:

- The C module panel sheet was modelled as equivalent shell with specific stiffness;
- The frame was modelled using mono-dimensional elements with cross section.

The wall and roof sheet forming the cover, is simplified as element flat shell but was given a stiffness, in the direction of the warping of the ribs, equivalent to the ratio between the inertia of the real section and the inertia of flat sheet. In this way it was possible to obtain a realistic displacement of the material under loads. In tensional terms it was necessary to evaluate the effective bound (considered by the software on the inertia of the flat section) as the ratio between the moment on linear meter, agent in the warping direction of the rib and the section modulus W of the real section, obtaining a maximum bound in line with the results of the software tension for orthogonal plate direction (Jcorrugated/Jflat). This aspect can be bypassed by analyzing detailed models for walls and cover including ribs. This approach also allows to consider the structural behavior of the wall together with the elements constituting the frame like a sort of compound section.

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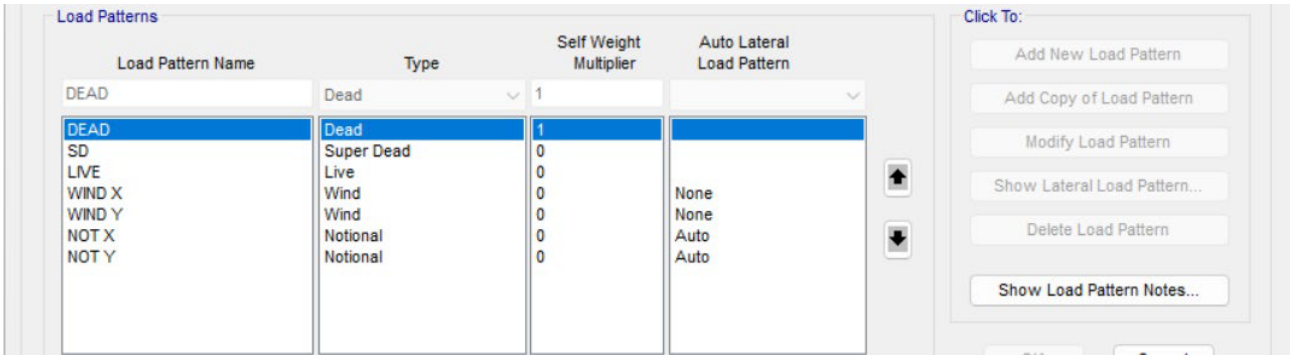
In order to apply the increase of stiffness on the shells so that it can be correctly distributed also on the surrounding frames, it is necessary to discretize the flat elements with a certain mesh and Sap will provide appropriate automation for the frames. The loads are applied as uniform to shell (meshed) for panels with structural function in order to also consider the contribution of the latter in the distribution and as uniform to frames for floor and deck where the plate area have only function as load distributors.

As regards the middle supports for perimeter beam UPN260, they are represented with GAP links and therefore all load combinations are converted into non-linear in order to take into account the contribution to only compression given from them (non-linear geometry analysis).

4.2 DESIGN LOADING

4.2.1 Dead load

The DEAD LOADS or permanent structural loads of steel FAR are calculated automatically (is considered an additional 3% for connections and NOTIONAL as 0.002 ratio of DEAD).



4.2.2 Super dead load

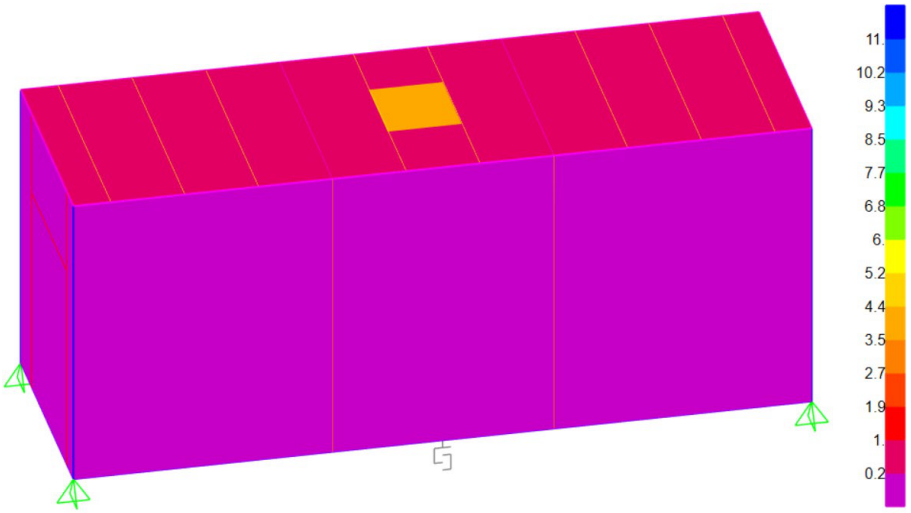
All non structural or SUPER DEAD LOADS on walls 20 kg/m^2 on roof 50 kg/m^2 load and floor 50 kg/m^2.

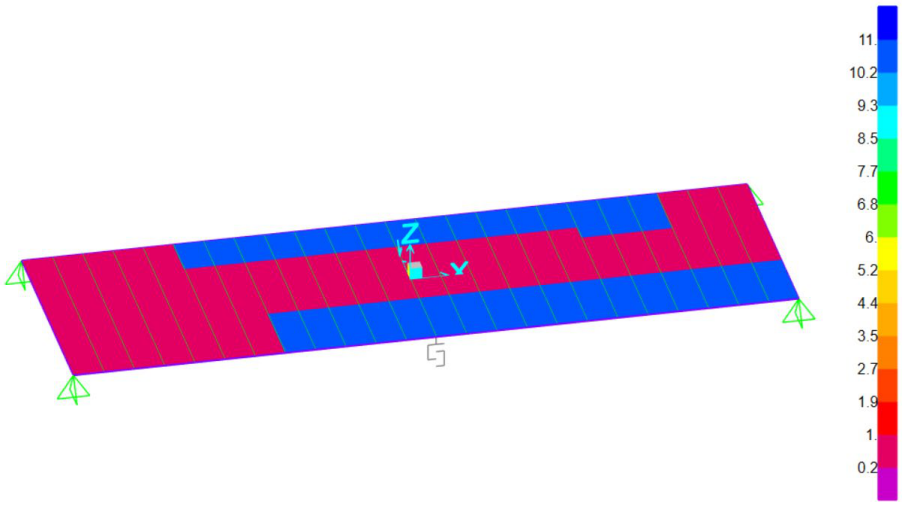
The weight of internal racks is calculated by data provided by customer and their overall dimensions, therefore simplified in favor of safety with a loading area in the model. The relevant equipments are switchgear and its GIS for two imprint respectively 9.4 m^2 and 7.4 m^2 for two distributed loads 8 kN/m^2 for switchgear and 3.5 kN/m^2 for GIS. For other equipment is in favor of safety to consider the live load instead of SD load.

In particular for HVAC units of roof, considering the worst condition 4 kN/m^2 for the foot-print 2 m^2 and 1 kN/m^2 for the conducts in extra areas. In these areas isn't applied live load.

	B200 [kg]
Metal structure	12638
Insulating panels wall roof	2863
Insulating panels floor	600
Insulating door A5	23
Insulating door A6	55
Insulating door C4	/
Insulating door D4	/
Total DEAD + INSULATION	**16179**

EQUIPMENT LIST						
REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	4900
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	600
3		*DELETED*				
4	CN-200N1	ICCP PANEL	700	580	1830	250
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	560
6	-	TOOL BOX	495	335	200	20
7	-	TABLE	1000	500	750	50
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	1000
9	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
10	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
11	HHU-77002A	AIR HANDLING UNIT A	1250	850	900	450
12	HHU-77002B	AIR HANDLING UNIT B	1250	850	900	450



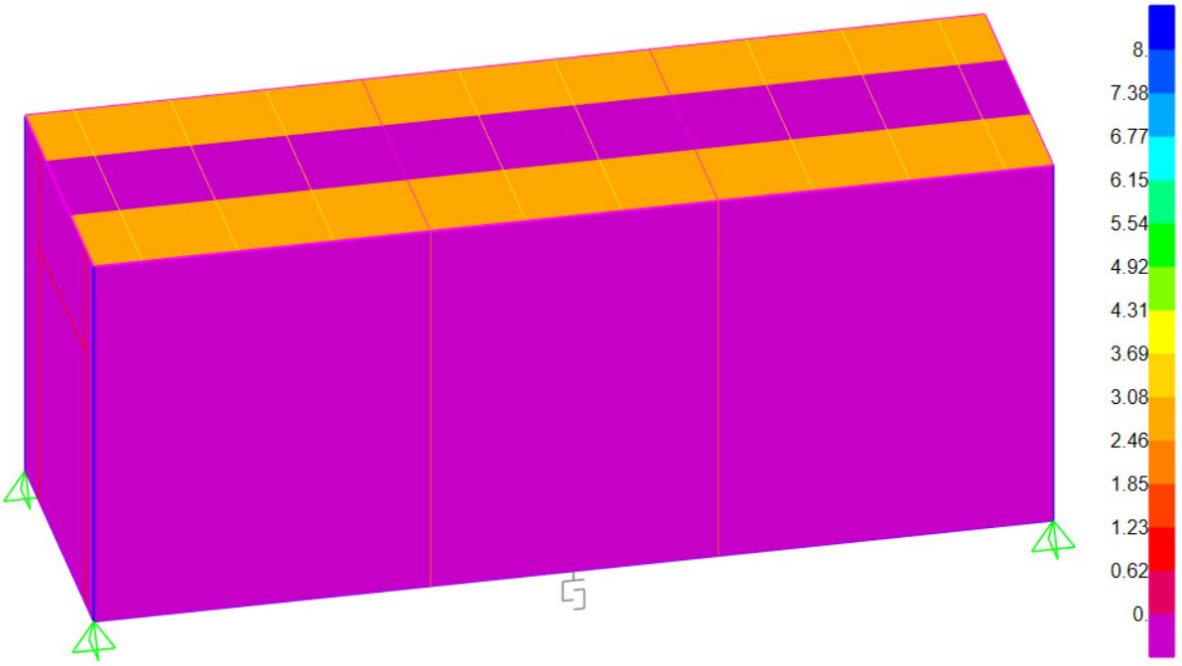


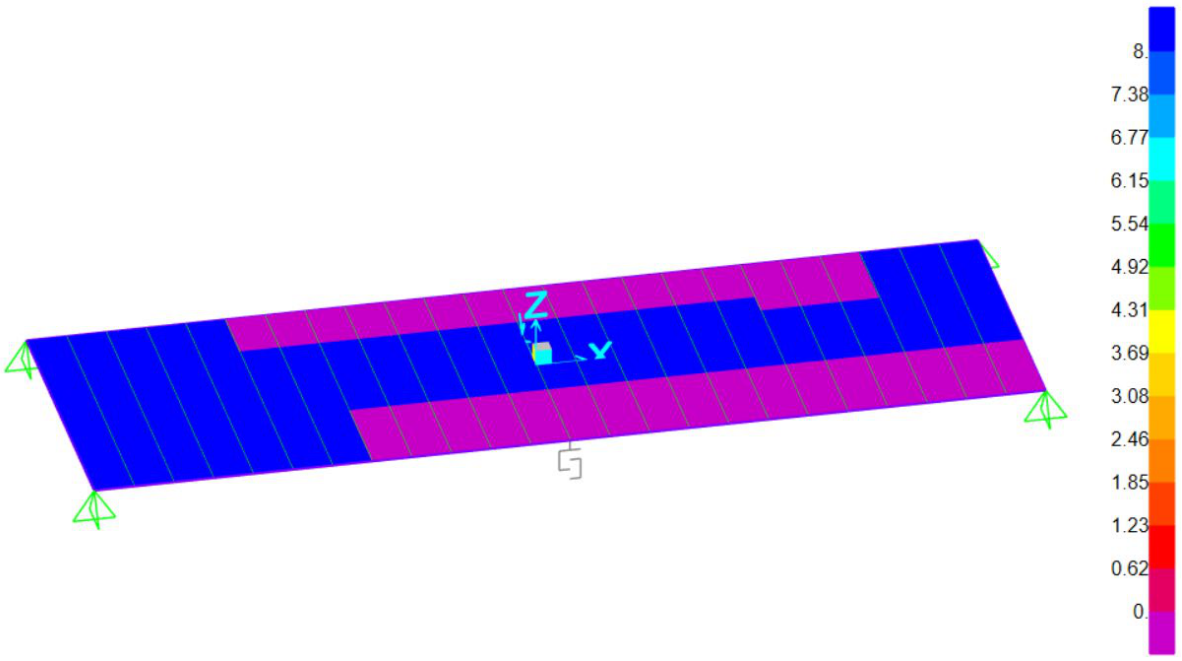
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SUPER DEAD LOADS APPLIED IN MODEL [kN/m²]

4.2.3 Live load

The LIVE LOADS are distributed in areas not loaded with cabinets or internal components. All loads are rounded up and equal to 2.5 kN/m² for roof and 8 kN/m² for internal floor.



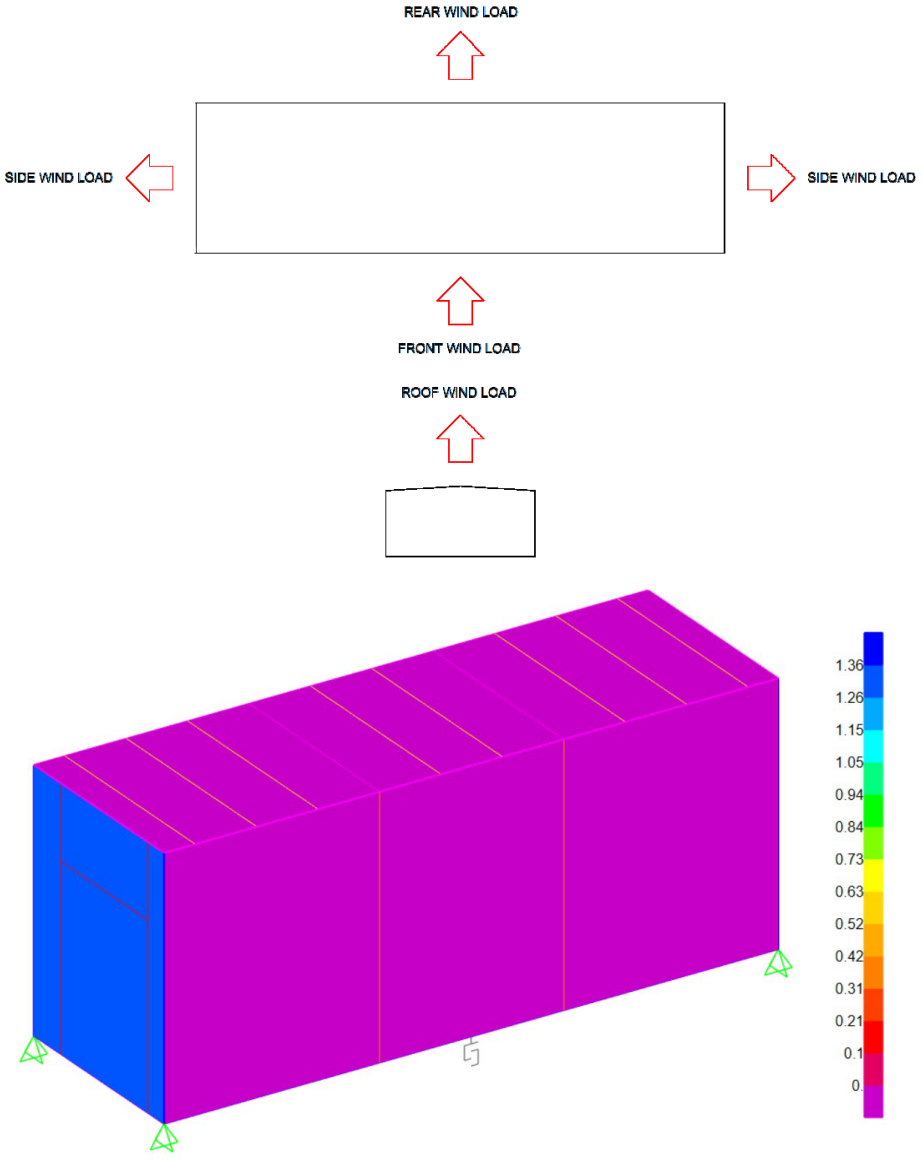


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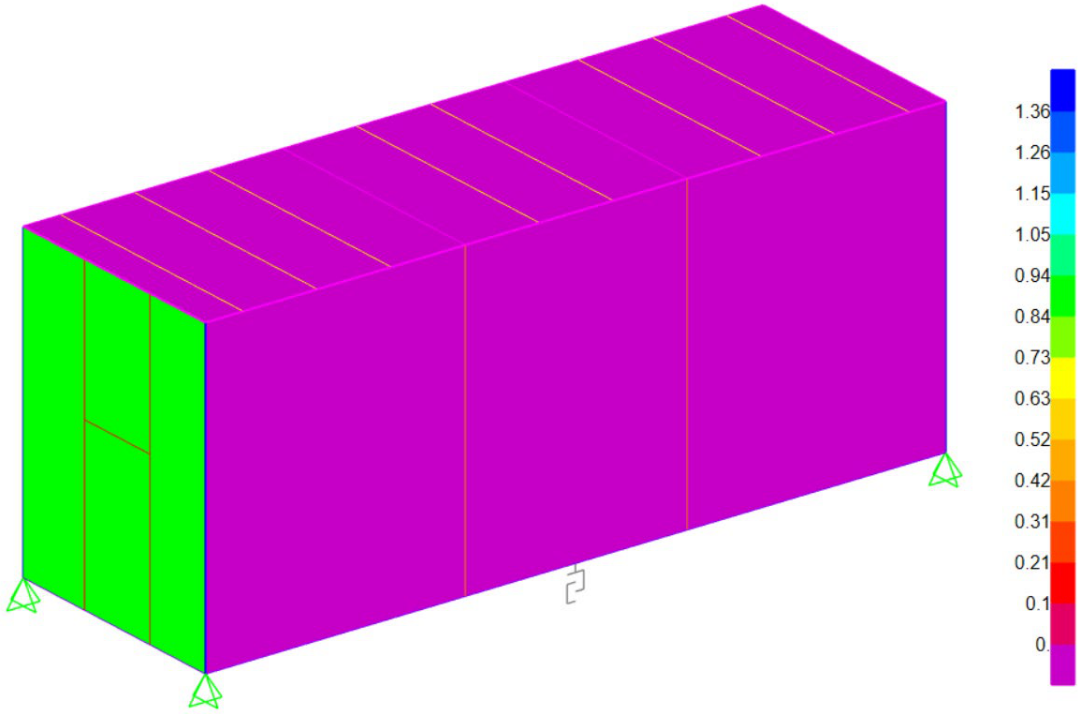
LIVE LOAD APPLIED IN MODEL [kN/m²]

4.2.4 Wind load

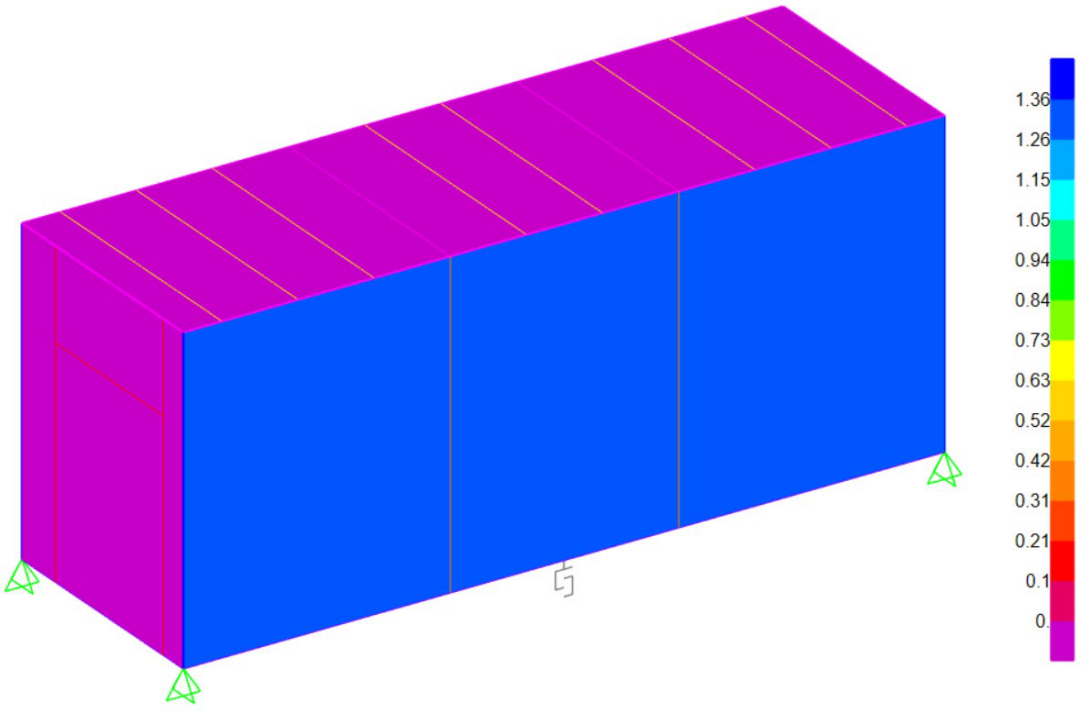
The design wind loads shall be automatically calculated for the worst condition of wind speed 41 m/s and exposure category D with importance factor 1.15 (Eurocode's worst condition for off-shore and in accordance with the specifics of customer WIND TABLE). The actions on walls and roof are automatically calculated by Sap by setting the parameters and applying the appropriate exposure coefficient to the plate elements (peak velocity pressure 1.69 kN/m² → pressure coefficient Cp front 0.8, Cp side, rear and roof 0.5).



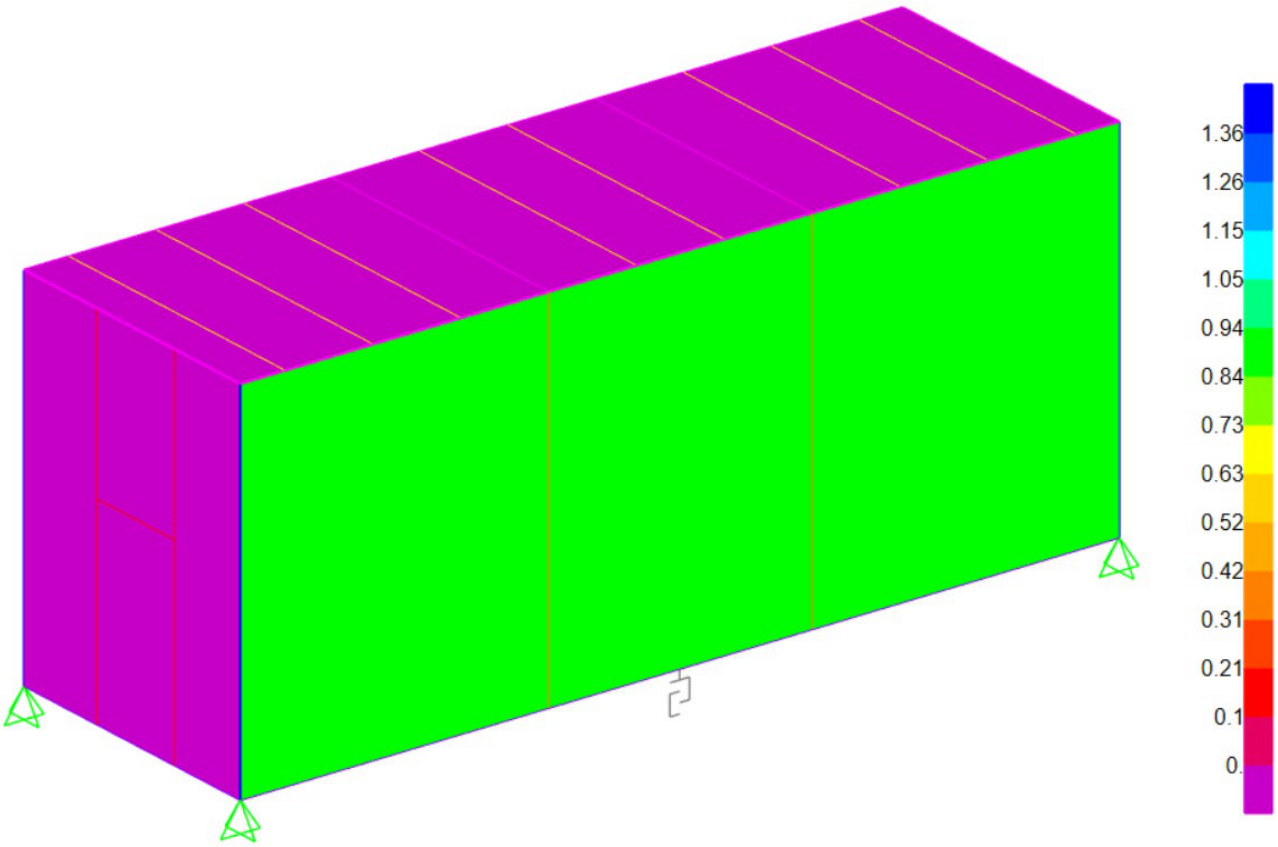
WIND X PRESSURE FRONT [kN/m²]



WIND X PRESSURE REAR [kN/m²]



WIND Y PRESSURE FRONT [kN/m²]



WIND Y PRESSURE REAR [kN/m²]

4.3 LOAD COMBINATIONS

TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
ULS LIVE	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.5	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
ULS WIND X	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.05	
			NonLin Static	WIND X	1.5	
			NonLin Static	WIND Y	0.3	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
ULS WIND Y	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.05	
			NonLin Static	WIND X	0.3	
			NonLin Static	WIND Y	1.5	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
SLS LIVE	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	LIVE	1	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
SLS WIND X	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	WIND X	1	
			NonLin Static	WIND Y	0.3	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
SLS WIND Y	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	WIND X	0.3	
			NonLin Static	WIND Y	1	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
LLC2 lifting	Linear Add	No	NonLin Static	DEAD	1.5	Strength
			NonLin Static	SD	1.5	
LLC3 lifting	Linear Add	No	NonLin Static	DEAD	2	Lifting point
			NonLin Static	SD	2	

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TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
SEA COMB 1	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	1	
SEA COMB 2	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	1	
SEA COMB 3	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	-1	
SEA COMB 4	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	-1	
SEA COMB 5	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	1	
SEA COMB 6	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	1	
SEA COMB 7	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	-1	
SEA COMB 8	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	-1	

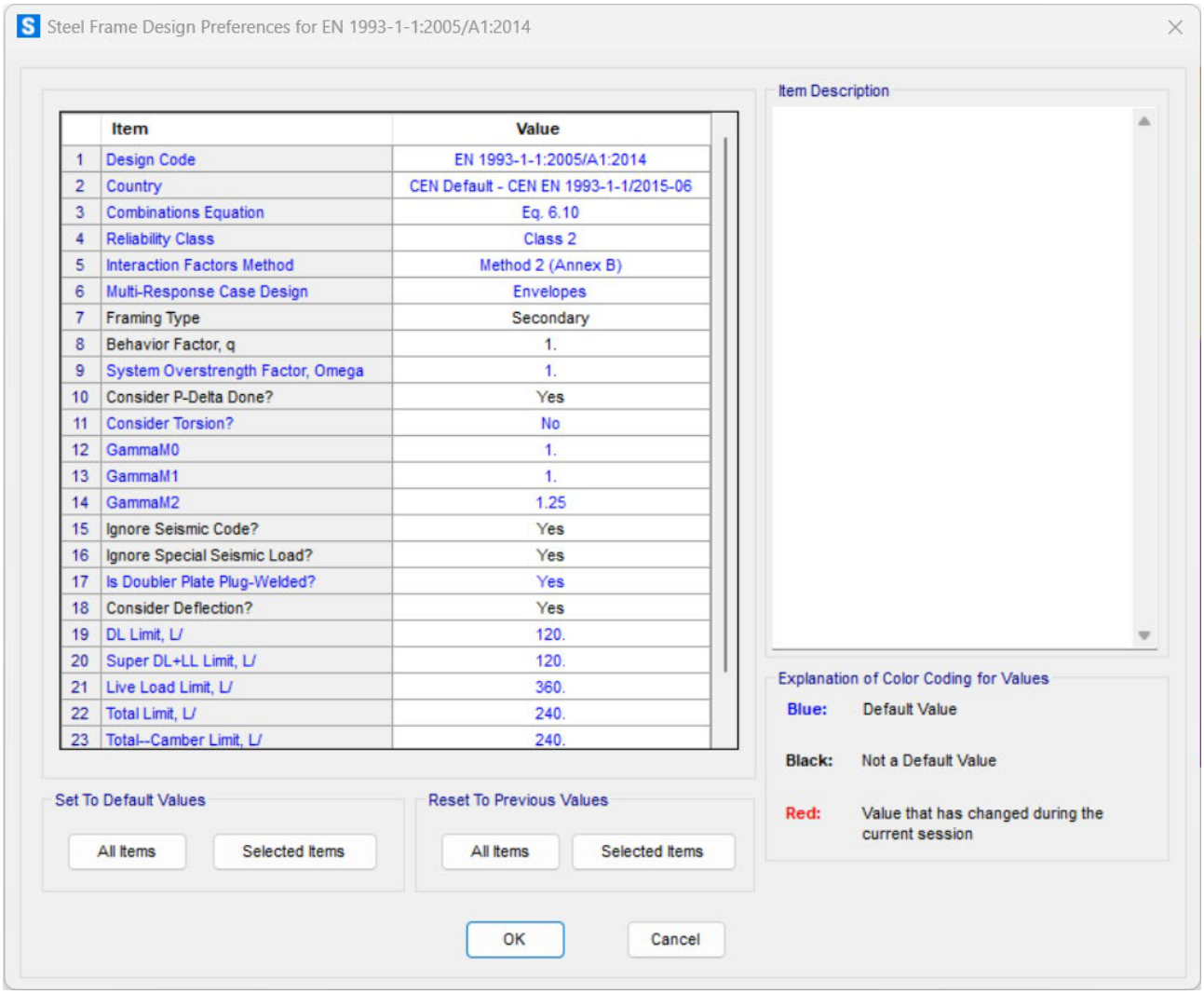
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TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
SEA COMB 9	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	1	
SEA COMB 10	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	1	
SEA COMB 11	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	-1	
SEA COMB 12	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	-1	
SEA COMB 13	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	1	
SEA COMB 14	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	1	
SEA COMB 15	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	-1	
SEA COMB 16	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	-1	

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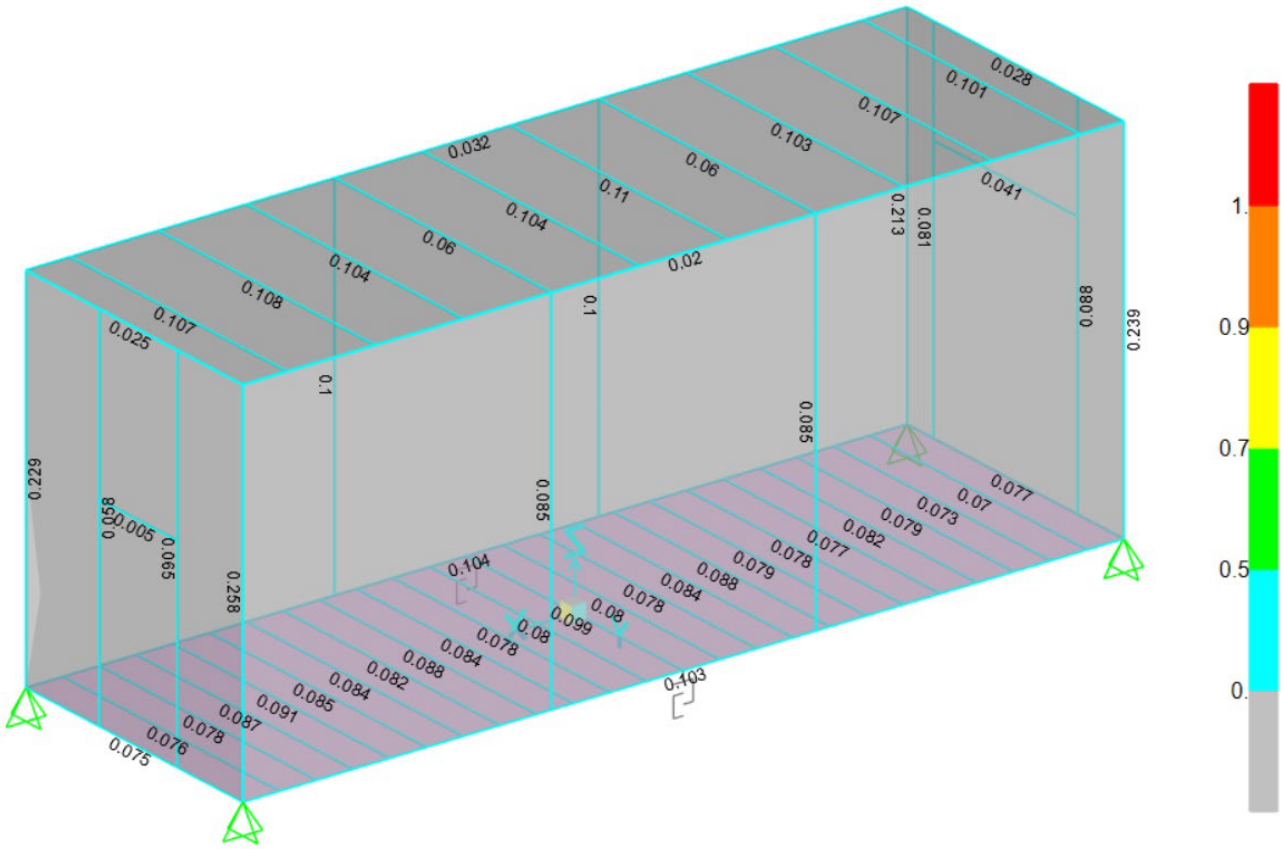
4.4 STRESS CHECK IN PLACE

All sections are check and verified in according with EN 1993 combinations ULS LIVE and WIND, SLS LIVE and WIND. Showed below the detailed printout for each type of section in its combination of maximum stress and the force diagrams with values for roof frames.



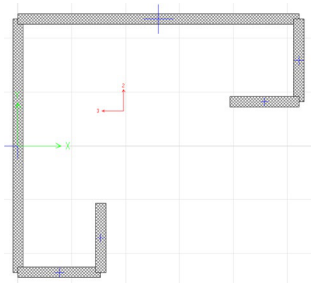
	Item	Value
1	Design Code	EN 1993-1-1:2005/A1:2014
2	Country	CEN Default - CEN EN 1993-1-1/2015-06
3	Combinations Equation	Eq. 6.10
4	Reliability Class	Class 2
5	Interaction Factors Method	Method 2 (Annex B)
6	Multi-Response Case Design	Envelopes
7	Framing Type	Secondary
8	Behavior Factor, q	1.
9	System Overstrength Factor, Omega	1.
10	Consider P-Delta Done?	Yes
11	Consider Torsion?	No
12	GammaM0	1.
13	GammaM1	1.
14	GammaM2	1.25
15	Ignore Seismic Code?	Yes
16	Ignore Special Seismic Load?	Yes
17	Is Doubler Plate Plug-Welded?	Yes
18	Consider Deflection?	Yes
19	DL Limit, L/	120.
20	Super DL+LL Limit, L/	120.
21	Live Load Limit, L/	360.
22	Total Limit, L/	240.
23	Total--Camber Limit, L/	240.

For in-place condition is automatically calculated also the relative deflection and compared with the limite L/240 (for beams). For beams in compression is calculated the lateral torsion buckling limit from code.



CHECK DESIGN FOR ULS LOADS (ORANGE < 1 RATIO)

4.4.1 C PILLAR



```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  188      X Mid:  5.       Combo:  ULS WIND Y      Design Type:  Column
Length:  4.122    Y Mid:  1.635    Shape:  C pillar        Frame Type:  Secndry
Loc   :  4.122    Z Mid:  2.061    Class:  Class 3         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 90.
deg

Aeff=0.003        Av,2=0.001        Av,3=0.001        eNy=0.             eNz=0.
A=0.003           Iy=8.703E-06      iy=0.055          Wel,y=8.999E-05    Weff,y=8.999E-05
It=3.406E-08      Iz=1.075E-05      iz=0.061          Wel,z=1.027E-04    Weff,z=1.027E-04
Iw=0.             Iyz=0.            h=0.153           Wpl,y=1.342E-04
E=210000000.      fy=355000.        fu=510000.        Wpl,z=1.489E-04


STRESS CHECK FORCES & MOMENTS
    Location            Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    4.122           -75.937       0.135       1.603       0.819       3.594       0.003

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.1.1(1)-6.46)
    D/C Ratio:     0.258 = 0.258   <         0.95          OK
                         = (NEd/Nb,Rd)       (EC3 6.3.1.1(1)-6.46)

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                      Force    Capacity    Capacity
    Axial           -75.937    1019.205    1019.205

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                   1019.205    1054.231     406.117     406.117          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49    1061.594        0.98       1.171       0.552     562.323
    Y-Y Braced    c    0.49    2190.264       0.682       0.851       0.736     749.834
    Z-Z           c    0.49    1310.964       0.882       1.056       0.611     622.834
```

Z-Z Braced	c	0.49	2004.257	0.713	0.88	0.717	730.321
Torsional TF	c	0.49	406.117	1.584	2.094	0.289	294.293

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.135	0.135	31.947	31.947	31.947	23.328
Z-Z	1.603	1.603	36.446	36.446	36.446	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.571	0.804	0.73	0.	98.132

Factors	kw	C1	C2	C3		
	1.	2.711	0.43	1.12		
	za	zs	zg	zz	zj	
	0.056	0.	0.056	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.417	0.418	0.975	0.418

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.819	249.477	0.003	1.
3-Axis	3.594	259.256	0.014	1.

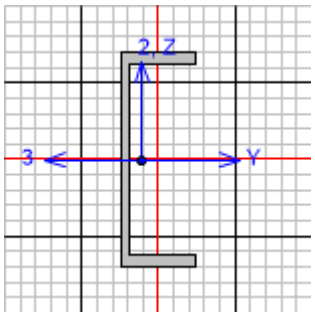
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.819	0.003	249.477	0.003	OK
3-Axis	3.594	0.003	259.256	0.014	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	249.477	1.2	0.	1.
3-Axis	259.256	1.2	0.	1.

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4.4.2 UPN260




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  215      X Mid:  4.500E-04 Combo:  ULS LIVE       Design Type:  Beam
Length:  10.      Y Mid:  -1.635    Shape:  UPN260         Frame Type:  Secndry
Loc   :  5.       Z Mid:  1.404E-07 Class:  Class 1        Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10             Reliability = Class 2              Interaction = Method 2
(Annex B)
MultiResponse = Envelopes          P-Delta Done? Yes                  Consider Torsion? No

GammaM0=1.        GammaM1=1.       GammaM2=1.25
An/Ag=1.          RLLF=1.          PLLF=0.75        D/C Lim=0.95      Prin. Axis Angle = 0. deg

Aeff=0.005        Av,2=0.003       Av,3=0.003       eNy=0.            eNz=0.
A=0.005           Iy=4.821E-05     iy=0.1           Wel,y=3.708E-04   Weff,y=3.708E-04
It=2.420E-07      Iz=3.178E-06     iz=0.026         Wel,z=4.784E-05   Weff,z=4.784E-05
Iw=3.850E-08      Iyz=0.           h=0.26           Wpl,y=4.531E-04
E=210000000.      fy=355000.       fu=510000.       Wpl,z=1.025E-04


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    5.             -25.276     -12.394       0.443      33.779       1.732       0.041

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.1(7))
    D/C Ratio:     0.104 = 0.015 + 0.077 + 0.012   <         0.95          OK
                         = (NEd/NRd) + (My,Ed/My,Rd) + (Mz,Ed/Mz,Rd)       (EC3 6.2.1(7))

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                        Force    Capacity    Capacity
    Axial            -25.276    1713.585    1713.585

                       Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                     1713.585    1772.474   35881.544   10255.137          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49   11102.318       0.393       0.624       0.901    1544.088
    Y-Y Braced      c    0.49   11102.318       0.393       0.624       0.901    1544.088
    Z-Z             c    0.49   38116.488       0.212       0.525       0.994    1703.077
```

Z-Z Braced	c	0.49	38116.488	0.212	0.525	0.994	1703.077
Torsional TF	c	0.49	10255.137	0.409	0.635	0.893	1529.669

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-12.394	-12.395	160.851	160.851	160.851	160.851
Z-Z	0.443	0.443	36.388	36.388	36.388	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.14	0.487	1.	3.850E-08	8246.895

Factors	kw	C1	C2	C3		
	1.	1.925	0.	0.933		
	za	zs	zg	zz	zj	
	0.13	0.	0.13	-6.539E-18	6.539E-18	

	kyy	kyz	kzy	kzz
Factors	0.898	0.24	0.812	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	33.779	541.707	0.062	1.
3-Axis	1.732	513.833	0.003	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	33.779	0.041	541.707	0.062	OK
3-Axis	1.732	0.041	513.833	0.003	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	541.707	1.2	0.33	1.2
3-Axis	513.833	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

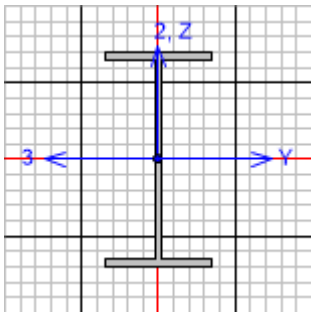
	V2 Left	V2 Right
2-2 (V2)	14.456	13.238

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	8.223E-04	0.083	0.01	OK
Super DL+LL	Yes	8.548E-04	0.083	0.01	OK
Live Load	Yes	8.010E-04	0.028	0.029	OK
Total Load	Yes	8.822E-04	0.042	0.021	OK
Total-Camber	Yes	8.822E-04	0.042	0.021	OK

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4.4.3 IPE240




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  35       X Mid:  1.579E-04 Combo:  ULS LIVE        Design Type:  Beam
Length:  3.27     Y Mid:  -5.000E-05Shape:  IPE240          Frame Type:  Secndry
Loc   :  3.27     Z Mid:  1.404E-07 Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.004        Av,2=0.002        Av,3=0.003        eNy=0.             eNz=0.
A=0.004           Iy=3.892E-05      iy=0.1            Wel,y=3.243E-04    Weff,y=3.243E-04
It=1.300E-07      Iz=2.840E-06      iz=0.027          Wel,z=4.733E-05    Weff,z=4.733E-05
Iw=3.739E-08      Iyz=0.            h=0.24            Wpl,y=3.670E-04
E=210000000.      fy=355000.        fu=510000.        Wpl,z=7.390E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    3.27           13.161       6.477      -0.001      10.254       0.005          0.

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.62)
    D/C Ratio:     0.099 = 0. + 0.099 + 0.   <         0.95          OK
                         = NEd/(Chi_z NRk/GammaM1) + kzy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kzz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)       (EC3 6.3.3(4)-6.62)

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                      Force    Capacity    Capacity
    Axial           13.161     1388.05     1388.05

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                    1388.05    1435.752    1661.727    1661.726          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           a    0.21    7544.087       0.429       0.616       0.945    1311.713
    Y-Y Braced    a    0.21    7544.087       0.429       0.616       0.945    1311.713
    Z-Z           b    0.34     550.494       1.588       1.997       0.312     432.798
    Z-Z Braced    b    0.34     550.494       1.588       1.997       0.312     432.798
```

Torsional TF	b	0.34	1661.726	0.914	1.039	0.652	905.295

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	1.355	6.477	130.285	130.285	130.285	65.278
Z-Z	-0.001	-0.001	26.235	26.235	26.235	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	a	0.21	1.247	1.388	0.501	3.739E-08	83.776

Factors	kw	C1	C2	C3		
	1.	1.125	0.43	1.12		
	za	zs	zg	zz	zj	
	0.12	0.	0.12	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.923	0.255	1.	0.425

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	10.254	392.038	0.026	1.
3-Axis	0.005	521.318	9.239E-06	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	10.254	0.	392.038	0.026	OK
3-Axis	0.005	0.	521.318	9.239E-06	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	392.038	1.2	0.506	1.2
3-Axis	521.318	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

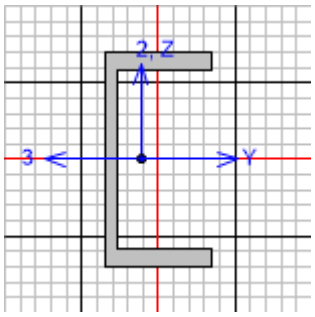
	V2 Left	V2 Right
2-2 (V2)	9.998	10.254

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	3.425E-04	0.027	0.013	OK
Super DL+LL	Yes	5.348E-04	0.027	0.02	OK
Live Load	Yes	2.782E-04	0.009	0.031	OK
Total Load	Yes	6.207E-04	0.014	0.046	OK
Total-Camber	Yes	6.207E-04	0.014	0.046	OK

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4.4.4 UPN100




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  15       X Mid:  -0.5      Combo:  ULS WIND Y      Design Type:  Beam
Length:  3.27     Y Mid:  -5.000E-05Shape:  UPN100          Frame Type:  Secndry
Loc   :  0.397    Z Mid:  4.122     Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.001        Av,2=6.193E-04    Av,3=8.480E-04    eNy=0.             eNz=0.
A=0.001           Iy=2.053E-06      iy=0.039          Wel,y=4.106E-05    Weff,y=4.106E-05
It=2.645E-08      Iz=2.929E-07      iz=0.015          Wel,z=8.478E-06    Weff,z=8.478E-06
Iw=4.853E-10      Iyz=0.            h=0.1             Wpl,y=5.033E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=1.800E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    0.397          -2.266       0.447       0.027       0.751       0.116       0.003

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.62)
    D/C Ratio:      0.11 = 0.047 + 0.061 + 0.002   <         0.95          OK
                         = NEd/(Chi_z NRk/GammaM1) + kzy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kzz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)       (EC3 6.3.3(4)-6.62)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial             -2.266      477.83      477.83

                      Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                      477.83     494.251     786.956     316.177          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49     397.945       1.096        1.32       0.486     232.461
    Y-Y Braced      c    0.49     397.945       1.096        1.32       0.486     232.461
```

Z-Z	c	0.49	56.774	2.901	5.37	0.101	48.321
Z-Z Braced	c	0.49	56.774	2.901	5.37	0.101	48.321
Torsional TF	c	0.49	316.177	1.229	1.508	0.42	200.693

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.003	0.447	17.867	17.867	17.867	7.262
Z-Z	0.021	0.027	6.39	6.39	6.39	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	1.128	1.489	0.406	4.853E-10	14.044

Factors	kw	C1	C2	C3		
	1.	1.391	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	1.598E-18	-1.598E-18	

	kyy	kyz	kzy	kzz
Factors	0.926	0.249	0.993	0.415

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.751	126.921	0.006	1.
3-Axis	0.116	173.805	6.701E-04	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.751	0.003	126.921	0.006	OK
3-Axis	0.116	0.003	173.805	0.001	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	126.921	1.2	0.197	1.2
3-Axis	173.805	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

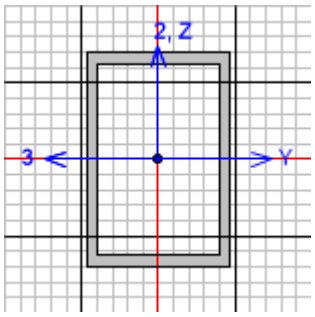
	V2 Left	V2 Right
2-2 (V2)	1.148	1.156

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	7.568E-04	0.027	0.028	OK
Super DL+LL	Yes	8.943E-04	0.027	0.033	OK
Live Load	Yes	3.968E-04	0.009	0.044	OK
Total Load	Yes	0.001	0.014	0.085	OK
Total-Camber	Yes	0.001	0.014	0.085	OK

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4.4.5 120x80x6.3




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  198      X Mid:  -5.       Combo:  ULS WIND X      Design Type:  Column
Length:  4.122    Y Mid:  0.938     Shape:  120x80x6.3      Frame Type:  Secndry
Loc   :  1.344    Z Mid:  2.061     Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2               Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                   Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95      Prin. Axis Angle = 0. deg

Aeff=0.002        Av,2=0.002        Av,3=0.001        eNy=0.            eNz=0.
A=0.002           Iy=4.562E-06      iy=0.044          Wel,y=7.603E-05   Weff,y=7.603E-05
It=4.721E-06      Iz=2.380E-06      iz=0.032          Wel,z=5.949E-05   Weff,z=5.949E-05
Iw=0.             Iyz=0.            h=0.12            Wpl,y=9.364E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=7.003E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    1.344           -5.47      -2.739       0.312       1.556       0.107       0.095

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.61)
    D/C Ratio:     0.088 = 0.016 + 0.07 + 0.003   <         0.95          OK
                         = NEd/(Chi_y NRk/GammaM1) + kyy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kyz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)     (EC3 6.3.3(4)-6.61)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial              -5.47      838.24      838.24

                      Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                      838.24     867.047  129713.748     556.477          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49     556.477       1.227       1.505       0.421     352.846
    Y-Y Braced      c    0.49     556.477       1.227       1.505       0.421     352.846
```

Z-Z	c	0.49	570.612	1.212	1.482	0.428	358.824
Z-Z Braced	c	0.49	570.612	1.212	1.482	0.428	358.824
Torsional TF	c	0.49	556.477	1.227	1.505	0.421	352.846

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-1.418	-2.739	33.242	33.242	33.242	33.242
Z-Z	0.025	0.312	24.86	24.86	24.86	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.212	0.527	0.99	0.	737.16

Factors	kw	C1	C2	C3	
	1.	1.634	0.459	0.525	
	za	zs	zg	zz	zj
	0.06	0.	0.06	0.	0.

	kyy	kyz	kzy	kzz
Factors	0.839	0.243	0.504	0.405

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	1.556	332.831	0.005	1.
3-Axis	0.107	206.599	5.164E-04	1.

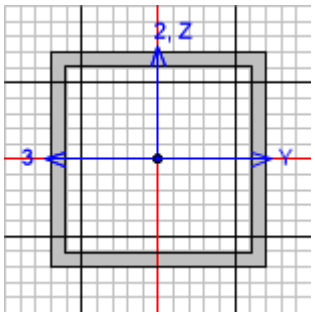
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	1.556	0.095	332.831	0.005	OK
3-Axis	0.107	0.095	206.599	0.001	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	332.831	1.2	0.243	1.2
3-Axis	206.599	1.2	0.	1.

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4.4.6 100x100x6.3




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  18       X Mid:  -1.5      Combo:  ULS LIVE        Design Type:  Beam
Length:  3.27     Y Mid:  -5.000E-05Shape:  100x100x6.3     Frame Type:  Secndry
Loc   :  1.502    Z Mid:  4.122     Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.002        Av,2=0.001        Av,3=0.001        eNy=0.             eNz=0.
A=0.002           Iy=3.471E-06      iy=0.038          Wel,y=6.942E-05    Weff,y=6.942E-05
It=5.183E-06      Iz=3.471E-06      iz=0.038          Wel,z=6.942E-05    Weff,z=6.942E-05
Iw=0.             Iyz=0.            h=0.1             Wpl,y=8.309E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=8.309E-05


STRESS CHECK FORCES & MOMENTS
    Location            Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    1.502            18.186       0.772       0.004       0.137       0.018          0.

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.9.1(6y))
    D/C Ratio:     0.026 = 0.026   <         0.95          OK
                         = (My,Ed/Mn,y,Rd)       (EC3 6.2.9.1(6y))

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                     Force    Capacity    Capacity
    Axial           18.186      838.24      838.24

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                     838.24     867.047  142392.944     672.761          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49     672.761       1.116       1.347       0.476     398.738
    Y-Y Braced    c    0.49     672.761       1.116       1.347       0.476     398.738
    Z-Z           c    0.49     672.761       1.116       1.347       0.476     398.738
```

Z-Z Braced	c	0.49	672.761	1.116	1.347	0.476	398.738
Torsional TF	c	0.49	672.761	1.116	1.347	0.476	398.738

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.772	0.772	29.498	29.498	29.498	29.498
Z-Z	0.004	0.014	29.498	29.498	29.498	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.224	0.534	0.981	0.	586.16

Factors	kw	C1	C2	C3		
	1.	1.144	0.553	1.73		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.906	0.24	0.543	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.137	270.851	5.062E-04	1.
3-Axis	0.018	258.249	6.809E-05	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.137	0.	270.851	0.001	OK
3-Axis	0.018	0.	258.249	6.809E-05	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	270.851	1.2	0.197	1.2
3-Axis	258.249	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

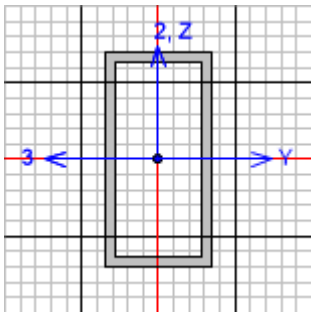
	V2 Left	V2 Right
2-2 (V2)	1.24	1.218

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	4.776E-04	0.027	0.018	OK
Super DL+LL	Yes	5.742E-04	0.027	0.021	OK
Live Load	Yes	3.407E-04	0.009	0.038	OK
Total Load	Yes	8.183E-04	0.014	0.06	OK
Total-Camber	Yes	8.183E-04	0.014	0.06	OK

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4.4.7 100x50x5




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  216      X Mid:  1.5      Combo:  ULS WIND Y      Design Type:  Column
Length:  4.122    Y Mid:  -1.635   Shape:  100x50x5        Frame Type:  Secndry
Loc   :  0.       Z Mid:  2.061    Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10             Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes          P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.       GammaM2=1.25
An/Ag=1.          RLLF=1.          PLLF=0.75        D/C Lim=0.95        Prin. Axis Angle = 0. deg

Aeff=0.001        Av,2=0.001       Av,3=5.000E-04   eNy=0.              eNz=0.
A=0.001           Iy=1.737E-06     iy=0.035         Wel,y=3.473E-05     Weff,y=3.473E-05
It=1.305E-06      Iz=5.617E-07     iz=0.02          Wel,z=2.247E-05     Weff,z=2.247E-05
Iw=0.             Iyz=0.           h=0.1            Wpl,y=4.400E-05
E=210000000.      fy=355000.       fu=510000.       Wpl,z=2.650E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    0.              -0.531       0.015      -0.937       0.061       1.156       0.003

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.9.1(6z))
    D/C Ratio:       0.1 = 0.1   <         0.95          OK
                       = (Mz,Ed/Mn,z,Rd)       (EC3 6.2.9.1(6z))

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                      Force    Capacity    Capacity
    Axial           -0.531        497.        497.

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                       497.      514.08   64225.156      68.514          1.

              Curve   Alpha         Ncr   LambdaBar          Phi          Chi       Nb,Rd
    Y-Y           c    0.49     211.845       1.532        1.999        0.304     151.329
    Y-Y Braced    c    0.49     211.845       1.532        1.999        0.304     151.329
    Z-Z           c    0.49      68.514       2.693        4.738        0.116      57.552
```

Z-Z Braced	c	0.49	124.941	1.994	2.929	0.197	97.969
Torsional TF	c	0.49	68.514	2.693	4.738	0.116	57.552

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.015	0.029	15.62	15.62	15.62	15.62
Z-Z	-0.937	-0.937	9.408	9.408	9.408	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.263	0.558	0.952	0.	226.499

Factors	kw	C1	C2	C3		
	1.	2.711	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.401	0.252	0.241	0.42

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.061	221.356	2.748E-04	1.
3-Axis	1.156	102.48	0.011	1.

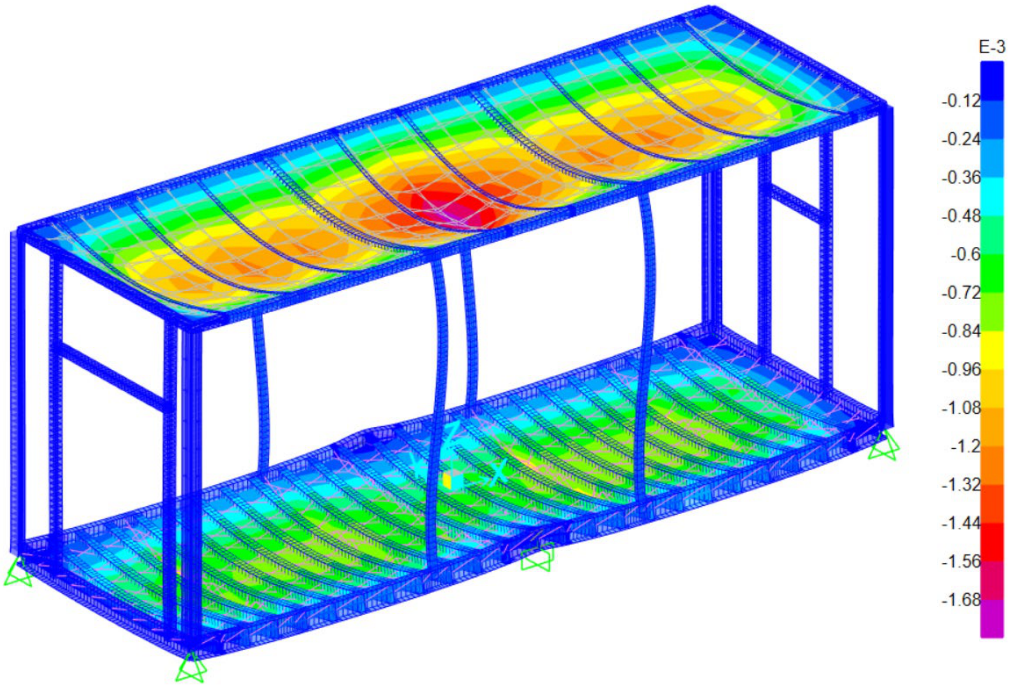
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.061	0.003	221.356	0.	OK
3-Axis	1.156	0.003	102.48	0.011	OK

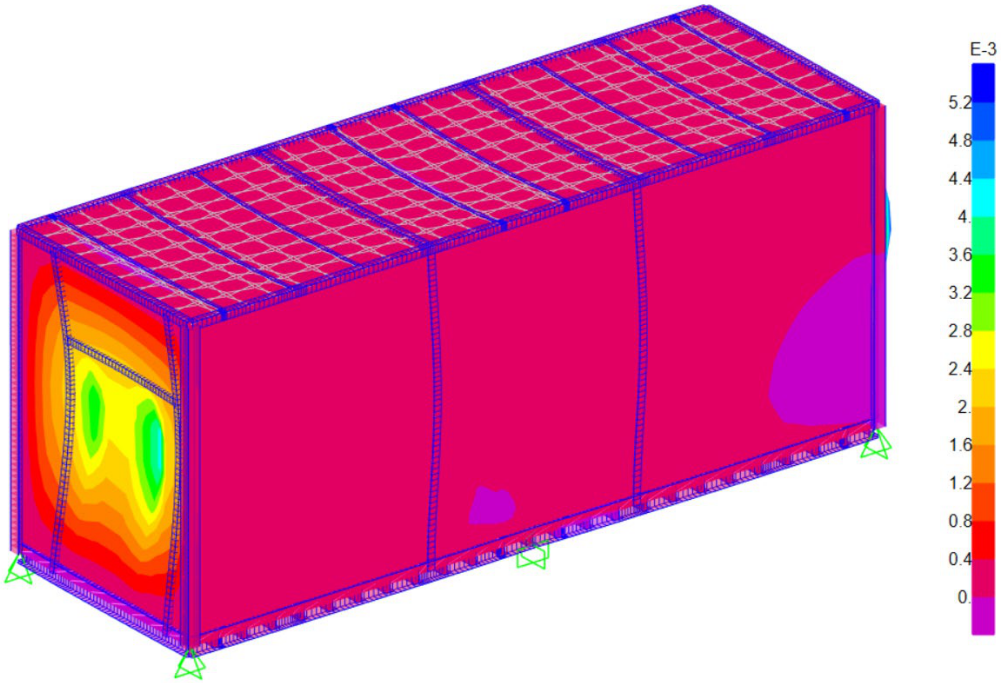
	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	221.356	1.2	0.256	1.2
3-Axis	102.48	1.2	0.	1.

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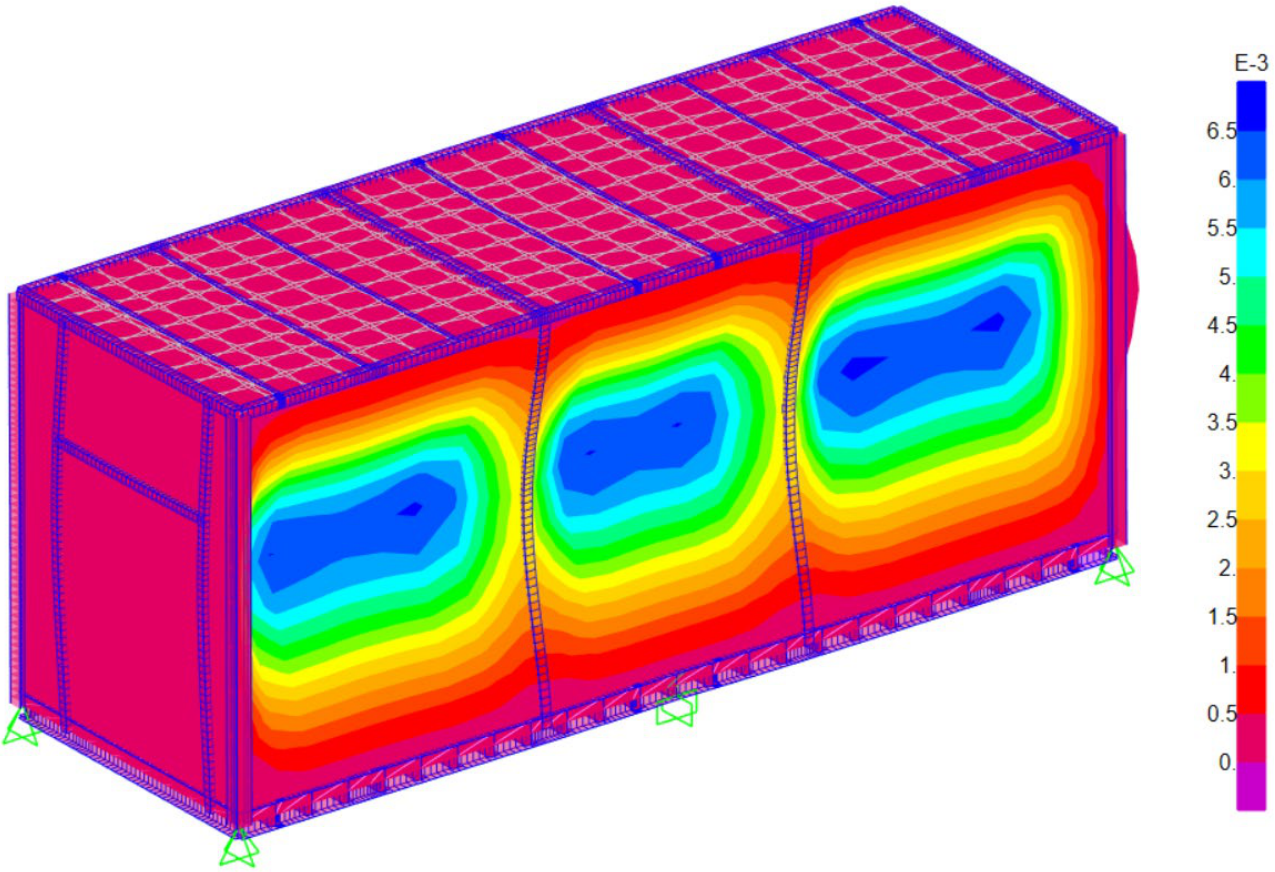
5 DISPLACEMENT CHECK



Uz SLS LIVE = 1.7 mm < 4500/240 = 18.75 mm



Ux SLS WIND X = 5.2mm < 4500/240 = 18.75 mm



Uy SLS WIND Y = 6.5 mm < 4500/240 = 18.75 mm

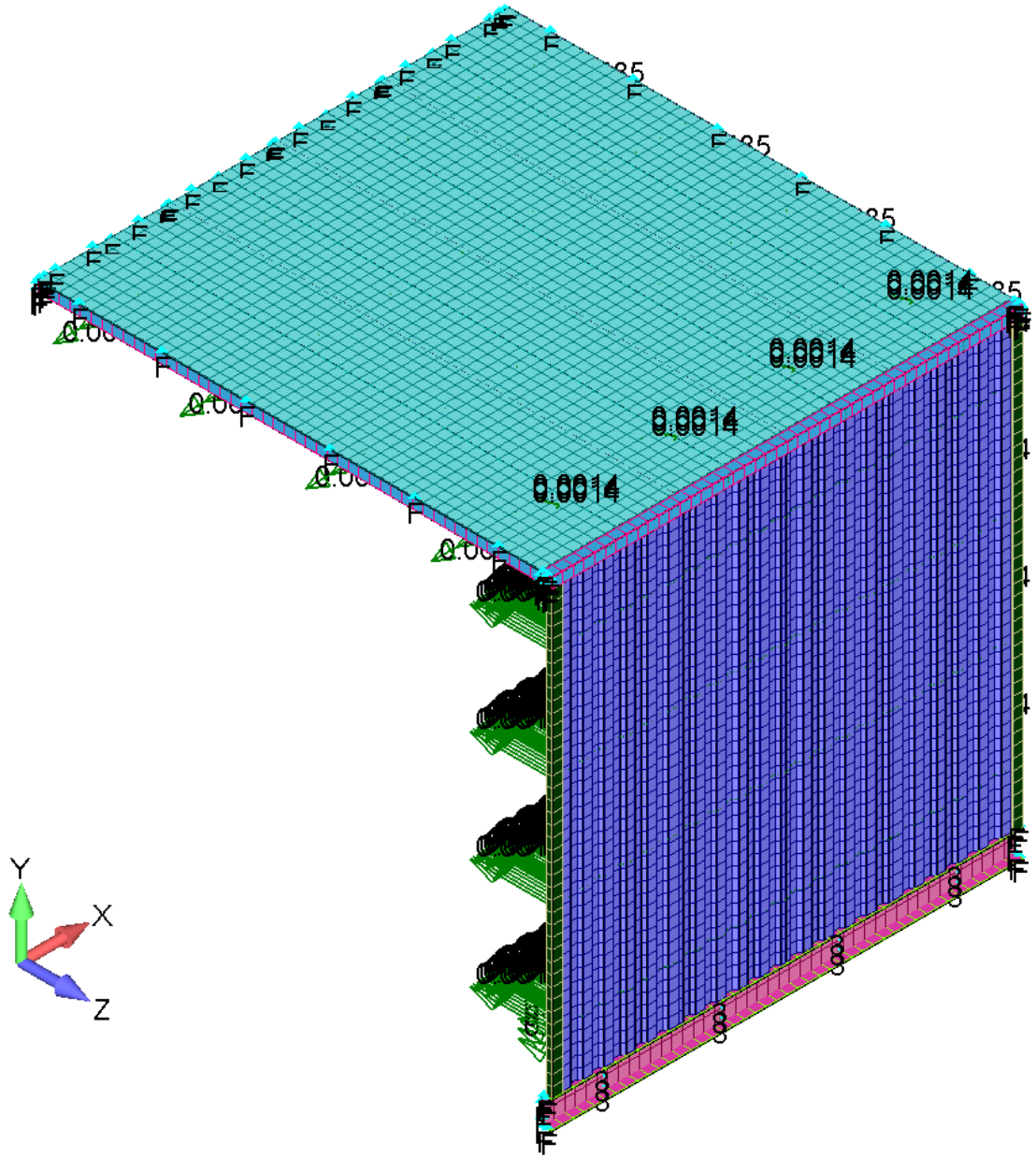
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6 METAL SHEET CHECK

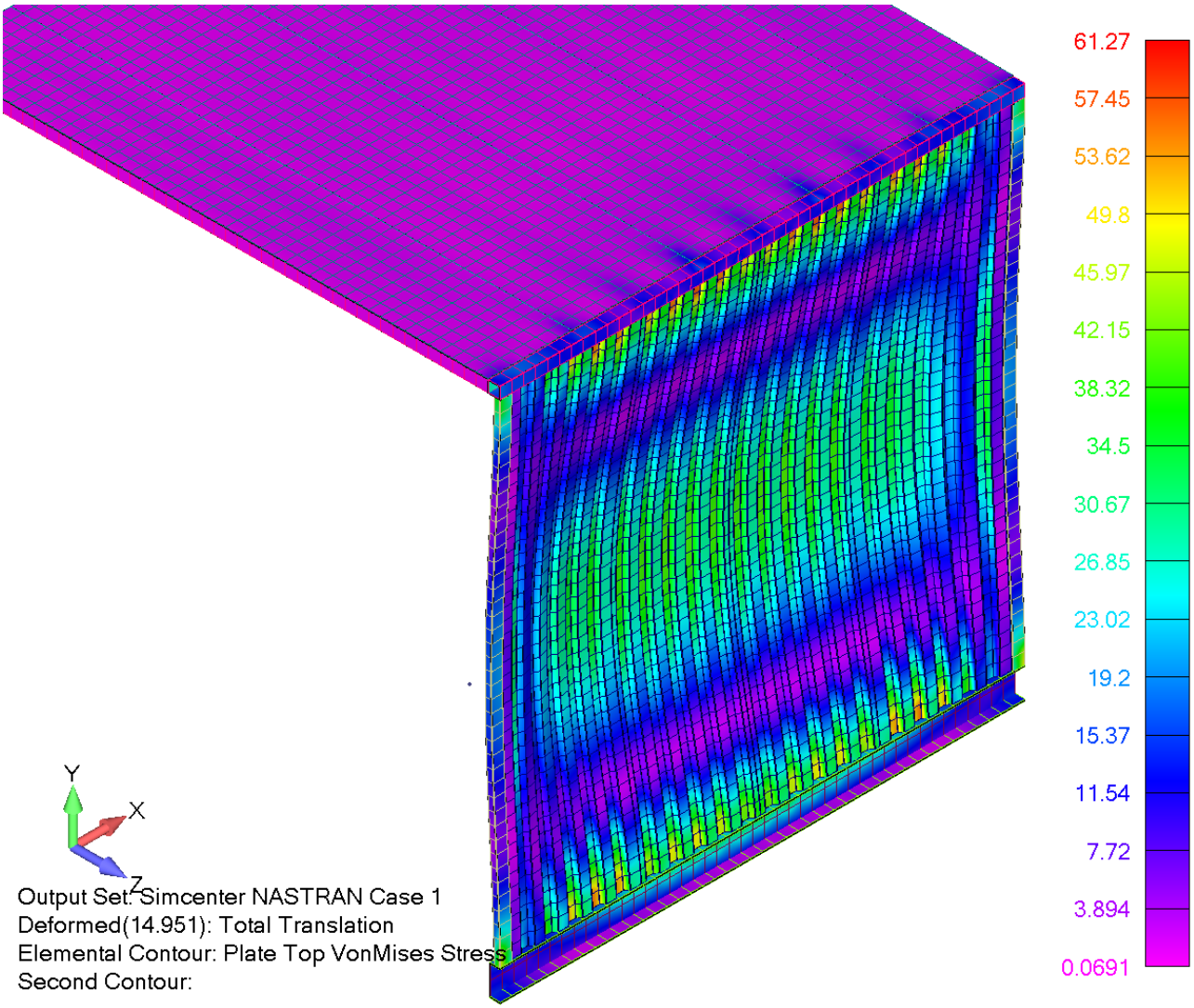
A detailed analysis of the corrugated wall and stave roof is carried out. The structure is modeled taking into account all the metal sheets constituting the geometry of metal sheet.

The front is loaded with 1.69 kN/m^2 wind pressure and Cp = 0.8. For the roof is applied 1.69 kN/m^2 with Cp = 0.5 and 45 degree (worst case).

The analysis is performed with FEMAP NASTRAN finite element software and post-processor.



MODEL WITH 8211 ELEMENTS AND 8805 NODES, LOADED AND FIXED AT THE ENDS



MAXIMUM VM STRESS 61 MPA AND 15 MM LATERAL DISPLACEMENT

Displacement value is lower than sap2000 simplified model for global analysis.

The maximum Von Mises stress is lower than yield limit reduced by safety factor 1.15 → 275/1.15 = 239 MPa.

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7 BASE REACTIONS

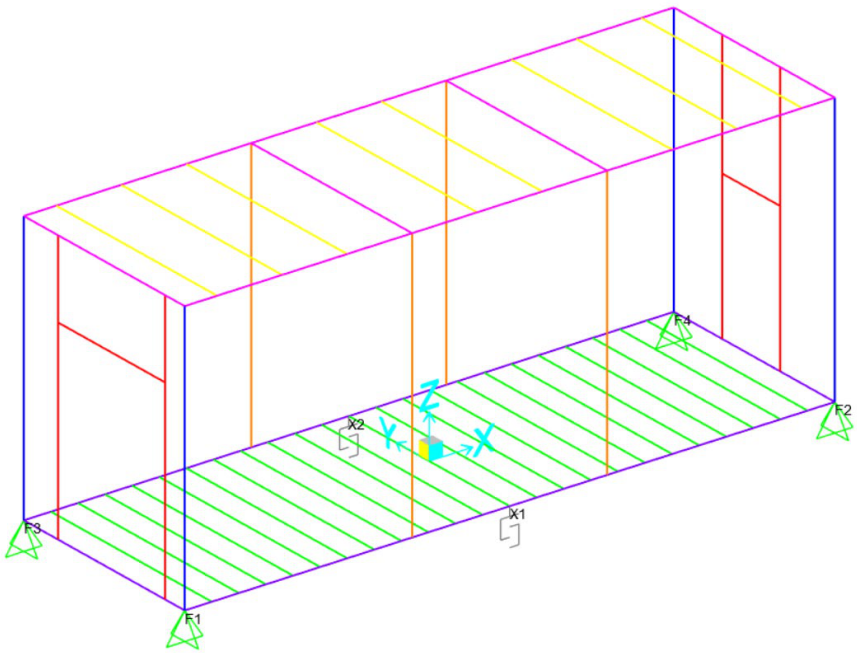


TABLE: Joint Reactions

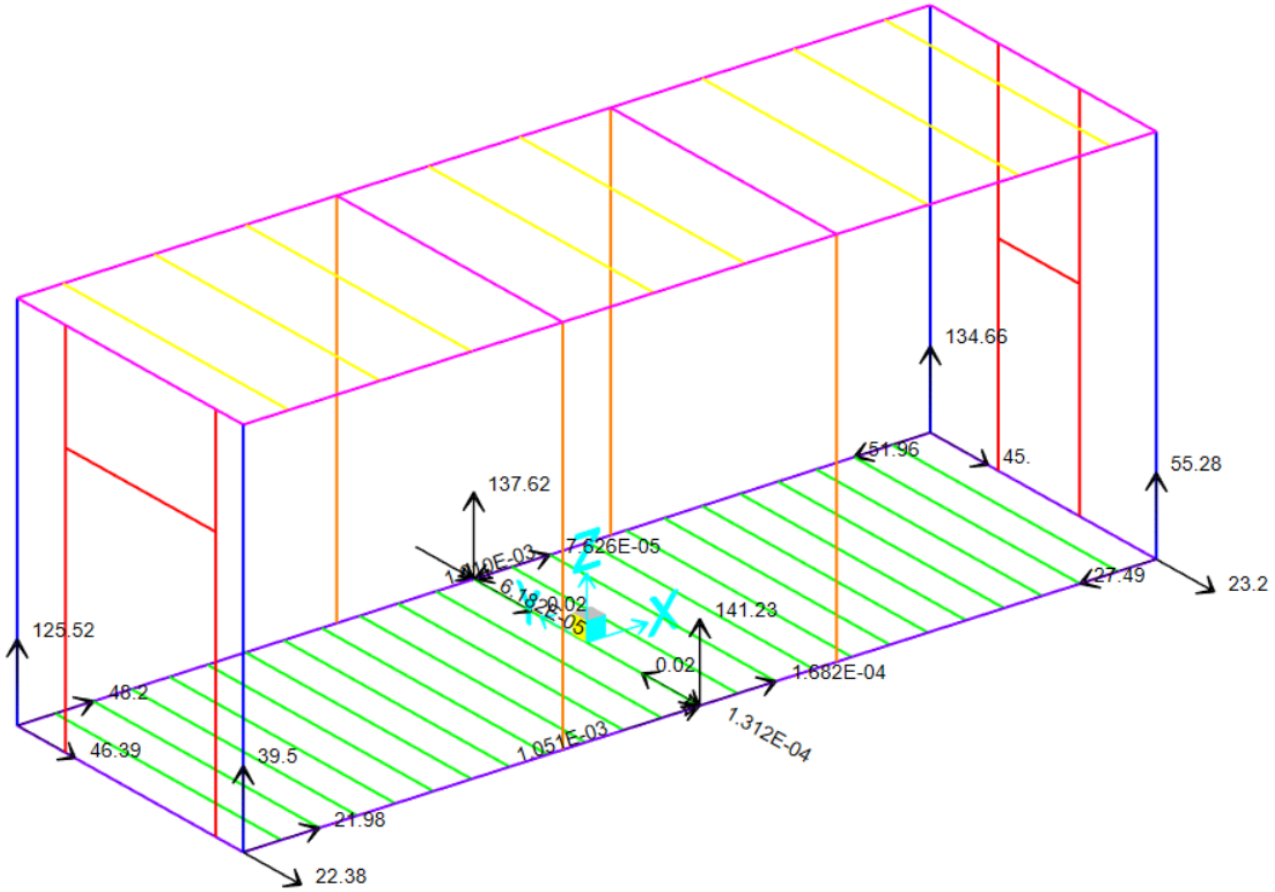
Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F1	DEAD	NonStatic	Last Step	7.06	3.99	20.50	0.00	0.00	0.00
F1	SD	NonStatic	Last Step	13.01	4.55	19.04	0.00	0.00	0.00
F1	LIVE	NonStatic	Last Step	14.07	5.34	39.40	0.00	0.00	0.00
F1	WIND X	NonStatic	Last Step	-11.37	2.10	-9.99	0.00	0.00	0.00
F1	WIND Y	NonStatic	Last Step	-11.97	-27.03	-35.97	0.00	0.00	0.00
F1	NOT X	NonStatic	Last Step	-0.06	-0.01	-0.02	0.00	0.00	0.00
F1	NOT Y	NonStatic	Last Step	-0.03	-0.06	-0.07	0.00	0.00	0.00
F1	SLU LIVE	Combination		49.68	19.93	114.19	0.00	0.00	0.00
F1	SLU WIND X	Combination		22.69	12.58	70.68	0.00	0.00	0.00
F1	SLU WIND Y	Combination		21.98	-22.38	39.50	0.00	0.00	0.00
F1	SLE LIVE	Combination		34.05	13.81	78.85	0.00	0.00	0.00
F1	SLE WIND X	Combination		5.01	2.47	18.67	0.00	0.00	0.00
F1	SLE WIND Y	Combination		4.60	-17.93	0.48	0.00	0.00	0.00
F2	DEAD	NonStatic	Last Step	-7.04	3.97	20.19	0.00	0.00	0.00
F2	SD	NonStatic	Last Step	-13.96	6.14	38.62	0.00	0.00	0.00
F2	LIVE	NonStatic	Last Step	-13.28	3.92	24.14	0.00	0.00	0.00
F2	WIND X	NonStatic	Last Step	-3.45	-2.84	-3.91	0.00	0.00	0.00
F2	WIND Y	NonStatic	Last Step	11.75	-27.17	-35.34	0.00	0.00	0.00
F2	NOT X	NonStatic	Last Step	-0.06	0.01	0.02	0.00	0.00	0.00
F2	NOT Y	NonStatic	Last Step	0.03	-0.06	-0.07	0.00	0.00	0.00
F2	SLU LIVE	Combination		-50.06	20.16	120.32	0.00	0.00	0.00
F2	SLU WIND X	Combination		-45.73	6.00	93.00	0.00	0.00	0.00
F2	SLU WIND Y	Combination		-27.49	-23.20	55.28	0.00	0.00	0.00
F2	SLE LIVE	Combination		-34.31	13.96	82.90	0.00	0.00	0.00
F2	SLE WIND X	Combination		-20.96	-0.94	44.26	0.00	0.00	0.00
F2	SLE WIND Y	Combination		-10.32	-17.97	22.25	0.00	0.00	0.00

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TABLE: Joint Reactions

Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F3	DEAD	NonStatic	Last Step	7.04	-3.98	20.19	0.00	0.00	0.00
F3	SD	NonStatic	Last Step	12.77	-4.86	18.96	0.00	0.00	0.00
F3	LIVE	NonStatic	Last Step	14.04	-5.08	38.74	0.00	0.00	0.00
F3	WIND X	NonStatic	Last Step	-11.51	-2.08	-10.05	0.00	0.00	0.00
F3	WIND Y	NonStatic	Last Step	5.77	-18.59	22.08	0.00	0.00	0.00
F3	NOT X	NonStatic	Last Step	-0.06	0.01	-0.02	0.00	0.00	0.00
F3	NOT Y	NonStatic	Last Step	0.03	-0.06	0.07	0.00	0.00	0.00
F3	SLU LIVE	Combination		49.32	-20.17	112.85	0.00	0.00	0.00
F3	SLU WIND X	Combination		27.47	-26.58	86.97	0.00	0.00	0.00
F3	SLU WIND Y	Combination		48.20	-46.39	125.52	0.00	0.00	0.00
F3	SLE LIVE	Combination		33.81	-13.98	77.93	0.00	0.00	0.00
F3	SLE WIND X	Combination		9.99	-16.56	35.77	0.00	0.00	0.00
F3	SLE WIND Y	Combination		22.09	-28.12	58.25	0.00	0.00	0.00
F4	DEAD	NonStatic	Last Step	-7.06	-3.98	20.32	0.00	0.00	0.00
F4	SD	NonStatic	Last Step	-11.82	-5.83	29.87	0.00	0.00	0.00
F4	LIVE	NonStatic	Last Step	-14.83	-4.17	30.77	0.00	0.00	0.00
F4	WIND X	NonStatic	Last Step	-3.46	2.81	-3.85	0.00	0.00	0.00
F4	WIND Y	NonStatic	Last Step	-5.55	-18.31	21.44	0.00	0.00	0.00
F4	NOT X	NonStatic	Last Step	-0.06	-0.01	0.02	0.00	0.00	0.00
F4	NOT Y	NonStatic	Last Step	-0.03	-0.06	0.06	0.00	0.00	0.00
F4	SLU LIVE	Combination		-49.27	-20.26	117.50	0.00	0.00	0.00
F4	SLU WIND X	Combination		-49.44	-19.65	104.31	0.00	0.00	0.00
F4	SLU WIND Y	Combination		-51.96	-45.00	134.66	0.00	0.00	0.00
F4	SLE LIVE	Combination		-33.80	-14.04	81.05	0.00	0.00	0.00
F4	SLE WIND X	Combination		-24.09	-12.55	52.86	0.00	0.00	0.00
F4	SLE WIND Y	Combination		-25.56	-27.34	70.57	0.00	0.00	0.00
X1	DEAD	NonStatic	Last Step	0.00	0.00	22.31	0.00	0.00	0.00
X1	SD	NonStatic	Last Step	0.00	0.01	48.86	0.00	0.00	0.00
X1	LIVE	NonStatic	Last Step	0.00	0.01	37.09	0.00	0.00	0.00
X1	WIND X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	WIND Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	NOT X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	NOT Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	SLU LIVE	Combination		0.00	0.02	157.92	0.00	0.00	0.00
X1	SLU WIND X	Combination		0.00	0.02	141.23	0.00	0.00	0.00
X1	SLU WIND Y	Combination		0.00	0.02	141.23	0.00	0.00	0.00
X1	SLE LIVE	Combination		0.00	0.01	108.26	0.00	0.00	0.00
X1	SLE WIND X	Combination		0.00	0.01	71.17	0.00	0.00	0.00
X1	SLE WIND Y	Combination		0.00	0.01	71.17	0.00	0.00	0.00
X2	DEAD	NonStatic	Last Step	0.00	0.00	22.38	0.00	0.00	0.00
X2	SD	NonStatic	Last Step	0.00	-0.01	43.73	0.00	0.00	0.00
X2	LIVE	NonStatic	Last Step	0.00	-0.01	40.88	0.00	0.00	0.00
X2	WIND X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	WIND Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	NOT X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	NOT Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	SLU LIVE	Combination		0.00	-0.02	156.02	0.00	0.00	0.00
X2	SLU WIND X	Combination		0.00	-0.02	137.62	0.00	0.00	0.00
X2	SLU WIND Y	Combination		0.00	-0.02	137.62	0.00	0.00	0.00
X2	SLE LIVE	Combination		0.00	-0.01	107.00	0.00	0.00	0.00
X2	SLE WIND X	Combination		0.00	-0.01	66.11	0.00	0.00	0.00
X2	SLE WIND Y	Combination		0.00	-0.01	66.11	0.00	0.00	0.00

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BASE REACTIONS FOR WORST ULS WIND Y CASE (F1 = FX, F2 = FY and F3 = FZ)



MAX FY reaction (SHEAR) = 95 kN

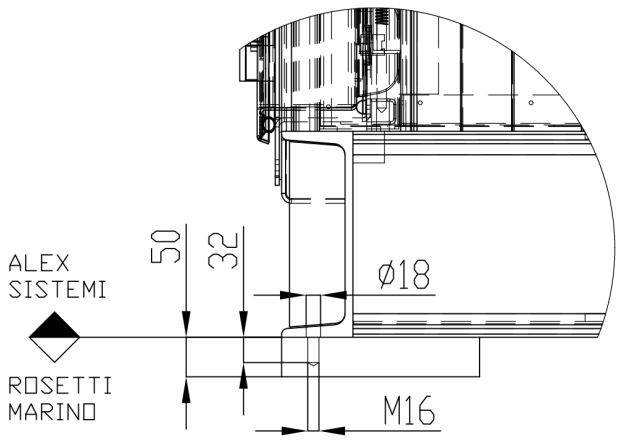
M1 and M2 in the image are values close to zero in according with the boundary conditions and concern only gaps non-linear link elements (as non-linear elements with imposed zero stiffness, the software calculate the value to the limit of zero).

For the fixing at the ground will be considered two M18 bar class 8.8 for hinge.

CORNER ANCHOR BOLT CHECK					
Nc=	0	kN			
Nt=	0	kN			
Vx=	52	kN	Vmax=(Vx^2+Vy^2)^0.5=		
Vy=	45	kN		69	kN
Φb=	18	mm			
SIF*DIF=	1				
fu=	860	Mpa			
Ω blast=	1				
Ab=(π*(Φb-3)^2)/4=		176.715	mm^2		
Abn=0.78*Ab=		137.837	mm^2		
Tension check	Nbu=Nt/2=		0.000	kN	
	Nbn=DIF*fu*Abn=		118.540	kN	
	Nbu/(Ω*Nbn)=		0.000	<1	OK
Shear check	Vbu=Vmax/2=		34.384	kN	
	Vbn=0.6*DIF*fu*Abn=		71.124	kN	
	Vbu/(Ω*Vbn)=		0.483	<1	OK
Combined	(Nbu/1.4/Nbn)+(Vbu/Vbn)=		0.483	<1	OK

The vertical reactions in model are always compression on the ground but in favour of safety is considered tension Nt on bolt.

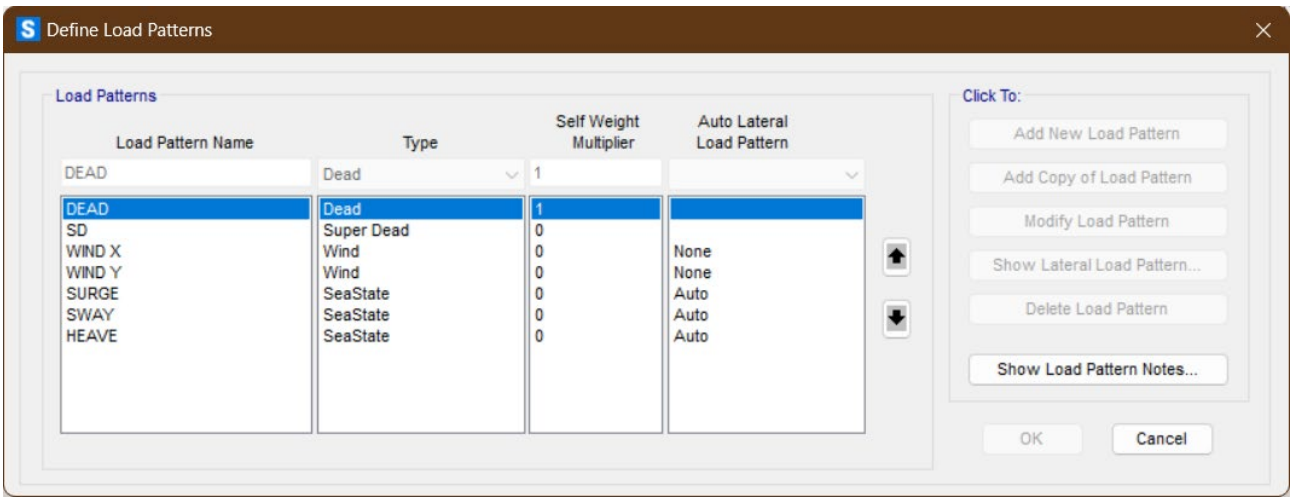
M18 bar verified (worst ULS WIND Y case)



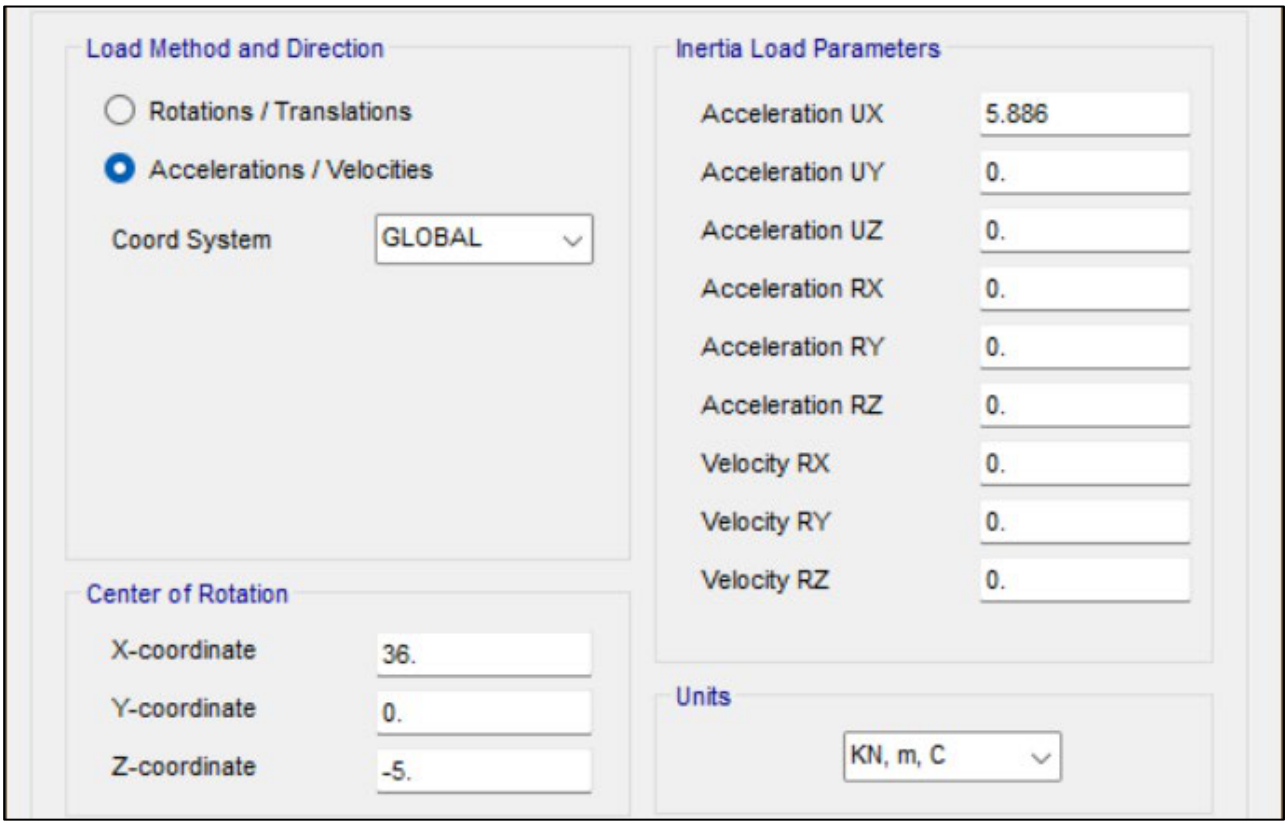
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8 SEA TRANSPORT ANALYSIS

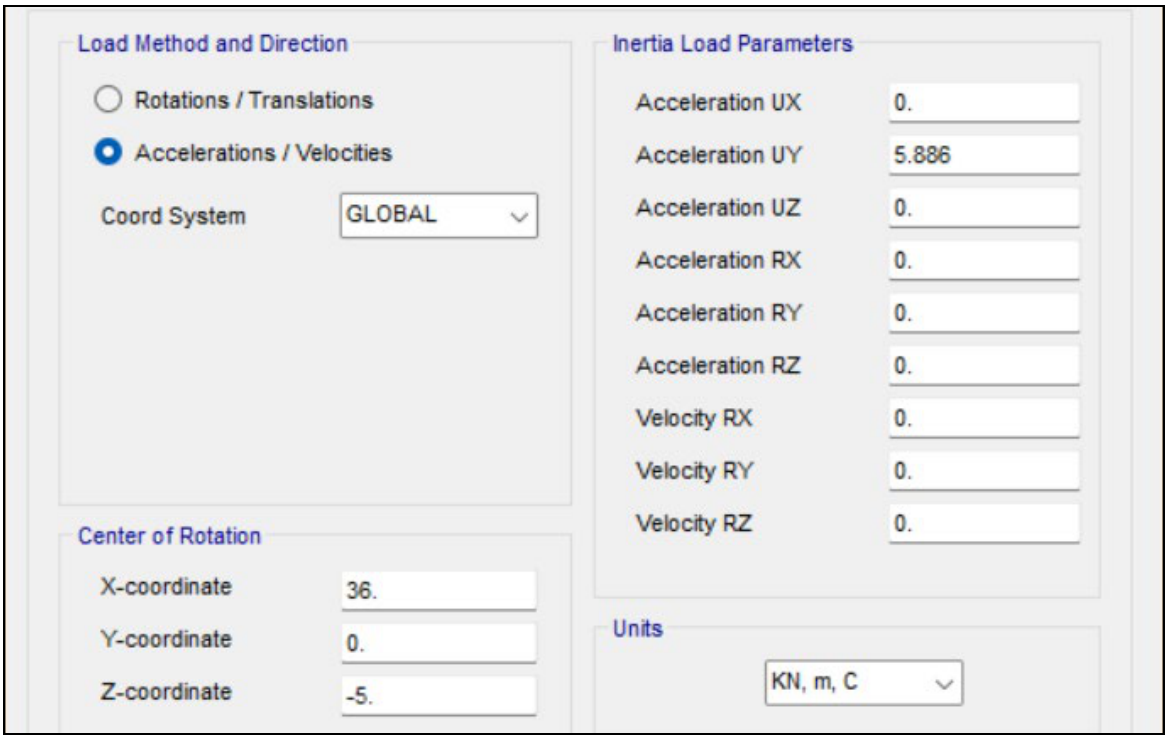
For the sea transport analysis are considered the three translational acceleration as 0.6g for Surge and Sway and 0.5g for Heave. The three accelerations are applied as sea-state loads considering also the center of rotation that is the distances between cog of structure and cog of barge.



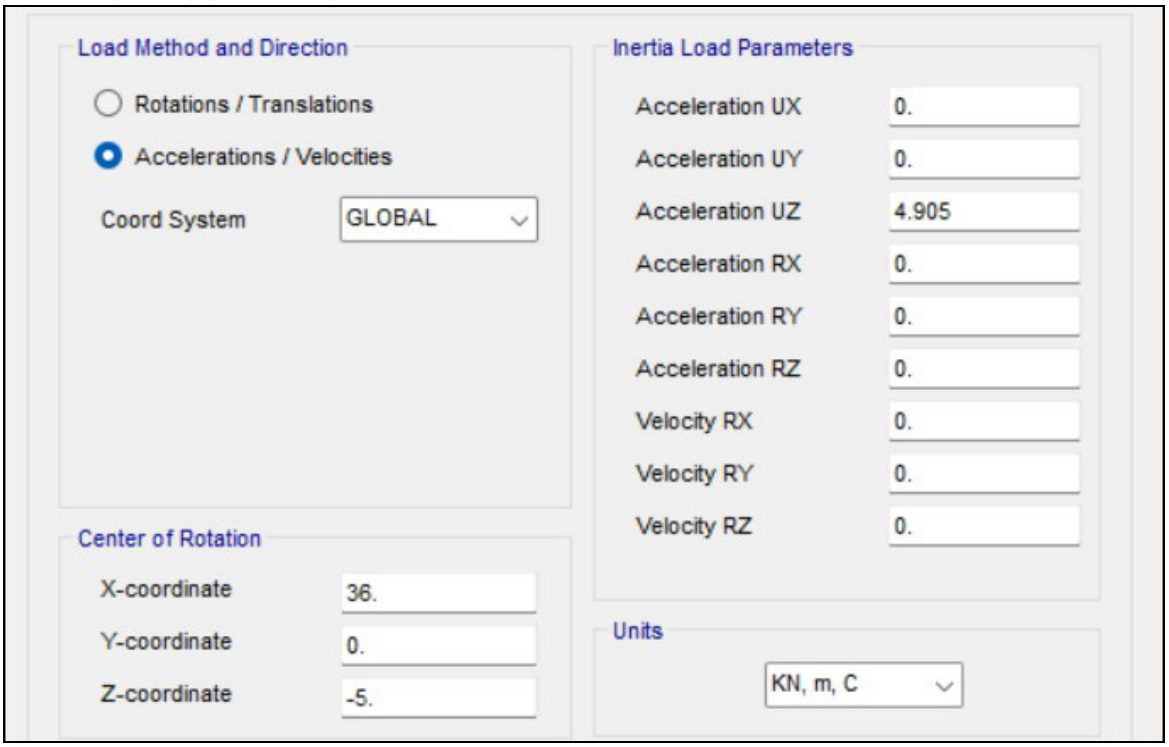
SURGE LONGITUDINAL ACCELERATION

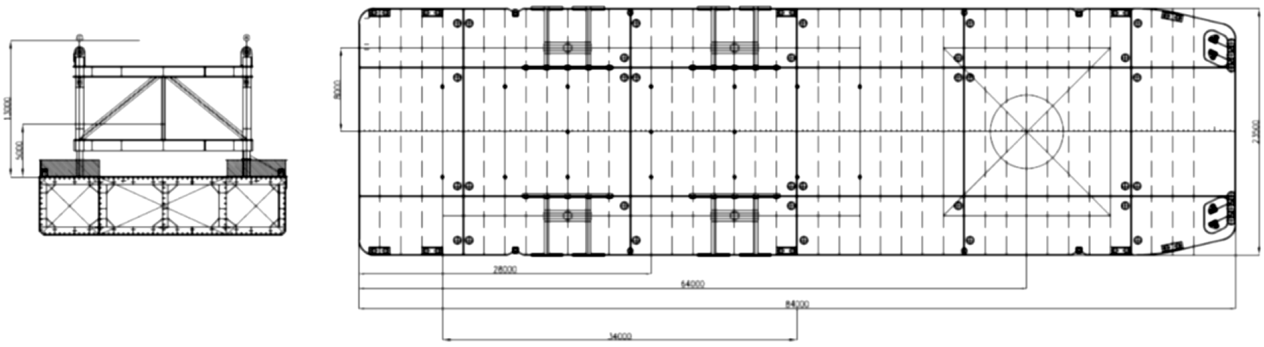


SWAY TRANSVERSAL ACCELERATION



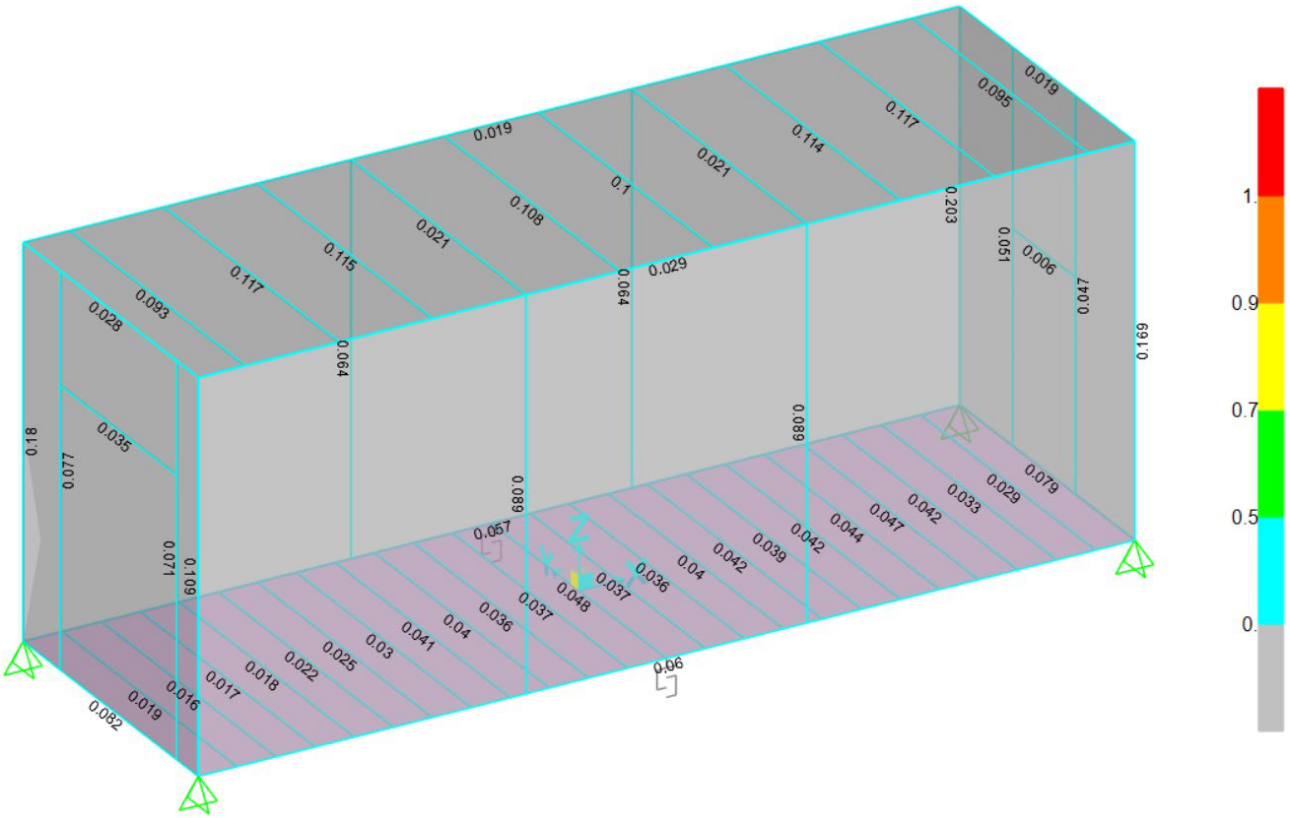
HEAVE VERTICAL ACCELERATION





8.2 STRESS CHECK SEA TRANSPORT

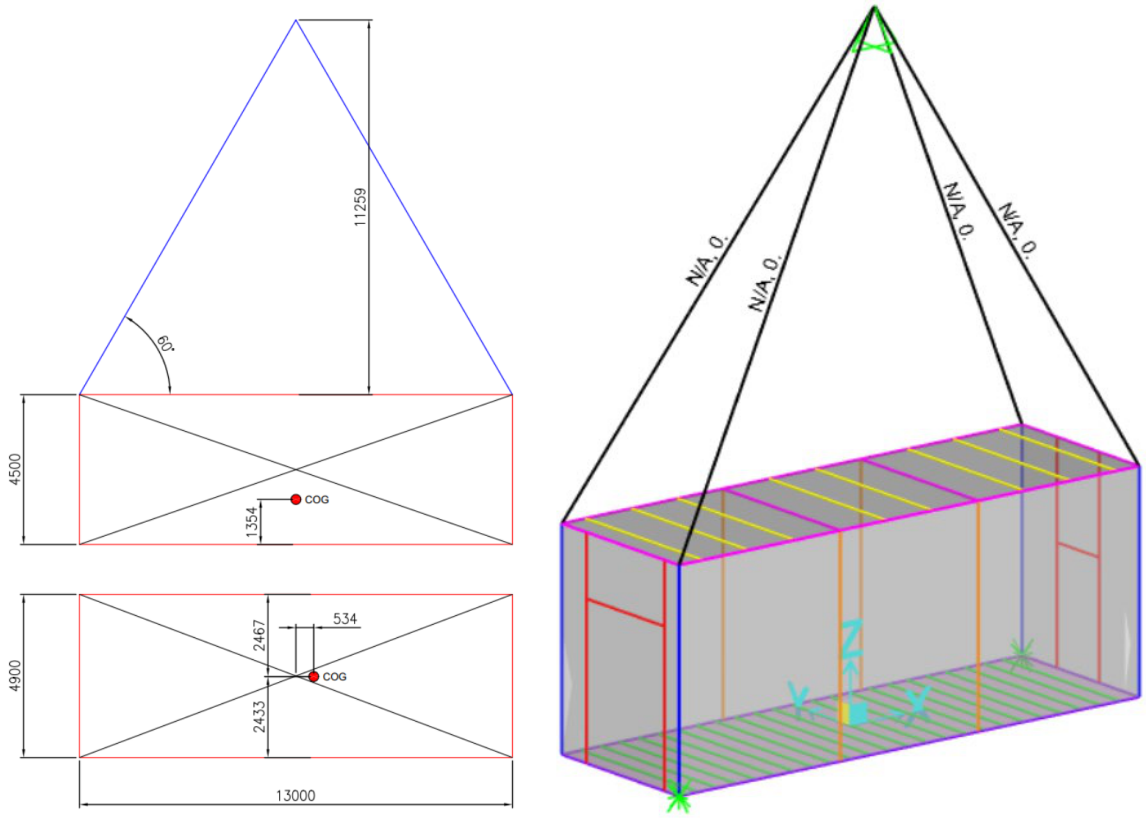
The loads are combined as explained in chapter 4.3 and verified in according with EN 1993.



9 LIFTING ANALYSIS

For lifting analysis, only the weight of shelter (DEAD LOAD AND NO STRUCTURAL LOAD SD in LLC 2 combinations) are considered.

Total weight of shelter is about 33 ton including equipment. Lifting cables are modeled with non-linear elements cables tension-only connected to the top corner points (lifting points) of model in non-linear geometry analysis.



LIFTING SCHEME AND MODEL

TABLE: Base Reactions

OutputCase	CaseType	GlobalFX	GlobalFY	GlobalFZ	GlobalMX	GlobalMY	GlobalMZ	XCentroidFZ	YCentroidFZ	ZCentroidFZ
Text	Text	KN	KN	KN	KN-m	KN-m	KN-m	m	m	m
DEAD	NonStatic	0.000	0.000	125.893	-0.182	0.867	0.000	-0.007	-0.001	1.702
SD	NonStatic	0.000	0.000	199.080	-22.826	-152.551	0.000	0.766	-0.115	0.761
DEAD+SD	Combination	0.000	0.000	324.973	-23.008	-151.684	0.000	0.467	-0.071	1.125

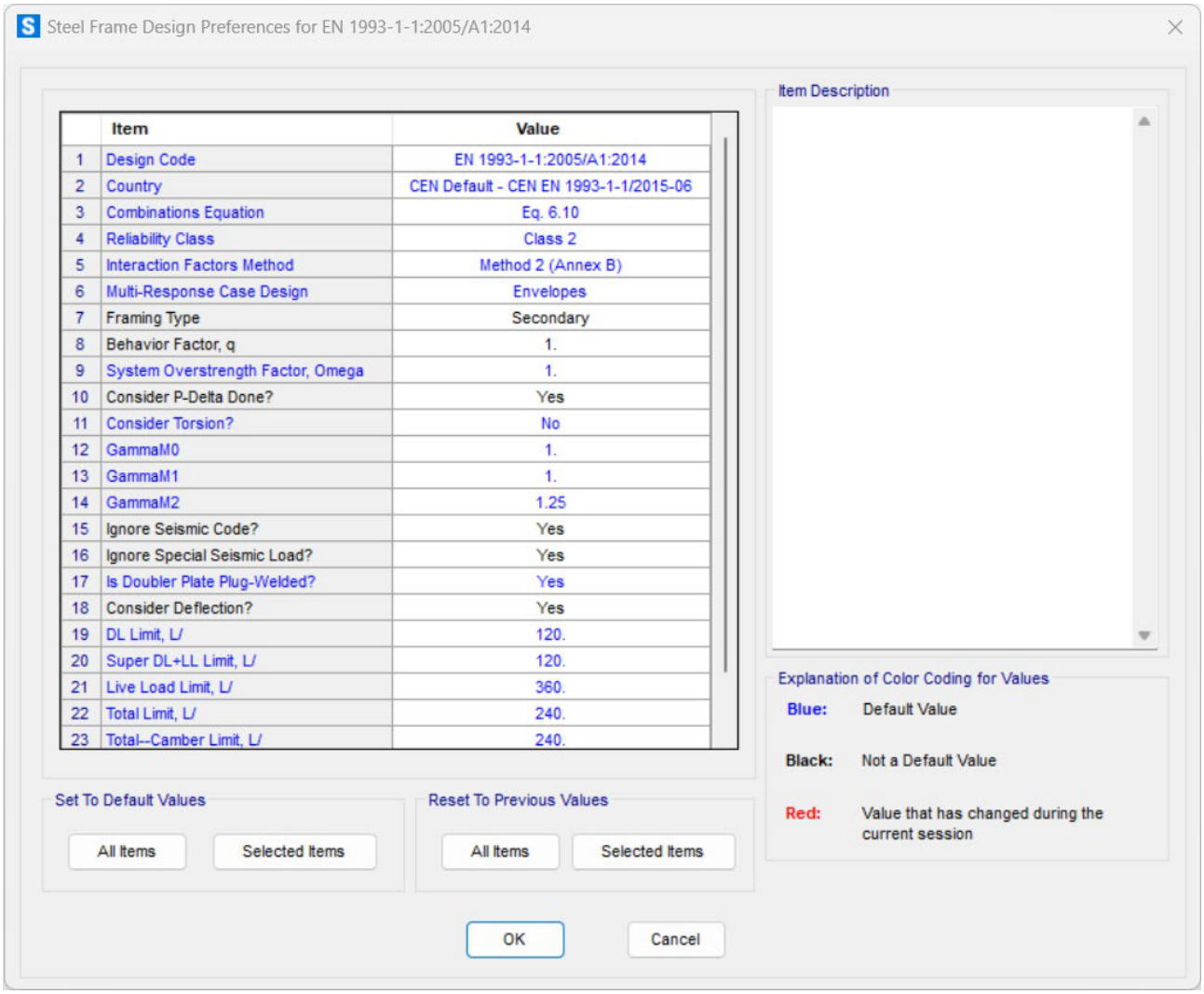
The total weight DEAD + SD was estimated in favor of safety about 33 ton. For the real values refer to the 4.2.1 and 4.2.2 chapters. The red numbers represent the shift in horizontal place for the shackle pin restraints at the top of cables.

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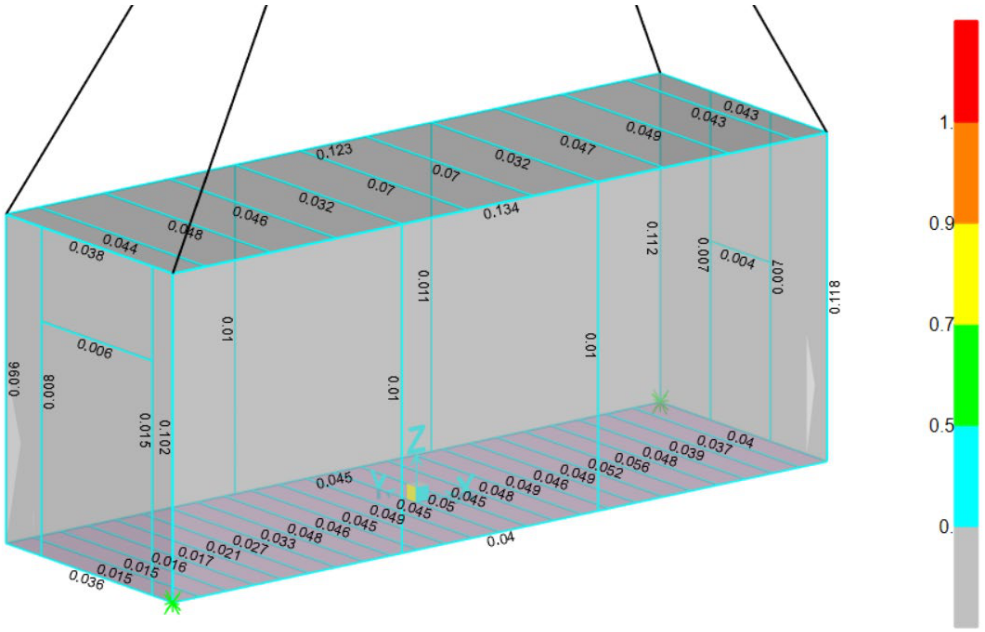
To converge the non-linear analysis results (tension only cables elements) translational XY restrains are added at the bottom corners. These restrains act only against torsional effects on the whole structure acting around the vertical Z axis.

9.2 STRESS CHECK LIFTING

All sections are check and verified in according with EN 1993 combination LLC2. Showed below the detailed printout for each type of section in its combination of maximum stress and the force diagrams with values for roof frames.



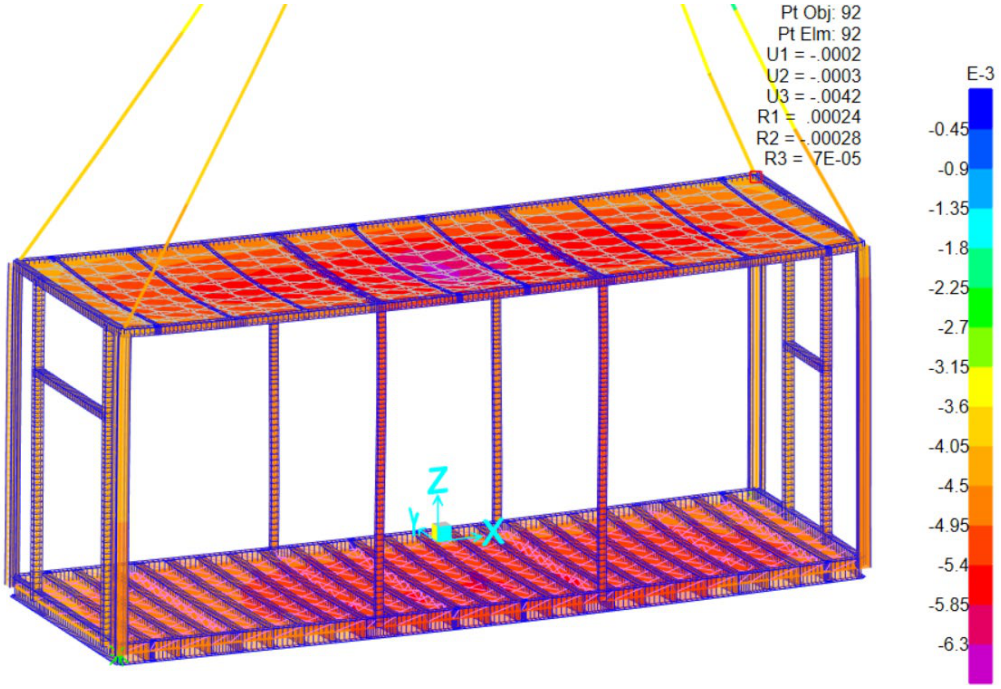
For lifting condition is automatically calculated also the relative deflection and compared with the limit L/240 (for beams). For beams in compression is calculated the lateral torsion buckling limit from code.



CHECK DESIGN FOR ULS LOADS (ORANGE < 1 RATIO)

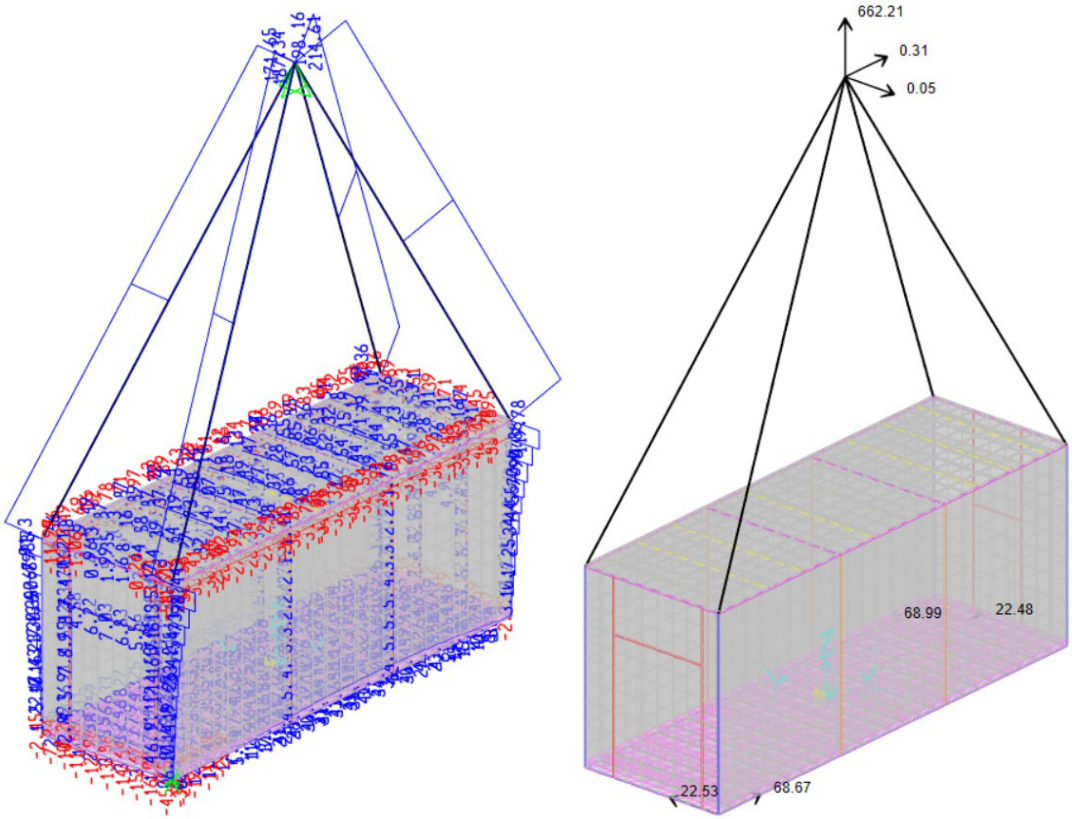
9.3 DISPLACEMENT CHECK LIFTING

For the graphic visualization of absolute displacement is necessary to remove the elongation of cables taken at its connection end with the shelter.



MAX UZ ABSOLUTE DISPLACEMENT FOR LIFTING ROOF BEAM 6.3-4.2 = 2.1 mm < 13000/360 = 36 mm

10 LIFTING HOOK DETAIL CHECK



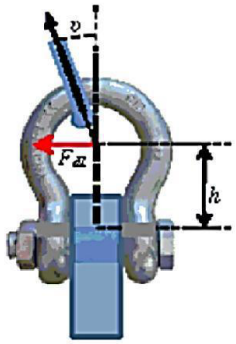
The maximum tension force on cable for lifting stress combination LLC3 (factor 2) is 215 kN.

In the model is applied also the sling load due to the transversal component of tension force. Is added an extra lateral load of 5% 215 kN = 11 kN in the X and Z directions (horizontal in Femap).

This force is applied on the spider node represented the surface contact between shackle and lifting lug. The model is characterized by solid hexahedral elements for a total of 33704 (20218 nodes).

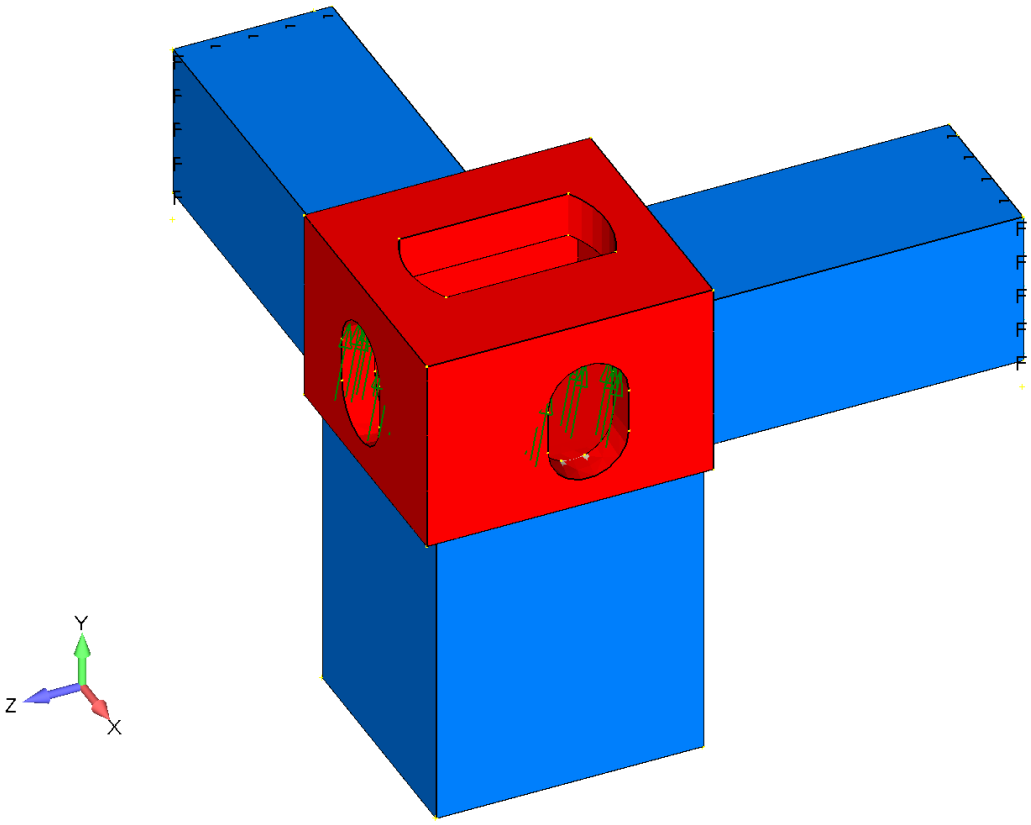
P.2.6.1

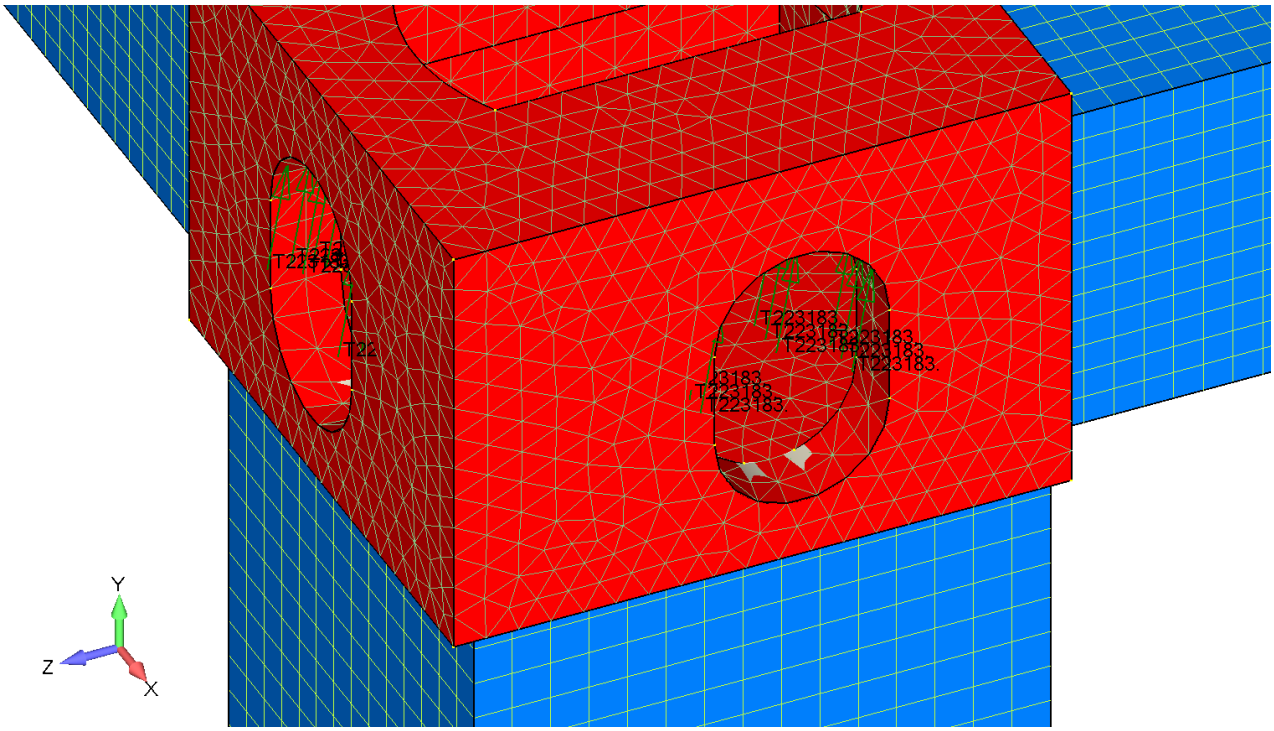
The design loads on the padeye may be calculated as indicated below. The following assumptions apply:



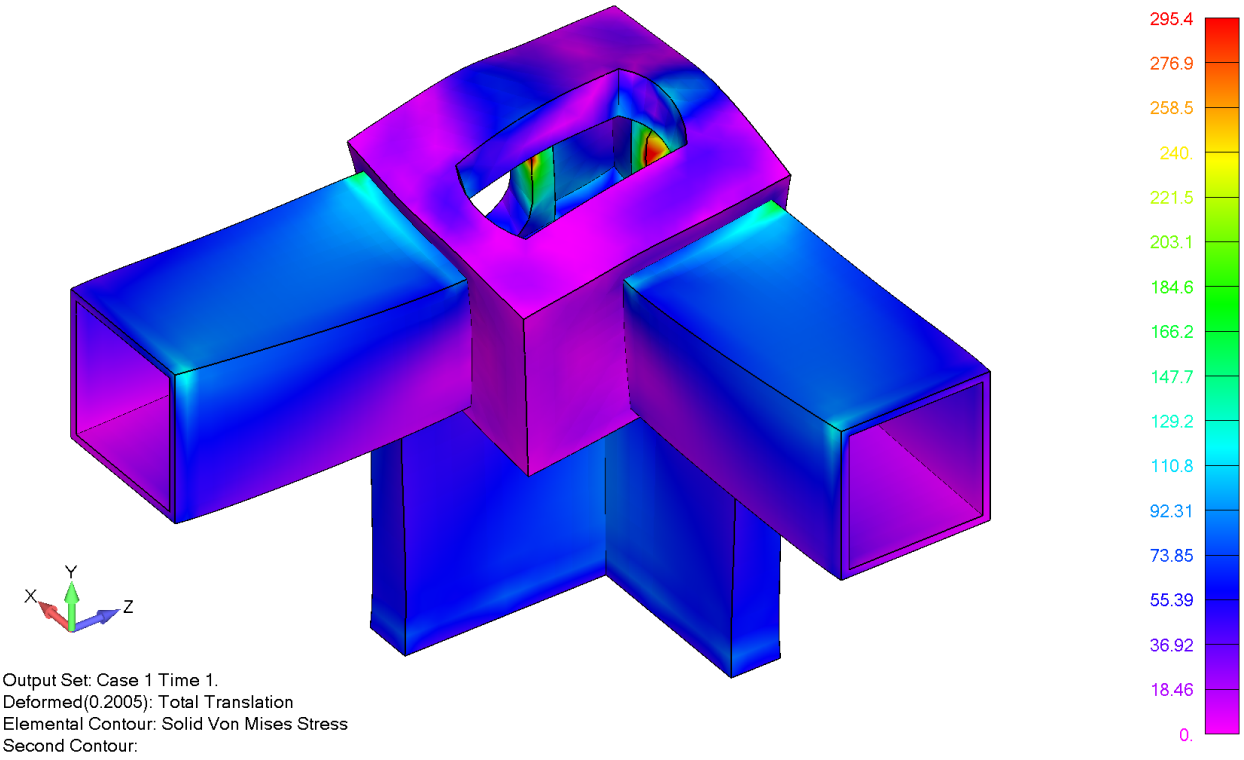
- The sling design load (FSD) is transferred to the padeye through a shackle as indicated on the sketch.
- No friction between sling and shackle.
- The shackle is positioned centric in the padeye.
- Lateral load (F_{dl}) is transferred to the padeye through contact pressure between shackle body and padeye and/or as friction force between pin and padeye. Load resultant is assumed to work at top of pin.
- Moment (M_e) is transferred to the padeye through contact pressure between shackle pin and padeye.

F_d=FSD × cos(v)	F_{dl}=FSD × sin(v)	M_e=F_{dl} × h

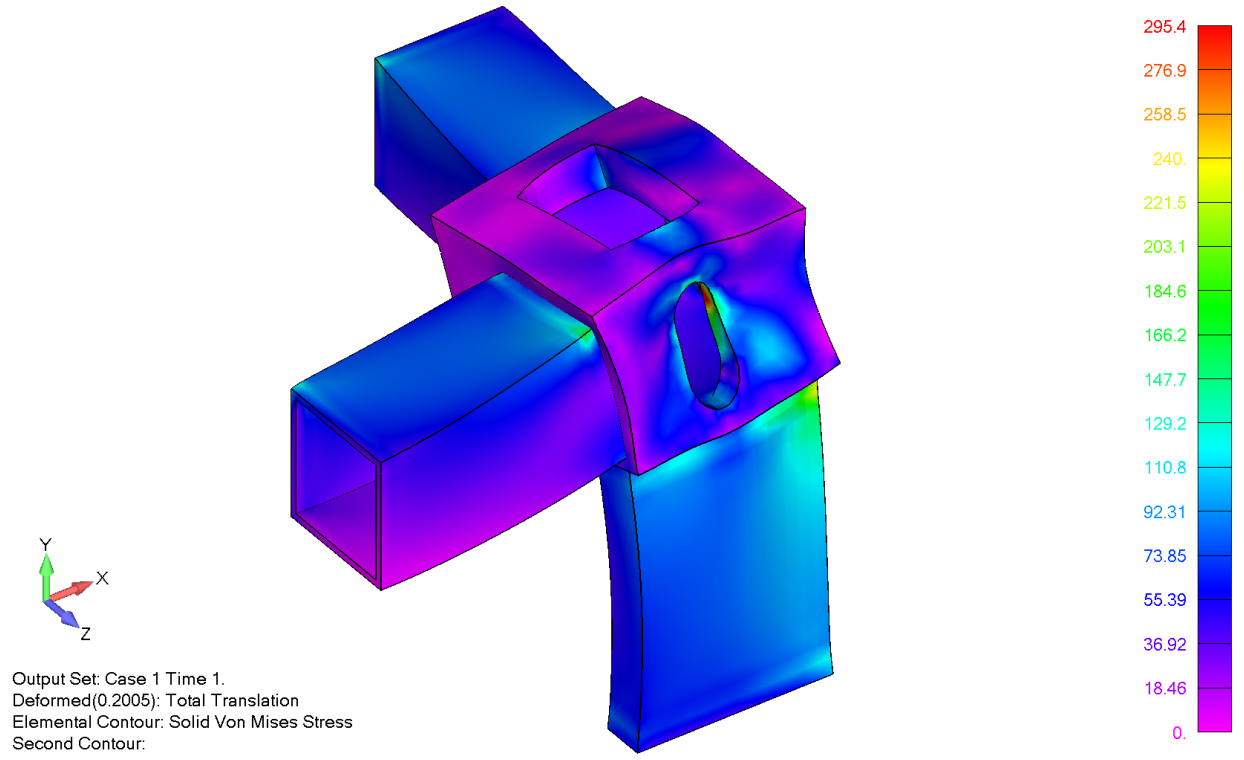




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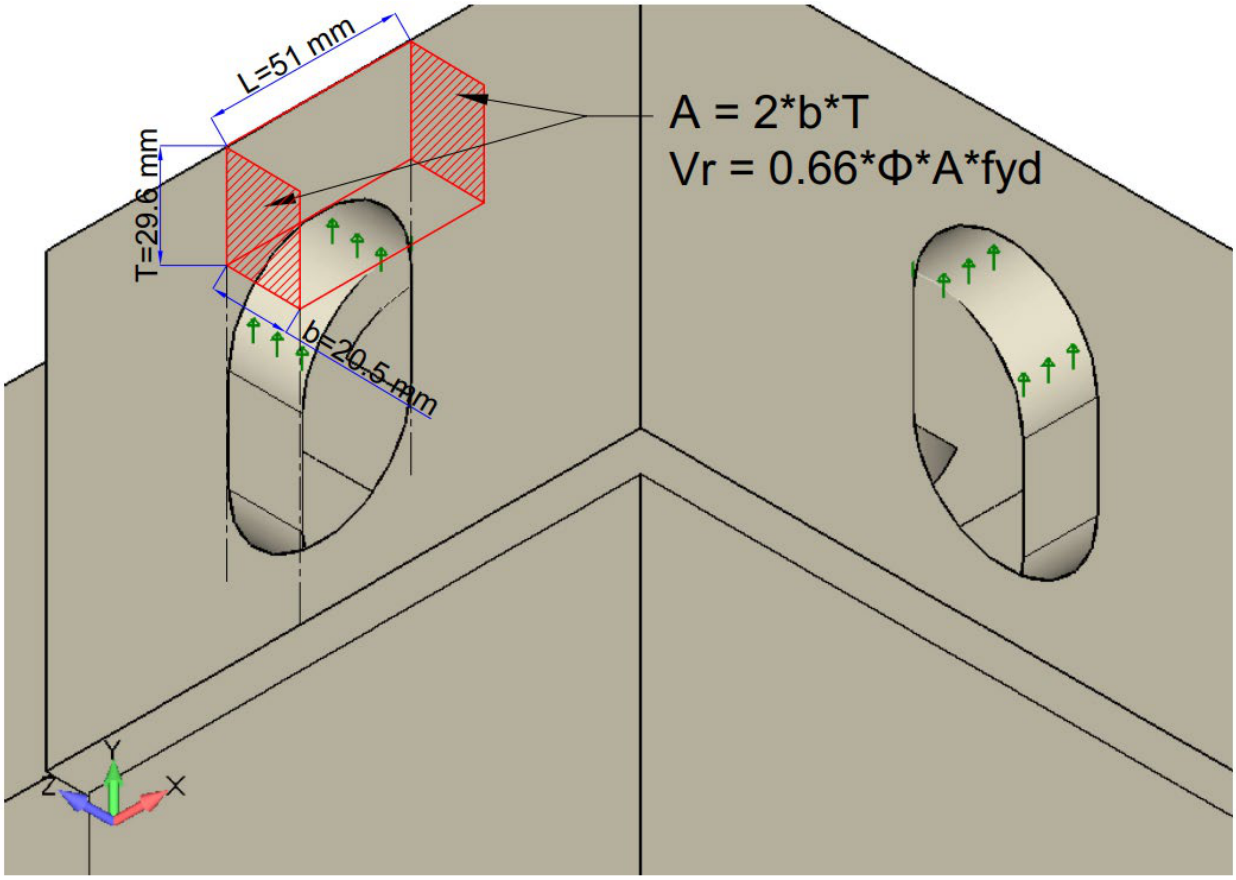
Output Set: Case 1 Time 1.
Deformed(0.2005): Total Translation
Elemental Contour: Solid Von Mises Stress
Second Contour:



Output Set: Case 1 Time 1.
Deformed(0.2005): Total Translation
Elemental Contour: Solid Von Mises Stress
Second Contour:

*MAXIMUM STRESS 295 MPA < 355*0.9 = 320 MPA*

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For shear check of the lifting point subjected to tension from lifting cables, the shear stress is manually checked and compared with the limit value of the steel.

$A = 2*b*T = 2*20.5*29.6 = 1213.6\ mm^2$

$Vr = 0.66*\Phi*A*fyd = 0.66*0.9*1213.6*355 = 255912\ N = 256\ kN > 215\ kN$ **(Verified)**

11 CONCLUSIONS

All structural components of cabin are verified. The stresses and displacements are compatible with the real behaviour and the structure is capable of supporting of assigned load.

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	01/07/2024

Base Load Power Hub (BLPH)

B-300 STRUCTURAL CALCULATION - E&I SHELTERS

Document Number:

1724000049-ST-CA-00008

Document Class: 2

2	11/06/2024	Accepted for Construction (AFC)	FB	SKV	OA
1	21/05/2024	Accepted for Construction (AFC)	FB	SKV	OA
0	24/04/2024	Issue for Review (IFR)	FB	SKV	OA
Rev.	Date	Description	Prepared	Reviewed	Approved

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
1	Accepted for Construction (AFC)
2	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.2 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.2.1 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

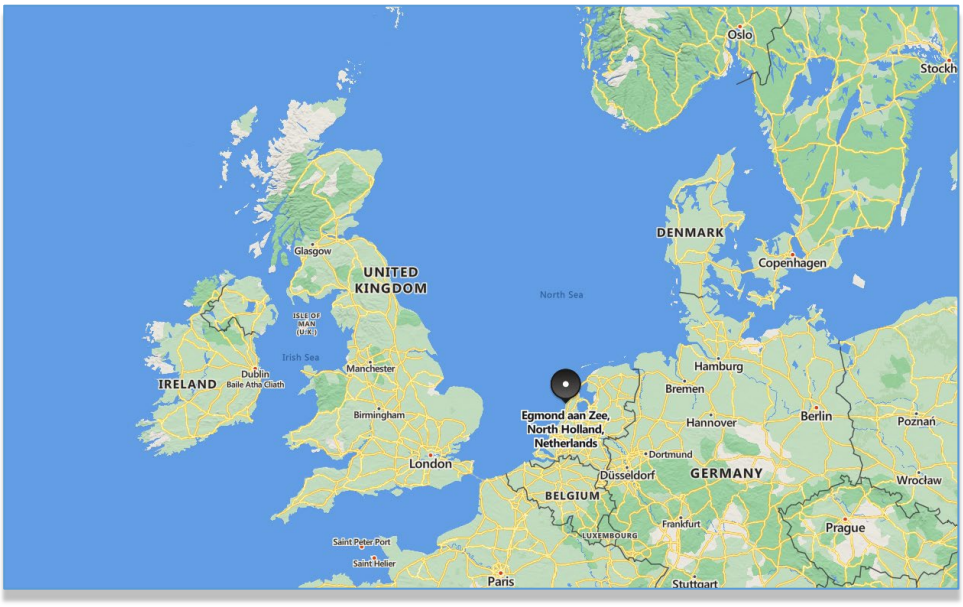


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.2.2 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

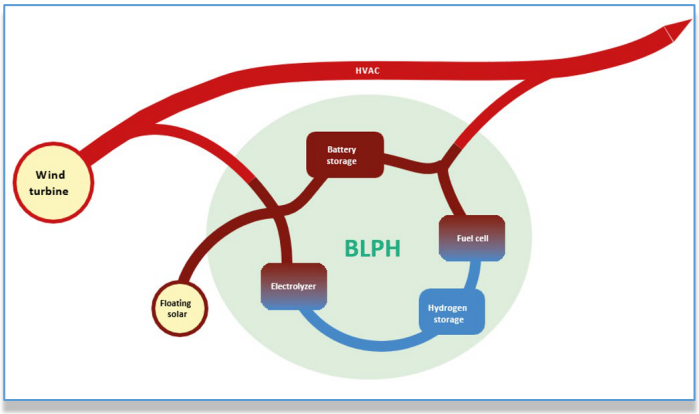


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

Structural report.

2.2 REFERENCES

Doc. No.	Description
123A90-DDL-ST-SP-90017 Rev.01	Structural design basis
123A90-DDL-IN-DL-40012 Rev.01_OPEN	BLPH off-shore iter equipment layout

Table 1 - Reference Documents

2.3 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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3 PURPOSE OF WORK

The B300 (UPS equipment room), which is the object of the following report, has been design and build by Alex Sistemi S.p.A.

This calculation report describes the structural analysis of steel room, that will be placed off the coast of Netherlands near the town of Egmond aan Zee. This report summarizes the results of the analyses performed to evaluate the actual stress path and strength verification on the cabin in the worst condition among those feasible.

The following conditions have been considered for the analyses:

- Dead load;
- Live load;
- Wind load;
- Sea transport;
- Lifting.

The structure has been diagrammed so as to allow calculation by use of a computer program for finite element analysis. The structure has been calculated using SAP2000 v.25 for the finished elements (FEM) and Femap Nastran 2401 for solid models of lifting lug and corrugated panel.

1.1 CODES AND STANDARDS

For structural ULS, SLS and lifting design of has been used Eurocodes.

- EN 1993-1-1 2005 Eurocode specifications for steel building;
- 0027 ND rev. 11 Guideline for lifting Noble Denton.

1.2 UNITS

- Density [kg/m^3];
- Length [m], [mm];
- Mass [kg], [ton]= 1000 [kg];
- Force [N], [kN] = 1000 [N];
- Area Load [kN/m^2];
- Temperature [°C];
- Stress [MPa] = [N/mm^2];

1.3 MATERIALS

- Framing structure and panelling EN S355J0:
  - Modulus of elasticity E=210000 N/mm^2
  - Modulus of rigidity G=81000 N/mm^2
  - Tensile stress breakage fr>=470 N/mm^2
  - Yield stress fy=355 N/mm^2

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- Ultimate elongation percentage A=22%

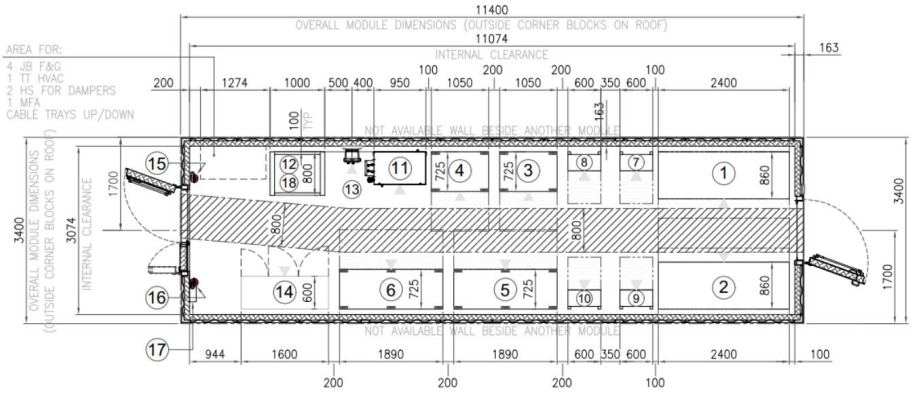
- **Welding steel dependent of welded section material:**
  - Structural steel with a yield stress of at least 300 MPa matching electrode ultimate tensile strength X_u=490 N/mm^2.

- **Bolting ASTM A325:**
  - Tensile ultimate stress fu=830 N/mm^2
  - Yield stress fy=660 N/mm^2

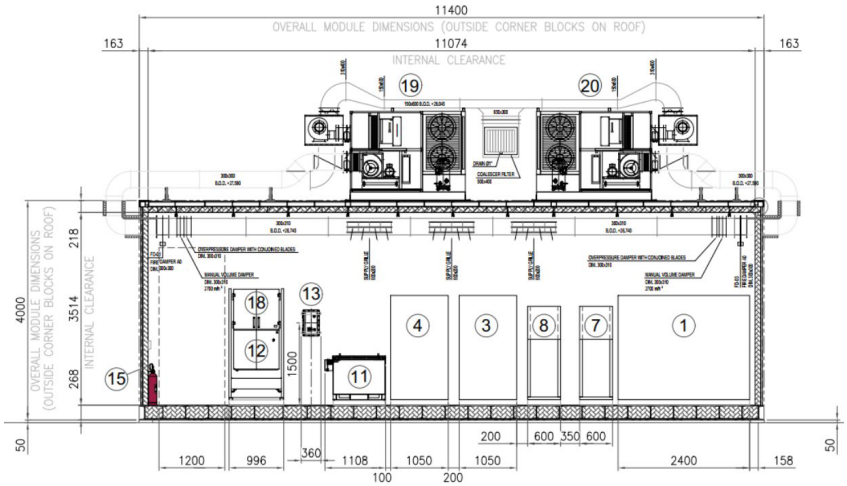
1.4 GENERAL DESCRIPTION

The structure has finished dimensions:

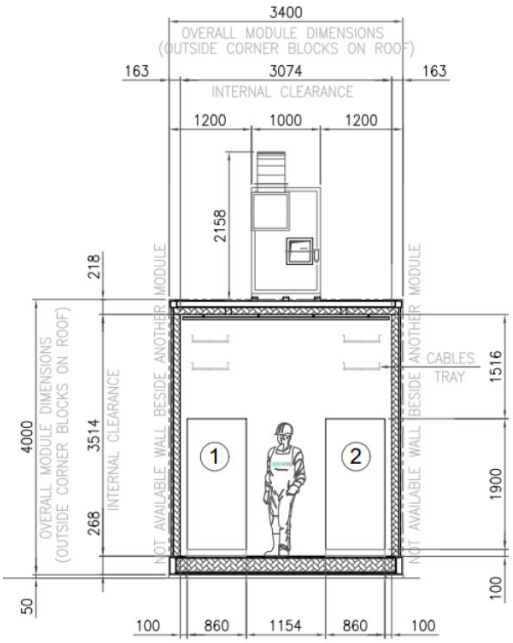
- Maximum lenght: 11400 mm;
- Maximum width: 3400 mm;
- Height: 4000 mm.



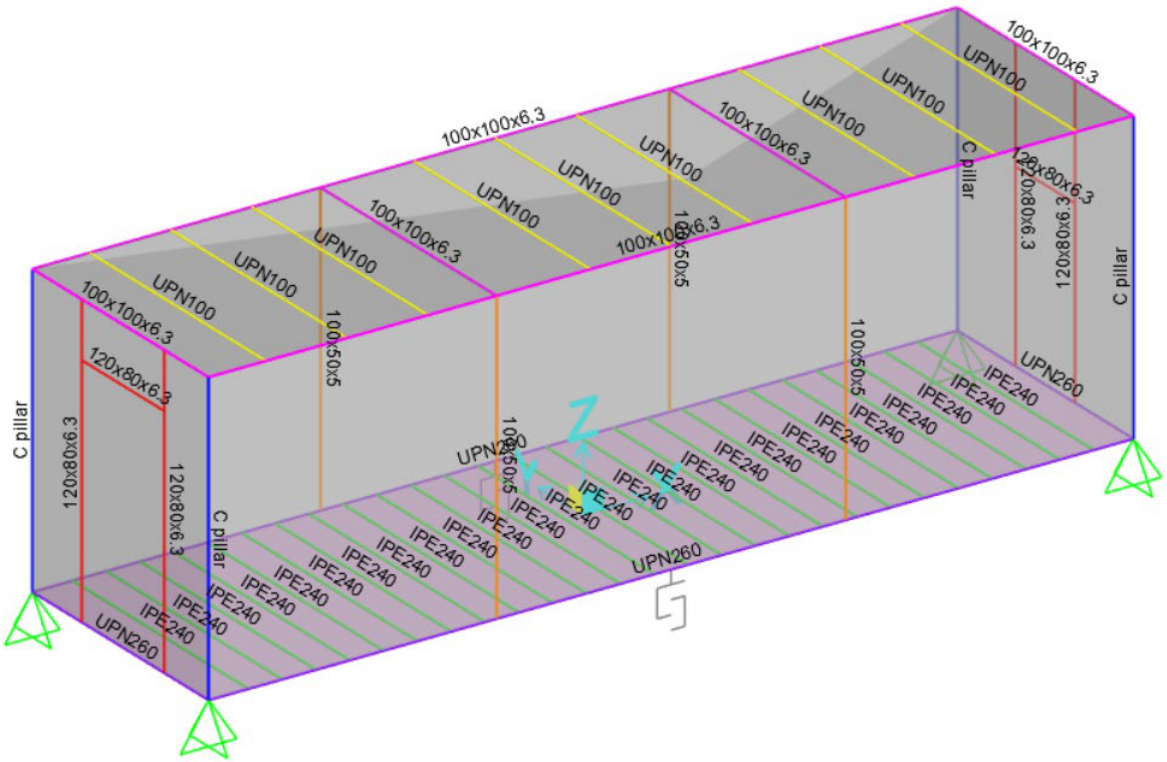
PLAN VIEW

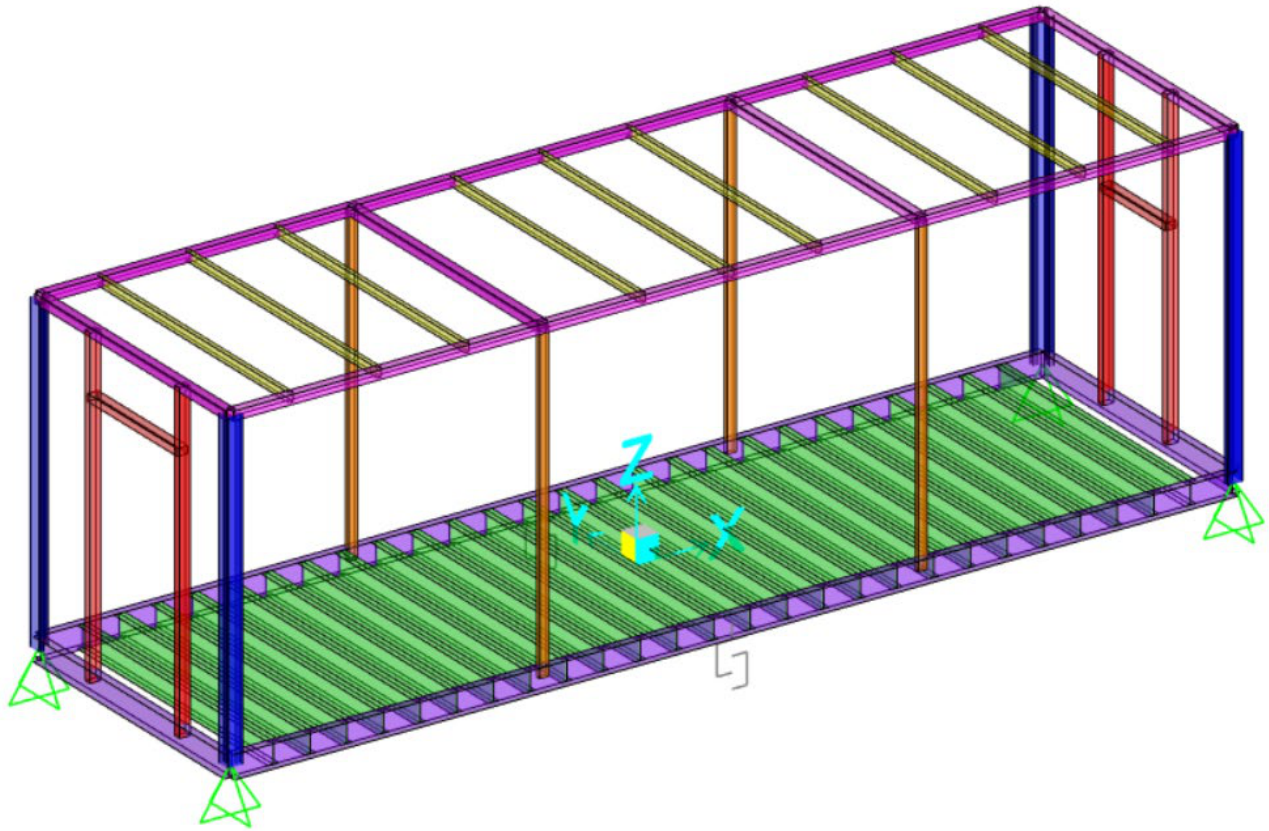


LONG SIDE VIEW



Below is shown the summary of all sections, also identified by color.





- Corrugated wall sheet thickness 3 mm;
- Roof sheet stave thickness 6 mm;
- Floor metal sheet thickness 6 mm.

TABLE: Area Section Properties

Section	Material	MatAngle	AreaType	Type	DrillDOF	Thickness	BendThick	Color	TotalWt	TotalMass
Text	Text	Degrees	Text	Text	Yes/No	m	m	Text	KN	KN-s2/m
Corrugate 3mm	S355	0	Shell	Shell-Thin	Yes	0.003	0.003	Gray	36.631	3.74
Metal sheet 6mm	S355	0	Shell	Shell-Thin	Yes	0.006	0.006	Gray	20.215	2.06
Roof stave 6mm	S355	0	Shell	Shell-Thin	Yes	0.006	0.006	Gray	21.9	2.23

TABLE: Area Section Properties

Section	F11Mod	F22Mod	F12Mod	M11Mod	M22Mod	M12Mod	V13Mod	V23Mod	MMod	WMod
Text	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless
Corrugate 3mm	1	1	1	1	261	1	1	1	1.5	1.5
Metal sheet 6mm	1	1	1	1	1	1	1	1	1.2	1.2
Roof stave 6mm	1	1	1	1	613	1	1	1	1.3	1.3

The mass and weight multiplier for the flat sheet representing the C-stave wall, is evaluated about 90% more than the equivalent flat sheet of the same thickness (4 mm of thickness) as is possible to see on the following pages.

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The structural skeleton is made with combinations of different types of section, listed below:

TABLE: Frame Section Properties 01 - General

SectionName	Material	Shape	t3	t2	tf	tw	t2b	tfb	FilletRadius	Area	TorsConst
Text	Text	Text	m	m	m	m	m	m	m	m2	m4
100x100x6.3	S355	Box/Tube	0.10	0.10	0.01	0.01			0.00	0.00	0.00
100x50x5	S355	Box/Tube	0.10	0.05	0.01	0.01			0.00	0.00	0.00
120x80x6.3	S355	Box/Tube	0.12	0.08	0.01	0.01			0.00	0.00	0.00
C pillar	S355	SD Section								0.00	0.00
IPE240	S355	I/Wide Flange	0.24	0.12	0.01	0.01	0.12	0.01	0.02	0.00	0.00
UPN100	S355	Channel	0.10	0.05	0.01	0.01			0.01	0.00	0.00
UPN260	S355	Channel	0.26	0.09	0.01	0.01			0.01	0.00	0.00

TABLE: Frame Section Properties 01 - General

SectionName	I33	I22	I23	AS2	AS3	S33Top	S33Bot	S22Left	S22Right	Z33	Z22
Text	m4	m4	m4	m2	m2	m3	m3	m3	m3	m3	m3
100x100x6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100x50x5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120x80x6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C pillar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IPE240	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPN100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPN260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE: Frame Section Properties 01 - General

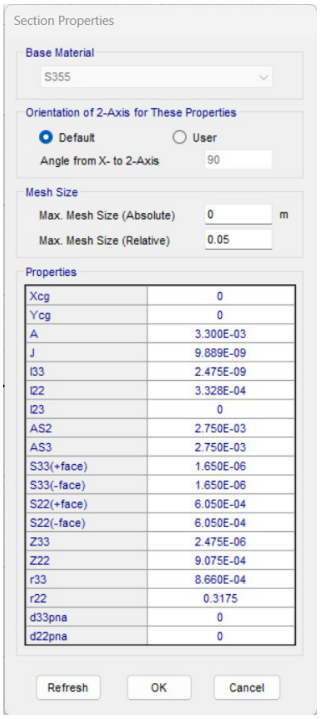
SectionName	R33	R22	CGOffset3	CGOffset2	EccV2	EccV3	Cw	IncludeSCAn	ConcCol	ConcBeam	Color
Text	m	m	m	m	m	m	m6	Yes/No	Yes/No	Yes/No	Text
100x100x6.3	0.04	0.04	0.00	0.00	0.00	0.00	0.00		No	No	Magenta
100x50x5	0.04	0.02	0.00	0.00	0.00	0.00	0.00		No	No	Orange
120x80x6.3	0.04	0.03	0.00	0.00	0.00	0.00	0.00		No	No	Red
C pillar	0.06	0.06	0.02	0.02	0.00	0.00	0.00		No	No	Blue
IPE240	0.10	0.03	0.00	0.00	0.00	0.00	0.00		No	No	Green
UPN100	0.04	0.01	0.01	0.00	0.03	0.00	0.00	Yes	No	No	Yellow
UPN260	0.10	0.03	0.02	0.00	0.05	0.00	0.00	Yes	No	No	Purple

TABLE: Frame Section Properties 01 - General

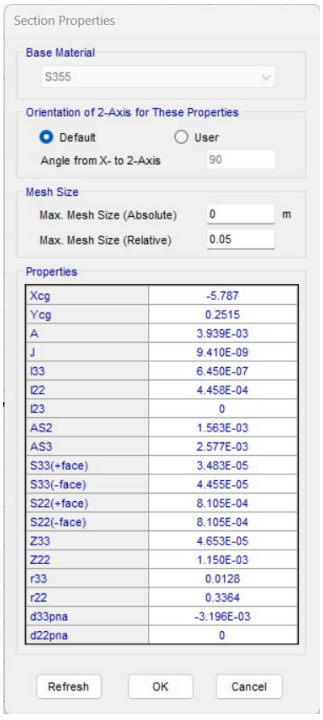
SectionName	TotalWt	TotalMass	FromFile	AMod	A2Mod	A3Mod	JMod	I2Mod	I3Mod	MMod	WMod
Text	KN	KN-s2/m	Yes/No	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless
100x100x6.3	6.47	0.66	No	1	1	1	1	1	1	1	1
100x50x5	1.561	0.16	No	1	1	1	1	1	1	1	1
120x80x6.3	3.102	0.32	No	1	1	1	1	1	1	1	1
C pillar	3.202	0.33	No	1	1	1	1	1	1	1	1
IPE240	25.039	2.55	Yes	1	1	1	1	1	1	1	1
UPN100	2.984	0.3	Yes	1	1	1	1	1	1	1	1
UPN260	10.848	1.11	Yes	1	1	1	1	1	1	1	1

The roof and wall assembly C profile modules is modelled with a flat plate with flexural stiffness calibrated on a specific FEM comparative model and consequently increased weight by a multiplier in the property (see column MMOD and WMOD in the previous tables → I33 ration between the real section and flat section).

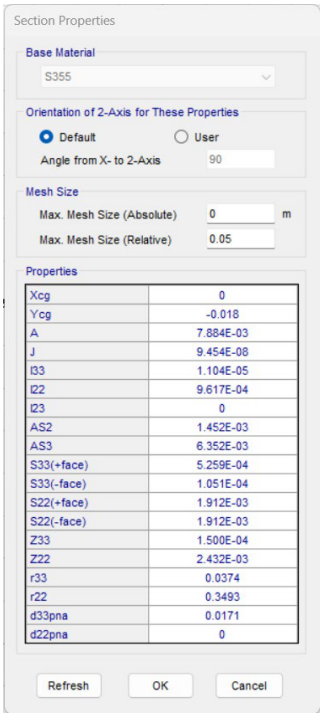
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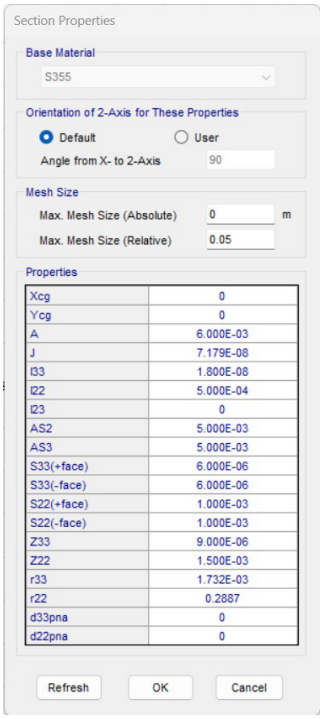
REAL MODELS FOR WALL



CALIBRATED MODELS FOR WALL



REAL MODELS FOR ROOF



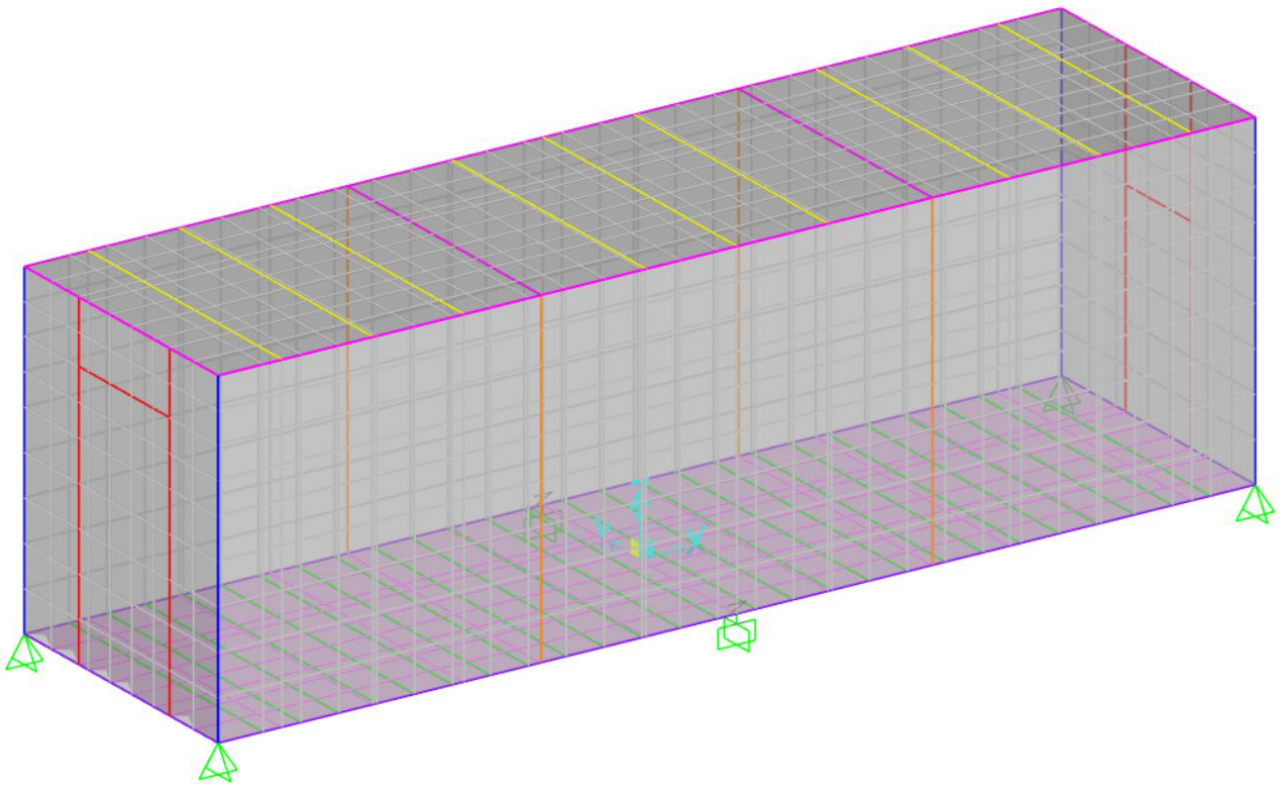
CALIBRATED MODELS FOR ROOF

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4 NUMERICAL MODEL

The analyses were performed using SAP2000 v25 Advanced.

Mono-dimensional (beam) and bi-dimensional (shell) elements were used to create the model.



ANALYSIS MESHED MODEL

The model was developed to analyse the components of steel structure, in particular:

- The C module panel sheet was modelled as equivalent shell with specific stiffness;
- The frame was modelled using mono-dimensional elements with cross section.

The wall and roof sheet forming the cover, is simplified as element flat shell but was given a stiffness, in the direction of the warping of the ribs, equivalent to the ratio between the inertia of the real section and the inertia of flat sheet. In this way it was possible to obtain a realistic displacement of the material under loads. In tensional terms it was necessary to evaluate the effective bound (considered by the software on the inertia of the flat section) as the ratio between the moment on linear meter, agent in the warping direction of the rib and the section modulus W of the real section, obtaining a maximum bound in line with the results of the software tension for orthogonal plate direction (Jcorrugated/Jflat). This aspect can be bypassed by analyzing detailed models for walls and cover including ribs. This approach also allows to consider the structural behavior of the wall together with the elements constituting the frame like a sort of compound section.

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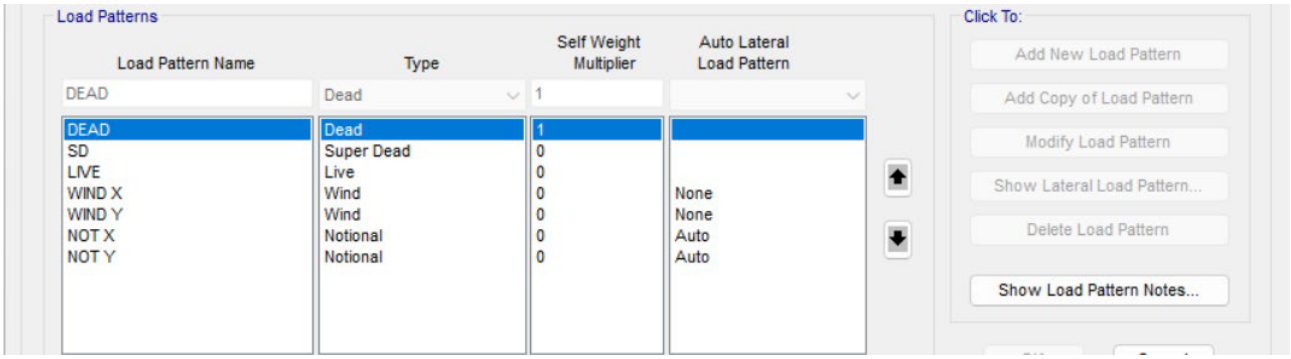
In order to apply the increase of stiffness on the shells so that it can be correctly distributed also on the surrounding frames, it is necessary to discretize the flat elements with a certain mesh and Sap will provide appropriate automation for the frames. The loads are applied as uniform to shell (meshed) for panels with structural function in order to also consider the contribution of the latter in the distribution and as uniform to frames for floor and deck where the plate area have only function as load distributors.

As regards the middle supports for perimeter beam UPN260, they are represented with GAP links and therefore all load combinations are converted into non-linear in order to take into account the contribution to only compression given from them (non-linear geometry analysis).

4.2 DESIGN LOADING

4.2.1 Dead load

The DEAD LOADS or permanent structural loads of steel FAR are calculated automatically (is considered an additional 3% for connections and NOTIONAL as 0.002 ratio of DEAD).



4.2.2 Super dead load

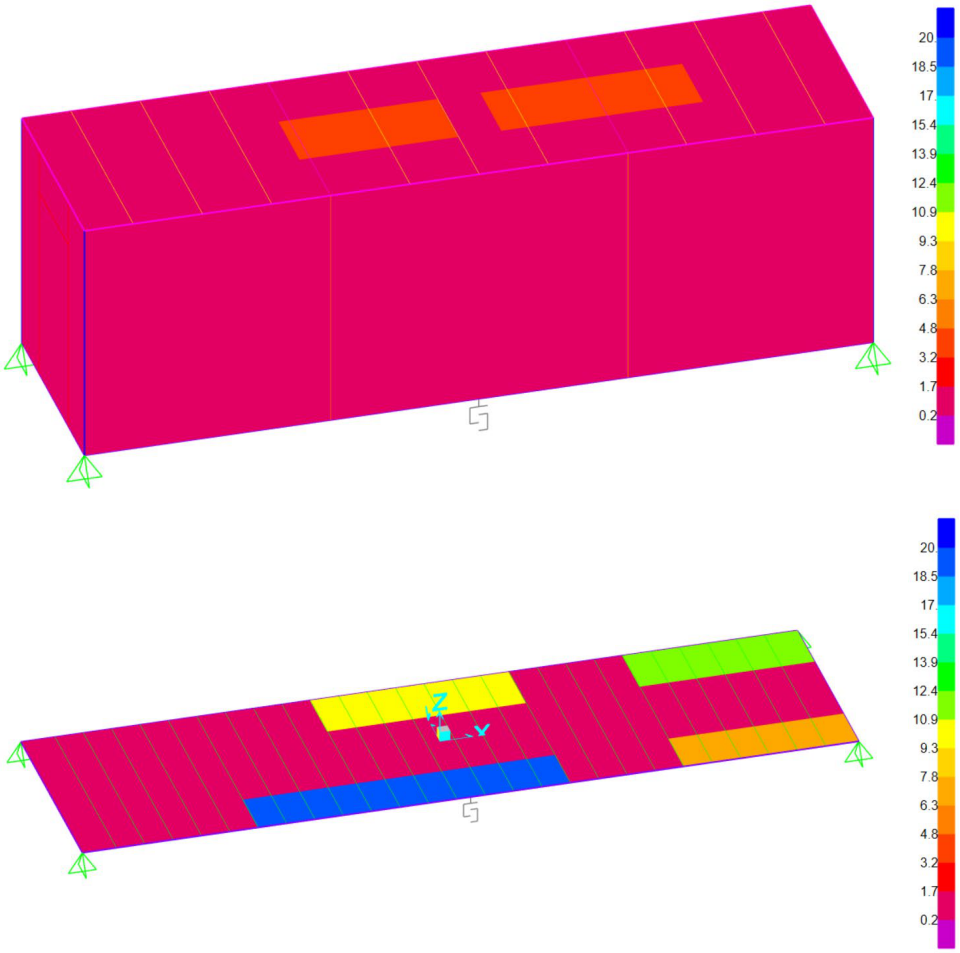
All non structural or SUPER DEAD LOADS on walls 20 kg/m^2 on roof 50 kg/m^2 load and floor 50 kg/m^2.

The weight of internal racks is calculated by data provided by customer and their overall dimensions, therefore simplified in favor of safety with a loading area in the model. The relevant equipments are switchgear and its GIS for two imprint respectively 9.4 m^2 and 7.4 m^2 for two distributed loads 8 kN/m^2 for switchgear and 3.5 kN/m^2 for GIS. For other equipment is in favor of safety to consider the live load instead of SD load.

In particular for HVAC units of roof, considering the worst condition 4 kN/m^2 for the foot-print 2 m^2 and 1 kN/m^2 for the conducts in extra areas. In these areas isn't applied live load.

	B300 [kg]
Metal structure	13518
Insulating panels wall roof	2947
Insulating panels floor	685
Insulating door A5	23
Insulating door A6	/
Insulating door C4	41
Insulating door D4	/
Total DEAD + INSULATION	17215

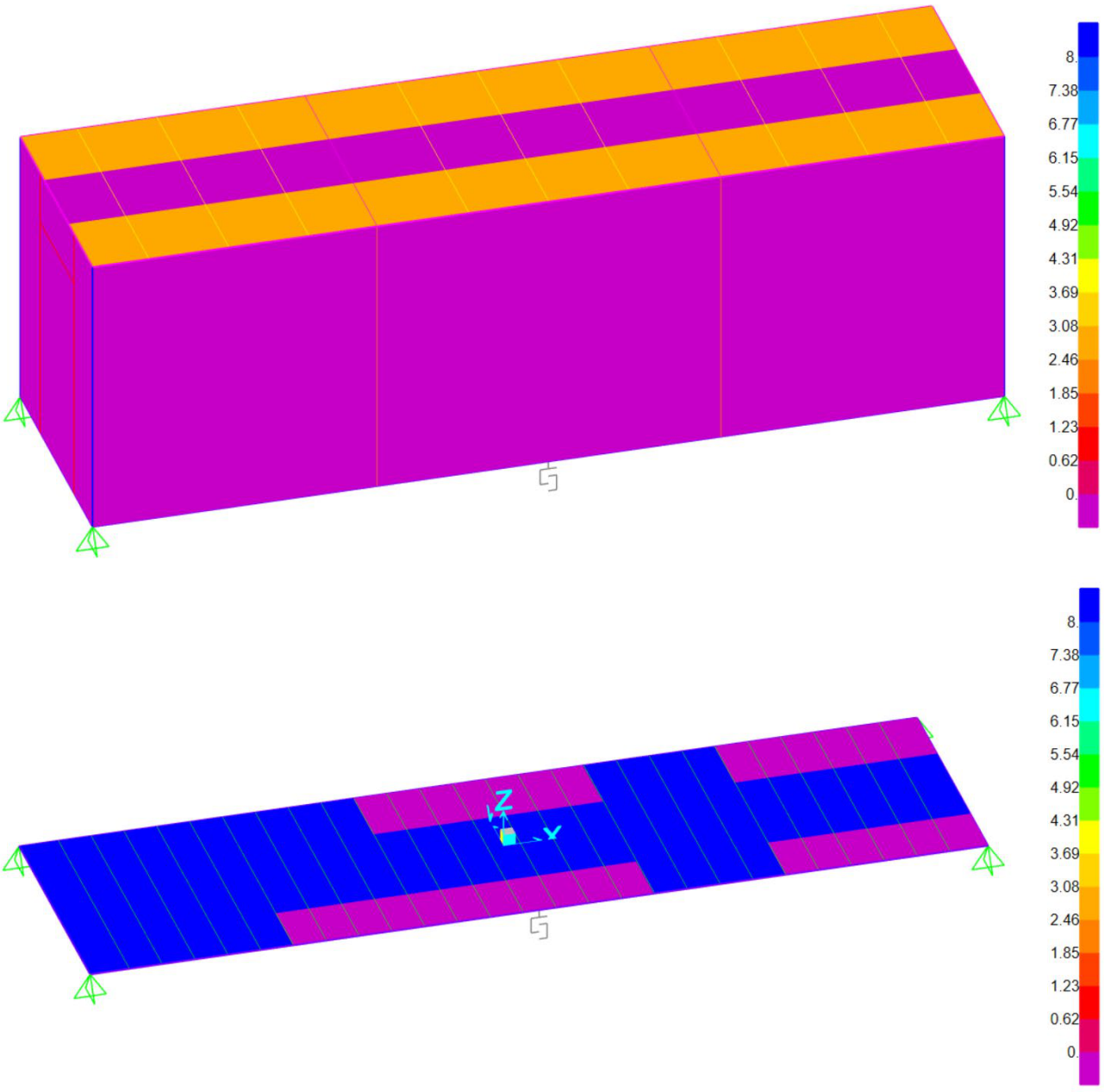
EQUIPMENT LIST						
REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)
	UP-200F3	AC UPS 35kVA	2400	860	1915	2258
2	UP-200F4	AC UPS 15kVA	2400	860	1915	1530
3	BA-200F3A	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914
4	BA-200F3B	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914
5	BA-200F4A	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429
6	BA-200F4B	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429
7	CB-200F3A	ISOLATOR BOX AC UPS 35kVA	600	300	800	100
8	CB-200F3B	ISOLATOR BOX AC UPS 35kVA	600	300	800	100
9	CB-200F4A	ISOLATOR BOX AC UPS 15kVA	600	300	800	100
10	CB-200F4B	ISOLATOR BOX AC UPS 15kVA	600	300	800	100
11	NC-200F2	NAVAID PANEL	1180	810	675	500
12	BA-200F2	BATTERY BOX NAVAID	1000	500	1135	325
13	CB-200F2	ISOLATOR BOX NAVAID	500	400	765	70
14	B3000-HSB-001	DISTRIBUTION & HVAC PANEL - AC/UPS ROOM	1600	600	2300	350
15	-	EYE WASH STATION	228	80	290	5
16	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
17	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
18	BC-200F2	BATTERY CHARGER NAVAID	607	607	2157	500
19	HHU-77003A	AIR HANDLING UNIT A	2100	1000	2158	840
20	HHU-77003B	AIR HANDLING UNIT B	2100	1000	2158	840



SUPER DEAD LOADS APPLIED IN MODEL [kN/m²]

4.2.3 Live load

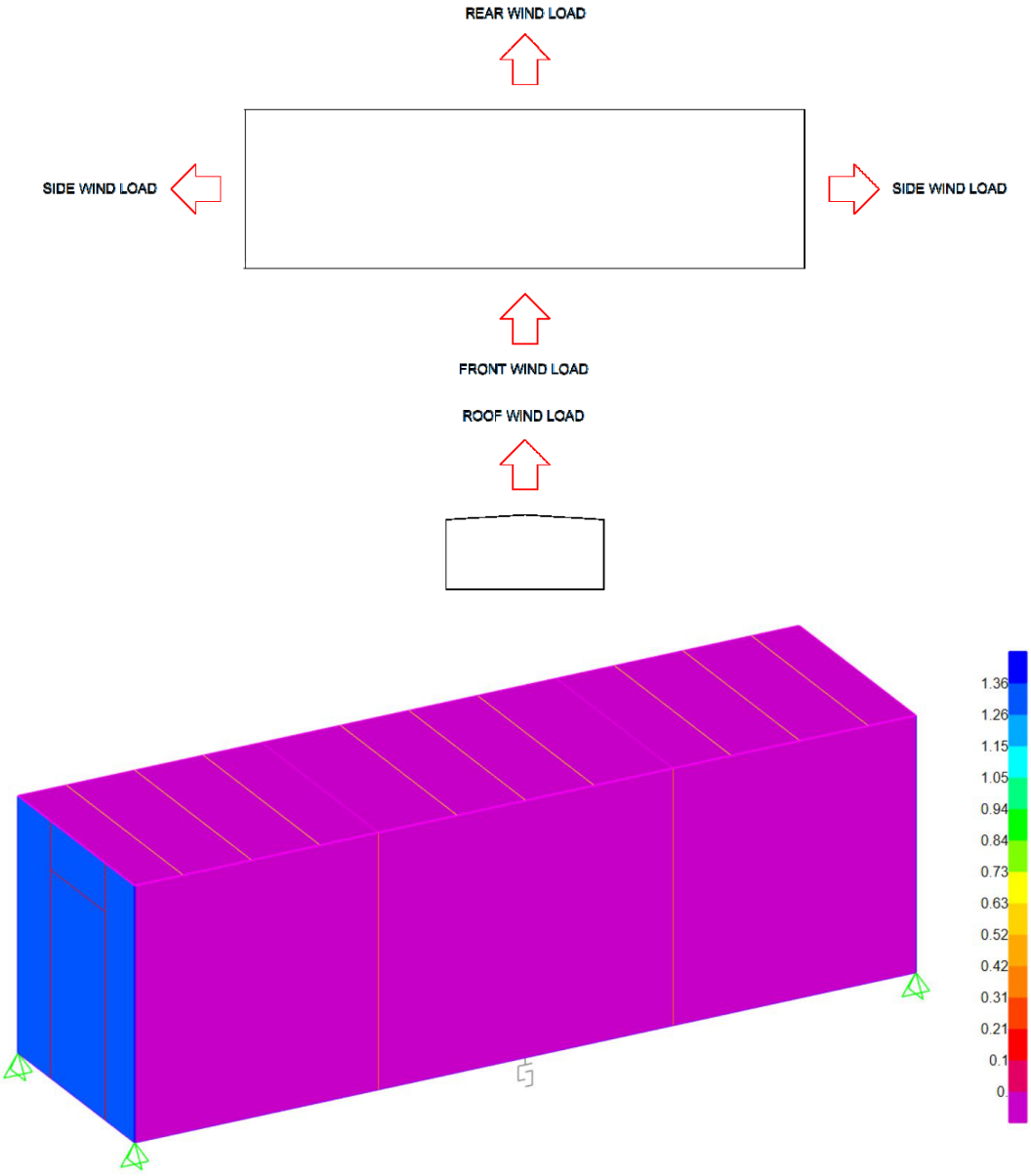
The LIVE LOADS are distributed in areas not loaded with cabinets or internal components. All loads are rounded up and equal to 2.5 kN/m^2 for roof and 8 kN/m^2 for internal floor.



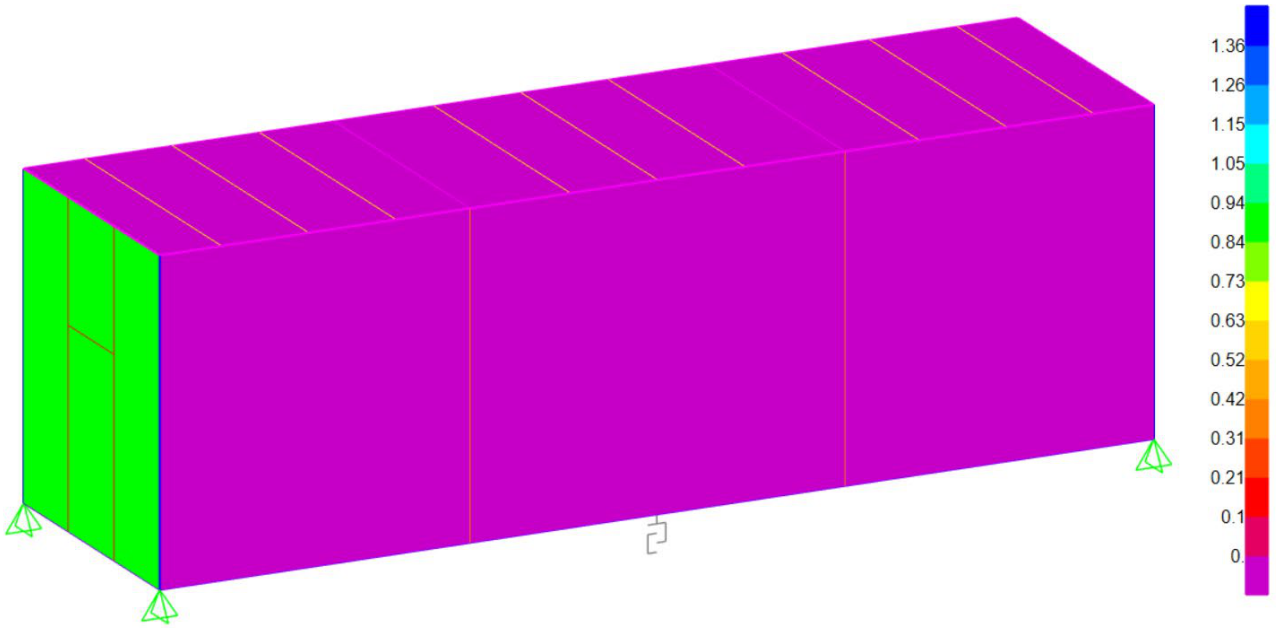
LIVE LOAD APPLIED IN MODEL [kN/m^2]

4.2.4 Wind load

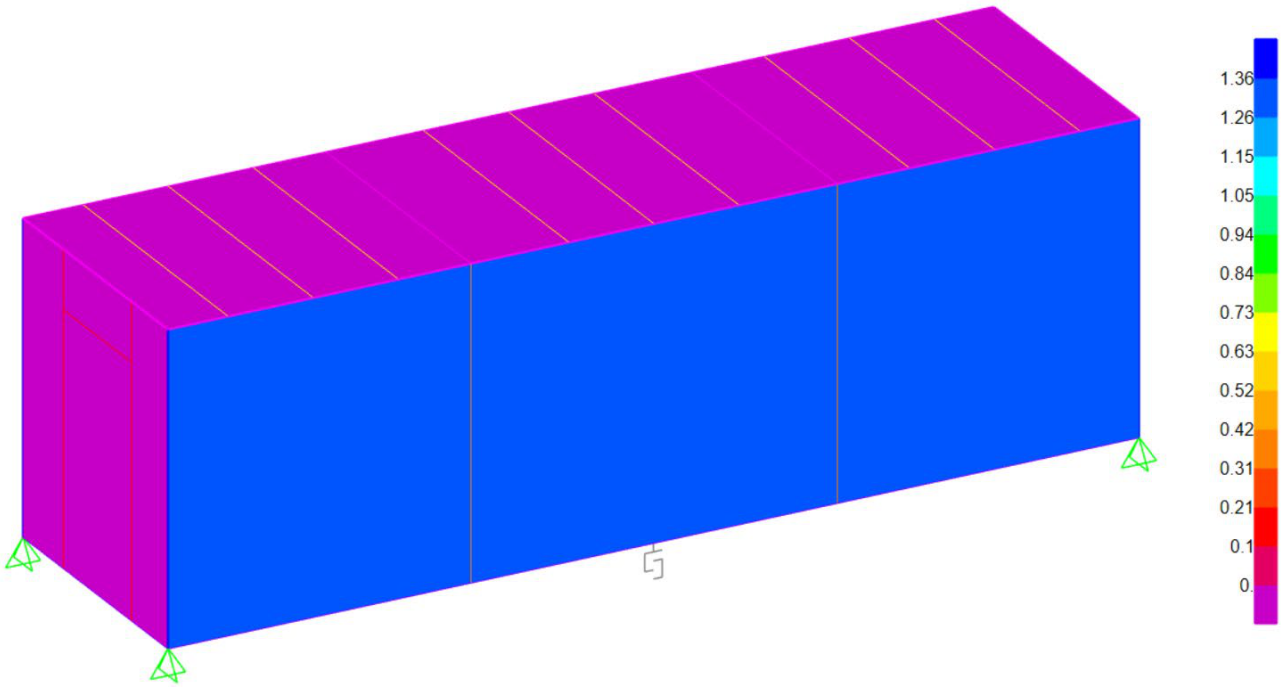
The design wind loads shall be automatically calculated for the worst condition of wind speed 41 m/s and exposure category D with importance factor 1.15 (Eurocode's worst condition for off-shore and in accordance with the specifics of customer WIND TABLE). The actions on walls and roof are automatically calculated by Sap by setting the parameters and applying the appropriate exposure coefficient to the plate elements (peak velocity pressure 1.69 kN/m^2 → pressure coefficient Cp front 0.8, Cp side, rear and roof 0.5).



WIND X PRESSURE FRONT [kN/m^2]

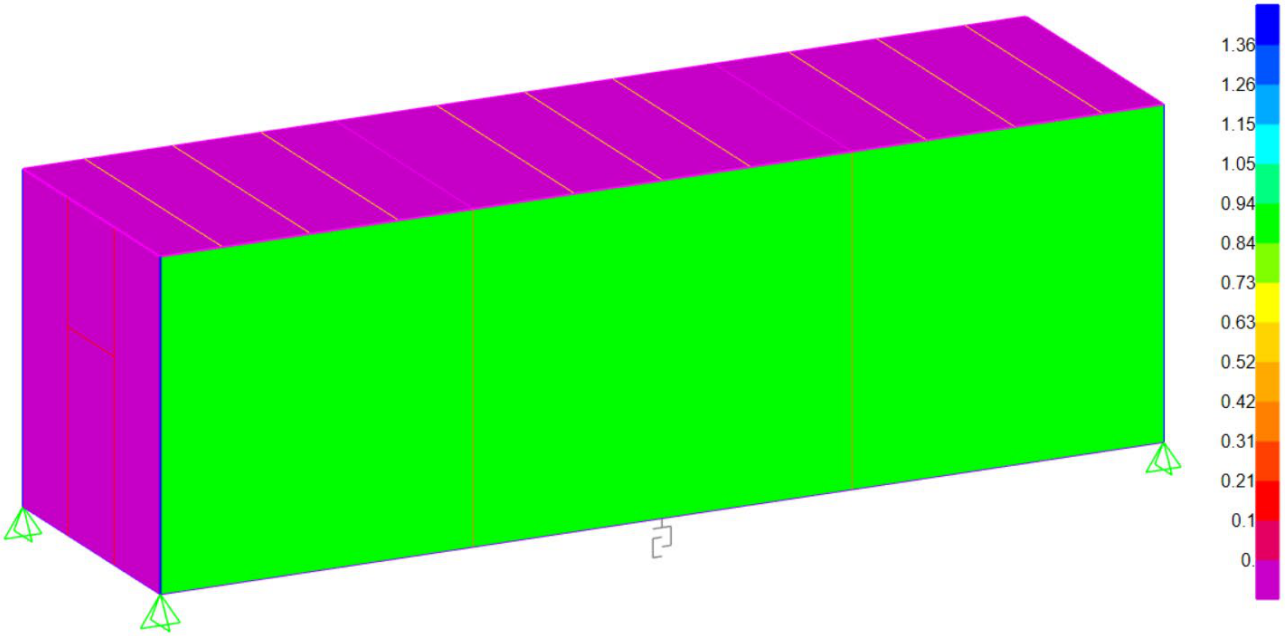


WIND X PRESSURE REAR [kN/m²]



WIND Y PRESSURE FRONT [kN/m²]

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WIND Y PRESSURE REAR [kN/m²]

4.3 LOAD COMBINATIONS

TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
ULS LIVE	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.5	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
ULS WIND X	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.05	
			NonLin Static	WIND X	1.5	
			NonLin Static	WIND Y	0.3	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
ULS WIND Y	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.05	
			NonLin Static	WIND X	0.3	
			NonLin Static	WIND Y	1.5	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
SLS LIVE	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	LIVE	1	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
SLS WIND X	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	WIND X	1	
			NonLin Static	WIND Y	0.3	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
SLS WIND Y	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	WIND X	0.3	
			NonLin Static	WIND Y	1	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
LLC2 lifting	Linear Add	No	NonLin Static	DEAD	1.5	Strength
			NonLin Static	SD	1.5	
LLC3 lifting	Linear Add	No	NonLin Static	DEAD	2	Lifting point
			NonLin Static	SD	2	

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TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
SEA COMB 1	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	1	
SEA COMB 2	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	1	
SEA COMB 3	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	-1	
SEA COMB 4	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	-1	
SEA COMB 5	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	1	
SEA COMB 6	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	1	
SEA COMB 7	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	-1	
SEA COMB 8	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	-1	

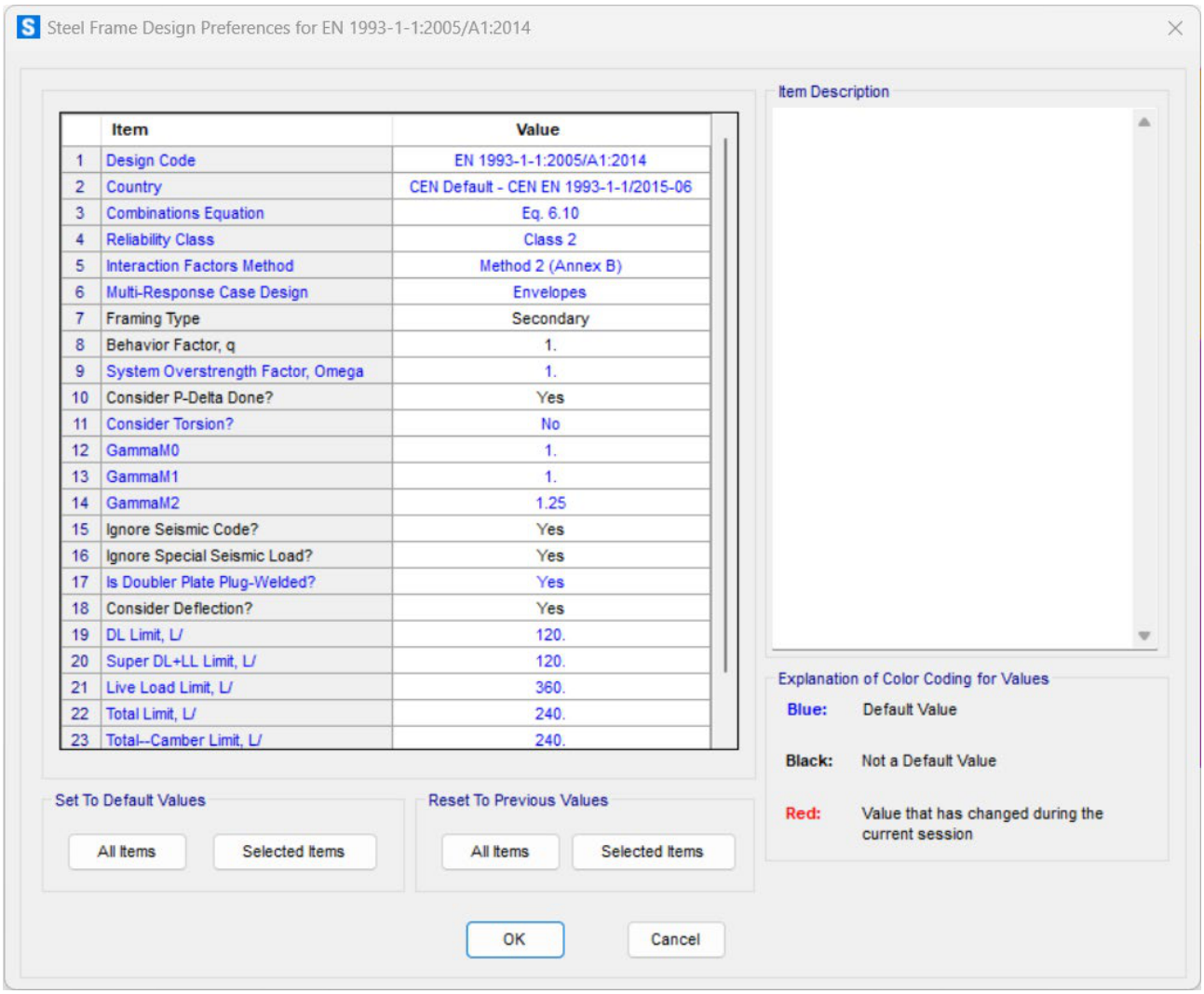
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TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
SEA COMB 9	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	1	
SEA COMB 10	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	1	
SEA COMB 11	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	-1	
SEA COMB 12	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	-1	
SEA COMB 13	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	1	
SEA COMB 14	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	1	
SEA COMB 15	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	-1	
SEA COMB 16	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	-1	

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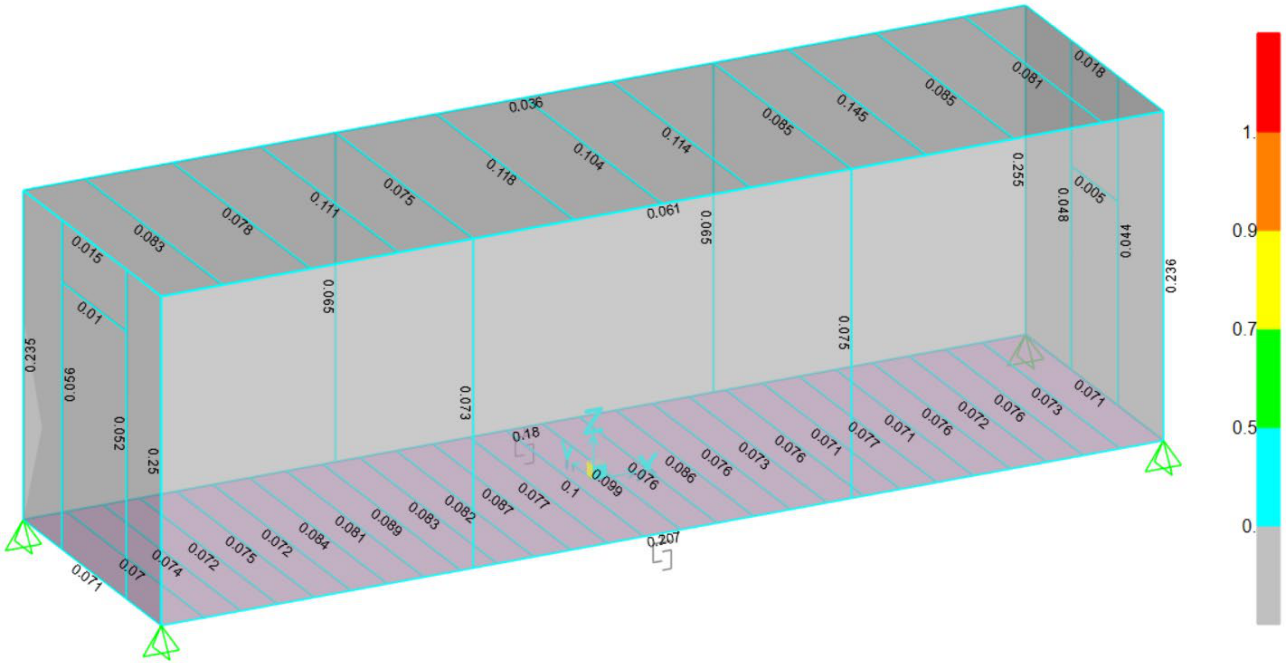
4.4 STRESS CHECK IN PLACE

All sections are check and verified in according with EN 1993 combinations ULS LIVE and WIND, SLS LIVE and WIND. Showed below the detailed printout for each type of section in its combination of maximum stress and the force diagrams with values for roof frames.



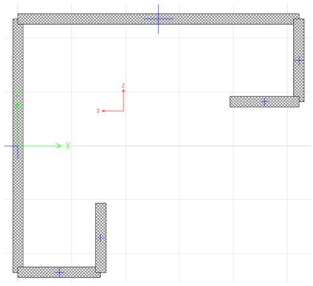
	Item	Value
1	Design Code	EN 1993-1-1:2005/A1:2014
2	Country	CEN Default - CEN EN 1993-1-1/2015-06
3	Combinations Equation	Eq. 6.10
4	Reliability Class	Class 2
5	Interaction Factors Method	Method 2 (Annex B)
6	Multi-Response Case Design	Envelopes
7	Framing Type	Secondary
8	Behavior Factor, q	1.
9	System Overstrength Factor, Omega	1.
10	Consider P-Delta Done?	Yes
11	Consider Torsion?	No
12	GammaM0	1.
13	GammaM1	1.
14	GammaM2	1.25
15	Ignore Seismic Code?	Yes
16	Ignore Special Seismic Load?	Yes
17	Is Doubler Plate Plug-Welded?	Yes
18	Consider Deflection?	Yes
19	DL Limit, L/	120.
20	Super DL+LL Limit, L/	120.
21	Live Load Limit, L/	360.
22	Total Limit, L/	240.
23	Total--Camber Limit, L/	240.

For in-place condition is automatically calculated also the relative deflection and compared with the limite L/240 (for beams). For beams in compression is calculated the lateral torsion buckling limit from code.



CHECK DESIGN FOR ULS LOADS (ORANGE < 1 RATIO)

4.4.1 C PILLAR



```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  190      X Mid:  -5.7      Combo:  ULS LIVE       Design Type:  Column
Length:  3.622    Y Mid:  -1.6      Shape:  C pillar       Frame Type:  Secndry
Loc   :  3.622    Z Mid:  1.811     Class:  Class 3        Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2              Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                  Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75        D/C Lim=0.95      Prin. Axis Angle = 90.
deg

Aeff=0.003        Av,2=0.001        Av,3=0.001       eNy=0.            eNz=0.
A=0.003           Iy=8.703E-06      iy=0.055         Wel,y=8.999E-05   Weff,y=8.999E-05
It=3.406E-08      Iz=1.075E-05      iz=0.061         Wel,z=1.027E-04   Weff,z=1.027E-04
Iw=0.             Iyz=0.            h=0.153          Wpl,y=1.342E-04
E=210000000.      fy=355000.        fu=510000.       Wpl,z=1.489E-04


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    3.622          -73.52       0.269       2.009       0.845        4.77          0.

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.1.1(1)-6.46)
    D/C Ratio:      0.25 = 0.25   <         0.95          OK
                         = (NEd/Nb,Rd)       (EC3 6.3.1.1(1)-6.46)

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                      Force    Capacity    Capacity
    Axial           -73.52    1019.205    1019.205

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                   1019.205    1054.231     406.117     406.117          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49     1374.92       0.861       1.033       0.624     635.963
    Y-Y Braced    c    0.49     2771.045      0.606       0.783       0.782     796.553
    Z-Z           c    0.49     1697.891      0.775       0.941       0.678     691.019
```

Z-Z Braced	c	0.49	2449.451	0.645	0.817	0.758	772.934
Torsional TF	c	0.49	406.117	1.584	2.094	0.289	294.293

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.269	0.269	31.947	31.947	31.947	23.736
Z-Z	2.009	2.009	36.446	36.446	36.446	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.552	0.786	0.743	0.	104.807

Factors	kw	C1	C2	C3		
	1.	2.711	0.43	1.12		
	za	zs	zg	zz	zj	
	0.056	0.	0.056	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.413	0.415	0.98	0.415

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.845	249.477	0.003	1.
3-Axis	4.77	259.256	0.018	1.

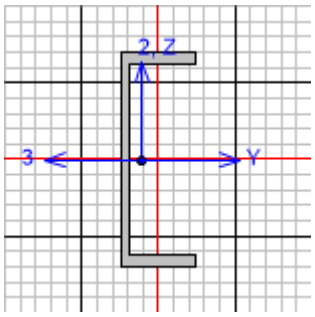
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.845	0.	249.477	0.003	OK
3-Axis	4.77	0.	259.256	0.018	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	249.477	1.2	0.	1.
3-Axis	259.256	1.2	0.	1.

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4.4.2 UPN260




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  215      X Mid:  -4.441E-15Combo:  ULS LIVE        Design Type:  Beam
Length:  11.399   Y Mid:  -1.6      Shape:  UPN260          Frame Type:  Secndry
Loc   :  5.7      Z Mid:  1.404E-07 Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.005        Av,2=0.003        Av,3=0.003        eNy=0.             eNz=0.
A=0.005           Iy=4.821E-05      iy=0.1            Wel,y=3.708E-04    Weff,y=3.708E-04
It=2.420E-07      Iz=3.178E-06      iz=0.026          Wel,z=4.784E-05    Weff,z=4.784E-05
Iw=3.850E-08      Iyz=0.            h=0.26            Wpl,y=4.531E-04
E=210000000.      fy=355000.        fu=510000.        Wpl,z=1.025E-04


STRESS CHECK FORCES & MOMENTS
    Location            Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    5.7              -39.953     -16.451       2.972      58.627      24.188         0.1

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.1(7))
    D/C Ratio:     0.207 = 0.023 + 0.102 + 0.082   <         0.95          OK
                         = (NEd/NRd) + (My,Ed/My,Rd) + (Mz,Ed/Mz,Rd)       (EC3 6.2.1(7))

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial           -39.953    1713.585    1713.585

                      Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                    1713.585    1772.474   35722.072    5219.656          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49    5404.043       0.563       0.748       0.807    1382.911
    Y-Y Braced      c    0.49    5404.043       0.563       0.748       0.807    1382.911
    Z-Z             c    0.49   37939.914       0.213       0.526       0.994    1702.647
```

Z-Z Braced	c	0.49	37939.914	0.213	0.526	0.994	1702.647
Torsional TF	c	0.49	5219.656	0.573	0.756	0.801	1373.074

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-16.451	-16.451	160.851	160.851	160.851	156.082
Z-Z	2.972	2.974	36.388	36.388	36.388	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.238	0.543	0.97	3.850E-08	2839.869

Factors	kw	C1	C2	C3		
	1.	1.217	0.553	1.73		
	za	zs	zg	zz	zj	
	0.13	0.	0.13	-6.539E-18	6.539E-18	

	kyy	kyz	kzy	kzz
Factors	0.909	0.498	0.813	0.83

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	58.627	541.707	0.108	1.
3-Axis	24.188	513.833	0.047	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	58.627	0.1	541.707	0.108	OK
3-Axis	24.188	0.1	513.833	0.047	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	541.707	1.2	0.33	1.2
3-Axis	513.833	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

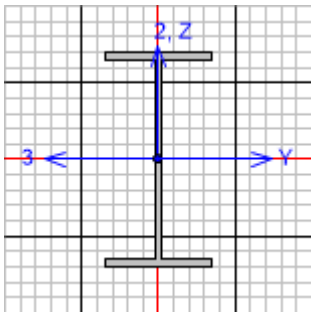
	V2 Left	V2 Right
2-2 (V2)	13.093	13.617

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	0.003	0.095	0.031	OK
Super DL+LL	Yes	0.003	0.095	0.031	OK
Live Load	Yes	0.003	0.032	0.091	OK
Total Load	Yes	0.003	0.047	0.063	OK
Total-Camber	Yes	0.003	0.047	0.063	OK

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4.4.3 IPE240




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  32       X Mid:  -0.208    Combo:  ULS LIVE        Design Type:  Beam
Length:  3.2      Y Mid:  0.        Shape:  IPE240          Frame Type:  Secndry
Loc   :  2.75     Z Mid:  1.404E-07 Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.004        Av,2=0.002        Av,3=0.003        eNy=0.             eNz=0.
A=0.004           Iy=3.892E-05      iy=0.1            Wel,y=3.243E-04    Weff,y=3.243E-04
It=1.300E-07      Iz=2.840E-06      iz=0.027          Wel,z=4.733E-05    Weff,z=4.733E-05
Iw=3.739E-08      Iyz=0.            h=0.24            Wpl,y=3.670E-04
E=210000000.      fy=355000.        fu=510000.        Wpl,z=7.390E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    2.75           21.878        5.92      -0.647       7.903       1.294       0.006

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.62)
    D/C Ratio:       0.1 = 0. + 0.09 + 0.01   <         0.95          OK
                         = NEd/(Chi_z NRk/GammaM1) + kzy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kzz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)       (EC3 6.3.3(4)-6.62)

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                      Force    Capacity    Capacity
    Axial            21.878     1388.05     1388.05

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                    1388.05    1435.752    1691.785    1691.785          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             a    0.21    7878.247        0.42       0.611       0.948    1315.195
    Y-Y Braced      a    0.21    7878.247        0.42       0.611       0.948    1315.195
    Z-Z             b    0.34     574.877       1.554       1.937       0.323      448.54
    Z-Z Braced      b    0.34     574.877       1.554       1.937       0.323      448.54
```

Torsional TF	b	0.34	1691.785	0.906	1.03	0.657	912.581

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	2.346	5.92	130.285	130.285	130.285	65.738
Z-Z	-0.284	-0.647	26.235	26.235	26.235	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	a	0.21	1.241	1.38	0.505	3.739E-08	84.57

Factors	kw	C1	C2	C3		
	1.	1.106	0.43	1.12		
	za	zs	zg	zz	zj	
	0.12	0.	0.12	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.882	0.24	1.	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	7.903	392.038	0.02	1.
3-Axis	1.294	521.318	0.002	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	7.903	0.006	392.038	0.02	OK
3-Axis	1.294	0.006	521.318	0.002	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	392.038	1.2	0.506	1.2
3-Axis	521.318	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

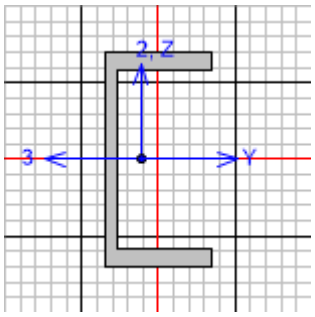
	V2 Left	V2 Right
2-2 (V2)	12.632	9.955

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	2.894E-04	0.027	0.011	OK
Super DL+LL	Yes	4.671E-04	0.027	0.018	OK
Live Load	Yes	2.380E-04	0.009	0.027	OK
Total Load	Yes	5.274E-04	0.013	0.04	OK
Total-Camber	Yes	5.274E-04	0.013	0.04	OK

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4.4.4 UPN100




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  129      X Mid:  -1.      Combo:  ULS LIVE      Design Type:  Beam
Length:  3.2      Y Mid:  0.       Shape:  UPN100        Frame Type:  Secndry
Loc   :  2.75     Z Mid:  3.622    Class:  Class 1       Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2              Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                  Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75        D/C Lim=0.95      Prin. Axis Angle = 0. deg

Aeff=0.001        Av,2=6.193E-04    Av,3=8.480E-04   eNy=0.            eNz=0.
A=0.001           Iy=2.053E-06      iy=0.039         Wel,y=4.106E-05   Weff,y=4.106E-05
It=2.645E-08      Iz=2.929E-07      iz=0.015         Wel,z=8.478E-06   Weff,z=8.478E-06
Iw=4.853E-10      Iyz=0.            h=0.1            Wpl,y=5.033E-05
E=210000000.      fy=355000.        fu=510000.       Wpl,z=1.800E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    2.75            7.018       0.757      -0.018       0.585       0.047       0.007

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.62)
    D/C Ratio:     0.118 = 0. + 0.116 + 0.001   <         0.95          OK
                         = NEd/(Chi_z NRk/GammaM1) + kzy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kzz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)       (EC3 6.3.3(4)-6.62)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial              7.018      477.83      477.83

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                     477.83     494.251     788.427     326.619          1.

               Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y            c    0.49     415.571       1.072       1.289       0.499     238.525
    Y-Y Braced     c    0.49     415.571       1.072       1.289       0.499     238.525
```

Z-Z	c	0.49	59.289	2.839	5.176	0.105	50.275
Z-Z Braced	c	0.49	59.289	2.839	5.176	0.105	50.275
Torsional TF	c	0.49	326.619	1.21	1.479	0.429	205.108

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.412	0.757	17.867	17.867	17.867	6.498
Z-Z	-0.009	-0.018	6.39	6.39	6.39	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	1.232	1.651	0.364	4.853E-10	11.775

Factors	kw	C1	C2	C3		
	1.	1.143	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	1.598E-18	-1.598E-18	

	kyy	kyz	kzy	kzz
Factors	0.909	0.24	1.	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.585	126.921	0.005	1.
3-Axis	0.047	173.805	2.720E-04	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.585	0.007	126.921	0.005	OK
3-Axis	0.047	0.007	173.805	0.	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	126.921	1.2	0.197	1.2
3-Axis	173.805	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

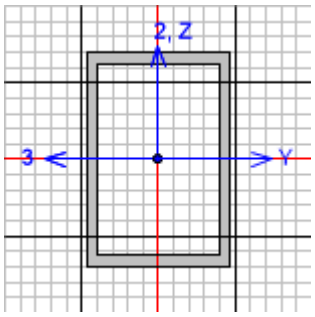
	V2 Left	V2 Right
2-2 (V2)	0.906	0.987

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	8.816E-04	0.027	0.033	OK
Super DL+LL	Yes	0.001	0.027	0.038	OK
Live Load	Yes	3.720E-04	0.009	0.042	OK
Total Load	Yes	0.001	0.013	0.094	OK
Total-Camber	Yes	0.001	0.013	0.094	OK

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4.4.5 120x80x6.3




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  192      X Mid:  -5.7      Combo:  ULS WIND X      Design Type:  Column
Length:  3.622    Y Mid:  -0.8      Shape:  120x80x6.3      Frame Type:  Secndry
Loc   :  2.278    Z Mid:  1.811     Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75        D/C Lim=0.95        Prin. Axis Angle = 0. deg

Aeff=0.002        Av,2=0.002        Av,3=0.001       eNy=0.              eNz=0.
A=0.002           Iy=4.562E-06      iy=0.044         Wel,y=7.603E-05     Weff,y=7.603E-05
It=4.721E-06      Iz=2.380E-06      iz=0.032         Wel,z=5.949E-05     Weff,z=5.949E-05
Iw=0.             Iyz=0.            h=0.12           Wpl,y=9.364E-05
E=210000000.      fy=355000.        fu=510000.       Wpl,z=7.003E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    2.278          -3.249      -1.629       0.174       0.942       0.002       0.044

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.61)
    D/C Ratio:     0.052 = 0.008 + 0.042 + 0.002   <         0.95          OK
                         = NEd/(Chi_y NRk/GammaM1) + kyy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kyz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)     (EC3 6.3.3(4)-6.61)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial             -3.249      838.24      838.24

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                     838.24     867.047  129713.748     570.612          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49     720.719       1.078       1.297       0.496     415.624
    Y-Y Braced      c    0.49     720.719       1.078       1.297       0.496     415.624
```

Z-Z	c	0.49	570.612	1.212	1.482	0.428	358.824
Z-Z Braced	c	0.49	570.612	1.212	1.482	0.428	358.824
Torsional TF	c	0.49	570.612	1.212	1.482	0.428	358.824

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-1.231	-1.629	33.242	33.242	33.242	33.242
Z-Z	0.002	0.174	24.86	24.86	24.86	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.236	0.542	0.972	0.	595.242

Factors	kw	C1	C2	C3		
	1.	1.32	0.459	0.525		
	za	zs	zg	zz	zj	
	0.06	0.	0.06	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.842	0.242	0.505	0.403

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.942	332.831	0.003	1.
3-Axis	0.002	206.599	8.334E-06	1.

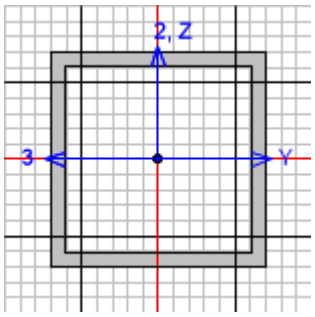
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.942	0.044	332.831	0.003	OK
3-Axis	0.002	0.044	206.599	8.334E-06	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	332.831	1.2	0.243	1.2
3-Axis	206.599	1.2	0.	1.

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4.4.6 100x100x6.3




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  128      X Mid:  2.15     Combo:  ULS LIVE       Design Type:  Beam
Length:  3.2      Y Mid:  0.       Shape:  100x100x6.3    Frame Type:  Secndry
Loc   :  1.42     Z Mid:  3.622    Class:  Class 1        Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10             Reliability = Class 2              Interaction = Method 2
(Annex B)
MultiResponse = Envelopes          P-Delta Done? Yes                  Consider Torsion? No

GammaM0=1.        GammaM1=1.       GammaM2=1.25
An/Ag=1.          RLLF=1.          PLLF=0.75        D/C Lim=0.95      Prin. Axis Angle = 0. deg

Aeff=0.002        Av,2=0.001       Av,3=0.001       eNy=0.            eNz=0.
A=0.002           Iy=3.471E-06     iy=0.038         Wel,y=6.942E-05   Weff,y=6.942E-05
It=5.183E-06      Iz=3.471E-06     iz=0.038         Wel,z=6.942E-05   Weff,z=6.942E-05
Iw=0.             Iyz=0.           h=0.1            Wpl,y=8.309E-05
E=210000000.      fy=355000.       fu=510000.       Wpl,z=8.309E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    1.42           26.512       1.165      -0.003       0.284       0.038       0.006

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.9.1(6y))
    D/C Ratio:      0.04 = 0.04   <         0.95          OK
                         = (My,Ed/Mn,y,Rd)       (EC3 6.2.9.1(6y))

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                     Force    Capacity    Capacity
    Axial           26.512      838.24      838.24

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                     838.24     867.047  142392.944      702.56          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49      702.56       1.092       1.315       0.488     409.361
    Y-Y Braced    c    0.49      702.56       1.092       1.315       0.488     409.361
    Z-Z           c    0.49      702.56       1.092       1.315       0.488     409.361
```

Z-Z Braced	c	0.49	702.56	1.092	1.315	0.488	409.361
Torsional TF	c	0.49	702.56	1.092	1.315	0.488	409.361

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	1.165	1.165	29.498	29.498	29.498	29.498
Z-Z	-0.003	-0.019	29.498	29.498	29.498	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.22	0.532	0.984	0.	608.982

	kw	C1	C2	C3		
Factors	1.	1.155	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.904	0.24	0.542	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.284	270.851	0.001	1.
3-Axis	0.038	258.249	1.460E-04	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.284	0.006	270.851	0.001	OK
3-Axis	0.038	0.006	258.249	0.	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	270.851	1.2	0.197	1.2
3-Axis	258.249	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

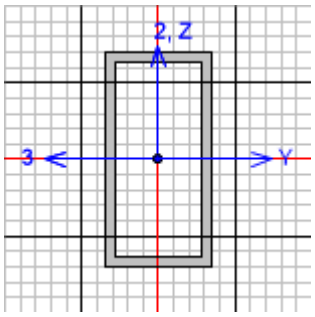
	V2 Left	V2 Right
2-2 (V2)	1.726	1.787

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	8.150E-04	0.027	0.031	OK
Super DL+LL	Yes	9.097E-04	0.027	0.034	OK
Live Load	Yes	3.143E-04	0.009	0.035	OK
Total Load	Yes	0.001	0.013	0.085	OK
Total-Camber	Yes	0.001	0.013	0.085	OK

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4.4.7 100x50x5




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  216      X Mid:  2.15      Combo:  ULS WIND Y      Design Type:  Column
Length:  3.622    Y Mid:  -1.6      Shape:  100x50x5        Frame Type:  Secndry
Loc   :  0.       Z Mid:  1.811     Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.001        Av,2=0.001        Av,3=5.000E-04    eNy=0.             eNz=0.
A=0.001           Iy=1.737E-06      iy=0.035          Wel,y=3.473E-05    Weff,y=3.473E-05
It=1.305E-06      Iz=5.617E-07      iz=0.02           Wel,z=2.247E-05    Weff,z=2.247E-05
Iw=0.             Iyz=0.            h=0.1             Wpl,y=4.400E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=2.650E-05


STRESS CHECK FORCES & MOMENTS
    Location            Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    0.                -0.521       0.024      -0.706       0.107       0.921       0.006

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.9.1(6z))
    D/C Ratio:     0.075 = 0.075   <         0.95          OK
                         = (Mz,Ed/Mn,z,Rd)       (EC3 6.2.9.1(6z))

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                      Force    Capacity    Capacity
    Axial            -0.521        497.        497.

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                       497.      514.08   64225.156      88.736          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49     274.371       1.346       1.686        0.37     183.892
    Y-Y Braced    c    0.49     274.371       1.346       1.686        0.37     183.892
    Z-Z           c    0.49      88.736       2.367       3.831       0.146      72.616
```

Z-Z Braced	c	0.49	159.991	1.763	2.436	0.243	120.701
Torsional TF	c	0.49	88.736	2.367	3.831	0.146	72.616

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.024	0.026	15.62	15.62	15.62	15.62
Z-Z	-0.706	-0.706	9.408	9.408	9.408	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.306	0.587	0.919	0.	166.8

Factors	kw	C1	C2	C3		
	1.	1.759	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.53	0.241	0.318	0.401

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.107	221.356	4.830E-04	1.
3-Axis	0.921	102.48	0.009	1.

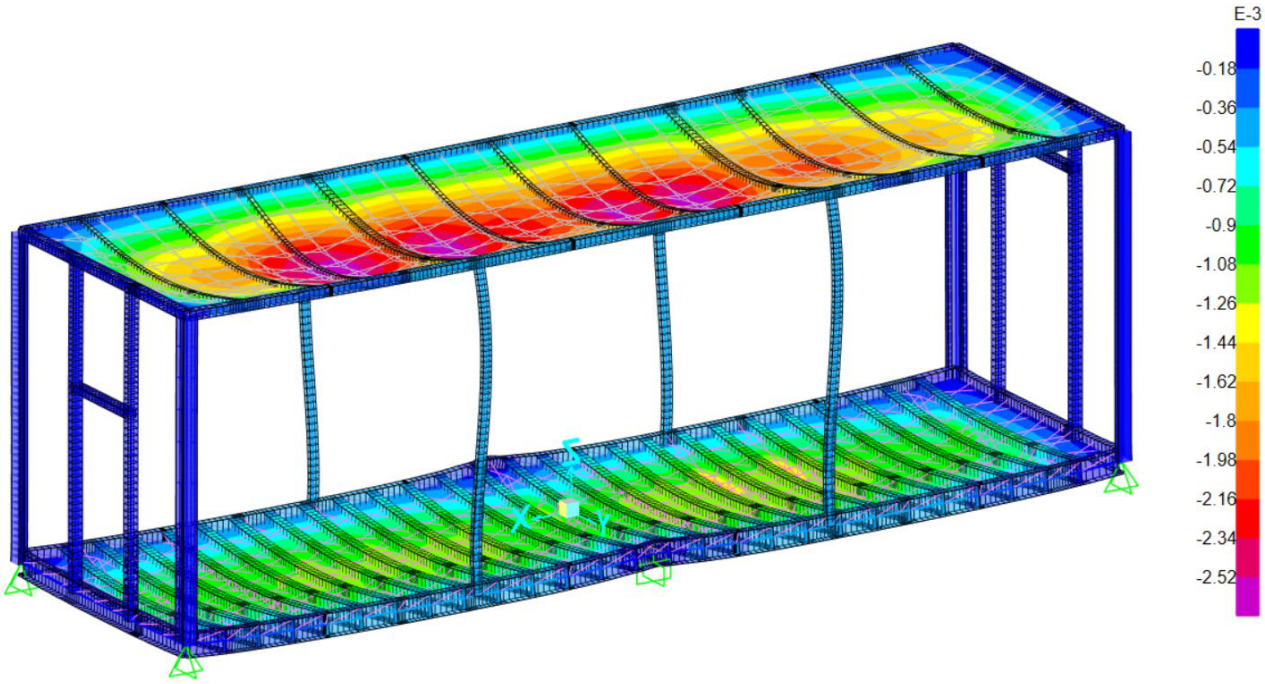
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.107	0.006	221.356	0.	OK
3-Axis	0.921	0.006	102.48	0.009	OK

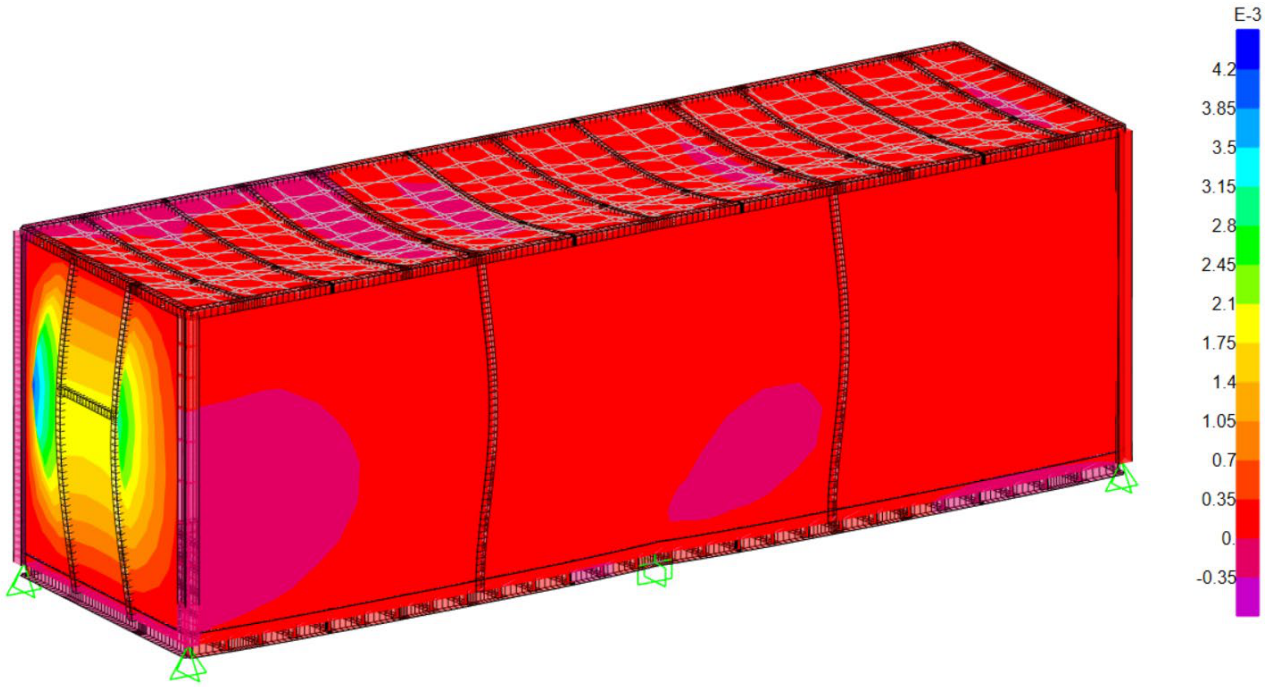
	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	221.356	1.2	0.256	1.2
3-Axis	102.48	1.2	0.	1.

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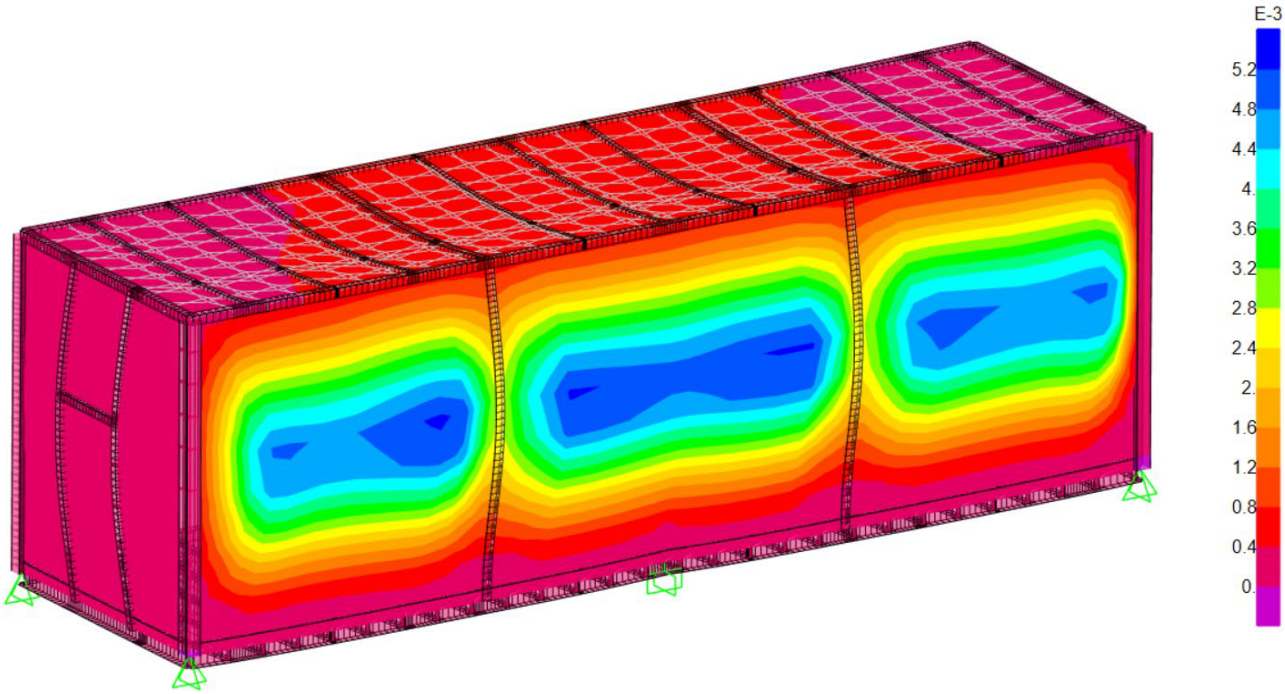
5 DISPLACEMENT CHECK



Uz SLS LIVE = 1.7 mm < 4500/240 = 18.75 mm



Ux SLS WIND X = 5.2mm < 4500/240 = 18.75 mm



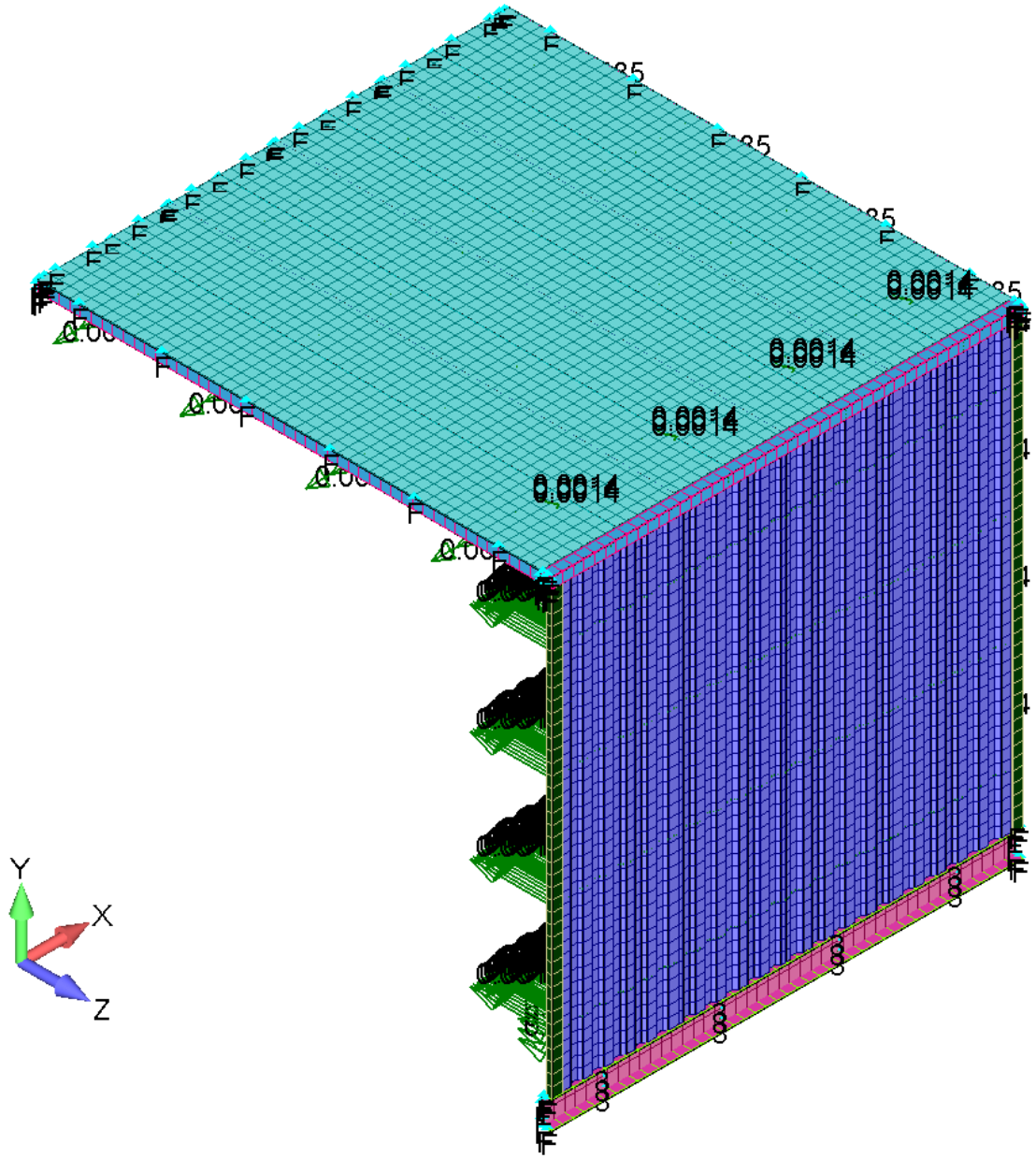
Uy SLS WIND Y = 6.5 mm < 4500/240 = 18.75 mm

6 METAL SHEET CHECK

A detailed analysis of the corrugated wall and stave roof is carried out. The structure is modeled taking into account all the metal sheets constituting the geometry of metal sheet.

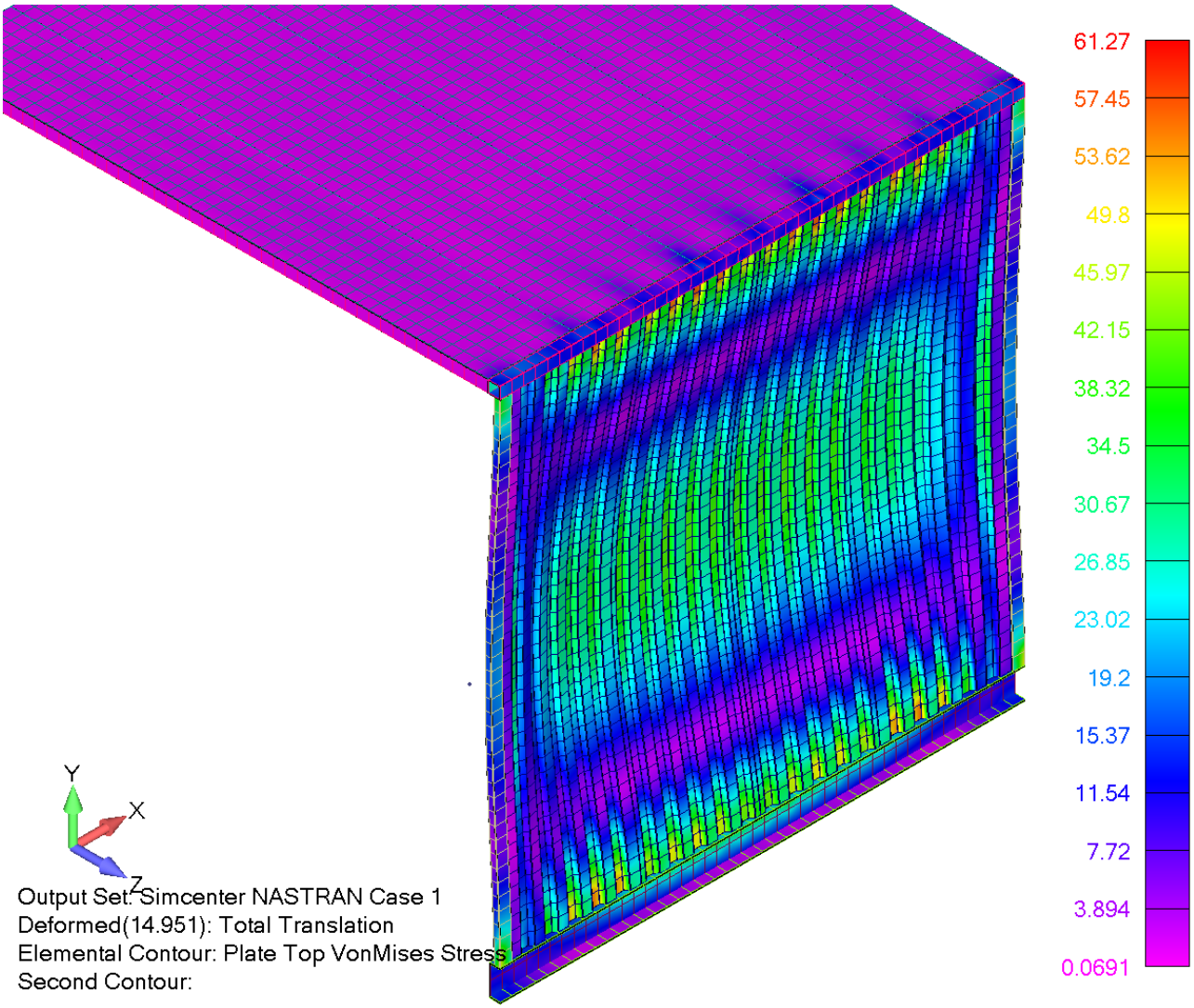
The front is loaded with 1.69 kN/m^2 wind pressure and Cp = 0.8. For the roof is applied 1.69 kN/m^2 with Cp = 0.5 and 45 degree (worst case).

The analysis is performed with FEMAP NASTRAN finite element software and post-processor.



MODEL WITH 8211 ELEMENTS AND 8805 NODES, LOADED AND FIXED AT THE ENDS

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MAXIMUM VM STRESS 61 MPA AND 15 MM LATERAL DISPLACEMENT

Displacement value is lower than sap2000 simplified model for global analysis.

The maximum Von Mises stress is lower than yield limit reduced by safety factor 1.15 → 275/1.15 = 239 MPa.

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7 BASE REACTIONS

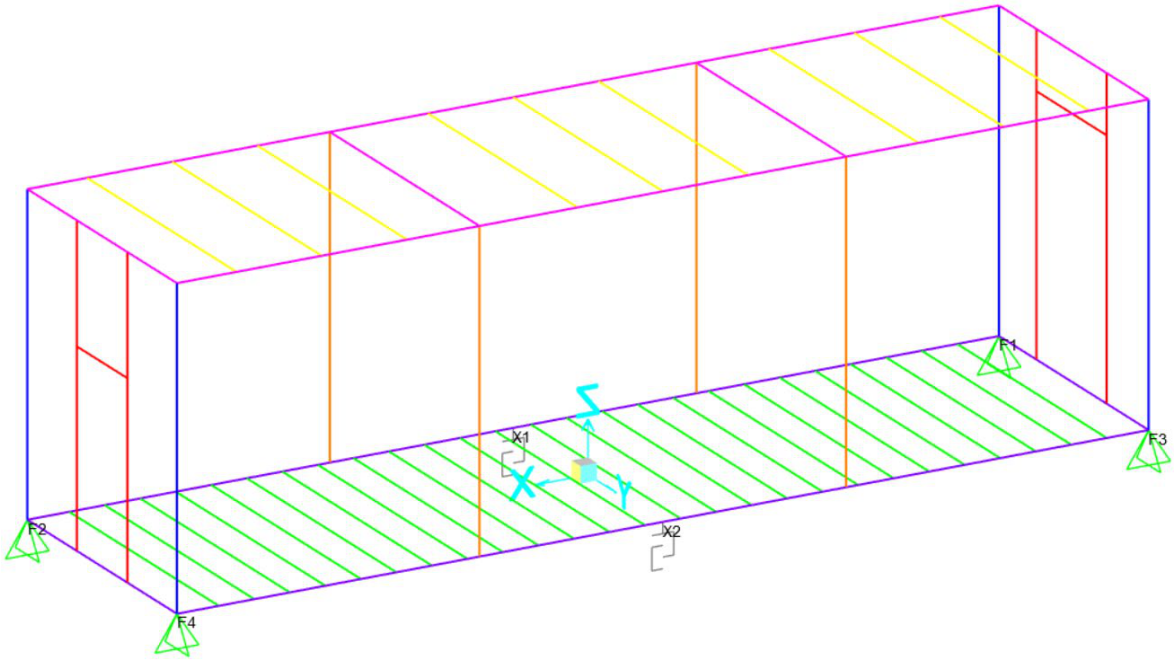


TABLE: Joint Reactions

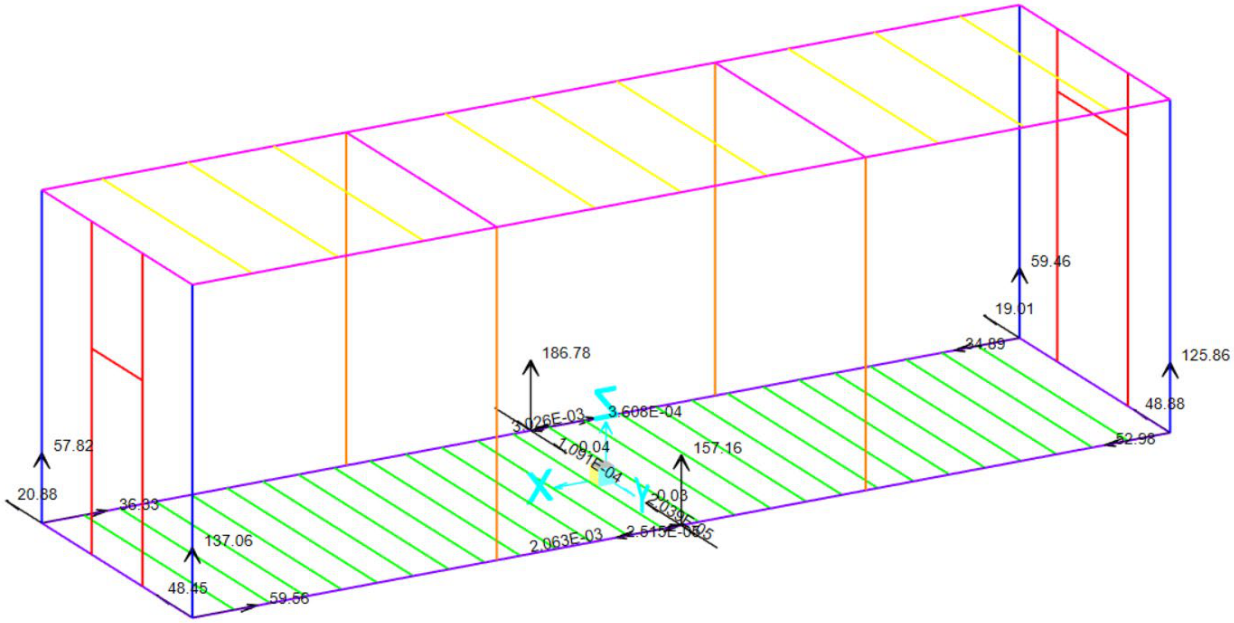
Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F1	DEAD	NonStatic	Last Step	8.15	3.98	20.56	0.00	0.00	0.00
F1	SD	NonStatic	Last Step	17.79	5.10	26.86	0.00	0.00	0.00
F1	LIVE	NonStatic	Last Step	18.94	6.80	43.72	0.00	0.00	0.00
F1	WIND X	NonStatic	Last Step	-11.64	0.34	-9.78	0.00	0.00	0.00
F1	WIND Y	NonStatic	Last Step	-12.43	-25.98	-33.62	0.00	0.00	0.00
F1	NOT X	NonStatic	Last Step	-0.07	-0.01	-0.02	0.00	0.00	0.00
F1	NOT Y	NonStatic	Last Step	-0.04	-0.07	-0.06	0.00	0.00	0.00
F1	SLU LIVE	Combination		65.55	22.92	132.49	0.00	0.00	0.00
F1	SLU WIND X	Combination		35.85	12.57	88.06	0.00	0.00	0.00
F1	SLU WIND Y	Combination		34.89	-19.01	59.46	0.00	0.00	0.00
F1	SLE LIVE	Combination		44.78	15.80	91.06	0.00	0.00	0.00
F1	SLE WIND X	Combination		10.47	1.55	27.47	0.00	0.00	0.00
F1	SLE WIND Y	Combination		9.91	-16.88	10.79	0.00	0.00	0.00
F2	DEAD	NonStatic	Last Step	-8.15	3.95	20.50	0.00	0.00	0.00
F2	SD	NonStatic	Last Step	-15.55	4.85	31.79	0.00	0.00	0.00
F2	LIVE	NonStatic	Last Step	-19.68	6.13	33.86	0.00	0.00	0.00
F2	WIND X	NonStatic	Last Step	-1.08	-2.06	-5.72	0.00	0.00	0.00
F2	WIND Y	NonStatic	Last Step	12.41	-26.02	-33.53	0.00	0.00	0.00
F2	NOT X	NonStatic	Last Step	-0.07	0.01	0.02	0.00	0.00	0.00
F2	NOT Y	NonStatic	Last Step	0.04	-0.07	-0.06	0.00	0.00	0.00
F2	SLU LIVE	Combination		-63.48	21.52	125.06	0.00	0.00	0.00
F2	SLU WIND X	Combination		-52.52	7.87	91.19	0.00	0.00	0.00
F2	SLU WIND Y	Combination		-36.33	-20.88	57.82	0.00	0.00	0.00
F2	SLE LIVE	Combination		-43.41	14.87	86.10	0.00	0.00	0.00
F2	SLE WIND X	Combination		-21.09	-1.13	36.46	0.00	0.00	0.00
F2	SLE WIND Y	Combination		-11.65	-17.90	17.00	0.00	0.00	0.00

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TABLE: Joint Reactions

Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F3	DEAD	NonStatic	Last Step	8.15	-3.98	20.51	0.00	0.00	0.00
F3	SD	NonStatic	Last Step	11.42	-4.47	17.26	0.00	0.00	0.00
F3	LIVE	NonStatic	Last Step	20.70	-7.01	46.69	0.00	0.00	0.00
F3	WIND X	NonStatic	Last Step	-11.74	-0.31	-9.79	0.00	0.00	0.00
F3	WIND Y	NonStatic	Last Step	4.72	-19.65	18.12	0.00	0.00	0.00
F3	NOT X	NonStatic	Last Step	-0.07	0.01	-0.02	0.00	0.00	0.00
F3	NOT Y	NonStatic	Last Step	0.04	-0.07	0.06	0.00	0.00	0.00
F3	SLU LIVE	Combination		58.73	-22.47	122.63	0.00	0.00	0.00
F3	SLU WIND X	Combination		33.23	-25.68	92.38	0.00	0.00	0.00
F3	SLU WIND Y	Combination		52.98	-48.88	125.86	0.00	0.00	0.00
F3	SLE LIVE	Combination		40.24	-15.52	84.50	0.00	0.00	0.00
F3	SLE WIND X	Combination		9.22	-14.72	33.46	0.00	0.00	0.00
F3	SLE WIND Y	Combination		20.74	-28.25	52.99	0.00	0.00	0.00
F4	DEAD	NonStatic	Last Step	-8.15	-3.95	20.50	0.00	0.00	0.00
F4	SD	NonStatic	Last Step	-13.65	-5.48	33.05	0.00	0.00	0.00
F4	LIVE	NonStatic	Last Step	-19.97	-5.92	33.74	0.00	0.00	0.00
F4	WIND X	NonStatic	Last Step	-1.16	2.03	-5.71	0.00	0.00	0.00
F4	WIND Y	NonStatic	Last Step	-4.70	-19.60	18.02	0.00	0.00	0.00
F4	NOT X	NonStatic	Last Step	-0.07	-0.01	0.02	0.00	0.00	0.00
F4	NOT Y	NonStatic	Last Step	-0.04	-0.07	0.06	0.00	0.00	0.00
F4	SLU LIVE	Combination		-61.15	-22.33	126.93	0.00	0.00	0.00
F4	SLU WIND X	Combination		-55.32	-22.49	108.58	0.00	0.00	0.00
F4	SLU WIND Y	Combination		-59.56	-48.45	137.06	0.00	0.00	0.00
F4	SLE LIVE	Combination		-41.87	-15.42	87.36	0.00	0.00	0.00
F4	SLE WIND X	Combination		-24.48	-13.35	53.32	0.00	0.00	0.00
F4	SLE WIND Y	Combination		-26.95	-28.49	69.93	0.00	0.00	0.00
X1	DEAD	NonStatic	Last Step	0.00	0.00	24.94	0.00	0.00	0.00
X1	SD	NonStatic	Last Step	0.00	0.02	65.88	0.00	0.00	0.00
X1	LIVE	NonStatic	Last Step	0.00	0.01	52.89	0.00	0.00	0.00
X1	WIND X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	WIND Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	NOT X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	NOT Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	SLU LIVE	Combination		0.00	0.05	210.58	0.00	0.00	0.00
X1	SLU WIND X	Combination		0.00	0.04	186.78	0.00	0.00	0.00
X1	SLU WIND Y	Combination		0.00	0.04	186.78	0.00	0.00	0.00
X1	SLE LIVE	Combination		0.00	0.03	143.71	0.00	0.00	0.00
X1	SLE WIND X	Combination		0.00	0.02	90.82	0.00	0.00	0.00
X1	SLE WIND Y	Combination		0.00	0.02	90.82	0.00	0.00	0.00
X2	DEAD	NonStatic	Last Step	0.00	0.00	24.95	0.00	0.00	0.00
X2	SD	NonStatic	Last Step	0.00	-0.01	43.97	0.00	0.00	0.00
X2	LIVE	NonStatic	Last Step	0.00	-0.01	55.99	0.00	0.00	0.00
X2	WIND X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	WIND Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	NOT X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	NOT Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	SLU LIVE	Combination		0.00	-0.04	182.36	0.00	0.00	0.00
X2	SLU WIND X	Combination		0.00	-0.03	157.17	0.00	0.00	0.00
X2	SLU WIND Y	Combination		0.00	-0.03	157.17	0.00	0.00	0.00
X2	SLE LIVE	Combination		0.00	-0.03	124.90	0.00	0.00	0.00
X2	SLE WIND X	Combination		0.00	-0.01	68.91	0.00	0.00	0.00
X2	SLE WIND Y	Combination		0.00	-0.01	68.91	0.00	0.00	0.00

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BASE REACTIONS FOR WORST ULS WIND Y CASE (F1 = FX, F2 = FY and F3 = FZ)

Joint Reactions in Joint Local CoordSys

Joint Object	F4	Joint Element	F4
	1	2	3
Force	-59.56	-48.451	137.064
Moment	0.	0.	0.

MAX FY reaction (SHEAR) = 60 kN

M1 and M2 in the image are values close to zero in according with the boundary conditions and concern only gaps non-linear link elements (as non-linear elements with imposed zero stiffness, the software calculate the value to the limit of zero).

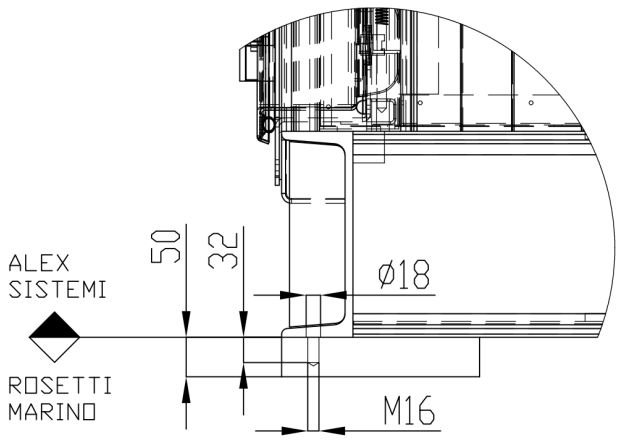
For the fixing at the ground will be considered two M18 bar class 8.8 for hinge.

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CORNER ANCHOR BOLT CHECK					
Nc=	0	kN			
Nt=	0	kN			
Vx=	60	kN	Vmax=(Vx^2+Vy^2)^0.5=		
Vy=	49	kN		77	kN
Φb=	18	mm			
SIF*DIF=	1				
fu=	860	Mpa			
Ω blast=	1				
Ab=(π*(Φb-3)^2)/4=		176.715	mm^2		
Abn=0.78*Ab=		137.837	mm^2		
Tension check	Nbu=Nt/2=		0.000	kN	
	Nbn=DIF*fu*Abn=		118.540	kN	
	Nbu/(Ω*Nbn)=		0.000	<1	OK
Shear check	Vbu=Vmax/2=		38.733	kN	
	Vbn=0.6*DIF*fu*Abn=		71.124	kN	
	Vbu/(Ω*Vbn)=		0.545	<1	OK
Combined	(Nbu/1.4/Nbn)+(Vbu/Vbn)=		0.545	<1	OK

The vertical reactions in model are always compression on the ground but in favour of safety is considered tension Nt on bolt.

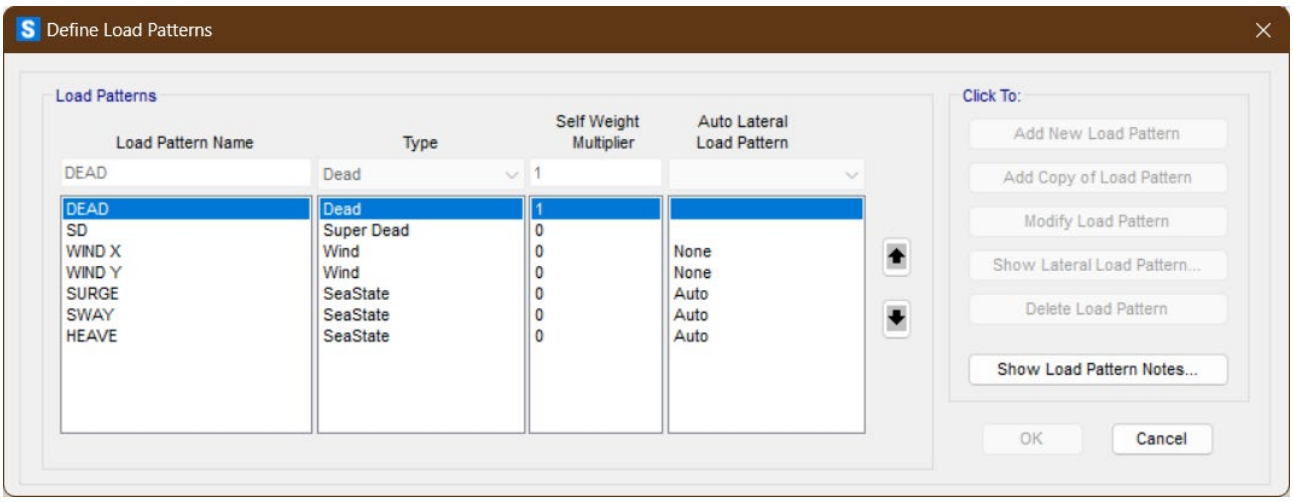
M18 bar verified (worst ULS WIND Y case)



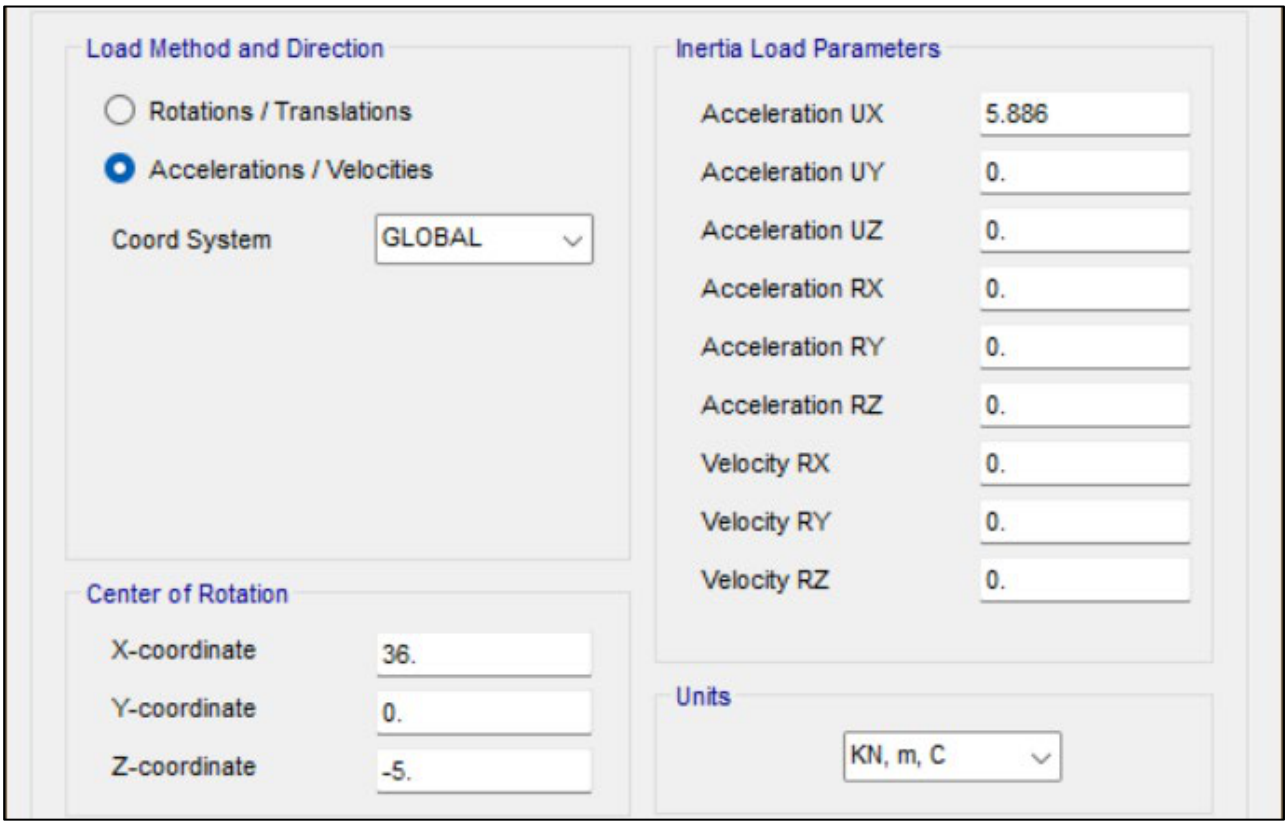
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8 SEA TRANSPORT ANALYSIS

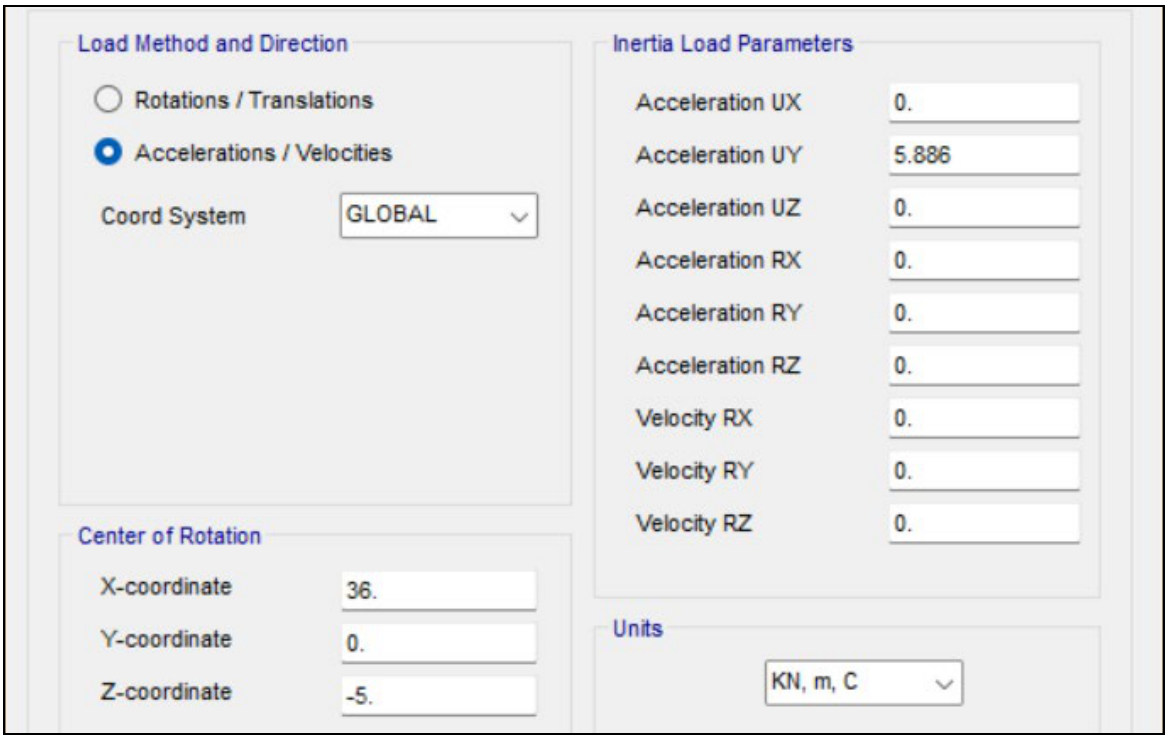
For the sea transport analysis are considered the three translational acceleration as 0.6g for Surge and Sway and 0.5g for Heave. The three accelerations are applied as sea-state loads considering also the center of rotation that is the distances between cog of structure and cog of barge.



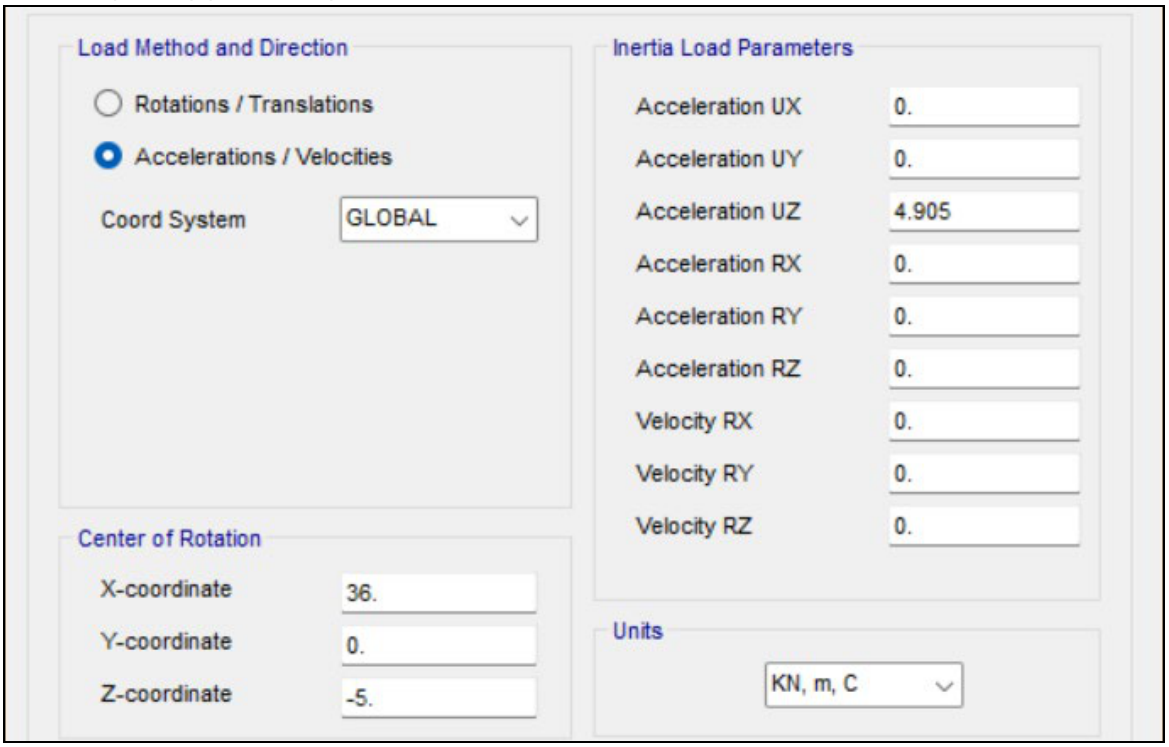
SURGE LONGITUDINAL ACCELERATION



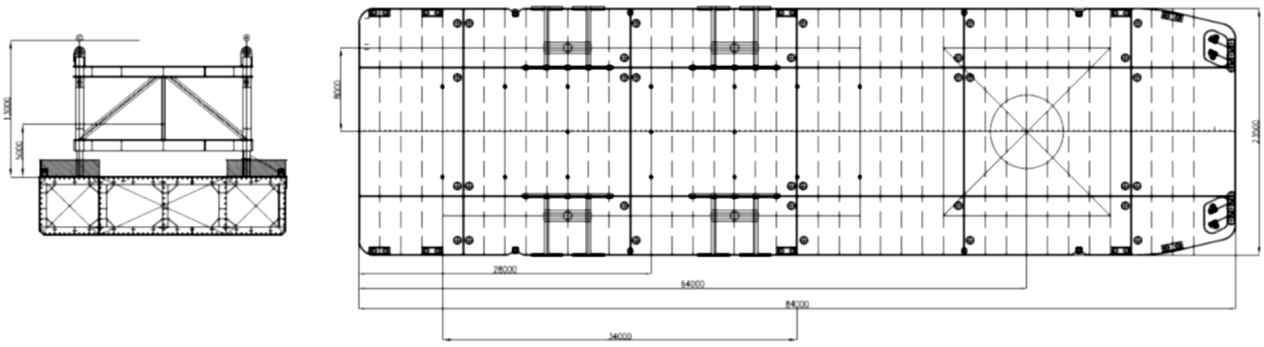
SWAY TRANSVERSAL ACCELERATION



HEAVE VERTICAL ACCELERATION

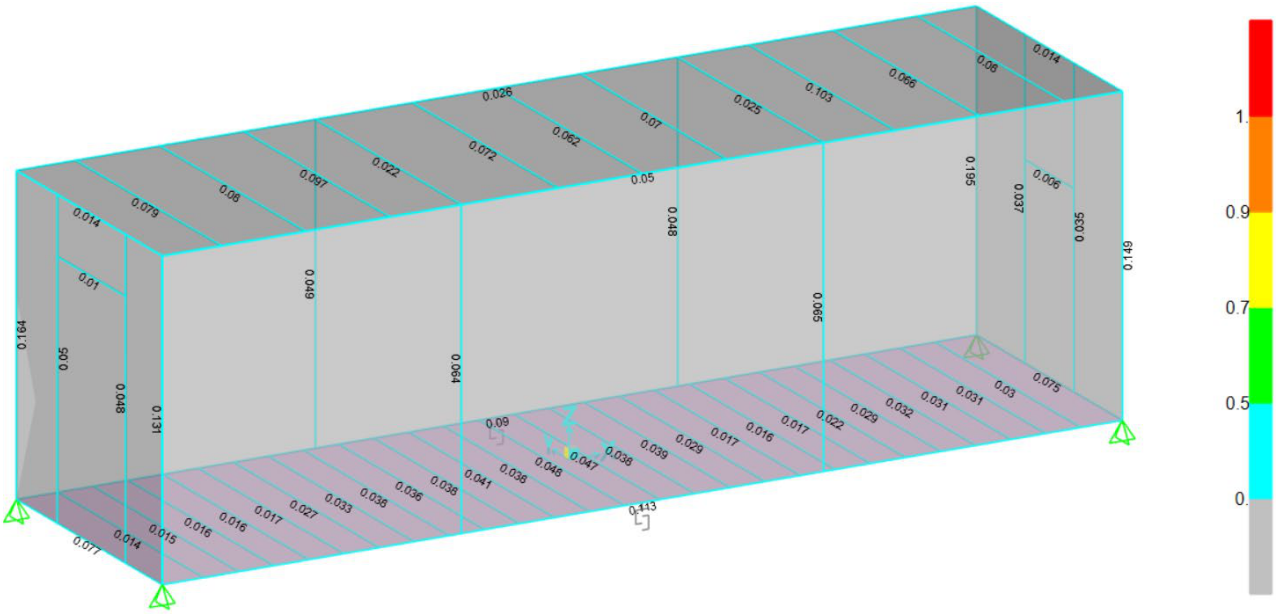


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8.2 STRESS CHECK SEA TRANSPORT

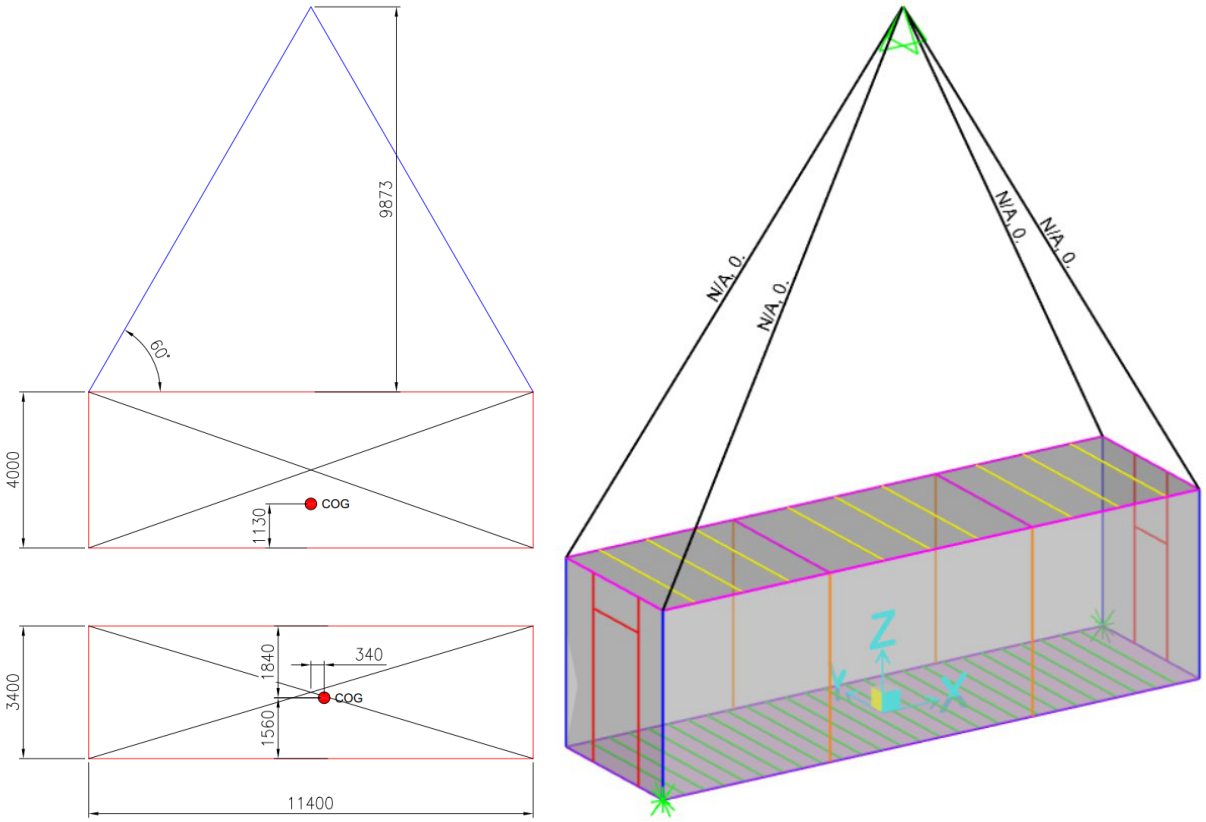
The loads are combined as explained in chapter 4.3 and verified in according with EN 1993.



9 LIFTING ANALYSIS

For lifting analysis, only the weight of shelter (DEAD LOAD AND NO STRUCTURAL LOAD SD in LLC 2 combinations) are considered.

Total weight of shelter is about 35 ton including equipment. Lifting cables are modeled with non-linear elements cables tension-only connected to the top corner points (lifting points) of model in non-linear geometry analysis.



LIFTING SCHEME AND MODEL

TABLE: Base Reactions

OutputCase	CaseType	GlobalFX	GlobalFY	GlobalFZ	GlobalMX	GlobalMY	GlobalMZ	XCentroidFZ	YCentroidFZ	ZCentroidFZ
Text	Text	KN	KN	KN	KN-m	KN-m	KN-m	m	m	m
DEAD	NonStatic	0.00	0.00	131.95	-0.08	0.44	0.00	0.00	0.00	1.48
SD	NonStatic	0.00	0.00	218.80	-48.40	-118.00	0.00	0.54	-0.22	0.93
DEAD+SD	Combination	0.00	0.00	350.75	-48.48	-117.57	0.00	0.34	-0.14	1.13

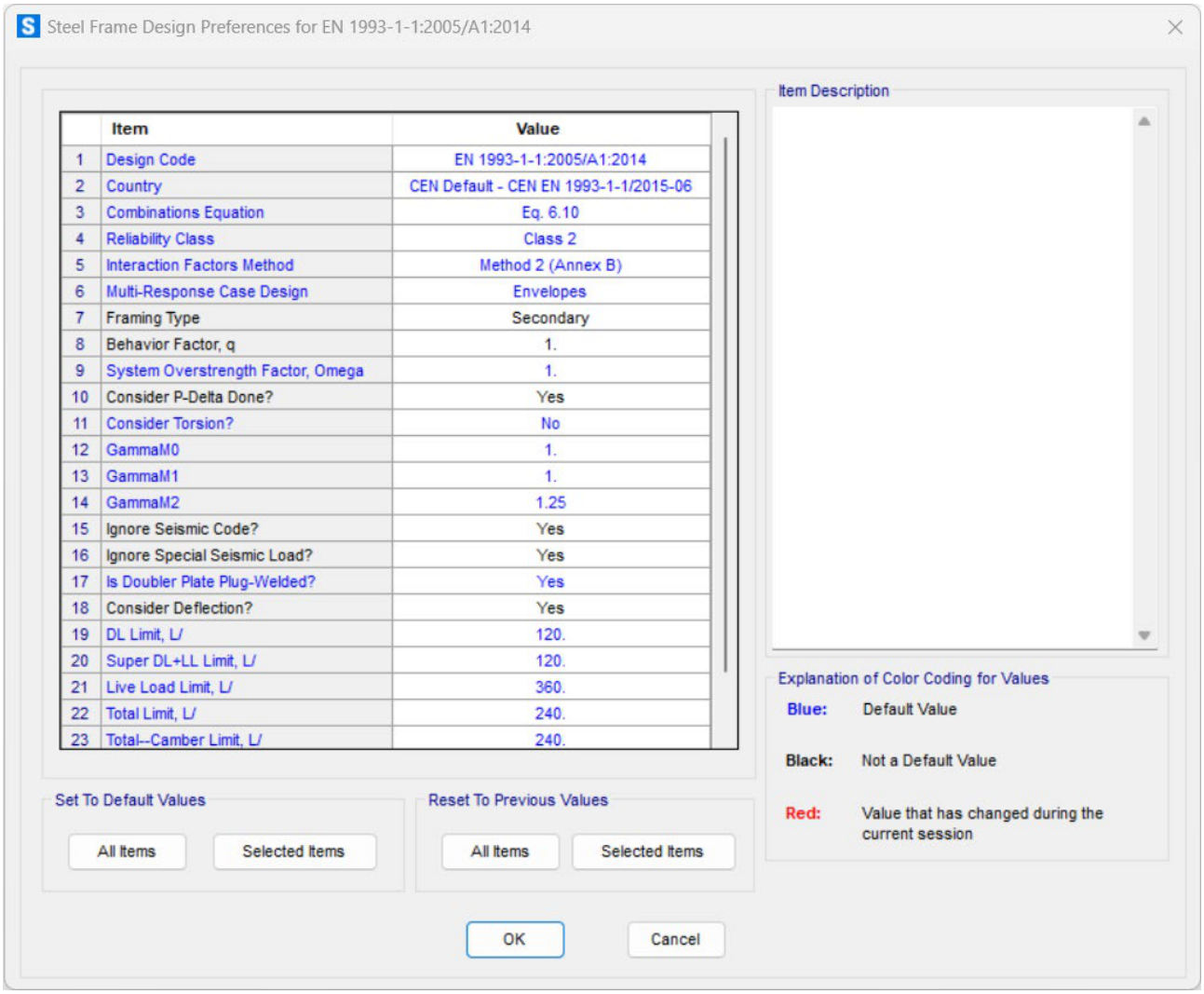
The total weight DEAD + SD was estimated in favor of safety about 35 ton. For the real values refer to the 4.2.1 and 4.2.2 chapters. The red numbers represent the shift in horizontal place for the shackle pin restraints at the top of cables.

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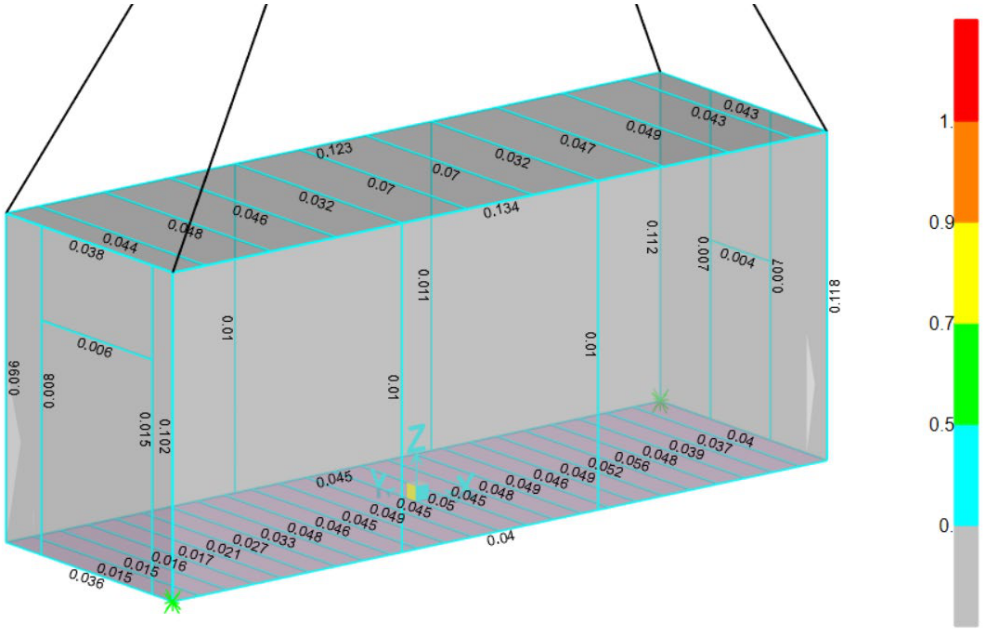
To converge the non-linear analysis results (tension only cables elements) translational XY restrains are added at the bottom corners. These restrains act only against torsional effects on the whole structure acting around the vertical Z axis.

9.2 STRESS CHECK LIFTING

All sections are check and verified in according with EN 1993 combination LLC2. Showed below the detailed printout for each type of section in its combination of maximum stress and the force diagrams with values for roof frames.



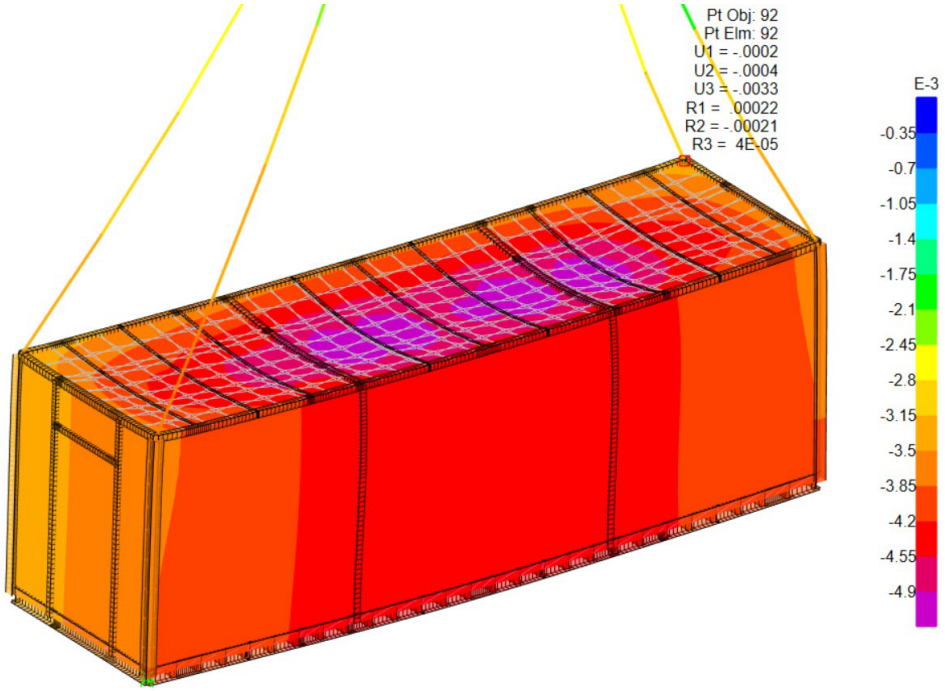
For lifting condition is automatically calculated also the relative deflection and compared with the limit L/240 (for beams). For beams in compression is calculated the lateral torsion buckling limit from code.



CHECK DESIGN FOR ULS LOADS (ORANGE < 1 RATIO)

9.3 DISPLACEMENT CHECK LIFTING

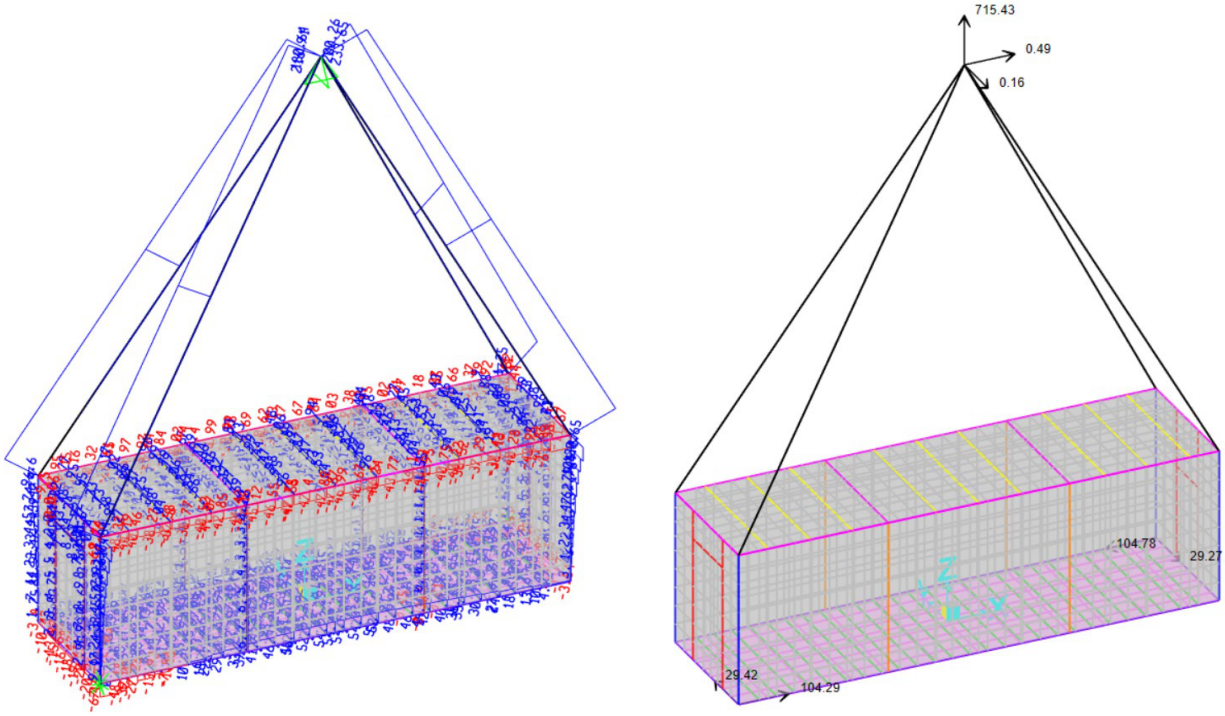
For the graphic visualization of absolute displacement is necessary to remove the elongation of cables taken at its connection end with the shelter.



MAX UZ ABSOLUTE DISPLACEMENT FOR LIFTING ROOF BEAM 4.9-3.3 = 1.6 mm < 13000/360 = 36 mm

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10 LIFTING HOOK DETAIL CHECK



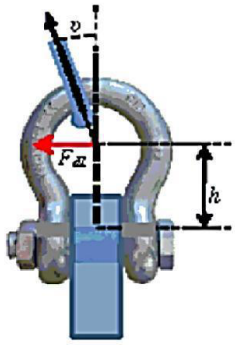
The maximum tension force on cable for lifting stress combination LLC3 (factor 2) is 234 kN.

In the model is applied also the sling load due to the transversal component of tension force. Is added an extra lateral load of 5% 234 kN = 12 kN in the X and Z directions (horizontal in Femap).

This force is applied on the spider node represented the surface contact between shackle and lifting lug. The model is characterized by solid hexahedral elements for a total of 33704 (20218 nodes).

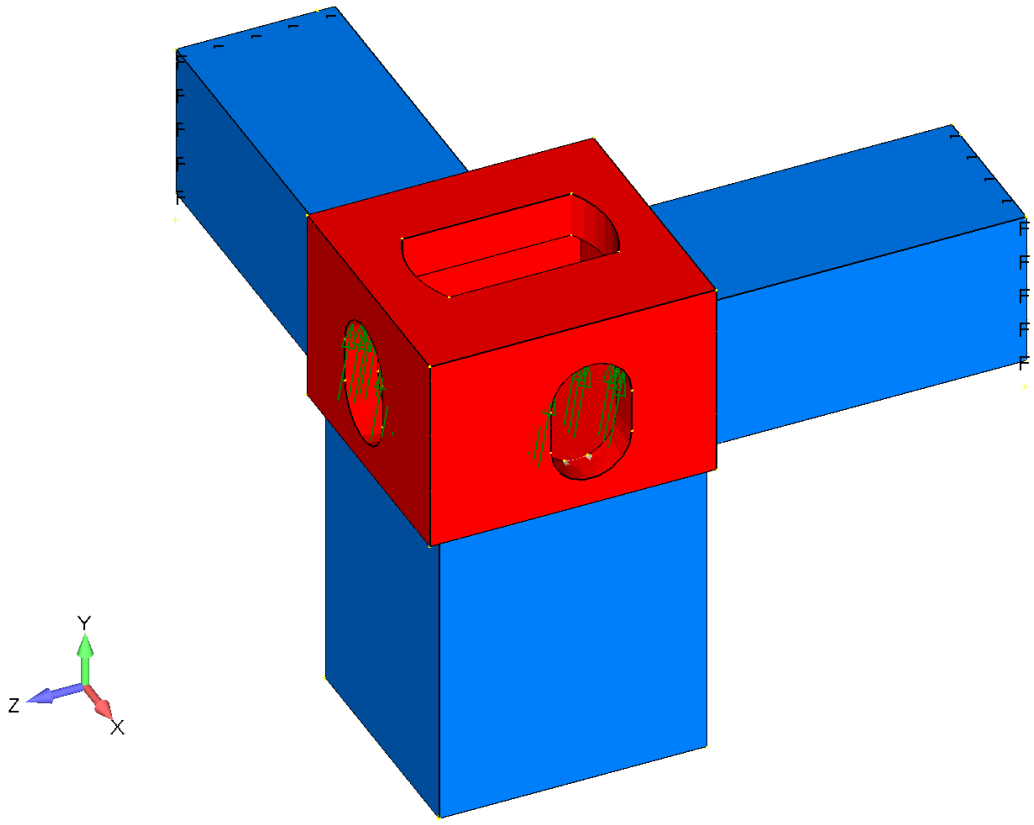
P.2.6.1

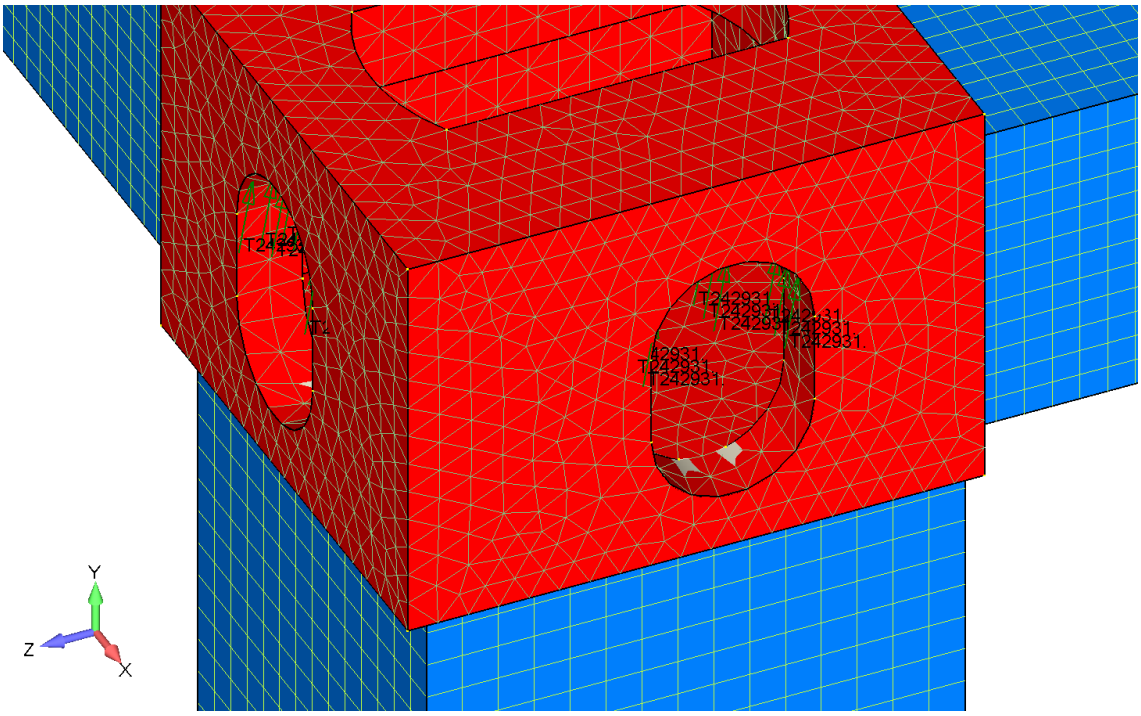
The design loads on the padeye may be calculated as indicated below. The following assumptions apply:



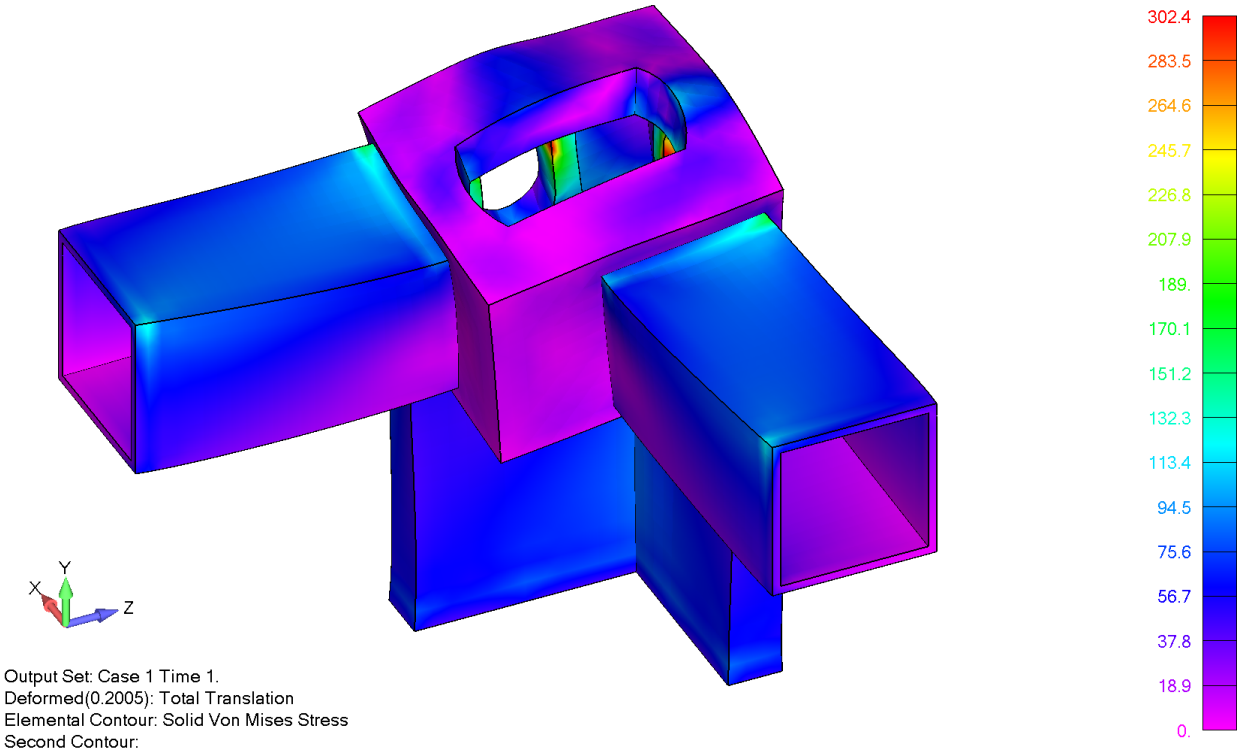
- The sling design load (FSD) is transferred to the padeye through a shackle as indicated on the sketch.
- No friction between sling and shackle.
- The shackle is positioned centric in the padeye.
- Lateral load (F_{dl}) is transferred to the padeye through contact pressure between shackle body and padeye and/or as friction force between pin and padeye. Load resultant is assumed to work at top of pin.
- Moment (M_e) is transferred to the padeye through contact pressure between shackle pin and padeye.

F_d=FSD × cos(v)	F_{dl}=FSD × sin(v)	M_e=F_{dl} × h

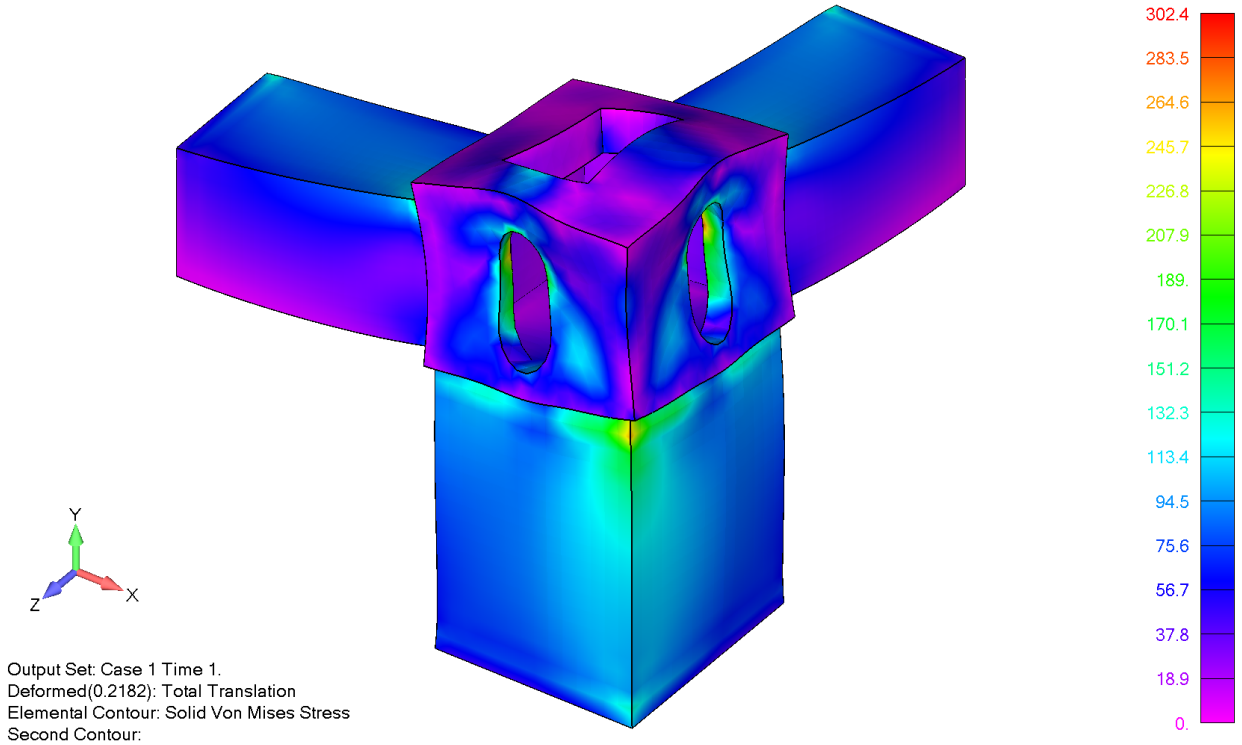




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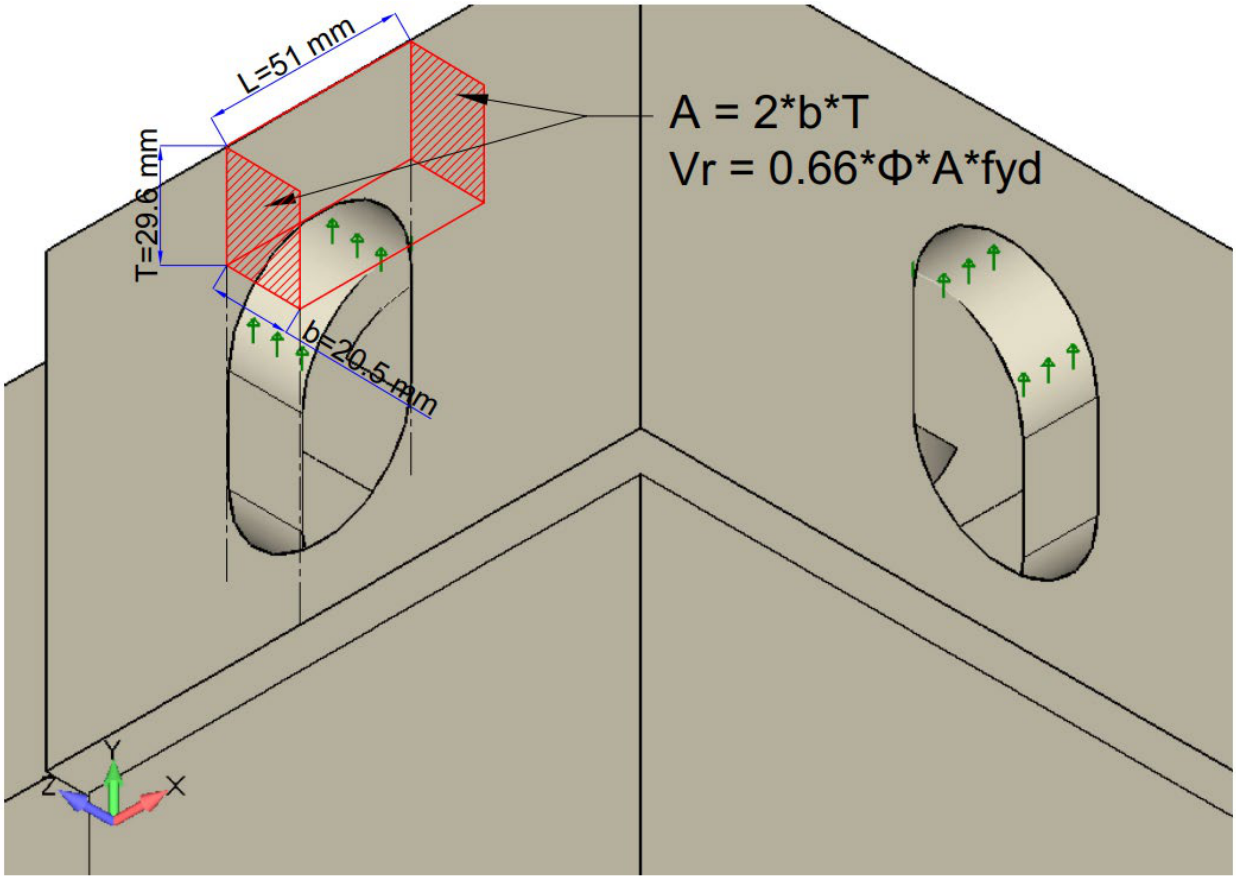
Output Set: Case 1 Time 1.
Deformed(0.2005): Total Translation
Elemental Contour: Solid Von Mises Stress
Second Contour:



Output Set: Case 1 Time 1.
Deformed(0.2182): Total Translation
Elemental Contour: Solid Von Mises Stress
Second Contour:

*MAXIMUM STRESS 302.4 MPA < 355*0.9 = 320 MPA*

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For shear check of the lifting point subjected to tension from lifting cables, the shear stress is manually checked and compared with the limit value of the steel.

$A = 2*b*T = 2*20.5*29.6 = 1213.6\ mm^2$

$Vr = 0.66*\Phi*A*fyd = 0.66*0.9*1213.6*355 = 255912\ N = 256\ kN > 234\ kN$ **(Verified)**

11 CONCLUSIONS

All structural components of cabin are verified. The stresses and displacements are compatible with the real behaviour and the structure is capable of supporting of assigned load.

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Base Load Power Hub (BLPH)

B-400 STRUCTURAL CALCULATION - E&I SHELTERS

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	09/07/2024

Document Number:

1724000049-ST-CA-00009

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
3	02/07/2024	Accepted for Construction (AFC)	FB	SKV	OA
2	11/06/2024	Accepted for Construction (AFC)	FB	SKV	OA
1	21/05/2024	Accepted for Construction (AFC)	FB	SKV	OA
0	26/04/2024	Issue for Review (IFR)	FB	SKV	OA

ALEX SISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
1	Accepted for Construction (AFC)
2	Accepted for Construction (AFC)
3	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.2 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.2.1 PROJECT LOCATION

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

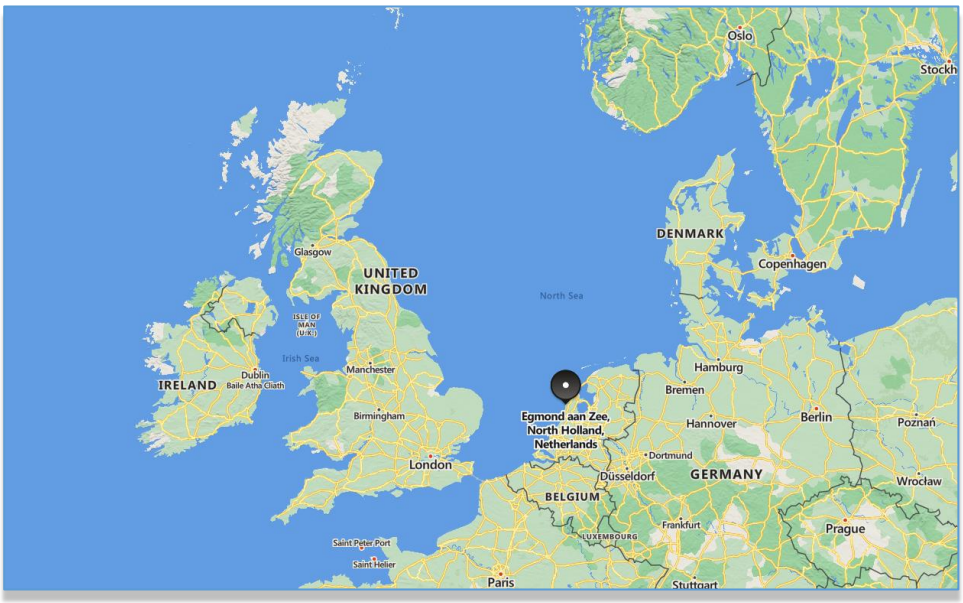


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.2.2 PROJECT CONCEPT

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

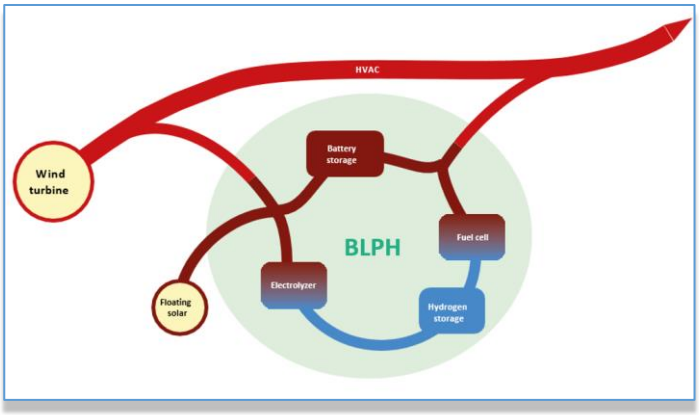


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

Structural report.

2.2 REFERENCES

Doc. No.	Description
123A90-DDL-ST-SP-90017 Rev.01	Structural design basis
123A90-DDL-IN-DL-40012 Rev.01_OPEN	BLPH off-shore iter equipment layout

Table 1 - Reference Documents

2.3 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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3 PURPOSE OF WORK

The B400 (I&T Equipment Room), which is the object of the following report, has been design and build by Alex Sistemi S.p.A.

This calculation report describes the structural analysis of steel room, which will be placed off the coast of Netherlands near the town of Egmond aan Zee. This report summarizes the results of the analyses performed to evaluate the actual stress path and strength verification on the cabin in the worst condition among those feasible.

The following conditions have been considered for the analyses:

- Dead load;
- Live load;
- Wind load;
- Sea transport;
- Lifting.

The structure has been diagrammed so as to allow calculation by use of a computer program for finite element analysis. The structure has been calculated using SAP2000 v.25 for the finished elements (FEM) and Femap Nastran 2401 for solid models of lifting lug and corrugated panel.

1.1 CODES AND STANDARDS

For structural ULS, SLS and lifting design of has been used Eurocodes.

- EN 1993-1-1 2005 Eurocode specifications for steel building;
- 0027 ND rev. 11 Guideline for lifting Noble Denton.

1.2 UNITS

- Density [kg/m³];
- Length [m], [mm];
- Mass [kg], [ton]= 1000 [kg];
- Force [N], [kN] = 1000 [N];
- Area Load [kN/m^2];
- Temperature [°C];
- Stress [MPa] = [N/mm^2];

1.3 MATERIALS

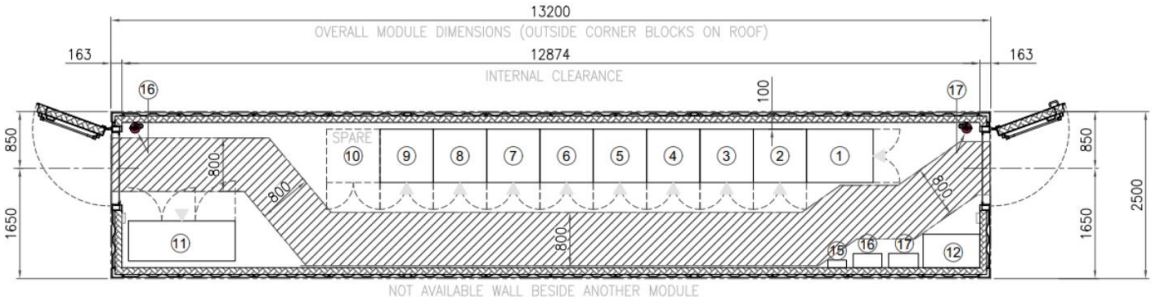
- **Framing structure and panelling EN S355J0:**
  - Modulus of elasticity E=210000 N/mm^2
  - Modulus of rigidity G=81000 N/mm^2
  - Tensile stress breakage fr>=470 N/mm^2
  - Yield stress fy=355 N/mm^2
  - Ultimate elongation percentage A=22%

- **Welding steel dependent of welded section material:**
  - Structural steel with a yield stress of at least 300 MPa matching electrode ultimate tensile strength X_u=490 N/mm^2.
- **Bolting ASTM A325:**
  - Tensile ultimate stress fu=830 N/mm^2
  - Yield stress fy=660 N/mm^2

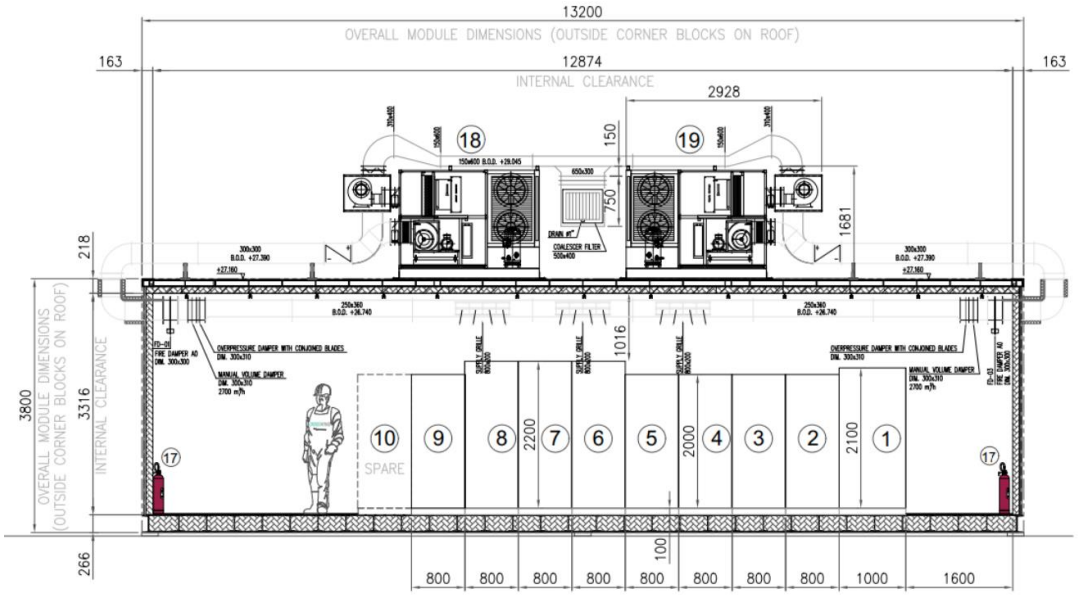
1.4 GENERAL DESCRIPTION

The structure has finished dimensions:

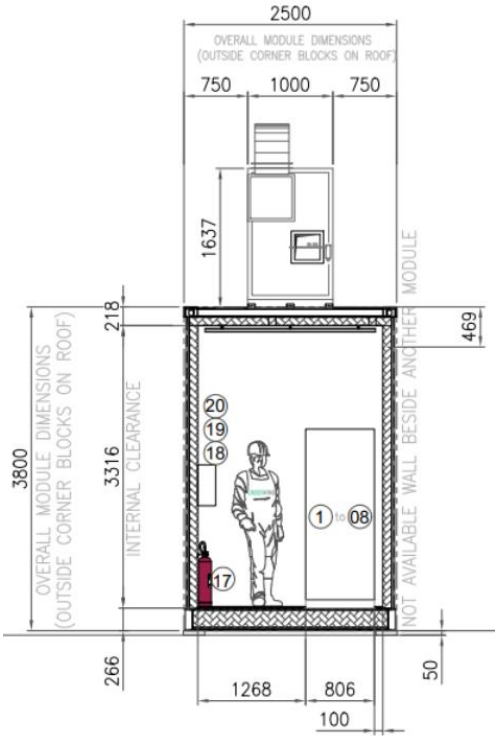
- Maximum lenght: 13200 mm;
- Maximum width: 2500 mm;
- Height: 3800 mm.



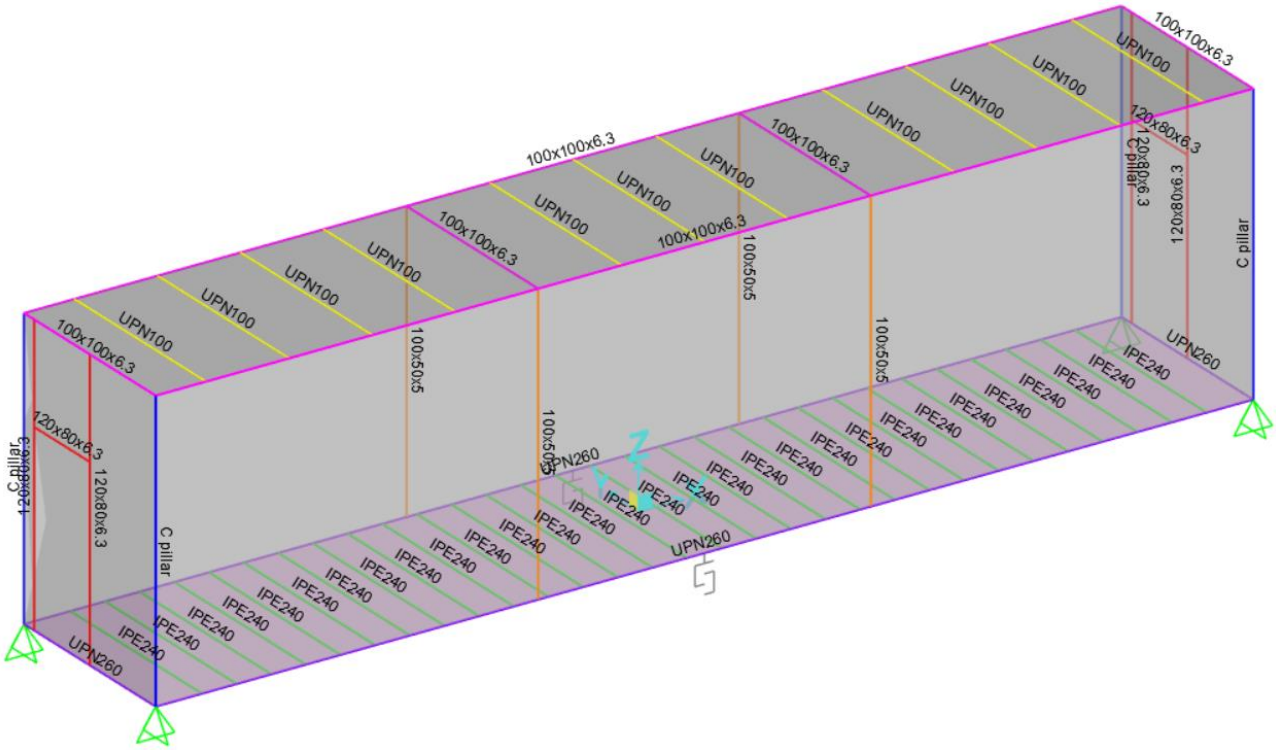
PLAN VIEW

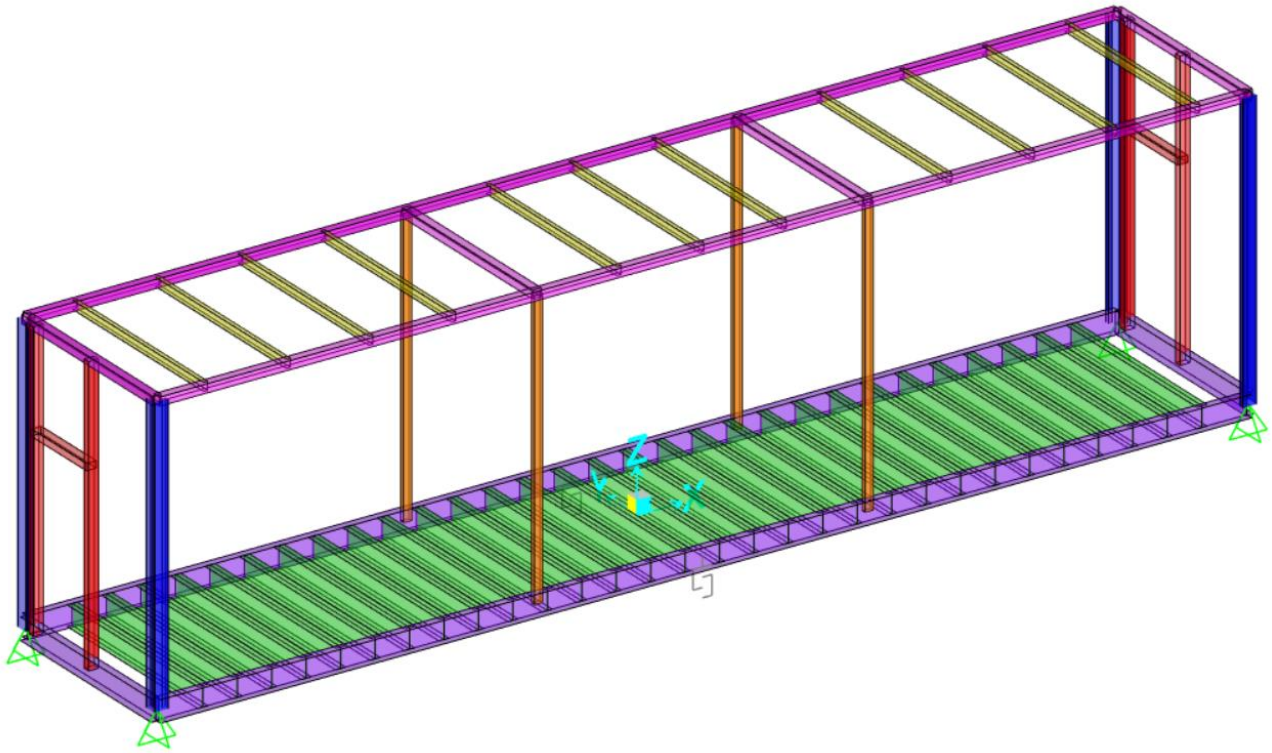


LONG SIDE VIEW



Below is shown the summary of all sections, also identified by color.





- Corrugated wall sheet thickness 3 mm;
- Roof sheet stave thickness 6 mm;
- Floor metal sheet thickness 6 mm.

TABLE: Area Section Properties

Section	Material	MatAngle	AreaType	Type	DrillDOF	Thickness	BendThick	Color	TotalWt	TotalMass
Text	Text	Degrees	Text	Text	Yes/No	m	m	Text	KN	KN-s2/m
Corrugate 3mm	S355	0	Shell	Shell-Thin	Yes	0.003	0.003	Gray	36.631	3.74
Metal sheet 6mm	S355	0	Shell	Shell-Thin	Yes	0.006	0.006	Gray	20.215	2.06
Roof stave 6mm	S355	0	Shell	Shell-Thin	Yes	0.006	0.006	Gray	21.9	2.23

TABLE: Area Section Properties

Section	F11Mod	F22Mod	F12Mod	M11Mod	M22Mod	M12Mod	V13Mod	V23Mod	MMod	WMod
Text	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless
Corrugate 3mm	1	1	1	1	261	1	1	1	1.5	1.5
Metal sheet 6mm	1	1	1	1	1	1	1	1	1.2	1.2
Roof stave 6mm	1	1	1	1	613	1	1	1	1.3	1.3

The mass and weight multiplier for the flat sheet representing the C-stave wall, is evaluated about 90% more than the equivalent flat sheet of the same thickness (4 mm of thickness) as is possible to see on the following pages.

The structural skeleton is made with combinations of different types of section, listed below:

TABLE: Frame Section Properties 01 - General

SectionName	Material	Shape	t3	t2	tf	tw	t2b	tfb	FilletRadius	Area	TorsConst
Text	Text	Text	m	m	m	m	m	m	m	m2	m4
100x100x6.3	S355	Box/Tube	0.10	0.10	0.01	0.01			0.00	0.00	0.00
100x50x5	S355	Box/Tube	0.10	0.05	0.01	0.01			0.00	0.00	0.00
120x80x6.3	S355	Box/Tube	0.12	0.08	0.01	0.01			0.00	0.00	0.00
C pillar	S355	SD Section								0.00	0.00
IPE240	S355	I/Wide Flange	0.24	0.12	0.01	0.01	0.12	0.01	0.02	0.00	0.00
UPN100	S355	Channel	0.10	0.05	0.01	0.01			0.01	0.00	0.00
UPN260	S355	Channel	0.26	0.09	0.01	0.01			0.01	0.00	0.00

TABLE: Frame Section Properties 01 - General

SectionName	I33	I22	I23	AS2	AS3	S33Top	S33Bot	S22Left	S22Right	Z33	Z22
Text	m4	m4	m4	m2	m2	m3	m3	m3	m3	m3	m3
100x100x6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100x50x5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120x80x6.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C pillar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IPE240	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPN100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPN260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

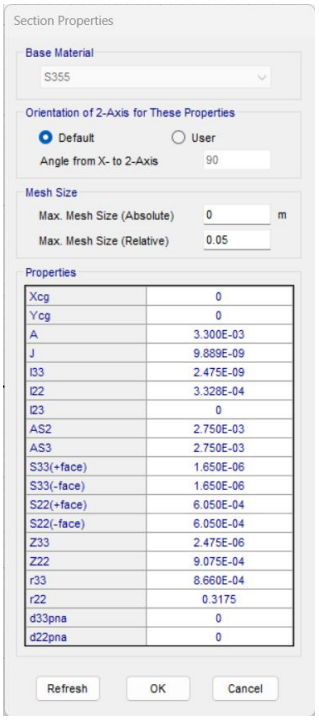
TABLE: Frame Section Properties 01 - General

SectionName	R33	R22	CGOffset3	CGOffset2	EccV2	EccV3	Cw	IncludeSCAn	ConcCol	ConcBeam	Color
Text	m	m	m	m	m	m	m6	Yes/No	Yes/No	Yes/No	Text
100x100x6.3	0.04	0.04	0.00	0.00	0.00	0.00	0.00		No	No	Magenta
100x50x5	0.04	0.02	0.00	0.00	0.00	0.00	0.00		No	No	Orange
120x80x6.3	0.04	0.03	0.00	0.00	0.00	0.00	0.00		No	No	Red
C pillar	0.06	0.06	0.02	0.02	0.00	0.00	0.00		No	No	Blue
IPE240	0.10	0.03	0.00	0.00	0.00	0.00	0.00		No	No	Green
UPN100	0.04	0.01	0.01	0.00	0.03	0.00	0.00	Yes	No	No	Yellow
UPN260	0.10	0.03	0.02	0.00	0.05	0.00	0.00	Yes	No	No	Purple

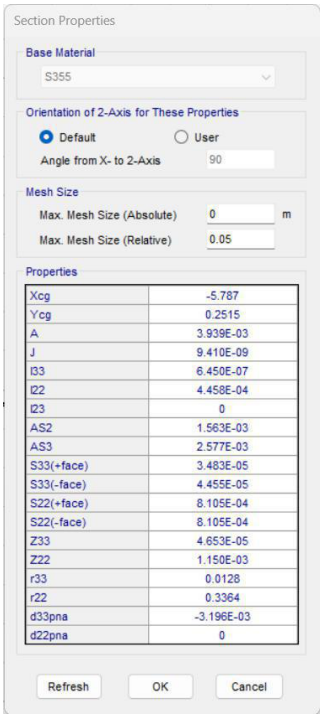
TABLE: Frame Section Properties 01 - General

SectionName	TotalWt	TotalMass	FromFile	AMod	A2Mod	A3Mod	JMod	I2Mod	I3Mod	MMod	WMod
Text	KN	KN-s2/m	Yes/No	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless
100x100x6.3	6.521	0.66	No	1	1	1	1	1	1	1	1
100x50x5	1.475	0.15	No	1	1	1	1	1	1	1	1
120x80x6.3	2.851	0.29	No	1	1	1	1	1	1	1	1
C pillar	3.025	0.31	No	1	1	1	1	1	1	1	1
IPE240	21.397	2.18	Yes	1	1	1	1	1	1	1	1
UPN100	2.701	0.28	Yes	1	1	1	1	1	1	1	1
UPN260	11.57	1.18	Yes	1	1	1	1	1	1	1	1

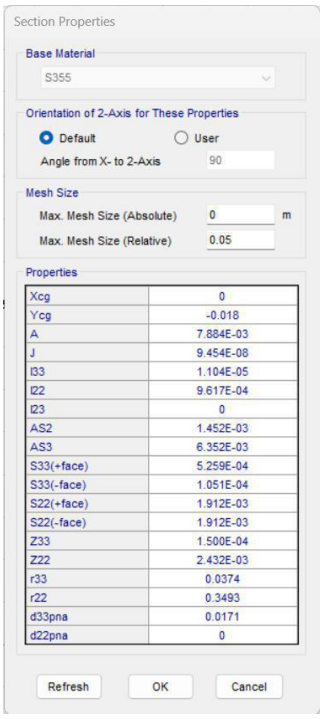
The roof and wall assembly C profile modules is modelled with a flat plate with flexural stiffness calibrated on a specific FEM comparative model and consequently increased weight by a multiplier in the property (see column MMOD and WMOD in the previous tables → I33 ration between the real section and flat section).



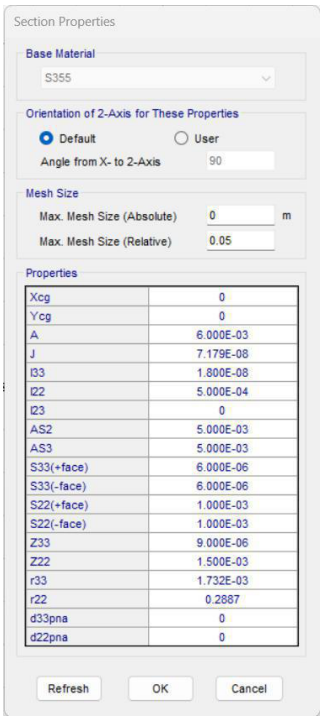
REAL MODELS FOR WALL



CALIBRATED MODELS FOR WALL



REAL MODELS FOR ROOF

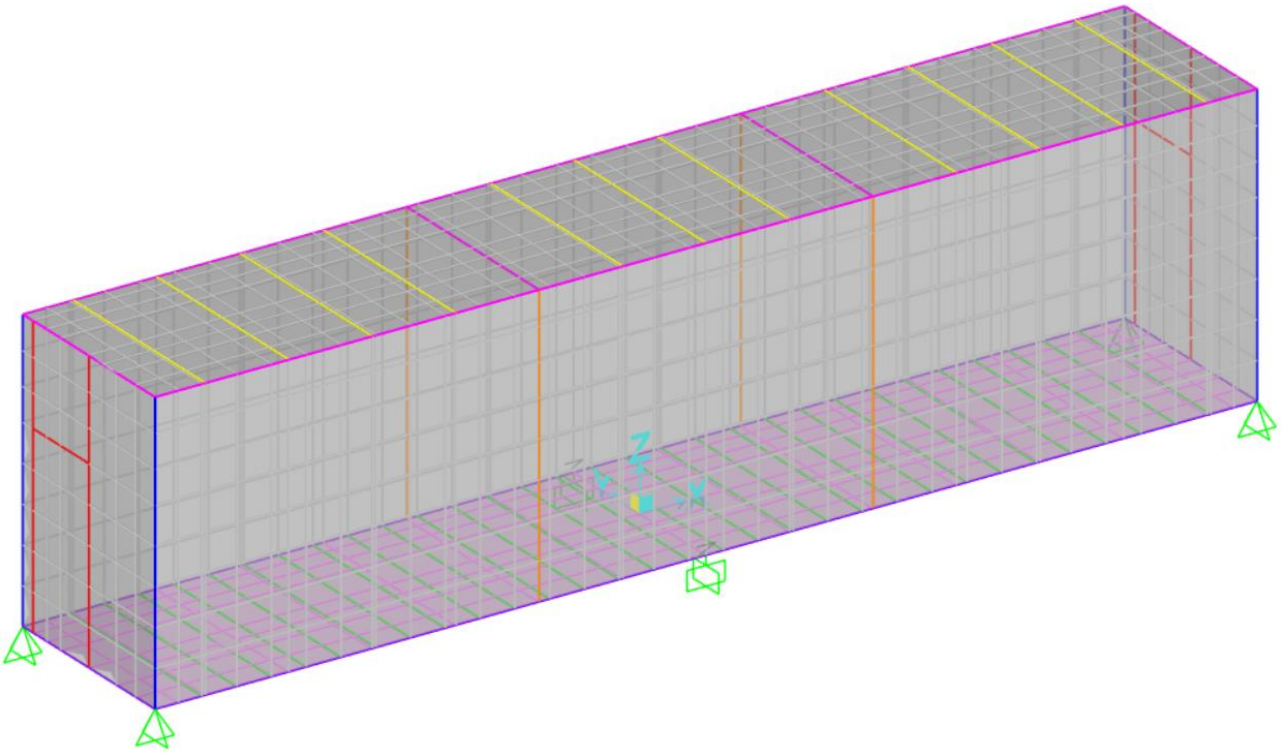


CALIBRATED MODELS FOR ROOF

4 NUMERICAL MODEL

The analyses were performed using SAP2000 v25 Advanced.

Mono-dimensional (beam) and bi-dimensional (shell) elements were used to create the model.



ANALYSIS MESHED MODEL

The model was developed to analyse the components of steel structure, in particular:

- The C module panel sheet was modelled as equivalent shell with specific stiffness;
- The frame was modelled using mono-dimensional elements with cross section.

The wall and roof sheet forming the cover, is simplified as element flat shell but was given a stiffness, in the direction of the warping of the ribs, equivalent to the ratio between the inertia of the real section and the inertia of flat sheet. In this way it was possible to obtain a realistic displacement of the material under loads. In tensional terms it was necessary to evaluate the effective bound (considered by the software on the inertia of the flat section) as the ratio between the moment on linear meter, agent in the warping direction of the rib and the section modulus W of the real section, obtaining a maximum bound in line with the results of the software tension for orthogonal plate direction (Jcorrugated/Jflat). This aspect can be bypassed by analyzing detailed models for walls and cover including ribs. This approach also allows to consider the structural behavior of the wall together with the elements constituting the frame like a sort of compound section.

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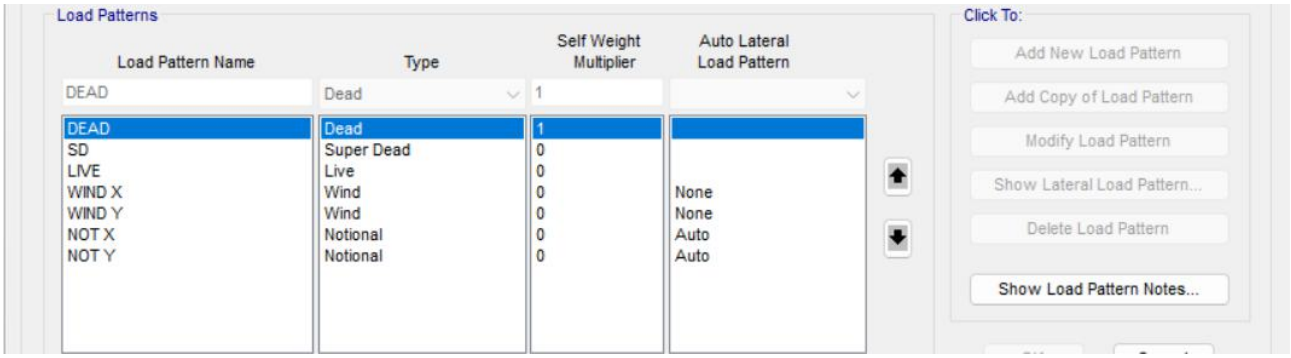
In order to apply the increase of stiffness on the shells so that it can be correctly distributed also on the surrounding frames, it is necessary to discretize the flat elements with a certain mesh and Sap will provide appropriate automation for the frames. The loads are applied as uniform to shell (meshed) for panels with structural function in order to also consider the contribution of the latter in the distribution and as uniform to frames for floor and deck where the plate area have only function as load distributors.

As regards the middle supports for perimeter beam UPN260, they are represented with GAP links and therefore all load combinations are converted into non-linear in order to take into account the contribution to only compression given from them (non-linear geometry analysis).

4.2 DESIGN LOADING

4.2.1 Dead load

The DEAD LOADS or permanent structural loads of steel FAR are calculated automatically (is considered an additional 3% for connections and NOTIONAL as 0.002 ratio of DEAD).



4.2.2 Super dead load

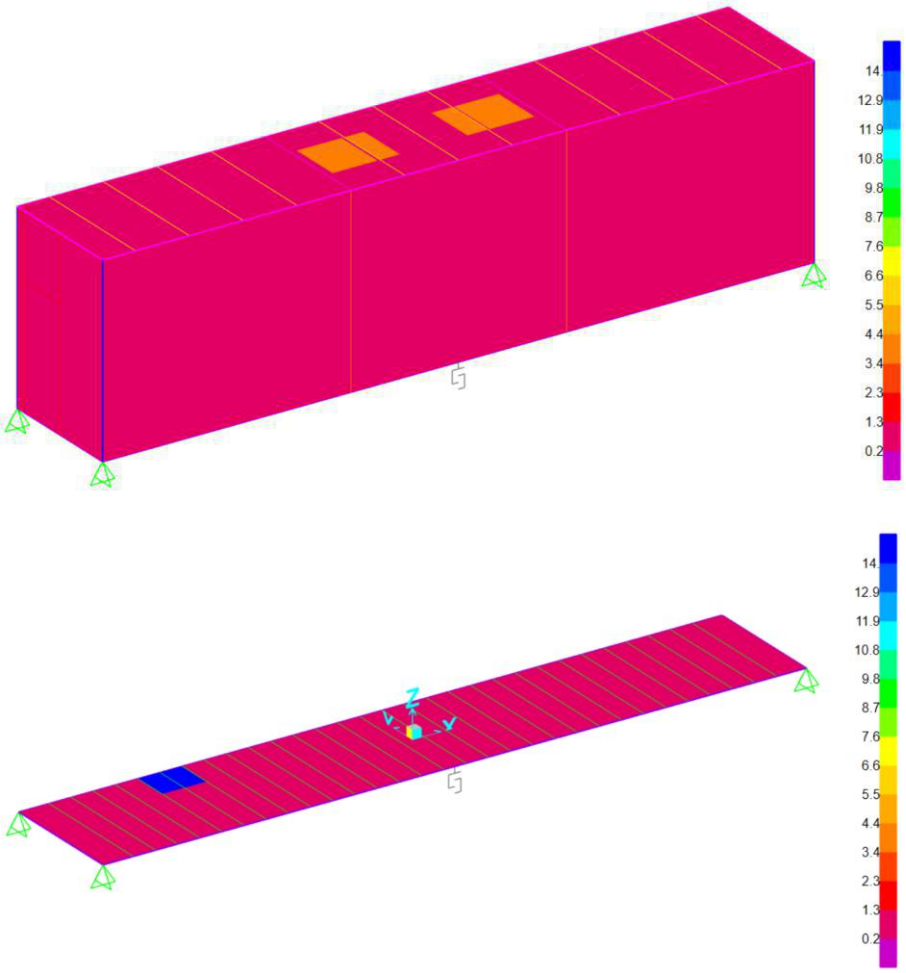
All non structural or SUPER DEAD LOADS on walls 20 kg/m² on roof 50 kg/m² load and floor 50 kg/m².

The weight of internal racks is calculated by data provided by customer and their overall dimensions, therefore simplified in favor of safety with a loading area in the model. The relevant equipments are switchgear and its GIS for two imprint respectively 9.4 m² and 7.4 m² for two distributed loads 8 kN/m² for switchgear and 3.5 kN/m² for GIS. For other equipment is in favor of safety to consider the live load instead of SD load.

In particular for HVAC units of roof, considering the worst condition 4 kN/m² for the foot-print 2 m² and 1 kN/m² for the conducts in extra areas. In these areas isn't applied live load.

	B400 [kg]
Metal structure	12128
Insulating panels wall roof	2876
Insulating panels floor	571
Insulating door A5	23
Insulating door A6	/
Insulating door C4	/
Insulating door D4	25
Total DEAD + INSULATION	**15624**

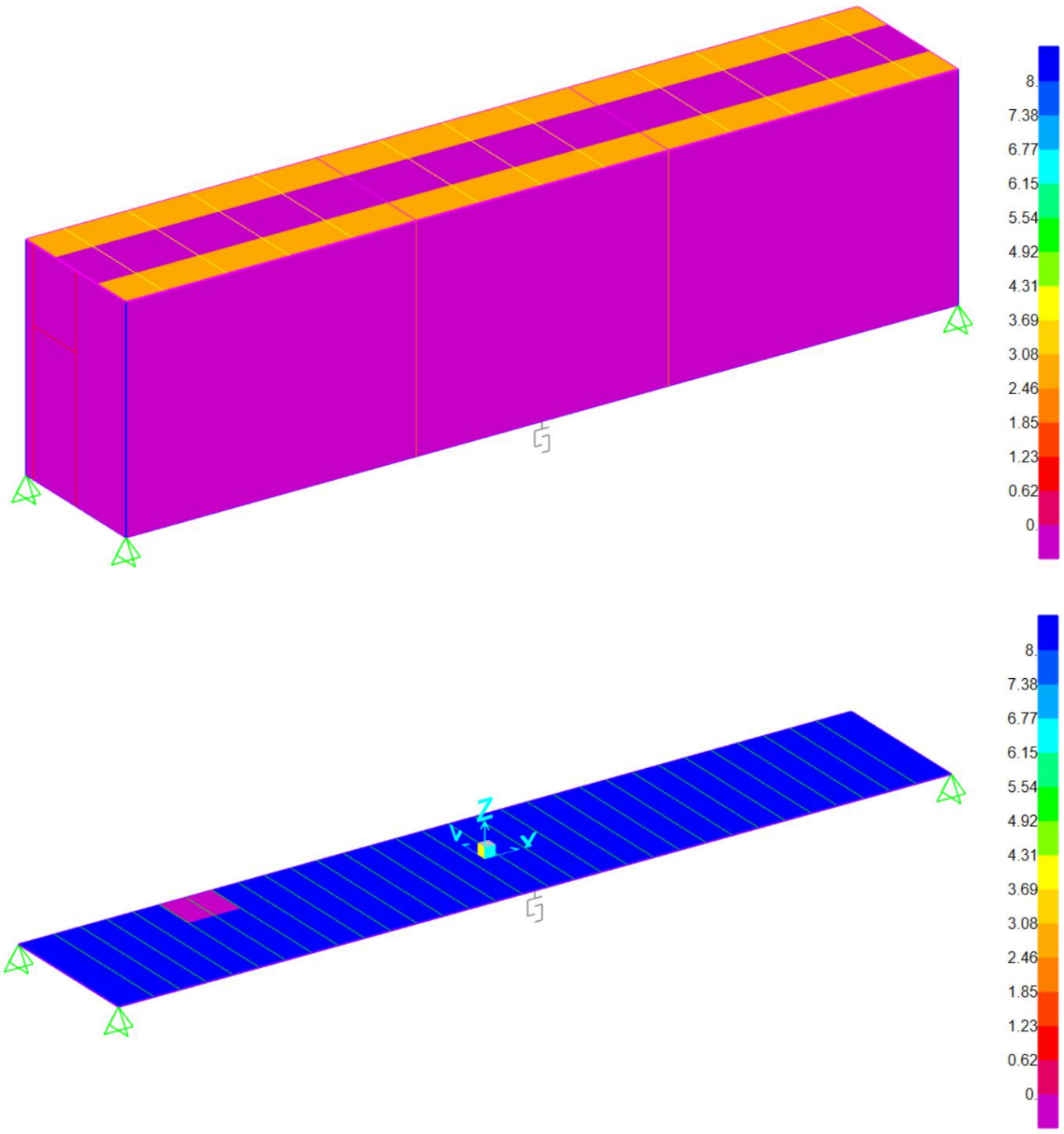
EQUIPMENT LIST						
REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)
1	B400-SRV-001	SERVER CABINET	1000	800	2100	250
2	B400-NET-001	NETWORK CABINET	800	800	2100	250
3	B400-EMCS-001	EMCS SYSTEM CABINET	800	800	2100	250
4	B400-PCS-001	PCS SYSTEM CABINET	800	800	2100	250
5	B400-PCS-002	PCS MARSHALLING CABINET	800	800	2100	250
6	B400-FGS-001	FGS SYSTEM CABINET	800	800	2100	250
7	B400-FGS-002	FGS MARSHALLING CABINET 1	800	800	2100	250
8	B400-FGS-003	FGS MARSHALLING CABINET 2	800	800	2100	250
9	B400-SIS-001	SIS SYSTEM/MARSHALLING CABINET	800	800	2100	250
10	-	SPARE				
11	B400-HSB-001	DISTRIBUTION & HVAC PANEL - I&T ROOM	1600	600	2300	560
12	-	TABLE	850	500	750	50
13	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
14	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
15	-	FIRST AID KIT	280	115	200	10
16	-	RESUSCITATION UNIT	430	210	480	10
17	-	CABINET INCLUDED N.10 ESCAPE MASK	448	213	422	15
18	HHU-77004A	AIR HANDLING UNIT A	2928	1135	1680	840
19	HHU-77004B	AIR HANDLING UNIT B	2928	1135	1680	840



SUPER DEAD LOADS APPLIED IN MODEL [kN/m²]

4.2.3 Live load

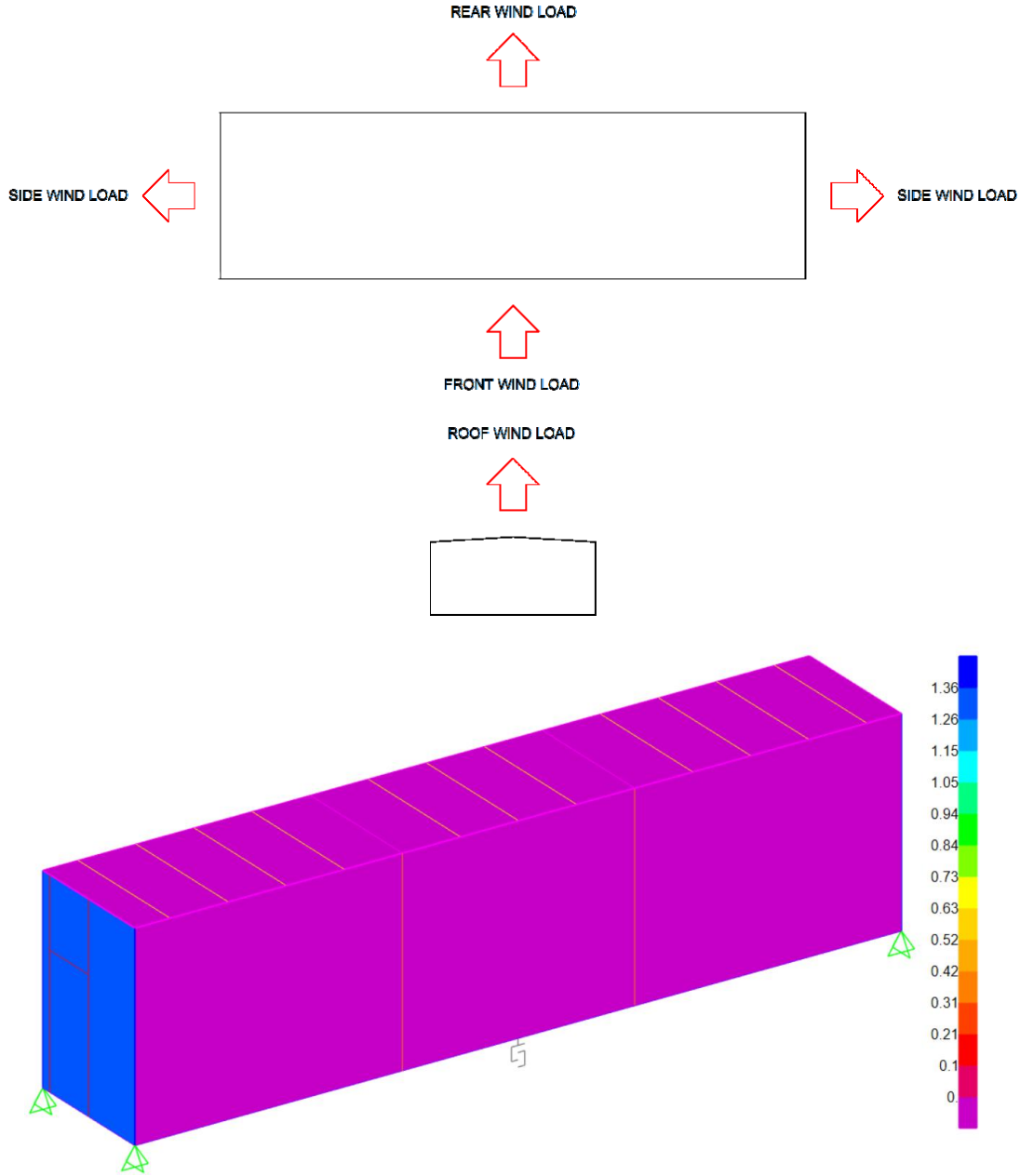
The LIVE LOADS are distributed in areas not loaded with cabinets or internal components. All loads are rounded up and equal to 2.5 kN/m^2 for roof and 8 kN/m² for internal floor.



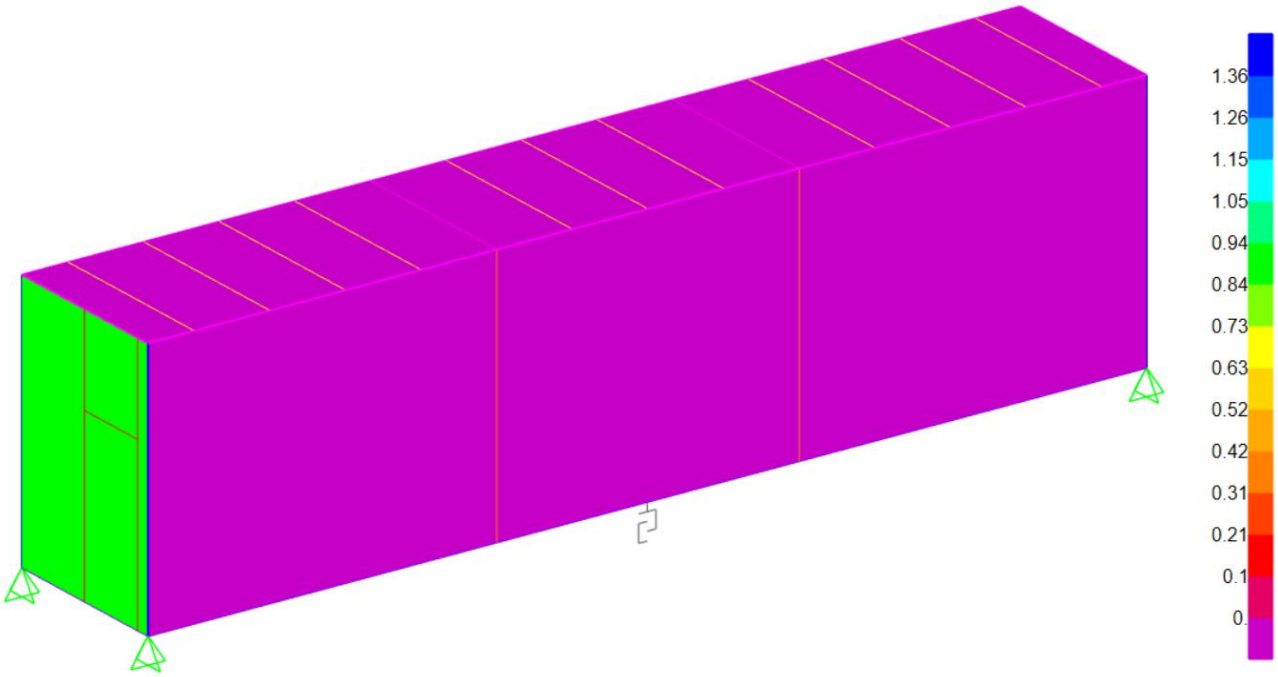
LIVE LOAD APPLIED IN MODEL [kN/m²]

4.2.4 Wind load

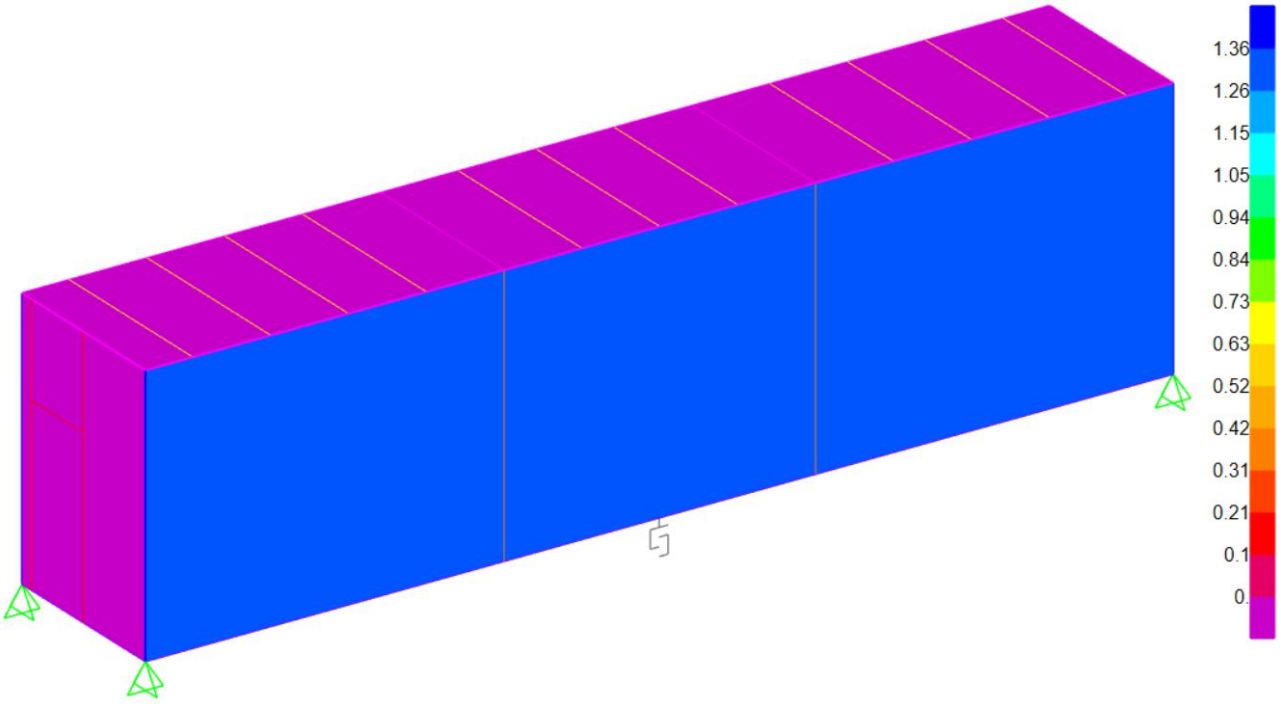
The design wind loads shall be automatically calculated for the worst condition of wind speed 41 m/s and exposure category D with importance factor 1.15 (Eurocode's worst condition for off-shore and in accordance with the specifics of customer WIND TABLE). The actions on walls and roof are automatically calculated by Sap by setting the parameters and applying the appropriate exposure coefficient to the plate elements (peak velocity pressure 1.69 kN/m² → pressure coefficient Cp front 0.8, Cp side, rear and roof 0.5).



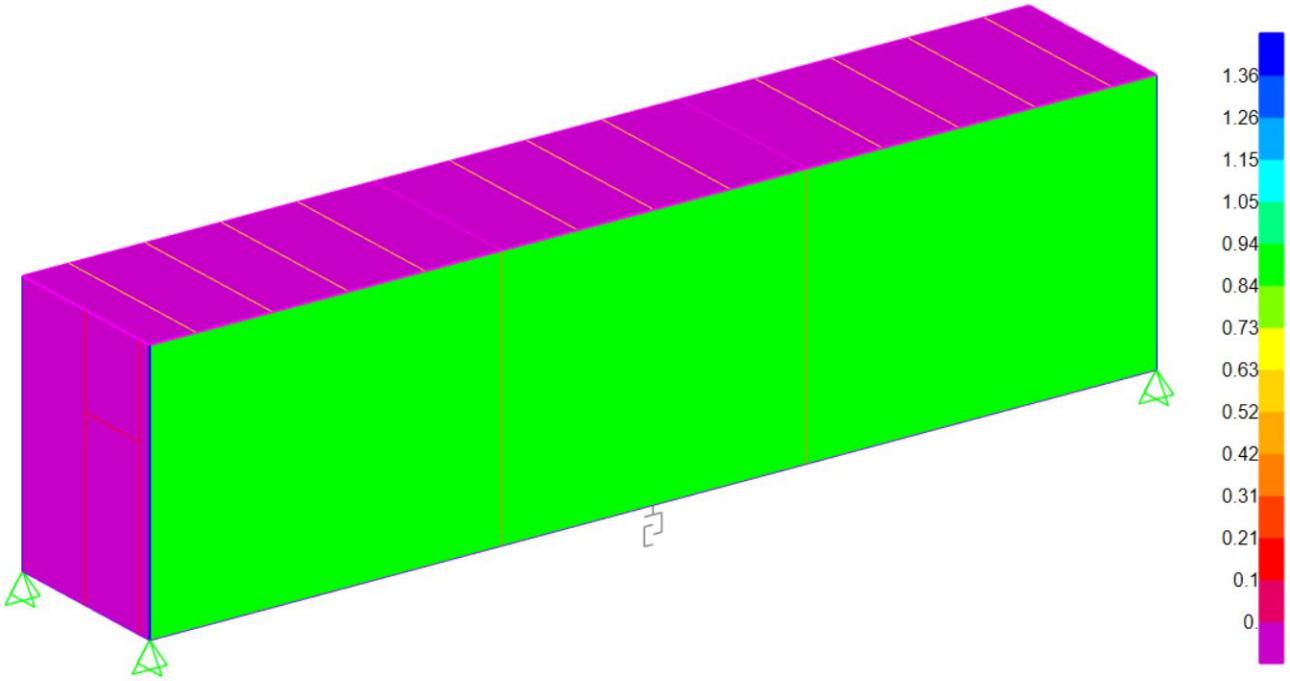
WIND X PRESSURE FRONT [kN/m²]



WIND X PRESSURE REAR [kN/m²]



WIND Y PRESSURE FRONT [kN/m²]



WIND Y PRESSURE REAR [kN/m²]

4.3 LOAD COMBINATIONS

TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
ULS LIVE	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.5	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
ULS WIND X	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.05	
			NonLin Static	WIND X	1.5	
			NonLin Static	WIND Y	0.3	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
ULS WIND Y	Linear Add	No	NonLin Static	DEAD	1.3	Strength
			NonLin Static	SD	1.5	
			NonLin Static	LIVE	1.05	
			NonLin Static	WIND X	0.3	
			NonLin Static	WIND Y	1.5	
			NonLin Static	NOT X	1.3	
			NonLin Static	NOT Y	1.3	
SLS LIVE	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	LIVE	1	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
SLS WIND X	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	WIND X	1	
			NonLin Static	WIND Y	0.3	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
SLS WIND Y	Linear Add	No	NonLin Static	DEAD	1	Deflection
			NonLin Static	SD	1	
			NonLin Static	WIND X	0.3	
			NonLin Static	WIND Y	1	
			NonLin Static	NOT X	1	
			NonLin Static	NOT Y	1	
LLC2 lifting	Linear Add	No	NonLin Static	DEAD	1.5	Strength
			NonLin Static	SD	1.5	
LLC3 lifting	Linear Add	No	NonLin Static	DEAD	2	Lifting point
			NonLin Static	SD	2	

TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
SEA COMB 1	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	1	
SEA COMB 2	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	1	
SEA COMB 3	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	-1	
SEA COMB 4	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	-1	
SEA COMB 5	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	1	
SEA COMB 6	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	1	
SEA COMB 7	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	-1	
SEA COMB 8	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND X	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	-1	

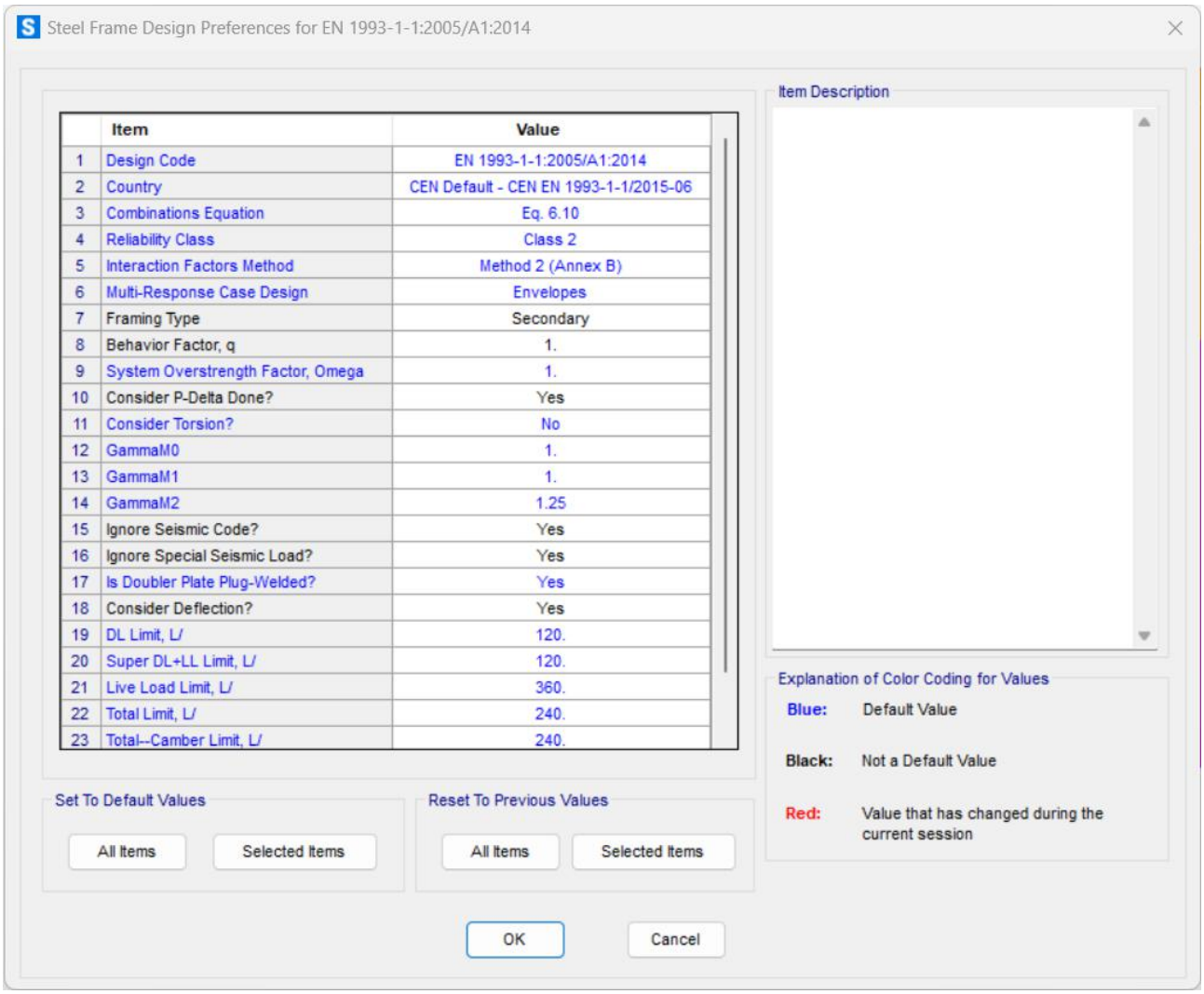
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TABLE: Combination Definitions						
ComboName	ComboType	AutoDesign	CaseType	CaseName	ScaleFactor	SteelDesign
Text	Text	Yes/No	Text	Text	Unitless	Text
SEA COMB 9	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	1	
SEA COMB 10	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	1	
SEA COMB 11	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	1	
			NonLin Static	HEAVE	-1	
SEA COMB 12	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SURGE	-1	
			NonLin Static	HEAVE	-1	
SEA COMB 13	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	1	
SEA COMB 14	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	1	
SEA COMB 15	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	1	
			NonLin Static	HEAVE	-1	
SEA COMB 16	Linear Add	No	NonLin Static	DEAD	1.1	Strength
			NonLin Static	SD	1.1	
			NonLin Static	WIND Y	1	
			NonLin Static	SWAY	-1	
			NonLin Static	HEAVE	-1	

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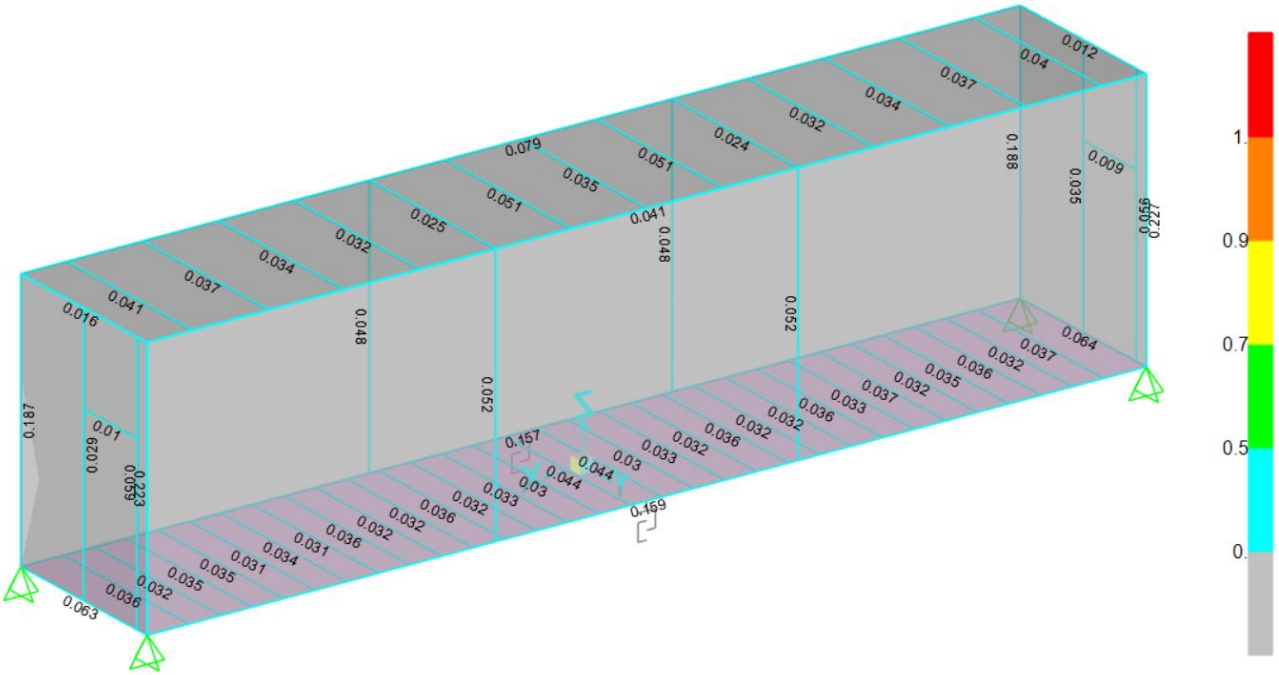
4.4 STRESS CHECK IN PLACE

All sections are check and verified in according with EN 1993 combinations ULS LIVE and WIND, SLS LIVE and WIND. Showed below the detailed printout for each type of section in its combination of maximum stress and the force diagrams with values for roof frames.



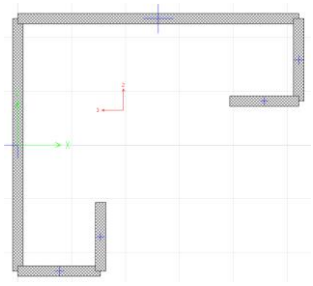
	Item	Value
1	Design Code	EN 1993-1-1:2005/A1:2014
2	Country	CEN Default - CEN EN 1993-1-1/2015-06
3	Combinations Equation	Eq. 6.10
4	Reliability Class	Class 2
5	Interaction Factors Method	Method 2 (Annex B)
6	Multi-Response Case Design	Envelopes
7	Framing Type	Secondary
8	Behavior Factor, q	1.
9	System Overstrength Factor, Omega	1.
10	Consider P-Delta Done?	Yes
11	Consider Torsion?	No
12	GammaM0	1.
13	GammaM1	1.
14	GammaM2	1.25
15	Ignore Seismic Code?	Yes
16	Ignore Special Seismic Load?	Yes
17	Is Doubler Plate Plug-Welded?	Yes
18	Consider Deflection?	Yes
19	DL Limit, L/	120.
20	Super DL+LL Limit, L/	120.
21	Live Load Limit, L/	360.
22	Total Limit, L/	240.
23	Total--Camber Limit, L/	240.

For in-place condition is automatically calculated also the relative deflection and compared with the limite L/240 (for beams). For beams in compression is calculated the lateral torsion buckling limit from code.



CHECK DESIGN FOR ULS LOADS (ORANGE < 1 RATIO)

4.4.1 C PILLAR



EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame :	178	X Mid:	-6.6	Combo:	ULS WIND Y	Design Type:	Column
Length:	3.422	Y Mid:	1.185	Shape:	C pillar	Frame Type:	Secndry
Loc :	0.	Z Mid:	1.711	Class:	Class 3	Rolled :	No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10 Reliability = Class 2 Interaction = Method 2 (Annex B)
MultiResponse = Envelopes P-Delta Done? Yes Consider Torsion? No

GammaM0=1.	GammaM1=1.	GammaM2=1.25		
An/Ag=1.	RLLF=1.	PLLF=0.75	D/C Lim=0.95	Prin. Axis Angle = 90. deg

Aeff=0.003	Av,2=0.001	Av,3=0.001	eNy=0.	eNz=0.
A=0.003	Iy=8.703E-06	iy=0.055	Wel,y=8.999E-05	Weff,y=8.999E-05
It=3.406E-08	Iz=1.075E-05	iz=0.061	Wel,z=1.027E-04	Weff,z=1.027E-04
Iw=0.	Iyz=0.	h=0.153	Wpl,y=1.342E-04	
E=210000000.	fy=355000.	fu=510000.	Wpl,z=1.489E-04	

STRESS CHECK FORCES & MOMENTS

Location	Ned	My,Ed	Mz,Ed	V2,Ed	V3,Ed	TEd
0.	-66.86	0.687	1.059	1.811	2.519	0.002

PMM DEMAND/CAPACITY RATIO (Governing Equation EC3 6.3.1.1(1)-6.46)
D/C Ratio: 0.227 = 0.227 < 0.95 OK
= (NEd/Nb,Rd) (EC3 6.3.1.1(1)-6.46)

AXIAL FORCE DESIGN

	NEd Force	Nc,Rd Capacity	Nt,Rd Capacity
Axial	-66.86	1019.205	1019.205

Npl,Rd	Nu,Rd	Ncr,T	Ncr,TF	An/Ag
1019.205	1054.231	406.117	406.117	1.

	Curve	Alpha	Ncr	LambdaBar	Phi	Chi	Nb,Rd
Y-Y	c	0.49	1540.332	0.813	0.981	0.654	666.273
Y-Y Braced	c	0.49	3272.912	0.558	0.743	0.81	825.524
Z-Z	c	0.49	1902.158	0.732	0.898	0.705	718.331

Z-Z Braced	c	0.49	2627.638	0.623	0.798	0.772	786.612
Torsional TF	c	0.49	406.117	1.584	2.094	0.289	294.293

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.687	0.687	31.947	31.947	31.947	23.899
Z-Z	1.059	1.059	36.446	36.446	36.446	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.545	0.779	0.748	0.	107.666

Factors	kw	C1	C2	C3		
	1.	2.711	0.43	1.12		
	za	zs	zg	zz	zj	
	0.056	0.	0.056	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.411	0.413	0.982	0.413

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	1.811	249.477	0.007	1.
3-Axis	2.519	259.256	0.01	1.

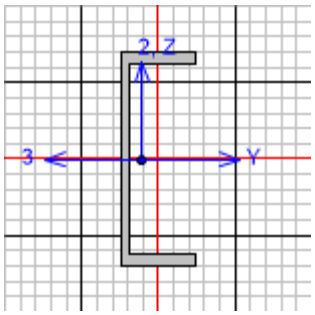
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	1.811	0.002	249.477	0.007	OK
3-Axis	2.519	0.002	259.256	0.01	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	249.477	1.2	0.	1.
3-Axis	259.256	1.2	0.	1.

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4.4.2 UPN260




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  179      X Mid:  4.500E-04 Combo:  ULS LIVE       Design Type:  Beam
Length:  13.2     Y Mid:  1.185     Shape:  UPN260         Frame Type:  Secndry
Loc   :  6.6      Z Mid:  1.404E-07 Class:  Class 1        Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10             Reliability = Class 2              Interaction = Method 2
(Annex B)
MultiResponse = Envelopes          P-Delta Done? Yes                  Consider Torsion? No

GammaM0=1.        GammaM1=1.       GammaM2=1.25
An/Ag=1.          RLLF=1.          PLLF=0.75        D/C Lim=0.95      Prin. Axis Angle = 0. deg

Aeff=0.005        Av,2=0.003       Av,3=0.003       eNy=0.            eNz=0.
A=0.005           Iy=4.821E-05     iy=0.1           Wel,y=3.708E-04   Weff,y=3.708E-04
It=2.420E-07      Iz=3.178E-06     iz=0.026         Wel,z=4.784E-05   Weff,z=4.784E-05
Iw=3.850E-08      Iyz=0.           h=0.26           Wpl,y=4.531E-04
E=210000000.      fy=355000.       fu=510000.       Wpl,z=1.025E-04


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    6.6           -32.459     -12.395       2.276      42.555      17.736       0.079

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.1(7))
    D/C Ratio:     0.159 = 0.019 + 0.077 + 0.063   <         0.95          OK
                         = (NEd/NRd) + (My,Ed/My,Rd) + (Mz,Ed/Mz,Rd)       (EC3 6.2.1(7))

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                        Force    Capacity    Capacity
    Axial           -32.459     1713.585    1713.585

                       Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                     1713.585     1772.474    35829.31    5996.258          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49    6245.054       0.524       0.717        0.83    1421.547
    Y-Y Braced      c    0.49    6245.054       0.524       0.717        0.83    1421.547
    Z-Z             c    0.49   38058.653       0.212       0.525       0.994    1702.936
```

Z-Z Braced	c	0.49	38058.653	0.212	0.525	0.994	1702.936
Torsional TF	c	0.49	5996.258	0.535	0.725	0.823	1411.059

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-12.395	-12.395	160.851	160.851	160.851	156.
Z-Z	2.276	2.276	36.388	36.388	36.388	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.239	0.543	0.97	3.850E-08	2824.22

Factors	kw	C1	C2	C3		
	1.	1.206	0.553	1.73		
	za	zs	zg	zz	zj	
	0.13	0.	0.13	-6.539E-18	6.539E-18	

	kyy	kyz	kzy	kzz
Factors	0.904	0.503	0.812	0.838

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	42.555	541.707	0.079	1.
3-Axis	17.736	513.833	0.035	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	42.555	0.079	541.707	0.079	OK
3-Axis	17.736	0.079	513.833	0.035	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	541.707	1.2	0.33	1.2
3-Axis	513.833	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

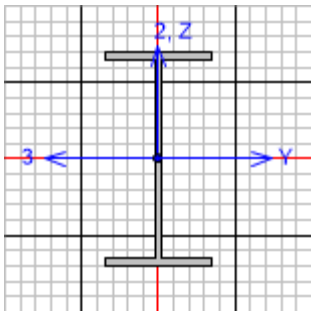
	V2 Left	V2 Right
2-2 (V2)	10.546	10.356

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	0.004	0.11	0.034	OK
Super DL+LL	Yes	0.004	0.11	0.035	OK
Live Load	Yes	0.004	0.037	0.103	OK
Total Load	Yes	0.004	0.055	0.07	OK
Total-Camber	Yes	0.004	0.055	0.07	OK

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4.4.3 IPE240




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  35       X Mid:  0.208     Combo:  ULS LIVE        Design Type:  Beam
Length:  2.37     Y Mid:  0.        Shape:  IPE240          Frame Type:  Secndry
Loc   :  2.028    Z Mid:  1.404E-07 Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2               Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                   Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95      Prin. Axis Angle = 0. deg

Aeff=0.004        Av,2=0.002        Av,3=0.003        eNy=0.            eNz=0.
A=0.004           Iy=3.892E-05      iy=0.1            Wel,y=3.243E-04   Weff,y=3.243E-04
It=1.300E-07      Iz=2.840E-06      iz=0.027          Wel,z=4.733E-05   Weff,z=4.733E-05
Iw=3.739E-08      Iyz=0.            h=0.24            Wpl,y=3.670E-04
E=210000000.      fy=355000.        fu=510000.        Wpl,z=7.390E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    2.028          11.724       3.062      -0.531       5.161       1.031          0.

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.62)
    D/C Ratio:     0.044 = 0. + 0.035 + 0.008   <         0.95          OK
                         = NEd/(Chi_z NRk/GammaM1) + kzy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kzz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)       (EC3 6.3.3(4)-6.62)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                        Force    Capacity    Capacity
    Axial              11.724     1388.05     1388.05

                       Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                      1388.05    1435.752    2275.107    2275.107          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             a    0.21    14363.03       0.311        0.56       0.975    1353.265
    Y-Y Braced      a    0.21    14363.03       0.311        0.56       0.975    1353.265
    Z-Z             b    0.34    1048.073       1.151       1.324       0.506     701.688
    Z-Z Braced      b    0.34    1048.073       1.151       1.324       0.506     701.688
```

Torsional TF	b	0.34	2275.107	0.781	0.904	0.736	1021.669

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	1.432	3.062	130.285	130.285	130.285	86.275
Z-Z	-0.045	-0.531	26.235	26.235	26.235	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	a	0.21	1.005	1.089	0.662	3.739E-08	129.028

Factors	kw	C1	C2	C3		
	1.	1.128	0.43	1.12		
	za	zs	zg	zz	zj	
	0.12	0.	0.12	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.876	0.24	1.	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	5.161	392.038	0.013	1.
3-Axis	1.031	521.318	0.002	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	5.161	0.	392.038	0.013	OK
3-Axis	1.031	0.	521.318	0.002	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	392.038	1.2	0.506	1.2
3-Axis	521.318	1.2	0.	1.

CONNECTION SHEAR FORCES FOR BEAMS

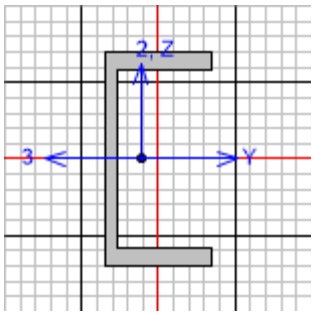
	V2 Left	V2 Right
2-2 (V2)	6.523	6.312

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	2.886E-05	0.02	0.001	OK
Super DL+LL	Yes	1.213E-04	0.02	0.006	OK
Live Load	Yes	1.127E-04	0.007	0.017	OK
Total Load	Yes	1.415E-04	0.01	0.014	OK
Total-Camber	Yes	1.415E-04	0.01	0.014	OK

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4.4.4 UPN100




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  14       X Mid:  1.       Combo:  ULS WIND X      Design Type:  Beam
Length:  2.37     Y Mid:  0.       Shape:  UPN100          Frame Type:  Secndry
Loc   :  2.37     Z Mid:  3.422    Class:  Class 1         Rolled : Yes

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.001        Av,2=6.193E-04    Av,3=8.480E-04    eNy=0.             eNz=0.
A=0.001           Iy=2.053E-06      iy=0.039          Wel,y=4.106E-05    Weff,y=4.106E-05
It=2.645E-08      Iz=2.929E-07      iz=0.015          Wel,z=8.478E-06    Weff,z=8.478E-06
Iw=4.853E-10      Iyz=0.            h=0.1             Wpl,y=5.033E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=1.800E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    2.37             4.966      0.381      -0.011       0.317       0.062         0.

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.62)
    D/C Ratio:     0.051 = 0. + 0.05 + 0.   <         0.95          OK
                         = NEd/(Chi_z NRk/GammaM1) + kzy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kzz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)       (EC3 6.3.3(4)-6.62)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                        Force    Capacity    Capacity
    Axial               4.966      477.83      477.83

                       Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                       477.83     494.251     816.959     484.926          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49     757.639       0.794       0.961       0.666     318.152
    Y-Y Braced    c    0.49     757.639       0.794       0.961       0.666     318.152
```

Z-Z	c	0.49	108.092	2.103	3.176	0.18	85.981
Z-Z Braced	c	0.49	108.092	2.103	3.176	0.18	85.981
Torsional TF	c	0.49	484.926	0.993	1.187	0.544	260.041

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.176	0.381	17.867	17.867	17.867	7.569
Z-Z	-0.011	-0.011	6.39	6.39	6.39	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	1.09	1.432	0.424	4.853E-10	15.047

Factors	kw	C1	C2	C3		
	1.	1.101	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	1.598E-18	-1.598E-18	

	kyy	kyz	kzy	kzz
Factors	0.946	0.24	1.	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.317	126.921	0.002	1.
3-Axis	0.062	173.805	3.581E-04	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.317	0.	126.921	0.002	OK
3-Axis	0.062	0.	173.805	0.	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	126.921	1.2	0.197	1.2
3-Axis	173.805	1.2	0.	1.

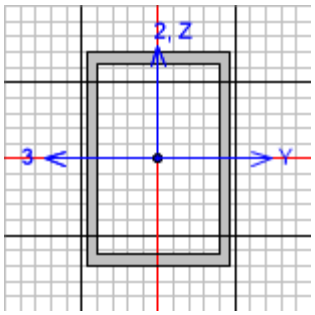
CONNECTION SHEAR FORCES FOR BEAMS

	V2 Left	V2 Right
2-2 (V2)	0.669	0.433

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	2.672E-04	0.02	0.014	OK
Super DL+LL	Yes	2.791E-04	0.02	0.014	OK
Live Load	Yes	8.047E-05	0.007	0.012	OK
Total Load	Yes	3.477E-04	0.01	0.035	OK
Total-Camber	Yes	3.477E-04	0.01	0.035	OK

4.4.5 120x80x6.3




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  204      X Mid:  6.6      Combo:  ULS WIND Y      Design Type:  Column
Length:  3.422    Y Mid:  1.       Shape:  120x80x6.3      Frame Type:  Secndry
Loc   :  2.526    Z Mid:  1.711    Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75        D/C Lim=0.95        Prin. Axis Angle = 0. deg

Aeff=0.002        Av,2=0.002        Av,3=0.001       eNy=0.              eNz=0.
A=0.002           Iy=4.562E-06      iy=0.044         Wel,y=7.603E-05     Weff,y=7.603E-05
It=4.721E-06      Iz=2.380E-06      iz=0.032         Wel,z=5.949E-05     Weff,z=5.949E-05
Iw=0.             Iyz=0.            h=0.12           Wpl,y=9.364E-05
E=210000000.      fy=355000.        fu=510000.       Wpl,z=7.003E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    2.526          -18.647      -0.634       0.093       0.436       0.568       0.106

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.61)
    D/C Ratio:     0.059 = 0.042 + 0.016 + 0.   <         0.95          OK
                         = NEd/(Chi_y NRk/GammaM1) + kyy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kyz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)      (EC3 6.3.3(4)-6.61)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                        Force    Capacity    Capacity
    Axial            -18.647      838.24      838.24

                       Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                       838.24     867.047  129713.748     807.426          1.

                Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y             c    0.49     807.426       1.019        1.22       0.529     443.469
    Y-Y Braced      c    0.49     807.426       1.019        1.22       0.529     443.469
```

Z-Z	c	0.49	982.968	0.923	1.104	0.585	490.781
Z-Z Braced	c	0.49	982.968	0.923	1.104	0.585	490.781
Torsional TF	c	0.49	807.426	1.019	1.22	0.529	443.469

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-0.188	-0.634	33.242	33.242	33.242	33.242
Z-Z	0.093	0.093	24.86	24.86	24.86	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.179	0.508	1.	0.	1039.743

	kw	C1	C2	C3		
Factors	1.	1.77	0.43	1.12		
	za	zs	zg	zz	zj	
	0.06	0.	0.06	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.833	0.247	0.5	0.411

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.436	332.831	0.001	1.
3-Axis	0.568	206.599	0.003	1.

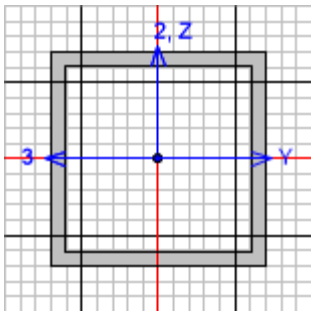
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.436	0.106	332.831	0.001	OK
3-Axis	0.568	0.106	206.599	0.003	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	332.831	1.2	0.243	1.2
3-Axis	206.599	1.2	0.	1.

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4.4.6 100x100x6.3




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  213      X Mid:  4.500E-04 Combo:  ULS WIND Y      Design Type:  Beam
Length:  13.2     Y Mid:  -1.185    Shape:  100x100x6.3     Frame Type:  Secndry
Loc   :  4.31     Z Mid:  3.422     Class:  Class 1         Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10              Reliability = Class 2                Interaction = Method 2
(Annex B)
MultiResponse = Envelopes           P-Delta Done? Yes                    Consider Torsion? No

GammaM0=1.        GammaM1=1.        GammaM2=1.25
An/Ag=1.          RLLF=1.           PLLF=0.75         D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.002        Av,2=0.001        Av,3=0.001        eNy=0.             eNz=0.
A=0.002           Iy=3.471E-06      iy=0.038          Wel,y=6.942E-05    Weff,y=6.942E-05
It=5.183E-06      Iz=3.471E-06      iz=0.038          Wel,z=6.942E-05    Weff,z=6.942E-05
Iw=0.             Iyz=0.            h=0.1             Wpl,y=8.309E-05
E=210000000.      fy=355000.        fu=510000.        Wpl,z=8.309E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed         TEd
    4.31          -18.555       0.112      -0.072       0.383       0.077       0.078

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.3.3(4)-6.61)
    D/C Ratio:     0.079 = 0.076 + 0.003 + 0.001   <          0.95          OK
                         = NEd/(Chi_y NRk/GammaM1) + kyy (My,Ed+NEd eNy)/(Chi_LT My,Rk/GammaM1)
                             + kyz (Mz,Ed+NEd eNz)/(Mz,Rk/GammaM1)      (EC3 6.3.3(4)-6.61)

AXIAL FORCE DESIGN
                          NEd       Nc,Rd       Nt,Rd
                       Force    Capacity    Capacity
    Axial          -18.555      838.24      838.24

                      Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                      838.24     867.047  142392.944     339.829          1.

               Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y            c    0.49     339.829       1.571       2.069       0.293     245.374
    Y-Y Braced     c    0.49     339.829       1.571       2.069       0.293     245.374
```

Z-Z	c	0.49	7193.595	0.341	0.593	0.928	777.831
Z-Z Braced	c	0.49	7193.595	0.341	0.593	0.928	777.831
Torsional TF	c	0.49	339.829	1.571	2.069	0.293	245.374

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	0.078	0.112	29.498	29.498	29.498	29.498
Z-Z	-0.024	-0.072	29.498	29.498	29.498	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.094	0.464	1.	0.	3333.315

Factors	kw	C1	C2	C3
	1.	2.1	0.43	1.12
	za	zs	zg	zz	zj
	0.05	0.	0.05	0.	0.

	kyy	kyz	kzy	kzz
Factors	0.707	0.489	0.424	0.815

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.383	270.851	0.001	1.
3-Axis	0.077	258.249	2.964E-04	1.

SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.383	0.078	270.851	0.001	OK
3-Axis	0.077	0.078	258.249	0.	OK

	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	270.851	1.2	0.197	1.2
3-Axis	258.249	1.2	0.	1.

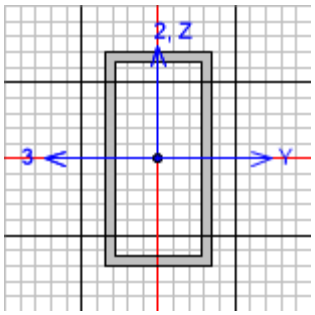
CONNECTION SHEAR FORCES FOR BEAMS

	V2 Left	V2 Right
2-2 (V2)	1.043	1.406

DEFLECTION CHECK (ComboSLS LIVE)

Type	Consider	Deflection	Limit	Ratio	Status
Dead Load	Yes	5.084E-04	0.11	0.005	OK
Super DL+LL	Yes	5.262E-04	0.11	0.005	OK
Live Load	Yes	5.220E-04	0.037	0.014	OK
Total Load	Yes	4.891E-04	0.055	0.009	OK
Total-Camber	Yes	4.891E-04	0.055	0.009	OK

4.4.7 100x50x5




```
EN 1993-1-1:2005/A1:2014 STEEL SECTION CHECK  (Summary for Combo and Station)
Units  : KN, m, C

Frame :  184      X Mid:  2.       Combo:  ULS WIND Y     Design Type:  Column
Length:  3.422    Y Mid:  1.185    Shape:  100x50x5       Frame Type:  Secndry
Loc   :  3.422    Z Mid:  1.711    Class:  Class 1        Rolled : No

Country = CEN Default - CEN EN 1993-1-1/2015-06
Combination = Eq. 6.10            Reliability = Class 2              Interaction = Method 2
(Annex B)
MultiResponse = Envelopes         P-Delta Done? Yes                  Consider Torsion? No

GammaM0=1.        GammaM1=1.      GammaM2=1.25
An/Ag=1.          RLLF=1.         PLLF=0.75       D/C Lim=0.95       Prin. Axis Angle = 0. deg

Aeff=0.001        Av,2=0.001      Av,3=5.000E-04  eNy=0.             eNz=0.
A=0.001           Iy=1.737E-06    iy=0.035        Wel,y=3.473E-05    Weff,y=3.473E-05
It=1.305E-06      Iz=5.617E-07    iz=0.02         Wel,z=2.247E-05    Weff,z=2.247E-05
Iw=0.             Iyz=0.          h=0.1           Wpl,y=4.400E-05
E=210000000.      fy=355000.      fu=510000.      Wpl,z=2.650E-05


STRESS CHECK FORCES & MOMENTS
    Location          Ned       My,Ed       Mz,Ed       V2,Ed       V3,Ed        TEd
    3.422           3.575      -0.072      -0.492       0.213       0.631       0.002

PMM DEMAND/CAPACITY RATIO   (Governing Equation EC3 6.2.9.1(6z))
    D/C Ratio:     0.052 = 0.052   <        0.95          OK
                         = (Mz,Ed/Mn,z,Rd)       (EC3 6.2.9.1(6z))

AXIAL FORCE DESIGN
                        NEd       Nc,Rd       Nt,Rd
                      Force    Capacity    Capacity
    Axial             3.575        497.        497.

                     Npl,Rd       Nu,Rd       Ncr,T      Ncr,TF       An/Ag
                       497.      514.08   64225.156      99.412          1.

              Curve   Alpha         Ncr   LambdaBar         Phi         Chi       Nb,Rd
    Y-Y           c    0.49      307.38       1.272       1.571       0.401     199.316
    Y-Y Braced    c    0.49      307.38       1.272       1.571       0.401     199.316
    Z-Z           c    0.49      99.412       2.236       3.499       0.162       80.3
```

Z-Z Braced	c	0.49	183.674	1.645	2.207	0.272	135.118
Torsional TF	c	0.49	99.412	2.236	3.499	0.162	80.3

MOMENT DESIGN

	MEd Moment	MEd,span Moment	Mc,Rd Capacity	Mv,Rd Capacity	Mn,Rd Capacity	Mb,Rd Capacity
Y-Y	-0.072	-0.072	15.62	15.62	15.62	15.62
Z-Z	-0.492	-0.492	9.408	9.408	9.408	

	Curve	AlphaLT	LambdaBarLT	PhiLT	ChiLT	Iw	Mcr
LTB	d	0.76	0.24	0.544	0.969	0.	271.867

Factors	kw	C1	C2	C3		
	1.	2.711	0.43	1.12		
	za	zs	zg	zz	zj	
	0.05	0.	0.05	0.	0.	

	kyy	kyz	kzy	kzz
Factors	0.4	0.24	0.24	0.4

	VEd Force	Vpl,Rd Capacity	Ved/Vpl.Rd Ratio	rho Factor
2-Axis	0.213	221.356	9.604E-04	1.
3-Axis	0.631	102.48	0.006	1.

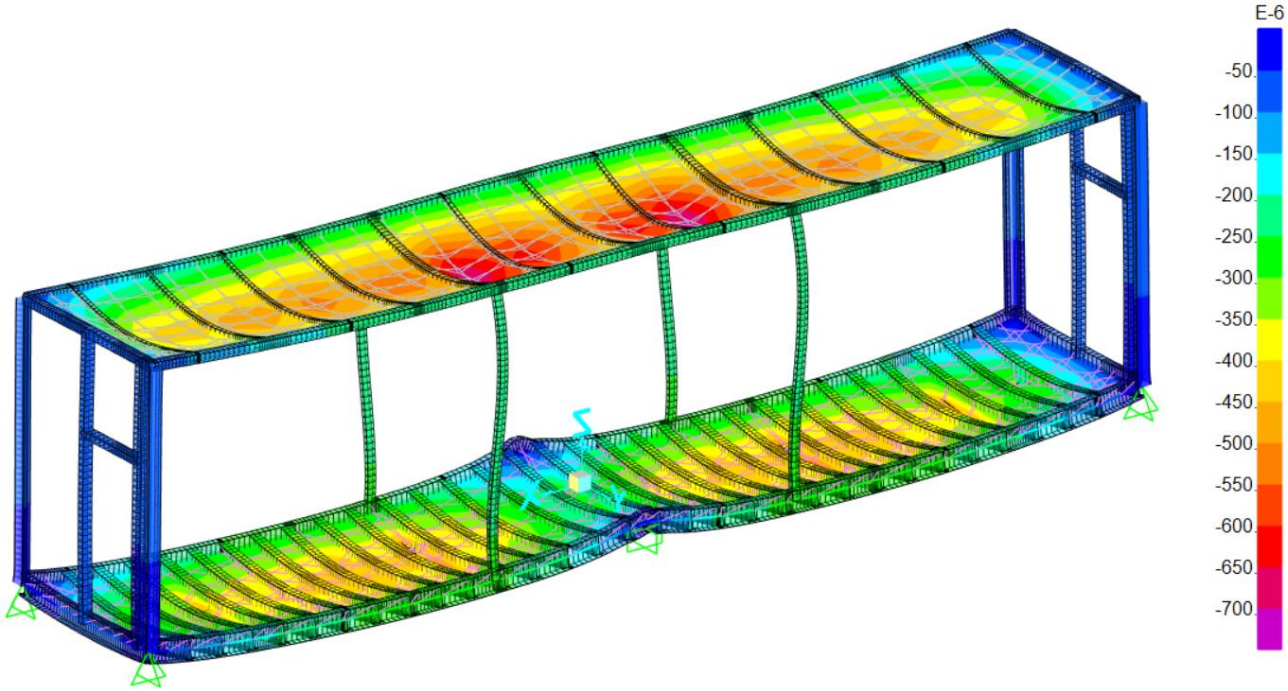
SHEAR DESIGN

	VEd Force	TEd Torsion	Vc,Rd Capacity	Stress Ratio	Status Check
2-Axis	0.213	0.002	221.356	0.001	OK
3-Axis	0.631	0.002	102.48	0.006	OK

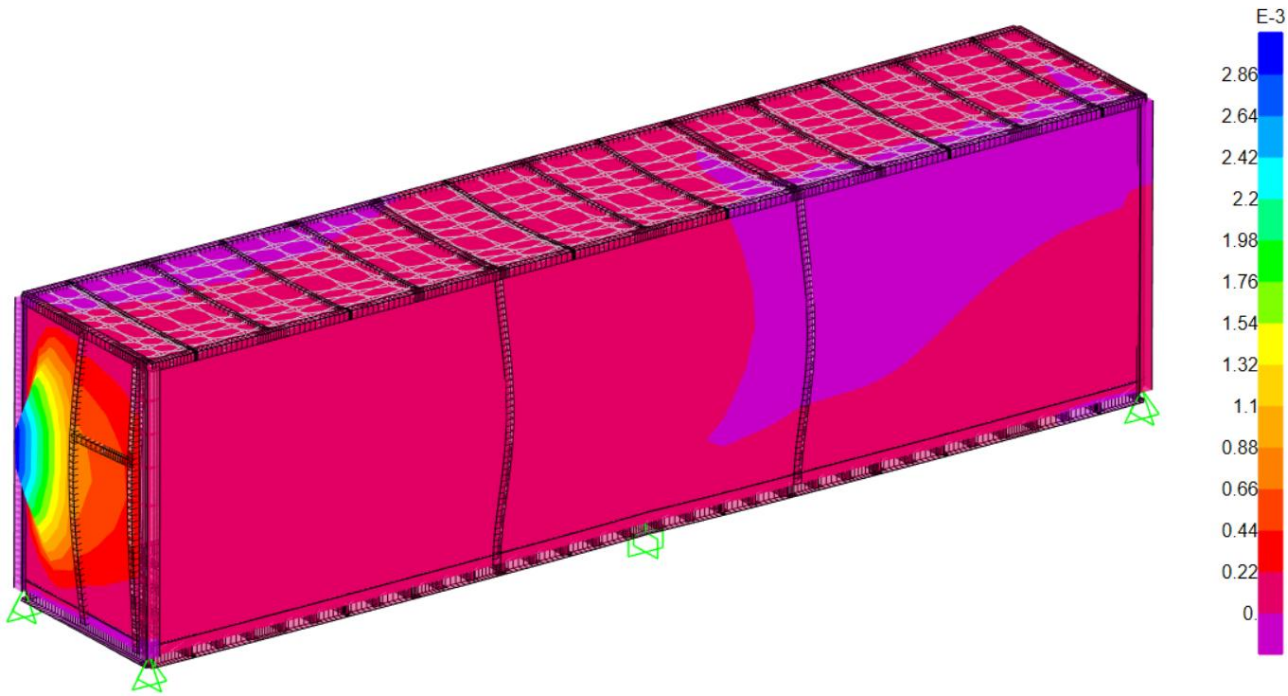
	Vpl,Rd Capacity	Eta Factor	Lambdabar Ratio	Chi Factor
2-Axis	221.356	1.2	0.256	1.2
3-Axis	102.48	1.2	0.	1.

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5 DISPLACEMENT CHECK

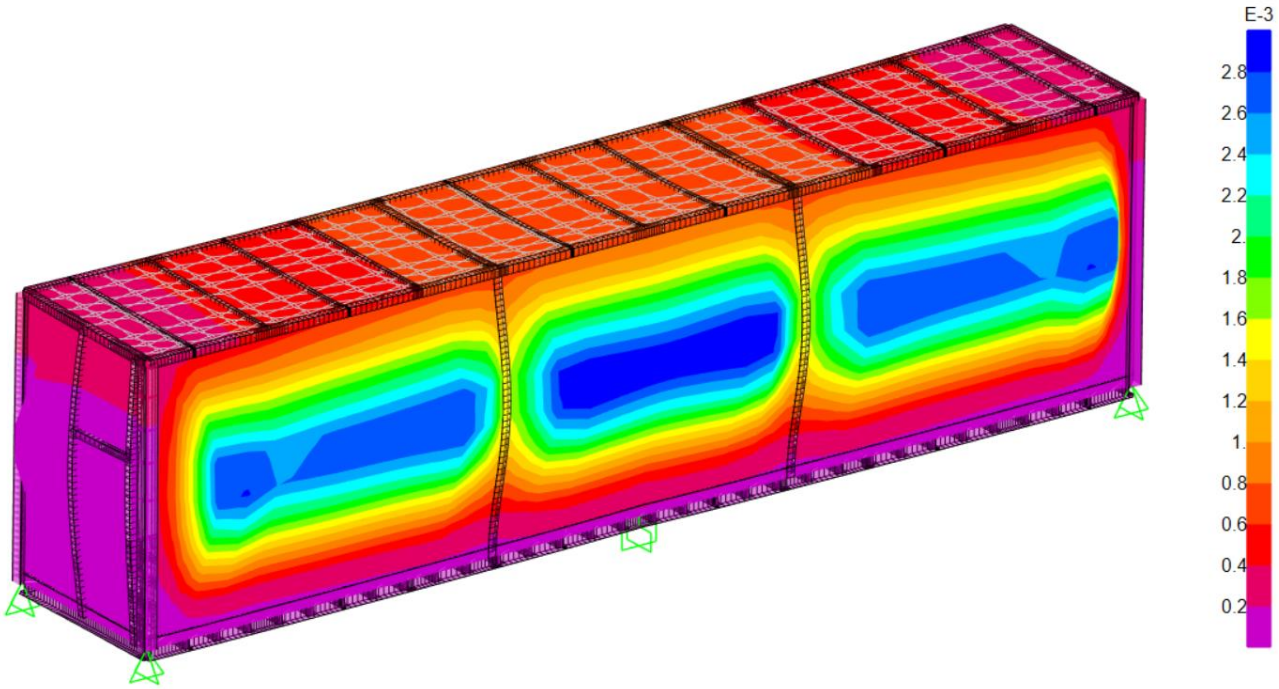


Uz SLS LIVE = 0.7 mm < 4500/240 = 18.75 mm



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Ux SLS WIND X = 2.86 mm < 4500/240 = 18.75 mm



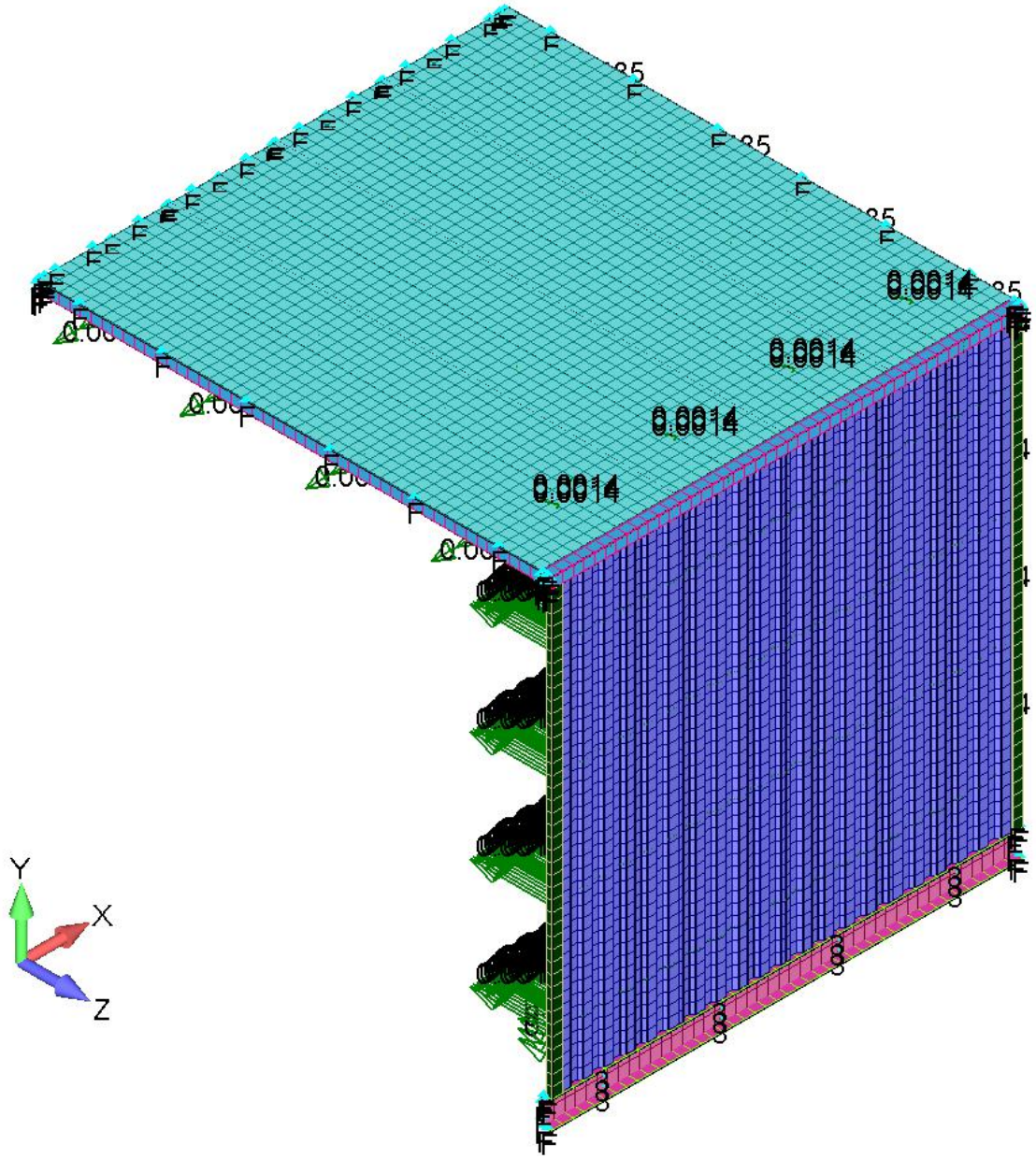
Uy SLS WIND Y = 2.8 mm < 4500/240 = 18.75 mm

6 METAL SHEET CHECK

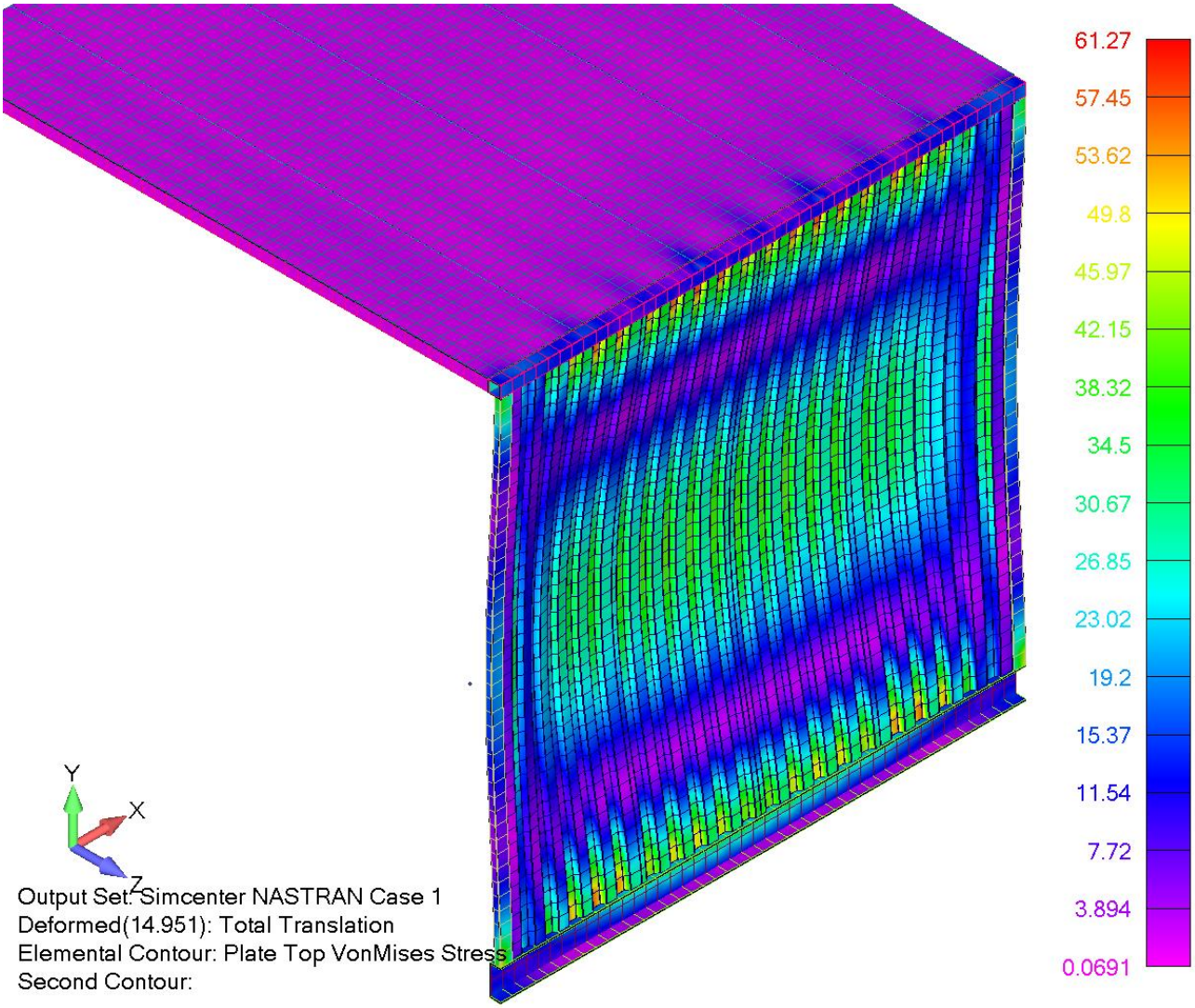
A detailed analysis of the corrugated wall and stave roof is carried out. The structure is modeled taking into account all the metal sheets constituting the geometry of metal sheet.

The front is loaded with 1.69 kN/m² wind pressure and Cp = 0.8. For the roof is applied 1.69 kN/m² with Cp = 0.5 and 45 degree (worst case).

The analysis is performed with FEMAP NASTRAN finite element software and post-processor.



MODEL WITH 8211 ELEMENTS AND 8805 NODES, LOADED AND FIXED AT THE ENDS



MAXIMUM VM STRESS 61 MPA AND 15 MM LATERAL DISPLACEMENT

Displacement value is lower than sap2000 simplified model for global analysis.

The maximum Von Mises stress is lower than yield limit reduced by safety factor 1.15 → 275/1.15 = 239 MPa.

7 BASE REACTIONS

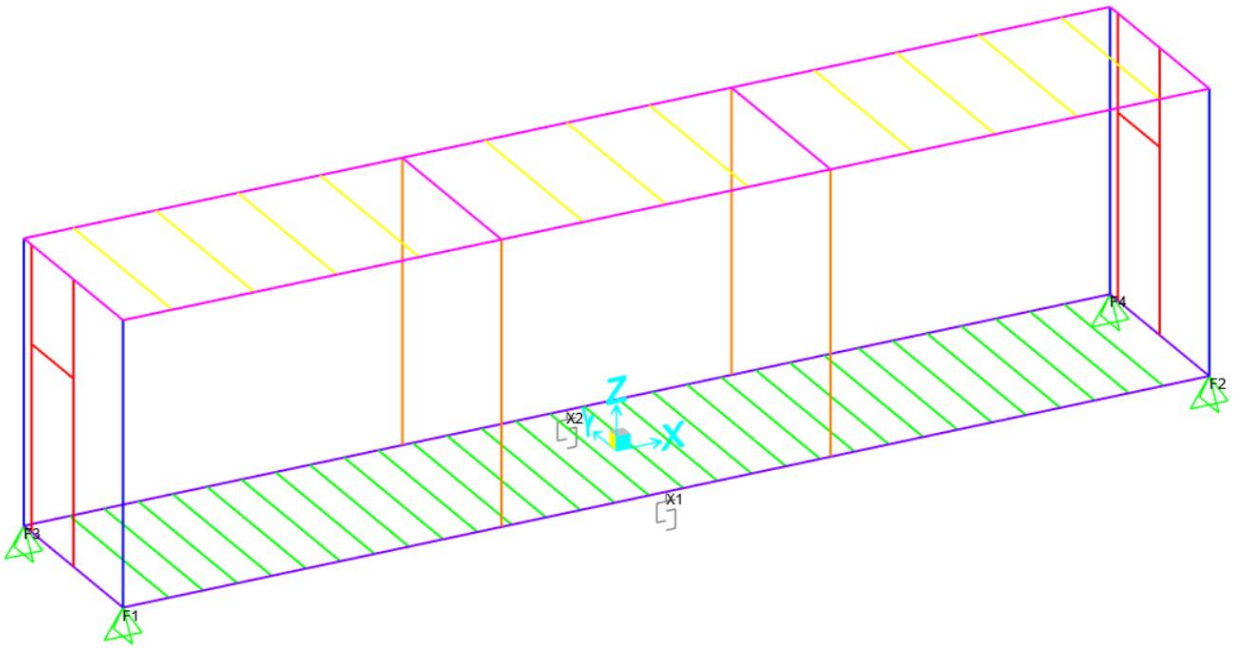


TABLE: Joint Reactions

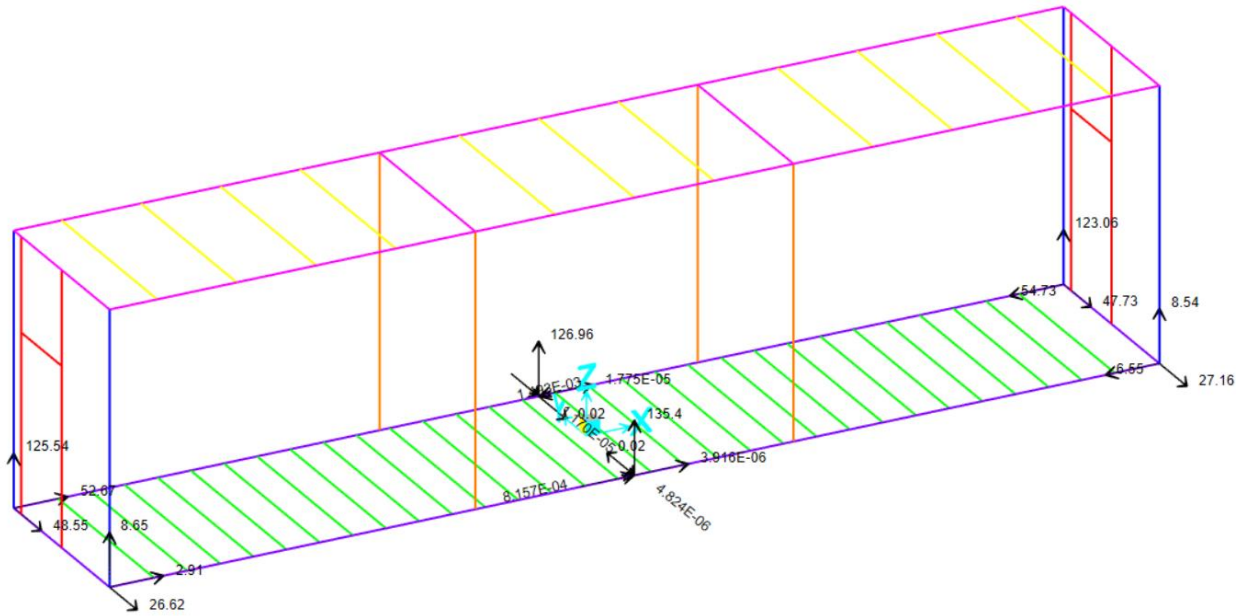
Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F1	DEAD	NonStatic	Last Step	7.70	3.33	17.81	0.00	0.00	0.00
F1	SD	NonStatic	Last Step	4.47	1.95	10.06	0.00	0.00	0.00
F1	LIVE	NonStatic	Last Step	20.82	7.12	39.60	0.00	0.00	0.00
F1	WIND X	NonStatic	Last Step	-10.02	-0.28	-7.81	0.00	0.00	0.00
F1	WIND Y	NonStatic	Last Step	-21.67	-27.45	-45.81	0.00	0.00	0.00
F1	NOT X	NonStatic	Last Step	-0.06	-0.01	-0.01	0.00	0.00	0.00
F1	NOT Y	NonStatic	Last Step	-0.06	-0.06	-0.08	0.00	0.00	0.00
F1	SLU LIVE	Combination		47.79	17.84	97.52	0.00	0.00	0.00
F1	SLU WIND X	Combination		16.89	5.98	54.25	0.00	0.00	0.00
F1	SLU WIND Y	Combination		2.91	-26.62	8.65	0.00	0.00	0.00
F1	SLE LIVE	Combination		32.87	12.33	67.38	0.00	0.00	0.00
F1	SLE WIND X	Combination		-4.47	-3.30	6.23	0.00	0.00	0.00
F1	SLE WIND Y	Combination		-12.62	-22.32	-20.37	0.00	0.00	0.00
F2	DEAD	NonStatic	Last Step	-7.71	3.32	17.81	0.00	0.00	0.00
F2	SD	NonStatic	Last Step	-5.27	1.80	9.12	0.00	0.00	0.00
F2	LIVE	NonStatic	Last Step	-20.35	7.17	40.17	0.00	0.00	0.00
F2	WIND X	NonStatic	Last Step	0.86	-1.62	-5.49	0.00	0.00	0.00
F2	WIND Y	NonStatic	Last Step	21.65	-27.43	-45.82	0.00	0.00	0.00
F2	NOT X	NonStatic	Last Step	-0.06	0.01	0.01	0.00	0.00	0.00
F2	NOT Y	NonStatic	Last Step	0.06	-0.06	-0.08	0.00	0.00	0.00
F2	SLU LIVE	Combination		-48.44	17.70	97.00	0.00	0.00	0.00
F2	SLU WIND X	Combination		-31.50	3.82	56.94	0.00	0.00	0.00
F2	SLU WIND Y	Combination		-6.55	-27.16	8.55	0.00	0.00	0.00
F2	SLE LIVE	Combination		-33.32	12.23	67.03	0.00	0.00	0.00
F2	SLE WIND X	Combination		-5.62	-4.79	7.63	0.00	0.00	0.00
F2	SLE WIND Y	Combination		8.93	-22.86	-20.60	0.00	0.00	0.00

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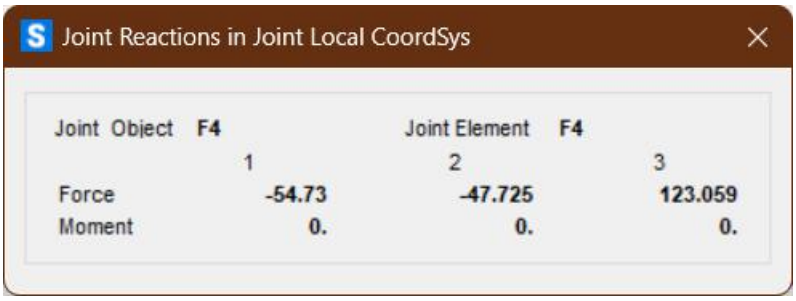
TABLE: Joint Reactions

Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F3	DEAD	NonStatic	Last Step	7.70	-3.33	18.50	0.00	0.00	0.00
F3	SD	NonStatic	Last Step	6.05	-2.10	13.16	0.00	0.00	0.00
F3	LIVE	NonStatic	Last Step	19.91	-7.03	38.05	0.00	0.00	0.00
F3	WIND X	NonStatic	Last Step	-9.76	0.24	-7.81	0.00	0.00	0.00
F3	WIND Y	NonStatic	Last Step	10.42	-22.47	29.38	0.00	0.00	0.00
F3	NOT X	NonStatic	Last Step	-0.06	0.01	-0.01	0.00	0.00	0.00
F3	NOT Y	NonStatic	Last Step	0.05	-0.06	0.07	0.00	0.00	0.00
F3	SLU LIVE	Combination		48.93	-18.09	100.94	0.00	0.00	0.00
F3	SLU WIND X	Combination		28.46	-21.30	80.91	0.00	0.00	0.00
F3	SLU WIND Y	Combination		52.67	-48.55	125.54	0.00	0.00	0.00
F3	SLE LIVE	Combination		33.65	-12.51	69.77	0.00	0.00	0.00
F3	SLE WIND X	Combination		7.11	-11.98	32.72	0.00	0.00	0.00
F3	SLE WIND Y	Combination		21.23	-27.87	58.75	0.00	0.00	0.00
F4	DEAD	NonStatic	Last Step	-7.69	-3.32	18.50	0.00	0.00	0.00
F4	SD	NonStatic	Last Step	-5.26	-1.66	9.47	0.00	0.00	0.00
F4	LIVE	NonStatic	Last Step	-20.38	-7.26	40.24	0.00	0.00	0.00
F4	WIND X	NonStatic	Last Step	0.99	1.65	-5.48	0.00	0.00	0.00
F4	WIND Y	NonStatic	Last Step	-10.40	-22.48	29.40	0.00	0.00	0.00
F4	NOT X	NonStatic	Last Step	-0.06	-0.01	0.01	0.00	0.00	0.00
F4	NOT Y	NonStatic	Last Step	-0.05	-0.06	0.07	0.00	0.00	0.00
F4	SLU LIVE	Combination		-48.60	-17.77	98.72	0.00	0.00	0.00
F4	SLU WIND X	Combination		-41.06	-18.77	81.20	0.00	0.00	0.00
F4	SLU WIND Y	Combination		-54.73	-47.73	123.06	0.00	0.00	0.00
F4	SLE LIVE	Combination		-33.44	-12.30	68.29	0.00	0.00	0.00
F4	SLE WIND X	Combination		-15.19	-10.13	31.39	0.00	0.00	0.00
F4	SLE WIND Y	Combination		-23.16	-27.02	55.80	0.00	0.00	0.00
X1	DEAD	NonStatic	Last Step	0.00	0.00	25.06	0.00	0.00	0.00
X1	SD	NonStatic	Last Step	0.00	0.00	15.16	0.00	0.00	0.00
X1	LIVE	NonStatic	Last Step	0.00	0.02	67.30	0.00	0.00	0.00
X1	WIND X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	WIND Y	NonStatic	Last Step	0.00	0.00	6.26	0.00	0.00	0.00
X1	NOT X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X1	NOT Y	NonStatic	Last Step	0.00	0.00	0.01	0.00	0.00	0.00
X1	SLU LIVE	Combination		0.00	0.03	156.29	0.00	0.00	0.00
X1	SLU WIND X	Combination		0.00	0.02	127.88	0.00	0.00	0.00
X1	SLU WIND Y	Combination		0.00	0.02	135.40	0.00	0.00	0.00
X1	SLE LIVE	Combination		0.00	0.02	107.54	0.00	0.00	0.00
X1	SLE WIND X	Combination		0.00	0.00	42.11	0.00	0.00	0.00
X1	SLE WIND Y	Combination		0.00	0.00	46.50	0.00	0.00	0.00
X2	DEAD	NonStatic	Last Step	0.00	0.00	24.89	0.00	0.00	0.00
X2	SD	NonStatic	Last Step	0.00	0.00	17.19	0.00	0.00	0.00
X2	LIVE	NonStatic	Last Step	0.00	-0.02	65.54	0.00	0.00	0.00
X2	WIND X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	WIND Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	NOT X	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	NOT Y	NonStatic	Last Step	0.00	0.00	0.00	0.00	0.00	0.00
X2	SLU LIVE	Combination		0.00	-0.03	156.45	0.00	0.00	0.00
X2	SLU WIND X	Combination		0.00	-0.02	126.96	0.00	0.00	0.00
X2	SLU WIND Y	Combination		0.00	-0.02	126.96	0.00	0.00	0.00
X2	SLE LIVE	Combination		0.00	-0.02	107.62	0.00	0.00	0.00
X2	SLE WIND X	Combination		0.00	0.00	42.08	0.00	0.00	0.00
X2	SLE WIND Y	Combination		0.00	0.00	42.08	0.00	0.00	0.00

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BASE <u>REACTIONS</u> FOR WORST ULS WIND Y CASE (F1 = FX, F2 = FY and F3 = FZ)



MAX FY reaction (SHEAR) = 55 kN

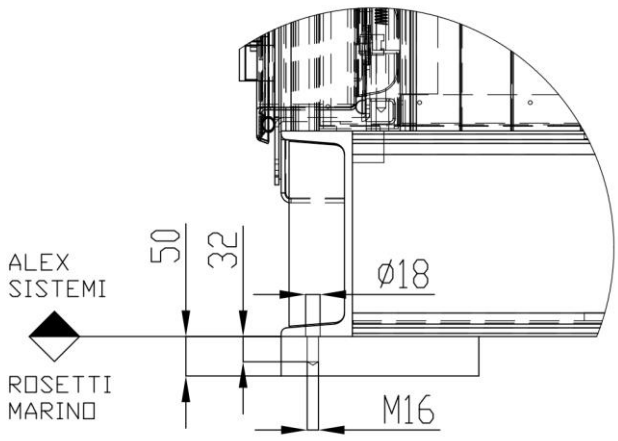
M1 and M2 in the image are values close to zero in according with the boundary conditions and concern only gaps non-linear link elements (as non-linear elements with imposed zero stiffness, the software calculate the value to the limit of zero).

For the fixing at the ground will be considered two M18 bar class 8.8 for hinge.

CORNER ANCHOR BOLT CHECK						
Nc=	0	kN				
Nt=	0	kN				
Vx=	55	kN	Vmax=(Vx^2+Vy^2)^0.5=			
Vy=	48	kN			73	kN
Φb=	18	mm				
SIF*DIF=	1					
fu=	860	Mpa				
Ω blast=	1					
Ab=(π*(Φb-3)^2)/4=		176.715	mm^2			
Abn=0.78*Ab=		137.837	mm^2			
Tension check	Nbu=Nt/2=		0.000	kN		
	Nbn=DIF*fu*Abn=		118.540	kN		
	Nbu/(Ω*Nbn)=		0.000	<1	OK	
Shear check	Vbu=Vmax/2=		36.500	kN		
	Vbn=0.6*DIF*fu*Abn=		71.124	kN		
	Vbu/(Ω*Vbn)=		0.513	<1	OK	
Combined	(Nbu/1.4/Nbn)+(Vbu/Vbn)=		0.513	<1	OK	

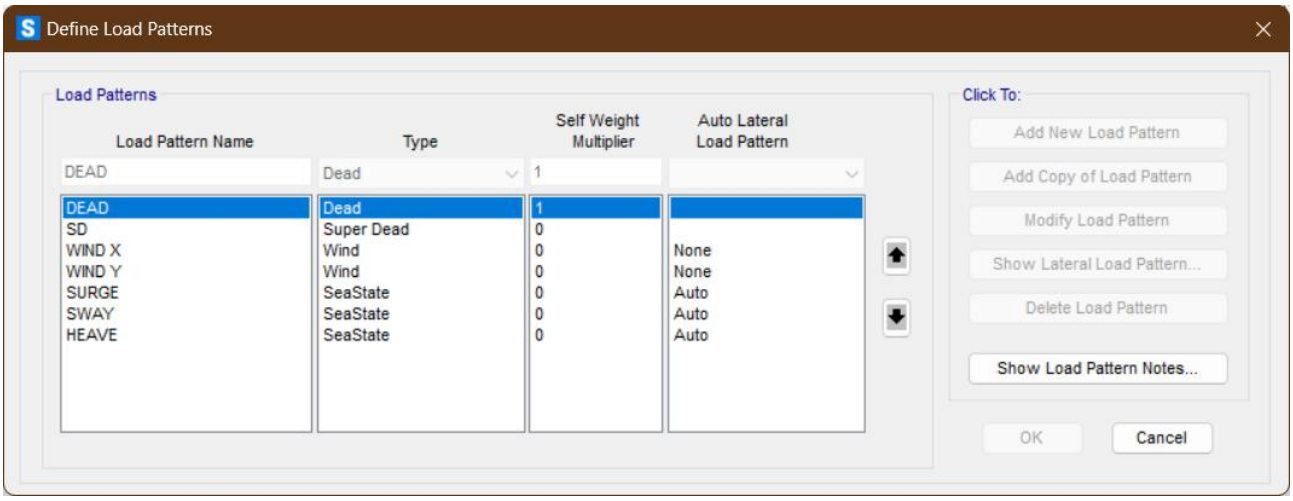
The vertical reactions in model are always compression on the ground but in favour of safety is considered tension Nt on bolt.

M18 bar **verified** **(worst ULS WIND Y case)**

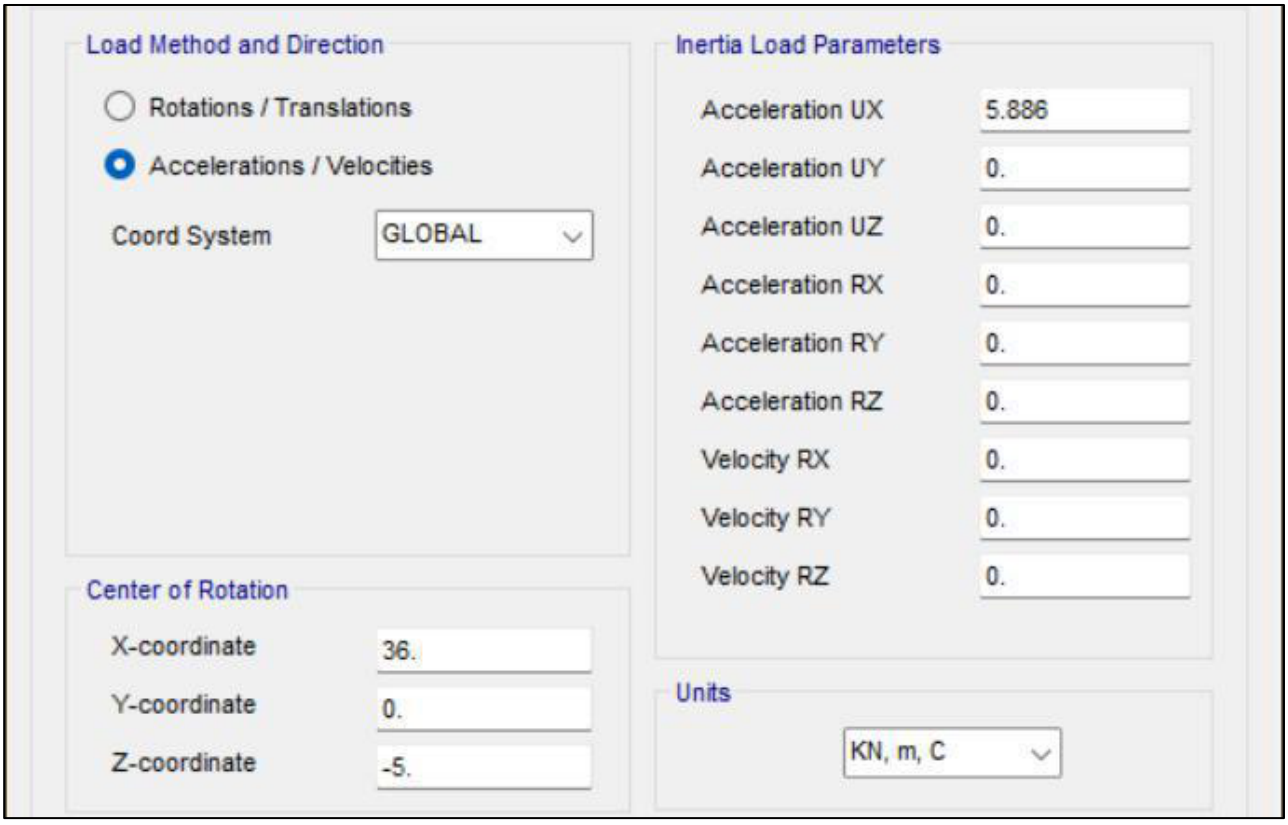


8 SEA TRANSPORT ANALYSIS

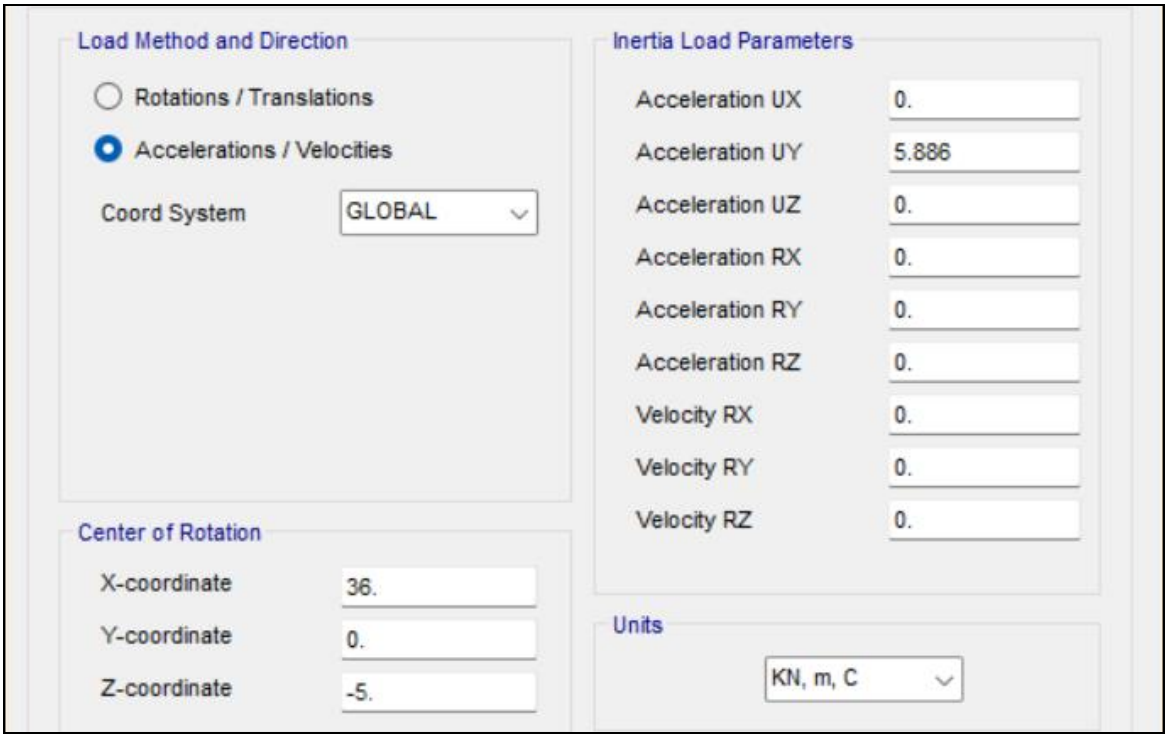
For the sea transport analysis are considered the three translational acceleration as 0.6g for Surge and Sway and 0.5g for Heave. The three accelerations are applied as sea-state loads considering also the center of rotation that is the distances between cog of structure and cog of barge.



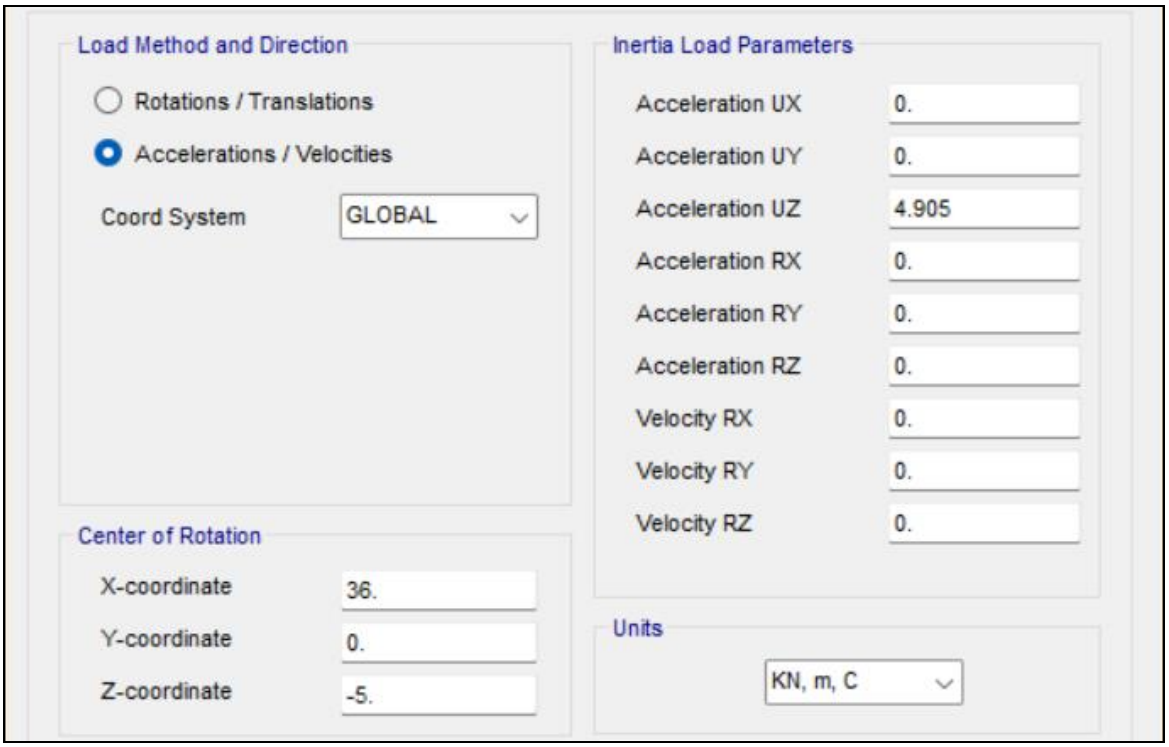
SURGE LONGITUDINAL ACCELERATION

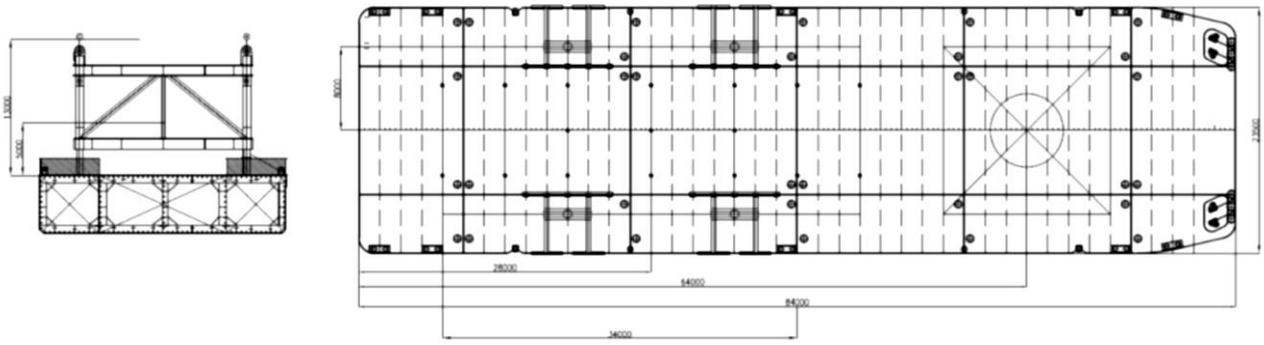


SWAY TRANSVERSAL ACCELERATION



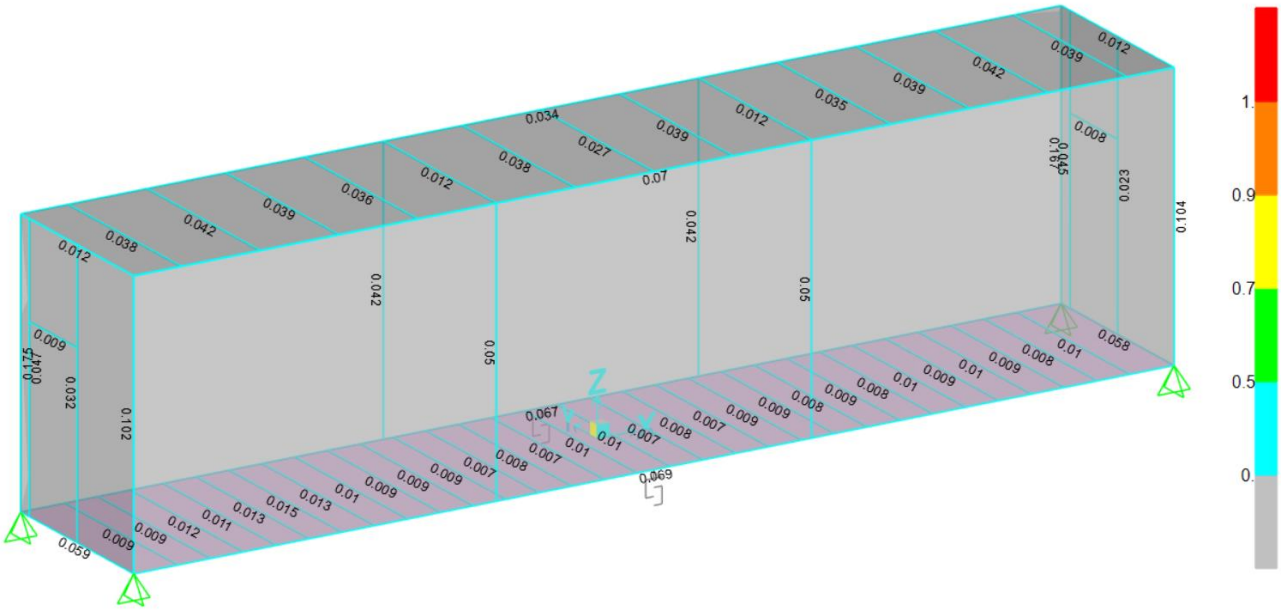
HEAVE VERTICAL ACCELERATION





8.2 STRESS CHECK SEA TRANSPORT

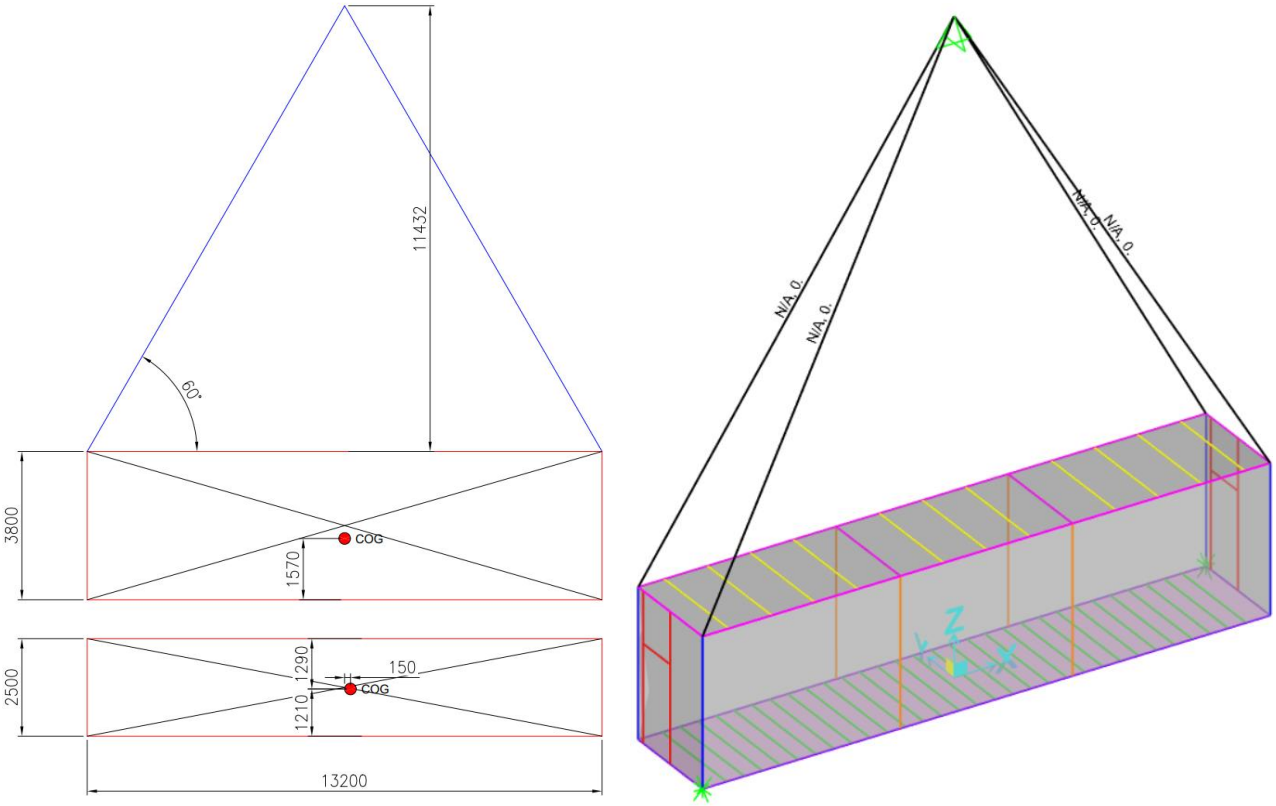
The loads are combined as explained in chapter 4.3 and verified in according with EN 1993.



9 LIFTING ANALYSIS

For lifting analysis, only the weight of shelter (DEAD LOAD AND NO STRUCTURAL LOAD SD in LLC 2 combinations) are considered.

Total weight of shelter is about 20 ton including equipment. Lifting cables are modeled with non-linear elements cables tension-only connected to the top corner points (lifting points) of model in non-linear geometry analysis.



LIFTING SCHEME AND MODEL

TABLE: Base Reactions

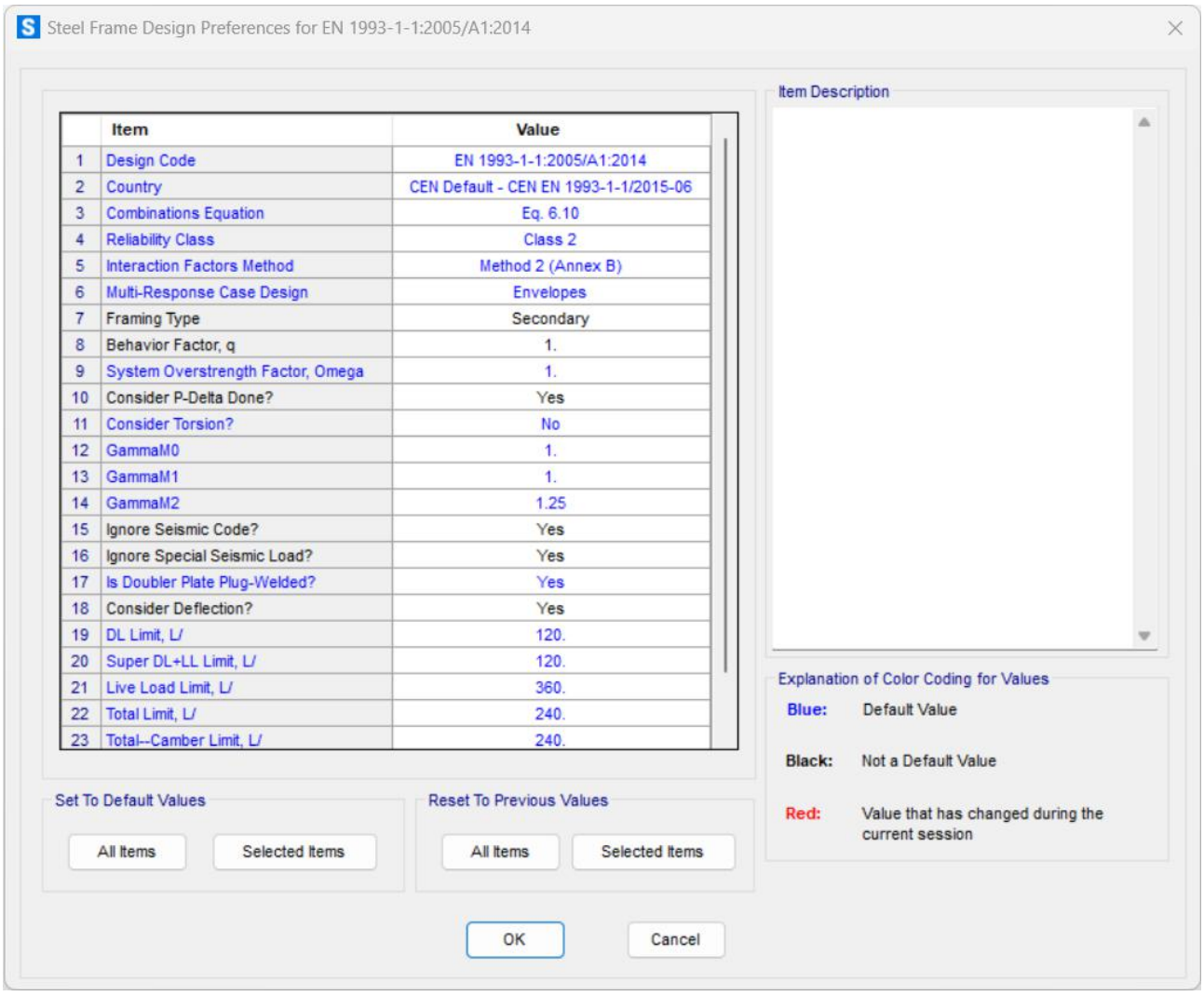
OutputCase	CaseType	GlobalFX	GlobalFY	GlobalFZ	GlobalMX	GlobalMY	GlobalMZ	XCentroidFZ	YCentroidFZ	ZCentroidFZ
Text	Text	KN	KN	KN	KN-m	KN-m	KN-m	m	m	m
DEAD	NonStatic	0.00	0.00	122.57	1.42	-0.03	0.00	0.00	0.01	1.40
SD	NonStatic	0.00	0.00	74.16	6.49	30.49	0.00	-0.41	0.09	1.85
DEAD+SD	Combination	0.00	0.00	196.73	7.91	30.46	0.00	-0.15	0.04	1.57

The total weight DEAD + SD was estimated in favor of safety about 20 ton. For the real values refer to the 4.2.1 and 4.2.2 chapters. The red numbers represent the shift in horizontal place for the shackle pin restraints at the top of cables.

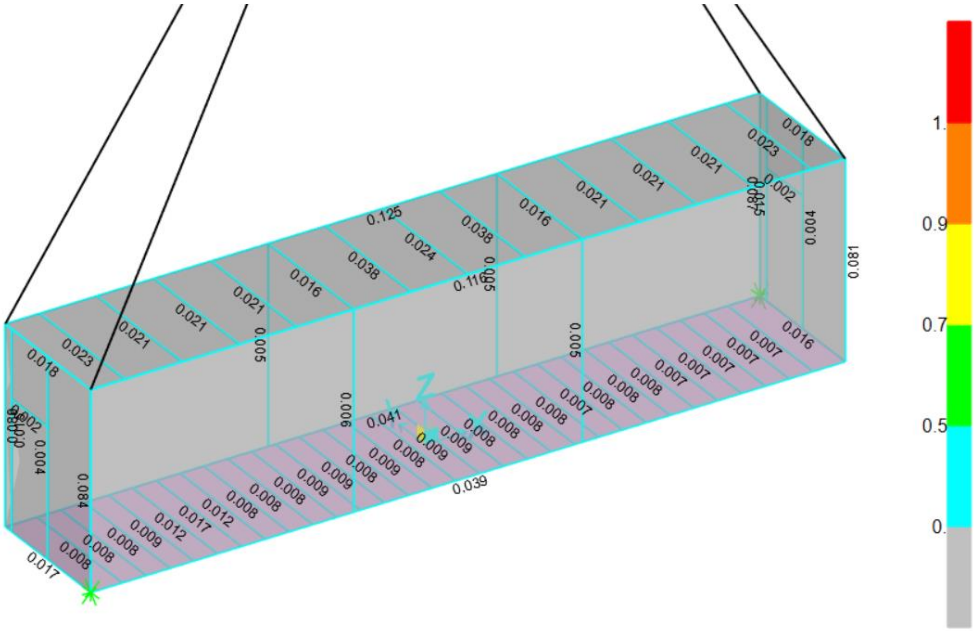
To converge the non-linear analysis results (tension only cables elements) translational XY restrains are added at the bottom corners. These restrains act only against torsional effects on the whole structure acting around the vertical Z axis.

9.2 STRESS CHECK LIFTING

All sections are check and verified in according with EN 1993 combination LLC2. Showed below the detailed printout for each type of section in its combination of maximum stress and the force diagrams with values for roof frames.



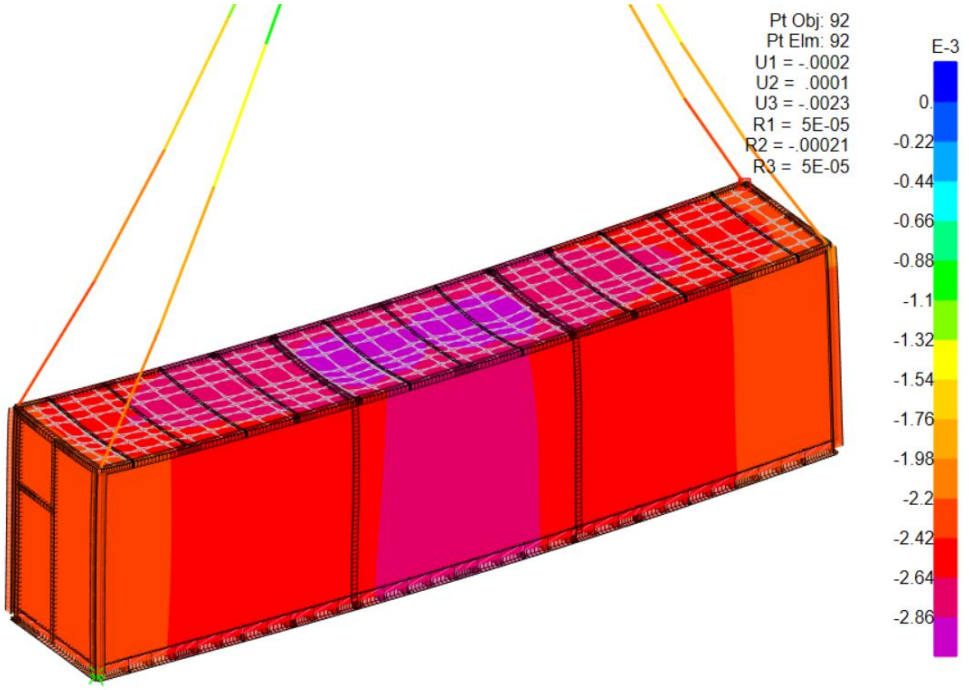
For lifting condition is automatically calculated also the relative deflection and compared with the limit L/240 (for beams). For beams in compression is calculated the lateral torsion buckling limit from code.



CHECK DESIGN FOR ULS LOADS (ORANGE < 1 RATIO)

9.3 DISPLACEMENT CHECK LIFTING

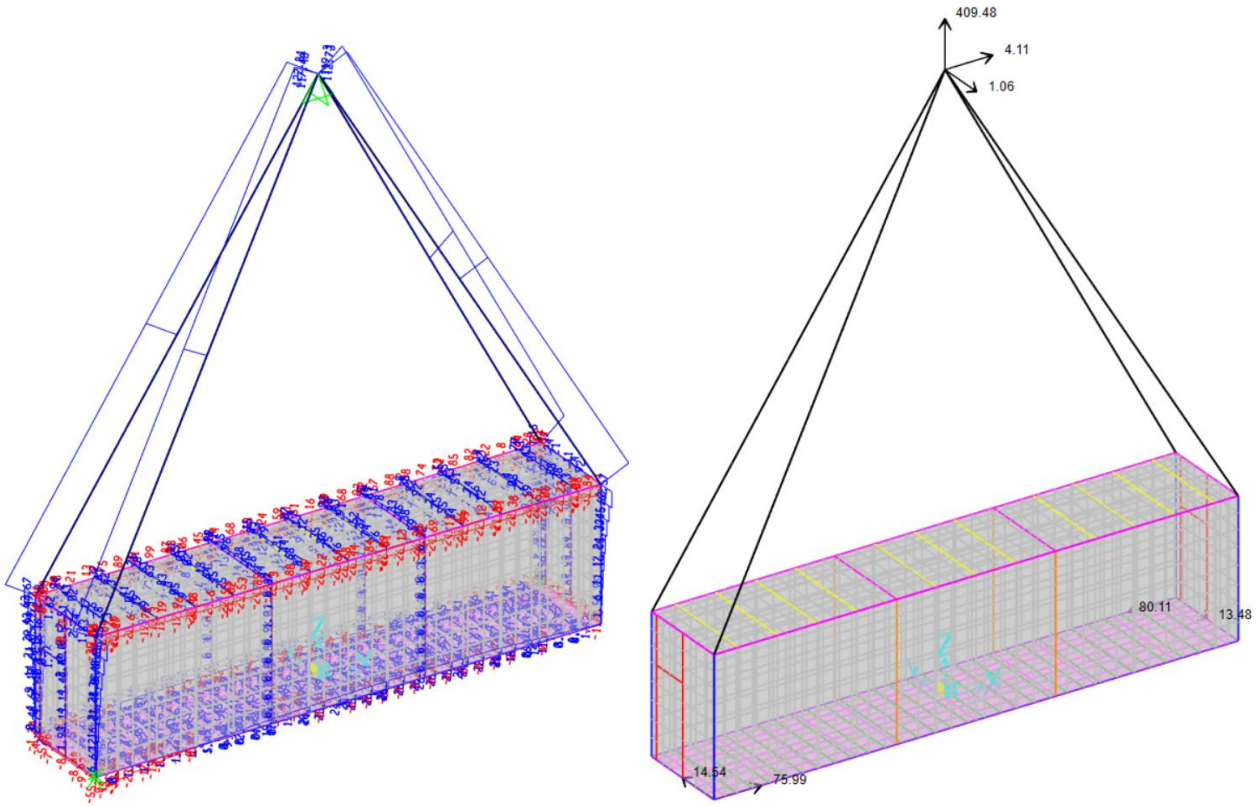
For the graphic visualization of absolute displacement is necessary to remove the elongation of cables taken at its connection end with the shelter.



MAX UZ ABSOLUTE DISPLACEMENT FOR LIFTING ROOF BEAM 2.9-2.3 = 0.6 mm < 13000/360 = 36 mm

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10 LIFTING HOOK DETAIL CHECK



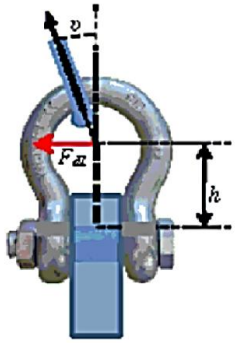
The maximum tension force on cable for lifting stress combination LLC3 (factor 2) is 123 kN.

In the model is applied also the sling load due to the transversal component of tension force. Is added an extra lateral load of 5% 123 kN = 6.2 kN in the X and Z directions (horizontal in Femap).

This force is applied on the spider node represented the surface contact between shackle and lifting lug. The model is characterized by solid hexahedral elements for a total of 33704 (20218 nodes).

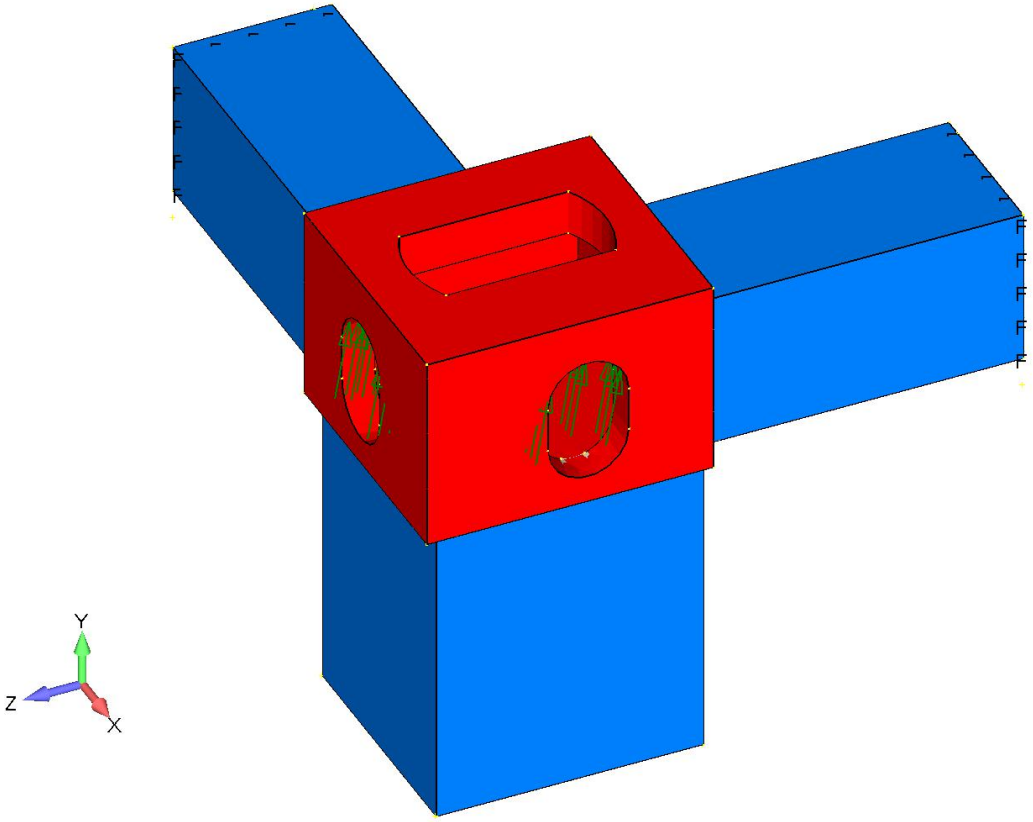
P.2.6.1

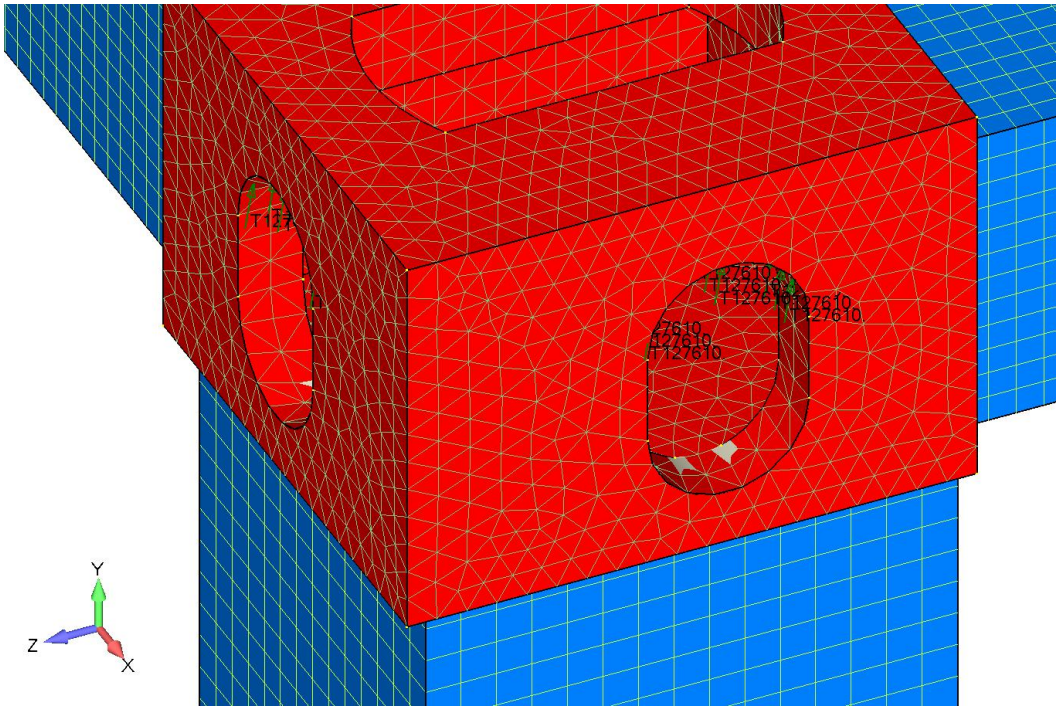
The design loads on the padeye may be calculated as indicated below. The following assumptions apply:

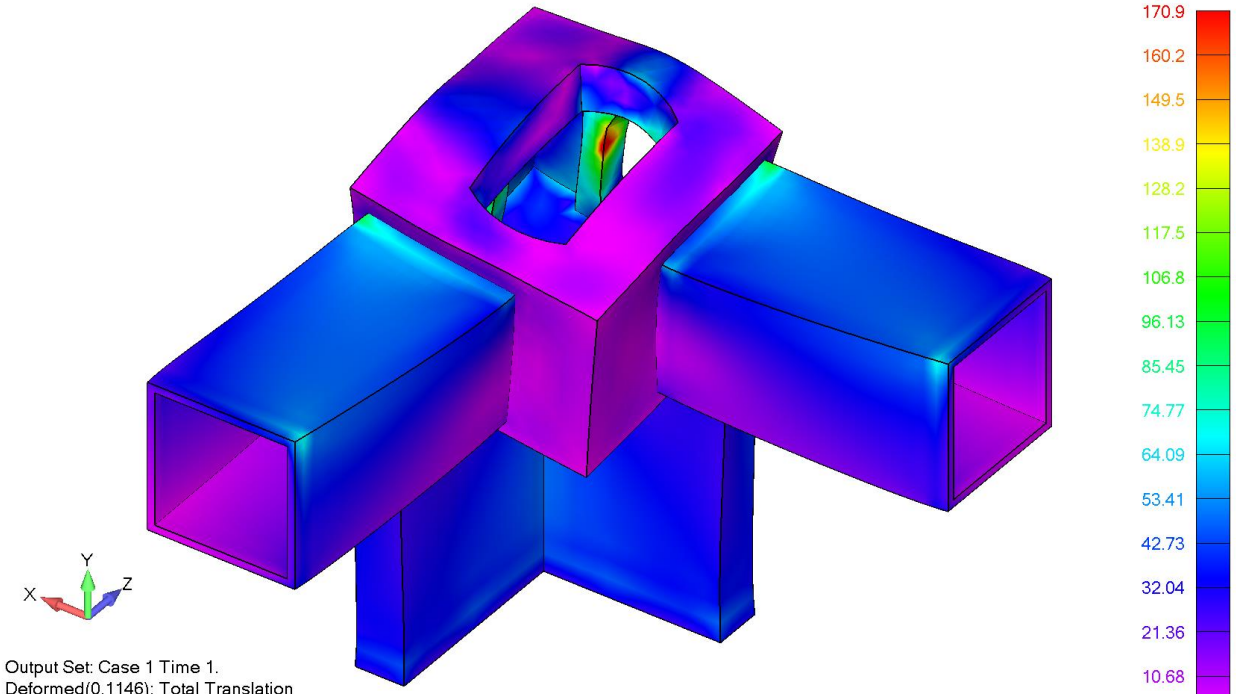


- The sling design load (FSD) is transferred to the padeye through a shackle as indicated on the sketch.
- No friction between sling and shackle.
- The shackle is positioned centric in the padeye.
- Lateral load (F_{dl}) is transferred to the padeye through contact pressure between shackle body and padeye and/or as friction force between pin and padeye. Load resultant is assumed to work at top of pin.
- Moment (M_e) is transferred to the padeye through contact pressure between shackle pin and padeye.

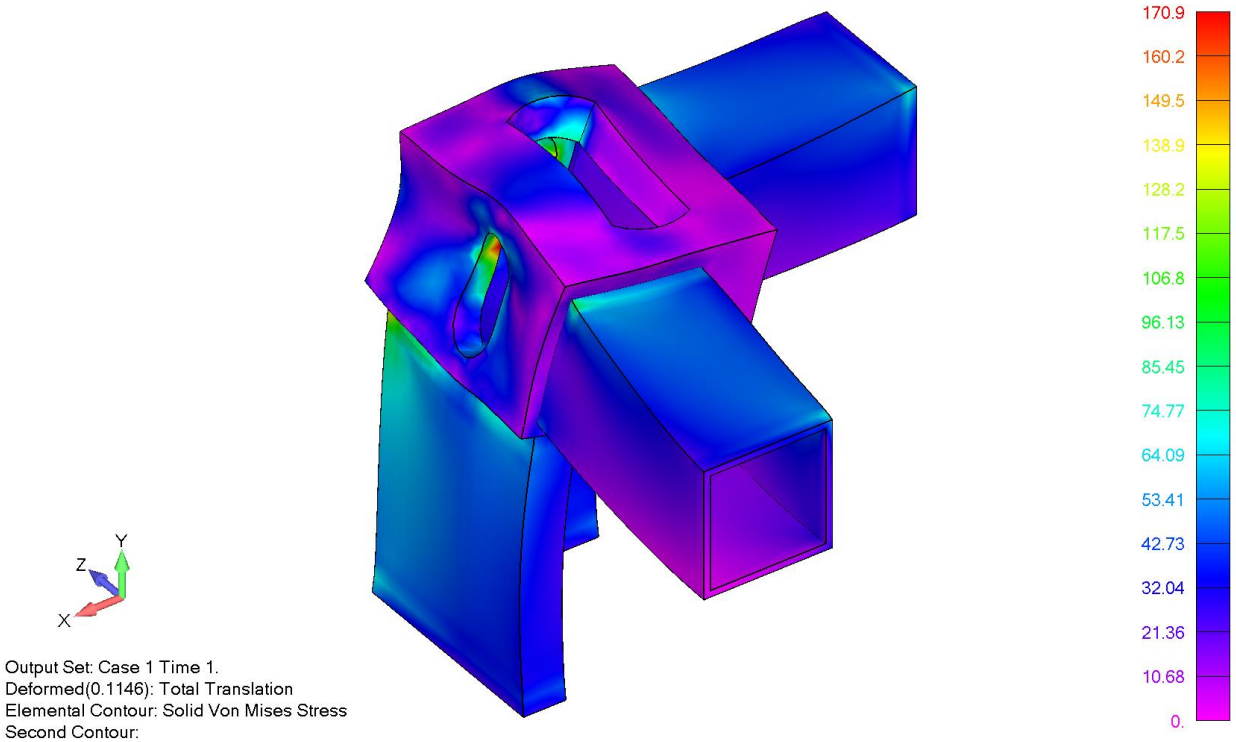
F_d=FSD × cos(v)	F_{dl}=FSD × sin(v)	M_e=F_{dl} × h


Y
Z
X


Y
Z
X

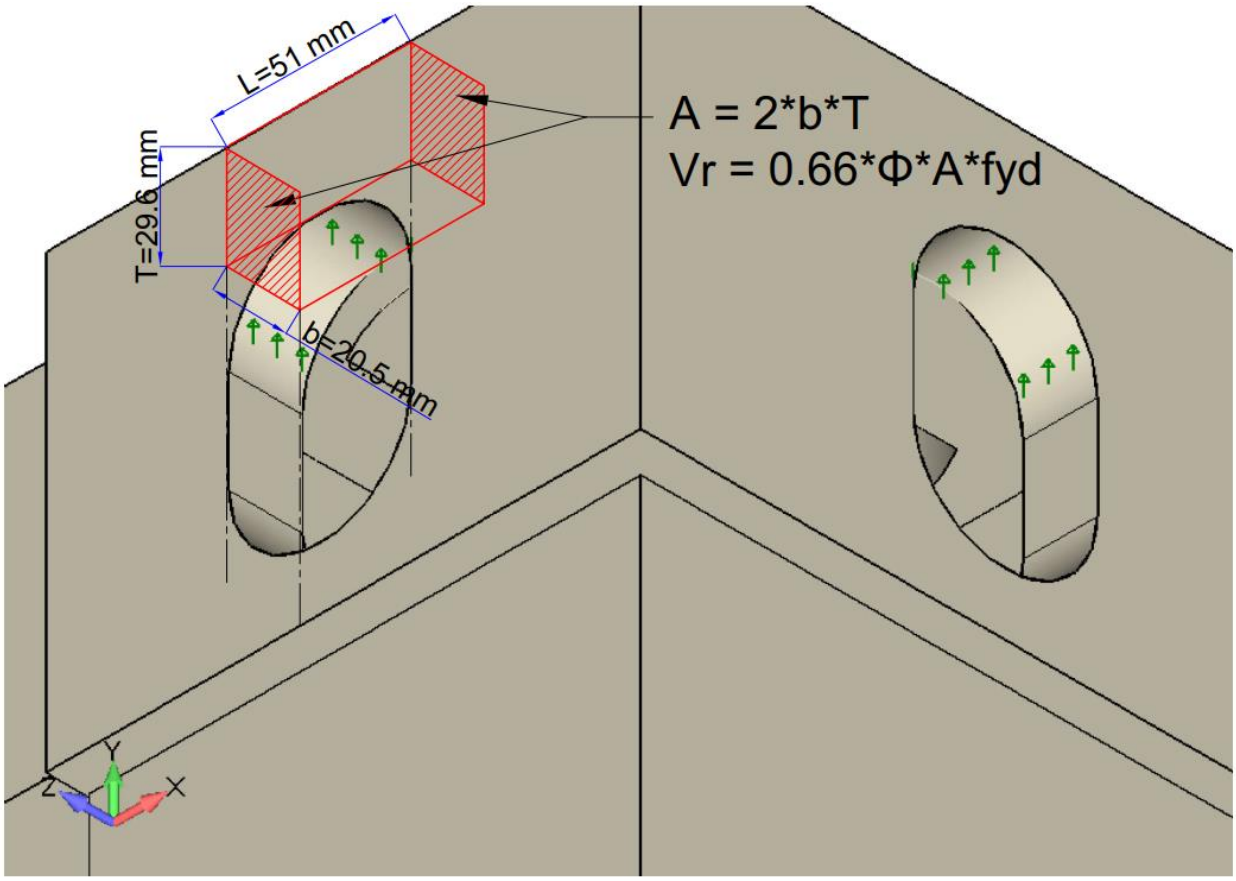


Output Set: Case 1 Time 1.
Deformed(0.1146): Total Translation
Elemental Contour: Solid Von Mises Stress
Second Contour:



Output Set: Case 1 Time 1.
Deformed(0.1146): Total Translation
Elemental Contour: Solid Von Mises Stress
Second Contour:

*MAXIMUM STRESS 171 MPA < 355*0.9 = 320 MPA*



For shear check of the lifting point subjected to tension from lifting cables, the shear stress is manually checked and compared with the limit value of the steel.

A = 2*b*T = 2*20.5*29.6 = 1213.6 mm²

Vr = 0.66*Φ*A*fyd = 0.66*0.9*1213.6*355 = 255912 N = 256 kN > 123 kN **(Verified)**

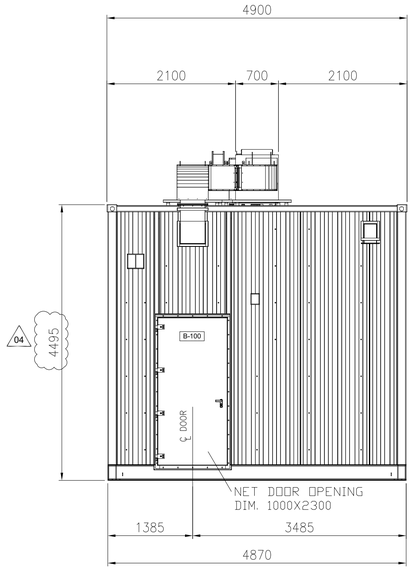
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11 CONCLUSIONS

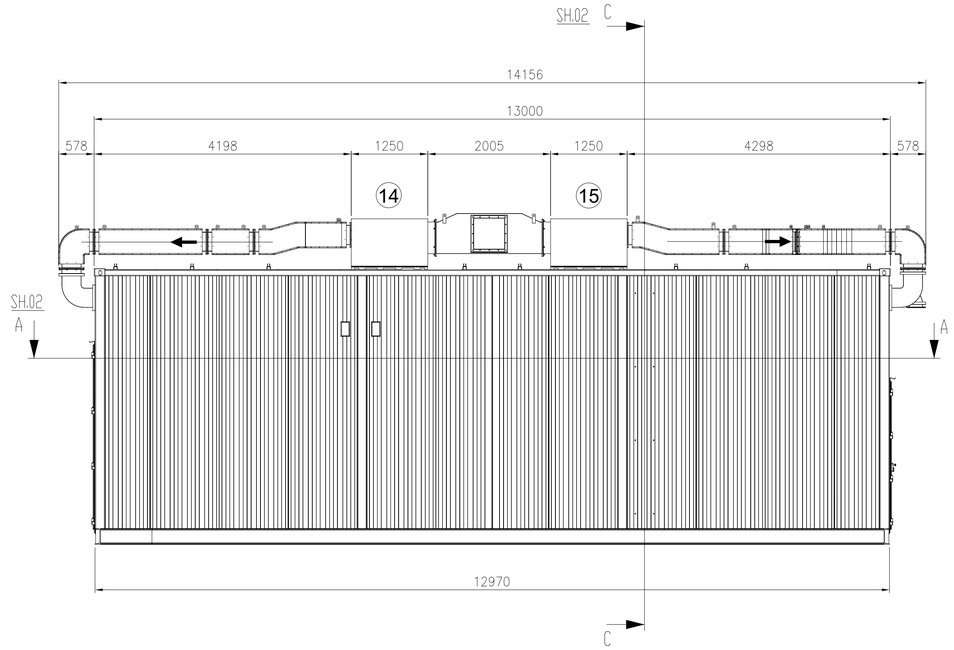
All structural components of cabin are verified. The stresses and displacements are compatible with the real behaviour and the structure is capable of supporting of assigned load.

DRAWING NO. 1724000049-AR-DA-00014

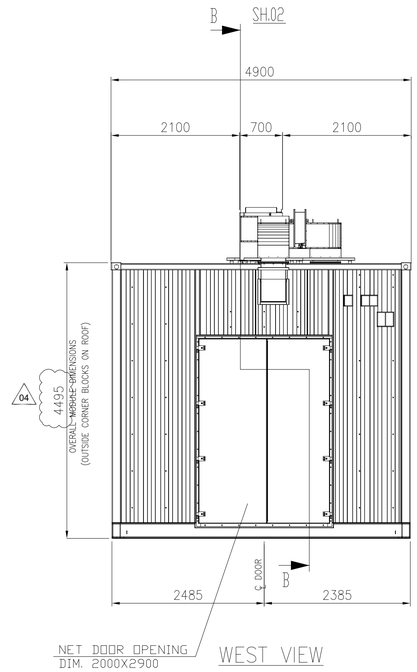
REV. 04



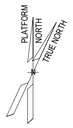
EAST VIEW

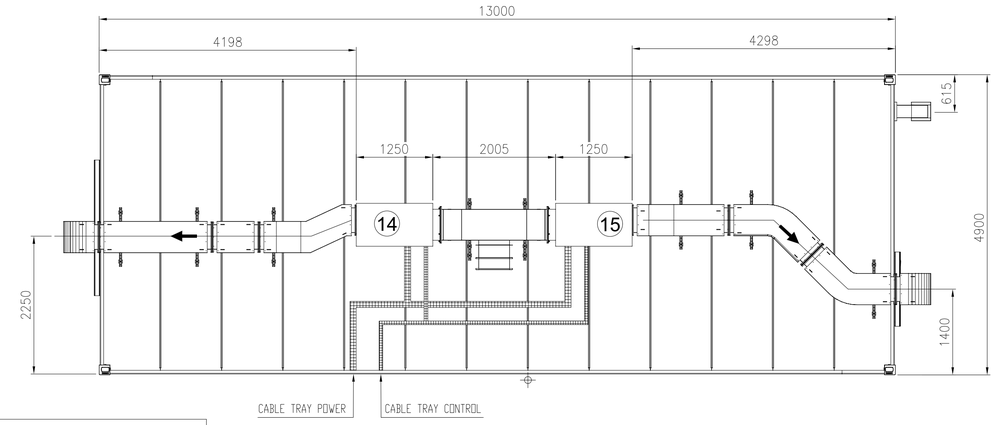


SOUTH VIEW



WEST VIEW



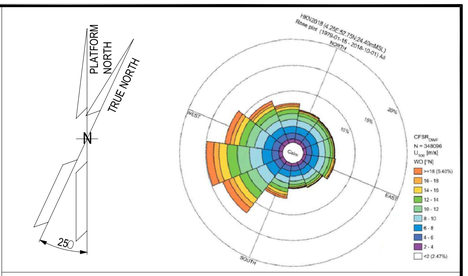


TOP VIEW

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	2600
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	7400
3	UP-200F1	DC UPS PANEL	1200	850	2105	500
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	522
5	CB-200F1	ISOLATOR FOR DC UPS	600	300	800	100
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2100	2100
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV ROOM	1200	600	1900	400
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	70
9	-	TOOL BOX	495	335	920	20
10	-	ELECTRIC SAFETY KIT	230	110	280	20
11	-	TABLE	1000	500	750	50
12	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
13	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
14	HHU-77001	AIR HANDLING UNIT A	1250	850	900	140
15	HHU-77002	AIR HANDLING UNIT B	1250	850	900	140
16	HSS-77-001	SPACE HEATER 1	184	145	1100	5
17	HSS-77-002	SPACE HEATER 2	184	145	1100	5
18	HSS-77-003	SPACE HEATER 3	184	145	1100	5

"B-100" HV (66kV/6.6kV) SWITCHGEAR ROOM



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

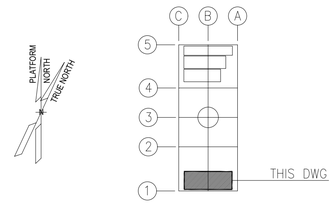
DOCUMENT TITLE	DOCUMENT NUMBER
"B-100" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00064
"B-100" DETAILED DRAWING	1724000049-AR-DD-00018
PAINTING PROCEDURE	1724000049-MAT-PRO-00004
"B-100" FOUNDATION	1724000049-ST-DD-00010
"B-100" STRUCTURAL CALCULATION	1724000049-ST-CA-00006

LEGEND

- INTERNAL LIGHT
- E — INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR – WIDTH 800mm.
- MAINTENANCE AREA – VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	28/06/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	14/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

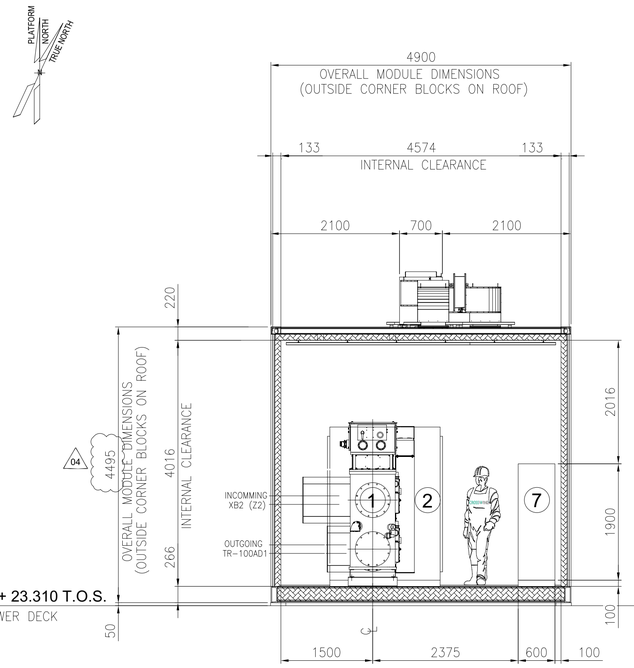
CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-100 GENERAL ARRANGEMENT DRAWINGS

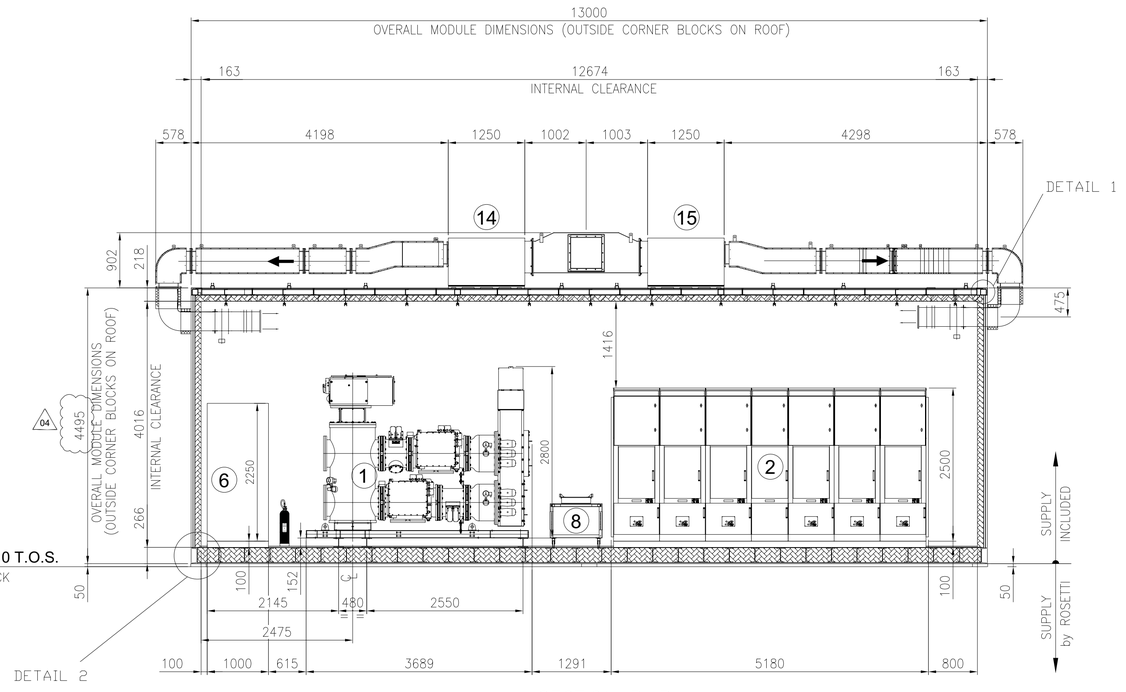
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00014	SHEET 001	REV. 04

File Name : 1724000049-AR-DA-00014-REV.04

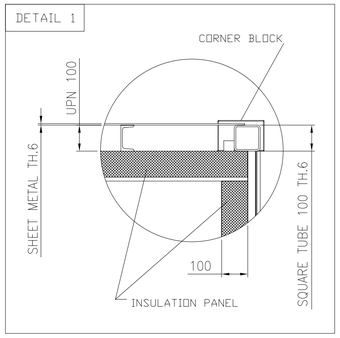
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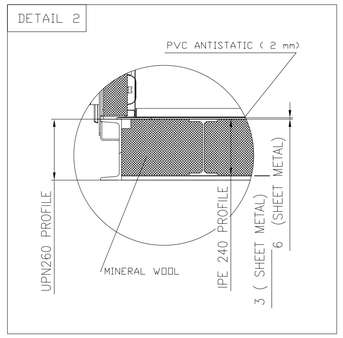


SECTION C–C



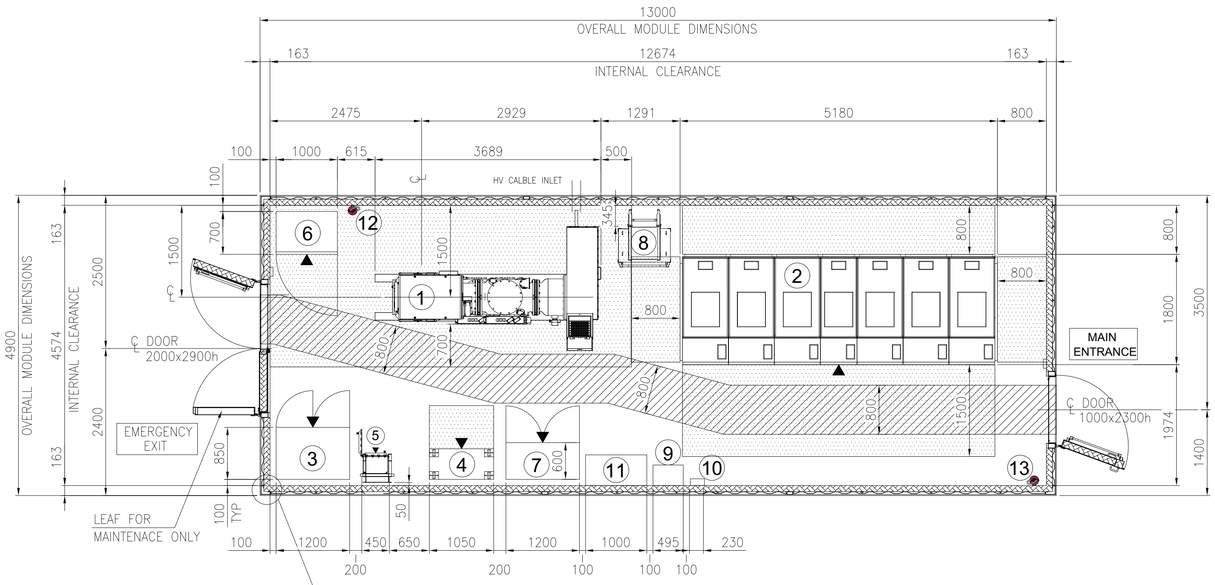
SECTION B–B



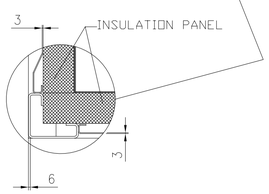


EQUIPMENT LIST

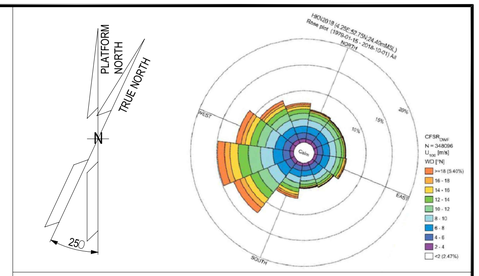
REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	2600
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	7400
3	UP-200F1	DC UPS PANEL	1200	850	2105	500
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	522
5	CB-200F1	ISOLATOR FOR DC UPS	600	300	800	100
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2100	2100
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV ROOM	1200	600	1900	400
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	70
9	-	TOOL BOX	495	335	920	20
10	-	ELECTRIC SAFETY KIT	230	110	280	20
11	-	TABLE	1000	500	750	50
12	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
13	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
14	HHU-77001	AIR HANDLING UNIT A	1250	850	900	140
15	HHU-77002	AIR HANDLING UNIT B	1250	850	900	140
16	HSS-77-001	SPACE HEATER 1	184	145	1100	5
17	HSS-77-002	SPACE HEATER 2	184	145	1100	5
18	HSS-77-003	SPACE HEATER 3	184	145	1100	5



SECTION A–A



EQUIPMENT LAYOUT
"B–100" HV (66kV/6.6kV) SWITCHGEAR ROOM
BOTTOM PLAN



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

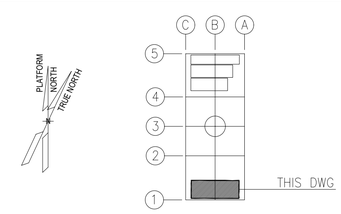
DOCUMENT TITLE	DOCUMENT NUMBER
"B–100" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00064
"B–100" DETAILED DRAWING	1724000049-AR-DD-00018
PAINTING PROCEDURE	1724000049-MAT-PRO-00004
"B–100" FOUNDATION	1724000049-ST-DD-00010
"B–100" STRUCTURAL CALCULATION	1724000049-ST-CA-00006

LEGEND

- INTERNAL LIGHT
- E INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR – WIDTH 800mm.
- MAINTENANCE AREA – VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	28/06/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	14/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

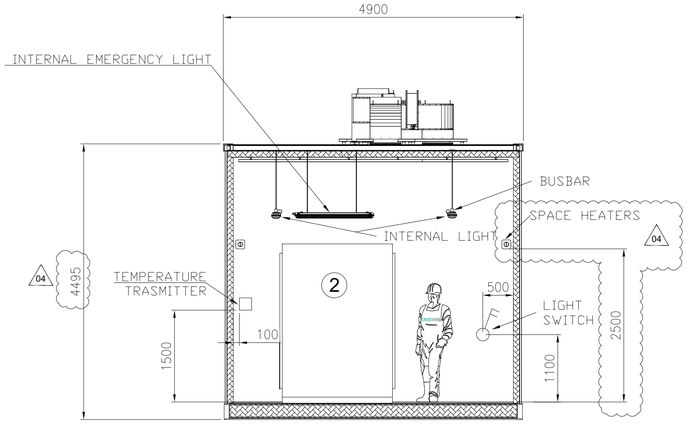
CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-100 GENERAL ARRANGEMENT DRAWINGS

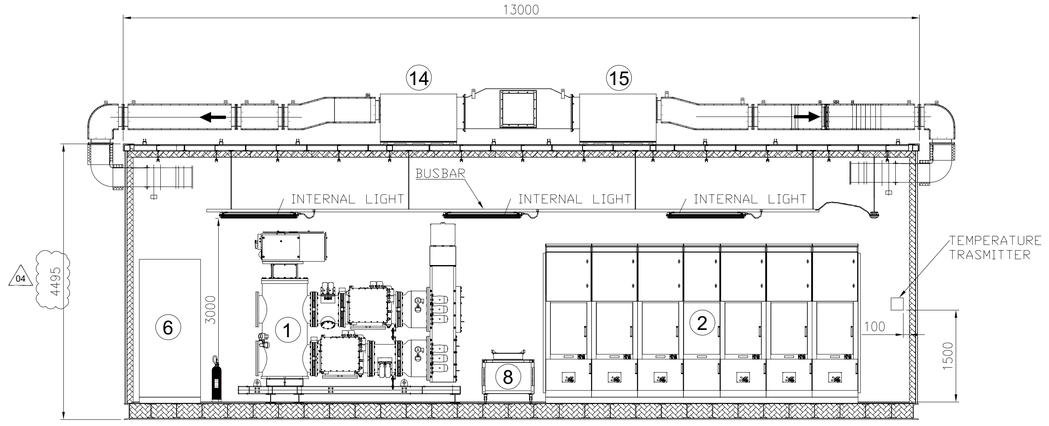
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00014	SHEET 002	REV. 04

File Name : 1724000049-AR-DA-00014-REV.04

DRAWING NO. 1724000049-AR-DA-00014 REV. 04



SECTION E-E

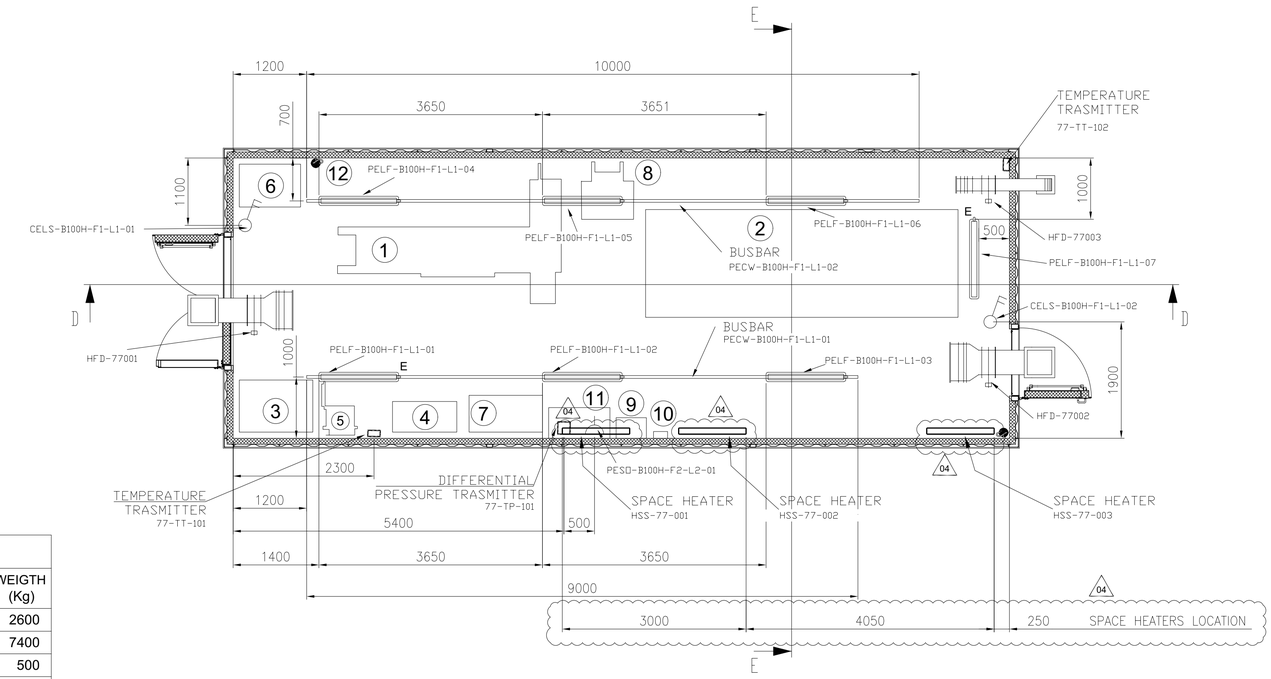


SECTION D-D

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

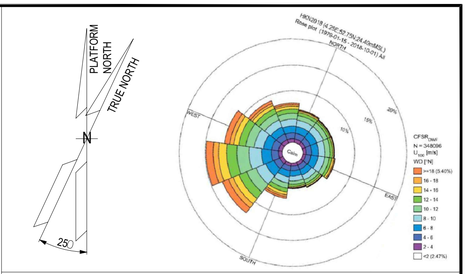
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	20-11-2024



"B-100" HV (66kV/6.6kV) SWITCHGEAR ROOM PLAN

EQUIPMENT LIST						
REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	2600
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	7400
3	UP-200F1	DC UPS PANEL	1200	850	2105	500
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	522
5	CB-200F1	ISOLATOR FOR DC UPS	600	300	800	100
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2100	2100
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV ROOM	1200	600	1900	400
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	70
9	-	TOOL BOX	495	335	920	20
10	-	ELECTRIC SAFETY KIT	230	110	280	20
11	-	TABLE	1000	500	750	50
12	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
13	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
14	HHU-77001	AIR HANDLING UNIT A	1250	850	900	140
15	HHU-77002	AIR HANDLING UNIT B	1250	850	900	140
16	HSS-77-001	SPACE HEATER 1	184	145	1100	5
17	HSS-77-002	SPACE HEATER 2	184	145	1100	5
18	HSS-77-003	SPACE HEATER 3	184	145	1100	5



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

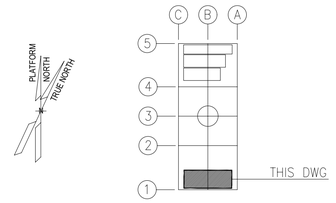
DOCUMENT TITLE	DOCUMENT NUMBER
"B-100" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00064
"B-100" DETAILED DRAWING	1724000049-AR-DD-00018
PAINTING PROCEDURE	1724000049-MAT-PRO-00004
"B-100" FOUNDATION	1724000049-ST-DD-00010
"B-100" STRUCTURAL CALCULATION	1724000049-ST-CA-00006

LEGEND

- INTERNAL LIGHT
- E — INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR – WIDTH 800mm.
- MAINTENANCE AREA – VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	28/06/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	14/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

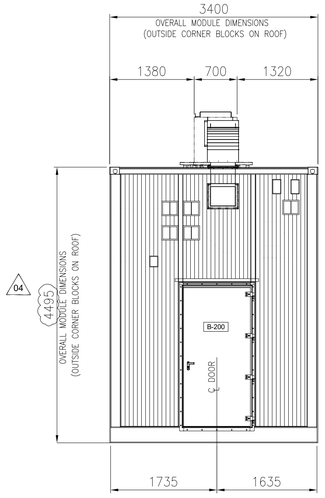
TITLE : BASE LOAD POWER HUB (BLPH)
B-100 GENERAL ARRANGEMENT DRAWINGS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00014	SHEET 003	REV. 04

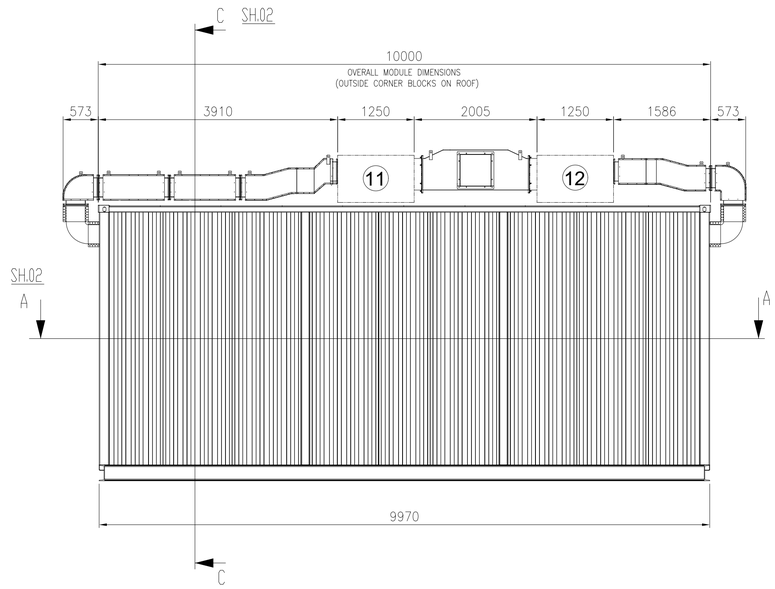
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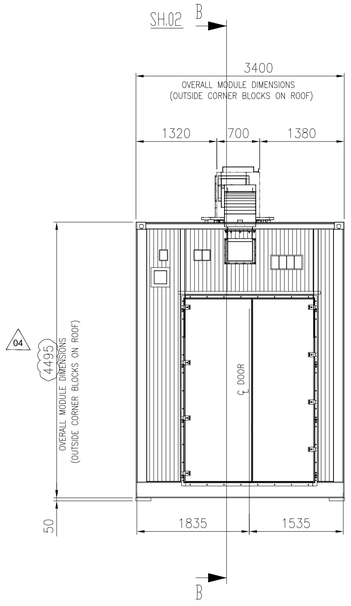
REV. 04



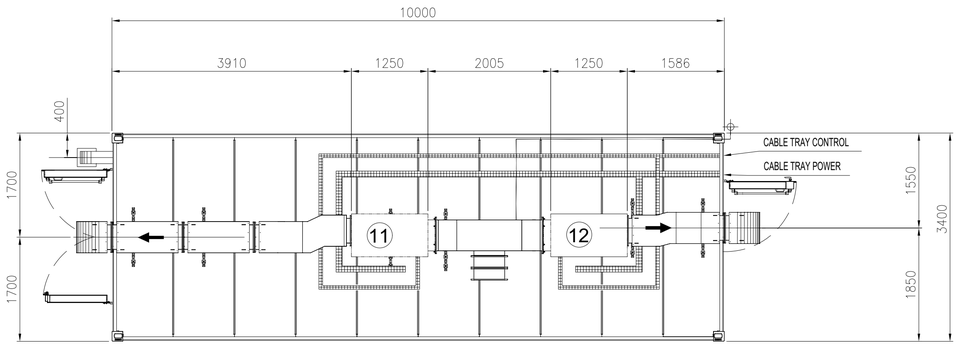
EAST VIEW



SOUTH VIEW



WEST VIEW



TOP VIEW

EQUIPMENT LIST						
REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	4900
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	600
3	-	SERVICE TROLLEY FOR 400V SWITCHGEAR	1034	490	2030	90
4	CN-200N1	ICCP PANEL	700	580	1830	250
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	400
6	-	TOOL BOX	495	335	200	20
7	-	TABLE	1000	500	750	50
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	1000
9	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
10	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
11	HHU-77003	AIR HANDLING UNIT A	1250	850	900	140
12	HHU-77004	AIR HANDLING UNIT B	1250	850	900	140
13	HSS-77-004	SPACE HEATER 1	184	145	1100	5
14	HSS-77-005	SPACE HEATER 2	184	145	1100	5
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04

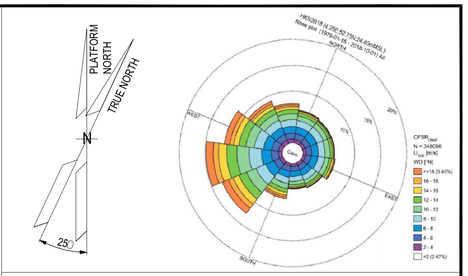
"B-200" LV (400V) SWITCHGEAR ROOM

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	15/11/2024



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

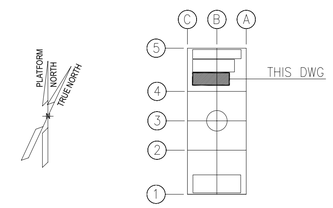
DOCUMENT TITLE	DOCUMENT NUMBER
"B-200" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00065
"B-200" DETAILED DRAWING	1724000049-AR-DD-00019
PAINTING PROCEDURE	1724000049-MAT-PRO-00005
"B-200" FOUNDATION	1724000049-ST-DD-00011
"B-200" STRUCTURAL CALCULATION	1724000049-ST-CA-00007

LEGEND

- INTERNAL LIGHT
- E — INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR – WIDTH 800mm.
- MAINTENANCE AREA – VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	28/06/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	14/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

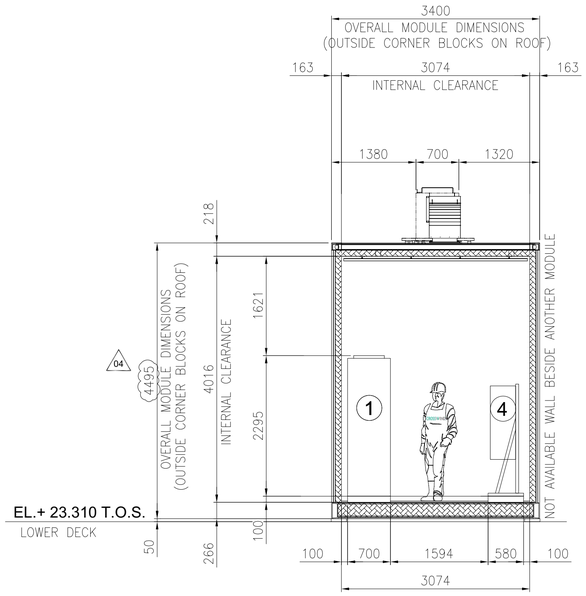
CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-200 GENERAL ARRANGEMENT DRAWINGS

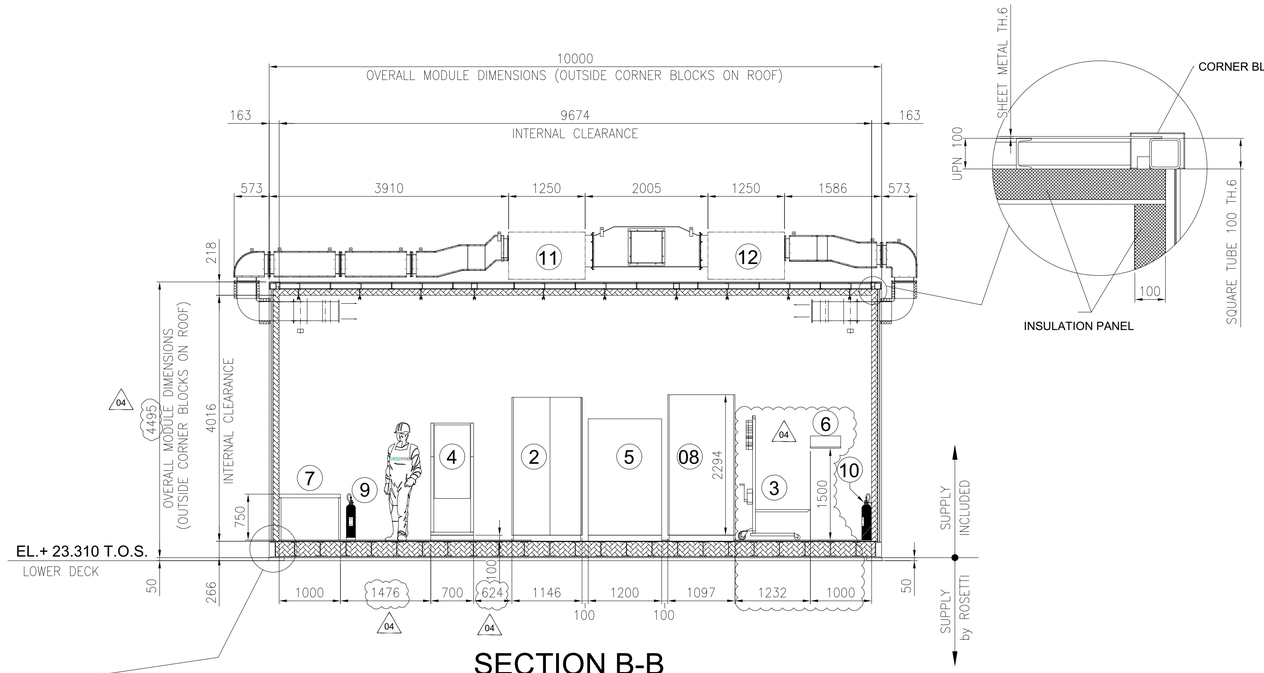
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00015	SHEET 001	REV. 04

File Name : 1724000049-AR-DA-00015-REV.04

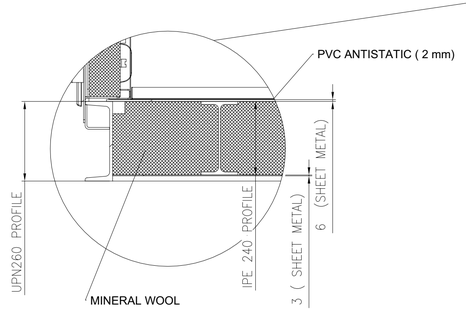
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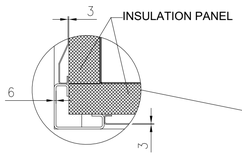


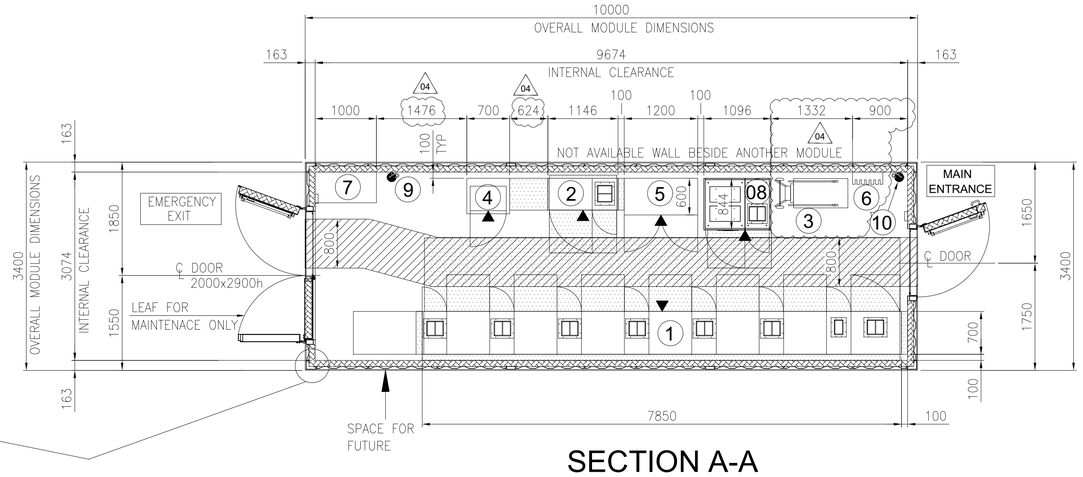
SECTION C-C



SECTION B-B





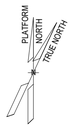


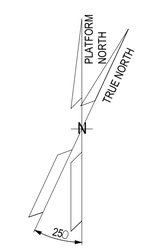
SECTION A-A

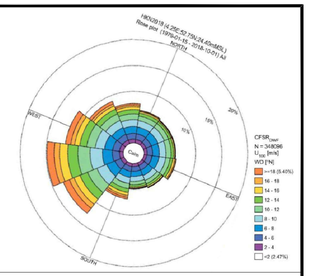
EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)	
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	4900	
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	600	
3	-	SERVICE TROLLEY FOR 400V SWITCHGEAR	1034	490	2030	90	04
4	CN-200N1	ICCP PANEL	700	580	1830	250	
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	400	
6	-	TOOL BOX	495	335	200	20	
7	-	TABLE	1000	500	750	50	
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	1000	
9	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20	
10	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20	
11	HHU-77003	AIR HANDLING UNIT A	1250	850	900	140	
12	HHU-77004	AIR HANDLING UNIT B	1250	850	900	140	
13	HSS-77-004	SPACE HEATER 1	184	145	1100	5	
14	HSS-77-005	SPACE HEATER 2	184	145	1100	5	
15	HSS-77-006	SPACE HEATER 3	184	145	1100	5	

EQUIPMENT LAYOUT "B-200" LV (400V) SWITCHGEAR ROOM BOTTOM PLAN







NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

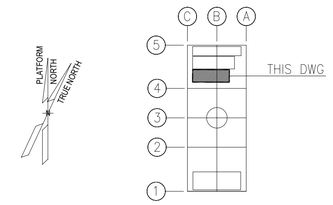
DOCUMENT TITLE	DOCUMENT NUMBER
"B-200" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00065
"B-200" DETAILED DRAWING	1724000049-AR-DD-00019
PAINTING PROCEDURE	1724000049-MAT-PRO-00005
"B-200" FOUNDATION	1724000049-ST-DD-00011
"B-200" STRUCTURAL CALCULATION	1724000049-ST-CA-00007

LEGEND

- INTERNAL LIGHT
- E INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR – WIDTH 800mm.
- MAINTENANCE AREA – VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	28/06/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	14/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

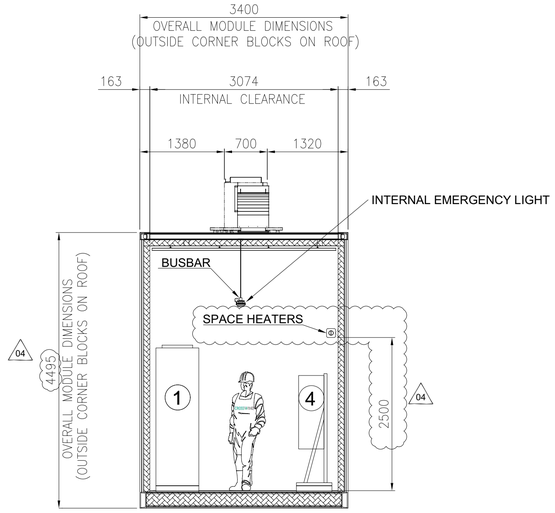
TITLE : BASE LOAD POWER HUB (BLPH)
B-200 GENERAL ARRANGEMENT DRAWINGS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00015	SHEET 002	REV. 04

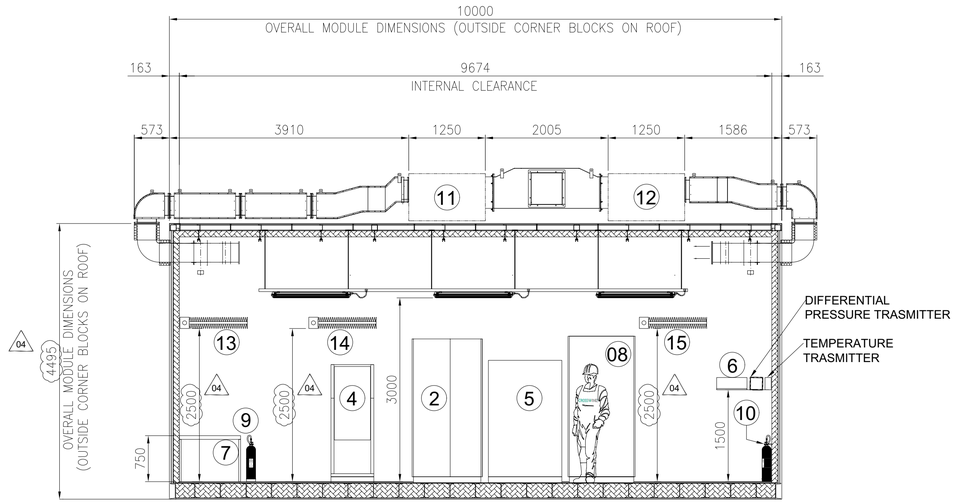
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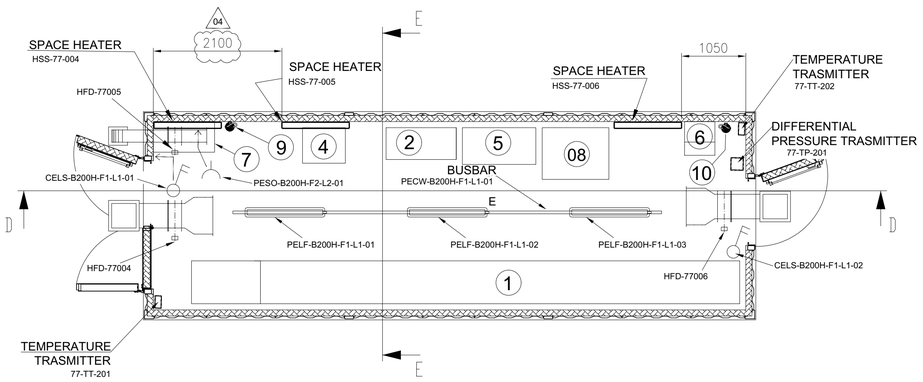
REV. 04



SECTION E-E



SECTION D-D



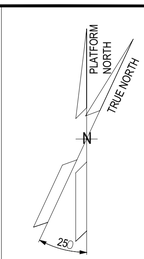
"B-200" LV (400V) SWITCHGEAR ROOM PLAN

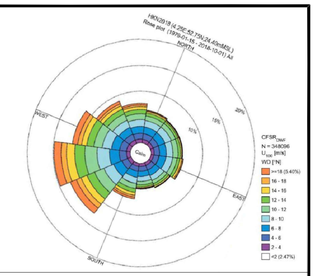


EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	4900
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	600
3	-	SERVICE TROLLEY FOR 400V SWITCHGEAR	1034	490	2030	90
4	CN-200N1	ICCP PANEL	700	580	1830	250
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	400
6	-	TOOL BOX	495	335	200	20
7	-	TABLE	1000	500	750	50
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	1000
9	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
10	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
11	HHU-77003	AIR HANDLING UNIT A	1250	850	900	140
12	HHU-77004	AIR HANDLING UNIT B	1250	850	900	140
13	HSS-77-004	SPACE HEATER 1	184	145	1100	5
14	HSS-77-005	SPACE HEATER 2	184	145	1100	5
15	HSS-77-006	SPACE HEATER 3	184	145	1100	5

04





NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

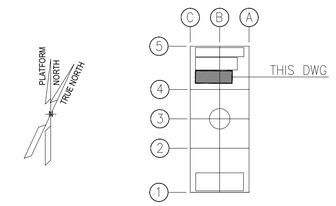
DOCUMENT TITLE	DOCUMENT NUMBER
"B-200" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00065
"B-200" DETAILED DRAWING	1724000049-AR-DD-00019
PAINTING PROCEDURE	1724000049-MAT-PRO-00005
"B-200" FOUNDATION	1724000049-ST-DD-00011
"B-200" STRUCTURAL CALCULATION	1724000049-ST-CA-00007

LEGEND

- INTERNAL LIGHT
- E — INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- _____ ESCAPE CORRIDOR – WIDTH 800mm.
- _____ MAINTENANCE AREA – VENDOR REQUIREMENT
- _____ INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	28/06/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	14/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

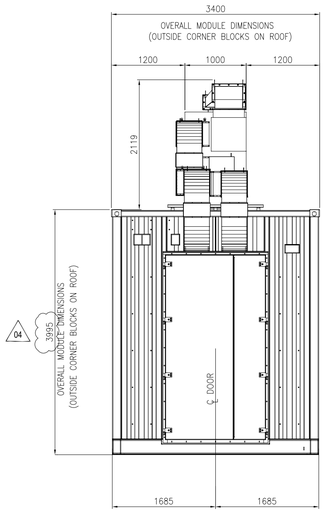
TITLE :
BASE LOAD POWER HUB (BLPH)
B-200 GENERAL ARRANGEMENT DRAWINGS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00015	SHEET 003	REV. 04

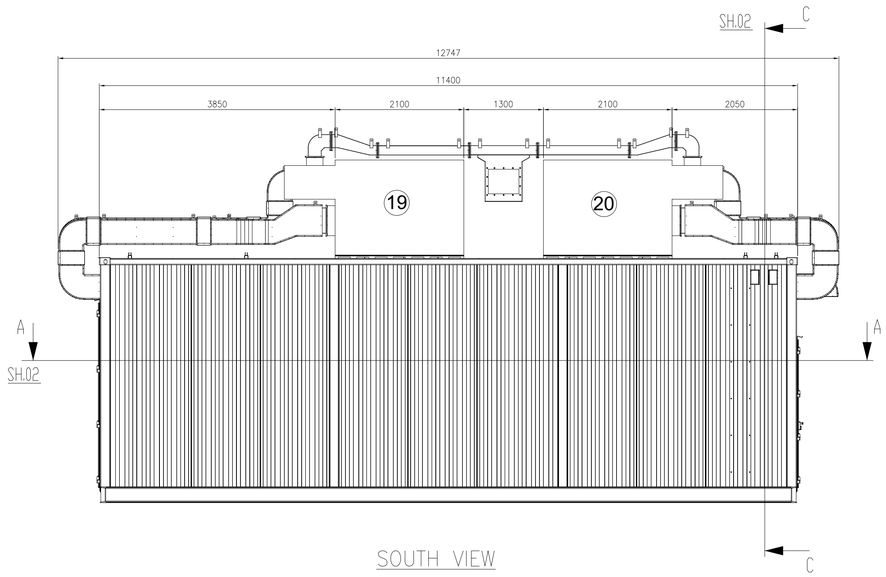
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DRAWING NO. 1724000049-AR-DA-00016

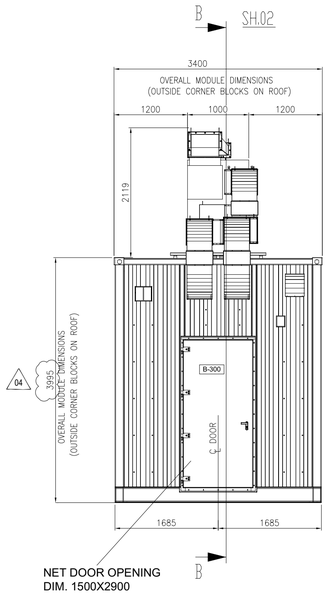
REV. 04



WEST VIEW

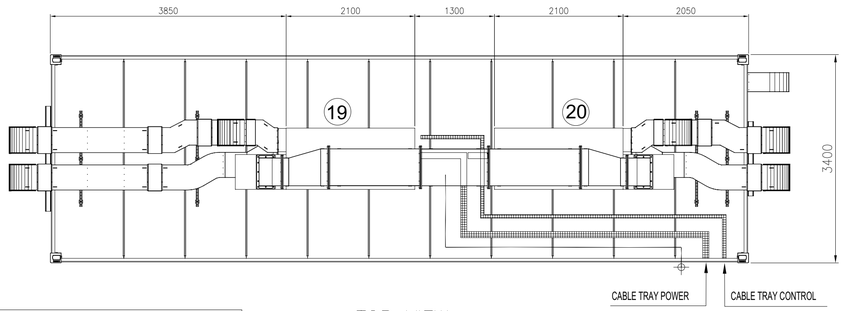


SOUTH VIEW



NET DOOR OPENING
DIM. 1500X2900

EAST VIEW



TOP VIEW

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)
1	UP-200F3	AC UPS 35kVA	2400	860	1915	2258
2	UP-200F4	AC UPS 15kVA	2400	860	1915	2258
3	BA-200F3A	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914
4	BA-200F3B	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914
5	BA-200F4A	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429
6	BA-200F4B	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429
7	CB-200F3A	ISOLATOR BOX AC UPS 35kVA	600	300	800	100
8	CB-200F3B	ISOLATOR BOX AC UPS 35kVA	600	300	800	100
9	CB-200F4A	ISOLATOR BOX AC UPS 15kVA	600	300	800	100
10	CB-200F4B	ISOLATOR BOX AC UPS 15kVA	600	300	800	100
11	NC-200F2	NAVAID PANEL	1000	800	2600	535
12	BA-200F2	BATTERY BOX NAVAID	958	993	1210	1552
13	CB-200F2	ISOLATOR BOX NAVAID	500	400	765	70
14	B300-HSB-001	DISTRIBUTION & HVAC PANEL - AC/UPS ROOM	1600	600	2300	500
15	-	EYE WASH STATION	228	80	290	5
16	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
17	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
18	BC-200F2	BATTERY CHARGER NAVAID	607	607	2157	500
19	HHU-77005	AIR HANDLING UNIT A	2100	1000	2158	850
20	HHU-77006	AIR HANDLING UNIT B	2100	1000	2158	850
21	HSS-77-007	SPACE HEATER 1	184	145	1100	5
22	HSS-77-008	SPACE HEATER 2	184	145	1100	5
23	HSS-77-009	SPACE HEATER 3	184	145	1100	5

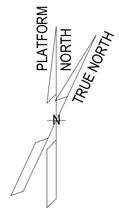
"B-300" AC UPS FITTED WITH UPS SYSTEM EQUIPMENT ROOM

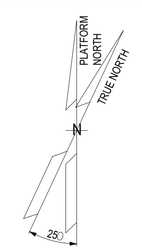
ROSETTI MARINO

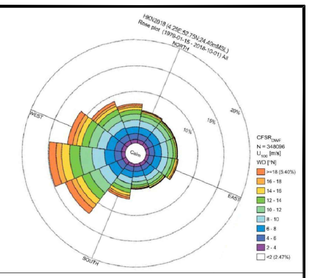
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	15/11/2024







NOTE

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2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

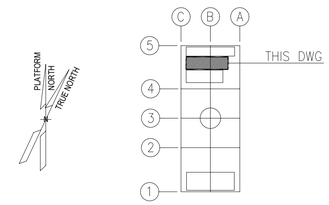
DOCUMENT TITLE	DOCUMENT NUMBER
"B-300" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00066
"B-300" DETAILED DRAWING	1724000049-AR-DD-00020
PAINTING PROCEDURE	1724000049-MAT-PRO-00006
"B-300" FOUNDATION	1724000049-ST-DD-00012
"B-300" STRUCTURAL CALCULATION	1724000049-ST-CA-00008

LEGEND

- INTERNAL LIGHT
- E INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR – WIDTH 800mm.
- MAINTENANCE AREA – VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	03/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	16/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

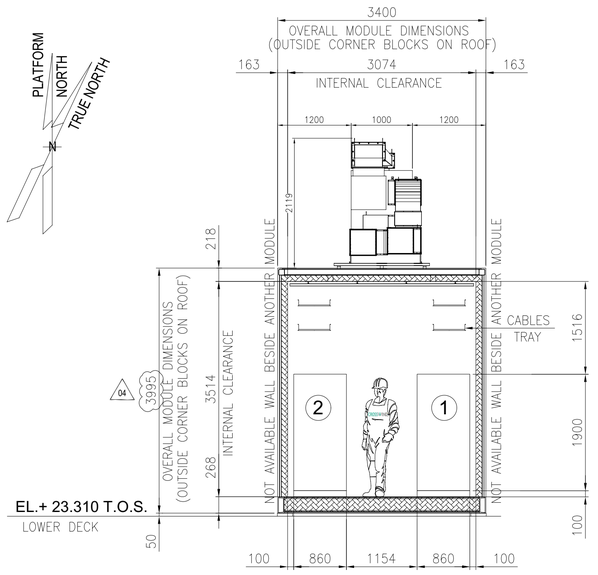
CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-300 GENERAL ARRANGEMENT DRAWINGS

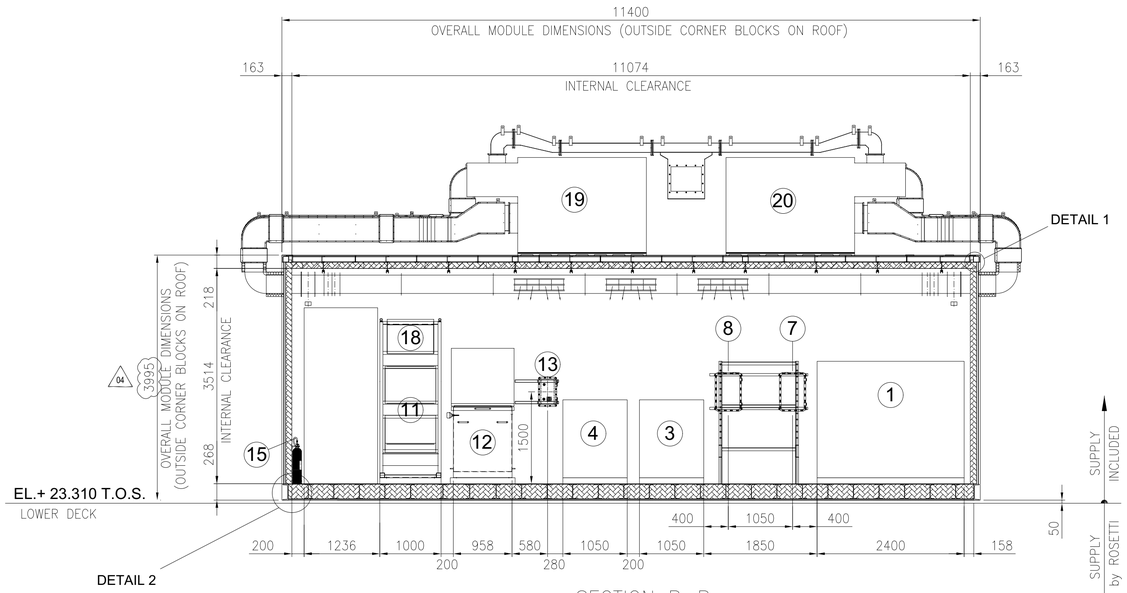
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00016	SHEET 001	REV. 04

File Name : 1724000049-AR-DA-00016-REV.04

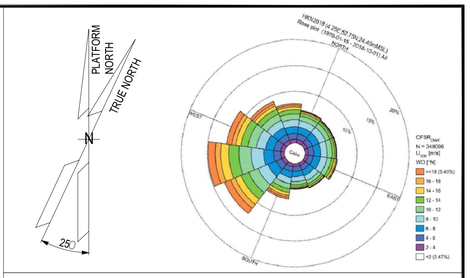
DRAWING NO. 1724000049-AR-DA-00016 REV. 04



SECTION C-C



SECTION B-B



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

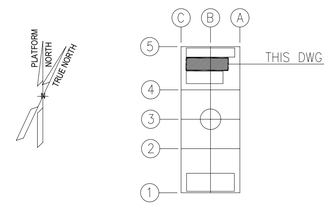
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"B-300" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00066
"B-300" DETAILED DRAWING	1724000049-AR-DD-00020
PAINTING PROCEDURE	1724000049-MAT-PRO-00006
"B-300" FOUNDATION	1724000049-ST-DD-00012
"B-300" STRUCTURAL CALCULATION	1724000049-ST-CA-00008

LEGEND

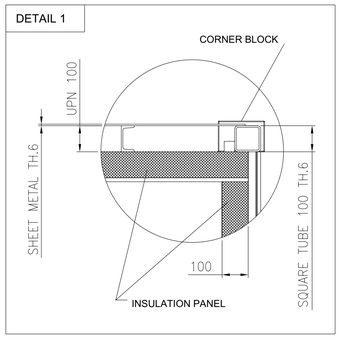
- INTERNAL LIGHT
- E INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR - WIDTH 800mm.
- MAINTENANCE AREA - VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

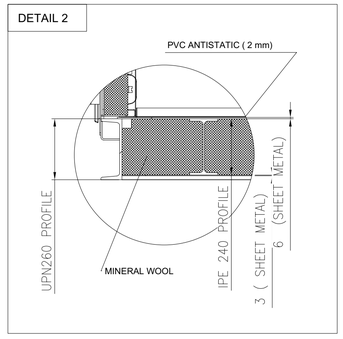
KEY PLAN



DETAIL 1



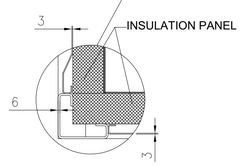
DETAIL 2



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)
1	UP-200F3	AC UPS 35kVA	2400	860	1915	2258
2	UP-200F4	AC UPS 15kVA	2400	860	1915	2258
3	BA-200F3A	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914
4	BA-200F3B	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914
5	BA-200F4A	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429
6	BA-200F4B	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429
7	CB-200F3A	ISOLATOR BOX AC UPS 35kVA	600	300	800	100
8	CB-200F3B	ISOLATOR BOX AC UPS 35kVA	600	300	800	100
9	CB-200F4A	ISOLATOR BOX AC UPS 15kVA	600	300	800	100
10	CB-200F4B	ISOLATOR BOX AC UPS 15kVA	600	300	800	100
11	NC-200F2	NAVAID PANEL	1000	800	2600	535
12	BA-200F2	BATTERY BOX NAVAID	958	993	1210	1552
13	CB-200F2	ISOLATOR BOX NAVAID	500	400	765	70
14	B300-HSB-001	DISTRIBUTION & HVAC PANEL - AC/UPS ROOM	1600	600	2300	500
15	-	EYE WASH STATION	228	80	290	5
16	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
17	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
18	BC-200F2	BATTERY CHARGER NAVAID	607	607	2157	500
19	HHU-77005	AIR HANDLING UNIT A	2100	1000	2158	850
20	HHU-77006	AIR HANDLING UNIT B	2100	1000	2158	850
21	HSS-77-007	SPACE HEATER 1	184	145	1100	5
22	HSS-77-008	SPACE HEATER 2	184	145	1100	5
23	HSS-77-009	SPACE HEATER 3	184	145	1100	5

SECTION A-A



EQUIPMENT LAYOUT
"B-300" AC UPS FITTED WITH UPS SYSTEM EQUIPMENT ROOM
BOTTOM PLAN

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	03/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	16/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

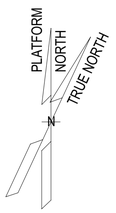
TITLE : BASE LOAD POWER HUB (BLPH)
B-300 GENERAL ARRANGEMENT DRAWINGS

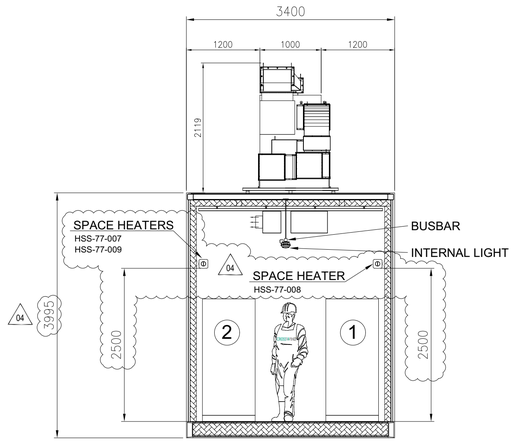
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00016	SHEET 002	REV. 04

File Name : 1724000049-AR-DA-00016-REV.04

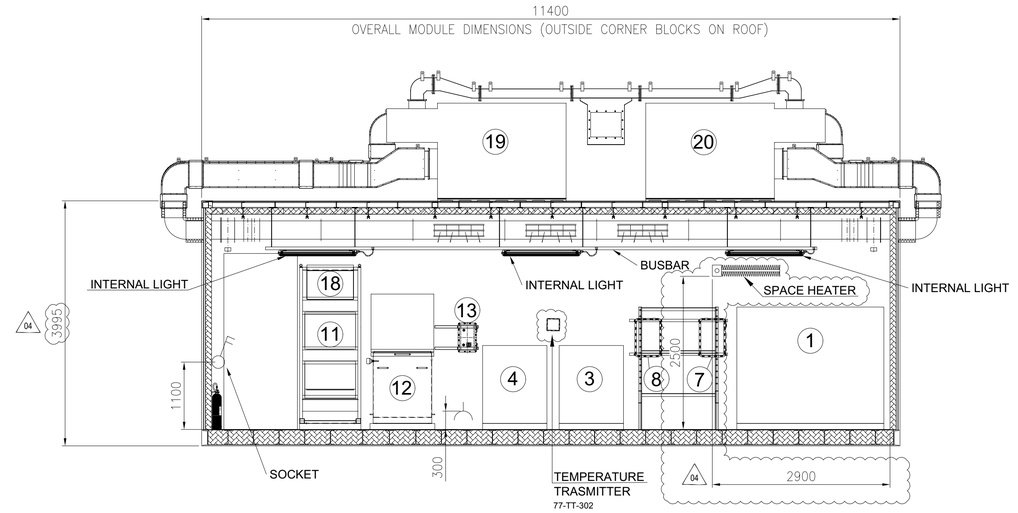
DRAWING NO. 1724000049-AR-DA-00016

REV. 04



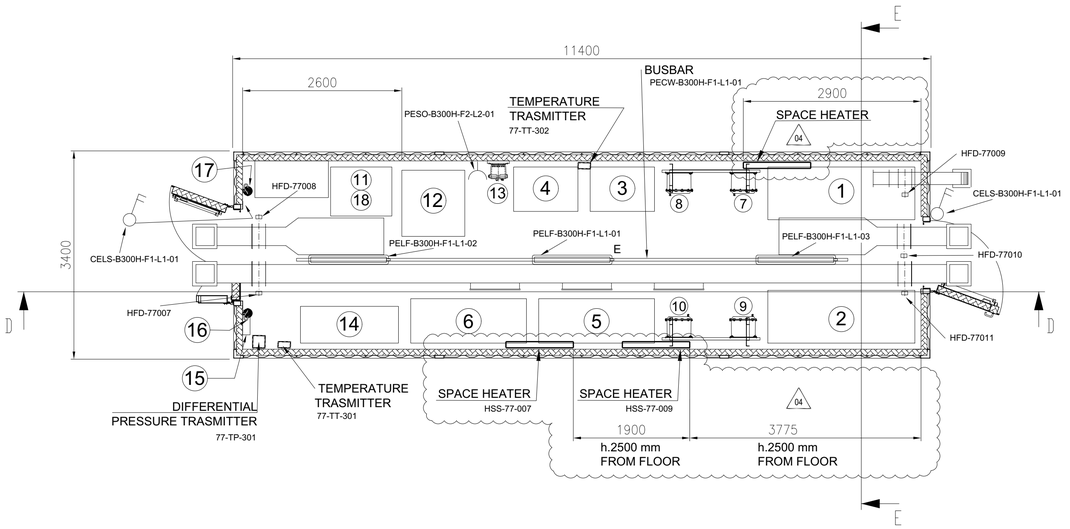


SECTION E-E

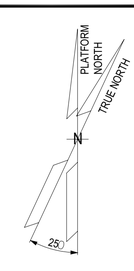


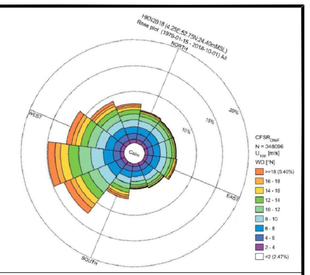
SECTION D-D

EQUIPMENT LIST						
REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)
1	UP-200F3	AC UPS 35kVA	2400	860	1915	2258
2	UP-200F4	AC UPS 15kVA	2400	860	1915	2258
3	BA-200F3A	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914
4	BA-200F3B	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914
5	BA-200F4A	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429
6	BA-200F4B	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429
7	CB-200F3A	ISOLATOR BOX AC UPS 35kVA	600	300	800	100
8	CB-200F3B	ISOLATOR BOX AC UPS 35kVA	600	300	800	100
9	CB-200F4A	ISOLATOR BOX AC UPS 15kVA	600	300	800	100
10	CB-200F4B	ISOLATOR BOX AC UPS 15kVA	600	300	800	100
11	NC-200F2	NAVAID PANEL	1000	800	2600	535
12	BA-200F2	BATTERY BOX NAVAID	958	993	1210	1552
13	CB-200F2	ISOLATOR BOX NAVAID	500	400	765	70
14	B300-HSB-001	DISTRIBUTION & HVAC PANEL - AC/UPS ROOM	1600	600	2300	500
15	-	EYE WASH STATION	228	80	290	5
16	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
17	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20
18	BC-200F2	BATTERY CHARGER NAVAID	607	607	2157	500
19	HHU-77005	AIR HANDLING UNIT A	2100	1000	2158	850
20	HHU-77006	AIR HANDLING UNIT B	2100	1000	2158	850
21	HSS-77-007	SPACE HEATER 1	184	145	1100	5
22	HSS-77-008	SPACE HEATER 2	184	145	1100	5
23	HSS-77-009	SPACE HEATER 3	184	145	1100	5



"B-300" AC UPS FITTED WITH UPS SYSTEM EQUIPMENT ROOM PLAN





NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

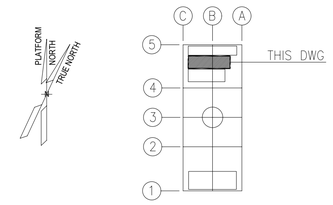
DOCUMENT TITLE	DOCUMENT NUMBER
"B-300" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00066
"B-300" DETAILED DRAWING	1724000049-AR-DD-00020
PAINTING PROCEDURE	1724000049-MAT-PRO-00006
"B-300" FOUNDATION	1724000049-ST-DD-00012
"B-300" STRUCTURAL CALCULATION	1724000049-ST-CA-00008

LEGEND

- INTERNAL LIGHT
- E INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR - WIDTH 800mm.
- MAINTENANCE AREA - VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	03/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	16/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

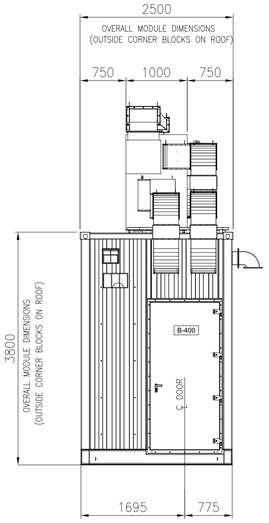
TITLE :
BASE LOAD POWER HUB (BLPH)
B-300 GENERAL ARRANGEMENT DRAWINGS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00016	SHEET 003	REV. 04

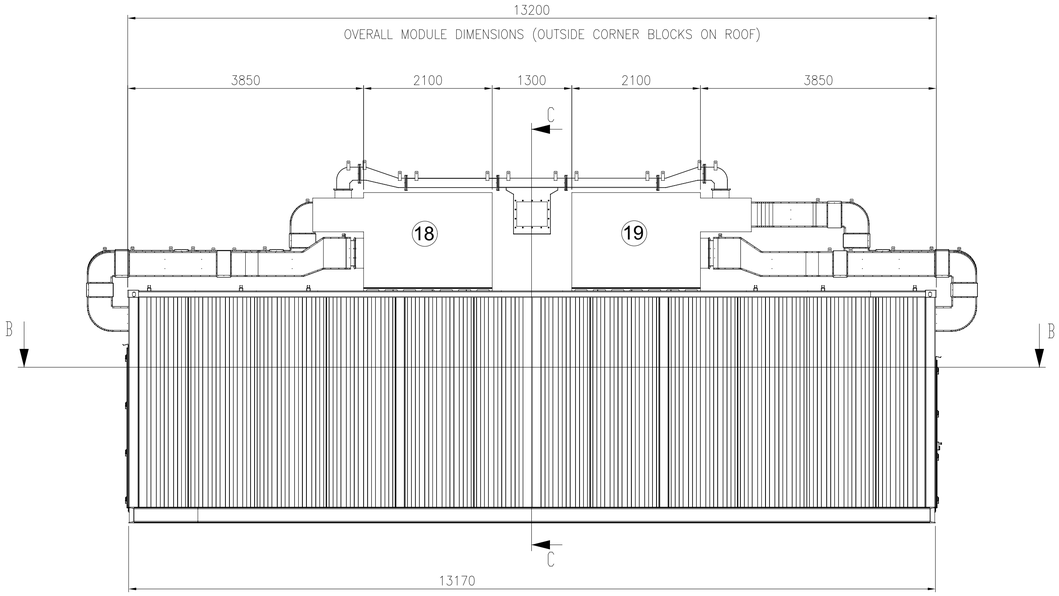
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DRAWING NO. 1724000049-AR-DA-00017

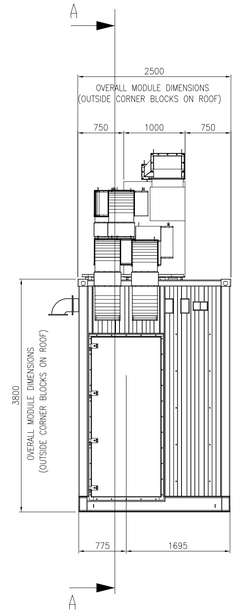
REV. 04



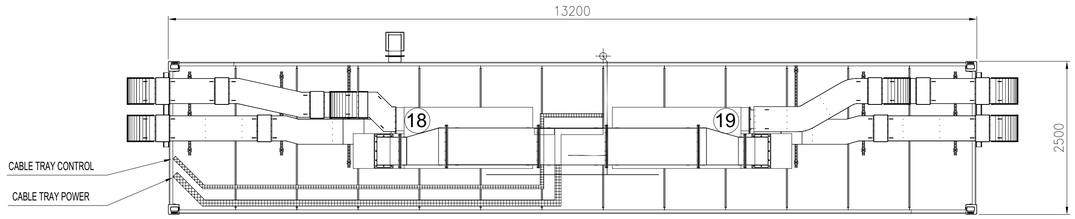
EAST VIEW



SOUTH VIEW



WEST VIEW



TOP VIEW

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)	NOTE
1	B400-SRV-001	SERVER CABINET	1000	800	2100	250	SINGLE CABINET
2	B400-NET-001	NETWORK CABINET	800	800	2100	250	SINGLE CABINET
3	B400-EMCS-001	EMCS SYSTEM CABINET	800	800	2100	250	SINGLE CABINET
4	B400-PCS-001	PCS SYSTEM CABINET	800	800	2100	250	DOUBLE CABINET
5	B400-PCS-002	PCS MARSHALLING CABINET	800	800	2100	250	
6	B400-FGS-001	FGS SYSTEM CABINET	800	800	2100	250	TRIPLE CABINET
7	B400-FGS-002	FGS MARSHALLING CABINET 1	800	800	2100	250	
8	B400-FGS-003	FGS MARSHALLING CABINET 2	800	800	2100	250	
9	B400-SIS-001	SIS SYSTEM/MARSHALLING CABINET	800	800	2100	250	SINGLE CABINET
10	-	SPARE					
11	B400-HSB-001	DISTRIBUTION & HVAC PANEL - I&T ROOM	1600	600	2300	1150	
12	-	TABLE	850	500	750	50	
13	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20	
14	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20	
15	-	FIRST AID KIT	280	115	200	10	
16	-	RESUSCITATION UNIT	430	210	480	10	
17	-	CABINET INCLUDED N.10 ESCAPE MASK	448	213	422	15	
18	HHU-77007	AIR HANDLING UNIT A	2100	1000	2158	850	
19	HHU-77008	AIR HANDLING UNIT B	2100	1000	2158	850	
20	HSS-77-010	SPACE HEATER 1	184	145	1100	5	
21	HSS-77-011	SPACE HEATER 2	184	145	1100	5	
22	HSS-77-012	SPACE HEATER 3	184	145	1100	5	

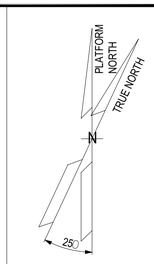
"B-400" I&T EQUIPMENT ROOM

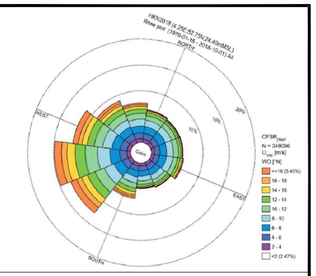
ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	15/11/2024





NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

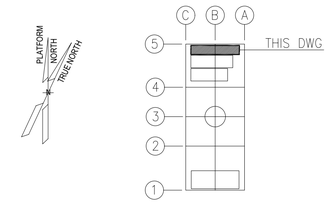
DOCUMENT TITLE	DOCUMENT NUMBER
"B-400" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00067
"B-400" DETAILED DRAWING	1724000049-AR-DD-00021
PAINTING PROCEDURE	1724000049-MAT-PRO-00007
"B-400" FOUNDATION	1724000049-ST-DD-00013
"B-400" STRUCTURAL CALCULATION	1724000049-ST-CA-00009

LEGEND

- INTERNAL LIGHT
- E — INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR – WIDTH 800mm.
- MAINTENANCE AREA – VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	04/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	16/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

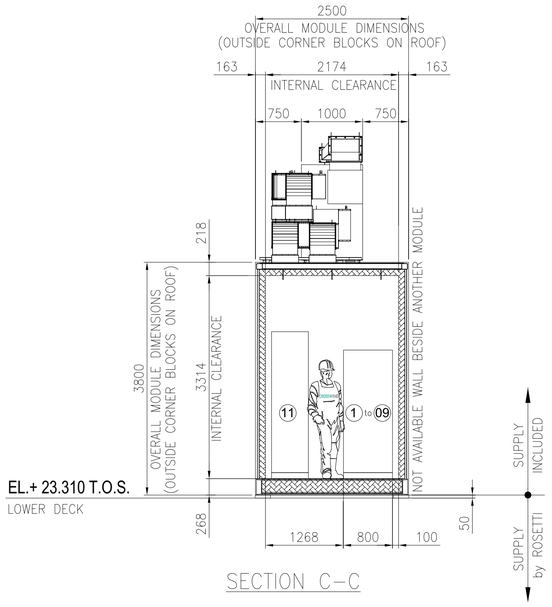
ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-400 GENERAL ARRANGEMENT DRAWINGS

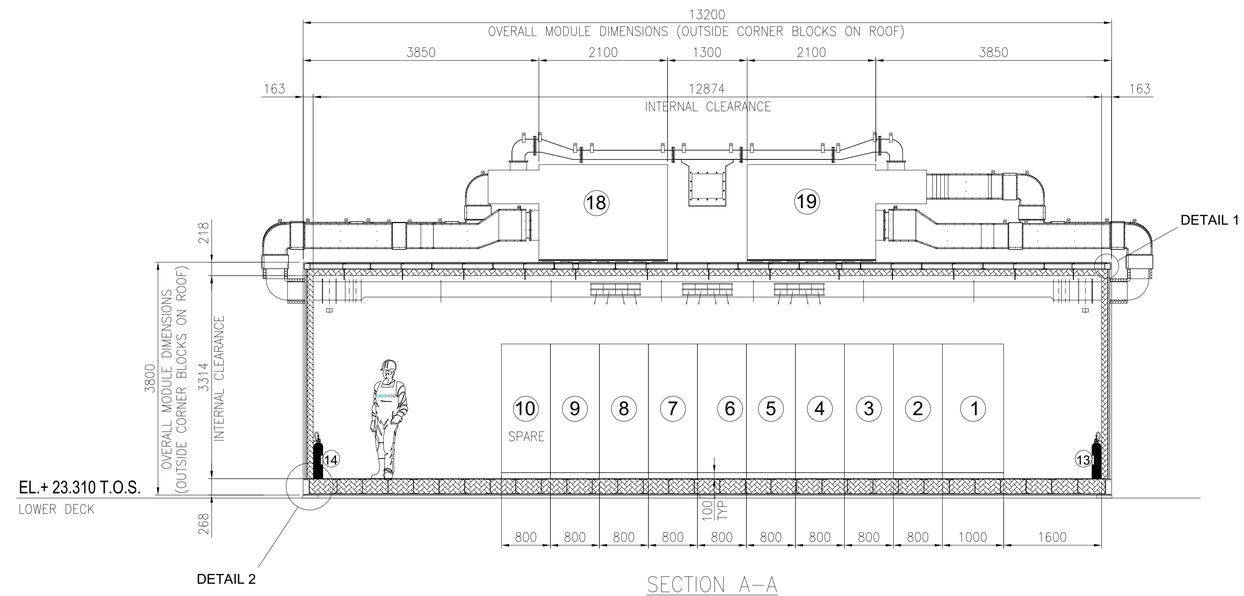
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00017	SHEET 001	REV. 04

File Name : 1724000049-AR-DA-00017-REV.04

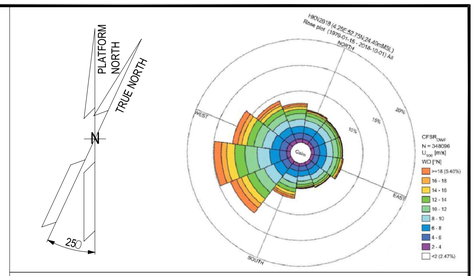
DRAWING NO. 1724000049-AR-DA-00017 REV. 04



SECTION C-C



SECTION A-A



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

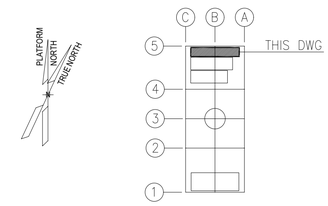
DOCUMENT TITLE	DOCUMENT NUMBER
"B-400" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00067
"B-400" DETAILED DRAWING	1724000049-AR-DD-00021
PAINTING PROCEDURE	1724000049-MAT-PRO-00007
"B-400" FOUNDATION	1724000049-ST-DD-00013
"B-400" STRUCTURAL CALCULATION	1724000049-ST-CA-00009

LEGEND

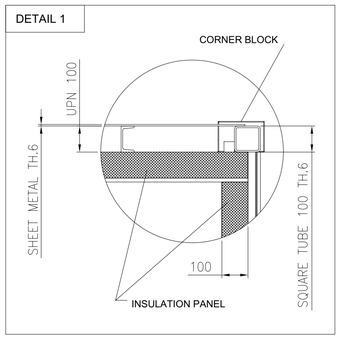
- INTERNAL LIGHT
- E INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR – WIDTH 800mm.
- MAINTENANCE AREA – VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

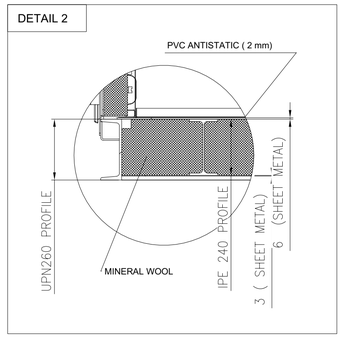
KEY PLAN

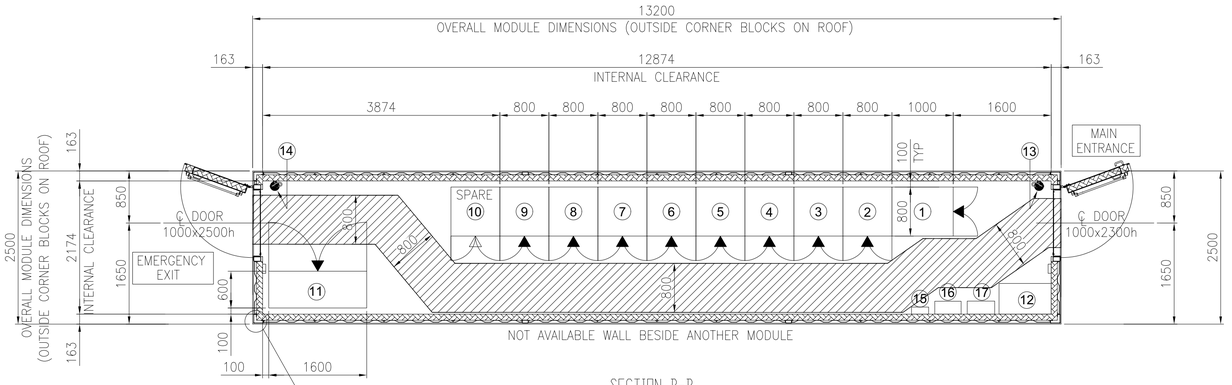


DETAIL 1

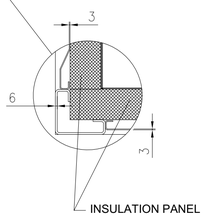


DETAIL 2





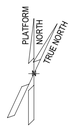
SECTION B-B



EQUIPMENT LAYOUT
"B-400" I&T EQUIPMENT ROOM
BOTTOM PLAN

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)	NOTE
1	B400-SRV-001	SERVER CABINET	1000	800	2100	250	SINGLE CABINET
2	B400-NET-001	NETWORK CABINET	800	800	2100	250	SINGLE CABINET
3	B400-EMCS-001	EMCS SYSTEM CABINET	800	800	2100	250	SINGLE CABINET
4	B400-PCS-001	PCS SYSTEM CABINET	800	800	2100	250	DOUBLE CABINET
5	B400-PCS-002	PCS MARSHALLING CABINET	800	800	2100	250	
6	B400-FGS-001	FGS SYSTEM CABINET	800	800	2100	250	TRIPLE CABINET
7	B400-FGS-002	FGS MARSHALLING CABINET 1	800	800	2100	250	
8	B400-FGS-003	FGS MARSHALLING CABINET 2	800	800	2100	250	
9	B400-SIS-001	SIS SYSTEM/MARSHALLING CABINET	800	800	2100	250	SINGLE CABINET
10	-	SPARE					
11	B400-HSB-001	DISTRIBUTION & HVAC PANEL - I&T ROOM	1600	600	2300	1150	
12	-	TABLE	850	500	750	50	
13	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20	
14	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20	
15	-	FIRST AID KIT	280	115	200	10	
16	-	RESUSCITATION UNIT	430	210	480	10	
17	-	CABINET INCLUDED N.10 ESCAPE MASK	448	213	422	15	
18	HHU-77007	AIR HANDLING UNIT A	2100	1000	2158	850	
19	HHU-77008	AIR HANDLING UNIT B	2100	1000	2158	850	
20	HSS-77-010	SPACE HEATER 1	184	145	1100	5	
21	HSS-77-011	SPACE HEATER 2	184	145	1100	5	
22	HSS-77-012	SPACE HEATER 3	184	145	1100	5	



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	04/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	16/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

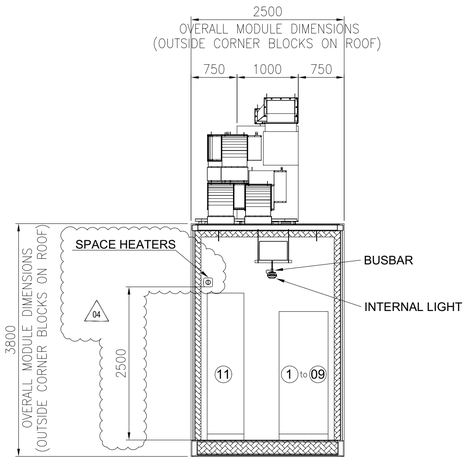
CROSSWIND

ROSETTI MARINO

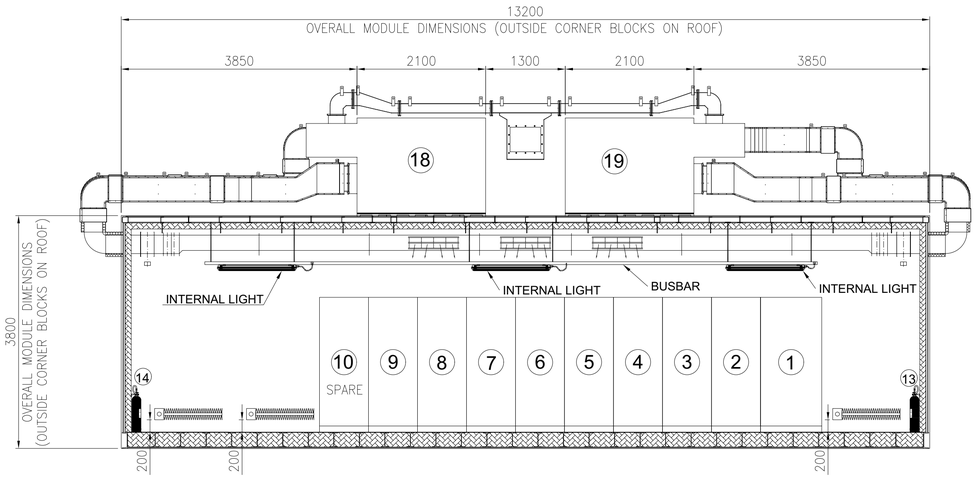
TITLE :
BASE LOAD POWER HUB (BLPH)
B-400 GENERAL ARRANGEMENT DRAWINGS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00017	SHEET 002	REV. 04

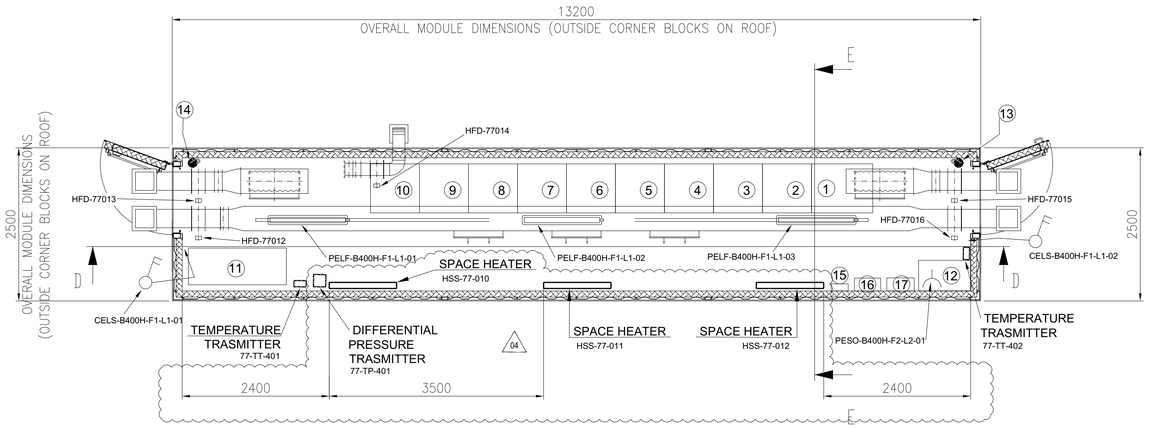
File Name : 1724000049-AR-DA-00017-REV.04



SECTION E-E



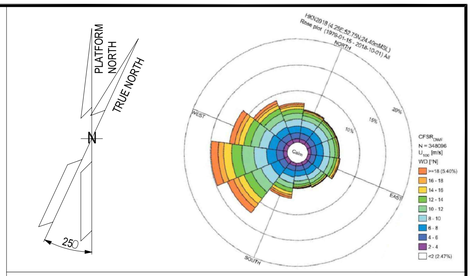
SECTION D-D



"B-400" I&T EQUIPMENT ROOM PLAN

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)	NOTE
1	B400-SRV-001	SERVER CABINET	1000	800	2100	250	SINGLE CABINET
2	B400-NET-001	NETWORK CABINET	800	800	2100	250	SINGLE CABINET
3	B400-EMCS-001	EMCS SYSTEM CABINET	800	800	2100	250	SINGLE CABINET
4	B400-PCS-001	PCS SYSTEM CABINET	800	800	2100	250	DOUBLE CABINET
5	B400-PCS-002	PCS MARSHALLING CABINET	800	800	2100	250	
6	B400-FGS-001	FGS SYSTEM CABINET	800	800	2100	250	TRIPLE CABINET
7	B400-FGS-002	FGS MARSHALLING CABINET 1	800	800	2100	250	
8	B400-FGS-003	FGS MARSHALLING CABINET 2	800	800	2100	250	
9	B400-SIS-001	SIS SYSTEM/MARSHALLING CABINET	800	800	2100	250	SINGLE CABINET
10	-	SPARE					
11	B400-HSB-001	DISTRIBUTION & HVAC PANEL - I&T ROOM	1600	600	2300	1150	
12	-	TABLE	850	500	750	50	
13	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20	
14	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	20	
15	-	FIRST AID KIT	280	115	200	10	
16	-	RESUSCITATION UNIT	430	210	480	10	
17	-	CABINET INCLUDED N.10 ESCAPE MASK	448	213	422	15	
18	HHU-77007	AIR HANDLING UNIT A	2100	1000	2158	850	
19	HHU-77008	AIR HANDLING UNIT B	2100	1000	2158	850	
20	HSS-77-010	SPACE HEATER 1	184	145	1100	5	
21	HSS-77-011	SPACE HEATER 2	184	145	1100	5	
22	HSS-77-012	SPACE HEATER 3	184	145	1100	5	



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) THE POSITION OF THE LAMPS INDICATED IS TO BE CONSIDERED THE THEORETICAL ONE, THE FINAL ONE WILL BE CONFIRMED IN THE AS-BUILT ISSUE.

REFERENCE

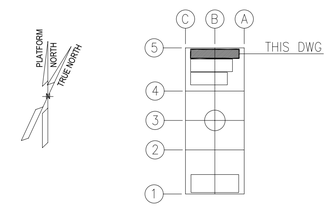
DOCUMENT TITLE	DOCUMENT NUMBER
"B-400" HVAC SYSTEM G.A. & DETAILS	1724000049-HV-DA-00067
"B-400" DETAILED DRAWING	1724000049-AR-DD-00021
PAINTING PROCEDURE	1724000049-MAT-PRO-00007
"B-400" FOUNDATION	1724000049-ST-DD-00013
"B-400" STRUCTURAL CALCULATION	1724000049-ST-CA-00009

LEGEND

- INTERNAL LIGHT
- E — INTERNAL EMERGENCY LIGHT
- SOCKET OUTLET, INDOOR
- LIGHT SWITCH
- ESCAPE CORRIDOR - WIDTH 800mm.
- MAINTENANCE AREA - VENDOR REQUIREMENT
- INSULATION PANEL

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	22/10/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
03	23/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	04/07/24	M.G.	SKV	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	16/05/24	M.G.	SKV	C.A.	ISSUE FOR REVIEW (IFR)
00	08/02/24	A.G.	SKV	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-400 GENERAL ARRANGEMENT DRAWINGS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED SKV	APPROVED C.A.	DATE 22/10/24
A1	DRAWING NO. 1724000049-AR-DA-00017	SHEET 003	REV. 04

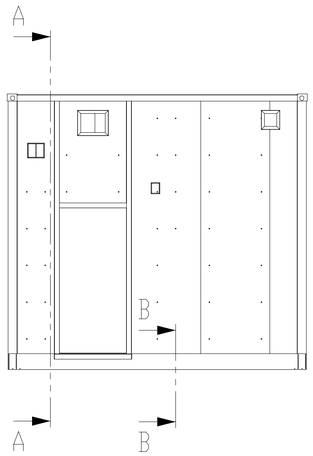
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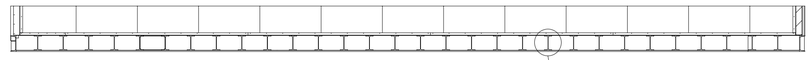
DRAWING NO. 1724000049-AR-DD-00018

REV. 03

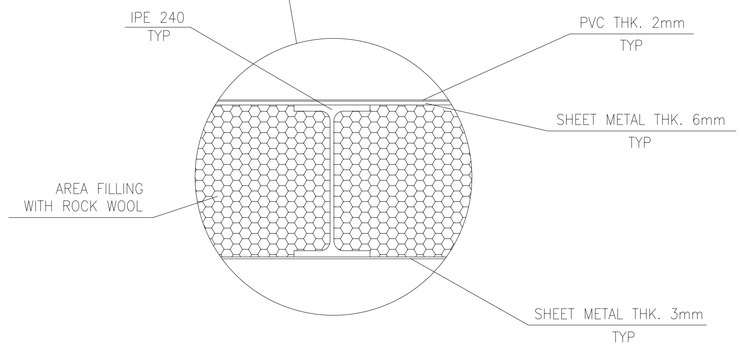
MODULE B-100
HV (66kV 6.6kV) SWITCHROOM

REFERENCE	
DOCUMENT TITLE	DOCUMENT NUMBER
"B-100" STRUCTURAL CALCULATION	1724000049-ST-CA-00006
Weld Procedure Specifications (WPS), Weld Procedure Qualification Report (WPQR), Welding Map and Welders Qualifications	1724000049-WEL-RE-00003

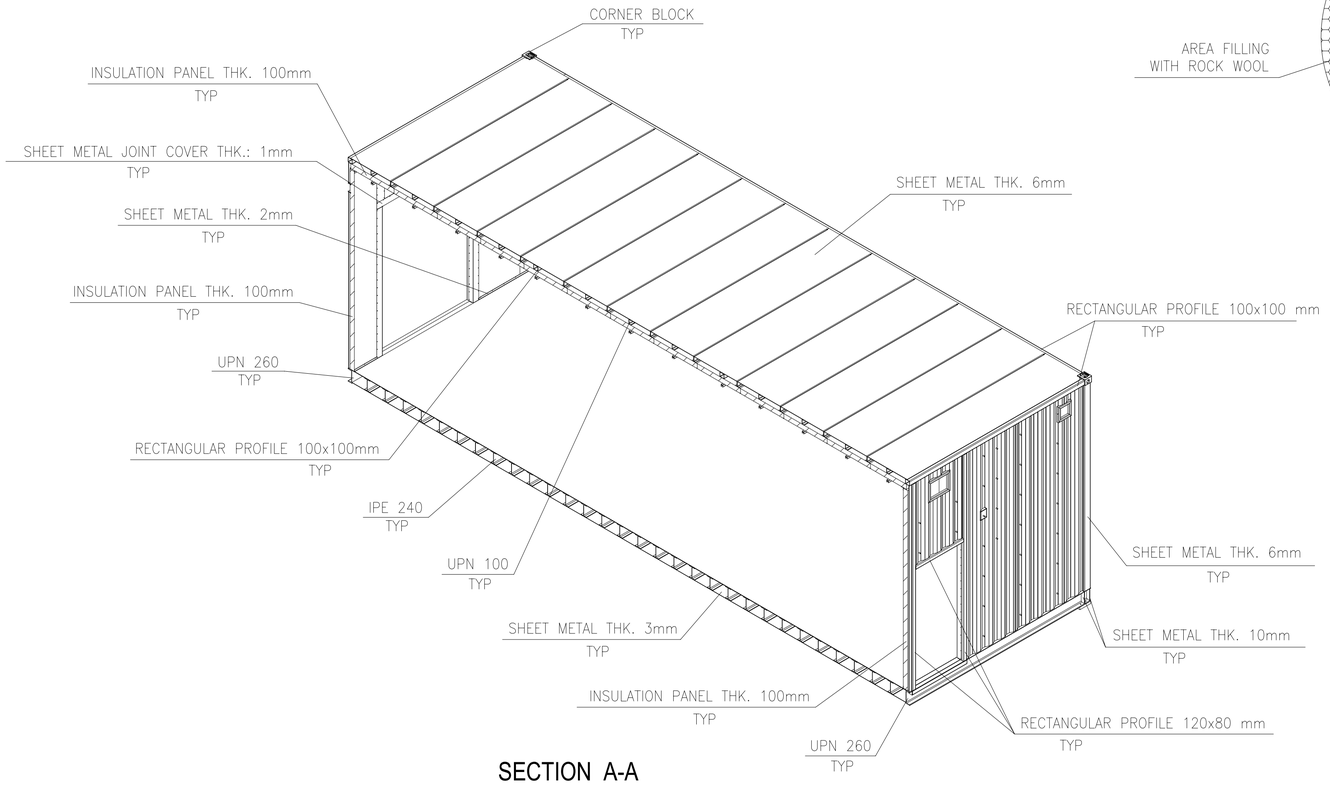




SECTION B-B

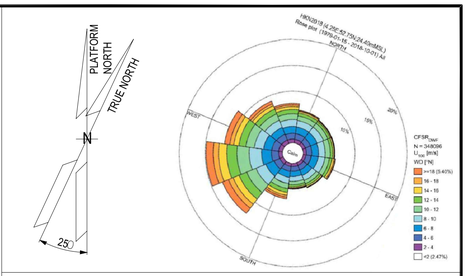


DETAIL "C"



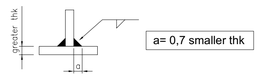
SECTION A-A

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
R. Bossi	15/11/2024



NOTES

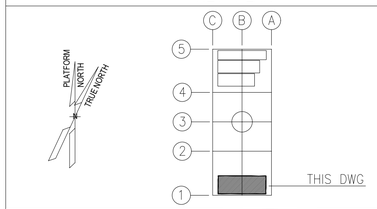
1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



LEGEND

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	23/05/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

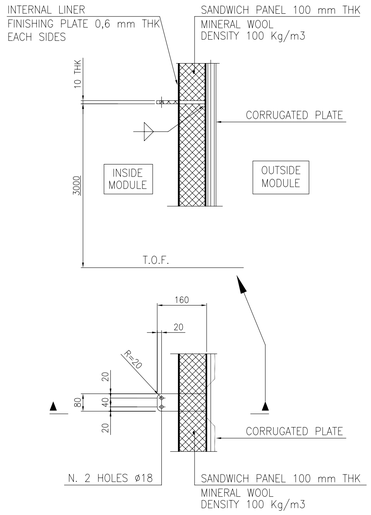
TITLE :

B-100 DETAILED DRAWINGS-E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00018	SHEET 001	REV. 03

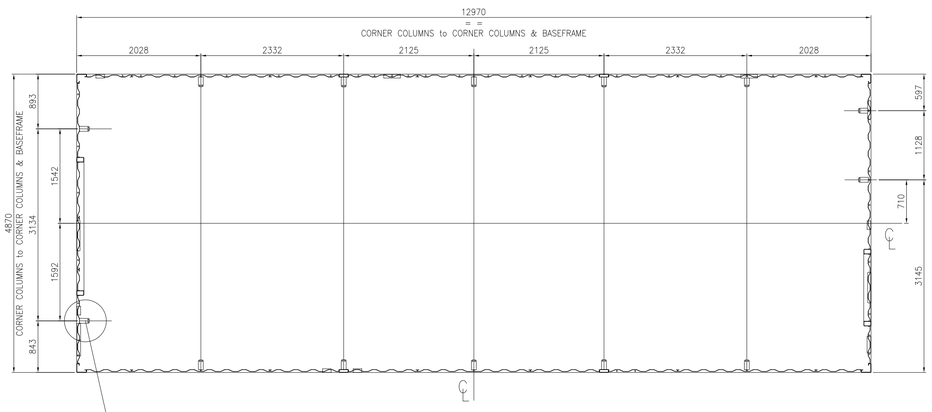
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DRAWING NO. 1724000049-AR-DD-00018 REV. 03



WEST WALL

NORTH WALL

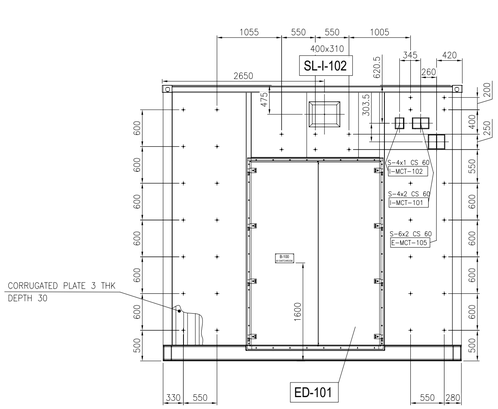


SOUTH WALL

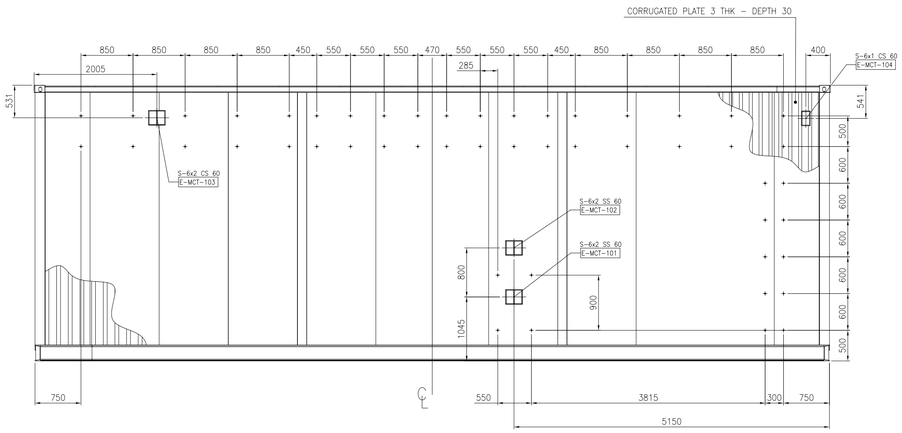
EST WALL

MODULE B-100

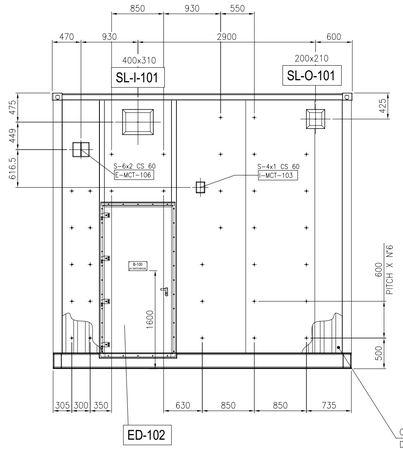
INTERNAL SEA FASTENING PLATES PLAN



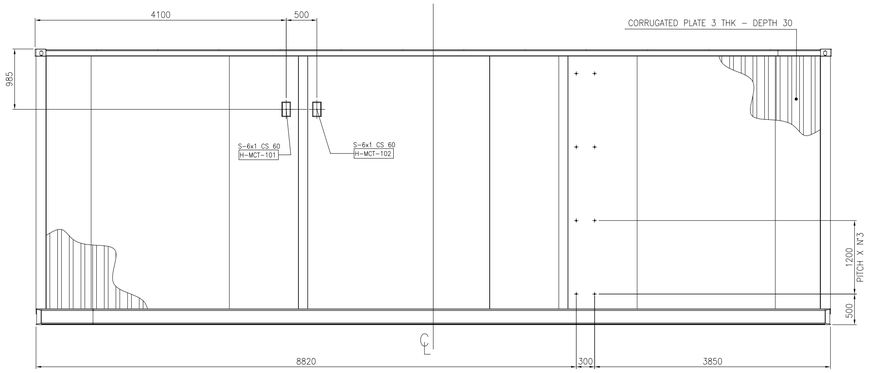
VIEW OF WEST WALL



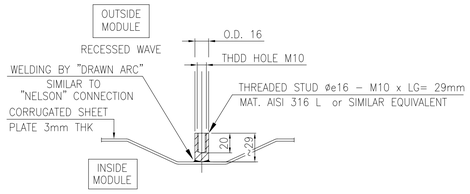
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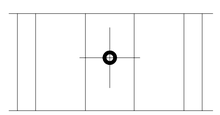


VIEW OF EAST WALL



VIEW OF SOUTH WALL

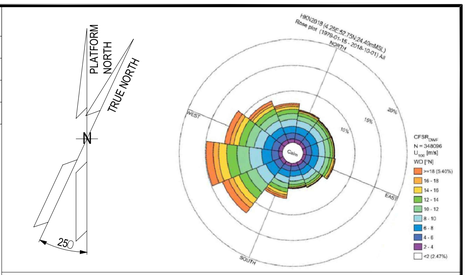




THREADED STUD INSTALLATION

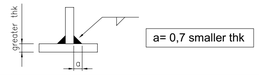
REFERENCE

DOCUMENT TITLE	DOCUMENT NUMBER
"B-100" GENERAL ARRANGEMENT DRAWING	1724000049-AR-DA-00014
"B-100" HVAC GENERAL ARRANGEMENT	1724000049-HV-DA-00064



NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



LEGEND

THREADED STUD ø16 – M10 x LG= 29mm

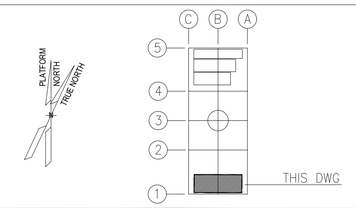
T.O.F. TOP OF FLOOR

MCT LEGEND: E-MCT-101
- MCT TYPE & SIZE / BRAND ROXTEC
- MATERIAL: C.S.= PRIMED MILD STEEL; S.S.= AISI 316 L
- S 6x2 C.S. 60 — MCT DEPTH
- MCT SERVICE: E= ELECTRICAL; I= INSTRUMENTAL; H= HVAC
- PROGRESSIVE NUMBER FROM 01
- MODULE LOCATION: 1= B-100 3= B-300 2= B-200 4= B-400

HVAC SLEEVE LEGEND: SL-I-101
- 300x300 — INTERNAL SIZE OF DUCT L x H (mm)
- PROGRESSIVE NUMBER FROM 01
- SERVICE: I= AIR IN; R= RECYRCLE; O= OVERPRESSURE
- MODULE LOCATION: 1= B-100 3= B-300 2= B-200 4= B-400

DOOR LEGEND: ED-101
- EXTERNAL DOOR
- PROGRESSIVE NUMBER FROM 01
- MODULE LOCATION: 1= B-100; 2= B-200; 3= B-300; 4= B-400

KEY PLAN



MCT LIST

SERVICE	TAG No.	MCT DIMENSIONS and INSTALLATION SENSE L (mm) HORIZONTAL	H (mm) VERTICAL	W (mm) DEPTH	MCT SIZE TYPE "S" FRAME Primed Mild Steel BRAND: ROXTEC	MCT SIZE TYPE "S" FRAME AISI 316 L BRAND: ROXTEC
ELECTRICAL	E-MCT-101	271	238	60		6x2
	E-MCT-102	271	238	60		6x2
	E-MCT-103	271	238	60	6x2	
	E-MCT-104	140.5	238	60	6x1	
	E-MCT-105	271	238	60	6x2	
	E-MCT-106	271	238	60	6x2	
INSTRUMENTAL	I-MCT-101	271	179.5	60	4x2	
	I-MCT-102	140.5	179.5	60	4x1	
	I-MCT-103	140.5	179.5	60	4x1	
HVAC	H-MCT-101	140.5	238	60	6x1	
	H-MCT-102	140.5	238	60	6x1	

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	23/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :

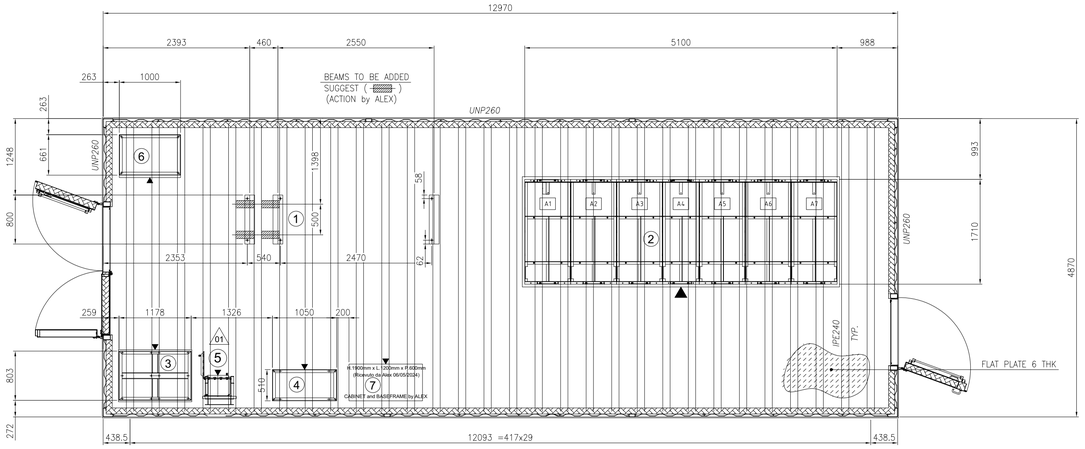
B-100 DETAILED DRAWINGS-E&I SHELTERS

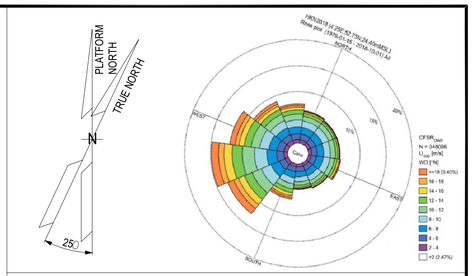
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00018	SHEET 002	REV. 03

File Name : 1724000049-AR-DD-00018-REV.03

DRAWING NO. 1724000049-AR-DD-00018 REV. 03

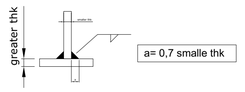
B-100
HV (66kV 6.6kV) SWITCHROOM
BASEFRAME LOCATION PLAN





NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



4. ALL WELDS ON TOP & BOTTOM SIDES OF BASEFRAMES MUST BE PERFECTLY SMOOTHED.
5. WHERE INDICATED " ▲ " SHOULD BE STAMP "FRONT", ABOVE "TOP" AND BELOW "BOTTOM".

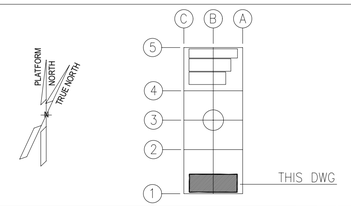


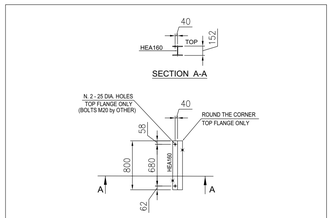
6. SURFACE TREATMENT ACCORDING DOCUMENT N. 1724000049-MAT-PRO-00004 - PAINTING PROCEDURE FINAL COLOUR LIGHT GREY RAL 7035.

LEGEND

ASI = ALEX SISTEMI

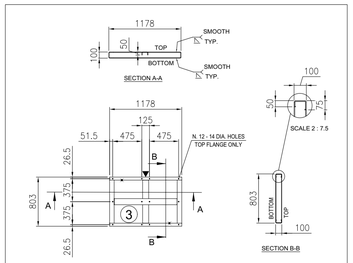
KEY PLAN





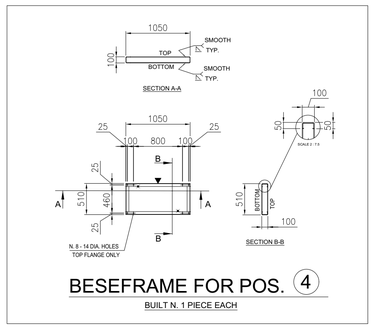
BESEFRAME FOR POS. 1

BUILT N. 3 PIECES
FOR LOCATION SEE PLAN
HEA160 MANDATORY



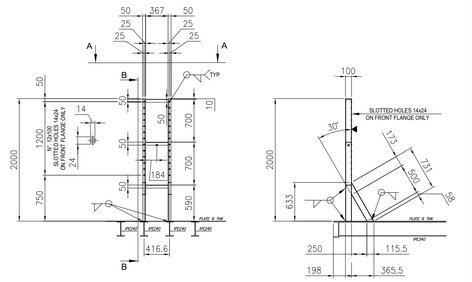
BESEFRAME FOR POS. 3

BUILT N. 1 PIECE



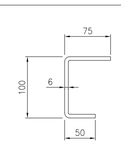
BESEFRAME FOR POS. 4

BUILT N. 1 PIECE EACH

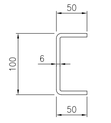


BESEFRAME FOR POS. 5

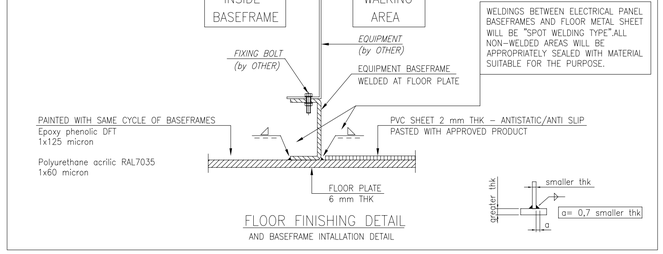
BUILT N. 1 PIECE EACH



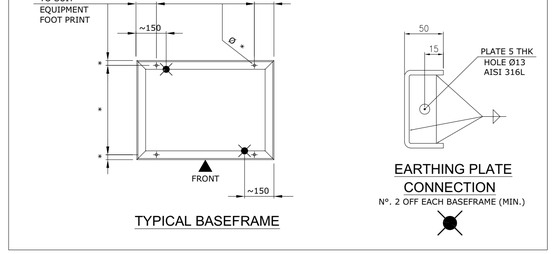
C 100x80x50 THK 6mm.
FROM BENT PLATE THK 6mm.
MAT. CARBON STEEL



C 100x50x50 THK 6mm.
FROM BENT PLATE THK 6mm.
MAT. CARBON STEEL

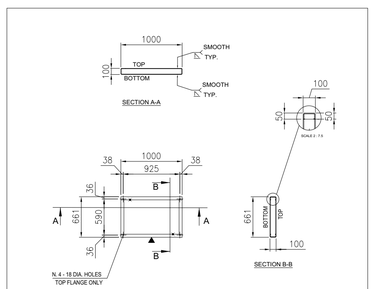


FLOOR FINISHING DETAIL
AND BASEFRAME INTALLATION DETAIL



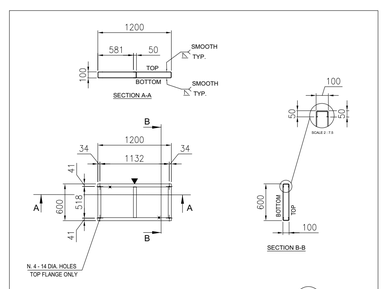
TYPICAL BASEFRAME

EARTHING PLATE
CONNECTION
N°. 2 OFF EACH BASEFRAME (MIN.)



BESEFRAME FOR POS. 6

BUILT N. 1 PIECE



BESEFRAME FOR POS. 7

BUILT N. 1 PIECE

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)	SCOPE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	2600	ASI
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	7400	ROSETTI MARINO
3	UP-200F1	DC UPS PANEL	1200	850	2105	500	ASI
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	522	ASI
5	CB-200F1	ISOLATOR FOR DC UPS	600	300	800	100	ASI
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2100	2100	ASI
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	TBD	ASI

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	23/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :

B-100 DETAILED DRAWINGS-E&I SHELTERS

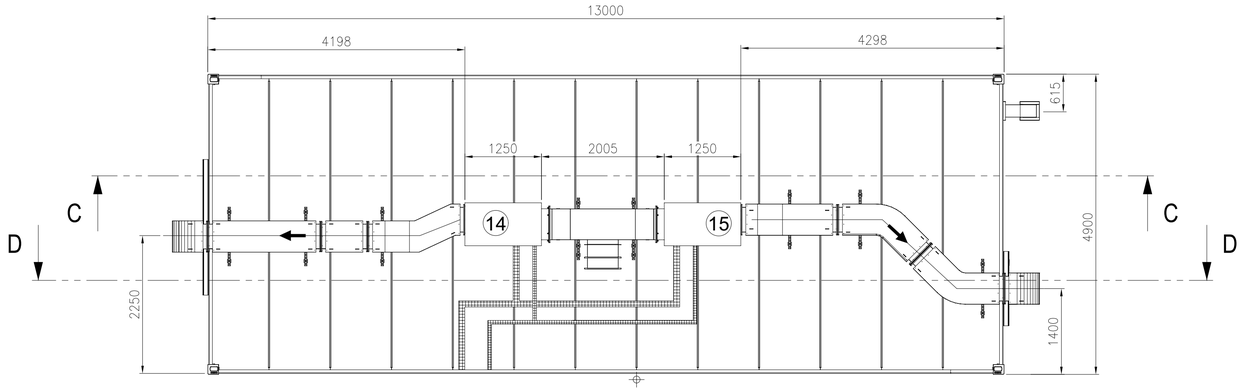
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00018	SHEET 003	REV. 03

File Name : 1724000049-AR-DD-00018-REV.03

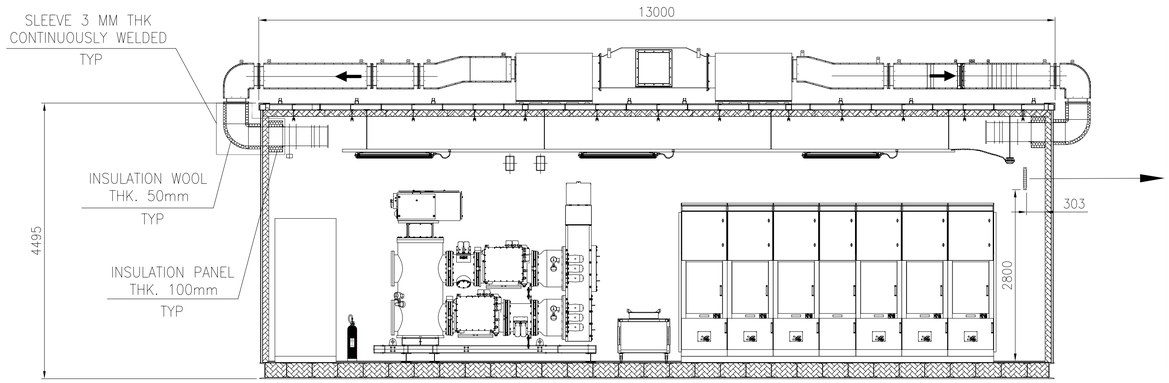
DRAWING NO. 1724000049-AR-DD-00018

REV. 03

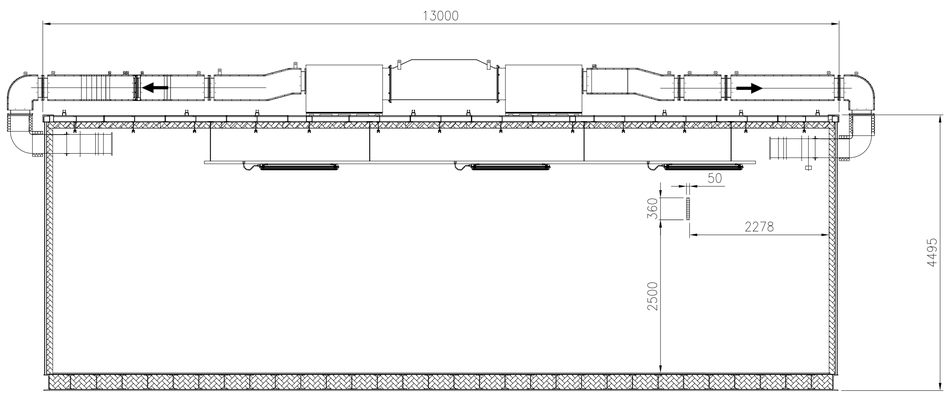
MODULE B-100
HV (66kV 6.6kV) SWITCHROOM



TOP VIEW



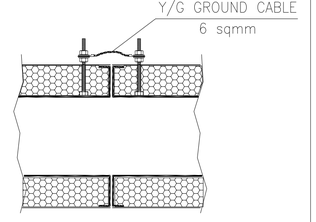
SECTION C-C



SECTION D-D

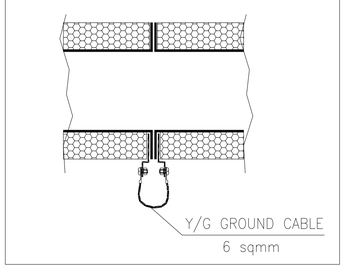
DET. 1

EXTERNAL DUCT



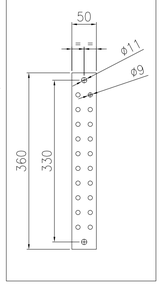
DET. 2

INTERNAL DUCT



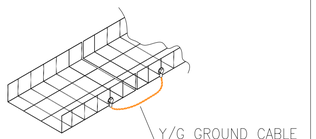
DET. 3

TYPICAL DETAIL
Ground bar



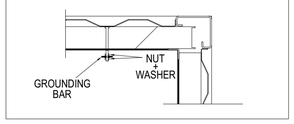
DET. 4

TYPICAL DETAIL
Cable tray grounding system



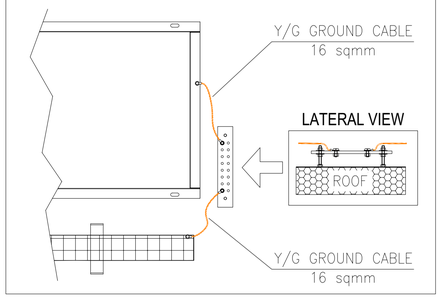
DET. 5

TYPICAL INSTALLATION BTH PE



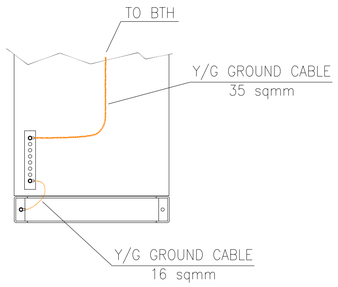
DET. 6

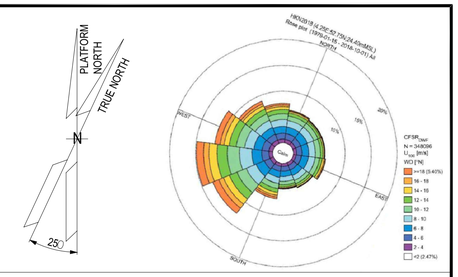
TYPICAL ROOF GROUNDING CONNECTION



DET. 7

TYPICAL CABINET GROUNDING CONNECTION



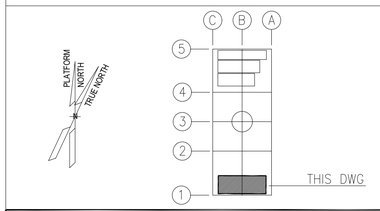


NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.

LEGEND

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
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00	23/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :

B-100 DETAILED DRAWINGS-E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00018	SHEET 004	REV. 03

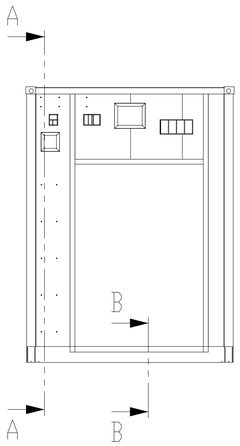
File Name : 1724000049-AR-DD-00018-REV.03

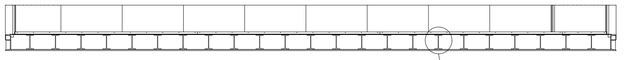
DRAWING NO. 1724000049-AR-DD-00019

REV. 03

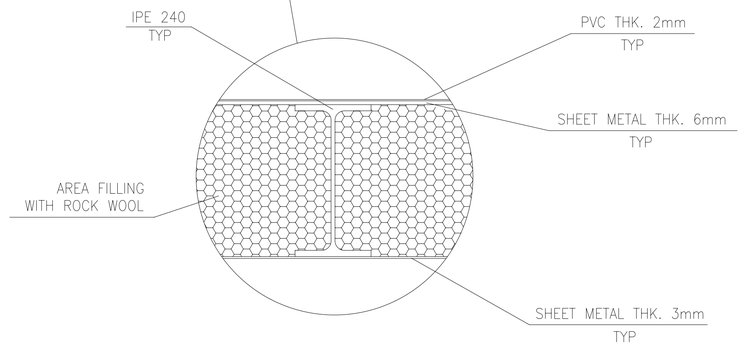
REFERENCE	
DOCUMENT TITLE	DOCUMENT NUMBER
"B-200" STRUCTURAL CALCULATION	1724000049-ST-CA-00007
Weld Procedure Specifications (WPS), Weld Procedure Qualification Report (WPQR), Welding Map and Welders Qualifications	1724000049-WEL-RE-00003

MODULE B-200
LV (400V) SWITCHROOM

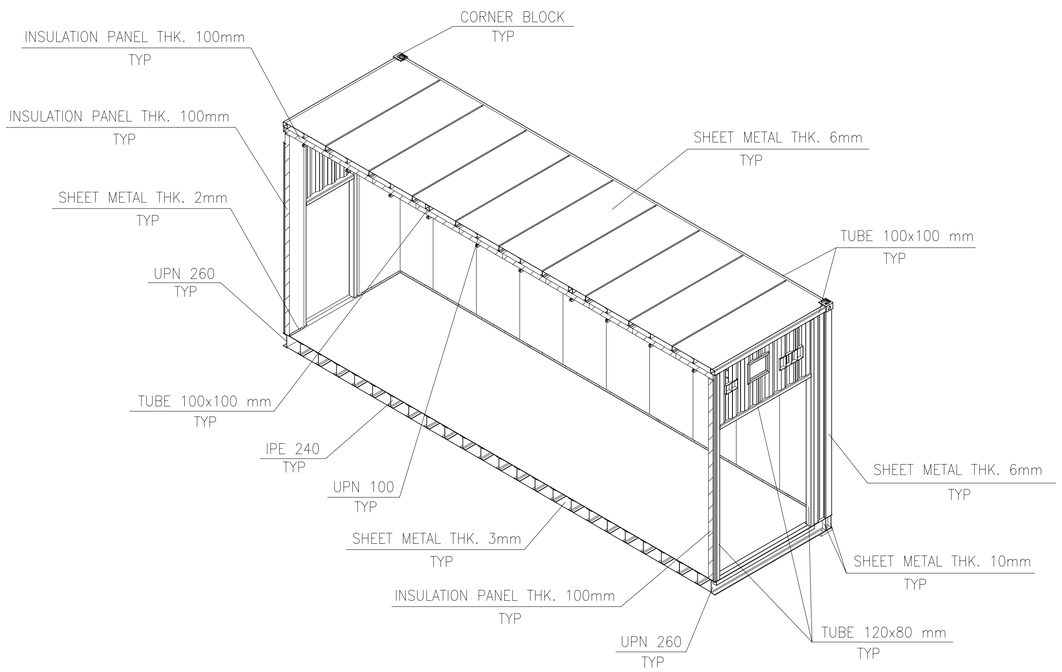




SECTION B-B



DETAIL "C"

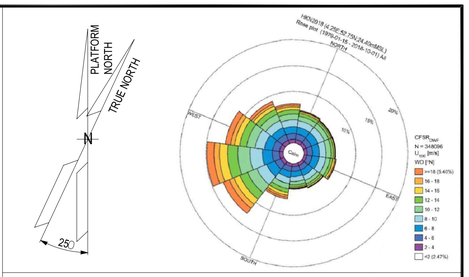


SECTION A-A

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

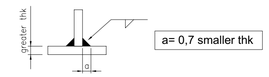
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	15/11/2024



NOTES

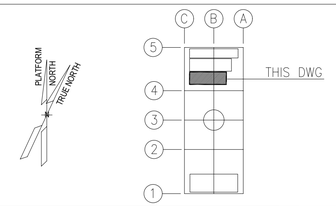
1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



LEGEND

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
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01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	23/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :

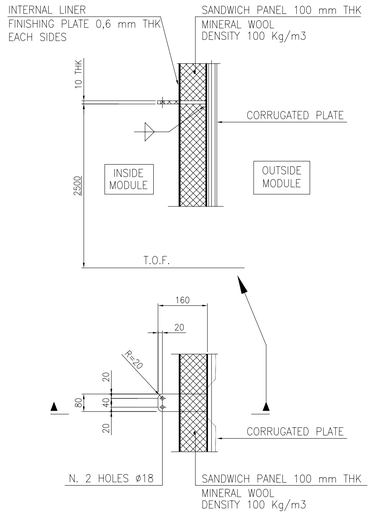
B-200 DETAILED DRAWINGS-E&I SHELTERS

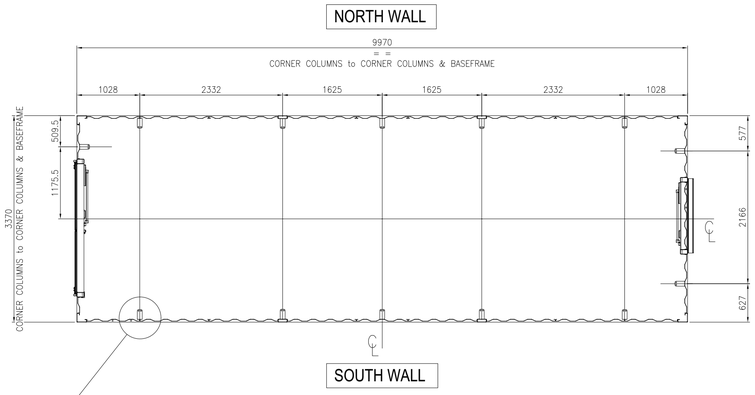
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00019	SHEET 001	REV. 03

File Name : 1724000049-AR-DD-00019-REV.03

DRAWING NO. 1724000049-AR-DD-00019 REV. 03

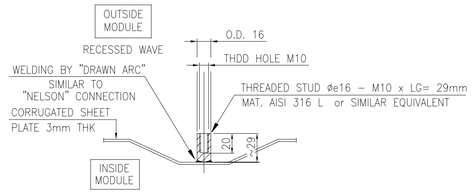
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DOCUMENT TITLE	DOCUMENT NUMBER
"B-200" GENERAL ARRANGEMENT DRAWING	1724000049-AR-DA-00015
"B-200" HVAC GENERAL ARRANGEMENT	1724000049-HV-DA-00065

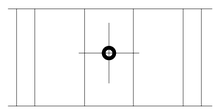




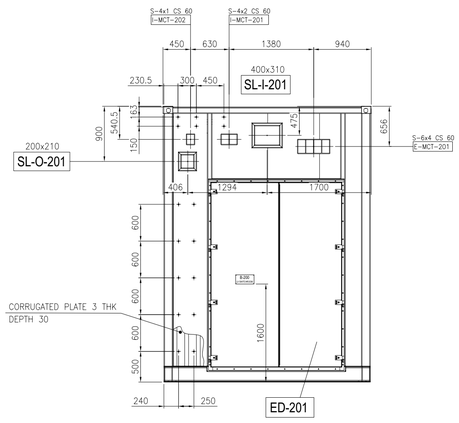
MODULE B-200

INTERNAL SEA FASTENING PLATES PLAN

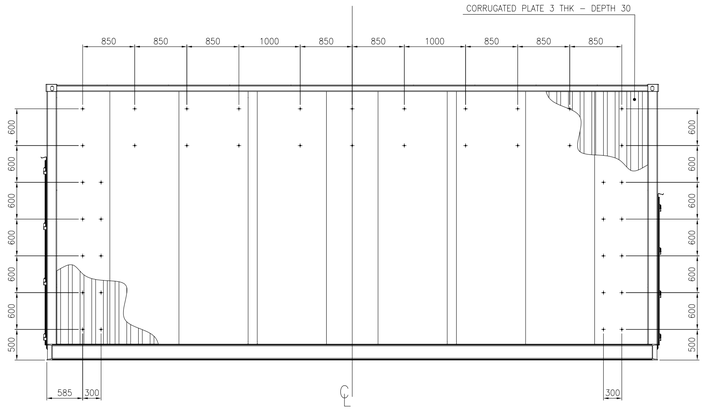




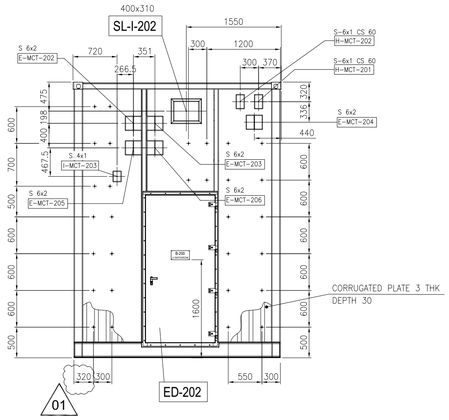
THREADED STUD INSTALLATION



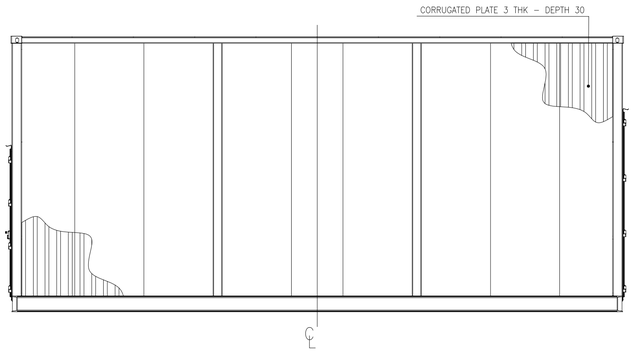
VIEW OF WEST WALL



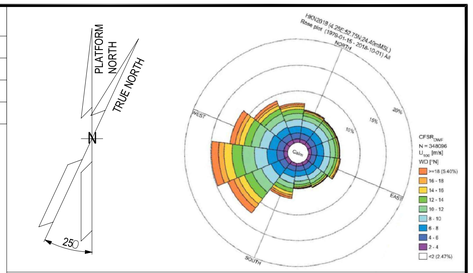
VIEW OF NORTH WALL



VIEW OF EAST WALL

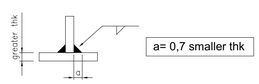


VIEW OF SOUTH WALL



NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



LEGEND

THREADED STUD ø6e16 – M10 x LG= 29mm

T.O.F. TOP OF FLOOR

MCT LEGEND: E-MCT-201

- MCT TYPE & SIZE / BRAND ROXTEC
- MATERIAL: C.S.= PRIMED MILD STEEL; S.S.= AISI 316 L
- S 6x2 C.S. 60 — MCT DEPTH
- MCT SERVICE: E= ELECTRICAL; I= INSTRUMENTAL; H= HVAC
- PROGRESSIVE NUMBER FROM 01
- MODULE LOCATION: 1= B-100; 2= B-200; 3= B-300; 4= B-400

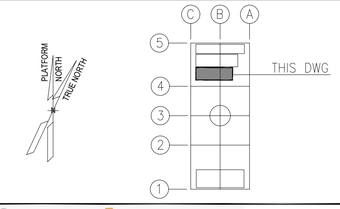
HVAC SLEEVE LEGEND: SL-I-201

- 300x300 — INTERNAL SIZE OF DUCT L x H (mm)
- PROGRESSIVE NUMBER FROM 01
- SERVICE: I= AIR IN; R= RECYRCLE; O= OVERPRESSURE
- MODULE LOCATION: 1= B-100; 2= B-200; 3= B-300; 4= B-400

DOOR LEGEND: ED-201

- EXTERNAL DOOR
- PROGRESSIVE NUMBER FROM 01
- MODULE LOCATION: 1= B-100; 2= B-200; 3= B-300; 4= B-400

KEY PLAN



MCT LIST

	TAG No.	MCT DIMENSIONS and INSTALLATION SENSE L (mm) HORIZONTAL	H (mm) VERTICAL	W (mm) DEPTH	MCT SIZE TYPE "S" FRAME Primed Mild Steel BRAND: ROXTEC	MCT SIZE TYPE "S" FRAME AISI 316 L BRAND: ROXTEC
ELECTRICAL	E-MCT-201	532	238	60	6x4	
	E-MCT-202	271	238	60		6x2
	E-MCT-203	271	238	60		6x2
	E-MCT-204	271	238	60	6x2	
	E-MCT-205	271	238	60		6x2
	E-MCT-206	271	238	60		6x2
INSTRUMENTAL	I-MCT-201	271	179.5	60	4x2	
	I-MCT-202	140.5	179.5	60	4x1	
	I-MCT-203	140.5	179.5	60	4x1	
HVAC	H-MCT-201	140.5	238	60	6x1	
	H-MCT-202	140.5	238	60	6x1	

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
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01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	23/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :

B-200 DETAILED DRAWINGS-E&I SHELTERS

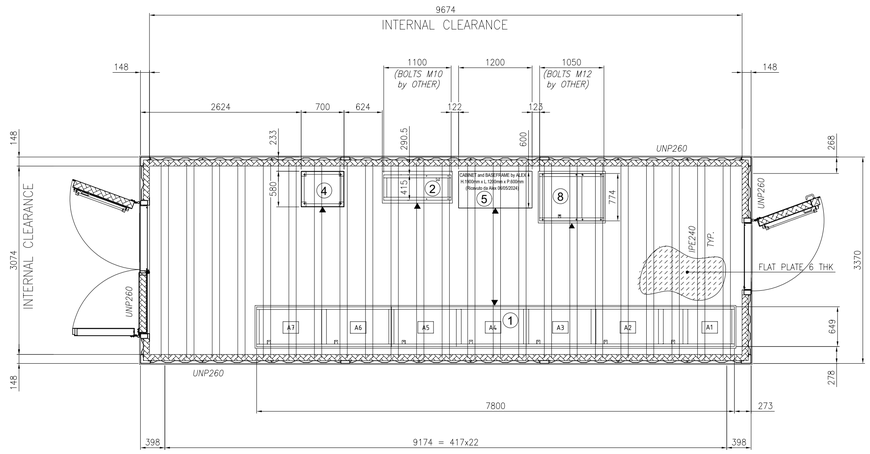
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00019	SHEET 002	REV. 03

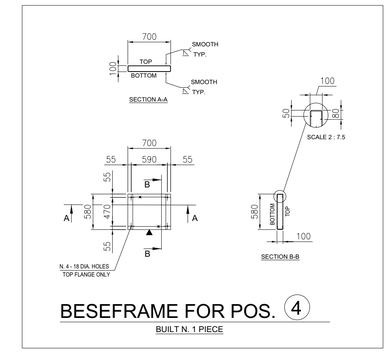
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DRAWING NO. 1724000049-AR-DD-00019

REV. 03

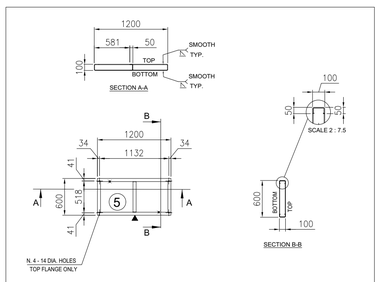
B-200
LV (400V) SWITCHROOM
BASEFRAME LOCATION PLAN





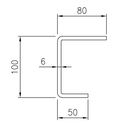
BESEFRAME FOR POS. 4

BUILT N. 1 PIECE

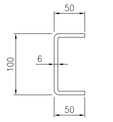


BESEFRAME FOR POS. 5

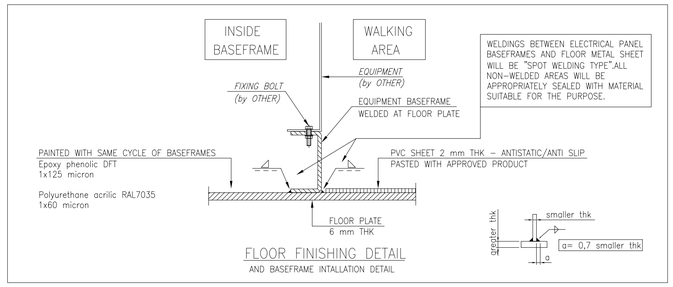
BUILT N. 1 PIECE



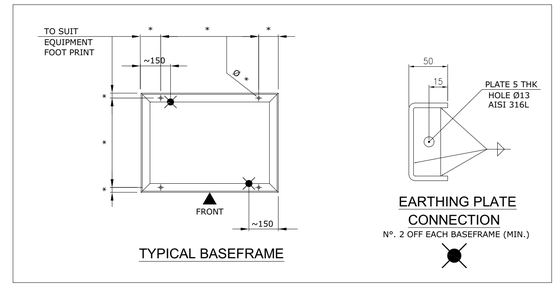
C 100x80x50 THK 6mm.
FROM BENT PLATE THK 6mm.
MAT. CARBON STEEL



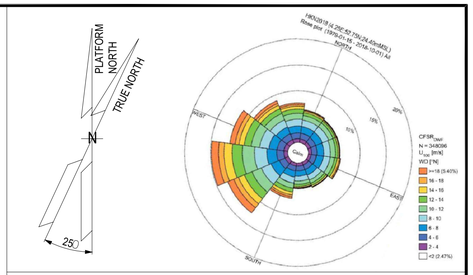
C 100x50x50 THK 6mm.
FROM BENT PLATE THK 6mm.
MAT. CARBON STEEL



FLOOR FINISHING DETAIL
AND BASEFRAME INTALLATION DETAIL

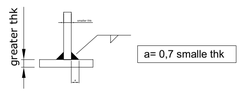


TYPICAL BASEFRAME



NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



4. ALL WELDS ON TOP & BOTTOM SIDES OF BASEFRAMES MUST BE PERFECTLY SMOOTHED.
5. WHERE INDICATED " ▲ " SHOULD BE STAMP "FRONT", ABOVE "TOP" AND BELOW "BOTTOM".



6. SURFACE TREATMENT ACCORDING DOCUMENT N. 1724000049-MAT-PRO-00004 - PAINTING PROCEDURE FINAL COLOUR LIGHT GREY RAL 7035.

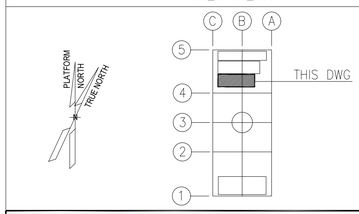
LEGEND

ASI = ALEX SISTEMI

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)	SCOPE
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	4900	ROSETTI MARINO
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	600	ROSETTI MARINO
4	CN-200N1	ICCP PANEL	700	580	1830	250	ASI
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	TBD	ASI
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	1000	ROSETTI MARINO

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	23/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :

B-200 DETAILED DRAWINGS-E&I SHELTERS

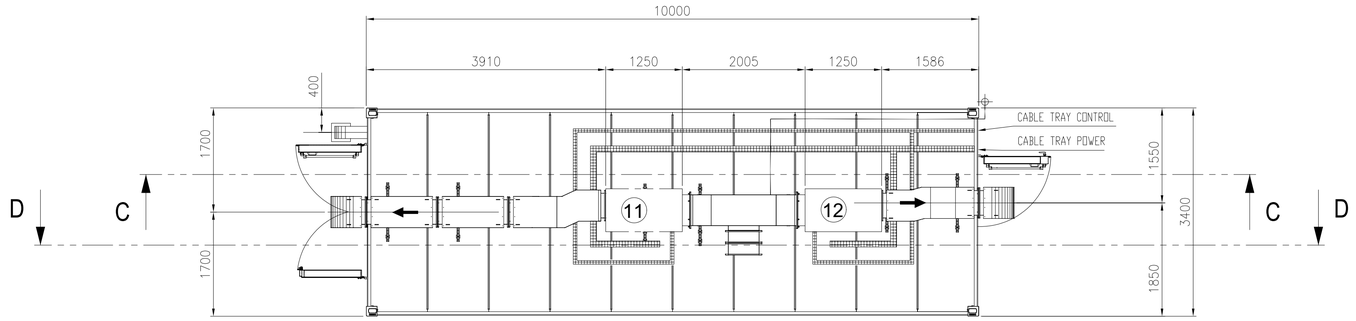
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00019	SHEET 003	REV. 03

File Name : 1724000049-AR-DD-00019-REV.03

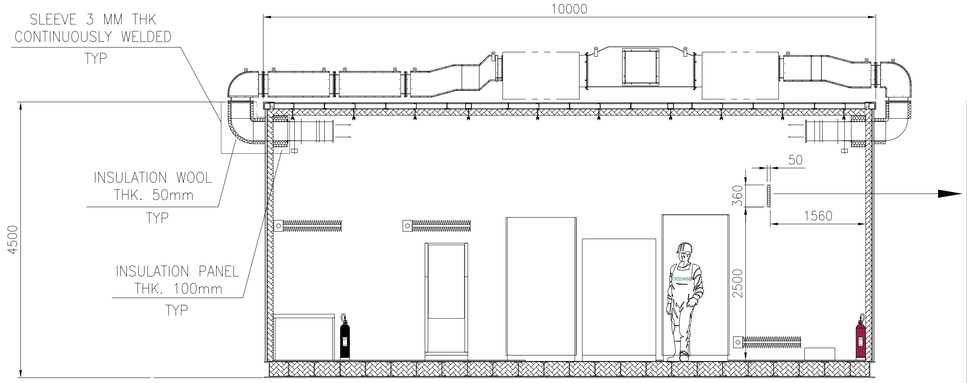
DRAWING NO. 1724000049-AR-DD-00019

REV. 03

MODULE B-200
LV (400V) SWITCHROOM



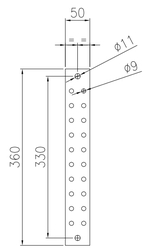
TOP VIEW



SECTION C-C

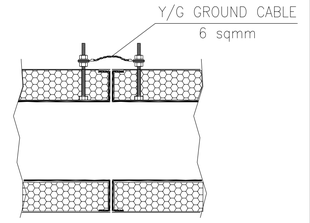
DET. 3

TYPICAL DETAIL
Ground bar



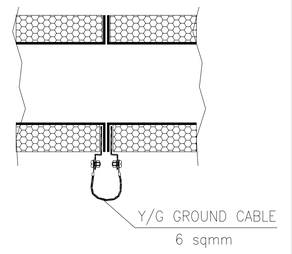
DET. 1

EXTERNAL DUCT



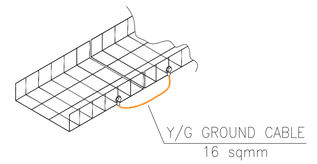
DET. 2

INTERNAL DUCT



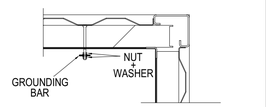
DET. 4

TYPICAL DETAIL
Cable tray grounding system



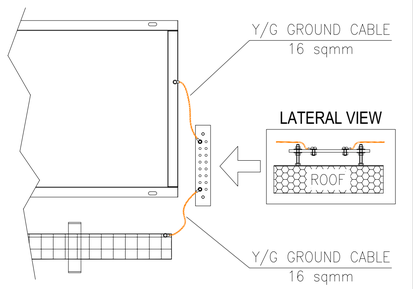
DET. 5

TYPICAL INSTALLATION BTH PE



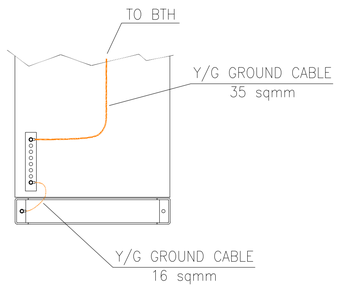
DET. 6

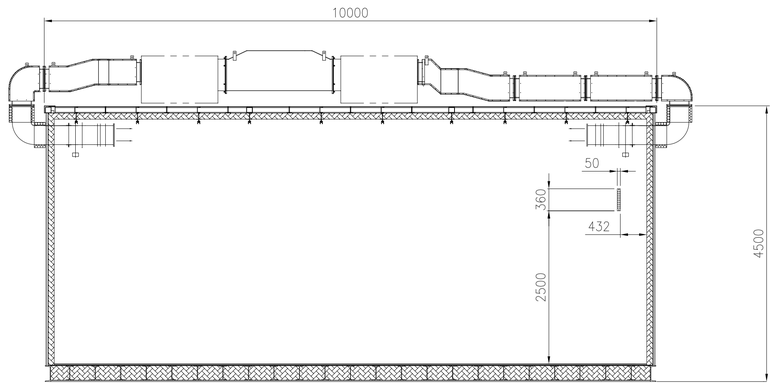
TYPICAL ROOF GROUNDING CONNECTION



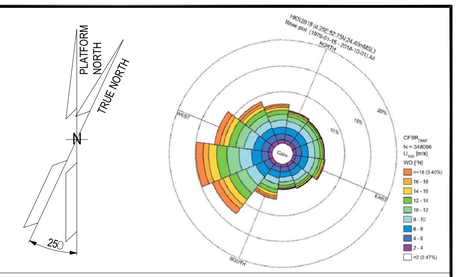
DET. 7

TYPICAL CABINET GROUNDING CONNECTION





SECTION D-D

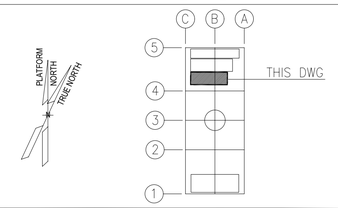


NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.

LEGEND

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	23/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :
B-200 DETAILED DRAWINGS-E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00019	SHEET 004	REV. 03

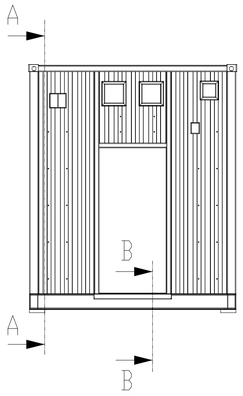
File Name : 1724000049-AR-DD-00019-REV.03

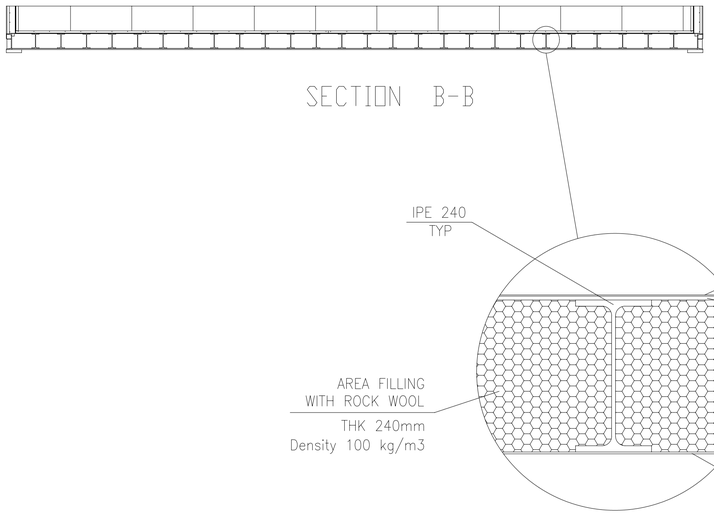
DRAWING NO. 1724000049-AR-DD-00020

REV. 03

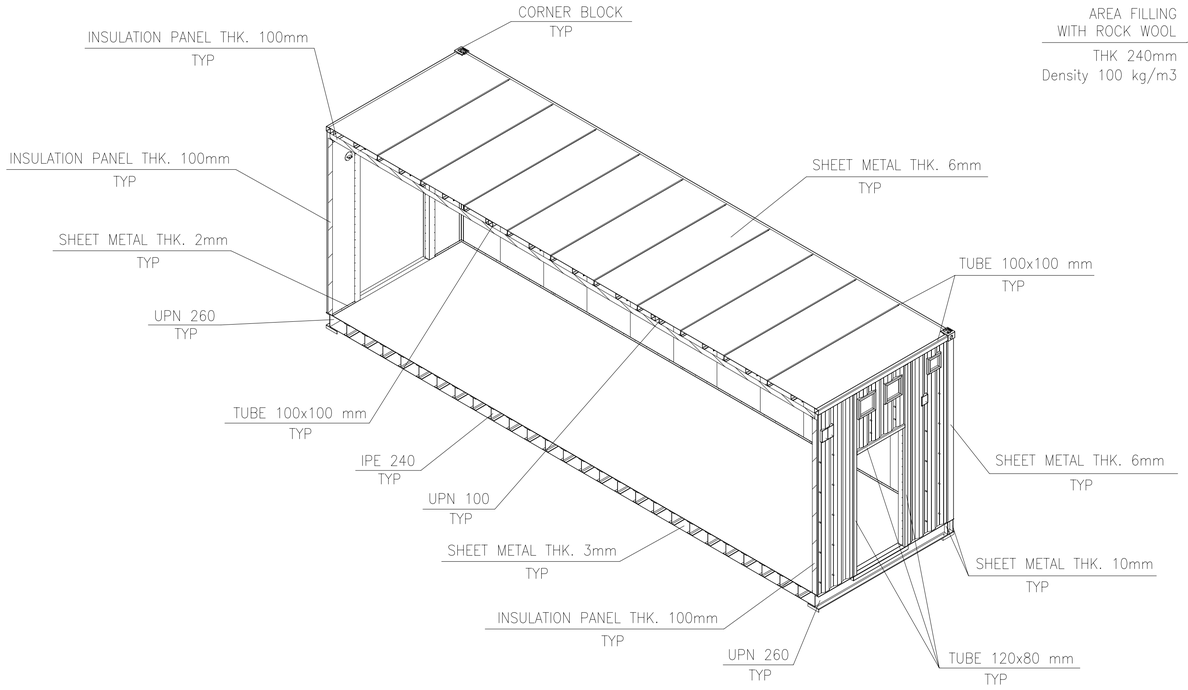
MODULE B-300
AC UPS FITTED WITH UPS SYSTEM
EQUIPMENT ROOM

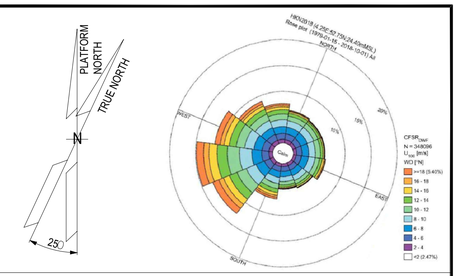
REFERENCE	
DOCUMENT TITLE	DOCUMENT NUMBER
"B-300" STRUCTURAL CALCULATION	1724000049-ST-CA-00008
Weld Procedure Specifications (WPS), Weld Procedure Qualification Report (WPQR), Welding Map and Welders Qualifications	1724000049-WEL-RE-00003





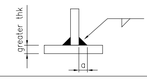
DETAIL "C"





NOTES

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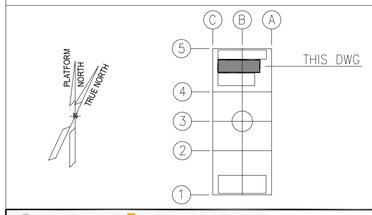


a= 0,7 smaller thk

LEGEND

HOLDS

KEY PLAN



03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	15/11/2024

ALEXSISTEMI spa

CROSSWIND

ROSETTI MARINO

TITLE :

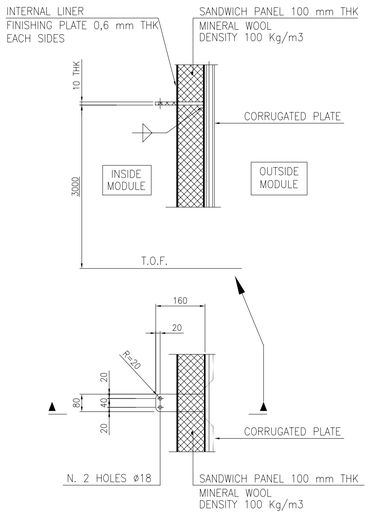
B-300 DETAILED DRAWINGS-E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00020	SHEET 001	REV. 03

File Name : 1724000049-AR-DD-00020-REV.03

DRAWING NO. 1724000049-AR-DD-00020 REV. 03

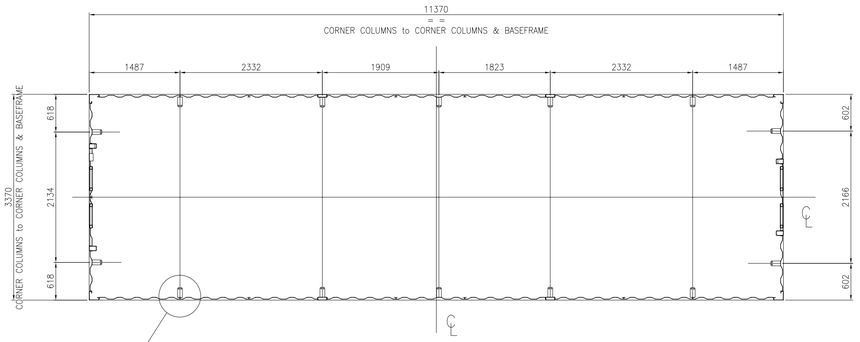
REFERENCE	
DOCUMENT TITLE	DOCUMENT NUMBER
"B-300" GENERAL ARRANGEMENT DRAWING	1724000049-AR-DA-00016
"B-300" HVAC GENERAL ARRANGEMENT	1724000049-HV-DA-00066



NORTH WALL

WEST WALL

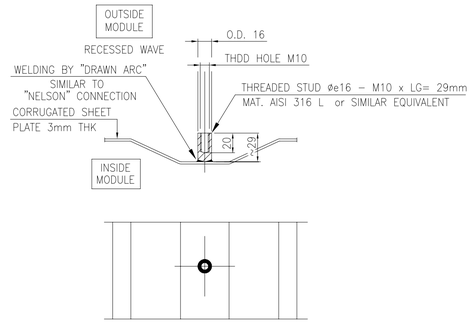
EST WALL



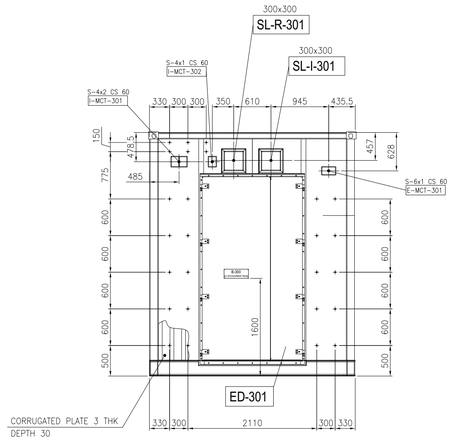
SOUTH WALL

MODULE B-300

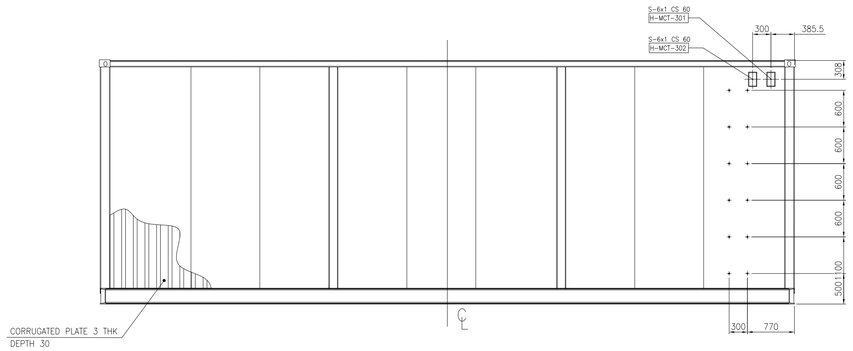
INTERNAL SEA FASTENING PLATES PLAN



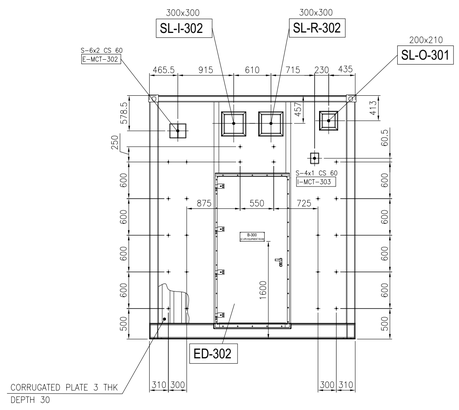
THREADED STUD INSTALLATION



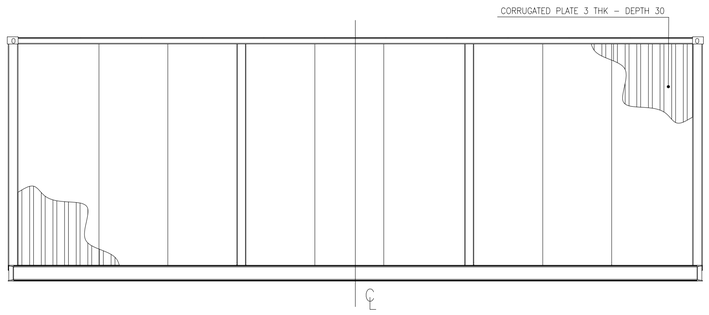
VIEW OF WEST WALL



VIEW OF NORTH WALL



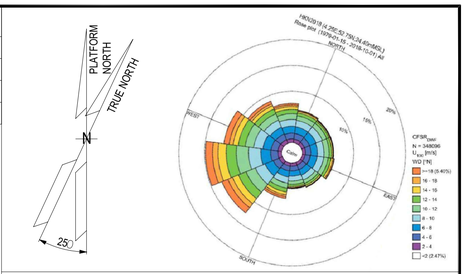
VIEW OF EAST WALL



VIEW OF SOUTH WALL

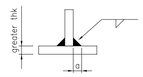
MCT LIST

SERVICE	TAG No.	MCT DIMENSIONS and INSTALLATION SENSE L (mm) HORIZONTAL	H (mm) VERTICAL	W (mm) DEPTH	MCT SIZE TYPE "S" FRAME Primed Mild Steel BRAND: ROXTEC	MCT SIZE TYPE "S" FRAME AISI 316 L BRAND: ROXTEC
ELECTRICAL	E-MCT-301	238	140.5	60	6x1	
	E-MCT-302	271	238	60	6x2	
INSTRUMENTAL	I-MCT-301	271	179.5	60	4x2	
	I-MCT-302	140.5	179.5	60	4x1	
	I-MCT-303	140.5	179.5	60	4x1	
HVAC	H-MCT-301	140.5	238	60	6x1	
	H-MCT-302	140.5	238	60	6x1	



NOTES

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3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



a= 0,7 smaller thk

LEGEND

THREADED STUD ø16 - M10 x LG= 29mm

T.O.F. TOP OF FLOOR

MCT LEGEND:

MCT TYPE & SIZE
BRAND ROXTEC
MATERIAL
C.S.= PRIMED MILD STEEL
S.S.= AISI 316 L
S 6x2 C.S. 60
MCT DEPTH
E-MCT-301
PROGRESSIVE NUMBER
FROM 01
MCT SERVICE
E= ELECTRICAL
I= INSTRUMENTAL
H= HVAC
MODULE LOCATION
1= B-100 3= B-300
2= B-200 4= B-400

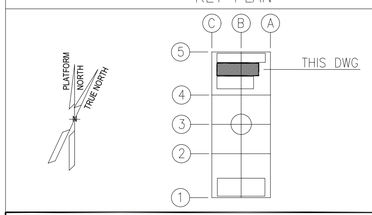
HVAC SLEEVE LEGEND:

300x300
INTERNAL SIZE OF DUCT
L x H (mm)
SL-I-301
PROGRESSIVE NUMBER
FROM 01
SERVICE
I= AIR IN
R= RECYRCLE
O= OVERPRESSURE
MODULE LOCATION
1= B-100 3= B-300
2= B-200 4= B-400

DOOR LEGEND:

ED-301
EXTERNAL DOOR
PROGRESSIVE NUMBER
FROM 01
MODULE LOCATION
1= B-100
2= B-200
3= B-300
4= B-400

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :

B-300 DETAILED DRAWINGS-E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049 | SCALE 1:50

DRAWN M.G. | CHECKED O.A. | APPROVED C.A. | DATE 23/10/24

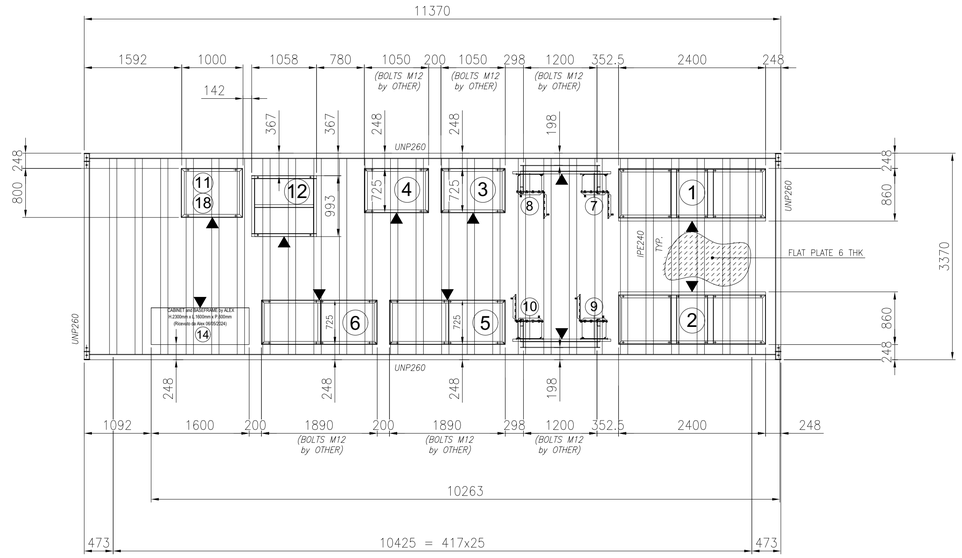
A1 | DRAWING NO. 1724000049-AR-DD-00020 | SHEET 002 | REV. 03

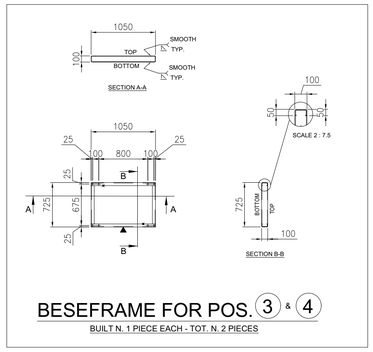
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DRAWING NO. 1724000049-AR-DD-00020

REV. 03

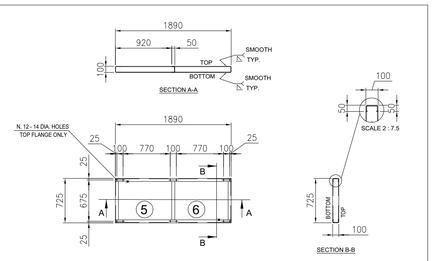
B-300
AC UPS FITTED WITH UPS SYSTEM EQUIPMENT ROOM
BASEFRAME LOCATION PLAN





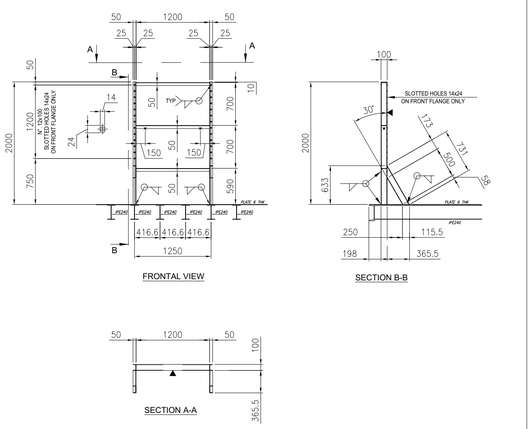
BESEFRAME FOR POS. 3 & 4

BUILT N. 1 PIECE EACH - TOT. N. 2 PIECES



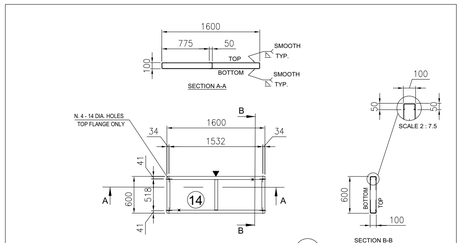
BESEFRAME FOR POS. 5 & 6

BUILT N. 1 PIECE EACH - TOT. N. 2 PIECES



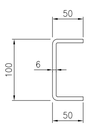
BESEFRAME FOR POS. 7 & 8 AND 9 & 10

BUILT N. 1 PIECE EACH - TOT. N. 2 PIECES

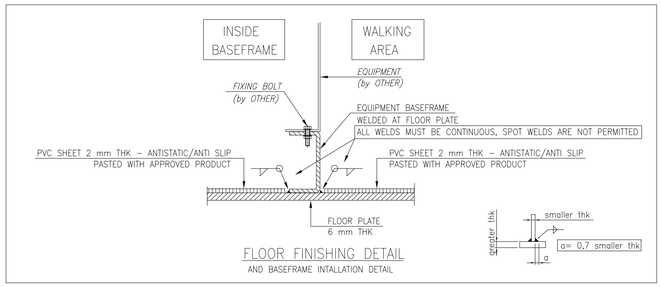


BESEFRAME FOR POS. 14

BUILT N. 1 PIECE

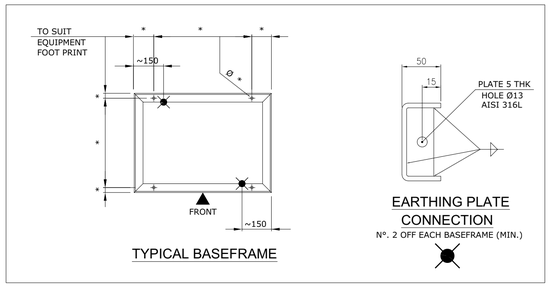


C 100x50x50 THK 6mm.
FROM BENT PLATE THK 6mm.
MAT. CARBON STEEL



FLOOR FINISHING DETAIL

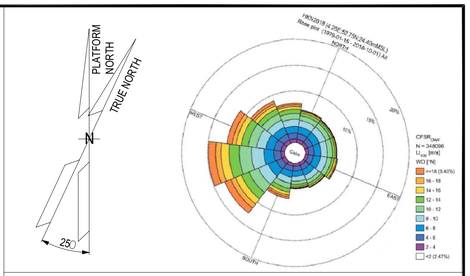
AND BASEFRAME INTALLATION DETAIL



TYPICAL BASEFRAME

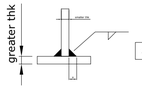
EARTHING PLATE CONNECTION

N°. 2 OFF EACH BASEFRAME (MIN.)



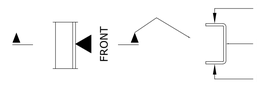
NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



a= 0,7 smalle thk

4. ALL WELDS ON TOP & BOTTOM SIDES OF BASEFRAMES MUST BE PERFECTLY SMOOTHED.
5. WHERE INDICATED " ▲ " SHOULD BE STAMP "FRONT", ABOVE "TOP" AND BELOW "BOTTOM".



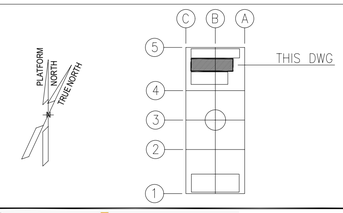
6. SURFACE TREATMENT ACCORDING DOCUMENT N. 1724000049-MAT-PRO-00004 - PAINTING PROCEDURE FINAL COLOUR LIGHT GREY RAL 7035.

LEGEND

ASI = ALEX SISTEMI

HOLDS

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)	SCOPE
1	UP-200F3	AC UPS 35kVA	2400	860	1915	2258	ASI
2	UP-200F4	AC UPS 15kVA	2400	860	1915	2258	ASI
3	BA-200F3A	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914	ASI
4	BA-200F3B	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914	ASI
5	BA-200F4A	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429	ASI
6	BA-200F4B	BATTERY RACK GEL VRLA 7y AC UPS 15kVA	1890	725	1761	3429	ASI
7	CB-200F3A	ISOLATOR BOX AC UPS 35kVA	600	300	800	100	ASI
8	CB-200F3B	ISOLATOR BOX AC UPS 35kVA	600	300	800	100	ASI
9	CB-200F4A	ISOLATOR BOX AC UPS 15kVA	600	300	800	100	ASI
10	CB-200F4B	ISOLATOR BOX AC UPS 15kVA	600	300	800	100	ASI
11	NC-200F2	NAVAID PANEL	1180	810	675	500	ASI
12	BA-200F2	BATTERY BOX NAVAID	1000	500	1135	325	ASI
14	B3000-HSB-001	DISTRIBUTION & HVAC PANEL - AC/UPS ROOM	1600	600	2300	1150	ASI
18	BC-200F2	BATTERY CHARGER NAVAID	607	607	2157	500	ASI

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :

B-300 DETAILED DRAWINGS-E&I SHELTERS

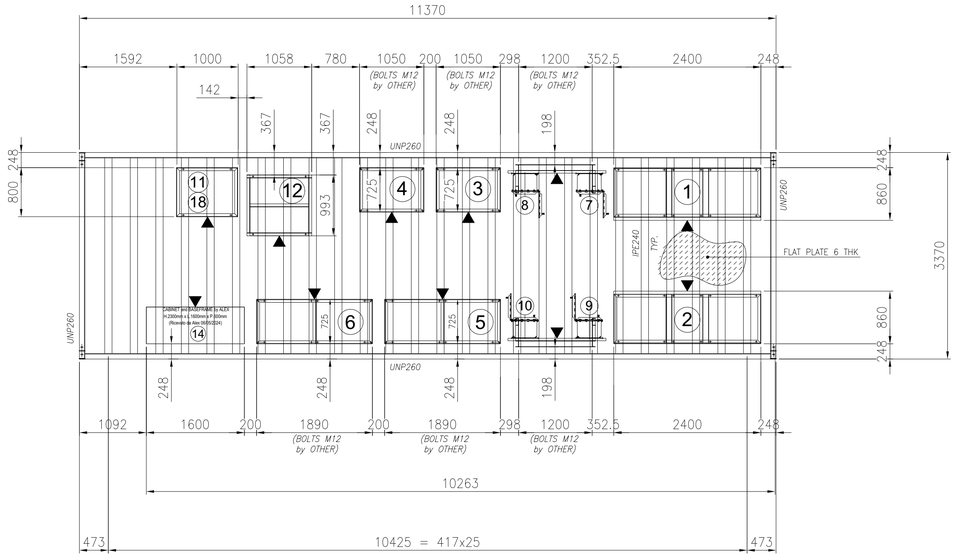
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00020	SHEET 003	REV. 03

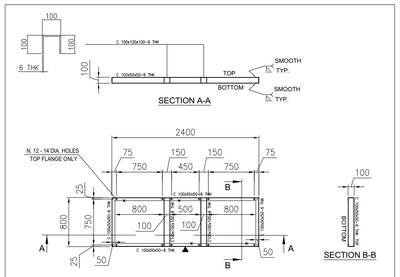
File Name : 1724000049-AR-DD-00020-REV.03

DRAWING NO. 1724000049-AR-DD-00020

REV. 03

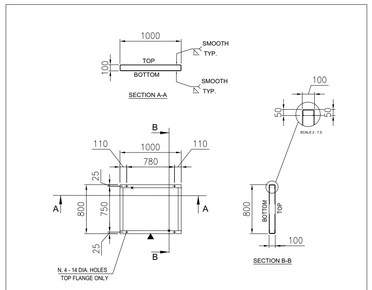
B-300
AC UPS FITTED WITH UPS SYSTEM EQUIPMENT ROOM
BASEFRAME LOCATION PLAN





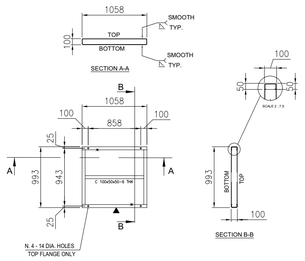
BESEFRAME FOR POS. 1 & 2

BUILT N. 1 PIECE EACH - TOT. N. 2 PIECES



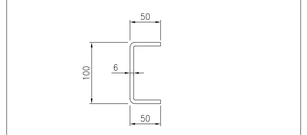
BESEFRAME FOR POS. 11 & 18

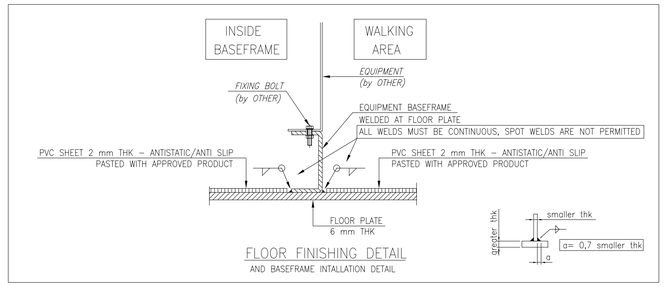
BUILT N. 1 PIECE



BESEFRAME FOR POS. 12

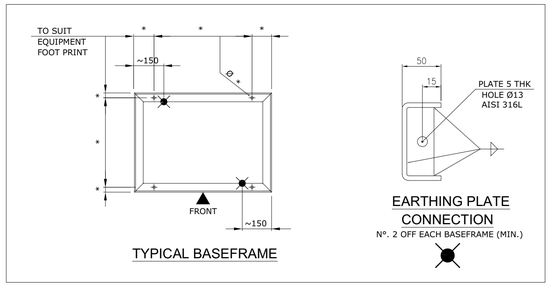
BUILT N. 1 PIECE





FLOOR FINISHING DETAIL

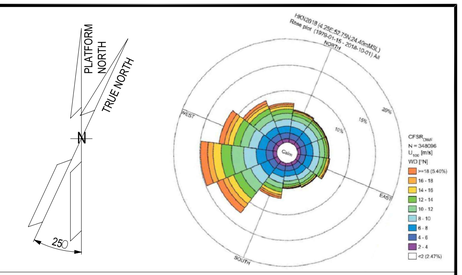
AND BASEFRAME INTALLATION DETAIL



TYPICAL BASEFRAME

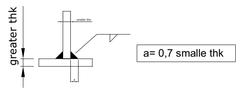
EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)	SCOPE
1	UP-200F3	AC UPS 35kVA	2400	860	1915	2258	ASI
2	UP-200F4	AC UPS 15kVA	2400	860	1915	2258	ASI
3	BA-200F3A	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914	ASI
4	BA-200F3B	BATTERY RACK GEL VRLA 7y AC UPS 35kVA	1050	725	1272	914	ASI
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8	CB-200F3B	ISOLATOR BOX AC UPS 35kVA	600	300	800	100	ASI
9	CB-200F4A	ISOLATOR BOX AC UPS 15kVA	600	300	800	100	ASI
10	CB-200F4B	ISOLATOR BOX AC UPS 15kVA	600	300	800	100	ASI
11	NC-200F2	NAVAID PANEL	1180	810	675	500	ASI
12	BA-200F2	BATTERY BOX NAVAID	1000	500	1135	325	ASI
14	B3000-HSB-001	DISTRIBUTION & HVAC PANEL - AC/UPS ROOM	1600	600	2300	1150	ASI
18	BC-200F2	BATTERY CHARGER NAVAID	607	607	2157	500	ASI

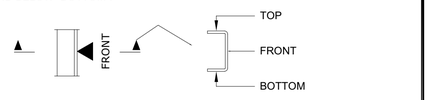


NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



4. ALL WELDS ON TOP & BOTTOM SIDES OF BASEFRAMES MUST BE PERFECTLY SMOOTHED.
5. WHERE INDICATED " ▲ " SHOULD BE STAMP "FRONT", ABOVE "TOP" AND BELOW "BOTTOM".



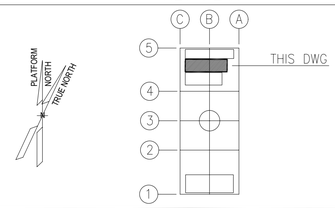
6. SURFACE TREATMENT ACCORDING DOCUMENT N. 1724000049-MAT-PRO-00004 - PAINTING PROCEDURE FINAL COLOUR LIGHT GREY RAL 7035.

LEGEND

ASI = ALEX SISTEMI

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :

B-300 DETAILED DRAWINGS-E&I SHELTERS

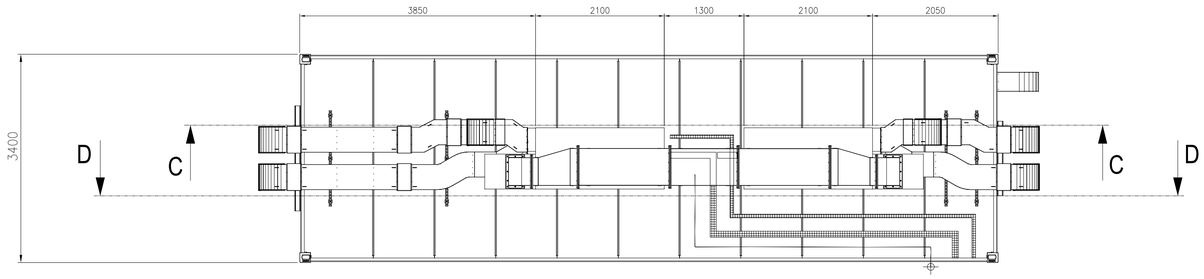
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00020	SHEET 004	REV. 03

File Name : 1724000049-AR-DD-00020-REV.03

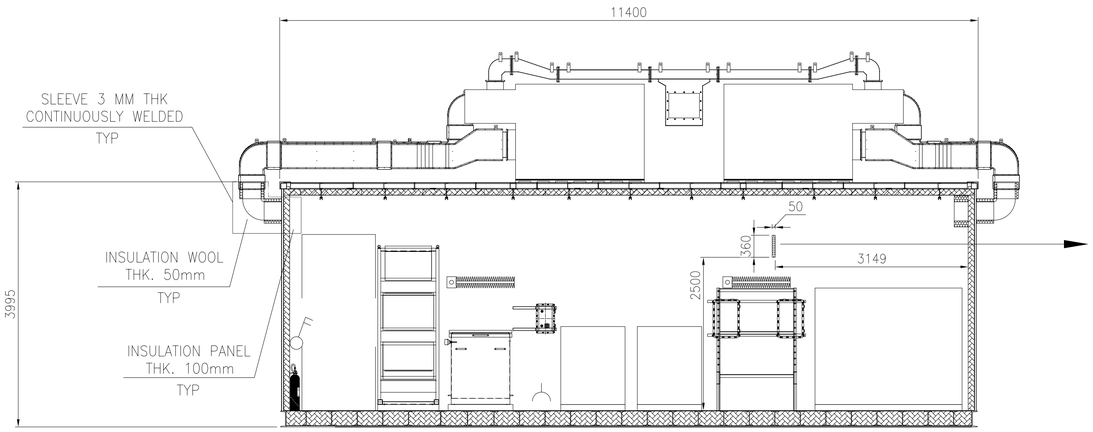
DRAWING NO. 1724000049-AR-DD-00020

REV. 03

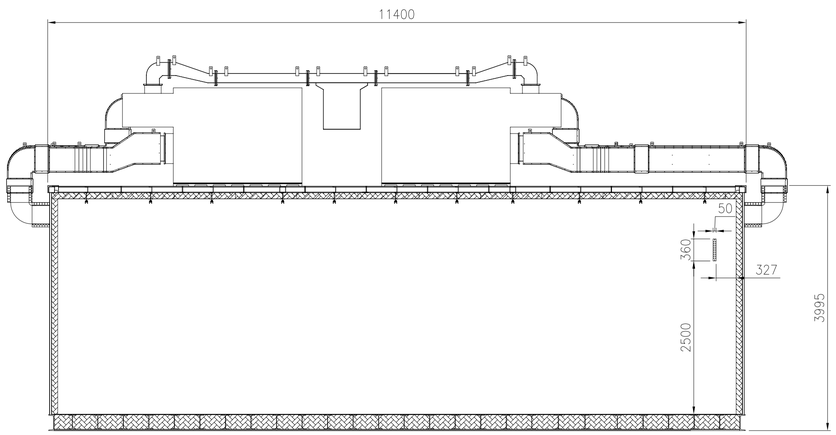
MODULE B-300
AC UPS FITTED WITH UPS SYSTEM EQUIPMENT ROOM



TOP VIEW



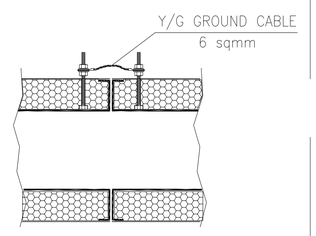
SECTION C-C



SECTION D-D

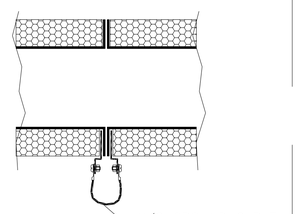
DET. 1

EXTERNAL DUCT



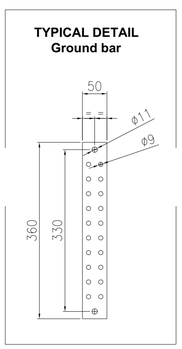
DET. 2

INTERNAL DUCT



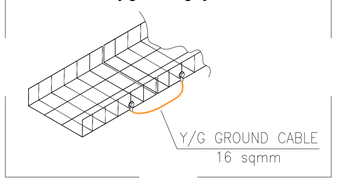
DET. 3

TYPICAL DETAIL
Ground bar



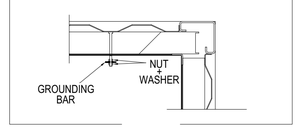
DET. 4

TYPICAL DETAIL
Cable tray grounding system



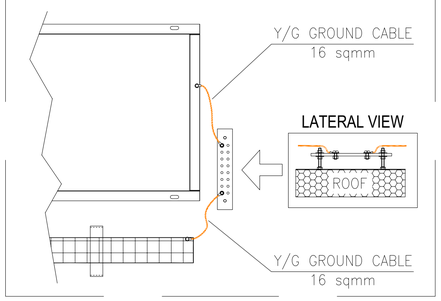
DET. 5

TYPICAL INSTALLATION BTH PE



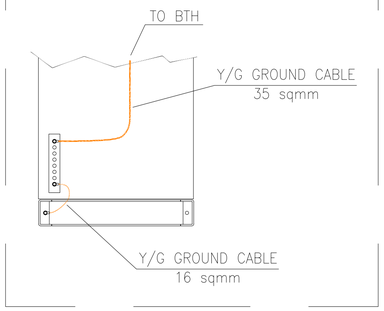
DET. 6

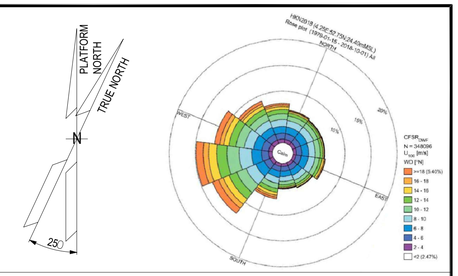
TYPICAL ROOF GROUNDING CONNECTION



DET. 7

TYPICAL CABINET GROUNDING CONNECTION





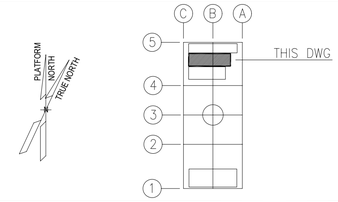
NOTES

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LEGEND

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
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00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :

B-300 DETAILED DRAWINGS-E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00020	SHEET 005	REV. 03

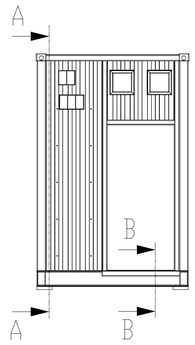
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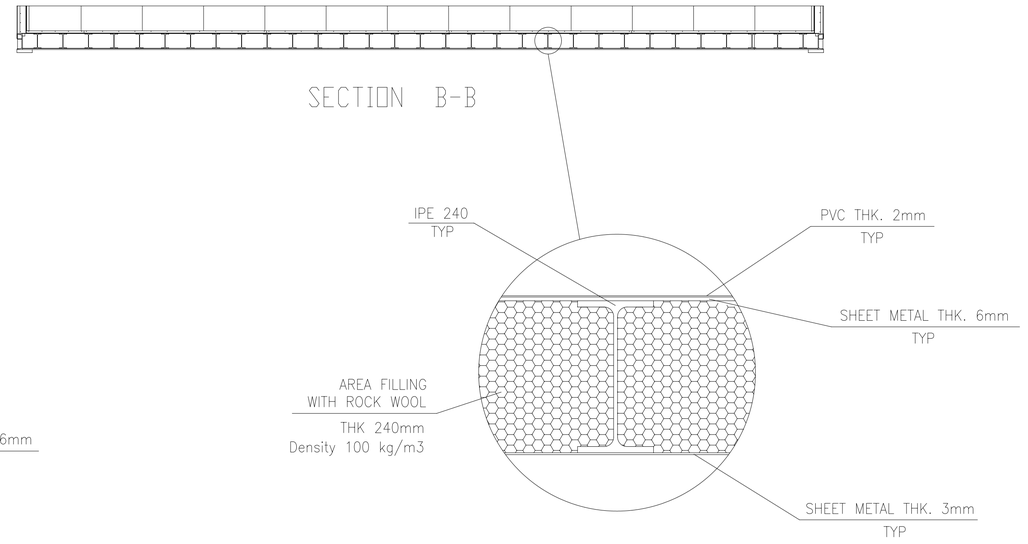
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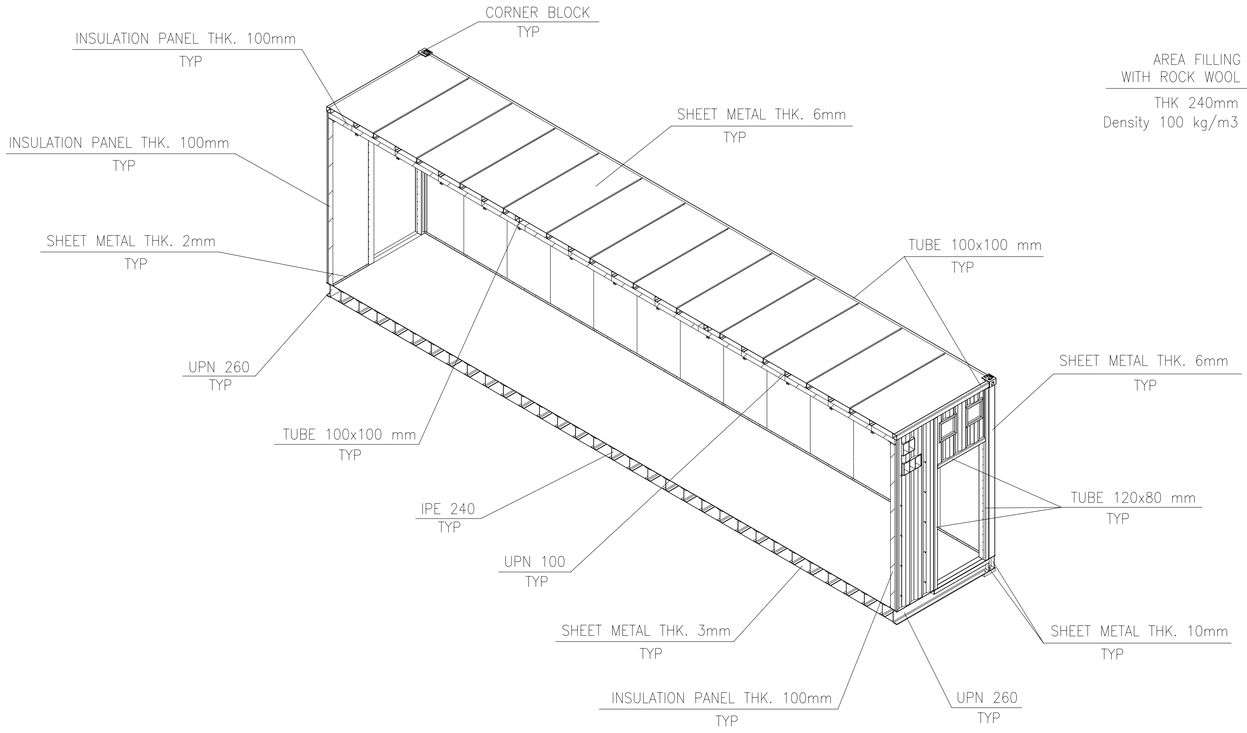
REV. 03

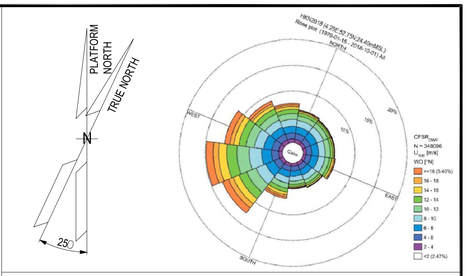
MODULE B-400
I&T EQUIPMENT ROOM

REFERENCE	
DOCUMENT TITLE	DOCUMENT NUMBER
"B-400" STRUCTURAL CALCULATION	1724000049-ST-CA-00009
Weld Procedure Specifications (WPS), Weld Procedure Qualification Report (WPQR), Welding Map and Welders Qualifications	1724000049-WEL-RE-00003



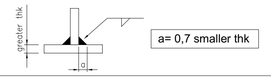






NOTES

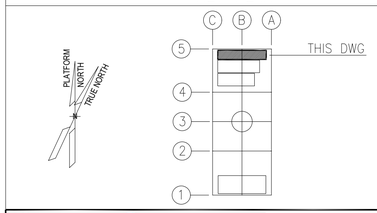
1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



LEGEND

HOLDS

KEY PLAN



03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	15/11/2024

ALEXSISTEMI spa

CROSSWIND | ROSETTI MARINO

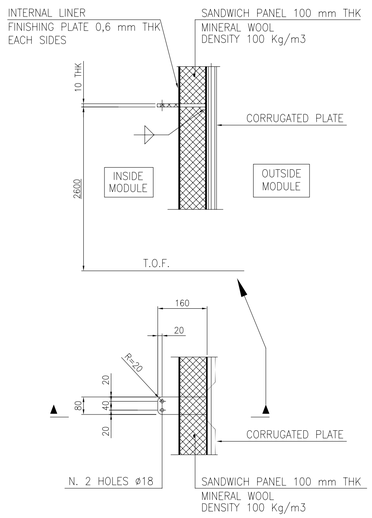
TITLE :

B-400 DETAILED DRAWINGS-E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00021	SHEET 001	REV. 03

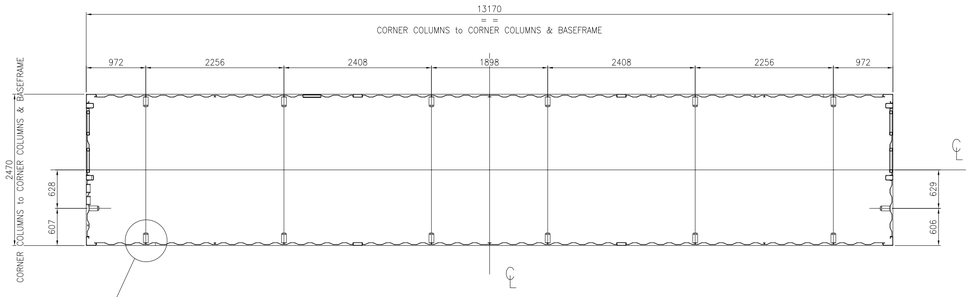
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DRAWING NO. 1724000049-AR-DD-0021 REV. 03



WEST WALL

NORTH WALL

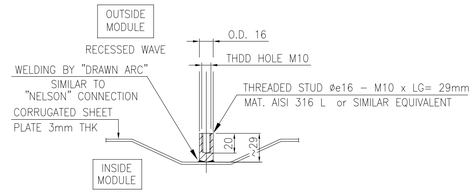


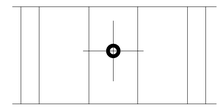
EST WALL

SOUTH WALL

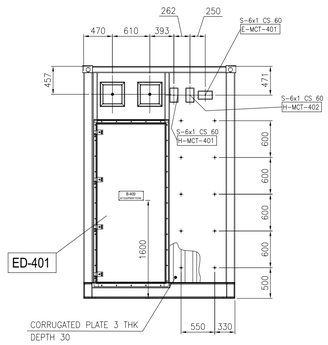
MODULE B-400

INTERNAL SEA FASTENING PLATES PLAN

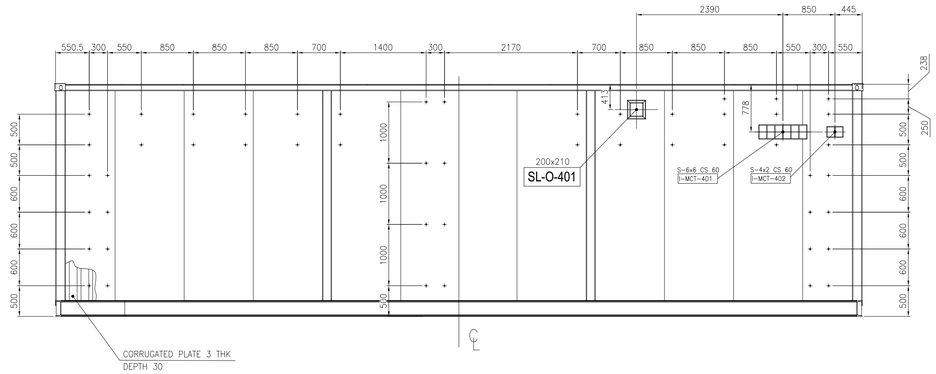




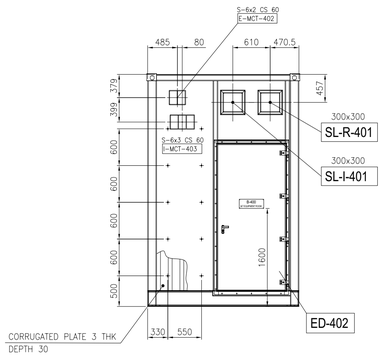
THREADED STUD INSTALLATION



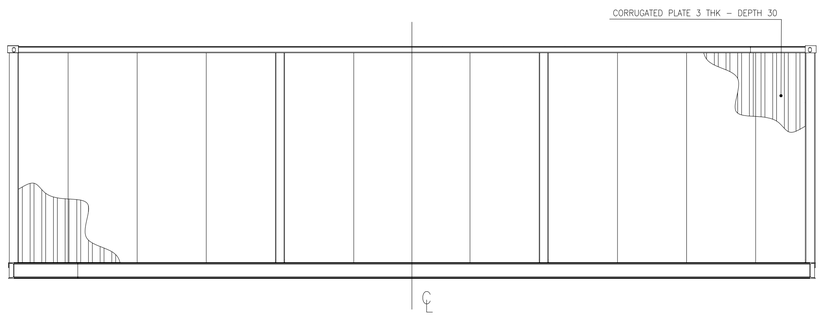
VIEW OF WEST WALL



VIEW OF NORTH WALL



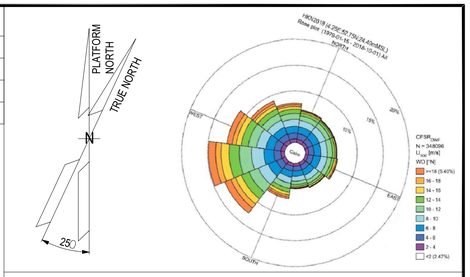
VIEW OF EAST WALL



VIEW OF SOUTH WALL

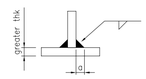
REFERENCE

DOCUMENT TITLE	DOCUMENT NUMBER
"B-400" GENERAL ARRANGEMENT DRAWING	1724000049-AR-DA-00017
"B-400" HVAC GENERAL ARRANGEMENT	1724000049-HV-DA-00067



NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



a= 0,7 smaller thk

LEGEND

- THREADED STUD ø16 - M10 x LG= 29mm
- T.O.F. — TOP OF FLOOR

MCT LEGEND:

E-MCT-401

- S 6x2 C.S. 60 — MCT TYPE & SIZE / BRAND ROXTEC
- MATERIAL: C.S.= PRIMED MILD STEEL; S.S.= AISI 316 L
- MCT DEPTH
- MCT SERVICE: E= ELECTRICAL; I= INSTRUMENTAL; H= HVAC
- PROGRESSIVE NUMBER FROM 01
- MODULE LOCATION: 1= B-100 3= B-300 2= B-200 4= B-400

HVAC SLEEVE LEGEND:

SL-I-401

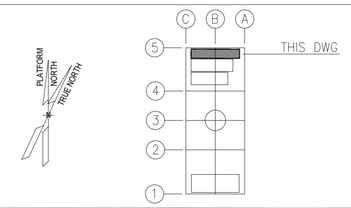
- 300x300 — INTERNAL SIZE OF DUCT L x H (mm)
- PROGRESSIVE NUMBER FROM 01
- SERVICE: I= AIR IN; R= RECYRCLE; O= OVERPRESSURE
- MODULE LOCATION: 1= B-100 3= B-300 2= B-200 4= B-400

DOOR LEGEND:

ED-401

- EXTERNAL DOOR
- PROGRESSIVE NUMBER FROM 01
- MODULE LOCATION: 1= B-100; 2= B-200; 3= B-300; 4= B-400

KEY PLAN



MCT LIST

	TAG No.	MCT DIMENSIONS and INSTALLATION SENSE L (mm) HORIZONTAL	H (mm) VERTICAL	W (mm) DEPTH	MCT SIZE TYPE "S" FRAME Primed Mild Steel BRAND: ROXTEC	MCT SIZE TYPE "S" FRAME AISI 316 L BRAND: ROXTEC
ELECTRICAL	E-MCT-401	238	140.5	60	6x1	
	E-MCT-402	271	238	60	6x2	
INSTRUMENTAL	I-MCT-401	793	238	60	6x6	
	I-MCT-402	271	179.5	60	4x2	
	I-MCT-403	411.5	238	60	6x3	
HVAC	H-MCT-401	140.5	238	60	6x1	
	H-MCT-402	140.5	238	60	6x1	

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND — ROSETTI MARINO

TITLE :

B-400 DETAILED DRAWINGS-E&I SHELTERS

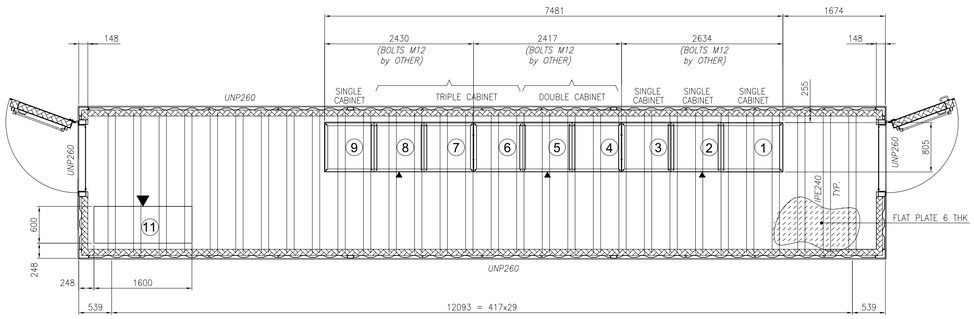
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00021	SHEET 002	REV. 03

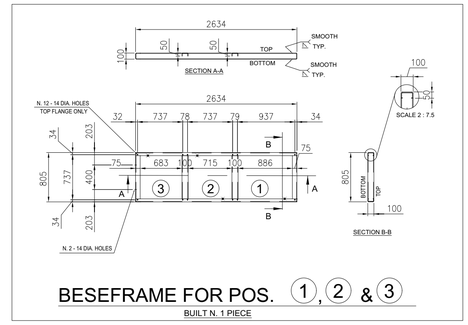
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DRAWING NO. 1724000049-AR-DD-00021

REV. 03

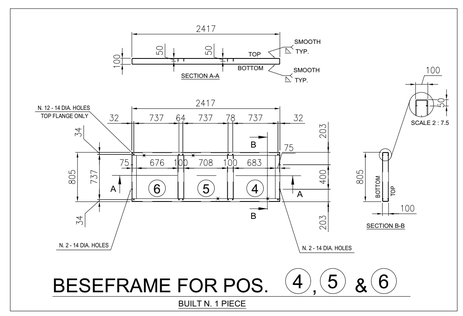
B-400
I&T EQUIPMENT ROOM
BASEFRAME LOCATION PLAN





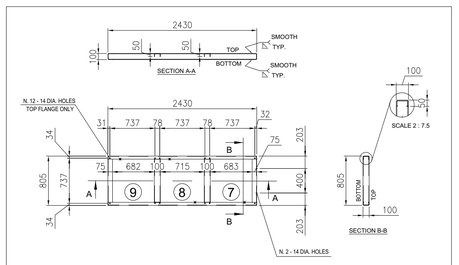
BESEFRAME FOR POS. (1), (2) & (3)

BUILT N. 1 PIECE



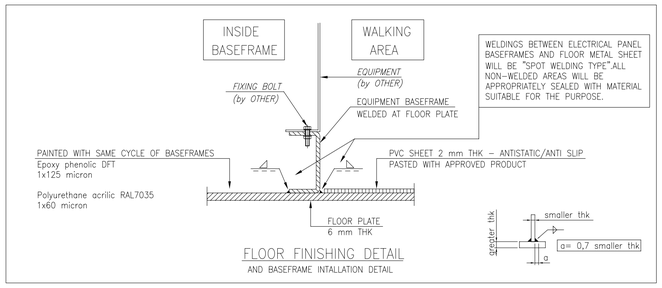
BESEFRAME FOR POS. (4), (5) & (6)

BUILT N. 1 PIECE



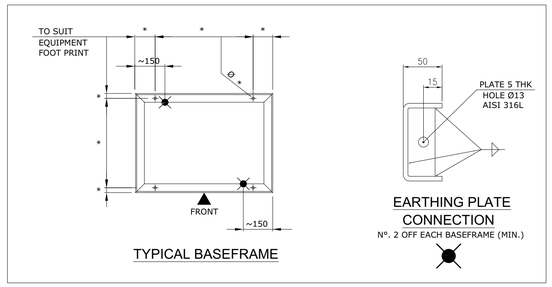
BESEFRAME FOR POS. (7), (8) & (9)

BUILT N. 1 PIECE



FLOOR FINISHING DETAIL

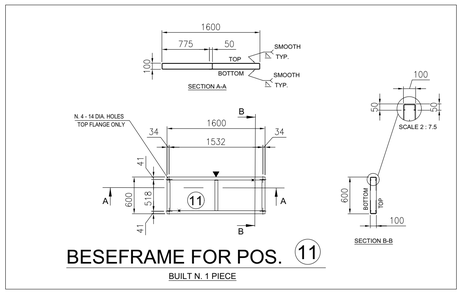
AND BASEFRAME INTALLATION DETAIL



TYPICAL BASEFRAME

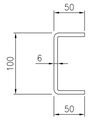
EARTHING PLATE CONNECTION

N°. 2 OFF EACH BASEFRAME (MIN.)



BESEFRAME FOR POS. (11)

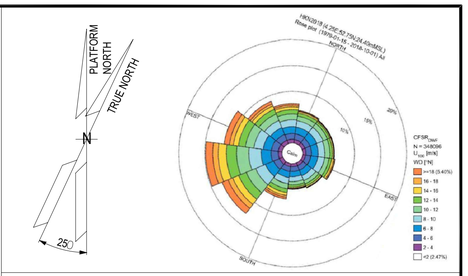
BUILT N. 1 PIECE



C 100x50x50 THK 6mm.
FROM BENT PLATE THK 6mm.
MAT. CARBON STEEL

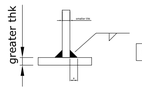
EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (Kg)	SCOPE
1	B400-SRV-001	SERVER CABINET	1000	800	2100	250	ASI
2	B400-NET-001	NETWORK CABINET	800	800	2100	250	ASI
3	B400-EMCS-001	EMCS SYSTEM CABINET	800	800	2100	250	ASI
4	B400-PCS-001	PCS SYSTEM CABINET	800	800	2100	250	ASI
5	B400-PCS-002	PCS MARSHALLING CABINET	800	800	2100	250	ASI
6	B400-FGS-001	FGS SYSTEM CABINET	800	800	2100	250	ASI
7	B400-FGS-002	FGS MARSHALLING CABINET 1	800	800	2100	250	ASI
8	B400-FGS-003	FGS MARSHALLING CABINET 2	800	800	2100	250	ASI
9	B400-SIS-001	SIS SYSTEM/MARSHALLING CABINET	800	800	2100	250	ASI
10	-	SPARE					
11	B400-HSB-001	DISTRIBUTION & HVAC PANEL - I&T ROOM	1600	600	2300	1150	ASI

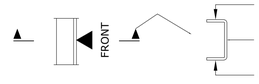


NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL WELDINGS SYMBOLS ARE IN ACCORDANCE WITH A.W.S. CODE D.1.1
3. UNLESS OTHERWISE INDICATED FILLET WELDS SHALL HAVE FOLLOWING DIM.:



4. ALL WELDS ON TOP & BOTTOM SIDES OF BASEFRAMES MUST BE PERFECTLY SMOOTHED.
5. WHERE INDICATED " ▲ " SHOULD BE STAMP "FRONT", ABOVE "TOP" AND BELOW "BOTTOM".



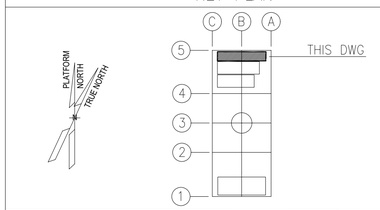
6. SURFACE TREATMENT ACCORDING DOCUMENT N. 1724000049-MAT-PRO-00004 - PAINTING PROCEDURE FINAL COLOUR LIGHT GREY RAL 7035.

LEGEND

ASI = ALEX SISTEMI

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :

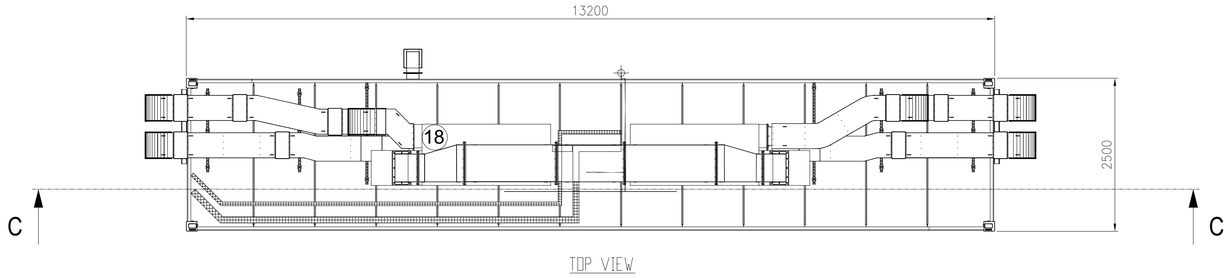
B-400 DETAILED DRAWINGS-E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00021	SHEET 003	REV. 03

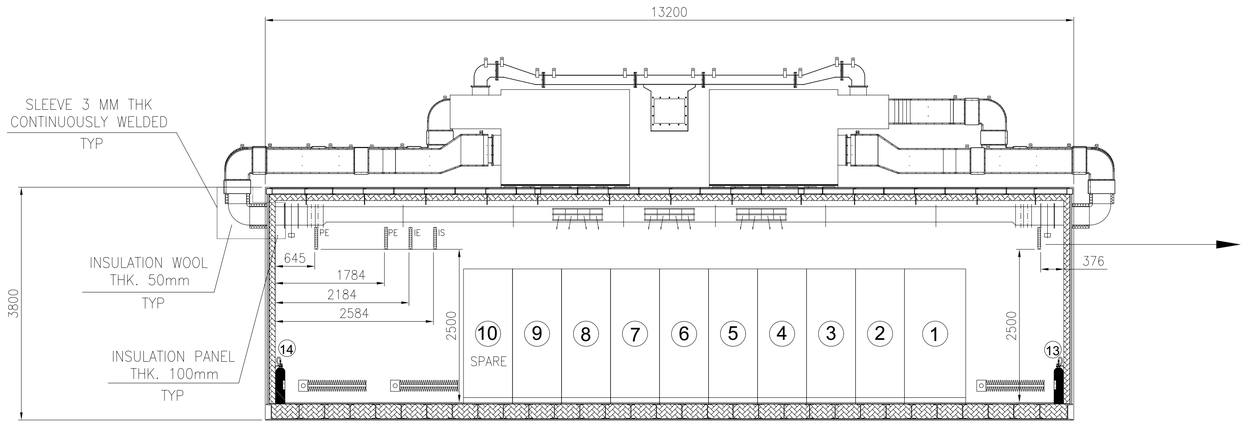
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REV. 03

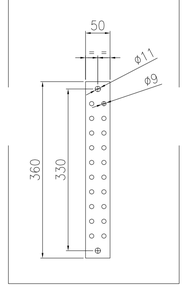


MODULE B-400
I&T EQUIPMENT ROOM



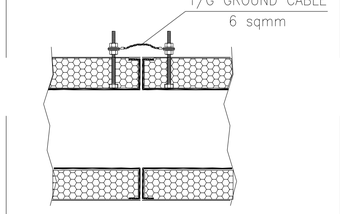
DET. 3

TYPICAL DETAIL
Ground bar



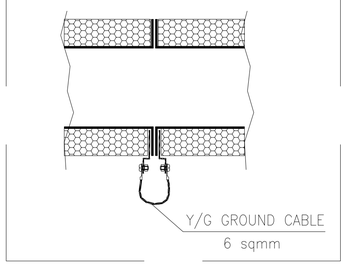
DET. 1

EXTERNAL DUCT



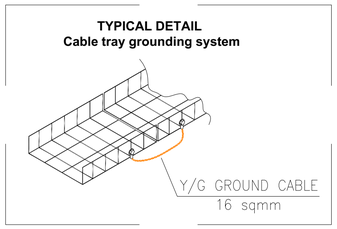
DET. 2

INTERNAL DUCT



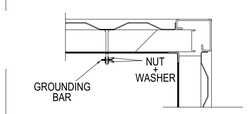
DET. 4

TYPICAL DETAIL
Cable tray grounding system



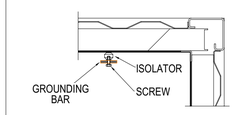
DET. 5

TYPICAL FASTENING DETAIL



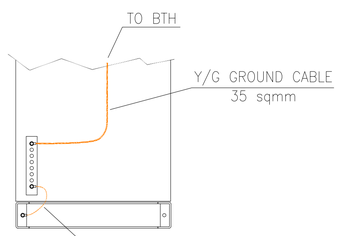
DET. 6

TYPICAL INSTALLATION BTH PI and IS



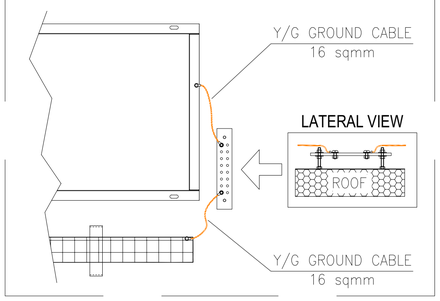
DET.8

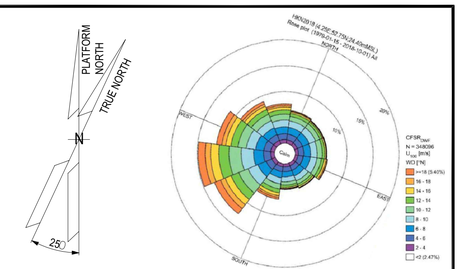
TYPICAL CABINET GROUNDING CONNECTION



DET. 7

TYPICAL ROOF GROUNDING CONNECTION





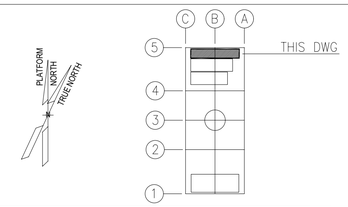
NOTES

1. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.

LEGEND

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	23/10/24	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
02	11/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
01	08/07/24	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	30/05/24	M.G.	O.A.	C.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :

B-400 DETAILED DRAWINGS-E&I SHELTERS

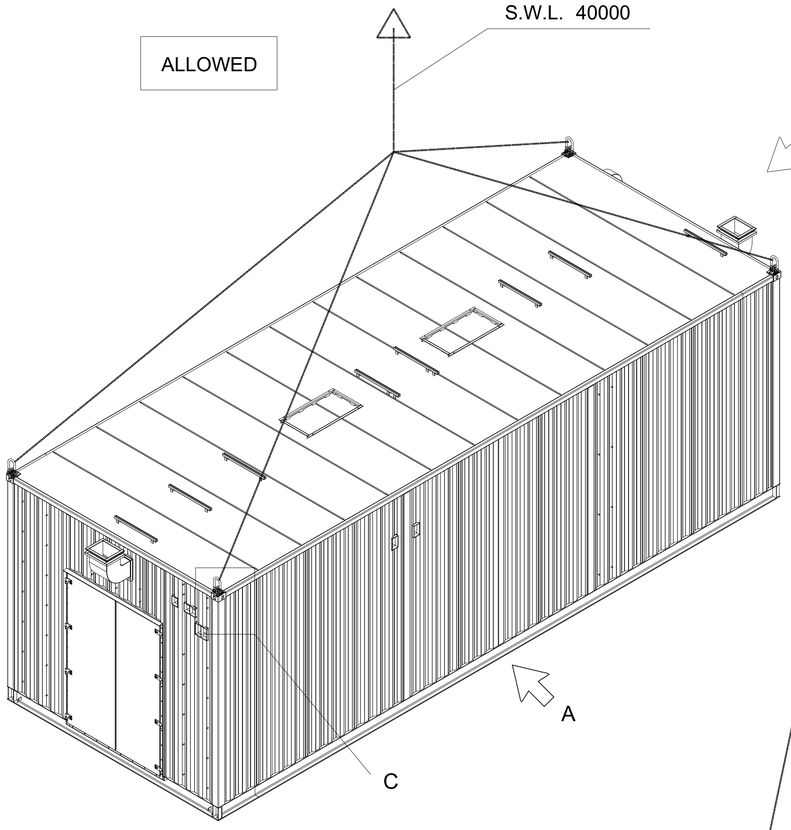
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DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 23/10/24
A1	DRAWING NO. 1724000049-AR-DD-00021	SHEET 004	REV. 03

File Name : 1724000049-AR-DD-00021-REV.03

DRAWING NO. 1724000049-AR-DD-00062

REV. 01

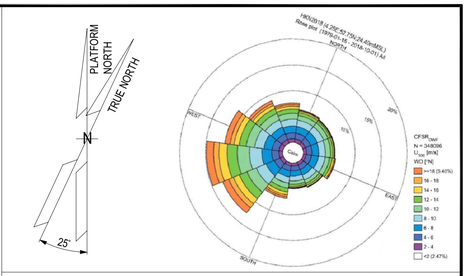
ALLOWED



B-100

01

ALL INDICATIONS ON THIS DOCUMENT ARE THEORETICAL, ALL DEFINITIONS OF LOADS, LENGTHS AND SECTION OF SLINGS, TYPE OF SCHACKLES WILL BE DEFINED FOLLOWING THE PHYSICAL WEIGHING OF THE MANUFACTURED MODULE COMPLETE WITH ALL EQUIPMENT AND ACCESSORIES INCLUDING THE CORRECT DEFINITION OF THE CENTER OF GRAVITY.



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) BLPH WEIGHT: 40000 kg
3) USE ROPES/CHAINS FITTED WITH HOOKS WITH THE SAFETY WORKING LOAD OF 40000 kg
4) HOOKS, SHACKLE, SPREADER, ROPES/CHAINS ARE NOT IN THE ALEX-SISTEMI SCOPE OF SUPPLY

REFERENCE

DOCUMENT TITLE	DOCUMENT NUMBER
"B-100" GENERAL ARRANGEMENT DWGS	1724000049-AR-DA-00014
"B-100" STRUCTURAL CALCULATION	1724000049-ST-CA-00006

LEGEND

C.O.G. _____ CENTER OF GRAVITY

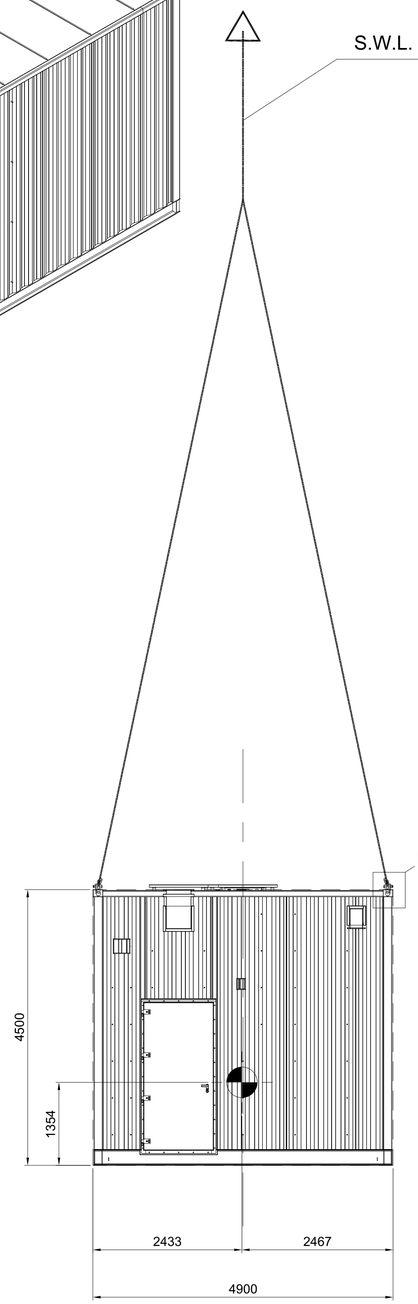
DETAIL D

DETAIL E

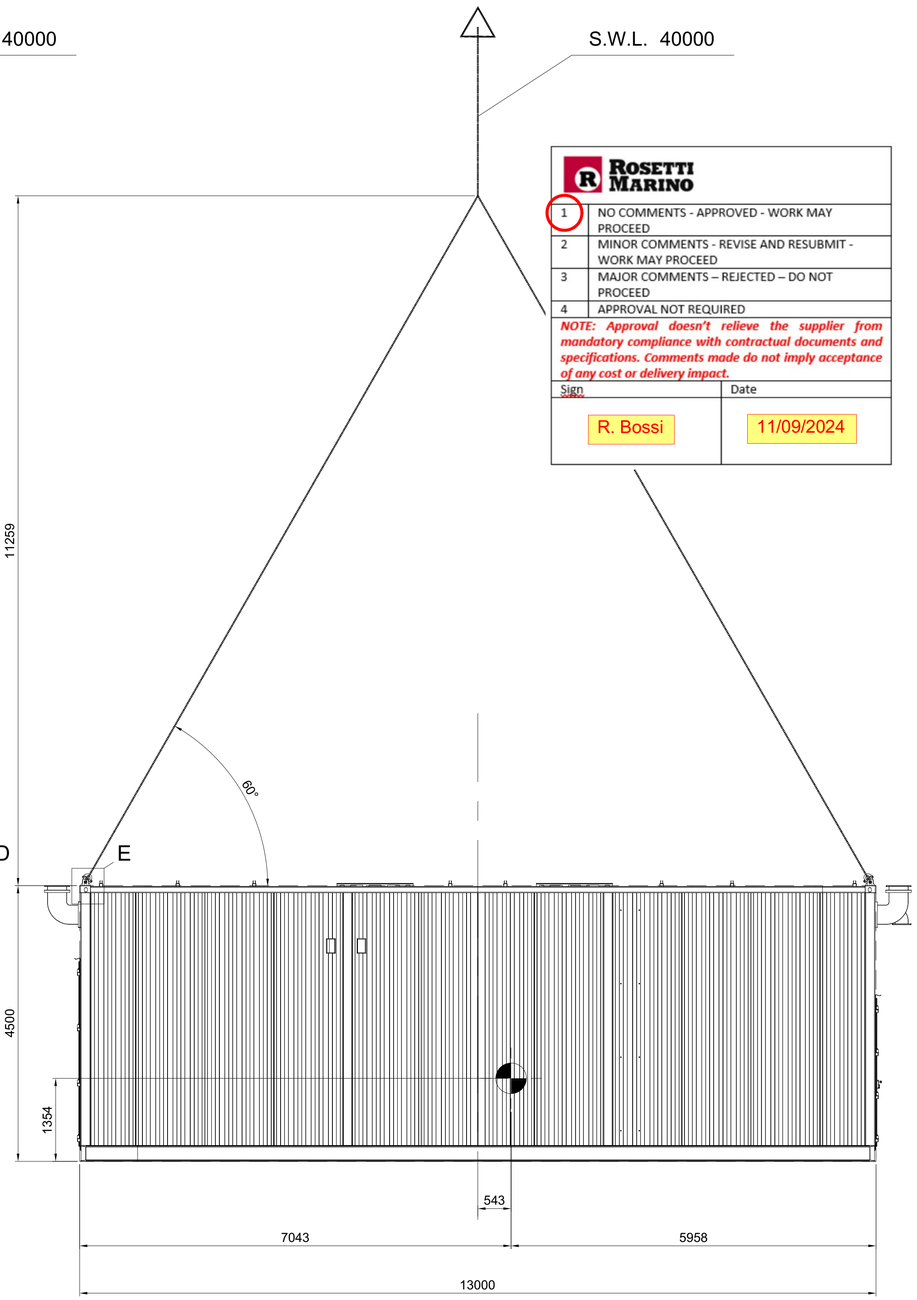
FLEX LINK DIMENSIONS

ISO LIFT LUG ASS'Y (S20901AA)

DETAIL C



VIEW FROM "B"



VIEW FROM "A"

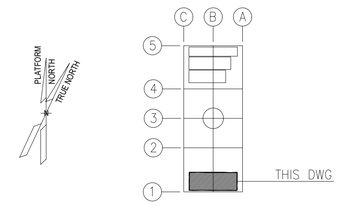
ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	11/09/2024

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	02/08/24	F.P.	SKV	C.A.	ISSUE FOR INFORMATION (IFI)
00	04/07/24	F.P.	SKV	C.A.	ISSUE FOR INFORMATION (IFI)

CROSSWIND | ROSETTI MARINO

TITLE :

BASE LOAD POWER HUB (BLPH)
LIFTING DRAWINGS
E&I SHELTERS

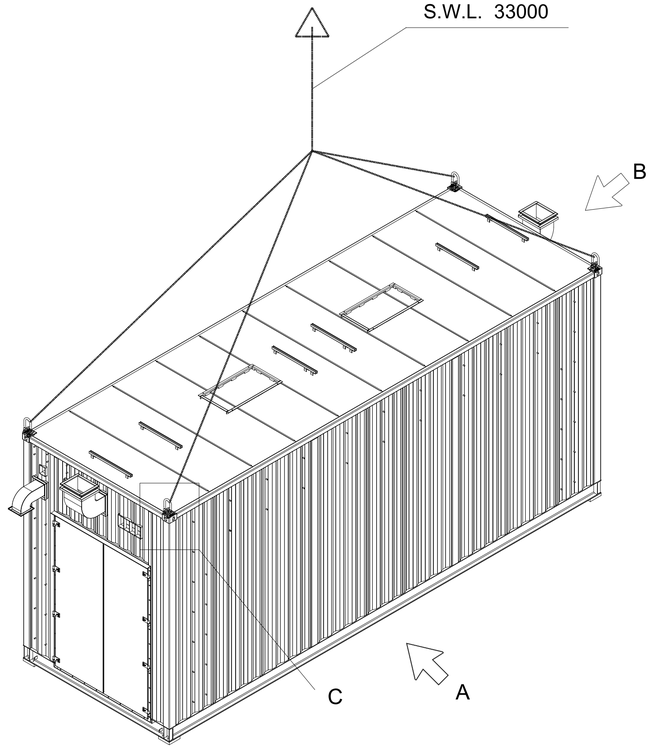
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN F.P.	CHECKED SKV	APPROVED C.A.	DATE 02/08/24
A1	DRAWING NO. 1724000049-AR-DD-00062	SHEET 001	REV. 01

File Name : 1724000049-AR-DD-00062-REV.01

DRAWING NO. 1724000049-AR-DD-00062

REV. 01

ALLOWED



B-200

01

ALL INDICATIONS ON THIS DOCUMENT ARE THEORETICAL, ALL DEFINITIONS OF LOADS, LENGTHS AND SECTION OF SLINGS, TYPE OF SCHACKLES WILL BE DEFINED FOLLOWING THE PHYSICAL WEIGHING OF THE MANUFACTURED MODULE COMPLETE WITH ALL EQUIPMENT AND ACCESSORIES INCLUDING THE CORRECT DEFINITION OF THE CENTER OF GRAVITY.

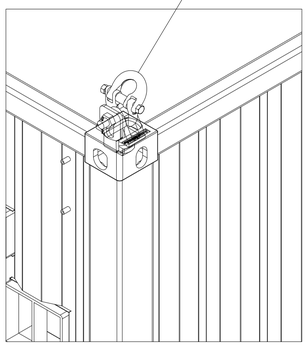


DETAIL D

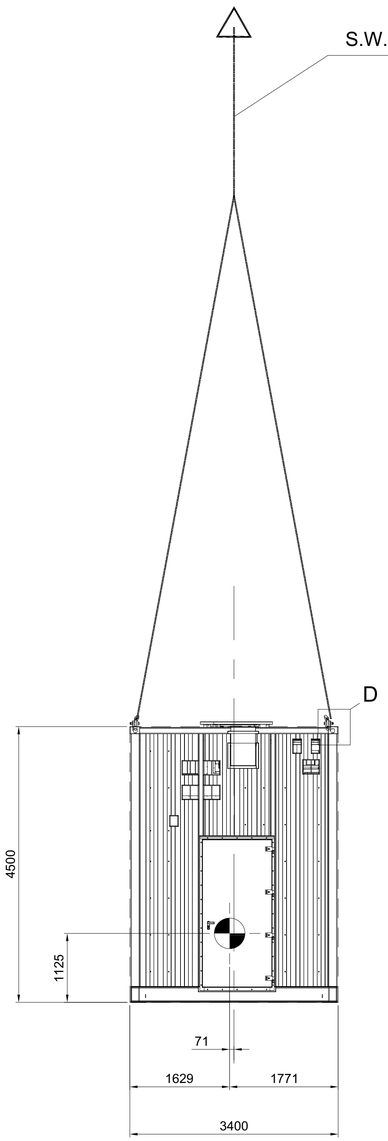
DETAIL E

FLEX LINK DIMENSIONS

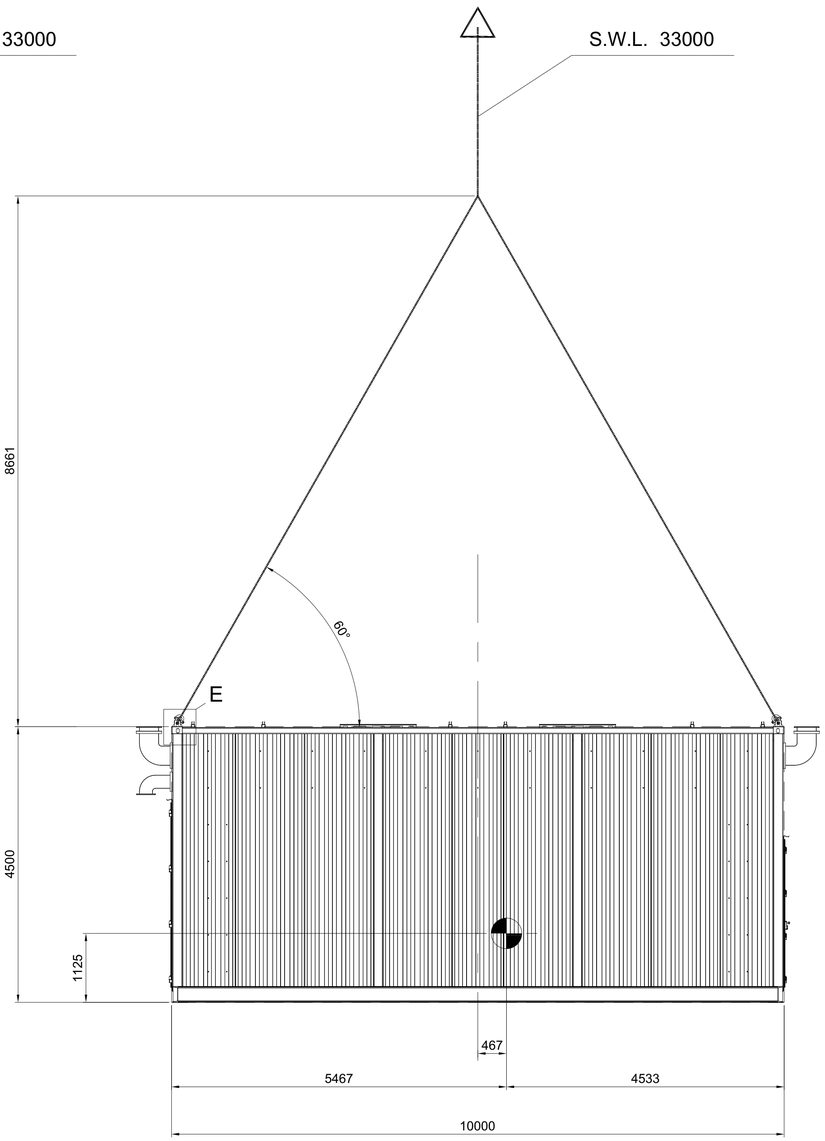
ISO LIFT LUG ASS'Y (S20901AA)



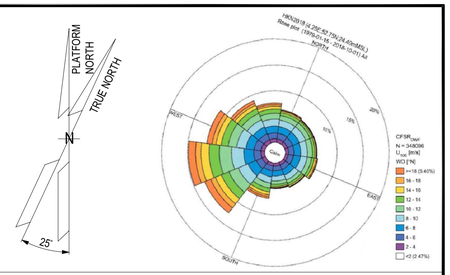
DETAIL C



VIEW FROM "B"



VIEW FROM "A"



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) BLPH WEIGHT: 33000 kg
3) USE ROPES/CHAINS FITTED WITH HOOKS WITH THE SAFETY WORKING LOAD OF 33000 kg
4) HOOKS, SHACKLE, SPREADER, ROPES/CHAINS ARE NOT IN THE ALEX-SISTEMI SCOPE OF SUPPLY

REFERENCE

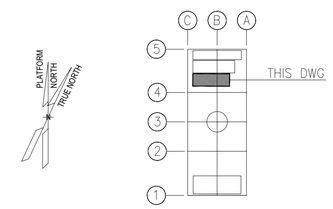
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"B-200" STRUCTURAL CALCULATION	1724000049-ST-CA-00007

LEGEND

C.O.G. _____ CENTER OF GRAVITY

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	02/08/24	F.P.	SKV	C.A.	ISSUE FOR INFORMATION (IFI)
00	04/07/24	F.P.	SKV	C.A.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE :

BASE LOAD POWER HUB (BLPH)
LIFTING DRAWINGS
E&I SHELTERS

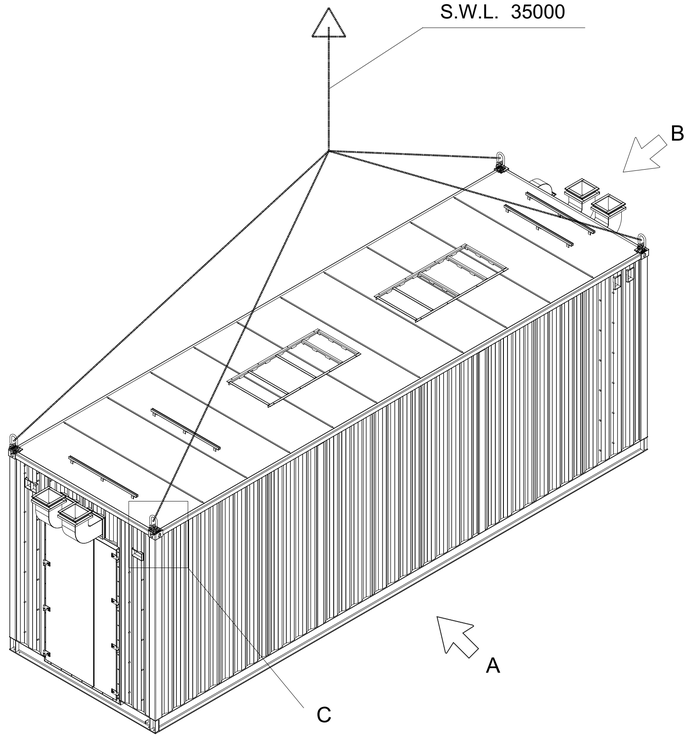
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN F.P.	CHECKED SKV	APPROVED C.A.	DATE 02/08/24
A1	DRAWING NO. 1724000049-AR-DD-00062	SHEET 002	REV. 01

File Name : 1724000049-AR-DD-00062-REV.01

DRAWING NO. 1724000049-AR-DD-00062

REV. 01

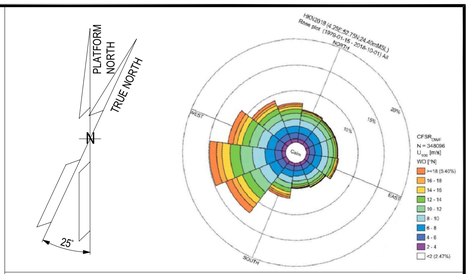
ALLOWED



B-300

01

ALL INDICATIONS ON THIS DOCUMENT ARE THEORETICAL, ALL DEFINITIONS OF LOADS, LENGTHS AND SECTION OF SLINGS, TYPE OF SCHACKLES WILL BE DEFINED FOLLOWING THE PHYSICAL WEIGHING OF THE MANUFACTURED MODULE COMPLETE WITH ALL EQUIPMENT AND ACCESSORIES INCLUDING THE CORRECT DEFINITION OF THE CENTER OF GRAVITY.



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) BLPH WEIGHT: 35000 kg
3) USE ROPES/CHAINS FITTED WITH HOOKS WITH THE SAFETY WORKING LOAD OF 35000 kg
4) HOOKS, SHACKLE, SPREADER, ROPES/CHAINS ARE NOT IN THE ALEX-SISTEMI SCOPE OF SUPPLY

REFERENCE

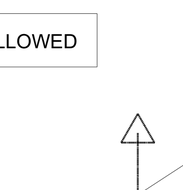
DOCUMENT TITLE	DOCUMENT NUMBER
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"B-300" STRUCTURAL CALCULATION	1724000049-ST-CA-00008

LEGEND

C.O.G. _____ CENTER OF GRAVITY



DETAIL D

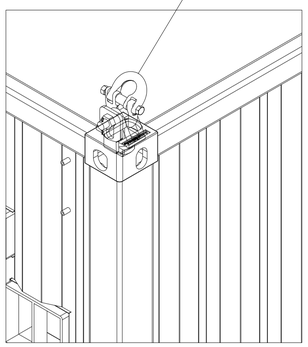


DETAIL E

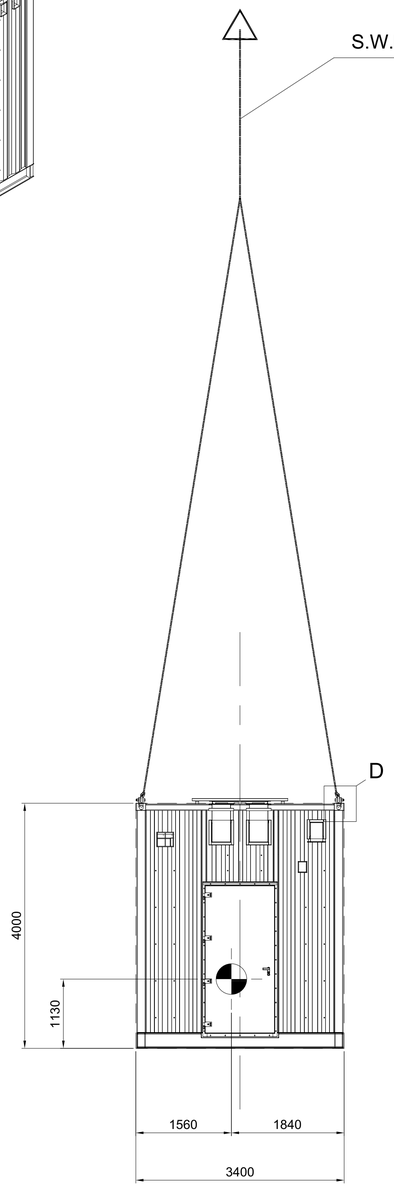


FLEX LINK DIMENSIONS

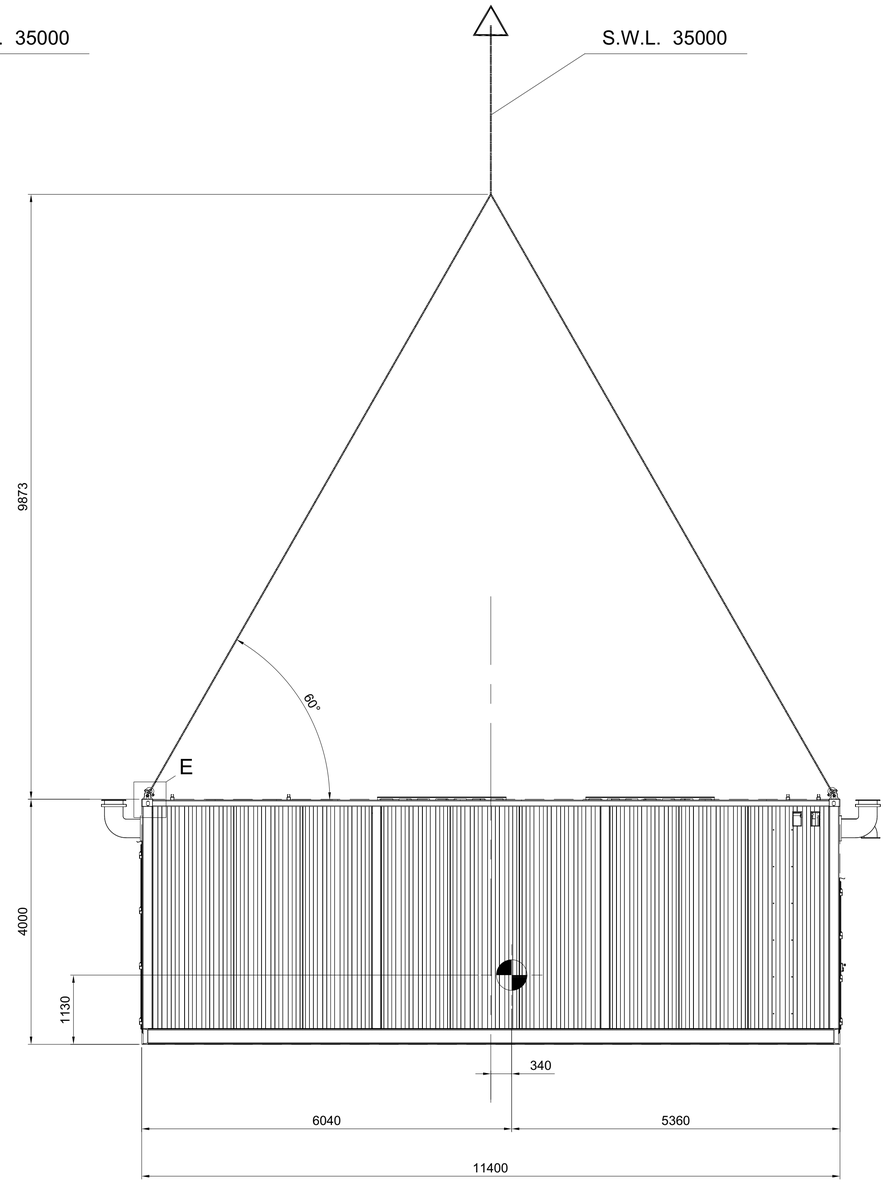
ISO LIFT LUG ASS'Y
(S20901AA)



DETAIL C



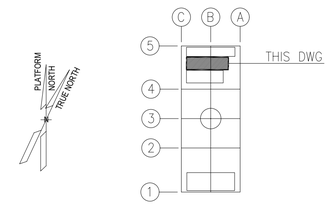
VIEW FROM "B"



VIEW FROM "A"

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	02/08/24	F.P.	SKV	C.A.	ISSUE FOR INFORMATION (IFI)
00	04/07/24	F.P.	SKV	C.A.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE :

BASE LOAD POWER HUB (BLPH)
LIFTING DRAWINGS
E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN F.P.	CHECKED SKV	APPROVED C.A.	DATE 02/08/24

A1	DRAWING NO. 1724000049-AR-DD-00062	SHEET 003	REV. 01

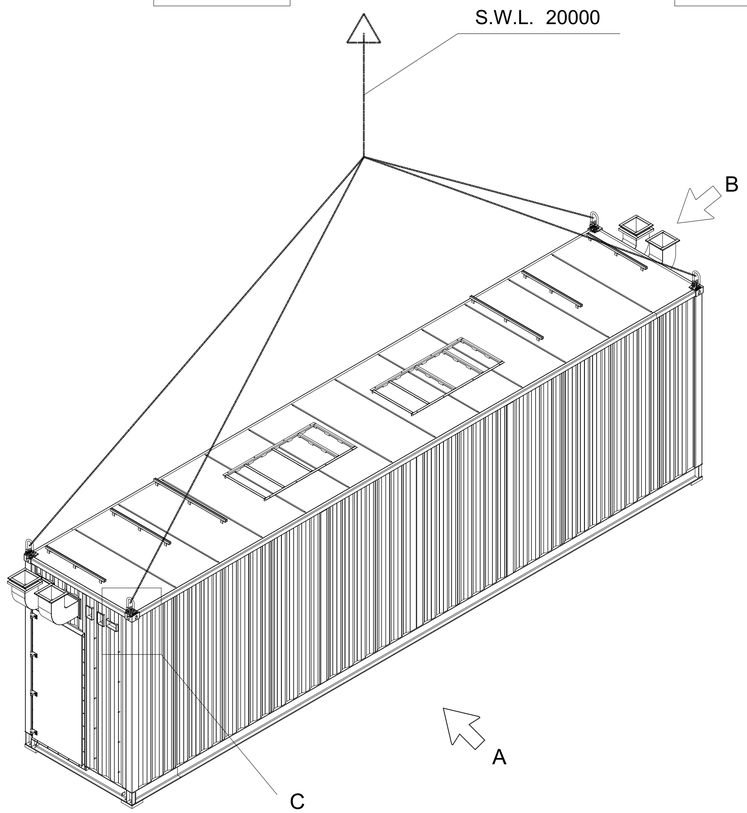
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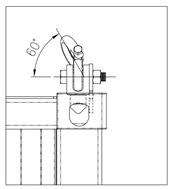
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REV. 01

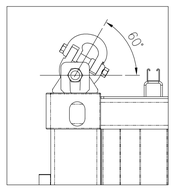
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B-400

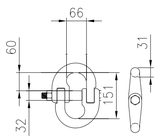




DETAIL D

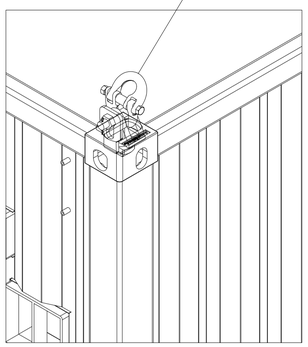


DETAIL E



FLEX LINK DIMENSIONS

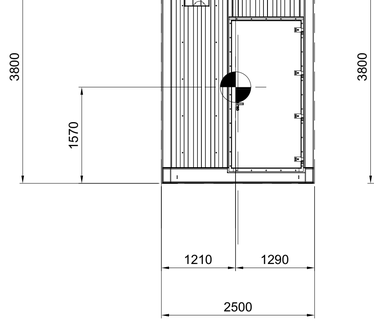
ISO LIFT LUG ASS'Y (S20901AA)



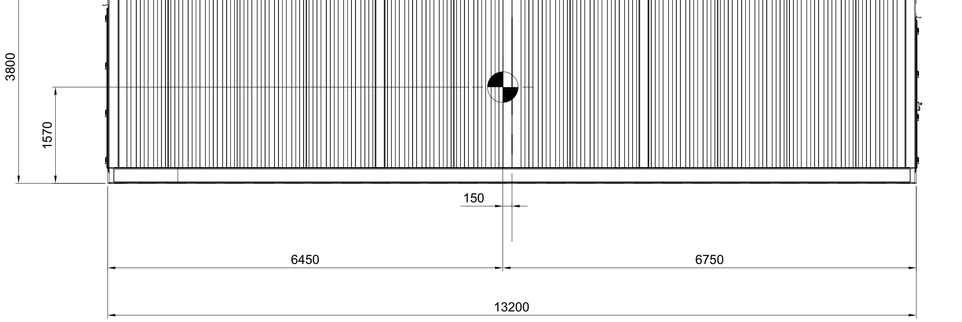
DETAIL C

01

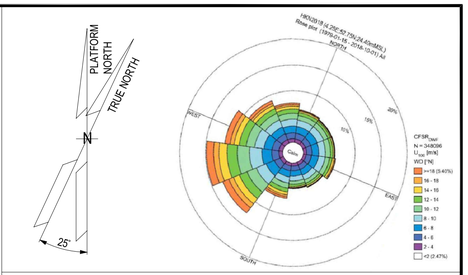
ALL INDICATIONS ON THIS DOCUMENT ARE THEORETICAL, ALL DEFINITIONS OF LOADS, LENGTHS AND SECTION OF SLINGS, TYPE OF SCHACKLES WILL BE DEFINED FOLLOWING THE PHYSICAL WEIGHING OF THE MANUFACTURED MODULE COMPLETE WITH ALL EQUIPMENT AND ACCESSORIES INCLUDING THE CORRECT DEFINITION OF THE CENTER OF GRAVITY.



VIEW FROM "B"



VIEW FROM "A"



NOTE

1) ALL DIMENSIONS ARE IM MM.
2) BLPH WEIGHT: 20000 kg
3) USE ROPES/CHAINS FITTED WITH HOOKS WITH THE SAFETY WORKING LOAD OF 20000 kg
4) HOOKS, SHACKLE, SPREADER, ROPES/CHAINS ARE NOT IN THE ALEX-SISTEMI SCOPE OF SUPPLY

REFERENCE

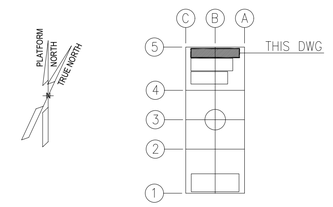
DOCUMENT TITLE	DOCUMENT NUMBER
"B-400" GENERAL ARRANGEMENT DWGS	1724000049-AR-DA-00017
"B-400" STRUCTURAL CALCULATION	1724000049-ST-CA-00009

LEGEND

C.O.G. _____ CENTER OF GRAVITY

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	02/08/24	F.P.	SKV	C.A.	ISSUE FOR INFORMATION (IFI)
00	04/07/24	F.P.	SKV	C.A.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE :

BASE LOAD POWER HUB (BLPH)
LIFTING DRAWINGS
E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE 1:50
DRAWN F.P.	CHECKED SKV	APPROVED C.A.	DATE 02/08/24
A1	DRAWING NO. 1724000049-AR-DD-00062	SHEET 004	REV. 01

File Name : 1724000049-AR-DD-00062-REV.01

BASE LOAD POWER HUB (BLPH)

B-300 HVAC and LIGHTING PANEL WIRING DRAWING and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

B300-HSB-001

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	03/02/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
05	24/01/25				ACCEPT FOR CONSTRUCTION (AFC)
04	10/12/24				ACCEPT FOR CONSTRUCTION (AFC)
03	04/09/24				ISSUE FOR REVIEW (IFR)
02	03/07/24				ISSUE FOR REVIEW (IFR)
01	28/06/24				ISSUE FOR REVIEW (IFR)
00	22/04/24				ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH) WIRING DIAGRAM FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724000049-HV-DA-00028

SHEET 001

REV. 05

CROSSWIND

ROSETTI MARINO

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
				APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
COVER

ROSETTI MARINO

1724000049-HV-DA-00028

F.G. 1

F.S. 2

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
1	COVER	X	X	X	X	X				
2	INDEX	X	X	X	X	X				
2A	INDEX	X	X	X	X	X				
3	SIMBOL LIST	X	X	X	X	X				
4	EXTERNAL VIEW	X	X	X	X	X				
5	INTERNAL VIEW	X	X	X	X	X				
6	POWER SECTION	X	X	X	X	X				
7	POWER SECTION	X	X	X	X	X				
8	POWER SECTION	X	X	X	X	X				
9	POWER SECTION A	X	X	X	X	X				
10	POWER SECTION A	X	X	X	X	X				
11	POWER SECTION A	X	X	X	X	X				
12	AUX SECTION A	X	X	X	X	X				
13	AUX SECTION A	X	X	X	X	X				
14	AUX SECTION A	X	X	X	X	X				
15	AUX SECTION A	X	X	X	X	X				
16	AUX SECTION A	X	X	X	X	X				
17	POWER SECTION B	X	X	X	X	X				
18	POWER SECTION B	X	X	X	X	X				
19	POWER SECTION B	X	X	X	X	X				
20	AUX SECTION B	X	X	X	X	X				
21	AUX SECTION B	X	X	X	X	X				
22	AUX SECTION B	X	X	X	X	X				
23	AUX SECTION B	X	X	X	X	X				
24	AUX SECTION B	X	X	X	X	X				
25	UPS POWER SUPPLY	X	X	X	X	X				
26	PLC SECTION	X	X	X	X	X				
26A	PLC SECTION	X	X	X	X	X				

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
27	PLC SECTION	X	X	X	X	X				
28	PLC SECTION	X	X	X	X	X				
29	PLC SECTION	X	X	X	X	X				
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37	PLC SECTION	X	X	X	X	X				
38	PLC SECTION	X	X	X	X	X				
39	PLC SECTION	X	X	X	X	X				
40	PLC SECTION	X	X	X	X	X				
41	PLC ARCHITECTURE	X	X	X	X	X				
42	EH MODULATION A	X	X	X	X	X				
43	EH MODULATION B	X	X	X	X	X				
44	AVAILABLE SIGNAL	X	X	X	X	X				
45	TERMINAL STRIP	X	X	X	X	X				
46	TERMINAL STRIP	X	X	X	X	X				
47	TERMINAL STRIP	X	X	X	X	X				
48	TERMINAL STRIP	X	X	X	X	X				
49	TERMINAL STRIP	X	X	X	X	X				
50	MATERIAL LIST	X	X	X	X	X				
51	MATERIAL LIST	X	X	X	X	X				
52	MATERIAL LIST	X	X	X	X	X				
53	MATERIAL LIST	X	X	X	X	X				
54	MATERIAL LIST	X	X	X	X	X				

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

INDEX

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 2
F.S. 2A

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
55	MATERIAL LIST	X	X	X	X	X				
56	MATERIAL LIST	X	X	X	X	X				
57	MATERIAL LIST	X	X	X	X	X				
58	MATERIAL LIST	X	X	X	X	X				
59	MATERIAL LIST	X	X	X	X	X				
60	MATERIAL LIST	X	X	X	X	X				
61	MATERIAL LIST	X	X	X	X	X				

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9

REV.	MODIFICA	DATA	FIRMA		
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

INDEX

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 2A
F.S. 3

Symbol	Description	Symbol	Description	Symbol	Description
TR	VOLTAGE TRANSFORMER		SONIC INDICATOR	F.	FUSE
TA	CURRENT TRANSFORMER	*	INDICATOR INSTRUMENT		CONTACT N.O.
M ~	MOTOR IN C.A.		SELECTOR SWITCH		CONTACT N.C.
	GROUND : GENERAL SYMBOL	52.	SWITCH		COMMUTATION CONTACT
L..	SIGNAL LAMP	52.	AUTOMATIC CIRCUIT BREAKER	P	CONTACT ACTUATED BY A PRESSURE
L..	SIGNAL LAMP + HEATER	52. Id	DIFFERENTIAL AUTOMATIC BREAKER		CONTACT ACTUATED BY A FLOW
L..	SIGNAL LAMP + VOLTAGE TRANSF.	89.	DISCONNECTING SWITCH		CONTACT ACTUATED BY A LEVEL
	SIGNAL LAMP–PUSH BUTTON	89.	LOADED CIRCUIT BREAKER	θ	CONTACT ACTUATED BY A TEMPERATURE
	CLOSING BUTTON	89.	FUSE DISCONNECTING SWITCH	2 3 4	TERMINAL STRIP
	OPENING BUTTON	6.	CONTACTOR		SQUARE POWER TERMINAL CLAMP
	ROTARY SWITCH	6..	CONTACTOR COIL		SQUARE AUX. TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.O.		AUXILIARY RELAY COIL		REMOTE TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.C.	T..	TIMER WITH DELAY TO THE ATTRACTION		ONE–PHASE SYSTEM + NEUTRAL
T..	CONTACT DELAYED TO THE RE–DROP N.O.	T..	TIMER WITH DELAY TO THE RE–DROP		THREE–PHASE SYSTEM
T..	CONTACT DELAYED TO THE RE–DROP N.C.	49..	THERMAL RELAY		THREE–PHASE SYSTEM + NEUTRAL
79.	LIMIT SWITCH N.O.		HEATING ELEMENT		
79.	LIMIT SWITCH N.C.		ELECTROVALVE		

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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BASE LOAD POWER HUB (BLPH)
B–300AC UPS EQUIPMENT ROOM

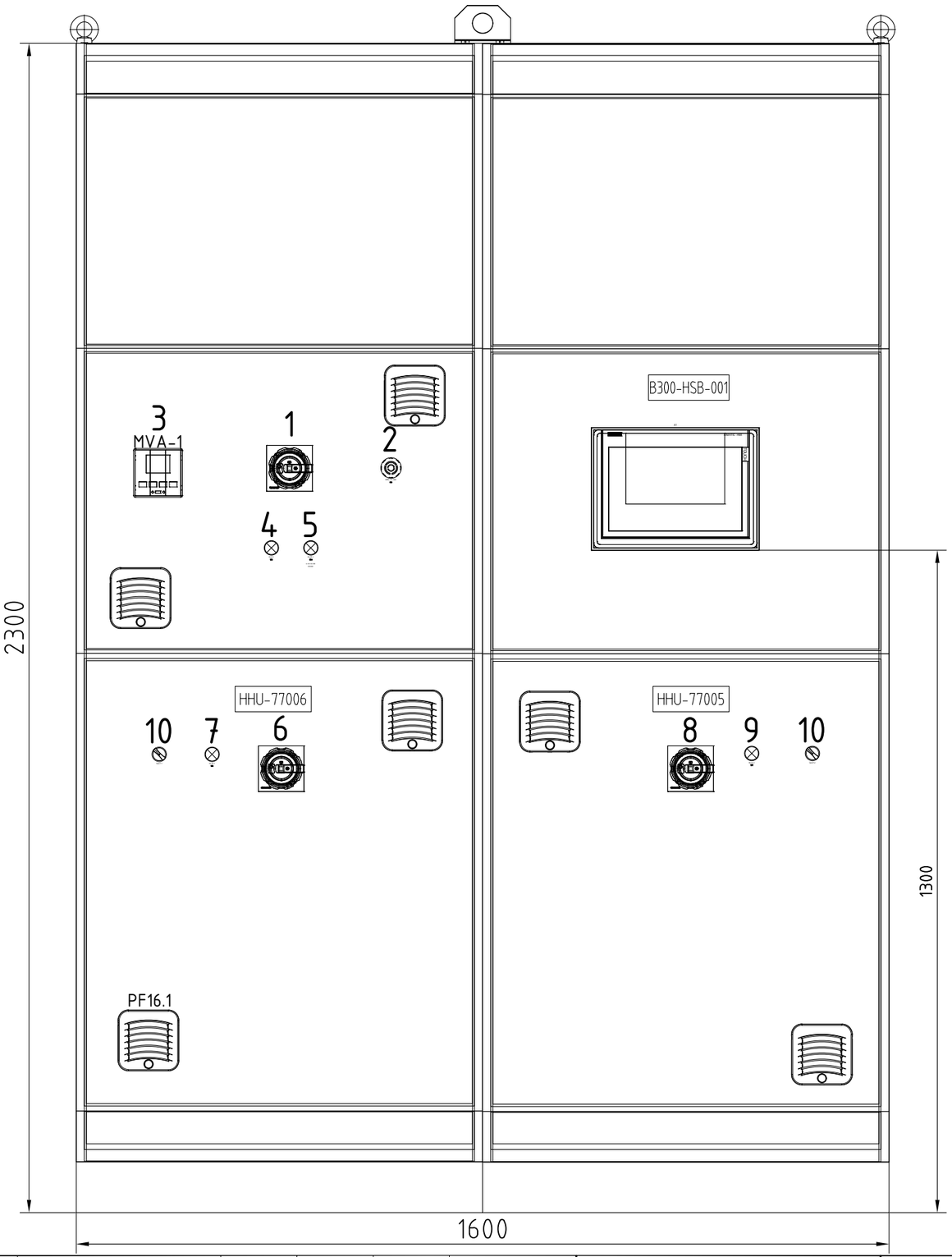
SIMBOL LIST

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 3
F.S. 4

EXTERNAL VIEW



LABEL	
1	MAIN SWITCH
2	ERGENCY POWER BUTTON
3	MULTIMETER
4	230V AC PRESENCE
5	24V DC PRESENCE
6	HHU-77006 MAIN SWITCH
7	230VAC PRESENCE
8	HHU-77005 MAIN SWITCH
9	230VAC PRESENCE
10	AUTO-0-MANUAL

CABINET QUOTE:
LENGHT 1600mm
HEIGHT 2300mm
DEPT 600mm

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SERIAL n.: *Matricola n.:*	1628
TAG: *Codice identificativo:*	B300-HSB-001
POWER SUPPLY: *Alimenatzione:*	400 Vac 50Hz 3Ph+N
Icc: *Coorente cortocircuito:*	25 kA/1s
AUX. TENSION: *Tensione ausiliaria:*	24 Vdc
INTERNAL PROTECTION: *Protezione interna:*	IP54
MAIN BUS BAR RATING: *Barra principale:*	32 A
YEAR OF MANUFACTURE: *Anno produzione:*	2024
MANUFACTURER: *Costruzione:*	FRIGOTERMICA s.r.l.
CONTRACT n.: *Contratto:*	51/240554
PROJECT: *Progetto:*	BASE LOAD POWER HUB
WEIGHT: *Peso:*	1150 Kg

CE

FRIGOTERMICA JOB NUMBER: 4112

SCALE 1:10

REV.	MODIFICA	DATA	FIRMA		
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

EXTERNAL VIEW

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 4
F.S. 5

INTERNAL VIEW

CABLE ENTRY FROM TOP
WITH CABLE GLANDS

PLATE 700 x 470

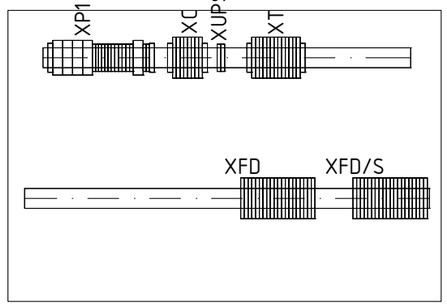


PLATE 700 x 470_2

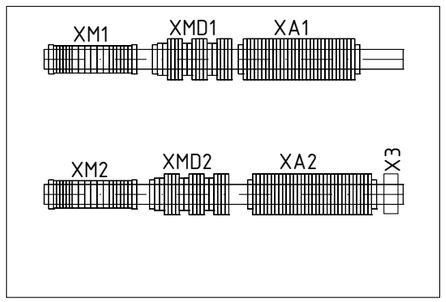


PLATE 700 x 570

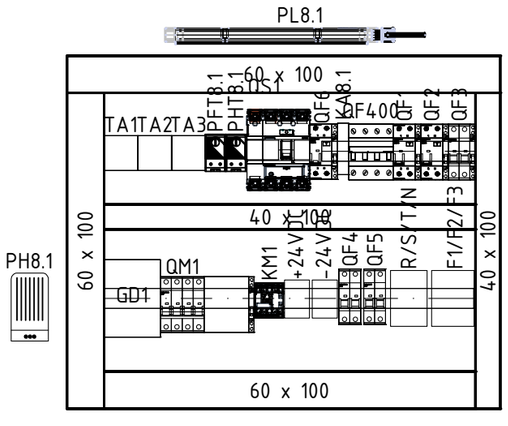


PLATE 700 x 570_2

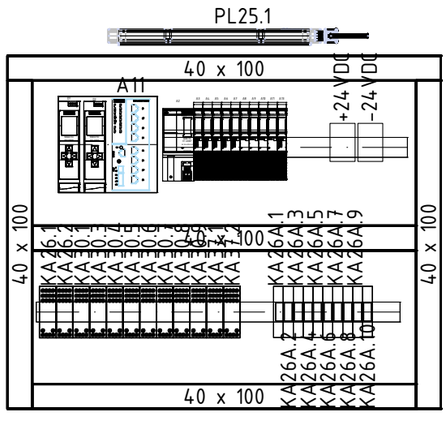


PLATE 700 x 870_2

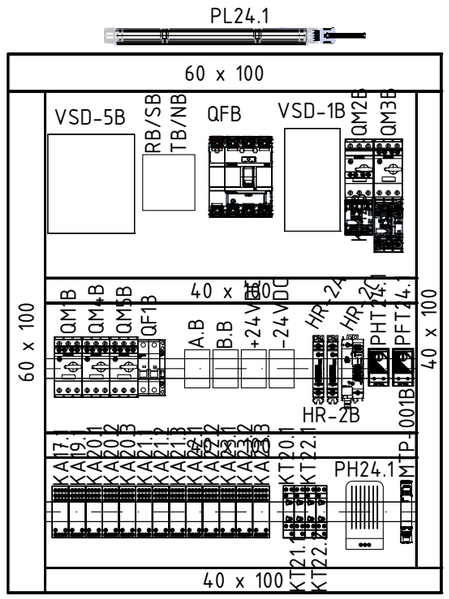
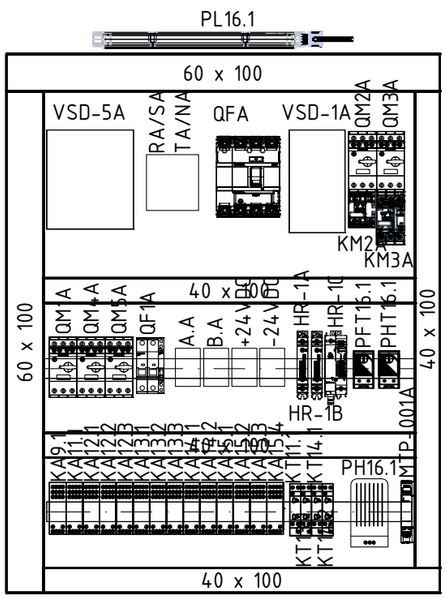


PLATE 700 x 870



SCALE 1:10

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

INTERNAL VIEW

ROSETTI MARINO

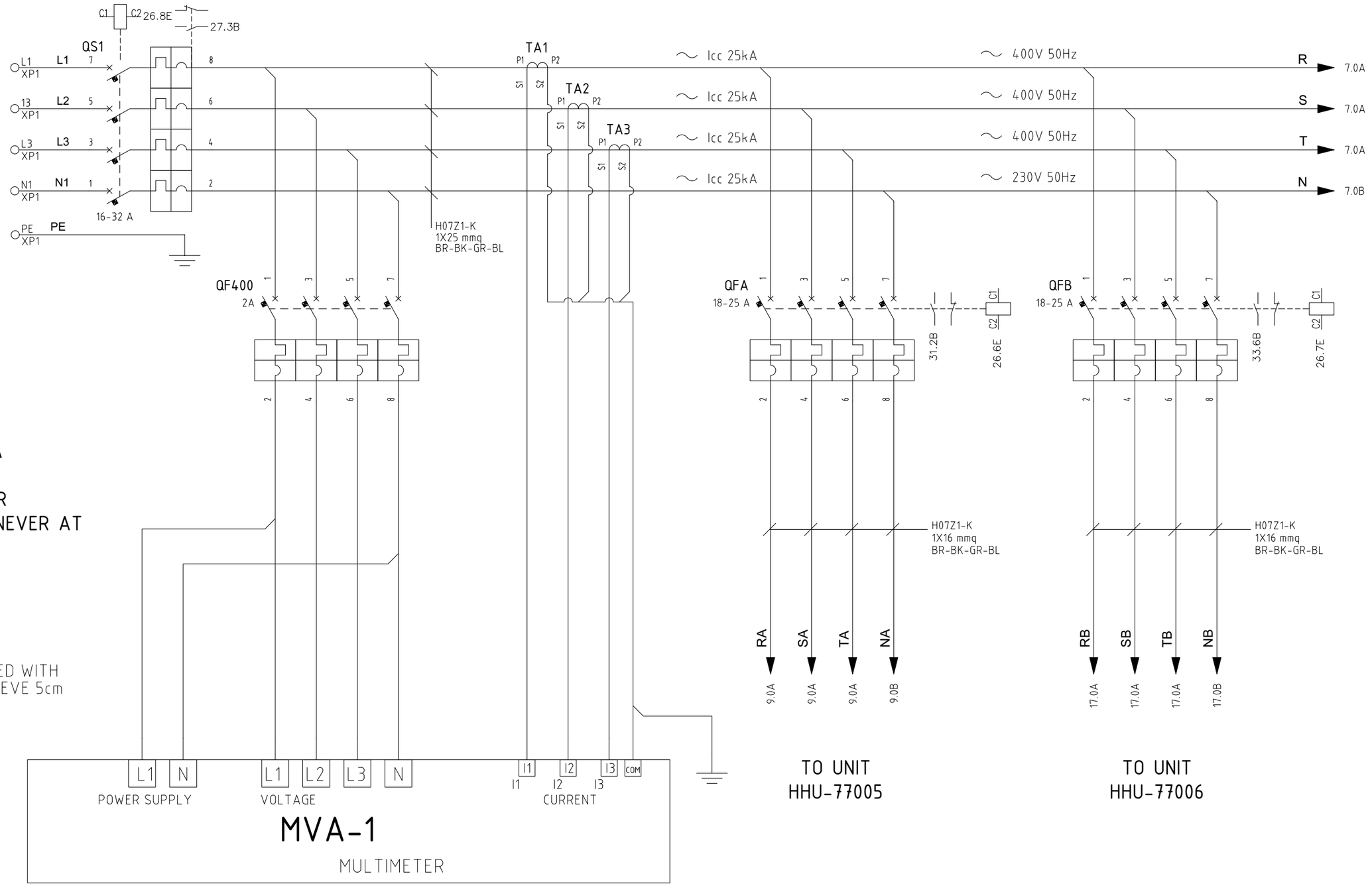
1724000049-HV-DA-00028

FG. 5
F.S. 6

CLIENT POWER SUPPLY
FROM LV SWITCHGEAR
3 PH + N + PE
400V 50Hz
5G25
TAG SG-200N1

RATED POWER: 15.13 kW
RATED CURRENT: 24.75 A

ONLY UNIT HHU-77005 OR
HHU-77006 ACTIVATED, NEVER AT
SAME TIME



TO UNIT
HHU-77005

TO UNIT
HHU-77006

COLOR IDENTIFICATION:
COLORED CABLE OR IDENTIFIED WITH
HEAT SHRINK COLOURED SLEEVE 5cm

400V 3P + N
- ⟶ BROWN
- ⟶ BLACK
- ⟶ GRAY
- ⟶ BLU

230V 1P + N
- ⟶ BROWN
- ⟶ BLU

24Vdc
- ⟶ RED
- ⟶ BLACK

PANEL INTERNAL CABLES TYPE: H07Z1-K OR FG17
UNIT INTERNAL CABLES TYPE: FG160M16 GREEN SHEATH NOT ARMOURED

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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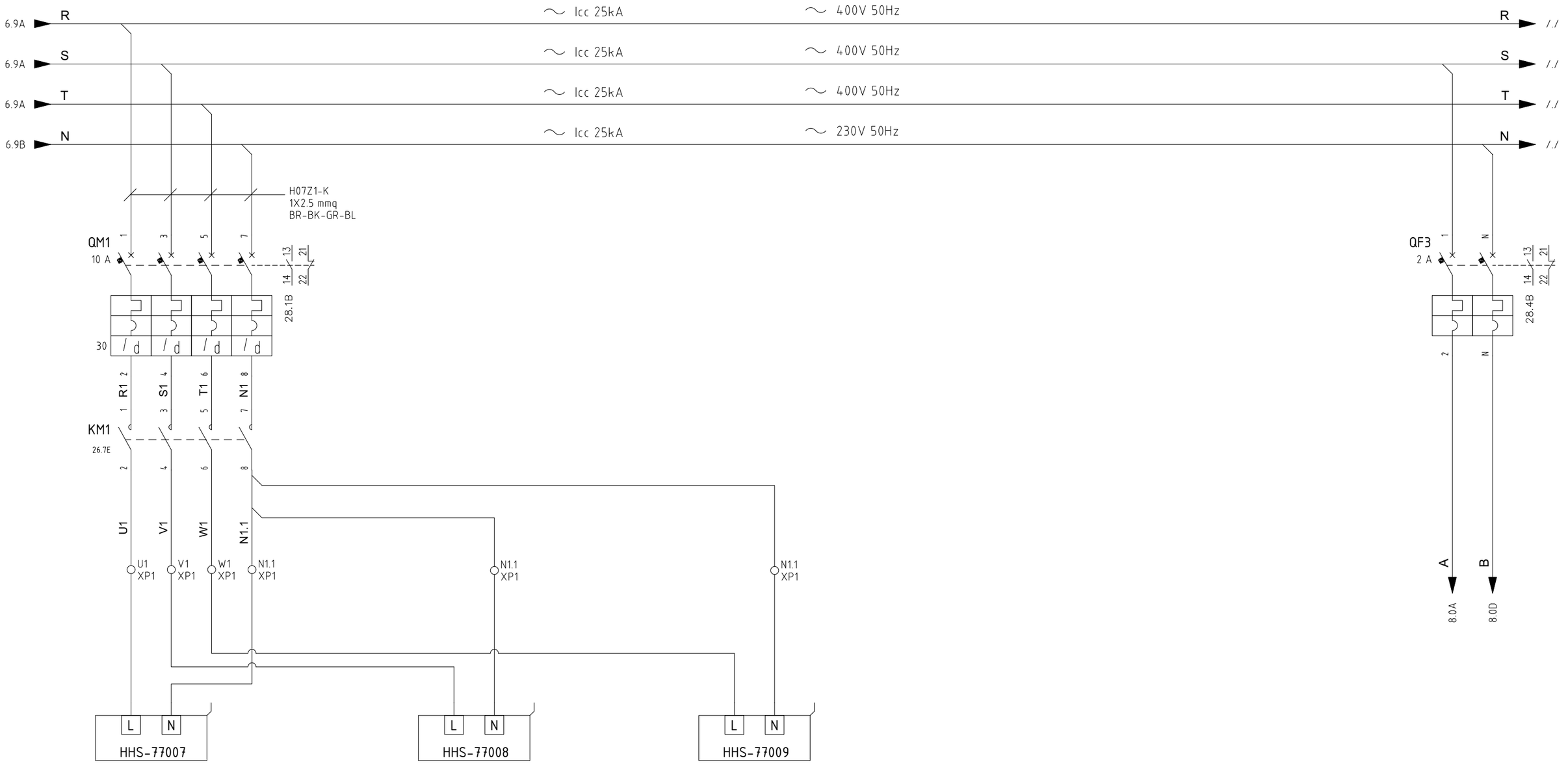
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
POWER SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 6
F.S. 7



HHS-77-007	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HSS-77-008	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HSS-77-009	
ELECTRICAL HEATER	
RATED	ABSORBED
2.7 kW	2 kW
8.7 A	8.7 A

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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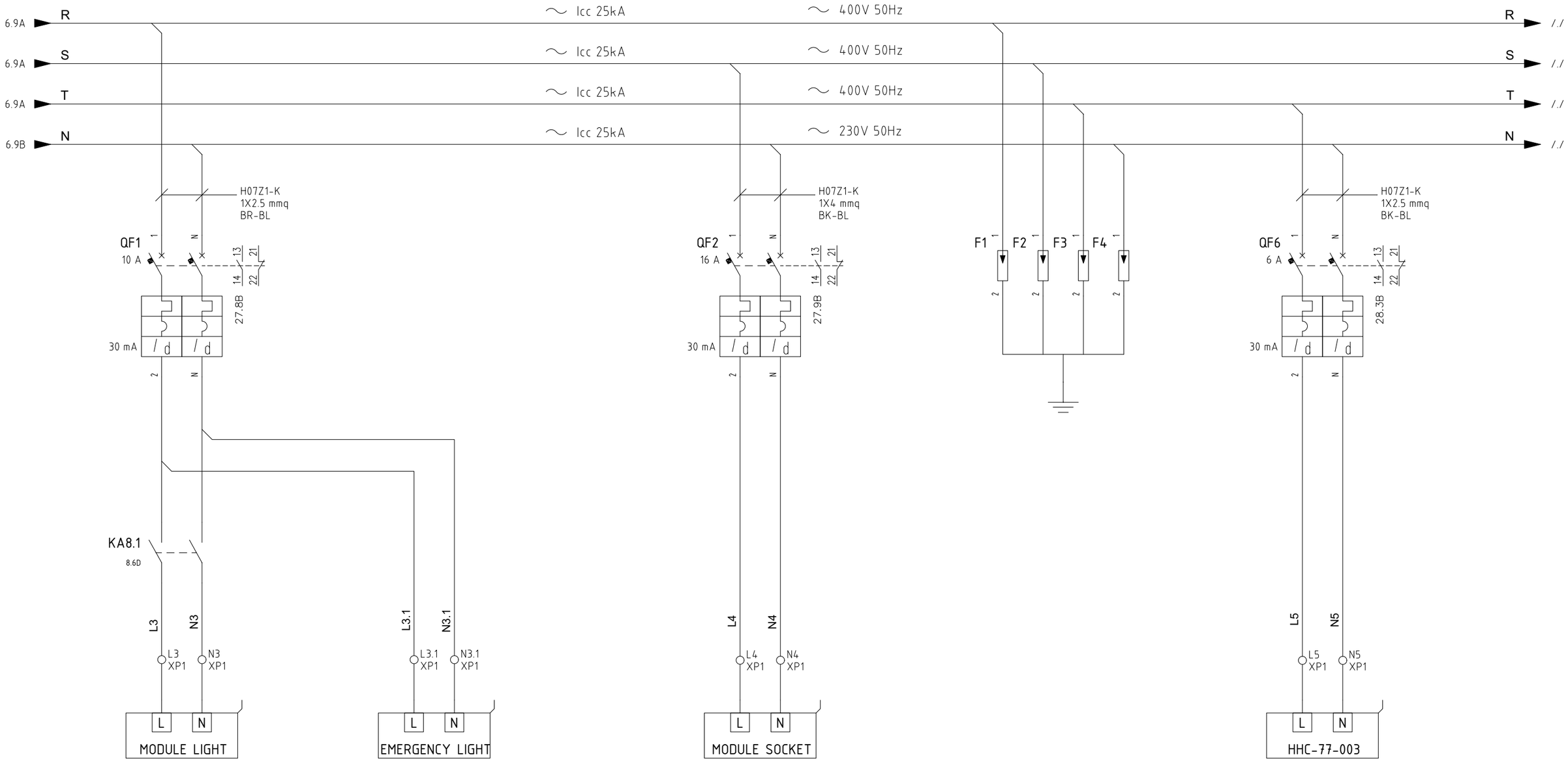
BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

POWER SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 7
F.S. 7A



MODULE INTERNAL LIGHT	
RATED	ABSORBED
1 kW	0.9 kW
4.35 A	3.9 A

MODULE INTERNAL SOCKET	
RATED	ABSORBED
3.5 kW	3.5 kW
16 A	16 A

HHC-77-003	
HEATING CABLE	
RATED	ABSORBED
0.25 kW	0.25 kW
1.2 A	1.2 A

REV.	MODIFICA	DATA	FIRMA
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DISEGN.	F.M.
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

POWER SECTION
Power section

ROSETTI MARINO

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FG. 7A
F.S. 8

PANEL INTERNAL LIGHT POWER SECTION

PANEL ANTI CONDENSING HEATER POWER SECTION

PANEL FAN VENTILATION POWER SECTION

230V VOLTAGE PRESENCE LIGHT POWER SECTION

MODULE LIGHT

7.7D A

A ./.

PLS8.1 13 14 8.1

PL8.1 X1 X2

PHT8.1 13 14 8.2

t<

PH8.1

PFT8.1 13 14 8.3

t>

PF8.1

M 1~ A1

HL8.1 X1 X2 WH

KA26.2 11 14 12 8.4

26.5E

KA8.1 A1 A2

7.8D B

B ./.

7A.1D
7A.1D

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

POWER SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 8
F.S. 9

HHU-77005
SECTION

RATED POWER: 11 kW
RATED CURRENT: 18.81 A

ABSORBED POWER: 7.6 kW
ABSORBED CURRENT: 14.4 A

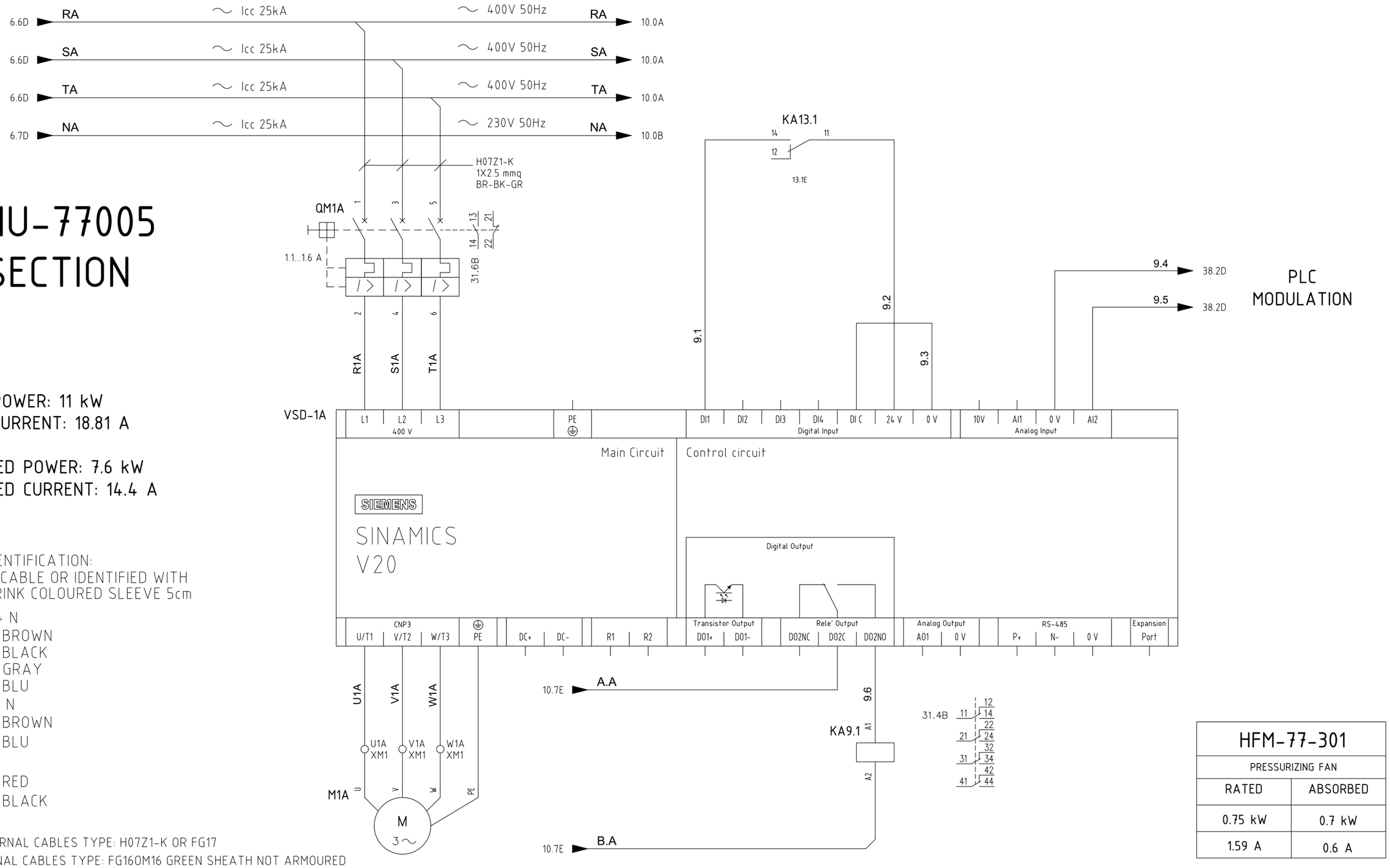
COLOR IDENTIFICATION:
COLORED CABLE OR IDENTIFIED WITH
HEAT SHRINK COLOURED SLEEVE 5cm

400V 3P + N
- ⟶ BROWN
- ⟶ BLACK
- ⟶ GRAY
- ⟶ BLU

230V 1P + N
- ⟶ BROWN
- ⟶ BLU

24Vdc
- ⟶ RED
- ⟶ BLACK

PANEL INTERNAL CABLES TYPE: H07Z1-K OR FG17
UNIT INTERNAL CABLES TYPE: FG160M16 GREEN SHEATH NOT ARMOURED



HFM-77-301	
PRESSURIZING FAN	
RATED	ABSORBED
0.75 kW	0.7 kW
1.59 A	0.6 A

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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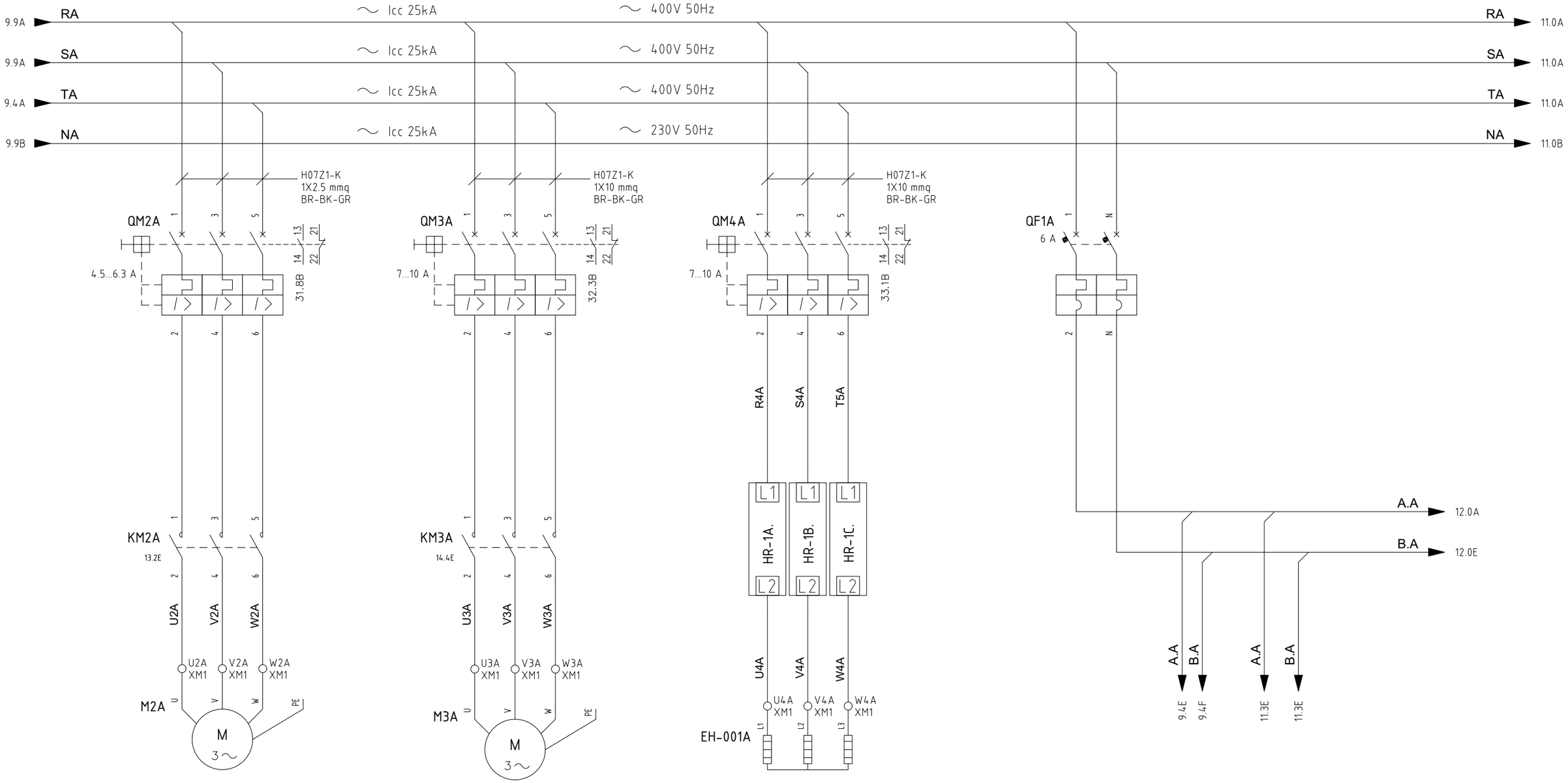
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
POWER SECTION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 9
F.S. 10



HFM-77-302	
SUPPLY FAN	
RATED	ABSORBED
3 kW	2.48 kW
6.35 A	4.21 A

HCO-77-301	
COMPRESSOR 1 A	
RATED	ABSORBED
5.8 kW	3.80 kW
9.86 A	7.3 A

HSS-77-301	
ELECTRICAL HEATER	
RATED	ABSORBED
6.00 kW	6.00 kW
8.67 A	8.67 A

REV.	MODIFICA	DATA	FIRMA		
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
POWER SECTION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 10
F.S. 11

10.9A RA ~ Icc 25kA ~ 400V 50Hz RA /./

10.9A SA ~ Icc 25kA ~ 400V 50Hz SA /./

10.9A TA ~ Icc 25kA ~ 400V 50Hz TA 42.4F

10.9B NA ~ Icc 25kA ~ 230V 50Hz NA /./

H07Z1-K
1X4 mmq
BR-BK-GR

QM5A

1 3 5 13 21
14 22

2.2...3.2 A

32.6B

2 4 6

R5A S5A T5A

KA15.2

14 11
12

15.4D

11.8 11.9 11.10 11.11

118 XA1

119 XA1

PTH-77-301

VSD-5A

L1	L2	L3		PE		DI1	DI2	DI3	DI4	DI C	24 V	0 V		10V	AI1	0 V	AI2
400 V						Digital Input								Analog Input			

Main Circuit | Control circuit

SIEMENS

SINAMICS
V20

Digital Output

CNP3								Transistor Output		Rele' Output			Analog Output		RS-485			Expansion
U/T1	V/T2	W/T3	PE	DC+	DC-	R1	R2	DO1+	DO1-	DO2NC	DO2C	DO2NO	AO1	0 V	P+	N-	0 V	Port

U5A.1 V5A.1 W5A.1

U5A.1 XM1 V5A.1 XM1 W5A.1 XM1

M5.1A U V W PE

M 3~

M5.2A U V W PE

M 3~

10.7E A.A

KA11.1 A1 A2

10.8E B.A

14.2B 11 12 14 22

32.7B 21 24 32 31 34 42 41 44

HFM-77-305	
CONDENSER FAN 1	
RATED	ABSORBED
0.37 kW	0.35 kW
1 A	0.6 A

HFM-77-306	
CONDENSER FAN 2	
RATED	ABSORBED
0.37 kW	0.35 kW
1 A	0.6 A

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

POWER SECTION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 11
F.S. 12

0	1	2	3	4	5	6	7	8	9
	START / STOP HHU-77005		MOTORISED DAMPER POWER SUPPLY		MOTORISED DAMPER OPEN SIGNAL HHU-77005	MOTORISED DAMPER CLOSED SIGNA HHU-77005		MOTORISED DAMPER NOT OPEN ALARM SIGNAL HHU-77005	

A.A — 10.8D — A.A — 13.0A

KA30.3 — 30.5D — 12 14 11

KA12.3 — 12.7E — 14 12 11

12.2

KA12.1 — 12.5E — 14 12 11

12.3

KT11.1 — A1 A2 — 120"

On–D 12.7B

HDZ-77-301: 1 XMD1, 2 XMD1 — M 1~ A1

HDZ-77-302: 7 XMD1, 8 XMD1 — M 1~ A1

HDZ-77303: 13 XMD1, 14 XMD1 — M 1~ A1

HDZ-77-301: 3 XMD1, 4 XMD1 — 13 14 11 12

HDZ-77-301: 5 XMD1, 6 XMD1 — 13 14 11 12

12.4

12.7

HDZ-77-302: 9 XMD1, 10 XMD1 — 13 14 11 12

HDZ-77-302: 11 XMD1, 12 XMD1 — 13 14 11 12

12.5

12.8

HDZ-77-303: 15 XMD1, 16 XMD1 — 13 14 11 12

HDZ-77-303: 17 XMD1, 18 XMD1 — 13 14 11 12

12.6

KA12.1 — A1 A2

12.9

KA12.2 — A1 A2

KA12.3 — A1 A2

12.10

KA12.3 — 12.7E — 21 24 22

Delay/Ritardo

KT11.1 — 12.1E

12.11

KA37.1 — 37.2D — 14 12 11

B.A — 10.8D — B.A — 13.0E

12.1C 11 12 14
13.1B 21 22 24
13.2B 31 32 34
31.2B 41 42 44

31.2B 11 12 14
21 22 24
31 32 34
41 42 44

12.1C 11 12 14
12.8B 21 22 24
28.5B 31 32 34
41 42 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

AUX SECTION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 12
F.S. 13

0	1	2	3	4	5	6	7	8	9
	PRESSURIZING FAN START / STOP HH-77005	SUPPLY AIR FAN START/STOP HH-77005		SUPPLY AIR FAN BROKEN BELT ALARM HHU-77005		SUPPLY AIR FAN MOTOR HEATER HHU-77005		PRESSURIZIN FAN OVERLOAD PROTECTION HHU-77005	

12.9A A.A — A.A 14.0A

KA12.1 21 24 22 — 12.5E
KA12.1 31 34 32 — 12.5E
KA37.1 21 24 22 — 37.2D
PDSL-77-301 13 14 — p>
100 XA1
101 XA1
KT13.1 — Delay/Ritardo — 13.3E
KM2A 21 22 — 13.2E
13.1
13.2
13.3
13.4
13.5
13.6
KA13.3 11 14 12 — 13.8E
KA13.2 11 14 12 — 13.4E
MTP-001A A1/11 SIEMENS
TRIPPED
NC NO
T1 T2 A2 12 14
13.7 13.8
102 XA1 103 XA1
TE-77-301
13.9
HSS-77-303
106 XA1
107 XA1
KA13.1 A1 A2
KM2A A1 A2
KT13.1 A1 A2
KA13.2 A1 A2
KA13.3 A1 A2

12.9E B.A — B.A 14.0E

9.5B 11 14 12 / 21 24 22 / 31 34 32 / 41 44
10.1D 2 1
10.1D 4 3
10.1D 6 5
14.1B 14 13
31.7B 44 43
13.5B 22 21 / 32 31
13.4B On-D
13.4C 11 14 12 / 29.4B 21 24 22 / 31 34 32 / 41 44
13.1C 11 14 12 / 21 24 22 / 29.1B 31 34 32 / 41 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
AUX SECTION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 13
F.S. 14

PRESSURIZING FAN NìMOTOR HEATER
HHU-77005

COMPRESSOR START/STOP
HHU-77005

LOW PRESSURE ALARM
HHU-77005

HIGH PRESSURE ALARM
HHU-77005

COMPRESSOR OIL HEATER
HHU-77005

13.9A A.A

A.A 15.0A

KA30.4
30.6D

KA30.5
35.6D
PLC START

KM2A
13.2E

KA14.1
14.5E

KA14.2
14.7E

KA11.1
11.4E

KT14.1
14.2E
Delay/Ritardo

PSL-77-301

PSH-77-301

KA14.1
14.5E

KT14.2
14.4E
Delay/Ritardo

KA37.1
37.2D

KA14.2
14.7E

KA37.1
37.2D

KM3A
14.4E

HSS-77-302

HSS-77-304

KT14.1
120"

KM3A

KT14.2
10"

KA14.1

KA14.2

13.9E B.A

B.A 15.0E

On–D 14.4B

On–D 14.5C

10.3D 2 1
10.3D 4 3
10.3D 6 5
15.1B 14 13
32.2B 44 43
14.8B 22 21
32 31

14.2C 11 12 14
14.6B 21 22 24
32.5B 31 32 34
41 42 44

14.2D 11 12 14
14.8B 21 22 24
32.4B 31 32 34
41 42 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
AUX SECTION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 14
F.S. 15

SOLENOID VALVE HHU-77005	FILTER CLOGGED HHU-77005	CONDENSING PRESSURE SWITCH HHU-77005	ELECTRICAL HEATER SECURITY THERMOSTATE HHU-77005	PRESSURIZING FAN LOW PRESSURE SWITCH PDSL-77-302 HHU-77005

14.9A A.A

A.A 16.0A

KM3A
14.4E
13
14
15.1

PDSH-77-301
p>
13
14
114 XA1
115 XA1
15.2

PC-77-301
p>
13
14
116 XA1
117 XA1
15.3

TSH-77-301
t>
11
12
120 XA1
121 XA1
15.4

TSHH-77-301
t>
11
12
122 XA1
123 XA1
15.5

PDSL-77-302
p>
11
12
128 XA1
129 XA1
15.6

HSV-77-301
A1
A2
112 XA1
113 XA1

KA15.1 A1 A2

KA15.2 A1 A2

KA15.3 A1 A2

KA15.4 A1 A2

14.9E B.A

B.A 16.0E

32.8B 11 12 14 21 22 24 31 32 34 41 42 44

11.3B 11 12 14 21 22 24 31 32 34 41 42 44

32.8B 11 12 14 21 22 24 31 32 34 41 42 44

27.2B 11 12 14 21 22 24 31 32 34 41 42 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
AUX SECTION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 15
F.S. 16

PANEL INTERNAL LIGHT	PANEL FAN	PANEL HEATER	230V AUX VOLTAGE PRESENCE
HHU-77005	HHU-77005	HHU-77005	HHU-77005

15.9A A.A

A.A /./

PLS16.1 11 12 16.1

PFT16.1 13 14 16.2 t>

PHT16.1 13 14 16.3 t<

PL16.1 X1 X2

PF16.1 M 1~ A1

PH16.1

HL16.1 X1 X2 WH

15.9E B.A

B.A /./

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

AUX SECTION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 16
F.S. 17

HHU-77006
SECTION

RATED POWER: 11 kW
RATED CURRENT: 18.81 A

ABSORBED POWER: 7.6 kW
ABSORBED CURRENT: 14 A

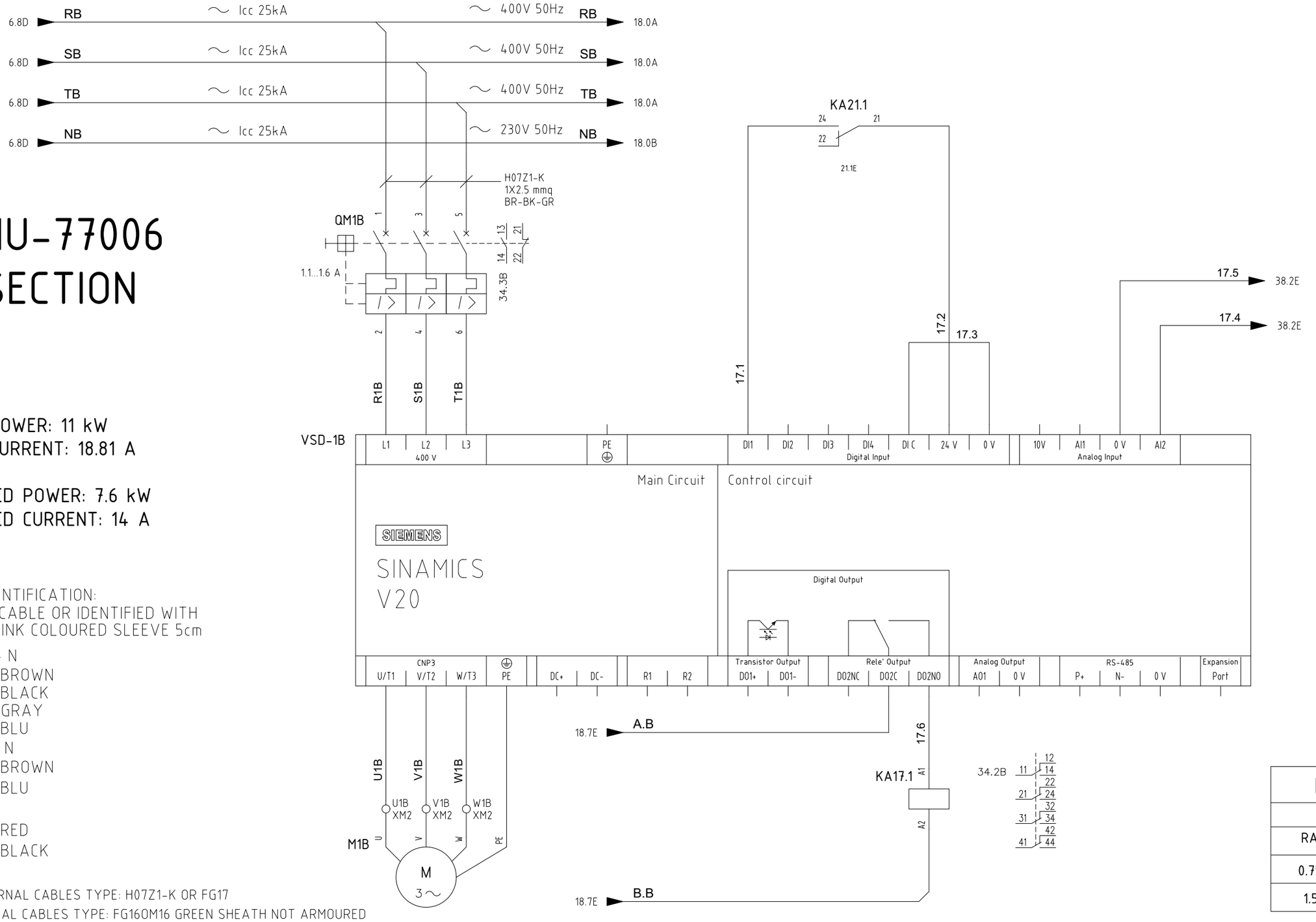
COLOR IDENTIFICATION:
COLORED CABLE OR IDENTIFIED WITH
HEAT SHRINK COLOURED SLEEVE 5cm

400V 3P + N
- ⟶ BROWN
- ⟶ BLACK
- ⟶ GRAY
- ⟶ BLU

230V 1P + N
- ⟶ BROWN
- ⟶ BLU

24Vdc
- ⟶ RED
- ⟶ BLACK

PANEL INTERNAL CABLES TYPE: H07Z1-K OR FG17
UNIT INTERNAL CABLES TYPE: FG160M16 GREEN SHEATH NOT ARMOURED



HFM-77-303	
PRESSURIZING FAN	
RATED	ABSORBED
0.75 kW	0.7 kW
1.59 A	0.6 A

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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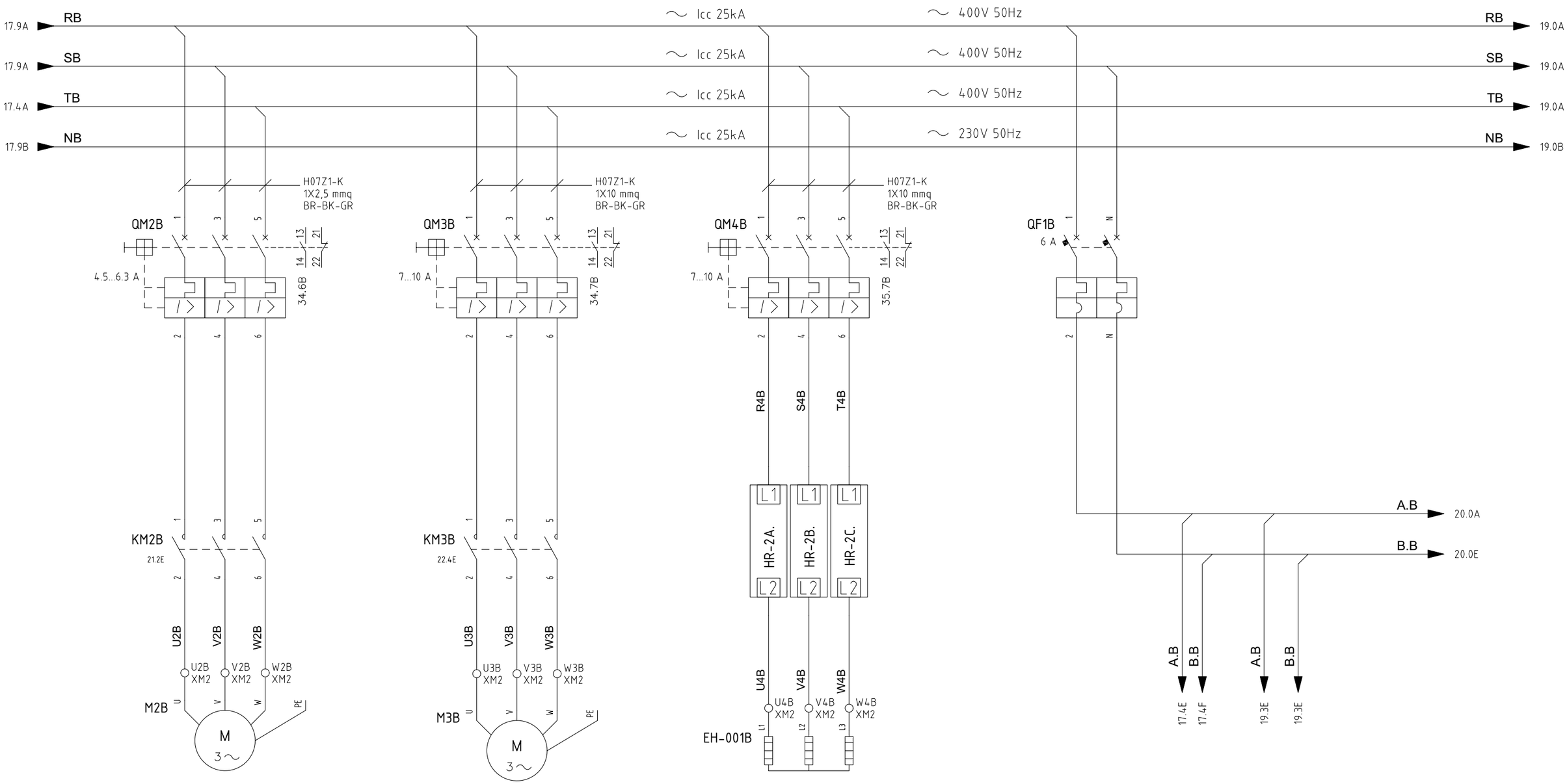
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
POWER SECTION B

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 17
F.S. 18



HFM-77-304	
SUPPLY FAN	
RATED	ABSORBED
3.00 kW	2.48 kW
5.10 A	4.21 A

HCO-77-302	
COMPRESSOR 1 A	
RATED	ABSORBED
5.8 kW	3.80 kW
9.86 A	7.30 A

HHS-77-305	
ELECTRICAL HEATER	
RATED	ABSORBED
6.00 kW	6.00 kW
8.67 A	8.67 A

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
				APPR.	M.G.

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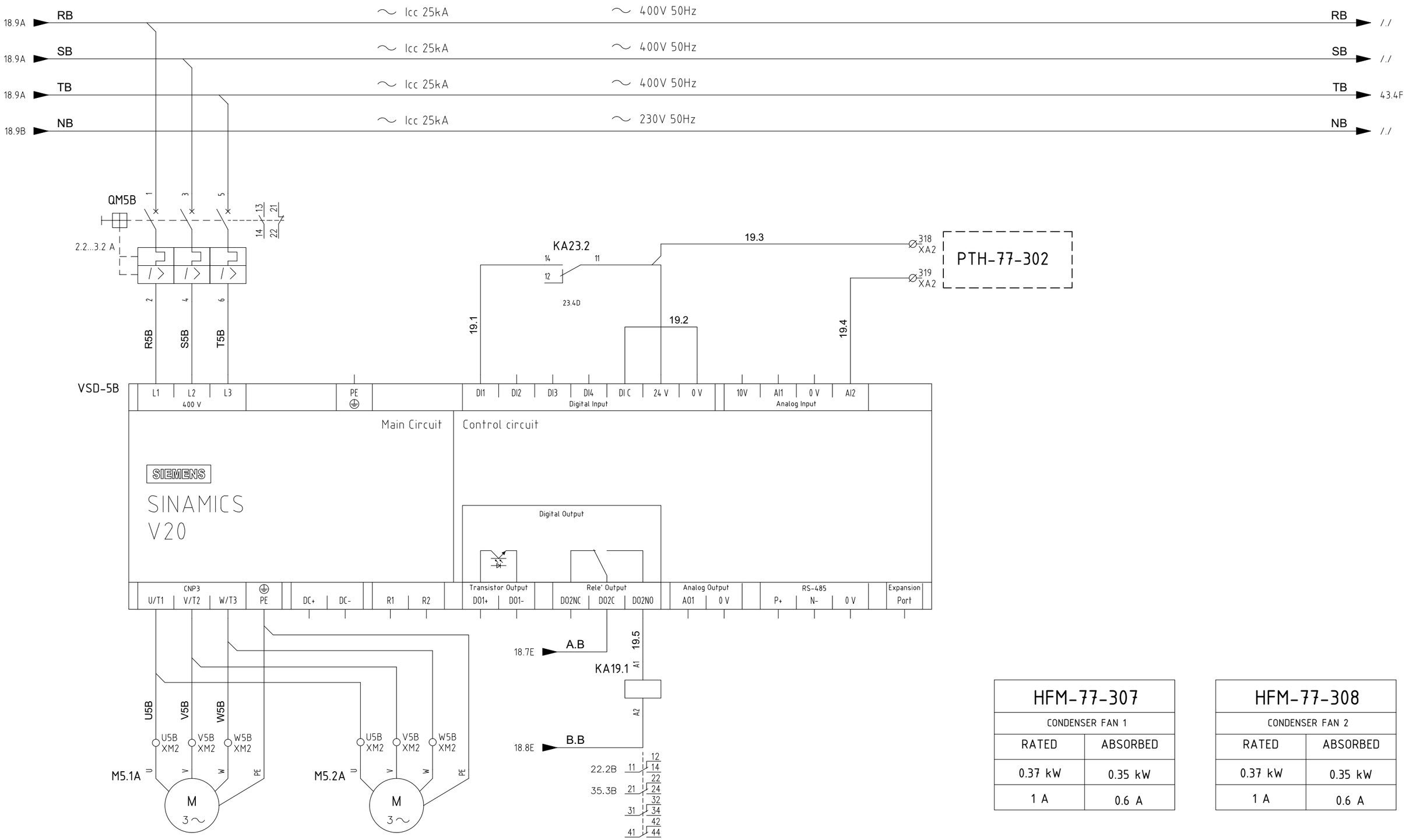
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
POWER SECTION B

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 18
F.S. 19



HFM-77-307	
CONDENSER FAN 1	
RATED	ABSORBED
0.37 kW	0.35 kW
1 A	0.6 A

HFM-77-308	
CONDENSER FAN 2	
RATED	ABSORBED
0.37 kW	0.35 kW
1 A	0.6 A

REV.	MODIFICA	DATA	FIRMA	APPR.	
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
POWER SECTION B

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 19
F.S. 20

START / STOP HHU-77006	MOTORISED DAMPER POWER SUPPLY	MOTORISED DAMPER OPEN SIGNAL HHU-77006	MOTORISED DAMPER CLOSED SIGNA HHU-77006	MOTORISED DAMPER NOT OPEN ALARM SIGNAL HHU-77006

18.8D A.B

A.B 21.0A

KA30.6
35.7D
UNIT B
START FROM PLC
12 14
11
20.1
11
KA20.3
20.7E
14 12
20.3
11
KA20.1
20.5E
14 12
KT20.1 A1 20.4 A2
120"
On–D 20.7B

200 XMD2
HDZ-77-304
M 1~ A1
201 XMD2

206 XMD2
HDZ-77-305
M 1~ A1
207 XMD2

212 XMD2
HDZ-77-306
M 1~ A1
213 XMD2

202 XMD2 — 204 XMD2
HDZ-77-304 — HDZ-77-304
203 XMD2 — 205 XMD2
20.5 — 20.8
208 XMD2 — 210 XMD2
HDZ-77-305 — HDZ-77-305
209 XMD2 — 211 XMD2
20.6 — 20.9
214 XMD2 — 216 XMD2
HDZ-77-306 — HDZ-77-306
215 XMD2 — 217 XMD2
KA20.1 A1 20.7 A2
KA20.2 A1 20.10 A2
KA20.3 A1 A2

KA20.3
20.7E
21
24 22
20.11
11
KA37.2
37.3D
14 12
20.12
Delay/Ritardo
KT20.1
20.1E

18.8D B.B

B.B 21.0E

20.1C 11 12 14
21.1B 21 22 24
33.7B 31 32 34
41 42 44

33.7B 11 12 14
21 22 24
31 32 34
41 42 44

20.1C 11 12 14
20.8B 21 22 24
33.6B 31 32 34
41 42 44

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
AUX SECTION B

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 20
F.S. 21

1	2	3	4	5	6	7	8	9
PRESSURIZING FAN START / STOP HHU-77006	SUPPLY AIR FAN START/STOP HHU-77006		SUPPLY AIR FAN BROKEN BELT ALARM HHU-77006	SUPPLY AIR FAN MOTOR HEATER HHU-77006		PRESSURIZIN FAN OVERLOAD PROTECTION HHU-77006		

20.9A A.B

A.B 22.0A

KA20.1 21 24 22 — 20.5E

21.1

KA21.3 11 14 12 — 21.8E

21.2

KA21.1 A1 A2

KA21.1 11 14 12 — 21.1E

21.3

KM2B A1 A2

300 XA2

PDSL-77-302 13 14 p>

301 XA2

KA37.2 21 24 22 — 37.3D

21.12

KT21.1 A1 A2

KA21.2 21 24 22 — 21.4E

21.4

Delay/Ritardo

KT21.1 — 21.3E

KM2B 21 22 — 21.2E

21.5

306 XA2

HSS-77-307

307 XA2

MTP-001B A1/11 + -

SIEMENS

TRIPPED

NC NO

T1 T2 A2 12 14

21.6 21.7

302 XA2 303 XA2

TE-77-302

21.8

KA21.3 A1 A2

20.9E B.B

B.B 22.0E

21.2B 11 12 14 21 22 24 31 32 34 41 42 44 — 17.5B

18.1D 2 1

18.1D 4 3

18.1D 6 5

22.1B 14 13

34.4B 44 43

21.5B 22 21 32 31

21.4B On–D

34.4B 11 12 14 21 22 24 31 32 34 41 42 44 — 21.4C

21.1C 11 12 14 21 22 24 31 32 34 41 42 44 — 33.8B

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

AUX SECTION B

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 21
F.S. 22

0	1	2	3	4	5	6	7	8	9

PRESSURIZING FAN MOTOR HEATER
HHU-77006

COMPRESSOR START/STOP
HHU-77006

LOW PRESSURE ALARM
HHU-77006

HIGH PRESSURE ALARM
HHU-77006

COMPRESSOR OIL HEATER
HHU-77006

21.9A A.B

A.B 23.0A

KA30.7
30.8D

KA30.8
30.9D

KM2B
21.2E

KA22.1
22.5E

KA22.2
22.7E

KA19.1
19.4E

KT22.1
22.2E
Delay/Ritardo

PSL-77-302

PSH-77-302

KA22.1
22.5E

KT22.2
22.4E
Delay/Ritardo

KA37.2
37.3D

KA22.2
22.7E

KA37.2
37.3D

KM3B
22.4E

22.1 22.2 22.3 22.4 22.5 22.6 22.7 22.8 22.9 22.10 22.11 22.12 22.13

HSS-77-306

KT22.1 120"

KM3B

KT22.2 10"

KA22.1

KA22.2

HSS-77-308

21.9E B.B

B.B 23.0E

On-D 14.4B

On-D 14.5C

18.3D 2 1
18.3D 4 3
18.3D 6 5
23.1B 14 13
34.7B 44 43
22.8B 22 21
32 31

22.2C 11 12 14
22.6B 21 22 24
35.2B 31 32 34
41 42 44

22.2D 11 12 14
22.8B 21 22 24
34.8B 31 32 34
41 42 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
AUX SECTION B

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 22
F.S. 23

1	3	4	6	8
SOLENOID VALVE HHU-77006	FILTER CLOGGED HHU-77006	CONDENSING PRESSURE SWITCH HHU-77006	ELECTRICAL HEATER SECURITY THERMOSTATE HHU-77006	PRESSURIZING FAN LOW PRESSURE SWITCH PDSL-77-304 HHU-77006

22.9A A.B

A.B 24.0A

KM3B 22.4E

PDSH-77-303

PC-77-302

TSH-77-302

PDSL-77-304

TSHH-77-302

HSV-77-302

KA23.1

KA23.2

KA23.3

KA23.4

23.1 23.2 23.3 23.4 23.5 23.6

22.9E B.B

B.B 24.0E

35.4B 19.3B 35.6B 34.7B

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
AUX SECTION B

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 23
F.S. 24

PANEL INTERNAL LIGHT	PANEL FAN	PANEL HEATER	230V AUX VOLTAGE PRESENCE
HHU-77006	HHU-77006	HHU-77006	HHU-77006

23.9A A.B

A.B /./

PLS24.1 11 12

PFT24.1 13 14 t>

PHT24.1 13 14 t<

PF24.1 M 1~ A1

PL24.1 X1 X2

PH24.1

HL24.1 X1 X2 WH

23.9E B.B

B.B /./

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

AUX SECTION B

ROSETTI MARINO

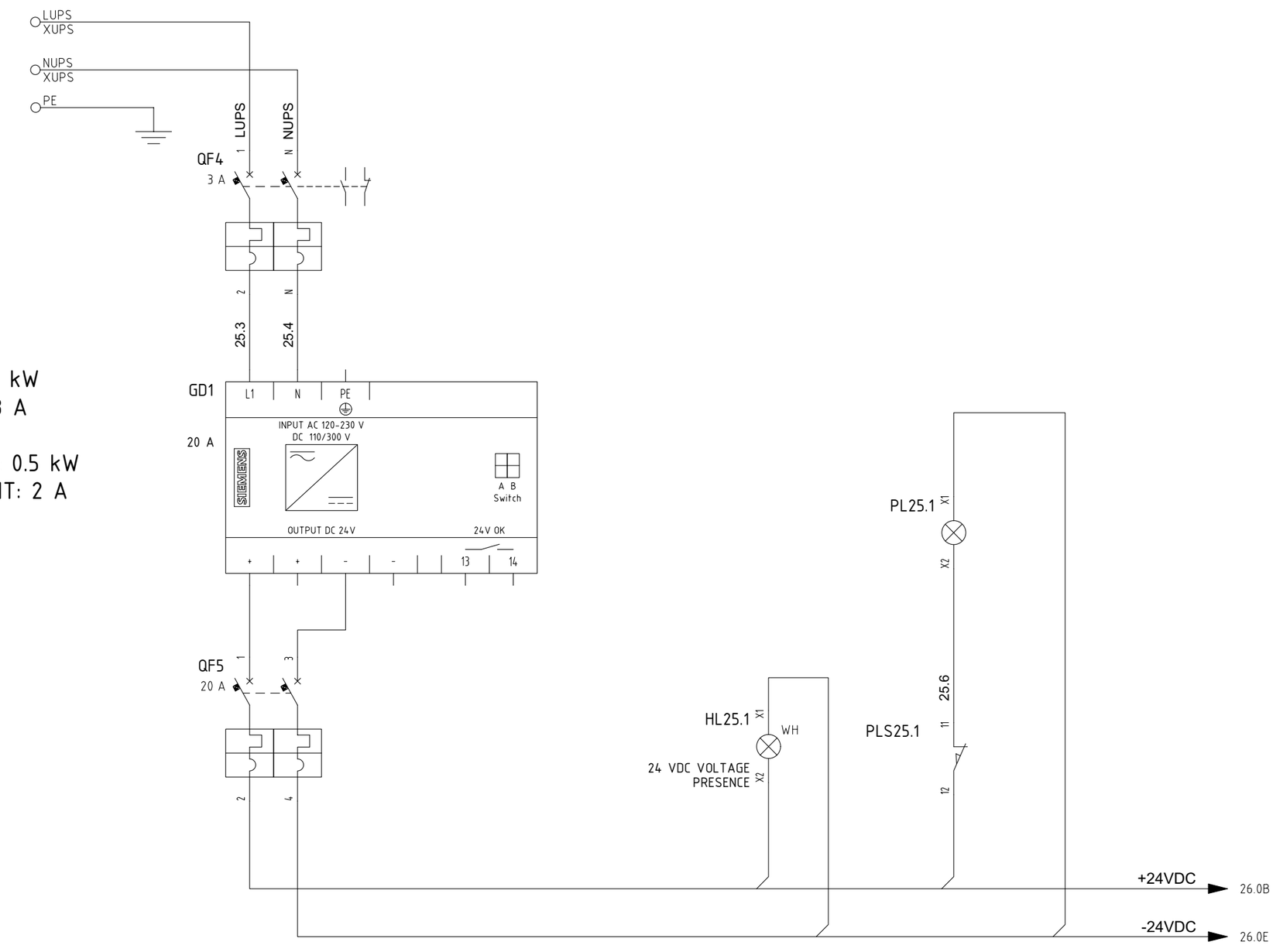
1724000049-HV-DA-00028

FG. 24
F.S. 25

POWER SUPPLY
FROM
AC UPS - PAS DB
1PH + N + PE
230V 50Hz
3G4
TAD DP200-F3

RATED POWER: 0.7 kW
RATED CURRENT: 3 A

ABSORBED POWER: 0.5 kW
ABSORBED CURRENT: 2 A



REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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CLIENT:
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

UPS POWER SUPPLY

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 25
F.S. 26

SHUT DOWN FROM CUSTOMER SIS	PANEL EMERGENCY BUTTON LIGHT	HHS-77-007/8/9 SPACE HEATER START / STOP COMMAND	MODULE LIGHT	HPB-77-301 EMERGENCY POWER BUTTON HHU-77005	HPB-77-302 EMERGENCY POWER BUTTON HHU-77006	HPB-77-303 EMERGENCY POWER BUTTON B300-HSB-001

25.7E +24VDC → +24VDC 26A.0A

24V DC
FROM SIS
B400-SIS-0901
1= OK
0= SHUT
DOWN

500 XC — 26.1 — KA26.1 A1 — A2 — 26.2 — 501 XC

27.1B: 11-14, 21-24, 31-34, 41-44

HPB-77-303 33-34 26.8B → 26.3

KA30.9 11-12 30.3D → 26.4

504 XC — LIGHT PUSH BUTTON — 506 XC → 26.5

505 XC — 507 XC

HPB-77-301 104 XA1 — 13-14 — 31.1B — 105 XA1 → 26.6

HPB-77-302 304 XA2 — 13-14 — 33.5B — 305 XA2 → 26.7

HPB-77-303 13-14 RD X1 X2 → 26.8

EPB-002L X1 RD X2 → 26.3

KM1 A1 — A2 → 26.4

KA26.2 A1 — A2 → 26.5

QFA C1 — 6.6B — U> — C2 → 26.6

QFB C1 — 6.8B — U> — C2 → 26.7

QS1 C1 — 6.2B — U> — C2 → 26.8

25.7E -24VDC → -24VDC 26A.0E

7.0D 2-1
7.0D 4-3
7.0D 6-5
7.0D 8-7
28.2B 54-53, 62-61, 72-71, 84-83

8.6B 11-12, 21-22, 31-32, 41-42

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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				APPR.	M.G.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 26
F.S. 26A

HFD-77007
CLOSED FEEDBACK

HFD-77008
CLOSED FEEDBACK

HFD-77009
CLOSED FEEDBACK

HFD-77010
CLOSED FEEDBACK

HFD-77011
CLOSED FEEDBACK

HFD-77007
OPEN FEEDBACK

HFD-77008
OPEN FEEDBACK

HFD-77009
OPEN FEEDBACK

HFD-77010
OPEN FEEDBACK

HFD-77011
OPEN FEEDBACK

25.7E +24VDC

+24VDC 26A.0A

700 XFD
701 XFD
HFD-77007 11 12
702 XFD
703 XFD
HFD-77007 13 14

704 XFD
705 XFD
HFD-77008 11 12
706 XFD
707 XFD
HFD-77008 13 14

708 XFD
709 XFD
HFD-77009 11 12
710 XFD
711 XFD
HFD-77009 13 14

712 XFD
713 XFD
HFD-77010 11 12
714 XFD
715 XFD
HFD-77010 13 14

716 XFD
717 XFD
HFD-77011 11 12
718 XFD
719 XFD
HFD-77011 13 14

KA26A.1 A1 A2
KA26A.2 A1 A2
KA26A.3 A1 A2
KA26A.4 A1 A2
KA26A.5 A1 A2
KA26A.6 A1 A2
KA26A.7 A1 A2
KA26A.8 A1 A2
KA26A.9 A1 A2
KA26A.10 A1 A2

25.7E -24VDC

-24VDC 26A.0E

34.2B 11 12 14 22 21 24
44.2B

34.3B 11 12 14 22 21 24
44.3B

34.4B 11 12 14 22 21 24
44.5B

34.4B 11 12 14 22 21 24
44.6B

34.5B 11 12 14 22 21 24
44.8B

34.6B 11 12 14 22 21 24
44.9B

39B.2B 11 12 14 22 21 24
44.2E

39B.3B 11 12 14 22 21 24
44.3E

39B.4B 11 12 14 22 21 24
44.5E

39B.4B 11 12 14 22 21 24
44.6E

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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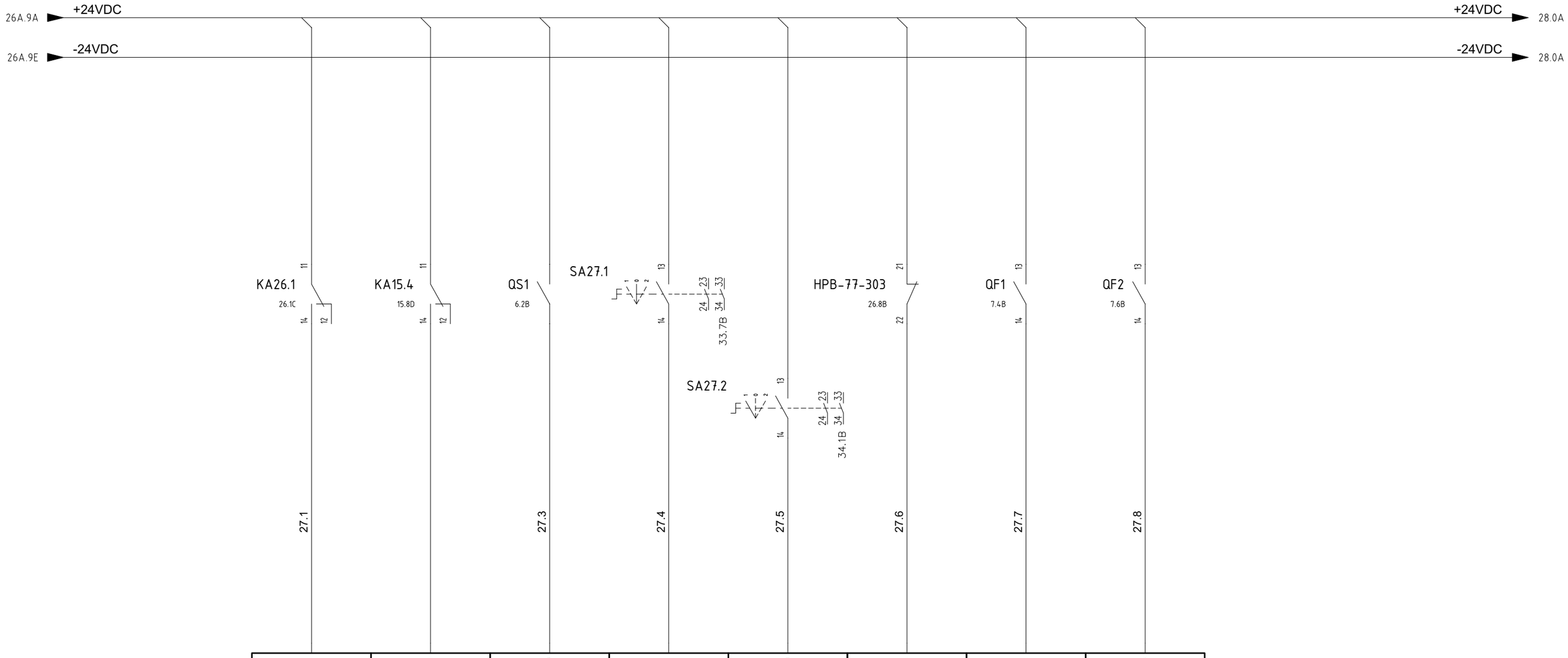
CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 26A
F.S. 27



1	2	3	4	5	6	7	8
I0.0	I0.1	I0.2	I0.3	I0.4	I0.5	I0.6	I0.7
CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
SHUT DOWN FROM SIS 0=SHUT DOWN 1= NORMAL	HHU-77005 PDSL-77-303 0=STOP 1=RUN	MAIN BRAKER TRIP	HHU-77005 AUTOMATIC MODE 1=AUTOMATIC 0= NOT AUTOMATIC	HHU-77006 AUTOMATIC MODE 1=AUTOMATIC 0=NOT AUTOMATIC	EPB-002 PANEL EMERGENCY POWER BUTTON	MODULE LIGHT TRIP	MODULE SOCKET TRIP

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 27
F.S. 28

27.9A +24VDC → +24VDC 29.0A

27.9A -24VDC → -24VDC 29.0A

	QM1	KM1	QF6	QF3	KA12.3	KA12.2	KA12.1
	7.0B	26.7E	7A.8B	7.7B	12.7E	12.6E	12.5E
	13	53	13	13	31	11	41
	14	54	14	14	34	14	44
					32	12	42
	28.1	28.2	28.3	28.5	28.6	28.7	28.8

9	10	11	12	13	14	15	16	L+ M
I1.0	I1.1	I1.2	I1.3	I1.4	I1.5	I1.6	I1.7	
CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
HSS-77-007/8/9 SPACE HEATER TRIP	HSS-77-007/8/9 SPACE HEATER RUN SIGNAL	HEATING CABLE TRIP	SPARE	AUX SECTION TRIP	HHU-77005 MOTORISE DAMPER NOT OPEN FAULT	HHU-77005 MOTORISE DAMPER CLOSED	HHU-77005 MOTORISE DAMPER OPEN	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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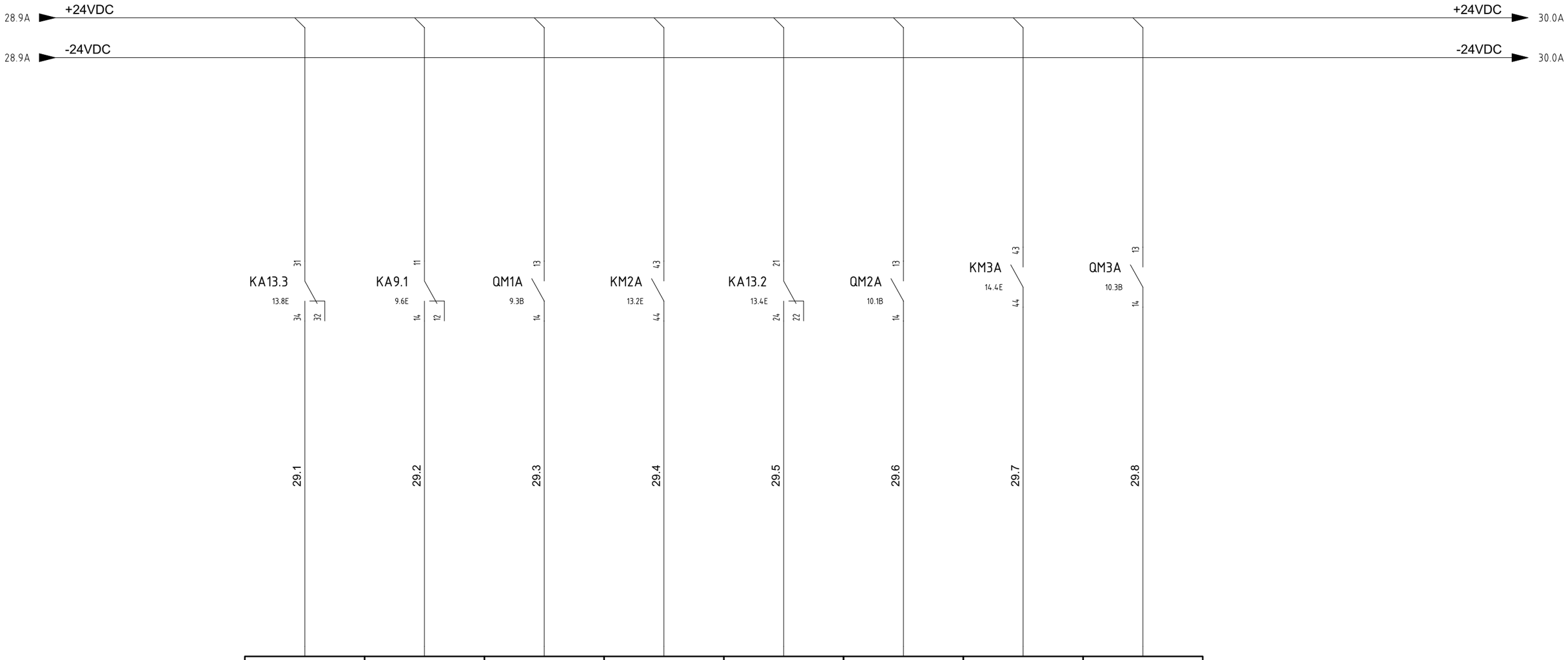
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 28
F.S. 29



1	2	3	4	5	6	7	8
I2.0	I2.1	I2.2	I2.3	I2.4	I2.5	I2.6	I2.7
CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5
Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:
HHU-77005 TE-77-301 THERMIC PROT. RELAY	HHU-77005 HFM-77-301 VSD-1A MALFUNCTION	HHU-77005 HFM-77-301 TRIP	HHU-77005 HFM-77-302 RUN SIGNAL	HHU-77005 HFM-77-302 BROKEN BELT ALARM	HHU-77005 HFM-77-302 TRIP	HHU-77005 HCO-77-301 RUNNING SIGNAL	HHU-77005 HCO-77-301 TRIP

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 29
F.S. 30

29.9A +24VDC

29.9A -24VDC

+24VDC 31.0A

-24VDC 31.0A

KA14.2 14.7E	KA14.1 14.5E	QM5A 11.1B	KA11.1 11.4E	KA15.1 15.3D	KA15.3 15.6D	QM4A 10.4B	KA42.1 42.8C	
31 / 34 / 32	31 / 34 / 32	13 / 14	21 / 24 / 22	11 / 14 / 12	11 / 14 / 12	13 / 14	11 / 14 / 12	
30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	

9	10	11	12	13	14	15	16	L+ M
13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	
CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5
Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:
HHU-77005 HCO-77-301 HIGH PRESSURE ALARM	HHU-77005 HCO-77-301 LOW PRESSURE ALARM	HHU-77005 HFM-77-305/6 TRIP	HHU-77005 HFM-77-305/6 VSD-2A MALFUNCTION	HHU-77005 FILTER CLOGGED	HHU-77005 HSS-77-301 THERMOSTATE TRIP	HHU-77005 HSS-77-301 TRIP	HHU-77005 HSS-77-301 MODULATION FAULT	

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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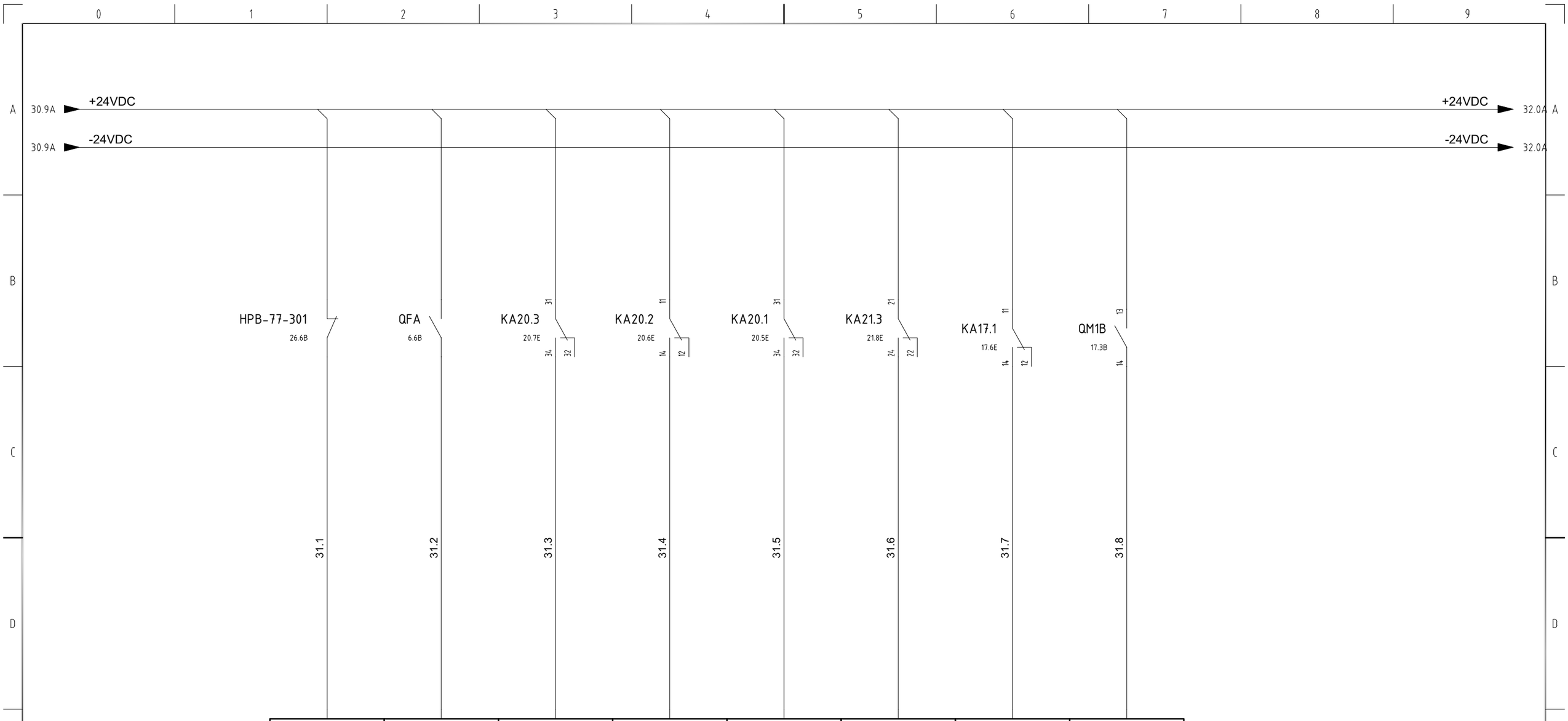
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 30
F.S. 31



1	2	3	4	5	6	7	8
14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7
CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
HHU-77005 HPB-77-301 EMERGENCY STOP BUTTON	HHU-77005 MAIN SWITCH OPEN	HHU-77006 HDZ-77-304/5/6 NOT OPEN FAULT	HHU-77006 HDZ-77-304/5/6 CLOSED	HHU-77006 HDZ-77-304/5/6 OPEN	HHU-77006 PF-001B THERMIC PROT. RELAY	HHU-77006 PF-001B VSD-1B MALFUNCTION	HHU-77006 PF-001B TRIP

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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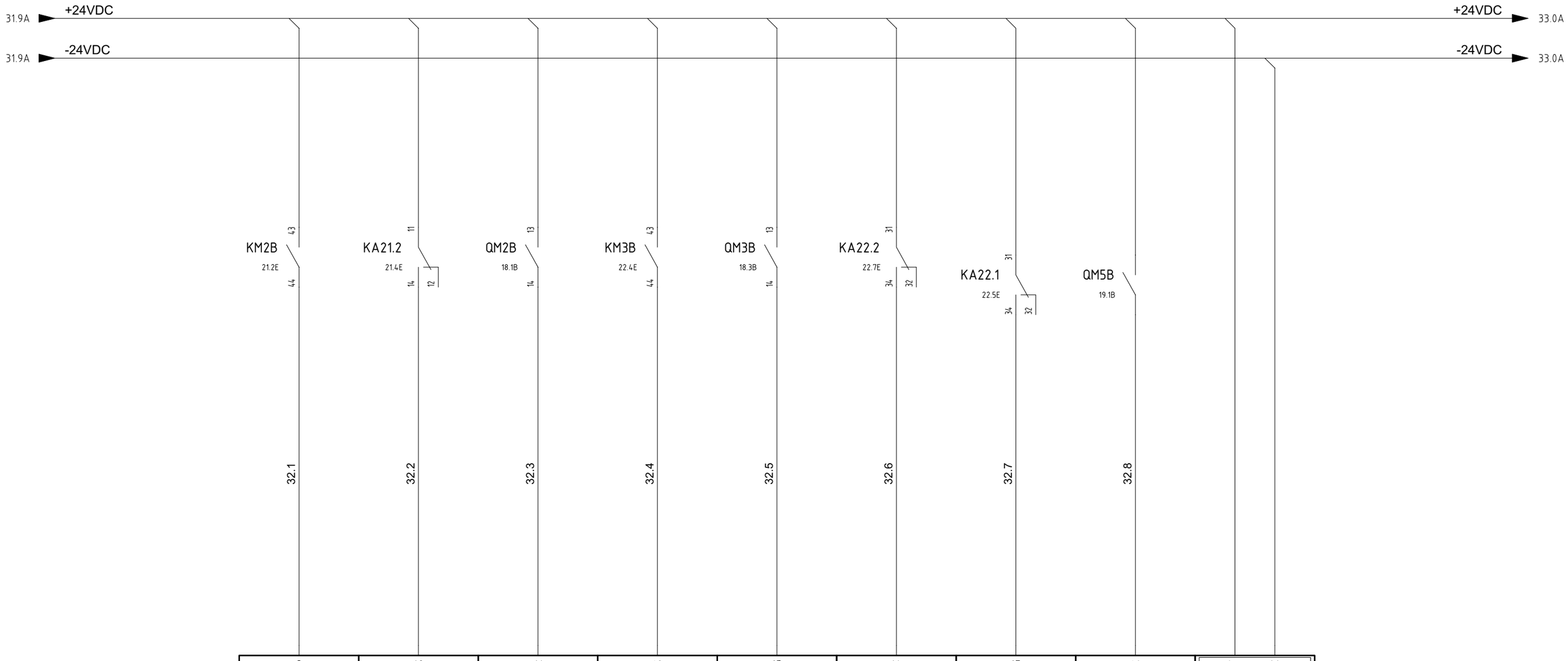
CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 31
F.S. 32



9	10	11	12	13	14	15	16	L+ M
I5.0	I5.1	I5.2	I5.3	I5.4	I5.5	I5.6	I5.7	
CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6
Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:
HHU-77006 SUPPLY FAN RUN SIGNAL	HHU-77006 SUPPLY FAN BROKEN BELT ALARM	HHU-77006 SUPPLY FAN TRIP	HHU-77006 COMPRESSOR RUNNING SIGNAL	HHU-77006 COMPRESSOR TRIP	HHU-77006 COMPRESSOR HIGH PRESSURE ALARM	HHU-77006 COMPRESSOR LOW PRESSURE ALARM	HHU-77006 CONDENSER FAN TRIP	

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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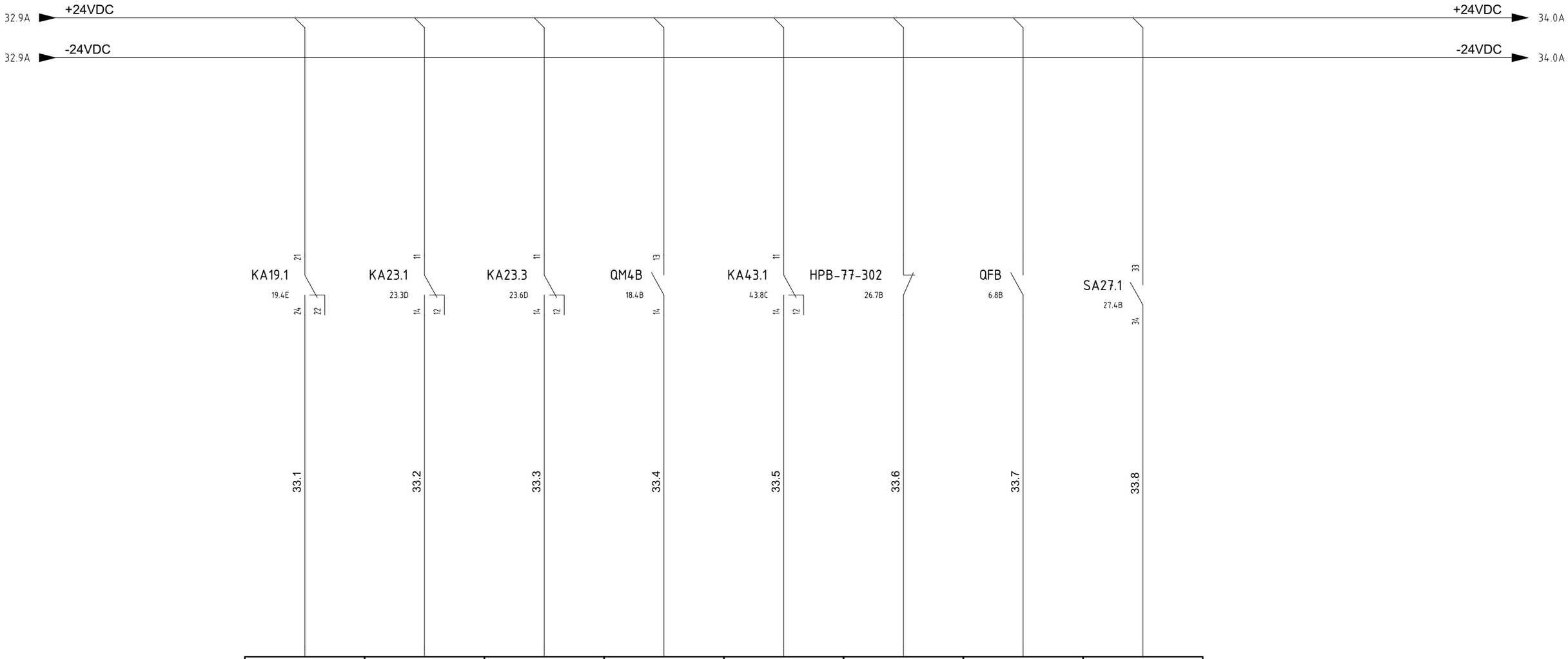
CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 32
F.S. 33



1	2	3	4	5	6	7	8
I6.0	I6.1	I6.2	I6.3	I6.4	I6.5	I6.6	I6.7
CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7
Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:
HHU-77006 CONDENSER FAN VSD-2A MALFUNCTION	HHU-77006 FILTER CLOGGED	HHU-77006 ELECTRICAL HEATER THERMOSTATE TRIP	HHU-77006 ELECTRICAL HEATER TRIP	HHU-77006 ELECTRICAL HEATER MODULATION FAULT	HHU-77006 EPB-001A EMERGENCY STOP BUTTON	HHU-77006 MAIN SWITCH OPEN	HHU-77005 MANUAL MODE 0=NOT MANUAL 1= MANUAL

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 33
F.S. 34

33.9A +24VDC

33.9A -24VDC

+24VDC 35.0C

-24VDC 35.0D

SA27.2	KA26A.1	KA26A.2	KA26A.3	KA26A.4	KA26A.5	KA26A.6	KA23.4
33	11	11	11	11	11	11	11
27.4C	26A.1E	26A.2E	26A.2E	26A.3E	26A.4E	26A.5E	23.8D
34	14 12	14 12	14 12	14 12	14 12	14 12	14 12
34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8

9	10	11	12	13	14	15	16	L+ M
17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	
CPU: QUADRO GENERALE MOD.: 7	CPU: QUADRO GENERALE MOD.: 7	CPU: QUADRO GENERALE MOD.: 7	CPU: QUADRO GENERALE MOD.: 7	CPU: QUADRO GENERALE MOD.: 7	CPU: QUADRO GENERALE MOD.: 7	CPU: QUADRO GENERALE MOD.: 7	CPU: QUADRO GENERALE MOD.: 7	CPU: QUADRO GENERALE MOD.: 7
Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:
HHU-77006 MANUAL MODE 0= NOT MANUAL 1= MANUAL	HFD-77007 CLOSE CONTACT 0= NOT CLOSED 1= CLOSED	HFD-77007 OPEN CONTACT 0=NOT OPEN 1= OPEN	HFD-77008 CLOSE CONTACT 0= NOT CLOSE 1= CLOSE	HFD-77008 OPEN CONTACT 0=NOT OPEN 1= OPEN	HFD-77009 CLOSE CONTACT 0= NOT CLOSE 1= CLOSE	HFD-77009 OPEN CONTACT 0=NOT CLOSE 1= CLOSE	HHU-77006 PRESS FAN RUN 0= STOP 1=RUN	

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 34
F.S. 35

HVAC MALFUNCTION		SPARE		HSS-77007/8/9 SPACE HEATER START SIGNAL		SPARE		HHU-77005 HVAC UNIT A START SIGNAL		HHU-77005 PF-001A MOTOR HEATER		HHU-77005 COMPRESSOR START SIGNAL		HHU-77006 HVAC UNIT B START SIGNAL	
Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:
CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8	
Q0.0		Q0.1		Q0.2		Q0.3		Q0.4		Q0.5		Q0.6		Q0.7	
1		2		3		4		5		6		7		8	

35.1 35.3 35.5 35.6 35.7 35.8

34.9A +24VDC → 36.0C +24VDC

34.9A -24VDC → 36.0D -24VDC

KA30.1 A1 A2

KA30.9 A1 A2

KA30.3 A1 A2

KA30.4 A1 A2

KA30.5 A1 A2

KA30.6 A1 A2

44.0B 11 12 14 21 22 24 31 32 34 41 42 44

26.7B 11 12 14 21 22 24 31 32 34 41 42 44

12.1B 11 12 14 21 22 24 31 32 34 41 42 44

14.1B 11 12 14 21 22 24 31 32 34 41 42 44

14.1A 11 12 14 21 22 24 31 32 34 41 42 44

20.1B 11 12 14 21 22 24 31 32 34 41 42 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 35
F.S. 36

HHU-77006 PF-001B MOTOR HEATER		HHU-77006 COMPRESSOR START SIGNAL		HVAC UNIT A / B ALARM RESET		SPARE		SPARE		SPARE		SPARE		SPARE		
Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:
CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8			
Q1.0		Q1.1		Q1.2		Q1.3		Q1.4		Q1.5		Q1.6		Q1.7			
9		10		11		12		13		14		15		16		L+	M

36.1 36.2 36.3

35.9C +24VDC → 37.0A +24VDC

35.9D -24VDC → 37.0A -24VDC

KA30.7 (A1 / A2)

KA30.8 (A1 / A2)

KA37.1 (A1 / A2) ALARM RESET RELAY

KA37.2 (A1 / A2)

22.1B 11 12 14 21 22 24 31 32 34 41 42 44

22.1A 11 12 14 21 22 24 31 32 34 41 42 44

12.8C 13.3B 14.6C 14.8C 11 12 14 21 22 24 31 32 34 41 42 44

20.8C 21.3B 22.6C 22.8C 11 12 14 21 22 24 31 32 34 41 42 44

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

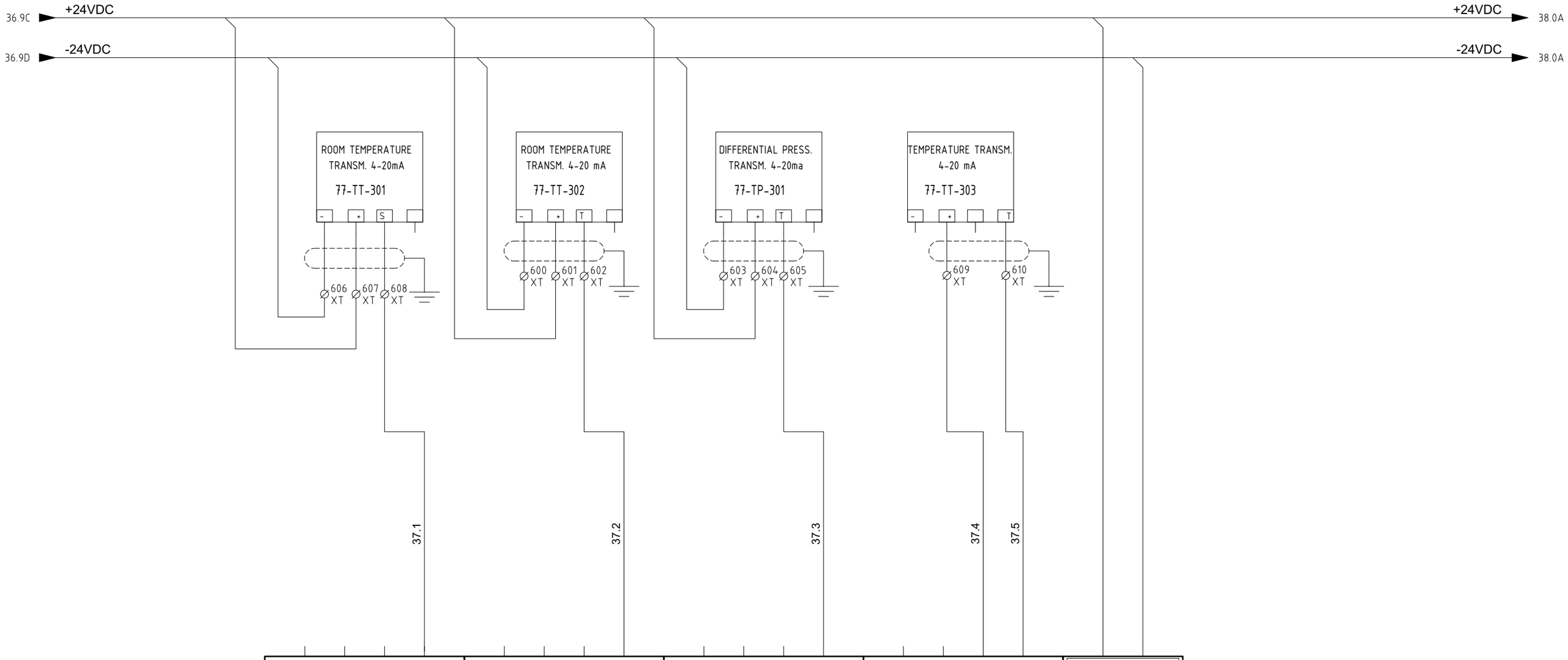
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 36
F.S. 37



1 5 9 13	2 6 10 14	3 7 11 15	4 8 12 16	L+ M
AI0.0	AI0.1	AI0.2	AI0.3	
CPU: QUADRO GENERALE MOD. : 9	CPU: QUADRO GENERALE MOD. : 9	CPU: QUADRO GENERALE MOD. : 9	CPU: QUADRO GENERALE MOD. : 9	CPU: QUADRO GENERALE MOD. : 9
Name: A8 / Sheet:	Name: A8 / Sheet:	Name: A8 / Sheet:	Name: A8 / Sheet:	Name: A8 / Sheet:
77-TT-301 TEMPERATURE TRANSM 4-20mA	77-TT-302 TEMPERATURE TRANSM 4-20mA	77-PT-301 DIFFERENTIAL PRESS. TRANSMITTER 4-20mA	77-TT-303 TEMPERATURE TRANSM 4-20 mA	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 37
F.S. 38

37.9A +24VDC → +24VDC 39.0A

37.9A -24VDC → -24VDC 39.0A

HHU-77005 PF-001A VSD MODULATION		HHU-77006 PF-001B VSD MODULATION		HHU-77005 ELECTRICAL HEATER MODULATION		HHU-77006 ELECTRICAL HEATER MODULATION		
Name: A9	Sheet:	Name: A9	Sheet:	Name: A9	Sheet:	Name: A9	Sheet:	Name: A9 Sheet:
CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10		CPU: QUADRO GENERALE MOD. : 10
AQ0.0		AQ0.1		AQ0.2		AQ0.3		
9 1 5 13		10 2 6 14		11 3 7 15		12 4 8 16		L+ M

9.8B 9.4

9.8C 9.5

17.8B 17.5

17.8C 17.4

42.8D 40.1

42.8D 40.2

43.8D 40.3

43.8D 40.4

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 38
F.S. 39

38.9A +24VDC → +24VDC 40.0E

38.9A -24VDC → -24VDC 40.0F

SPARE	SPARE	SPARE	SPARE	
Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:	Name: A10 / Sheet:
CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11	CPU: QUADRO GENERALE MOD. : 11
AQ1.0	AQ1.1	AQ1.2	AQ1.3	
9 1 5 13	10 2 6 14	11 3 7 15	12 4 8 16	L+ M

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

PLC SECTION

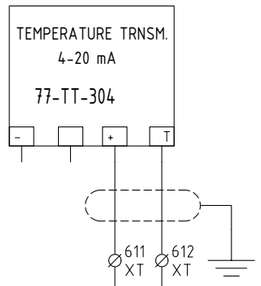
ROSETTI MARINO

1724000049-HV-DA-00028

FG. 39
F.S. 39A

38.9A +24VDC → +24VDC 40.0E

38.9A -24VDC → -24VDC 40.0F



1 5 9 13	2 6 10 14	3 7 11 15	4 8 12 16	L+ M
AI1.0	AI1.1	AI1.2	AI1.3	
CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12
Name: A11 / Sheet:	Name: A11 / Sheet:	Name: A11 / Sheet:	Name: A11 / Sheet:	Name: A11 / Sheet:
77-TT-304 TEMPERATURE TRANSM 4-20mA	SPARE	SPARE	SPARE	

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 39A
F.S. 39B

38.9A +24VDC → +24VDC 40.0E

38.9A -24VDC → -24VDC 40.0F

	KA26A.7	KA26A.8	KA26A.9	KA26A.10
	26A.6E	26A.7E	26A.8E	26A.8E
11				
14				
12				
	39B.1	39B.2	39B.3	39B.4

1	2	3	4	5	6	7	8
I8.0	I8.1	I8.2	I8.3	I8.4	I8.5	I8.6	I8.7
CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
HFD-77010 CLOSE CONTACT 0= NOT CLOSED 1= CLOSED	HFD-77010 OPEN CONTACT 0=NOT OPEN 1= OPEN	HFD-77011 CLOSE CONTACT 0= NOT CLOSED 1= CLOSED	HFD-77011 OPEN CONTACT 0=NOT OPEN 1= OPEN	SPARE	SPARE	SPARE	SPARE

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 39B
F.S. 39C

38.9A +24VDC → +24VDC 40.0E

38.9A -24VDC → -24VDC 40.0F

9	10	11	12	13	14	15	16	L+ M
19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	
CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13
Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:
SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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B-300AC UPS EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 39C
F.S. 40

A1

SIEMENS

SIMATIC HMI

12"

TOUCH

X1 P1 PROFINET

X1 P2 PROFINET

X2 PROFIBUS DP

X60 Mini USB - Type B

X61 USB - Type A

X62 USB - Type A

X90 OUT Line OUT

X90 IN Line IN

CABLE 1

CABLE 2

CABLE 3

CABLE 4

X1 P1 R PROFINET

X1 P2 R PROFINET

X1 P1 R PROFINET

X1 P2 R PROFINET

TO PAGE 41

D1

D2

SIEMENS

RUN

SIMATIC S7-1500

ESC OK

L+ M L+ M DC 24V (X80)

DC 24V (X80)

L+ 1

M 2

FG

39.9A +24VDC

39.9A -24VDC

+24VDC 41.0E

-24VDC 41.0F

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 40

F.S. 41

FROM PAGE 40

CABLE 4

CABLE 5

CABLE 1

CABLE 2

MODBUS TCP/P TO CLIENT

RJ45 CONNECTION IN TERMINAL STRIP

P1	LAN
P2	LAN
P3	LAN
P4	LAN
P5	LAN
P6	LAN
P7	LAN
P8	LAN

1	F1
2	F2

1	L1+	DC 24V
2	M1	
3	M2	
4	L2+	

A12

SIEMENS

SCALANCE XC208

F, RM, SB, DM1, DM2, L1, L2, P1–P8

SELECT/SET

CONSOLE

FAULT F1 F2

L1+ M1 M2 L2+

208-0BA00-2AC2

1	TD	PROFINET IO - Port 1 RJ45
2	TD_N	
3	RD	
4	GND	
5	GND	
6	RD_N	
7	GND	
8	GND	

X1

1	TD	PROFINET IO - Port 2 RJ45
2	TD_N	
3	RD	
4	GND	
5	GND	
6	RD_N	
7	GND	
8	GND	

X2

1L+	DC 24V
2L+	
1M	
2M	

A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A13

BA 2xRJ45

SIEMENS

RN ER MT

SIMATIC ET 200SP

IM 155-6 PN/2 HF

6ES7155-6AU01-0CN0

X1 PROFINET (LAN)

6ES7193-6RA00-0AA0

LK1 LK2 PR1 PR2

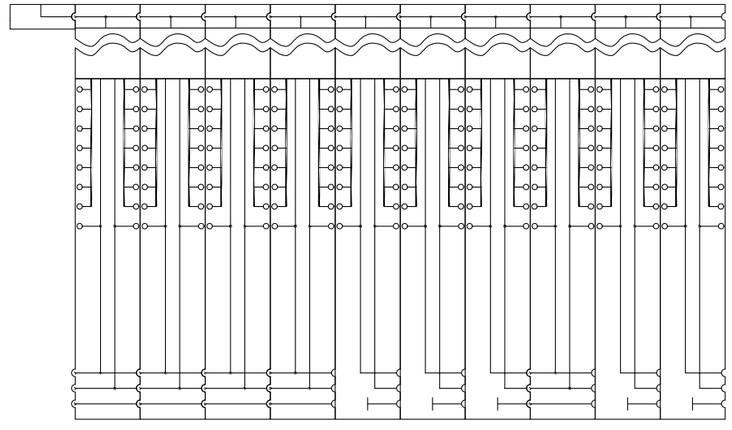
PWR

MAC ADDRESS

X80 24VDC

L+ M 2xL+ M

DI 16x24VDC ST	DI 16x24VDC ST	DI 16x24VDC ST	DI 16x24VDC ST	DQ 16x24VDC/0,5A ST	AI 4xU/I 2-wire ST	AQ 4xU/I ST	AQ 4xU/I ST	AI 4xU/I 2-wire ST	DI 16x24VDC ST
DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG
6ES7131-6BH01-0BA0	6ES7131-6BH01-0BA0	6ES7131-6BH01-0BA0	6ES7131-6BH01-0BA0	6ES7132-6BH01-0BA0	6ES7134-6HD01-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HD00-0BA1	6ES7134-6HD01-0BA1	6ES7131-6BH01-0BA0



40.9E +24VDC → +24VDC 42.0A

40.9F -24VDC → -24VDC 42.0A

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
				APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

PLC ARCHITECTURE

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 41

F.S. 42

41.9E +24VDC → +24VDC 43.0A

41.9F -24VDC → -24VDC 43.0A

42.1

42.2

1/L1

HR-1A

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-1B

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-1C

19 AL
18 AL
17 D17
16 A2
15 A-
14 A+
13 D13
12 US
11 A2

GRM 1

2/T1

3/L2

TA.1

FU42.1 1 2

11.9A RA

KA42.1 A1 A2

33.2B 11 12 14 21 22 24 31 32 34 41 42 44

40.1 38.4D

40.2 38.4D

05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.

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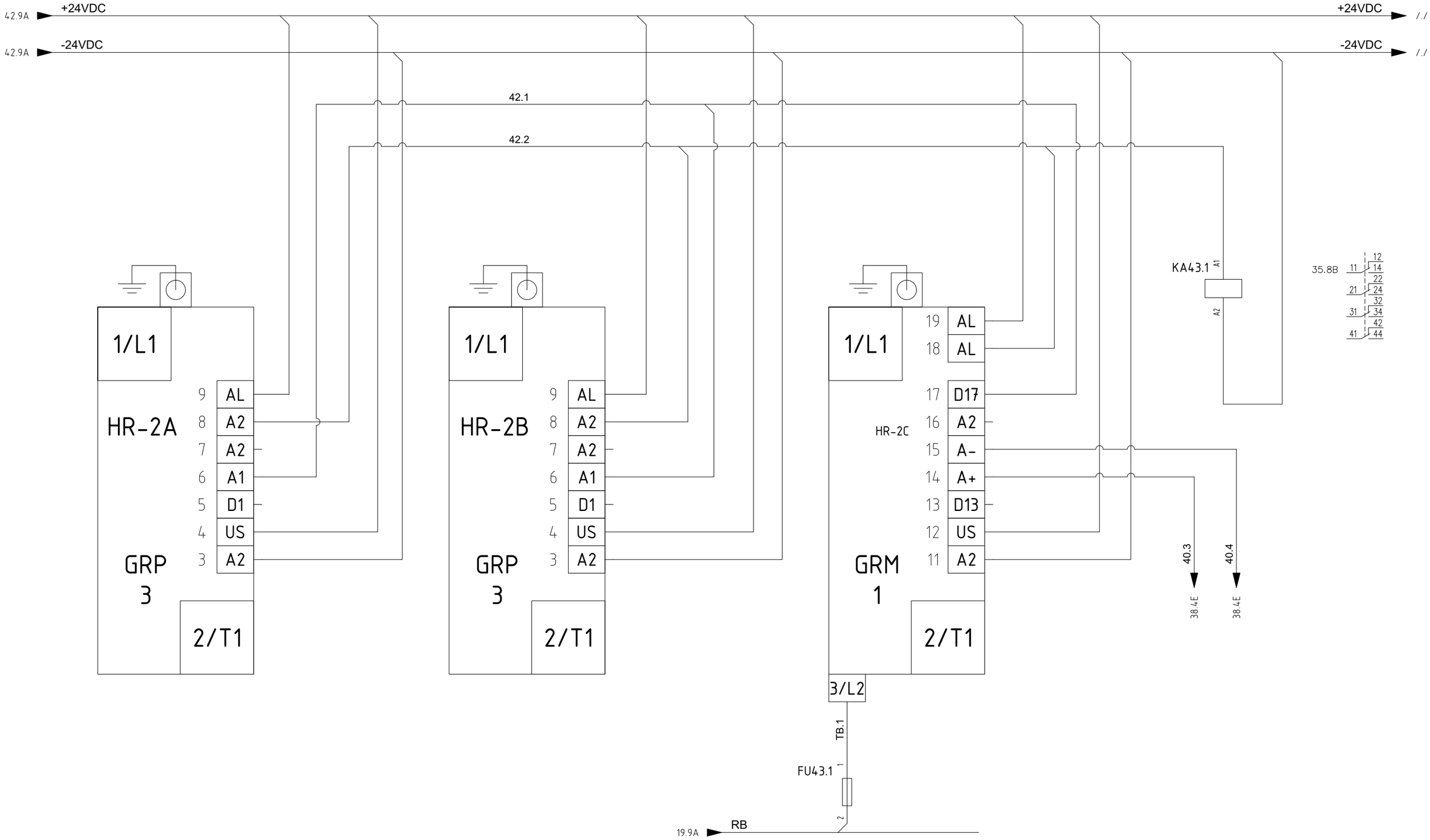
BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

EH MODULATION A

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 42
F.S. 43



REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

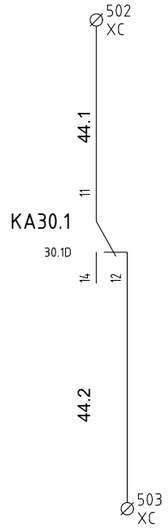
EH MODULATION B

ROSETTI MARINO

1724000049-HV-DA-00028

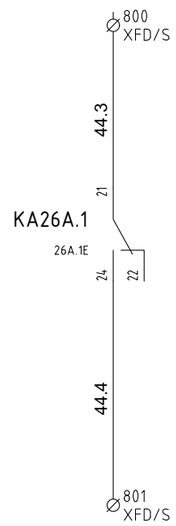
FG. 43
F.S. 44

AVAILABLE SIGNAL
GENERAL FAULT
TO SIS

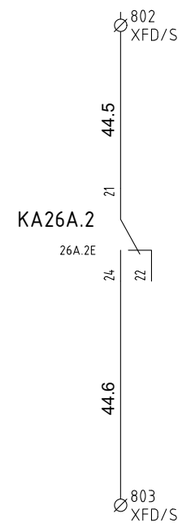


HVAC MALFUNCTION
0=MALF
1=NORMAL
TO SIS
B400-SIS-0901

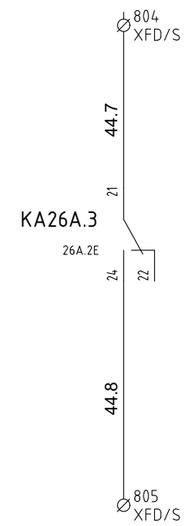
HFD-77007
CLOSED SIGNAL
TO F&G



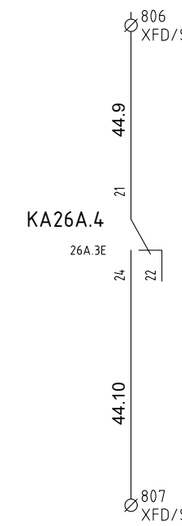
HFD-77007
OPEN SIGNAL
TO F&G



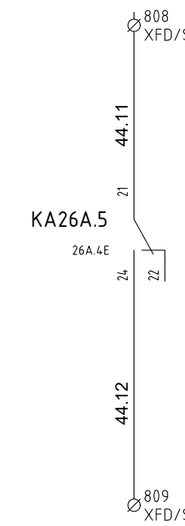
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CLOSED SIGNAL
TO F&G



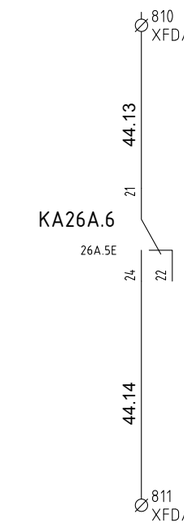
HFD-77008
OPEN SIGNAL
TO F&G



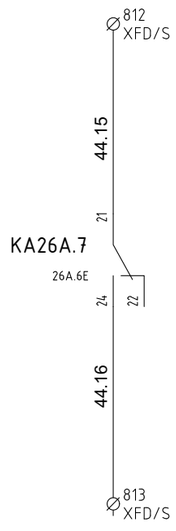
HFD-77009
CLOSED SIGNAL
TO F&G



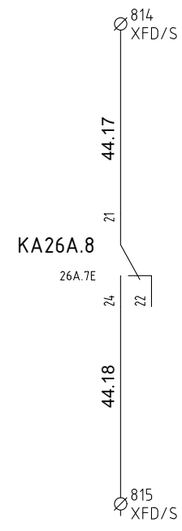
HFD-77009
OPEN SIGNAL
TO F&G



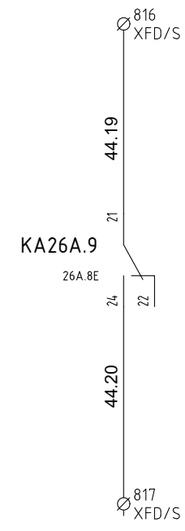
HFD-77010
CLOSED SIGNAL
TO F&G



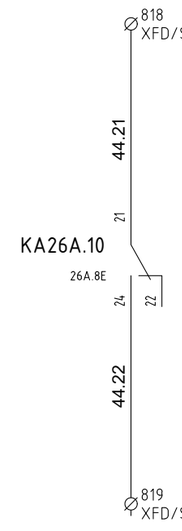
HFD-77010
OPEN SIGNAL
TO F&G



HFD-77011
CLOSED SIGNAL
TO F&G



HFD-77011
OPEN SIGNAL
TO F&G



REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
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CLIENT:
CROSSWIND

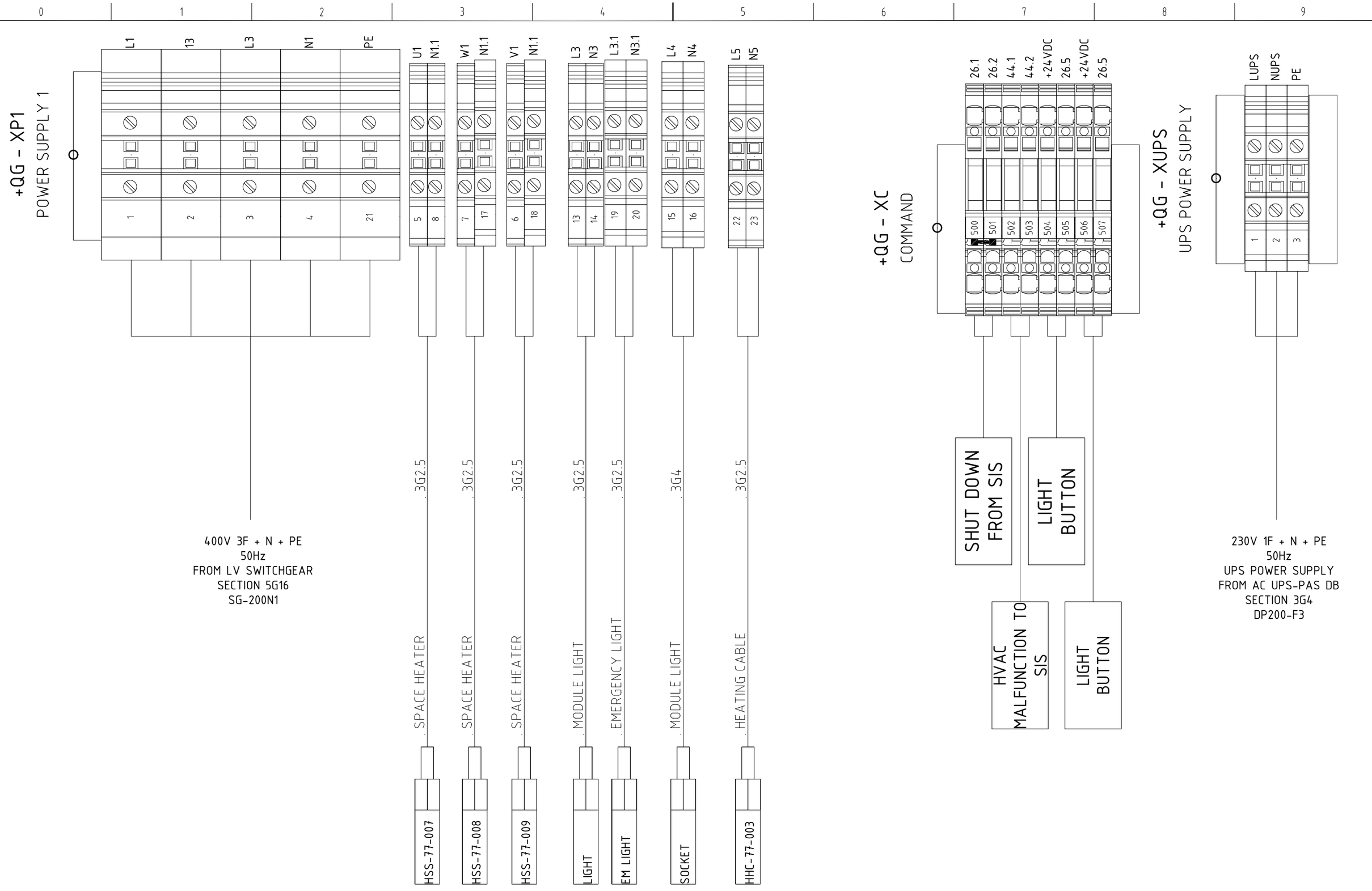
BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

AVAILABLE SIGNAL

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 44
F.S. 45



REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
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DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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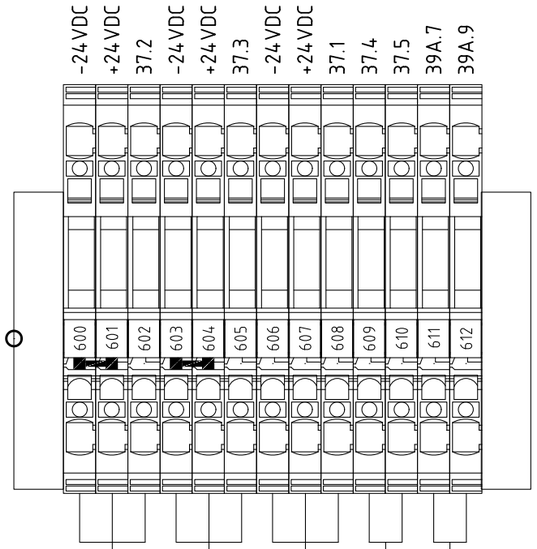
BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
TERMINAL STRIP

ROSETTI MARINO

1724000049-HV-DA-00028

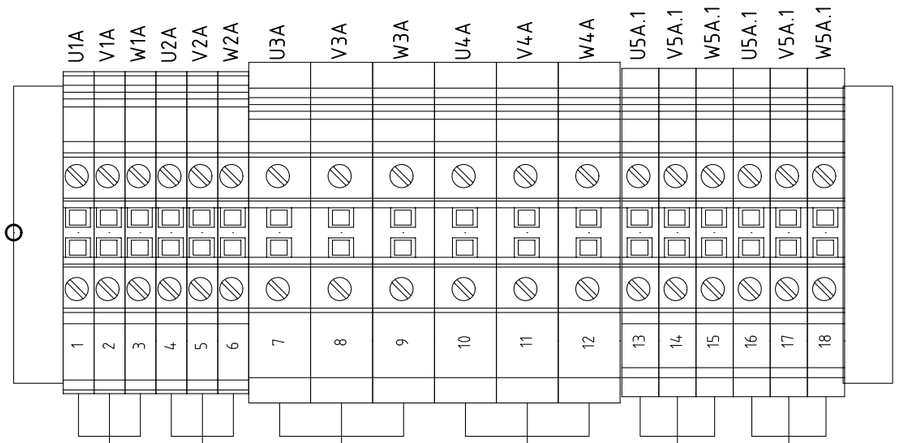
FG. 45
F.S. 46

+QG - XT
TRASMITTER

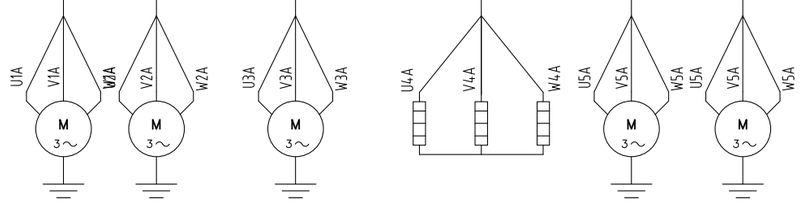


3X1.5+Sh FG16OH2M16 — TEMPERATURE TRANSMITTER — 77-TT-301
3X1.5+Sh FG16OH2M16 — TEMPERATURE TRANSMITTER — 77-TT-302
3X1.5+Sh FG16OH2M16 — TEMPERATURE TRANSMITTER — 77-PT-301
2X1.5+SH — TEMPERATURE TRANSMITTER — 77-TT-303
2X1.5+SH — TEMPERATURE TRANSMITTER — 77-TT-304

+QG - XM1
MOTOR 1



4G2.5 FG16OM16 — PRESSURIZING FAN
4G2.5 FG16OM16 — SUPPLY FAN
4G10 FG16OM16 — COMPRESSOR
4G10 FG16OM16 — ELECTRICAL HEATER
4G2.5 FG16OM16 — CONDENSER FAN 1
4G2.5 FG16OM16 — CONDENSER FAN 1



REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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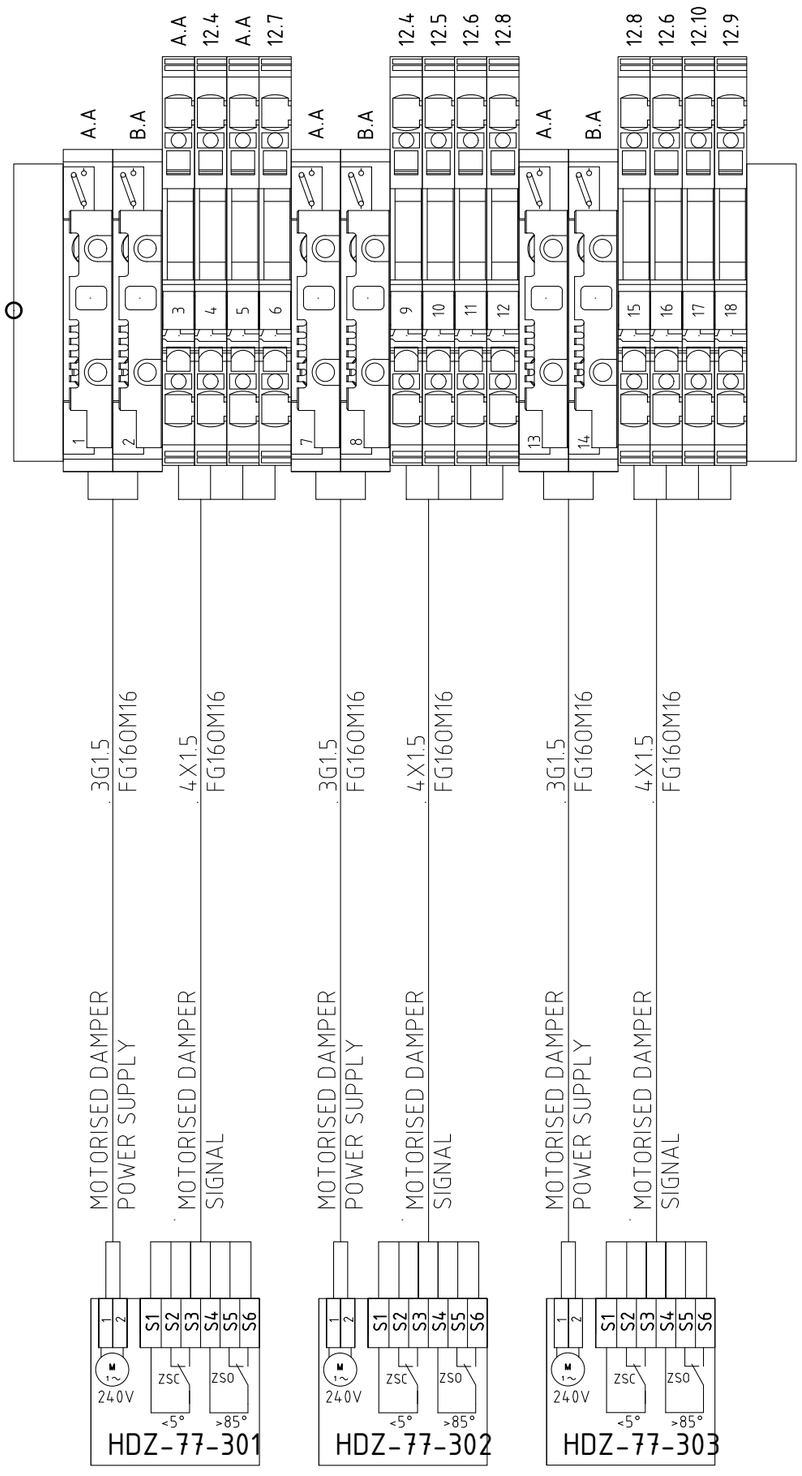
BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM
TERMINAL STRIP

ROSETTI MARINO

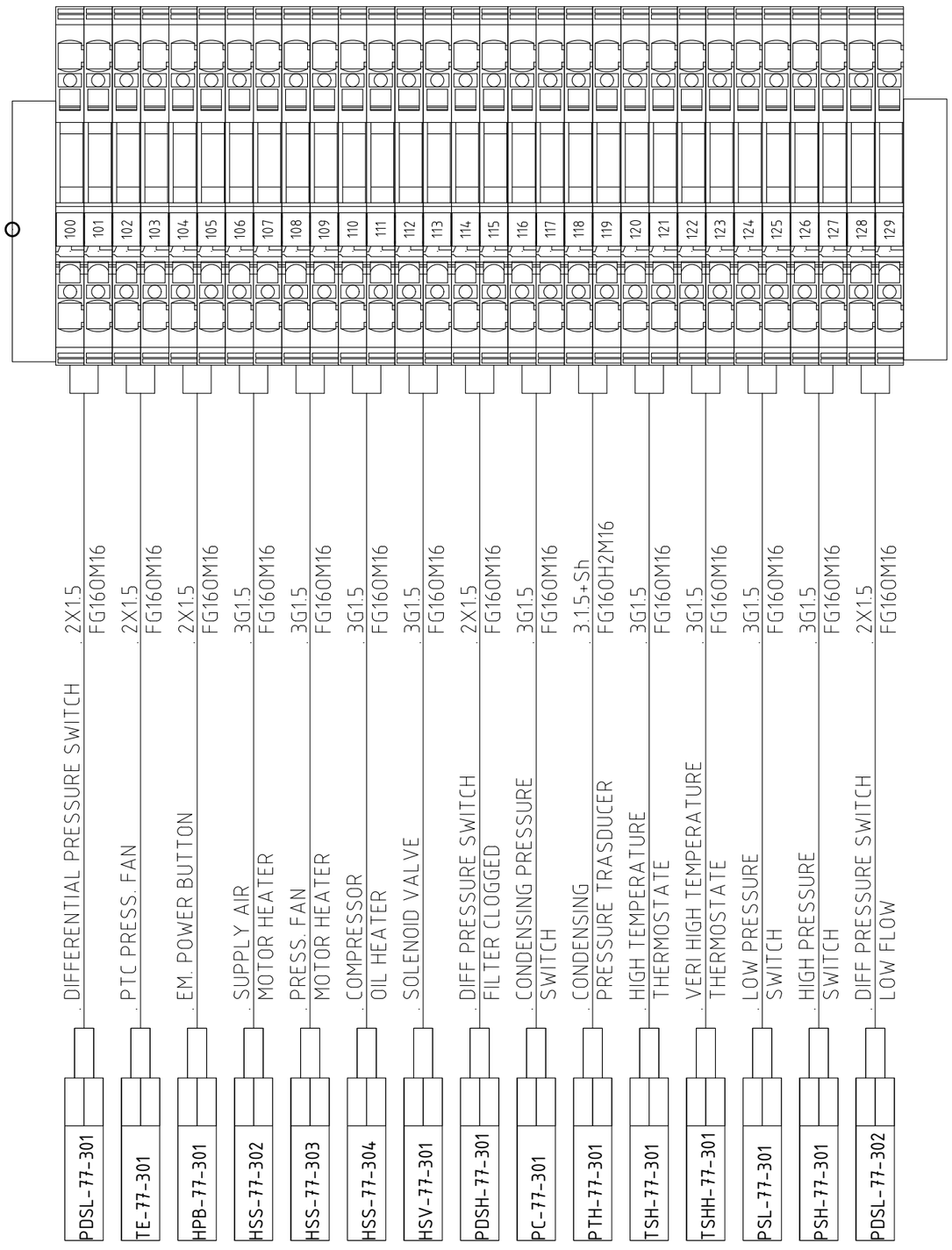
1724000049-HV-DA-00028

FG. 46
F.S. 47

+QG - XMD1
MOTORISED DAMPER 1



+QG - XA1
AUXILIARY 1



REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

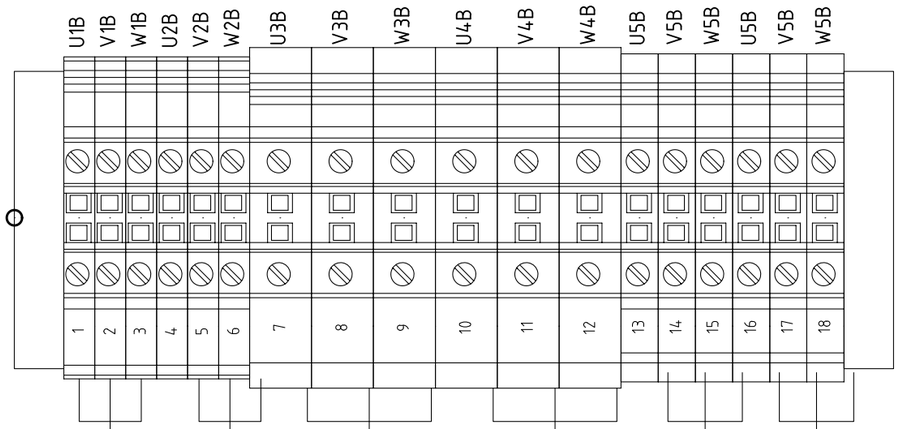
TERMINAL STRIP

ROSETTI MARINO

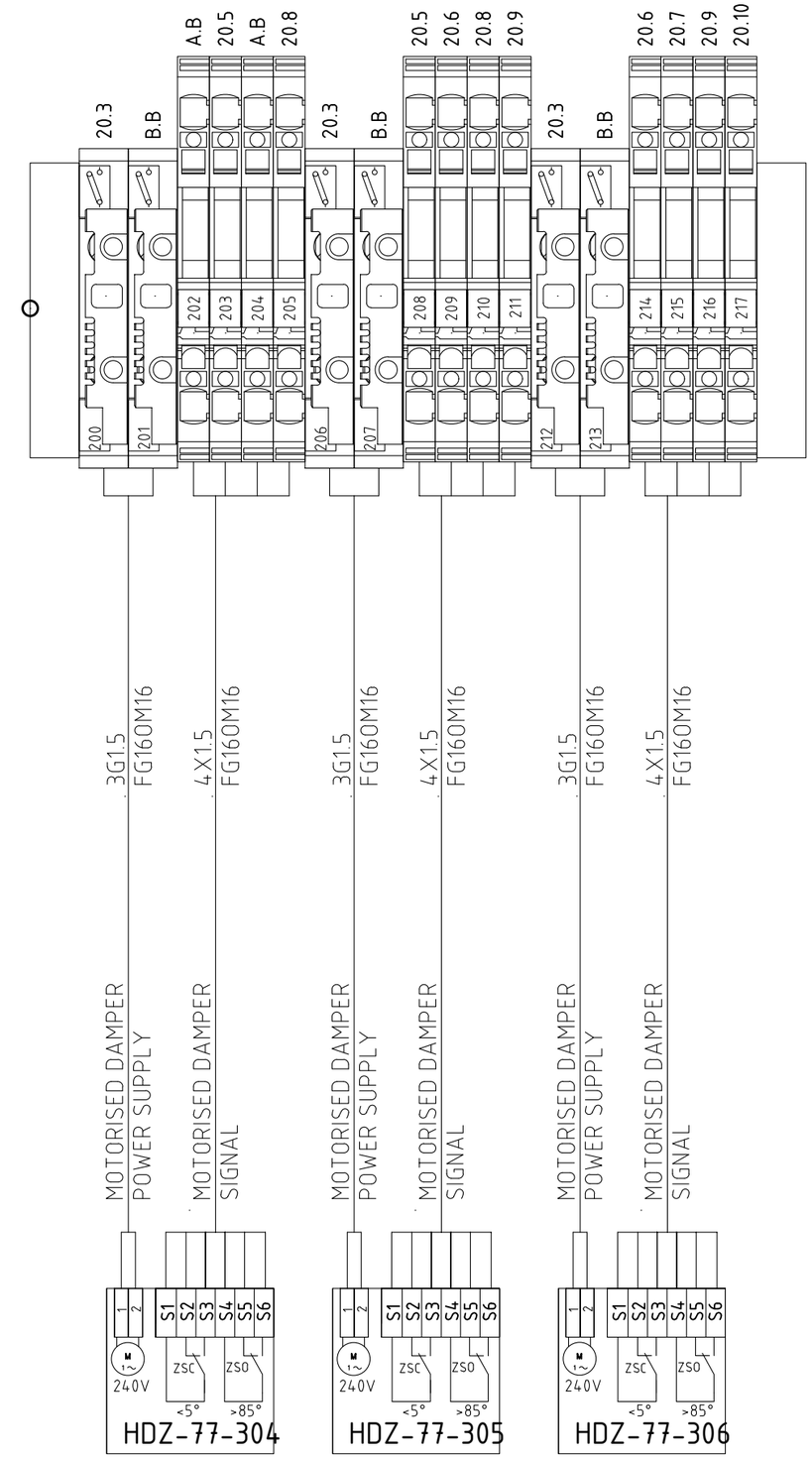
1724000049-HV-DA-00028

FG. 47
F.S. 48

+QG - XM2
MOTOR 2



+QG - XMD2
MOTORISED DAMPER 2



REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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S.p.186–Cornegliano Laud. (Lo) Italy
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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

TERMINAL STRIP

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 48
F.S. 49

+QG - XA2
AUXILIARY 2

A.B	21.4	13.12	13.14	+24VDC	26.7	12.3	B.B	14.1	B.B	5	B.B	15.1	B.B	A.A	23.2	A.A	23.3	11.5	11.6	A.A	23.4	15.9	23.5	A.A	22.8	A.A	22.11	A.B	23.6
300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329
CH . 2X1.5	FG160M16	2X1.5	FG160M16	2X1.5	FG160M16	3G1.5	FG160M16	3G1.5	FG160M16	3G1.5	FG160M16	3G1.5	FG160M16	2X1.5	FG160M16	3G1.5	FG160M16	3.1.5+Sh	FG160H2M16	3G1.5	FG160M16	3G1.5	FG160M16	3G1.5	FG160M16	3G1.5	FG160M16	2X1.5	FG160M16		
DIFFERENTIAL PRESSURE SWITCH	PTC PRESS. FAN	EM. POWER BUTTON	SUPPLY AIR MOTOR HEATER	PRESS. FAN MOTOR HEATER	COMPRESSOR OIL HEATER	SOLENOID VALVE	DIFF PRESSURE SWITCH FILTER CLOGGED	CONDENSING PRESSURE SWITCH	CONDENSING PRESSURE TRASDUCER	HIGH TEMPERATURE THERMOSTATE	VERI HIGH TEMPERATURE THERMOSTATE	LOW PRESSURE SWITCH	HIGH PRESSURE SWITCH	DIFF PRESSURE SWITCH LOW FLOW															
PDSL-77-302	TE-77-302	HPB-77-302	HSS-77-306	HSS-77-307	HSS-77-308	HSV-77-302	PDSH-77-303	PC-77-302	PTH-77-302	TSH-77-302	TSHH-77-302	PSL-77-302	PSH-77-302	PDSL-77-304															

+QG - XFD
FIRE DAMPER

+24VDC	34.2	+24VDC	34.3	+24VDC	34.4	+24VDC	34.5	+24VDC	34.6	+24VDC	34.7	+24VDC	39B.1	+24VDC	39B.2	+24VDC	39B.3	+24VDC	39B.4						
700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719						
. 4X1.5	SIGNAL FEEDBACK			. 4X1.5	SIGNAL FEEDBACK			. 4X1.5	SIGNAL FEEDBACK			. 4X1.5	SIGNAL FEEDBACK			. 4X1.5	SIGNAL FEEDBACK								
1 2	S1 S2 S3 S4 S5 S6																								
240V	ZSC <5°	ZSO >85°	HFD-77007	240V	ZSC <5°	ZSO >85°	HFD-77008	240V	ZSC <5°	ZSO >85°	HFD-77009	240V	ZSC <5°	ZSO >85°	HFD-77010	240V	ZSC <5°	ZSO >85°	HFD-77011						

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

TERMINAL STRIP

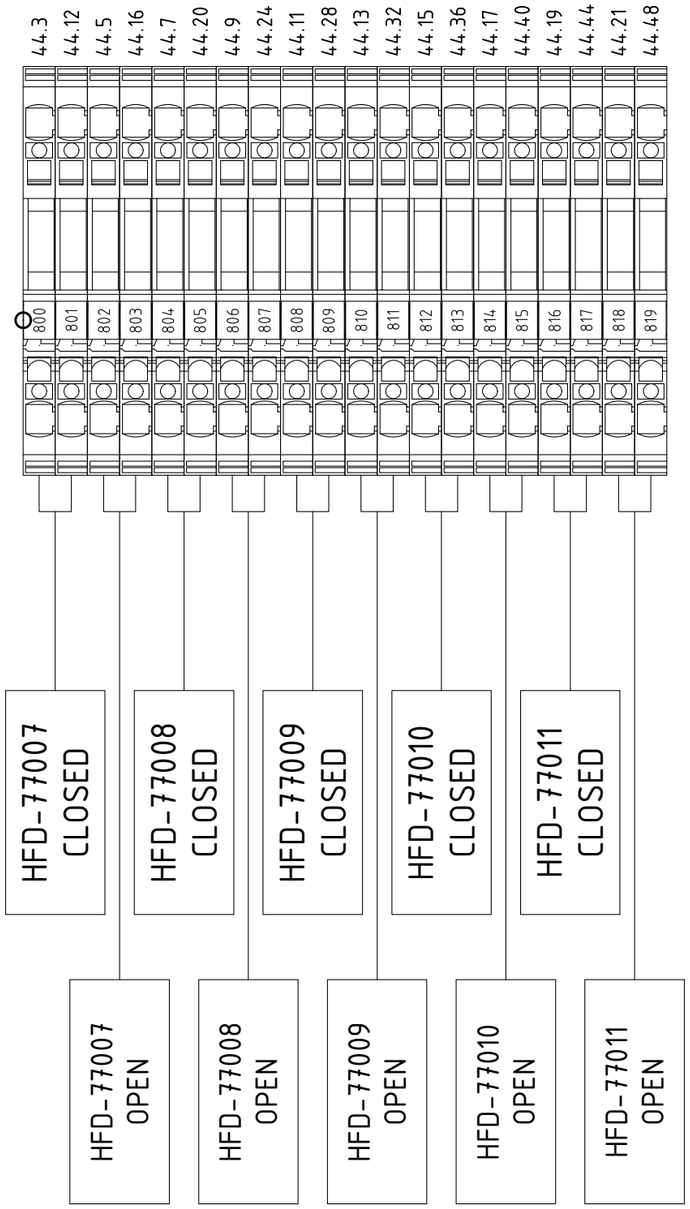
ROSETTI MARINO

1724000049-HV-DA-00028

FG. 49
F.S. 49A

+QG - XFD/S

FIRE DAMPERS SIGNAL TO SIS





MODBUS TCP/IP
CONNECTION
FROM
B400-NET-001

REV.	MODIFICA	DATA	FIRMA	APPR.	
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

TERMINAL STRIP

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 49A
F.S. 50

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
				Hq	4	9
	R5CQE2286R	cabinet comp. 2200x800x600 back	dkc	Hq	4	2
	R5CPFE8100	Modular cabinet compensation panel height 100 width 800	dkc			2
	R5TOE80	Rebate crossbar for modular doors, width 800	dkc			5
	RZPCE8900	Modular wiring panel L.800 H.900	dkc			2
	RZPCE8600	Modular wiring panel L.800 H.600	dkc			2
	RZPCE8500	Modular wiring panel L.800 H.500	dkc			2
	R5CPME8900	Solid modular cabinet door 800 width, 900 door height	dkc			2
	R5CPME8600	Solid modular cabinet door width 800, door height 600	dkc			2
	R5CPME8500	Solid modular cabinet door 800 width, 500 door height	dkc			2
	RZSOE545	Total horizontal support cabinet width 600	dkc			5
	rzdoe8545	PARTIAL HORIZONTAL PARTITION CABINET WIDTH 800 TOTAL DEPTH 545 MM	dkc			5
	RZA33	Lifting Ring	dkc			1
	R5LE2262	Side for cabinet depth 600mm height 2200mm2pcs	dkc			1
	R1ZPRO801	Flangefrontal/side H100 Length 800 2pcs	dkc			2
	R1ZPRO601	Front/side flange H100 length 600	dkc			2
	R1ZCOR1	Modular plinth corner H100 4pcs	dkc			2
	RZKE65	CQE cabinet union kit	dkc			1
	rzkre65	Flat Cooling Kit for CQE Cabinets	dkc			1
	rzksre65	L-shaped union reinforcement kit for CQE cabinets	dkc			1
	RZDVE2260	Vertical partition for QE 2200x600	dkc	Hq	4	1
	rztse02	Lifting brackets for CQE PZ2	dkc			1
32 x 15	PD32Z	Sendzimir rail 32x15x9 closed	Canloplast	Hq	5	6.63
40 x 100	E354	Can.cabl.40x100 SG S/4	Canloplast	Hq	5	9.33
60 x 100	E184	Can.Cabl.60x100 SG S/4	Canloplast	Hq	5	4.83
77-TT-303				Hq		1
77-TT-304				Hq		1
A1	6AV2124-0MC01-0AX0	SIMATIC HMI TP1200 Comfort. Touch control, 12" widescreen display	siemens	Hq	40	1
A2	6ES7155-6AU01-0CN0	IM 155-6 PN HF/2 V4.2 Interface Module	siemens	Hq	41	1
	6ES7193-6AR00-0AA0	BA 2xRJ45 (PROFINET busadapter with standard Ethernet socket for IM-PN)	siemens			1
A3	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	41	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A4	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	41	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A5	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	41	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A6	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	41	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A7	6ES7132-6BH01-0BA0	Digital Output Module: DQ 16x24VDC/0.5A ST	siemens	Hq	41	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A8	6ES7134-6HD01-0BA1	Analog Input Module: AI 4XU/I 2-Wire ST	siemens	Hq	41	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A9	6ES7135-6HD00-0BA1	Analog Output Module: AQ 4XU/I ST	siemens	Hq	41	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A10	6ES7135-6HD00-0BA1	Analog Output Module: AQ 4XU/I ST	siemens	Hq	41	1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 50
F.S. 51

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
A10	*6ES7193-6BP00-0BA0*	*Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)*	*siemens*	*Hq*	41	1
A11	*6ES7134-6HD01-0BA1*	*Analog Input Module: AI 4XU/I 2-Wire ST*	*siemens*	*Hq*	41	1
	6ES7193-6BP00-0DA0	*Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)*	*siemens*			1
A12	*6GK5208-0BA00-2AC2*	*XC208 Managed Switch with 8 RJ45 100Mbit/s Ports*	*siemens*	*Hq*	41	1
A13	*6ES7131-6BH01-0BA0*	*Digital Input Module: 16x24VDC ST*	*siemens*	*Hq*	41	1
	6ES7193-6BP00-0DA0	*Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)*	*siemens*			1
D1	*6ES7513-1RM03-0AB0*	*CPU 1513R-1PN*	*siemens*	*Hq*	40	1
	6ES7954-8LF02-0AA0	*Memory card, 24 MB*	*siemens*			1
	6ES7590-1AB60-0AA0	*Profile rail S7-1500, 160 mm*	*siemens*			1
D2	*6ES7513-1RM03-0AB0*	*CPU 1513R-1PN*	*siemens*	*Hq*	40	1
	6ES7954-8LF02-0AA0	*Memory card, 24 MB*	*siemens*			1
	6ES7590-1AB60-0AA0	*Profile rail S7-1500, 160 mm*	*siemens*			1
EM LIGHT				*Hq*		1
EPB-002L	*3SU1401-1BH20-1AA0*	*Red LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*	*Hq*	26	1
F1		*docker*		*Hq*	*7th*	1
F2		*docker*		*Hq*	*7th*	1
F3		*docker*		*Hq*	*7th*	1
F4		*docker*		*Hq*	*7th*	1
FU42.1	*SF900GR*	*SFR.4/GR Sectionable clamp*	*Cabur*	*Hq*	42	1
FU43.1	*SF900GR*	*SFR.4/GR Sectionable clamp*	*Cabur*	*Hq*	43	1
GD1	*6EP1336-3BA10*	*Sitop PSU8200 Single Phase, DC 24 V/20 A. Stabilized Power Supply Input: AC 120...230 V/DC 110-220 V, Output: DC 24 V/20 A*	*siemens*	*Hq*	25	1
HFD-77007		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77007		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77007				*Hq*	49	1
HFD-77008		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77008		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77008				*Hq*	49	1
HFD-77009		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77009		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77009				*Hq*	49	1
HFD-77010		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77010		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77010				*Hq*	49	1
HFD-77011		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77011		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77011				*Hq*	49	1
HL8.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	8	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL16.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	16	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL24.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	24	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186-Cornegliano Laud. (Lo) Italy
tel. 0039-0371-69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 51
F.S. 52

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
HL24.1	*3su1500-0aa10-0aa0*	*Support without module. plastic*	*siemens*	*Hq*	24	1
HL25.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	25	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HPB-77-303	*3su1900-0dy30-0aa0*	*Protective collar for merge button, plastic, yellow, 22mm hole*	*siemens*	*Hq*	26	1
	3SU1001-1HB20-0AA0	*Emergency stop mushroom pushbutton, illuminatable, twist release, 40 mm diameter, 2 positions*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
	3SU1401-1BH20-1AA0	*Red LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
HR-1A	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	42	1
HR-1B	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	42	1
HR-1C	*GRM-H-25-48-AN-OL-00000*	*Static power master unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	42	1
HR-2A	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	43	1
HR-2B	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	43	1
HR-2C	*GRM-H-25-48-AN-OL-00000*	*Static power master unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	43	1
HSS-77-007				*Hq*		1
HSS-77-008				*Hq*		1
HSS-77-009				*Hq*		1
KA8.1	*EPN520*	*Stepper Relay 16A 230V 2NA 1M*	*Hager*	*Hq*	8	1
KA9.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	9	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA11.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	11	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA12.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	12	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA12.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	12	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA12.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	12	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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HVAC SYSTEM and EQUIPMENT
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frigotermica@frigotermica.com

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CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 52
F.S. 53

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA12.3	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*	*Hq*	12	1
KA13.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	13	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA13.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	13	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA13.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	13	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA14.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	14	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA14.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	14	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA15.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	15	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA15.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	15	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 53
F.S. 54

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA15.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	15	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA15.4	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	15	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA17.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	17	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA19.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	19	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA20.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	20	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA20.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	20	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA20.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	20	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA21.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	21	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 54
F.S. 55

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA21.1	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*	*Hq*	21	1
KA21.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	21	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA21.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	21	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA22.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	22	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA22.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	22	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA23.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	23	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA23.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	23	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA23.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	23	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 55
F.S. 56

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA23.4	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	23	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA26.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	26	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA26.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	26	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA26A.1	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer modules*	*Finder*			1
KA26A.2	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer modules*	*Finder*			1
KA26A.3	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer modules*	*Finder*			1
KA26A.4	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer modules*	*Finder*			1
KA26A.5	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer modules*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 56
F.S. 57

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA26A.6	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.7	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.8	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.9	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.10	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA30.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.3	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.4	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 57
F.S. 58

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA30.5	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.6	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.7	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	36	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.8	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	36	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.9	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA37.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	36	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA37.2	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	36	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA42.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	42	1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 58
F.S. 59

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA42.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	42	1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA43.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	43	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KM1	*3RT2316-1BB40*	*Contactor, 4 NO, AC-1: 18 to 24 V DC, 4-pole, 4 NO, size S00, screw terminals*	*siemens*	*Hq*	26	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KM2A	*3RT2015-1AP01*	*Power contactor, AC-3 7 A, 3 kW / 400 V 1 NO, 230 V AC, 50 / 60 Hz 3 poles, size S00 Screw terminals*	*siemens*	*Hq*	13	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KM2B	*3RT2015-1AP01*	*Power contactor, AC-3 7 A, 3 kW / 400 V 1 NO, 230 V AC, 50 / 60 Hz 3 poles, size S00 Screw terminals*	*siemens*	*Hq*	21	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KM3A	*3RT20261AN20*	*cont.11kw,1L 1R,AC 220V 50/60Hz,S0 VT*	*siemens*	*Hq*	14	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KM3B	*3RT20261AN20*	*cont.11kw,1L 1R,AC 220V 50/60Hz,S0 VT*	*siemens*	*Hq*	22	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KT11.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	12	1
KT13.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	13	1
KT14.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	14	1
KT14.2	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	14	1
KT20.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	20	1
KT21.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	21	1
KT22.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	22	1
KT22.2	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	22	1
LIGHT				*Hq*		1
MTP-001A	*3RN2000-1AW30*	*Motor protection relay for PTC thermistor supervision 24/240 V AC/DC 1 changeover contact*	*siemens*	*Hq*	13	1
MTP-001B	*3RN2000-1AW30*	*Motor protection relay for PTC thermistor supervision 24/240 V AC/DC 1 changeover contact*	*siemens*	*Hq*	21	1
MVA-1	*DMG600*	*multimeter with icon-based LCD*	*Lovato*	*Hq*	6	1
PDSL-77-303		*pressure-controlled (pressure switch) NC*		*Hq*	15	1
PDSL-77-304		*pressure-controlled (pressure switch) NC*		*Hq*	23	1
PF8.1	*GSV1000220*	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*	*Hq*	8	1
	GSF10	*air intake filter 100x100*	*Cosmotec*			1
PF16.1	*GSF10*	*air intake filter 100x100*	*Cosmotec*	*Hq*	16	1
	GSV1000220	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*			1
PF24.1	*GSV1000220*	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*	*Hq*	24	1
	GSF10	*air intake filter 100x100*	*Cosmotec*			1
PFT8.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	8	1
PFT16.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	16	1
PFT24.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	24	2
PH8.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	8	1
PH16.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	16	1
PH24.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	24	1

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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tel. 0039-0371-69076
frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 59
F.S. 60

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
PHT8.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	8	1
PHT16.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	16	1
PHT24.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	24	1
PL8.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	8	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL16.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	16	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL24.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	24	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL25.1	*050PEL3C-24V*	*LED Linear Ceiling Light 24V AC/DC, 600LM 368mm*	*New Elfin*	*Hq*	25	1
	050kfm	*Magnet kit*	*New Elfin*			1
PLS8.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	8	1
PLS16.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	16	1
PLS24.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	24	2
PLS25.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	25	1
QF1	*5SU1354-1KK10*	*Residual current circuit breaker, 10 kA, 1P N, AC type, 30 mA, C, IN: 10 A, UN AC: 230 V*	*siemens*	*Hq*	*7th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF1A	*5SY7506-7*	*Circuit breaker 230 V 15KA, 1P N, C, 6 A, D=70 mm*	*siemens*	*Hq*	10	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF1B	*5SY7506-7*	*Circuit breaker 230 V 15KA, 1P N, C, 6 A, D=70 mm*	*siemens*	*Hq*	18	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF2	*5SU1354-1KK16*	*RCD, 10 kA, 1P N, AC type, 30 mA, C, IN: 16 A, UN AC: 230 V*	*siemens*	*Hq*	*7th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF3	*5SY7502-7*	*Circuit breaker 230 V 15KA, 1P N, C, 2 A, D=70 mm*	*siemens*	*Hq*	7	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF4	*5SY7503-7*	*Circuit breaker 230 V 15Ka, 1P N, C, 3 A, D=70 mm*	*siemens*	*Hq*	25	1
QF5	*5SY5220-7*	*Universal current circuit breaker 440 V DC - 400 V AC 10Ka, 2P, C, 20 A*	*siemens*	*Hq*	25	1
QF6	*5su1354-1kk06*	*RCD, 10 kA, 1P N, AC Type, 30 mA, C, In: 6 A, One AC: 230 V*	*siemens*	*Hq*	*7th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF400	*5SY74027*	*Int. MT 4P C2 ICN 15KA, ICU 50KA*	*siemens*	*Hq*	6	1
QFA	*3VA1125-4GF42-0AA0*	*Switch 3VA1 IEC Chassis 160 Switching Capacity Class S ICU=36 KA 415 V 4-pole, TM240 system protection, ATAM, IN=25 A overload protection IR=18 A... 25 A Short-Circuit Protection II=6.4...12.8 x in N-Conductor Protection 100% LU terminal*	*siemens*	*Hq*	6	1
	3VA9157-0FK21	*com. rinv. Door Lock x 3VA10/1 STD*	*siemens*			1
	3VA9988-0BL30	*bobsleigh. Launch SIN 24VAC 50/60 Hz/12-30 VDC*	*siemens*			1
	3VA9988-0AA11	*Cont. HP-type status*	*siemens*			1
	3VA9111-0WD40	*Cover x 3VA10/1 4P 1pcs.*	*siemens*			2
QFB	*3VA1125-4GF42-0AA0*	*Switch 3VA1 IEC Chassis 160 Switching Capacity Class S ICU=36 KA 415 V 4-pole, TM240 system protection, ATAM, IN=25 A overload protection IR=18 A... 25 A Short-Circuit Protection II=6.4...12.8 x in N-Conductor Protection 100% LU terminal*	*siemens*	*Hq*	6	1
	3VA9157-0FK21	*com. rinv. Door Lock x 3VA10/1 STD*	*siemens*			1
	3VA9988-0BL30	*bobsleigh. Launch SIN 24VAC 50/60 Hz/12-30 VDC*	*siemens*			1
	3VA9988-0AA11	*Cont. HP-type status*	*siemens*			1
	3VA9111-0WD40	*Cover x 3VA10/1 4P 1pcs.*	*siemens*			2
QM1	*5SY7410-7*	*Circuit breaker 400 V 15kA, 4P, C, 10 A, D=70 mm*	*siemens*	*Hq*	7	1

REV.	MODIFICA	DATA	FIRMA	APPR.	
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186-Cornegliano Laud. (Lo) Italy
tel. 0039-0371-69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 60
F.S. 61

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
QM1	5SM23420	Block diff. 4P 40A 30mA Type AC x 5sy	siemens	Hq	7	1
	5ST3010	Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker	siemens			1
QM1A	3RV2011-1AA10	Circuit breaker size S00 for motor protection, class 10, trip A 1.1...1.6 A, trip N 21 A, screw terminal	siemens	Hq	9	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM1B	3RV2011-1AA10	Circuit breaker size S00 for motor protection, class 10, trip A 1.1...1.6 A, trip N 21 A, screw terminal	siemens	Hq	17	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM2A	3RV2011-1GA10	Circuit breaker size S00 for motor protection, class 10, trip A 4.5...6.3 A, trip N 82 A, screw terminal	siemens	Hq	10	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
	3RA19211DA00	El.Col. Electr.Mech. (1pack=1pcs)	siemens			1
QM2B	3RV2011-1GA10	Circuit breaker size S00 for motor protection, class 10, trip A 4.5...6.3 A, trip N 82 A, screw terminal	siemens	Hq	18	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
	3RA19211DA00	El.Col. Electr.Mech. (1pack=1pcs)	siemens			1
QM3A	3RV2011-1JA10	Circuit breaker size S00 for motor protection, class 10, trip A 7...10 A, trip N 130 A, screw terminal	siemens	Hq	10	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
	3RA29211AA00	mod.coll.vt x 3rv2-3rt2 ac	siemens			1
QM3B	3RV2011-1JA10	Circuit breaker size S00 for motor protection, class 10, trip A 7...10 A, trip N 130 A, screw terminal	siemens	Hq	18	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
	3RA29211AA00	mod.coll.vt x 3rv2-3rt2 ac	siemens			1
QM4A	3RV2011-1JA10	Circuit breaker size S00 for motor protection, class 10, trip A 7...10 A, trip N 130 A, screw terminal	siemens	Hq	10	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM4B	3RV2011-1JA10	Circuit breaker size S00 for motor protection, class 10, trip A 7...10 A, trip N 130 A, screw terminal	siemens	Hq	18	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM5A	3RV2011-1DA10	Circuit breaker size S00 for motor protection, class 10, trip A 2.2...3.2 A, trip N 42 A, screw terminal	siemens	Hq	11	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM5B	3RV2011-1DA10	Circuit breaker size S00 for motor protection, class 10, trip A 2.2...3.2 A, trip N 42 A, screw terminal	siemens	Hq	19	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QS1	3VA1132-4GF42-0AA0	Switch 3VA1 IEC Chassis 160 Switching Capacity Class S ICU=36 KA 415 V 4-Pole, TM240 System Protection, ATAM, IN=32 A Overload Protection IR=22 A... 32 A Short-Circuit Protection II=5...10 x in N-Conductor Protection 100% terminal LUG	siemens	Hq	6	1
	3VA9988-0BL30	bobsleigh. Launch SIN 24VAC 50/60 Hz/12-30 VDC	siemens			1
	3VA9988-0AA11	Cont. HP-type status	siemens			1
	3VA9157-0FK21	com. rinv. Door Lock x 3VA10/1 STD	siemens			1
	3VA9111-0WD40	Cover x 3VA10/1 4P 1pcs.	siemens			2
SA27.1		Three-position selector switch No rest 0		Hq	27	1
SA27.2		Three-position no-sleep selector switch 1		Hq	27	1

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S.p.186-Cornegliano Laud. (Lo) Italy
tel. 0039-0371-69076
frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 61
F.S. 62

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
TA1	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
TA2	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
TA3	*TAC022150X05*	*Amperometric transformer hole 22, transformation ratio 150/5 A*	*Frer*	*Hq*	6	1
VSD-1A	*6SL3210-5BE15-5CV0*	*SinamiCs V20 3AC380-480V 0.55kw with C3 filter*	*siemens*	*Hq*	9	1
VSD-1B	*6SL3210-5BE15-5CV0*	*SinamiCs V20 3AC380-480V 0.55kw with C3 filter*	*siemens*	*Hq*	17	1
VSD-5A	*6SL3210-5BE21-1CV0*	*SinamiCs V20 3AC380-480V 1.1kw with C3 Filter*	*siemens*	*Hq*	11	1
VSD-5B	*6SL3210-5BE21-1CV0*	*SinamiCs V20 3AC380-480V 1.1kw with C3 Filter*	*siemens*	*Hq*	19	1
X3		*RJ45 port per panel*		*Hq*	*49th*	1
XA1	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		30
	BT005	*BTU Terminal Block*	*Cabur*			2
XA2	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		30
	BT005	*BTU Terminal Block*	*Cabur*			2
XC	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		8
	BT005	*BTU Terminal Block*	*Cabur*			2
XFD	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		20
XFD/S	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		20
XM1	*CBC02GR*	*CBC.2/GR Thru-Clamp*	*Cabur*	*Hq*		6
	CBC10gr	*CBC.10/gr Thru-Clamp*	*Cabur*			6
	CBC04GR	*CBC.4/GR Feed-through clamp*	*Cabur*			6
	BT005	*BTU Terminal Block*	*Cabur*			2
XM2	*CBC02GR*	*CBC.2/GR Thru-Clamp*	*Cabur*	*Hq*		6
	CBC10gr	*CBC.10/gr Thru-Clamp*	*Cabur*			6
	CBC04GR	*CBC.4/GR Feed-through clamp*	*Cabur*			6
	BT005	*BTU Terminal Block*	*Cabur*			2
XMD1	*SF900GR*	*SFR.4/GR Sectionable clamp*	*Cabur*	*Hq*		6
	CBS02GR	*Sectionable clamp 2.5 mm2*	*Cabur*			12
	BT005	*BTU Terminal Block*	*Cabur*			2
XMD2	*SF900GR*	*SFR.4/GR Sectionable clamp*	*Cabur*	*Hq*		6
	CBS02GR	*Sectionable clamp 2.5 mm2*	*Cabur*			12
	BT005	*BTU Terminal Block*	*Cabur*			2
XP1	*CBC35gr*	*CBC.35/GR Feed-through clamp*	*Cabur*	*Hq*		5
	CBC02GR	*CBC.2/GR Thru-Clamp*	*Cabur*			8
	CBC04GR	*CBC.4/GR Feed-through clamp*	*Cabur*			6
	BT005	*BTU Terminal Block*	*Cabur*			2
XT	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		13
	BT005	*BTU Terminal Block*	*Cabur*			2
XUPS	*CBC04GR*	*CBC.4/GR Feed-through clamp*	*Cabur*	*Hq*		2
	BT005	*BTU Terminal Block*	*Cabur*			2

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186-Cornegliano Laud. (Lo) Italy
tel. 0039-0371-69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-300AC UPS EQUIPMENT ROOM

Distinta Materiali
Bill of Materials

ROSETTI MARINO

1724000049-HV-DA-00028

FG. 62
F.S. /

BASE LOAD POWER HUB (BLPH)

B-400 HVAC and LIGHTING PANEL WIRING DRAWING and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

B400-HSB-001

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	03/02/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
05	27/01/25				ACCEPT FOR CONSTRUCTION (AFC)
04	10/12/24				ACCEPT FOR CONSTRUCTION (AFC)
03	04/09/24				ISSUE FOR CONSTRUCTION (IFC)
02	03/07/24				ISSUE FOR REVIEW (IFR)
01	28/06/24				ISSUE FOR REVIEW (IFR)
00	22/04/24				ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
WIRING DIAGRAM
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1724000049-HV-DA-00029

SHEET 001

REV. 05

CROSSWIND

ROSETTI MARINO

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
				APPR.	M.G.

frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
COVER

ROSETTI MARINO ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 1

F.S. 2

LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
1	COVER	X	X	X	X	X				
2	INDEX	X	X	X	X	X				
2A	INDEX	X	X	X	X	X				
3	SIMBOL LIST	X	X	X	X	X				
4	EXTERNAL VIEW	X	X	X	X	X				
5	INTERNAL VIEW	X	X	X	X	X				
6	POWER SECTION	X	X	X	X	X				
7	POWER SECTION	X	X	X	X	X				
8	POWER SECTION	X	X	X	X	X				
9	POWER SECTION A	X	X	X	X	X				
10	POWER SECTION A	X	X	X	X	X				
11	POWER SECTION A	X	X	X	X	X				
12	AUX SECTION A	X	X	X	X	X				
13	AUX SECTION A	X	X	X	X	X				
14	AUX SECTION A	X	X	X	X	X				
15	AUX SECTION A	X	X	X	X	X				
16	AUX SECTION A	X	X	X	X	X				
17	POWER SECTION B	X	X	X	X	X				
18	POWER SECTION B	X	X	X	X	X				
19	POWER SECTION B	X	X	X	X	X				
20	AUX SECTION B	X	X	X	X	X				
21	AUX SECTION B	X	X	X	X	X				
22	AUX SECTION B	X	X	X	X	X				
23	AUX SECTION B	X	X	X	X	X				
24	AUX SECTION B	X	X	X	X	X				
25	UPS POWER SUPPLY	X	X	X	X	X				
26	PLC SECTION	X	X	X	X	X				
26A	PLC SECTION	X	X	X	X	X				

Foglio Sheet	Descrizione Description	Revisioni Revisions								
		1	2	3	4	5	6	7	8	9
27	PLC SECTION	X	X	X	X	X				
28	PLC SECTION	X	X	X	X	X				
29	PLC SECTION	X	X	X	X	X				
30	PLC SECTION	X	X	X	X	X				
31	PLC SECTION	X	X	X	X	X				
32	PLC SECTION	X	X	X	X	X				
33	PLC SECTION	X	X	X	X	X				
34	PLC SECTION	X	X	X	X	X				
35	PLC SECTION	X	X	X	X	X				
36	PLC SECTION	X	X	X	X	X				
37	PLC SECTION	X	X	X	X	X				
38	PLC SECTION	X	X	X	X	X				
39	PLC SECTION	X	X	X	X	X				
40	PLC SECTION	X	X	X	X	X				
41	PLC ARCHITECTURE	X	X	X	X	X				
42	EH MODULATION A	X	X	X	X	X				
43	EH MODULATION B	X	X	X	X	X				
44	AVAILABLE SIGNAL	X	X	X	X	X				
45	TERMINAL STRIP	X	X	X	X	X				
46	TERMINAL STRIP	X	X	X	X	X				
47	TERMINAL STRIP	X	X	X	X	X				
48	TERMINAL STRIP	X	X	X	X	X				
49	TERMINAL STRIP	X	X	X	X	X				
50	MATERIAL LIST	X	X	X	X	X				
51	MATERIAL LIST	X	X	X	X	X				
52	MATERIAL LIST	X	X	X	X	X				
53	MATERIAL LIST	X	X	X	X	X				
54	MATERIAL LIST	X	X	X	X	X				

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
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DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
INDEX

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 2
F.S. 2A

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Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9	Foglio Sheet	Descrizione Description	Revisioni Revisions 1	2	3	4	5	6	7	8	9
55	MATERIAL LIST	X	X	X	X	X															
56	MATERIAL LIST	X	X	X	X	X															
57	MATERIAL LIST	X	X	X	X	X															
58	MATERIAL LIST	X	X	X	X	X															
59	MATERIAL LIST	X	X	X	X	X															
60	MATERIAL LIST	X	X	X	X	X															
61	MATERIAL LIST	X	X	X	X	X															

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

INDEX

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 2A
F.S. 3

Symbol	Description	Symbol	Description	Symbol	Description
TR	VOLTAGE TRANSFORMER		SONIC INDICATOR	F.	FUSE
TA	CURRENT TRANSFORMER	*	INDICATOR INSTRUMENT		CONTACT N.O.
M ~	MOTOR IN C.A.		SELECTOR SWITCH		CONTACT N.C.
	GROUND : GENERAL SYMBOL	52.	SWITCH		COMMUTATION CONTACT
L..	SIGNAL LAMP	52.	AUTOMATIC CIRCUIT BREAKER	P	CONTACT ACTUATED BY A PRESSURE
L..	SIGNAL LAMP + HEATER	52. Id	DIFFERENTIAL AUTOMATIC BREAKER		CONTACT ACTUATED BY A FLOW
L..	SIGNAL LAMP + VOLTAGE TRANSF.	89.	DISCONNECTING SWITCH		CONTACT ACTUATED BY A LEVEL
	SIGNAL LAMP–PUSH BUTTON	89.	LOADED CIRCUIT BREAKER	θ	CONTACT ACTUATED BY A TEMPERATURE
	CLOSING BUTTON	89.	FUSE DISCONNECTING SWITCH	2 3 4	TERMINAL STRIP
	OPENING BUTTON	6.	CONTACTOR		SQUARE POWER TERMINAL CLAMP
	ROTARY SWITCH	6..	CONTACTOR COIL		SQUARE AUX. TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.O.		AUXILIARY RELAY COIL		REMOTE TERMINAL CLAMP
T..	CONTACT DELAYED TO THE ATTRACTION N.C.	T..	TIMER WITH DELAY TO THE ATTRACTION		ONE–PHASE SYSTEM + NEUTRAL
T..	CONTACT DELAYED TO THE RE–DROP N.O.	T..	TIMER WITH DELAY TO THE RE–DROP		THREE–PHASE SYSTEM
T..	CONTACT DELAYED TO THE RE–DROP N.C.	49..	THERMAL RELAY		THREE–PHASE SYSTEM + NEUTRAL
79.	LIMIT SWITCH N.O.		HEATING ELEMENT		
79.	LIMIT SWITCH N.C.		ELECTROVALVE		

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

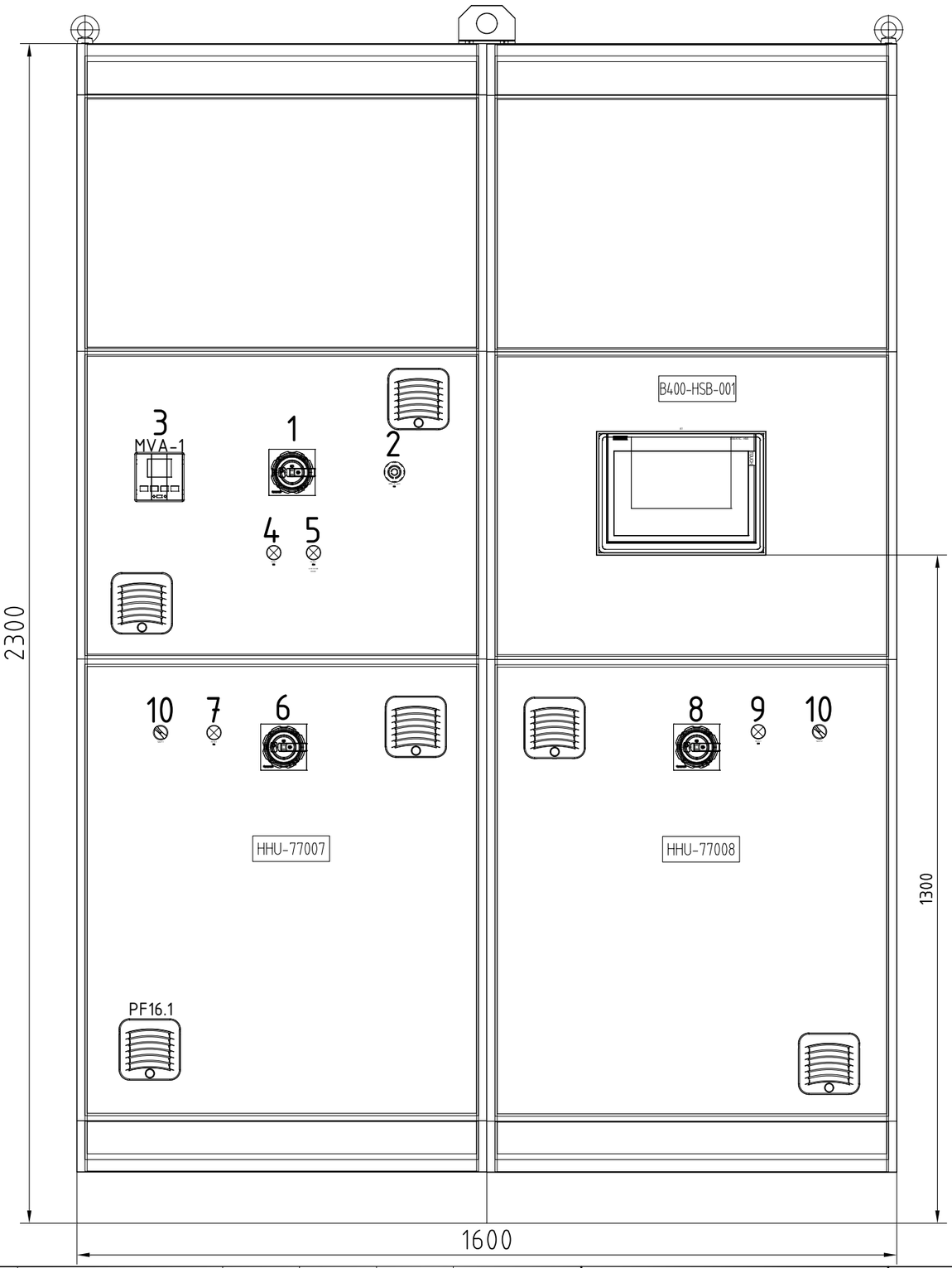
SIMBOL LIST

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 3
F.S. 4

EXTERNAL VIEW



LABEL	
1	MAIN SWITCH
2	ERGENCY POWER BUTTON
3	MULTIMETER
4	230V AC PRESENCE
5	24V DC PRESENCE
6	HHU-77007 MAIN SWITCH
7	230VAC PRESENCE
8	HHU-77008 MAIN SWITCH
9	230VAC PRESENCE
10	AUTO-0-MANUAL

CABINET QUOTE:
LENGHT 1600mm
HEIGHT 2300mm
DEPT 600mm

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tel. 0039–0371–69076
frigotermica@frigotermica.com

SERIAL n.: *Matricola n.:*	1629
TAG: *Codice identificativo:*	B400-HSB-001
POWER SUPPLY: *Alimenatzione:*	400 Vac 50Hz 3Ph+N
Icc: *Coorente cortocircuito:*	25 kA/1s
AUX. TENSION: *Tensione ausiliaria:*	24 Vdc
INTERNAL PROTECTION: *Protezione interna:*	IP54
MAIN BUS BAR RATING: *Barra principale:*	40 A
YEAR OF MANUFACTURE: *Anno produzione:*	2024
MANUFACTURER: *Costruzione:*	FRIGOTERMICA s.r.l.
CONTRACT n.: *Contratto:*	51/240554
PROJECT: *Progetto:*	BASE LOAD POWER HUB
WEIGHT: *Peso:*	1150 Kg

CE

FRIGOTERMICA JOB NUMBER: 4112

SCALE 1:10

REV.	MODIFICA	DATA	FIRMA	APPR.	
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

EXTERNAL VIEW

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 4
F.S. 5

INTERNAL VIEW

CABLE ENTRY FROM TOP
WITH CABLE GLANDS

PLATE 700 x 470

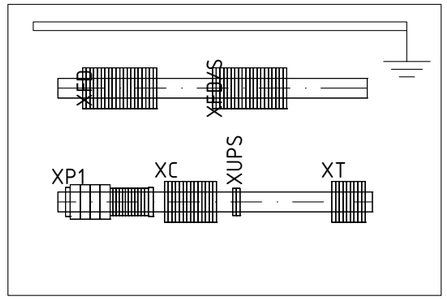
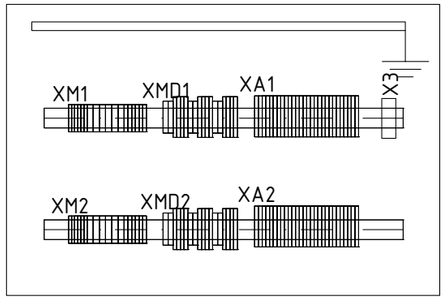


PLATE 700 x 470_2



COPPER BAR

PLATE 700 x 570

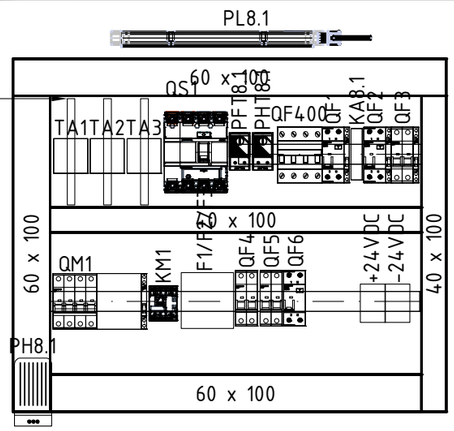


PLATE 700 x 570_2

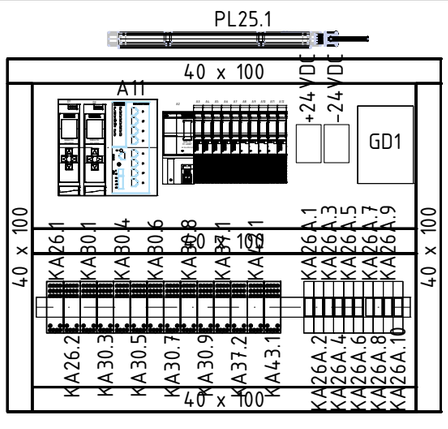


PLATE 700 x 870

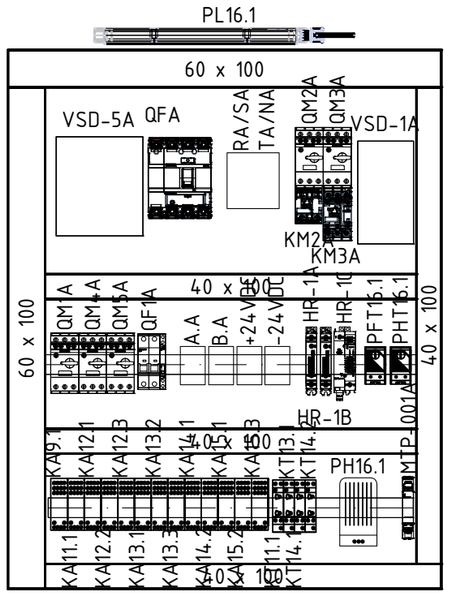
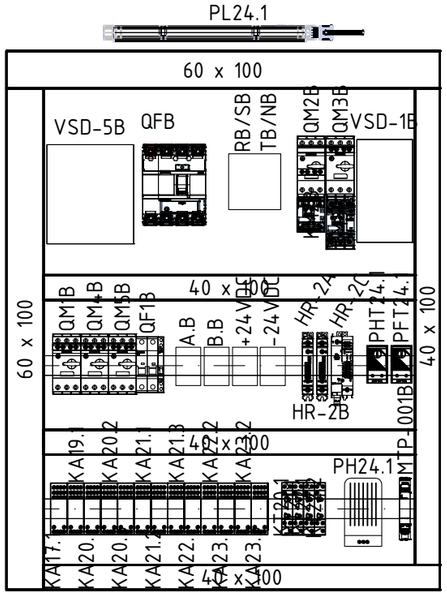


PLATE 700 x 870_2



SCALE 1:10

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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CLIENT:
CROSSWIND

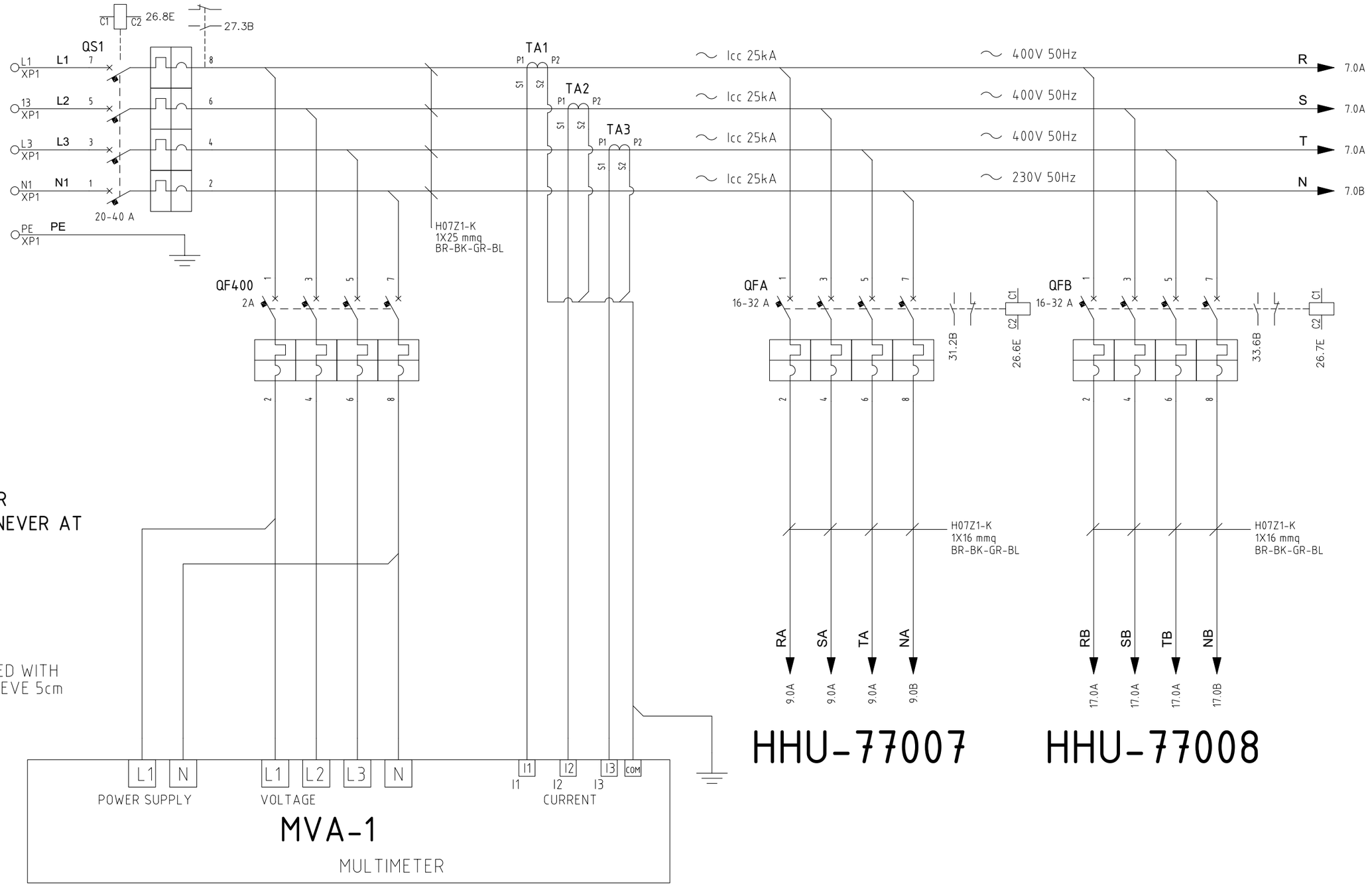
BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
INTERNAL VIEW

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 5
F.S. 6

CLIENT POWER SUPPLY
FROM LV SWITCHGEAR
3 PH + N + PE
400V 50Hz
5G25
TAG SG-200N1



HHU-77007

HHU-77008

RATED POWER: 18.08 kW
RATED CURRENT: 29.10 A

ONLY UNIT HHU-77007 OR
HHU-77008 ACTIVATED, NEVER AT
SAME TIME

COLOR IDENTIFICATION:
COLORED CABLE OR IDENTIFIED WITH
HEAT SHRINK COLOURED SLEEVE 5cm

400V 3P + N
- ⟶ BROWN
- ⟶ BLACK
- ⟶ GRAY
- ⟶ BLU

230V 1P + N
- ⟶ BROWN
- ⟶ BLU

24Vdc
- ⟶ RED
- ⟶ BLACK

PANEL INTERNAL CABLES TYPE: H07Z1-K OR FG17
UNIT INTERNAL CABLES TYPE: FG160M16 GREEN SHEATH NOT ARMOURED

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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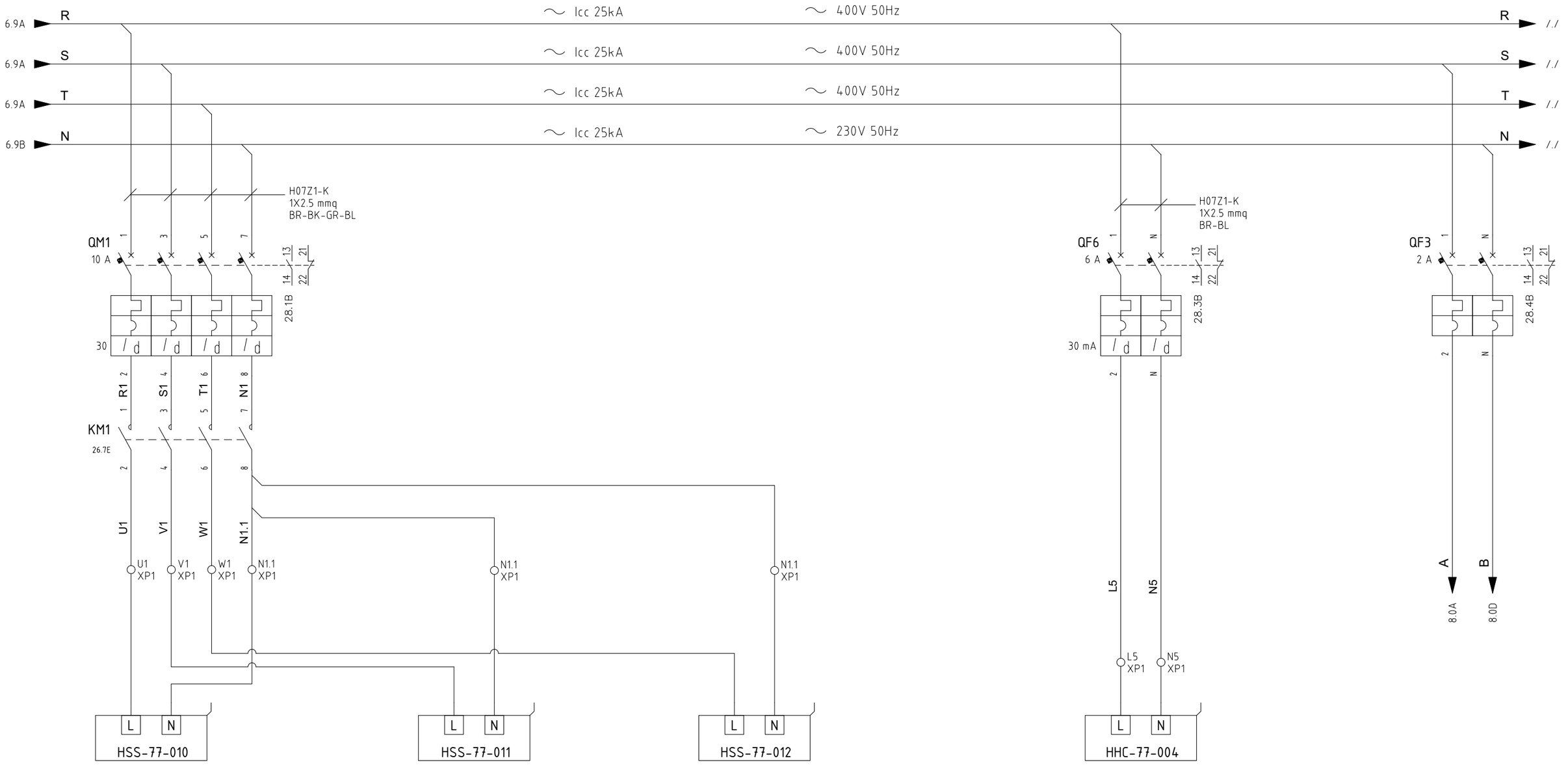
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

F.G. 6
F.S. 7



HSS-77-010	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HSS-77-011	
ELECTRICAL HEATER	
RATED	ABSORBED
2 kW	2 kW
8.7 A	8.7 A

HSS-77-012	
ELECTRICAL HEATER	
RATED	ABSORBED
2.7 kW	2 kW
8.7 A	8.7 A

HHC-77-004	
HEATIN CABLE	
RATED	ABSORBED
0.2 kW	0.2 kW
1.1 A	1.1 A

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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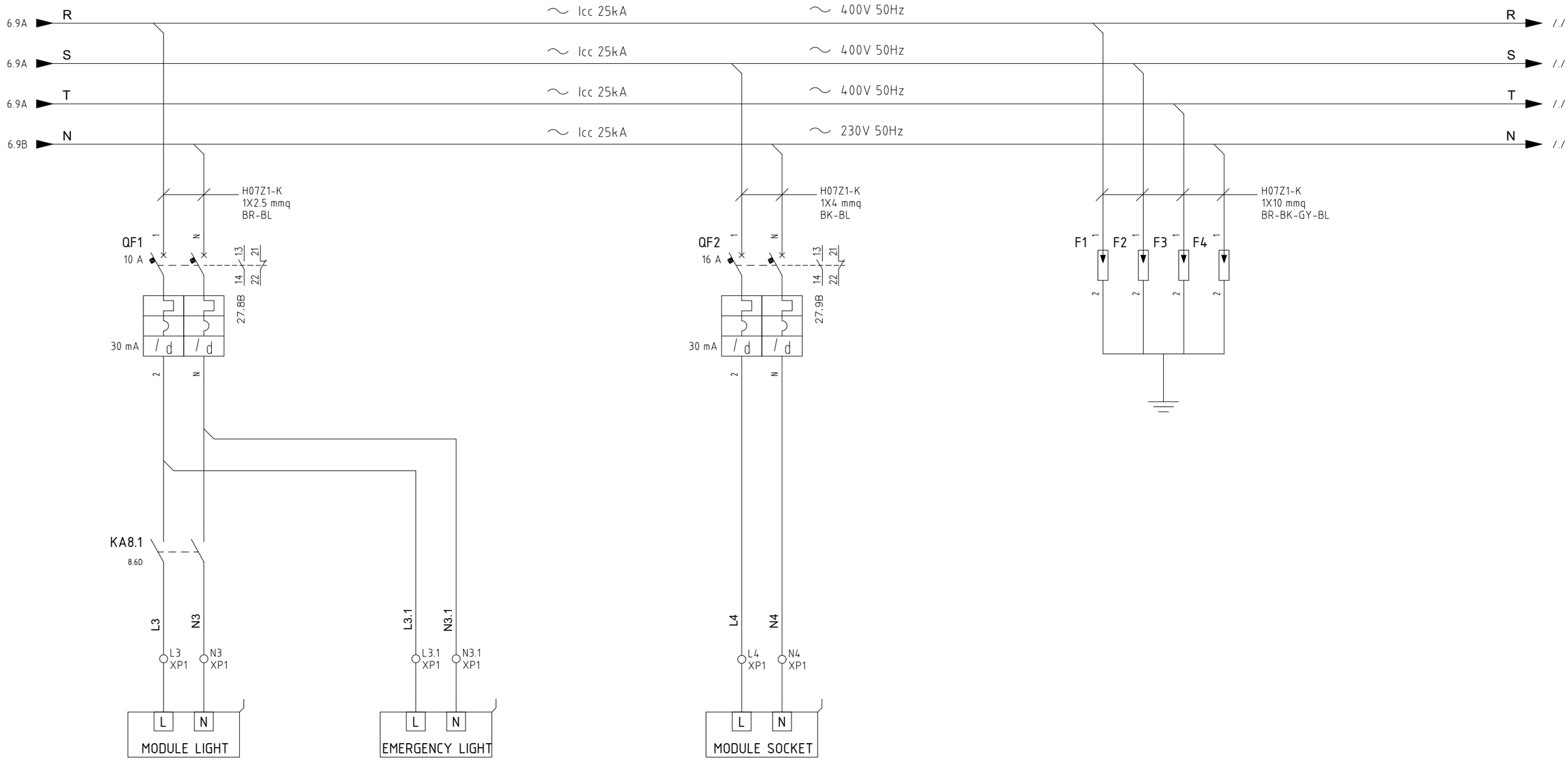
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 7
F.S. 7A



MODULE INTERNAL LIGHT	
RATED	ABSORBED
1 kW	0.9 kW
4.35 A	3.9 A

MODULE INTERNAL SOCKET	
RATED	ABSORBED
3.5 kW	3.5 kW
16 A	16 A

REV.	MODIFICA	DATA	FIRMA
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DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

POWER SECTION
Power section

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 7A
F.S. 8

1	2	3	4	5	6
PANEL INTERNAL LIGHT POWER SECTION	PANEL ANTI CONDENSING HEATER POWER SECTION	PANEL FAN VENTILATION POWER SECTION	230V VOLTAGE PRESENCE LIGHT POWER SECTION		MODULE LIGHT

7.7D A

A ./.

PLS8.1 13 14 8.1

PL8.1 X1 X2

PHT8.1 t< 13 14 8.2

PH8.1

PFT8.1 t> 13 14 8.3

PF8.1

M 1~ A1

HL8.1 X1 X2 WH

KA26.2 8.4

KA8.1 A1 A2

7A.1D
7A.1D

7.8D B

B ./.

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

POWER SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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FG. 8
F.S. 9

HHU-77007
SECTION

RATED POWER: 15 kW
RATED CURRENT: 29.76 A

ABSORBED POWER: 10 kW
ABSORBED CURRENT: 18.3 A

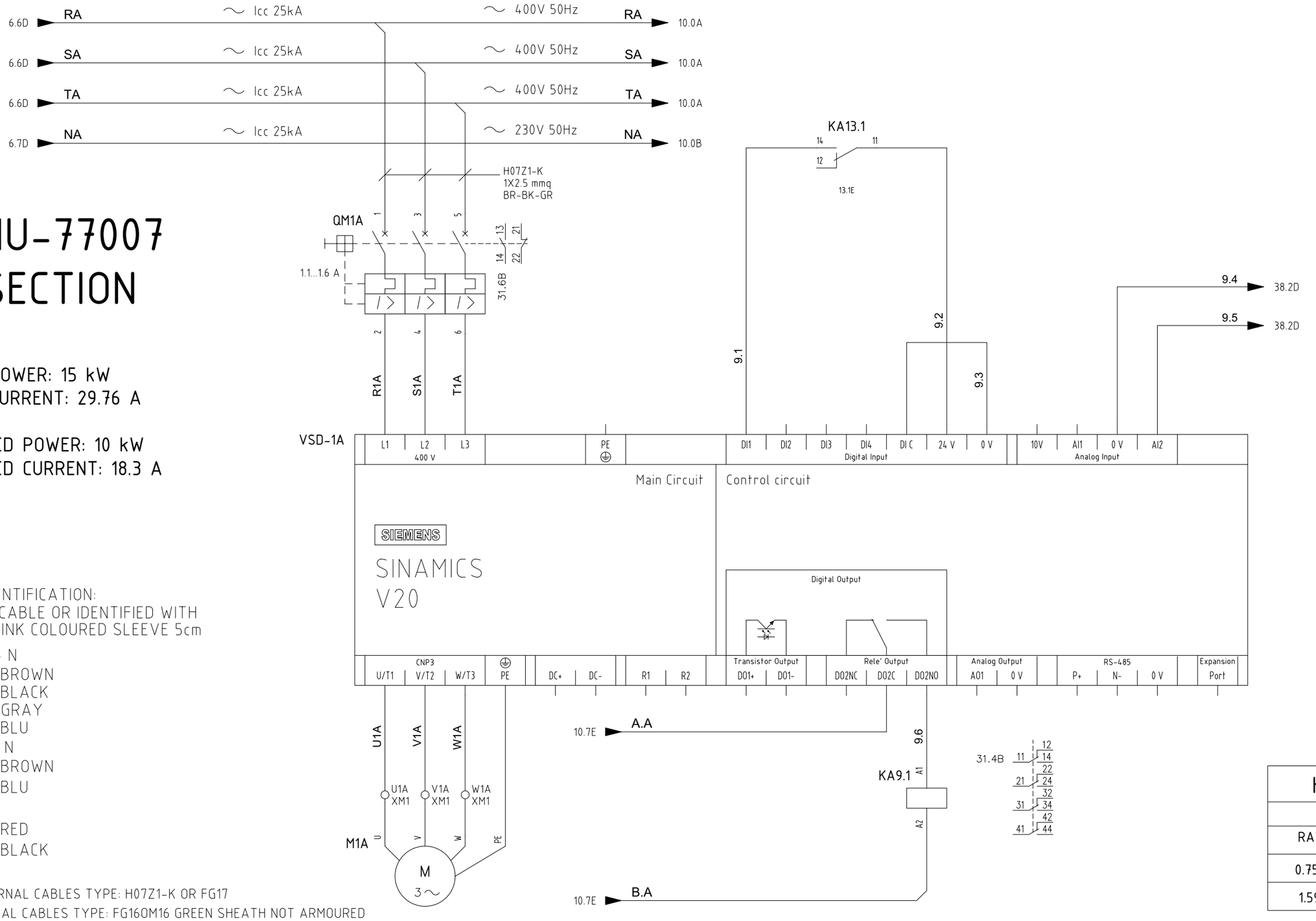
COLOR IDENTIFICATION:
COLORED CABLE OR IDENTIFIED WITH
HEAT SHRINK COLOURED SLEEVE 5cm

400V 3P + N
- ⟶ BROWN
- ⟶ BLACK
- ⟶ GRAY
- ⟶ BLU

230V 1P + N
- ⟶ BROWN
- ⟶ BLU

24Vdc
- ⟶ RED
- ⟶ BLACK

PANEL INTERNAL CABLES TYPE: H07Z1-K OR FG17
UNIT INTERNAL CABLES TYPE: FG160M16 GREEN SHEATH NOT ARMOURED



HFM-77-401	
PRESSURIZING FAN	
RATED	ABSORBED
0.75 kW	0.7 kW
1.59 A.	0.6 A

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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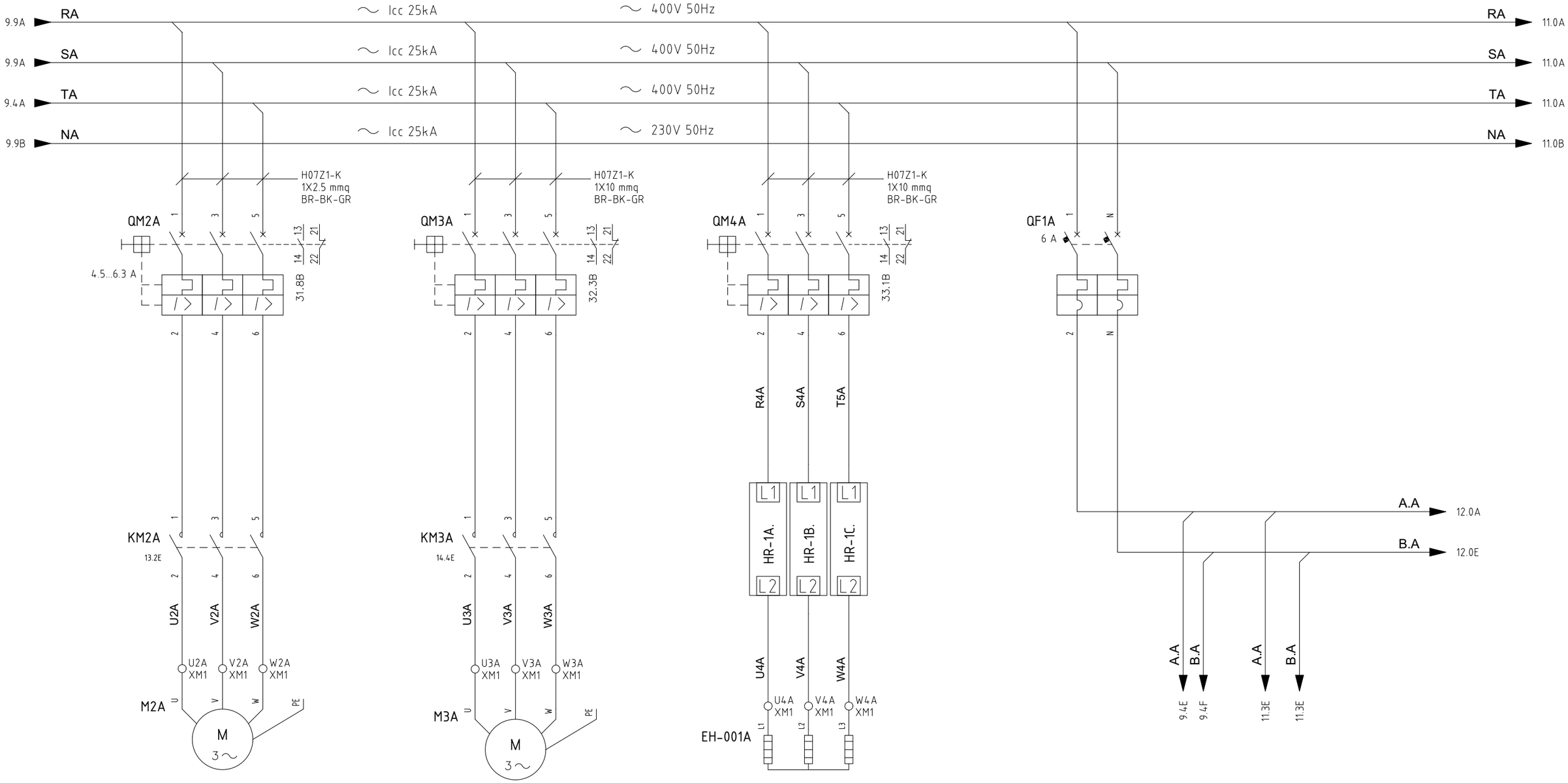
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
POWER SECTION A

ROSETTI MARINO | ALEXSISTEMI spa

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FG. 9
F.S. 10



HFM-77-402	
SUPPLY FAN	
RATED	ABSORBED
3 kW	2.48 kW
6.33 A	4.21 A

HCO-77-401	
COMPRESSOR 1 A	
RATED	ABSORBED
9.8 kW	6.21 kW
16.8 A	11.5 A

HSS-77-401	
ELECTRICAL HEATER	
RATED	ABSORBED
9 kW	9 kW
13 A	13 A

REV.	MODIFICA	DATA	FIRMA	APPR.	
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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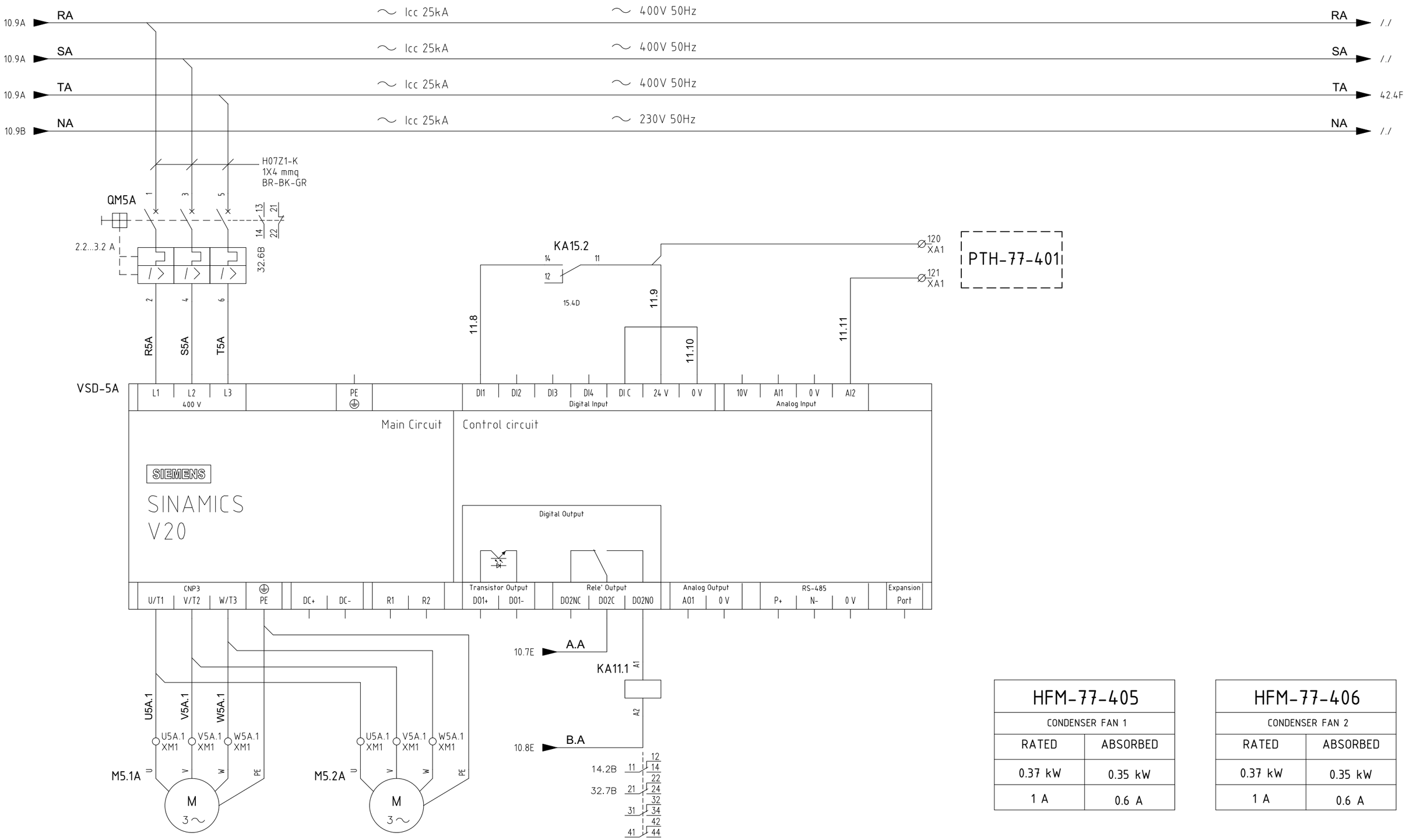
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
POWER SECTION A

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

F.G. 10
F.S. 11



HFM-77-405	
CONDENSER FAN 1	
RATED	ABSORBED
0.37 kW	0.35 kW
1 A	0.6 A

HFM-77-406	
CONDENSER FAN 2	
RATED	ABSORBED
0.37 kW	0.35 kW
1 A	0.6 A

REV.	MODIFICA	DATA	FIRMA	APPR.	
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
POWER SECTION A

ROSETTI MARINO ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 11
F.S. 12

START / STOP
HHU-77007

MOTORISED DAMPER POWER SUPPLY

MOTORISED DAMPER OPEN SIGNAL
HHU-77007

MOTORISED DAMPER CLOSED SIGNA
HHU-77007

MOTORISED DAMPER NOT OPEN ALARM SIGNAL
HHU-77007

10.8D A.A

A.A 13.0A

KA30.3
30.5D

KA12.3
12.7E

12.2

KA12.1
12.5E

12.3

KT11.1
60"

On–D 12.7B

HDZ-77-401
HDZ-77-402
HDZ-77-403

12.4
12.5
12.6
12.7
12.8
12.9

KA12.1
KA12.2

KA12.3
12.7E

Delay/Ritardo
KT11.1
12.1E

12.10
12.11

KA37.1
37.2D

KA12.3

10.8D B.A

B.A 13.0E

12.1C 11 12 14 22
13.1B 21 24
13.2B 31 32 34 42
31.2B 41 44

31.2B 11 12 14 22
21 24 32
31 34 42
41 44

12.1C 11 12 14 22
12.8B 21 24 32
28.5B 31 34 42
41 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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AUX SECTION A

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 12
F.S. 13

1	2	3	4	5	6	7
PRESSURIZING FAN START / STOP HH-77007	SUPPLY AIR FAN START/STOP HH-77007		SUPPLY AIR FAN BROKEN BELT ALARM HHU-77007	SUPPLY AIR FAN MOTOR HEATER HHU-77007		PRESSURIZIN FAN OVERLOAD PROTECTION HHU-77007

12.9A A.A

A.A 14.0A

KA12.1 12.5E — 21 / 24 / 22

13.1

KA13.3 13.8E — 11 / 14 / 12

13.2

KA13.1 — A1 / A2

KA12.1 12.5E — 31 / 34 / 32

13.3

KM2A — A1 / A2

KA37.1 37.2D — 21 / 24 / 22

PDSL-77-401 — 100 XA1 / 13 / p> / 14 / 101 XA1

13.4

KT13.1 13.3E — Delay/Ritardo

KT13.1 — A1 / A2

13.5

KA13.2 13.4E — 11 / 14 / 12

KA13.2 — A1 / A2

13.6

KM2A 13.2E — 21 / 22

HSS-77-403 — 108 XA1 / 109 XA1

MTP-001A — A1/11

SIEMENS

TRIPPED

NC / NO

T1 / T2 / A2 / 12 / 14

13.7 / 13.8

102 XA1 / 103 XA1

TE-77-401

13.9

KA13.3 — A1 / A2

12.9E B.A

B.A 14.0E

9.5B — 11 / 14 / 22 / 21 / 24 / 32 / 31 / 34 / 42 / 41 / 44

10.1D — 2 / 1

10.1D — 4 / 3

10.1D — 6 / 5

14.1B — 14 / 13

31.7B — 44 / 43

13.5B — 22 / 21 / 32 / 31

13.4B On-D

13.4C — 11 / 14 / 22 / 21 / 24 / 32 / 31 / 34 / 42 / 41 / 44

29.4B

13.1C — 11 / 14 / 22 / 21 / 24 / 32 / 31 / 34 / 42 / 41 / 44

29.1B

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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B-400 I&T EQUIPMENT ROOM
AUX SECTION A

ROSETTI MARINO — ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 13
F.S. 14

PRESSURIZING FAN
NìMOTOR HEATER

HHU-77007

COMPRESSOR
START/STOP

HHU-77007

LOW PRESSURE
ALARM

HHU-77007

HIGH PRESSURE
ALARM

HHU-77007

COMPRESSOR
OIL HEATER

HHU-77007

13.9A A.A

A.A 15.0A

KA30.4
30.6D

KA30.5
35.6D
PLC START

KM2A
13.2E

KA14.1
14.5E

KA14.2
14.7E

KA11.1
11.4E

KT14.1
14.2E
Delay/Ritardo

KT14.2
14.4E
Delay/Ritardo

PSL-77-401

PSH-77-401

KA14.1
14.5E

KA37.1
37.2D

KA14.2
14.7E

KA37.1
37.2D

KM3A
14.4E

128 XA1
129 XA1
126 XA1
127 XA1

14.1
14.2
14.3
14.4
14.5
14.6
14.7
14.9
14.10
14.11
14.12
14.13

HSS-77-402

110 XA1
111 XA1

KT14.1 A1 120" A2

KM3A A1 A2

KT14.2 A1 10" A2

KA14.1 A1 A2

KA14.2 A1 A2

HSS-77-404

112 XA1
113 XA1

13.9E B.A

B.A 15.0E

On-D 14.4B

On-D 14.5C

10.3D 2 1
10.3D 4 3
10.3D 6 5
15.1B 14 13
32.2B 44 43
14.8B 22 21
32 31

14.2C 11 12 14
14.6B 21 22 24
32.5B 31 32 34
41 42 44

14.2D 11 12 14
14.8B 21 22 24
32.4B 31 32 34
41 42 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

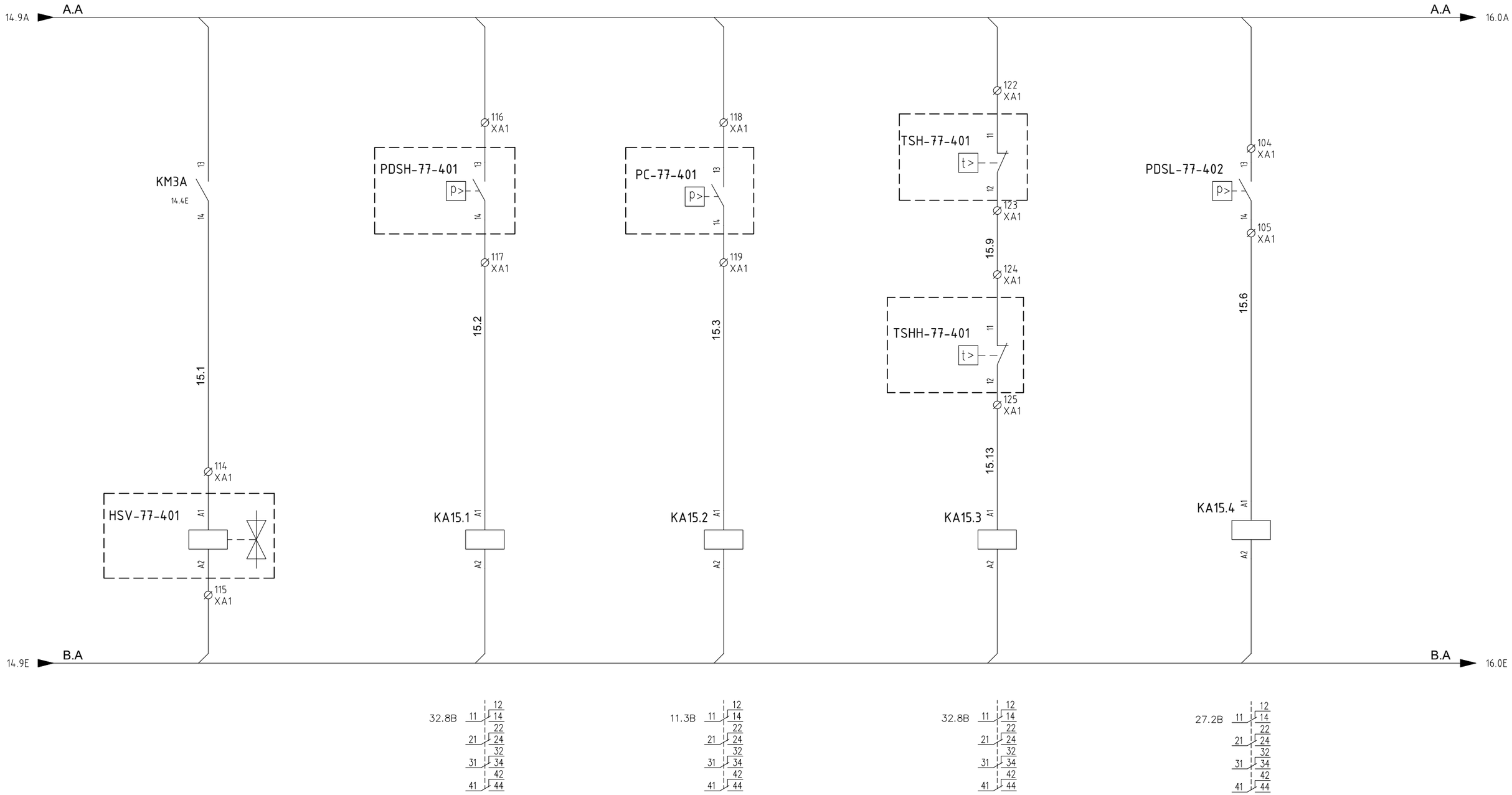
AUX SECTION A

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 14
F.S. 15

1	2	3	4	5	6	7	8	9
SOLENOID VALVE HHU-77007		FILTER CLOGGED HHU-77007	CONDENSING PRESSURE SWITCH HHU-77007		ELECTRICAL HEATER SECURITY THERMOSTATE HHU-77007		PRESSURIZING FAN LOW PRESSURE SWITCH	



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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

AUX SECTION A

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

F.G. 15
F.S. 16

PANEL INTERNAL LIGHT	PANEL FAN	PANEL HEATER	230V AUX VOLTAGE PRESENCE
HHU-77007	HHU-77007	HHU-77007	HHU-77007

15.9A A.A

A.A /./

PLS16.1 11 12 16.1

PFT16.1 13 14 16.2 t>

PHT16.1 13 14 16.3 t<

PL16.1 X1 X2

PF16.1 M 1~ A1

PH16.1

HL16.1 X1 X2 WH

15.9E B.A

B.A /./

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
AUX SECTION A

ROSETTI MARINO ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 16
F.S. 17

HHU-77008
SECTION

RATED POWER: 15 kW
RATED CURRENT: 29.76 A

ABSORBED POWER: 10 kW
ABSORBED CURRENT: 18.3 A

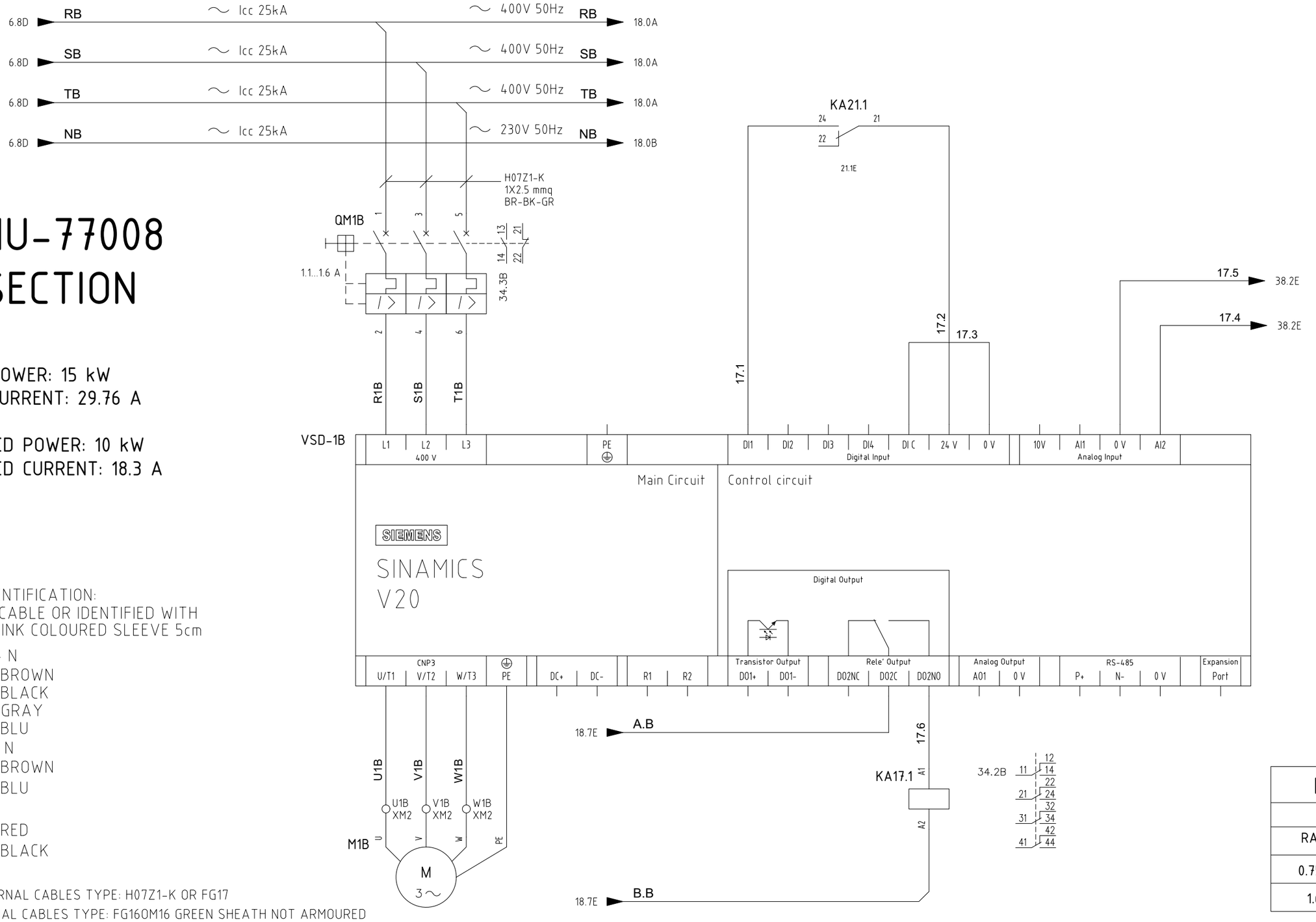
COLOR IDENTIFICATION:
COLORED CABLE OR IDENTIFIED WITH
HEAT SHRINK COLOURED SLEEVE 5cm

400V 3P + N
- ⟶ BROWN
- ⟶ BLACK
- ⟶ GRAY
- ⟶ BLU

230V 1P + N
- ⟶ BROWN
- ⟶ BLU

24Vdc
- ⟶ RED
- ⟶ BLACK

PANEL INTERNAL CABLES TYPE: H07Z1-K OR FG17
UNIT INTERNAL CABLES TYPE: FG160M16 GREEN SHEATH NOT ARMOURED



HFM-77-403	
PRESSURIZING FAN	
RATED	ABSORBED
0.75 kW	0.7 kW
1.6 A	0.6 A

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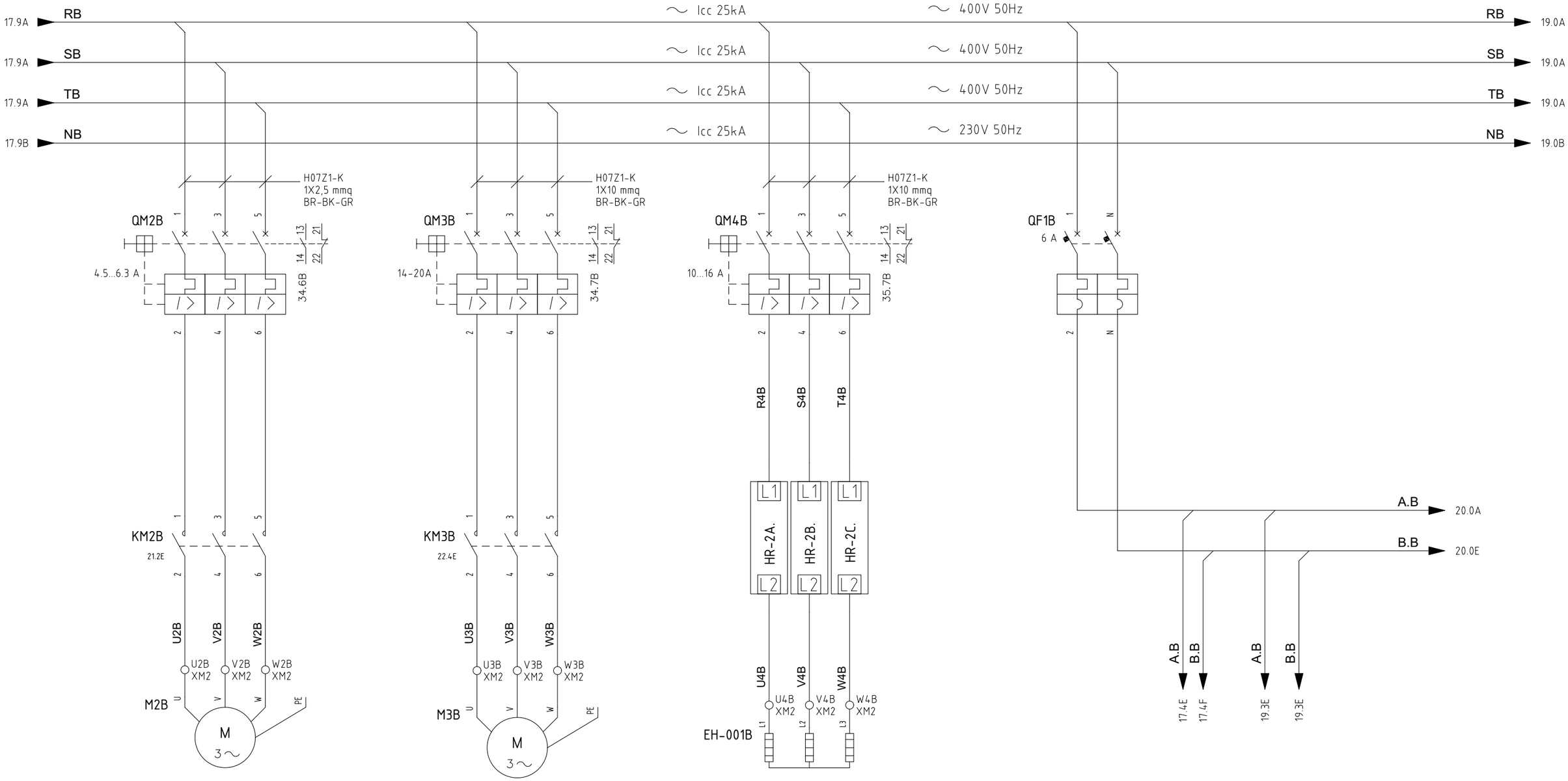
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
POWER SECTION B

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 17
F.S. 18



HFM-77-404	
SUPPLY FAN	
RATED	ABSORBED
3.00 kW	2.48 kW
6.33 A	4.21 A

HCO-77-402	
COMPRESSOR 1 A	
RATED	ABSORBED
9.80 kW	6.21 kW
16.8 A	11.5 A

HSS-77-405	
ELECTRICAL HEATER	
RATED	ABSORBED
9 kW	9 kW
13 A	13 A

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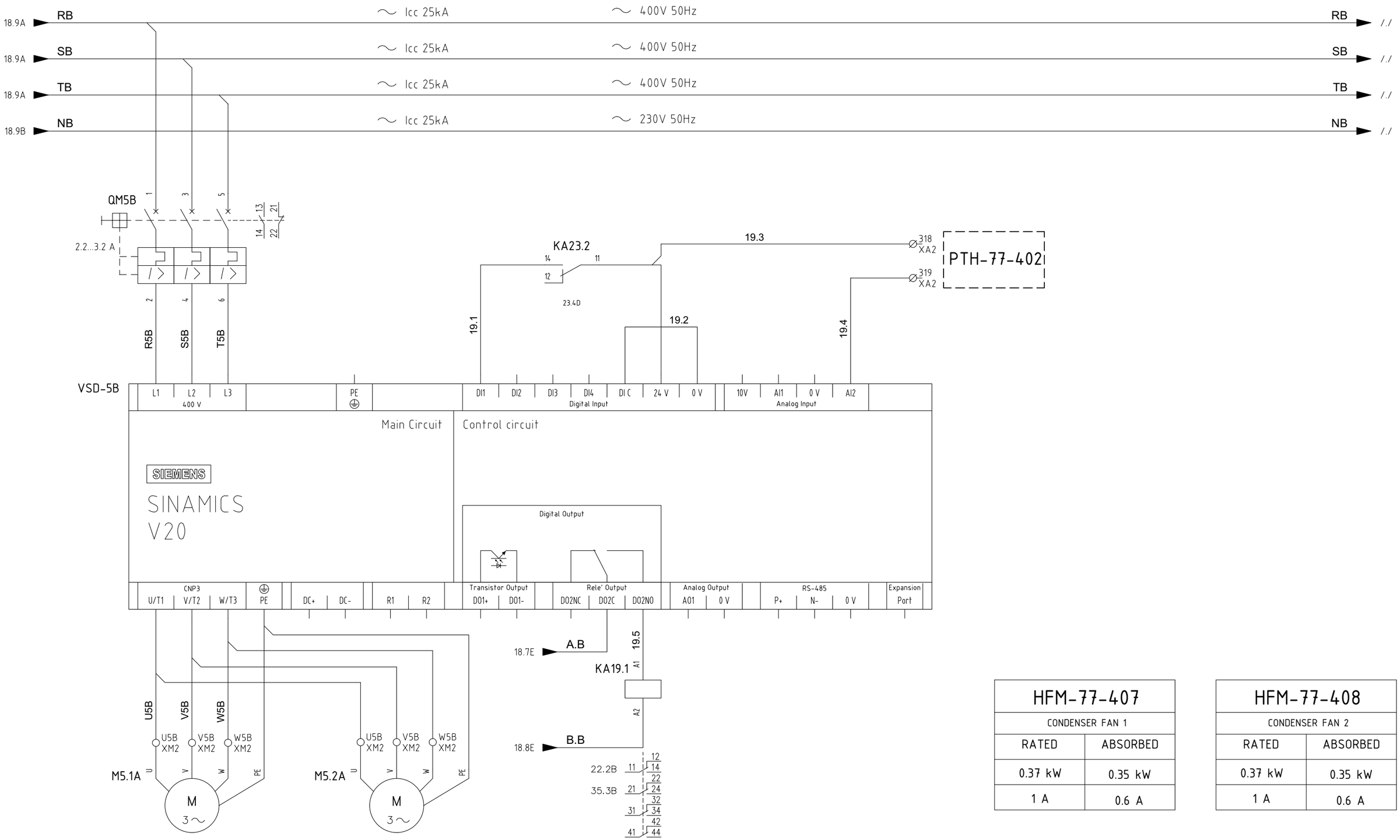
CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
POWER SECTION B

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 18
F.S. 19



HFM-77-407	
CONDENSER FAN 1	
RATED	ABSORBED
0.37 kW	0.35 kW
1 A	0.6 A

HFM-77-408	
CONDENSER FAN 2	
RATED	ABSORBED
0.37 kW	0.35 kW
1 A	0.6 A

REV.	MODIFICA	DATA	FIRMA	APPR.	
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				APPR.	M.G.

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B-400 I&T EQUIPMENT ROOM
POWER SECTION B

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 19
F.S. 20

START / STOP
HHU-77008

MOTORISED DAMPER
POWER SUPPLY

MOTORISED DAMPER
OPEN SIGNAL
HHU-77008

MOTORISED DAMPER
CLOSED SIGNA
HHU-77008

MOTORISED DAMPER
NOT OPEN
ALARM SIGNAL
HHU-77008

18.8D A.B

A.B 21.0A

KA30.6
35.7D
UNIT B
START FROM PLC

20.1

KA20.3
20.7E

20.3

KA20.1
20.5E

KT20.1 20.4
60"

On–D 20.7B

200 XMD2
HDZ-77-404
M 1~
201 XMD2

206 XMD2
HDZ-77-405
M 1~
207 XMD2

212 XMD2
HDZ-77-406
M 1~
213 XMD2

202 XMD2
204 XMD2
HDZ-77-404 HDZ-77-404

203 XMD2
205 XMD2
20.5
20.8

208 XMD2
210 XMD2
HDZ-77-405 HDZ-77-405

209 XMD2
211 XMD2
20.6
20.9

214 XMD2
216 XMD2
HDZ-77-406 HDZ-77-406

215 XMD2
KA20.1 20.7

217 XMD2
KA20.2 20.10

KA20.3

Delay/Ritardo
KT20.1
20.1E

KA20.3
20.7E

20.11

KA37.2
37.3D

20.12

18.8D B.B

B.B 21.0E

20.1C 11 12 14
21.1B 21 22 24
31.4B 31 32 34
21.2B 41 42 44

33.7B 11 12 14
21 22 24
31 32 34
41 42 44

20.1C 11 12 14
20.8B 21 22 24
33.6B 31 32 34
41 42 44

REV.	MODIFICA	DATA	FIRMA
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B-400 I&T EQUIPMENT ROOM
AUX SECTION B

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 20
F.S. 21

1	2	3	4	5	6	7	8	9
PRESSURIZING FAN START / STOP HHU-77008	SUPPLY AIR FAN START/STOP HHU-77008		SUPPLY AIR FAN BROKEN BELT ALARM HHU-77008	SUPPLY AIR FAN MOTOR HEATER HHU-77008		PRESSURIZIN FAN OVERLOAD PROTECTION HHU-77008		

20.9A A.B

A.B 22.0A

KA20.1 21 24 22 20.5E

21.1

KA21.3 11 14 12 21.8E

21.2

KA21.1 A1 A2

KA20.1 41 44 42 20.5E

21.3

KM2B A1 A2

300 XA2

PDSL-77-402 p> 13 14

301 XA2

KA37.2 21 24 22 37.3D

21.12

KT21.1 A1 A2

KA21.2 21 24 22 21.4E

21.4

Delay/Ritardo

KT21.1 21.3E

KM2B 21 22 21.2E

21.5

306 XA2

HSS-77-407

307 XA2

KA21.2 A1 A2

MTP-001B A1/11

SIEMENS

TRIPPED

NC NO

T1 T2 A2 12 14

21.6 21.7

302 XA2 303 XA2

TE-77-402

21.8

KA21.3 A1 A2

20.9E B.B

B.B 22.0E

17.5B 12 11 14 22 21 24 32 31 34 42 41 44

18.1D 2 1

18.1D 4 3

18.1D 6 5

22.1B 14 13

34.4B 44 43

21.5B 22 21 32 31

21.4B On–D

34.4B 12 11 14 22

21.4C 21 24 32 31 34 42 41 44

21.1C 12 11 14 22

33.8B 21 24 32 31 34 42 41 44

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
AUX SECTION B

ROSETTI MARINO ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 21

F.S. 22

PRESSURIZING FAN MOTOR HEATER
HHU-77008

COMPRESSOR START/STOP
HHU-77008

LOW PRESSURE ALARM
HHU-77008

HIGH PRESSURE ALARM
HHU-77008

COMPRESSOR OIL HEATER
HHU-77008

21.9A A.B

A.B 23.0A

KA30.7
30.8D

KA30.8
30.9D

KM2B
21.2E

KA22.1
22.5E

KA22.2
22.7E

KA19.1
19.4E

KT22.1
22.2E
Delay/Ritardo

PSL-77-402

PSH-77-402

KA22.1
22.5E

KT22.2
22.4E
Delay/Ritardo

KA37.2
37.3D

KA22.2
22.7E

KA37.2
37.3D

KM3B
22.4E

22.1 22.2 22.3 22.4 22.5 22.6 22.7 22.8 22.9 22.10 22.11 22.12 22.13

308 XA2
HSS-77-406
309 XA2

KT22.1 A1 120" A2

KM3B A1 A2

KT22.2 A1 10" A2

KA22.1 A1 A2

KA22.2 A1 A2

310 XA2
HSS-77-408
311 XA2

21.9E B.B

B.B 23.0E

On-D 14.4B

On-D 14.5C

18.3D 2 1
18.3D 4 3
18.3D 6 5
23.1B 14 13
34.7B 44 43
22.8B 22 21
32 31

22.2C 11 12 14
22.6B 21 22 24
35.2B 31 32 34
41 42 44

22.2D 11 12 14
22.8B 21 22 24
34.8B 31 32 34
41 42 44

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B-400 I&T EQUIPMENT ROOM
AUX SECTION B

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029
FG. 22
F.S. 23

SOLENOID VALVE HHU-77008	FILTER CLOGGED HHU-77008	CONDENSING PRESSURE SWITCH HHU-77008	ELECTRICAL HEATER SECURITY THERMOSTATE HHU-77008	PRESSURIZING FAN LOW PRESSURE SWITCH

22.9A → A.B

A.B → 24.0A

KM3B (22.4E) 13/14

PDSH-77-403 p> 13/14 — 314 XA2 / 315 XA2

PC-77-402 p> 13/14 — 316 XA2 / 317 XA2

TSH-77-402 t> 11/12 — 320 XA2 / 321 XA2

PDSL-77-404 p> 13/14 — 328 XA2 / 329 XA2

23.4: 321 XA2 → 322 XA2

TSHH-77-402 t> 11/12 — 322 XA2 / 323 XA2

23.5: 323 XA2 → 23.1 / 23.2 / 23.3 / 23.6

23.1: 312 XA2 → HSV-77-402 (A1/A2) → 313 XA2

23.2: KA23.1 (A1/A2)

23.3: KA23.2 (A1/A2)

23.6: KA23.3 (A1/A2) → KA23.4 (A1/A2)

22.9E → B.B

B.B → 24.0E

35.4B: 11/14, 21/24, 31/34, 41/44

19.3B: 11/14, 21/24, 31/34, 41/44

35.6B: 11/14, 21/24, 31/34, 41/44

27.5B: 11/14, 21/24, 31/34, 41/44

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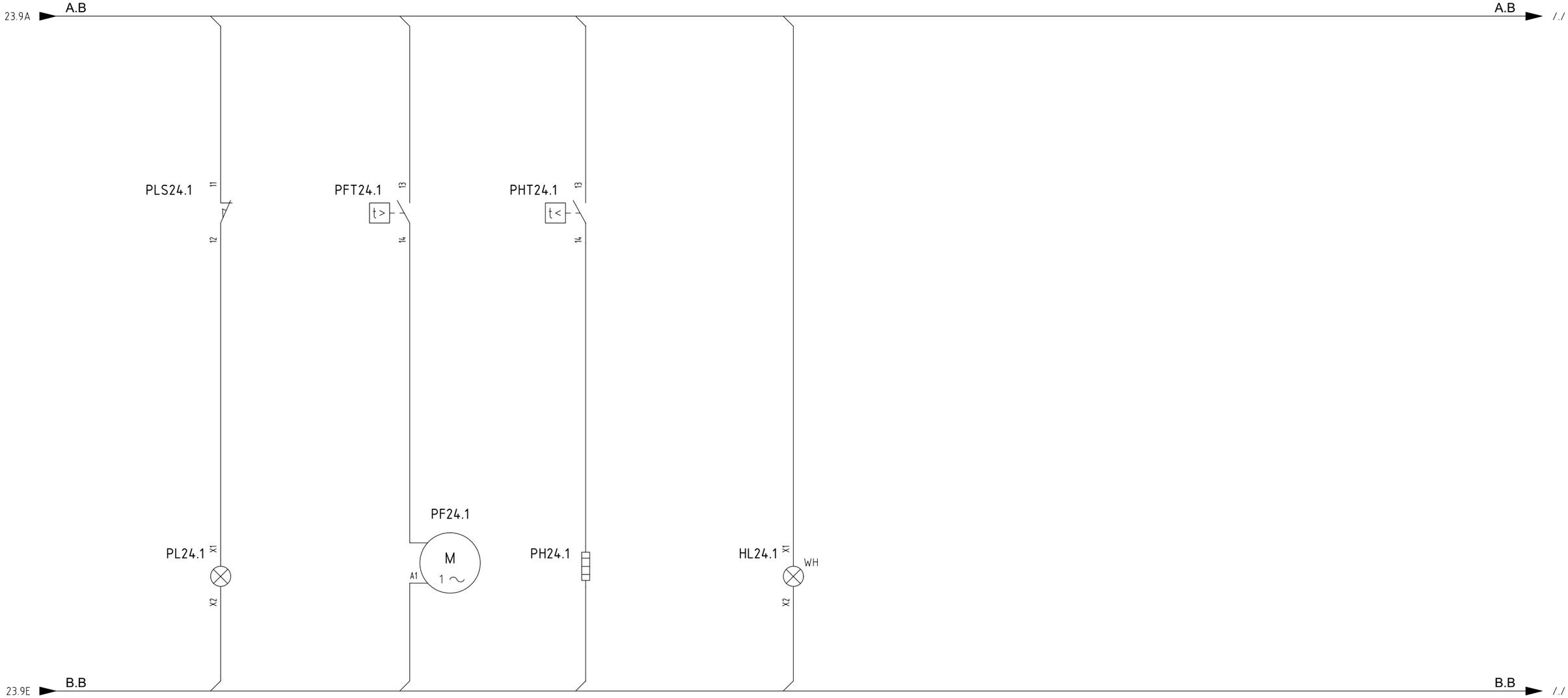
BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
AUX SECTION B

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 23
F.S. 24

PANEL INTERNAL LIGHT	PANEL FAN	PANEL HEATER	230V AUX VOLTAGE PRESENCE
HHU-77008	HHU-77008	HHU-77008	HHU-77008



REV.	MODIFICA	DATA	FIRMA
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DATA	22/04/2024
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BASE LOAD POWER HUB (BLPH)
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AUX SECTION B

ROSETTI MARINO | ALEXSISTEMI spa

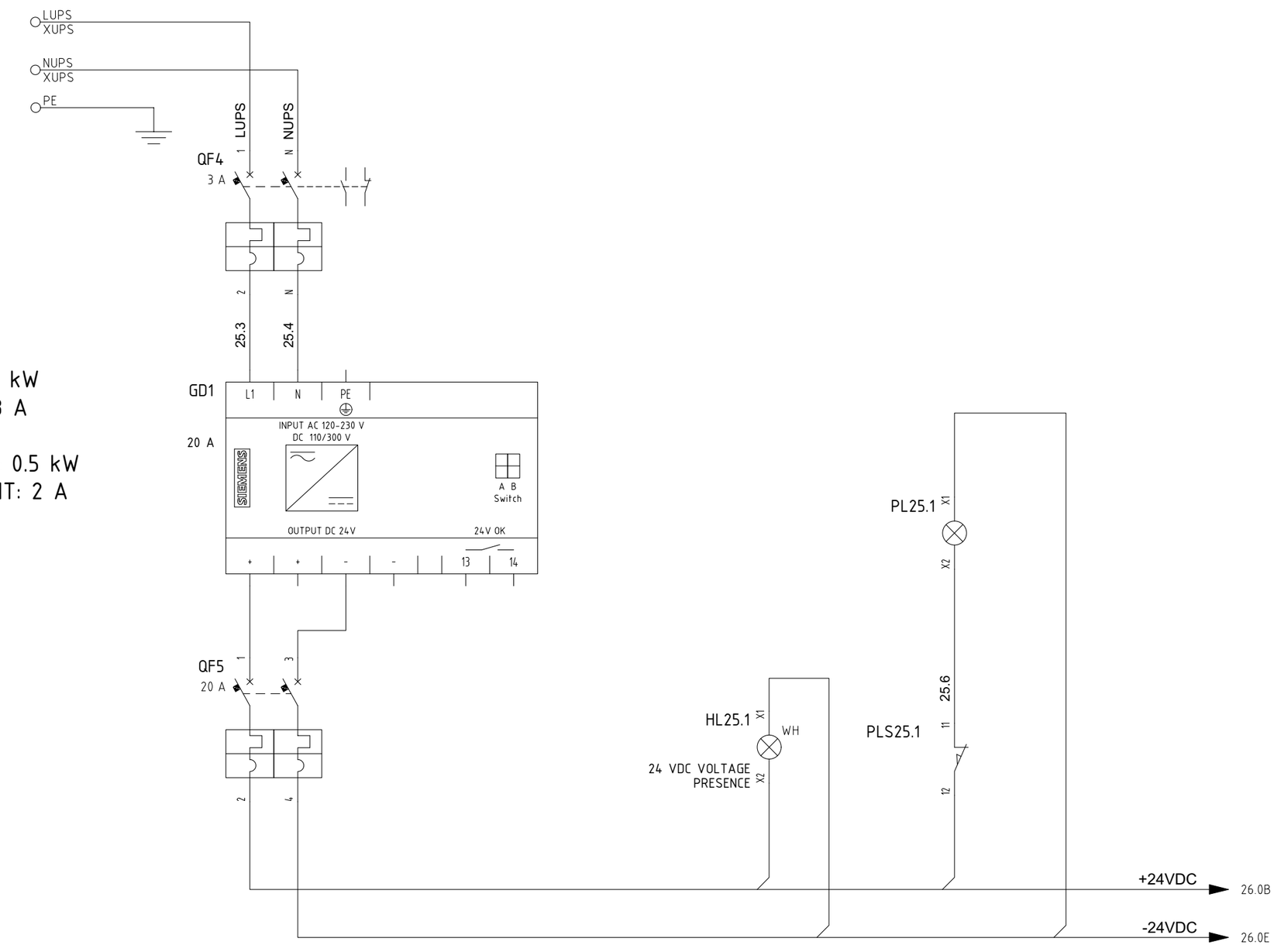
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FG. 24
F.S. 25

POWER SUPPLY
FROM
AC UPS - PAS DB
1PH + N + PE
230V 50Hz
3G4
TAG DP200-F3

RATED POWER: 0.7 kW
RATED CURRENT: 3 A

ABSORBED POWER: 0.5 kW
ABSORBED CURRENT: 2 A



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B-400 I&T EQUIPMENT ROOM

UPS POWER SUPPLY

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029

F.G. 25
F.S. 26

0	1	2	3	4	5	6	7	8	9
SHUT DOWN FROM CUSTOMER SIS			PANEL EMERGENCY BUTTON LIGHT	HHS-77-010/11/12 SPACE HEATER START / STOP COMMAND	MODULE LIGHT	HPB-77-401 EMERGENCY POWER BUTTON HHU-77007	HPB-77-402 EMERGENCY POWER BUTTON HHU-77008	HPB-77-403 EMERGENCY POWER BUTTON B400-HSB-001	

25.7E +24VDC → +24VDC 26A.0A

24V DC
FROM SIS
B400-SIS-0901
1= OK
0= SHUT
DOWN

500 XC — 26.1 — KA26.1 A1 — A2 — 26.2 — 501 XC

27.1B: 11-12, 21-22, 31-32, 41-42

HPB-77-403 33-34 (26.8B) — 26.3 — EPB-002L X1 RD X2

KA30.9 11-12 (30.3D) — 26.4 — KM1 A1 A2

504 XC — 506 XC — LIGHT PUSH BUTTON — 505 XC — 507 XC — 26.5 — KA26.2 A1 A2

106 XA1 — HPB-77-401 13-14 (31.1B) — 107 XA1 — 26.6 — QFA C1 C2 (6.6B)

304 XA2 — HPB-77-402 13-14 (33.5B) — 305 XA2 — 26.7 — QFB C1 C2 (6.8B)

HPB-77-403 13-14 — RD — X1 X2 — 26.8 — QS1 C1 C2 (6.2B)

25.7E -24VDC → -24VDC 26A.0E

7.0D 2-1
7.0D 4-3
7.0D 6-5
7.0D 8-7
28.2B 54-53, 62-61, 72-71, 84-83

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO — ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 26
F.S. 26A

HFD-77012
CLOSED CONTACT

HFD-77013
CLOSED CONTACT

HFD-77014
CLOSED CONTACT

HFD-77015
CLOSED CONTACT

HFD-77016
CLOSED CONTACT

HFD-77012
OPEN CONTACT

HFD-77013
OPEN CONTACT

HFD-77014
OPEN CONTACT

HFD-77015
OPEN CONTACT

HFD-77016
OPEN CONTACT

26.9B +24VDC → +24VDC 27.0A

700 XFD — 11 — HFD-77012 — 12 — 701 XFD
702 XFD — 13 — HFD-77012 — 14 — 703 XFD
704 XFD — 11 — HFD-77013 — 12 — 705 XFD
706 XFD — 13 — HFD-77013 — 14 — 707 XFD
708 XFD — 11 — HFD-77014 — 12 — 709 XFD
710 XFD — 13 — HFD-77014 — 14 — 711 XFD
712 XFD — 13 — HFD-77015 — 14 — 713 XFD
714 XFD — 11 — HFD-77015 — 12 — 715 XFD
716 XFD — 13 — HFD-77016 — 14 — 717 XFD
718 XFD — 11 — HFD-77016 — 12 — 719 XFD

KA26A.1 A1 / A2
KA26A.2 A1 / A2
KA26A.3 A1 / A2
KA26A.4 A1 / A2
KA26A.5 A1 / A2
KA26A.6 A1 / A2
KA26A.7 A1 / A2
KA26A.8 A1 / A2
KA26A.9 A1 / A2
KA26A.10 A1 / A2

26.9E -24VDC → -24VDC 27.0A

34.2B 11 — 12 / 14 / 22 — 21 — 24 — 44.2B
34.3B 11 — 12 / 14 / 22 — 21 — 24 — 44.3B
34.4B 11 — 12 / 14 / 22 — 21 — 24 — 44.5B
34.4B 11 — 12 / 14 / 22 — 21 — 24 — 44.6B
34.5B 11 — 12 / 14 / 22 — 21 — 24 — 44.8B
34.6B 11 — 12 / 14 / 22 — 21 — 24 — 44.2E
39B.2B 11 — 12 / 14 / 22 — 21 — 24 — 44.3E
39B.3B 11 — 12 / 14 / 22 — 21 — 24 — 44.5E
39B.4B 11 — 12 / 14 / 22 — 21 — 24 — 44.6E
39B.4B 11 — 12 / 14 / 22 — 21 — 24 — 44.8E

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA 22/04/2024
DISEGN. F.M.
VISTO S.S.
APPR. M.G.

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HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

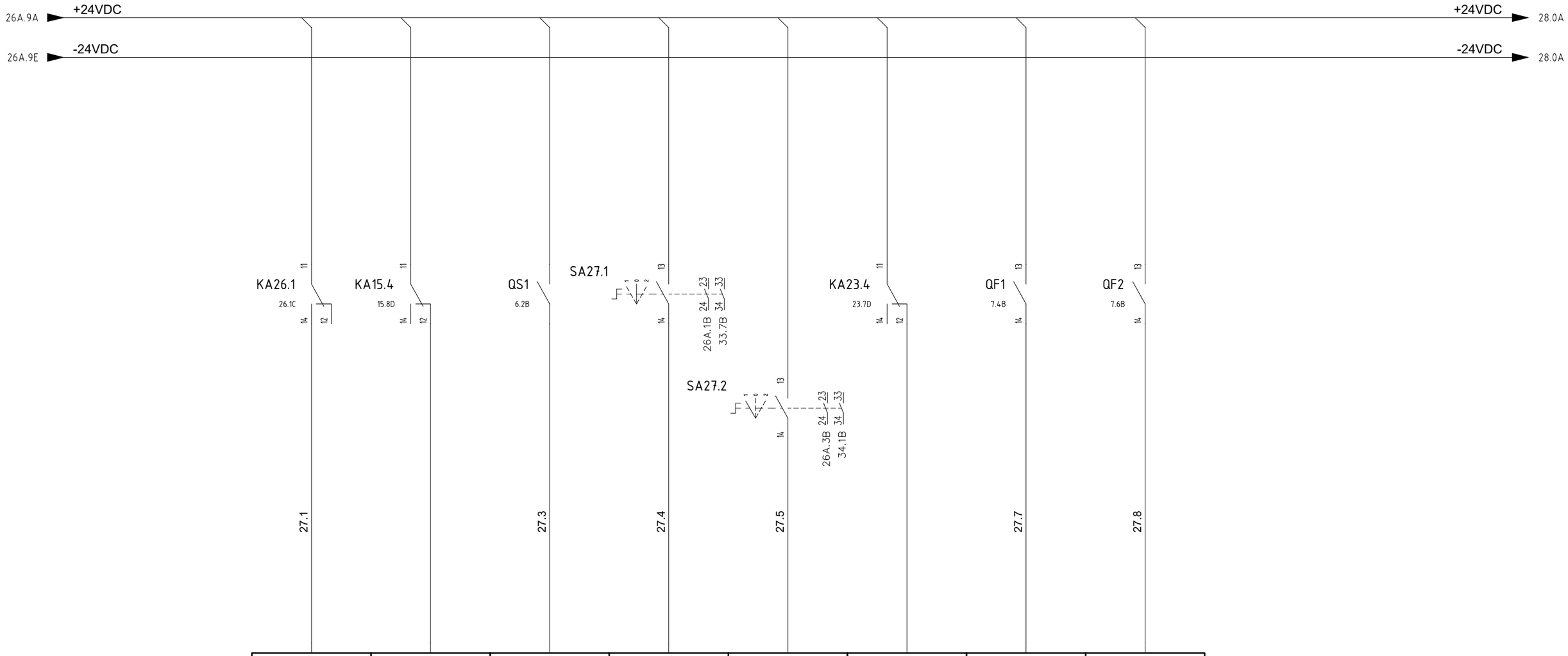
BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

PLC SECTION
plc section

ROSETTI MARINO — ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 26A
F.S. 27



1	2	3	4	5	6	7	8
I0.0	I0.1	I0.2	I0.3	I0.4	I0.5	I0.6	I0.7
CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
SHUT DOWN FROM SIS 0=SHUT DOWN 1= NORMAL	HHU-77007 PRESS FAN RUN 0=RUN 1 = STOP	MAIN BRAKER TRIP	HHU-77007 AUTOMATIC MODE 1=AUTOMATIC 0= NOT AUTOMATIC	HHU-77008 AUTOMATIC MODE 1=AUTOMATIC 0=NOT AUTOMATIC	HHU-77008 PRESS FAN RUN 0=RUN 1 = STOP	MODULE LIGHT TRIP	MODULE SOCKET TRIP

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
				APPR.	M.G.

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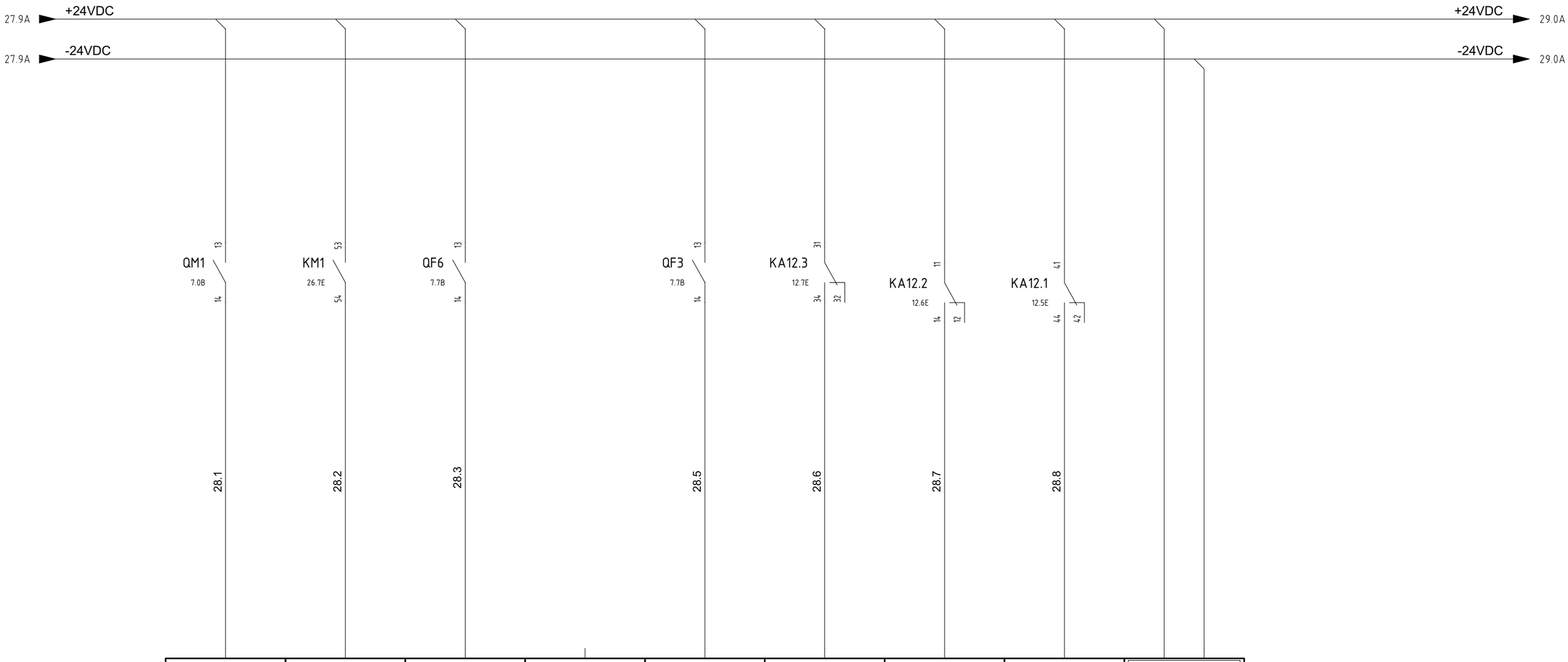
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 27
F.S. 28



9	10	11	12	13	14	15	16	L+ M
I1.0	I1.1	I1.2	I1.3	I1.4	I1.5	I1.6	I1.7	
CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4	CPU: QUADRO GENERALE MOD. : 4
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
HHS-77010/11/12 SPACE HEATER TRIP	HHS-77010/11/12 SPACE HEATER RUN SIGNAL	HEATING CABLE TRIP	SPARE	AUX SECTION TRIP	HHU-77007 MOTORISE DAMPER NOT OPEN FAULT	HHU-77007 MOTORISE DAMPER CLOSED	HHU-77007 MOTORISE DAMPER OPEN	

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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tel. 0039–0371–69076
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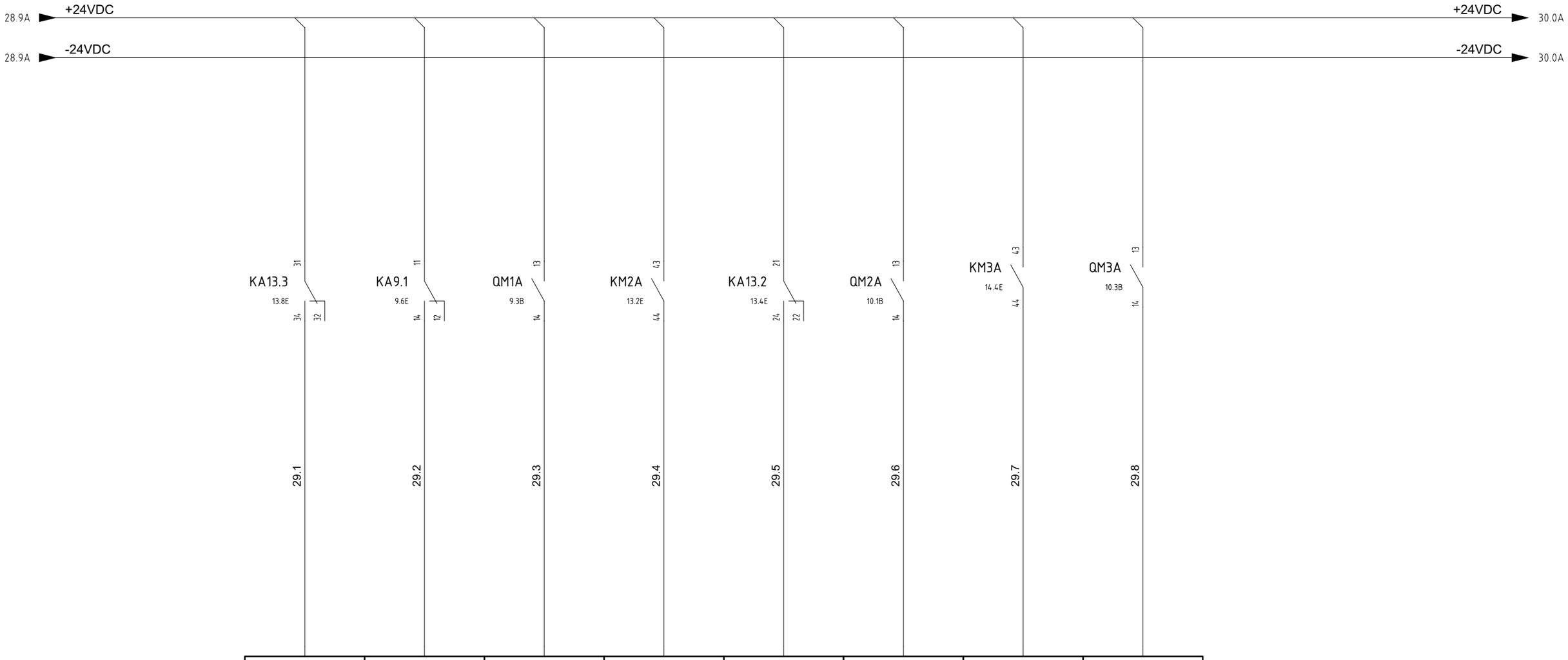
BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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FG. 28
F.S. 29



1	2	3	4	5	6	7	8
I2.0	I2.1	I2.2	I2.3	I2.4	I2.5	I2.6	I2.7
CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5
Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:	Name: A4 Sheet:
HHU-77007 PF-001A THERMIC PROT. RELAY	HHU-77007 PF-001A VSD-1A MALFUNCTION	HHU-77007 PF-001A TRIP	HHU-77007 SUPPLY FAN RUN SIGNAL	HHU-77007 SUPPLY FAN BROKEN BELT ALARM	HHU-77007 SUPPLY FAN TRIP	HHU-77007 COMPRESSOR RUNNING SIGNAL	HHU-77007 COMPRESSOR TRIP

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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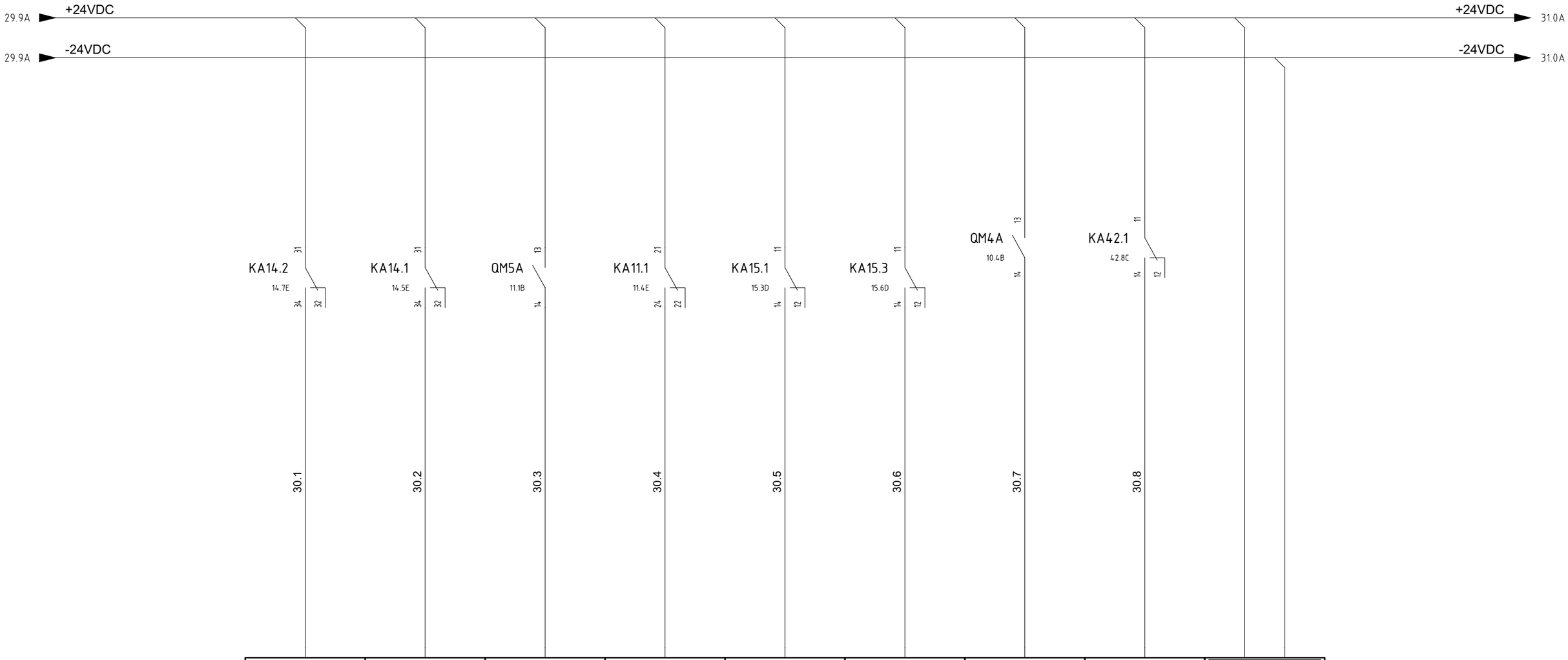
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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FG. 29
F.S. 30



9	10	11	12	13	14	15	16	L+ M
I3.0	I3.1	I3.2	I3.3	I3.4	I3.5	I3.6	I3.7	
CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5	CPU: QUADRO GENERALE MOD. : 5
Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:	Name: A4 / Sheet:
HHU-77007 COMPRESSOR HIGH PRESSURE ALARM	HHU-77007 COMPRESSOR LOW PRESSURE ALARM	HHU-77007 CONDENSER FAN TRIP	HHU-77007 CONDENSER FAN VSD-2A MALFUNCTION	HHU-77007 FILTER CLOGGED	HHU-77007 ELECTRICAL HEATER THERMOSTATE TRIP	HHU-77007 ELECTRICAL HEATER TRIP	HHU-77007 ELECTRICAL HEATER MODULATION FAULT	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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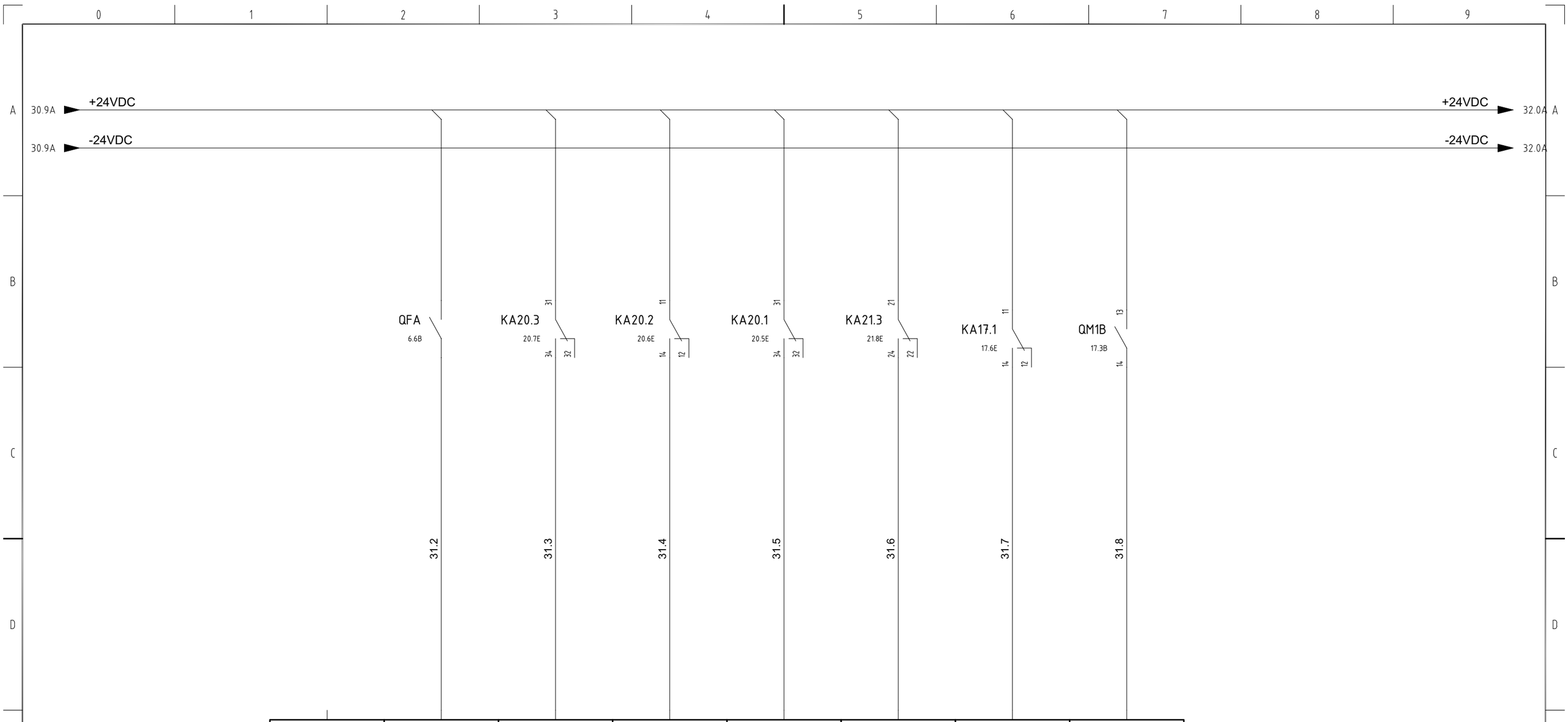
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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F.G. 30
F.S. 31



1	2	3	4	5	6	7	8
14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7
CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6
Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:	Name: Sheet:
SPARE	HHU-77008 MAIN SWITCH OPEN	HHU-77008 MOTORISE DAMPER NOT OPEN	HHU-77008 MOTORISE DAMPER CLOSED	HHU-77008 MOTORISE DAMPER OPEN	HHU-77008 PF-001B THERMIC PROT. RELAY	HHU-77008 PF-001B VSD-1B MALFUNCTION	HHU-77008 PF-001B TRIP

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
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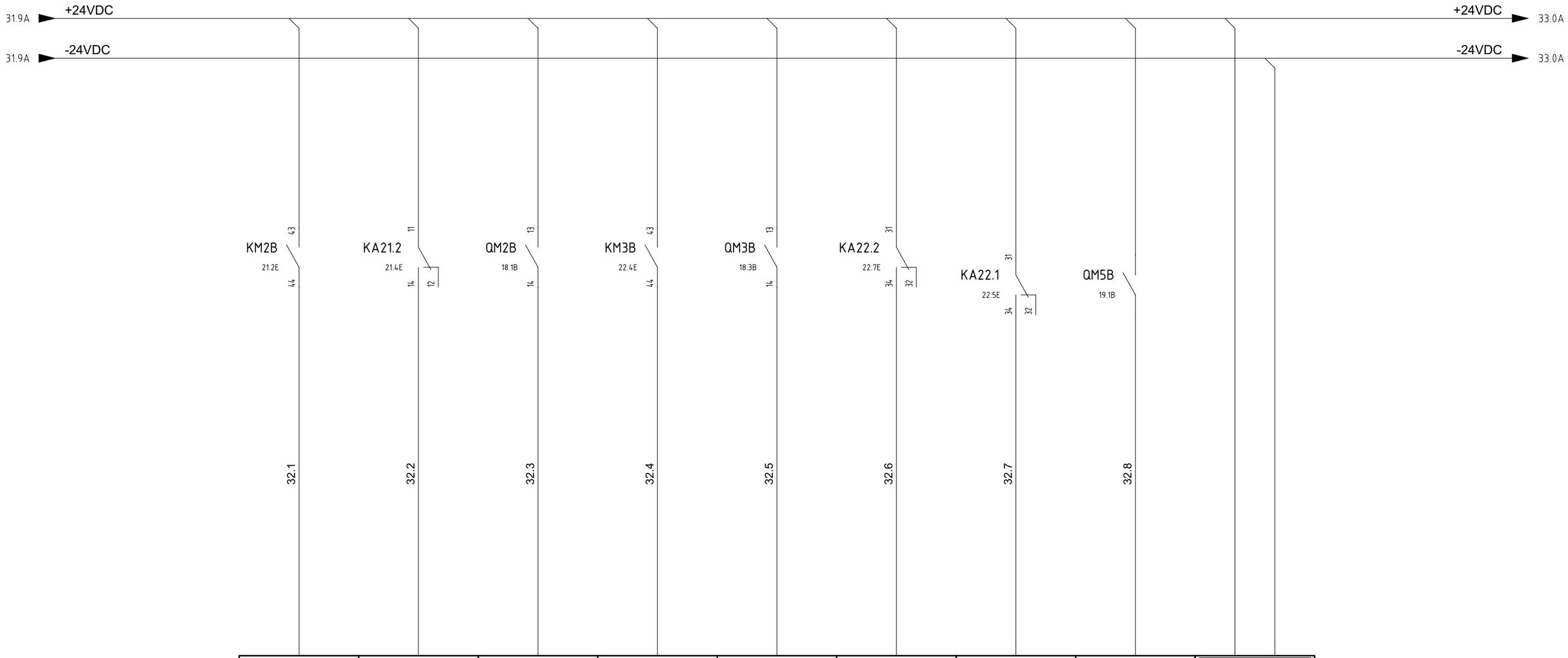
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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FG. 31
F.S. 32



9	10	11	12	13	14	15	16	L+ M
I5.0	I5.1	I5.2	I5.3	I5.4	I5.5	I5.6	I5.7	
CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6	CPU: QUADRO GENERALE MOD. : 6
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
HHU-77008 SUPPLY FAN RUN SIGNAL	HHU-77008 SUPPLY FAN BROKEN BELT ALARM	HHU-77008 SUPPLY FAN TRIP	HHU-77008 COMPRESSOR RUNNING SIGNAL	HHU-77008 COMPRESSOR TRIP	HHU-77008 COMPRESSOR HIGH PRESSURE ALARM	HHU-77008 COMPRESSOR LOW PRESSURE ALARM	HHU-77008 CONDENSER FAN TRIP	

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

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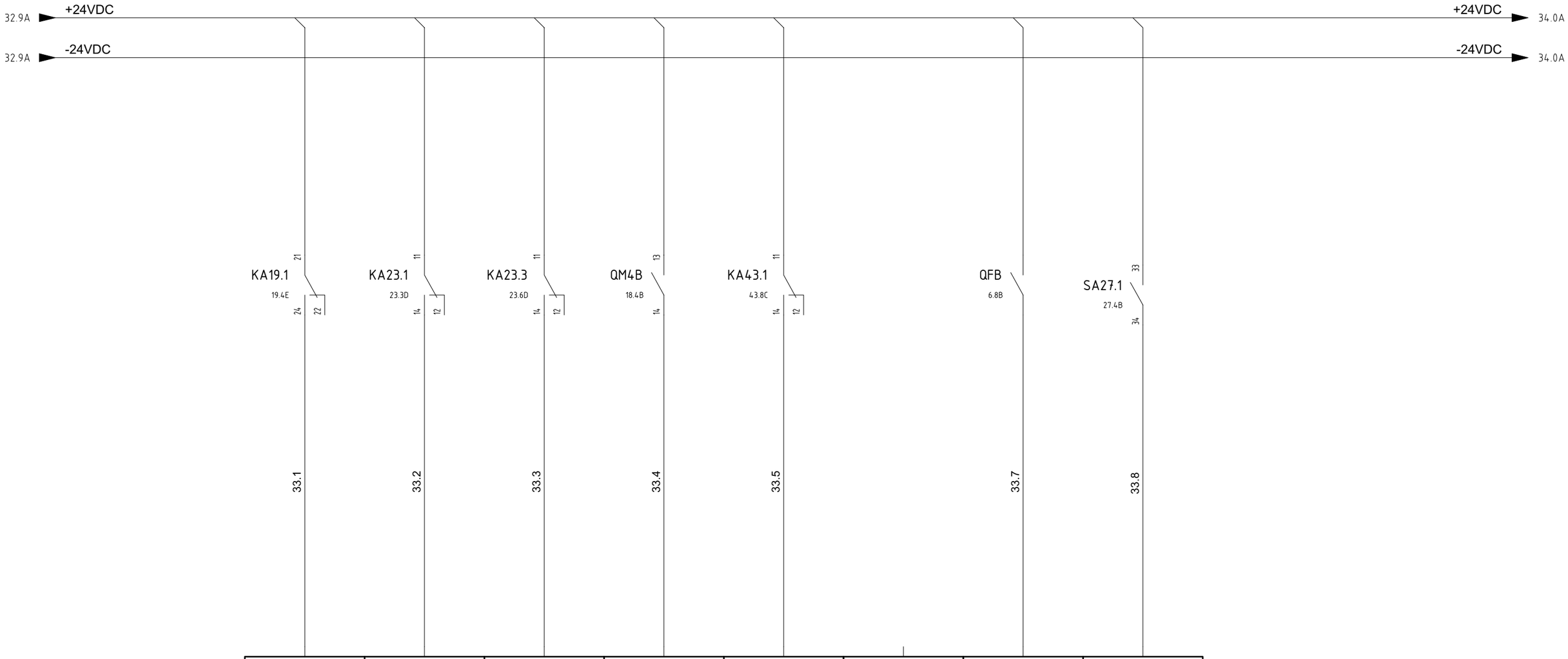
BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 32
F.S. 33



1	2	3	4	5	6	7	8
I6.0	I6.1	I6.2	I6.3	I6.4	I6.5	I6.6	I6.7
CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7
Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:	Name: A6 Sheet:
HHU-77008 CONDENSER FAN VSD-2A MALFUNCTION	HHU-77008 FILTER CLOGGED	HHU-77008 ELECTRICAL HEATER THERMOSTATE TRIP	HHU-77008 ELECTRICAL HEATER TRIP	HHU-77008 ELECTRICAL HEATER MODULATION FAULT	SPARE	HHU-77008 MAIN SWITCH OPEN	HHU-77007 MANUAL MODE 0=NOT MANUAL 1= MANUAL

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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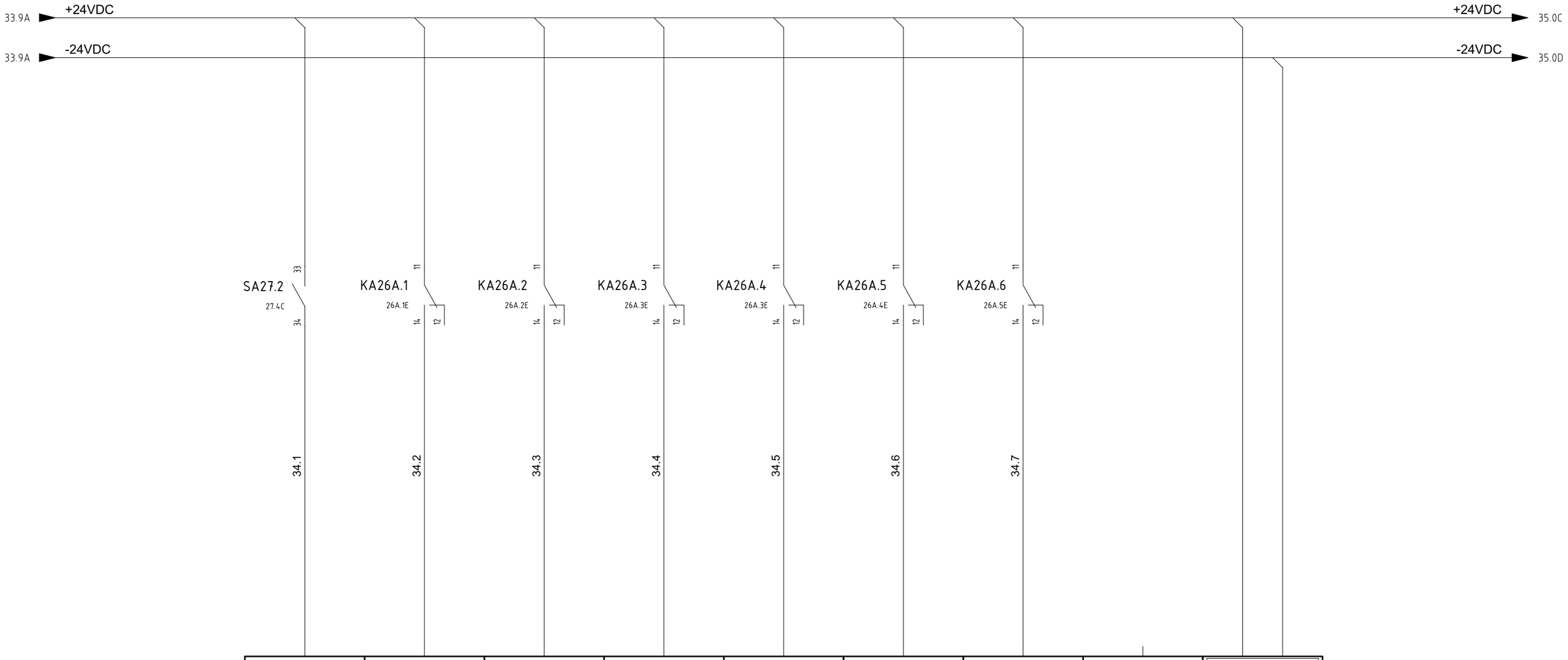
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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FG. 33
F.S. 34



9	10	11	12	13	14	15	16	L+ M
17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	
CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7	CPU: QUADRO GENERALE MOD. : 7
Name: A6 / Sheet:	Name: A6 / Sheet:	Name: A6 / Sheet:	Name: A6 / Sheet:	Name: A6 / Sheet:	Name: A6 / Sheet:	Name: A6 / Sheet:	Name: A6 / Sheet:	Name: A6 / Sheet:
HHU-77008 MANUAL MODE 0= NOT MANUAL 1= MANUAL	HFD-77012 CLOSE CONTACT 0= NOT CLOSED 1= CLOSED	HFD-77012 OPEN CONTACT 0=NOT OPEN 1= OPEN	HFD-77013 CLOSE CONTACT 0= NOT CLOSE 1= CLOSE	HFD-77013 OPEN CONTACT 0=NOT OPEN 1= OPEN	HFD-77014 CLOSE CONTACT 0= NOT CLOSE 1= CLOSE	HFD-77014 OPEN CONTACT 0=NOT CLOSE 1= CLOSE		

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
				APPR.	M.G.

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

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FG. 34
F.S. 35

HVAC MALFUNCTION		SPARE		HHS-77010/11/12 SPACE HEATER START SIGNAL		SPARE		HHU-77007 HVAC UNIT A START SIGNAL		HHU-77007 PF-001A MOTOR HEATER		HHU-77007 COMPRESSOR START SIGNAL		HHU-77008 HVAC UNIT B START SIGNAL	
Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:
CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8	
Q0.0		Q0.1		Q0.2		Q0.3		Q0.4		Q0.5		Q0.6		Q0.7	
1		2		3		4		5		6		7		8	

35.1 35.3 35.5 35.6 35.7 35.8

34.9A +24VDC → 36.0C +24VDC

34.9A -24VDC → 36.0D -24VDC

KA30.1 A1 A2

KA30.9 A1 A2

KA30.3 A1 A2

KA30.4 A1 A2

KA30.5 A1 A2

KA30.6 A1 A2

44.0B 11 12 14 21 22 24 31 32 34 41 42 44

26.7B 11 12 14 21 22 24 31 32 34 41 42 44

12.1B 11 12 14 21 22 24 31 32 34 41 42 44

14.1B 11 12 14 21 22 24 31 32 34 41 42 44

14.1A 11 12 14 21 22 24 31 32 34 41 42 44

20.1B 11 12 14 21 22 24 31 32 34 41 42 44

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
				APPR.	M.G.

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PLC SECTION

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FG. 35
F.S. 36

HHU-77008 PF-001B MOTOR HEATER		HHU-77008 COMPRESSOR START SIGNAL		HVAC UNIT A / B ALARM RESET											
Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:	Name: A7	Sheet:
CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8		CPU: QUADRO GENERALE MOD. : 8	
Q0.8		Q0.9		Q0.10		Q0.11		Q0.12		Q0.13		Q0.14		Q0.15	
9		10		11		12		13		14		15		16	
														L+	M

36.1 36.2 36.3

35.9C +24VDC → 37.0A +24VDC

35.9D -24VDC → 37.0A -24VDC

KA30.7 A1 A2

KA30.8 A1 A2

KA37.1 A1 A2 ALARM RESET RELAY

KA37.2 A1 A2

22.1B 11 12 14 21 22 24 31 32 34 41 42 44

22.1A 11 12 14 21 22 24 31 32 34 41 42 44

12.8C 13.3B 14.6C 14.8C 11 12 14 21 22 24 31 32 34 41 42 44

20.8C 21.3B 22.6C 22.8C 11 12 14 21 22 24 31 32 34 41 42 44

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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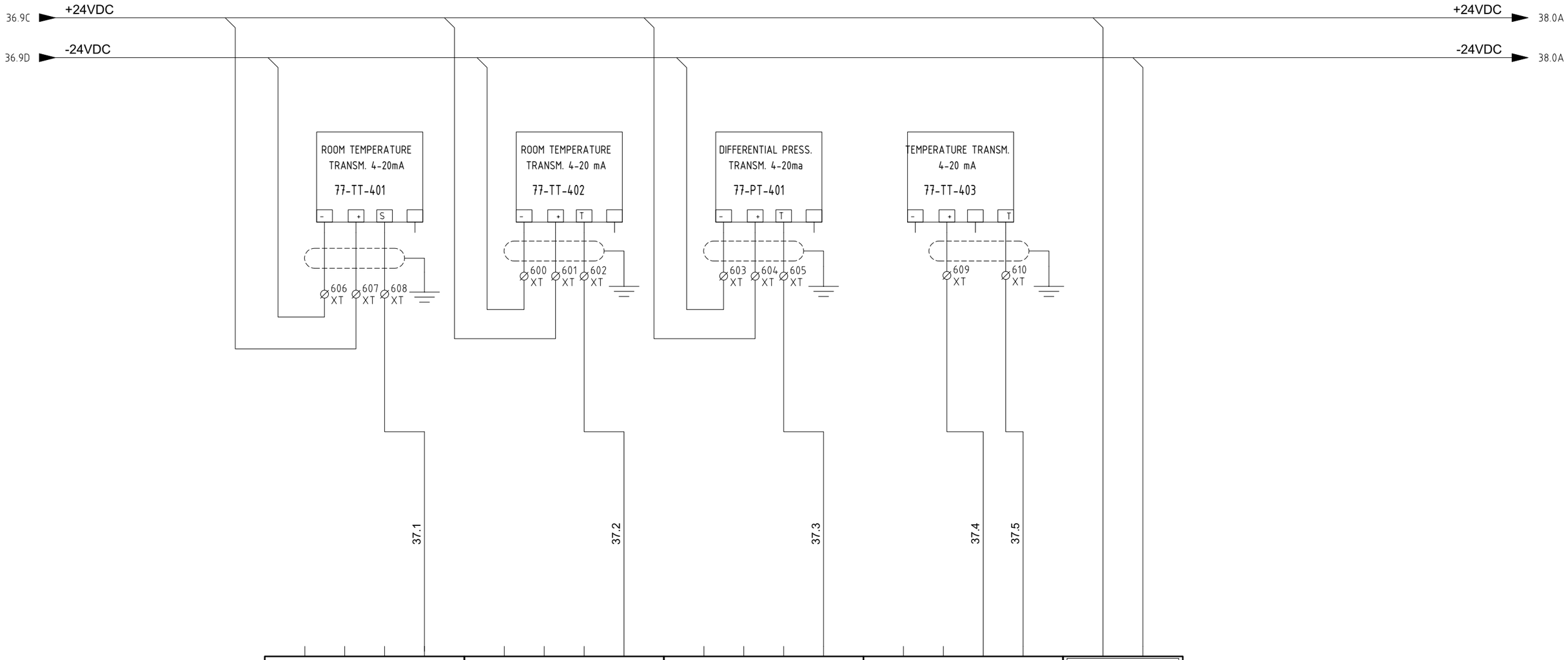
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 36
F.S. 37



1 5 9 13	2 6 10 14	3 7 11 15	4 8 12 16	L+ M
AI0.0	AI0.1	AI0.2	AI0.3	
CPU: QUADRO GENERALE MOD. : 9	CPU: QUADRO GENERALE MOD. : 9	CPU: QUADRO GENERALE MOD. : 9	CPU: QUADRO GENERALE MOD. : 9	CPU: QUADRO GENERALE MOD. : 9
Name: A8 / Sheet:	Name: A8 / Sheet:	Name: A8 / Sheet:	Name: A8 / Sheet:	Name: A8 / Sheet:
77-TT-401 TEMPERATURE TRANSM 4-20mA	77-TT-402 TEMPERATURE TRANSM 4-20mA	77-PT-401 DIFFERENTIAL PRESS. TRANSMITTER 4-20mA	77-TT-403 TEMPERATURE TRANSM 4-20 mA	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 37
F.S. 38

37.9A +24VDC → +24VDC 39.0A

37.9A -24VDC → -24VDC 39.0A

HHU-77007 PF-001A VSD MODULATION		HHU-77008 PF-001B VSD MODULATION		HHU-77007 ELECTRICAL HEATER MODULATION		HHU-77008 ELECTRICAL HEATER MODULATION		
Name: A9	Sheet:	Name: A9	Sheet:	Name: A9	Sheet:	Name: A9	Sheet:	Name: A9	Sheet:
CPU: **QUADRO GENERALE** MOD. : **10**		CPU: **QUADRO GENERALE** MOD. : **10**		CPU: **QUADRO GENERALE** MOD. : **10**		CPU: **QUADRO GENERALE** MOD. : **10**		CPU: **QUADRO GENERALE** MOD. : **10**	
AQ0.0		AQ0.1		AQ0.2		AQ0.3			
9 1 5 13		10 2 6 14		11 3 7 15		12 4 8 16		L+ M	

9.8B → 9.4

9.8C → 9.5

17.8B → 17.5

17.8C → 17.4

42.8D → 40.1

42.8D → 40.2

43.8D → 40.3

43.8D → 40.4

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 38

F.S. 39

38.9A +24VDC → +24VDC 40.0E

38.9A -24VDC → -24VDC 40.0F

Name: A10	Sheet:	Name: A10	Sheet:	Name: A10	Sheet:	Name: A10	Sheet:	Name: A10	Sheet:
CPU: QUADRO GENERALE MOD. : 11		CPU: QUADRO GENERALE MOD. : 11		CPU: QUADRO GENERALE MOD. : 11		CPU: QUADRO GENERALE MOD. : 11		CPU: QUADRO GENERALE MOD. : 11	
AQ1.0		AQ1.1		AQ1.2		AQ1.3			
9 1 5 13		10 2 6 14		11 3 7 15		12 4 8 16		L+ M	

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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frigotermica@frigotermica.com

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

PLC SECTION

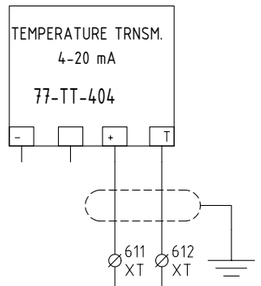
ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 39
F.S. 39A

38.9A +24VDC → +24VDC 40.0E

38.9A -24VDC → -24VDC 40.0F



1 5 9 13	2 6 10 14	3 7 11 15	4 8 12 16	L+ M
AI0.0	AI0.1	AI0.2	AI0.3	
CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12	CPU: QUADRO GENERALE MOD. : 12
Name: A11 / Sheet:	Name: A11 / Sheet:	Name: A11 / Sheet:	Name: A11 / Sheet:	Name: A11 / Sheet:
TT-004 TEMPERATURE TRANSM 4-20mA	SPARE	SPARE	SPARE	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

F.G. 39A
F.S. 39B

38.9A +24VDC → +24VDC 40.0E

38.9A -24VDC → -24VDC 40.0F

KA26A.7 (11 / 14 / 12) — 26A.6E

KA26A.8 (11 / 14 / 12) — 26A.7E

KA26A.9 (11 / 14 / 12) — 26A.7E

KA26A.10 (11 / 14 / 12) — 26A.8E

1	2	3	4	5	6	7	8
I8.0	I8.1	I8.2	I8.3	I8.4	I8.5	I8.6	I8.7
CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
HFD-77015 CLOSE CONTACT 0= NOT CLOSED 1= CLOSED	HFD-77015 OPEN CONTACT 0=NOT OPEN 1= OPEN	HFD-77016 CLOSE CONTACT 0= NOT CLOSE 1= CLOSE	HFD-77016 OPEN CONTACT 0=NOT OPEN 1= OPEN	SPARE *spare*	SPARE *spare*	SPARE *spare*	SPARE *spare*

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

PLC SECTION
plc section

ROSETTI MARINO — ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 39B
F.S. 39C

38.9A +24VDC

38.9A -24VDC

+24VDC 40.0E

-24VDC 40.0F

9	10	11	12	13	14	15	16	L+ M
19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	
CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13	CPU: QUADRO GENERALE MOD. : 13
Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:	Name: / Sheet:
SPARE *spare*	SPARE *spare*	SPARE *spare*	SPARE *spare*	SPARE *spare*	SPARE *spare*	SPARE *spare*	SPARE *spare*	

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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B-400 I&T EQUIPMENT ROOM

PLC SECTION
plc section

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 39C

F.S. 40

TO PAGE 41

A1

SIEMENS

SIMATIC HMI

12"

TOUCH

X1 P1 PROFINET
X1 P2 PROFINET
X2 PROFIBUS DP
X60 Mini USB - Type B
X61 USB - Type A
X62 USB - Type A
X90 OUT Line OUT
X90 IN Line IN

CABLE 1
CABLE 2
CABLE 3
CABLE 4

X1 P1 R PROFINET
X1 P2 R PROFINET
X1 P1 R PROFINET
X1 P2 R PROFINET

D1
D2

SIEMENS
RUN
SIMATIC S7-1500
ESC OK

L+
M
L+
M
DC 24V (X80)

DC 24V (X80)
L+ 1
M 2
FG

39.9A +24VDC
39.9A -24VDC
+24VDC 41.0E
-24VDC 41.0F

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
PLC SECTION

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 40
F.S. 41

FROM
PAGE 40

CABLE 4

CABLE 5

CABLE 1

CABLE 2

MODBUS TCP/P TO
CLIENT

RJ45
CONNECTION
IN TERMINAL
STRIP

P1	LAN
P2	LAN
P3	LAN
P4	LAN
P5	LAN
P6	LAN
P7	LAN
P8	LAN

1	F1
2	F2

1	L1+	DC 24V
2	M1	
3	M2	
4	L2+	

A12

SIEMENS

SCALANCE
XC208

F
RM
SB
DM1
DM2
L1
L2

P1
P2
P3
P4
P5
P6
P7
P8

SELECT/
SET

CONSOLE

FAULT
F1
F2

L1+
M1
M2
L2+

208-0BA00-2AC2

1	TD	PROFINET IO - Port 1 RJ45
2	TD_N	
3	RD	
4	GND	
5	GND	
6	RD_N	
7	GND	
8	GND	

X1

1	TD	PROFINET IO - Port 2 RJ45
2	TD_N	
3	RD	
4	GND	
5	GND	
6	RD_N	
7	GND	
8	GND	

X2

1L+		DC 24V
2L+		
1M		
2M		

A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12

BA 2xRJ45

SIEMENS

RN ER MT

SIMATIC
ET 200SP
IM 155-6 PN/2 HF

PWR

6ES7155-6AU01-0CN0

LK1
LK2

PR1
PR2

X1
PROFINET
(LAN)

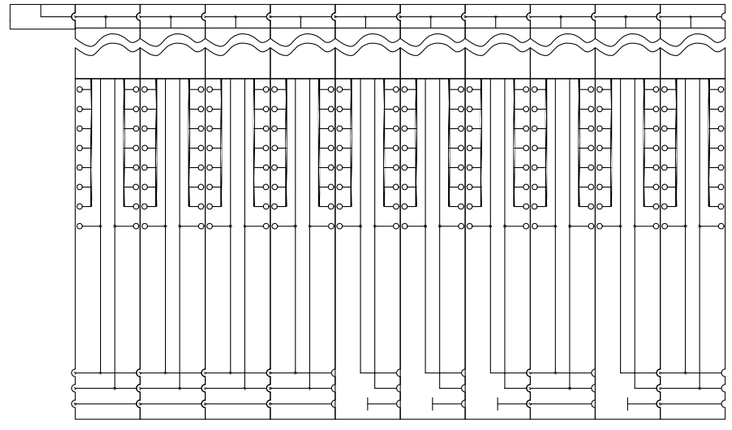
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MAC ADDRESS

X80
24VDC

1L+ M
2L+ M

DI 16x24VDC ST	DI 16x24VDC ST	DI 16x24VDC ST	DI 16x24VDC ST	DQ 16x24VDC/0,5A ST	AI 4xU/I 2-wire ST	AQ 4xU/I ST	AQ 4xU/I ST	AI 4xU/I 2-wire ST	DI 16x24VDC ST
DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG	DIAG
6ES7131-6BH01-0BA0	6ES7131-6BH01-0BA0	6ES7131-6BH01-0BA0	6ES7131-6BH01-0BA0	6ES7132-6BH01-0BA0	6ES7134-6HD01-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HD00-0BA1	6ES7134-6HD01-0BB1	6ES7131-6BH01-0BA0



40.9E +24VDC → +24VDC 42.0A

40.9F -24VDC → -24VDC 42.0A

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
				APPR.	M.G.

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CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

PLC ARCHITECTURE

ROSETTI MARINO

ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 41
F.S. 42

41.9E +24VDC

41.9F -24VDC

+24VDC 43.0A

-24VDC 43.0A

42.1

42.2

1/L1

HR-1A

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-1B

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-1C

19 AL
18 AL
17 D17
16 A2
15 A-
14 A+
13 D13
12 US
11 A2

GRM 1

2/T1

3/L2

FU42.1 TA.1 1 2

11.9A RA

KA42.1 A1 A2

33.2B 11 12 14 21 22 24 31 32 34 41 42 44

40.1 38.4D

40.2 38.4D

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

EH MODULATION A

ROSETTI MARINO ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 42
F.S. 43

42.9A +24VDC → +24VDC /./

42.9A -24VDC → -24VDC /./

42.1

42.2

1/L1

HR-2A

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-2B

9 AL
8 A2
7 A2
6 A1
5 D1
4 US
3 A2

GRP 3

2/T1

1/L1

HR-2C

19 AL
18 AL
17 D17
16 A2
15 A-
14 A+
13 D13
12 US
11 A2

GRM 1

2/T1

KA43.1 A1 A2

35.8B 11 12 14 21 22 24 31 32 34 41 42 44

40.3

40.4

38.4E

38.4E

3/L2

FU43.1 TB:1 1 2

11.9A RB

05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.
REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.

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tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

EH MODULATION B

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 43
F.S. 44

AVAILABLE SIGNAL
GENERAL FAULT
TO SIS

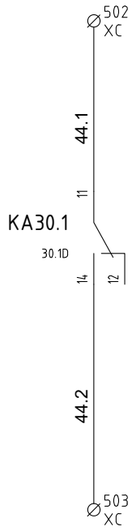
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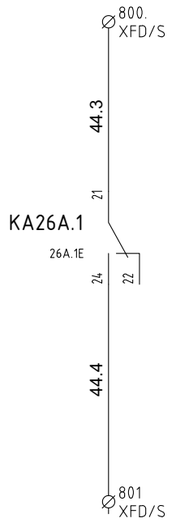
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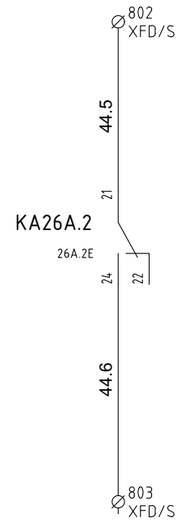
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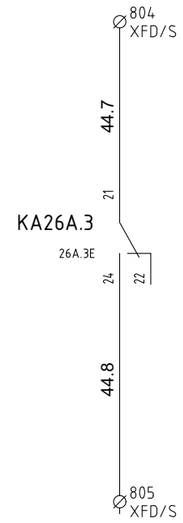
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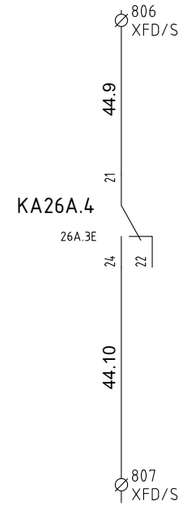
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CLOSED SIGNAL
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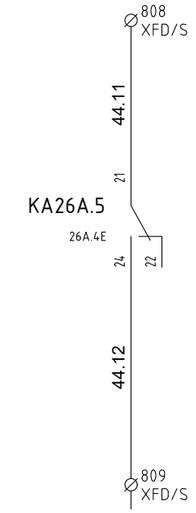












HVAC MALFUNCTION
0=MALF
1=NORMAL

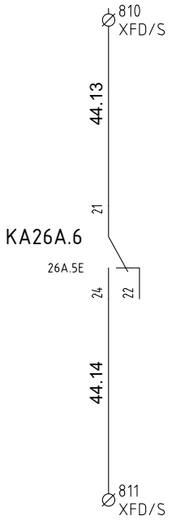
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OPEN SIGNAL
TO F&G

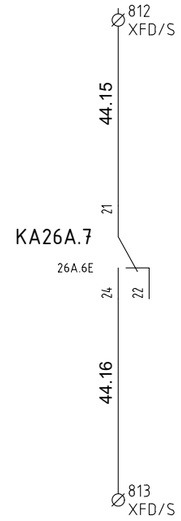
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CLOSED SIGNAL
TO F&G

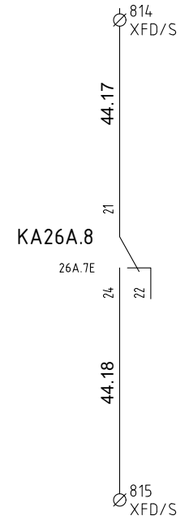
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OPEN SIGNAL
TO F&G

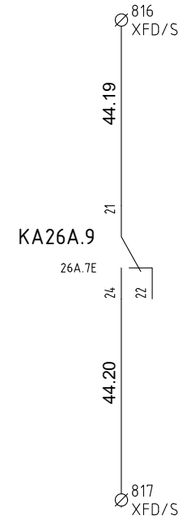
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CLOSED SIGNAL
TO F&G

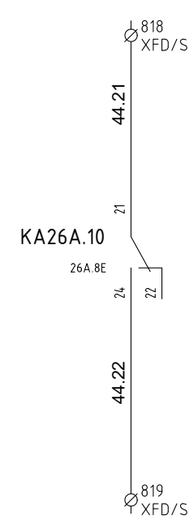
HFD-77016
OPEN SIGNAL
TO F&G











REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

AVAILABLE SIGNAL

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 44
F.S. 45

+QG - XP1
POWER SUPPLY 1

L1 | 13 | L3 | N1 | PE

400V 3F + N + PE
50Hz
FROM LV SWITCHGEAR
SECTION 5G25

U1 | N1.1 — 3G2.5 — SPACE HEATER — HSS-77-010
V1 | N1.1 — 3G2.5 — SPACE HEATER — HSS-77-011
W1 | N1.1 — 3G2.5 — SPACE HEATER — HSS-77-012
L3 | N3 — 3G2.5 — MODULE LIGHT — LIGHT
L3.1 | N3.1 — 3G2.5 — EMERGENCY LIGHT — EM LIGHT
L4 | N4 — 3G4 — MODULE LIGHT — SOCKET
L5 | N5 — 3G2.5 — HEATING CABLE — HHC-77-004

+QG - XC
COMMAND

26.1 | 26.2 | 44.1 | 44.2 | +24VDC | 26.5 | +24VDC | 26.5

500 | 501 | 502 | 503 | 504 | 505 | 506 | 507

SHUT DOWN FROM SIS

LIGHT BUTTON

HVAC MALFUNCTION TO SIS

LIGHT BUTTON

+QG - XUPS
UPS POWER SUPPLY

LUPS | NUPS | PE

1 | 2 | 3

230V 1F + N + PE
50Hz
UPS POWER SUPPLY
FROM AC UPS-PAS DB
SECTION 3G4
DP200-F3

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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B-400 I&T EQUIPMENT ROOM

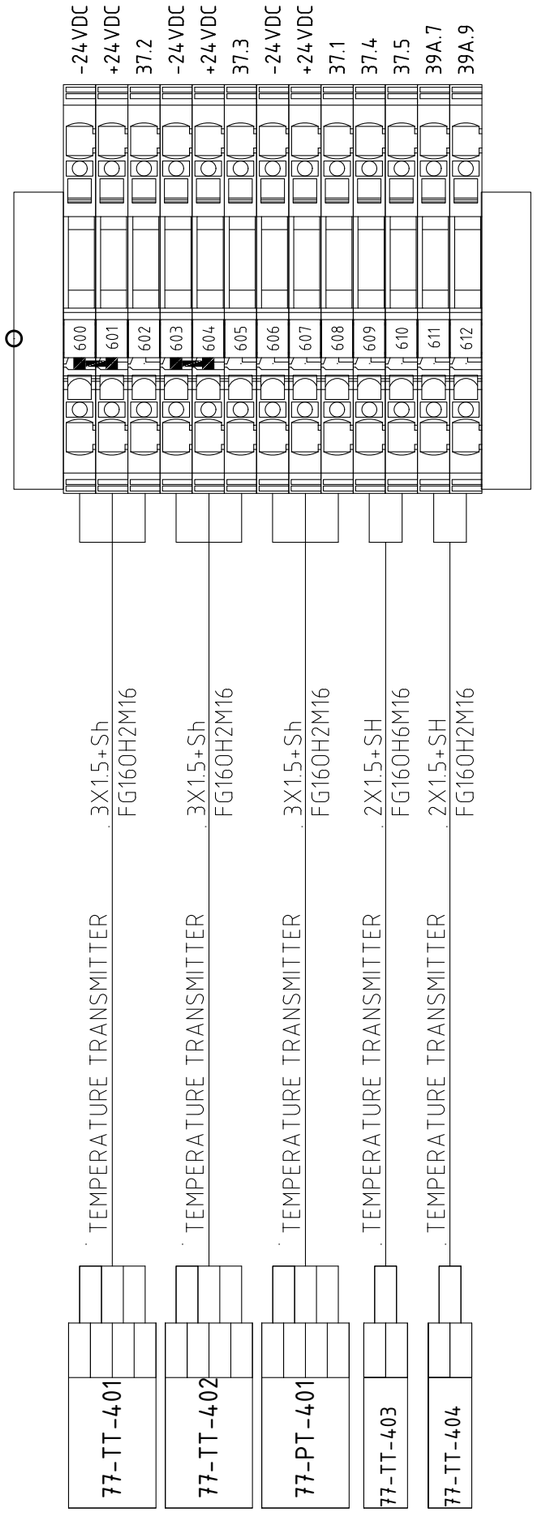
TERMINAL STRIP

ROSETTI MARINO | ALEXSISTEMI spa

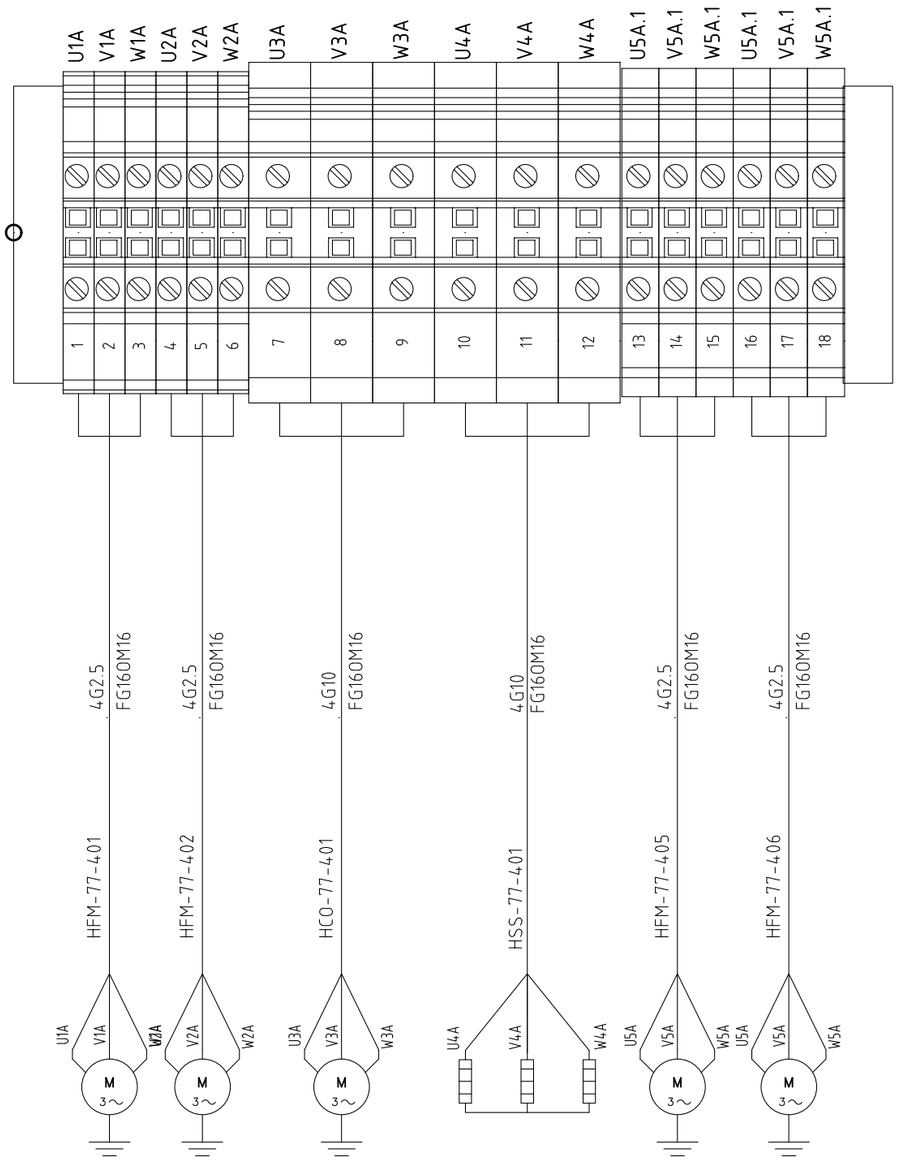
1724000049-HV-DA-00029

FG. 45
F.S. 46

+QG - XT
TRASMITTER



+QG - XM1
MOTOR 1



REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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B-400 I&T EQUIPMENT ROOM

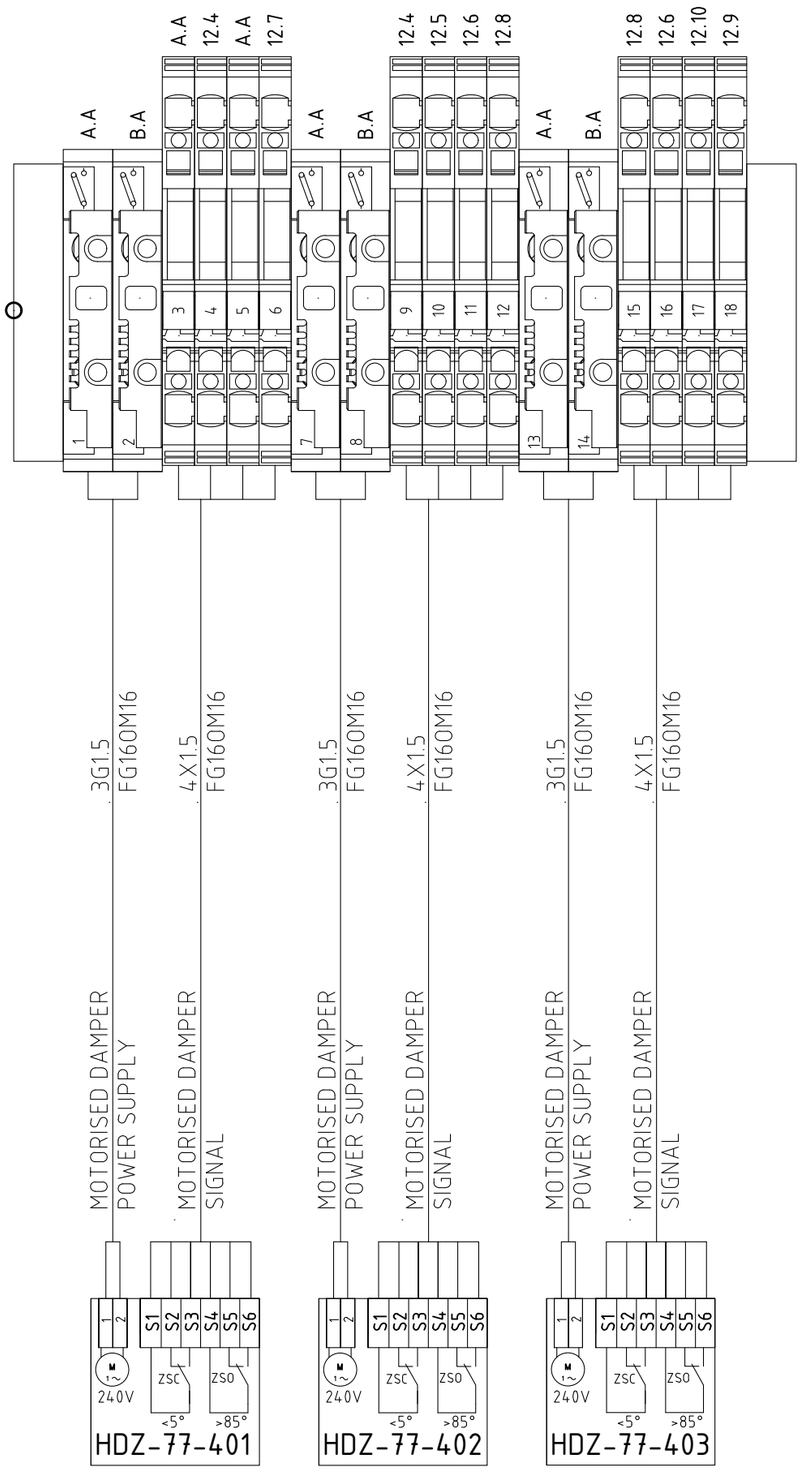
TERMINAL STRIP

ROSETTI MARINO | ALEXSISTEMI spa

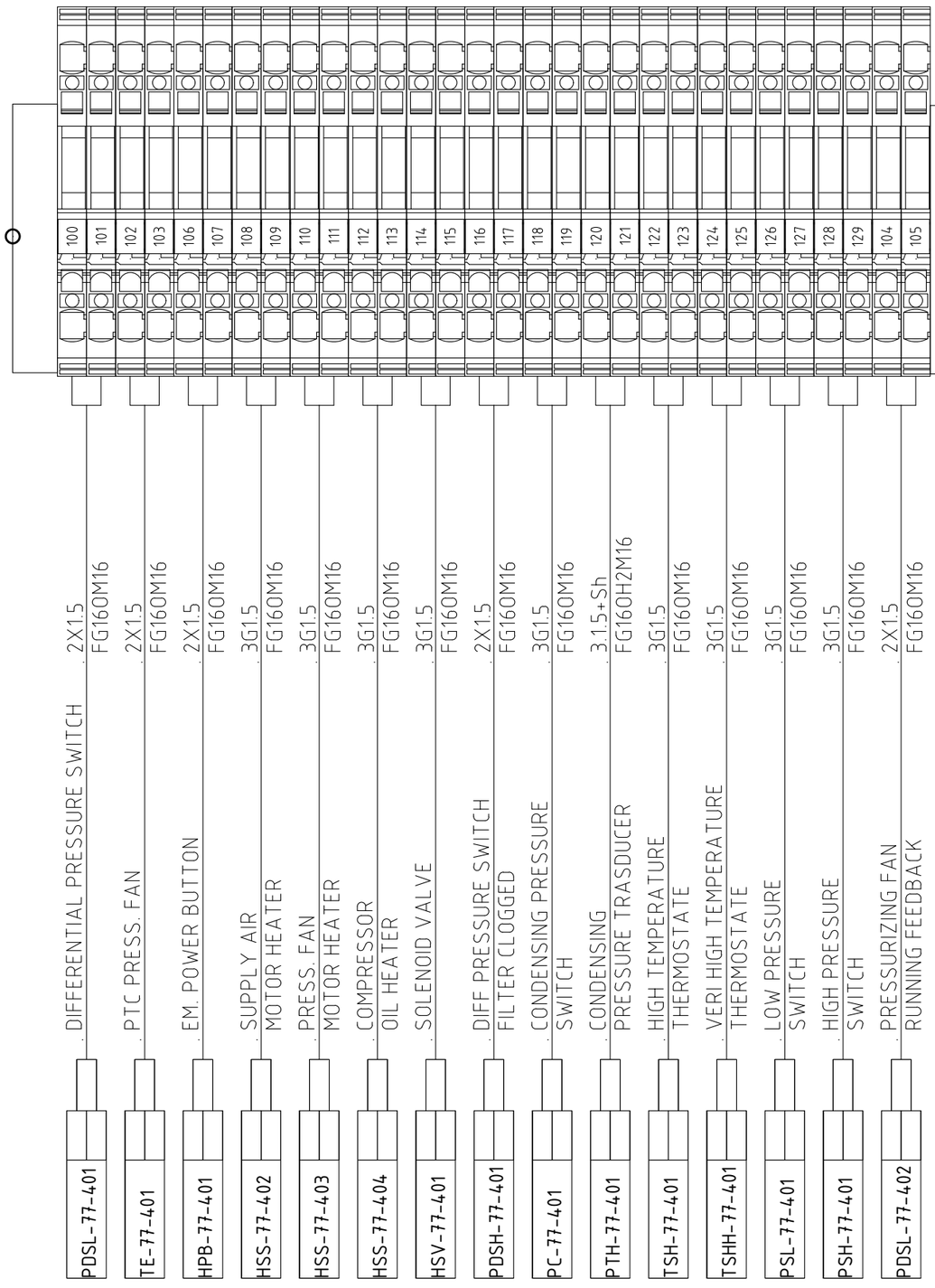
1724000049-HV-DA-00029

FG. 46
F.S. 47

+QG - XMD1
MOTORISED DAMPER 1



+QG - XA1
AUXILIARY 1



REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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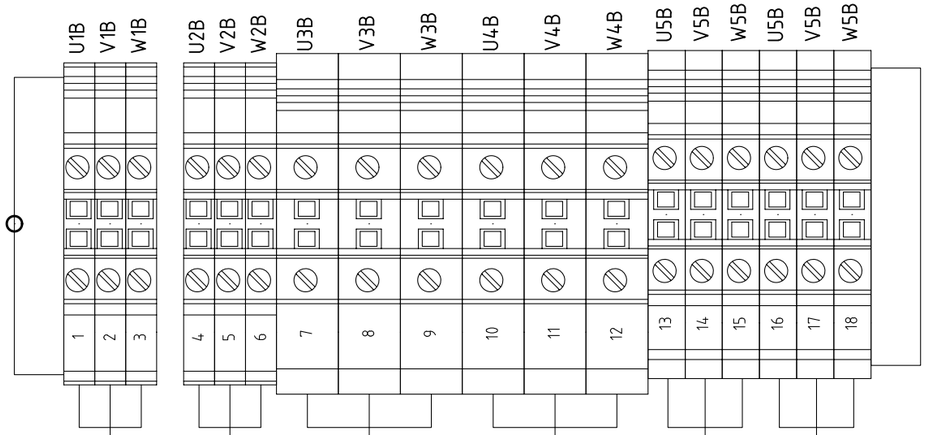
BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
TERMINAL STRIP

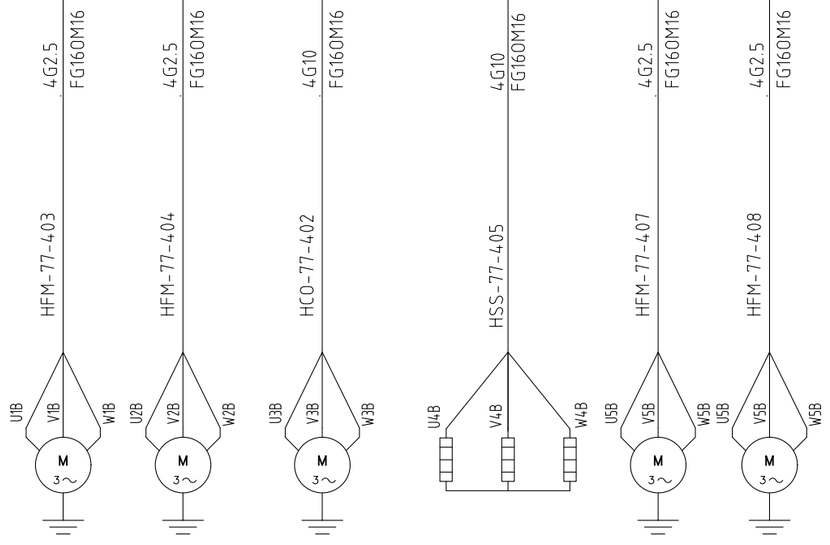
ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

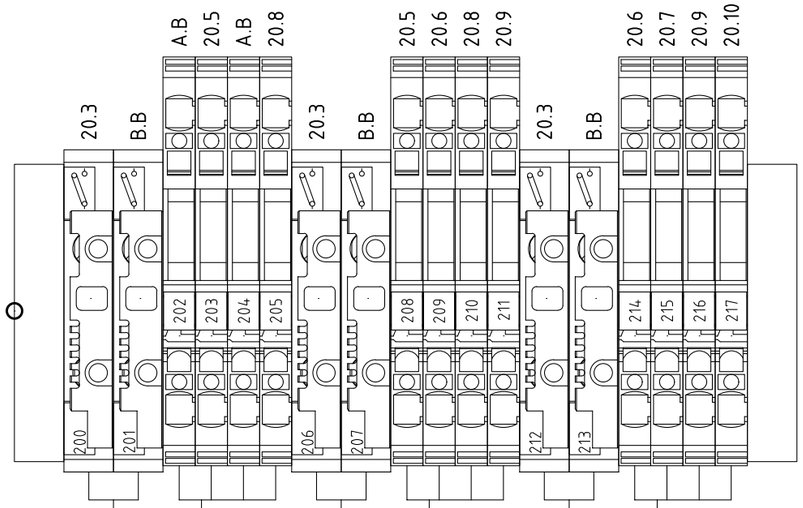
FG. 47
F.S. 48

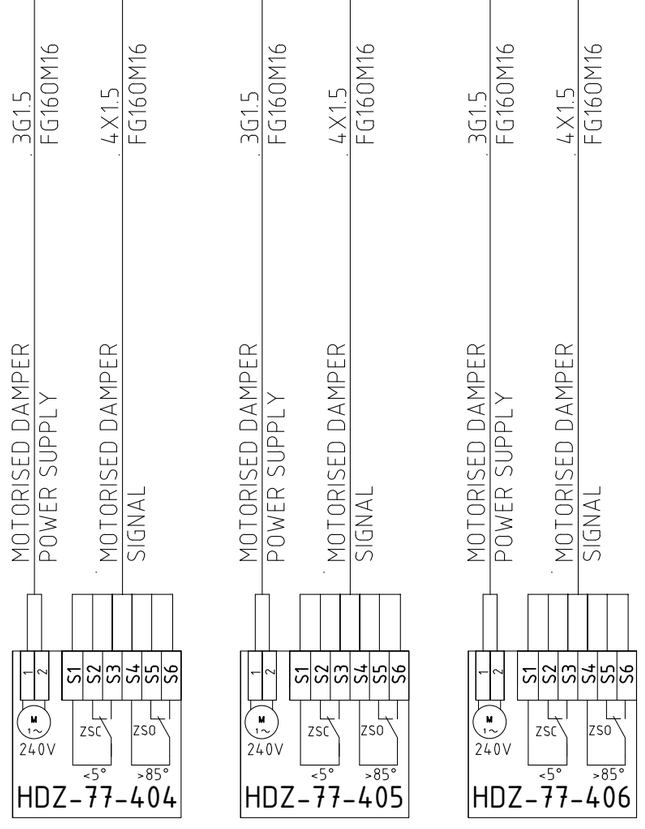
+QG - XM2
MOTOR 2





+QG - XMD2
MOTORISED DAMPER 2





REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
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DATA	22/04/2024
DISEGN.	F.M.
VISTO	S.S.
APPR.	M.G.

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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
TERMINAL STRIP

ROSETTI MARINO
ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 48
F.S. 49

REV.	MODIFICA	DATA	FIRMA
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.

DATA	APPR.
DISEGN. F.M.	M.G.
VISTO S.S.	

22/04/2024

frigotecnica
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tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT:

CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-4.00 I&T EQUIPMENT ROOM

TERMINAL STRIP

ROSETTI MARINO

ALEXSISTEMI spa

172400049-HV-DA-00029

FG. 49
F.S. 49A

+QG - XA2
AUXILIARY 2

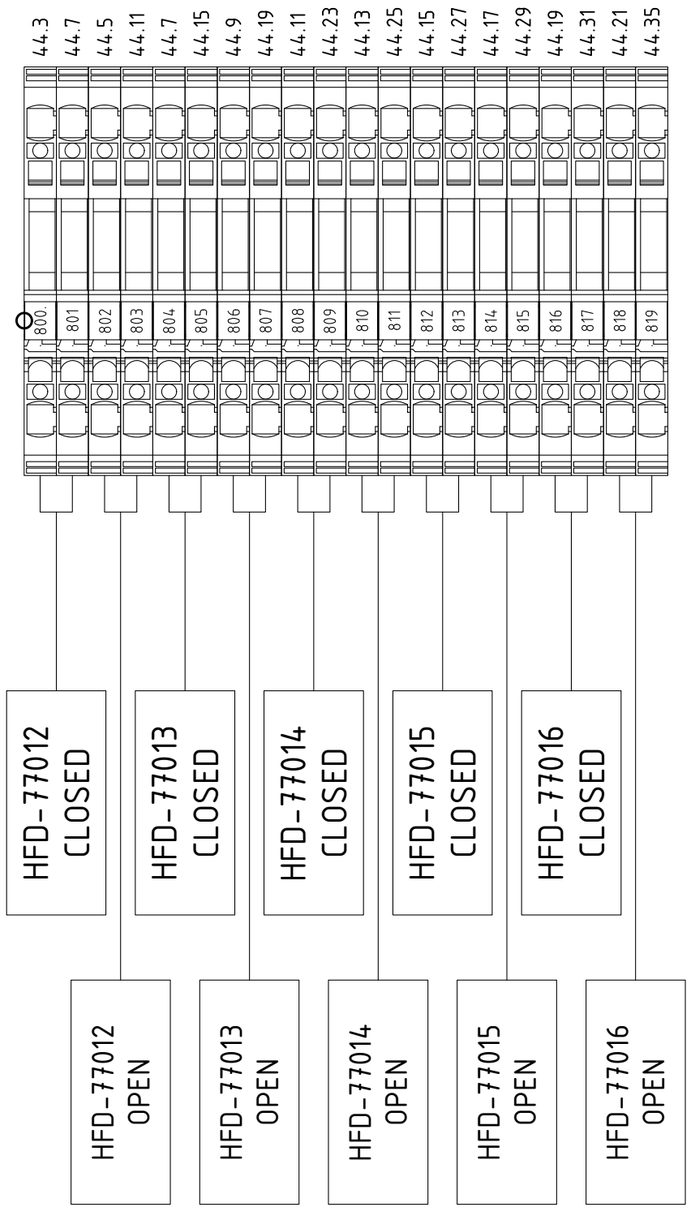
PDSL-77-402	DIFFERENTIAL PRESSURE SWITCH	2X1.5 FG16OM16	300	A.B
			301	21.4
TE-77-402	PTC PRESS. FAN	2X1.5 FG16OM16	302	13.12
			303	13.14
HPB-77-402	EM. POWER BUTTON	2X1.5 FG16OM16	304	+24VDC
			305	26.7
HSS-77-407	SUPPLY AIR MOTOR HEATER	3G1.5 FG16OM16	306	12.3
			307	B.B
HSS-77-406	PRESS. FAN MOTOR HEATER	3G1.5 FG16OM16	308	14.1
			309	B.B
HSS-77-408	COMPRESSOR OIL HEATER	3G1.5 FG16OM16	310	5
			311	B.B
HSV-77-402	SOLENOID VALVE	3G1.5 FG16OM16	312	15.1
			313	B.B
PDSH-77-403	DIFF PRESSURE SWITCH FILTER CLOGGED	2X1.5 FG16OM16	314	A.A
			315	23.2
PC-77-402	CONDENSING PRESSURE SWITCH	3G1.5 FG16OM16	316	A.A
			317	23.3
PTH-77-402	CONDENSING PRESSURE TRASDUCER	3.1.5+Sh FG16OH2M16	318	11.5
			319	11.6
TSH-77-402	HIGH TEMPERATURE THERMOSTATE	3G1.5 FG16OM16	320	A.A
			321	23.4
TSHH-77-402	VERI HIGH TEMPERATURE THERMOSTATE	3G1.5 FG16OM16	322	15.9
			323	23.5
PSL-77-402	LOW PRESSURE SWITCH	3G1.5 FG16OM16	324	A.A
			325	22.8
PSH-77-402	HIGH PRESSURE SWITCH	3G1.5 FG16OM16	326	A.A
			327	22.11
PDSL-77-404	PRESSURUZING FAN RUNNING FEEDBACK	3G1.5 FG16OM16	328	A.B
			329	23.6

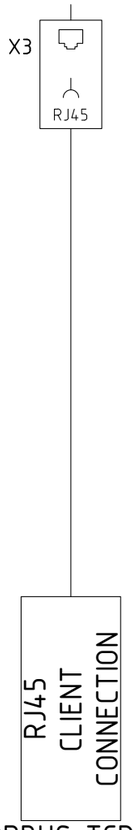
+QG - XFD
FIRE DAMPER

HFD-77012	SIGNAL FEEDBACK	4X1.5	700	+24VDC
			701	34.2
			702	+24VDC
			703	34.3
HFD-77013	SIGNAL FEEDBACK	4X1.5	704	+24VDC
			705	34.4
			706	+24VDC
			707	34.5
HFD-77014	SIGNAL FEEDBACK	4X1.5	708	+24VDC
			709	34.6
			710	+24VDC
			711	34.7
HFD-77015	SIGNAL FEEDBACK	4X1.5	712	+24VDC
			713	39B.8
			714	+24VDC
			715	39B.10
HFD-77016	SIGNAL FEEDBACK	4X1.5	716	+24VDC
			717	39B.12
			718	+24VDC
			719	39B.14

+QG - XFD/S

FIRE DAMPERS SIGNAL TO SIS





MODBUS TCP/IP CONNECTION FROM B400-NET-001

REV.	MODIFICA	DATA	FIRMA	APPR.	
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

TERMINAL STRIP

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 49A
F.S. 50

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
				Hq	4	9
	R5CQE2286R	cabinet comp. 2200x800x600 back	dkc	Hq	4	2
	R5CPFE8100	Modular cabinet compensation panel height 100 width 800	dkc			2
	R5TOE80	Rebate crossbar for modular doors, width 800	dkc			5
	RZPCE8900	Modular wiring panel L.800 H.900	dkc			2
	RZPCE8600	Modular wiring panel L.800 H.600	dkc			2
	RZPCE8500	Modular wiring panel L.800 H.500	dkc			2
	R5CPME8900	Solid modular cabinet door 800 width, 900 door height	dkc			2
	R5CPME8600	Solid modular cabinet door width 800, door height 600	dkc			2
	R5CPME8500	Solid modular cabinet door 800 width, 500 door height	dkc			2
	RZSOE545	Total horizontal support cabinet width 600	dkc			5
	rzdoe8545	PARTIAL HORIZONTAL PARTITION CABINET WIDTH 800 TOTAL DEPTH 545 MM	dkc			5
	RZA33	Lifting Ring	dkc			1
	R5LE2262	Side for cabinet depth 600mm height 2200mm2pcs	dkc			1
	R1ZPRO801	Flangefrontal/side H100 Length 800 2pcs	dkc			2
	R1ZPRO601	Front/side flange H100 length 600	dkc			2
	R1ZCOR1	Modular plinth corner H100 4pcs	dkc			2
	RZKE65	CQE cabinet union kit	dkc			1
	rzkre65	Flat Cooling Kit for CQE Cabinets	dkc			1
	rzksre65	L-shaped union reinforcement kit for CQE cabinets	dkc			1
	RZDVE2260	Vertical partition for QE 2200x600	dkc	Hq	4	1
	rztse02	Lifting brackets for CQE PZ2	dkc			1
32 x 15	534-2	DIN rail EN60715 32x15x1.5 closed	Arnocanali	Hq	5	1.1
32 x 15	PD32Z	Sendzimir rail 32x15x9 closed	Canloplast	Hq	5	4.95
40 x 100	E354	Can.cabl.40x100 SG S/4	Canloplast	Hq	5	9.33
60 x 100	E184	Can.Cabl.60x100 SG S/4	Canloplast	Hq	5	4.83
77-TT-403				Hq		1
77-TT-404				Hq		1
A1	6AV2124-0MC01-0AX0	SIMATIC HMI TP1200 Comfort. Touch control, 12" widescreen display	siemens	Hq	40	1
A2	6ES7155-6AU01-0CN0	IM 155-6 PN HF/2 V4.2 Interface Module	siemens	Hq	41	1
	6ES7193-6AR00-0AA0	BA 2xRJ45 (PROFINET busadapter with standard Ethernet socket for IM-PN)	siemens			1
A3	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	41	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A4	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	41	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A5	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	41	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A6	6ES7131-6BH01-0BA0	Digital Input Module: 16x24VDC ST	siemens	Hq	41	1
	6ES7193-6BP00-0BA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A7	6ES7132-6BH01-0BA0	Digital Output Module: DQ 16x24VDC/0.5A ST	siemens	Hq	41	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A8	6ES7134-6HD01-0BA1	Analog Input Module: AI 4XU/I 2-Wire ST	siemens	Hq	41	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1
A9	6ES7135-6HD00-0BA1	Analog Output Module: AQ 4XU/I ST	siemens	Hq	41	1
	6ES7193-6BP00-0DA0	Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)	siemens			1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 50
F.S. 51

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
A10	*6ES7135-6HD00-0BA1*	*Analog Output Module: AQ 4XU/I ST*	*siemens*	*Hq*	41	1
	6ES7193-6BP00-0BA0	*Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)*	*siemens*			1
A11	*6ES7134-6HD01-0BA1*	*Analog Input Module: AI 4XU/I 2-Wire ST*	*siemens*	*Hq*	41	1
	6ES7193-6BP00-0DA0	*Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)*	*siemens*			1
A12	*6GK5208-0BA00-2AC2*	*XC208 Managed Switch with 8 RJ45 100Mbit/s Ports*	*siemens*	*Hq*	41	1
A12	*6ES7131-6BH01-0BA0*	*Digital Input Module: 16x24VDC ST*	*siemens*	*Hq*	41	1
	6ES7193-6BP00-0BA0	*Type A0 BU, 16 push-in, 2 power terminals. Separate (digital/analogue, max. 24VDC/10A)*	*siemens*			1
D1	*6ES7513-1RM03-0AB0*	*CPU 1513R-1PN*	*siemens*	*Hq*	40	1
	6ES7954-8LF02-0AA0	*Memory card, 24 MB*	*siemens*			1
	6ES7590-1AB60-0AA0	*Profile rail S7-1500, 160 mm*	*siemens*			1
D2	*6ES7513-1RM03-0AB0*	*CPU 1513R-1PN*	*siemens*	*Hq*	40	1
	6ES7954-8LF02-0AA0	*Memory card, 24 MB*	*siemens*			1
	6ES7590-1AB60-0AA0	*Profile rail S7-1500, 160 mm*	*siemens*			1
EM LIGHT				*Hq*		1
EPB-002L	*3SU1401-1BH20-1AA0*	*Red LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*	*Hq*	26	1
F1		*docker*		*Hq*	*7th*	1
F2		*docker*		*Hq*	*7th*	1
F3		*docker*		*Hq*	*7th*	1
F4		*docker*		*Hq*	*7th*	1
FU42.1	*SF900GR*	*SFR.4/GR Sectionable clamp*	*Cabur*	*Hq*	42	1
FU43.1	*SF900GR*	*SFR.4/GR Sectionable clamp*	*Cabur*	*Hq*	43	1
GD1	*6EP1336-3BA10*	*Sitop PSU8200 Single Phase, DC 24 V/20 A. Stabilized Power Supply Input: AC 120...230 V/DC 110-220 V, Output: DC 24 V/20 A*	*siemens*	*Hq*	25	1
HFD-77012		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77012		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77012				*Hq*	49	1
HFD-77013		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77013		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77013				*Hq*	49	1
HFD-77014		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77014		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77014				*Hq*	49	1
HFD-77015		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77015		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77015				*Hq*	49	1
HFD-77016		*Limit Switch: No*		*Hq*	*26th*	1
HFD-77016		*NC Limit Switch*		*Hq*	*26th*	1
HFD-77016				*Hq*	49	1
HL8.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	8	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL16.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	16	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL24.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	24	1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186-Cornegliano Laud. (Lo) Italy
tel. 0039-0371-69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 51
F.S. 52

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
HL24.1	*3SU1401-1BH60-1AA0*	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*	*Hq*	24	1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HL25.1	*3SU1001-6AA60-0AA0*	*Indicator light with smooth lens, white*	*siemens*	*Hq*	25	1
	3SU1401-1BH60-1AA0	*White LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
HPB-77-403	*3su1900-0dy30-0aa0*	*Protective collar for merge button, plastic, yellow, 22mm hole*	*siemens*	*Hq*	26	1
	3SU1001-1HB20-0AA0	*Emergency stop mushroom pushbutton, illuminatable, twist release, 40 mm diameter, 2 positions*	*siemens*			1
	3su1500-0aa10-0aa0	*Support without module. plastic*	*siemens*			1
	3SU1401-1BH20-1AA0	*Red LED module for mounting on front plate, 24 ... 240 V AC/DC. Screw terminals*	*siemens*			1
HR-1A	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	42	1
HR-1B	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	42	1
HR-1C	*GRM-H-25-48-AN-OL-00000*	*Static power master unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	42	1
HR-2A	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	43	1
HR-2B	*GRP-H-25-48-D-1-0000*	*Static power slave unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	43	1
HR-2C	*GRM-H-25-48-AN-OL-00000*	*Static power master unit for load control, logic/analog control. Maximum current 25A.*	*Gefran*	*Hq*	43	1
HSS-77-010				*Hq*		1
HSS-77-011				*Hq*		1
HSS-77-012				*Hq*		1
KA8.1	*EPN520*	*Stepper Relay 16A 230V 2NA 1M*	*Hager*	*Hq*	8	1
KA9.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	9	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA11.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	11	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA12.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	12	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA12.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	12	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI*	*Finder*			1
		Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable				
		Protection category: RT I. OPTIO				
KA12.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20*	*Finder*	*Hq*	12	1
		Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC				

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
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MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 52
F.S. 53

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA12.3	094913	*Latching and unhooking jumper*	*Finder*	*Hq*	12	1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA13.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	13	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA13.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	13	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA13.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	13	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA14.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	14	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA14.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	14	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA15.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	15	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA15.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	15	1
	094913	*Latching and unhooking jumper*	*Finder*			1

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MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 53
F.S. 54

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA15.2	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*	*Hq*	15	1
KA15.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	15	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA15.4	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	15	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA17.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	17	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA19.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	19	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA20.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	20	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA20.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	20	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA20.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	20	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 54
F.S. 55

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA21.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	21	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA21.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	21	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA21.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	21	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA22.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	22	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA22.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	22	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA23.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	23	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA23.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	23	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA23.3	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	23	1
	094913	*Latching and unhooking jumper*	*Finder*			1

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MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 55
F.S. 56

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA23.3	553482300054	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*	*Hq*	23	1
KA23.4	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	23	1
	094913	*Latching and unhooking jumper*	*Finder*			1
	553482300040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in fitting Power supply: AC volt AC: 230 V. Non-polarized monostable Protection category: RT I. OPTIO*	*Finder*			1
KA26.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	26	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA26.2	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	26	1
	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA26A.1	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.2	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.3	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.4	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.5	465290240040	*mini relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186–Cornegliano Laud. (Lo) Italy
tel. 0039–0371–69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 56
F.S. 57

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA26A.5	*9702spa*	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*	*Hq*	*26th*	1
KA26A.6	465290240040	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.7	465290240040	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.8	465290240040	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.9	465290240040	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA26A.10	465290240040	*miniature relay. (A): 8 N° Contacts: 2 Contact configuration: CO Material Contacts: AGNI Electrical connection: plug-in fitting Power supply: DC Volt DC: 24 V. Non-polarized Monostable Protection category: RT II. Optional: PU*	*Finder*	*Hq*	*26th*	1
	9702spa	*Plinth with socket terminals Mounting: 35 mm blind bar (A): 8 Degree of protection: IP 20 Accessories: plastic or metal jumper, 8-pole comb, EMC signalling and protection modules, timer*	*Finder*			1
KA30.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.3	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.4	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 57
F.S. 58

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA30.5	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.6	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.7	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	36	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.8	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	36	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA30.9	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	35	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA37.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	36	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA37.2	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	36	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA42.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	42	1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
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MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 58
F.S. 59

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
KA42.1	*9404spa*	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*	*Hq*	42	1
	094913	*Latching and unhooking jumper*	*Finder*			1
KA43.1	553490240040	*industrial relay. (A): 7 No. of contacts: 4 Contact configuration: CO Contact material: AGNI Electrical connection: Push-in connection Power supply: DC volts DC: 24 V. Non-polarized monostable Protection category: RT I. Option*	*Finder*	*Hq*	43	1
	9404spa	*Socket with socket clamps Mounting: Blind bar 35 mm (H): 10 Degree of protection: IP 20 Accessories: metal or plastic jumper, 6-pole comb, timer modules, signaling modules and EMC*	*Finder*			1
	094913	*Latching and unhooking jumper*	*Finder*			1
KM1	*3RT2316-1BB40*	*Contactor, 4 NO, AC-1: 18 to 24 V DC, 4-pole, 4 NO, size S00, screw terminals*	*siemens*	*Hq*	26	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KM2A	*3RT2015-1AP01*	*Power contactor, AC-3 7 A, 3 kW / 400 V 1 NO, 230 V AC, 50 / 60 Hz 3 poles, size S00 Screw terminals*	*siemens*	*Hq*	13	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KM2B	*3RT2015-1AP01*	*Power contactor, AC-3 7 A, 3 kW / 400 V 1 NO, 230 V AC, 50 / 60 Hz 3 poles, size S00 Screw terminals*	*siemens*	*Hq*	21	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KM3A	*3RT20261AN20*	*cont.11kw,1L 1R,AC 220V 50/60Hz,S0 VT*	*siemens*	*Hq*	14	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KM3B	*3RT20261AN20*	*cont.11kw,1L 1R,AC 220V 50/60Hz,S0 VT*	*siemens*	*Hq*	22	1
	3RH29111HA22	*Bloc.Aus.2L 2R 1L,1L,S00/S0,*	*siemens*			1
KT11.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	12	1
KT13.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	13	1
KT14.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	14	1
KT14.2	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	14	1
KT20.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	20	1
KT21.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	21	1
KT22.1	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	22	1
KT22.2	*dtmsmm1*	*Temporised Relay 1 C 230V*	*Microidea*	*Hq*	22	1
LIGHT				*Hq*		1
MTP-001A	*3RN2000-1AW30*	*Motor protection relay for PTC thermistor supervision 24/240 V AC/DC 1 changeover contact*	*siemens*	*Hq*	13	1
MTP-001B	*3RN2000-1AW30*	*Motor protection relay for PTC thermistor supervision 24/240 V AC/DC 1 changeover contact*	*siemens*	*Hq*	21	1
MVA-1	*DMG600*	*multimeter with icon-based LCD*	*Lovato*	*Hq*	6	1
PDSL-77-402		*Pressure-controlled (pressure switch) No*		*Hq*	15	1
PDSL-77-404		*Pressure-controlled (pressure switch) No*		*Hq*	23	1
PF8.1	*GSV1000220*	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*	*Hq*	8	1
	GSF10	*air intake filter 100x100*	*Cosmotec*			1
PF16.1	*GSF10*	*air intake filter 100x100*	*Cosmotec*	*Hq*	16	1
	GSV1000220	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*			1
PF24.1	*GSV1000220*	*Panel Fan 100x100 230V 24m³/h*	*Cosmotec*	*Hq*	24	1
	GSF10	*air intake filter 100x100*	*Cosmotec*			1
PFT8.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	8	1
PFT16.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	16	1
PFT24.1	*007026.00001*	*Thermostate Panel Fan*	*Fandis*	*Hq*	24	2
PH8.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	8	1
PH16.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	16	1
PH24.1	*050ra50*	*Anticondensing Heater 230V 50W*	*New Elfin*	*Hq*	24	1

REV.	MODIFICA	DATA	FIRMA		
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
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				APPR.	M.G.

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MATERIAL LIST
LISTA METERIALI

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 59
F.S. 60

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
PHT8.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	8	1
PHT16.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	16	1
PHT24.1	*007038.00001*	*Antcondensing Thermostat 230V*	*Fandis*	*Hq*	24	1
PL8.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	8	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL16.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	16	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL24.1	*050PEL3C*	*230V lamp*	*New Elfin*	*Hq*	24	1
	050kfm	*Magnet kit*	*New Elfin*			1
PL25.1	*050PEL3C-24V*	*LED Linear Ceiling Light 24V AC/DC, 600LM 368mm*	*New Elfin*	*Hq*	25	1
	050kfm	*Magnet kit*	*New Elfin*			1
PLS8.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	8	1
PLS16.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	16	1
PLS24.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	24	2
PLS25.1	*RAMC05*	*Micro Door Opening Switch 1 No & 1NC*	*dkc*	*Hq*	25	1
QF1	*5SU1354-1KK10*	*Residual current circuit breaker, 10 kA, 1P N, AC type, 30 mA, C, IN: 10 A, UN AC: 230 V*	*siemens*	*Hq*	*7th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF1A	*5SY7506-7*	*Circuit breaker 230 V 15KA, 1P N, C, 6 A, D=70 mm*	*siemens*	*Hq*	10	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF1B	*5SY7506-7*	*Circuit breaker 230 V 15KA, 1P N, C, 6 A, D=70 mm*	*siemens*	*Hq*	18	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF2	*5SU1354-1KK16*	*RCD, 10 kA, 1P N, AC type, 30 mA, C, IN: 16 A, UN AC: 230 V*	*siemens*	*Hq*	*7th*	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF3	*5SY7502-7*	*Circuit breaker 230 V 15KA, 1P N, C, 2 A, D=70 mm*	*siemens*	*Hq*	7	1
	5ST3010	*Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker*	*siemens*			1
QF4	*5SY7503-7*	*Circuit breaker 230 V 15Ka, 1P N, C, 3 A, D=70 mm*	*siemens*	*Hq*	25	1
QF5	*5SY5220-7*	*Universal current circuit breaker 440 V DC - 400 V AC 10Ka, 2P, C, 20 A*	*siemens*	*Hq*	25	1
QF6	*5su1354-1kk06*	*RCD, 10 kA, 1P N, AC Type, 30 mA, C, In: 6 A, One AC: 230 V*	*siemens*	*Hq*	7	1
QF400	*5SY74027*	*Int. MT 4P C2 ICN 15KA, ICU 50KA*	*siemens*	*Hq*	6	1
QFA	*3VA1132-4GF42-0AA0*	*Switch 3VA1 IEC Chassis 160 Switching Capacity Class S ICU=36 KA 415 V 4-Pole, TM240 System Protection, ATAM, IN=32 A Overload Protection IR=22 A... 32 A Short-Circuit Protection II=5...10 x in N-Conductor Protection 100% terminal LUG*	*siemens*	*Hq*	6	1
	3VA9157-0FK21	*com. rinv. Door Lock x 3VA10/1 STD*	*siemens*			1
	3VA9988-0BL30	*bobsleigh. Launch SIN 24VAC 50/60 Hz/12-30 VDC*	*siemens*			1
	3VA9988-0AA11	*Cont. HP-type status*	*siemens*			1
	3VA9111-0WD40	*Cover x 3VA10/1 4P 1pcs.*	*siemens*			2
QFB	*3VA1132-4GF42-0AA0*	*Switch 3VA1 IEC Chassis 160 Switching Capacity Class S ICU=36 KA 415 V 4-Pole, TM240 System Protection, ATAM, IN=32 A Overload Protection IR=22 A... 32 A Short-Circuit Protection II=5...10 x in N-Conductor Protection 100% terminal LUG*	*siemens*	*Hq*	6	1
	3VA9157-0FK21	*com. rinv. Door Lock x 3VA10/1 STD*	*siemens*			1
	3VA9988-0BL30	*bobsleigh. Launch SIN 24VAC 50/60 Hz/12-30 VDC*	*siemens*			1
	3VA9988-0AA11	*Cont. HP-type status*	*siemens*			1
	3VA9111-0WD40	*Cover x 3VA10/1 4P 1pcs.*	*siemens*			2
QM1	*5SY7410-7*	*Circuit breaker 400 V 15kA, 4P, C, 10 A, D=70 mm*	*siemens*	*Hq*	7	1
	5SM23420	*Block diff. 4P 40A 30mA Type AC x 5sy*	*siemens*			1

REV.	MODIFICA	DATA	FIRMA	APPR.	
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MATERIAL LIST
LISTA METERIALI

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FG. 60
F.S. 61

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
QM1	5ST3010	Auxiliary contact block, 1 NO 1 NC for 5SL, 5SY, 5SP circuit breaker	siemens	Hq	7	1
QM1A	3RV2011-1AA10	Circuit breaker size S00 for motor protection, class 10, trip A 1.1...1.6 A, trip N 21 A, screw terminal	siemens	Hq	9	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM1B	3RV2011-1AA10	Circuit breaker size S00 for motor protection, class 10, trip A 1.1...1.6 A, trip N 21 A, screw terminal	siemens	Hq	17	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM2A	3RV2011-1GA10	Circuit breaker size S00 for motor protection, class 10, trip A 4.5...6.3 A, trip N 82 A, screw terminal	siemens	Hq	10	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
	3RA19211DA00	El.Col. Electr.Mech. (1pack=1pcs)	siemens			1
QM2B	3RV2011-1GA10	Circuit breaker size S00 for motor protection, class 10, trip A 4.5...6.3 A, trip N 82 A, screw terminal	siemens	Hq	18	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
	3RA19211DA00	El.Col. Electr.Mech. (1pack=1pcs)	siemens			1
QM3A	3RV20214BA10	Int.aut.s0, 14-20a,vt	siemens	Hq	10	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
	3RA29211AA00	mod.coll.vt x 3rv2-3rt2 ac	siemens			1
QM3B	3RV20214BA10	Int.aut.s0, 14-20a,vt	siemens	Hq	18	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
	3RA29211AA00	mod.coll.vt x 3rv2-3rt2 ac	siemens			1
QM4A	3RV20114AA10	int.aut.s00, 11-16a,vt	siemens	Hq	10	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM4B	3RV2011-4AA10	Circuit breaker size S00 for motor protection, class 10, trip A 10...16 A, trip N 208 A, screw terminal	siemens	Hq	18	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM5A	3RV2011-1DA10	Circuit breaker size S00 for motor protection, class 10, trip A 2.2...3.2 A, trip N 42 A, screw terminal	siemens	Hq	11	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QM5B	3RV2011-1DA10	Circuit breaker size S00 for motor protection, class 10, trip A 2.2...3.2 A, trip N 42 A, screw terminal	siemens	Hq	19	1
	3RV2901-1E	Cross Auxiliary Contact Block 1No 1NC Screw Terminals for 3RV2 Circuit Breakers	siemens			1
QS1	3VA1140-4GF42-0AA0	Switch 3VA1 IEC Chassis 160 Switching Capacity Class S ICU=36 KA 415 V 4-pole, TM240 system protection, ATAM, IN=40 A overload protection IR=28 A... 40 A Short-Circuit Protection II=5...10 x in N-Conductor Protection 100% terminal LUG	siemens	Hq	6	1
	3VA9988-0BL30	bobsleigh. Launch SIN 24VAC 50/60 Hz/12-30 VDC	siemens			1
	3VA9988-0AA11	Cont. HP-type status	siemens			1
	3VA9157-0FK21	com. rinv. Door Lock x 3VA10/1 STD	siemens			1
	3VA9111-0WD40	Cover x 3VA10/1 4P 1pcs.	siemens			2
SA27.1		Three-position selector switch No rest 0		Hq	27	1
SA27.2		Three-position no-sleep selector switch 1		Hq	27	1
TA1	TAC022150X05	Amperometric transformer hole 22, transformation ratio 150/5 A	Frer	Hq	6	1
TA2	TAC022150X05	Amperometric transformer hole 22, transformation ratio 150/5 A	Frer	Hq	6	1
TA3	TAC022150X05	Amperometric transformer hole 22, transformation ratio 150/5 A	Frer	Hq	6	1
VSD-1A	6SL3210-5BE15-5CV0	SinamiCs V20 3AC380-480V 0.55kw with C3 filter	siemens	Hq	9	1

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

Frigotermica
HVAC SYSTEM and EQUIPMENT
S.p.186-Cornegliano Laud. (Lo) Italy
tel. 0039-0371-69076
frigotermica@frigotermica.com

CLIENT: CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 61
F.S. 62

Nome/Item	Tipo/Type	Descrizione/Description	Costruttore/Manufacturer	Quadro/Board	Fg/Sh	Q.ta/Q.ty
VSD-1B	*6SL3210-5BE15-5CV0*	*SinamiCs V20 3AC380-480V 0.55kw with C3 filter*	*siemens*	*Hq*	17	1
VSD-5A	*6SL3210-5BE21-1CV0*	*SinamiCs V20 3AC380-480V 1.1kw with C3 Filter*	*siemens*	*Hq*	11	1
VSD-5B	*6SL3210-5BE21-1CV0*	*SinamiCs V20 3AC380-480V 1.1kw with C3 Filter*	*siemens*	*Hq*	19	1
X3		*RJ45 port per panel*		*Hq*	*49th*	1
XA1	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		30
	BT005	*BTU Terminal Block*	*Cabur*			2
XA2	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		30
	BT005	*BTU Terminal Block*	*Cabur*			2
XC	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		8
	BT005	*BTU Terminal Block*	*Cabur*			2
XFD	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		20
XFD/S	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		20
XM1	*CBC02GR*	*CBC.2/GR Thru-Clamp*	*Cabur*	*Hq*		6
	CBC10gr	*CBC.10/gr Thru-Clamp*	*Cabur*			6
	CBC04GR	*CBC.4/GR Feed-through clamp*	*Cabur*			6
	BT005	*BTU Terminal Block*	*Cabur*			2
XM2	*CBC02GR*	*CBC.2/GR Thru-Clamp*	*Cabur*	*Hq*		6
	CBC10gr	*CBC.10/gr Thru-Clamp*	*Cabur*			6
	CBC04GR	*CBC.4/GR Feed-through clamp*	*Cabur*			6
	BT005	*BTU Terminal Block*	*Cabur*			2
XMD1	*SF900GR*	*SFR.4/GR Sectionable clamp*	*Cabur*	*Hq*		6
	CBS02GR	*Sectionable clamp 2.5 mm2*	*Cabur*			12
	BT005	*BTU Terminal Block*	*Cabur*			2
XMD2	*SF900GR*	*SFR.4/GR Sectionable clamp*	*Cabur*	*Hq*		6
	CBS02GR	*Sectionable clamp 2.5 mm2*	*Cabur*			12
	BT005	*BTU Terminal Block*	*Cabur*			2
XP1	*CBC35gr*	*CBC.35/GR Feed-through clamp*	*Cabur*	*Hq*		5
	CBC02GR	*CBC.2/GR Thru-Clamp*	*Cabur*			8
	CBC04GR	*CBC.4/GR Feed-through clamp*	*Cabur*			6
	BT005	*BTU Terminal Block*	*Cabur*			2
XT	*CBS02GR*	*Sectionable clamp 2.5 mm2*	*Cabur*	*Hq*		13
	BT005	*BTU Terminal Block*	*Cabur*			2
XUPS	*CBC04GR*	*CBC.4/GR Feed-through clamp*	*Cabur*	*Hq*		2
	BT005	*BTU Terminal Block*	*Cabur*			2

REV.	MODIFICA	DATA	FIRMA	APPR.	M.G.
05	ACCEPT FOR CONSTRUCTION	27/01/25	F.M.	DATA	22/04/2024
04	ACCEPT FOR CONSTRUCTION	10/12/24	F.M.	DISEGN.	F.M.
03	ISSUED FOR CONSTRUCTION	04/09/24	F.M.	VISTO	S.S.

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tel. 0039-0371-69076
frigotermica@frigotermica.com

CLIENT:
CROSSWIND

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM

Distinta Materiali
Bill of Materials

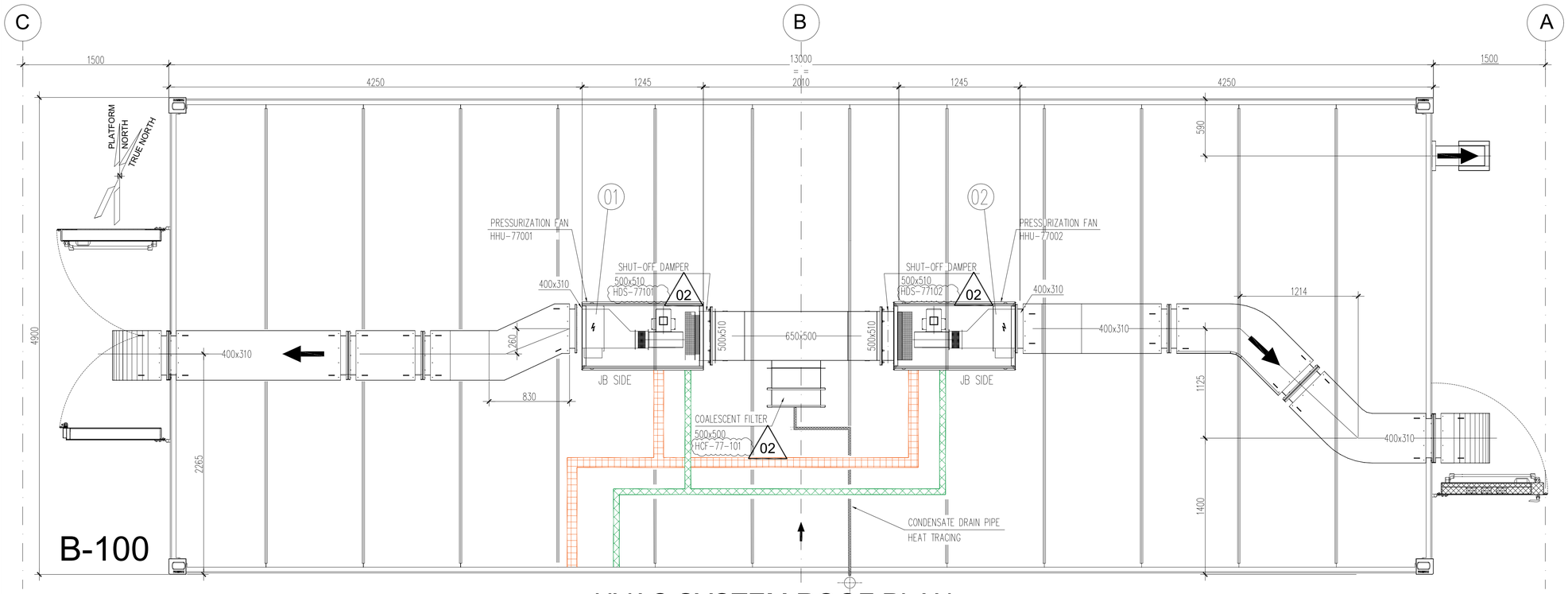
ROSETTI MARINO | ALEXSISTEMI spa

1724000049-HV-DA-00029

FG. 62
F.S. /

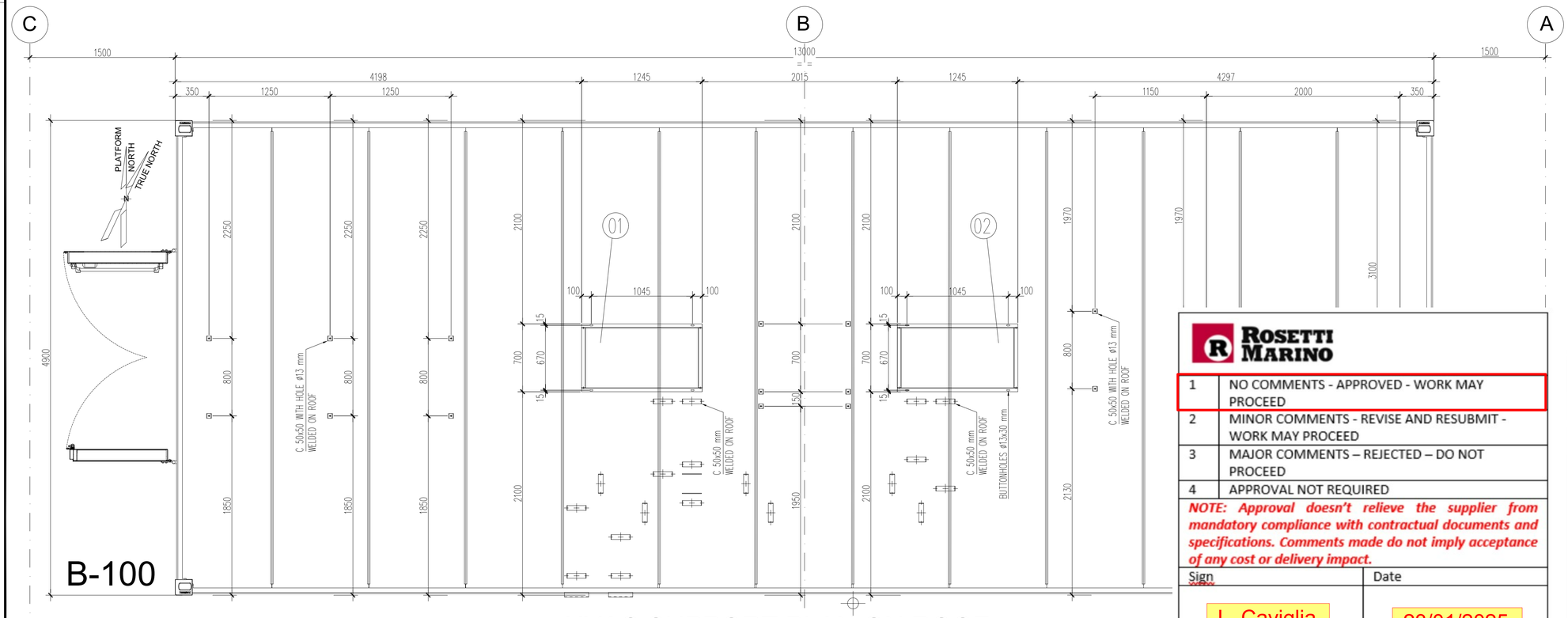
DRAWING NO. 1724000049-HV-DA-00064_2

REV. 02



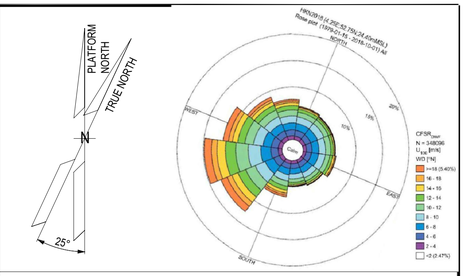
HVAC SYSTEM ROOF PLAN

EL. +28.800



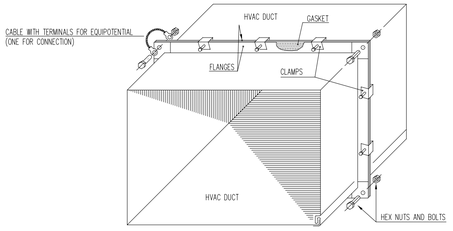
HVAC SUPPORT PLAN ON ROOF

EL. +28.050



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



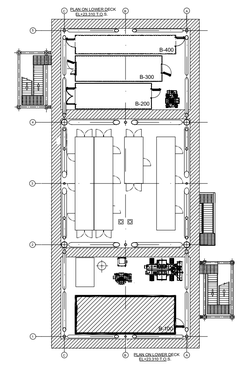
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power
AISI 316L

Basket tray Instrument
AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77001	AIR HANDLING UNIT A	1250	850	900	140
02	HHU-77002	AIR HANDLING UNIT B	1250	850	900	140

KEY PLAN



ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	23/01/2025

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	09/12/2024	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE :
S.S.
MODULE B-100
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 09/12/2024
A1	DRAWING NO. 1724000049-HV-DA-00064	SHEET 001	REV. 02

File Name : 1724000049-HV-DA-00064_2

DRAWING NO. 1724000049-HV-DA-00064_2 | REV. 02

B-100

HANGER OF DUCT

AIR HANDLING UNIT AHU 2 HHU-77001

SHUT-OFF DAMPER ACTUATOR HDZ-77-101

SHUT-OFF DAMPER 500x510 HDS-77-101

COALESCENT FILTER 500x500 HCF-77-103

SHUT-OFF DAMPER ACTUATOR HDZ-77-102

SHUT-OFF DAMPER 500x510 HDS-77-102

AIR HANDLING UNIT AHU 1 HHU-77002

TYP.

INSULATED ROCK WOOL

HVAC DUCT

310x400

510x500

650x500

EL.+28.090

EL.+27.905

EL.+27.905

EL.+28.090

EL.+27.860

HIGH VOLUME INDUSTRIAL SUPPLY GRILLE #2 600x300 HSG-77-102

HIGH VOLUME INDUSTRIAL SUPPLY GRILLE #1 600x300 HSG-77-101

DRAIN ø1"

FD-01 FIRE DAMPER AO DIM. 300x400 HFD-77001

OVERPRESSURE DAMPER WITH CONJOINED BLADES DIM. 600x310 HDN-77-102

OVERPRESSURE DAMPER WITH CONJOINED BLADES DIM. 600x310 HDN-77-101

FD-02 FIRE DAMPER AO DIM. 300x400 HFD-77002

U-CHANNEL, NUTS M8, WASHER, SPRING AND THREADED BAR

4500

2250

1416

100

152

163

12674
INTERNAL CLEARANCE

163

13000
OVERALL MODULE DIMENSIONS (OUTSIDE CORNER BLOCKS ON ROOF)

SUPPLY INCLUDED

EL.+ 23.310 T.O.S.
LOWER DECK

SUPPLY by ROSETTI

50

SECTION 1-1

B-100

PLATFORM NORTH

TRUE NORTH

25°

FD-01 FIRE DAMPER AO DIM. 400x300 HFD-77001

HIGH VOLUME INDUSTRIAL SUPPLY GRILLE #2 600x300 HSG-77-102

OVERPRESSURE DAMPER WITH CONJOINED BLADES DIM. 600x310 HDN-77-102

FIRE AND GAS DAMPER ACTUATOR HDZ-77001

400x310

400x310

SLEEVE ø4" ON LOWER DECK SUITABLE FOR CONDESING DRAIN PIPE (SLEEVE SUPPLY by ROSETTI)

PRESSURE RELIEF DAMPER DIM. 200x210 HDR-77-101

REGULATING DAMPER DIM. 200x210 HDB-77-101

WIRE MESH EXHAUST GRILLE #1 HEG-77-101

FD-03 FIRE DAMPER AO DIM. 200x200 HFD-77003

FIRE AND GAS DAMPER ACTUATOR HDZ-77003

FD-02 FIRE DAMPER AO DIM. 400x300 HFD-77002

HIGH VOLUME INDUSTRIAL SUPPLY GRILLE #1 600x300 HSG-77-101

OVERPRESSURE DAMPER WITH CONJOINED BLADES DIM. 600x310 HDN-77-101

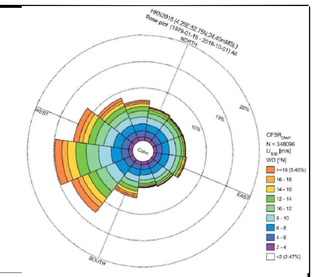
FIRE AND GAS DAMPER ACTUATOR HDZ-77002

4900

HVAC SYSTEM INDOOR DUCT LAYOUT

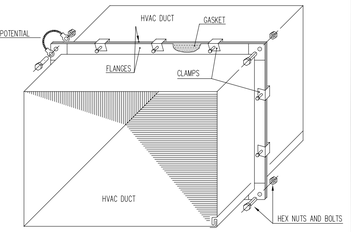
PLATFORM NORTH

TRUE NORTH



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



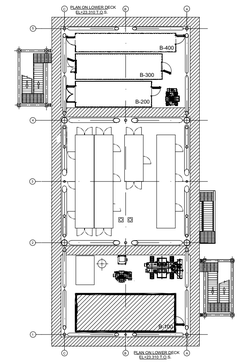
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77001	AIR HANDLING UNIT A	1250	850	900	140
02	HHU-77002	AIR HANDLING UNIT B	1250	850	900	140

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	09/12/2024	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE :
S.S.
MODULE B-100
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1 : 25

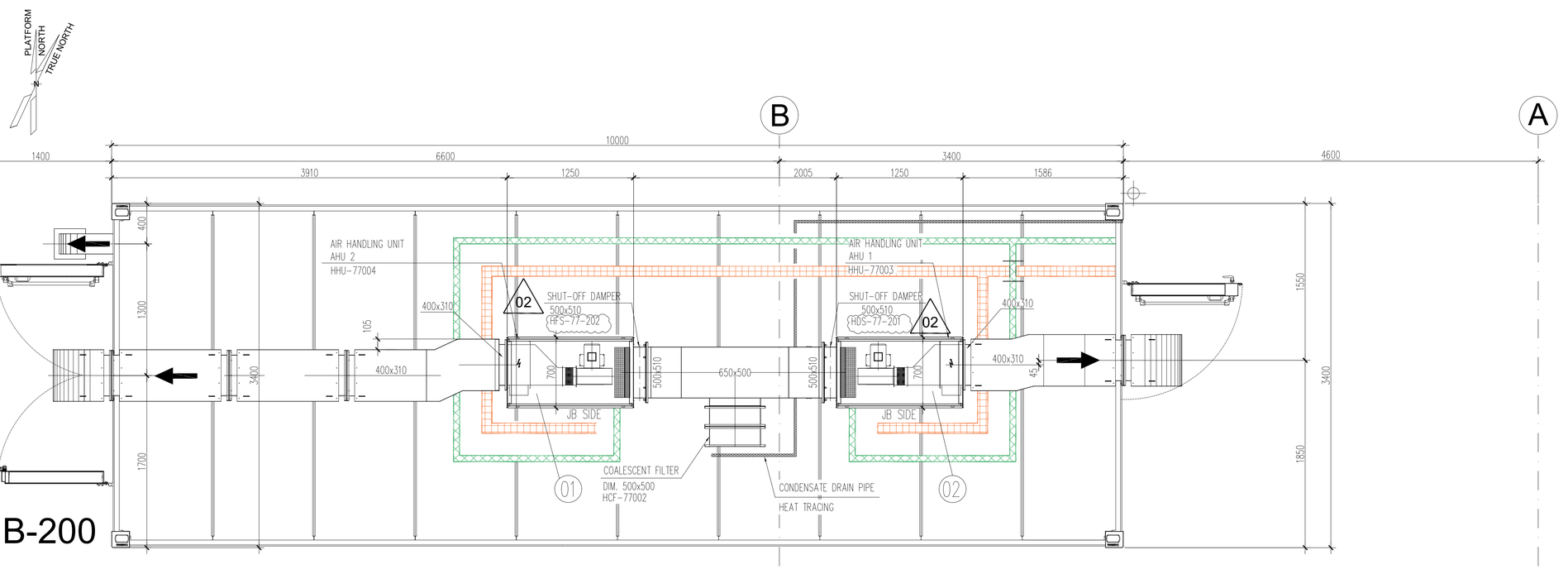
DRAWN M.G. | CHECKED O.A. | APPROVED C.A. | DATE 09/12/2024

A1 | DRAWING NO. 1724000049-HV-DA-00064 | SHEET 002 | REV. 02

File Name : 1724000049-HV-DA-00064_2

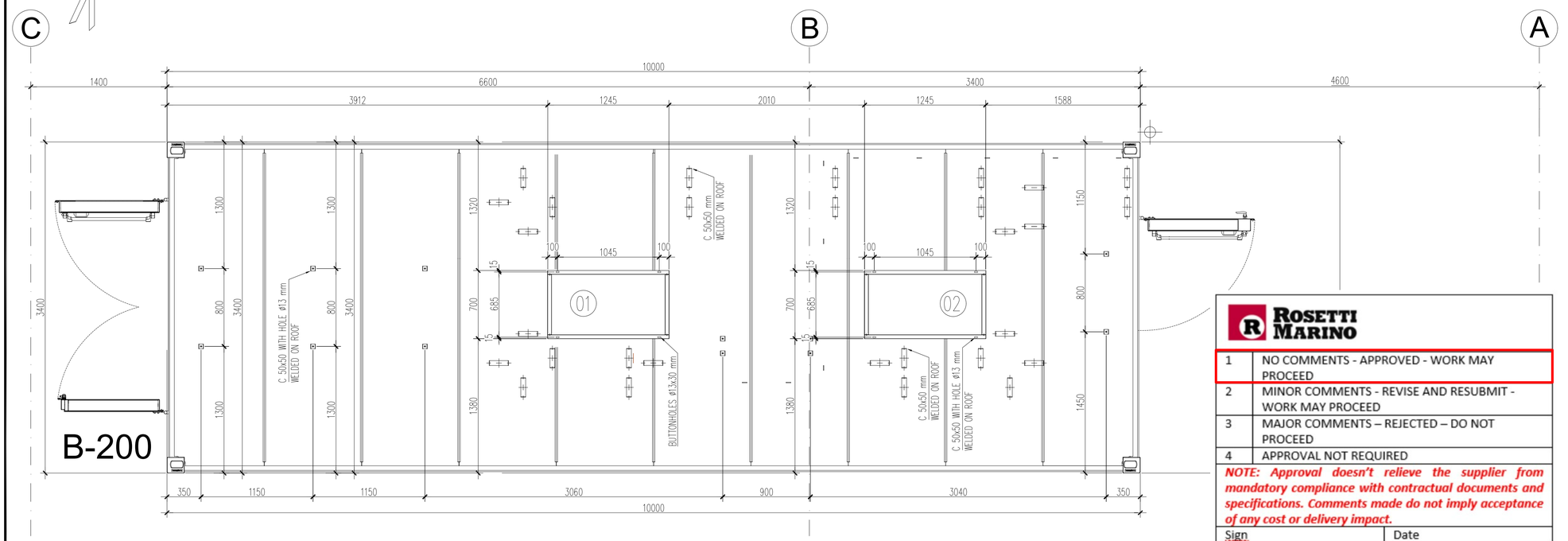
DRAWING NO. 1724000049-HV-DA-00065_2

REV. 02



HVAC SYSTEM ROOF PLAN

EL. +28.800



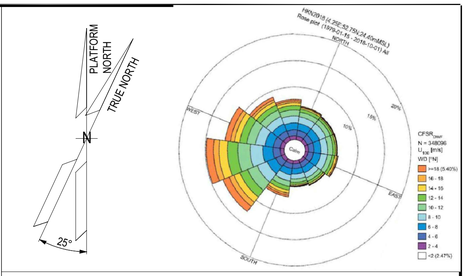
HVAC SUPPORT PLAN ON ROOF

EL. +28.050

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

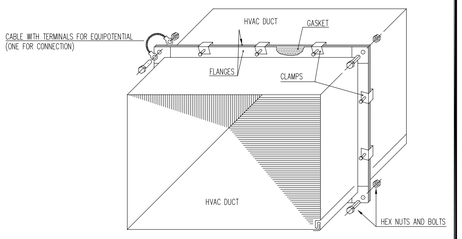
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	23/01/2025



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



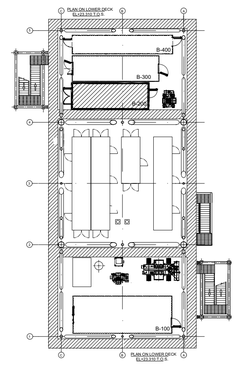
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power
AISI 316L

Basket tray Instrument
AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77003	AIR HANDLING UNIT A	1250	850	900	140
02	HHU-77004	AIR HANDLING UNIT B	1250	850	900	140

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	09/12/2024	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE :

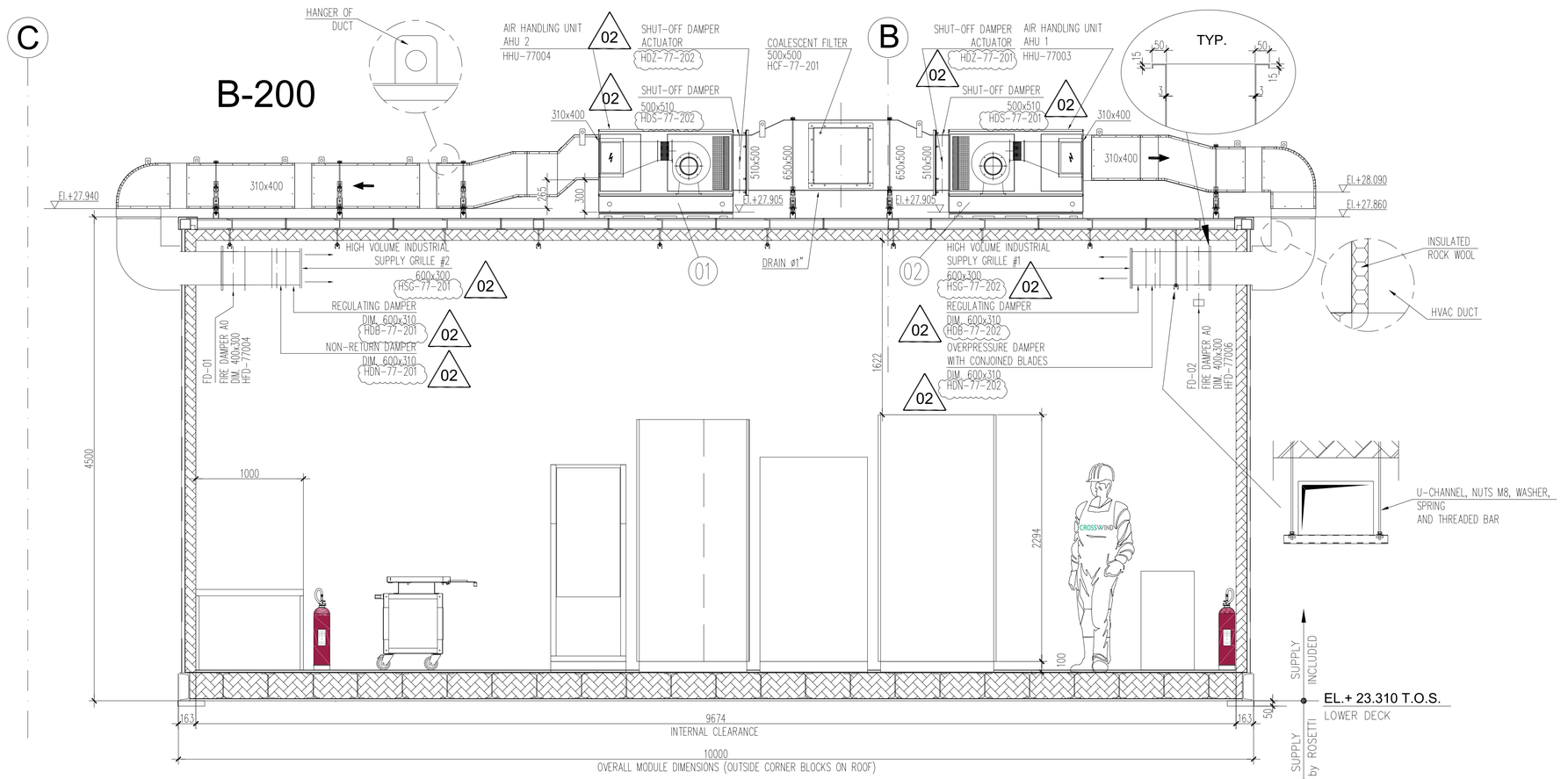
S.S.
MODULE B–200
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 09/12/2024
A1	DRAWING NO. 1724000049–HV–DA–00065	SHEET 001	REV. 02

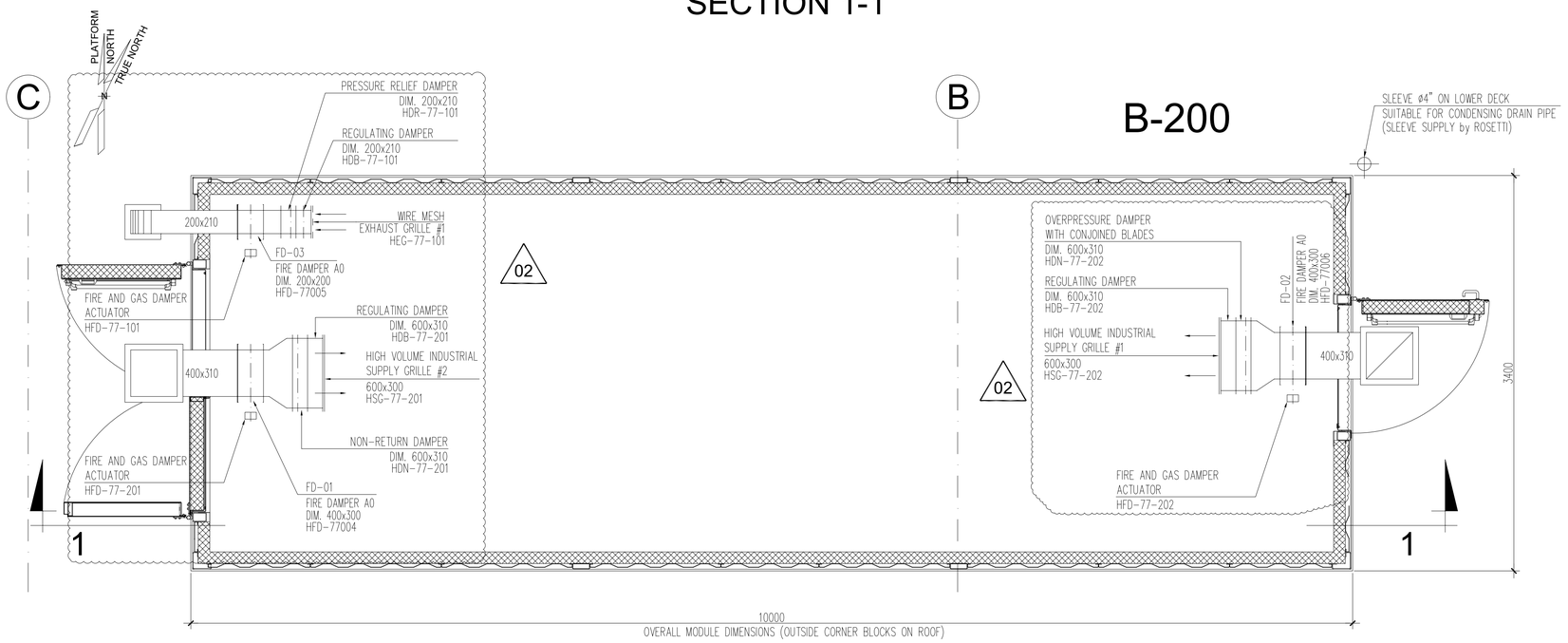
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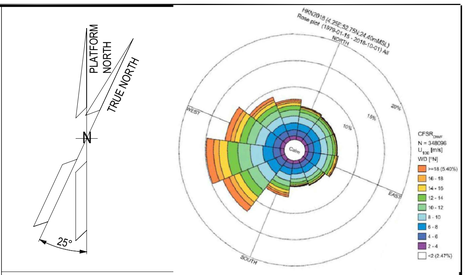
REV. 02



SECTION 1-1

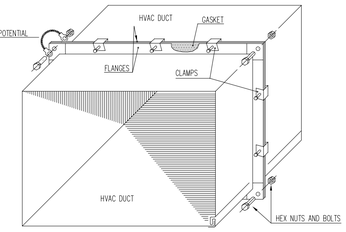


HVAC SYSTEM INDOOR DUCT LAYOUT



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



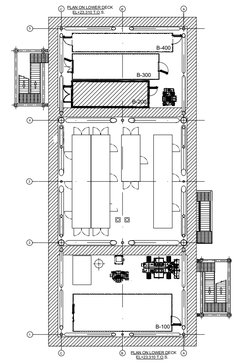
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77003	AIR HANDLING UNIT A	1250	850	900	140
02	HHU-77004	AIR HANDLING UNIT B	1250	850	900	140

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	09/12/2024	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

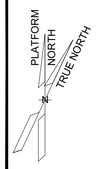
TITLE :
S.S.
MODULE B-200
HVAC SYSTEM - G.A. AND DETAILS

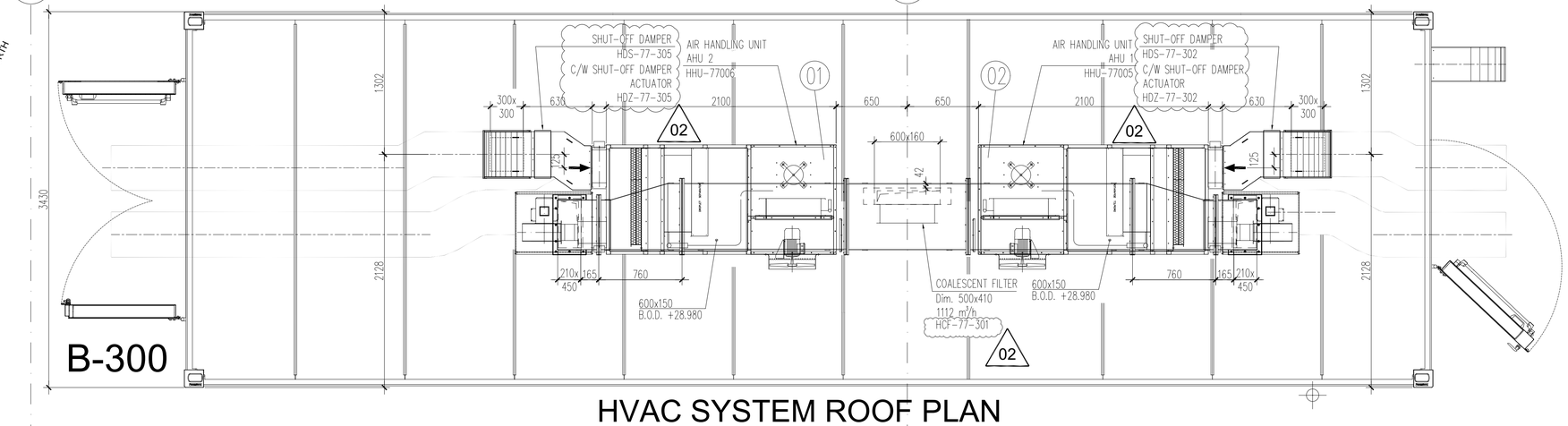
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 09/12/2024
A1	DRAWING NO. 1724000049-HV-DA-00065	SHEET 002	REV. 02

File Name : 1724000049-HV-DA-00065_2

DRAWING NO. 1724000049-HV-DA-00066_2

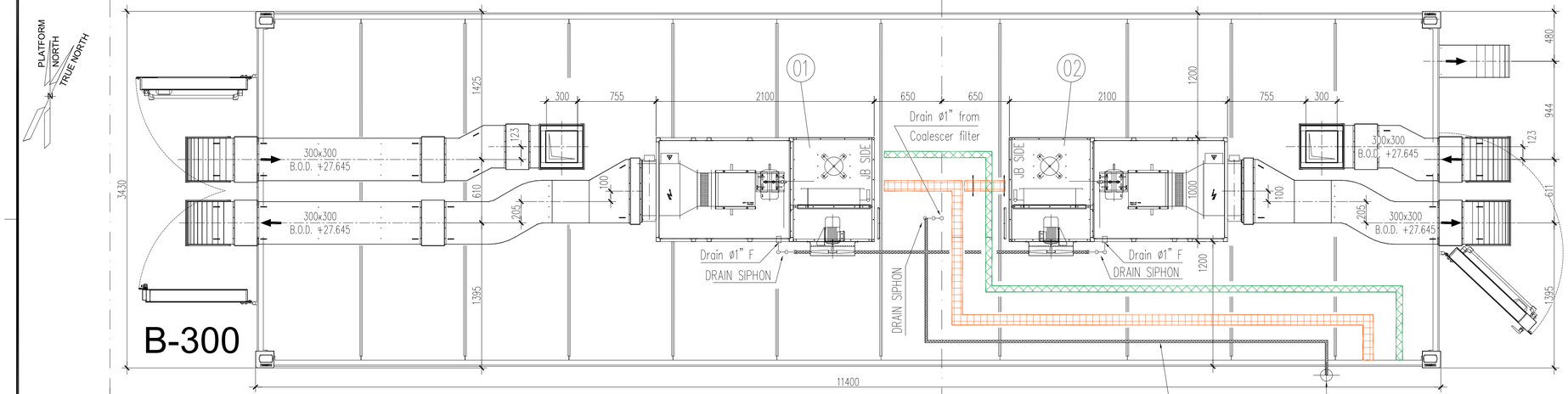
REV. 02





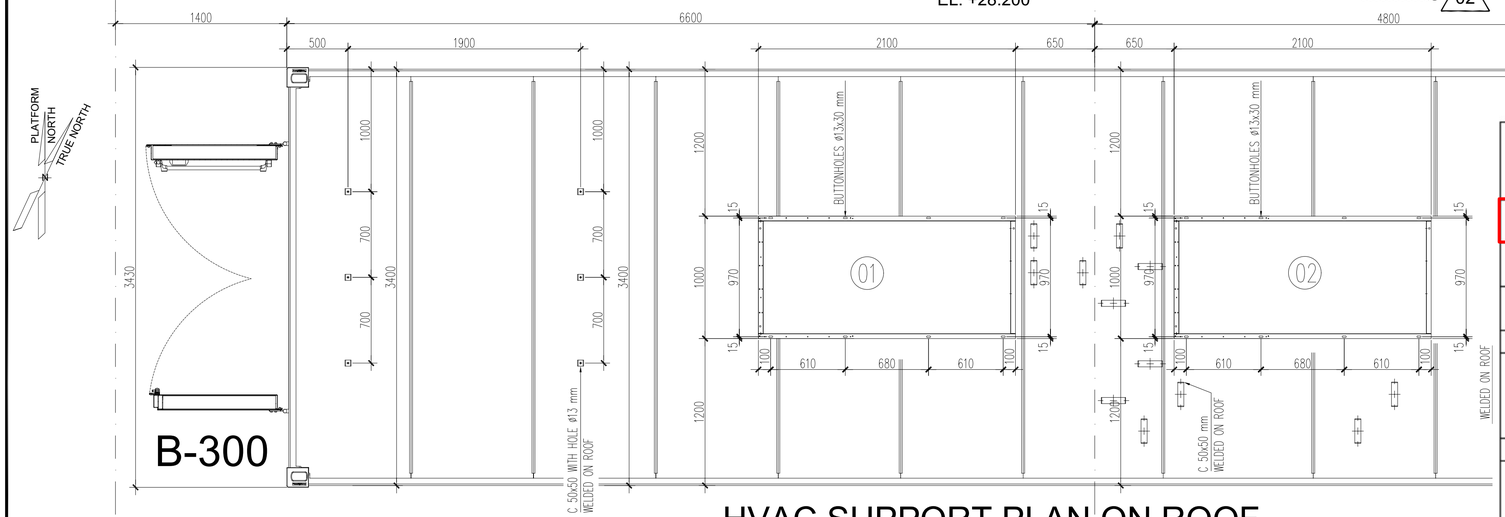
HVAC SYSTEM ROOF PLAN

EL. +28.980



HVAC SYSTEM ROOF PLAN

EL. +28.200



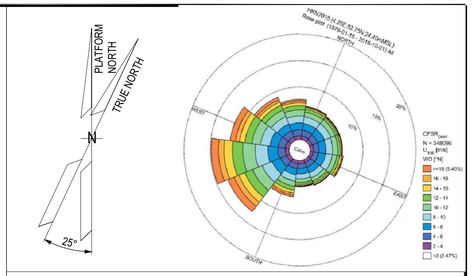
HVAC SUPPORT PLAN ON ROOF

EL. +27.480

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

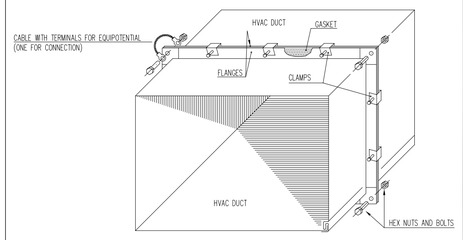
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	23/01/2025



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



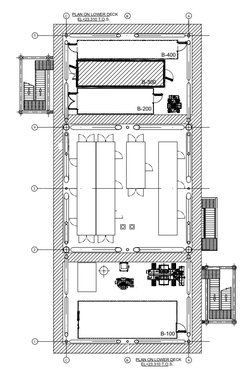
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77005	AIR HANDLING UNIT A	2100	1000	2158	850
02	HHU-77006	AIR HANDLING UNIT B	2100	1000	2158	850

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	09/12/2024	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE :

S.S.
MODULE B-300
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 09/12/2024
A1	DRAWING NO. 1724000049-HV-DA-00066	SHEET 001	REV. 02

File Name : 1724000049-HV-DA-00066_2

DRAWING NO. 1724000049-HV-DA-00066_2

REV. 02

B-300

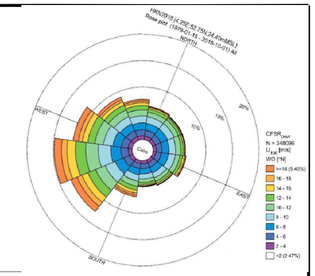
TYP.

SECTION 1-1

B-300

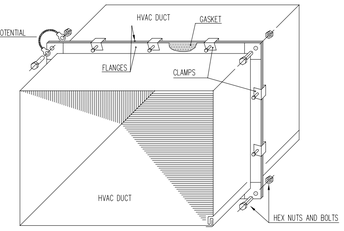
HVAC SYSTEM INDOOR DUCT LAYOUT

PLATFORM NORTH
TRUE NORTH
25°



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



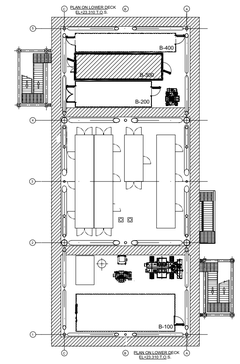
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77005	AIR HANDLING UNIT A	2100	1000	2158	850
02	HHU-77006	AIR HANDLING UNIT B	2100	1000	2158	850

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	09/12/2024	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

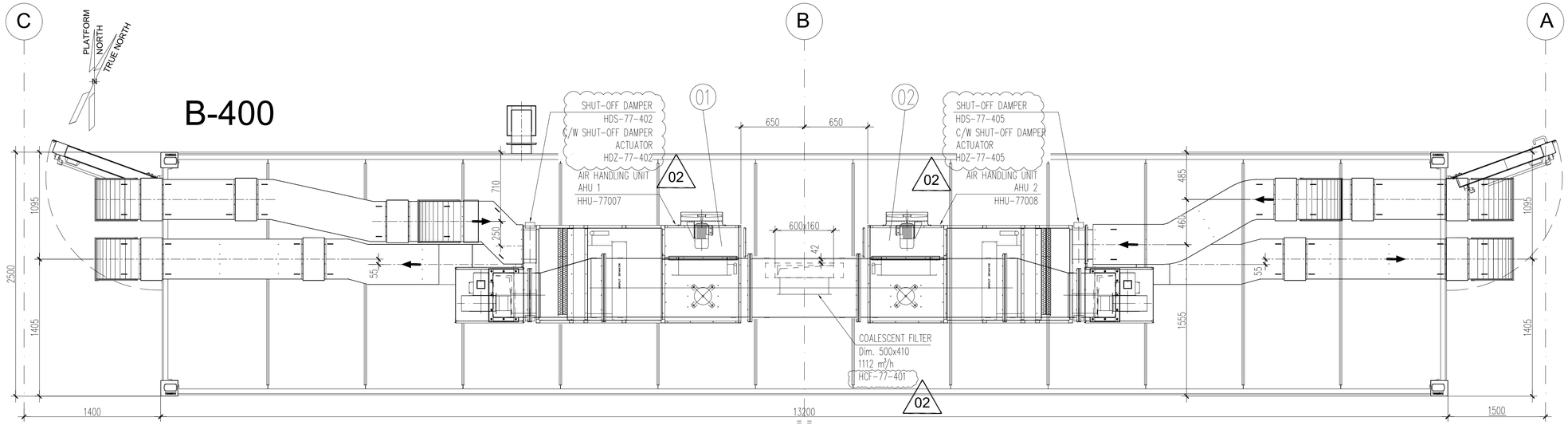
TITLE :
S.S.
MODULE B-300
HVAC SYSTEM - G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 09/12/2024
A1	DRAWING NO. 1724000049-HV-DA-00066	SHEET 002	REV. 02

File Name : 1724000049-HV-DA-00066_2

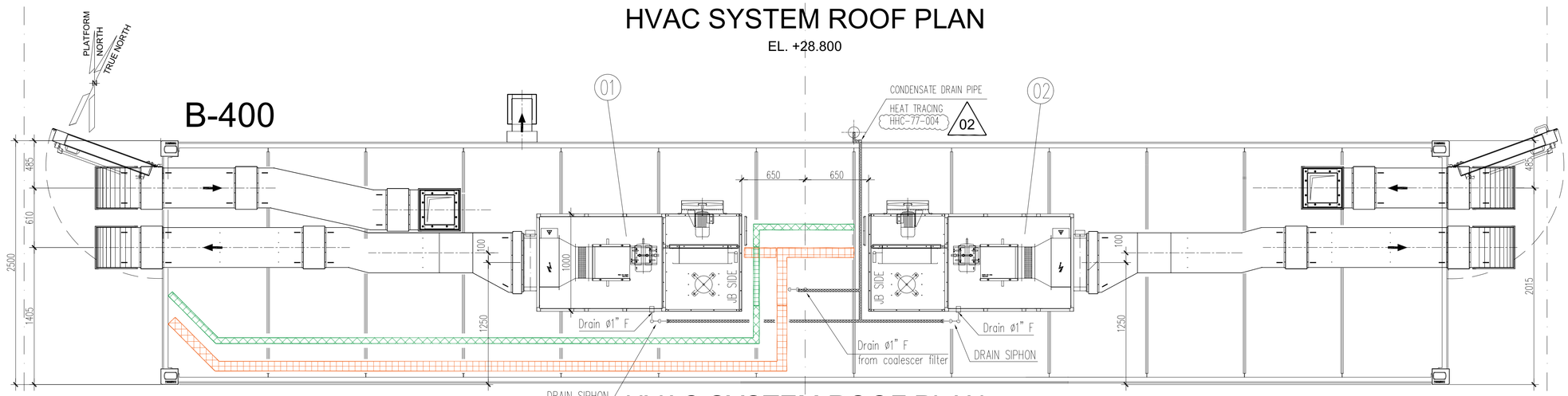
DRAWING NO. 1724000049-HV-DA-00067_2

REV. 02



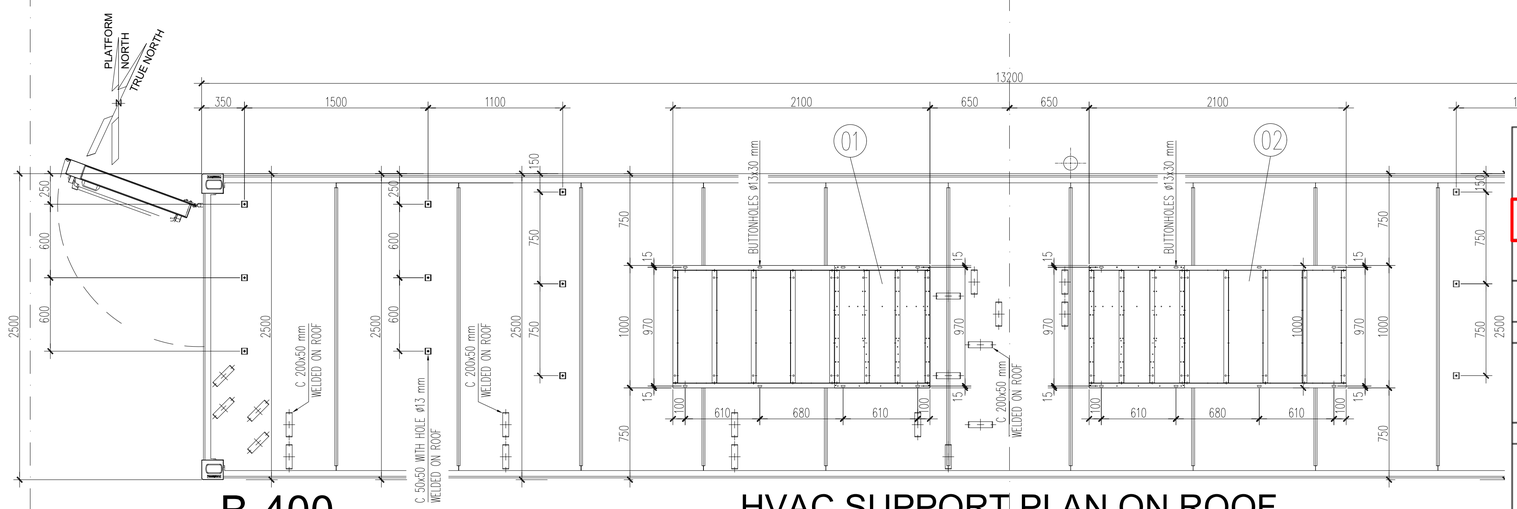
HVAC SYSTEM ROOF PLAN

EL. +28.800



HVAC SYSTEM ROOF PLAN

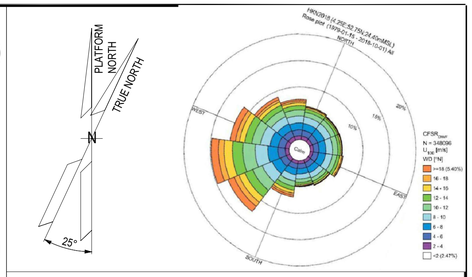
EL. +28.000



B-400

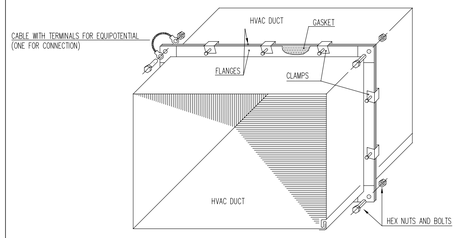
HVAC SUPPORT PLAN ON ROOF

EL. +27.300



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



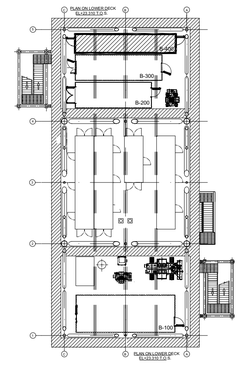
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77007	AIR HANDLING UNIT A	2100	1000	2158	850
02	HHU-77008	AIR HANDLING UNIT B	2100	1000	2158	850

KEY PLAN



ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	23/01/2025

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	09/12/2024	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND — ROSETTI MARINO

TITLE :
S.S.
MODULE B-400
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 09/12/2024
A1	DRAWING NO. 1724000049-HV-DA-00067	SHEET 001	REV. 02

File Name : 1724000049-HV-DA-00067_2

DRAWING NO. 1724000049-HV-DA-00067_2

REV. 02

B-400

HANGER OF DUCT

INSULATED ROCK WOOL

HVAC DUCT

AIR HANDLING UNIT AHU 1 HHU-77007

AIR HANDLING UNIT AHU 2 HHU-77008

02 COALESCENT FILTER 500x400 HCF-77-401 806 m³/h

02 SHUT-OFF DAMPER HDS-77-403 HDS-77-402 C/W SHUT-OFF DAMPER ACTUATOR HDZ-77-403 HDZ-77-402

02 SHUT-OFF DAMPER HDS-77-406 HDS-77-405 C/W SHUT-OFF DAMPER ACTUATOR HDZ-77-406 HDZ-77-405

TYP.

210x450

150x600

150x600 B.O.D. +28.800

600x160

Drain ø1" F

300x300 B.O.D. +27.445

+27.160

+27.230

C 50x50 WITH HOLE WELDED ON ROOF

177

410x500

01

02

El.+27.205

El.+27.205

El.+27.760

250x450 B.O.D. +26.590

02 REGULATING DAMPER DIM. 300x310 HDN-77-401

02 REGULATING DAMPER DIM. 300x310 HDN-77-402

02 FD-01 FIRE DAMPER AO DIM. 300x300 HFD-77012

02 FD-03 FIRE DAMPER AO DIM. 300x300 HFD-77016

SUPPLY AIR DUCT WITH THERMAL INSULATION IN MINERAL WOOL Th. 30 mm JACHETING WITH CHICKEN MESH.

02 SUPPLY GRILLE 800x200 HSS-77-401

02 SUPPLY GRILLE 800x200 HSS-77-402

02 SUPPLY GRILLE 800x200 HSS-77-403

1016

U-CHANNEL, NUTS M8, WASHER, SPRING AND THREADED BAR

CROSSWIND

3800

2200

SPARE

100

50

163

12874

SUPPLY INCLUDED by ROSETTI

EL.+ 23.310 T.O.S. LOWER DECK

SECTION 1-1

PLATFORM NORTH

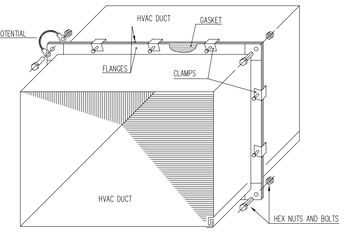
TRUE NORTH

25°

CFSR max N = 3480086 U_ref [m/s] WD [%]

NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



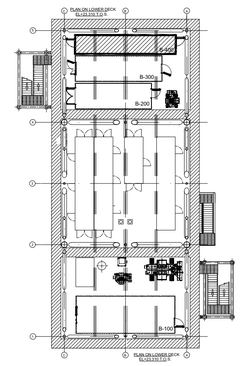
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77007	AIR HANDLING UNIT A	2100	1000	2158	850
02	HHU-77008	AIR HANDLING UNIT B	2100	1000	2158	850

KEY PLAN



C

PLATFORM NORTH

TRUE NORTH

02 REGULATING DAMPER DIM. 300x310 1895 m³/h HDB-77-401

FD-02 FIRE DAMPER AO DIM. 300x300 HFD-77013

02 PRESSURE RELIEF DAMPER DIM. 200x210 HDR-77-401

BALANCING DAMPER HDB-77-403

WIRE MESH EXHAUST GRILLE #1 HEG-77-401

02 FD-05 FIRE DAMPER AO DIM. 200x200 HFD-77014

SLEEVE 200x210

400x310 B.O.D. +26.590

RETURN GRILLE 800x200 HRG-77-401

RETURN GRILLE 800x300 HRG-77-402

B

SLEEVE ø4" ON LOWER DECK SUITABLE FOR CONDENSING DRAIN PIPE (SLEEVE SUPPLY by ROSETTI)

A

02 REGULATING DAMPER DIM. 300x310 1895 m³/h HDB-77-402

400x310 B.O.D. +26.590

RETURN GRILLE 800x300 HRG-77-403

FD-04 FIRE DAMPER AO DIM. 300x300 HFD-77015

300x300 RETURN AIR

300x300

F&G D.A. HDZ-77013

F&G D.A. HDZ-77015

FLANGE 50 mm FOR DRILLING SEE FIRE DAMPER DATA SHEET

FIRE AND GAS DAMPER ACTUATOR HDZ-77014

SUPPLY AIR DUCT WITH THERMAL INSULATION IN MINERAL WOOL Th. 30 mm JACHETING WITH CHICKEN MESH.

1600

1600

RETURN GRILLE 800x200 HRG-77-404

450x250 B.O.D. +26.590

300x300 SUPPLY AIR

FD-01 FIRE DAMPER AO DIM. 300x300 HFD-77012

NON-RETURN DAMPER DIM. 300x310 HDN-77-401

FIRE AND GAS DAMPER ACTUATOR HDZ-77012

02 SUPPLY GRILLE WITH BALANCING DAMPER #1 800x200 HSS-77-401

02 SUPPLY GRILLE WITH BALANCING DAMPER #2 800x200 HSS-77-402

02 SUPPLY GRILLE WITH BALANCING DAMPER #3 800x200 HSS-77-403

NON-RETURN DAMPER DIM. 300x310 HDN-77-402

FIRE AND GAS DAMPER ACTUATOR HDZ-77016

FD-03 FIRE DAMPER AO DIM. 300x300 HFD-77016

1

B-400

HVAC SYSTEM INDOOR DUCT LAYOUT

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	09/12/2024	M.G.	O.A.	C.A.	ACCEPTED FOR CONSTRUCTION (AFC)
01	16/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE :

S.S.
MODULE B-400
HVAC SYSTEM – G.A. AND DETAILS

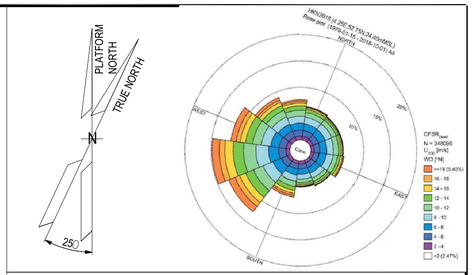
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 09/12/2024
A1	DRAWING NO. 1724000049-HV-DA-00067	SHEET 002	REV. 02

File Name : 1724000049-HV-DA-00067_2

DRAWING NO. 123A90-1724000049-HV-PID-00039

REV. 04

BASE LOAD POWER HUB (BLPH)
B-100 HV Switch Room
P&ID HVAC System



NOTES

LEGEND

HOLDS

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	10/02/2025

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	06/02/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
03	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
02	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
01	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
00	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE	CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.		DATE 19/12/24
A1	DRAWING NO. 1724000049-HV-PID-00039		SHEET 001	REV. 04

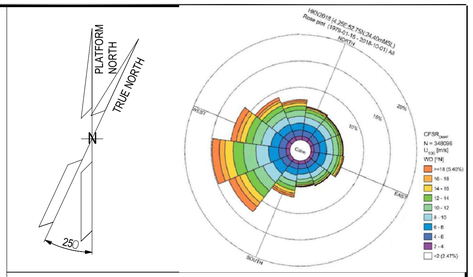
File Name : 123A90-1724000049-HV-PID-00039

DRAWING NO. 123A90-1724000049-HV-PID-00039

REV. 04

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
04	001	FRONT PAGE	IFI
04	002	SUMMARY and GENERAL NOTES	IFI
04	003	P&ID HVAC System	IFI

GENERAL NOTES



NOTES

LEGEND

HOLDS

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	06/02/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
03	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
02	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
01	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
00	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE			SCALE
CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 19/12/2024
A1	DRAWING NO. 1724000049-HV-PID-00039	SHEET 002	REV. 04

File Name : 123A90-1724000049-HV-PID-00039

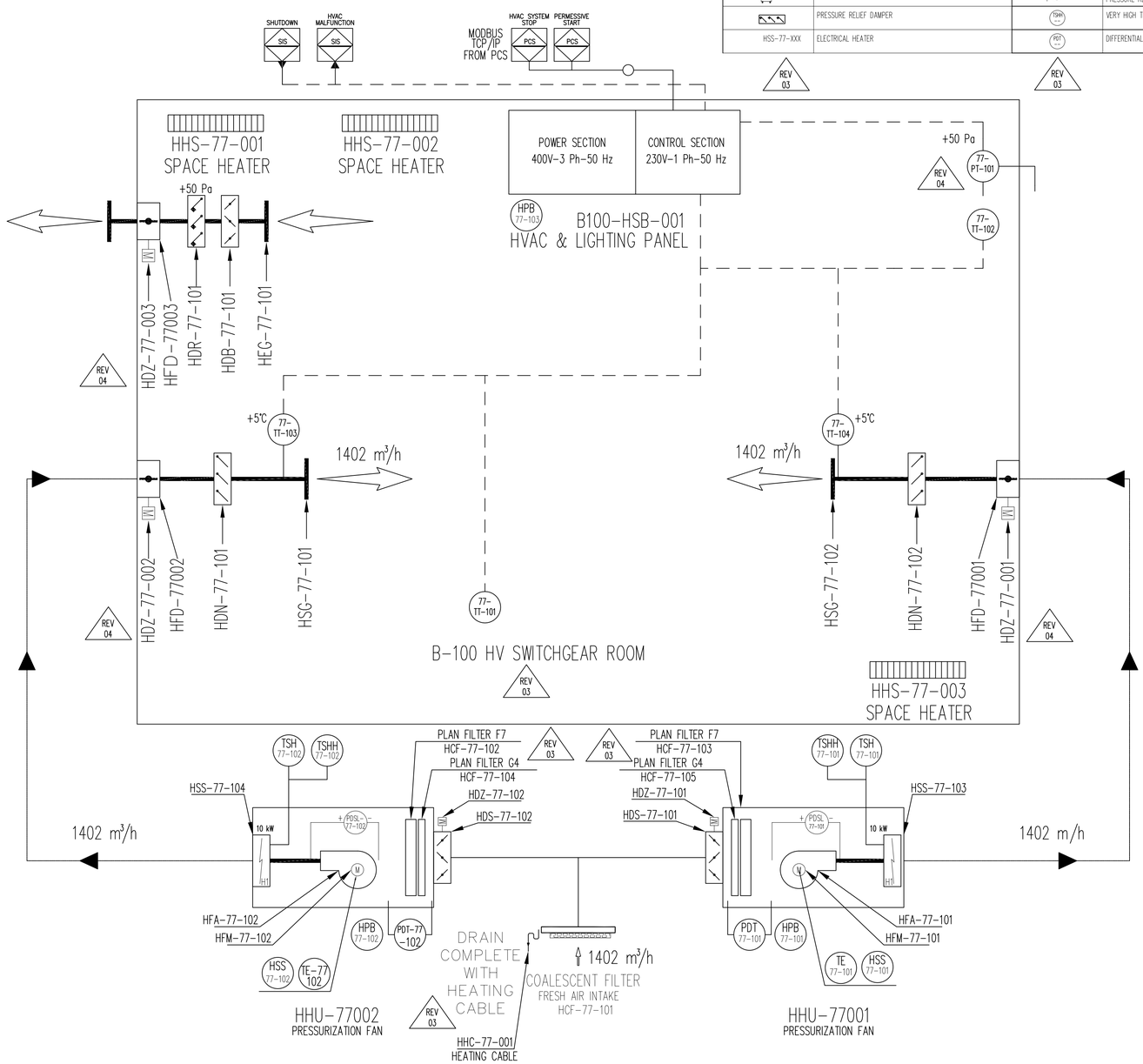
DRAWING NO. 123A90-1724000049-HV-PID-00039 REV. 04

ITEM	HVAC-PRESSURISING FAN
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-DMPD-400
SUPPLY AIR FLOW	389 l/s
COOLING COIL CAPACITY	N.A.
HEATING COIL CAPACITY	10 kW
TENSIONE	400 V - 50 Hz - 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	N.A.

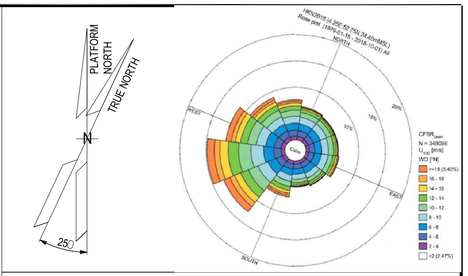
LEGEND

	MOTORISED DAMPER WITH SPRING RETURN	F1	AIR FILTER "G4"		MOTORISED FIRE DAMPER WITH SPRING RETURN
	REGULATION DAMPER	F2	BAG FILTER "F8"		EVAPORATING COIL
	OVERPRESSURE DAMPER		CONDENSING COIL		
PDSH	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE		CONDENSING FAN		
PDSL	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE		HEATING COIL		LIQUID RECEIVER
TT	TEMPERATURE TRASMITTER		SUPPLY FAN	MT	MOISTURE TRASMITTER
HPB	EMERGENCY PUSH BUTTON		GLOBE VALVE	PTR	HIG PRESSURE TRASDUCER
CH	COMPRESSOR OIL HEATER		DRYER FILTER	TP	COMPRESSOR THERMIC PROTECTION
SV	SOLENOID VALVE		SIGHT GLASS	TSH	HIGH TEMPERATURE SECURIYI THERMOSTATE
	REFRIGERANT COMPRESSOR		THERMOSTATIC VALVE	PSH	HIGH PRESSURE SWITCH
	PRESSURE RELIEF DAMPER		PRESSURE RELIEF VALVE	PS	LOW PRESSURE SWITCH
HSS-77-XXX	ELECTRICAL HEATER	TSHH	VERY HIGH TEMPERATURE SECURITY THERMOSTATE	PC	CONDENSING PRESSURE SWITCH
		PDT	DIFFERENTIAL PRESSURE SWITCH FOR FILTER		SPACE HEATER
				PT	DIFFERENTIAL PRESSURE TRANSMITTER
				HHC-77-XXX	HEATING CABLE

REV 03



REV 04 REV 04 REV 04 REV 04 REV 03 REV 03 REV 03 REV 03 REV 03 REV 04



OUTDOOR DESIGN CONDITIONS

Safe Area
Min. design DB Temp: -8.4°C with RH 100 %
Max. design DB Temp: +25°C with RH 90 %

Module B100 HV Switchroom REV 03

Safe Area
Indoor min. design temperature: +5°C with RH 30 ÷ 70%
Indor max. design temperature: +35°C with RH 30 ÷ 70%
Min. ACH: 6

NOTES:

- HVAC POWER CABINET will energize what above shown.
- HVAC CONTROL CABINET will control all what above shown.
- HVAC POWER CABINET will energize light and socket.
- Outside drainage system shall be provided of heatng cable with anti-freeze funcion to avoid ice inside pipes when outside temeprature reaches values close to 0°C.
- Outdoor air ductworks in stainless steel AISI 316

NOTES

LEGEND

HOLDS

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
04	06/02/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
03	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
02	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
01	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
00	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
P&ID HVAC System

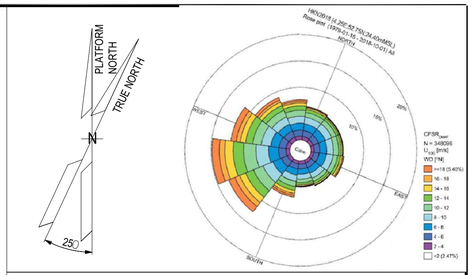
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DRAWN G.M.	CHECKED A.O.	APPROVED A.C.		DATE	19/12/24
A1	DRAWING NO. 1724000049-HV-PID-00039			SHEET 003	REV. 04

File Name : 123A90-1724000049-HV-PID-00039

DRAWING NO. 1724000049-HV-PID-00040

REV. 4

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
P&ID HVAC System



NOTES

LEGEND

HOLDS

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	10/02/2025

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
3	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
2	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 27/01/25
A1	DRAWING NO. 1724000049-HV-PID-00040	SHEET 001	REV. 4

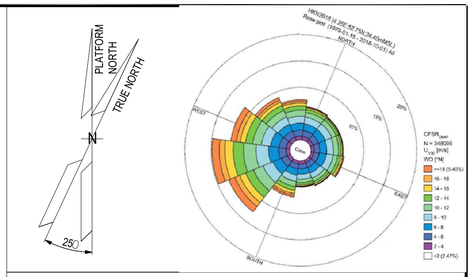
File Name : 1724000049-HV-PID-00040

DRAWING NO. 1724000049-HV-PID-00040

REV. 4

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
04	001	FRONT PAGE	IFI
04	002	SUMMARY and GENERAL NOTES	IFI
04	003	P&ID HVAC System	IFI

GENERAL NOTES



NOTES

LEGEND

HOLDS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
3	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
2	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

ALEXSISTEMI spa

CROSSWIND

ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 27/01/25
A1	DRAWING NO. 1724000049-HV-PID-00040	SHEET 002	REV. 4

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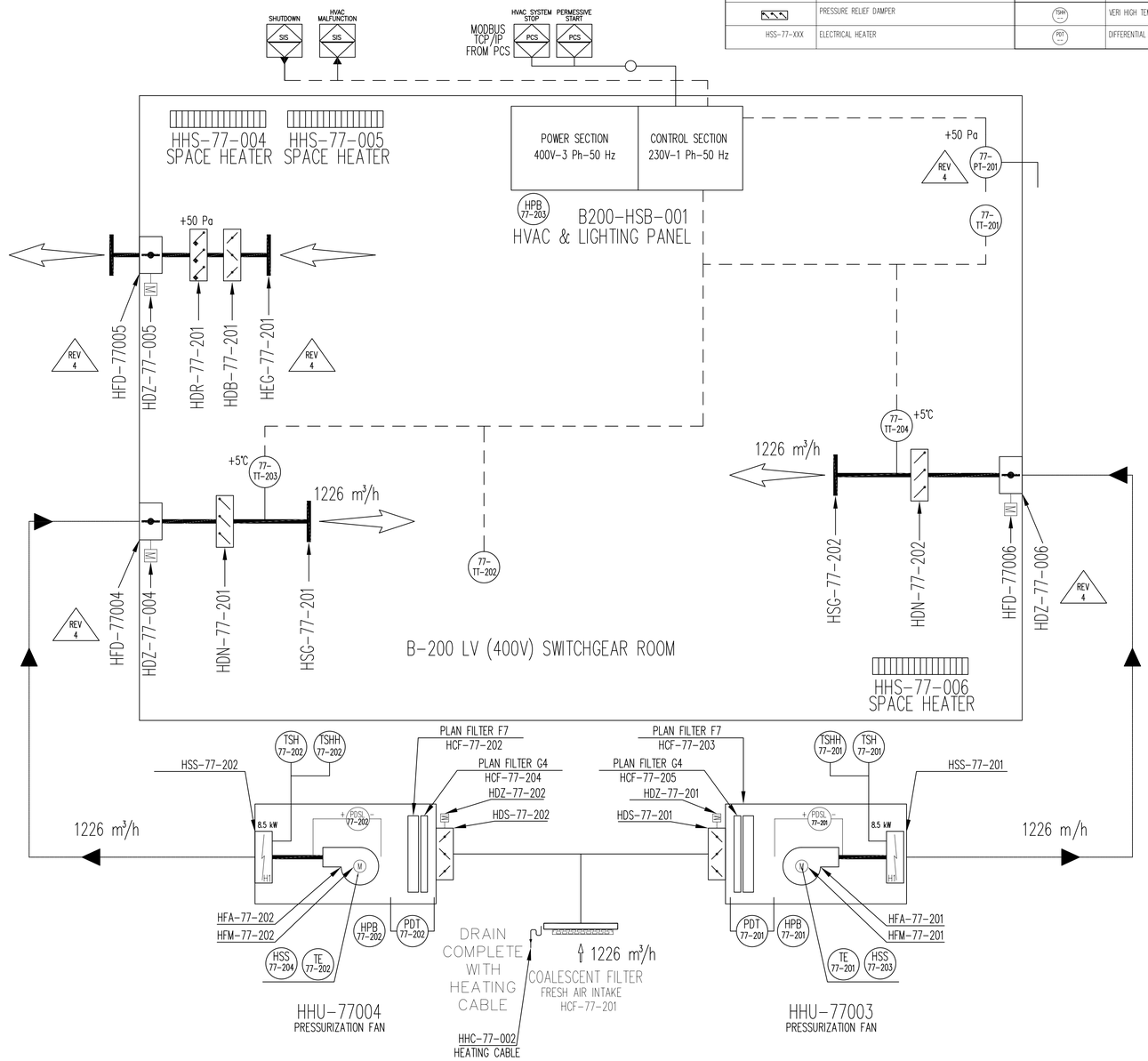
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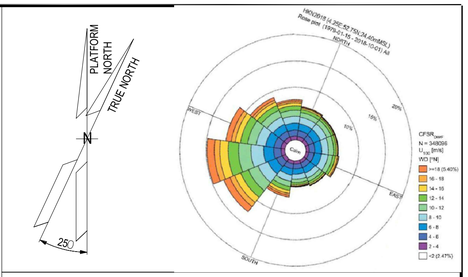
REV. 4

ITEM	HVAC-PRESSURISING FAN
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-DMPD-300
SUPPLY AIR FLOW	1226 mc/h
COOLING COIL CAPACITY	N.A.
HEATING COIL CAPACITY	8.5 kW
TENSIONE	400 V - 50 Hz - 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	N.A.

LEGEND

	MOTORISED DAMPER WITH SPRING RETURN	F1	AIR FILTER "G4"		MOTORISED FIRE DAMPER WITH SPRING RETURN
	REGULATION DAMPER	F2	BAG FILTER "F8"		EVAPORATING COIL
	OVERPRESSURE DAMPER		CONDENSING COIL		LIQUID RECEIVER
DPSH	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE		CONDENSING FAN	MT	MOISTURE TRASMITTER
DPSL	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE		HEATING COIL	PTH	HIG PRESSURE TRASDUCER
TT	TEMPERATURE TRASMITTER		SUPPLY FAN	TP	COMPRESSOR THERMIC PROTECTION
MPB	EMERGENCY PUSH BUTTON		GLOBE VALVE	TSH	HIGH TEMPERATURE SECURITY THERMOSTATE
CH	COMPRESSOR OIL HEATER		DRYER FILTER	PSH	HIGH PRESSURE SWITCH
SV	SOLENOID VALVE		SIGHT GLASS	PS	LOW PRESSURE SWITCH
	REFRIGERANT COMPRESSOR		THERMOSTATIC VALVE	PC	CONDENSING PRESSURE SWITCH
	PRESSURE RELIEF DAMPER		PRESSURE RELIEF VALVE		SPACE HEATER
HSS-77-XXX	ELECTRICAL HEATER	TSHH	VERI HIGH TEMPERATURE SECURITY THERMOSTATE	TP	DIFFERENTIAL PRESSURE TRANSMITTER
		PDT	DIFFERENTIAL PRESSURE SWITCH FOR FILTER	HHC-77-XXX	HEATING CABLE





NOTES

OUTDOOR DESIGN CONDITIONS

Safe Area
Min. design DB Temp: -8.4°C with RH 100 %
Max. design DB Temp: +25°C with RH 90 %

Module B200 LV Switchroom

Safe Area
Indoor min. design temperature: +5°C with RH 30 ÷ 70%
Indor max. design temperature: +35°C with RH 30 ÷ 70%
Min. ACH: 6

NOTES:

- HVAC POWER CABINET will energize what above shown.
- HVAC CONTROL CABINET will control all what above shown.
- HVAC POWER CABINET will energize light and socket.
- Outside drainage system shall be provided of heatng cable with anti-freeze funcion to avoid ice inside pipes when outside temeprature reaches values close to 0°C.
- Outdoor air ductworks in stainless steel AISI 316

LEGEND

HOLDS

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
3	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
2	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCHROOM
P&ID HVAC System

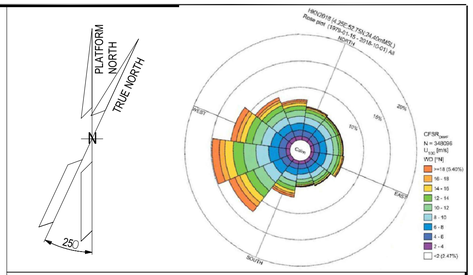
CONTRACT NO./TITLE	CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.		DATE 27/01/25
A1	DRAWING NO. 1724000049-HV-PID-00040		SHEET 003	REV. 4

File Name : 1724000049-HV-PID-00040

DRAWING NO. 1724000049-HV-PID-00041

REV. 4

BASE LOAD POWER HUB (BLPH)
B-300 AC UPS EQUIPMENT ROOM
P&ID HVAC System



NOTES

LEGEND

HOLDS

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

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Sign	Date
L. Caviglia	10/02/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
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2	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

TITLE : BASE LOAD POWER HUB (BLPH)
B-300 AC UPS EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 27/01/25
A1	DRAWING NO. 1724000049-HV-PID-00041	SHEET 001	REV. 4

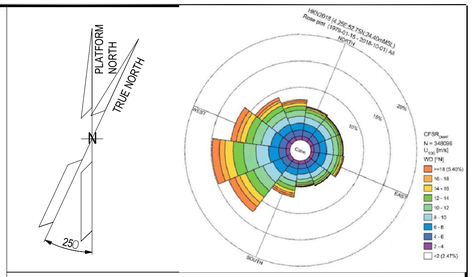
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DRAWING NO. 1724000049-HV-PID-00041

REV. 4

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
03	001	FRONT PAGE	IFR
03	002	SUMMARY and GENERAL NOTES	IFR
03	003	P&ID HVAC System	IFR

GENERAL NOTES



NOTES

LEGEND

HOLDS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
3	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
2	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

ALEXSISTEMI spa

CROSSWIND

ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-300 AC UPS EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 27/01/25
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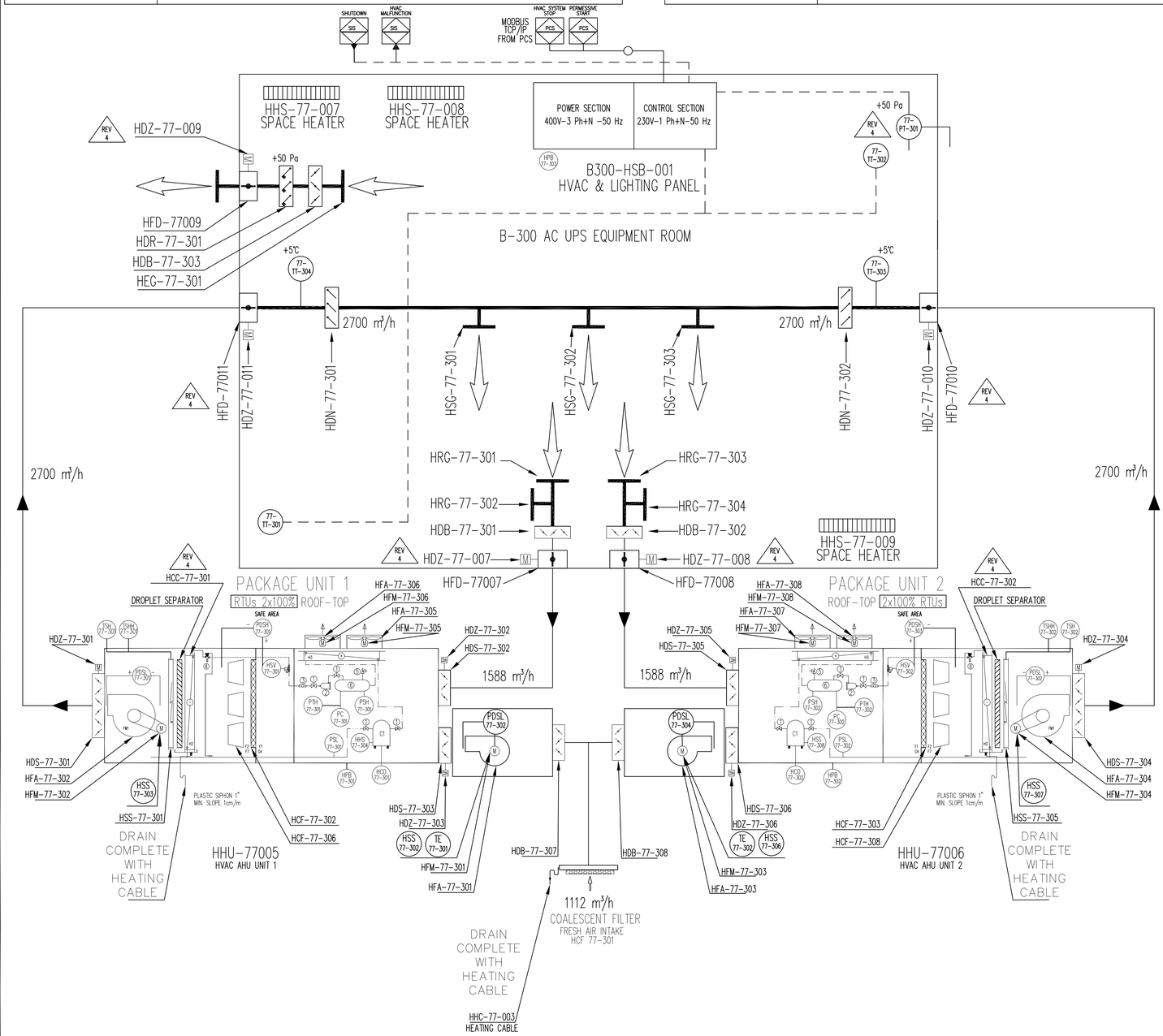
File Name : 1724000049-HV-PID-00041

DRAWING NO. 1724000049-HV-PID-00041

REV 4

ITEM	HVAC-ROOF TOP
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-DMPD-200
SUPPLY AIR FLOW	750 l/s
COOLING COIL CAPACITY	12 kW AT +26°C Outdoor Temperature
HEATING COIL CAPACITY	6 kW
TENSIONE	400 V – 50 Hz – 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	R513a

ITEM	HVAC-PRESSURISING FAN
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-DMPD-201
SUPPLY AIR FLOW	281 l/s
COOLING COIL CAPACITY	N.A.
HEATING COIL CAPACITY	N.A.
TENSIONE	400 V – 50 Hz – 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	N.A.



LEGEND

	MOTORISED DAMPER WITH SPRING RETURN
	REGULATION DAMPER
	OVERPRESSURE DAMPER
PDSH	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE
PDSL	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE
TT	TEMPERATURE TRASMITTER
HPB	EMERGENCY PUSH BUTTON
OH	COMPRESSOR OIL HEATER
SV	SOLENOID VALVE
R	REFRIGERANT COMPRESSOR
F1	AIR FILTER "G4"
F2	BAG FILTER "F8"
	CONDENSING COIL
	CONDENSING FAN
	ELECTRICAL HEATER
	SUPPLY FAN
	GLOBE VALVE
	DRYER FILTER
	SIGHT GLASS
	THERMOSTATIC VALVE
	PRESSURE RELIEF VALVE
	MOTORISED FIRE DAMPER WITH SPRING RETURN
	EVAPORATING COIL
	LIQUID RECEIVER
MT	MOISTURE TRASMITTER
PTH	HIGH PRESSURE TRASDUCER
TP	COMPRESSOR THERMIC PROTECTION
TSH	HIGH TEMPERATURE SECURITY THERMOSTATE
PSH	HIGH PRESSURE SWITCH
PSL	LOW PRESSURE SWITCH
PC	CONDENSING PRESSURE SWITCH
HEC	ELECTRICAL HEATING
HCO	REFRIGERANT COMPRESSOR
MDC	MOTORISE DAMPER
TSHH	VERY HIGH TEMPERATURE SECURITY THERMOSTATE
	PRESSURE RELIEF DAMPER
	SPACE HEATER
HSS-77-XXX	ELECTRICAL HEATER
HHC-77-XXX	HEATING CABLE
FT	DIFFERENTIAL PRESSURE TRANSMITTER

NOTES:

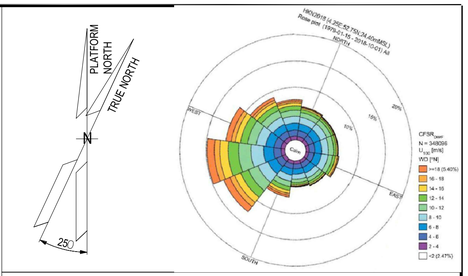
- HVAC POWER CABINET will energize what above shown.
- HVAC CONTROL CABINET will control all what above shown.
- HVAC POWER CABINET will energize light and socket.
- Outside drainage system shall be provided of heatng cable with anti-freeze funcion to avoid ice inside pipes when outside temeprature reaches values close to 0°C.
- Outdoor air ductworks in stainless steel AISI 316

OUTDOOR DESIGN CONDITIONS

Safe Area
Min. design DB Temp: -8.4°C with RH 100 %
Max. design DB Temp: +25°C with RH 90 %

Module B-300 AC UPS Equipment Room

Safe Area
Indoor min. design temperature: +5°C with RH 30 ÷ 70%
Indor max. design temperature: +35°C with RH 30 ÷ 70%
Min. ACH: 6



NOTES

LEGEND

HOLDS

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)
3	03/12/24	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)
2	29/10/24	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-300 AC UPS EQUIPMENT ROOM
P&ID HVAC System

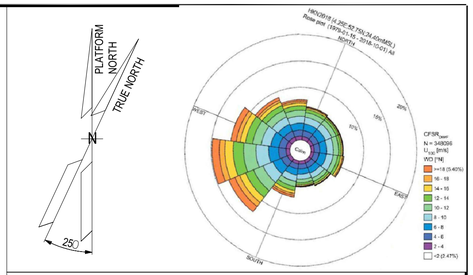
CONTRACT NO./TITLE	CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK		SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 27/01/25
A1	DRAWING NO. 1724000049-HV-PID-00041	SHEET 003	REV. 4

File Name : 1724000049-HV-PID-00041

DRAWING NO. 1724000049-HV-PID-00042

REV. 4

BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
P&ID HVAC System



NOTES

LEGEND

HOLDS

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
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Sign	Date
L. Caviglia	10/02/2025

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
3	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
2	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 27/01/25
A1	DRAWING NO. 1724000049-HV-PID-00042	SHEET 001	REV. 4

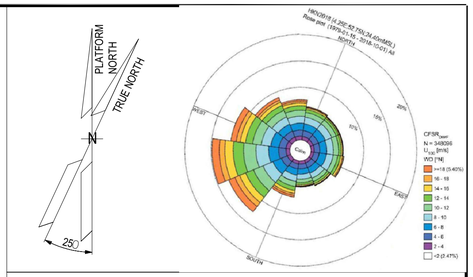
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DRAWING NO. 1724000049-HV-PID-00042

REV. 4

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
04	001	FRONT PAGE	IFI
04	002	SUMMARY and GENERAL NOTES	IFI
04	003	P&ID HVAC System	IFI

GENERAL NOTES



NOTES

LEGEND

HOLDS

ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
3	03/12/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
2	29/10/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR INFORMATION (IFI)

CROSSWIND

ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 27/01/25
A1	DRAWING NO. 1724000049-HV-PID-00042	SHEET 002	REV. 4

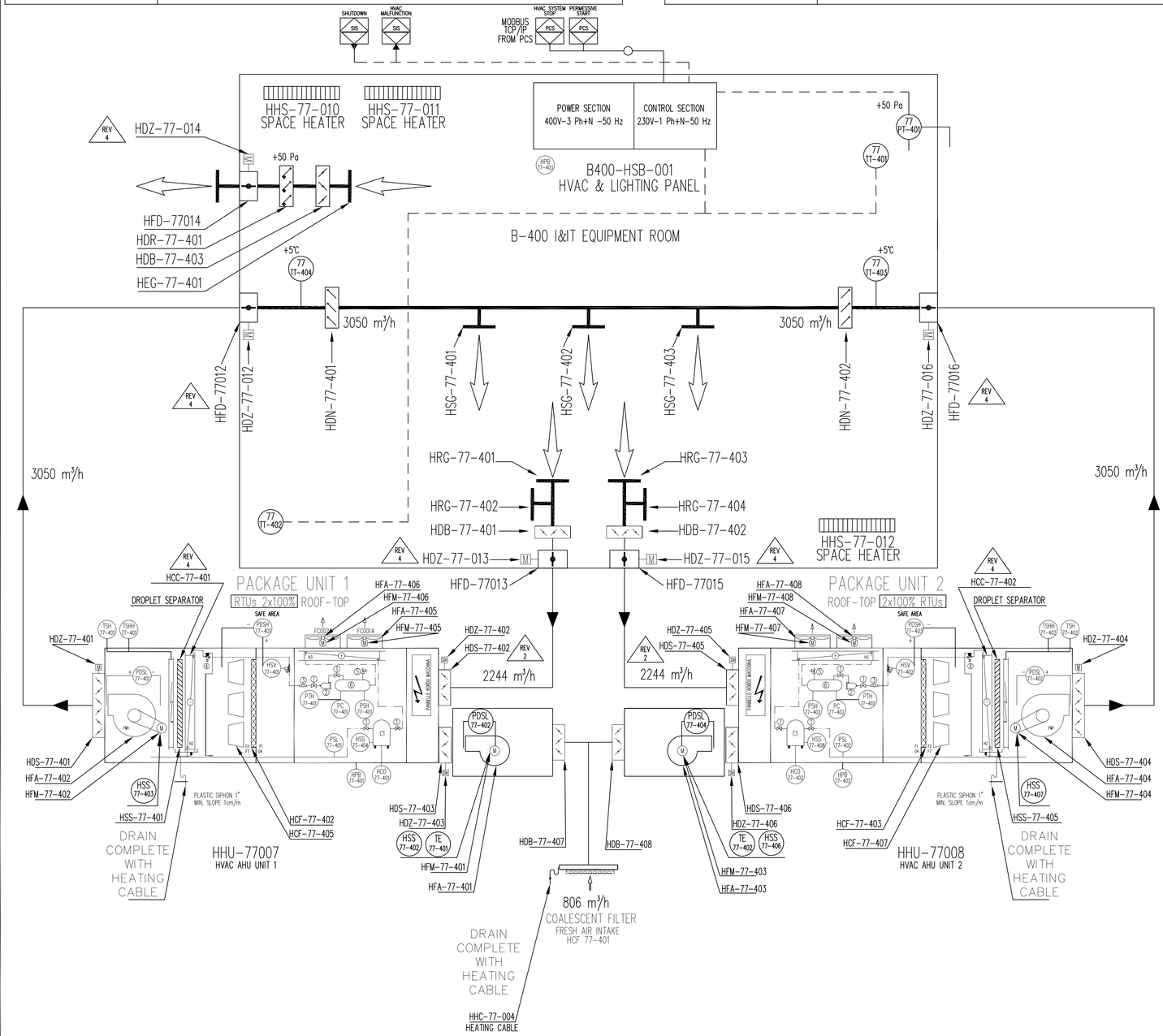
File Name : 1724000049-HV-PID-00042

DRAWING NO. 1724000049-HV-PID-00042

REV. 4

ITEM	HVAC-ROOF TOP
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-DMPD-100
SUPPLY AIR FLOW	847.2 l/s
COOLING COIL CAPACITY	21.8 kW AT +26°C Outdoor Temperature
HEATING COIL CAPACITY	8.6 kW
TENSIONE	400 V – 50 Hz – 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	R513a

ITEM	HVAC-PRESSURISING FAN
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-DMPD-101
SUPPLY AIR FLOW	224 l/s
COOLING COIL CAPACITY	N.A.
HEATING COIL CAPACITY	N.A.
TENSIONE	400 V – 50 Hz – 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	N.A.



LEGEND

	MOTORISED DAMPER WITH SPRING RETURN
	REGULATION DAMPER
	OVERPRESSURE DAMPER
PSHA	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE
PSLA	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE
TT	TEMPERATURE TRASMITTER
HPB	EMERGENCY PUSH BUTTON
OH	COMPRESSOR OIL HEATER
SV	SOLENOID VALVE
R	REFRIGERANT COMPRESSOR
F1	AIR FILTER "G4"
F2	BAG FILTER "F8"
	CONDENSING COIL
	CONDENSING FAN
	HEATING COIL
	SUPPLY FAN
	GLOBE VALVE
	DRYER FILTER
	SIGHT GLASS
4	THERMOSTATIC VALVE
5	PRESSURE RELIEF VALVE
6	MOTORISED FIRE DAMPER WITH SPRING RETURN
	EVAPORATING COIL
8	LIQUID RECEIVER
MT	MOISTURE TRASMITTER
PTH	HIGH PRESSURE TRASDUCER
TP	COMPRESSOR THERMIC PROTECTION
TSH	HIGH TEMPERATURE SECURITY THERMOSTATE
PSH	HIGH PRESSURE SWITCH
PSL	LOW PRESSURE SWITCH
PC	CONDENSING PRESSURE SWITCH
HEG	ELECTRICAL HEATING
HCO	REFRIGERANT COMPRESSOR
MDS	MOTORISE DAMPER
TSHH	VERY HIGH TEMPERATURE SECURITY THERMOSTATE
	PRESSURE RELIEF DAMPER
	SPACE HEATER
HSS-77-XXX	ELECTRICAL HEATER
HHC-77-XXX	HEATING CABLE
PT	DIFFERENTIAL PRESSURE TRANSMITTER

NOTES:

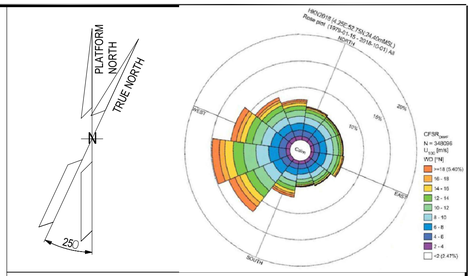
- HVAC POWER CABINET will energize what above shown.
- HVAC CONTROL CABINET will control all what above shown.
- HVAC POWER CABINET will energize light and socket.
- Outside drainage system shall be provided of heatng cable with anti-freeze funcion to avoid ice inside pipes when outside temeprature reaches values close to 0°C.
- Outdoor air ductworks in stainless steel AISI 316

OUTDOOR DESIGN CONDITIONS

Safe Area
Min. design DB Temp: –8.4°C with RH 100 %
Max. design DB Temp: +25°C with RH 90 %

B-400 Module I&T Equipment Room

Safe Area
Indoor min. design temperature: +15°C with RH 30-: 70%
Indor max. design temperature: +25°C with RH 30 ÷ 70%
Min. ACH: 6



NOTES

LEGEND

HOLDS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	06/02/25	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)
3	03/12/24	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)
2	29/10/24	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)
1	09/07/24	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)
0	10/06/24	S.Z.	S.S.	M.C.	ISSUE FOR INFORMATION (IFI)

ALEXSISTEMI spa

CROSSWIND

ROSETTI MARINO

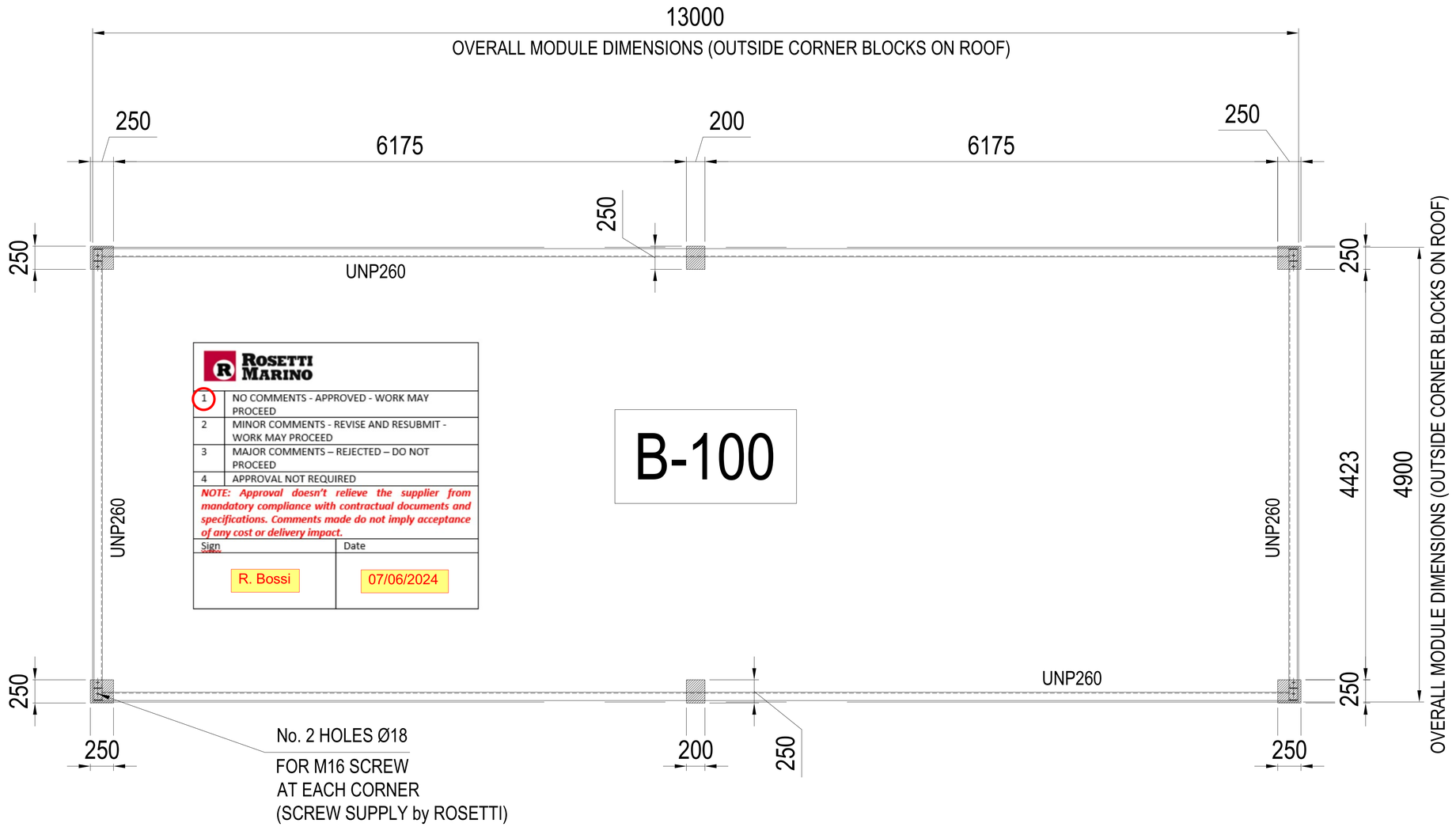
TITLE :
BASE LOAD POWER HUB (BLPH)
B-400 I&T EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE	CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK		SCALE 1 : 1
DRAWN G.M.	CHECKED A.O.	APPROVED A.C.	DATE 27/01/25
A1	DRAWING NO. 1724000049-HV-PID-00042	SHEET 003	REV. 4

File Name : 1724000049-HV-PID-00042

DRAWING NO. 1724000049-ST-DD-00010

REV. 01



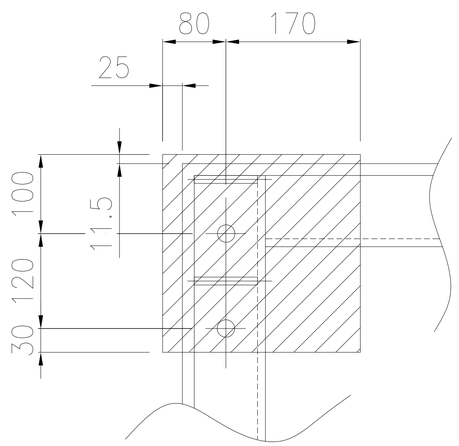
ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

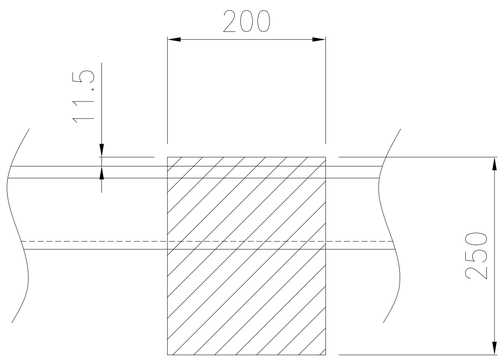
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	07/06/2024

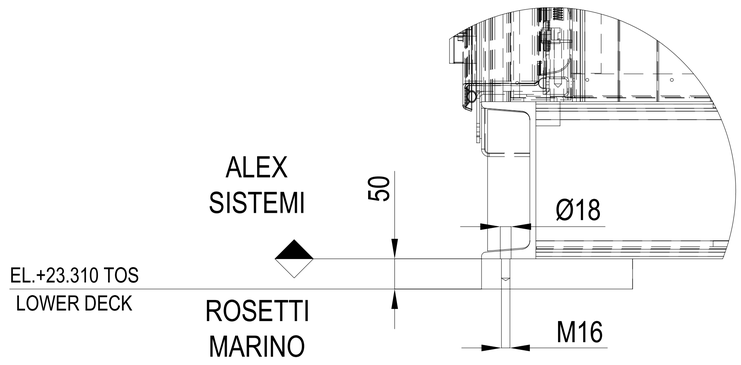
B-100



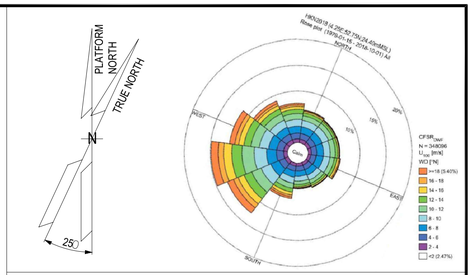
TYPICAL CORNER PLATE POSITION



TYPICAL CENTRAL PLATE POSITION



TYPICAL FIXING DETAIL
SCALE 1 : 10



NOTE

1) ALL DIMENSIONS ARE IM MM.

REFERENCE

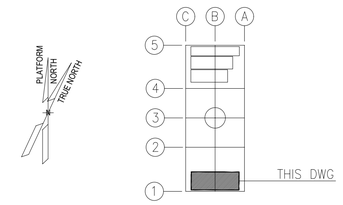
DOCUMENT TITLE	DOCUMENT NUMBER
B-100 STRUCTURAL CALCULATION - E&I SHELTERS	1724000049-ST-CA-00006

LEGEND

Plate 50 mm thk. welded on
Lower Deck - Supply by Rosetti

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	03/06/24	M.G.	M.R.	O.A.	APPROVED FOR CONSTRUCTION (AFC)
00	16/04/24	M.G.	M.R.	O.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :
B-100 FOUNDATION DRAWING -
E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE N.A.
DRAWN M.G.	CHECKED M.R.	APPROVED O.A.	DATE 03/06/24
A1	DRAWING NO. 1724000049-ST-DD-00010	SHEET 001/002	REV. 01

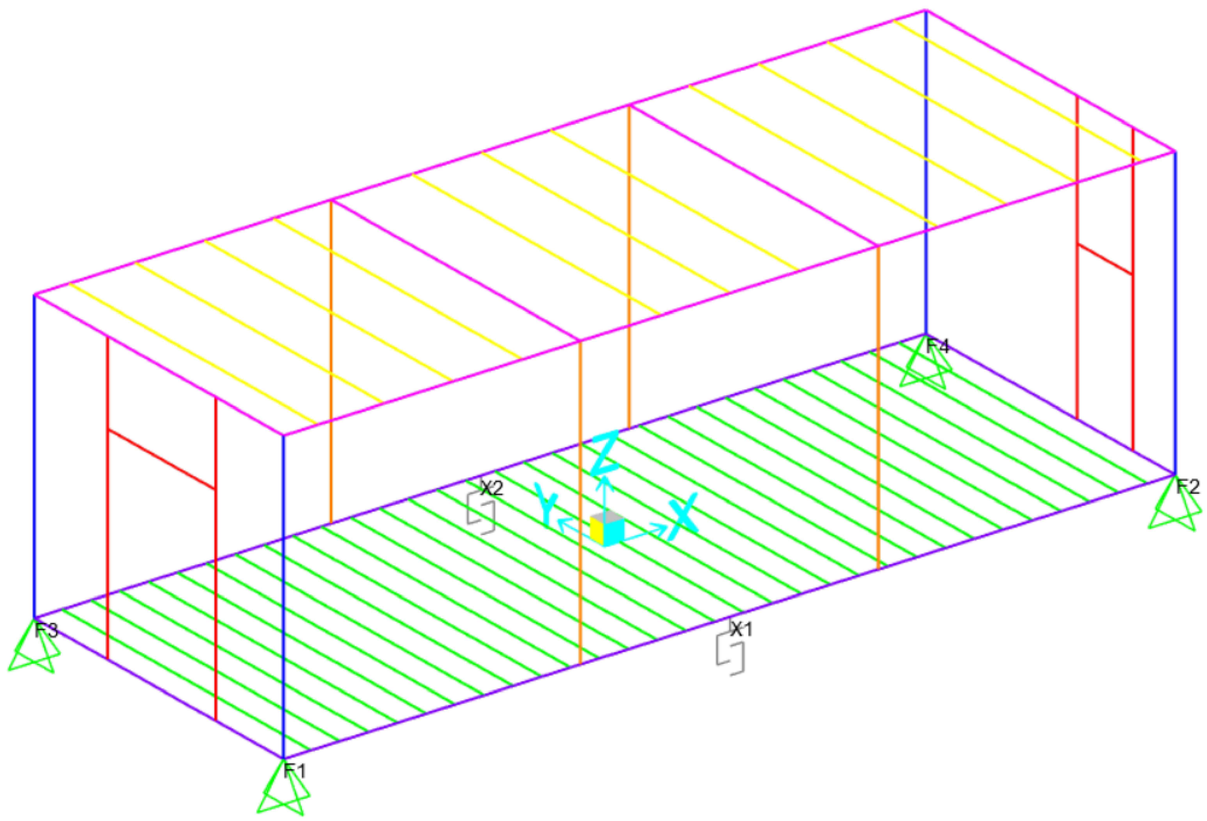
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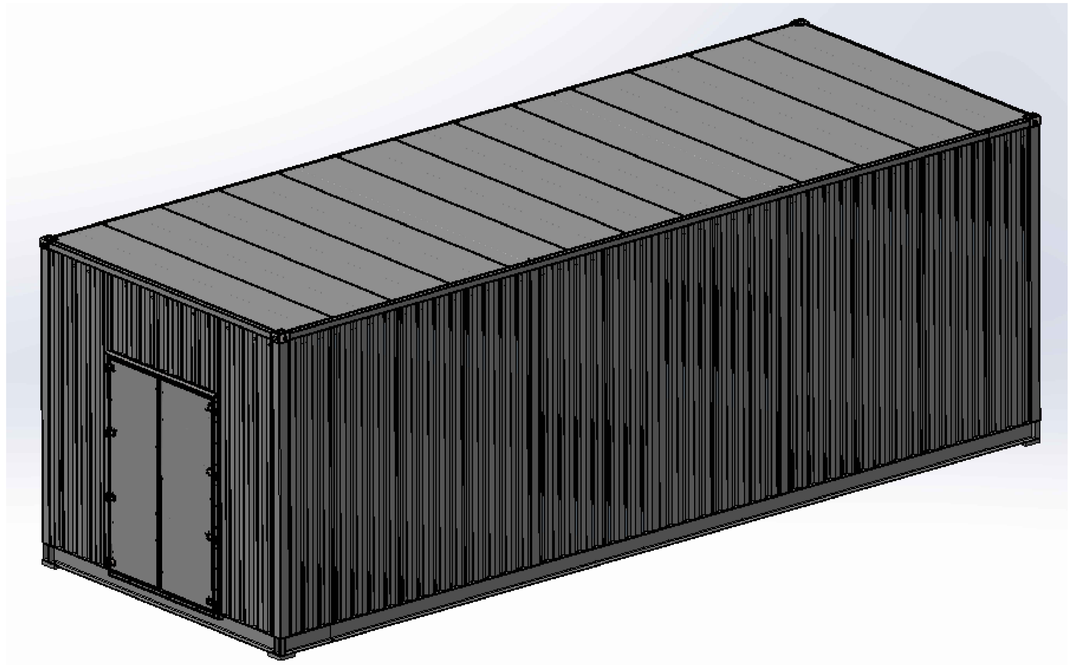
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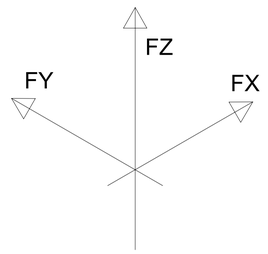
REV. 01

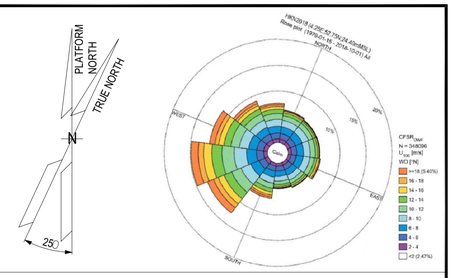
TABLE: Joint Reactions

Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F1	DEAD	NonStatic	Last Step	12,82	4,16	31,39	0,00	0,00	0,00
F1	SD	NonStatic	Last Step	16,38	5,33	21,73	0,00	0,00	0,00
F1	LIVE	NonStatic	Last Step	35,09	-0,18	78,19	0,00	0,00	0,00
F1	WIND X	NonStatic	Last Step	-19,31	1,03	-16,62	0,00	0,00	0,00
F1	WIND Y	NonStatic	Last Step	-16,35	-34,39	-38,28	0,00	0,00	0,00
F1	NOT X	NonStatic	Last Step	-0,10	-0,02	-0,03	0,00	0,00	0,00
F1	NOT Y	NonStatic	Last Step	-0,04	-0,10	-0,07	0,00	0,00	0,00
F1	SLU LIVE	Combination		93,68	12,99	190,55	0,00	0,00	0,00
F1	SLU WIND X	Combination		44,02	4,30	118,95	0,00	0,00	0,00
F1	SLU WIND Y	Combination		47,58	-38,21	92,96	0,00	0,00	0,00
F1	SLE LIVE	Combination		64,15	9,20	131,20	0,00	0,00	0,00
F1	SLE WIND X	Combination		4,84	0,09	24,91	0,00	0,00	0,00
F1	SLE WIND Y	Combination		6,92	-24,71	9,75	0,00	0,00	0,00
F2	DEAD	NonStatic	Last Step	-12,89	4,23	31,70	0,00	0,00	0,00
F2	SD	NonStatic	Last Step	-16,73	4,65	38,99	0,00	0,00	0,00
F2	LIVE	NonStatic	Last Step	-34,60	2,23	65,52	0,00	0,00	0,00
F2	WIND X	NonStatic	Last Step	-2,48	-2,84	-9,63	0,00	0,00	0,00
F2	WIND Y	NonStatic	Last Step	16,10	-35,47	-38,40	0,00	0,00	0,00
F2	NOT X	NonStatic	Last Step	-0,10	0,02	0,03	0,00	0,00	0,00
F2	NOT Y	NonStatic	Last Step	0,04	-0,10	-0,07	0,00	0,00	0,00
F2	SLU LIVE	Combination		-93,82	15,71	197,91	0,00	0,00	0,00
F2	SLU WIND X	Combination		-77,15	-0,20	142,47	0,00	0,00	0,00
F2	SLU WIND Y	Combination		-54,85	-39,35	107,95	0,00	0,00	0,00
F2	SLE LIVE	Combination		-64,28	11,02	136,16	0,00	0,00	0,00
F2	SLE WIND X	Combination		-27,33	-4,69	49,50	0,00	0,00	0,00
F2	SLE WIND Y	Combination		-14,32	-27,53	29,36	0,00	0,00	0,00
F3	DEAD	NonStatic	Last Step	12,94	-4,19	31,46	0,00	0,00	0,00
F3	SD	NonStatic	Last Step	16,46	-5,46	21,91	0,00	0,00	0,00
F3	LIVE	NonStatic	Last Step	34,14	0,36	76,92	0,00	0,00	0,00
F3	WIND X	NonStatic	Last Step	-19,52	-1,01	-16,62	0,00	0,00	0,00
F3	WIND Y	NonStatic	Last Step	2,37	-24,36	12,03	0,00	0,00	0,00
F3	NOT X	NonStatic	Last Step	-0,10	0,02	-0,03	0,00	0,00	0,00
F3	NOT Y	NonStatic	Last Step	0,04	-0,10	0,07	0,00	0,00	0,00
F3	SLU LIVE	Combination		92,65	-13,21	189,20	0,00	0,00	0,00
F3	SLU WIND X	Combination		48,71	-22,20	133,26	0,00	0,00	0,00
F3	SLU WIND Y	Combination		74,98	-50,22	167,64	0,00	0,00	0,00
F3	SLE LIVE	Combination		63,49	-9,37	130,33	0,00	0,00	0,00
F3	SLE WIND X	Combination		10,53	-18,05	40,41	0,00	0,00	0,00
F3	SLE WIND Y	Combination		25,85	-34,40	60,46	0,00	0,00	0,00
F4	DEAD	NonStatic	Last Step	-12,88	-4,20	30,83	0,00	0,00	0,00
F4	SD	NonStatic	Last Step	-16,11	-4,52	37,51	0,00	0,00	0,00
F4	LIVE	NonStatic	Last Step	-34,62	-2,41	65,64	0,00	0,00	0,00
F4	WIND X	NonStatic	Last Step	-2,36	2,82	-9,63	0,00	0,00	0,00
F4	WIND Y	NonStatic	Last Step	-2,12	-23,11	12,15	0,00	0,00	0,00
F4	NOT X	NonStatic	Last Step	-0,10	-0,02	0,03	0,00	0,00	0,00
F4	NOT Y	NonStatic	Last Step	-0,04	-0,10	0,07	0,00	0,00	0,00
F4	SLU LIVE	Combination		-93,03	-16,01	194,92	0,00	0,00	0,00
F4	SLU WIND X	Combination		-81,63	-17,62	154,59	0,00	0,00	0,00
F4	SLU WIND Y	Combination		-81,34	-48,74	180,72	0,00	0,00	0,00
F4	SLE LIVE	Combination		-63,76	-11,25	134,07	0,00	0,00	0,00
F4	SLE WIND X	Combination		-32,13	-12,95	62,45	0,00	0,00	0,00
F4	SLE WIND Y	Combination		-31,96	-31,10	77,70	0,00	0,00	0,00
X1	DEAD	NonStatic	Last Step	0,00	0,01	37,72	0,00	0,00	0,00
X1	SD	NonStatic	Last Step	0,00	0,01	44,32	0,00	0,00	0,00
X1	LIVE	NonStatic	Last Step	0,00	0,08	103,90	0,01	0,00	0,00
X1	WIND X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	WIND Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	NOT X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	NOT Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	SLU LIVE	Combination		0,00	0,14	271,37	0,01	0,00	0,00
X1	SLU WIND X	Combination		0,00	0,11	224,62	0,01	0,00	0,00
X1	SLU WIND Y	Combination		0,00	0,11	224,62	0,01	0,00	0,00
X1	SLE LIVE	Combination		0,00	0,10	185,94	0,01	0,00	0,00
X1	SLE WIND X	Combination		0,00	0,02	82,05	0,00	0,00	0,00
X1	SLE WIND Y	Combination		0,00	0,02	82,05	0,00	0,00	0,00
X2	DEAD	NonStatic	Last Step	0,00	-0,01	37,74	0,00	0,00	0,00
X2	SD	NonStatic	Last Step	0,00	-0,01	43,58	0,00	0,00	0,00
X2	LIVE	NonStatic	Last Step	0,00	-0,08	102,92	-0,01	0,00	0,00
X2	WIND X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	WIND Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	NOT X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	NOT Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	SLU LIVE	Combination		0,00	-0,14	268,80	-0,01	0,00	0,00
X2	SLU WIND X	Combination		0,00	-0,10	222,49	-0,01	0,00	0,00
X2	SLU WIND Y	Combination		0,00	-0,10	222,49	-0,01	0,00	0,00
X2	SLE LIVE	Combination		0,00	-0,09	184,23	-0,01	0,00	0,00
X2	SLE WIND X	Combination		0,00	-0,02	81,32	0,00	0,00	0,00
X2	SLE WIND Y	Combination		0,00	-0,02	81,32	0,00	0,00	0,00









NOTE

1) ALL DIMENSIONS ARE IM MM.

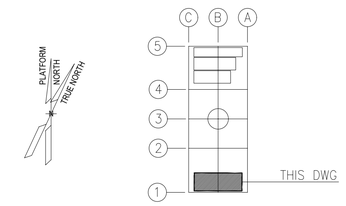
REFERENCE

DOCUMENT TITLE	DOCUMENT NUMBER
B-100 STRUCTURAL CALCULATION - E&I SHELTERS	1724000049-ST-CA-00006

LEGEND

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	03/06/24	M.G.	M.R.	O.A.	APPROVED FOR CONSTRUCTION (AFC)
00	16/04/24	M.G.	M.R.	O.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

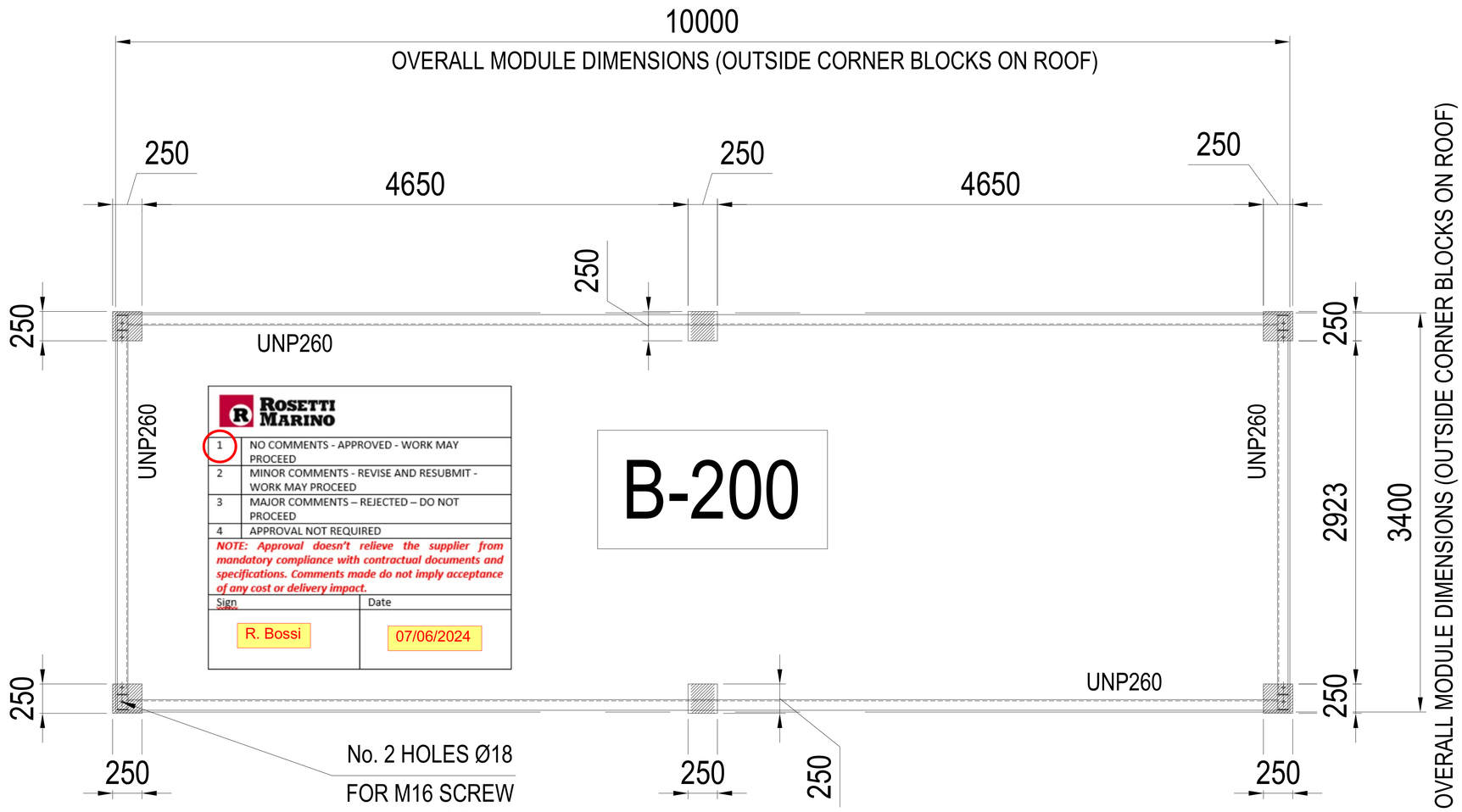
TITLE :
B-100 FOUNDATION DRAWING -
E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE N.A.
DRAWN M.G.	CHECKED M.R.	APPROVED O.A.	DATE 03/06/24
A1	DRAWING NO. 1724000049-ST-DD-00010		SHEET 002/002 / REV. 01

File Name : 1724000049-ST-DD-00010-REV.01

DRAWING NO. 1724000049-ST-DD-00011

REV. 01



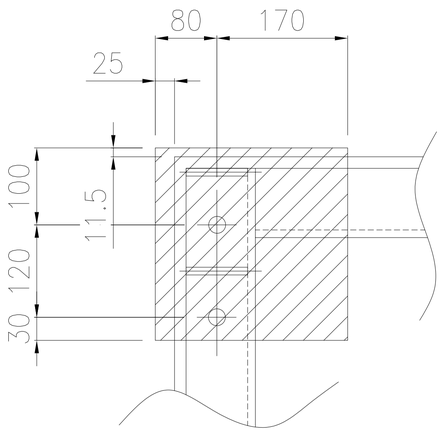
ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

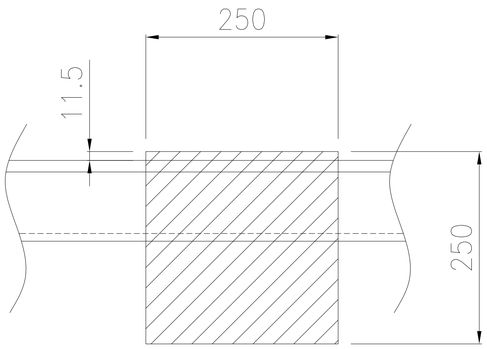
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	07/06/2024

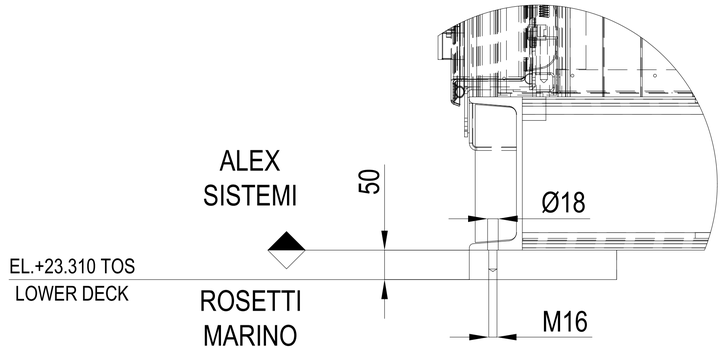
B-200



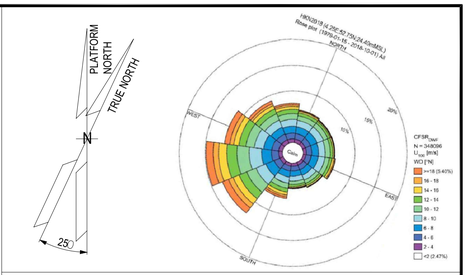
TYPICAL CORNER PLATE POSITION



TYPICAL CENTRAL PLATE POSITION



TYPICAL FIXING DETAIL
SCALE 1 : 10



NOTE

1) ALL DIMENSIONS ARE IM MM.

REFERENCE

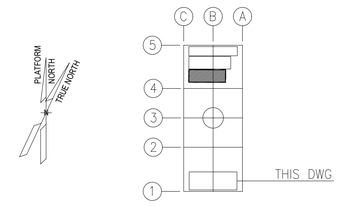
DOCUMENT TITLE	DOCUMENT NUMBER
B-200 STRUCTURAL CALCULATION - E&I SHELTERS	1724000049-ST-CA-00007

LEGEND

Plate 50 mm thk. welded on
Lower Deck - Supply by Rosetti

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	03/06/24	M.G.	M.R.	O.A.	APPROVED FOR CONSTRUCTION (AFC)
00	16/04/24	M.G.	M.R.	O.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :
B-200 FOUNDATION DRAWING -
E&I SHELTERS

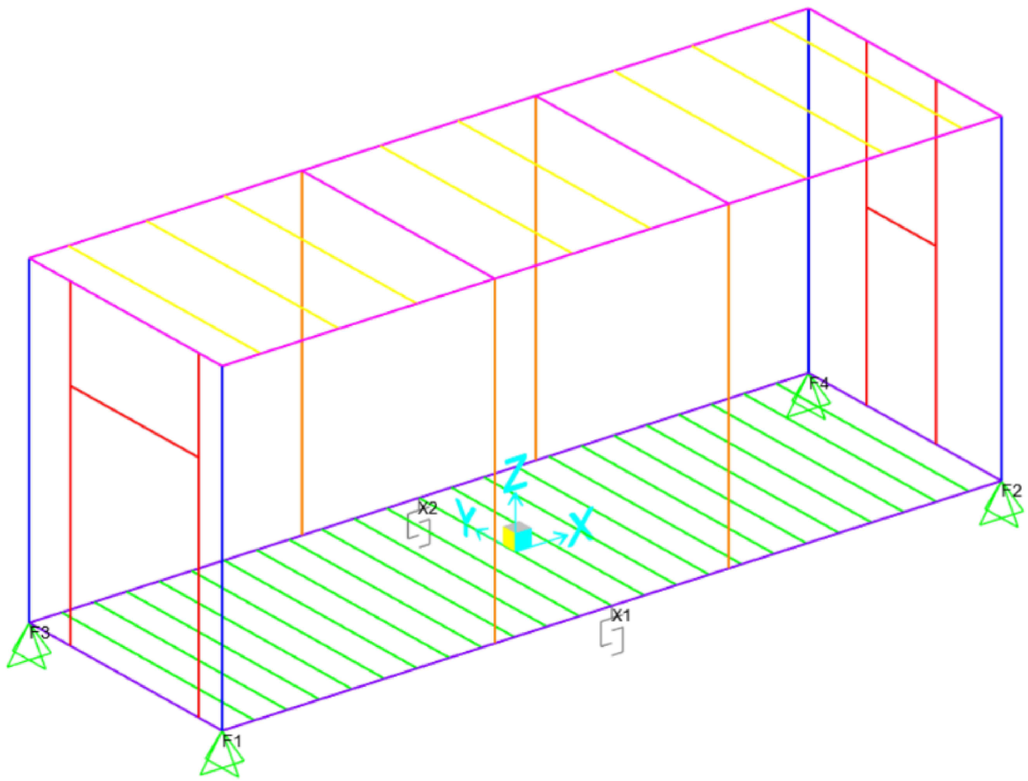
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DRAWN M.G.	CHECKED M.R.	APPROVED O.A.	DATE 03/06/24
A1	DRAWING NO. 1724000049-ST-DD-00011	SHEET 001/002	REV. 01

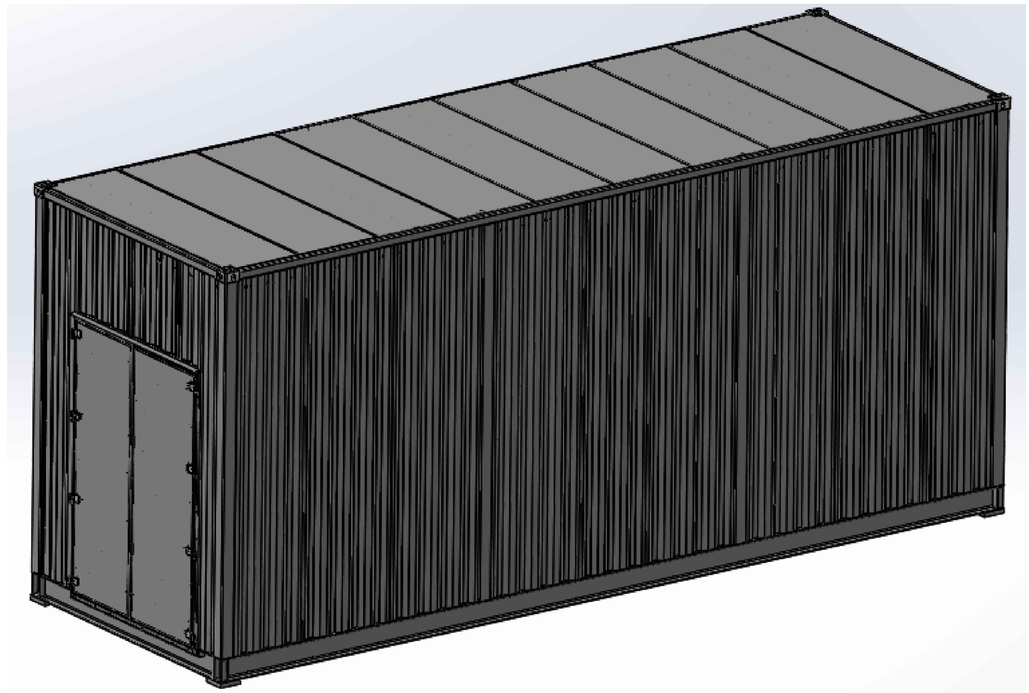
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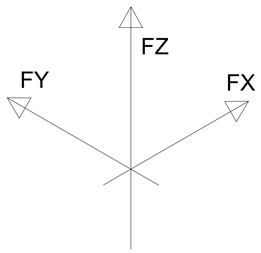
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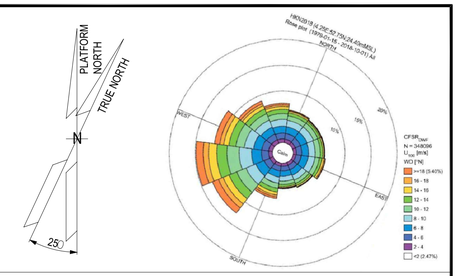
TABLE: Joint Reactions

Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F1	DEAD	NonStatic	Last Step	7,06	3,99	20,50	0,00	0,00	0,00
F1	SD	NonStatic	Last Step	13,01	4,55	19,04	0,00	0,00	0,00
F1	LIVE	NonStatic	Last Step	14,07	5,34	39,40	0,00	0,00	0,00
F1	WIND X	NonStatic	Last Step	-11,37	2,10	-9,99	0,00	0,00	0,00
F1	WIND Y	NonStatic	Last Step	-11,97	-27,03	-35,97	0,00	0,00	0,00
F1	NOT X	NonStatic	Last Step	-0,06	-0,01	-0,02	0,00	0,00	0,00
F1	NOT Y	NonStatic	Last Step	-0,03	-0,06	-0,07	0,00	0,00	0,00
F1	SLU LIVE	Combination		49,68	19,93	114,19	0,00	0,00	0,00
F1	SLU WIND X	Combination		22,69	12,58	70,68	0,00	0,00	0,00
F1	SLU WIND Y	Combination		21,98	-22,38	39,50	0,00	0,00	0,00
F1	SLE LIVE	Combination		34,05	13,81	78,85	0,00	0,00	0,00
F1	SLE WIND X	Combination		5,01	2,47	18,67	0,00	0,00	0,00
F1	SLE WIND Y	Combination		4,60	-17,93	0,48	0,00	0,00	0,00
F2	DEAD	NonStatic	Last Step	-7,04	3,97	20,19	0,00	0,00	0,00
F2	SD	NonStatic	Last Step	-13,96	6,14	38,62	0,00	0,00	0,00
F2	LIVE	NonStatic	Last Step	-13,28	3,92	24,14	0,00	0,00	0,00
F2	WIND X	NonStatic	Last Step	-3,45	-2,84	-3,91	0,00	0,00	0,00
F2	WIND Y	NonStatic	Last Step	11,75	-27,17	-35,34	0,00	0,00	0,00
F2	NOT X	NonStatic	Last Step	-0,06	0,01	0,02	0,00	0,00	0,00
F2	NOT Y	NonStatic	Last Step	0,03	-0,06	-0,07	0,00	0,00	0,00
F2	SLU LIVE	Combination		-50,06	20,16	120,32	0,00	0,00	0,00
F2	SLU WIND X	Combination		-45,73	6,00	93,00	0,00	0,00	0,00
F2	SLU WIND Y	Combination		-27,49	-23,20	55,28	0,00	0,00	0,00
F2	SLE LIVE	Combination		-34,31	13,96	82,90	0,00	0,00	0,00
F2	SLE WIND X	Combination		-20,96	-0,94	44,26	0,00	0,00	0,00
F2	SLE WIND Y	Combination		-10,32	-17,97	22,25	0,00	0,00	0,00
F3	DEAD	NonStatic	Last Step	7,04	-3,98	20,19	0,00	0,00	0,00
F3	SD	NonStatic	Last Step	12,77	-4,86	18,96	0,00	0,00	0,00
F3	LIVE	NonStatic	Last Step	14,04	-5,08	38,74	0,00	0,00	0,00
F3	WIND X	NonStatic	Last Step	-11,51	-2,08	-10,05	0,00	0,00	0,00
F3	WIND Y	NonStatic	Last Step	5,77	-18,59	22,08	0,00	0,00	0,00
F3	NOT X	NonStatic	Last Step	-0,06	0,01	-0,02	0,00	0,00	0,00
F3	NOT Y	NonStatic	Last Step	0,03	-0,06	0,07	0,00	0,00	0,00
F3	SLU LIVE	Combination		49,32	-20,17	112,85	0,00	0,00	0,00
F3	SLU WIND X	Combination		27,47	-26,58	86,97	0,00	0,00	0,00
F3	SLU WIND Y	Combination		48,20	-46,39	125,52	0,00	0,00	0,00
F3	SLE LIVE	Combination		33,81	-13,98	77,93	0,00	0,00	0,00
F3	SLE WIND X	Combination		9,99	-16,56	35,77	0,00	0,00	0,00
F3	SLE WIND Y	Combination		22,09	-28,12	58,25	0,00	0,00	0,00
F4	DEAD	NonStatic	Last Step	-7,06	-3,98	20,32	0,00	0,00	0,00
F4	SD	NonStatic	Last Step	-11,82	-5,83	29,87	0,00	0,00	0,00
F4	LIVE	NonStatic	Last Step	-14,83	-4,17	30,77	0,00	0,00	0,00
F4	WIND X	NonStatic	Last Step	-3,46	2,81	-3,85	0,00	0,00	0,00
F4	WIND Y	NonStatic	Last Step	-5,55	-18,31	21,44	0,00	0,00	0,00
F4	NOT X	NonStatic	Last Step	-0,06	-0,01	0,02	0,00	0,00	0,00
F4	NOT Y	NonStatic	Last Step	-0,03	-0,06	0,06	0,00	0,00	0,00
F4	SLU LIVE	Combination		-49,27	-20,26	117,50	0,00	0,00	0,00
F4	SLU WIND X	Combination		-49,44	-19,65	104,31	0,00	0,00	0,00
F4	SLU WIND Y	Combination		-51,96	-45,00	134,66	0,00	0,00	0,00
F4	SLE LIVE	Combination		-33,80	-14,04	81,05	0,00	0,00	0,00
F4	SLE WIND X	Combination		-24,09	-12,55	52,86	0,00	0,00	0,00
F4	SLE WIND Y	Combination		-25,56	-27,34	70,57	0,00	0,00	0,00
X1	DEAD	NonStatic	Last Step	0,00	0,00	22,31	0,00	0,00	0,00
X1	SD	NonStatic	Last Step	0,00	0,01	48,86	0,00	0,00	0,00
X1	LIVE	NonStatic	Last Step	0,00	0,01	37,09	0,00	0,00	0,00
X1	WIND X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	WIND Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	NOT X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	NOT Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	SLU LIVE	Combination		0,00	0,02	157,92	0,00	0,00	0,00
X1	SLU WIND X	Combination		0,00	0,02	141,23	0,00	0,00	0,00
X1	SLU WIND Y	Combination		0,00	0,02	141,23	0,00	0,00	0,00
X1	SLE LIVE	Combination		0,00	0,01	108,26	0,00	0,00	0,00
X1	SLE WIND X	Combination		0,00	0,01	71,17	0,00	0,00	0,00
X1	SLE WIND Y	Combination		0,00	0,01	71,17	0,00	0,00	0,00
X2	DEAD	NonStatic	Last Step	0,00	0,00	22,38	0,00	0,00	0,00
X2	SD	NonStatic	Last Step	0,00	-0,01	43,73	0,00	0,00	0,00
X2	LIVE	NonStatic	Last Step	0,00	-0,01	40,88	0,00	0,00	0,00
X2	WIND X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	WIND Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	NOT X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	NOT Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	SLU LIVE	Combination		0,00	-0,02	156,02	0,00	0,00	0,00
X2	SLU WIND X	Combination		0,00	-0,02	137,62	0,00	0,00	0,00
X2	SLU WIND Y	Combination		0,00	-0,02	137,62	0,00	0,00	0,00
X2	SLE LIVE	Combination		0,00	-0,01	107,00	0,00	0,00	0,00
X2	SLE WIND X	Combination		0,00	-0,01	66,11	0,00	0,00	0,00
X2	SLE WIND Y	Combination		0,00	-0,01	66,11	0,00	0,00	0,00









NOTE

1) ALL DIMENSIONS ARE IM MM.

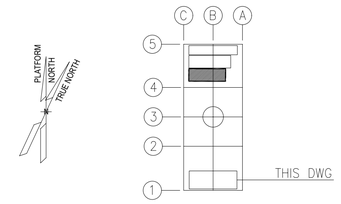
REFERENCE

DOCUMENT TITLE	DOCUMENT NUMBER
B-200 STRUCTURAL CALCULATION - E&I SHELTERS	1724000049-ST-CA-00007

LEGEND

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	03/06/24	M.G.	M.R.	O.A.	APPROVED FOR CONSTRUCTION (AFC)
00	16/04/24	M.G.	M.R.	O.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

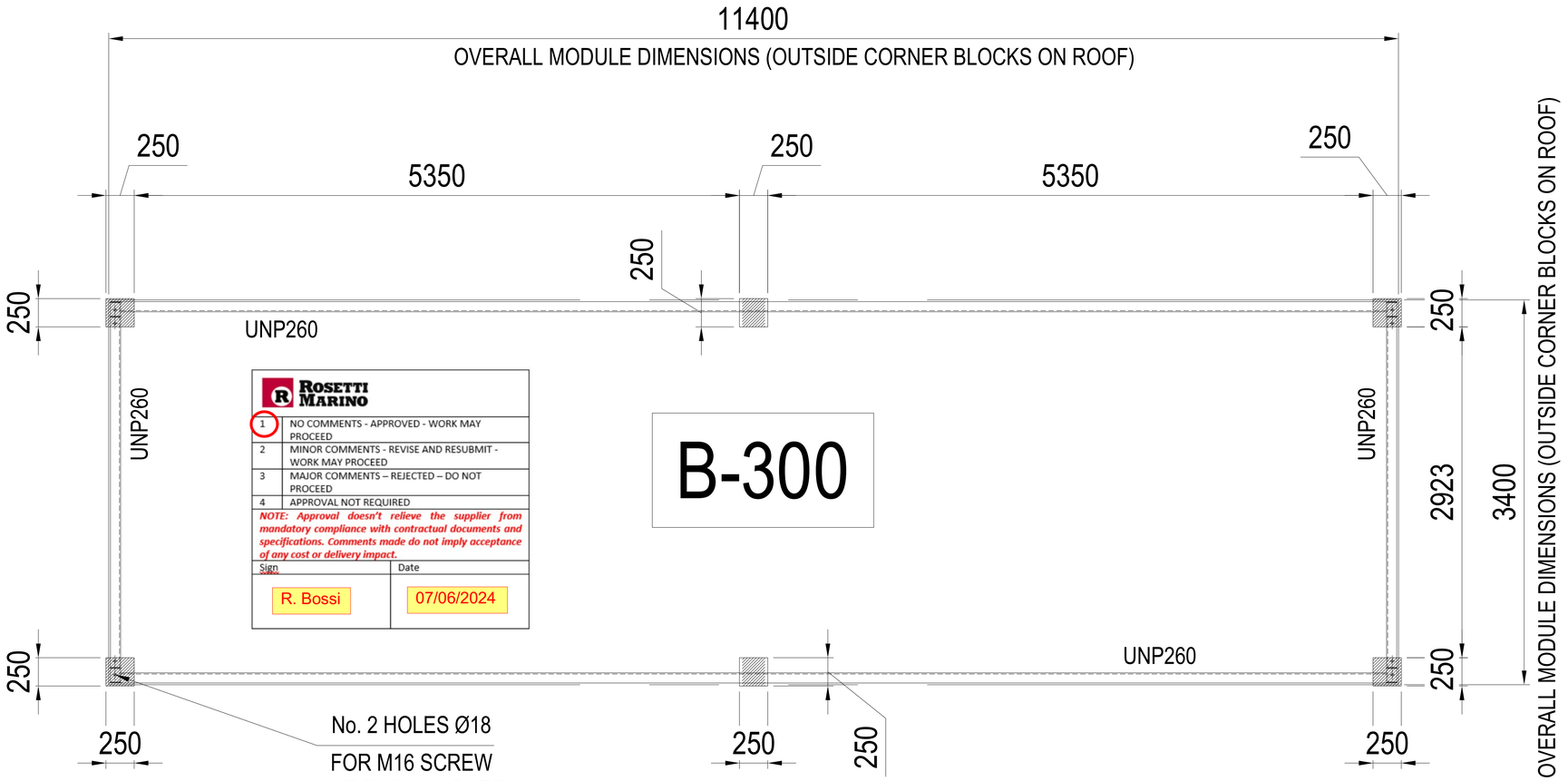
TITLE :
B-200 FOUNDATION DRAWING -
E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE N.A.
DRAWN M.G.	CHECKED M.R.	APPROVED O.A.	DATE 03/06/24
A1	DRAWING NO. 1724000049-ST-DD-00011	SHEET 002/002	REV. 01

File Name : 1724000049-ST-DD-00011-REV.01

DRAWING NO. 1724000049-ST-DD-00012

REV. 01



ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

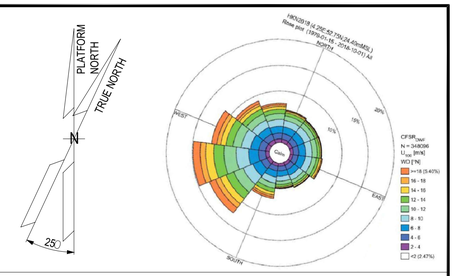
Sign	Date
R. Bossi	07/06/2024

B-300

TYPICAL CORNER PLATE POSITION

TYPICAL CENTRAL PLATE POSITION

TYPICAL FIXING DETAIL
SCALE 1 : 10



NOTE

1) ALL DIMENSIONS ARE IM MM.

REFERENCE

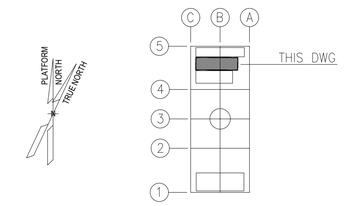
DOCUMENT TITLE	DOCUMENT NUMBER
B-300 STRUCTURAL CALCULATION - E&I SHELTERS	1724000049-ST-CA-00008

LEGEND

Plate 50 mm thk. welded on
Lower Deck - Supply by Rosetti

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	03/06/24	M.G.	M.R.	O.A.	APPROVED FOR CONSTRUCTION (AFC)
00	16/04/24	M.G.	M.R.	O.A.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :
B-300 FOUNDATION DRAWING -
E&I SHELTERS

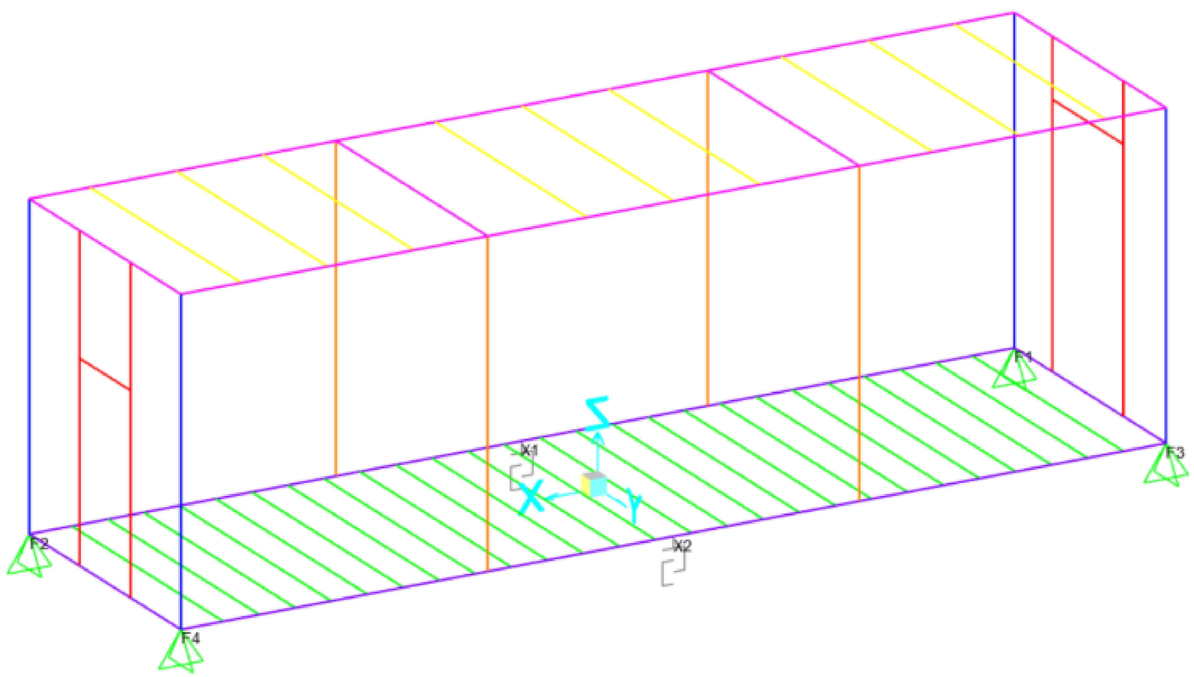
CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE N.A.
DRAWN M.G.	CHECKED M.R.	APPROVED O.A.	DATE 03/06/24
A1	DRAWING NO. 1724000049-ST-DD-00012	SHEET 001/002	REV. 01

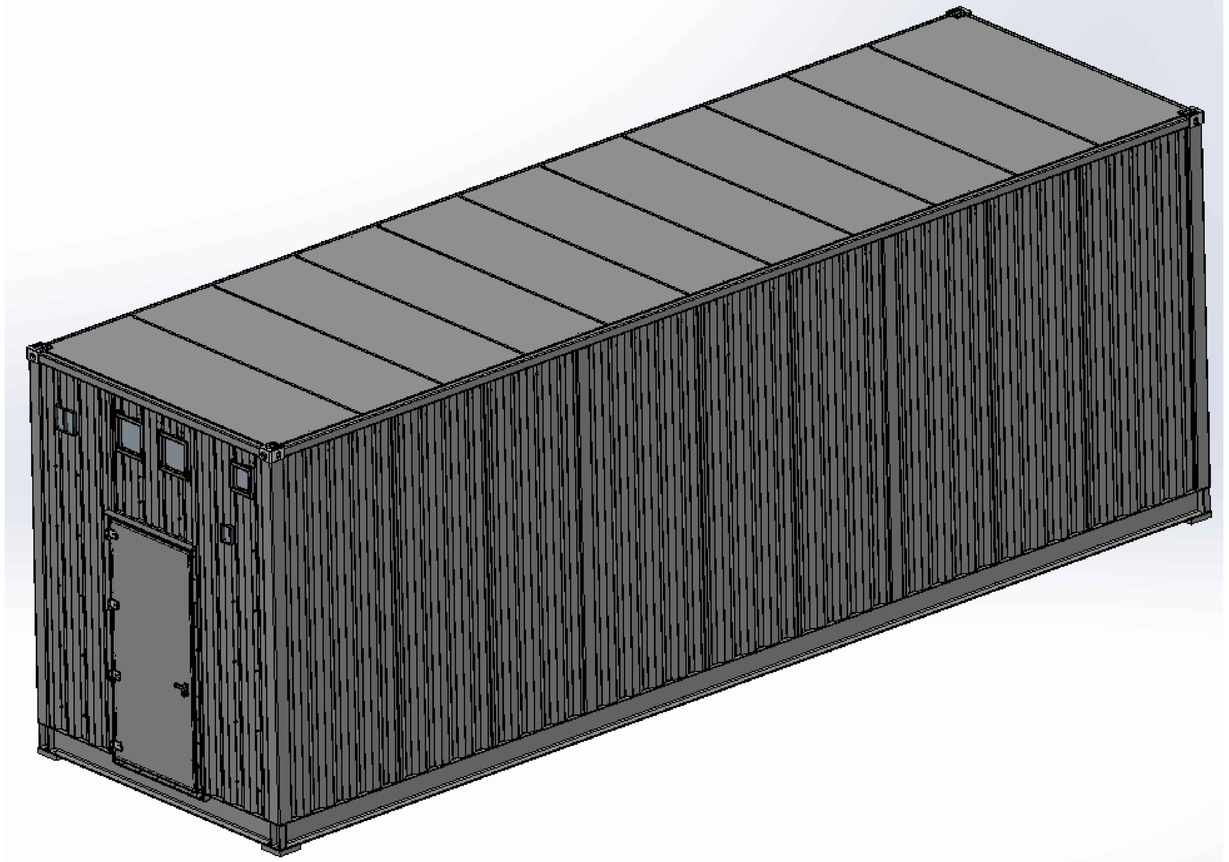
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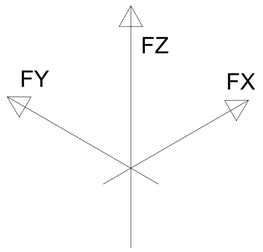
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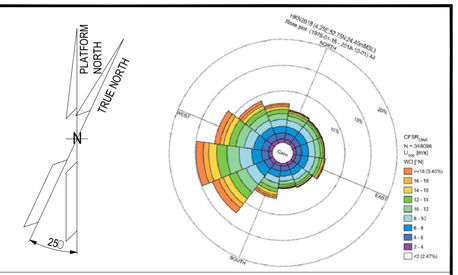
TABLE: Joint Reactions

Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F1	DEAD	NonStatic	Last Step	8,15	3,98	20,56	0,00	0,00	0,00
F1	SD	NonStatic	Last Step	17,79	5,10	26,86	0,00	0,00	0,00
F1	LIVE	NonStatic	Last Step	18,94	6,80	43,72	0,00	0,00	0,00
F1	WIND X	NonStatic	Last Step	-11,64	0,34	-9,78	0,00	0,00	0,00
F1	WIND Y	NonStatic	Last Step	-12,43	-25,98	-33,62	0,00	0,00	0,00
F1	NOT X	NonStatic	Last Step	-0,07	-0,01	-0,02	0,00	0,00	0,00
F1	NOT Y	NonStatic	Last Step	-0,04	-0,07	-0,06	0,00	0,00	0,00
F1	SLU LIVE	Combination		65,55	22,92	132,49	0,00	0,00	0,00
F1	SLU WIND X	Combination		35,85	12,57	88,06	0,00	0,00	0,00
F1	SLU WIND Y	Combination		34,89	-19,01	59,46	0,00	0,00	0,00
F1	SLE LIVE	Combination		44,78	15,80	91,06	0,00	0,00	0,00
F1	SLE WIND X	Combination		10,47	1,55	27,47	0,00	0,00	0,00
F1	SLE WIND Y	Combination		9,91	-16,88	10,79	0,00	0,00	0,00
F2	DEAD	NonStatic	Last Step	-8,15	3,95	20,50	0,00	0,00	0,00
F2	SD	NonStatic	Last Step	-15,55	4,85	31,79	0,00	0,00	0,00
F2	LIVE	NonStatic	Last Step	-19,68	6,13	33,86	0,00	0,00	0,00
F2	WIND X	NonStatic	Last Step	-1,08	-2,06	-5,72	0,00	0,00	0,00
F2	WIND Y	NonStatic	Last Step	12,41	-26,02	-33,53	0,00	0,00	0,00
F2	NOT X	NonStatic	Last Step	-0,07	0,01	0,02	0,00	0,00	0,00
F2	NOT Y	NonStatic	Last Step	0,04	-0,07	-0,06	0,00	0,00	0,00
F2	SLU LIVE	Combination		-63,48	21,52	125,06	0,00	0,00	0,00
F2	SLU WIND X	Combination		-52,52	7,87	91,19	0,00	0,00	0,00
F2	SLU WIND Y	Combination		-36,33	-20,88	57,82	0,00	0,00	0,00
F2	SLE LIVE	Combination		-43,41	14,87	86,10	0,00	0,00	0,00
F2	SLE WIND X	Combination		-21,09	-1,13	36,46	0,00	0,00	0,00
F2	SLE WIND Y	Combination		-11,65	-17,90	17,00	0,00	0,00	0,00
F3	DEAD	NonStatic	Last Step	8,15	-3,98	20,51	0,00	0,00	0,00
F3	SD	NonStatic	Last Step	11,42	-4,47	17,26	0,00	0,00	0,00
F3	LIVE	NonStatic	Last Step	20,70	-7,01	46,69	0,00	0,00	0,00
F3	WIND X	NonStatic	Last Step	-11,74	-0,31	-9,79	0,00	0,00	0,00
F3	WIND Y	NonStatic	Last Step	4,72	-19,65	18,12	0,00	0,00	0,00
F3	NOT X	NonStatic	Last Step	-0,07	0,01	-0,02	0,00	0,00	0,00
F3	NOT Y	NonStatic	Last Step	0,04	-0,07	0,06	0,00	0,00	0,00
F3	SLU LIVE	Combination		58,73	-22,47	122,63	0,00	0,00	0,00
F3	SLU WIND X	Combination		33,23	-25,68	92,38	0,00	0,00	0,00
F3	SLU WIND Y	Combination		52,98	-48,88	125,86	0,00	0,00	0,00
F3	SLE LIVE	Combination		40,24	-15,52	84,50	0,00	0,00	0,00
F3	SLE WIND X	Combination		9,22	-14,72	33,46	0,00	0,00	0,00
F3	SLE WIND Y	Combination		20,74	-28,25	52,99	0,00	0,00	0,00
F4	DEAD	NonStatic	Last Step	-8,15	-3,95	20,50	0,00	0,00	0,00
F4	SD	NonStatic	Last Step	-13,65	-5,48	33,05	0,00	0,00	0,00
F4	LIVE	NonStatic	Last Step	-19,97	-5,92	33,74	0,00	0,00	0,00
F4	WIND X	NonStatic	Last Step	-1,16	2,03	-5,71	0,00	0,00	0,00
F4	WIND Y	NonStatic	Last Step	-4,70	-19,60	18,02	0,00	0,00	0,00
F4	NOT X	NonStatic	Last Step	-0,07	-0,01	0,02	0,00	0,00	0,00
F4	NOT Y	NonStatic	Last Step	-0,04	-0,07	0,06	0,00	0,00	0,00
F4	SLU LIVE	Combination		-61,15	-22,33	126,93	0,00	0,00	0,00
F4	SLU WIND X	Combination		-55,32	-22,49	108,58	0,00	0,00	0,00
F4	SLU WIND Y	Combination		-59,56	-48,45	137,06	0,00	0,00	0,00
F4	SLE LIVE	Combination		-41,87	-15,42	87,36	0,00	0,00	0,00
F4	SLE WIND X	Combination		-24,48	-13,35	53,32	0,00	0,00	0,00
F4	SLE WIND Y	Combination		-26,95	-28,49	69,93	0,00	0,00	0,00
X1	DEAD	NonStatic	Last Step	0,00	0,00	24,94	0,00	0,00	0,00
X1	SD	NonStatic	Last Step	0,00	0,02	65,88	0,00	0,00	0,00
X1	LIVE	NonStatic	Last Step	0,00	0,01	52,89	0,00	0,00	0,00
X1	WIND X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	WIND Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	NOT X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	NOT Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	SLU LIVE	Combination		0,00	0,05	210,58	0,00	0,00	0,00
X1	SLU WIND X	Combination		0,00	0,04	186,78	0,00	0,00	0,00
X1	SLU WIND Y	Combination		0,00	0,04	186,78	0,00	0,00	0,00
X1	SLE LIVE	Combination		0,00	0,03	143,71	0,00	0,00	0,00
X1	SLE WIND X	Combination		0,00	0,02	90,82	0,00	0,00	0,00
X1	SLE WIND Y	Combination		0,00	0,02	90,82	0,00	0,00	0,00
X2	DEAD	NonStatic	Last Step	0,00	0,00	24,95	0,00	0,00	0,00
X2	SD	NonStatic	Last Step	0,00	-0,01	43,97	0,00	0,00	0,00
X2	LIVE	NonStatic	Last Step	0,00	-0,01	55,99	0,00	0,00	0,00
X2	WIND X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	WIND Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	NOT X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	NOT Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	SLU LIVE	Combination		0,00	-0,04	182,36	0,00	0,00	0,00
X2	SLU WIND X	Combination		0,00	-0,03	157,17	0,00	0,00	0,00
X2	SLU WIND Y	Combination		0,00	-0,03	157,17	0,00	0,00	0,00
X2	SLE LIVE	Combination		0,00	-0,03	124,90	0,00	0,00	0,00
X2	SLE WIND X	Combination		0,00	-0,01	68,91	0,00	0,00	0,00
X2	SLE WIND Y	Combination		0,00	-0,01	68,91	0,00	0,00	0,00









NOTE

1) ALL DIMENSIONS ARE IM MM.

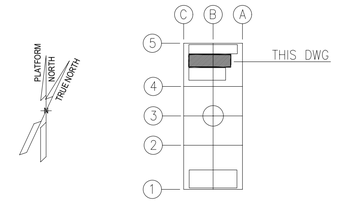
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DOCUMENT TITLE	DOCUMENT NUMBER
B-300 STRUCTURAL CALCULATION - E&I SHELTERS	1724000049-ST-CA-00008

LEGEND

HOLDS

KEY PLAN



ALEXSISTEMI spa

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	03/06/24	M.G.	M.R.	O.A.	APPROVED FOR CONSTRUCTION (AFC)
00	16/04/24	M.G.	M.R.	O.A.	ISSUE FOR CLIENT REVIEW (ICR)

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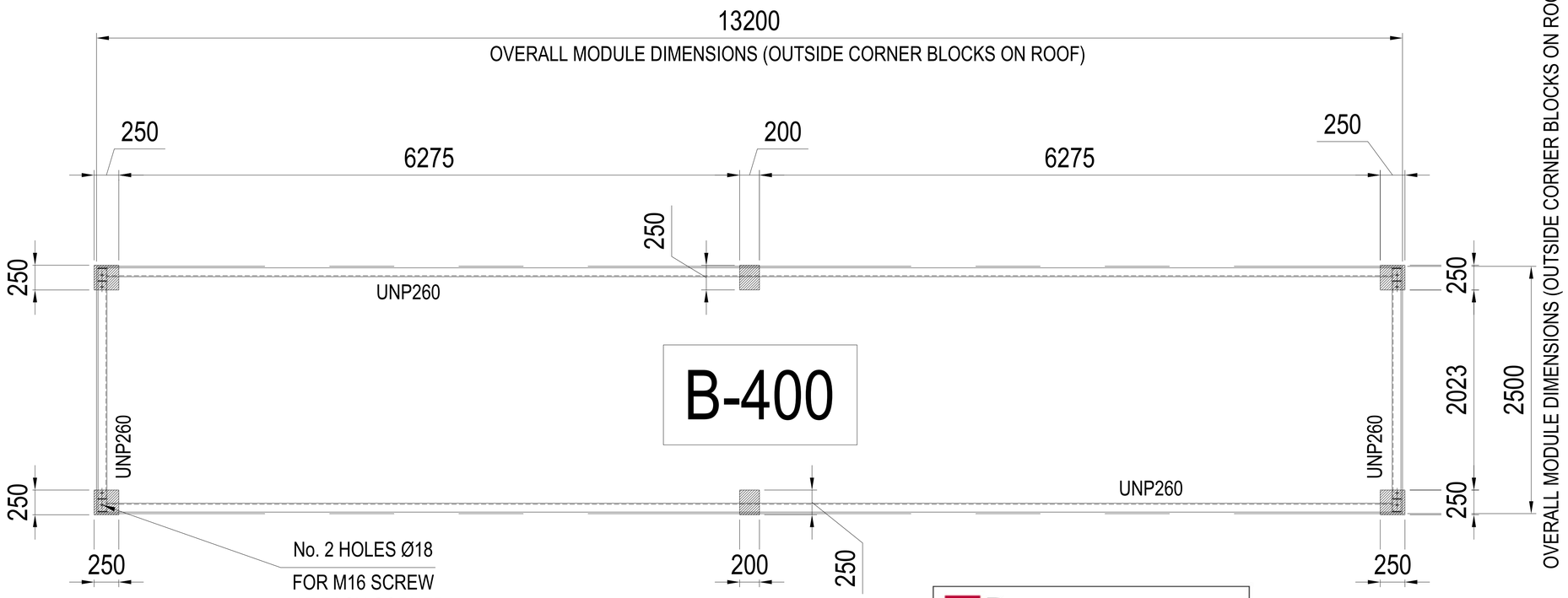
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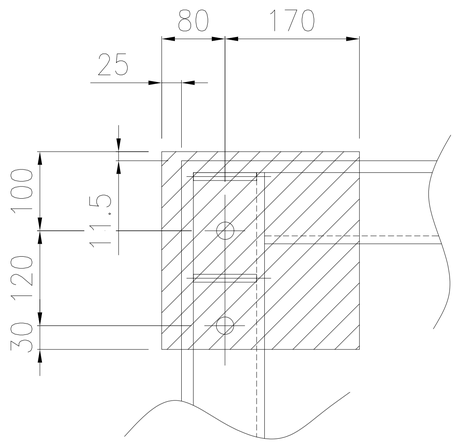
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DRAWN M.G.	CHECKED M.R.	APPROVED O.A.	DATE 03/06/24
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File Name : 1724000049-ST-DD-00012-REV.01

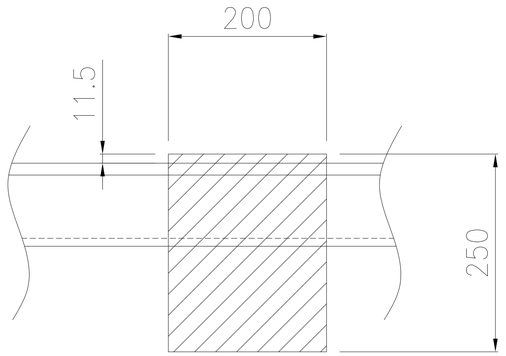
DRAWING NO. 1724000049-ST-DD-00013

REV. 01





TYPICAL CORNER PLATE POSITION

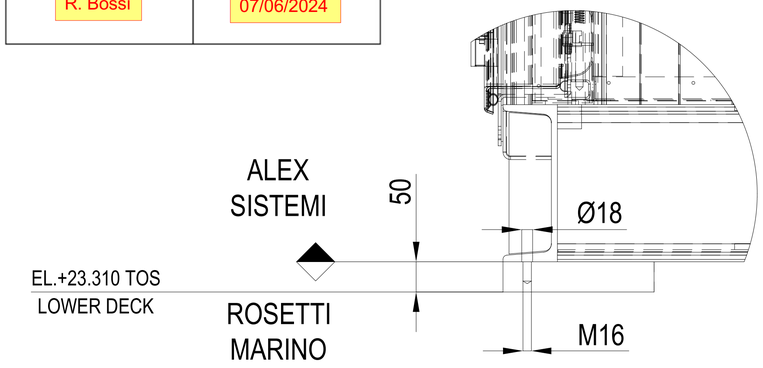


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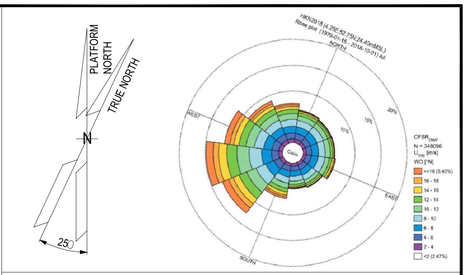
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1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
R. Bossi	07/06/2024



TYPICAL FIXING DETAIL
SCALE 1 : 10



NOTE

1) ALL DIMENSIONS ARE IM MM.

REFERENCE

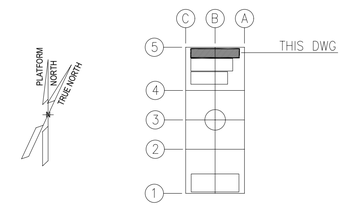
DOCUMENT TITLE	DOCUMENT NUMBER
B-400 STRUCTURAL CALCULATION - E&I SHELTERS	1724000049-ST-CA-00009

LEGEND

Plate 50 mm thk. welded on
Lower Deck - Supply by Rosetti

HOLDS

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E&I SHELTERS

CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE N.A.
DRAWN M.G.	CHECKED M.R.	APPROVED O.A.	DATE 03/06/24
A1	DRAWING NO. 1724000049-ST-DD-00013	SHEET 001/002	REV. 01

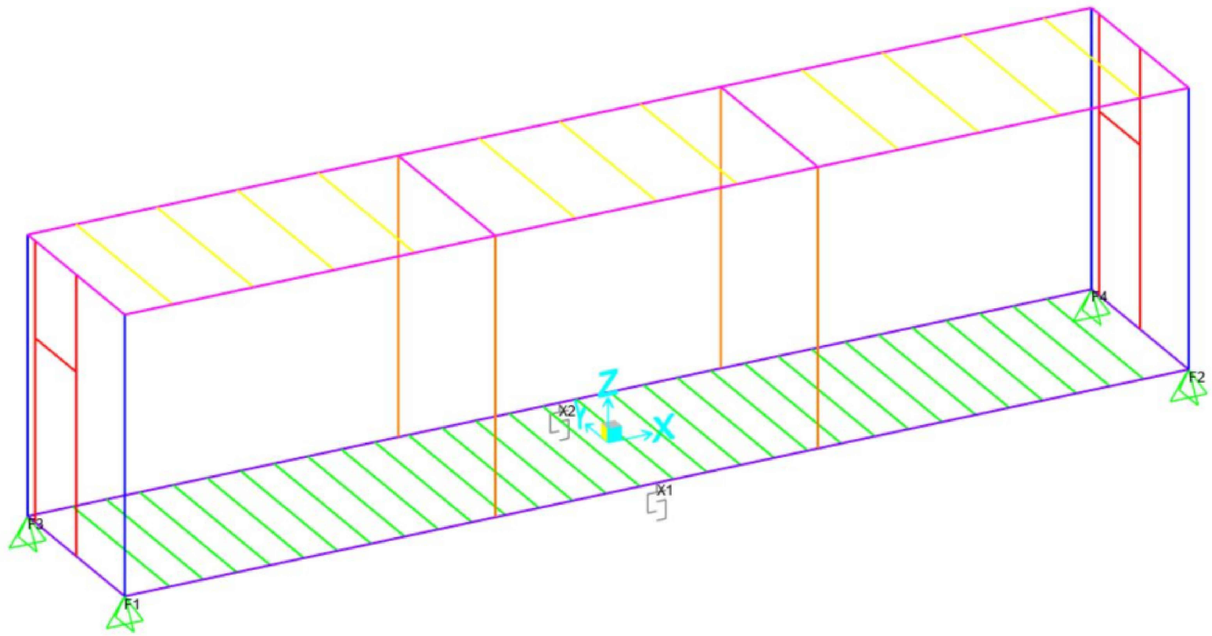
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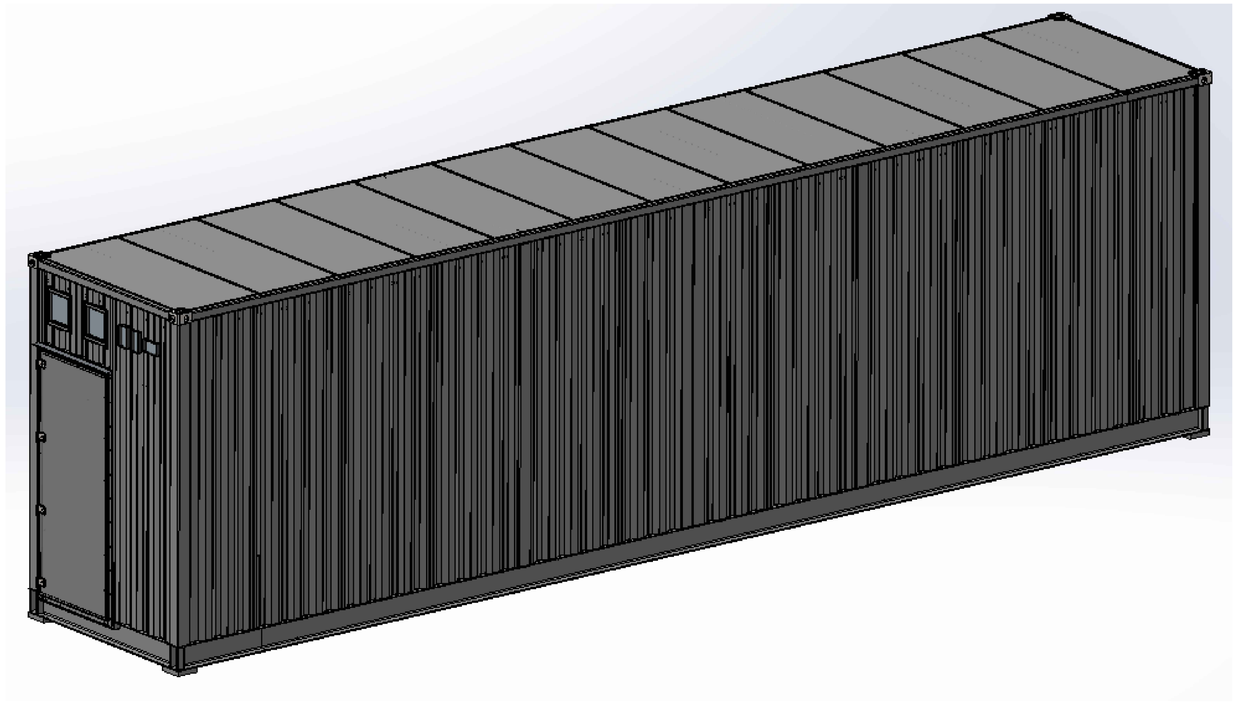
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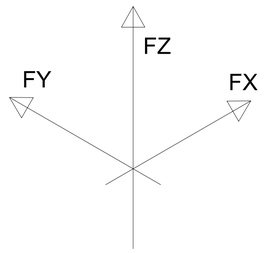
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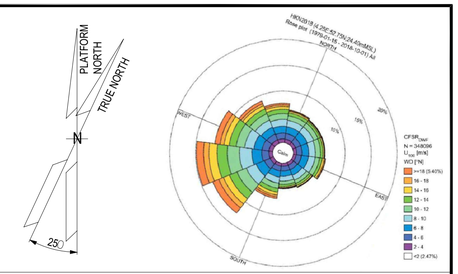
TABLE: Joint Reactions

Joint	OutputCase	CaseType	StepType	Fx	Fy	Fz	Mx	My	Mz
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
F3	DEAD	NonStatic	Last Step	7,70	-3,33	18,50	0,00	0,00	0,00
F3	SD	NonStatic	Last Step	6,05	-2,10	13,16	0,00	0,00	0,00
F3	LIVE	NonStatic	Last Step	19,91	-7,03	38,05	0,00	0,00	0,00
F3	WIND X	NonStatic	Last Step	-9,76	0,24	-7,81	0,00	0,00	0,00
F3	WIND Y	NonStatic	Last Step	10,42	-22,47	29,38	0,00	0,00	0,00
F3	NOT X	NonStatic	Last Step	-0,06	0,01	-0,01	0,00	0,00	0,00
F3	NOT Y	NonStatic	Last Step	0,05	-0,06	0,07	0,00	0,00	0,00
F3	SLU LIVE	Combination		48,93	-18,09	100,94	0,00	0,00	0,00
F3	SLU WIND X	Combination		28,46	-21,30	80,91	0,00	0,00	0,00
F3	SLU WIND Y	Combination		52,67	-48,55	125,54	0,00	0,00	0,00
F3	SLE LIVE	Combination		33,65	-12,51	69,77	0,00	0,00	0,00
F3	SLE WIND X	Combination		7,11	-11,98	32,72	0,00	0,00	0,00
F3	SLE WIND Y	Combination		21,23	-27,87	58,75	0,00	0,00	0,00
F4	DEAD	NonStatic	Last Step	-7,69	-3,32	18,50	0,00	0,00	0,00
F4	SD	NonStatic	Last Step	-5,26	-1,66	9,47	0,00	0,00	0,00
F4	LIVE	NonStatic	Last Step	-20,38	-7,26	40,24	0,00	0,00	0,00
F4	WIND X	NonStatic	Last Step	0,99	1,65	-5,48	0,00	0,00	0,00
F4	WIND Y	NonStatic	Last Step	-10,40	-22,48	29,40	0,00	0,00	0,00
F4	NOT X	NonStatic	Last Step	-0,06	-0,01	0,01	0,00	0,00	0,00
F4	NOT Y	NonStatic	Last Step	-0,05	-0,06	0,07	0,00	0,00	0,00
F4	SLU LIVE	Combination		-48,60	-17,77	98,72	0,00	0,00	0,00
F4	SLU WIND X	Combination		-41,06	-18,77	81,20	0,00	0,00	0,00
F4	SLU WIND Y	Combination		-54,73	-47,73	123,06	0,00	0,00	0,00
F4	SLE LIVE	Combination		-33,44	-12,30	68,29	0,00	0,00	0,00
F4	SLE WIND X	Combination		-15,19	-10,13	31,39	0,00	0,00	0,00
F4	SLE WIND Y	Combination		-23,16	-27,02	55,80	0,00	0,00	0,00
X1	DEAD	NonStatic	Last Step	0,00	0,00	25,06	0,00	0,00	0,00
X1	SD	NonStatic	Last Step	0,00	0,00	15,16	0,00	0,00	0,00
X1	LIVE	NonStatic	Last Step	0,00	0,02	67,30	0,00	0,00	0,00
X1	WIND X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	WIND Y	NonStatic	Last Step	0,00	0,00	6,26	0,00	0,00	0,00
X1	NOT X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X1	NOT Y	NonStatic	Last Step	0,00	0,00	0,01	0,00	0,00	0,00
X1	SLU LIVE	Combination		0,00	0,03	156,29	0,00	0,00	0,00
X1	SLU WIND X	Combination		0,00	0,02	127,88	0,00	0,00	0,00
X1	SLU WIND Y	Combination		0,00	0,02	135,40	0,00	0,00	0,00
X1	SLE LIVE	Combination		0,00	0,02	107,54	0,00	0,00	0,00
X1	SLE WIND X	Combination		0,00	0,00	42,11	0,00	0,00	0,00
X1	SLE WIND Y	Combination		0,00	0,00	46,50	0,00	0,00	0,00
X2	DEAD	NonStatic	Last Step	0,00	0,00	24,89	0,00	0,00	0,00
X2	SD	NonStatic	Last Step	0,00	0,00	17,19	0,00	0,00	0,00
X2	LIVE	NonStatic	Last Step	0,00	-0,02	65,54	0,00	0,00	0,00
X2	WIND X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	WIND Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	NOT X	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	NOT Y	NonStatic	Last Step	0,00	0,00	0,00	0,00	0,00	0,00
X2	SLU LIVE	Combination		0,00	-0,03	156,45	0,00	0,00	0,00
X2	SLU WIND X	Combination		0,00	-0,02	126,96	0,00	0,00	0,00
X2	SLU WIND Y	Combination		0,00	-0,02	126,96	0,00	0,00	0,00
X2	SLE LIVE	Combination		0,00	-0,02	107,62	0,00	0,00	0,00
X2	SLE WIND X	Combination		0,00	0,00	42,08	0,00	0,00	0,00
X2	SLE WIND Y	Combination		0,00	0,00	42,08	0,00	0,00	0,00









NOTE

1) ALL DIMENSIONS ARE IM MM.

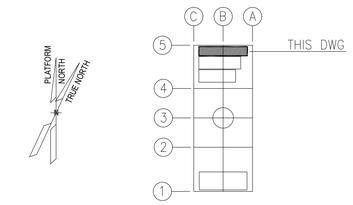
REFERENCE

DOCUMENT TITLE	DOCUMENT NUMBER
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KEY PLAN



ALEXSISTEMI spa

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00	16/04/24	M.G.	M.R.	O.A.	ISSUE FOR CLIENT REVIEW (ICR)

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TITLE :
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CONTRACT NO./TITLE CONTRACT_NO. 1724000049			SCALE N.A.
DRAWN M.G.	CHECKED M.R.	APPROVED O.A.	DATE 03/06/24
A1	DRAWING NO. 1724000049-ST-DD-00013	SHEET 002/002	REV. 01

File Name : 1724000049-ST-DD-00013-REV.01

Base Load Power Hub (BLPH)

COMMISSIONING PROCEDURE - E&I SHELTERS

ROSETTI MARINO

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2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

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Sign	Date
A.IVESON	08/07/2025

7240000049-COM-PRO-00057

nent Class: 2

02	10/10/2024	Accepted For Construction (AFC)	AD	OA	CA
01	18/09/2024	Issue for Review (IFR)	AD	OA	CA
0	19/07/2024	Issue for Review (IFR)	AD	SK	CA
Rev.	Date	Description	Prepared	Reviewed	Approved

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Accepted For Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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None

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

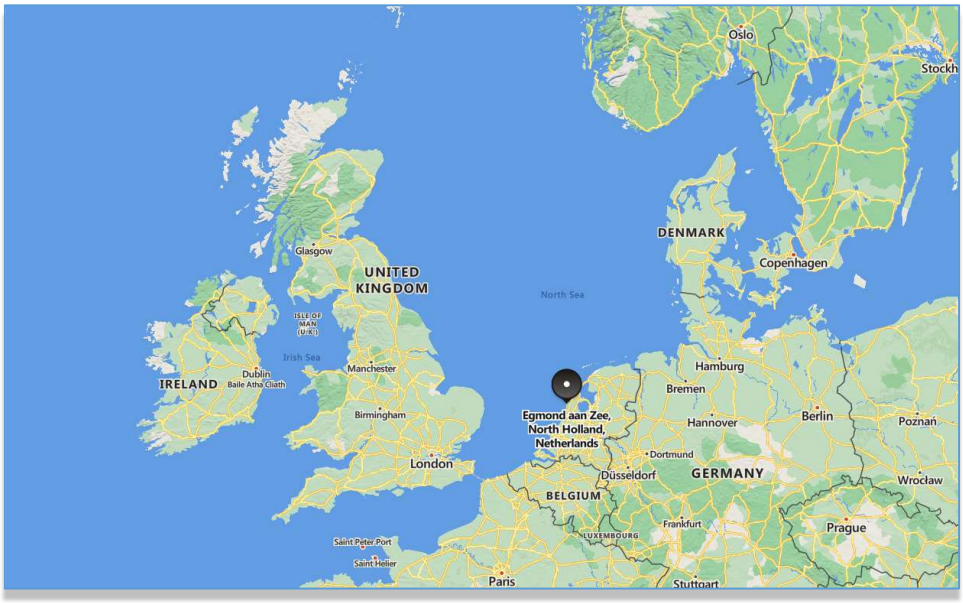


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

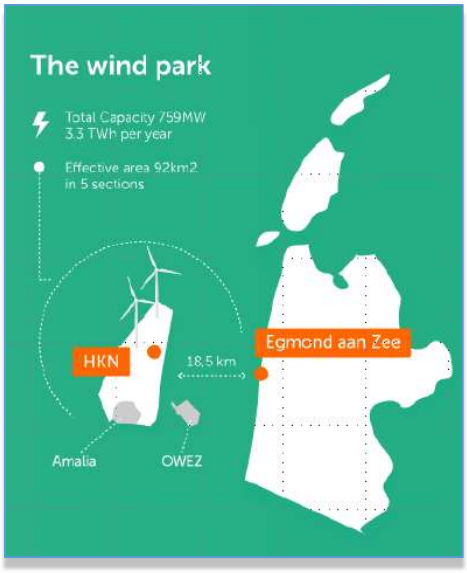


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

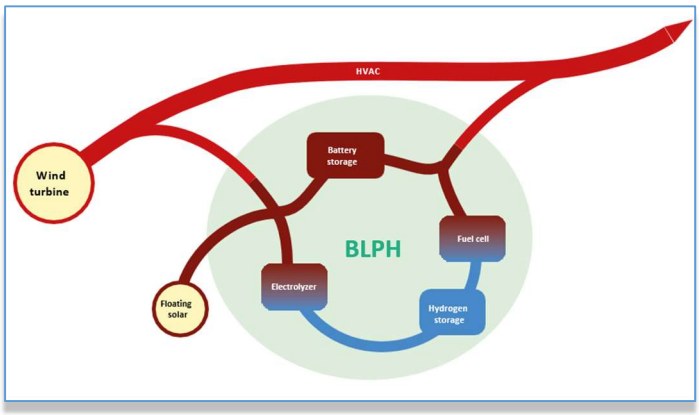


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

1.1.3 Plant and Equipment

- HV (66KV 6.6KV) SWITCH ROOM B-100
- LV (400V) SWITCH ROOM B-200
- AC UPS EQUIPMENT ROOM B-300
- I&T EQUIPMENT ROOM B-400

2 DOCUMENT SCOPE

The purpose of this document is to provide the operating methods for verifying the quality and design requirements relating to the shelter and in particular the HVAC system. The aim is to provide objective evidence that all engineering, design and specification requirements are correctly understood, verified and recorded.

2.1 REFERENCES

Doc. No.	Description
123A90-DDL-EL-DL-20104	Electrical Equipment Layout
123A90-DDL-EL-DL-20111	Electrical Cable Routing Layout
123A90-DDL-EL-DL-20122	Lighting & Socket Layout
123A90-DDL-EL-DG-20129	Lighting & Socket Circuit Diagr.
123A90-DDL-EL-DL-20136	Earthing & Lightning Layout
123A90-PML-QHSE-QP-00002	Project Quality Plan
1724000049-QC-PRO-00056	FAT Procedure
K559-2254-EL-PHI-002	Electrical System Description & Design Philosophy
K559-2254-IC-PHI-001	Control Systems Philosophy
K559-2254-PM-PHI-001	Equipment and System Tag Numbering
IEC 61439-1	Low-voltage switchgear and controlgear assemblies - Part 1: General rules
NFPA 90A	Standard for the Installation of Air-Conditioning and Ventilating Systems

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

Abbreviations	Description
AC	Voltage Alternating Current
Ah	Ampere-Hour
ATEX	Atmospheric EXplosible
CAT	Category
CENELEC	Committee for Electrotechnical
DC	Voltage Direct Current
EMT	Electrical Metallic Conduit
IEC	International Electrotechnical Commission
IEE	Institute of Electrical Engineers
IEEE	Institute of Electrical and Electronic Engineers
IP	Ingress Protection
IS	Intrinsically Safe
ISO	Internation Standard Organization
ITU	Internation Telecommunications Union
JB	Junction Box
MCT	Multi-Cable Transit
NC/NO	Normally Close / Normally Open
PCS	Passive Cooled Shelter
RTU	Remote Terminal Unit
TIA/EIA	Telecommunications Industry Association/Electronics Industries Association
W	Watts (in Power)

3 BUILDING RELATED CHECKS

INSPECTION TEST	B100	B200	B300	B400	Completed by Date	Witnessed by Date
VISUAL INSPECTION						
ELECTRICAL CHECKS						
HVAC TEST						
HVAC PRESSURIZATION AND TEMPERATURE TEST						

3.1 VISUAL INSPECTION

INSPECTION TEST	B100	B200	B300	B400	Completed by Date	Witnessed by Date
VISUAL INSPECTION						
DIMENSIONAL CHECKS						
PAINTING CHECK						
CHECK OF NAMEPLATES						
CHECK OF COMPONENTS TYPE AND POSITION						

- To ensure that all the necessary documentation is available.
- To verify that the Local Shelter building is delivered to site in good condition to ensure no damage resulting from shipment and with correct dimensions.
- Ensure that the filters installed on pressurization unit are clean. In case the pressurization unit is stored for long without protection, sand and dirt could be deposited on the filters. These must be replaced before starting the test.
- The result of inspection shall be documented in test data record of Annex 1

4 ELECTRICAL CHECKS AND PRE POWER-UP HVAC CHECKS BEFORE ENERGIZING

INSPECTION TEST	B100	B200	B300	B400	Completed by Date	Witnessed by Date
CHECK AND FUNCTIONAL TEST OF LIGHTING SYSTEM						
CHECK OF GROUNDING SYSTEM						
CHECK OF COMPONENTS TYPE AND POSITION						

- To ensure correct power, grounding and function of lighting and socket outlet.
- Ensure that all instruments and equipment are connected.
- Before powering on the HVAC system, all the power and signal electrical connections between Local Shelter and HVAC/Pressurization units need to carefully checked and verified against the drawings.
- Lighting system:
- Main characteristics of fixture and lighting material comply with project documentation.
- Correct installation of lighting fixture and completeness of lighting circuit
- Socket system:
- Main characteristics of power socket comply with project documentation.
- Correct installation of power socket and completeness of power distribution system.
- Earthing and lightning system:
- Main characteristics of earthing material comply with project documentation.
- Earthing system continuity checks.

- Building local board:
- Check of correct board installation
- Insulation test on equipment
- Electrical functionality check and test of auxiliary and accessories (switch, relay, alarms, signaling, interstrip, others)

- Checks and test after energizing:
- Preliminary check on external supply (Upstream switchgear, others)
- On voltage test and measurement (protection device, fixture, switch, sockets, illumination level, signaling and alarm.

5 HVAC TESTS SYSTEM INTEGRATION TEST PRE-REQUISITES:

Note: HVAC system can also be tested without the F&G system in operation. However, both the system is required to be working in order to perform the integration test.

- Verify that the extinguishing system is disabled.
- Make sure to have all MCTs completely sealed and all doors closed for the pressurization test and cooling performance test.
- Verify that all construction completion tests have been completed.
- Verify if the assembly completeness of each cabinet/console/equipment is compliant with the hardware configuration drawings provided by the vendor.
- Verify the functional and safety grounding networks outside the cabinets.
- Verify that the identification labels are properly located on the relevant cabinet/console/equipment.
- Verify the correctness of power supply connections (cables and terminals) according to Vendor/project documents.
- Verify electrical continuity between grounding bars of different cabinets.
- Power up of incoming lines (to each cabinet) and verify the relevant voltage level and polarity of power lines.
- Verify the hardware interconnections between systems.

6 HVAC SYSTEM PERFORMANCE TEST

6.1 VISUAL INSPECTION

The purpose of this part of test procedure is:

- To verify the HVAC capability to cool the air inside the Local Shelter.
- To test the pressurizing system to verify the over pressurization.

6.2 TEST STEPS

- Check temperature set point of each unit. Set point must be as per the specification:

Set point and temperature will be set considering site test environment and not following destination site requirements.

INSPECTION TEST	B100	B200	B300	B400	Completed by Date	Witnessed by Date
VISUAL & DIMENSIONAL CHECK OF THE HVAC						
CHECK OF GROUNDING SYSTEM						
FULL PANEL ELECTRICAL / CONTROL OPERATION & FUNCTION TEST						
DIELECTRIC TEST						
QUALITY AND QUANTITY CHECK FOR WEARABLE PART AND SPARE PARTS						
CHECKING OF PROTECTIVE MEASURES AND OF THE ELECTRICAL CONTINUITY OF THE PROTECTIVE CIRCUITS						

The following document refers to the details to be done in the Power and Control Cabinet :

1724000049-HV-DA-00026	**01**	**B-100 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)**
1724000049-HV-DA-00027	**01**	**B-200 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)**
1724000049-HV-DA-00028	**01**	**B-300 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)**
1724000049-HV-DA-00029	**01**	**B-400 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING)**

- The setpoints can be modified however it is not recommended to do that.

- Check that, when the all selector is on position, fire damper and are opened.

Notes:

- In the absence of a dissipative or partial load inside the Shelter, the required thermal dissipation will be obtained, in accordance with what is qualified in the document Local Shelter HVAC Calculation Notes, by means of portable electrical heaters.

- Switch ON all internal equipment inside the Local Shelter with doors closed and measure the temperature after at least 1 hour.
- Switch on HVAC system and monitor the internal temperature. Once the set point is reached, monitor the temperature for one hour.
- During this test, a pressurization test will also be performed by pressure tools (not supplied) to verify an overpressure of greater than or equal 50 Pa .

6.3 ACCEPTANCE

- The HVAC system must maintain the temperature inside the Shelter Room with the doors closed during the hottest part of the day for one hour.

- Differential pressure is greater than or equal 50 Pa inside the building.

6.4 RESULTS TABLE

- The results of the measurement (temperature) shall be recorded on Test Data Record.
- The record of all temperature and their location shall be taken during the duration on precondition and the test performance on both HVAC units.
- Record the differential pressure.
- The results of this test shall be recorded on Test Data Record of Annex No 1

7 HVAC AIR CONDITIONING CONTROL UNIT TEST

7.1 TEST SCOPE

- The purpose of this test is to ensure the functionality of both HVAC units and their automatic operation, failure and auto changeover.

7.2 TEST STEPS

Inspection Results	Positive	Negative	Completed by Date	Witnessed by Date
End of connection				
Wiring hardness check				
Numeration of cable				
Grounding				
Main braker Supply Voltage check				
UPS Supply voltage check				
Close all switches and check supply of all the users				

7.3 ACCEPTANCE

Inspection Results	Positive	Negative	Completed by Date	Witnessed by Date
HMI panel and PID correspondence				
Unit exchange in case of fault of one unit				
Automatic and manual function				
Shutdown contact functional check				
Remote start/stop of HVAC system by ModBUs signal				
Major Fault in case of both unit fault and Overpressure Sensor Fault				
Low overpressure alarm				
Space heater Status and setpoint				
Electrical Heater protection thermostate				
Temperature sensor indication check				
Overpressure sensor check				

For B100 and B200

Inspection Results	Positive	Negative	Completed by Date	Witnessed by Date
Fire damper open and close contact HMI check				
Fire damper Faul				
Unit Dampers Visual position on HMI				
Fresh air electrical heater functional check				
Fresh air filter clogged signal				
Overpressure maintenance				
Fan running feedback on HMI				
Alarm on HMI				

For B300 and B400

Inspection Results	Positive	Negative	Completed by Date	Witnessed by Date
Fire damper open and close contact HMI check				
Fire damper Faul				
Units Dampers Visual position on HMI				
Fresh air electrical heater functional check				
Fresh air filter clogged signal				
Overpressure maintenance				
Fan running feedback on HMI				
Alarm on HMI				
Cooling start and setpoint				

7.4 MEASUREMENT EQUIPMENT

Inspection Results	Positive	Negative	Completed by Date	Witnessed by Date
Unit exchange in case of fault				
HMI correct visualization				
Maintenance of overpressure				
Shutdown correct response				
Lighting and socket functionality				
Heater setpoint reach				
Major fault contact				
Cooling performance reached (Only for B300 and B400)				

7.5 RESULTS TABLE

- The results of this test shall be recorded on Test Data Record of Annex 1.

ANNEX 1

COMMISSIONING TEST RECORD

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1. HVAC AND PRESSURIZATION SYSTEM PERFORMANCE AND FUNCTIONAL TEST

Customer Name: Rosetti Marino **Customer Reference:** **Project Name:** BASE LOAD POWER HUB (BLPH) **Reference Doc Number:** CW-I-WP4-2023-05	**Verification** **RM** By: Date:

No.	Test #	Detail Test Item	OK	NOK	RTST OK
1		**Temperature test- HVAC system**			
	1.1	**Test Requirements:** Close the door of the shelter and power up equipment inside the Local Shelter. Record the internal temperature just before switching on HVAC. Monitor the temperature and record the time taken for HVAC to bring down the temperature from the initial temperature to the setpoint. Monitor internal temperature status for 1 hour. **Measurement Equipment:** Meter or equivalent and Multifunction Meter Testo. **Note the reading here:** Temperature before the test:_____time : _____ Temp reached setpoint : _____time:____ **Acceptance (Pass/Fail Criteria):** system maintained			
2		**HVAC Air Conditioning Control Unit (ACCU) Functional Test**			
	2.1	**Test Requirements:** Perform the test by keeping the breakers in ON position and Perform the test keeping the switches in the ON position and create a major fault on hvac/pu. running and waiting for the exchange Within 2 minutes check that the second HVAC unit starts automatically. The tests shall be performed on each HVAC unit. **Acceptance (Pass/Fail Criteria):** Within 2 minutes the standby HVAC unit will start automatically.			

3		**Pressurization System**			
	3.1	**Test Requirements:** Ensure that the filters installed on pressurization unit are clean. **Acceptance (Pass/Fail Criteria):** The filters installed on pressurization unit are clean			
	3.2	**Test Requirements:** Measure the differential pressure using pressure tools (not supplied) to verify an overpressure. **Note the reading here:** Before the test: _____ During the test: _____ **Acceptance (Pass/Fail Criteria):** The system maintains a positive pressure within the Local shelter with the door(s) closed (>/= 50 Pa).			

Base Load Power Hub (BLPH)

HVAC SYSTEM DESCRIPTION
(MANAGEMENT LOGICS)
E&I SHELTERS

Document Number: 1724000049-HV-RE-00055

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	07/02/2025

Document Class: 3

Rev.	Date	Description	Prepared	Reviewed	Approved
02	05/02/2025	Issue for Information (IFI)	FM	SKV	OA
01	04/11/2024	Issue for Information (IFI)	FM	SKV	OA
00	12/06/2024	Issue for Information (IFI)	FM	SKV	OA

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)
01	Issue for Information (IFI)
02	Issue for Information (IFI)

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No.	Description
1	
2	
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4	

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

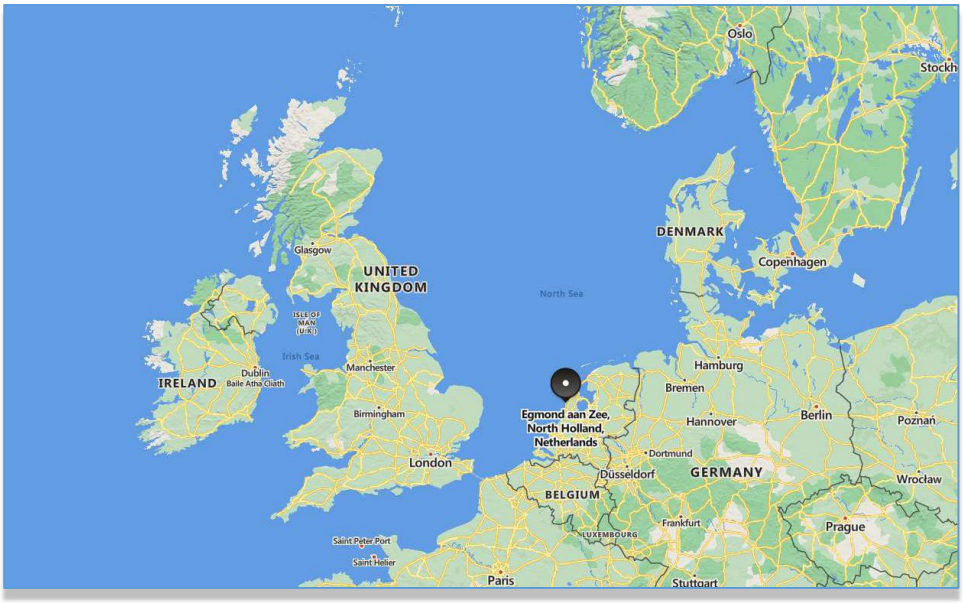


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

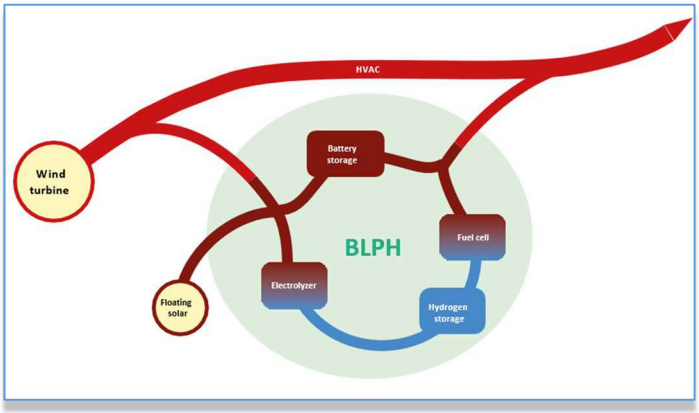


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

The aim of this document is to describe the general configuration/operation mode of the HVAC system and provide a detailed description of HVAC control and interlocks implemented to manage the HVAC system.

2.1 REFERENCES

Doc. No.	Description
1724000049-HV-PID-00039	B-100 PID - E&I Shelters
1724000049-HV-PID-00040	B-200 PID - E&I Shelters
1724000049-HV-PID-00041	B-300 PID - E&I Shelters
1724000049-HV-PID-00042	B-400 PID - E&I Shelters
1724000049-HV-CA-00035	B-100 HVAC Calculation Report
1724000049-HV-CA-00036	B-200 HVAC Calculation Report
1724000049-HV-CA-00037	B-300 HVAC Calculation Report
1724000049-HV-CA-00038	B-400 HVAC Calculation Report
1724000049-HV-LIS-00051	B-100 HVAC IO List - E&I Shelters
1724000049-HV-LIS-00052	B-200 HVAC IO List - E&I Shelters
1724000049-HV-LIS-00053	B-300 HVAC IO List - E&I Shelters
1724000049-HV-LIS-00054	B-400 HVAC IO List - E&I Shelters
1724000049-HV-DA-00026	B-100 HVAC and Lighting Panel Wiring Drawings and General Arrangement (Incl Interconnecting) - E&I Shelters
1724000049-HV-DA-00027	B-200 HVAC and Lighting Panel Wiring Drawings and General Arrangement (Incl Interconnecting) - E&I Shelters
1724000049-HV-DA-00028	B-300 HVAC and Lighting Panel Wiring Drawings and General Arrangement (Incl Interconnecting) - E&I Shelters
1724000049-HV-DA-00029	B-400 HVAC and Lighting Panel Wiring Drawings and General Arrangement (Incl Interconnecting) - E&I Shelters

Table 1 - Reference Documents

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2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
RH	Relative Humidity
D.B.	Dry Bulb Temperature
Pa	Pascal
ACH Min.	Minimum Air Changes per Hours
AHU	Air Handling Unit
HVAC	Heating Ventilation and Air Conditioning
HMI	Human Machine Interface
PCS	Process Control System
F&G	Fire and Gas System
SIS	Safety Instrumented System
PLC	Programmable Logic Controller
SIS	Safety Instrumented System
HLCP	HVAC & Lighting Control Panel

Table 2 - Definitions and Abbreviations

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2.3 DESIGN INPUT DATA

FOR B-100 SHELTER:

Outdoor design conditions:

Summer temperature:	+25°C D.B. (Dry Bulb) with RH 90 %
Winter temperature:	-8,4°C D.B. (Dry Bulb) with RH 100 %
Shelter U-Value:	0,450 W/(m² K).
Safe Area	

Indoor design conditions:

Room Pressurization:	+50 Pa
Summer temperature:	+35°C ±2 D.B. (Dry Bulb) with RH 30÷70%
Winter temperature:	+5°C ±2 D.B. (Dry Bulb) with RH 30÷70%
Internal Load Equipment:	5 kW
ACH Min.:	6
Safe Area	

FOR B-200 SHELTER:

Outdoor design conditions:

Summer temperature:	+25°C D.B. (Dry Bulb) with RH 90 %
Winter temperature:	-8,4°C D.B. (Dry Bulb) with RH 100 %
Shelter U-Value:	0,450 W/(m² K).
Safe Area	

Indoor design conditions:

Room Pressurization:	+50 Pa
Summer temperature:	+35°C ±2 D.B. (Dry Bulb) with RH 30÷70%
Winter temperature:	+5°C ±2 D.B. (Dry Bulb) with RH 30÷70%
Internal Load Equipment:	4,5 kW
ACH Min.:	6
Safe Area	

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FOR B-300 SHELTER:

Outdoor design conditions:

Summer temperature:	+25°C D.B. (Dry Bulb) with RH 90 %
Winter temperature:	-8,4°C D.B. (Dry Bulb) with RH 100 %
Shelter U-Value:	0,450 W/(m^2 K).
Safe Area	

Indoor design conditions

Room Pressurization:	+50 Pa
Summer temperature:	+35°C ±2 D.B. (Dry Bulb) with RH 30÷70%
Winter temperature:	+5°C ±2 D.B. (Dry Bulb) with RH 30÷70%
Internal Load Equipment:	10 kW
ACH Min.:	6
Safe Area	

FOR B-400 SHELTER:

Outdoor design conditions:

Summer temperature:	+25°C D.B. (Dry Bulb) with RH 90 %
Winter temperature:	-8,4°C D.B. (Dry Bulb) with RH 100 %
Shelter U-Value:	0,450 W/(m^2 K).
Safe Area	

Indoor design conditions:

Room Pressurization:	+50 Pa
Summer temperature:	+25°C D.B. (Dry Bulb) with RH 30÷70%
Winter temperature:	+15°C D.B. (Dry Bulb) with RH 30÷70%
Internal Load Equipment:	12 kW
ACH Min.:	6
Safe Area	

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3 HVAC SYSTEM DESCRIPTION

The HVAC system ensures that the internal design conditions within each shelter are maintained, considering external design conditions and the intended purpose of the shelter.
Designed for continuous operation, the HVAC system functions 24 hours a day, 365 days a year, with all equipment capable of sustaining uninterrupted performance. HVAC system controls ambient temperature to create an environment where systems can operate efficiently. Additionally, the HVAC system prevents gas ingress by maintaining positive pressurization of shelters relative to the external area.
The internal design temperature and overpressure inside each shelter, relative to the outdoor environment, are maintained through an Air Handling Unit (AHU). This system consists of the outdoor-installed AHU, a ductwork system, and the necessary in-line equipment to deliver the required service.

For heating purposes, space heaters are installed inside the shelters. Their function is to maintain the minimum temperature during maintenance activities and to supplement heating in case the AHU alone is insufficient to sustain the minimum design temperature.

Each HVAC system is managed by the HVAC & Lighting Panel Board (HVAC Panel), installed inside the corresponding shelter (e.g., panel B100-HSB-001 for shelter B-100). The panel is equipped with an HMI for system monitoring and parameter adjustment. It also communicates via both hardwired and serial signals with the Fire & Gas (F&G) system, Process Control System (PCS), and Safety Instrumented System (SIS), as detailed in Chapter 5.

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3.1 B-100 & B-200 HVAC SYSTEM

The main system serving the B-100 and B-200 shelters consists of two redundant AHU units (2x100%), one duty and one stand-by. Each AHU works with constant air flow and elaborate 100% fresh air coming from fresh air intake provided with Coalescer Assembly to eliminate moisture and guarantee the first filtration stage for moisture. After the coalescent filter, all fresh air passes in a G4 filter and then in a F7 filter. A pressure switch is mounted across the G4 and F7 filters to monitor the status of the filter and to give a visual warning of filter clogged on the HMI.
A motorized shut-off damper is provided at inlet for maintenance and changeover purposes.

The pressurization fan is powered by an inverter (VSD) to precisely regulate the overpressure within the shelter. The overpressure is monitored by a differential pressure transducer (PDIT-77-101 for B100, PDIT-77-201 for B200), whose signal is processed by the PLC to control the fan speed.
A pressure relief damper is provided to guarantee the overpressure requested inside the module, as previously specified. An outlet duct piece with bird screen wire mesh shall be installed on the external side of the sleeve, designed to avoid rain from entering the module.

Each unit is equipped with an electric heating coil to ensure that the air introduced into the cabinet has a temperature above 5°C. A temperature sensor is installed in the supply duct, and its signal is processed by the PLC, which regulates the heating element's power via triacs. This control mechanism ensures the design temperature is maintained while minimizing energy consumption.
Inside each shelter, two temperature sensors are installed (77-TT-101/102 for B100 and 77-TT-201/202 for B200). The average of these two measurements is used to verify that the internal temperature remains within the design limits.

The AHUs operate in automatic mode (AUTO mode), with a scheduled changeover between the duty and standby units every seven days. This alternating operation ensures equal aging of both AHUs.

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3.2 B-300 & B-400 HVAC SYSTEM

The main system serving the B-300 and B-400 shelters consists of two redundant AHU units (2x100%), one duty and one stand-by. Each AHU recirculate the shelter air with an addition of the fresh air coming from fresh air intake provided with Coalescer Assembly in order to eliminate moisture and guarantee the first filtration stage for moisture. After the coalescent filter, all fresh air passes in a G4 filter and then in a F7 filter. A pressure switch is mounted across the G4 and F7 filters to monitor the status of the filter and to give a visual warning of filter clogged on the HMI. The airflow rate supplied into the shelter will be constant.
These packaged units of DX type, so called rooftop unit, consist of a pressurization fan, supply fan, refrigeration circuit, and electric heating coil.
Motorized shut-off dampers are provided at inlet, return and outlet connections for maintenance and changeover purposes.
Cooling won't be provided if the external air temperature during winter season will be sufficient to maintain the internal design temperature (free cooling).
During normal functioning, the supply air will have a constant airflow rate, and the pressurization fan will be managed by VSD in order to set and maintain the overpressure required.

The pressurization fan is powered by an inverter (VSD) to precisely regulate the overpressure within the shelter. The overpressure is monitored by a differential pressure transducer (PDIT-77-301 for B300, PDIT-77-401 for B400), whose signal is processed by the PLC to control the fan speed.
A pressure relief damper is provided to guarantee the overpressure requested inside the module, as previously specified. An outlet duct piece with bird screen wire mesh shall be installed on the external side of the sleeve, designed to avoid rain from entering the module.

Each unit is equipped with an electric heating coil to ensure that the air introduced into the cabinet has a temperature above 5°C. A temperature sensor is installed in the supply duct, and its signal is processed by the PLC, which regulates the heating element's power via triacs. This control mechanism ensures the design temperature is maintained while minimizing energy consumption.
Two temperature sensors are installed inside the shelter (77-TT-301/302 for B300 and 77-TT-401/402 for B400). The average of these two measurements is used to verify that the internal temperature remains within the design limits.

The AHUs operate in automatic mode (AUTO mode), with a scheduled changeover between the duty and standby units every seven days. This alternating operation ensures equal aging of both AHUs.

4 HVAC PANEL AND PLC ARCHITECTURE

HVAC panel is microprocessor based and will monitor and control temperature, pressure, equipment operating status, alarm conditions of the HVAC system and guarantee all safety requirements. Control set point adjustments, equipment override commands and software modifications will be accessible from the local HMI.

Manual selector switches, alarm indicator lights and a local display terminal will be installed on board the control panel.

The HVAC panel is powered by the normal feeder, while the PLC is powered by an UPS power supply to ensure continuity in operation.

Furthermore, the HVAC Panel feeds the power to all field equipment, instruments, sockets, lighting system and switches. For detailed information please refer to the shelter's wiring diagrams.

During normal operation mode, the HVAC system is designed to supply the airflow rate to maintain the correct air quality and to maintain the internal design conditions inside the shelters.

HVAC panel manages the duty/standby of the units as follows:

- in case of failure of the duty unit the system automatically switches on the standby unit;
- changeover of the units: after a design time of operation (7 days), the duty unit automatically switch on the standby unit to guarantee equal wear and tear of units.

The PLC architecture is made with a redundant CPU and decentralized peripherals for the I/O.

All shelters HVAC panel have mounted a 12" HMI to keep the system under control and visualize temperature, differential pressure, warnings or alarms related to each shelter.

The PLC gives the client a hardwired signal of critical fault and MODBUS TCP/IP information about the system status, while it receives a hardwired signal of shutdown.

No redundant MODBUS communication is provided.

Refer to doc. Shelter's I/O List for all signal lists, both hardwired and via serial connection.

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5 CONTROL AND MANAGEMENT LOGICS

5.1 OVERVIEW

Each shelter is equipped with two redundant HVAC systems to ensure that internal design conditions are consistently maintained.

HVAC equipment, including AHUs and space heaters, is powered and managed by the HVAC & Lighting Control Panel (HLCP), which also allows for remote monitoring. The HLCP automatically switches HVAC functions (e.g., from cooling to heating and vice versa) based on the temperature detected inside the shelters. Space heaters are directly controlled by the HLCP through temperature probes installed within the shelters.

All Fire & Gas (F&G) dampers are controlled by the F&G System.

The HVAC systems will be activated once the HLCP receives a START signal via Modbus from the Process Control System (PCS), provided that the SHUT-DOWN signal is not active. Activation is only possible if the fire dampers are open, preventing potential damage to HVAC units and ductwork. The HLCP will receive an open signal from each fire damper to confirm their status.

An HVAC system can be started only if the following conditions are met:

- The permissive START signal has been received from the PCS System.
- All fire dampers associated with the HVAC system are open.
- The shut-off dampers of the corresponding AHU are open.
- No faults are detected.

The duty system is switched off and the standby system is switched on if:

- One fire damper related to the duty system is closed
- The AHU is fault, which can occur if:
    - One shut-off damper is closed
    - The electrical heater is fault
    - The cooling circuit is fault
    - The fan is fault

All exchanged signals are reported in the following documents:

- 1724000049-HV-LIS-00051- B-100 HVAC IO LIST - E&I SHELTERS

- 1724000049-HV-LIS-00052- B-200 HVAC IO LIST - E&I SHELTERS
- 1724000049-HV-LIS-00053- B-300 HVAC IO LIST - E&I SHELTERS
- 1724000049-HV-LIS-00054- B-400 HVAC IO LIST - E&I SHELTERS

In case of an emergency, the Safety Instrumented System (SIS) will send a SHUT-DOWN signal, turning off the entire HVAC system. After an appropriate delay, all fire dampers will be closed by the F&G System.

In the event of a malfunction of the internal sensor in the duct connected to the operating unit, the duty unit will be shut down, a fault signal will be sent, and the standby unit will be activated.
If the internal temperature exceeds a user-defined setpoint (adjustable via HMI), the pressurization fan will be set to maximum speed to increase air changes and achieve the required temperature.
In case of differential pressure switch malfunction, the PLC will set the fan to a fixed speed (adjustable via HMI) to ensure a minimum overpressure and airflow are guaranteed.
In the event of accidental closure or malfunction of the fire damper on the discharge side of the operating unit, that unit will be shut down, and the standby unit will be switched on.

In the event of failure to open or close during operation of the exhaust fire damper (related to the pressure relief damper), the entire HVAC system will be shut down and the critical fault signal will be sent via cable (hardwired signal) to SIS.

Once this signal has been received, the HVAC panel monitors the opening of the fire dampers and will only start once they are all fully open. If one or more dampers fail to open within the specified time limit (60 seconds), a dedicated signal will be sent to the Process Control System (PCS) indicating a fire damper malfunction.

5.2 AHU SELECTORS

The HVAC panel (HLCP) will be equipped with two AUT-0-MAN selectors, one for each Air Handling Unit (AHU). If both AHUs are set to automatic (AUT), the system start will be initiated via Modbus from the PCS. Upon receiving the permissive to start signal, the HVAC system will operate automatically and will manage the logic of changeover between the units depending on the operating time or due to malfunctions.

In manual mode (MAN), the first of the two units set on this mode will start. While manual mode activates the selected unit, the PLC will still manage the overall operation to maintain the shelter's internal design conditions.

The MAN operation mode will be active until the operator maintains the selection on this mode.

To reestablish the START and STOP from remote, both selectors have to be set on AUT mode.

If a selector is set on OFF mode, the other AHU will be switched on.

Following above description, the selector positions function as follows:

1. AUT (Automatic) Position:
    - The HVAC PLC manages the HVAC system according to its internal control logic.
    - The onshore operator can remotely START or STOP the HVAC system.
    - When the onshore operator issues a START command, the HVAC system operates under the PLC's internal logic.
2. 0 (Off) Position:
    - The AHU is switched off, typically for maintenance purposes.
3. MAN (Manual) Position:
    - The HVAC PLC continues to manage the HVAC system based on its internal control logic.
    - The onshore operator is unable to remotely START or STOP the system.

When the selector is on AUT (Automatic) position the operators (from remote) shall have the ability to start/stop the HVAC package, also having the ability to initiate remote shutdown.

Although control is by the package HLCP, all necessary data shall be transmitted to the PCS so that the PCS shall act as the operator interface for both visualization and supervisory command from remote. This communication shall be done via a serial link (Modbus TCP/IP).

5.3 AHU AUTOMATIC OPERATION MODE (AUT)

HLCP Logic permits single AHU to start if all the following conditions are satisfied:

- Permissive to START signal from PCS;
- All F&G dampers open;
- No fan fault alarm;
- No Fan Discordance alarm;
- AHU shut-off dampers open;
- No AHU shut-off dampers limit switch discordance alarm;
- No general alarm;
- No filter alarm;
- No heaters fault alarm;
- HVAC set on automatic mode (AUT).

In case of one of the AHUs is UNAVAILABLE (duty unit), HLCP Logic permits single AHU to start if the above essential conditions are satisfied for the other AHU (stand-by unit).

5.4 PRESSURE DIFFERENTIAL TRANSMITTER

For differential pressure transmitters checking ambient pressurization, the Low Differential Pressure Alarm (PDAL) is foreseen and set in the PLC.

If the low pressure (less than 25 Pa) inside the shelter is detected for more than 90 seconds, then:

- The duty AHU is switched off.
- The AHU fault signal is sent to PCS via Modbus.
- The standby AHU is switched on.

After the changeover, if the low pressure (less than 25 Pa) inside the shelter is detected for more than 120 seconds, then:

- Also the standby AHU is switched off.
- The CRITICAL FAULT signal is sent to SIS.
- The HVAC system keeps running.

HLCP will generate these alarms if they will be constantly active for a settable period of time in order to avoid false alarm notifications.

A fault for broken transmitter shall be generated for each instrument.

5.5 HEATING COIL

Each stage of heating coil is provided with two safety temperature switches:

- High temperature safety switch with automatic rearm (TSH) giving high alarm. When the alarm is generated, it cuts off power supply until the supply temperature decreases under pre-determined temperature threshold value.
- High high temperature safety switch with manual rearm (TSHH) generating trip. When the trip signal is generated, it cuts off power supply and sends heating system alarm to HLCP.

The activation of a safety temperature switch results on cutting off the relevant heating coil power supply, at the same time an alarm shall be generated by HLCP.

A fault for broken transmitter shall be generated for each instrument.

Availability of heating coils are interlocked with:

- AHU running status.
- Safety Temperature Alarm of one or more stages.
- Heater Alarm (TSH, TSHH).

In case of HLCP gives a ON command to a heater stage and if it doesn't receive back a running status feedback, a discordance alarm shall be generated for the relevant stage after a settable time delay, then the duty AHU will be switched off and the standby one switched on.

5.6 FILTRATION STAGE

Filter status shall be monitored by Pressure Differential Transmitter, which communicate filter condition to the HLCP. In case of clogged filter, PDT shall generate an alarm (PDAH) to HLCP, which in turn will generate an alarm of high-level pressure.

A fault for broken transmitter shall be generated for each instrument.

5.7 AHU SHUT-OFF DAMPERS

The shut-off dampers shall be equipped with electric actuators and limit switches to provide indication of the damper open/closed status to the HLCP. The shut-off dampers shall be controlled by the HLCP. Suitable delays in damper opening/closing will be defined respect to fan start/shutdown in order to avoid any possible damages on AHUs/Fans.

Shut-off damper command and signals:

- Open command (damper powered)
- Open status
- Close Status

5.8 AHU CHANGEOVER

Duty and standby AHUs shall be provided with automatic changeover within the HLCP. If a duty AHU fails or is unavailable, the standby unit shall start automatically. AHU status shall be displayed at the HMI.

HLCP shall preform the changeover actions in order to reduce the "dead time" and limit the loss of pressurization. Time delays shall be appropriately set-up during the commissioning phase and the following sequence shall be followed:

1- HLCP gives STOP command to the relevant fan of the duty AHU (eg. Unit "1") waiting for the NO Running status.

2- HLCP gives OFF command to the relevant electric heating coils (if running) waiting for the NO Running status.
3- With a time delay of 5 second (useful to avoid critical pressure hummer on the AHU dampers), HLCP gives close command to the AHU shut-off dampers and monitors the relative limit switches close status ensuring the absence of Shut-off damper Discordance Alarm.
4- When the "1" running status is lost, at the same time, the HLCP change the priority to the AHU unit "2".
5- At the same time (without waiting the closure feedback of the Dampers), HLCP gives the OPEN command to the shut-off dampers relating the "2" unit and monitors the relative limit switches open status ensuring the absence of Shut-off damper Discordance Alarm.
6- HLCP gives the START command to the "2" unit, and thus the fan related, waiting for the Running status.
7- HLCP gives the ON command to the relevant electric heating coils (if any) waiting for the Running status.
8- If one of the AHUs fails the start procedure the HLCP will switch to the other; the HVAC general alarm will be set from HLCP and HMI, and communicated by serial link to PCS system (Modbus TCP/IP).
9- If both the AHUs fail the start procedure, the "HVAC System Critical Fault" will be set from HLCP and HMI and communicated by hardwired link to PCS system.

5.9 FAN FLOW ALARM

When HLCP receives (after a suitable settable delay of time to avoid false alarm during fans switchover) a flow alarm from the pressure differential transmitter (PDSL) mounted on fan module, it shall shut off currently operating fan and assign a fault status alarm to it; then it shall switch duty operational condition to the other unit.

5.10 FAN DISCORDANCE ALARM

When HLCP gives a start command to duty fan and, after a suitable delay of time, it doesn't receive running status feedback, a discordance alarm shall be generated for duty fan and (for duty/stand-by fans) stand-by fan shall be switched on.

Vice versa, when HLCP toggles the stop command to duty fan but, after a suitable delay of time, running status feedback is still on (i.e. contactor opening problem) a discordance alarm shall be generated for duty fan and (for duty/stand-by fans) stand-by fan shall be switched on.

5.11 AHU SHUT-OFF DAMPER DISCORDANCE ALARM

HLCP shall generate damper OPEN POSITION alarm when after 45 seconds (settable), damper open command has been given, it shall not receive relevant limit switch signal of damper opened.

HLCP shall generate damper CLOSE POSITION alarm when after 45 second (settable), damper close command has toggled, it shall not receive relevant limit switch signal of damper closed.

5.12 EMERGENCY PUSH BUTTON

In case of emergency, the AHU can be stopped manually pushing the Emergency Push Button located on the equipment and directly connected to the HLCP.

- Supply fan of the AHU is switched off and is out of the HLCP Logic.
- Motor UNAVAILABLE signal is generated by HLCP.
- Heater UNAVAILABLE signal is generated by HLCP.

Motor UNAVAILABLE signal must be reset on HLCP to restart the unit.

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6 CAUSES AND EFFECTS MATRIX

CROSSWIND

ROSETTI MARINO

BASE LOAD POWER HUB: HVAC CONTROL PANEL

CAUSE

Signal From	Description	–	EFFECT	Description	Shutdown stop all equipment	Start in automatic mode	Start	Start	Start	Start	ALLARM SIGNAL	MODBUS TCP/IP		Shutdown stop all equipment	Start in automatic mode	Start	Start	Start	Start	ALLARM SIGNAL	MODBUS TCP/IP		Shutdown stop all equipment	Start in automatic mode	Start	Start	Start	Start	ALLARM SIGNAL	MODBUS TCP/IP		Shutdown stop all equipment	Start in automatic mode	Start	Start	Start	Start	ALLARM SIGNAL	MODBUS TCP/IP
				Equipment	B100-HSB-001	B100-HSB-001	HHU-77001	HHU-77002	HHS-77-00112	HHS-77003	SIS	PCS		B200-HSB-001	B200-HSB-001	HHU-77003	HHU-77004	HHS-77-00445	HHS-77004	SIS	PCS		B300-HSB-001	B300-HSB-001	HHU-77005	HHU-77006	HHS-77-00178	HHS-77-009	SIS	PCS		B400-HSB-001	B400-HSB-001	HHU-77007	HHU-77008	HHS-77-01011	HHS-77-012	SIS	PCS
				System	HVAC	HVAC	HVAC	HVAC	HVAC	HVAC				HVAC	HVAC	HVAC	HVAC	HVAC	HVAC				HVAC	HVAC	HVAC	HVAC	HVAC	HVAC				HVAC	HVAC	HVAC	HVAC	HVAC	HVAC		
SIS	HVAC System Shutdown Actuation B100				S																																	
SIS	HVAC System Shutdown Deactivation B100					A	DUTY	STB	A	A																													
PCS	Hhvac System Stop From Modbus					S	S	S	S	S																													
B100-HSB-001	HVAC HHU-77001 malfunction					A	F	DUTY	A	A		X																											
B100-HSB-001	HVAC HHU-77002 malfunction					A	DUTY	F	A	A		X																											
B100-HSB-001	HVAC HHU-77001/2 malfunction					A	F	F			X																												
B100-HSB-001	HVAC HHU-77001 filter dogged																																					
B100-HSB-001	HVAC HHU-77002 filter dogged											X																											
SIS	HVAC System Shutdown Actuation B200													S																									
SIS	HVAC System Shutdown Deactivation B200														A	DUTY	STB	A	A																				
PCS	Hhvac System Stop From Modbus														S	S	S	S	S																				
B200-HSB-001	HVAC HHU-77003 malfunction														A	F	DUTY	A	A		X																		
B200-HSB-001	HVAC HHU-77004 malfunction														A	DUTY	F	A	A		X																		
B200-HSB-001	HVAC HHU-77003/4 malfunction														A	F	F			X																			
B200-HSB-001	HVAC HHU-77003 filter dogged																																						
B200-HSB-001	HVAC HHU-77004 filter dogged																				X																		
SIS	HVAC System Shutdown Actuation B300																					S																	
SIS	HVAC System Shutdown Deactivation B300																						A	DUTY	STB	A	A												
PCS	Hhvac System Stop From Modbus																						S	S	S	S	S												
B300-HSB-001	HVAC HHU-77005 malfunction																						A	F	DUTY	A	A		X										
B300-HSB-001	HVAC HHU-77006 malfunction																						A	DUTY	F	A	A		X										
B300-HSB-001	HVAC HHU-77005/6 malfunction																						A	F	F			X										
B300-HSB-001	HVAC HHU-77005 filter dogged																																					
B300-HSB-001	HVAC HHU-77006 filter dogged																												X									
SIS	HVAC System Shutdown Actuation B400																															S						
SIS	HVAC System Shutdown Deactivation B400																																A	DUTY	STB	A	A		
PCS	Hhvac System Stop From Modbus																																S	S	S	S	S		
B400-HSB-001	HVAC HHU-77007 malfunction																																A	F	DUTY	A	A		X
B400-HSB-001	HVAC HHU-77008 malfunction																																A	DUTY	F	A	A		X
B400-HSB-001	HVAC HHU-77007/8 malfunction																																A	F	F			X	
B400-HSB-001	HVAC HHU-77007 filter dogged																																						
B400-HSB-001	HVAC HHU-77008 filter dogged																																						X

S : SHUTDOWN
A: AUTOMATIC
DUTY : UNIT START
STD: UNIT STAND BY
F: UNIT FAULT
X: SIGNAL TO

NOTES:

Base Load Power Hub (BLPH)

INSTALLATION, OPERATING AND MAINTENANCE MANUAL

Document Number: 1724000049-MD-MAN-00061

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

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Sign	Date
M. Gatti	02/09/2025

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1	20/06/2025	Issue for Information (IFI)	FP	MR	OA
0	26/02/2025	Issue for Information (IFI)	FP	MR	OA

ALEXSISTEMI spa

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Rev.	Description
0	Issue for Information (IFI)
1	Issue for Information (IFI)
2	Issue for Information (IFI)

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None

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

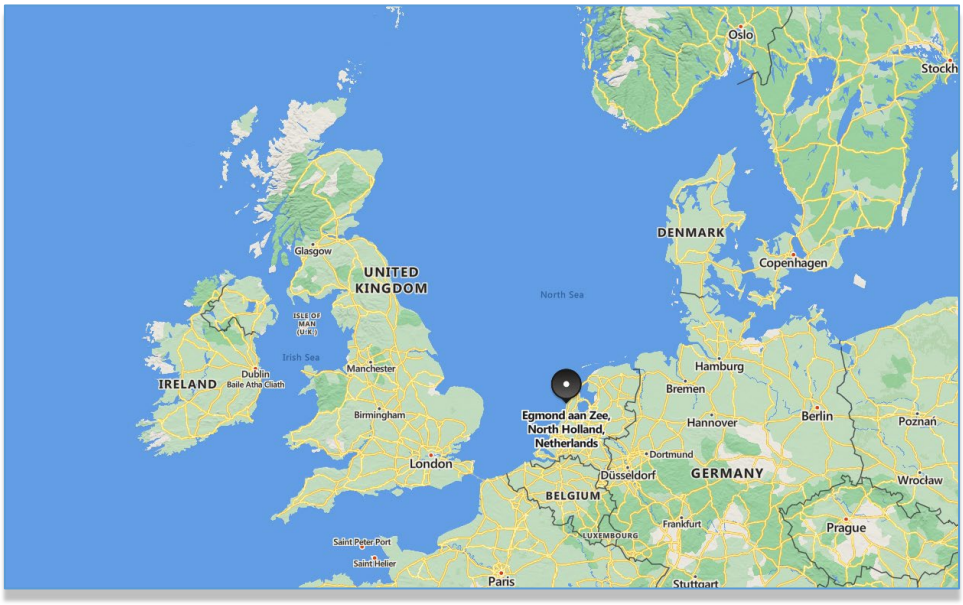


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

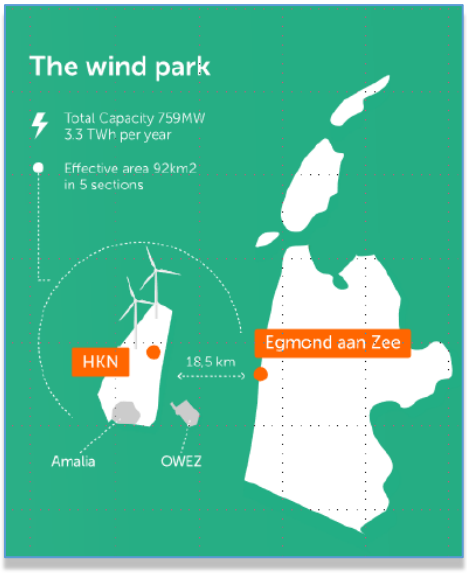


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

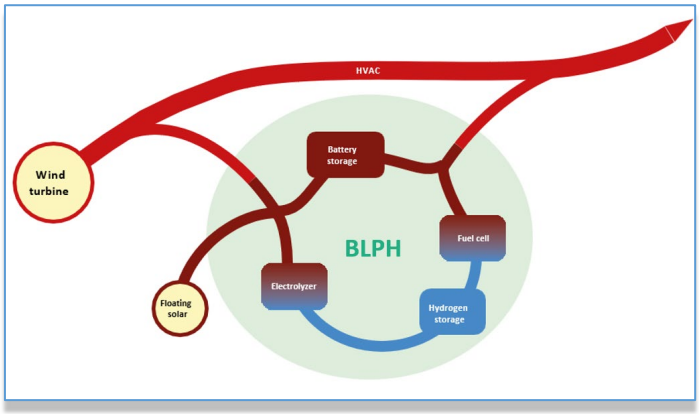


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

This manual provides detailed instructions for the installation, operation, and maintenance of the Base Load Power Hub (BLPH), an integrated energy storage and management system designed to ensure continuous power supply within the Hollandse Kust Noord offshore wind farm. It is intended for qualified technicians and includes safety guidelines, operational procedures, required tools, and technical references.

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

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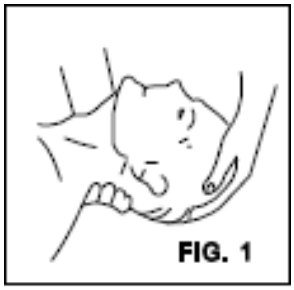
3 FIRST AID AND GENERAL SAFETY ADVICES

- IN CASE OF ELECTRIC SHOCK DO NOT TOUCH THE PATIENT WITH BARE HANDS until the circuit has been interrupted.

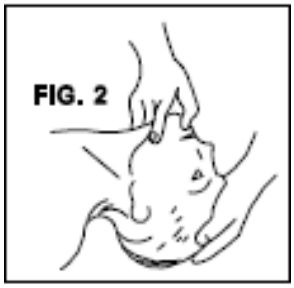
Interrupt the circuit by opening the mains circuit breakers; if this is not possible PROTECT YOURSELF WITH DRY MATERIAL and then free the patient from the conductor.

ARTIFICIAL RESPIRATION - Mouth-to-mouth Method

It is essential to start respiration at once and immediately ask for a doctor's intervention.


FIG. 1

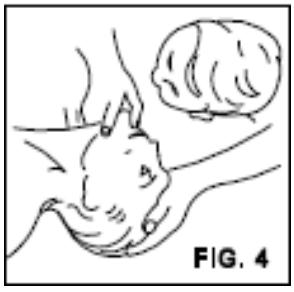
1) Place the patient with face upwards and arms parallel to the body;
If the patient is lying on an inclined plane, make sure that the stomach Is slightly lower than the chest. Open the patient's mouth and check that there are no foreign bodies (denture - chewing-gum– etc).
Kneel near the patient at the same height of his head, place one hand under his head and one under his neck (Fig. 1).
LIFT THE PATIENT'S NECK AND TILTS HIS HEAD BACK AS FAR AS POSSIBLE.


FIG. 2

2) Move your hand from the patient's neck to his chin: place your thumb between chin and mouth, your forefinger along the maxillary bone, keep the other fingers closed (Fig. 2). During these operations, start self-ventilation by breathing in deeply with open mouth.


FIG. 3

3) With your thumb between the patient's chin and mouth, keep his lips closed; apply your lips onto the patient's nostrils and blow into his nasal cavities (Fig.3).


FIG. 4

4) During these operations watch to check whether the patient's chest rises (Fig. 4). If not, the nose may be obstructed: then, levering on his chin with your hand, open the patient's mouth as wide as possible, put your lips around it and blow into the oral cavity. Watch if the patient's chest rises. You can use this latter method instead of the former even when the patient's nose is not obstructed, provided his nostrils are kept closed by your hand after moving

the latter from his head.
THE PATIENT'S HEAD MUST BE KEPT TILTED BACK AS FAR AS POSSIBLE.

5) Start by breathing out quickly and deeply for ten times, then go on with about twelve/fifteen expirations per minute. Continue until the patient has regained consciousness, or until a doctor ascertains his death.

TREATMENT FROM BURNS

This treatment must be applied after the patient has regained consciousness. It may be applied even during artificial respiration (however, there must be at least two persons).

a. DO NOT TRY TO REMOVE CLOTHING FROM THE BURNED PARTS.
b. Apply dry gauze on burns.
c. DO NOT apply ointments or other oily tinctures.

SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of installation, operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

All personnel are warned not to engage in repairs or adjustments within live, high-voltage equipment. Moreover, though power has been removed from equipment circuits, dangerous potentials may still exist due to charges retained by capacitors. Always remove power, discharge and ground a circuit prior to touching it. Before making adjustments, trained personnel should ensure that circuits are grounded. If possible, adjustments should be made with one hand, keeping the other free of the equipment.

DO NOT SERVICE LIVE EQUIPMENT UNASSISTED

When repair, replacement, or alignment is required with power applied, under no circumstances should it be attempted alone. Only trained personal with adequate personal protective equipment should be permitted. The immediate presence of someone capable of rendering aid is required.

RESUSCITATION

All personnel working with or near high-voltage shall be instructed in the latest methods of cardiopulmonary resuscitation. Should someone be injured by electricity and stopped breathing, begin resuscitation immediately. Warnings appear in the text in this manual, and are emphasized where necessary.

4 WARNING SIGNS AND NOTICES – TO READ BEFORE USE



HIGH VOLTAGE

In presence of this signal be sure not to come in contact with electrical components as you may be affected by an electrical shock.



FLAMMABLE MATERIAL

In presence of this signal be sure not to use anything that could inflame the components.



DANGER OF DEATH

In presence of this signal be absolutely sure not to do anything if you are not a certificate operator. These components are the most dangerous as they may cause the death.



IRRITATION HARMFUL SUBSTANCES

In presence of this signal be sure not to come in contact with reported substances, as they could damage irreversibly your skin.



GENERAL BAN

In presence of this signal don't exceed the stopping point. This because there is one or more dangers after that and isn't a safe area.



GEARS BAN

In presence of this signal don't put your hands in the gears of the machine or in it working areas.



GENERIC DANGERS

In presence of this signal pay attention at all the component in this area. This signal has two reasons for be used:

1) There are many signs to be reported and not enough space for them;

2)There isn't an exact signal for the danger in this area



GENERAL NOTICE SIGN

1) The practice of the component equipped inside cabin must be execute by expert and technically prepared staff.
2) Use the component equipped inside cabin only after reading carefully this manual and under the respect of the indications.



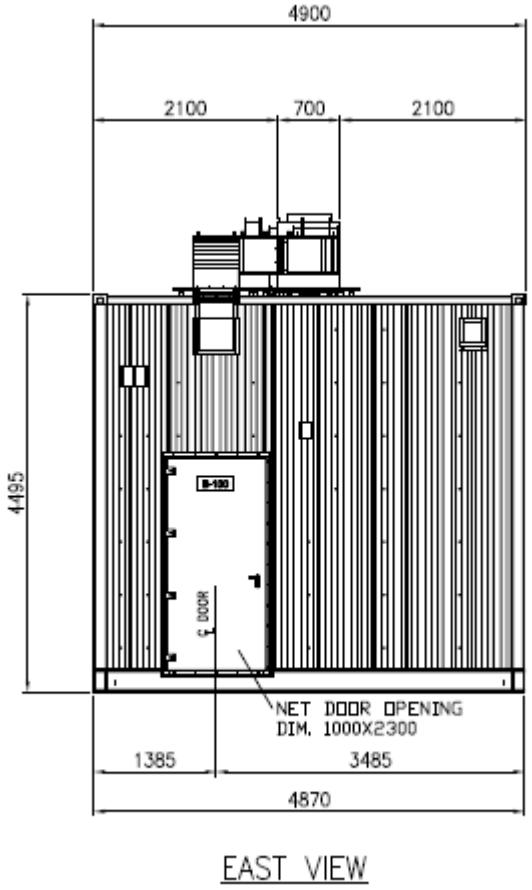
RISK OF EXPLOSION In presence of this signal, the area is under risk of fire or explosion. No welding, cutting or brazing in this area.

Combustible gas explosion hazard.

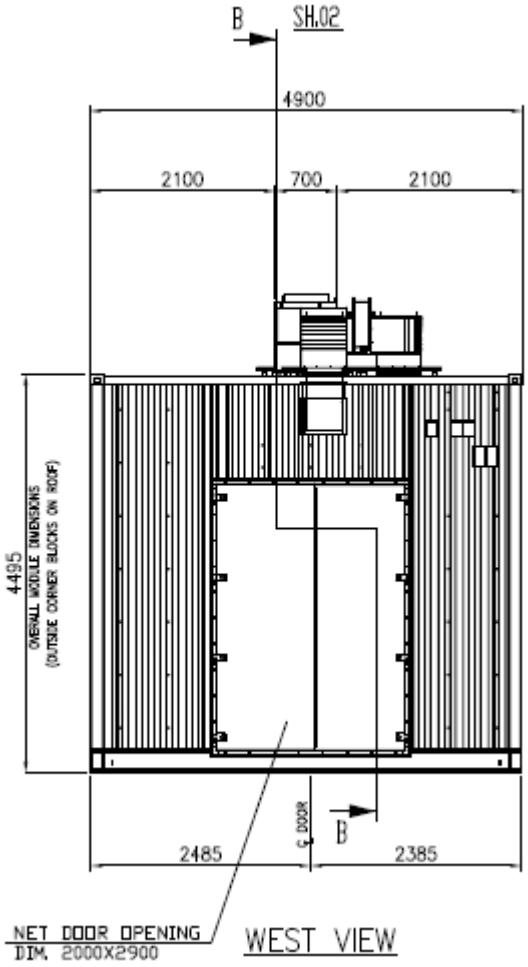
5 GENERAL LAYOUT

- Shelter's External General Layout:

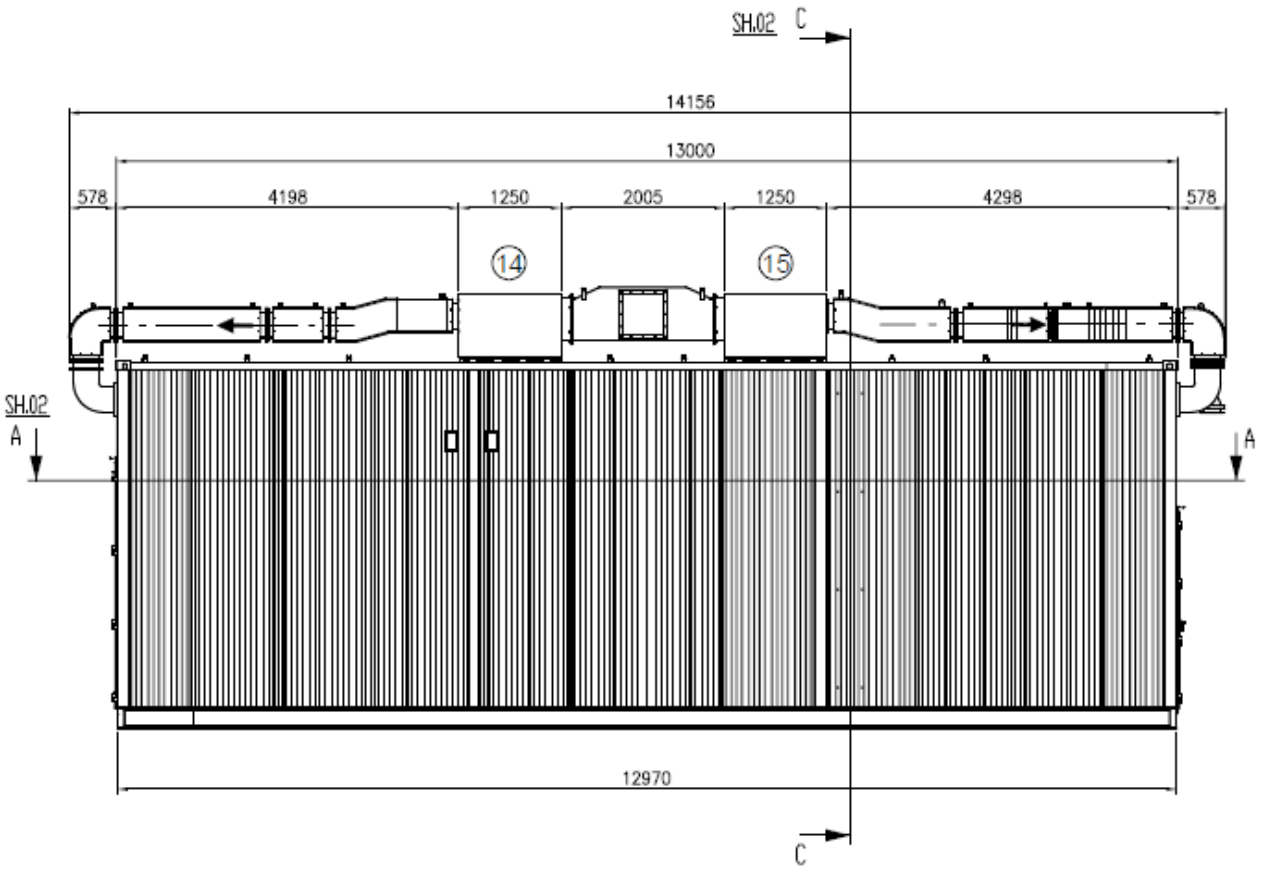
B-100 HV (66kV/6.6kV) SWITCHGEAR ROOM



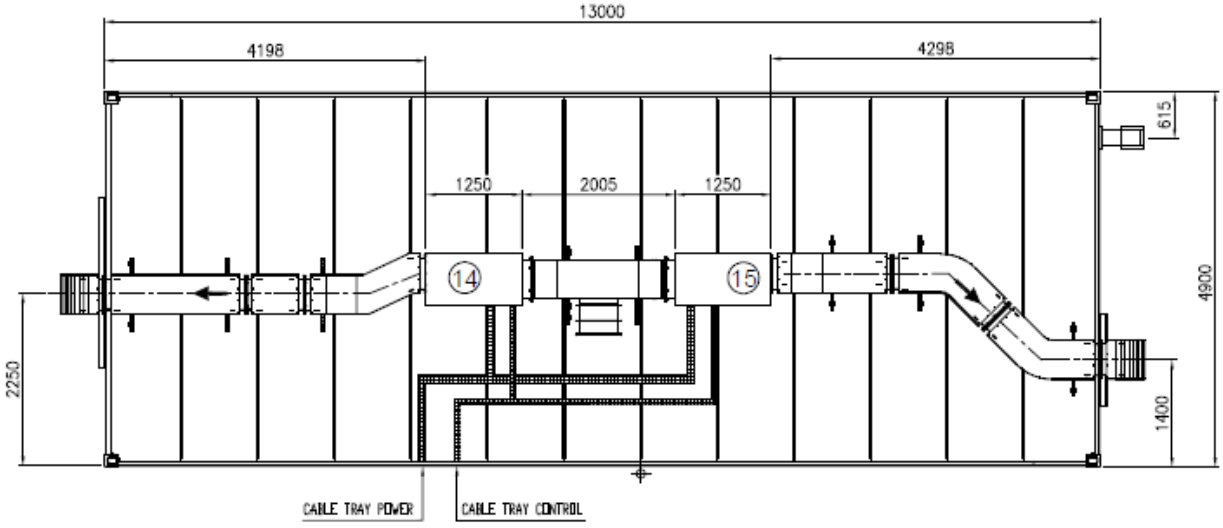
EAST VIEW



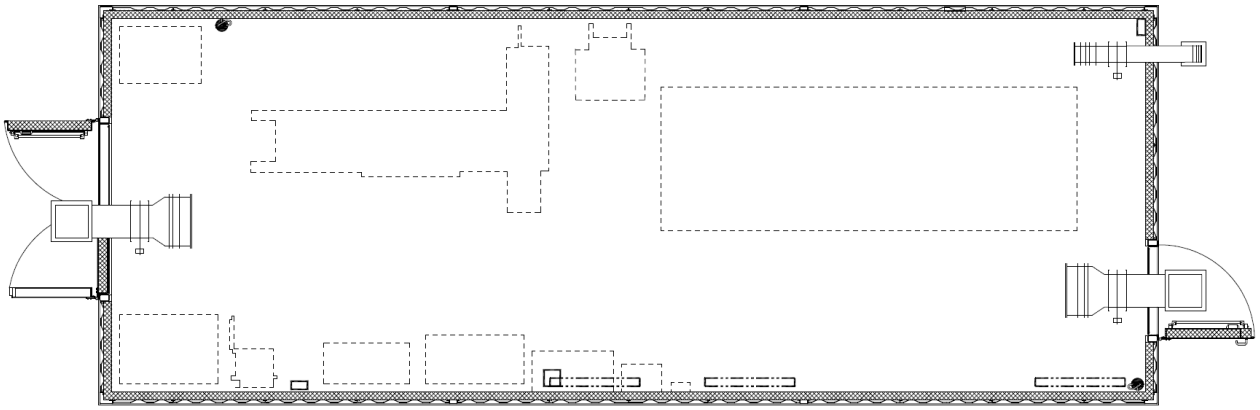
WEST VIEW


SH.02
C
14156
13000
578
4198
1250
2005
1250
4298
578
14
15
SH.02
A
A
12970
C

SOUTH VIEW

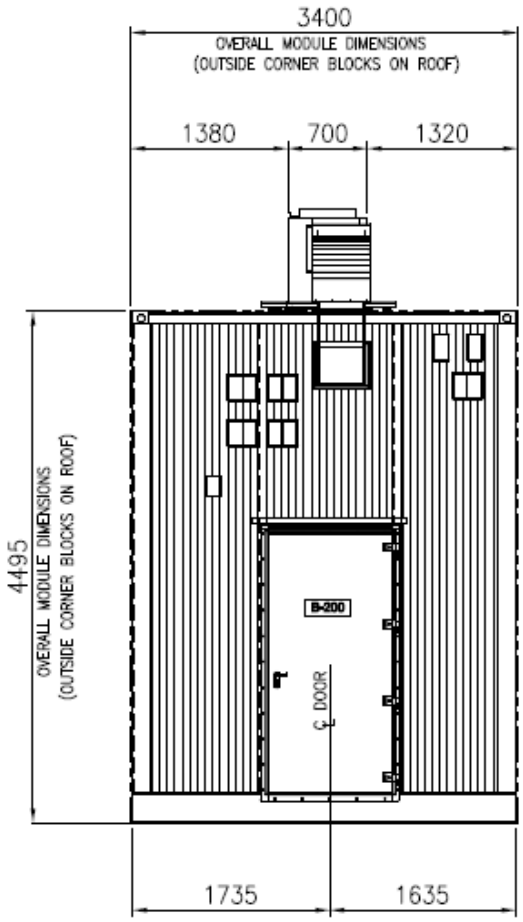


TOP VIEW

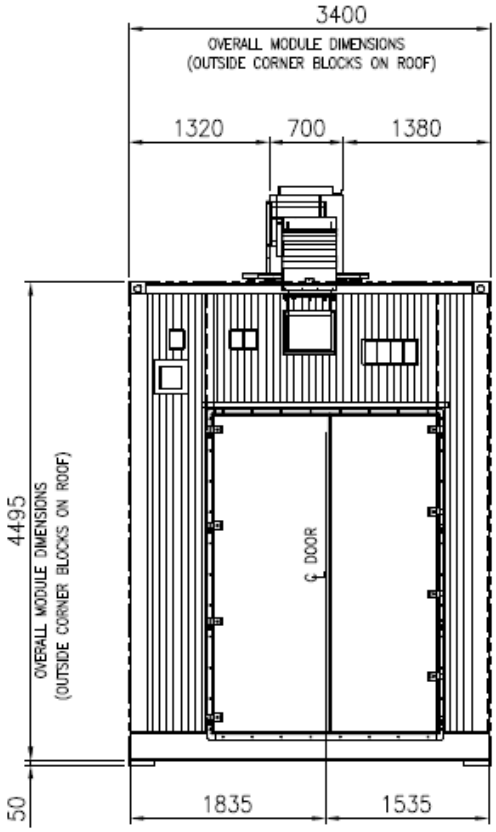


PLAN

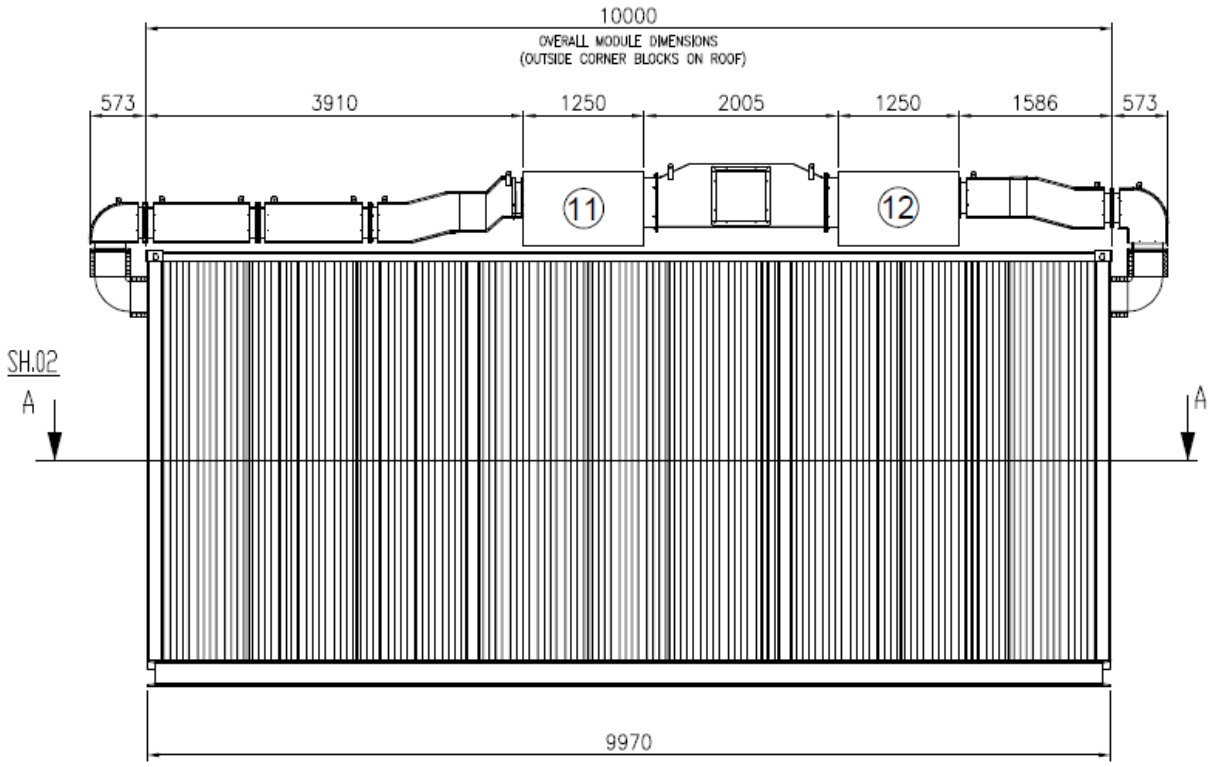
B-200 LV (400V) SWITCHGEAR ROOM



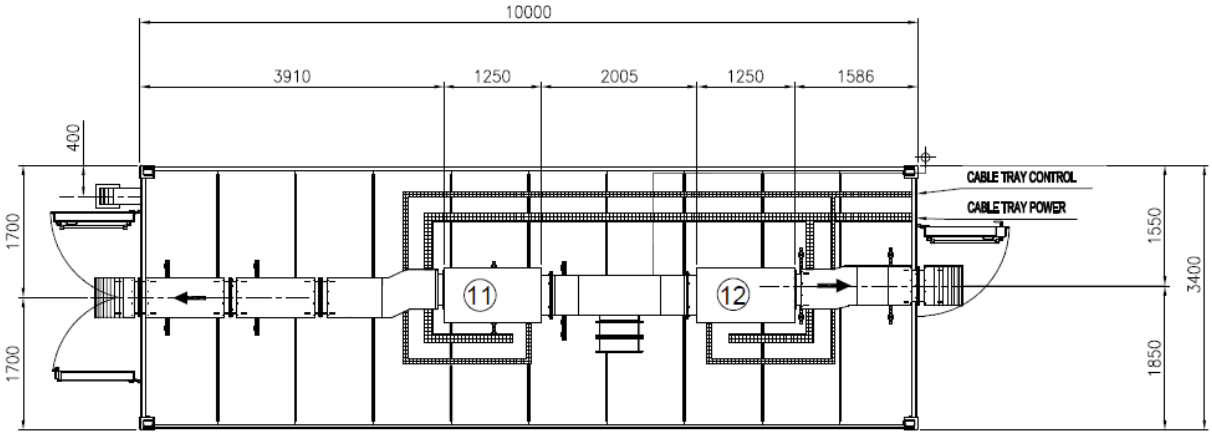
EAST VIEW



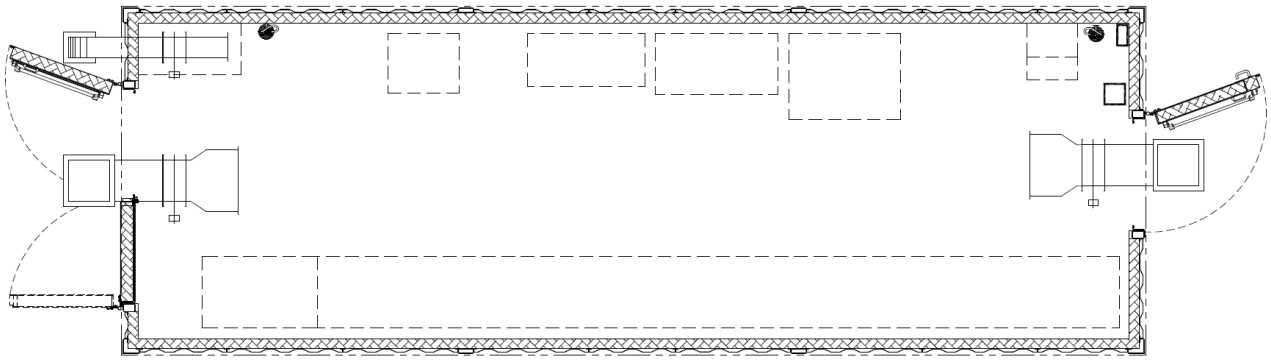
WEST VIEW


10000
OVERALL MODULE DIMENSIONS
(OUTSIDE CORNER BLOCKS ON ROOF)
573
3910
1250
2005
1250
1586
573
11
12
SH.02
A
A
9970

SOUTH VIEW

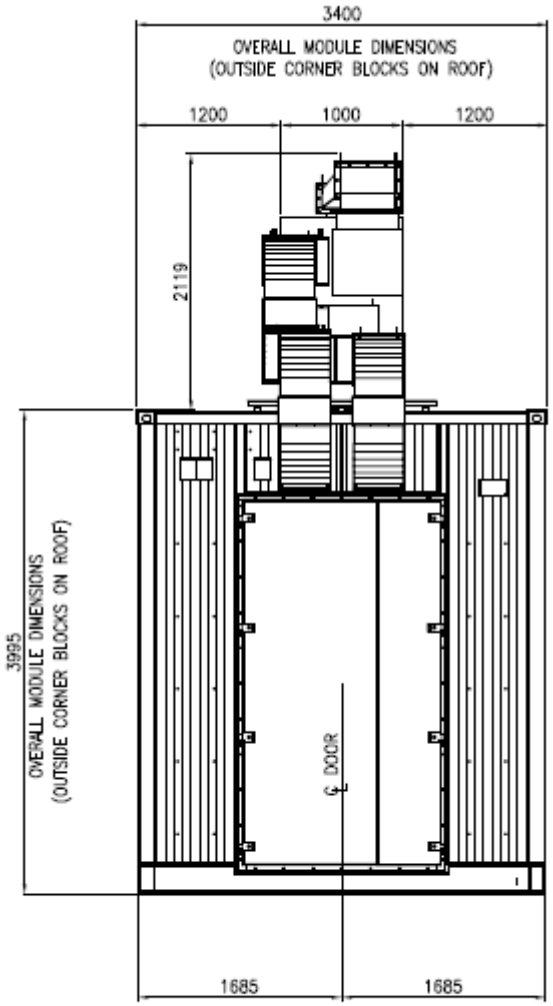


TOP VIEW

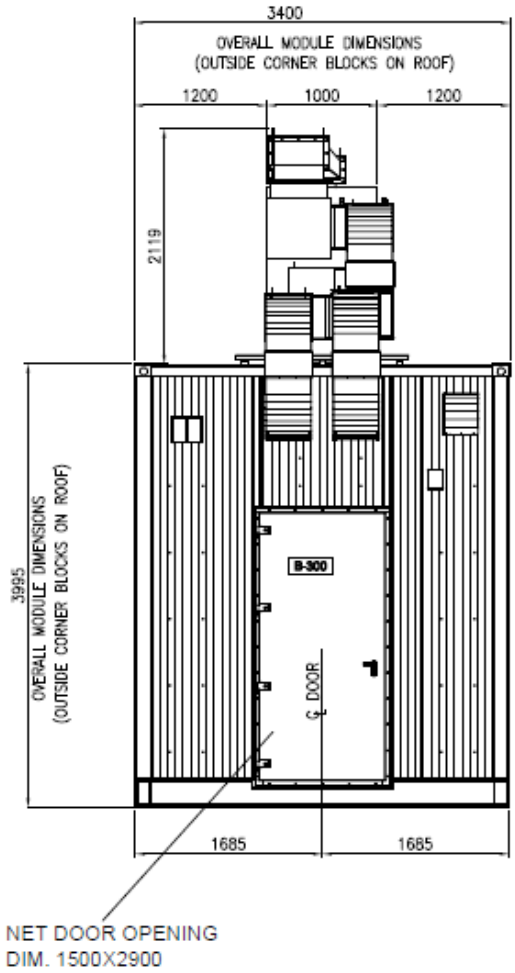


PLAN

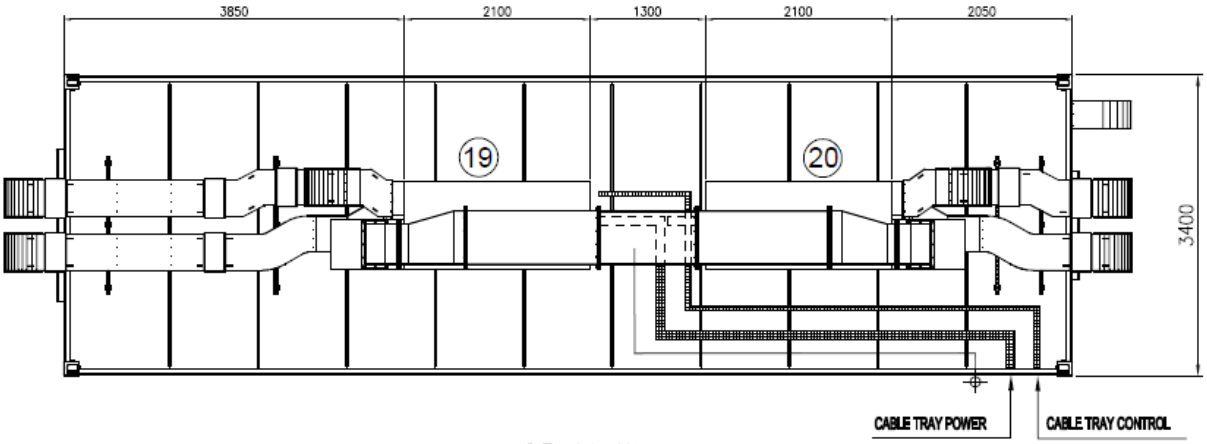
B-300 AC UPS FITTED WITH UPS SYSTEM EQUIPMENT ROOM



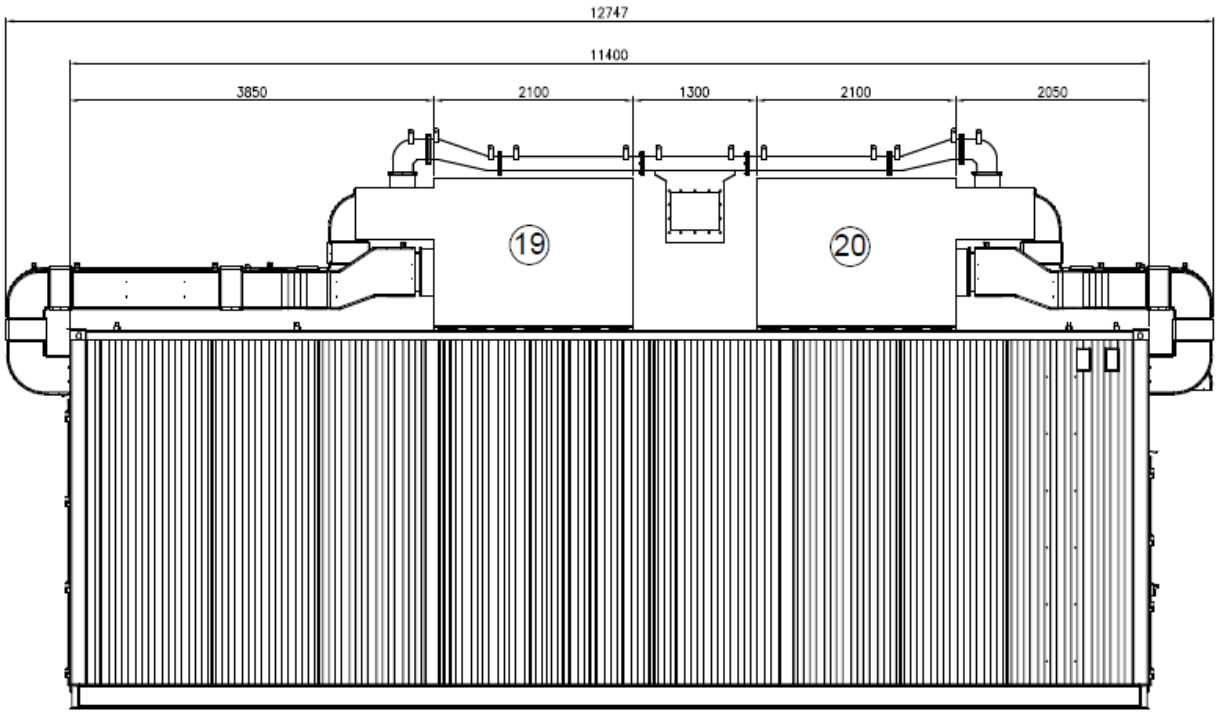
WEST VIEW



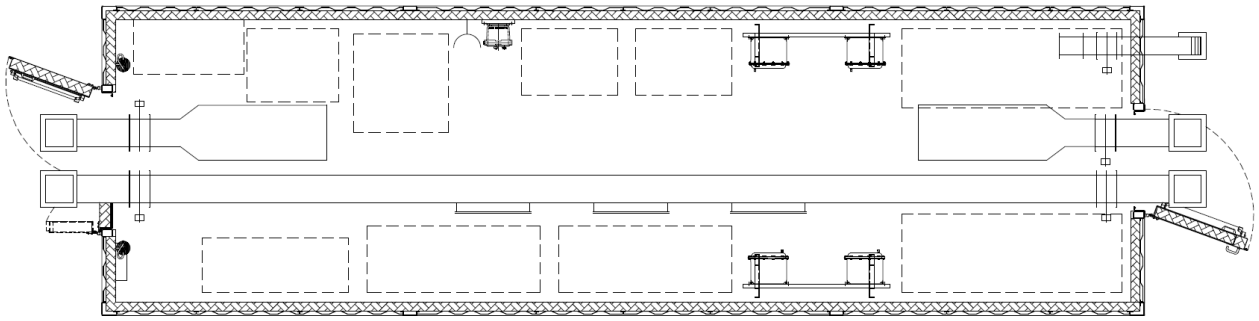
EAST VIEW



TOP VIEW

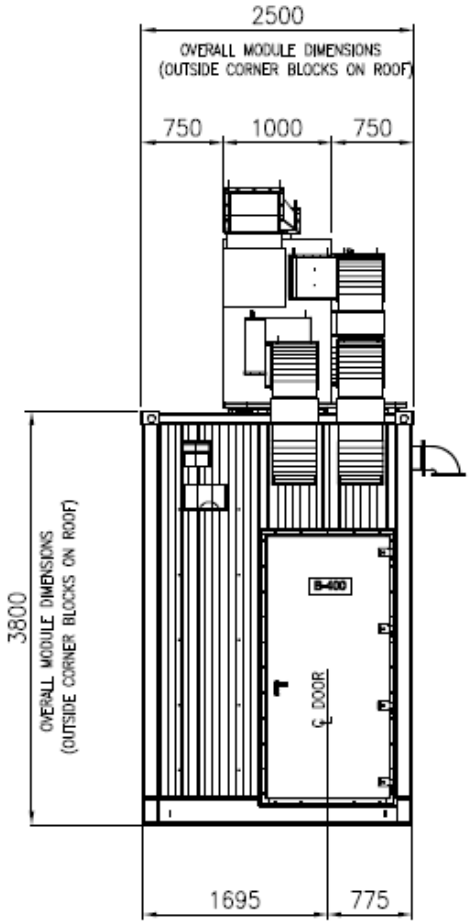


SOUTH VIEW

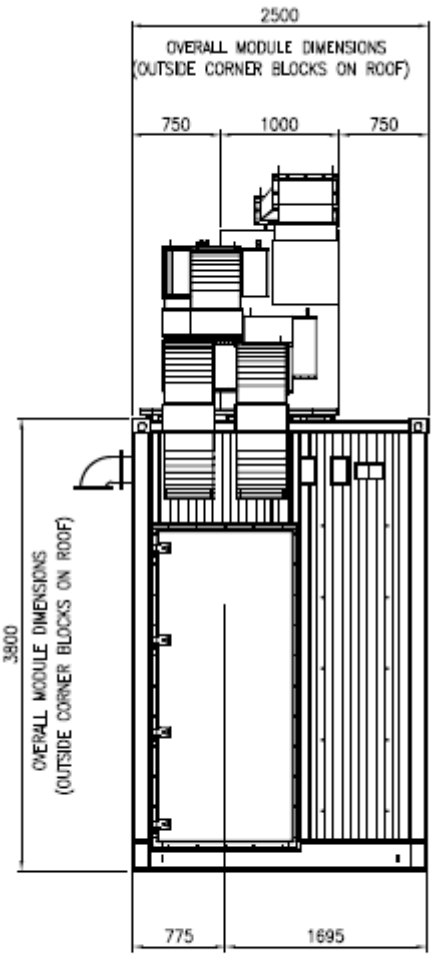


PLAN

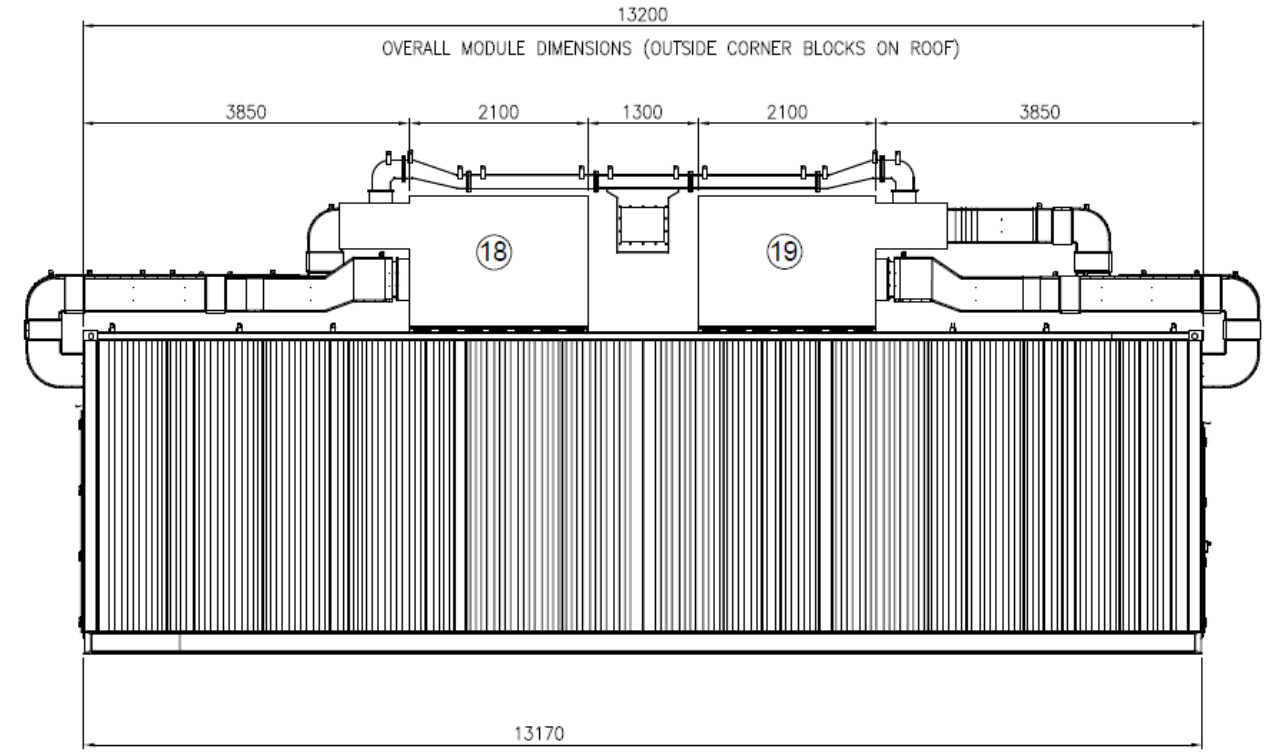
B-400 I&T EQUIPMENT ROOM



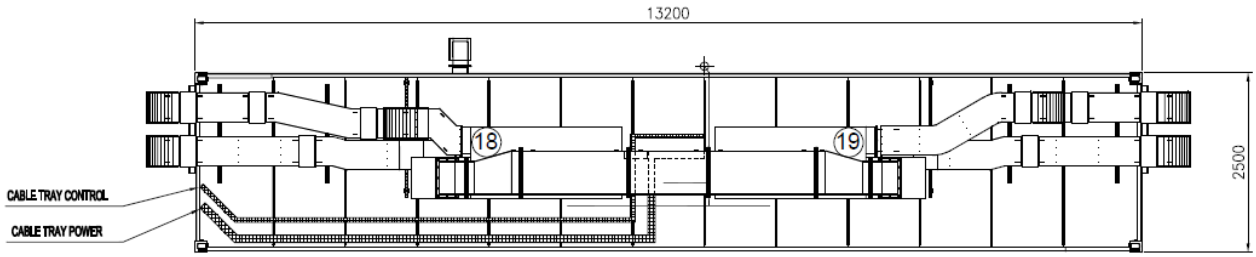
EAST VIEW



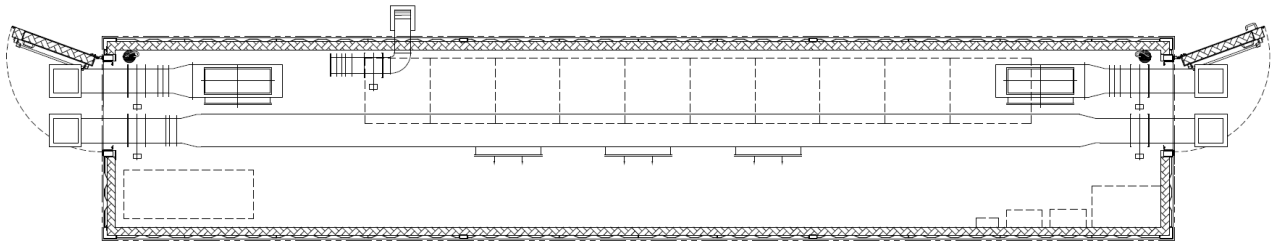
WEST VIEW



SOUTH VIEW



TOP VIEW



PLAN

6 GENERAL NOTES

- SHELTERS:

B-100 HV (66kV/6.6kV) SWITCHGEAR ROOM:

Cabin's weight: 40000 kg. (Approx.) fully equipped
Dimension: 13000 x 4900 x 4500 mm (L x W x H)

B-200 LV (400V) SWITCHGEAR ROOM:

Cabin's weight: 33000 kg. (Approx.) fully equipped
Dimension: 10000 x 3400 x 4500 mm (L x W x H)

B-300 AC UPS FITTED WITH UPS SYSTEM EQUIPMENT ROOM:

Cabin's weight: 35000 kg. (Approx.) fully equipped
Dimension: 11400 x 3400 x 4000 mm (L x W x H)

B-400 I&T EQUIPMENT ROOM:

Cabin's weight: 20000 kg. (Approx.) fully equipped
Dimension: 13200 x 2500 x 3800 mm (L x W x H)

⚠ NOTES:

Shelter is composed of a module, divided in N. 1 rooms and Air Pressurizers, externally mounted.

During the commissioning phase make sure to enable the Power Input Feed ONLY when all the other internal cables have been connected and preliminary tested as correct.

Once having mechanically installed all the electrical panels, a different routing of the cables layout could become impossible to perform.

The necessary cables have to be pulled before the Cabin's electrical activation.

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- All the external openings, on each module, have been sealed for transportation purpose, and the external elements isolated and sealed, to protect them from humidity, dust or damages, during transportation.
- Please remove every protection, before any of the mounting or re-connection procedures!

- Floor is composed of 18mm thick plywooden panels with embossed metal sheet.
- All threaded joints have been designed to use metric Tools.

⚠ LIFTING NOTE:

- Use always certified hoisting devices with adequate SWL.
- Use adequate crane evaluating the weight of Shelter and the outreach.
- Each chain must have a hoist certified of adequate load.
- Lifting of the Shelter must be done with always four lifting point.
- The crane hoisting power depend on the working range.

⚠ NOTES:

- The control cabins can be lifted from proper lifting points, placed in the upper edges of Cabins' Lifting pillars.
- To fix the lifting chains take off hooks from each corner.
- Important issue is taking care to the lifting system: it MUST be one of the represented in the dedicated annexed schemes. NO OTHER LIFTING SCHEME IS ADMITTED. Refer to chapter n.7 Lifting Scheme

⚠ ATTENTION: for technical details please see Reference Documents.

- BE SURE THAT THE ROPES/CHAINS' SWL (Safety Working Load) HAS ENOUGH SAFETY LIFTING MARGIN TO LIFT THE SHELTER WEIGHT.

- TO CALCULATE THE CORRECT ROPE/CHAIN SWL PLEASE REFER THE WEIGHT ON DATA PLATE LOCATED CLOSE TO THE MAIN DOOR.

- To lift the Shelter, use appropriate lifting eyes, placed on the top corners, with metallic ropes.

- According to the weight indicated on the data plate, use the hooks of the appropriate SWL weight capacity, taking in consideration the lifting strain values.

7 ASSEMBLY, TESTS AND MAINTENACE

- After having successfully passed **Alex-sistemi**'s FAT and all certificated controls, it has been necessary to disassemble some equipments due to the shipment limitations.
- The reconnection procedure, all tests of correct operation and subsequent maintenance should be entrusted to qualified technicians.
- Technicians have to be qualified to issue certificates of working proper execution and correct installation of all systems, according to local regulations.
- Tests that have to be performed prior to the re-activation of the shelter.
- Be sure to use only the specified accessories and parts for installation work.

DO NOT ACTIVATE ANY INSTALLATION BEFORE HAVING PERFORMED ALL TESTS AND OBTAINED LOCAL REGULATION CERTIFICATIONS.

- **Alex-sistemi** recommend to perform maintenance procedures in time-needed: IN CASE OF MALFUNCTIONS DUE TO A MAINTENANCE DEFICIENCY,

- **Alex-sistemi** WON'T ASSUME THE RESPONSIBILITY FOR DAMAGES CAUSED TO THE SHELTER OR OTHER LINKED STRUCTURES.

- Please store this manual for future reference.

⚠ ATTENTION:

All the assembly procedures and other operations indicated in this manual have to be performed by qualified technicians, paying attention to the instructions here contained.

8 TOOLS NEEDED

- All the operations on the shelter have to be performed by qualified technicians, acting following the worksite safety standards, using the proper protections (a helmet, protective glasses and gloves, reinforced shoes) and slings, if necessary.

- Shelter has been designed by choosing to use only threaded joints with metric heads.
- Tools that are necessary during the process of mounting and maintaining of the shelter are listed below:
  - > Properly dimensioned cranes
  - > Lifting cricket, to lift from the perimetral eyebolts
  - > A series of 6mm to 36mm metric wrench
  - > Manual HEX wrench, for lifting eyebolts only
  - > Phillips-head screwdrivers
  - > A series of 6mm to 36mm Torques
  - > A series of 6mm to 36mm Allen wrenches
  - > A multimeter tester
  - > A clamp meter
  - > An hacksaw
  - > A cutter

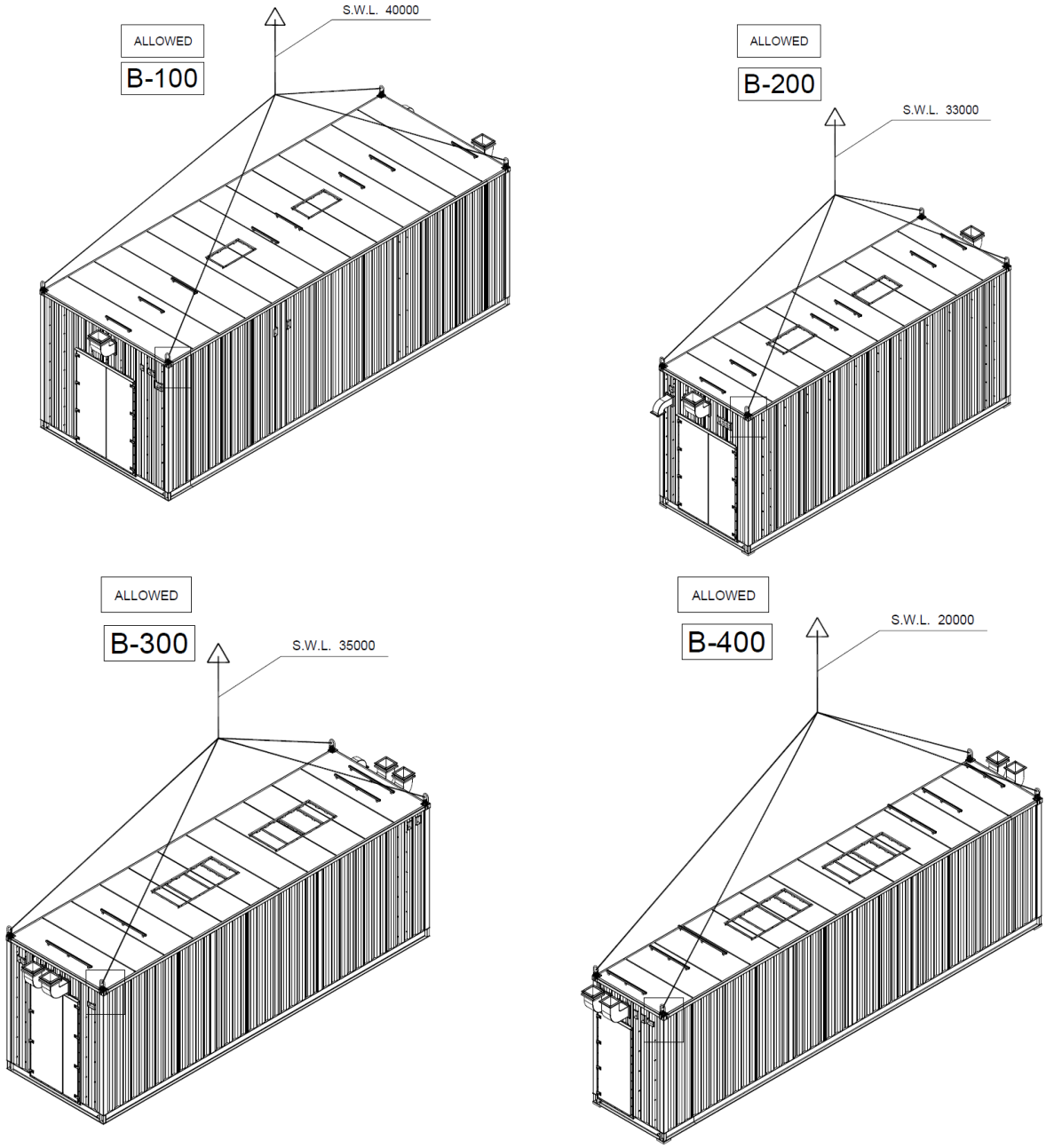
- Also CONSUMABLE materials are needed:
  - > Electrical sealing / Gasketing tape
  - > Teflon tape
  - > Sylicone grease
  - > Hacksaw blades
  - > Cutter blades

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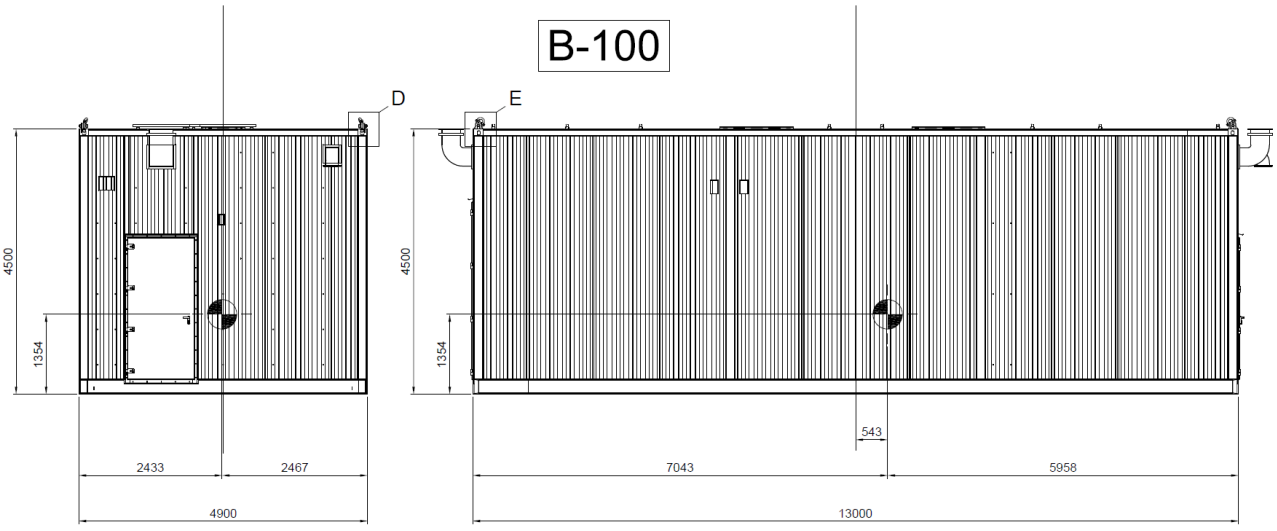
9 LIFTING SCHEME

Rif. Doc. 1724000049-AR-DD-00062 Lifting Drawing E&I Shelters

- Use proper chains, or ropes, with hooks (not provided)



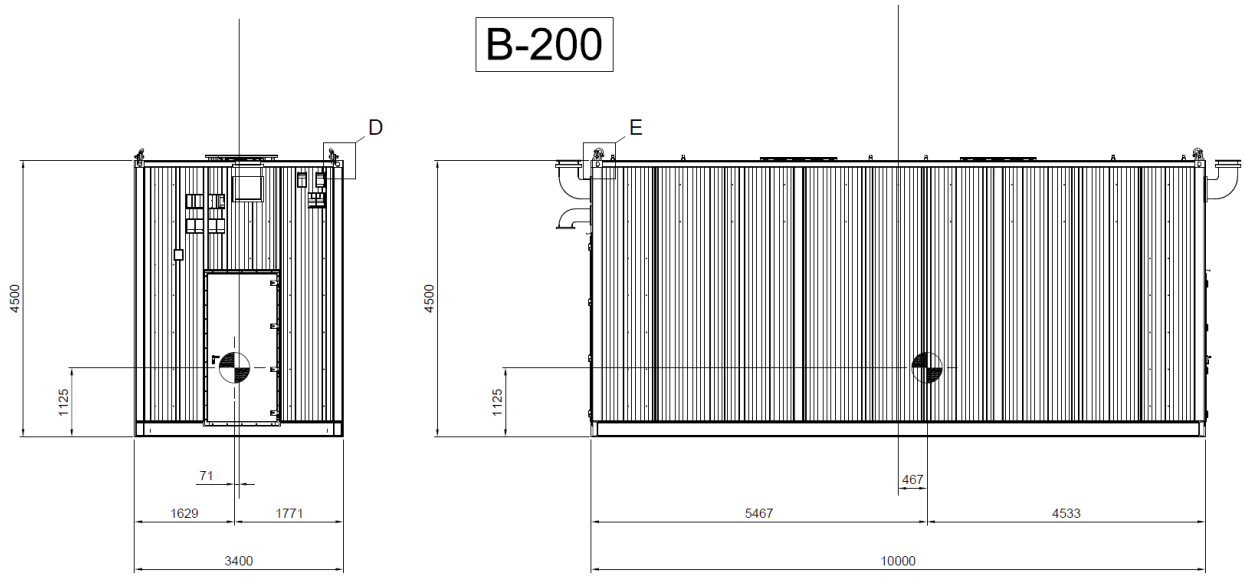
B-100



VIEW FROM "B"

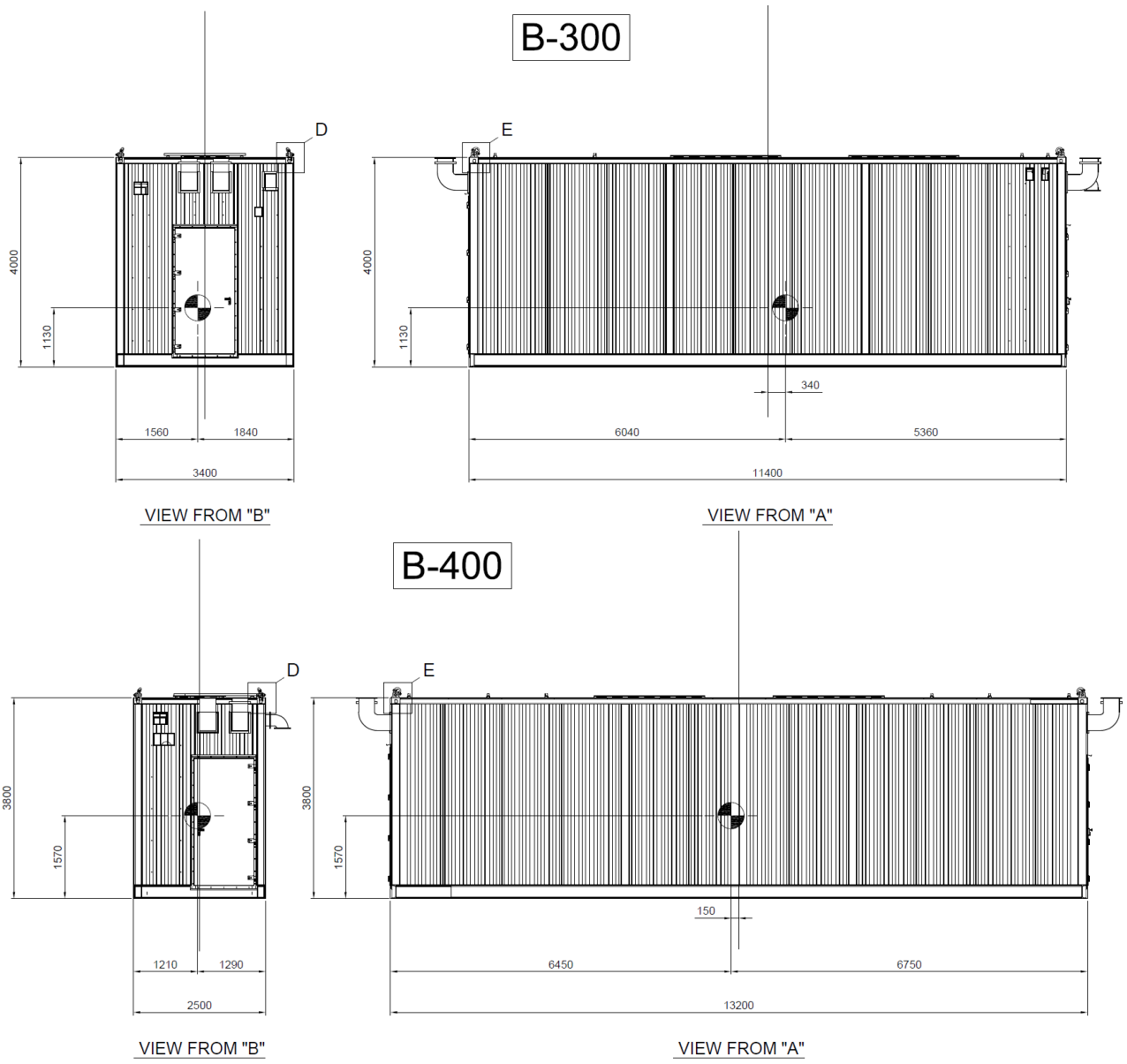
VIEW FROM "A"

B-200

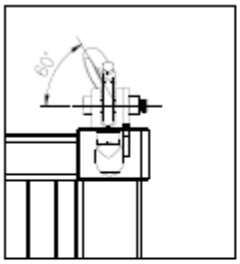


VIEW FROM "B"

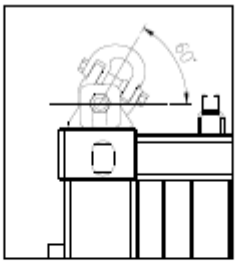
VIEW FROM "A"


B-300
D
E
4000
1130
1560
1840
3400
340
6040
5360
11400
VIEW FROM "B"
VIEW FROM "A"
B-400
D
E
3800
1570
1210
1290
2500
150
6450
6750
13200
VIEW FROM "B"
VIEW FROM "A"

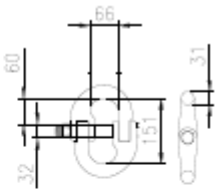
The shelters must be lifted by ISO LUG ASS'Y



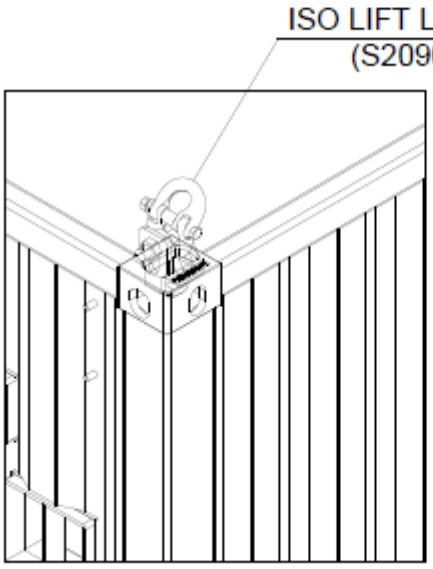
DETAIL D



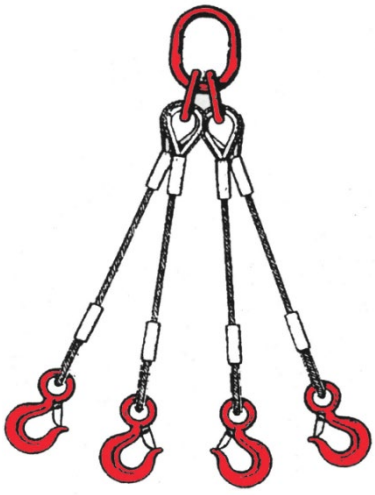
DETAIL E



FLEX LINK DIMENSIONS

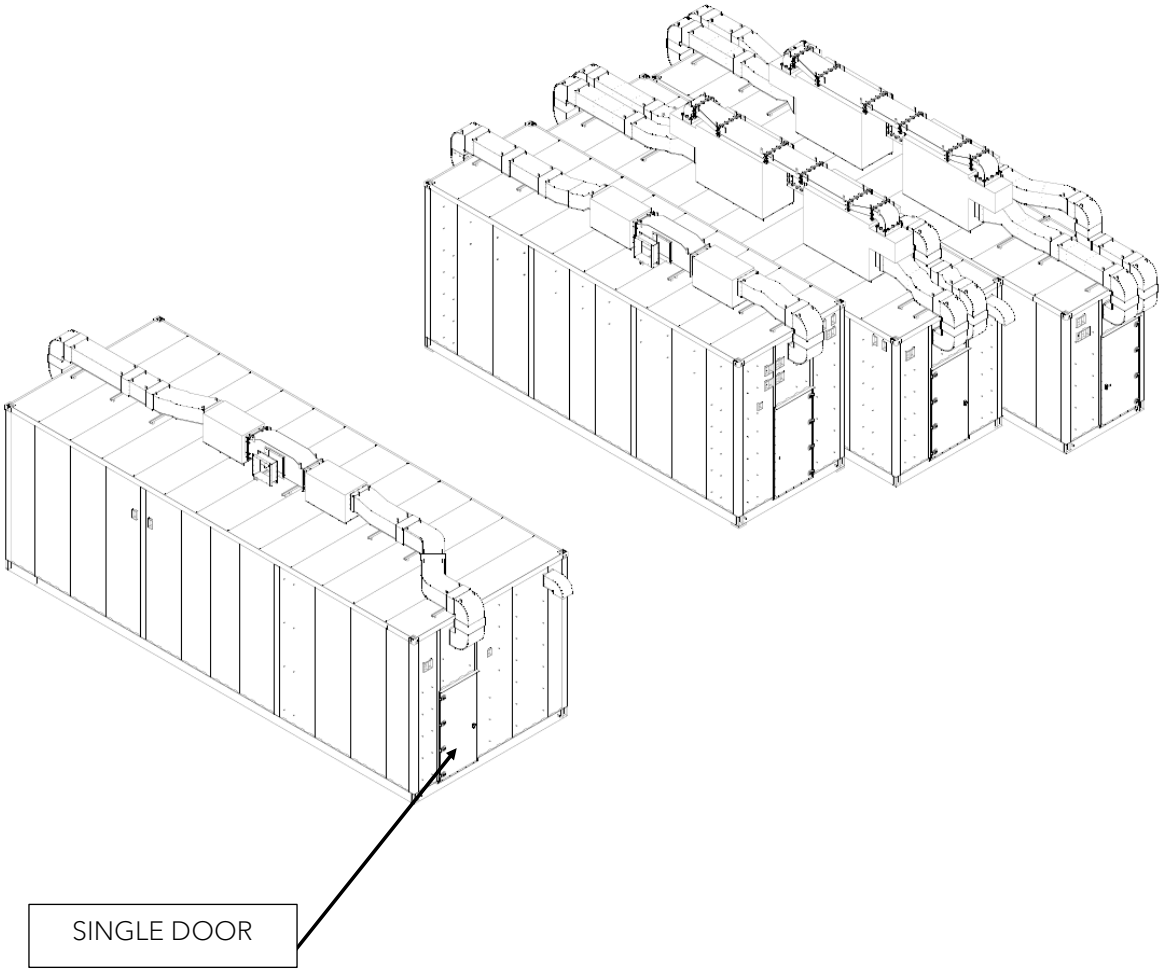


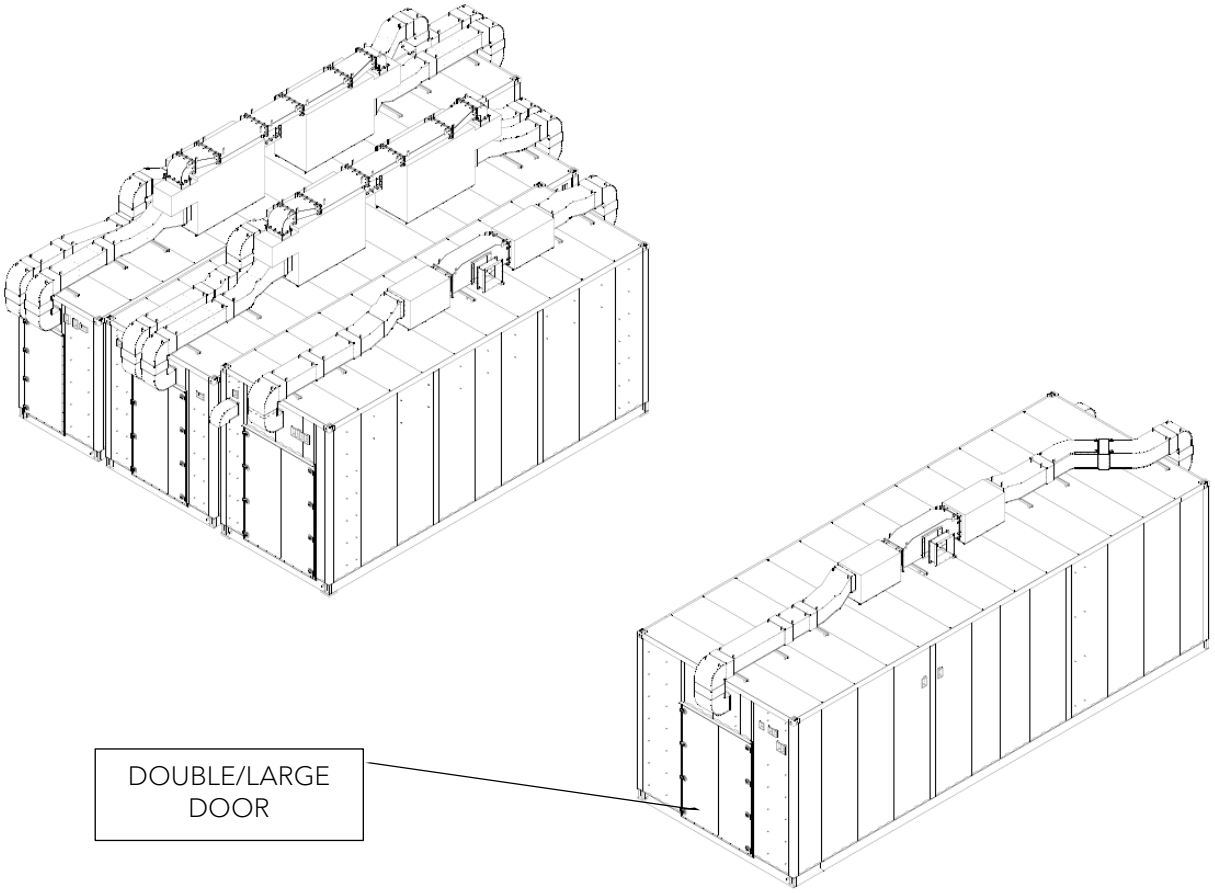
DETAIL C



EXAMPLE OF PROPER CHAINS TO BE USED FOR LIFTING OPERATION

10 DOORS OPENING





- To open the door, use the handle:
- The keys of each door have been fixed to the external handle:



- There are two doors positioned on the short side of the cabinet

- As the other metallic elements, also the External Door has a grounding connection, composed of an copper braid:

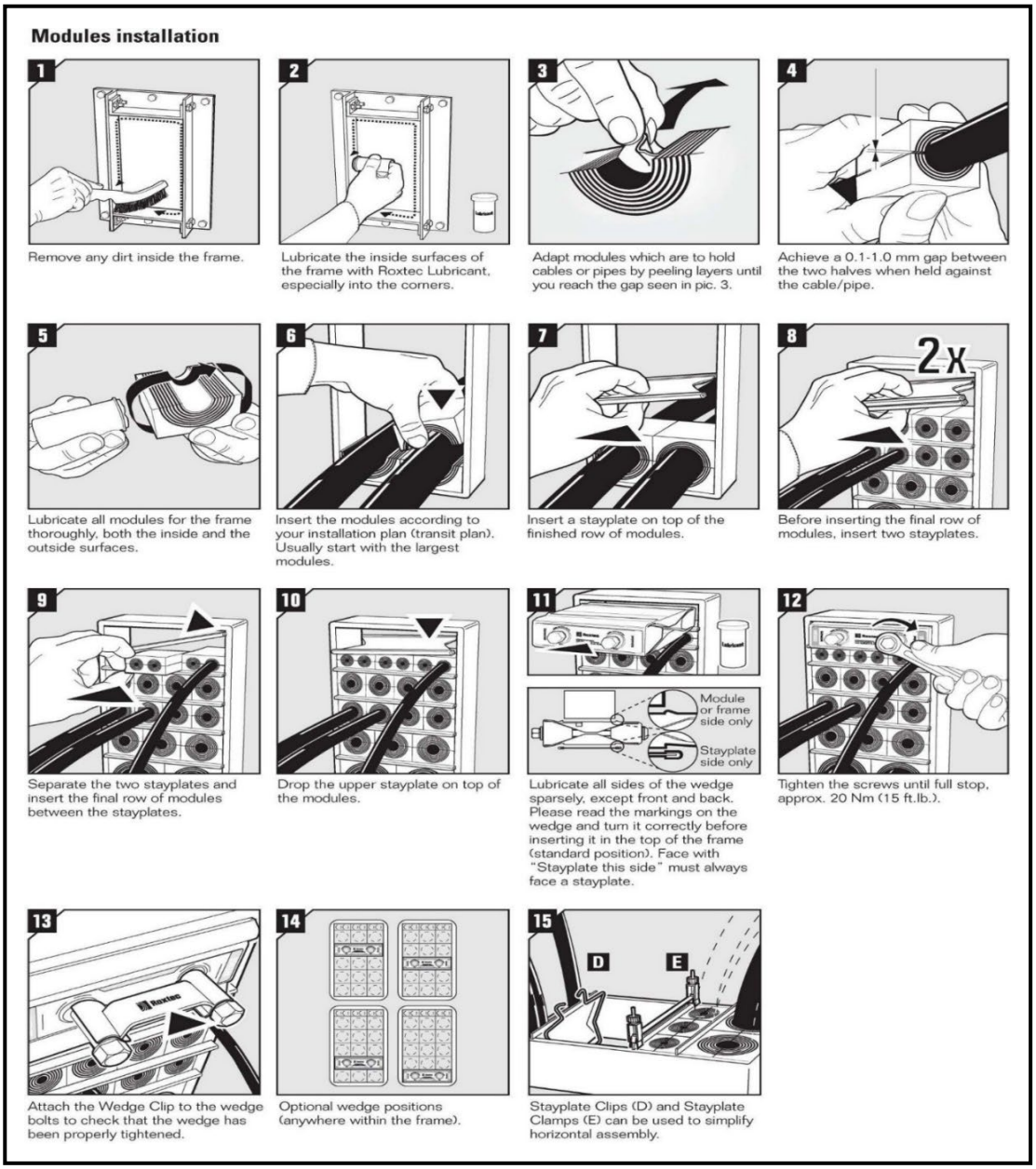


TYPICAL PICTURES

11 ROXTEC CABLE ENTRIES

Rif. Doc. 1724000049-AR-DD-00018 B-100 DETAILED DRAWINGS-E&I SHELTERS
1724000049-AR-DD-00019 B-200 DETAILED DRAWINGS-E&I SHELTERS
1724000049-AR-DD-00020 B-300 DETAILED DRAWINGS-E&I SHELTERS
1724000049-AR-DD-00021 B-400 DETAILED DRAWINGS-E&I SHELTERS

- Cables From Field and HVAC cables goes inside-out the Module through a series of Roxtec Gateways: a system that consents the rapid insertion and fixing of the cables and that guarantees the ATEX protection level of the entries.
- Refer to General Arrangements.



12 AIR HANDLING AND TREATMENT SYSTEM

Due to the different combinations of internal heat dissipations and the set-point to be maintained inside the buildings, the installed systems are of 2 different types. B-100 and B-200 mount pressurization-only units, without air cooling. B-300 and B-400, on the other hand, mount air treatment and pressurization units. The systems, for all 4 buildings, are 100% redundant (2x100% pressurizers for B-100 and B-200 and 2x100% combined treatment and pressurization units for B-300 and B-400. These units are installed on the roof, the air flow is ducted, and the management is entrusted to the internal electrical panel of the building (one for each building). Thanks to temperature transmitters and pressure transmitters the internal condition is constantly monitored and managed by the PLC. Heating, when and if necessary, is entrusted to space heaters installed inside the buildings, with set-up entrusted to the manual thermostat.

All parameters, set points and the management logics regarding the HVAC system can be read and modified through the HMI. Please refer to the reference documents mentioned at chapter 14.

13 MAINTENACE

- Verify every six months the general conditions of the shelter structure, scratches and damage shall be promptly restored following the procedures for touch-up paint usage.

- Verify every six months the good shape of the door gasket, if is necessary restore the damaged section.

- Verify every six months the efficiency of the door closer and the correct function of closing the door.

- Verify every six months the correct function of the door handle and cleanness of the cylinder.

- Verify every six months the following activities shall be permormed:

  > Check of filters
  > Check of fan belt
  > Check of dampers
  > Check of tightness of bolting of units on support frame
  > Check of oil level in compressors
  > Check of refrigerant circuit pressure

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14 REFERENCE DOCUMENTS

Client Document No.	Document
1724000049-AR-DA-00014	B-100 General Arrangement drawings
1724000049-AR-DA-00015	B-200 General Arrangement drawings
1724000049-AR-DA-00016	B-300 General Arrangement drawings
1724000049-AR-DA-00017	B-400 General Arrangement drawings
1724000049-ST-DD-00010	B-100 Foundation drawings-E&I Shelters
1724000049-ST-DD-00011	B-200 Foundation drawings-E&I Shelters
1724000049-ST-DD-00012	B-300 Foundation drawings-E&I Shelters
1724000049-ST-DD-00013	B-400 Foundation drawings-E&I Shelters
1724000049-HV-DA-00064	B-100 HVAC System-G.A. and details
1724000049-HV-DA-00065	B-200 HVAC System-G.A. and details
1724000049-HV-DA-00066	B-300 HVAC System-G.A. and details
1724000049-HV-DA-00067	B-400 HVAC System-G.A. and details
1724000049-AR-DD-00062	B-100 Lifting drawings - E&I Shelters
1724000049-AR-DD-00063	B-200 Lifting drawings - E&I Shelters
1724000049-AR-DD-00064	B-300 Lifting drawings - E&I Shelters
1724000049-AR-DD-00065	B-400 Lifting drawings - E&I Shelters
1724000049-HV-DA-00026	B-100 HVAC and LIGHTING PANEL WIRING DWGS and GENERAL ARRANGEMENT
1724000049-HV-LIS-00047	B-100 HV SWITCH ROOM - COMPONENTS LIST AND DS - E&I SHELTERS
1724000049-HV-RE-00055	HVAC SYST DESCRIPTION (MANAGEMENT LOGICS)
1724000049-COM-LIS-00060	COMMISSIONING AND START-UP AND 2 YEAR SPARES LIST

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1724000049-QC-LIS-00064	VENDOR ASSET TAG REGISTER
1724000049-HV-PID-00039 1724000049-HV-PID-00040 1724000049-HV-PID-00041 1724000049-HV-PID-00042	B-100 PID B-200 PID B-300 PID B-400 PID
123A90-DDL-AR-SP-10000	SUPPLY SPECIFICATION FOR HV (66Kv-6.6V) SWITCHROOM B-100
123A90-DDL-AR-SP-10007	SUPPLY SPECIFICATION LV (400V) SWITCHROOM
123A90-DDL-AR-SP-10021	SUPPLY SPECIFICATION FOR AC UPS FITTED WITH UPS SYS. EQUIPMENT ROOM B-300
123A90-DDL-AR-SP-10014	SUPPLY SPECIFICATION FOR I&T EQUIPMENT ROOM B-400

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Base Load Power Hub (BLPH)

PACKING, SHIPPING, HANDLING, PRESERVATION AND STORAGE PROCEDURE – E&I SHELTERS

Document Number: 1724000049-QC-PRO-00063

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
	05/06/2024

Document Class: 3

0	04/06/2024	Issue for Information (IFI)	MG	SKV	OA
Rev.	Date	Description	Prepared	Reviewed	Approved

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Rev.	Description
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1	
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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

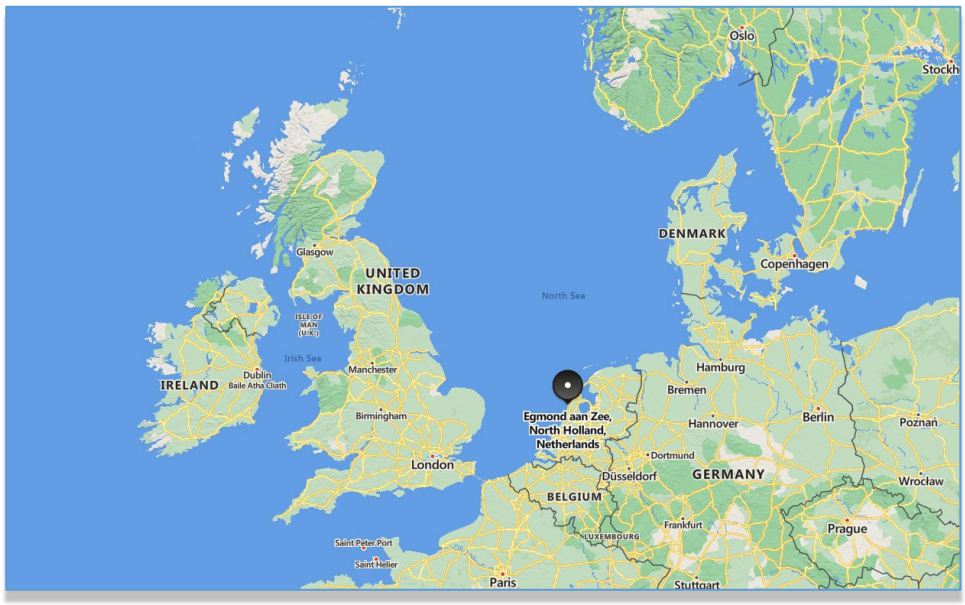


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

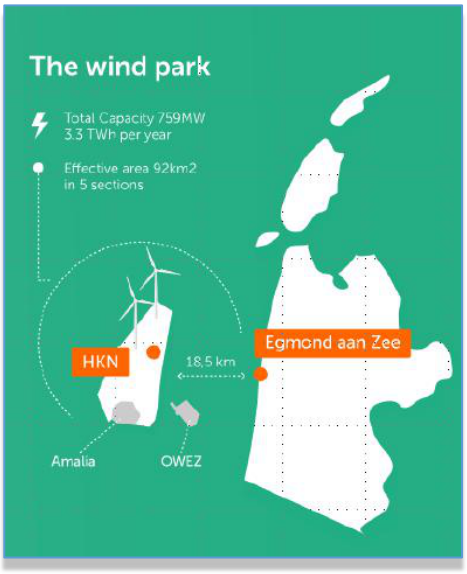


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

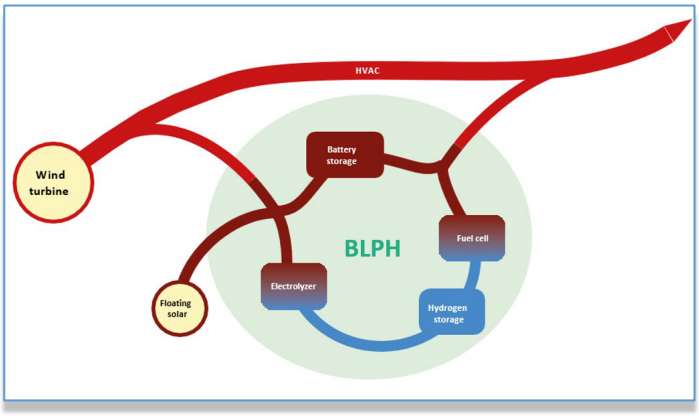


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document provides the general Alex-Sistemi general requirements on the external protection, packaging and marking of boxes containing machines and plant materials during the period of storage subsequent shipping to the site.

The requirements of this document are to be considered as guidelines for final packaging completed by the supplier of the material.

2.1 REFERENCES

Doc. No.	Description
ISO668	Classification, dimensions and ratings Standard specifications.
ISO780	Graphic symbols specifications used for marking packaging
MIL PRF131-K / MIL-PRF-131-J	Performance material specific. (barrier bag, water-proof, flexible, etc.)
MIL-D-3464-D / DIN55473	Desiccant dehydrating agent that prevents corrosion specifications
UNI9151	Wooden packaging construction specifications
IMDG-ADR-IATA-RID-IMO	Transport of dangerous goods specifications
IPPC FAO ISPM-15	International Standards for Phytosanitary packaging measures
UNI EN 1263-1	Temporary nets system protection specifications
MIL-PRF-131-J, MIL-PRF-131-K	Type of moisture barrier bag
MIL-D-3464-D and DIN 55473	Dehydrating salts specifications

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
VpCI	Vapour phase Corrosion Inhibitors
Propack Stirofilm	Multi-layer plastic film co-extruded

Table 2 - Definitions and Abbreviations

3 BASIC WARNING TO READ BEFORE USE

3.1 WARNING NOTICES HAVE TO BE READ BEFORE USE



HIGH VOLTAGE

In presence of this signal be sure to not come in contact with electrical components as you may be affected by an electrical shock.



FLAMMABLE MATERIAL

In presence of this signal be sure to not use anything that could inflame the components.



DANGER OF DEATH

In presence of this signal be absolutely sure to don't do anything if you are not a certificate operator. These component are the most dangerous as they may cause the death.



IRRITATION HARMFUL SUBSTANCES

In presence of this signal be sure to not come in contact with the substances reported, as they could damage irreversibly your skin.



GENERAL BAN

In presence of this signal not exceed the stopping point. This because there is one or more dangers after that and isn't a safe area.



GEARS BAN

In presence of this signal not put your hands in the gears of the machine or in it working areas.



GENERAL DANGERS

In presence of this signal pay attention at all the component in this area. This signal has two reason for be used:

1) There are many signs to be reported and not enough space for them;
2) There isn't an exact signal for the danger in this area

3.1.1 General notices

a) The practice of the component equipped inside cabin must be execute by expert personal and technically prepared.

b) Use the component equipped inside cabin only after reading attentively this instruction manual and under the respect of the indications.

c) Do not stop closeness the cabin during charge / discharge phases.

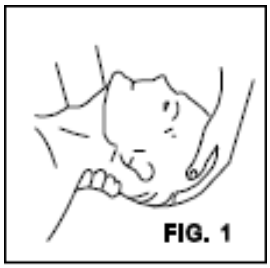
4 FIRST AID

IN CASE OF ELECTRIC SHOCK

DO NOT TOUCH THE PATIENT WITH BARE HANDS until the circuit has been interrupted Interrupt the circuit by opening the mains circuit breakers; if this is not possible PROTECT YOURSELF WITH DRY MATERIAL and then free the patient from the conductor.

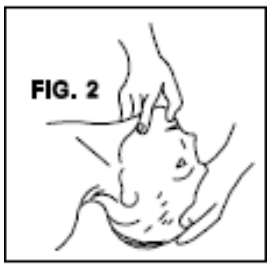
ARTIFICIAL RESPIRATION - Mouth-to-mouth Method

It is essential to start respiration at once and immediately ask for a doctor's intervention


FIG. 1

1. Place the patient with face upwards and arms parallel to the body; if the patient is lying on an inclined plane, make sure that the stomach is slightly lower than the chest. Open the patient's mouth and check that there are no foreign bodies (denture - chewing-gum– etc).

2. Kneel near the patient at the same height of his head, place one hand under his head and one under his neck (Fig. 1). LIFT THE PATIENT'S NECK AND TILT HIS HEAD BACK AS FAR AS POSSIBLE.


FIG. 2

3. Move your hand from the patient's neck to his chin: place your thumb between chin and mouth, your forefinger along the maxillary bone, keep the other fingers closed (Fig. 2). During these operations, start self-ventilation by breathing in deeply with open mouth.

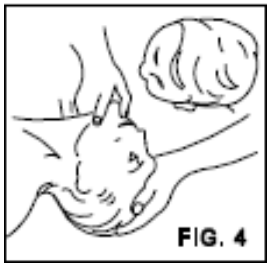
4. With your thumb between the patient's chin and mouth, keep his lips closed; apply your lips onto the patient's nostrils and blow into his nasal cavities (Fig. 3).


FIG. 3

5. During these operations watch to check whether the patient's chest rises (Fig. 4). If not, the nose may be obstructed: then, levering on

his chin with your hand, open the patient's mouth as wide as possible, put your lips around it and blow into the oral cavity. Watch if the patient's chest rises. You can use this latter method instead of the former even when the patient's nose is not obstructed, provided his nostrils are kept closed by your hand after moving the latter from his head.

THE PATIENT'S HEAD MUST BE KEPT TILTED BACK AS FAR AS POSSIBLE.


FIG. 4

6. Start by breathing out quickly and deeply for ten times, then go on with about twelve/fifteen expirations per minute. Continue until the patient has regained consciousness, or until a doctor ascertains

his death.

4.1 TREATMENT FORM BURNS

This treatment must be applied after the patient has regained consciousness. It may be applied even during artificial respiration (however, there must be at least two persons).

a. DO NOT TRY TO REMOVE CLOTHING FROM THE BURNED PARTS.

b. Apply dry gauze on burns.

c. DO NOT apply ointments or other oily tinctures.

4.2 SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of installation, operation and maintenance.

4.3 KEEP AWAY FROM LIVE CIRCUITS

Personnel are warned not to engage in repairs or adjustments within live, high-voltage equipment unless absolutely necessary. Moreover, though power has been removed from equipment circuits, dangerous potentials may still exist due to charges retained by capacitors. Always remove power, discharge and ground a circuit prior to touching it.

Before making adjustments, personnel should ensure that circuits are grounded. If possible, adjustments should be made with one hand, keeping the other free of the equipment.

4.4 DO NOT SERVICE LIVE EQUIPMENT UNASSISTED

When repair, replacement, or alignment is required with power applied, under no circumstances should it be attempted alone. The immediate presence of someone capable of rendering aid is required.

4.5 RESUSCITATION

Personnel working with or near high-voltage shall be instructed in the latest methods of cardiopulmonary resuscitation. Should someone be injured by electricity and stopped breathing, begin resuscitation immediately.

Warnings appear in the text in this manual, and are emphasized where necessary

5 INTRODUCTION

This document provides the Alex-Sistemi general requirements on the external protection, packaging and marking of boxes containing machines and plant materials during the period of storage subsequent shipping to the site.

The requirements of this document are to be considered as guidelines for final packaging completed by the supplier of the material.

The supplier should therefore comply with the following conditions specified in detail in appendix 1, depending on the material:

- Type of transport
- Duration of external conservation
- Storage (in the open//uncovered)

Applicable documents

- ISO668 - ISO780
- MIL-PRF-131-J - MIL-D-3464-D
- MIL PRF131K class 1
- DIN55473
- UNI9151
- IMDG-ADR-IATA-RID-IMO
- IPPC FAO ISPM-15
- UNI EN 1263-1

6 EXTERNAL PRESERVATION

6.1 AIM

The aim of external preservation is to guarantee the external protection of plant machine components during the storage and shipping period. This document describes the physical/chemical characteristics of the protective products to be used, their means of application and the preparation of the manufactured articles.

The place, means and maximum storage period of the various types of components and manufactured items will then be defined so as to guarantee their correct storage.

The labelling on the outside of any package must show the external storage expiry date.

Once this period has expired, the material must be externally re-stored following the same indications

as in this document. In any case, the internal storage expiry date shall also be taken into account so as to retain the correct maintenance of the materials.

This activity allows the external storage duration to be extended by a further 12 months from the package closure date.

6.2 APPLICABILITY

This specification applies to manufactured items (excluding those for the oxygen unit) constructed by Alex-Sistemi and/or or behalf of Alex-Sistemi, and constitute rules of general application.

6.3 PREPARATION OF THE SURFACE TO BE PROTECTED

The aim of preparation is to prepare the surfaces of the part in order to make them ready for protective treatment by ensuring that they are perfectly clean and dry, free from any foreign substance such as oil, water, dust, shavings any possible signs of oxidation.

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6.3.1 Degreasing using solvent

This is particularly required in all cases in which the presence of grease, oil, lathe work, etc are particularly noticeable.

The operation should be carried out using one of the following methods:

a) Total immersion of the item in solvent

b) Coating of the item with a jet of solvent

Where the degreasing is not carried out in accordance with the methods described above,(a, b), the operation shall be completed manually with using rags or a brush soaked in solvent. Regardless of the method selected, the solvent should be placed on the surface to be treated and not allowed to evaporate so as to avoid the dissolved greases from forming a thin film on the surface.

Particular attention should be paid to the selection of the solvents in relation to the flammability, operating conditions, toxicity limits and safety.

The treated surfaces should be free from grease or other contaminating residues. Any traces of oxidation should be removed mechanically and avoiding any damage to the surface area in question.

6.3.2 Washing using water-based detergents

Particularly recommended in all cases where the presence of greases, oils even if associated with dust or other solid substances are not so significant, barely attached to the material and are emulsifiable or soluble in water.

The operation shall be carried out in accordance with the following method:

a) Spray cleaning using aqueous detergent solutions formulated with emulsifying agents and surfactants. The pressure and temperature shall be determined by the product used.
b) Rinsing with water using a pressure jet suitable to remove any trace of detergent. The detergents used must be neutral, non-toxic and biodegradable.
c) Drying: the treated surface should be perfectly dry and totally free of any contaminating substances. Any traces of oxidation shall be removed mechanically and avoiding any damage to the surface area in question.

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6.3.3 Steam degreasing with or without detergents

Particularly recommended when substances are to be removed that are soluble in water or greasy substances mixed with dust, layers or varnish or thermoplastic coatings.

The operation shall be carried out in accordance with the following method:

a) The surface areas to be treated shall be hit with a water vapour jet produced using suitable equipment and applied at high pressure (60-120 bar).

b) Drying: the surface treated should be perfectly dry and totally free of contaminating substances. Any traces of oxidation shall be removed mechanically and avoiding any damage to the surface area in question.

6.4 PROTECTIVE PRODUCTS AND CORROSION INHIBITORS

The products used for external protection against humidity, salt, dirt, oxygen and anything else that can cause corrosion are:

- Oils
- Greases
- Polyethylene film mixed with additives of corrosion inhibitors
- Sponges with additives
- Detergents
- Barrier bag and dehydrating salts

Corrosion inhibitors (VpCI Vapour phase Corrosion Inhibitors) form a protective molecular layer on the surface on the metal to be protected. This protective layer impedes humidity, salt, dirt, rust and other materials from forming of the metal thereby causing corrosion.

6.4.1 Oils

Oils used to protect external surfaces, their relative physical characteristics and duration are listed in the following table.

Manufacturer	Product	Solvent	Thickness in microns (min) [1]	Opacity (1)	Drying time	Storage Time(2)
Agip	7921	Petroleum solvents	17	17 g/m²	0.5 - 1 h	12 months
Fuchs	Anticorit 2006	Petroleum solvents	20	29 g/m²	1 - 2 h	12 months
Valvoline	Tectyl 506	---	50	9.6 m²/l	2 h	12 months
Cortec	VpCI 368D	---	75	7 m²/l	12 - 24 h	12 months

Note:

(1) The information relating to the thicknesses of the films and the hiding power refer to perfectly smooth surfaces free of any abrasions.
(2) The product applied should have a preservation time expiry date equal to, or greater than, 12 months.

6.4.2 Application

Oils can be applied using sprays, brushes and/or by immersion as temporary protection to rough or altered surfaces (to be painted or not), particularly those made from materials subject to corrosion.

The spray method is generally the most appropriate. In this case it is necessary to ensure that the compressed air does not carry any humidity. The oil in question must be appropriately dissolved with the relative solvent so as to obtain the more suitable viscosity for the application that shall be carried out at room temperature.

6.4.3 Removal

This is done with the solvent used for the dilution or by washing with detergent in water or steam cleaning.

Removal can be carried out by using cloths soaked in solvent or by spraying the solvent itself. When the individual items are to be subsequently lubricated it is not necessary to remove the protective film.

6.4.4 Greases

VpCI (=Vapour phase Corrosion Inhibitor)	**Description**	**Application method**
VpCI 369	Oily/greasy protective liquid for external services with great anti - corrosion properties; has the consistency of honey. Used to protect bare unprotected machined parts. Leaves a sticky film that does not dry.	The product should be evenly mixed before use and then be applied using a spray, brush or by immersion. A litre of product preserves 12-13 square metres of surface area.

The VpCI 369 is a self-repairing protective, thermally stable up to 82°C, which removes humidity and protects against environmental attacks.

6.4.5 Polyethylene film with the addition of corrosion inhibitors

VpCI (=Vapour phase Corrosion Inhibitor)	**Description**	**Application method**
VpCI 126	Plastic polyethylene film with VpCI added	The film has a surface additive that must completely cover the manufactured item,thereby internally releasing the VpCI molecule that will protect the metal. Duct tape or heat sealing between the edges to be joined can be used. The surfaces areas to be wrapped should be dry, clean and without any traces of oxidation. $6m^2$ of film are needed to preserve a $1m^3$ vacuum. For higher volumes it will be necessary to integrate with film with the anticorrosive VpCI 130 sponge.

MilCor VpCI shrink film	MilCor VpCI shrink film is a composite film with VpCI Cortec and UV ray inhibitors. Characteristics: 1.Protection against multi-metallic corrosion 2.Self-extinguishing 3.Protection against UV rays 4.High heat shrink force for larger applications 5.Can be used as protection against particularly severe weather conditions.	Before applying the product check that the surfaces to be protected have no traces of rust, are clean, free of grease, dust, salt and other elements that might trigger oxidation processes. 1. Roll out the film in the desired storage area. 2. Put the equipment on the film 3. Overlap the edges by at least 50 cm 4. Use the gun, carefully move the heat ventilator over the film and shrink it to the desired size.
VpCI 126 FR UV	VpCI heat shrink film with additives The VpCI126 FR-UV film is a thick film (200/250 micron) extremely resistant to mechanical strain and with consolidated VpCi anticorrosion efficiency combined with other important features: - Thermo shrinking - Self-extinguishing - Anti UV	Completely cover the manufactured item and shrink using the appropriate equipment, generally a flame gun

6.4.6 Sponges with additives

VpCI (=Vapour phase Corrosion Inhibitor)	**Description**	**Application method**
VpCI 130	Sponge with added VpCI	Used to preserve electrical, electronic parts where required in a localized way. A square meters of sponge with additive preserves 3 cubic meters of volume

6.4.7 Detergents

VpCI (=Vapour phase Corrosion Inhibitor)	**Description**	**Application method**
VpCI418LM	VpCI418LM (with pale yellow inconsistent appearance) is an alkaline detergent for the industrial cleaning of marine and commercial equipment. VpCI 418LM contains corrosion inhibitors that act on the surface of the metal and prevent it from rusting. It does not leave any residue.	VpCI 418LM can be applied with a pressure washer at a temperature that varies between 30 and 70°C. With a 5% dilution (per weight) of VpCI418LM in water. Must be shaken before use.

6.4.8 Moisture barrier bag

The type of moisture barrier bag to use in the following: MIL-PRF-131-J, class 1.

The moisture barrier bag must be wrapped around the manufactured item to be protected and then thermally sealed at the end. Prior to complete closure the air inside should be aspirated.

The air pressure bag should not contain any materials containing any humidity (for example wood fixtures, pallets, etc.). The use of phenolic glue plywood is allowed.

The reinforced moisture barrier bag complying with the MIL PRF131K class 1 standard is to be used for materials to be packaged with a volume greater than 40m^3.

The moisture barrier bag can be combined with humidity indicators, one for each 5 m3 of the moisture barrier bag and up to a maximum of three per crate and not more than one for each wall.

The indicators shall be placed in the positions felt most appropriate by the packer if possible, at an approximate height of 150 cm from the floor so as to facilitate reading through the inspection door.

6.4.9 Dehydrating salts

Dehydrating salts shall comply with the characteristics specified in standards MIL-D-3464-D and DIN 55473 and shall be applied within the package and within the internal parts of the product to be shipped or stored in the warehouse. The sachets containing the salts shall not come into direct contract with the product to be protected.

The quantity of salt should be sufficient to preserve the product for the period planned for storage in the warehouse or for shipping and subsequent warehousing.

The quantity should be selected on the basis of the overall volume of the area to be dehydrated. For indicative purposes, the amount of salt to use is 1kg/m^3 of packed volume.

6.5 SUMMARY OF CORTEC VPCI PRODUCTS TABLE

Identification code	Cortec product	Consistency	Class of materials to be preserved	Material description
C1	VpCI 126	PE film additive	Electrical, electronic and external mechanical parts	Instrument panels, motors, turbines and protection of materials in general
C2	VpCI 130	Sponge with additive	Electrical and electronic parts	Inside Skid, cab interior, engines, internal space in general
C4	VpCI 368D	Dry protective wax	Mechanical parts	Static mechanical parts, engine (not varnished)
C5	VpCI 369	Sticky greasy, oily, protective	Mechanical parts	Machined moving parts (not varnished), Engine
C6	Milcor VpCI shrink film	Composite Film	Mechanical parts	Rotors, Diaphragms, Engines
C7	VpCI418LM	Alkaline detergent (leaves no residue)	Mechanical parts	Rotors, Diaphragms
C8	VpCI126FRUV	Thermal shrink film with VpCI additive	Mechanical parts	Rotors, Diaphragms - Motors, Valves, Pumps

7 PACKAGING

7.1 SCOPE

The specification defines the type, physical, qualitative and quantitative characteristics of the packages for Alex-Sistemi products, based on the place of destination, the number of in transhipments, the storage time and environment.

The main purpose of packaging is that of providing mechanical protection of the materials from internal and external stresses during the phases of loading and unloading, transporting and storage and thus preventing any damage due to shock, stacking weight, stacking, forces of inertia and acceleration.

7.2 APPLICABILITY

This specification applies to manufactured items constructed by or o behalf of Alex-Sistemi, and should be applied when documents are referred to which define the characteristics of the manufactured item (design, specification, order, etc.).

7.3 CLASSIFICATION OF THE PACKAGES

- Package to be transported by land:

  Package suitable to be transported by land.

- Package to be transported by sea:

  Package suitable to be transported by sea under cover, including in a particularly severe climate.

- Package to be transported by air:

  Package suitable for air transporting with covered storage. Cardboard packages are permitted. For the type of packaging to use the instructions of the airfreight company responsible for transport should always be consulted.

7.4 GENERAL PESCRIPTION FOR THE PACKAGES

7.4.1 Minimum supply requirements

Requirement	Wooden B&P	Thermo shrinking	Plastic B&P	Multi-packings (cage + Thermo Shrinking)
Temperature min/max: -20°C / +50°C*	✓ *	✓	✓ *	✓ *
Longitudinal acceleration max: 1.5 g	✓	✓	✓	✓
Maximum transverse acceleration: 0.3 g	✓	✓	✓	✓
Maximum vertical acceleration: 0.5 g	✓	✓	✓	✓
Stackable packaging: 500 Kg/m² (covered area)	✓		✓	✓

7.4.2 Size of the packages

With the aim of avoiding the use of oversize load transportation, the limits of the road and/or rail gauges are to be taken into account in the planning and/or construction phase of the packages.

The upper limits are shown below in respect of packages for transporting in Europe (sizes and maximum weights).

ROAD TRANSPORT

- Length: 13.50 m
- Width: 2.50 m
- Height: 4.00 m (see fig. 1a and 1b: the overall height is determined by a+b)
- Weight: 27,000 Kg

RAIL TRANSPORT

- Length: 12 m
- Width: according to appended gauge: Fig 1c – 1d
- Height: according to appended gauge: Fig 1c – 1d
- Weight: 20,000 Kg

AIR TRANSPORT

- Information to be received from the carrier used

SEA TRANSPORT

- For transport by sea, the minimum size per package is 1 m^3

If the values listed above are exceeded, it is obligatory to notify Alex-Sistemi.

Heavy Lift is defined as materials that, once packaged, exceed 15,000 kg in weight. The Shipping Sketch must always be placed on both long sides of the package.

Heavy Lift items are NOT stackable.

The Shipping Sketch should also be provided in cases in which, notwithstanding the weight of the package does not exceed 15,000 kg, its lifting requires the use of special equipment (spreader bar, swingle bar, etc.). In order to issue the Shipping Sketch, it is necessary to have the related Lifting Sketch.

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7.5 PRE-PACKAGING

The material within the package should be properly placed and blocked so as to prevent movement in any direction.

To this end, the moving parts of any item shall be securely fixed to the item itself and any delicate points shall be suitably protected so as to not interfere with the package.

Where the items have sharp edges, it is vital to cover these with a soft material so as not to tear the protective guard (moisture bag and/or polyethylene) where requested.

Nozzles and all internal orifices must be plugged.

Items of a small dimension shall be identified, quantified and collected code by code in intermediary containers.

For the protecting of materials shavings, paper and polystyrene should not be used. The use of foam or bubblewrap is recommended.

The list of contents should be shown on the outside of the pre-packaging.

7.6 TYPE OF PACKAGE

(see Appendix_1 for more informations, page 34)

The types of packaging requested are:

- Wooden packing;
- Thermo shrinking;
- Plastic packing;
- Multi packing (Crate + Thermo shrinking).

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8 MARKING AND DOCUMENTATION

8.1 EXTERNAL MARKING

Each package shall be marked on at least 3 sides.

The marking shall be resistant to bad weather conditions and light and shall be made with two plastic or laminated sheets with black letters on a white background. The fixing of the sheets should be done using metallic staples at the corner.

The format of the paper shall be A3, A4 or A5, and suited to the size of the packages.

As an exemption, where specially requested, it may be made using black stencil with characters having a height of 5 cm (2.5 cm for smaller crates having a volume of around 1 m^3).

Given the characteristics of the stencil marking, the information of the Box number is visible only in text format and not in bar code format.

On all other packages or loose items, where standard marking cannot be carried out, an indelible marking or engraving on galvanized sheet metal and/or enamel of the appropriate size and tied or nailed to the packages or items shall be made (at least 2 for each package).

THE MARKING SHOULD CONTAIN THE FOLLOWING MINIMUM INFORMATION:

8.1.1 Sheet 1

- Name of the recipient
- Destination location
- Plant (name)
- Order and any modification -
- Box number in text format and bar code

8.1.2 Sheet 2

- Box number in text form and bar code format
- Shipping Sales Order
- Order N°
- Type of package
- Gross weight (Kg)
- Net weight (Kg)
- Volume (Cubic meters)
- Dimensions (Meters)

8.1.3 Storage informations

- Storage code- (see table below)
- Presence of moisture barrier bag
- Date of closing package
- Date of storage expiry
- International signs (see description below)

Storage code table:

"A" – Air conditioned closed warehouse (From 5°C to 40°C 80% max humidity)
"B" – Closed warehouse
"C" – Warehouse under cover *
"D" – Open warehouse
"E" – Dangerous materials Air-conditioned Closed Warehouse (From 5°C to 40°C 80% max humidity
"F" – Dangerous materials closed warehouse
"G" – Dangerous materials warehouse under cover

* At the storage areas managed by Alex-Sistemi situated at sites that are not characterized by high changes in temperature and other rates of humidity, the packages destined to be stored under cover can be positioned in the open since a protective Propack Stirofilm will be applied (or equivalent), on the covering of the packages and with an edge of 20 cm that guarantees the sealing of the package.

The plastic stirofilm film is a multi-layer co-extruded film which gives it a high mechanical resistance, both mechanical and against perforation.

International signs:

In accordance with the characteristics of the materials, signage should always be present on packages in accordance with ISO780, made from indelible paint or labels (see Fig. 2 on next page).

8.2 DOCUMENTATION: BOX CONTENT LIST AND PACKING LIST

(see figures 3 and 4)

The Box Content List is the detailed indication of the material contained in a package.

The Packing List contains the same information as the Box Content list, with the addition of weight and sizes of the package.

A copy of the box content list (in a waterproof sealed envelope) should be inserted inside the package whilst a copy of the packing list should be inserted on the outside protected by galvanized sheet metal or glazed and secured with galvanized nails.

The Box Content List and Packing List must be in English.

Figure 1: Transport load profile (Sizes expressed in mm)

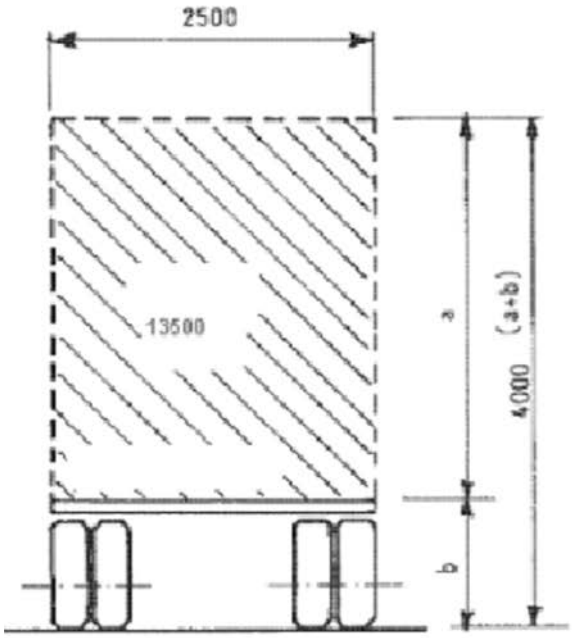


Figure 1a
Road gauge

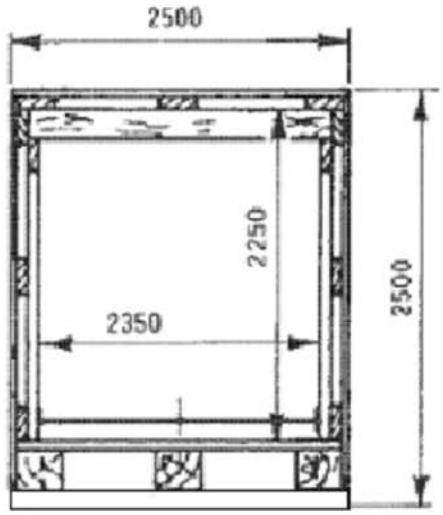


Figure 1b
Maximum internal dimensions for road transport

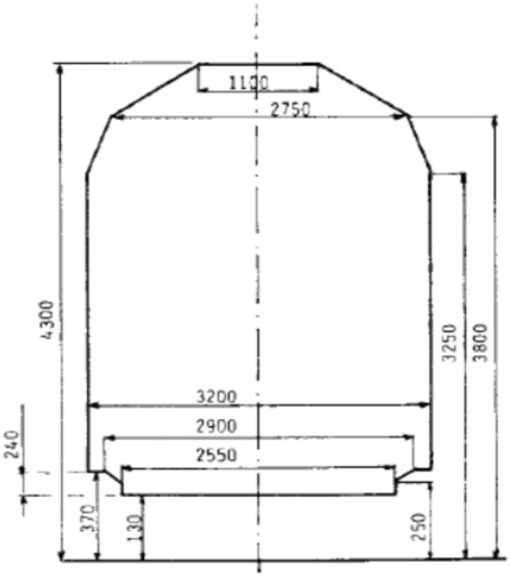


Figure 1c
Italian railway line gauge

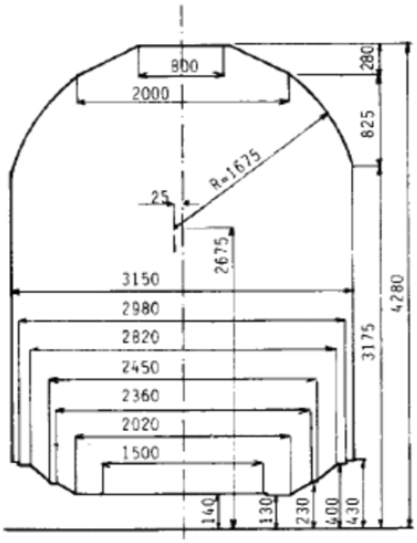
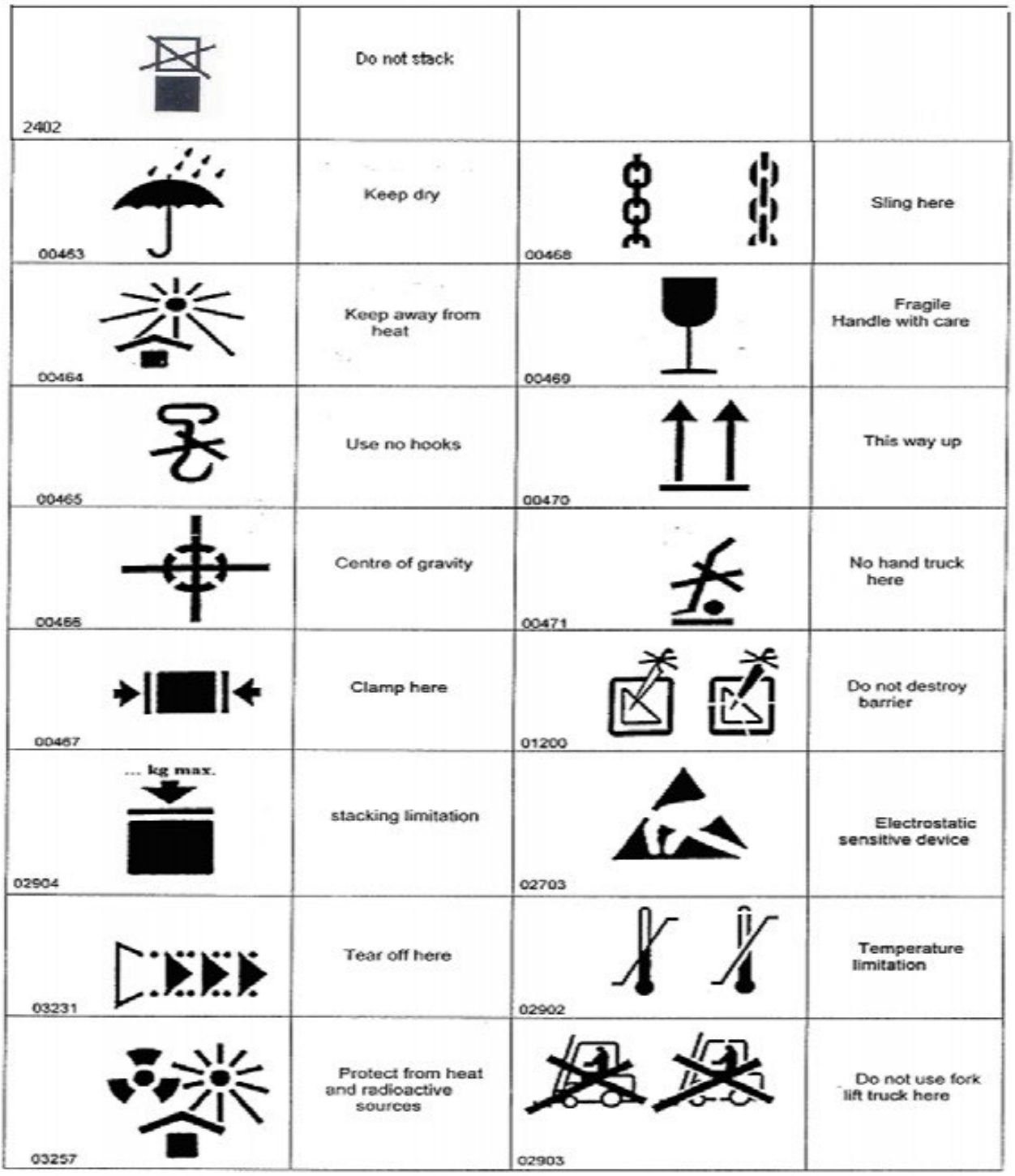


Figure 1d
International railway line gauge

Figure 2: International warning signs (ISO 780)



9 TRANSPORTATION AND STORAGE INTRUCTIONS

9.1 TRANSPORTATION

With regard to the transport you need to ensure the following:

1) Each opening for cables, ventilation, etc. .. must be hermetically sealed so as to prevent inlet water, moisture, debris and any other type of agent capable of altering the interior of the cabin and its contents.
2) Make sure there are no protruding parts with a maximum size reported (handles, knobs, sheds, etc. ..) so as to avoid inadvertent contact during maneuvers.
3) The cab must be firmly secured to the transport vehicle, making sure that all support points are level with each other so as to avoid twisting and deformation of the structure.

9.2 STORAGE

As regards the long-term storage (1 year) refer to the table of "appendix 1" bearing in mind that:

1) The expiry of the time limit indicated in the table, the packaging is considered unsuitable as expired. You will then need to restore it to prolong the storage phase.
2) If, due to inspection, for example, were to be temporarily removed / open the packaging will be restored as if it were expired.
3) If there is a need to inspect the cabin then you will have to restore what has been done for its storage as if it were past the period of validity.

With regard to the short-term storage must be followed the devices below:

1) Periodically inspect the cabin making sure the actual state of preservation.
2) If the cabin contains electrical (electrical panels, for example) are crammed inside the cabin the appropriate salts against moisture. They will be replaced periodically to prevent damage to the electrical components.
3) If no external protection must verify that there are no doors or other openings are not properly secured.

10 HANDLING – LIFTING METHOD / ANCHORING – ASSEMBLY PHASE

10.1 HANDLING – LIFTING METHOD

E&I Shelters must be lifted with an angle of anchoring of 60° respect to roof (is dangerous to reduce this angle). There are four lifting points, the location of the lifting points depends on the size of the E&I Shelters.

For detailed information regarding allowed lifting methods, safety working load, C.O.G. and scope of supply, please refer to doc. **1724000049-AR-DD-00062 LIFTING DRAWINGS - E&I SHELTERS**.



ANCHORING ANGLE > 60°
VERIFY IF THE ROPES CAPACITY LOAD IS SUITBLE FOR
THE WIGHT OF THE E&I Shelters.

10.2 ANCHORING – ASSEMBLY PHASE

E&I Shelters can have different sizes and so different number of fixing point, different size of anchoring kit and different location of HVAC units, landings and bottle rack.

Several loose part/material will be shipped separately from related E&I Shelters. Every loose part will be marked properly in order to identify it easily.

For detailed information regarding anchoring point, fixing kit and loose part, please refer to following docs:

- **1724000049-ST-DD-00010 B-100 FOUNDATION DRAWING - E&I SHELTERS**
- **1724000049-ST-DD-00012 B-200 FOUNDATION DRAWING - E&I SHELTERS**
- **1724000049-ST-DD-00013 B-300 FOUNDATION DRAWING - E&I SHELTERS**
- **1724000049-ST-DD-00014 B-400 FOUNDATION DRAWING - E&I SHELTERS**
- **1724000049-AR-DD-00018 B-100 DETAILED DRAWINGS - E&I SHELTERS**
- **1724000049-AR-DD-00019 B-200 DETAILED DRAWINGS - E&I SHELTERS**
- **1724000049-AR-DD-00020 B-300 DETAILED DRAWINGS - E&I SHELTERS**
- **1724000049-AR-DD-00021 B-400 DETAILED DRAWINGS - E&I SHELTERS**

Appendix 1: Type of package application

POS.	MATERIAL TYPE	SEA SHIPPING STANDARD PACKAGE	LAND TRANSPORT STANDARD PACKAGE	EXTERNAL PROTECTION (ref codes. Tab.2.5)	PROTECTION DURATION	STORAGE (ref. Par. 4.1.3)	ALTERNATIVE PACKAGING (9)
1	SKID MACHINES AND GT AUXILIARIES WITH SUPPORTING BASE	THERMO SHRINKING	THERMO SHRINKING	C1. C2. C4. C5. C6. C8	12 MONTHS	D	Crate/Wooden crate (7)
2	AUXILIARY SKIDS	THERMO SHRINKING	THERMO SHRINKING	C1. C2. C4. C5. C6. C8	12 MONTHS	D	Wooden crate (7)
3	HEAT EXCHANGERS, TANKS, LUNGS, SEPARATORS, REFRIGERATORS	SADDLE (1) + SHRINK-WRAP	SADDLE (1) + SHRINK-WRAP	C1. C2. C4. C5. C6. C8	12 MONTHS	D	Crate/Wooden cage; Multi-layered cage
4	CARPENTRY	WOODEN CRATE	TIES	C4	12 MONTHS	D	Cage; Multi-layered cage
5	BUNDLES OF TUBES	THERMO SHRINKING	THERMO SHRINKING	C4 . C6. C8	12 MONTHS	D	Wooden cage
6	GENERATORS, ENGINES, ENGINE PUMPS, TRANSFORMERS (6)	THERMO SHRINKING	THERMO SHRINKING	Cl. C2. C4. C5. C6. C8	12 MONTHS	B	Wooden crate (7)
7	REELED CABLE	EXTERNAL COVERING	EXTERNAL COVERING	-	12 MONTHS	D	-
8	TUBES, COMMERCIAL BARS, LAMINATES	TIES	TIES	-	12 MONTHS	D	-
9	SKETCH TUBING, TUBING, THREADED BARS	WOODEN CRATE	WOODEN CRATE	C1, C4, C5	12 MONTHS	D	Multi-layered cage (7)
10	FOUNDATION, ACCESSORIES, HARDWARE	WOODEN CRATE	WOODEN CRATE	C4, C5, MOISTURE BAG, SALTS	12 MONTHS	D	Plastic crate (7,8); Multi-layered cage
11	CYLINDER CABINET	WOODEN CRATE	WOODEN CRATE	C1, C2, C5, C6, C8, MOISTURE BAG, SALTS	12 MONTHS	D	Multi-layered cage (7)
12	ELECTRICAL PANELS BATTERY CHARGERS	WOODEN CRATE	WOODEN CRATE	C1, C2, C5, C6, C8 MOISTURE BAG, SALTS	12 MONTHS	A	Multi-layered cage (7)
13	IMO MATERIAL, BATTERIES, ELECTROLYTES, FLAMMABLE MATERIALS, SOLVENTS	ACCREDITED WOODEN CRATE	ACCREDITED WOODEN CRATE		12 MONTHS	F	
14	PRESSURISED CONTAINERS				12 MONTHS	G	
15	METAL OR PVC DRUMS , GENERAL CONTAINERS	PALLET	PALLET		12 MONTHS	D	Wooden cage; Multi-layered cage
16	FILTER CARTRIDGES	WOODEN CRATE/CONTAINER (2)	WOODEN CRATE / CONTAINER (2)	MOISTURE BAG, SALTS	12 MONTHS	C	Multi-layered cage (7)
17	CONTAINER CONTROL CABIN, CONTAINER CYLINDERS			C1, C2, C4	12 MONTHS	D	Shrink-wrap
18	ROOM FILTER MODULES / OUTLET PIPES	THERMO SHRINKING	THERMO SHRINKING	C1, C2, C4, C5	12 MONTHS	D	Wooden cage
19	SPARE PARTS, ROTORS, DIAPHRAGMS, GASKETS	WOODEN CRATE	WOODEN CRATE	C5 MOISTURE BAG, SALTS	12 MONTHS	B	Plastic cage (7,8); Multi-layered cage (7)
20	VENTILATION PIPES COMPLETE WITH ACCESSORIES	CONTAINER/WOODEN CRATE (5)	CONTAINER / WOODEN CRATE (5)		12 MONTHS	D	Multi-layered cage (7)
21	SPARE PARTS, ROTORS, DIAPHRAGMS IN PRESSURISED CONTAINERS	(3)	(3)	(3)	12 MONTHS	(3)	
22	CYLINDERS, FRAMES	WOODEN CRATE	WOODEN CRATE	C4, C5, C8 MOISTURE BAGS, SALT	12 MONTHS	C	Multi-layered cage (7)
23	ALTERNATIVE SKIDS WITH SUPPORTING BASE	THERMO SHRINKING	THERMO SHRINKING	Cl. C2. C4. C6	12 MONTHS	C	Wooden crate (7)
24	ISOLATING MATERIAL, ACOUSTIC PANELS AND COVERS	WOODEN CRATE/ CONTAINER	WOODEN CRATE / CONTAINER		12 MONTHS	D	Multi-layered cage
25	VALVES, JOINTS	WOODEN CRATE/ CONTAINER	WOODEN CRATE	C4, C5, MOISTURE BAG, SALTS	12 MONTHS	B	Plastic crate (7,8); Multi-layered cage (7)
26	ELECTRICAL MATERIAL INSTRUMENTS, FITTING	WOODEN CRATE/ CONTAINER	WOODEN CRATE	MOISTURE BAG, SALTS	12 MONTHS	B	Plastic crate (7,8); Multi-layered cage (7)
27	VENTILATORS	SHRINK-WRAP/ CONTAINER	SHRINK-WRAP / CONTAINER	C1. C2. C4. C5. C6. C8	12 MONTHS	D	Multi-layered cage (7)
28	GAS GENERATOR	(6)	(6)	(6)	(6)	(6)	
29	HSPT MODULES	(6)	(6)	(6)	(6)	(6)	

1 The saddle is used when the material to be packaged does not have its own support structure.
2 The container is used if the volume allows the container allows lashing and the cartridges are provided with their own container. When the container is used the moisture bag does not apply
3 The applicable specification is SOS87281
5 If the package is made using a crate, additional metal fasteners, gaskets and electrical parts are inserted in the moisture bag or using salt
6 Preservation and packaging are in accordance with the specifications of the supplier
7 The use of the moisture bag is envisaged
8 The use of plastic crates is envisaged for volumes of less than 8 cubic metres and as an alternative form of packaging can be extended to all miscellaneous materials in accordance with
9 Alternative packaging can be requested by the Client on the basis of particular phyto-sanitary and/or protection requirements (e.g.: Quarantine).

NOTE: WHERE THE ORIGINAL PACKAGING IS RE-OPENED, THE EXTERNAL PRESERVATION GUARANTEE DURATION SHALL BECOME VOID. PACKAGING SHALL BE REPEATED IN ACCORDANCE WITH BOTH THIS PROCEDURE AND WITH THE MEANS OF APPLICATION

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	23/01/2025

Base Load Power Hub (BLPH)

B-100 HVAC CALCULATION REPORT
(Incl HVAC SYS CALC and HEAT DISSIPATION CALC)
E&I SHELTERS

Document Number: 1724000049-HV-CA-00035

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
04	09/12/2024	Accepted for Construction(AFC)	S.Z.	S.S.	M.G.
03	17/06/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
02	23/05/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
01	07/05/2024	Issue for Review (IFR)	S.Z.	S.S.	M.G.
00	03/04/2024	Issue for Review (IFR)	S.Z.	S.S.	M.G.

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
1	Issue for Review (IFR)
2	Accepted for Contruction (AFC)
3	Accepted for Contruction (AFC)
4	Accepted for Contruction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.1 PURPOSE OF THE PROJECT

Scope of this document is to report the Cooling and Heating Loads calculations, of the HVAC system provided for the Technical Shelter B-100 HV Switchgear Room (BLPH).

Cooling and Heating loads calculations have been carried out by means of CARRIER II 20 Hourly Analysis Program Version 5.11.

1.2 MEASURING SYSTEM

Length	m, mm
Area	m2, mm2
Volume	3, mm3
Mass	Kg
Airflow	l/s
Pressure	Pa = N/m2, kPa = kN/m2
Temperature	° C
Thermal Load	W, kW
Specific Enthalpy	kJ/kg
Specific Volume	m3/kg

1.3 DESIGN INPUT DATA

Outdoor design conditions:

Summer temperature:	+25°C D.B. (Dry Bulb) with RH 90%
Winter temperature:	-8,4°C D.B. (Dry Bulb) with RH 100%
Shelter U-Value:	0,450 W/(m^2 K).
Safe Area	

Indoor design conditions:

Room Pressurization:	+50 Pa
Summer temperature:	+35°C D.B. (Dry Bulb) with RH 30÷70%.
Winter temperature:	+5°C D.B. (Dry Bulb) with RH 30÷70%.
Internal Load Equipment:	5 kW
ACH Min.:	6
Safe Area	

2 SYSTEM DESCRIPTION

To guarantee the necessary overpressure and the internal design temperatures in the summer and winter seasons, two AHU have been provided, one for service and one for stand-by, which introduce external air directly into the Shelter.

In the winter season, to guarantee the minimum temperature inside the shelter, two electric heating batteries will be installed inside the pressurization fans.

2.1 ARCHITECTURAL DATA

Geometric data are based on document listed below:

1724000049-AR-DA-00014 Base load power HUB (BLPH) B-100 general arrangement drawing.

2.2 ROOM PRESSURIZATION

In order to guarantee the pressurization, where external doors are provided, fresh air flow requirement to maintain specified positive pressure shall be calculated based on following formula in accord to

ASHRAE:

$Q = Cd * A * Vp = m^3/s$

where ΔP = pressure difference across opening, Pa

Q = Airflow rate, m3/s

Cd = Discharge coefficient for opening, dimensionless (0,625 assumed)

Generally general 0.5 for large gaps and 0,625 for small openings.

A = Leakage area (m^2).

Vp: Velocity through crack area to maintain required pressure (2 ΔP/d) ^0.5

d = Density of air (kg/m^3) assumed 1.225 kg/m^3.

Note:

Leakage area for double leaf door = 0,03 m^2
Leakage area for single leaf door = 0,02 m^2

Container structures, walls, floor and the ceiling are joined together by continuous welding.

Therefore, there isn't air leakage.

Vp for overpressure required 50 Pa = (2 x 50 / 1,225) ^0,5 = 9,03

Single Door overpressure required: (0,625x0,02x9,03) = 0,112 m^3/s that become 0,112x 3600 = 403 m^3/h

Double Door overpressure required: (0,625x0,03x9,03) = 0,169 m^3/s that become 0,112 x 3600 = 608 m^3/h

Total pressurization air flow equal to 403 m^3/h + 608 m^3/h = 1011 m^3/h -> 280,8 l/s

Air change required for room: (B 58,4 m^2 x H 4) x 6 = 1401,6 m^3/h -> 389,3 l/s

3 AIR FLOW REQUIRED TO COOL THE ROOM BY MEANS OF FORCED VENTILATION

The calculation will be performed with the following equation:

$Q = [q / (r \times Cp \times \Delta T)] \times 60$

Where:

Q= air flow (m^3 / min)

Zone Design Load Summary for B-100

q = amount of heat to dissipate (W) -> 4196 W from HAP Carrier (see following sheet)

r= Air Density at +25°C D.B. (Dry Bulb) with RH 90 % -> 1,177 kg/m^3

Cp = specific air heat (1005 Joule / kg • K)

ΔT = air temperature rises from 25°C to 35°C (10°C)

Q= [4196 / (1,171 x 1005 x 10)] x 60 = 21,39 m^3/min.

that become 21,39 m^3/min x 60 = 1283,4 m^3/h -> 356,5 l/s

According to the calculations above, the air flow rate required to cool the room by forced ventilation is less than the No. 6 ACH required.

Therefore, the minimum external air flow rate to ventilate and maintain the room under overpressure is equal to 389,3 l/s. (we assumed 1402 m^3/h)

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Heat losses transmission from HAP Carrier

Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 24.8 °C / 23.6 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
	OCCUPIED T-STAT 35.0 °C			OCCUPIED T-STAT 5.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	153 m²	-786	-	153 m²	926	-
Roof Transmission	64 m²	-327	-	64 m²	386	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-176	-	8 m²	207	-
Floor Transmission	58 m²	-597	-	58 m²	352	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	701 W	701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	5000 W	5000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	381	0	10%	187	0
>> Total Zone Loads	-	4196	0	-	2057	0

Below checking the room temperature by introducing 389,3 l/s of external air at +25°C.

t_A = Ambient temperature = 25°C

v_{imm} = Air Specific volume = 0,85 m^3/kg

P_s = Sensible heat to dissipate = 4,196 kW

Q_{imm} = Total air flow = 0,389 m^3/s

c_p [kJ/kgK] air specific heat

t_{imm} = Air temperature entering the envelope = +25°C

$$t_A = \frac{v_{imm} * P_s}{Q_{imm} * c_p} + t_{imm}$$

$$t_A = \frac{0.85 * 4{,}196}{0{,}389 * 1} + 25 = 34{,}1°C$$

The internal air temperature with the given conditions will be 34.1°C<35°C.

4 WINTER SEASON

To calculate the thermal power necessary to heat the rooms it is necessary to add heat load of fresh air to the heat losses transmission through boundaries.

Heat losses transmission from HAP Carrier equal to 2057 Watt.

To calculate the heat load of fresh air to heat rooms from -8,4°C (external ambient temperature) to +5°C (winter design temperature) we used the following formula:

(Q / 3600) x (r x Cp x ΔT) = Watt

Where:

Q = air flow (m^3/h),

r = air density at -8,4°C (1,332 kg/m^3)

Cp = specific air heat (1005 Joule / kg • K)

ΔT = air temperature rises from -8,4°C to +5°C (13,4°C)

(1402 / 3600) x (1,332 x 1005 x 13,4) = 6985,8 Watt

The heating coil capacity to install equal to 6985,8 + 2057 = 9042,8 Watt -> assumed 10 kW as per HAP.

5 WEATER REPORT FROM HAP CARRIER

Design Weather Parameters & MSHGs

4112 - B 100
Frigotermica

05/06/2024
09:04

Design Parameters:

City Name	..	
Location	..	
Latitude	52.3	Deg.
Longitude	-4.8	Deg.
Elevation	30.0	m
Summer Design Dry-Bulb	25.0	°C
Summer Coincident Wet-Bulb	23.7	°C
Summer Daily Range	8.2	K
Winter Design Dry-Bulb	-8.4	°C
Winter Design Wet-Bulb	-8.4	°C
Atmospheric Clearness Number	1.00	
Average Ground Reflectance	0.20	
Soil Conductivity	1.385	W/(m K)
Local Time Zone (GMT +/- N hours)	1.0	hours
Consider Daylight Savings Time	No	
Simulation Weather Data	N/A	
Current Data is	User Modified	
Design Cooling Months	January to December	

Design Day Maximum Solar Heat Gains

(The MSHG values are expressed in W/m²)

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S
January	38.8	38.8	38.8	98.7	308.2	473.1	618.1	687.5	715.2
February	55.8	55.8	72.2	288.0	480.0	639.4	730.3	775.6	780.0
March	74.7	74.7	242.5	454.2	611.0	724.2	761.7	755.4	742.3
April	94.1	186.7	400.6	555.9	679.0	712.3	689.8	650.0	629.4
May	113.0	305.1	487.7	621.3	687.3	680.1	627.5	556.8	529.7
June	156.7	346.4	514.5	633.8	681.4	657.2	591.6	514.4	481.4
July	121.5	292.0	483.9	602.9	676.6	664.8	608.7	547.0	515.0
August	99.5	190.3	383.3	541.5	652.7	690.1	668.2	630.2	608.5
September	78.4	78.4	207.4	425.5	567.6	686.1	722.0	721.7	716.9
October	58.7	58.7	84.1	257.4	462.4	607.7	708.1	747.1	757.4
November	40.0	40.0	40.0	117.9	278.2	473.7	589.8	681.0	706.2
December	31.5	31.5	31.5	44.3	228.7	378.7	538.8	614.4	652.4
Month	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**HOR**	**Mult**
January	695.2	617.9	473.7	306.6	106.1	38.8	38.8	185.7	1.00
February	770.8	727.7	643.5	465.5	291.7	68.1	55.8	353.1	1.00
March	752.0	759.6	711.4	622.6	440.4	251.6	74.7	526.9	1.00
April	649.4	697.7	714.0	674.0	564.6	399.0	191.9	661.6	1.00
May	559.0	630.7	685.8	678.1	624.4	477.2	311.6	738.6	1.00
June	516.8	595.8	664.1	679.6	633.7	511.7	348.8	760.6	1.00
July	548.1	616.6	672.1	670.4	611.6	473.1	308.7	731.3	1.00
August	629.1	674.2	688.9	648.8	544.4	385.3	190.6	652.5	1.00
September	719.3	718.7	685.0	574.3	424.7	206.4	78.4	511.0	1.00
October	748.8	707.9	596.6	464.8	253.0	86.0	58.7	352.7	1.00
November	679.4	594.2	473.7	285.1	117.6	40.0	40.0	189.4	1.00
December	623.5	529.5	397.8	216.4	62.0	31.5	31.5	128.0	1.00

Mult. = User-defined solar multiplier factor.

6 SYSTEM DESIGN REPORT FROM HAP CARRIER

Air System Sizing Summary for B-100

Project Name: 4112 - B 100 — 05/06/2024
Prepared by: Frigotermica — 09:06

Air System Information

Air System Name	**B-100**	Number of zones	**1**
Equipment Class	**PKG ROOF**	Floor Area	**58.4** m²
Air System Type	**SZCAV**	Location	**.., ..**

Sizing Calculation Information

Calculation Months	**Jan to Dec**	Zone L/s Sizing	**Sum of space airflow rates**
Sizing Data	**Calculated**	Space L/s Sizing	**Individual peak space loads**

Central Cooling Coil Sizing Data

No central cooling coil loads occurred during this calculation.

Central Heating Coil Sizing Data

Max coil load	**10.0**	kW	Load occurs at	**Jan 0400**	
Coil L/s at Jan 0400	**389**	L/s	W/m²	**171.5**	
Max coil L/s	**389**	L/s	Ent. DB / Lvg DB	**8.5 / 29.9**	°C
Water flow @ 11.1 K drop	**N/A**				

Supply Fan Sizing Data

Actual max L/s	**389**	L/s	Fan motor BHP	**0.23**	BHP
Standard L/s	**388**	L/s	Fan motor kW	**0.18**	kW
Actual max L/(s·m²)	**6.67**	L/(s·m²)	Fan static	**300**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**389**	L/s	L/s/person	**0.00**	L/s/person
L/(s·m²)	**6.67**	L/(s·m²)			

Zone Sizing Summary for B-100

Project Name: 4112 - B 100 — 05/06/2024
Prepared by: Frigotermica — 09:06

Air System Information

Air System Name **B-100**
Equipment Class ..... **PKG ROOF**
Air System Type ..... **SZCAV**

Number of zones **1**
Floor Area ..... **58.4** m²
Location ..... **.., ..**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**
Space L/s Sizing ..... **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (L/s)	Minimum Supply Airflow (L/s)	Zone L/(s·m²)	Reheat Coil Load (kW)	Reheat Coil Water L/s @ 11.1 K	Zone Htg Unit Coil Load (kW)	Zone Htg Unit Water L/s @ 11.1 K	Mixing Box Fan Airflow (L/s)
Zone 1	389	389	6.67	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Zone Heating Load (kW)	Zone Floor Area (m²)
Zone 1	4.2	Jul 1600	2.1	58.4

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
Zone 1							
B 100	1	4.2	Jul 1600	389	2.1	58.4	6.67

Ventilation Sizing Summary for B-100

Project Name: 4112 - B 100
Prepared by: Frigotermica

05/06/2024
09:06

1. Summary

Ventilation Sizing Method ..... **Sum of Space OA Airflows**
Design Ventilation Airflow Rate ..... **389** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m^2)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m^2))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
B 100	1	58.4	0.0	389.3	0.00	0.00	389.3	0.0	389.3
Totals (incl. Space Multipliers)				**389.3**					**389.3**

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Air System Design Load Summary for B-100

Project Name: 4112 - B 100
Prepared by: Frigotermica
05/06/2024
09:06

	DESIGN COOLING			DESIGN HEATING		
	NO COOLING DATA NO COOLING OA DB / WB			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	-	-	0 m²	-	-
Wall Transmission	153 m²	-	-	153 m²	926	-
Roof Transmission	64 m²	-	-	64 m²	386	-
Window Transmission	0 m²	-	-	0 m²	0	-
Skylight Transmission	0 m²	-	-	0 m²	0	-
Door Loads	8 m²	-	-	8 m²	207	-
Floor Transmission	58 m²	-	-	58 m²	352	-
Partitions	0 m²	-	-	0 m²	0	-
Ceiling	0 m²	-	-	0 m²	0	-
Overhead Lighting	-	-	-	0	0	-
Task Lighting	-	-	-	0	0	-
Electric Equipment	-	-	-	0	0	-
People	-	-	-	0	0	0
Infiltration	-	-	-	-	0	0
Miscellaneous	-	-	-	-	0	0
Safety Factor	10% / 0%	-	-	10%	187	0
>> Total Zone Loads	-	-	-	-	2057	0
Zone Conditioning	-	-	-	-	2128	0
Plenum Wall Load	0%	-	-	0	0	-
Plenum Roof Load	0%	-	-	0	0	-
Plenum Lighting Load	0%	-	-	0	0	-
Return Fan Load	-	-	-	0 L/s	0	-
Ventilation Load	-	-	-	389 L/s	6287	0
Supply Fan Load	-	-	-	389 L/s	-180	-
Space Fan Coil Fans	-	-	-	-	0	-
Duct Heat Gain / Loss	0%	-	-	0%	0	-
>> Total System Loads	-	-	-	-	8235	0
Central Cooling Coil	-	-	-	-	0	0
Central Heating Coil	-	-	-	-	9748	-
>> Total Conditioning	-	-	-	-	9748	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

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Zone Design Load Summary for B-100

Project Name: 4112 - B 100
Prepared by: Frigotermica

05/06/2024
09:06

Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 24.8 °C / 23.6 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
	OCCUPIED T-STAT 35.0 °C			OCCUPIED T-STAT 5.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	153 m²	-786	-	153 m²	926	-
Roof Transmission	64 m²	-327	-	64 m²	386	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-176	-	8 m²	207	-
Floor Transmission	58 m²	-597	-	58 m²	352	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	701 W	701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	5000 W	5000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	381	0	10%	187	0
>> Total Zone Loads	**-**	**4196**	**0**	**-**	**2057**	**0**

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Space Design Load Summary for B-100

Project Name: 4112 - B 100 — 05/06/2024
Prepared by: Frigotermica — 09:06

TABLE 1.1.A. Component Loads For Space "B 100" In Zone "Zone 1"

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 24.8 °C / 23.6 °C OCCUPIED T-STAT 35.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C OCCUPIED T-STAT 5.0 °C		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(W)**	**(W)**	**Details**	**(W)**	**(W)**
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	153 m²	-786	-	153 m²	926	-
Roof Transmission	64 m²	-327	-	64 m²	386	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-176	-	8 m²	207	-
Floor Transmission	58 m²	-597	-	58 m²	352	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	701 W	701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	5000 W	5000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	381	0	10%	187	0
>> Total Zone Loads	**-**	**4196**	**0**	**-**	**2057**	**0**

TABLE 1.1.B. Envelope Loads For Space "B 100" In Zone "Zone 1"

				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m²)	(W/(m²·K))	Coeff.	(W)	(W)	(W)
N EXPOSURE						
WALL	59	0.450	-	-300	-	354
E EXPOSURE						
WALL	20	0.450	-	-102	-	120
DOOR	2	1.930	-	-48	-	57
S EXPOSURE						
WALL	59	0.450	-	-300	-	354
W EXPOSURE						
WALL	16	0.450	-	-83	-	98
DOOR	6	1.930	-	-128	-	150
H EXPOSURE						
ROOF	64	0.450	-	-327	-	386

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System Psychrometrics for B-100

Project Name: 4112 - B 100
Prepared by: Frigotermica

05/06/2024
09:06

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°C)	Specific Humidity (kg/kg)	Airflow (L/s)	CO2 Level (ppm)	Sensible Heat (W)	Latent Heat (W)
Ventilation Air	Inlet	-8.4	0.00185	389	400	-6287	0
Vent - Return Mixing	Outlet	-8.4	0.00185	389	400	-	-
Central Cooling Coil	Outlet	-8.4	0.00185	389	400	0	0
Central Heating Coil	Outlet	12.4	0.00185	389	400	9748	-
Supply Fan	Outlet	12.8	0.00185	389	400	180	-
Cold Supply Duct	Outlet	9.6	0.00185	389	400	-	-
Zone Air	-	5.0	0.00185	389	400	-2128	0
Zone Direct Exhaust	Outlet	5.0	0.00185	389	400	-	-
Return Plenum	Outlet	5.0	0.00185	0	400	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.203 W/(L/s-K)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2937.1 W/(L/s)
Site Altitude = 30.0 m

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (W)	T-stat Mode	Zone Cond (W)	Zone Temp (°C)	Zone Airflow (L/s)	CO2 Level (ppm)	Terminal Heating Coil (W)	Zone Heating Unit (W)
Zone 1	-2057	Deadband	-2128	5.0	389	400	0	0

7 SYSTEM SUMMARY

Below is the system performance:

Pressurizing air flow rate: 1402 m/h (each fan)

Heating coil capacity: 10 kW (for each fan)

8 DUCT PRESSURE DROP

The HVAC Ducts, have been sized with the criterion of constant pressure drop.

In this paper we have calculated the static pressure drop of the most unfavorable sections of the air duct distribution according to ASHRAE standards.

METHOD:

To calculate the friction losses, the following equation have been used as detailed below. These equations have a wide and internationally recognised application for this kind of calculation.
The friction losses (Dp) in terms of specific energy (mm w.g.) have been evaluated by means of the below equation:

$$Dp = k \times pd$$

where:

- K Accidental Resistance (see value attach in table 1)
- pd Dynamic Pressure (mm w.g) $pd = \frac{c^2 \times \gamma}{2 \times g}$

Where:

- γ: Air density (1,22 Kg/m^3)
- c velocity of air m/s

If the Duct are linear the Dp are independent of Dynamic Pressure but depend of:

$$Dp = 0{,}00117722 \frac{c^{1,9}}{d_{eq}{}^{1,22}}$$

This value is for each meter of linear duct

where:

- c velocity of air m/s
- d_{eq} Diameter of equivalent duct

$$d_{eq} = \frac{4{,}5 \times A}{P}$$

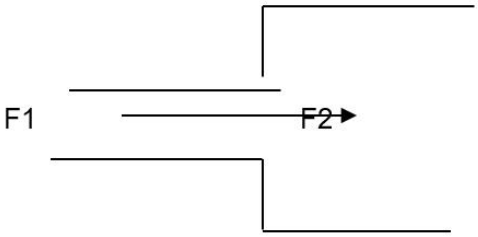
where:

- A Cross section of duct
- P Perimeter

Tab. 1

Pos	Description	K for special peace
1	Linear duct	0
2	Bend 90°	0,1
3	Outlet	1
4	Inlet	0,35
5	Section reduction	0,35

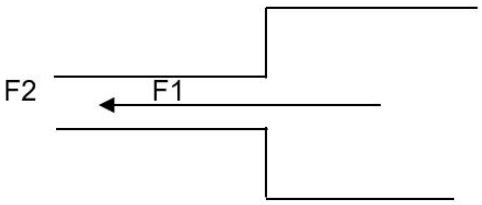
POS .6 Inlet in the Plenum



See detail

AxB/A1xB1	0,1	0,2	0,4	0,6	0,8
K	1	0,7	0,4	0,2	0,1

POS.7 Outlet from Plenum



See detail

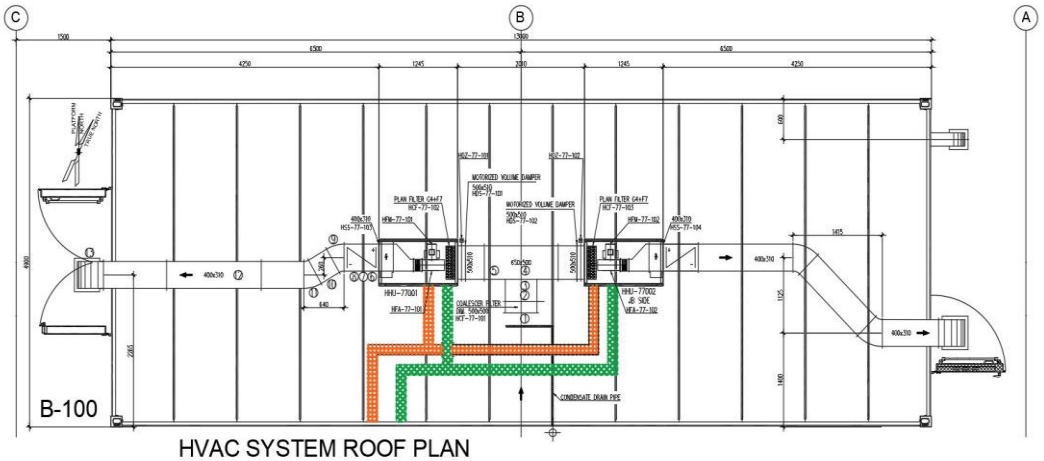
AxB/A1xB1	0,2	0,4	0,6	0,8
K	0,45	0,3	0,2	0,1

B100 duct layout pressure drop:

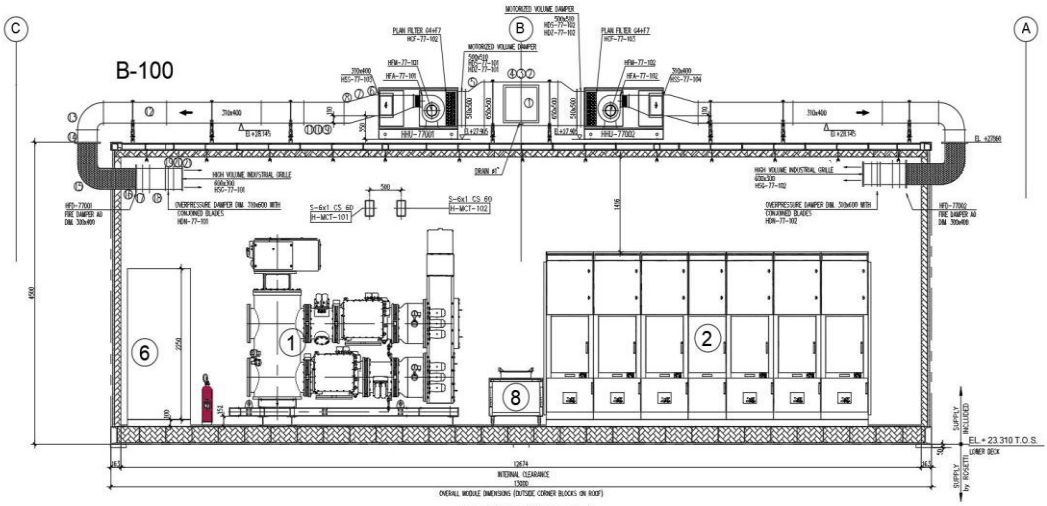
B-100					Duct pressure loss calculation						
	POS.	Inlet air dimens. (mm)		Outlet air dimens. (mm)		Lenght	Air Flow	Velocity	POS.	Dp for linear duct	DP for special pieces
		A	B	A1	B1	L (mm)	mc/h	m/s		mm w.g.	mm w.g.
HHU-77001 / 77002	1	COALESCER FILTER 500 x 500					1402			0,00	2,04
	2	500	500	500	500	350	1402	2	1	0,00	0,00
	3	500	500	500	500	350	1402	2	1	0,00	0,00
	4	650	500	650	500	585	1402	1	1	0,00	0,00
	5	650	500	500	510	300	1402	1	5	0,00	0,00
	6	400	310	400	310	0	1402	3	7	0,00	0,06
	7	400	310	400	310	420	1402	3	1	0,01	0,00
	8	400	310	400	310	0	1402	3	7	0,00	0,06
	9	400	310	400	310	0	1402	3	7	0,00	0,06
	10	400	310	400	310	330	1402	3	1	0,01	0,00
	11	400	310	400	310	0	1402	3	7	0,00	0,06
	12	400	310	400	310	3430	1402	3	1	0,10	0,00
	13	400	310	400	310	0	1402	3	2	0,00	0,28
	14	400	310	400	310	985	1402	3	1	0,03	0,00
	15	400	310	400	310	0	1402	3	2	0,00	0,28
	16	400	310	400	310	780	1402	3	1	0,02	0,00
	17	FIRE DAMPER					1402			0,00	1,02
	18	400	310	600	300	250	1402	3	5	0,00	0,20
	19	OVERPRESSURE DAMPER					1402			0,00	2,35
	20	600	300	600	300	130	1402	2	1	0,00	0,00
	21	SUPPLY GRILLE					1402			0,00	0,71
									1	0,19	7,10
									TOTAL LOSS Pa	71,44	

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B-100 → **DUCT LAYOUT:**



HVAC SYSTEM ROOF PLAN



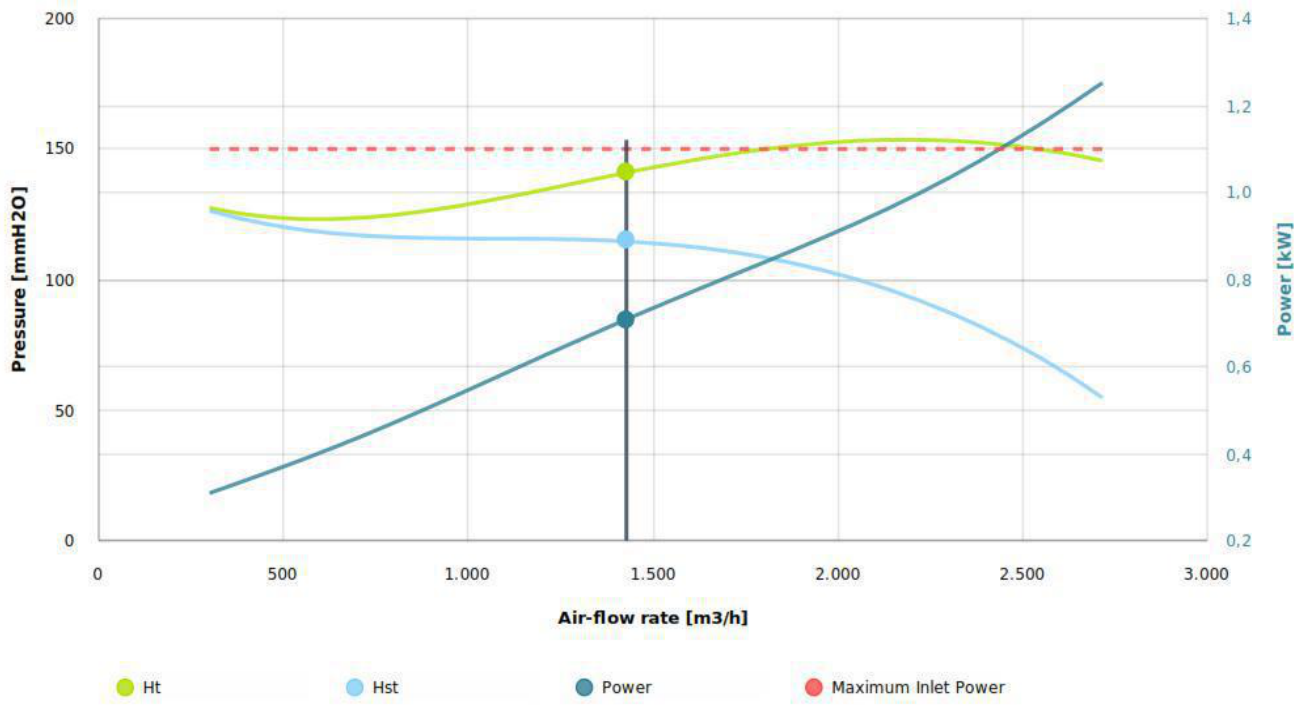
SECTION 1-1

9 CONCLUSION

The pressure drop duct layout of the B-100 loss: 71.44Pa

The ducts were built based on the flow rate required by the thermal calculation and the fans were sized based on the pressure loss, obtained with the calculation sheet illustrated above.

The fan's air flow is sufficient to guarantee the required overpressure of 50 Pa.



ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	23/01/2025

Base Load Power Hub (BLPH)

B-200 HVAC CALCULATION REPORT
(Incl HVAC SYS CALC and HEAT DISSIPATION CALC)
E&I SHELTERS

Document Number: 1724000049-HV-CA-00036

Document Class: 2

03	09/12/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
02	17/06/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
01	23/05/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
00	07/05/2024	Issue for Review (IFR)	S.Z.	S.S.	M.G.
Rev.	Date	Description	Prepared	Reviewed	Approved

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)
02	Accepted for Construction (AFC)
03	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
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1 INTRODUCTION

1.1 PURPOSE OF THE PROJECT

Scope of this document is to report the Cooling and Heating Loads calculations, of the HVAC system provided for the Technical Shelter B-200.

Cooling and Heating loads calculations have been carried out by means of CARRIER II 20 Hourly Analysis Program Version 5.11.

1.2 MEASURING SYSTEM

Length	m, mm
Area	m2, mm2
Volume	3, mm3
Mass	Kg
Airflow	l/s
Pressure	Pa = N/m2, kPa = kN/m2
Temperature	° C
Thermal Load	W, kW
Specific Enthalpy	kJ/kg
Specific Volume	m3/kg

1.3 DESIGN INPUT DATA

Outdoor design conditions:

Summer temperature:	+25°C D.B. (Dry Bulb) with RH 90%
Winter temperature:	-8,4°C D.B. (Dry Bulb) with RH 100%
Shelter U-Value:	0,450 W/(m^2 K).
Safe Area	

Indoor design conditions:

Room Pressurization:	+50 Pa
Summer temperature:	+35°C D.B. (Dry Bulb) with RH 30÷70%.
Winter temperature:	+5°C D.B. (Dry Bulb) with RH 30÷70%.
Internal Load Equipment:	4,5 kW
ACH Min.:	6
Safe Area	

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2 SYSTEM DESCRIPTION

To guarantee the necessary overpressure and the internal design temperatures in the summer and winter seasons, two AHU have been provided, one for service and one for stand-by, which introduce external air directly into the Shelter.

In the winter season, to guarantee the minimum temperature inside the shelter, two electric heating batteries will be installed inside the pressurization fans.

2.1 ARCHITECTURAL DATA

Geometric data are based on document listed below:

1724000049-AR-DA-00015 Base load power HUB (BLPH) B-200 general arrangement drawing.

2.2 ROOM PRESSURIZATION

In order to guarantee the pressurization, where external doors are provided, fresh air flow requirement to maintain specified positive pressure shall be calculated based on following formula in accord to

ASHRAE:

$Q = Cd * A * Vp = m^3/s$

where ΔP = pressure difference across opening, Pa

Q = Airflow rate, m3/s

Cd = Discharge coefficient for opening, dimensionless (0,625 assumed)

Generally general 0.5 for large gaps and 0,625 for small openings.

A = Leakage area (m^2).

Vp: Velocity through crack area to maintain required pressure (2 ΔP/d) ^0.5

d = Density of air (kg/m^3) assumed 1.225 kg/m^3.

Note:

Leakage area for double leaf door = 0,03 m^2
Leakage area for single leaf door = 0,02 m^2

Container structures, walls, floor and the ceiling are joined together by continuous welding.

Therefore, there isn't air leakage.

Vp for overpressure required 50 Pa = (2 x 50 / 1,225) ^0,5 = 9,03

Single Door overpressure required: (0,625x0,02x9,03) = 0,112 m^3/s that become 0,112x 3600 = 403 m^3/h

Double Door overpressure required: (0,625x0,03x9,03) = 0,169 m^3/s that become 0,112 x 3600 = 608 m^3/h

Total pressurization air flow equal to 403 m^3/h + 608 m^3/h = 1011 m^3/h -> 280,8 l/s

Air change required for room: (B 30 m^2 x H 4) x 6 = 720 m^3/h -> 200 l/s

3 AIR FLOW REQUIRED TO COOL THE ROOM BY MEANS OF FORCED VENTILATION

The calculation will be performed with the following equation:

Q = [q / (r x Cp x ΔT)] x 60

Where:

Q= air flow (m^3 / min)

Zone Design Load Summary for B-200

q = amount of heat to dissipate (W) -> 4009 W from HAP Carrier.

r= Air Density at +25°C D.B. (Dry Bulb) with RH 90 % -> 1,177 kg/m^3

Cp = specific air heat (1005 Joule / kg • K)

ΔT = air temperature rises from 25°C to 35°C (10°C)

Q= [4009 / (1,171 x 1005 x 10)] x 60 = 20,43 m^3/min.

that become 20,43 m^3/min x 60 = 1225,8 m^3/h -> 340,5 l/s

As per above calculations the pressurization air flow rate is less than the air flow required to cool the room by means forced ventilation.

Therefore, the minimum external air flow rate to ventilate and maintain the room under overpressure is equal to 340,5 l/s.

Below checking the room temperature by introducing 340,5 l/s of external air at +25°C.

Heat losses transmission from HAP Carrier

Zone Design Load Summary for B-200

Project Name: 4112 - B 200
Prepared by: Frigotermica
05/06/2024
01:35

Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 24.8 °C / 23.6 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
	OCCUPIED T-STAT 35.0 °C			OCCUPIED T-STAT 5.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	113 m²	-579	-	113 m²	682	-
Roof Transmission	30 m²	-154	-	30 m²	181	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-176	-	8 m²	207	-
Floor Transmission	30 m²	-306	-	30 m²	181	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	360 W	360	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4500 W	4500	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	364	0	10%	125	0
>> Total Zone Loads	-	4009	0	-	1376	0

t_A = Ambient temperature = 25°C

v_{imm} = Air Specific volume = 0,85 m^3/kg

P_s = Sensible heat to dissipate = 4,009 kW

Q_{imm} = Total air flow = 0,340 m^3/s

c_p [kJ/kgK] air specific heat

t_{imm} = Air temperature entering the envelope = +25°C

$$t_A = \frac{v_{imm} * P_s}{Q_{imm} * c_p} + t_{imm}$$

$$t_A = \frac{0.85 * 4{,}009}{0{,}340 * 1} + 25 = 35\ °C$$

The internal air temperature with the given conditions will be 35 °C.

4 WINTER SEASON

To calculate the thermal power necessary to heat the rooms it is necessary to add heat load of fresh air to the heat losses transmission through boundaries.

Heat losses transmission from HAP Carrier equal to 1376 Watt.

To calculate the heat load of fresh air to heat rooms from -8,4°C (external ambient temperature) to +5°C (winter design temperature) we used the following formula:

(Q / 3600) x (r x Cp x ΔT) = Watt

Where:

Q = air flow (m^3/h),

r = air density at -8,4°C (1,332 kg/m^3)

Cp = specific air heat (1005 Joule / kg • K)

ΔT = air temperature rises from -8,4°C to +5°C (13,4°C)

(1225,8 / 3600) x (1,332 x 1005 x 13,4) = 6107,9 Watt

The heating coil capacity to install equal to 6107,9 + 1376 = 7483,9 Watt -> assumed 8,5 kW as per HAP carrier calculation.

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5 WEATER REPORT FROM HAP CARRIER

Design Weather Parameters & MSHGs

4112 - B 200
Frigotermica

05/06/2024
01:33

Design Parameters:

City Name	..	
Location	..	
Latitude	52.3	Deg.
Longitude	-4.8	Deg.
Elevation	30.0	m
Summer Design Dry-Bulb	25.0	°C
Summer Coincident Wet-Bulb	23.7	°C
Summer Daily Range	8.2	K
Winter Design Dry-Bulb	-8.4	°C
Winter Design Wet-Bulb	-8.4	°C
Atmospheric Clearness Number	1.00	
Average Ground Reflectance	0.20	
Soil Conductivity	1.385	W/(m K)
Local Time Zone (GMT +/- N hours)	1.0	hours
Consider Daylight Savings Time	No	
Simulation Weather Data	N/A	
Current Data is	User Modified	
Design Cooling Months	January to December	

Design Day Maximum Solar Heat Gains

(The MSHG values are expressed in W/m²)

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S
January	38.8	38.8	38.8	98.7	308.2	473.1	618.1	687.5	715.2
February	55.8	55.8	72.2	288.0	480.0	639.4	730.3	775.6	780.0
March	74.7	74.7	242.5	454.2	611.0	724.2	761.7	755.4	742.3
April	94.1	186.7	400.6	555.9	679.0	712.3	689.8	650.0	629.4
May	113.0	305.1	487.7	621.3	687.3	680.1	627.5	556.8	529.7
June	156.7	346.4	514.5	633.8	681.4	657.2	591.6	514.4	481.4
July	121.5	292.0	483.9	602.9	676.6	664.8	608.7	547.0	515.0
August	99.5	190.3	383.3	541.5	652.7	690.1	668.2	630.2	608.5
September	78.4	78.4	207.4	425.5	567.6	686.1	722.0	721.7	716.9
October	58.7	58.7	84.1	257.4	462.4	607.7	708.1	747.1	757.4
November	40.0	40.0	40.0	117.9	278.2	473.7	589.8	681.0	706.2
December	31.5	31.5	31.5	44.3	228.7	378.7	538.8	614.4	652.4
Month	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**HOR**	**Mult**
January	695.2	617.9	473.7	306.6	106.1	38.8	38.8	185.7	1.00
February	770.8	727.7	643.5	465.5	291.7	68.1	55.8	353.1	1.00
March	752.0	759.6	711.4	622.6	440.4	251.6	74.7	526.9	1.00
April	649.4	697.7	714.0	674.0	564.6	399.0	191.9	661.6	1.00
May	559.0	630.7	685.8	678.1	624.4	477.2	311.6	738.6	1.00
June	516.8	595.8	664.1	679.6	633.7	511.7	348.8	760.6	1.00
July	548.1	616.6	672.1	670.4	611.6	473.1	308.7	731.3	1.00
August	629.1	674.2	688.9	648.8	544.4	385.3	190.6	652.5	1.00
September	719.3	718.7	685.0	574.3	424.7	206.4	78.4	511.0	1.00
October	748.8	707.9	596.6	464.8	253.0	86.0	58.7	352.7	1.00
November	679.4	594.2	473.7	285.1	117.6	40.0	40.0	189.4	1.00
December	623.5	529.5	397.8	216.4	62.0	31.5	31.5	128.0	1.00

Mult. = User-defined solar multiplier factor.

6 SYSTEM DESIGN REPORT FROM HAP CARRIER

Air System Sizing Summary for B-200

Project Name: 4112 - B 200 — 05/06/2024
Prepared by: Frigotermica — 01:35

Air System Information

Air System Name	**B-200**	Number of zones	**1**	
Equipment Class	**SPLT AHU**	Floor Area	**30.0**	m²
Air System Type	**SZCAV**	Location	**.., ..**	

Sizing Calculation Information

Calculation Months	**Jan to Dec**	Zone L/s Sizing	**Sum of space airflow rates**
Sizing Data	**Calculated**	Space L/s Sizing	**Individual peak space loads**

Central Cooling Coil Sizing Data

No central cooling coil loads occurred during this calculation.

Central Heating Coil Sizing Data

Max coil load	**8.5**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**341**	L/s	W/m²	**284.2**	
Max coil L/s	**341**	L/s	Ent. DB / Lvg DB	**-8.4 / 12.4**	°C
Water flow @ 11.1 K drop	**N/A**				

Supply Fan Sizing Data

Actual max L/s	**341**	L/s	Fan motor BHP	**0.20**	BHP
Standard L/s	**339**	L/s	Fan motor kW	**0.16**	kW
Actual max L/(s·m²)	**11.35**	L/(s·m²)	Fan static	**300**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**341**	L/s	L/s/person	**0.00**	L/s/person
L/(s·m²)	**11.35**	L/(s·m²)			

Zone Sizing Summary for B-200

Project Name: 4112 - B 200 — 05/06/2024
Prepared by: Frigotermica — 01:35

Air System Information

Air System Name **B-200**
Equipment Class ..... **SPLT AHU**
Air System Type ..... **SZCAV**

Number of zones **1**
Floor Area ..... **30.0** m²
Location ..... **.., ..**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**
Space L/s Sizing ..... **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (L/s)	Minimum Supply Airflow (L/s)	Zone L/(s·m²)	Reheat Coil Load (kW)	Reheat Coil Water L/s @ 11.1 K	Zone Htg Unit Coil Load (kW)	Zone Htg Unit Water L/s @ 11.1 K	Mixing Box Fan Airflow (L/s)
Zone 1	341	341	11.35	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Zone Heating Load (kW)	Zone Floor Area (m²)
Zone 1	4.0	Jul 1600	1.4	30.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
Zone 1							
B 200	1	4.0	Jul 1600	341	1.4	30.0	11.35

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Ventilation Sizing Summary for B-200

Project Name: 4112 - B 200
Prepared by: Frigotermica

05/06/2024
01:35

1. Summary

Ventilation Sizing Method ..... **Sum of Space OA Airflows**
Design Ventilation Airflow Rate ..... **341** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m^2)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m^2))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
B 200	1	30.0	0.0	340.5	0.00	0.00	340.5	0.0	340.5
Totals (incl. Space Multipliers)				**340.5**					**340.5**

Air System Design Load Summary for B-200

Project Name: 4112 - B 200
Prepared by: Frigotermica

05/06/2024
01:35

	DESIGN COOLING			DESIGN HEATING		
	NO COOLING DATA NO COOLING OA DB / WB			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
ZONE LOADS	**Details**	**Sensible (W)**	**Latent (W)**	**Details**	**Sensible (W)**	**Latent (W)**
Window & Skylight Solar Loads	0 m²	-	-	0 m²	-	-
Wall Transmission	113 m²	-	-	113 m²	682	-
Roof Transmission	30 m²	-	-	30 m²	181	-
Window Transmission	0 m²	-	-	0 m²	0	-
Skylight Transmission	0 m²	-	-	0 m²	0	-
Door Loads	8 m²	-	-	8 m²	207	-
Floor Transmission	30 m²	-	-	30 m²	181	-
Partitions	0 m²	-	-	0 m²	0	-
Ceiling	0 m²	-	-	0 m²	0	-
Overhead Lighting	-	-	-	0	0	-
Task Lighting	-	-	-	0	0	-
Electric Equipment	-	-	-	0	0	-
People	-	-	-	0	0	0
Infiltration	-	-	-	-	0	0
Miscellaneous	-	-	-	-	0	0
Safety Factor	10% / 0%	-	-	10%	125	0
>> Total Zone Loads	-	-	-	-	**1376**	**0**
Zone Conditioning	-	-	-	-	1435	0
Plenum Wall Load	0%	-	-	0	0	-
Plenum Roof Load	0%	-	-	0	0	-
Plenum Lighting Load	0%	-	-	0	0	-
Return Fan Load	-	-	-	0 L/s	0	-
Ventilation Load	-	-	-	341 L/s	5536	0
Supply Fan Load	-	-	-	341 L/s	-157	-
Space Fan Coil Fans	-	-	-	-	0	-
Duct Heat Gain / Loss	0%	-	-	0%	0	-
>> Total System Loads	-	-	-	-	**6814**	**0**
Central Cooling Coil	-	-	-	-	0	0
Central Heating Coil	-	-	-	-	8526	-
>> Total Conditioning	-	-	-	-	**8526**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

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Zone Design Load Summary for B-200

Project Name: 4112 - B 200
Prepared by: Frigotermica

05/06/2024
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Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 24.8 °C / 23.6 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
	OCCUPIED T-STAT 35.0 °C			OCCUPIED T-STAT 5.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	113 m²	-579	-	113 m²	682	-
Roof Transmission	30 m²	-154	-	30 m²	181	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-176	-	8 m²	207	-
Floor Transmission	30 m²	-306	-	30 m²	181	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	360 W	360	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4500 W	4500	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	364	0	10%	125	0
>> Total Zone Loads	-	4009	0	-	1376	0

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Space Design Load Summary for B-200

Project Name: 4112 - B 200
Prepared by: Frigotermica

05/06/2024
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TABLE 1.1.A. Component Loads For Space "B 200" In Zone "Zone 1"

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 24.8 °C / 23.6 °C OCCUPIED T-STAT 35.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C OCCUPIED T-STAT 5.0 °C		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(W)**	**(W)**	**Details**	**(W)**	**(W)**
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	113 m²	-579	-	113 m²	682	-
Roof Transmission	30 m²	-154	-	30 m²	181	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-176	-	8 m²	207	-
Floor Transmission	30 m²	-306	-	30 m²	181	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	360 W	360	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4500 W	4500	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	364	0	10%	125	0
>> Total Zone Loads	**-**	**4009**	**0**	**-**	**1376**	**0**

TABLE 1.1.B. Envelope Loads For Space "B 200" In Zone "Zone 1"

				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m²)	(W/(m²·K))	Coeff.	(W)	(W)	(W)
N EXPOSURE						
WALL	45	0.450	-	-231	-	272
E EXPOSURE						
WALL	13	0.450	-	-68	-	80
DOOR	2	1.930	-	-48	-	57
S EXPOSURE						
WALL	45	0.450	-	-231	-	272
W EXPOSURE						
WALL	10	0.450	-	-49	-	58
DOOR	6	1.930	-	-128	-	150
H EXPOSURE						
ROOF	30	0.450	-	-154	-	181

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System Psychrometrics for B-200

Project Name: 4112 - B 200
Prepared by: Frigotermica

05/06/2024
01:35

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°C)	Specific Humidity (kg/kg)	Airflow (L/s)	CO2 Level (ppm)	Sensible Heat (W)	Latent Heat (W)
Ventilation Air	Inlet	-8.4	0.00185	341	400	-5536	0
Vent - Return Mixing	Outlet	-8.4	0.00185	341	400	-	-
Central Cooling Coil	Outlet	-8.4	0.00185	341	400	0	0
Central Heating Coil	Outlet	12.4	0.00185	341	400	8526	-
Supply Fan	Outlet	12.8	0.00185	341	400	157	-
Cold Supply Duct	Outlet	8.6	0.00185	341	400	-	-
Zone Air	-	5.1	0.00185	341	0	-1435	0
Zone Direct Exhaust	Outlet	5.1	0.00185	341	0	-	-
Return Plenum	Outlet	5.1	0.00185	0	0	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.203 W/(L/s-K)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2937.1 W/(L/s)
Site Altitude = 30.0 m

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (W)	T-stat Mode	Zone Cond (W)	Zone Temp (°C)	Zone Airflow (L/s)	CO2 Level (ppm)	Terminal Heating Coil (W)	Zone Heating Unit (W)
Zone 1	-1376	Deadband	-1435	5.1	341	400	0	0

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7 SYSTEM SUMMARY

Below is the system performance:

Pressurizing air flow rate: 1226 m³/h (each fan)

Heating coil capacity: 8,5 kW (for each fan)

8 DUCT PRESSURE DROP

The HVAC Ducts, have been sized with the criterion of constant pressure drop.

In this paper we have calculated the static pressure drop of the most unfavorable sections of the air duct distribution according to ASHRAE standards.

METHOD:

To calculate the friction losses, the following equation have been used as detailed below. These equations have a wide and internationally recognised application for this kind of calculation.
The friction losses (Dp) in terms of specific energy (mm w.g.) have been evaluated by means of the below equation:

$$Dp = k \times pd$$

where:

- K Accidental Resistance (see value attach in table 1)
- pd Dynamic Pressure (mm w.g) $pd = \frac{c^2 \times \gamma}{2 \times g}$

Where:

- γ: Air density (1,22 Kg/m^3)
- c velocity of air m/s

If the Duct are linear the Dp are independent of Dynamic Pressure but depend of:

$$Dp = 0{,}00117722 \frac{c^{1,9}}{d_{eq}{}^{1,22}}$$

This value is for each meter of linear duct

where:

- c velocity of air m/s
- d_{eq} Diameter of equivalent duct

$$d_{eq} = \frac{4{,}5 \times A}{P}$$

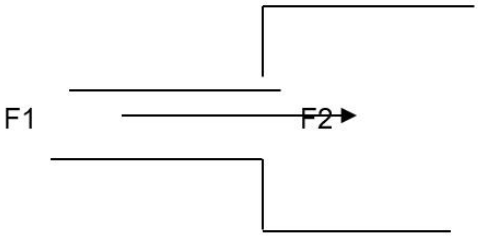
where:

- A Cross section of duct
- P Perimeter

Tab. 1

Pos	Description	K for special peace
1	Linear duct	0
2	Bend 90°	0,1
3	Outlet	1
4	Inlet	0,35
5	Section reduction	0,35

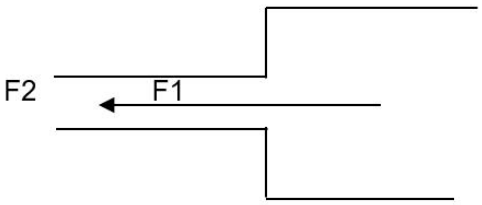
POS .6 Inlet in the Plenum



See detail

AxB/A1xB1	0,1	0,2	0,4	0,6	0,8
K	1	0,7	0,4	0,2	0,1

POS.7 Outlet from Plenum



See detail

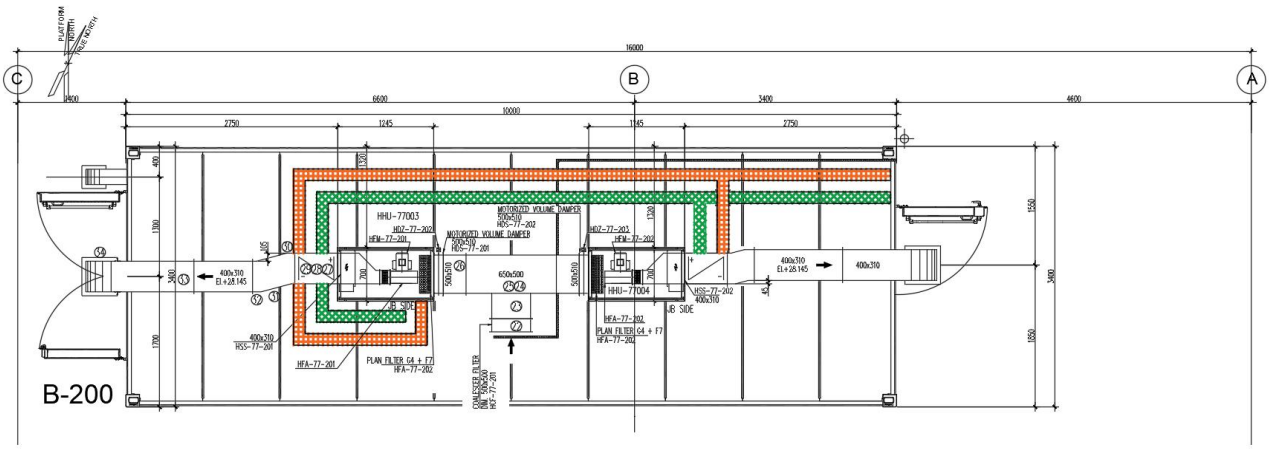
AxB/A1xB1	0,2	0,4	0,6	0,8
K	0,45	0,3	0,2	0,1

B-200 duct layout pressure drop:

	B-200				Duct pressure loss calculation					
	POS.	Inlet air dimens. (mm)		Outlet air dimens. (mm)		Lenght	Air Flow	Velocity	POS.	Dp for linear duct	DP for special pieces
		A	B	A1	B1	L (mm)	mc/h	m/s		mm w.g.	mm w,g,
HHU-77003 / 77004	22	COALESCER FILTER 500 x 500					1226			0,00	2,04
	23	500	500	500	500	350	1226	1	1	0,00	0,00
	24	500	500	500	500	350	1226	1	1	0,00	0,00
	25	650	500	650	500	585	1226	1	1	0,00	0,00
	26	650	500	500	510	300	1226	1	5	0,00	0,00
	27	400	310	400	310	0	1226	3	7	0,00	0,06
	28	400	310	400	310	420	1226	3	1	0,01	0,00
	29	400	310	400	310	0	1226	3	7	0,00	0,06
	30	400	310	400	310	0	1226	3	7	0,00	0,06
	31	400	310	400	310	330	1226	3	1	0,01	0,00
	32	400	310	400	310	0	1226	3	7	0,00	0,06
	33	400	310	400	310	3430	1226	3	1	0,10	0,00
	34	400	310	400	310	0	1226	3	2	0,00	0,28
	35	400	310	400	310	985	1226	3	1	0,03	0,00
	36	400	310	400	310	0	1226	3	2	0,00	0,28
	37	400	310	400	310	780	1226	3	1	0,02	0,00
	38	FIRE DAMPER					1226			0,00	1,02
	39	400	310	600	300	250	1226	3	5	0,00	0,20
	40	OVERPRESSURE DAMPER					1226			0,00	2,35
	41	600	300	600	300	130	1226	2	1	0,00	0,00
	42	SUPPLY GRILLE					1226			0,00	0,71
									1	0,18	7,10
									TOTAL LOSS Pa	71,40	

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B-200 →**DUCT LAYOUT:**

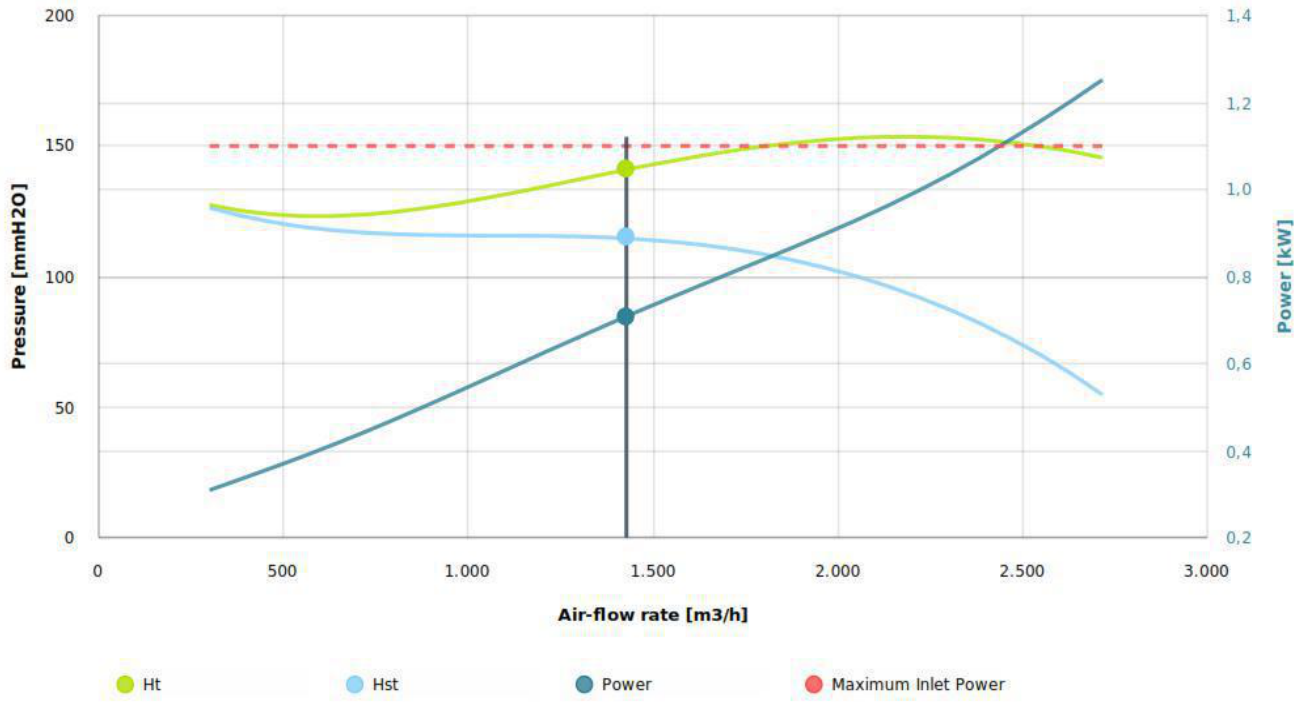


9 CONCLUSION

The pressure drop duct layout of the B-200 loss: 71,40 Pa

The ducts were built based on the flow rate required by the thermal calculation and the fans were sized based on the pressure loss, obtained with the calculation sheet illustrated above.

The fan's air flow is sufficient to guarantee the required overpressure of 50 Pa.



ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
L. Caviglia	23/01/2025

Base Load Power Hub (BLPH)

B-300 HVAC CALCULATION REPORT
(Incl HVAC SYS CALC and HEAT DISSIPATION CALC)
E&I SHELTERS

Document Number: 1724000049-HV-CA-00037

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
04	09/12/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
03	17/06/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
02	23/05/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
01	07/05/2024	Issue for Review (IFR)	S.Z.	S.S.	M.G.
00	19/04/2024	Issue for Review (IFR)	S.Z.	S.S.	M.G.

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
1	Issue for Review (IFR)
2	Accepted for Construction (AFC)
3	Accepted for Construction (AFC)
4	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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9 conclusion 22

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1 INTRODUCTION

1.1 PURPOSE OF THE PROJECT

Scope of this document is to report the Cooling and Heating Loads calculations, of the HVAC system provided for the Technical Shelter B-300.

Cooling and Heating loads calculations have been carried out by means of CARRIER II 20 Hourly Analysis Program Version 5.11.

1.2 MEASURING SYSTEM

Length	m, mm
Area	m2, mm2
Volume	3, mm3
Mass	Kg
Airflow	l/s
Pressure	Pa = N/m2, kPa = kN/m2
Temperature	° C
Thermal Load	W, kW
Specific Enthalpy	kJ/kg
Specific Volume	m3/kg

1.3 DESIGN INPUT DATA

Outdoor design conditions:

Summer temperature:	+25°C D.B. (Dry Bulb) with RH 90 %
Winter temperature:	-8,4°C D.B. (Dry Bulb) with RH 100 %
Shelter U-Value:	0,450 W/(m^2 K).
Safe Area	

Indoor design conditions:

Room Pressurization:	+50 Pa
Summer temperature:	+35°C D.B. (Dry Bulb) with RH 30÷70%.
Winter temperature:	+5°C D.B. (Dry Bulb) with RH 30÷70%.
Internal Load Equipment:	10 kW
ACH Min.:	6
Safe Area	

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2 SYSTEM DESCRIPTION

To guarantee the necessary overpressure and internal design temperatures in the summer and winter seasons, two Roof-Top type units have been provided, one duty and one stand-by.

3 ARCHITECTURAL DATA

Geometric data are based on document listed below:

1724000049-AR-DA-00016 Base load power HUB (BLPH) B-300 general arrangement drawing.

3.1 ROOM PRESSURIZATION

In order to guarantee the pressurization, where external doors are provided, fresh air flow requirement to maintain specified positive pressure shall be calculated based on following formula in accord to

ASHRAE:

$Q = Cd * A * Vp = m^3/s$

where ΔP = pressure difference across opening, Pa

Q = Airflow rate, m3/s

Cd = Discharge coefficient for opening, dimensionless (0,625 assumed)

Generally general 0.5 for large gaps and 0,625 for small openings.

A = Leakage area (m^2).

Vp: Velocity through crack area to maintain required pressure (2 ΔP/d) ^0.5

d = Density of air (kg/m^3) assumed 1.225 kg/m^3.

Note:

Leakage area for double leaf door = 0,03 m^2
Leakage area for single leaf door = 0,02 m^2

Container structures, walls, floor and the ceiling are joined together by continuous welding.

Therefore, there isn't air leakage.

Vp for overpressure required 50 Pa = (2 x 50 / 1,225) ^0,5 = 9,03

Single Door overpressure required: (0,625x0,02x9,03) = 0,112 m^3/s that become 0,112x 3600 = 403 m^3/h

Double Door overpressure required: (0,625x0,03x9,03) = 0,169 m^3/s that become 0,112 x 3600 = 608 m^3/h

Total pressurization air flow equal to 403 m^3/h + 608 m^3/h = 1011 m^3/h -> 280,8 l/s

Air change required for room: (B 30 m^2 x H 3,5) x 6 = 630 m^3/h -> 175 l/s

According to the calculation above, the pressurizing air flow rate is greater than the ACH required.
So, the fresh air rate will be equal to 280,8 l/s (pressurizing air flow rate).

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4 WEATER REPORT FROM HAP CARRIER

Design Weather Parameters & MSHGs

4112 - B 300
Frigotermica

05/06/2024
03:47

Design Parameters:

City Name	..	
Location	..	
Latitude	52.3	Deg.
Longitude	-4.8	Deg.
Elevation	30.0	m
Summer Design Dry-Bulb	25.0	°C
Summer Coincident Wet-Bulb	23.7	°C
Summer Daily Range	8.2	K
Winter Design Dry-Bulb	-8.4	°C
Winter Design Wet-Bulb	-8.4	°C
Atmospheric Clearness Number	1.00	
Average Ground Reflectance	0.20	
Soil Conductivity	1.385	W/(m K)
Local Time Zone (GMT +/- N hours)	1.0	hours
Consider Daylight Savings Time	No	
Simulation Weather Data	N/A	
Current Data is	User Modified	
Design Cooling Months	January to December	

Design Day Maximum Solar Heat Gains

(The MSHG values are expressed in W/m²)

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S
January	38.8	38.8	38.8	98.7	308.2	473.1	618.1	687.5	715.2
February	55.8	55.8	72.2	288.0	480.0	639.4	730.3	775.6	780.0
March	74.7	74.7	242.5	454.2	611.0	724.2	761.7	755.4	742.3
April	94.1	186.7	400.6	555.9	679.0	712.3	689.8	650.0	629.4
May	113.0	305.1	487.7	621.3	687.3	680.1	627.5	556.8	529.7
June	156.7	346.4	514.5	633.8	681.4	657.2	591.6	514.4	481.4
July	121.5	292.0	483.9	602.9	676.6	664.8	608.7	547.0	515.0
August	99.5	190.3	383.3	541.5	652.7	690.1	668.2	630.2	608.5
September	78.4	78.4	207.4	425.5	567.6	686.1	722.0	721.7	716.9
October	58.7	58.7	84.1	257.4	462.4	607.7	708.1	747.1	757.4
November	40.0	40.0	40.0	117.9	278.2	473.7	589.8	681.0	706.2
December	31.5	31.5	31.5	44.3	228.7	378.7	538.8	614.4	652.4
Month	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**HOR**	**Mult**
January	695.2	617.9	473.7	306.6	106.1	38.8	38.8	185.7	1.00
February	770.8	727.7	643.5	465.5	291.7	68.1	55.8	353.1	1.00
March	752.0	759.6	711.4	622.6	440.4	251.6	74.7	526.9	1.00
April	649.4	697.7	714.0	674.0	564.6	399.0	191.9	661.6	1.00
May	559.0	630.7	685.8	678.1	624.4	477.2	311.6	738.6	1.00
June	516.8	595.8	664.1	679.6	633.7	511.7	348.8	760.6	1.00
July	548.1	616.6	672.1	670.4	611.6	473.1	308.7	731.3	1.00
August	629.1	674.2	688.9	648.8	544.4	385.3	190.6	652.5	1.00
September	719.3	718.7	685.0	574.3	424.7	206.4	78.4	511.0	1.00
October	748.8	707.9	596.6	464.8	253.0	86.0	58.7	352.7	1.00
November	679.4	594.2	473.7	285.1	117.6	40.0	40.0	189.4	1.00
December	623.5	529.5	397.8	216.4	62.0	31.5	31.5	128.0	1.00

Mult. = User-defined solar multiplier factor.

5 SYSTEM DESIGN REPORT FROM HAP CARRIER

Air System Sizing Summary for B-300

Project Name: 4112 - B 300
Prepared by: Frigotermica
05/06/2024
03:49

Air System Information

Air System Name	B-300		Number of zones	1	
Equipment Class	PKG ROOF		Floor Area	30.0	m²
Air System Type	SZCAV		Location	.., ..	

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone L/s Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space L/s Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	11.8	kW	Load occurs at	Jul 1400	
Sensible coil load	6.5	kW	OA DB / WB	24.8 / 23.6	°C
Coil L/s at Jul 1400	450	L/s	Entering DB / WB	28.9 / 23.2	°C
Max block L/s	450	L/s	Leaving DB / WB	17.0 / 16.5	°C
Sum of peak zone L/s	450	L/s	Coil ADP	15.6	°C
Sensible heat ratio	0.548		Bypass Factor	0.100	
L/(s kW)	38.2		Resulting RH	31	%
m²/kW	2.5		Design supply temp.	16.4	°C
W/m²	393.0		Zone T-stat Check	1 of 1	OK
Water flow @ 5.6 K rise	N/A		Max zone temperature deviation	0.0	K

Central Heating Coil Sizing Data

Max coil load	5.6	kW	Load occurs at	Des Htg	
Coil L/s at Des Htg	450	L/s	W/m²	185.5	
Max coil L/s	450	L/s	Ent. DB / Lvg DB	-3.4 / 6.9	°C
Water flow @ 11.1 K drop	N/A				

Supply Fan Sizing Data

Actual max L/s	450	L/s	Fan motor BHP	0.26	BHP
Standard L/s	448	L/s	Fan motor kW	0.21	kW
Actual max L/(s·m²)	15.00	L/(s·m²)	Fan static	300	Pa

Outdoor Ventilation Air Data

Design airflow L/s	281	L/s	L/s/person	0.00	L/s/person
L/(s·m²)	9.36	L/(s·m²)			

Zone Sizing Summary for B-300

Project Name: 4112 - B 300 — 05/06/2024
Prepared by: Frigotermica — 03:49

Air System Information

Air System Name **B-300**
Equipment Class ..... **PKG ROOF**
Air System Type ..... **SZCAV**

Number of zones **1**
Floor Area ..... **30.0** m²
Location ..... **.., ..**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**
Space L/s Sizing ..... **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (L/s)	Minimum Supply Airflow (L/s)	Zone L/(s·m²)	Reheat Coil Load (kW)	Reheat Coil Water L/s @ 11.1 K	Zone Htg Unit Coil Load (kW)	Zone Htg Unit Water L/s @ 11.1 K	Mixing Box Fan Airflow (L/s)
Zone 1	450	450	15.00	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Zone Heating Load (kW)	Zone Floor Area (m²)
Zone 1	10.1	Jul 1600	1.4	30.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
Zone 1							
B 300	1	10.1	Jul 1600	450	1.4	30.0	15.00

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Ventilation Sizing Summary for B-300

Project Name: 4112 - B 300
Prepared by: Frigotermica

05/06/2024
03:49

1. Summary

Ventilation Sizing Method ..... **Sum of Space OA Airflows**
Design Ventilation Airflow Rate ..... **281** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m^2)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m^2))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
B 300	1	30.0	0.0	450.0	0.00	0.00	280.8	0.0	280.8
Totals (incl. Space Multipliers)				**450.0**					**280.8**

Air System Design Load Summary for B-300

Project Name: 4112 - B 300
Prepared by: Frigotermica

05/06/2024
03:49

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 24.8 °C / 23.6 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	111 m²	-593	-	111 m²	669	-
Roof Transmission	30 m²	-160	-	30 m²	181	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-180	-	8 m²	207	-
Floor Transmission	30 m²	-310	-	30 m²	181	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	360 W	360	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	10000 W	10000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	912	0	10%	124	0
>> Total Zone Loads	-	**10027**	**0**	-	**1361**	**0**
Zone Conditioning	-	9967	0	-	1306	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	169 L/s	0	-	169 L/s	0	-
Ventilation Load	281 L/s	-3715	5331	281 L/s	4467	0
Supply Fan Load	450 L/s	208	-	450 L/s	-208	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	**6460**	**5331**	-	**5565**	**0**
Central Cooling Coil	-	6460	5331	-	0	0
Central Heating Coil	-	0	-	-	5565	-
>> Total Conditioning	-	**6460**	**5331**	-	**5565**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Zone Design Load Summary for B-300

Project Name: 4112 - B 300
Prepared by: Frigotermica

05/06/2024
03:49

Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 24.8 °C / 23.6 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
	OCCUPIED T-STAT 35.0 °C			OCCUPIED T-STAT 5.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	111 m²	-568	-	111 m²	669	-
Roof Transmission	30 m²	-154	-	30 m²	181	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-176	-	8 m²	207	-
Floor Transmission	30 m²	-306	-	30 m²	181	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	360 W	360	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	10000 W	10000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	916	0	10%	124	0
>> Total Zone Loads	-	10071	0	-	1361	0

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Space Design Load Summary for B-300

Project Name: 4112 - B 300
Prepared by: Frigotermica
05/06/2024
03:49

TABLE 1.1.A. Component Loads For Space "B 300" In Zone "Zone 1"

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 24.8 °C / 23.6 °C OCCUPIED T-STAT 35.0 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C OCCUPIED T-STAT 5.0 °C		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(W)**	**(W)**	**Details**	**(W)**	**(W)**
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	111 m²	-568	-	111 m²	669	-
Roof Transmission	30 m²	-154	-	30 m²	181	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	8 m²	-176	-	8 m²	207	-
Floor Transmission	30 m²	-306	-	30 m²	181	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	360 W	360	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	10000 W	10000	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	916	0	10%	124	0
>> Total Zone Loads	**-**	**10071**	**0**	**-**	**1361**	**0**

TABLE 1.1.B. Envelope Loads For Space "B 300" In Zone "Zone 1"

				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m²)	(W/(m²·K))	Coeff.	(W)	(W)	(W)
N EXPOSURE						
WALL	46	0.450	-	-234	-	276
E EXPOSURE						
WALL	12	0.450	-	-59	-	69
DOOR	2	1.930	-	-48	-	57
S EXPOSURE						
WALL	46	0.450	-	-234	-	276
W EXPOSURE						
WALL	8	0.450	-	-40	-	48
DOOR	6	1.930	-	-128	-	150
H EXPOSURE						
ROOF	30	0.450	-	-154	-	181

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System Psychrometrics for B-300

Project Name: 4112 - B 300 — 05/06/2024
Prepared by: Frigotermica — 03:49

July DESIGN COOLING DAY, 1400

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°C)	Specific Humidity (kg/kg)	Airflow (L/s)	CO2 Level (ppm)	Sensible Heat (W)	Latent Heat (W)
Ventilation Air	Inlet	24.8	0.01804	281	400	-3715	5331
Vent - Return Mixing	Outlet	28.9	0.01561	450	403	-	-
Central Cooling Coil	Outlet	17.0	0.01158	450	403	6460	5331
Central Heating Coil	Outlet	17.0	0.01158	450	403	0	-
Supply Fan	Outlet	17.3	0.01158	450	403	208	-
Cold Supply Duct	Outlet	17.3	0.01158	450	403	-	-
Zone Air	-	35.8	0.01158	450	408	9967	0
Zone Direct Exhaust	Outlet	35.8	0.01158	281	408	-	-
Return Plenum	Outlet	35.8	0.01158	169	408	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.203 W/(L/s-K)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2937.1 W/(L/s)
Site Altitude = 30.0 m

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (W)	T-stat Mode	Zone Cond (W)	Zone Temp (°C)	Zone Airflow (L/s)	CO2 Level (ppm)	Terminal Heating Coil (W)	Zone Heating Unit (W)
Zone 1	10027	Cooling	9967	35.8	450	408	0	0

System Psychrometrics for B-300

Project Name: 4112 - B 300 — 05/06/2024
Prepared by: Frigotermica — 03:49

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°C)	Specific Humidity (kg/kg)	Airflow (L/s)	CO2 Level (ppm)	Sensible Heat (W)	Latent Heat (W)
Ventilation Air	Inlet	-8.4	0.00185	281	400	-4467	0
Vent - Return Mixing	Outlet	-3.4	0.00185	450	403	-	-
Central Cooling Coil	Outlet	-3.4	0.00185	450	403	0	0
Central Heating Coil	Outlet	6.9	0.00185	450	403	5565	-
Supply Fan	Outlet	7.2	0.00185	450	403	208	-
Cold Supply Duct	Outlet	7.2	0.00185	450	403	-	-
Zone Air	-	4.8	0.00185	450	408	-1306	0
Zone Direct Exhaust	Outlet	4.8	0.00185	281	408	-	-
Return Plenum	Outlet	4.8	0.00185	169	408	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.203 W/(L/s-K)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2937.1 W/(L/s)
Site Altitude = 30.0 m

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (W)	T-stat Mode	Zone Cond (W)	Zone Temp (°C)	Zone Airflow (L/s)	CO2 Level (ppm)	Terminal Heating Coil (W)	Zone Heating Unit (W)
Zone 1	-1361	Heating	-1306	4.8	450	408	0	0

6 COOLING COIL SELECTION

In order to ensure the good functioning of the unit we chose to select the cooling coil with the following characteristics.

D.B.M. SpA a Socio Unico
Via Ugo La Malfa 10 – 28040 Varallo Pombia (NO) – Italy
Tel. +39 0321 956794 – E mail: sales@dbmcoils.com

03/04/2024

Offer

Contact	
Delivery Schedule	
Goods rendered	ex DBM factory
Packing	Included
Payment	As usual
Offer validity	30 days

NOTE

24 months guarantee according to DBM sales terms

DESIGN DATA — CC User-185-00115/2 0 538 — *Rel. 6.5.0.4 01-10-2022*

EXTERNAL FLUID:	**Air**				
Ambient pressure	mmHg	760			
Capacity	**kW**	**12.14**			
Gas quantity	**Sm³/h**	**2700**			
Air treated weight	kg/h	3251	Sensible heat factor		0.76
Inlet temperature	**°C**	**26.00**	Condensed water	kg/h	4.00
Relative humidity	%	50.00	Actual velocity	m/s	2.47
Outlet temperature	**°C**	**15.95**	Pressure drop	Pa	117
Outlet relative humidity	%	82.26	Dry fin pressure drop	Pa	48
INTERNAL FLUID:	**R32**				
Evaporating pressure	**bar(a)**	**10.12**	**Evaporating temperature**	**°C**	**7.00**
Condensing pressure	bar(a)	31.41	Liquid temperature	°C	50.00
Superheating	°C	5.00	Subcooling	°C	2.00
Liquid weight	kg/h	189	Pressure drop	bar	0.06
Distributor diameter	mm	16.00	Distributors pressure drop	bar	0.67
Capillars Ø 5 lenght 550 mm			Capillars pressure drop	bar	0.40

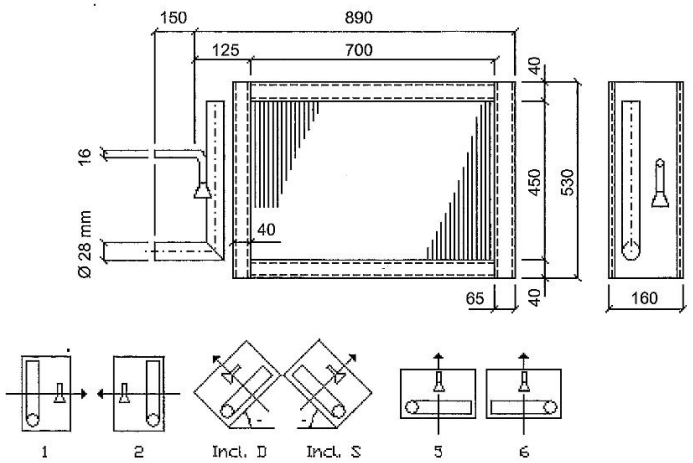
N°·1 Coil Cu-Cu-FeZn P3012ED 4R-15T-700A-2.5pa 5C 28 mm

TECHNICAL FEATURES

Tubes	**Cu**	**12.45 x 0.35**	mm	Weight	28	Kg
Fins	**Cu**	**0.10**	mm	Internal volume	6	dm3
Frame	**FeZn**	**1.50 / 1.50**	mm	Total exchange surface	23.63	m2
Manifolds material	**Cu**			**PED 2014/68/UE Cat.**	**Class I**	
				Maximum allowable pressur	21.0	bar
				Min/Max allowable temp	-10/80	°C

ACCESSORIES

Certified calculation - Counterflow



7 SYSTEM SUMMARY

Below is the system performance:

Fresh Air intake: 1112 m³/h -> 281 l/s

Supply Air: 2700 m³/h -> 750 l/s as per cooling coil sizing.

Cooling Coil Capacity: 12 kW (design required 11.8 kW)

Heating Coil Capacity: 6,0 kW

8 DUCT PRESSURE DROP

The HVAC Ducts, have been sized with the criterion of constant pressure drop.

In this paper we have calculated the static pressure drop of the most unfavorable sections of the air duct distribution according to ASHRAE standards.

METHOD:

To calculate the friction losses, the following equation have been used as detailed below. These equations have a wide and internationally recognised application for this kind of calculation.
The friction losses (Dp) in terms of specific energy (mm w.g.) have been evaluated by means of the below equation:

$$Dp = k \times pd$$

where:

- K Accidental Resistance (see value attach in table 1)
- pd Dynamic Pressure (mm w.g) $pd = \frac{c^2 \times \gamma}{2 \times g}$

Where:

- γ: Air density (1,22 Kg/m^3)
- c velocity of air m/s

If the Duct are linear the Dp are independent of Dynamic Pressure but depend of:

$$Dp = 0{,}00117722 \frac{c^{1,9}}{d_{eq}{}^{1,22}}$$

This value is for each meter of linear duct

where:

- c velocity of air m/s
- d_{eq} Diameter of equivalent duct

$$d_{eq} = \frac{4{,}5 \times A}{P}$$

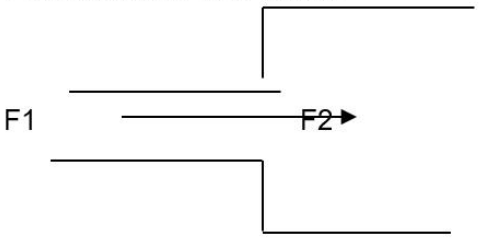
where:

- A Cross section of duct
- P Perimeter

Tab. 1

Pos	Description	K for special peace
1	Linear duct	0
2	Bend 90°	0,1
3	Outlet	1
4	Inlet	0,35
5	Section reduction	0,35

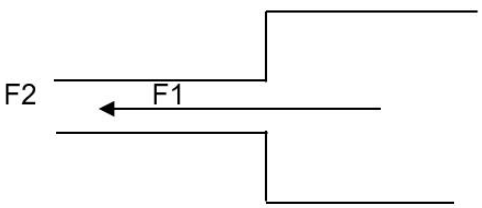
POS .6 Inlet in the Plenum



See detail

AxB/A1xB1	0,1	0,2	0,4	0,6	0,8
K	1	0,7	0,4	0,2	0,1

POS.7 Outlet from Plenum



See detail

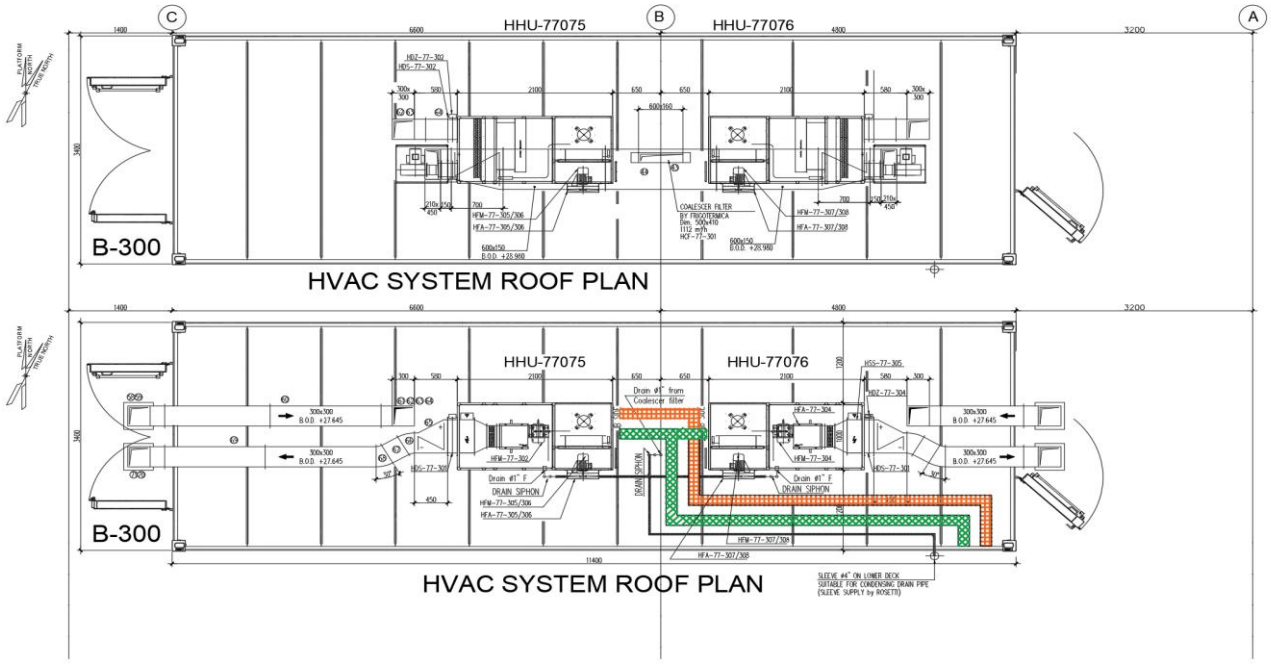
AxB/A1xB1	0,2	0,4	0,6	0,8
K	0,45	0,3	0,2	0,1

-300 duct layout pressure drop:

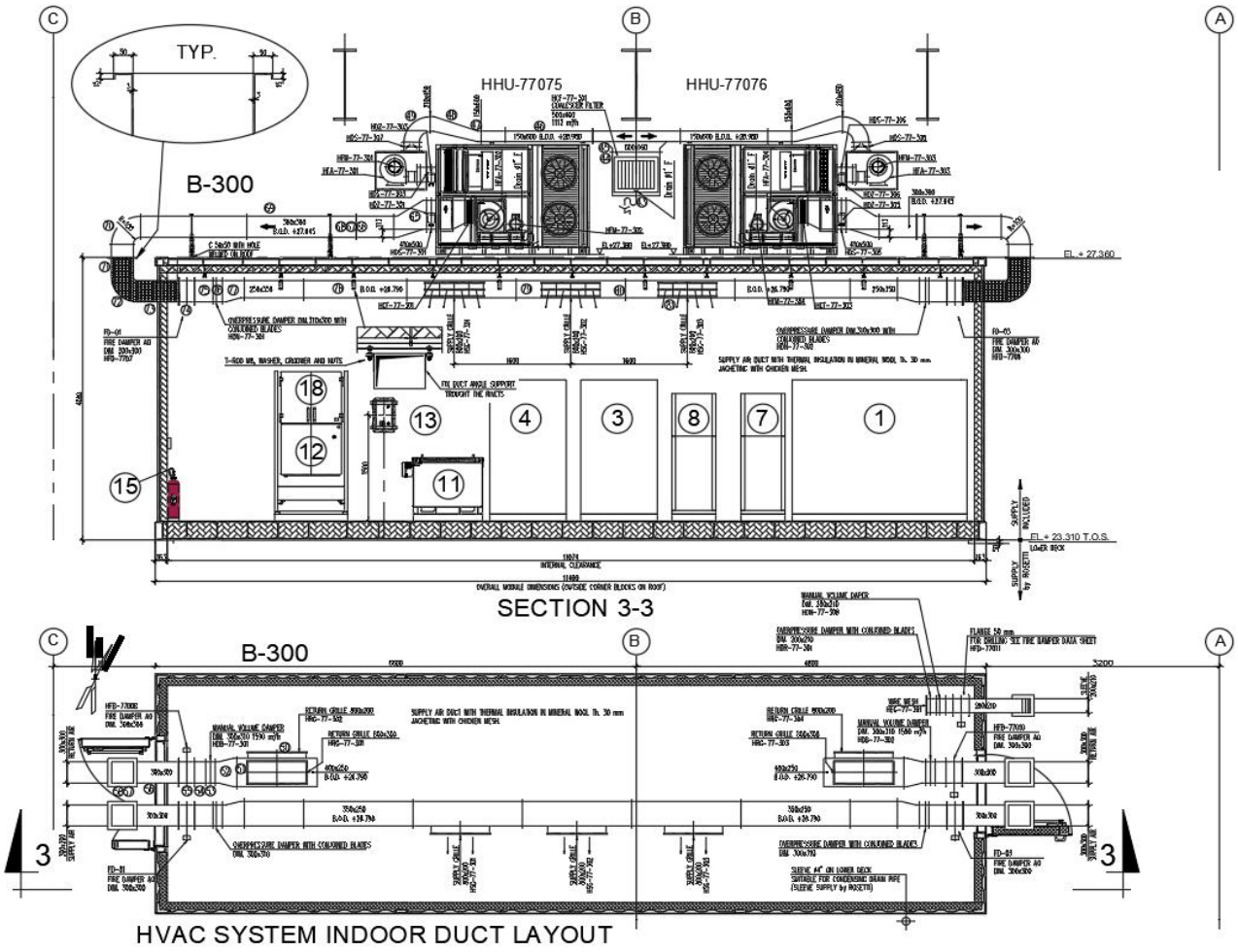
	B-300			Duct pressure loss calculation							
	POS.	Inlet air dimens. (mm)		Outlet air dimens. (mm)		Lenght	Air Flow	Velocity	POS.	Dp for linear duct	DP for special pieces
		A	B	A1	B1	L (mm)	mc/h	m/s		mm w.g.	mm w.g.
HHU-77005/77006	43	COALESCER FILTER 500 x 400					1112			0,00	1,53
	44	600	160	600	160	300	1112	3	1	0,01	0,00
	45	600	160	600	150	150	1112	3	4	0,00	0,20
	46	600	150	600	150	2132	1112	3	1	0,10	0,00
	47	600	150	600	150	0	1112	3	7	0,00	0,06
	48	600	150	450	210	730	1112	3	5	0,00	0,20
	49	450	210	450	210	0	1112	3	2	0,00	0,28
	50	RETURN GRILLES					1588	#VALORE!		0,00	1,02
	51	400	250	400	250	550	1588	4	1	0,03	0,00
	52	400	250	300	300	300	1588	4	5	0,00	0,35
	53	MANUAL VOLUME DAMPER					1588	#VALORE!		0,00	19,60
	54	300	300	300	300	150	1588	5	1	0,01	0,00
	55	FIRE DAMPER					1588	#VALORE!		0,00	1,02
	56	300	300	300	300	770	1588	5	1	0,07	0,00
	57	300	3300	300	300	0	1588	0	2	0,00	0,00
	58	300	3300	300	300	900	1588	0	1	0,00	0,00
	59	300	3300	300	300	0	1588	0	2	0,00	0,00
	60	300	300	300	300	2920	1588	5	1	0,27	0,00
	61	300	300	300	300	0	1588	5	2	0,00	0,80
	62	300	300	300	300	800	1588	5	1	0,08	0,00
	63	300	300	300	300	0	1588	5	2	0,00	0,80
	64	300	300	300	300	300	1588	5	1	0,03	0,00
	65	410	500	300	300	415	2700	4	5	0,00	0,35
	66	300	300	300	300	0	2700	8	2	0,00	2,00
	67	300	300	300	300	215	2700	8	1	0,05	0,00
	68	300	300	300	300	0	2700	8	2	0,00	2,00
	69	300	300	300	300	3725	2700	8	1	0,86	0,00
	70	300	300	300	300	0	2700	8	2	0,00	2,00
	71	300	300	300	300	910	2700	8	1	0,21	0,00
	72	300	300	300	300	0	2700	8	2	0,00	2,00
	73	300	300	300	300	785	2700	8	1	0,18	0,00
	74	FIRE DAMPER					2700	#VALORE!		0,00	1,02
	75	300	300	300	300	250	2700	8	1	0,06	0,00
	76	OVERPRESSURE DAMPER				0	2700	#VALORE!		0,00	6,94
	77	300	300	250	350	300	2700	8	5	0,00	1,40
	78	250	350	250	350	2880	2700	9	1	0,86	0,00
	79	250	350	250	350	1600	1800	6	1	0,22	0,00
	80	250	350	250	350	1600	900	3	1	0,06	0,00
	81	SUPPLY GRILLE				0	900	#VALORE!		0,00	0,51
									1	1,96	43,56
									TOTAL LOSS Pa	446,42	

B-300 → DUCT LAYOUT:

A:



B:

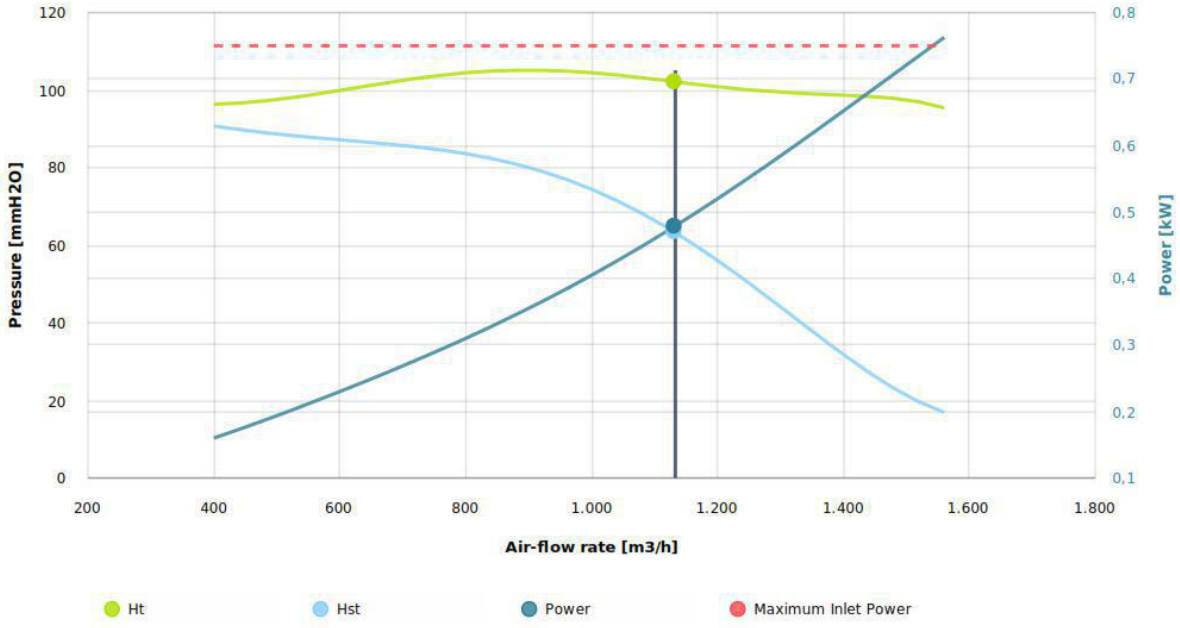

TYP.
B-300
HHU-77075
HHU-77076
SECTION 3-3
B-300
HVAC SYSTEM INDOOR DUCT LAYOUT

9 CONCLUSION

The pressure drop duct layout of the B-300 loss: 446.42Pa

The ducts were built based on the flow rate required by the thermal calculation and the fans were sized based on the pressure loss, obtained with the calculation sheet illustrated above.

The fan's air flow is sufficient to guarantee the required overpressure of 50 Pa.



ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
L. Caviglia	23/01/2025

Base Load Power Hub (BLPH)

B-400 HVAC CALCULATION REPORT
(Incl HVAC SYS CALC and HEAT DISSIPATION CALC)
E&I SHELTERS

Document Number: 1724000049-HV-CA-00038

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
04	09/12/2024	Accepted for Construction(AFC)	S.Z.	S.S.	M.G.
03	17/06/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
02	23/05/2024	Accepted for Construction (AFC)	S.Z.	S.S.	M.G.
01	07/05/2024	Issue for Review (IFR)	S.Z.	S.S.	M.G.
00	03/04/2024	Issue for Review (IFR)	S.Z.	S.S.	M.G.

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
1	Issue for Review (IFR)
2	Accepted for Construction (AFC)
3	Accepted for Construction (AFC)
4	Accepted for Construction (AFC)

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1 INTRODUCTION

1.1 PURPOSE OF THE PROJECT

Scope of this document is to report the Cooling and Heating Loads calculations, of the HVAC system provided for the Technical Shelter B-400.

Cooling and Heating loads calculations have been carried out by means of CARRIER II 20 Hourly Analysis Program Version 5.11.

1.2 MEASURING SYSTEM

Length	m, mm
Area	m2, mm2
Volume	3, mm3
Mass	Kg
Airflow	l/s
Pressure	Pa = N/m2, kPa = kN/m2
Temperature	° C
Thermal Load	W, kW
Specific Enthalpy	kJ/kg
Specific Volume	m3/kg

1.3 DESIGN INPUT DATA

Outdoor design conditions:

Summer temperature:	+25°C D.B. (Dry Bulb) with RH 90 %
Winter temperature:	-8,4°C D.B. (Dry Bulb) with RH 100 %
Shelter U-Value:	0,450 W/(m^2 K).
Safe Area	

Indoor design conditions:

Room Pressurization:	+50 Pa
Summer temperature:	+25°C D.B. (Dry Bulb) with RH 30÷70%
Winter temperature:	+15°C D.B. (Dry Bulb) with RH 30÷70%
Internal Load Equipment:	12 kW
ACH Min.:	6
Safe Area	

2 SYSTEM DESCRIPTION

To guarantee the necessary overpressure and internal design temperatures in the summer and winter seasons, two Roof-Top type units have been provided, one duty and one stand-by.

3 ARCHITECTURAL DATA

Geometric data are based on document listed below:

1724000049-AR-DA-00017 Base load power HUB (BLPH) B-400 general arrangement drawing.

3.1 ROOM PRESSURIZATION

In order to guarantee the pressurization, where external doors are provided, fresh air flow requirement to maintain specified positive pressure shall be calculated based on following formula in accord to

ASHRAE:

$Q = Cd * A * Vp = m^3/s$

where ΔP = pressure difference across opening, Pa

Q = Airflow rate, m3/s

Cd = Discharge coefficient for opening, dimensionless (0,625 assumed)

Generally general 0.5 for large gaps and 0,625 for small openings.

A = Leakage area (m^2).

Vp: Velocity through crack area to maintain required pressure (2 ΔP/d) ^0.5

d = Density of air (kg/m^3) assumed 1.225 kg/m^3.

Note:

Leakage area for single leaf door = 0,02 m^2

Container structures, walls, floor and the ceiling are joined together by continuous welding.

Therefore, there isn't air leakage.

Vp for overpressure required 50 Pa = (2 x 50 / 1,225) ^0,5 = 9,03

Single Door overpressure required: (0,625x0,02x9,03) = 0,112 m^3/s that become 0,112x 3600 = 403 m^3/h

Total pressurization air flow equal to 403 m^3/h + 403 m^3/h = 806 m^3/h -> 223,9 l/s

Air change required for room: (B 28,5 m x H 3,3) x 6 = 564,3 m^3/h -> 156,7,1 l/s

According to the calculation above, the pressurizing air flow rate is greater than the ACH required.

So, the fresh air rate will be equal to 223,9 l/s (pressurizing air flow rate).

4 WEATER REPORT FROM HAP CARRIER

Design Weather Parameters & MSHGs

4112 - B 400
Frigotermica

05/23/2024
04:37

Design Parameters:

City Name	..	
Location	..	
Latitude	52.3	Deg.
Longitude	-4.8	Deg.
Elevation	30.0	m
Summer Design Dry-Bulb	25.0	°C
Summer Coincident Wet-Bulb	23.7	°C
Summer Daily Range	8.2	K
Winter Design Dry-Bulb	-8.4	°C
Winter Design Wet-Bulb	-8.4	°C
Atmospheric Clearness Number	1.00	
Average Ground Reflectance	0.20	
Soil Conductivity	1.385	W/(m K)
Local Time Zone (GMT +/- N hours)	1.0	hours
Consider Daylight Savings Time	No	
Simulation Weather Data	N/A	
Current Data is	User Modified	
Design Cooling Months	January to December	

Design Day Maximum Solar Heat Gains

(The MSHG values are expressed in W/m²)

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S
January	38.8	38.8	38.8	98.7	308.2	473.1	618.1	687.5	715.2
February	55.8	55.8	72.2	288.0	480.0	639.4	730.3	775.6	780.0
March	74.7	74.7	242.5	454.2	611.0	724.2	761.7	755.4	742.3
April	94.1	186.7	400.6	555.9	679.0	712.3	689.8	650.0	629.4
May	113.0	305.1	487.7	621.3	687.3	680.1	627.5	556.8	529.7
June	156.7	346.4	514.5	633.8	681.4	657.2	591.6	514.4	481.4
July	121.5	292.0	483.9	602.9	676.6	664.8	608.7	547.0	515.0
August	99.5	190.3	383.3	541.5	652.7	690.1	668.2	630.2	608.5
September	78.4	78.4	207.4	425.5	567.6	686.1	722.0	721.7	716.9
October	58.7	58.7	84.1	257.4	462.4	607.7	708.1	747.1	757.4
November	40.0	40.0	40.0	117.9	278.2	473.7	589.8	681.0	706.2
December	31.5	31.5	31.5	44.3	228.7	378.7	538.8	614.4	652.4
Month	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**HOR**	**Mult**
January	695.2	617.9	473.7	306.6	106.1	38.8	38.8	185.7	1.00
February	770.8	727.7	643.5	465.5	291.7	68.1	55.8	353.1	1.00
March	752.0	759.6	711.4	622.6	440.4	251.6	74.7	526.9	1.00
April	649.4	697.7	714.0	674.0	564.6	399.0	191.9	661.6	1.00
May	559.0	630.7	685.8	678.1	624.4	477.2	311.6	738.6	1.00
June	516.8	595.8	664.1	679.6	633.7	511.7	348.8	760.6	1.00
July	548.1	616.6	672.1	670.4	611.6	473.1	308.7	731.3	1.00
August	629.1	674.2	688.9	648.8	544.4	385.3	190.6	652.5	1.00
September	719.3	718.7	685.0	574.3	424.7	206.4	78.4	511.0	1.00
October	748.8	707.9	596.6	464.8	253.0	86.0	58.7	352.7	1.00
November	679.4	594.2	473.7	285.1	117.6	40.0	40.0	189.4	1.00
December	623.5	529.5	397.8	216.4	62.0	31.5	31.5	128.0	1.00

Mult. = User-defined solar multiplier factor.

5 SYSTEM DESIGN REPORT FROM HAP CARRIER

Air System Sizing Summary for B-400

Project Name: 4112 - B 400 — 05/23/2024
Prepared by: Frigotermica — 04:43

Air System Information

Air System Name	B-400		Number of zones	1	
Equipment Class	PKG ROOF		Floor Area	28.5	m²
Air System Type	SZCAV		Location	.., ..	

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone L/s Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space L/s Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	19.4	kW	Load occurs at	Jul 1400	
Sensible coil load	13.1	kW	OA DB / WB	24.8 / 23.6	°C
Coil L/s at Jul 1400	847	L/s	Entering DB / WB	25.3 / 18.8	°C
Max block L/s	847	L/s	Leaving DB / WB	12.4 / 11.9	°C
Sum of peak zone L/s	847	L/s	Coil ADP	11.0	°C
Sensible heat ratio	0.675		Bypass Factor	0.100	
L/(s kW)	43.7		Resulting RH	42	%
m²/kW	1.5		Design supply temp.	12.0	°C
W/m²	680.1		Zone T-stat Check	1 of 1	OK
Water flow @ 5.6 K rise	N/A		Max zone temperature deviation	0.0	K

Central Heating Coil Sizing Data

Max coil load	8.6	kW	Load occurs at	Des Htg	
Coil L/s at Des Htg	847	L/s	W/m²	301.5	
Max coil L/s	847	L/s	Ent. DB / Lvg DB	8.9 / 17.3	°C
Water flow @ 11.1 K drop	N/A				

Supply Fan Sizing Data

Actual max L/s	847	L/s	Fan motor BHP	0.04	BHP
Standard L/s	844	L/s	Fan motor kW	0.03	kW
Actual max L/(s·m²)	29.72	L/(s·m²)	Fan static	35	Pa

Outdoor Ventilation Air Data

Design airflow L/s	224	L/s	L/s/person	0.00	L/s/person
L/(s·m²)	7.86	L/(s·m²)			

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Zone Sizing Summary for B-400

Project Name: 4112 - B 400 05/23/2024
Prepared by: Frigotermica 04:43

Air System Information

Air System Name **B-400**
Equipment Class ..... **PKG ROOF**
Air System Type ..... **SZCAV**

Number of zones **1**
Floor Area ..... **28.5** m²
Location ..... **.., ..**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**
Space L/s Sizing ..... **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (L/s)	Minimum Supply Airflow (L/s)	Zone L/(s·m²)	Reheat Coil Load (kW)	Reheat Coil Water L/s @ 11.1 K	Zone Htg Unit Coil Load (kW)	Zone Htg Unit Water L/s @ 11.1 K	Mixing Box Fan Airflow (L/s)
Zone 1	847	847	29.72	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Zone Heating Load (kW)	Zone Floor Area (m²)
Zone 1	13.3	Jul 1500	2.2	28.5

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
Zone 1							
B 400	1	13.3	Jul 1500	847	2.2	28.5	29.72

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Ventilation Sizing Summary for B-400

Project Name: 4112 - B 400
Prepared by: Frigotermica

05/23/2024
04:43

1. Summary

Ventilation Sizing Method ..... **Sum of Space OA Airflows**
Design Ventilation Airflow Rate ..... **224** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m^2)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m^2))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
B 400	1	28.5	0.0	847.0	0.00	0.00	223.9	0.0	223.9
Totals (incl. Space Multipliers)				**847.0**					**223.9**

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Air System Design Load Summary for B-400

Project Name: 4112 - B 400
Prepared by: Frigotermica

05/23/2024
04:43

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 24.8 °C / 23.6 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
ZONE LOADS	**Details**	**Sensible (W)**	**Latent (W)**	**Details**	**Sensible (W)**	**Latent (W)**
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	72 m²	-61	-	72 m²	757	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	4 m²	-14	-	4 m²	199	-
Floor Transmission	29 m²	-71	-	29 m²	300	-
Partitions	43 m²	-109	-	43 m²	457	-
Ceiling	29 m²	-71	-	29 m²	300	-
Overhead Lighting	342 W	342	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	12000 W	11999	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	1201	0	10%	201	0
>> Total Zone Loads	-	**13216**	**0**	-	**2214**	**0**
Zone Conditioning	-	13259	0	-	2291	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	623 L/s	0	-	623 L/s	0	-
Ventilation Load	224 L/s	-196	6290	224 L/s	6332	0
Supply Fan Load	847 L/s	31	-	847 L/s	-31	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	**13094**	**6290**	-	**8592**	**0**
Central Cooling Coil	-	13094	6290	-	0	0
Central Heating Coil	-	0	-	-	8592	-
>> Total Conditioning	-	**13094**	**6290**	-	**8592**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Zone Design Load Summary for B-400

Project Name: 4112 - B 400
Prepared by: Frigotermica

05/23/2024
04:43

Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 25.0 °C / 23.7 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C		
	OCCUPIED T-STAT 25.0 °C			OCCUPIED T-STAT 15.0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	72 m²	-48	-	72 m²	757	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	4 m²	-12	-	4 m²	199	-
Floor Transmission	29 m²	-58	-	29 m²	300	-
Partitions	43 m²	-89	-	43 m²	457	-
Ceiling	29 m²	-58	-	29 m²	300	-
Overhead Lighting	342 W	342	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	12000 W	11999	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	1208	0	10%	201	0
>> Total Zone Loads	**-**	**13284**	**0**	**-**	**2214**	**0**

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Space Design Load Summary for B-400

Project Name: 4112 - B 400
Prepared by: Frigotermica

05/23/2024
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TABLE 1.1.A. Component Loads For Space "B 400" In Zone "Zone 1"

	DESIGN COOLING COOLING DATA AT Jul 1500 COOLING OA DB / WB 25.0 °C / 23.7 °C OCCUPIED T-STAT 25.0 °C			DESIGN HEATING HEATING DATA AT DES HTG HEATING OA DB / WB -8.4 °C / -8.4 °C OCCUPIED T-STAT 15.0 °C		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(W)**	**(W)**	**Details**	**(W)**	**(W)**
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	72 m²	-48	-	72 m²	757	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	4 m²	-12	-	4 m²	199	-
Floor Transmission	29 m²	-58	-	29 m²	300	-
Partitions	43 m²	-89	-	43 m²	457	-
Ceiling	29 m²	-58	-	29 m²	300	-
Overhead Lighting	342 W	342	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	12000 W	11999	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 0%	1208	0	10%	201	0
>> Total Zone Loads	**-**	**13284**	**0**	**-**	**2214**	**0**

TABLE 1.1.B. Envelope Loads For Space "B 400" In Zone "Zone 1"

				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(m²)	(W/(m²·K))	Coeff.	(W)	(W)	(W)
N EXPOSURE						
WALL	50	0.450	-	-33	-	529
E EXPOSURE						
WALL	7	0.450	-	-5	-	77
DOOR	2	1.930	-	-6	-	99
S EXPOSURE						
WALL	7	0.450	-	-5	-	74
W EXPOSURE						
WALL	7	0.450	-	-5	-	77
DOOR	2	1.930	-	-6	-	99

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System Psychrometrics for B-400

Project Name: 4112 - B 400
Prepared by: Frigotermica

05/23/2024
04:43

July DESIGN COOLING DAY, 1400

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°C)	Specific Humidity (kg/kg)	Airflow (L/s)	CO2 Level (ppm)	Sensible Heat (W)	Latent Heat (W)
Ventilation Air	Inlet	24.8	0.01804	224	400	-196	6290
Vent - Return Mixing	Outlet	25.3	0.01100	847	425	-	-
Central Cooling Coil	Outlet	12.4	0.00847	847	425	13094	6290
Central Heating Coil	Outlet	12.4	0.00847	847	425	0	-
Supply Fan	Outlet	12.5	0.00847	847	425	31	-
Cold Supply Duct	Outlet	12.5	0.00847	847	425	-	-
Zone Air	-	25.5	0.00847	847	434	13259	0
Zone Direct Exhaust	Outlet	25.5	0.00847	224	434	-	-
Return Plenum	Outlet	25.5	0.00847	623	434	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.203 W/(L/s-K)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2937.1 W/(L/s)
Site Altitude = 30.0 m

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (W)	T-stat Mode	Zone Cond (W)	Zone Temp (°C)	Zone Airflow (L/s)	CO2 Level (ppm)	Terminal Heating Coil (W)	Zone Heating Unit (W)
Zone 1	13216	Cooling	13259	25.5	847	434	0	0

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System Psychrometrics for B-400

Project Name: 4112 - B 400
Prepared by: Frigotermica

05/23/2024
04:43

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°C)	Specific Humidity (kg/kg)	Airflow (L/s)	CO2 Level (ppm)	Sensible Heat (W)	Latent Heat (W)
Ventilation Air	Inlet	-8.4	0.00185	224	400	-6332	0
Vent - Return Mixing	Outlet	8.9	0.00185	847	425	-	-
Central Cooling Coil	Outlet	8.9	0.00185	847	425	0	0
Central Heating Coil	Outlet	17.3	0.00185	847	425	8592	-
Supply Fan	Outlet	17.4	0.00185	847	425	31	-
Cold Supply Duct	Outlet	17.4	0.00185	847	425	-	-
Zone Air	-	15.1	0.00185	847	434	-2291	0
Zone Direct Exhaust	Outlet	15.1	0.00185	224	434	-	-
Return Plenum	Outlet	15.1	0.00185	623	434	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.203 W/(L/s-K)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2937.1 W/(L/s)
Site Altitude = 30.0 m

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (W)	T-stat Mode	Zone Cond (W)	Zone Temp (°C)	Zone Airflow (L/s)	CO2 Level (ppm)	Terminal Heating Coil (W)	Zone Heating Unit (W)
Zone 1	-2214	Deadband	-2291	15.1	847	434	0	0

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6 COOLING COIL SELECTION

To ensure the good functioning of the unit we chose to select the cooling coil with the following characteristics.

D.B.M. SpA a Socio Unico
Via Ugo La Malfa 10 – 28040 Varallo Pombia (NO) – Italy
Tel. +39 0321 956794 – E mail: sales@dbmcoils.com

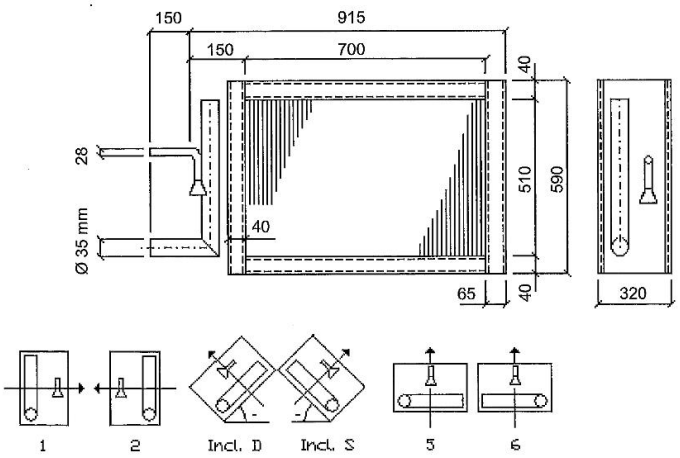
23/05/2024

			Offer		
			Contact		
			Delivery Schedule		
			Goods rendered	ex DBM factory	
			Packing	Included	
NOTE			Payment	As usual	
			Offer validity	30 days	
			24 months guarantee according to DBM sales terms		
DESIGN DATA			CC User-249-00148/2 0 538		*Rel. 6.5.0.4 01-10-2022*
EXTERNAL FLUID:	**Air**				
Ambient pressure	mmHg	760			
Capacity	**kW**	**21.84**			
Gas quantity	**Sm³/h**	**3050**			
Air treated weight	kg/h	3673	Sensible heat factor		0.67
Inlet temperature	**°C**	**25.70**	Condensed water	kg/h	10.10
Relative humidity	%	52.60	Actual velocity	m/s	2.46
Outlet temperature	**°C**	**11.60**	Pressure drop	Pa	218
Outlet relative humidity	%	95.91	Dry fin pressure drop	Pa	104
INTERNAL FLUID:	**R32**				
Evaporating pressure	**bar(a)**	**10.12**	**Evaporating temperature**	**°C**	**7.00**
Condensing pressure	bar(a)	31.41	Liquid temperature	°C	50.00
Superheating	°C	5.00	Subcooling	°C	2.00
Liquid weight	kg/h	341	Pressure drop	bar	0.02
Distributor diameter	mm	28.00	Distributors pressure drop	bar	0.67
Capillars Ø 5 lenght 550 mm			Capillars pressure drop	bar	0.12

N°·1 Coil CuSn-CuSn-Inox316 P3012ED 8R-17T-700A-2.5pa 17C 35 mm

TECHNICAL FEATURES					**ACCESSORIES**
Tubes	**CuSn**	**12.45 x 0.35**	mm	Weight	82 Kg
Fins	**CuSn**	**0.20**	mm	Internal volume	14 dm3
Frame	**Inox316**	**1.50 / 1.50**	mm	Total exchange surface	53.25 m2
Manifolds material	**Cu**			**PED 2014/68/UE Cat.**	**Class I**
				Maximum allowable pressur	21.0 bar
				Min/Max allowable temp	-10/80 °C

Certified calculation - Counterflow



7 DESIGN SYSTEM SUMMARY

Below is the system performance:

Fresh Air intake: 806 m³/h -> 224 l/s

Supply Air: 3050 m³/h -> 847,2 l/s

Cooling Coil Capacity: 21,8 kW

Heating Coil Capacity: 8,6 kW

8 DUCT PRESSURE DROP

The HVAC Ducts, have been sized with the criterion of constant pressure drop.

In this paper we have calculated the static pressure drop of the most unfavorable sections of the air duct distribution according to ASHRAE standards.

METHOD:

To calculate the friction losses, the following equation have been used as detailed below. These equations have a wide and internationally recognised application for this kind of calculation.
The friction losses (Dp) in terms of specific energy (mm w.g.) have been evaluated by means of the below equation:

$$Dp = k \times pd$$

where:

- K Accidental Resistance (see value attach in table 1)
- pd Dynamic Pressure (mm w.g) $pd = \frac{c^2 \times \gamma}{2 \times g}$

Where:

- γ: Air density (1,22 Kg/m^3)
- c velocity of air m/s

If the Duct are linear the Dp are independent of Dynamic Pressure but depend of:

$$Dp = 0{,}00117722 \frac{c^{1,9}}{d_{eq}{}^{1,22}}$$

This value is for each meter of linear duct

where:

- c velocity of air m/s
- d_{eq} Diameter of equivalent duct

$$d_{eq} = \frac{4{,}5 \times A}{P}$$

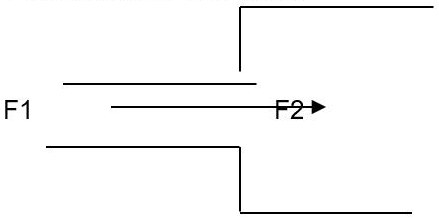
where:

- A Cross section of duct
- P Perimeter

Tab. 1

Pos	Description	K for special peace
1	Linear duct	0
2	Bend 90°	0,1
3	Outlet	1
4	Inlet	0,35
5	Section reduction	0,35

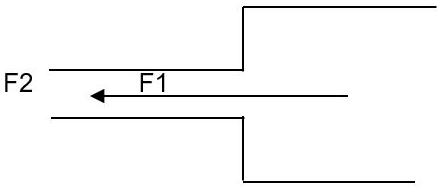
POS .6 Inlet in the Plenum



See detail

AxB/A1xB1	0,1	0,2	0,4	0,6	0,8
K	1	0,7	0,4	0,2	0,1

POS.7 Outlet from Plenum



See detail

AxB/A1xB1	0,2	0,4	0,6	0,8
K	0,45	0,3	0,2	0,1

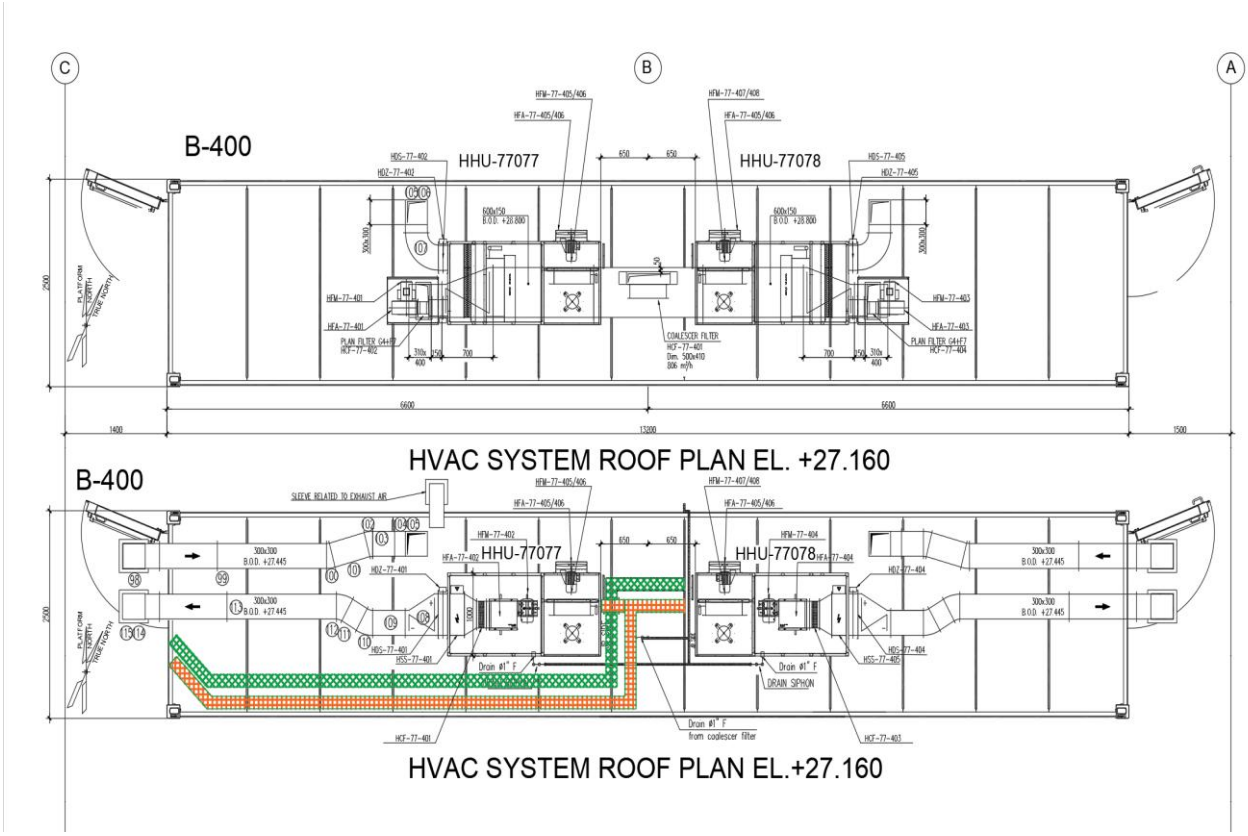
B-400 duct layout pressure drop:

B-400				Duct pressure loss calculation								
	POS.	Inlet air dimens. (mm)		Outlet air dimens. (mm)		Lenght	Air Flow	Velocity	POS.	Dp for linear duct	DP for special pieces
		A	B	A1	B1	L (mm)	mc/h	m/s		mm w.g.	mm w,g,
	82	COALESCER FILTER 500 x 400					806			0,00	1,02
	83	600	160	600	160	300	806	2	1	0,01	0,00
	84	600	160	600	150	150	806	2	4	0,00	0,09
	85	600	150	600	150	2132	806	2	1	0,05	0,00
	86	600	150	600	150	0	806	2	7	0,00	0,03
	87	600	150	450	210	730	806	2	5	0,00	0,09
	88	450	210	450	210	0	806	2	2	0,00	0,13
	89	RETURN GRILLES					2244	#VALORE!		0,00	1,02
	90	400	250	400	250	550	2244	6	1	0,07	0,00
	91	400	250	300	300	300	2244	6	5	0,00	0,81
	92	MANUAL VOLUME DAMPER					2244	#VALORE!		0,00	19,60
	93	300	300	300	300	150	2244	7	1	0,03	0,00
	94	FIRE DAMPER					2244	#VALORE!		0,00	1,02
	95	300	300	300	300	770	2244	7	1	0,14	0,00
	96	300	300	300	300	0	2244	7	2	0,00	1,55
	97	300	300	300	300	900	2244	7	1	0,16	0,00
	98	300	300	300	300	0	2244	7	2	0,00	1,55
	99	300	300	300	300	2290	2244	7	1	0,41	0,00
	100	300	300	300	300	0	2244	7	2	0,00	1,55
	101	300	300	300	300	800	2244	7	1	0,14	0,00
	102	300	300	300	300	0	2244	7	2	0,00	1,55
	103	300	300	300	300	300	2244	7	1	0,05	0,00
	104	300	300	300	300	0	2244	7	2	0,00	1,55
	105	300	300	300	300	1000	2244	7	1	0,18	0,00
	106	300	300	300	300	0	2244	7	2	0,00	1,55
	107	300	300	300	300	0	2244	7	2	0,00	1,55
	108	410	500	300	300	415	3050	4	5	0,00	0,35
	109	410	500	410	500	450	3050	4	1	0,02	0,00
	110	300	300	300	300	0	3050	9	2	0,00	2,55
	111	300	300	300	300	230	3050	9	1	0,07	0,00
	112	300	300	300	300	0	3050	9	2	0,00	2,55
	113	300	300	300	300	2430	3050	9	1	0,70	0,00
	114	300	300	300	300	0	3050	9	2	0,00	2,55
	115	300	300	300	300	900	3050	9	1	0,26	0,00
	116	300	300	300	300	0	3050	9	2	0,00	2,55
	117	300	300	300	300	780	3050	9	1	0,22	0,00
	118	FIRE DAMPER					3050	#VALORE!		0,00	1,02
	119	300	300	300	300	125	3050	9	1	0,04	0,00
	120	OVERPRESSURE DAMPER				0	3050	#VALORE!		0,00	6,94
	121	300	300	250	350	300	3050	9	5	0,00	1,79
	122	250	350	250	350	2880	3050	10	1	1,05	0,00
	123	250	350	250	350	1600	2050	7	1	0,30	0,00
	124	250	350	250	350	1600	1050	3	1	0,06	0,00
	125	SUPPLY GRILLE				0	1050	#VALORE!		0,00	0,51
									1	2,53	54,94
									TOTAL LOSS Pa	563,56	

HHU-77007 / 77008

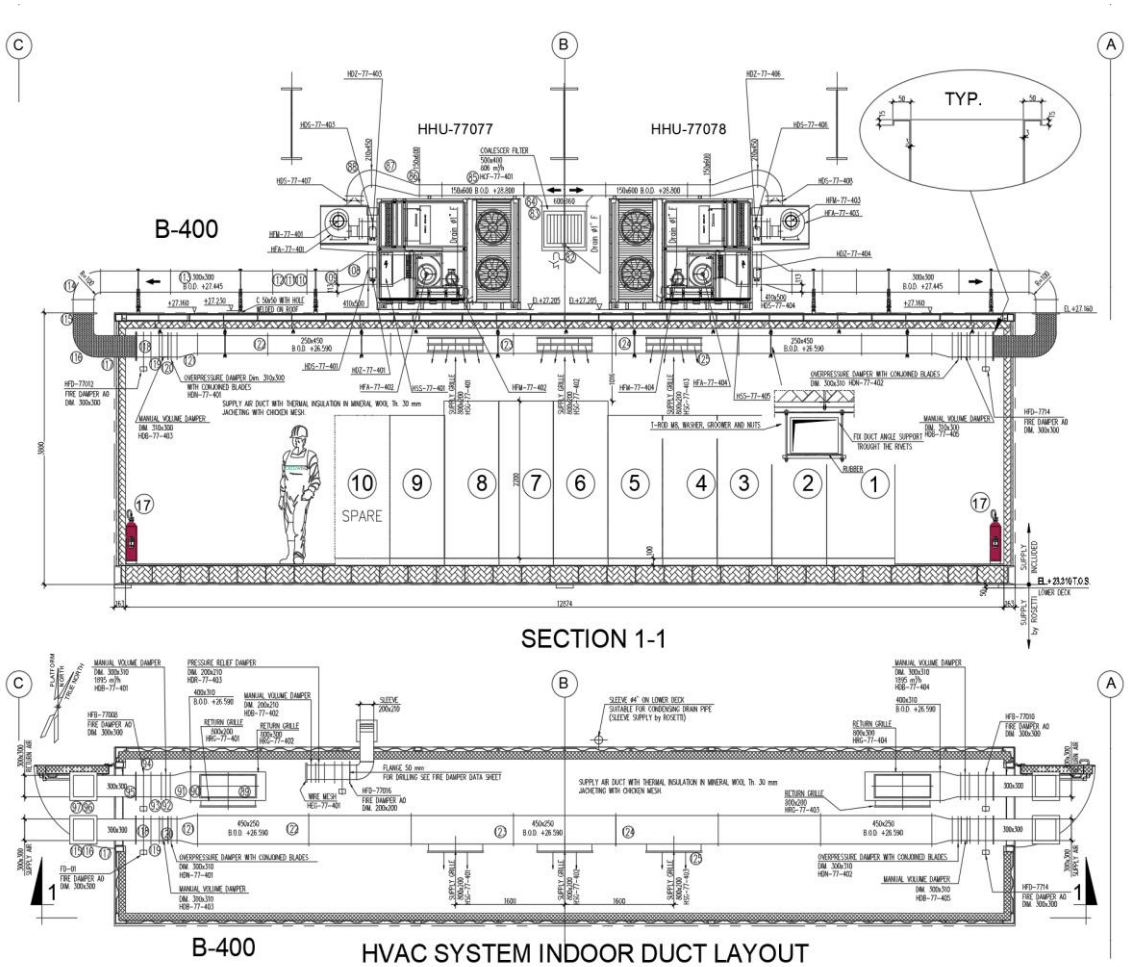
B-400 → DUCT LAYOUT

A:



CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	B-400 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC) - E&I SHELTERS	Sheet 20 of 21 Date: 09/12/2024 Rev: 4

B:

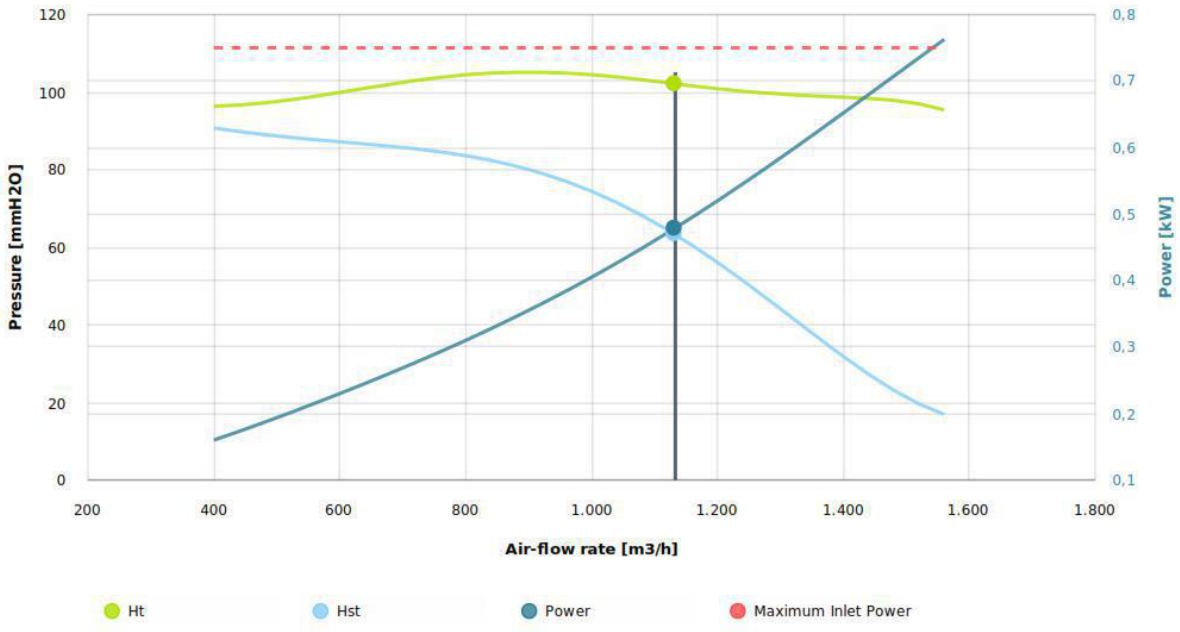


9 CONCLUSION

The pressure drops duct layout of the B-400 loss: 563.56Pa

The ducts were built based on the flow rate required by the thermal calculation and the fans were sized based on the pressure loss, obtained with the calculation sheet illustrated above.

The fan's air flow is sufficient to guarantee the required overpressure of 50 Pa.



Base Load Power Hub (BLPH)

PAINTING PROCEDURE

Document Number: 1724000049-MAT-PRO-00004

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
Michele Sacchi	04/07/2024

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
04	17/06/2024	Accepted for Construction (AFC)	AD	SK	CA
03	29/05/2024	Accepted for Construction (AFC)	AD	SK	CA
02	10/04/2024	Accepted for Construction (AFC)	AD	SK	CA
01	13/03/2024	Issue for Review (IFR)	AD	SK	CA
0	19/02/2024	Issue for Review (IFR)	AD	SK	CA

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Accepted for Construction (AFC)
03	Accepted for Construction (AFC)
04	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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None

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

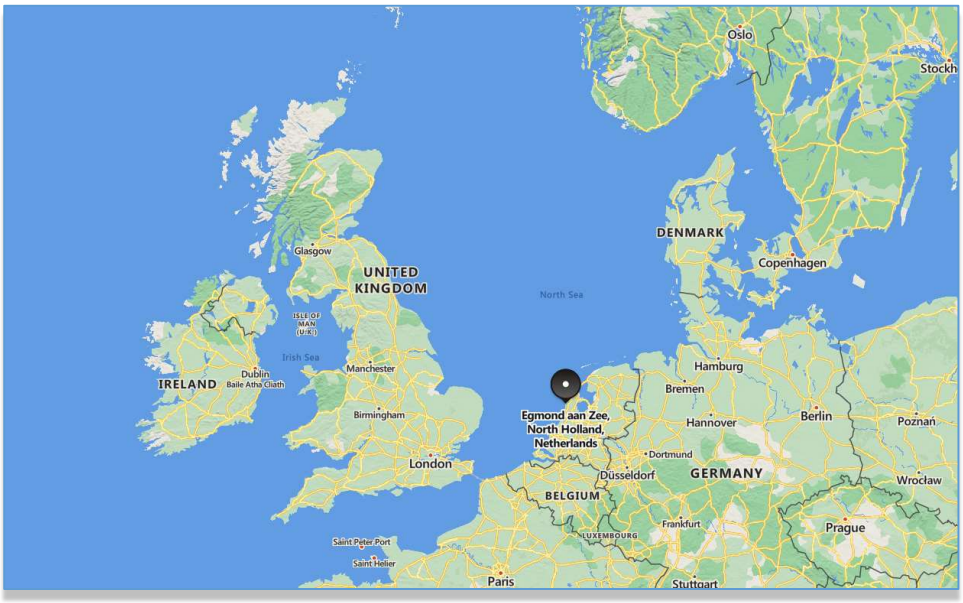


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

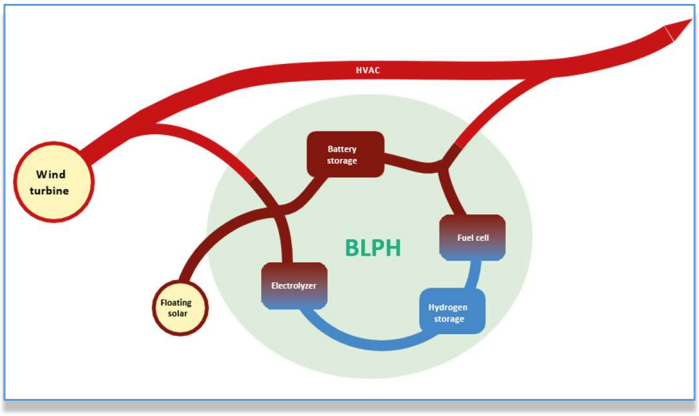


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This specification covers the painting requirements for:

- Structural surfaces of Prefabricated Buildings made in Carbon Steel
- Under Insulation Structure surfaces of Prefabricated Buildings made in Carbon Steel
- Internal and External surfaces of Prefabricated Buildings Doors

2.1 REFERENCES

Doc. No.	Description
123A90-DDL-MAT-SP-60006	Coating and Painting Specification
K559-2254-PM-PLN-003	Basic Design Engineering Package
K559-2254-MT-REP-0001	Material Selection Report
123A90-DDL-MAT-RE-60011	Material Selection Report
NORSOK M-501 Ed 6 -2022	Surface Preparation and protective coating
NORSOK Z-DP-002-1996	Coding System
ISO 9223-2022	Corrosion of metals and allows – corrosivity of atmospheres – Classification, Determination and Estimation
ISO 1461-2022	Metallic coatings – Hot Dip Galvanising coating on fabricated ferrous products - Requirements
ISO 8501-1-2017	Preparation of Steel Substrates before Application of Coatings and Related Products – Visual Assessment of Surface Cleanliness – Part 1: Rust Grades and Preparation Grades of Uncoated Steel Substrates and of Steel Substrates after Removal of Previous Coatings.
ISO 8501-3-2020	Preparation of Steel Substrates before Application of Coatings and Related Products – Visual Assessment of Surface Cleanliness – Part 3: Preparation Grades of Welds, Cut Edges and Other Areas with Surface Imperfections
ISO 11124-1-4-2018	Preparation of Steel Substrates before Application of Paints and Related Products – Parts 1-4, Specifications for Metallic Blast-Cleaning Abrasives
ISO 11126-1-10-2018	Preparation of Steel Substrates before Application of Paints and Related Products – Parts 1-10, Specifications for Non-Metallic Cleaning Abrasives
ISO 12944-4-2023	Paints and varnishes -- Corrosion protection of steel structures by protective paint systems -- Part 4: Types of surface and surface preparation
ASTM D4285-2018	Standard Test Method for Indicating Oil or Water in Compressed Air

Table 1 - Reference Documents

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2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
CA	Certification Agency
DS	Surveyor
EXP	Expediting dept.
LOG	Logistic Dept.
NDE	Non Destructive Examination
PQR	Procedure Qualification Record
QC	Quality Control Dept.
QCI	Quality Control Inspector
SC	Sub-contractor
WI	Welding Inspector
WLD	Welding Dept.
WQR	Welder Qualification Record
WPS	Welding Procedure Specification

Table 2 - Definitions and Abbreviations

2.3 PLANT AND EQUIPMENT

- HV-MV (66KV 6.6KV) SWITCH ROOM B-100
- LV (400V) SWITCH ROOM B-200
- AC UPS EQUIPMENT ROOM B-300
- I&T EQUIPMENT ROOM B-400

2.4 SURFACE PREPARATION

Very thorough preparation: surface is free of significant visible imperfections.

Any surface to be coated shall be dry and rendered dust free prior to the application of the first coat.

The grade of preparation for creating steel surfaces with visible imperfections suitable for the application of paints and related products is as follows:

P3 - Very careful preparation: the surface is free from significant visible imperfections.

as described in ISO 8501-3 preparation level P3 tab.1

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2.5 ABRASIVES

The abrasives used shall be free of oil, grease, moisture, salt, dust etc. They shall not be contaminated with heavy metals or other matter that would complicate disposal. Abrasive Including re-used) shall be clean and reasonably sharp. For Stainless steel non-iron containing abrasive shall be used.

Type of abrasives to be used on CS parts: Corundum to obtain Gritblasting SA 2½ (ISO 8501-1 Std).

As per coating spec. 123A90-DDL-MAT-SP-60006 :

must to do use metallic grit 123A90-DDL-MAT-SP-60006

2.6 SOLVENT CLEANING

Prior to the actual cleaning, any oil, grease, or other fatty matter shall be removed by means of the appropriate solvents or the solvents used in the primer, in accordance with SSPC SP1 "Solvent Cleaning".

Petroleum, kerosene, diesel oil, turpentine or other fatty solvents shall not be used.

2.7 BLAST CLEANING OF SURFACES

Blasted surface shall be free of dusty, oil, grease and other foreign matters. If contaminated, surface shall be cleaned with solvents. The cleaned surface shall subsequently be blasted once more.

Abrasive media shall be chloride-free (e.g. alumina) and contain no free metals (copper slag shall not be used). Surface profile shall be checked.

Stainless steels and nickel alloys shall be blasted with equipment that has not been used on carbon steel and shall be protected from contamination by debris produced during grit blasting of adjacent carbon steel.

Blast cleaning standard:	*ISO-8501-1:2001 Sa 2½*
Surface profile:	*Medium G - 50 to 85 µm (ISO 8503-2)*
Soluble salt:	*max allowed chloride 20 mg/m^2 (ISO 8502-6 / 9)*
Dust Test:	*Class 2 / Grade 2 (ISO 8502-3)*

Interval time between blast cleaning and coating application: max 4 hours

Is flash blasting performed if this 4 hours is exceeded

2.8 – COATING APPLICATION

Coatings shall not be applied when:

- The ambient temperature is less than 5°C (10°C for some coating types) or greater than 40°C.
- The relative humidity is more than 85%.
- The surface temperature is less than 3°C above the dew point.
- The metal surface temperature is higher than that recommended by manufacturer for application, however the maximum in any case shall be 40°C.
- Surface preparation has not been completed or oil, grease, and dust are present on the substrate to be painted.
- Poor weather conditions for painting exist or are expected within the same working day of application such as blowing sand, fog, or rain.

Where there is a deposition of water in the form of rain, condensation, frost, etc. on the surface.

3 PREPARATION FOR PAINTING

Storing, thinning, mixing, and handling of paint materials, provided by paint manufacturer, shall be in accordance with application data. All containers shall remain closed in factory sealed containers until required for use. Paint which has deteriorated shall be removed from the work area. Each container shall have full identification information including manufacturer name, product identification, batch number, date of manufacture, shelf life, basic instructions, and contact telephone number for technical service. All aspects of safety relating to the use of coatings and associated thinners shall be in accordance with manufacturer stated.

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3.1 SPRAY APPLICATION

Hose and containers shall be thoroughly cleaned before addition of new materials. The spray gun shall be held no closer than 200 mm or more than 600 mm from the surface to be coated. During application the spray gun shall always be held at a right angle to the substrate. Each pass shall overlap the previous one by 50 percent. In order to achieve a uniform application, when large surface areas are being coated, spray application shall be made in two directions so that the passes are at right angles to each other. Pressures and spray fan shall be adjusted so that the optimum spray pattern is utilized for the surface being coated.

The compressed air supply shall have sufficient capacity to meet the work requirement and be free from oil and water contamination.

3.2 BRUSH APPLICATION

Application with brush is acceptable when the materials to be applied are suitable for brush application and under the following conditions:

- When areas cannot be properly coated by spray method
- When spray application is difficult due to location of work and wind conditions
- For touch-up or repair of localized damaged paint or to areas of incorrectly applied paint
- For painting of stripe coat
- When applying the initial coat of paint to corners, edges, crevices, holes, welds or other irregular surfaces prior to spray application. An additional stripe coating of primer or intermediate coat shall be applied to all sharp edges, corners, and welds before application of the final coat regardless of the method of coating application. This is in addition to the number of coats stated in the painting schedules.
- The number of coats shall be adjusted to the dry film thickness to match Paintbrushes used shall be of a type and quality that will permit appropriate application of the material being applied.

Material applied by brush shall be smooth, uniform in thickness, without any apparent surface defects such as brush marks, runs, sags, or curtains.

4. DAMAGES & REPAIR

Manual cleaning shall be performed using hand wire brushes, or mechanically operated tools (grinders, chippers, or wire brush) in accordance with ISO 8504-3. The surface shall be left roughly abraded, but a burnished surface is not acceptable.

Areas that have been damaged without exposing the primer shall be washed with a proprietary detergent solution and rinsed with fresh water. This shall be followed by abrading and ensuring that edges of sound paint are chamfered. The area shall then be sprayed or brushed with appropriate mid coats and finishing coat.

More significant coating damage involving the removal of large areas of coating down to bare metal shall be re-prepared by blast cleaning to the original standard and recoated with the specified system.

4.1 MINOR DAMAGE

Surfaces to be overcoated which become contaminated or damaged shall be cleaned by solvent cleaning and/or lightly brush blasted ensuring that the surface is free of all contamination prior to applying the following coats. After cleaning, any residual contaminants shall be removed by dry compressed air and wiped by hand with clean, dry rags. The coating around the damaged area shall be chamfered, using an approved method, to ensure continuity of the patch coating. The full coating system shall then be touched-up with roller or spray application.

4.2 MAJOR DAMAGE

The damaged area shall be re-cleaned as originally specified for that item and the full coating system reapplied in accordance with application data. The re-cleaning shall carry over onto tightly adhering surrounding coating for not less than 25 mm all around and the edges shall be chamfered using an approved method, to ensure continuity of the patch coating.

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5 INSPECTION & TESTING

For each coat/activities the following check has been done:

a) Surface salt contamination

b) Recording the ambient condition such as air temperature, humidity, and substrate temperature

c) Verify storage/stage mixing of paint against the datasheets

d) Surface profile

e) DFT Test to be carried out on each coat

f) Wet film thickness

g) Adhesion Test (Pull-off test)

h) Inspection records are to be reviewed on completion of work

Previews listed tests are in accordance with 123A90-DDL-MAT-SP-60006 Painting Specification, where applicable.

In compliance with ISO 8502-3, the quantity and size of dust particles on surfaces is checked before applying a coating

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Test Type	Method	Frequency	Acceptance criteria	Consequence
Environmental conditions	Ambient and steel temperature. Relative humidity. Dew point.	Before start of each shift + minimum twice per shift.	In accordance with specified requirements	No blasting or coating
Visual examination	Visual for sharp edges weld spatter slivers, rust grade, etc. ISO 8501-3	100 % of all surfaces	No defects, see specified requirements. Where defects are noted on pressure retaining equipment such as pipework, these items shall be quarantined and the CONTRACTOR advised prior to repair.	Defects to be repaired
Cleanliness	a) ISO 8501-1 b) ISO 8502-3	a) 100 % visual of all surfaces b) Spot checks	a) The required blast standard shall be minimum SA 2.5 for all coating systems. b) Maximum quantity and size rating 2	a) Reblasting b) Recleaning and retesting until acceptable
Salt test	The ISO 8502-9 method shall be used.	Tests shall be carried out on each fabricated item.	Maximum conductivity corresponding to 20 mg/m2 NaCl	Repeated washing with potable water and retesting until acceptable
Roughness	Comparator, stylus instrument (preferred) or testex tape (see ISO 8503). Surface profile comparators in accordance with ISO 8501-2 may be used but only as an inspection tool to supplement DFT measurements.	Each component or once per 10 m2	As specified	Reblasting
Curing test (for Zn silicate).	ASTM D4752. This test is not required for system 7 coatings.	Each component or once per 100 m2	Rating 4 to 5	Allow to cure
Visual examination of coating	Visual to determine curing, contamination, solvent retention, pinholes/popping, sagging and surface defects	100% of all coating shall be holiday tested and pinholes repaired.	According to specified requirements	Repair of defects
Holiday detection	ISO 29601. Voltage, see table 1	As per coating system specification	No holidays	Repair and retesting.
Film thickness	ISO 19840. Calibration on a smooth surface. Measurement of DFT readings on non magnetic (e.g. DSS) surfaces shall be subject to agreement with COMPANY. Supplier shall select suitable instrument and demonstrate accuracy of readings (against precision foils and against test plate and micrometer).	ISO 19840	ISO 19840, and coating system data sheet	Repair, additional coats or recoating as appropriate
Adhesion	ISO 4624. For adhesion testing, only hydraulic type 'pull-off' testing devices shall be used.	An adhesion test shall be performed as part of qualification and on each item during production with separate tests panels sprayed at the same time as the primary item.	See notes below	Coating to be rejected

NOTE 1 For coating system no. 2 A, adhesion during CPT shall be minimum 9,0 MPa. Adhesion measured during production shall be minimum 7,0 MPa for any single measurement.
NOTE 2 For coating system no. 3A, system no. 3C, system no. 3D, system no. 3E, system no. 3F and system no. 3G, maximum 30 % reduction from the CPT is acceptable. Absolute minimum value is 5 MPa.
NOTE 3 For sprayed on passive fire protection, maximum 50 % reduction from CPT value read as cohesion is acceptable. Absolute minimum values are 2.0 MPa for cement based products and 5.0 MPa for epoxy based products. Epoxy based passive fire protection may be used to glue the test dollies to the primer in order to measure the adhesive strength.
NOTE 4 For the remaining coating systems, 50 % reduction of average adhesion value from the CPT is acceptable as minimum adhesion during production coating. Absolute minimum value is 5 MPa.
NOTE 5 For adhesion test during CPT, glue failure with values below 15 MPa is not accepted. X-cut test can be used as a supplementary test for adhesion, when relevant.
NOTE 6 Spot checks shall be defined and agreed on before start of each project and included in the inspection and test plan (ITP).
NOTE 7 Holiday detection shall only apply for the splash zone, subsea and internally lined vessels.

Table 9-1 - Inspection and testing

5.1 VISUAL INSPECTION OF PREPARED SURFACES

All blast cleaned or otherwise prepared surfaces shall be visually inspected for conformance to the specified standard of cleanliness and surface profile immediately prior to application of the first coat in accordance with ISO 8503-2 Medium G.

5.2 VISUAL INSPECTION OF COATED SURFACES

All coated surfaces shall be visually examined after application of each coat for deleterious film defects, e.g. blisters, pinholes, dry spray, runs, sagging, wrinkling etc.

After each coat drying, the entire package will be visually inspected, to verify the absence of areas with mismatched color or paint drops, blisters, pinholes, bubbles, craters, wrinkles, sags, runs, unnecessary over-spray or brush marks, damages, scoring.

The same visual inspection will be carried out on the whole air compressor package before shipment as well.

6. COATING SYSTEM

Coating system and painting map specified in the following tables shall be applied:

123A90-DDL-MAT-SP-60006 _ANNEX1 Painting Specification

The Coating System considered has been approved in doc No. "593-23 Rev.2 Technical Offer" and is in compliance with 123A90-DDL-MAT-SP-60006 Painting Specification requirements, where.applicable.

6.1 METHOD OF TESTING

- For the execution of destructive tests, one Test Panel for each Painting System will be prepared.
- Inspection and check of painting shall be done as per Chapter 7 of this Procedure in accordance with 123A90-DDL-MAT-SP-60006 Painting Specification and recorded on Test report "Mod. P11.1 PR rev.A Painting Report"

- Adhesion Test shall be done in accordance with 123A90-DDL-MAT-SP-60006 Painting Specification and recorded on Test report "Mod. P11.1 PR rev. A Painting Report"
- Acceptance standard for Adhesion Test:

Pull-off Test ISO 4624 5 MPa only for complete Cycle (External CS Surface) after 14 days from Finishing.

Test Panel size: 250 x 300 x 5 mm

Test Panel composition: 30 mm gritblasting, 30 mm primer, 30 mm intermediate, 210 mm finishing

- Cleanliness, Roughness and Salt contamination Tests shall be tested for carbon steel in accordance with 123A90-DDL-MAT-SP-60006 Painting Specification and recorded on Test report "Mod. P11.1 PR rev. A Painting Report"

6.2 ANNEXES

Document title	Document
Painting Specification	123A90-DDL-MAT-SP-60006
Painting Report	Mod P11.1 rev.A
Painting Datasheets	ANNEX

ANNEX -1

1. PAINTING DETAILS

PART	COLOR (RAL)	CYCLE	MATERIAL
Structural External CS Surface	Grey Ral 7035	AS-535-C5M	Carbon steel
Under Insulation Internal CS Surface	Dark grey	Epoxy phenolic DFT 1x125 micron	Carbon steel
External & Internal) Doors	Grey Ral 7035	AS-535-C5M	Carbon steel
Internal lining on walls and roof (visible side)	White Ral 9002	STD Manufacturer	Galvanized Carbon Steel
Internal Equipment Baseframe	Grey Ral 7035	Epoxy phenolic DFT 1x125 micron Polyurethane acrilic RAL 7035 1x60 micron	Carbon steel

2. AS-535-C5M PAINTING CYCLE

Enviroment:	**High durability coating system for environmental conditions classified as C5M-very high corrosivity (marine) See coating system 1**
Metallic support:	Uninsulated carbon steel, low alloy, cast iron, galvanized carbon steel
Maximum temperature:	100°C (Dry)
Surface preparation:	Deagrease if necessary as per SSPC SP1 Gritblasting Sa 2½ According to ISO 8501– SSPC SP 10 Incision profile ISO 8503 Medium G 55-85 µm Salt Test ISO 8502 part 6 2µg/cm2 As per coating spec. Dust Test Lev.2 ISO 8502-3 As per coating spec
Final nominal dry film thickness:	**320 µm**
Adhesion Test:	Pull-off Test ISO 4624 5 MPa only for complete Cycle (External CS Surface) after 14 days from Finishing Test Panel size: 250 x 300 x 5 mm Test Panel composition: 30 mm gritblasting, 30 mm primer, 30 mm intermediate, 210 mm finishing

AS-535-C5M						
	Type	Chemical nature	Thickness µm	Yeild (m2/l)	Max T	Color
Primer	Interzinc 52	Organic zinc	60	7.9	150°C	Blue Grey, Green
Int Coat	Intergard 475 HS	Epoxy ferromycaceous	200	4.6	100°C	Light Grey
Finishing	Interthane 990	Polyurethane acrilic	60	8.0	100°C	RAL 7035

Touch UP for limited areas (200 cm^2 ~)						
	Type	Chemical nature	Thickness µm	Yeild (m2/l)	Max T	Color
Primer	Interzinc 52	Organic zinc	60	7.9	150°C	Blue Grey, Green
Int Coat	Intergard 475 HS	Epoxy ferromycaceous	200	4.6	100°C	Light Grey
Finishing	Interthane 990	Polyurethane acrilic	60	8.0	100°C	RAL 7035

For product information refer to the attached technical datasheet of Painting Products used.

Mod. P11.1 rev.A

DONELLI ALEXO S.R.L.

TRATTAMENTI E RIVESTIMENTI ANTICORROSIVI
VIA SOMMA, 64 – 20012 CUGGIONO (MI)
TEL. 02/97240792 – FAX 02/9746141
Web site: www.donelli.it - email: alexo@donelli.it

LICENZIATARIA PRODOTTI E TECNOLOGIE SAKAPHEN

COMPANY WITH QUALITY SYSTEM CERTIFIED BY SGS =ISO 9001=

COATING INSPECTION REPORT N° | **INSPECTION DATE:**

ACCORDING TO UNI EN 10204 TYPE 3 | **INSPECTIONED BY:**

DONELLI ALEXO SRL	INSPECTOR	CUSTOMER

CUSTOMER			
ORDER			
DELIVERY NOTE #		YOUR REF.	
OUR DELIVERY NOTE		OUR REF.	
INSPECTION SPEC.			

TYPE OF TREATED SURFACES: INTERNAL | EXTERNAL

SURFACE PREPARATION	SPECIFIED	RECORDED
STEEL PREPARATION		
DUST LEVEL		
BLASTING		
ABRASIVE TYPE		

BLAST PROFILE

VALUE :	SPEC. VALUE	REC. VALUE	REC. VALUE
KEANE TATOR			
TESTEX REPLICA TAPE			
HOMMEL TESTER P5Z			

HOLIDAY DETECTION
NACE RP 0188

RESULT:	RESULT: //

VISUAL INSPECTION: SATISFACTORY

PAINT'S SUPPLIER:

PROTECTIVE SYSTEM	1° COAT	2° COAT	3° COAT	4° COAT
PAINT'S TYPE				
COLOR				
SPECIFIED D.F.T. FOR COAT MICRON				
TOTAL SPECIFIED D.F.T.	***MICRON***			
TOTAL D.F.T.				
TOTAL D.F.T. AS SSPC-PA 2 AVERAGE – MICRON (MINIMUN > – MAXIMUM <)			GAUGE:	

OPERATION CONDITIONS

SPEC. VALUE	SURF. PREP.	REC. VALUE	REC. VALUE	REC. VALUE	REC. VALUE
ROOM TEMP.					
R.H.					
DEW POINT					
SUBSTRATE TEMP. +3°C D.P.					
RECORDING DATE					

ADHESION TEST	SPECIFIED VALUE	RECORDED VALUE
ACCORDING TO ASTM D 3359		
ACCORDING TO DIN 53151		
ACCORDING TO ISO 4624		

Interzinc® 52

International

Epoxy Zinc-Rich

PRODUCT DESCRIPTION

A two component, metallic zinc rich epoxy primer which complies with the composition and performance requirements of SSPC Paint 20.

INTENDED USES

As a high performance primer to give maximum protection as part of any anti-corrosive coating system for aggressive environments including those found on offshore structures, petrochemical facilities, pulp and paper plants, bridges and power plants.

Interzinc 52 has been designed to provide excellent corrosion resistance in both maintenance and new construction situations.

PRACTICAL INFORMATION FOR INTERZINC 52

Colour	Blue, Grey, Green
Gloss Level	Matt
Volume Solids	59% ± 2%
Typical Thickness	50-75 microns (2-3 mils) dry equivalent to 85-127 microns (3.4-5.1 mils) wet
Theoretical Coverage	7.87 m²/litre at 75 microns d.f.t and stated volume solids 315 sq.ft/US gallon at 3 mils d.f.t and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless Spray, Air Spray, Brush

Drying Time

			Overcoating Interval with recommended topcoats	
Temperature	**Touch Dry**	**Hard Dry**	*Minimum*	*Maximum*
5°C (41°F)	2 hours	10 hours	8 hours	Extended[1]
15°C (59°F)	90 minutes	6 hours	4 hours	Extended[1]
25°C (77°F)	75 minutes	4 hours	3 hours	Extended[1]
40°C (104°F)	45 minutes	2 hours	2 hours	Extended[1]

[1] See International Protective Coatings Definitions and Abbreviations

For curing at low temperatures an alternative curing agent is available. See Product Characteristics for details.

Maximum overcoating intervals are shorter when using polysiloxane topcoats. Consult International Protective Coatings for further details.

REGULATORY DATA

Flash Point (Typical)	Part A 29°C (84°F); Part B 30°C (86°F); Mixed 29°C (84°F)	
Product Weight	2.52 kg/l (21.0 lb/gal)	
VOC	2.80 lb/gal (336 g/lt)	EPA Method 24
	152 g/kg	EU Solvent Emissions Directive (Council Directive 1999/13/EC)
	360 g/lt	Chinese National Standard GB23985

See Product Characteristics section for further details

Interzinc® 52

Epoxy Zinc-Rich

SURFACE PREPARATION

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Oil or grease should be removed in accordance with SSPC-SP1 solvent cleaning.

Abrasive Blast Cleaning

Abrasive blast clean to Sa2½ (ISO 8501-1:2007) or SSPC-SP6. If oxidation has occurred between blasting and application of Interzinc 52, the surface should be reblasted to the specified visual standard.

Surface defects revealed by the blast cleaning process should be ground, filled, or treated in the appropriate manner.

A surface profile of 40-75 microns (1.6-3.0 mils) is recommended.

Shop Primed Steelwork

Interzinc 52 is suitable for application to unweathered steelwork freshly coated with zinc silicate shop primers.

If the zinc shop primer shows extensive or widely scattered breakdown, or excessive zinc corrosion products, overall sweep blasting will be necessary. Other types of shop primer are not suitable for overcoating and will require complete removal by abrasive blast cleaning.

Weld seams and damaged areas should be cleaned to a minimum St3 (ISO 8501-1:2007) or SSPC-SP3. Optimum performance will be achieved with blasting to Sa2½ (ISO 8501-1:2007) or SSPC-SP6; where this is not practical, power tool preparation to SSPC-SP11 is recommended.

APPLICATION

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.
(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

4 part(s) : 1 part(s) by volume

Working Pot Life

5°C (41°F)	15°C (59°F)	25°C (77°F)	40°C (104°F)
24 hours	12 hours	5 hours	2 hours

Airless Spray

Recommended

Tip Range 0.43-0.53 mm (17-21 thou)
Total output fluid pressure at spray tip not less than 176 kg/cm² (2503 p.s.i.)

Air Spray (Pressure Pot)

Recommended

Gun DeVilbiss MBC or JGA
Air Cap 704 or 765
Fluid Tip E

Brush

Suitable - small areas only

Typically 50-75 microns (2.0-3.0 mils) can be achieved

Roller

Not recommended

Thinner

International GTA220 (or International GTA415)

Thinning is not normally required. Consult the local representative for advice during application in extreme conditions. Do not thin more than allowed by local environmental legislation.

Cleaner

International GTA822 (or International GTA415)

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA822. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA822. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with approrpriate regional regulations/legislation.

PRODUCT CHARACTERISTICS

In order to ensure good anti-corrosive performance, it is important to achieve a minimum dry film thickness of Interzinc 52 of 40 microns (1.5 mils). To achieve a uniform, coalesced, closed film at this dry film thickness, it will be necessary to thin Interzinc 52 10% with International thinners. The film thickness of Interzinc 52 applied must be compatible with the blast profile achieved during surface preparation. Low film thickness should not be applied over coarse blast profiles.

Care should be excercised to avoid the application of dry film thicknesses in excess of 150 microns (6 mils). Care should be exercised to avoid over-application, which may result in cohesive film failure with subsequent high builds, and to avoid dry spray which can lead to pinholing of subsequent coats. Over-application will also result in slower curing and extended handling and overcoating times. Over-application of Interzinc 52 will extend both the minimum overcoating periods and handling times, and may be detrimental to long term overcoating properties.

When Interzinc 52 is allowed to weather before topcoating ensure all zinc salts are removed prior to paint application and only topcoat with recommended materials.

Surface temperature must always be a minimum of 3°C (5°F) above dew point.

Interzinc 52 is not normally recommended for underwater use. Please consult International Protective Coatings for details in this situation.

Interzinc 52 is suitable for the localised repair of damaged inorganic zinc primer - consult International Protective Coatings for specific advice.

Low Temperature Curing

An alternative curing agent is available for applications at temperatures less than 5°C (41°F). When using this alternative curing agent it should be noted that the VOC will increase to 384 g/l (EPA Method 24) and the Part B flash point is 24ºC (79ºF).

Interzinc 52 is capable of curing at temperatures below 0°C (32°F). However, this product should not be applied at temperatures below 0°C (32°F) where there is a possibility of ice formation on the substrate.

			Minimum overcoating interval with recommended topcoats		
Temperature	Touch Dry	Hard Dry	*Minimum*	*Maximum*	Pot Life
-5°C (23°F)	3 hours	31 hours	31 hours	Extended*	18 hours
0°C (32°F)	2.5 hours	16 hours	16 hours	Extended*	18 hours
5°C (41°F)	30 minutes	4 hours	4 hours	Extended*	18 hours
15°C (59°F)	20 minutes	3.5 hours	3.5 hours	Extended*	8 hours
25°C (77°F)	15 minutes	3 hours	3 hours	Extended*	2.5 hours

Touch dry times shown above are actual drying times due to chemical cure, rather than physical set due to solidification of the coating film at temperatures below 0°C (32°F)

* See International Protective Coatings Definitions & Abbreviations

For further details regarding cure times and overcoatability, please contact International Protective Coatings.

This product has the following specification approvals:
- Steel Structures Painting Council - SSPC Paint 20

On consultation with International Protective Coatings this product is compatible with alternative application methods such as flow coating.

Note: VOC values are typical and are provided for guidance purpose only. These may be subject to variation depending on factors such as differences in colour and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24.

SYSTEMS COMPATIBILITY

Interzinc 52 is designed for application to correctly prepared steel. However, it is also possible to apply over approved prefabrication primers. Further details of these can be obtained from International Protective Coatings. Recommended topcoats are:

Intercure 200	InterH2O 401
Intercure 420	Interseal 670HS
Interfine 629HS	Interthane 990
Intergard 251	Interzone 1000
Intergard 269	Interzone 505
Intergard 475HS	Interzone 954
Intergard 740	

For other suitable topcoats, consult International Protective Coatings.

ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at www.international-pc.com:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage

Individual copies of these information sections are available upon request.

SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

PACK SIZE	Unit Size	Part A		Part B	
		Vol	Pack	Vol	Pack
	10 litre	8 litre	10 litre	2 litre	2.5 litre
	3 US gal	2.4 US gal	3.5 US gal	0.6 US gal	1 US gal
	For availability of other pack sizes, contact International Protective Coatings.				
SHIPPING WEIGHT (TYPICAL)	Unit Size	Part A		Part B	
	10 litre	24.5 kg		2.1 kg	
	3 US gal	63.3 lb		5.3 lb	
STORAGE	Shelf Life	12 months minimum at 25°C (77°F). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.			

Important Note

The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to the maximum extent permitted by law) any loss or damage arising out of the use of the product. We hereby disclaim any warranties or representations, express or implied, by operation of law or otherwise, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local representative that this data sheet is current prior to using the product.

This Technical Data Sheet is available on our website at www.international-marine.com or www.international-pc.com, and should be the same as this document. Should there be any discrepancies between this document and the version of the Technical Data Sheet that appears on the website, then the version on the website will take precedence.

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www.international-pc.com

Intergard® 475HS

International

Epoxy

PRODUCT DESCRIPTION

A low VOC, high solids, high build, two component epoxy coating. Available with conventional pigmentation, or alternatively can be pigmented with micaceous iron oxide to provide enhanced overcoating properties.

INTENDED USES

For use as a high build epoxy coating to improve barrier protection for a range of anti-corrosive coating systems in a wide range of environments including offshore structures, petrochemical plants, pulp and paper mills and bridges.

Suitable for use in both maintenance and new construction situations as part of an anti-corrosive coating system.

The micaceous iron oxide variant improves long term overcoating properties, better facilitating application in the fabrication shop, prior to shipping, with final overcoating on site.

PRACTICAL INFORMATION FOR INTERGARD 475HS

Colour	Light Grey MIO and a selected range of colours
Gloss Level	Matt
Volume Solids	80%
Typical Thickness	100-200 microns (4-8 mils) dry equivalent to 125-250 microns (5-10 mils) wet
Theoretical Coverage	6.40 m²/litre at 125 microns d.f.t and stated volume solids 257 sq.ft/US gallon at 5 mils d.f.t and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless Spray, Air Spray, Brush, Roller

Drying Time

			Overcoating Interval with recommended topcoats	
Temperature	**Touch Dry**	**Hard Dry**	*Minimum*	*Maximum*
-5°C (23°F)	150 minutes	48 hours	48 hours	Extended[1]
5°C (41°F)	90 minutes	16 hours	16 hours	Extended[1]
10°C (50°F)	80 minutes	14 hours	13 hours	Extended[1]
15°C (59°F)	75 minutes	10 hours	10 hours	Extended[1]
25°C (77°F)	60 minutes	5 hours	5 hours	Extended[1]

[1] See International Protective Coatings Definitions and Abbreviations

Maximum overcoating intervals are shorter when using polysiloxane topcoats. Consult International Protective Coatings for further details.

For curing at elevated temperatures an alternative curing agent is available. See Product Characteristics for details.

REGULATORY DATA

Flash Point (Typical)	Part A 34°C (93°F); Part B 31°C (88°F); Mixed 33°C (91°F)	
Product Weight	2.1 kg/l (17.5 lb/gal)	
VOC	1.72 lb/gal (207 g/lt) 92 g/kg 159 g/lt	EPA Method 24 EU Solvent Emissions Directive (Council Directive 2010/75/EU) Chinese National Standard GB23985

See Product Characteristics section for further details

SURFACE PREPARATION

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Primed Surfaces

Intergard 475HS should always be applied over a recommended anti-corrosive coating scheme. The primer surface should be dry and free from all contamination and Intergard 475HS must be applied within the overcoating intervals specified (consult the relevant product data sheet).

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. Sa2½ (ISO 8501-1:2007) or SSPC-SP6, Abrasive Blasting, or SSPC-SP11, Power Tool Cleaning) and patch primed prior to the application of Intergard 475HS.

Metallic Zinc Primed Surfaces

Ensure that the surface of the primer is clean, dry and free from contamination and zinc salts before application of Intergard 475HS. Ensure zinc primers are fully cured before overcoating.

APPLICATION

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.

(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

3 part(s) : 1 part(s) by volume

Working Pot Life

-5°C (23°F)	5°C (41°F)	15°C (59°F)	25°C (77°F)
3 hours	3 hours	2.5 hours	2 hours

Airless Spray	Recommended	Tip Range 0.53-0.63 mm (21-25 thou) Total output fluid pressure at spray tip not less than 190 kg/cm² (2702 p.s.i.)
Air Spray (Pressure Pot)	Recommended	Gun: DeVilbiss MBC or JGA Air Cap: 704 or 765 Fluid Tip: E
Brush	Suitable	Typically 75 microns (3.0 mils) can be achieved
Roller	Suitable	Typically 75 microns (3.0 mils) can be achieved
Thinner	International GTA007	Thinning is not normally required. Consult the local representative for advice during application in extreme conditions. Do not thin more than allowed by local environmental legislation.

Cleaner

International GTA822 (or International GTA415)

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA822. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA822. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.

Intergard® 475HS

Epoxy

PRODUCT CHARACTERISTICS

Intergard 475HS is primarily designed for use as a high build barrier coat to impart barrier protection to a coating system. It is recommended that it should be overcoated with a durable finish from the Interfine or Interthane range when appearance is important.

Maximum film build in one coat is best attained by airless spray. When applying by methods other than airless spray, the required film build is unlikely to be achieved. Application by air spray may require a multiple cross spray pattern to attain maximum film build. Low or high temperatures may require specific application techniques to achieve maximum film build.

When applying Intergard 475HS by brush or roller, it may be necessary to apply multiple coats to achieve the total specified system dry film thickness.

Surface temperature must always be a minimum of 3°C above dew point. When applying Intergard 475HS in confined spaces ensure adequate ventilation. Exposure to unacceptably low temperatures and/or high humidities during or immediately after application may result in incomplete cure and surface contamination that could jeopardise subsequent intercoat adhesion.

Elevated Temperature Curing

An alternative curing agent is available for applications at temperatures greater than 25°C (77°F).

			Overcoating Interval with recommended topcoats	
Temperature	Touch Dry	Hard Dry	*Minimum*	*Maximum*
25°C (77°F)	90 minutes	6 hours	6 hours	Extended *
40°C (104°F)	60 minutes	2 hours	2 hours	Extended *

* See International Protective Coatings Definitions and Abbreviations

Interchanging standard and elevated temperature curing agents during application to a specific structure will give rise to an observable colour change due to the difference in the yellowing/discolouration process common to all epoxies on exposure to UV light. In common with all epoxies Intergard 475HS will chalk and discolour on exterior exposure. However, these phenomena are not detrimental to anti-corrosive performance.

Intergard 475HS is not designed for continuous water immersion.

The micaceous iron oxide variant of this product is frequently used as a 'travel coat' prior to final overcoating on site. To ensure best extended overcoating properties ensure over-application does not occur and that the surface is fully cleaned of any contamination which may be present in the surface texture due to the coarse nature of the micaceous iron oxide pigmentation.

When applying Intergard 475HS at temperatures less than 15°C (59°F) or wet film thicknesses of 150 microns (6 mils) or less, addition of around 5% International GTA007 thinners will improve film appearance, sprayability and aid film thickness control.

Note: VOC values are typical and are provided for guidance purpose only. These may be subject to variation depending on factors such as differences in colour and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24.

SYSTEMS COMPATIBILITY

Intergard 475HS is designed for use over correctly primed steel. Suitable primers are:

Intercure 200
Intergard 251
Intergard 269
Interzinc 22 * (mist coat or tie coat may be required)
Interzinc 315
Interzinc 52
Interzinc 2280* (mist coat or tie coat may be required)

Suitable topcoats are:

Intergard 740
Interthane 990
Interfine 629HS
Intergard 475HS

For alternative primers and finishes, consult International Protective Coatings.

See relevant product data sheet for details.

ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at www.international-pc.com:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage

Individual copies of these information sections are available upon request.

SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Safety Data Sheet and the container(s), and should not be used without reference to the Safety Data Sheet (SDS).

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

PACK SIZE	Unit Size	Part A		Part B	
		Vol	Pack	Vol	Pack
	20 litre	15 litre	20 litre	5 litre	5 litre
	5 US gal	3 US gal	5 US gal	1 US gal	1 US gal
	For availability of other pack sizes, contact International Protective Coatings.				

SHIPPING WEIGHT (TYPICAL)	Unit Size	Part A	Part B
	20 litre	29.3 kg	9.3 kg
	5 US gal	57.1 lb	8.4 lb

STORAGE	Shelf Life	12 months minimum at 25°C (77°F). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition. Elevated storage temperatures reduce shelf life.

Important Note

The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to the maximum extent permitted by law) any loss or damage arising out of the use of the product. We hereby disclaim any warranties or representations, express or implied, by operation of law or otherwise, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local representative that this data sheet is current prior to using the product.

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www.international-pc.com

Interthane 990

Polyurethane Finish

PRODUCT DESCRIPTION

A two pack, acrylic polyurethane finish giving excellent durability and long term recoatability.

INTENDED USES

As a cosmetic finish on above water areas. Suitable for use on topsides, external superstructure, external decks and boottops.
For use at Newbuilding, Maintenance & Repair or On Board Maintenance.

PRODUCT INFORMATION

Colour	PHB000-White, PHY999-Black ; and a wide range of colours.
Finish/Sheen	High Gloss
Part B (Curing Agent)	PHA046
Volume Solids	57% ±3% (ISO 3233:1998)
Mix Ratio	6.00 volume(s) Part A to 1 volume(s) Part B
Typical Film Thickness	50 microns dry (88 microns wet)
Theoretical Coverage	11.4 m²/litre at 50 microns dft, allow appropriate loss factors
Method of Application	Airless Spray, Brush, Conventional Spray, Roller
Flash Point (Typical)	Part A 34°C; Part B 49°C; Mixed 35°C
Induction Period	Not required

Drying Information	-5°C	5°C	25°C	35°C
Touch Dry [ISO 9117/3:2010]	8 hrs	5 hrs	1.5 hrs	60 mins
Hard Dry [ISO 9117-1:2009]	60 hrs	24 hrs	6 hrs	4 hrs
Pot Life	26 hrs	12 hrs	2 hrs	60 mins

Overcoating Data - see limitations

	Substrate Temperature							
	-5°C		5°C		25°C		35°C	
Overcoated By	Min	Max	Min	Max	Min	Max	Min	Max
Interthane 990	60 hrs	ext	24 hrs	ext	6 hrs	ext	4 hrs	ext

Note Drying and overcoating times quoted are measured at 50 microns dry, at higher film thickness times will be increased.

REGULATORY DATA

VOC

420 g/lt as supplied (EPA Method 24)
341 g/kg of liquid paint as supplied. EU Solvent Emissions Directive (Council Directive 1999/13/EC)
379 g/lt Chinese National Standard GB23985

Note: VOC values are typical and are provided for guidance purposes only. These may be subject to variation depending on factors such as differences in colour and normal manufacturing tolerances.

CERTIFICATION

When used as part of an approved scheme, this material has the following certification:

- Fire Resistance - Surface Spread of Flame (Exova Warringtonfire)
- Fire Resistance - Smoke & Toxicity (Exova Warringtonfire)
- NORSOK M-501, Rev 4, system no.1 (NITN)
- Fire Resistance - Marine Equipment Directive compliant

Consult your International Paint representative for details.

SYSTEMS AND COMPATIBILITY

Interthane 990 must be applied over a recommended primer system, which will vary depending upon the vessel area. Direct application is acceptable over the following marine anticorrosives:

Intergard 264 (USA)
Intergard 400
Intergard 5600
Intergard 5620
Intergard 7600
Intershield 300
Intershield 803

A tiecoat of Intergard 263, Intergard 267 or Intergard 269 may be required if Interthane 990 is to be applied over other epoxy primers and may also be used to extend the maximum overcoating interval when Interthane 990 is to be applied over those primers listed above.

Interprime 198 may also be used as a primer for Interthane 990.

Consult your International Paint representative for the system best suited for the surfaces to be protected.

SURFACE PREPARATIONS

Use in accordance with the standard Worldwide Marine Specifications.
All surfaces to be coated should be clean, dry and free from contamination.
High pressure fresh water wash or fresh water wash, as appropriate, and remove all oil or grease, soluble contaminants and other foreign matter in accordance with SSPC-SP1 solvent cleaning.

NEWBUILDING/MAJOR REFURBISHMENT
Interthane 990 should always be applied over a recommended primer coating scheme. The primer surface should be dry and free from all contamination, and Interthane 990 must be applied within the overcoating intervals specified (consult the relevant product data sheet). For boottop areas the overcoating intervals for primers are reduced. Consult International Paint.
Areas of breakdown, damage etc. should be prepared to the specified standard (eg. Sa2½ (ISO 8501-1:2007)) and primed prior to the application of Interthane 990.

REPAIR/OBM
Interthane 990 should always be applied over a recommended primer coating scheme. The primer surface should be dry and free from all contamination, and Interthane 990 must be applied within the overcoating intervals specified (consult the relevant product data sheet). For boottop areas the overcoating intervals for primers are reduced. Consult International Paint.
Areas of breakdown, damage etc. should be prepared to the specified standard (eg. Sa2½ (ISO 8501-1:2007)) and primed prior to the application of Interthane 990.
Interthane 990 may be applied directly over aged Interthane 990 following thorough fresh water washing and degreasing provided the coating to be overcoated is in an intact and tightly adherent condition. Loose or flaking coatings should be removed back to a firm edge and Interthane 990 or an appropriate primer should be used to repair the area before application of the full coat.
This product may be applied directly over most generic types of paint that have been aged for at least 3 months. It is advisable that a small trial be carried out before applying a full coat.

Consult your International Paint representative for specific recommendations.

NOTE
For use in Marine situations in North America, the following surface preparation standards can be used: SSPC-SP10 in place of Sa2½ (ISO 8501-1:2007)

Interthane 990

Polyurethane Finish

APPLICATION

Mixing	Material is supplied in 2 containers as a unit. Always mix a complete unit in the proportions supplied. (1) Agitate Base (Part A) with a power agitator. (2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.
Thinner	Thinning is not normally required. Consult the local representative for advice during application in extreme conditions. Do not thin more than allowed by local environmental legislation.
Airless Spray	Recommended Tip Range 0.33-0.45 mm (13-18 thou) Total output fluid pressure at spray tip not less than 155 kg/cm² (2200 p.s.i.)
Conventional Spray	Use suitable proprietary equipment. Thinning may be required.
Brush	Suitable.
Roller	Suitable.
Cleaner	International GTA056/GTA713/GTA733
Work Stoppages and Cleanup	Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA056/GTA713/GTA733. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units. Clean all equipment immediately after use with International GTA056/GTA713/GTA733. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays. Do not exceed pot life limitations. All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.
Welding	In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation. In North America do so in accordance with instruction in ANSI/ASC Z49.1 "Safety in Welding and Cutting."

SAFETY

All work involving the application and use of this product should be performed in compliance with all relevant national Health, Safety & Environmental standards and regulations.

Prior to use, obtain, consult and follow the Material Safety Data Sheet for this product concerning health and safety information. Read and follow all precautionary notices on the Material Safety Data Sheet and container labels. If you do not fully understand these warnings and instructions or if you can not strictly comply with them, do not use this product. Proper ventilation and protective measures must be provided during application and drying to keep solvent vapour concentrations within safe limits and to protect against toxic or oxygen deficient hazards. Take precautions to avoid skin and eye contact (ie. gloves, goggles, face masks, barrier creams etc.) Actual safety measures are dependant on application methods and work environment.
EMERGENCY CONTACT NUMBERS:
USA/Canada - Medical Advisory Number 1-800-854-6813
Europe - Contact (44) 191 4696111. For advice to Doctors & Hospitals only contact (44) 207 6359191
China – Contact (86) 532 83889090
R.O.W. - Contact Regional Office

Warning: Contains isocyanate. Wear air-fed hood for spray application.

Interthane 990

Polyurethane Finish

LIMITATIONS

This product is not recommended for use in permanantly immersed conditions.
Interthane 990 may be used on boottop areas at reduced overcoating intervals over appropriate primers. Consult International Paint.
For brush and roller application, and in some colours, two coats of Interthane 990 may be required to give uniform coverage, especially when applying Interthane 990 over dark undercoats and when using certain lead-free bright finish colours such as yellows and oranges. Best practice is to use a colour compatible intermediate or anticorrosive coating under Interthane 990.
Interthane 990 may be applied at substrate temperatures down to -15°C. Before applications are made below -5°C consult your local IP representative for further detail of application procedure.
Low temperature, high relative humidity and condensation occurring during or immediately after application may result in a matt finish and an inferior film. Premature exposure to ponding water will cause colour change, especially in dark colours and at low temperatures.
Overcoating information is given for guidance only and is subject to regional variation depending upon local climate and environmental conditions. Consult your local International Paint representative for specific recommendations.
Apply in good weather. Temperature of the surface to be coated must be at least 3°C above the dew point. For optimum application properties bring the material to 21-27°C, unless specifically instructed otherwise, prior to mixing and application. Unmixed material (in closed containers) should be maintained in protected storage in accordance with information given in the STORAGE Section of this data sheet. Technical and application data herein is for the purpose of establishing a general guideline of the coating application procedures. Test performance results were obtained in a controlled laboratory environment and International Paint makes no claim that the exhibited published test results, or any other tests, accurately represent results found in all field environments. As application, environmental and design factors can vary significantly, due care should be exercised in the selection, verification of performance and use of the coating.
In the overcoating data section 'ext' = extended overcoating period. Please refer to our Marine Painting Guide - Definitions and Abbreviations available on our website.

UNIT SIZE

Unit Size	Part A		Part B	
	Vol	Pack	Vol	Pack
20 lt	17.14 lt	20 lt	2.86 lt	5 lt
5 US gal	5 US gal	5 US gal	1 US gal	1 US gal
1 US gal	1 US gal	1 US gal	1 US quart	1 US quart

Note : US containers are short filled
For availability of other unit sizes consult International Paint

UNIT SHIPPING WEIGHT (TYPICAL)

Unit Size	Unit Weight
1 US gal	13.7 lb
20 lt	26.59 Kg
5 US gal	54.7 lb

STORAGE

Shelf Life: Part A - 24 months minimum at 25°C.
Part B - 12 months minimum at 25°C
Subject to reinspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

WORLDWIDE AVAILABILITY Consult International Paint.

IMPORTANT NOTE

The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to the maximum extent permitted by law) any loss or damage arising out of the use of the product. We hereby disclaim any warranties or representations, express or implied, by operation of law or otherwise, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local representative that this data sheet is current prior to using the product.

This Technical Data Sheet is available on our website at www.international-marine.com or www.international-pc.com, and should be the same as this document. Should there be any discrepancies between this document and the version of the Technical Data Sheet that appears on the website, then the version on the website will take precedence.

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Base Load Power Hub (BLPH)

NDT PROCEDURE

Document Number: 1724000049-NDT-PRO-00005

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
Comandini Massimo Level III NDT EN - ISO9712 WI CSWIP 3.1	31-07-2024

Roberto Mastantuono
Level 3 UNI EN ISO 9712:2012
UT-RT-LT-ET-VT-PT-MT

Rev.	Date	Description	Prepared	Reviewed	Approved
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0	22/02/2024	Issue for Review (IFR)	AD	SK	CA

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Accepted for Construction (AFC)
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HOLDS LIST

No.	Description
1	
2	
3	
4	

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None

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

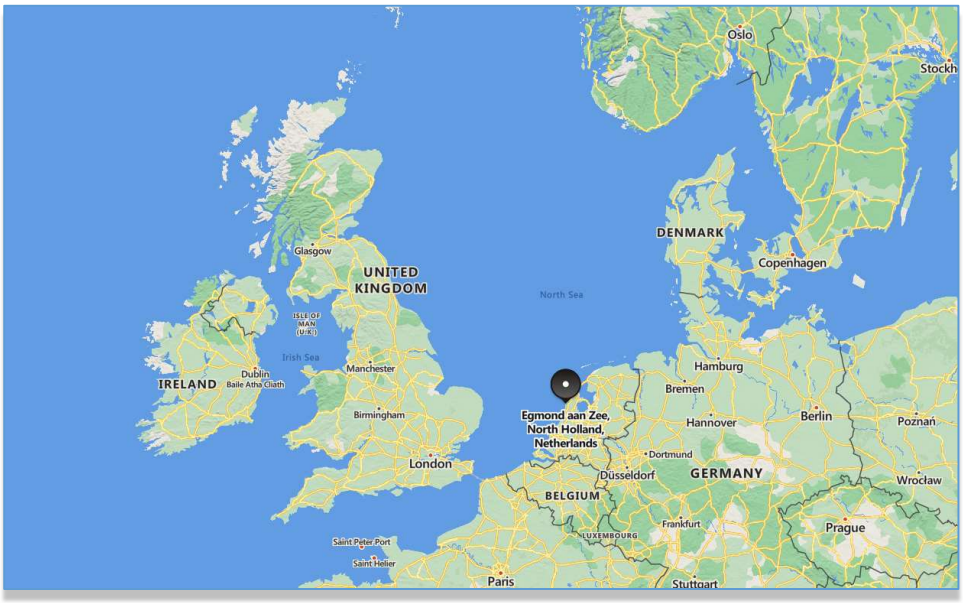


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

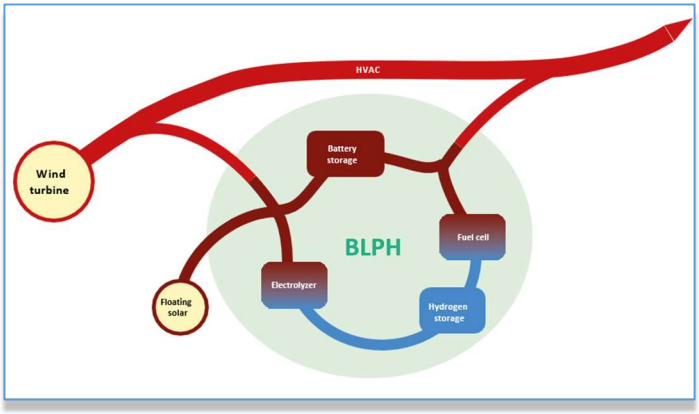


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

The scope of this document is to provide the criteria and the operating ways to verify the quality and the design requirements related to the shelter. The purpose is to give objective evidence that all engineering, design and specification requirements are correctly understood, accounted for, verified, and recorded.

2.1 REFERENCES

Doc. No.	Description
123A90-PML-QHSE-QP-00002	Project Quality Plan
K559-2254-MT-SPE-001	Structural Fabrication Specification
EEMUA 158	Construction for fixed offshore structures
UNI EN ISO 17637	Non-Destructive testing of welds-Visual testing of fusion-welded joints

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
CA	Certification Agency
DS	Surveyor
EXP	Expediting dept.
LOG	Logistic Dept.
NDE	Non Destructive Examination
PQR	Procedure Qualification Record
QC	Quality Control Dept.
QCI	Quality Control Inspector
SC	Sub-contractor
WI	Welding Inspector
WLD	Welding Dept.
WQR	Welder Qualification Record
WPS	Welding Procedure Specification

Table 2 - Definitions and Abbreviations

3 VISUAL TEST

3.1 PURPOSE

This procedure describes the methods and requirements for the execution of the visual inspection, when is required by the Code of reference or by the specifics applicable in order, as specified in point 3.3.

The purpose of this procedure is to establish the arrangements for implementing the dimensional inspection of components and finished devices

3.2 APPLICABILITY

This document is intended to be applicable to the dimensional control carried out on all components and welds performed on manufactured pieces for internal order and therefore a supply destined to third parties.

This procedure describes the methods and requirements for the execution of the visual inspection, when is required by the Code of reference or by the specifics applicable in order.

3.3 OPERATIONAL MODALITY

This procedure is applied to the control of elements manufactured at the Alex Sistemi SpA or at its suppliers.

The visual inspection is used to determine:

- the assembly of parts to be welded, the configuration of the welding preparations according to their specifications
- The conditions, the appearance and the absence of coarse discontinuities of welded joints, before further non-destructive testing or any possible heat treatment
- the conditions of the finished element, both in the raw state and as welded or worked by machines according to the demands of the drawing.

Test results should be evaluated within the time allowed by the parameters of acceptability of the referencing Code or the specifications applied in order.

As a general criterion, to be used in the absence of further acceptance parameters, should be adopted the following recommendations:

- preparation of welding: verify the compliance of the drawing' s preparation or of the specification of related welding. Verify the absence of peelings, burning flame's cutting and other discontinuities that may be produced by flaws in welding.
- welding: check the conformity of the weld's cordon to the drawing or to the related welding specification, in particular, the height of the throat in the corner welds and the excess thickness of welding for joints head to head. Verify that the weld's cordon is sufficiently free from marginal incisions to the

cordon and from other rough surface irregularities and also verify that the reduction in thickness caused by these discontinuities is not higher than the lower of 1mm and 10% of the thickness welded and that the minimum thickness calculated is guaranteed. The cracks are not allowed independently from their size (see examples in the following figures).

• Finished components: verify that all surfaces are free from rough incisions, excessive amounts of weld spatter, weld slag residues and dirt in general

3.4 SURFACE PREPARATION

The examination surface and the adjacent area shall be dry and free of rust, grease, oil, water, welding flux, weld spatters or any other impediments for the application of paints and related products.

The weld shall be prepared by grinding if necessary, to assure that the examination shall be performed properly and that the surface condition of the weld is not causing misleading interpretations of the results.VIEWING CONDITION

The surface to be examined shall be sufficiently lighted by natural or artificial light (a minimum light intensity of 500 lx is required on the surface to be examined).

Examination shall be performed using a direct viewing at a distance of 600 mm from the surface and the viewing angle shall be minimum 30° in conditions of adequate visibility of parts to be examined; in case of limited access the remote viewing by inspection mirrors can be used. The surface and the adjacent area to be examined shall be clean and free of all dirt, grease, paint, spatter, heavy oxidation, etc., that may interfere with the examination.

Visual weld examination shall be carried out if necessary by using the following equipment:

- Inspection mirror
- Misalignment gauge
- Magnifying lens X2 to X5
- Radius gauge
- Various set of weld gauges for measuring fillet welds,reinforcement,undercuts,misalingnment etc.

VISUAL EXAMINATION PROCEDURE EXECUTION OF VISUAL EXAMINATION

Visual examination shall be performed during the following operations:

- After cutting and beveling parts to be welded
- After fit-up
- After welding
- After performing repairs by grinding.

VISUAL EXAMINATION ON BEVELS

For visual examination of bevels ends , the following shall be verified:

- All surfaces shall be clean and free from paint , oil , scale , rust and any other deleterious foreign material prior to welding. Degreasing shall be applied where applicable.
- Bevels are in accordance wuth applicable Welding Procedure Specification (WPS) and applicable shop drawings

VISUAL EXAMINATION ON FIT-UP

For visual examination of fit-up, the following shall be verified:

- Root face and root opening of the joint are in accordance with Welding Specifications and applicable shop drawings
- Tack welds are removed prior to final welding.

VISUAL EXAMINATION ON WELD

During visual examination of welds, the following shall be verified:

- Complete removal of extraneous material resulting from the use of temporary alignments near the joint
- Possible arc strikes
- Possible surface defects such as visible cracks, craters, undercut
- Profile of the weld face and the height of any excess weld metal meet the requirements of the acceptance standard.
- Weld reinforcement.

3.5 SAFETY

- Visual test personnel should follow the company's safety procedures and wear the relevant PPE.
- By way of explanation, the main risks are: handling of heavy and bulky loads, blunt objects, presence of flammable fluids, corrosive substances, presence of metal burrs and oxidised objects, etc.

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4 DIMENSIONAL CHECK

4.1 PURPOSE

The purpose of this procedure is to establish the arrangements for implementing the dimensional inspection of components and finished devices

4.2 PROCEDURES FOR IMPLEMENTATION OF DIMENSIONAL CONTROL

The dimensional control is intended to check the consistency of components or finished parts with the dimensions shown on drawings, in compliance with the specified tolerances

The dimensional inspection will be carried out using instruments duly calibrated.

4.3 NON-COMPLIANCE

Any anomaly detection will be provided through the issue of non-compliance according to the specific procedure.
The acceptance criteria shall be in accordance with TABLE 14 as per EEMUA_158

4.4 CERTIFICATION

At the end of each test, will be marked a signature and date in the Plan of manufacture and testing by the staff who carried out these checks.
And if requested during contractual phase, will be issued a report of the inspection carried out (Mod. P12.1 VT- DR) based on reference code requirements, specific contractual or control plan, in accordance with ISO 17637

This report shall contain the following information:

- the name of the component manufacturer;
- the name of the testing body, if different from
- the identity of the object tested; d) the material
- the type of joint; f) the material thickness
- the welding process
- an acceptance criteria
- the imperfections exceeding the acceptance criteria and their location
- the extent of testing with reference to drawings as appropriate
- the test devices used
- the result of testing with reference to acceptance criteria
- the name of tester and date of test.

4.5 ANNEX

Mod. P12.1 VT- DR – Visual Test & Dimensional Check

ALEX SISTEMI spa

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

Doc. Name: VISUAL TEST & DIMENSIONAL CHECK	Report No.	
OUR JOB	Date	Page 1/1

Cliente *Customer*	Ordine *Order*
Progetto *Project*	Descrizione *Description*
Codice Mat. *Mat. Code*	QCP QCP:

Condizioni d'esame –Test conditions -

Norme di riferimento / *Reference standard*		ASME V					
Procedura di controllo / *Test procedure*		- ASME V Art. 9 – Procedure PQVT					
Criteri di accettabilità / *Acceptance criteria*							
Condizioni superficiali / *Surface finish*	X	Saldato *As welded*		Molato *Ground*		Lav. di mecch. *Machined*		Forgiato *Forged*

Tipo di controllo - Examination Method -

Metodo diretto / *Direct Method*	X	Metodo remoto / *Remote method*	NA
Apparecchiatura/ *Equipment*	Caliper and handable light	No. ---	
Preparazione superficiale *Surface preparation*	Sounding		
Allegati *Annexes*	---		

Risultati del controllo - Test results -

Dwg	Mark	Item/Detail	Qty.	% Check	Measured	Result

Valutazione finale – Final evalutation

X	Positivo *Positive -*	---	Negativo *Negative -*

ALEX SISTEMI SPA	CUSTOMER	FINAL CUSTOMER	3RD PARTY BODY
VT Level II			

Mod. P12.1 VT-DR Rev.0

5. PENETRANT INSPECTION

5.1 SCOPE

This procedure covers the examination and evaluation of carbon and stainless steel material and welds in all shapes and sizes using colour contrast solvent/water removable penetrants.

5.2 REFERENCE DOCUMENT

- K559-2254-MT-SPE-001 Structural Fabrication Specification
- EEMUA 158 Construction Specification for fixed offshore structures
- ISO 3452- 1 Non destructive testing – Penetrant testing – Part: General principles
- ISO 9712 Non destructive testing -Qualification and certification of NDT personnel

5.3 PERSONNEL

The examiner who carries out dye penetrant test and evaluates indication on all the other welds shall be qualified as a Level 2 or 3 in the applicable method and on the relevant product sector in accordance with the requirements of ISO9712. The operator shall have a valid near vision acuity test, which permits reading, a minimum of Times Roman N°4.5 or equivalent letters Jaeger 1 at not less than 30 cm with one or both eyes, either corrected or uncorrected. Colour vision shall be sufficient that the candidate can distinguish contrast between the colours used in NDT method.

5.4 PRODUCTS USED

Only product families described in QPL AMS 2644 shall be used.
"Product family" means the penetrant, removal agent, and developer.

It is not recommended to mix products from different manufacturers because it would not ensure the effectiveness of the PT. To verify the effectiveness make the Test Panel.

For Stainless steel the products to be used shall not contain sulphur and halogen in more than 0.1% in weight and this will be declared by the producer of the penetrant products

MATERIALI PENETRANTI - Penetrant materials		
PULITORE (SOLVENTE) Cleaning (Solvent)	DR-62 spray	or equivalent
PENETRANTE (CONTRASTO DI COLORE) Penetrant (Color contrast)	DP51 spray	or equivalent
SVILUPPATORE LIQUIDO NON ACQUOSO Non acqueous liquid Developer	D100 spray	or equivalent

5.5 SURFACE PREPARATION

a. Surface to be examined may be in the as-welded, as-rolled or as-forged condition, but grinding may be necessary in certain cases when surface irregularities could mask unacceptable discontinuities.
b. Prior to penetrant application, the surface to be examined and all adjacent areas within at least 25 mm shall be cleaned with solvent to remove any dirt, grease, scale, welding flux, weld spatter, oil or other matter which could interfere with the examination.
c. After solvent cleaning the surface shall dry by normal evaporation for at least 5 minutes before applying the penetrant.

5.6 PENETRANT APPLICATION

a. It is important that the temperature of the surface to be processed is within the range of 10°C to 38°C.
b. The penetrant shall be applied by spraying using pressurized containers which are not rechargeable, or by brush within a maximum time of 15 minutes.
c. The minimum penetration time is 15 minutes (20 minutes if the temperature is between 5 °C and 10 °C).

5.7 PENETRANT REMOVAL

When the penetration time in 6.c has elapsed, excess penetrant shall be removed as follows:
a. When using solvent as remover, excess penetrants shall be removed by wiping with a cloth or absorbent paper, repeating the operation until most traces of penetrant have been removed. The remaining traces shall be removed with cloth or absorbent paper moistened with solvent.
b. When using water as remover, excess penetrant shall be removed with a water spry at pressure not over 2,7 Bar and temperature between 10°C and 40°C.
Subsequently the area shall be dried with cloth or absorbent paper.

5.8 DEVELOPER APPLICATION

Immediately following the penetrant removal, the developer shall be applied by spraying, within a maximum time interval of 15 minutes.
The developer shall be thoroughly agitated prior to and during its application to ensure dispersion of the suspended particles.
The developer shall be applied so that a thin, even coat covers the entire surface. The spray nozzles shall not be closer to the surface than 300 mm during application of the developer.

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5.9 EXAMINATION

The examination shall be performed with an adequate illumination (min. 1076Lux) and a visual angle not greater than 60°.
Every indication on the developer may mean the possible presence of a discontinuity. Final evaluation shall be made after allowing the penetrant to bleed out for a least 10 minutes but no longer than 30 minutes.
If the surface to be examined is so large that complete examination cannot be made within the prescribed time, then only portions shall be examined at one time.

5.10 SAFETY

- Visual test personnel should follow the company's safety procedures and wear the relevant PPE.

- By way of information, the main risks are: use of highly volatile and flammable chemicals, handling of heavy and bulky loads, blunt bodies, presence of flammable fluids, corrosive substances, presence of metal burrs and oxidised objects, etc.

- It is required that the use of the techniques described herein, as they are carried out mainly with spray cans, be carried out under ventilated conditions and that consumable products are used and stored under the conditions recommended by the manufacturer.

- In addition, it is required that consumable products are correlated with the relevant safety data sheets and technical data sheets and in accordance with national legislation

.

- The use of products for expired penetrant liquids (penetrant liquid, removal solvent and developer) is not allowed.

5.11 ACCEPTANCE STANDARD

Acceptance criteria shall be in accordance with EEMUA_158:2014,S7.5.5

5.12 CLEANING AFTER EXAMINATION

After examination all checked surfaces shall be cleaned from development and penetrant with solvent or water and dry with clothes or forced air.

5.13 REPORT

A report shall be prepared using the form “Mod. P17.1 PT”.



ALEX SISTEMI

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

Doc. Name: NDE PENETRANT DYE TEST REPORT | Report No. 17.1 Rev.0

OUR JOB | Date | Page 1/1

CUSTOMER:	PO:
JOB:	DESCRIPTION:
ITEM:	DATE:

CONDIZIONI D'ESAME - Test conditions

Norme di riferimento / Reference standard	ASME V
Procedura di controllo / Test Procedure	ASME V, art.6 – Procedure PQPT
Criteri di accettabilità / Acceptance criteria	CSA W59 - 2018

condizioni superficiali / Surface finish	X	Saldato As welded		Molato Ground		Lav. di macch. Machined		Forgiato Forged

MATERIALI PENETRANTI - Penetrant (accordance with AMS 2644)

PULITORE (SOLVENTE) Cleaning (Solvent)	Water
PENETRANTE (CONTRASTO DI COLORE) Penetrant (Color contrast)	ELITE K71B2p spray
SVILUPPATORE LIQUIDO NON ACQUOSO Non acqueous liquid Detector	ELITE D112A spray

TECNICA - Technique

PULIZIA INIZIALE – (Precleaning)	Spray con solvente / Solvent spray
APPLICAZIONE PENETRANTE – (Penetrant application)	Spruzzo manuale / - Manual Spray
TEMPO DI PENETRAZIONE – (Penetration time)	5 ÷ 20 min
RIMOZIONE PENETRANTE – (Penetrant removal)	Water spray
ASCIUGATURA – (Drying)	air
APPLICAZIONE SVILUPPATORE – (Detector application)	Spruzzo manuale Manual Spray
TEMPO DI SVILUPPO – (Development time)	10 ÷ 30 min.
INTENSITA' DI ILLUMINAZIONE – (Light intensity)	Luce naturale/ artificiale–Light natural or artificial ≥ 1000 lux
PULIZIA FINALE – (Final Cleaning)	Spray con solvente / / Solvent spray
ALTRO – (Other)	//

Dwg	Mark	Item/Detail	Qty	% Check	Result

Valutazione finale – Final Evalutation

	Positivo/Positive		Negativo/Negative

Alex Sistemi SPA	CUSTOMER	FINAL CUSTOMER	3RD PARTY BODY
PT Level II ISO 9712:2012			

Mod. PI7.1 PT Rev.0

6. MAGNETIC PARTICLE EXAMINATION

6.1 SCOPE

This procedure establishes the method for the execution, examination and evaluation of magnetic particle inspection to detect discontinuities on surface and sub-surface of ferromagnetic materials.

This method involves magnetizing an area to be examined and applying ferromagnetic particles to the surface.

This procedure applies also to qualification of welders and welding procedures.

The welds shall be tested at 100% of external surface and internal surface if accessible if accessible.

Final Non-Destructive Tests (NDT) shall not be carried out sooner than 48 hours after completion of welding.

Doc. No.	Description
K559-2254-MT-SPE-001	Structural Fabrication Specification
EEMUA_158	Construction Specification for fixed offshore structures
EN ISO 9934-1	Non Destructive testing – Magnetic particle examination. Part 1: General principles
ISO 9712	Non-destructive testing — Qualification and certification of NDT personnel

Table 3 - Reference Documents

6.2 PERSONNEL QUALIFICATION

The examiner who carries out magnetic particle test and evaluates indication on all the other welds shall be qualified as a Level 2 or 3 in the applicable method and on the relevant product sector in accordance with the requirements of ISO9712.

The operator shall have a valid near vision acuity test, which permits reading, a minimum of Times Roman N°4.5 or equivalent letters Jaeger 1 at not less than 30 cm with one or both eyes, either corrected or uncorrected.

Colour vision shall be sufficient that the candidate can distinguish contrast between the colours used in NDT method.

6.3 NDT EXTENSION

The extend shall be in accordance to Spec. K559-2254-MT-SPE-001 and will reported on design drawings and inspection test plan

6.4 SURFACE PREPARATION

Prior to magnetic particle examination, the surface to be examined and all adjacent areas within at least 1" (25,4 mm) shall be free of all dirty, grease, scale or other extraneous matter that could interfere with the examination.

If and when necessary, surfaces to be examined can be cleaned by grit or metal blasting.

The weld shall be prepared by grinding if necessary, to assure that the examination shall be performed properly and that the surface condition of the weld is not causing misleading interpretations of the results.

For butt weld requiring cap to be ground flush for inspection purposes final MT examination shall be performed after cap removal.

The status of the weld shall be reported in MT inspection report.

All temporary attachments for scaffolding, temporary bracings, temporary lifting appliances, moved supports, equipment or piping, etc., shall be removed and inspected by MT.

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6.5 CONSUMABLES

In all cases the magnetic detection media shall be of a wet suspension type, a contrast white lacquer shall be applied to surfaces to be inspected after cleaning and prior to magnetization, in order to improve the contrast and to facilitate the mobility of the magnetic particles.

Lacquer is to be applied by spraying (also from spray cans).

Black magnetic powder shall be used as an examination medium.

The following materials shall be used:

a) wet particles:

CGM LK 35 BLACK COLOUR

ELITE – BLACK MAGNETIC INK BW2

b) white lacquer:

CGM VECOPLAST

WHITE BACKGROUND LACQUER WBL5

Or equivalent.

Particles shall be used within the temperature range limitations set by the manufacturer of the particles.

6.6 EXAMINATION

Visual examination shall be performed prior to start magnetic particle examination.

The Magnetic examination shall be performed not earlier than 48 hours after completion weld.

The technique shall be carried out in the continuous mode and test shall be performed at least in two perpendicular directions to detect any discontinuities regardless their position and orientation (see Attachment 1).

Magnetization shall be made using sufficient overlap to assure 100% coverage at the required sensitivity of the controlled areas.

To ensure detection of imperfections in all orientations, the welds shall be magnetized in two directions approximately perpendicular to each other with a maximum deviation of 30°.

Electromagnetic yoke (A.C. alternative current) shall be used.

Each alternative current electromagnetic yokes shall be verified prior to every use, establishing their lifting force equal or more than 4,5 kg at the maximum pole spacing that will be used.
Magnetic field adequacy and direction indicator shall be used to check magnetic field adequacy (see attachment 2).
For the structural steels in welds, a tangential field between 2kA/m to 6kA/m is required.

6.7 PARTICLES APPLICATIONS

Magnetic suspension solution shall be applied, during application of magnetic force (continuous method), by means of a sprayer to provide a homogeneous distribution.

The magnetizing current shall be turned on after the particles have been applied.

Flow of particles shall stop with the application of current.

Wet particles applied from aerosol spray cans may be applied before and/or after magnetizing current is applied.

Wet particles may be applied during the application of magnetizing current if they are not applied directly to the examination area and are allowed to flow over the examination area or are applied directly to the examination area with low velocities insufficient to remove accumulated particles

6.8 VIEWING AND SAFETY CONDITION

All the testing area shall be easily accessible in safety condition; if necessary, the part shall be moved, to avoid that limited access could interfere with the test results.

The area under test shall be evenly illuminated at a level of not less than 500 lx (lux) daylight or artificial light.

Light meters shall be calibrated at least once a year or whenever a meter has been repaired.

If meters have not been in use for one year or more, calibration shall be done before being used.

- Visual test personnel should follow the company's safety procedures and wear the relevant PPE.

- By way of information, the main risks are: use of highly volatile and flammable chemicals, handling of heavy and bulky loads, blunt bodies, presence of flammable fluids, corrosive substances, presence of metal burrs and oxidised objects, etc.

- It is required that the use of the techniques described herein, as they are carried out mainly with spray cans, be carried out under ventilated conditions and that consumable products are used and stored under the conditions recommended by the manufacturer.

- In addition, it is required that consumable products are correlated with the relevant safety data sheets and technical data sheets and in accordance with national legislation

.

- The use of products for expired penetrant liquids (wet magnetic particle type, removal solvent and white coating) is not allowed.

6.9 DEMAGNETIZATION

After testing with alternating current, residual magnetization will normally be low for low carbon steels, and there will generally be no need for demagnetization of the object

6.10 ACCEPTANCE CRITERIA

The acceptance criteria shall be in accordance with EEMUA_158:2014, S7.5.5

All surfaces to be examined shall be free of the following:

- Relevant linear indications
- Relevant rounded indications greater than 4mm
- 4 or more relevant rounded indications in a line, separated by 1,5mm or less (Edge to Edge)
-

- Relevant indications

A "relevant" indication is that caused by defect rather than by weld geometry.

- Linear Indication

A "linear" indication is one having a length greater than three times the width. Intermittent and aligned indications shall be treated as a linear indication.

- Rounded Indication

A "rounded" indication is one having circular or elliptical shape with the length equal or less than three times the width.

Any questionable or doubtful indications shall be re-examined (after cleaning of the surface) to determine whether or not they are relevant; in case of doubt, it's possible to use other NDT method for identification and confirmation of suspected flaw indications.

6.11 WELD REPAIR

All defects after repair with a new magnetic particle examination, shall be carried out all over the interested area including 50 mm on either side of defects.
The examination after repair shall be performed not earlier than 48 hours after completion weld.
Welding repairs (or replaced welds) shall be examined with the methods prescribed for the original WPS.

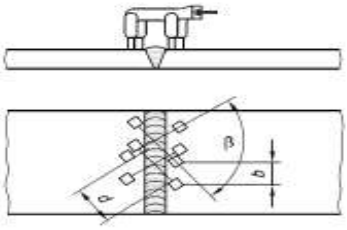
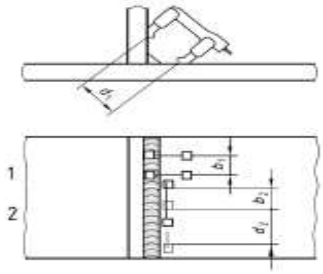
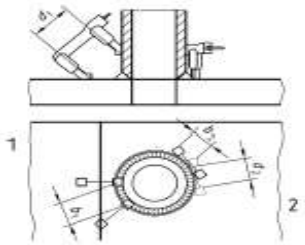
6.12 REPORT

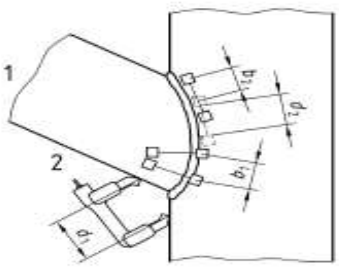
A report will be drawn up using a specific form

6.13 ATTACHMENT

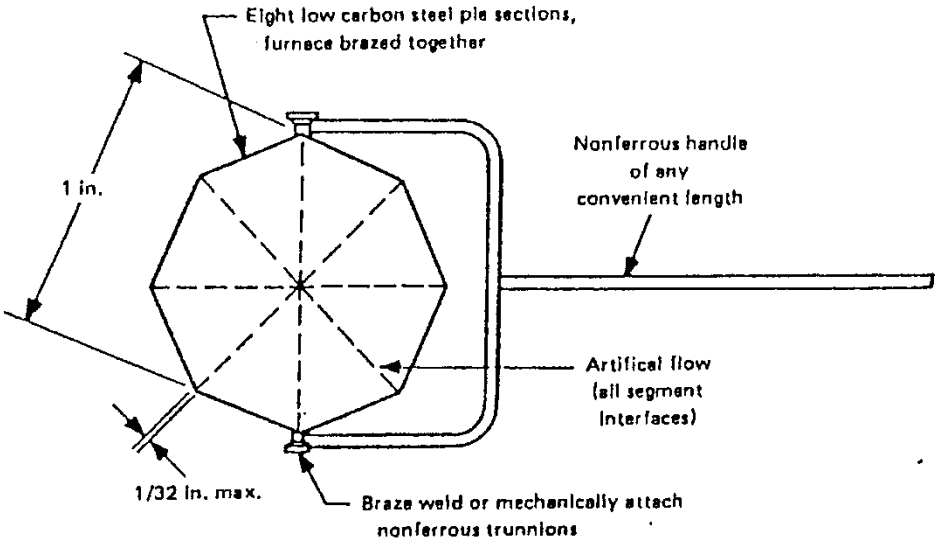
Attachment 1 - Example of an area to be examined by yoke magnetization technique
Attachment 2 – Magnetic particle field indicator
Attachment 3 – Sample Examination Report

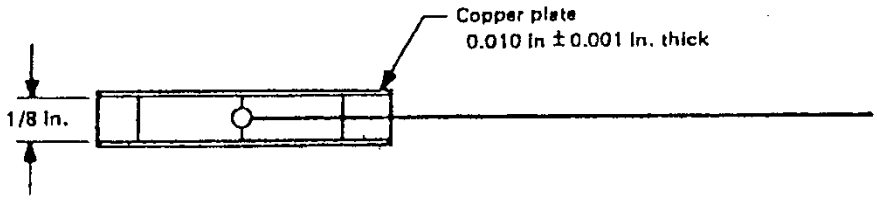
Attachment 1 - Example of an area to be examined by yoke magnetization technique.

	Material type: Ferromagnetic material	*Dimensions in mm*
1		$75 \le d \le 250$ $b_1 \le 0.5d$ $b_2 \le d - 50$ (minimum overlap 50) $b \approx 90°$
2		$d_1 \ge 75$ $b_1 \le 0.5d_1$ $b_2 \le d_2 - 50$ (minimum overlap 50) $d_2 \ge 75$
3		$d_1 \ge 75$ $d_2 \ge 75$ $b_1 \le 0.5\ d_1$ $b_2 \le d_2 - 50$ (minimum overlap 50)

	Material type: Ferromagnetic material	*Dimensions in mm*
4		$d_1 \ge 75$ $d_2 \ge 75$ $b_2 \le d_2 - 50$ (minimum overlap 50) $b_1 \le 0.5\ d_1$

Attachment 2 – Magnetic particle field indicator





MAGNETIC PARTICLE FIELD INDICATOR

Attachment 3 – Sample Examination Report

B&M

CERTIFICATO di CONTROLLO MAGNETOSCOPICO
MAGNETIC PARTICLE EXAMINATION CERTIFICATE
B&M Safe Controls S.n.c. – Cassano Magnago (VA) – Italy
Phone: +39-0331-202764 – belcore-safecontrols@alice.it

N°
DATA DI ESECUZIONE: DATE OF EXAMINATION

DATI DEL CERTIFICATO - CERTIFICATE DATA

CLIENTE: CLIENT	ORDINE: P. O.	Ns. COMM.: OUR JOB	
OGGETTO: SOBJET	DISEGNO: DRAWING	PCQ / FASE: QCP / PHASE	
NORMA-SPEC./ACC CODE- SPECIFICATION/ACC	PROCEDURA: PROCEDURE	REV. REV.	QUANTITA': QUANTITY
MATERIALE: MATERIAL	DIAMETRO / SPESS. DIAMETER / THK.	MARCATURA (N.F. / Colata): MARKING (S.N. / Heat Number)	

TECNICA DI MAGNETIZZAZIONE - MAGNETIZATION TECNIQUE

APPARATI E PARAMETRI EQUIPMENTS AND PARAMETERS	TIPO CORRENTE CURRENT TYPE	INTENSITA' INTENSITY	INTENSITA' DI CAMPO MAGNETIC FIELD STRENGHT	DISTANZA DISTANCE	APPARATO (Marca e Modello) EQUIPMENT (Trade Mark and Model)
☐ PUNTALI PRODS	-	- Ampere	- A/m	- mm	-
☑ GIOGO YOKE	Lifting power verified, > 4,5 Kg	N.A.	Cheked with ASME Magnetic Field Indicator	> 100 mm	DIMART
☐ BANCALE CURRENT FLOW TECHNIQUE	-	- Ampere	- A/m	N.A.	-
☐ BOBINA COIL	-	- Ampere	- A/m	- mm	-

METODO DI ISPEZIONE - INSPECTION METHOD

PRODOTTI CONSUMABLE PRODUCTS	PARTICELLE MAGNETICHE MAGNETIC PARTICLE					SOSPENSIONE IN SUSPENSION IN			PRODOTTI (Marca e Modello) CONSUMABLE PRODUCTS (Trade Mark and Model)
COLORE COLOUR	NERO BLACK	GRIGIO GREY	BLU BLUE	ROSSO RED	GIALLO YELLOW	ACQUA WATER	OLIO OIL	CHEROSENE KEROSENE	
☐ SECCO DRY	☐	☐	☐	☐	☐	☐	☐	☐	
☑ UMIDO WET	☑	☐	☐	☐	☐	☐	☐	☐	TIEDE MAGNAFLUX FERROFLUX-650.2
☐ FLUORESCENTE FLUORESCENT	☐	☐	☐	☐	☐	☐	☐	☐	
ILLUMINAMENTO MINIMO MINIMUM LIGHTING INTENSITY	1076 ☑ Lux ☐ µWatt /cm²					VERNICE DI CONTRASTO CONTRAST COATING ☑			TIEDE MAGNAFLUX FERROFLUX-696.1

SORGENTE DI ILLUMINAZIONE LIGHTING EQUIPMENT ☑ LUCE AMBIENTE DAY LIGHT ☑ LUCE ARTIFICIALE BULB LIGHT ☐ LUCE NERA BLACK LIGHT

ESTENSIONE DEL CONTROLLO EXTENSION OF EXAMINATION ☐ 10% ☐ 20% ☐ 100% ☐ .....

CONDIZIONI SUPERFICIALI - SURFACE CONDITION

☐ SABBIATO SAND BLASTED ☐ SPAZZOLATO BRUSHED ☐ LAMINATO AS ROLLED ☐ FORGIATO AS FORGED ☐ LAVORATO MACHINED ☐ SALDATO AS WELDED

PULITURA DOPO IL CONTROLLO CLEANING METHOD AFTER EXAMINATION **SOLVENTE** SOLVENT | SMAGNETIZZAZIONE DEMAGNETIZATION ☐ RICHIESTA REQUIRED ☐ NON RICHIESTA NOT REQUIRED

NOTE - REMARKS

INDICAZIONI RILEVATE DETECTED INDICATION ☐ NESSUNA NONE ☐ VEDI SCHIZZO ALLEGATO SEE ATTACHED SKETCH .....

VALUTAZIONI EVALUATION ☐ CONFORME CONFORM ☐ NON CONFORME NOT CONFORM ☐ RIPARARE E RICONTROLLARE TO REPAIR AND TO RECHECK

OPERATORE: OPERATOR	APPROVATO DA: APPROVED BY	ISPETTORE / CLIENT INSPECTOR / CLIENT	ISPETTORE / CLIENT INSPECTOR / CLIENT
Alessandro Belcore EN 473 - ISO 9712 - SNT TC 1A *Level II*			

Attachment 4 – NDT Level 3 Qualifications



PND
CENTRO ITALIANO DI COORDINAMENTO PER LE PROVE NON DISTRUTTIVE
Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.ciopnd.it
C.F. e P.I. 09510020150
ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

CERTIFICATO DI LIVELLO 3
LEVEL 3 CERTIFICATE

N° 38893/PND/C

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 3**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 3***

di / of

Mastantuono Roberto

nato a / *born in* **Carate Brianza (MB)**

il / *on* **28 febbraio 1982**

per il metodo / *for the method:*

Magnetoscopia (MT)

per i settori / *for the sectors:*

Collaudi pre e in servizio che comprendono la fabbricazione

(c; f; w; t; wp)

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2022.
This certificate is issued according to UNI EN ISO 9712:2022.

Direttore Generale
General Manager

Reggiani Michael
M. Reggiani

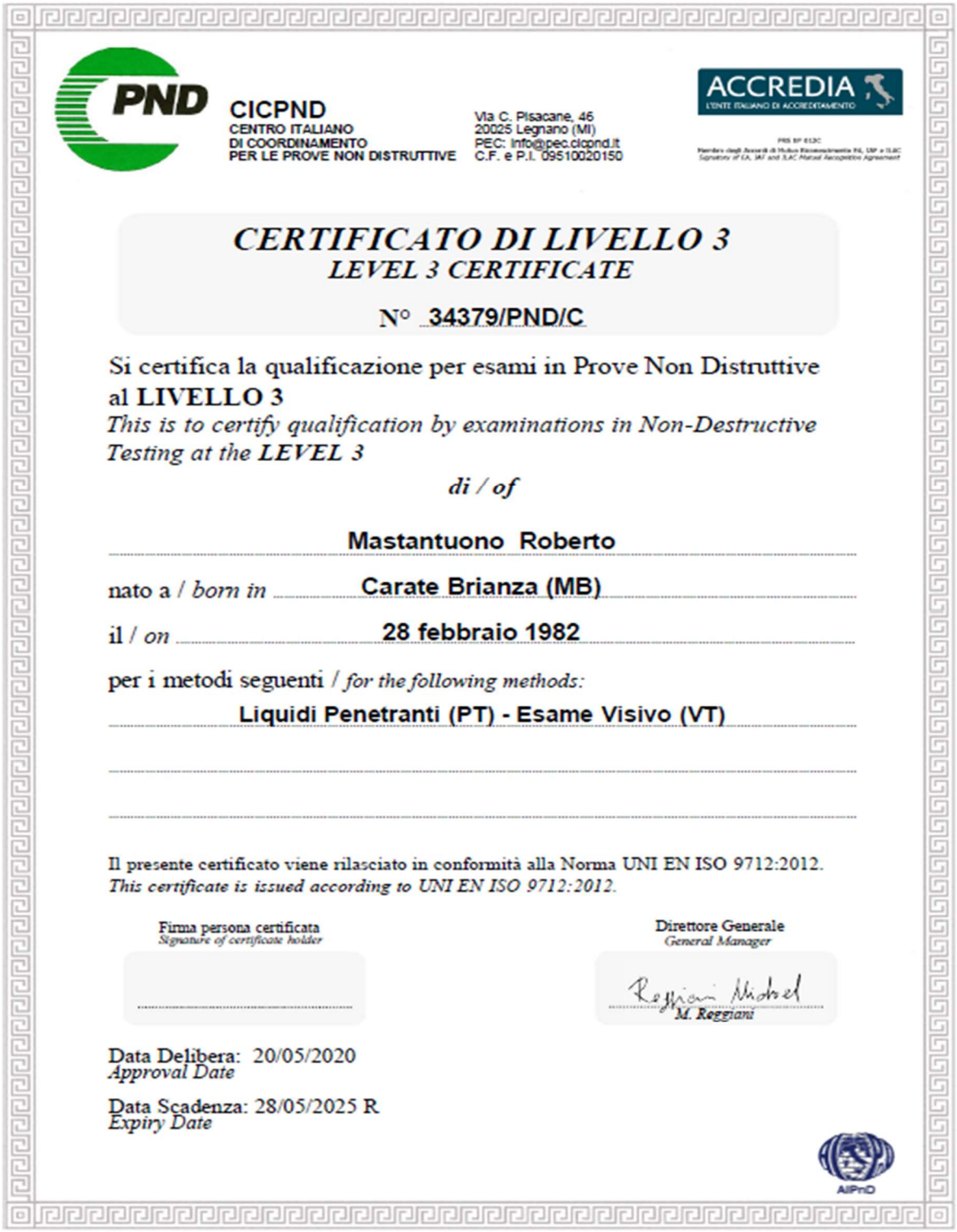
Data Delibera: 07/08/2024
Approval Date

Data Scadenza: 07/08/2029 C
Expiry Date

Approvazione per l'esecuzione di prove non distruttive secondo l'Allegato I paragrafo 3.1.3 della **Direttiva attrezzature in pressione 2014/68/UE/PED** (CEM/TR 15589 Route A).

AIPnD

Attachment 5 – NDT Level 3 Qualifications



PND

CICPND
CENTRO ITALIANO
DI COORDINAMENTO
PER LE PROVE NON DISTRUTTIVE

Via C. Pisacane, 46
20025 Legnano (MI)
PEC: info@pec.cicpnd.it
C.F. e P.I. 09510020150

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

CERTIFICATO DI LIVELLO 3
LEVEL 3 CERTIFICATE

N° 34379/PND/C

Si certifica la qualificazione per esami in Prove Non Distruttive al **LIVELLO 3**
*This is to certify qualification by examinations in Non-Destructive Testing at the **LEVEL 3***

di / of

Mastantuono Roberto

nato a / *born in* **Carate Brianza (MB)**

il / *on* **28 febbraio 1982**

per i metodi seguenti / *for the following methods:*

Liquidi Penetranti (PT) - Esame Visivo (VT)

Il presente certificato viene rilasciato in conformità alla Norma UNI EN ISO 9712:2012.
This certificate is issued according to UNI EN ISO 9712:2012.

Firma persona certificata
Signature of certificate holder

Direttore Generale
General Manager

M. Reggiani

Data Delibera: 20/05/2020
Approval Date

Data Scadenza: 28/05/2025 R
Expiry Date

AIPnD

Base Load Power Hub (BLPH)

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
ROSETTI MARINO S.p.A. Stefano Lippi Quality Control Dept.	02/05/2024

AND TESTING PLAN – E&I SHELTERS

Number: 1724000049-QC-ITP-00002

Document Class: 2

02	19/04/2024	Accepted for Construction (AFC)	SC	SK	CA
01	20/03/2024	Accepted for Construction (AFC)	SC	SK	CA
0	09/02/2024	Issue for Review (IFR)	SC	SK	CA
Rev.	Date	Description	Prepared	Reviewed	Approved

ALEXSISTEMI spa

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Rev.	Description
0	Issue for Review (IFR)
01	Accepted for Construction (AFC)
02	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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Attachment 1

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

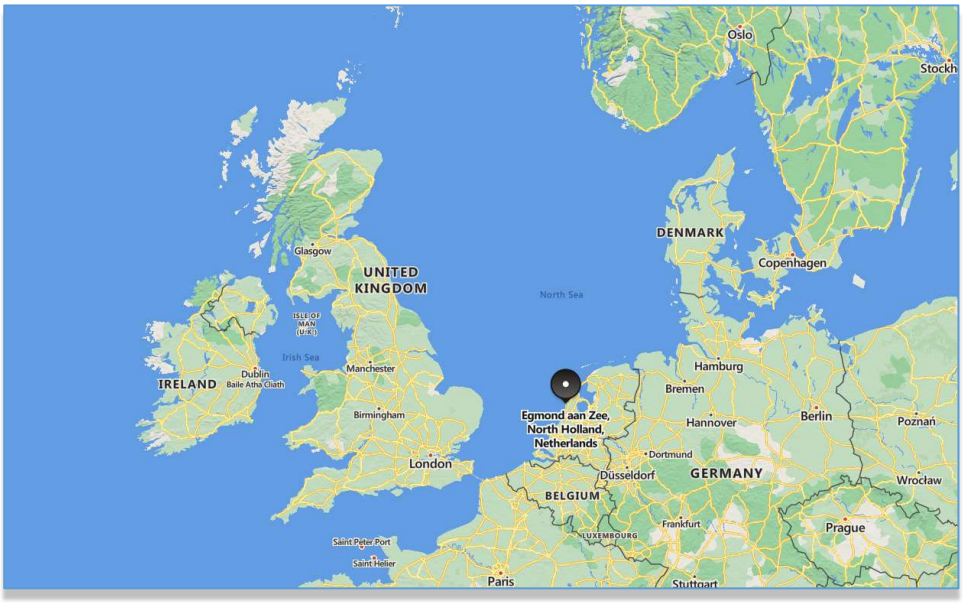


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

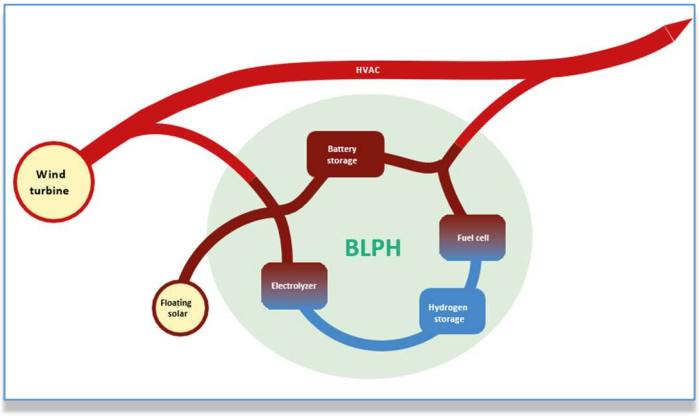


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT PURPOSE AND SCOPE

This plan defines inspections and tests to be carried out to verify quality requirements identified in all contractual documents: Drawings, Specification, Codes and Standards latest revisions.

This document shall be applied to structural fabrication and erection activities for Base Load Power Hub (BLPH), including sea fastening and grillage. Disciplines other than structural are covered by dedicated project ITPs.

2.1 REFERENCES DOCUMENTS

Table 1

Doc. No.	Description
123A90-DDL-AR-MR-10026	Material Requisition for AC UPS fitted with UPS system Equipment Room B-300
123A90-DDL-AR-MR-10019	Material Requisition for I&T Equipment Room B-400
123A90-DDL-AR-MR-10012	Material Requisition for LV (400V) Switchroom
123A90-DDL-AR-MR-10005	Material Requisition for HV-MV (66kV-6.6kV) Switchroom B-100

2.2 DEFINITIONS AND ABBREVIATIONS

Table 2

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
CA	Certification Agency
DS	Surveyor
EXP	Expediting dept.
LOG	Logistic Dept.
NDE	Non Destructive Examination
PQR	Procedure Qualification Record
QC	Quality Control Dept.
QCI	Quality Control Inspector
SC	Sub-contractor
WI	Welding Inspector
WLD	Welding Dept.
WQR	Welder Qualification Record
WPS	Welding Procedure Specification

3 RESPONSIBILITIES

3.1 PROJECT QUALITY MANAGER

The PQM shall assure that :

- the project quality requirements are implemented through all phase of the project;
- project works are properly controlled, inspected, tested and documented.
- The required documentation for certification purpose is submitted to CPY for review and signature on continuous basis;
- fabrication facilities are properly maintained and/or calibrated according to contractors and project quality standards ; all personnel holds required competence level and training in compliance with project specifications

3.2 QC INSPECTOR (QCI) / WELDING INSPECTOR (WI)

QCI / WI shall:

- perform the checks and tests as stated in responsibility column of this ITP;
- document the inspections issuing proper inspection reports;
- produce daily welding monitoring reports
- supervise and monitor the activities on site;
- interface with the CPY QA/QC site representative for the management of the inspection;
- notify the inspections to be attended to the CPY QA/QC site representative.
- coordinate all NDE activities;
- mark-up repairs area to be excavated in line with NDE report and control weld repairs (mark-up of areas to be repaired should be managed and independently performed by the NDE operator. Judgement of welds including characteristics of any repair shall be ensured the sole responsibility of the NDE operator).

3.3 NDE OPERATOR

The NDE operator shall :

- be suitably qualified (certified) in accordance with project requirements
- perform NDE according to the project requirements and applicable procedure, and ensure that NDE results shall be concluded subsequently after the inspection (at least daily), ensuring that inspection results are preserved and maintained
- prepare inspection reports within 48 hours from the inspection

3.4 DIMENSIONAL CONTROL ENGINEER

The dimensional control engineer shall:

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- carry out dimensional check
- issue dimensional reports, including relevant mark-up drawing
- Surveys will be carried out for the following items and steps :
  - Upper grillage subassemblies as-built
  - Upper grillage assembly, positioning and as-built
  - Topside structure subassemblies, as-built
  - Topside structure assemblies (by level), as built
  - Primary nodes at fit-up stage
  - Primary nodes as-built
  - Overall structure, including interfaces, as-built

3.5 SUB-CONTRACTOR

Subcontractor (1) shall:

- provide resources suitable for the required quality level, in terms of both personnel and equipment; RM has the right to reject or ask for replacement at any time in case of inadequate resources
- comply with instructions and coordination by RM construction supervisors
- execute the work in accordance with project requirements, by applying RM procedures and CPY specifications referenced in this document, supported by RM construction and inspection personnel

(1) for the purpose of this document "subcontractor" is intended as the organization providing resources and executing fabrication activities, with supervision by RM Construction Dept. and Quality Control by RM QC Dept. Such subcontractors may execute the work both within RM premises (yard, workshop) or in external workshops.

4 NOTIFICATION FOR INSPECTION

The CPY and CA site inspector must be notified of their presence at the inspection via "Notify for Inspection Form," containing all inspection details, emailed to the CPY QA/QC site CA representative and surveyor. Notification must be sent to CPY and CA at least 10 business days in advance for on-site and off-site inspections. In case of emergency, this communication may also be sent with shorter notice, provided it is previously agreed.

5 INSPECTION RECORDS

Inspection records shall be made available for CPY and CA in due time after completion of activities. Original records shall be filed in the CTR QC dept. and made available for CPY and CA re-view at any time.

6 INTERVENTION POINTS DESCRIPTION

Code	Description
M	Routine intervention (Monitoring). Activities concerned shall be continuously monitored. Monitoring activities are not formalised.
S	Percentage intervention (Spot). Activities shall be monitored in percentage. The intervention is formalised by issuing a document related to the specific activity (report, certificate or control report).
R	Documentation review (Review). Certificates, reports and documents issued for the specific activity foreseen by the Quality Control Plan shall be checked. Personnel in charge of controls shall formalise the review by signing relevant documents.
W	Witnessed intervention (Witness). CPY and\or CA shall be notified in written; should CPY and\or CA not be present at notified date and time, the activity may proceed.
H	Hold point (Hold). CPY and\or CA shall be notified in written; should CPY and\or CA decide not to witness the activity, the waiver shall be in written. In case the activity is not waived, it shall not proceed until CPY and\or CA are present.

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7 INSPECTION AND TEST

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
1.0	BEFORE MANUFACTURING									
1.1	PO Acceptance	/	SE	PO 1724000049	PO Requirements	PO 1724000049	H	H	H	
1.2	Kick-Off Meeting	/	PM	KOM Agenda	PO Requirements PO 1724000049	KOM MoM	H	H	R	
1.3	Documents Submittal	/	DC	SMIR	SMIR	SMIR	H	H	R	
1.4	Pre-Inspection Meeting	/	QC	PIM Agenda	PO Requirements	PIM MoM	H	W	W	
2.0	MANUFACTURING Valid for each shelter: - HV-MV (66KV 6.6KV) SWITCH ROOM B-100 - LV (400V) SWITCH ROOM B-200 - AC UPS EQUIPMENT ROOM B-300 - I&T EQUIPMENT ROOM B-400									

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
2.1	Material Incoming Inspection	Visual & Dimensional check	QC	Procedure PQ08 (Incoming material & traceability)	Procedure PQ08 (Incoming material & traceability)	Mod. P8.1 Material Traceability	H	R	R	
2.2	Material Indentification and Certification	3.1 Certification EN 10204 Certificate/declaration of conformity with "master Copy" stamp and ATEX and PED certificates	QC	PQ08	PQ08	Mod. P8.1 Material Traceability	H	R	R	
2.3	Steel sheet, tubing, profiles	Visual & Dimensional check	PROD	PQ08	PQ08	N.A.	H	R	R	
2.4	Doors	Visual & Dimensional check	PROD	PQ08	PQ08	N.A.	H	R	R	
2.5	Meccanical component, Accessories, Hardware	Visual check	PROD	PQ08	PQ08	N.A.	H	R	R	
2.6	Other Materials	Visual check	PROD	PQ08	PQ08	N.A.	H	R	R	
2.7	Cutting, Punching, Drilling	Visual check	PROD	AS DWG	PQ12, PQ13	N.A.	H	R	R	
2.8	Bending	Visual check	PROD	AS DWG	PQ12, PQ13	N.A.	H	R	R	
2.9	Assembly of the structure	Visual check	PROD	AS DWG	PQ12, PQ13	N.A.	H	R	R	

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
2.10	Final dimension of the structure	Visual check	PROD	AS DWG	AS DWG	N.A.	H	R	R	
2.11	Preparation of insulation panels	Visual check	PROD	AS DWG	AS DWG	N.A.	H	R	R	
2.12	Welding	Visual check	PROD	Welding Book AS-WB-X176,PQ09, AWS D1.1, EEMUA 197	Welding Book, PQ09 AWS D1.1, EEMUA 197	N.A.	H	R	R	
2.13	MCT frame assembly	Visual check	PROD	AS DWG	AS DWG	N.A.	H	R	R	
2.14	Sandblasting and surface preparation	Visual check	PROD	Painting Procedure AS-PP-X176, PQ 10	PQ10	N.A.	H	R	R	
2.15	Painting	Visual check	PROD	Painting Procedure AS-PP-X176	PQ11	N.A.	H	R	R	
2.16	Earthing System Assembly	Visual & Functional check	PROD	As per approved DWG	As per approved DWG	N.A.	H	R	R	
2.17	Cable tray assembly	Visual & Functional check	PROD	As per approved DWG	As per approved DWG	N.A.	H	R	R	
2.18	Electrical/ Lighting System Assembly	Visual & Functional check	PROD	As per approved DWG	As per approved DWG	N.A.	H	R	R	

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
2.19	Pressurisation System Assembly	Visual & Functional check	PROD	As per approved DWG	As per approved DWG	N.A.	H	R	R	
2.20	A/C System Assembly	Visual & Functional check	PROD	As per approved DWG	As per approved DWG	N.A.	H	R	R	
2.21	Marking and labeling	Visual & Dimensional check	PROD	AS DWG	Spec.	N.A.	H	R	R	
3.0	INTERNAL FINAL ACCEPTANCE TEST Valid for each shelter: - HV-MV (66KV 6.6KV) SWITCH ROOM B-100 - LV (400V) SWITCH ROOM B-200 - AC UPS EQUIPMENT ROOM B-300 - I&T EQUIPMENT ROOM B-400									
3.1	Dimensional check and visual inspection	Visual & Dimensional check	QC	PQ13	As per Approved DWG	Mod. P13.1	H	R	R	

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
3.2	NDE Visual Test	Verify weld is free of defects -100% Lifting lugs - 10% Structural joints	QC	Visual Procedure PQ12, UNI EN ISO 17637, EEMUA 158	Visual Procedure PQ12, UNI EN ISO 17637, EEMUA 158	Mod. 12.1	H	R	R	
3.3	NDE Penetrant Test	Detect weld defect -100% Lifting lugs - 10% Structural joints	QC	PQ18 PT Procedure, UNI EN ISO 17637, EEMUA 158	PQ18 PT Procedure, UNI EN ISO 17637, EEMUA 158	Mod. 17.1	H	R	R	
3.4	Painting Check (RAL – Thk) AS-058-C5M	Check Thk and RAL AS-058-C5M	QC	AS-PP-X176	AS-PP-X176	Painting Reports	H	R	R	
3.5	Functional Test of Doors	opening/closing doors, doors locking	QC	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	Mod. 1.4.9	H	R	R	

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
3.6	Functional Test of Lighting System	Check of functional test of lighting system	QC	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	Mod 1.4.6	H	R	R	
3.7	Functional Test of Grounding System	Check the functionality of Grounding System	QC	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	Mod 1.4.6	H	R	R	
3.8	Functional & performance Test of A/C System (HVAC Test) : -visual and correct installation of hvac fans - functional check of fans	Check the functionality and performance of A/C System	QC	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 E.D.C	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	Mod 1.4.7	H	R	R	

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
4.0	FINAL ACCEPTANCE TEST Valid for each shelter: - HV-MV (66KV 6.6KV) SWITCH ROOM B-100 - LV (400V) SWITCH ROOM B-200 - AC UPS EQUIPMENT ROOM B-300 - I&T EQUIPMENT ROOM B-400									
4.1	Dimensional check and visual inspection	Visual & Dimensional check	QC	AS-FAT-X176	AS-FAT-X176	Mod. P13.1	H	W	W	
4.2	Painting Check (RAL – Thk)	Check Thk and RAL	QC	AS-FAT-X176, AS-PP-X176	AS-FAT-X176, AS-PP-X176	Painting Reports	H	W	W	
4.3	Door Functional Test (opening/closing doors, doors locking)	opening/closing doors, doors locking	QC	AS-FAT-X176 ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	AS-FAT-X176 ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	Mod. 1.4.9	H	W	W	

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
4.4	Functional Test of Doors	opening/closing doors, doors locking	QC	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	Mod. 1.4.9	H	W	W	
4.5	Functional Test of Electrical System	- Check of Lighting System, Control Panel, and socket/switch - Cable tag and wiring - cable tray and conduit installation - Grounding System Installation	QC	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	Mod 1.4.6	H	W	W	
4.6	Functional Test of Grounding System	Check the functionality of Grounding System	QC	AS-FAT-X176 (FAT Procedure)	AS-FAT-X176 (FAT Procedure)	E Mod 1.4.6	H	W	W	

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
4.7	Functional & performance Test of A/C System (HVAC Test) : -visual and correct installation of hvac fans - functional check of fans	Check the functionality and performance of A/C System	QC	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	AS-FAT-X176 (FAT Procedure) ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria	Mod 1.4.7	H	W	W	
4.8	Final documentation	Check of certificates and Documentation	QC	MRB Index	AS-FAT-X176	MRB	H	W	W/R	

Step	Step Description	Inspection/Test Requirement	Resp.	Reference Document	Acceptance Criteria	Ref. Record	Intervention Point			
							ASI	RM	CPY	
4.9	Packing visual inspection	Packing List packing preservation and storage procedure for HVAC dismantling : HVAC parts - fan coils unit - fans - fire damper and gas tight dampers -hvac power and control panel	QC	Compliance to the reference document requirements.	Compliance to the reference document requirements	Packing List	H	W	R	
5.0	Packing	Packing check	QC/PROD	Packing Procedure	Packing Procedure	Packing List	H	W	R	

Base Load Power Hub (BLPH)

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
R. Bossi	18-09-2024

FAT PROCEDURE

Document Number: 1724000049-QC-PRO-00056

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
04	31/07/2024	Accepted for Construction (AFC)	AD	SK	CA
03	18/06/2024	Accepted for Construction (AFC)	AD	SK	CA
02	21/05/2024	Issue for Review (IFR)	AD	SK	CA
01	25/03/2024	Issue for Review (IFR)	AD	SK	CA
0	22/02/2024	Issue for Review (IFR)	AD	SK	CA

ALEXSISTEMI spa

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Rev.	Description
0	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Issue for Review (IFR)
03	Accepted for Construction (AFC)
04	Accepted for Construction (AFC)

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Attachment 1

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

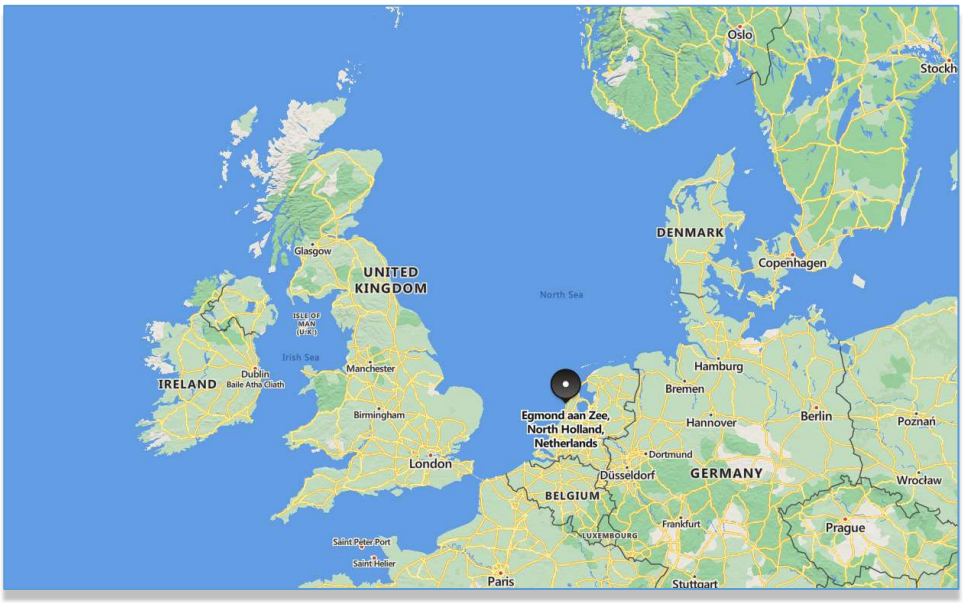


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

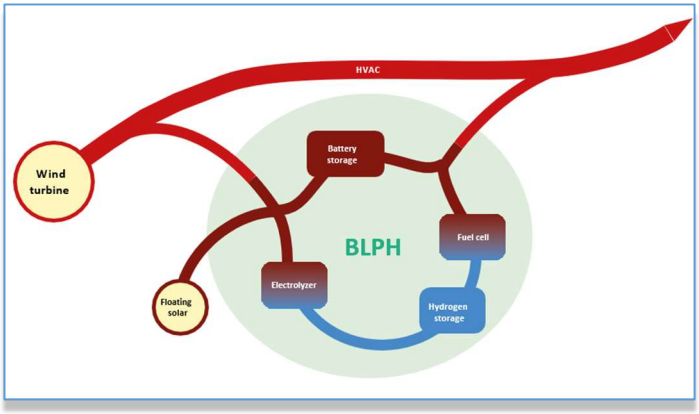


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

1.1.3 Plant and Equipment

- HV (66KV 6.6KV) SWITCH ROOM B-100
- LV (400V) SWITCH ROOM B-200
- AC UPS EQUIPMENT ROOM B-300
- I&T EQUIPMENT ROOM B-400

2 DOCUMENT SCOPE

The scope of this document is to provide the criteria and the operating ways to verify the quality and the design requirements related to the shelter. The purpose is to give objective evidence that all engineering, design and specification requirements are correctly understood, accounted for, verified, and recorded.

2.1 REFERENCES

Doc. No.	Description
123A90-DDL-EL-DL-20104	Electrical Equipment Layout - HV Switchroom B-100
123A90-DDL-EL-DL-20111	Electrical Cable Routing Layout - HV Switchroom B-100
123A90-DDL-EL-DL-20122	Lighting & Socket Layout - HV Switchroom B-100
123A90-DDL-EL-DG-20129	Lighting & Socket Circuit Diagr. - HV Switchroom B-100
123A90-DDL-EL-DL-20136	Earthing & Lightning Layout - HV Switchroom B-100
123A90-PML-QHSE-QP-00002	Project Quality Plan
1724000049-MAT-PRO-00004	Painting Procedure
1724000049-NDT-PRO-00005	NDT Procedure
K559-2254-EL-PHI-002	Electrical System Description & Design Philosophy
K559-2254-IC-PHI-001	Control Systems Philosophy
K559-2254-PM-PHI-001	Equipment and System Tag Numbering
IEC 61439-1	Low-voltage switchgear and controlgear assemblies - Part 1: General rules
NFPA 90A	Standard for the Installation of Air-Conditioning and Ventilating Systems

Table 1 - Reference Documents

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2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

AC	Voltage Alternating Current
Ah	Ampere-Hour
ATEX	ATmospheric EXplosible
BS	British Standard
CAT	Category
CENELEC	Committee for Electrotechnical
DC	Voltage Direct Current
EMT	Electrical Metallic Conduit
Kg/mm2	Kilogram per square meter
Km/H	Kilometer per Hour
IEC	International Electrotechnical Commission
IEE	Institute of Electrical Engineers
IEEE	Institute of Electrical and Electronic Engineers
IP	Ingress Protection
IRP	Inter Refineries Pipeline Project
IS	Intrinsically Safe
ISO	International Standard Organization
ITU	International Telecommunications Union
JB	Junction Box
MCT	Multi-Cable Transit
Ni-Cd	Nickel-Cadmium
NC/NO	Normally Close / Normally Open
PCS	Passive Cooled Shelter
PVC	Polyvinyl Chloride
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
SLHDPE	Super-Linear High Density Polyethylene
TIA/EIA	Telecommunications Industry Association/Electronics Industries Association
XLPE	Telecommunications Industry Association/Electronics Industries Association
W	Watts (in Power)

3 PURPOSE OF FAT

The purpose of the FAT is to give objective evidence that all engineering, design and specification requirements are correctly understood, accounted for, verified, and recorded.

FAT shall be performed for all Shelters for this PO and will be witnessed by Client. The applicability of the test is subjected to the Project ITP.

3.1 TESTING TASKS

The overall test activities will be performed with the test setup equipment under the control of the test executor and some witnesses.

The main steps that will be performed are the following:

- Verification of the test procedures and the related documentation availability;
- Preparation of the test setup;
- Execution of the test with respect to the Test Procedure and completion of the test report;
- Signing of the test procedures by the test executor and the witness.

3.2 ENVIRONMENTAL NEEDS

The acceptance test will be conducted with the deliverable items and a set of general-purpose tools. The detailed description for each test procedure is reported in the following chapters.

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3.3 TESTS PHASE AND PASS/FAIL CRITERIA

For each test procedure a set of pass/fail criteria will be defined (it is also possible that each test has a different criteria) in order to establish an acceptance procedure.

Where acceptance and rejection criteria are not established they shall be defined to the greatest practical by written standards or by samples.

The main possibilities are the following:

- All the steps are successfully performed (the test passes)
- Some steps fail but the function under test is verified (the test passes after Customer approval)
- Some steps fail but the function under test is not verified (the test fails)
- Some steps fail but with a dedicated action the correct function shall be recoverable (the test must be repeated)

If the test fails, a related NCR have to be opened.

4 TEST PLAN

1	DIMENSIONAL CHECK AND VISUAL INSPECTION
2	PAINTING CHECK
3	CHECK OF NAMEPLATES
4	CHECK OF COMPONENTS TYPE AND SIZE
5	CHECK AND FUNCTIONAL TEST OF LIGHTING SYSTEM
6	CHECK OF GROUNDING SYSTEM
7	CHECK OF CERTIFICATES AND FINAL DOCUMENTATION
8	ALL CHECKS/TESTS FOR HVAC SYSTEM

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4.1 ABOUT WITNESS TESTS

4.2 LOCATION OF TEST

The Tests are to take place in Alex Sistemi Spa (AS) factory, located in Ossona (Milan) and Inveruno (Milan), Italy, in indoor and outdoor areas.

4.3 SCOPE OF TESTS

Successful completion of the tests listed within this document will lead to Factory Acceptance of the Products and release the Products for delivery to the Customer. The Customer / Contractor will be expected to sign the Factory Acceptance Certificate. The Products shall be prepared for shipment only after all the parties witnessing the tests certify the satisfactory completion of the FAT.

FAT shall be performed for all PCS for this PO and will be witnessed by Client. The applicability of the test is subjected to the Project ITP

4.4 PERSONNEL REQUIREMENTS

Alex-sistemi will nominate a test supervisor who will ensure that tests are carried out in accordance with this test plan. The test supervisor may carry out the tests or nominate other personnel. The test supervisor has responsibility for signing test records. The test supervisor shall be technically competent, with a good understanding of the specific mechanical and electrical aspects, and also specific project uses. Alex-sistemi SpA will have available electrical / instrument technicians ready to assist whenever necessary during testing. The Customer, Contractor, End User or Buyer will nominate a test approver who will ensure that witnessed tests are carried out in accordance with this test plan. The test approver has responsibility for signing test records.

Additional personnel nominated by Alex-sistemi SpA and the Buyer may be present during the tests.

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4.5 SAFETY REQUIREMENTS

AS has a policy of absolute protection of the worker and of anyone who enters in his workshop. During the FAT must observe the following rules.

4.6 RESPONSIBILITY

AS has appointed a Safety Officer, that is in charge of legal requirements on safety at work.

The Safety Officer works with the Plant Manager and the Project Manager of the contract until all safety standards are met.

The Plant Manager and Project Manager have the power and duty to stop the test if there are not adequate safety measures.

Only the workers can use AS's equipment for testing, handling or lifting.

The staff of the Customer, the End User or its representatives (Inspectors) present during the tests cannot use this equipment for testing, handling or lifting.

The staff of the Customer, the End User or its representatives (Inspectors) present during the tests shall follow the provisions of the Plant Manager or Project Manager or the Safety Officer.

The staff of the Customer, the End User or its representatives (Inspectors) present during the tests will be identified at the entrance of AS (via a personal document, passport, identity card or driving license, provided with a photo and issued by government).

All responsibilities and names are listed in the organization charts exposed in the work areas.

4.7 TEST AREA

The test area must be properly marked and isolated.

The emergency plan, the location of fire suppression equipment, emergency exits, first aid kits and names of employees in first aid and fire suppression should be clearly marked in the appropriate panels hanging on the walls.

They can access the test Area:

- AS Manager;
- workers engaged in testing, handling and lifting;
- the staff of the Customer, the End User or its representatives (Inspectors) present during the tests, but only for the observation of test results; during handling or lifting they must remain in Safe Area.

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4.8 SAFE AREA

The Safe Area must be properly marked and isolated. Must be able to access to toilets and drinking water.

The emergency plan, the location of fire suppression equipment, emergency exits, first aid kits and names of employees in first aid and fire suppression should be clearly marked in the appropriate panels hanging on the walls. The staff of the Customer, the End User or its representatives (Inspectors) present during the tests, must always remain in the Safe Area, except as outlined above

4.9 PERSONAL SAFETY EQUIPMENT

People present at the test must wear:

- SHOES: AS managers, workers, staff of the Customer, the End User or its representatives (Inspectors) present during the tests shall wear safety shoes, ever.
  The staff of the Customer, the End User or its representatives (Inspectors) present during the tests must arrive already equipped with their own shoes, which are not provided by AS.

  The staff of the Customer, the End User or its representatives (Inspectors) present during the tests to not wear safety shoes, they may still access the Safe Area, but not the test area.

  They will therefore only observe the test from Safe Area and conducting the review of the results in test reports.
- GLASSES: workers must wear safety glasses when performing risky for their eyes.
- HELMET: workers must wear protective helmets when performing lifting and handling, or when there is a suspended load.
  When there are suspended loads or handling and lifting the staff of the Customer, the End User or its representatives (Inspectors) present during the tests must remain in the Safe Area.
- GLOVES: workers must wear gloves when performing risky for the hands or vibrations.
- DRESS: all workers must wear appropriate safety clothing, forever.

Helmet, gloves, glasses, safety clothing are not required to staff the Customer, the end Customer or his representatives (Inspectors) present during the tests.

5 CUSTOMER PRESENCE

AS shall notify to Customer the Final Inspection Date(s) 20 working days before

6 NOTIFICATION

The tests described in the next chapters must be performed by the AS staff for each PCS.

AS will require the Customer presence to attend FAT Tests for only one PCS (Witness), while for others will only require a Rewiev of the documents.

7 TEST RECORD

The test supervisor will ensure that a test log is maintained throughout the acceptance testing. The test log will record performance of tests, variations from test procedures (planned or unplanned), test failures and re-tests. All entries shall be cross-referenced to this test plan. Where appropriate, printouts may be appended to the test log. The test log shall consist of a copy of the Factory Acceptance Test plan document that is marked up regularly during each individual test.

8 TEST FAILURE

Test failure will be categorized by agreement of the test supervisor and test approver.

8.1 MINOR FAILURE

Failure is limited to one small part of the Product. This failure is logged, corrected and the test is re-started from the point where it occurred. This category of failure shall not prejudice continued testing of the remainder of the system.

8.2 MAJOR FAILURE

This failure (mechanical or electrical) affects operation of the Product and no further testing will take place until this has been corrected. Correction of this failure may prejudice previous tests, hence the entire test shall be repeated from the beginning.

9 TEST PROCEDURES

9.1 DIMENSIONAL CHECK AND VISUAL INSPECTION

9.1.1 Test Scope

Verify the items conformity to the specified features here below listed.

Verify the items sizes and the interfaces positions/measures correspondence to the specified values.

9.1.2 Test Requirements

Verification of the listed points.

Positive verification (including tolerances) of the measurements.

9.1.3 Reference documentation

Comply to the requirements and relevant tolerances according to UNI EN ISO 13920 Class B.

DIMENSIONAL TOLERANCE

TOLLERANCE FOR LINEAR DIMENSION

class of tollerance	≥ 2 ≤ 30	> 30 ≤ 120	> 120 ≤ 400	> 400 ≤ 1000	> 1000 ≤ 2000	> 2000 ≤ 4000	> 4000 ≤ 8000	> 8000 ≤ 12000	> 12000 ≤ 16000	> 16000 ≤ 20000	>20000
B	± 1	± 2	± 2	± 3	± 4	± 6	± 8	± 10	± 12	± 14	± 16

NOTE: - nominal dimensional range "L" in mm - Tollerance "t" in mm.

9.1.4 Acceptance (Pass/Fail Criteria)

All the highlighted quotas in the GA drawing shall be comply with the above table of tolerance.

9.1.5 Test Equipment

Measuring tape

9.1.6 Procedure

Visual inspection shall be carried out with maximum accuracy. It consists of the verifications described below:

CONFIGURATION:	The item configuration shall be as indicated in the Final Drawings.
DIMENSIONAL:	The external dimension of the shelter indicated on the Final Drawings excluding their accessories.
DAMAGE FREE:	There shall be no type of damage caused by transport, handling, product failures.
SAFETY ASPECT:	Projecting and overhanging edges shall be kept to a minimum. Edges and corners shall be rounded.
EXTERNAL TREATMENT:	External surfaces (except the masked surfaces required) shall be treated against environmental corrosion. External shelter colour: RAL 7035 LIGHT GREY Painting shall be free from scabs, blisters, cracks, voids, scratches and other defects that can affect the treatment reliability.
ACCURACY:	Verify the goodness and quality of the works and the level of their accuracy.
CLEANING:	Verify the item is properly clear before delivery (free from grease or oil spots, dust, dirtiness or other extraneous material).
SUPPLY COMPOSITION:	Verify supply completeness. Verify the bolt torque values before and after the proof test execution. All the measure return a value in the range specified.

Using test equipment as appropriate, according to Arrangement Drawing dimensions shall be verified and recorded.

9.1.7 Results Table

The results of the test shall be recorded on Mod P13.1

* SAMPLE "For Example"

ALEXSISTEMI spa

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

Doc. Name:
Dimensional Check and Visual Inspection *Report No.*

OUR JOB xxx | Date xxxxx | Page 1

COMPANY:	Ordine Order
P/N:	Descrizione: Description
S/N:	FAT procedure:

LOCATION : ON SITE ☐ OFF SITE ☐

DATE OF TEST:

REFERENCE DRAWING:

REFERENCE DOCUMENT:

Inspection List	measured	YES	NO	N.A.
Check all the dimensions indicated below on the drawing:				

Comments:

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other

Mod.P13.1

9.2 PAINTING CHECK

9.2.1 Test Scope

Verify the compliance to requirements described on Painting Specification.

9.2.2 Test Requirements

Verification of the painting with document of reference.

9.2.3 Acceptance (Pass/Fail Criteria)

The Dry Film Thickness should be correspond to the Standard Requirements

9.2.4 Measurement Equipment

Thicknessmeter - Elcometer 456 / Fisher Dualscope MP4C

9.2.5 Procedure

Verify the Dry Film Thickness of the final paint layer.

The measure should be taken in 5 points in each PCS side (4 sides).

9.2.6 Results Table

The results of the test shall be recorded on Mod 1.4.2

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* SAMPLE "For Example"

ALEXSISTEMI spa

Doc. Name: PAINTING CHECK		Report No. Mod 1.4.2
OUR JOB	Date	Page 1/1

COMPANY:	Ordine Order
EPC CONTRACTOR:	Descrizione: Description: Passive Cooled Shelter
P/N: S/N:	FAT procedure:

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST:

REFERENCE DRAWING:

REFERENCE DOCUMENT:

Inspection List	YES	NO	N.A.
1 Verification of paint and color code according to design specification			
Visual Check External Color walls, roof, base frame RAL			
Visual Check External Color doors RAL			
Layer thickness of external coating µm 320 total			
Painting shall be free from scabs, blisters, cracks, voids, scratches and other defects that can affect the treatment reliability			
Ladder,Handrails (HDG)			

Comments:

** Touch-up and cleaning are required before proceeding with packaging*

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other

Mod1.4.2

9.3 CHECK OF NAMEPLATES

9.3.1 Test Scope

Verify the nameplate conformity to the requirement specified on Approval Drawings.

9.3.2 Acceptance (Pass/Fail Criteria)

Positive Verification

9.3.3 Test Equipment

None

9.3.4 Procedure

Visual inspection shall be carried out with maximum accuracy.

It consists of the verifications with the label below:

IDENTIFICATION AND MARKING - NAMEPLATE: a nameplate shall be attached to the item.

9.3.5 Results Table

The results of the test shall be recorded on Mod 1.4.3

* SAMPLE "For Example"

ALEXSISTEMI spa

Doc. Name: NAMEPLATES AND LABELLING INSPECTION		Report No. Mod 1.4.3
OUR JOB	Date	Page 1/1

COMPANY:	Ordine Order	
EPC CONTRACTOR:	Descrizione: Description	Passive Cooled Shelter
P/N: S/N:	FAT procedure:	

Comments:

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST:

REFERENCE DRAWING:

REFERENCE DOCUMENT:

Inspection List	MEASURED	YES	NO	N.A.
All lamps installed are identified with label				
All Light Push Buttons installed are identified with label				
All door switches are identified with label				
Verify External nameplates				
External bulk head lights verifications				
Certificate (ex) shall be checked for lights.				
Lighting cable routing, cable tray inspection etc.				
Lux level shall be measured and recorded as per approved MR requirements.				

Test Equipment: none

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other

Mod1.4.3

9.4 CHECK OF COMPONENTS TYPE AND POSITION

9.4.1 Test Scope

This clause has been prepared to verify the size and type of components installed inside and outside the PCS.

9.4.2 Reference Documents

Device layout

Equipment layout

9.4.3 Test Requirements

Verify the correspondence of size and quantity of components installed on shelter refer to last version of the General arrangement Drawing

Verify the installation and position of all the components/equipment described in the GA

9.4.4 Acceptance (Pass/Fail Criteria)

The verification should be pass.

9.4.5 Measurement Equipment

Measuring tape

9.4.6 Procedure

Visual inspection shall be carried out with maximum accuracy. It consists of the verifications above described.

9.4.7 Results Table

The results of the measurement shall be recorded on Mod 1.4.4

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* SAMPLE "For Example"

ALEXSISTEMI spa

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

Doc. Name: CHECK OF COMPONENTS TYPE AND SIZE	Report No. Mod 1.4.4
OUR JOB xxx	Date xxxxx / Page 1

COMPANY:	Ordine Order
P/N:	Descrizione: Description
S/N:	FAT procedure:

LOCATION : ON SITE ☐ OFF SITE ☐

DATE OF TEST:

REFERENCE DRAWING:

REFERENCE DOCUMENT:

Inspection List	YES	NO	N.A	
Verify the presence of the following components:				

Comments:

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other

Mod 1.4.4

9.5 CHECK AND FUNCTIONAL TEST OF LIGHTING SYSTEM

9.5.1 Test Scope

The scope is to test the functionality of the lighting system

9.5.2 Procedure

To perform this test, the lighting system will be temporary connected by using Alex-Sistemi power supply.

Verify the correct configuration and installation of the lamps and light switch base on electrical layout drawing.

Switch on the lamps using the devoted light switch to verify proper functionality of lighting system; if any backup light fixture is installed (with batteries) the emergency lights shall be tested.

In addition to a basic function test of the lighting system, lux levels at floor elevation should be measured for both normal and emergency fittings. The autonomy of the emergency light fittings should be measured (batteries to be fully charged before starting test).

During normal operation both lighting systems will be in operation, providing the required illumination levels. The emergency lighting shall illuminate escape routes, emergency exits and ladders and panels. These luminaries shall have an integrated Ni-CD battery with autonomy time of 3 hours in all area.

The Emergency Light Test, fixed emergency lighting shall be installed at strategic points in the installations and the emergency luminaires shall have integral battery packs to avoid complete darkness during emergency/lack of energy.

All the lights will be power off and then it will check the battery autonomy of emergency lights.

Battery autonomy shall be minimum 30 minutes.

The required illumination levels, measured at the working plane (0.8m) or 1m above the floor level in a horizontal plane, shall be as given in the table below except walkways and escape routes:

For walkways and escape routes calculation surfaces must be at the elevation 0.00m.

The illumination level indicated in the below table shall be used as a basis for the design of new installations unless higher illumination levels are required by national or local regulations in the country of installation.

The illumination levels apply when the luminaries are dirty: i.e. after taking account of the following fouling factors:

Fouling factor of 0.80 for all plant areas and for outdoor non-plant areas;

Fouling factor of 0.85 for indoor non-plant areas.

Recorded lighting measurements to be reported on equipment room layouts.

Location	E_{mean} (LUX)	Notes
Control Rooms		
General, including front of panel	300 - 500	See note 1
Rear of panels	50	
Auxiliary rooms	150 / 300	See note 2
Outdoor near entrances	150	
Plant Areas		
Operating areas requiring operator intervention (pumps, compressors, valves, manifolds, loading arms)	150	
Local control and monitoring points (Indicating instruments, gauges and control devices)	75	
Level gauges (see-through) to be lit from behind by single tube fluorescent luminaries		
Access ways (walk ways, platforms, stairways, ladders, module roofs)	25	
Non-operational areas with limited attendance, e.g. tank farms without equipment requiring regular operator intervention	0.5	
Non-Plant Areas		
Switchrooms, including relay and auxiliary rooms	200	

Table 3 - Required Illumination Levels

Note:

1. For control rooms, control of the illumination level should be possible either by switching off rows/groups of luminaires, or by use of electronic dimmers, or both.
   - 300 lux applies at night and 500 lux during the daytime.

2. For auxiliary rooms, the illumination level should be controlled by switching each lamp in a twin fitting from separately controlled circuits or by switching alternative fittings.
   - 150 lux applies for normal access and 300 lux for maintenance activities

3. For Embarkation area emergency lux level should be 5lux.

4. For other areas emergency lux level should be 11lux(avg) and 1 lux(min).

9.5.3 Results Table

The results shall be recorded on Mod 1.4.6

9.6 CHECK OF GROUNDING SYSTEM

9.6.1 Test Scope

This test procedure has been issued to verify the safety and functionality of grounding system installed inside the shelter.

9.6.2 Test Equipment

Tools and equipment necessary to perform testing described in this procedure are reported in below Table:

Description	Model – number	Cal. Required
Insulation continuity tester	IR4056/20 710811	Yes
Multimeter	HT GSC 59	Yes

Identification of hearting points measured and relative test results.

The test will be conducted obtaining 5 different measurement and the peak and average should be less than the maximum value required.

Measurement point	Required	Measured
	200 mΩ	1
		2
		3
		4
		5
		Average

9.6.3 Procedure

Verify that all ground connection points are conveniently marked.

Verify that all shelter metal electrical panels and JBs are connected by grounding strip, with impedance less than 200 mΩ . Verify that the shelter door is grounded by grounding strip.

Verify that the internal earthing system are connected to the external earting points and relative impedance

9.6.4 Acceptance (Pass/Fail Criteria)

Pass = fully compliant or with accepted deviation;

Fail = not compliant.

9.6.5 Results Table

The results of the test shall be recorded on Mod 1.4.6

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* SAMPLE "For Example"

ALEXSISTEMI spa

Doc. Name: ELECTRICAL TESTS		Report No. Mod 1.4.6
OUR JOB	Date	Page 1/1

COMPANY:	Ordine Order
EPC CONTRACTOR:	Descrizione: Description
P/N: S/N:	FAT procedure:

LOCATION: ON SITE ☐ OFF SITE ☐

DATE OF TEST:

REFERENCE DRAWING:

REFERENCE DOCUMENT:

Inspection List	YES	NO	N.A.
Check of grounding system			
Check and functional test of lighting system			

Comments:

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	Other

Mod1.4.6

9.7 CHECK OF CERTIFICATES AND FINAL DOCUMENTATION

Check the certificates of the main materials and components used for the manufacture of the shelter reported on the form and the compilation of the final test reports, as indicated by ITP

9.7.1 Test Scope

Verify the certificates of main materials and components used for shelter fabrication.

9.7.2 Instruments

N/A

9.7.3 Acceptance (Pass/Fail Criteria)

Main materials and components should have a certificate of conformity issued by original manufacturer.

9.7.4 Results Table

The certificates of the final NDE performed must be recorded on Mod P13.1

The certificates of main materials and components shall be recorded on Mod 1.4.9

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* SAMPLE "For Example"

ALEXSISTEMI spa

DNV·GL

Doc. Name: RAW MATERIAL CERT. LIST		Report No. Mod. 1.4.9
OUR JOB	Date	Page 1/1

COMPANY:	**Ordine** **Order**
EPC CONTRACTOR:	**Descrizione:** **Description** Passive Cooled Shelter
P/N: **S/N:**	**FAT procedure:**

Pos.	Supplier	Material	Cert. No.	Pages
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Alex Sistemi SPA	CUSTOMER	FINAL CUSTOMER	3RD PARTY BODY
Quality Assurance			

Mod. 1.4.9

9.8 HVAC FUNCTIONAL AND IDENTIFICATION TEST

9.8.1 Test Scope

The identification test shall verify the correct marking of every part that makes up the HVAC matching it with layout.
The Functional Test serves to verify that HVAC System works properly (e.g. On / Off, Heating / Cooling based on a set point) and his compliance with Cause&Effect Matrix (alarms, shutdown, etc..).
Pressurizing system,will be tested to verify only the overpressure ambient as per values in P&Id.
The Performance Test shall verify the HVAC system capability to cool air inside the shelter at the specified conditions. In particular, the Performance Test shall verify the capability of the HVAC System to keep temperature as set by means of switched ON electrical heaters simulating heat losses as stated on Thermal Calculation. All electrical equipment installed shall be suitable and designed for operation without degradation of its performance at 40°C, regardless of their location.
All instruments shall be designed to be capable of operating continuously and efficiently when the ambient temperature reaches 45°C, regardless of their location.

The HVAC functional test must be followed with a full system PERFORMANCE test. Supplier to provide performance procedure test step descriptions and include related acceptance criteria.

Following shall be checked:

- Visual check of the HVAC panel, including inspection of wiring (aspect, painting, finish, welding, sheet metal, lifting ring, locks, screwed and bolted connection, proper conductors laying, proper devices mounting, conformity to the wiring diagrams, labels)

- Full panel electrical / control operation & function test (remote control and signalling, inter-tripping, automatic sequences if any, etc.) shall be demonstrated to COMPANY by simulation of field devices.
All exchanged signals with ICSS reported on project documentation shall be tested e verified, both hardwired and via Modbus. These tests will be performed by means of a CONTRACTOR's terminal device.

- Dielectric test
- Dimension controls (terminals, busbar and wires, clearances and creepage distances, fixation axis, overall dimensions)

- Quality and quantity check for wearable parts and spare parts according to the specification

- Checking of protective measures and of the electrical continuity of the protective circuits. A test report of the acceptance tests shall be issued.

The HVAC PERFORMANCE test is to verify the design and sizing of the HVAC system.

1. Acceptance (Pass/Fail Criteria)
The test shall guarantee tthe achievement and maintenance of the project internal temperature set point, appropriately set with both units.

After reaching the set point value, if the next average measurement, to be carried out after 1 hour

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of operation, still returns values lower than or equal to the set point, the test will be passed.

2. Measurement Equipment
Temperature data Logger
Air Flow Meter

3. Procedure
a. If the test is carried out in climatic conditions different from design rooms (devices turned off and/or autumn/winter external temperature) the test can be conducted anyway: the important thing is to simulate (with the use of a heater or a heat blower) internal dissipation + solar radiation as per thermal calculation. The design conditions must be reproduced.
b. Measure the temperature inside the shelter, with the HVAC system turned off. The measurement must be taken at the 4 corners and in the center, 5 total measurements. Take the average between them and use this value as the starting one. Once the design condition has been reached, i.e. with a temperature higher than the maximum internally required, the test can begin.
c. Turn on one of the two HVAC units, make sure that the set point is the project one, exit the shelter making sure to close the door. The internal environment must be isolated from the external one.
d. Every 15 minutes, enter the shelter and take the same 5 measurements described in point 2. When the average is less than or equal to the set point, exit the shelter and return after 1 hour. Take the measurements again and take the average.
e. Repeat step "d" with the HVAC unit first on standby.
- The cooling performance is measured by verifying if the design temperature parameter is maintained inside the shelter.
- The duration of the test is 1 hour for each unit HVAC

9.8.2 Test Reports

The HVAC System test shall guarantee the functionality as per Cause & Effect document showing both units and relevant interchange.
Here below the operational steps to be followed:
- Review contractual documents and drawings/scheme of the HVAC system.
- Shelter Inspection before functional and overpressure test about his readiness.
- The following is a general list of items that will be checked: o External ductwork installed according to the drawings, with no damages and properly coupled.
o Building components such as dampers, doors and ventilation grilles and their proper installation.
o All instruments/devices are in good order and in operation (differential pressure switch, temperature probe, etc...).

- Pressurization shall be tested with HVAC System to ensure set points of temperature and humidity are maintained. Set point and temperature will be decided considering site test environment and not following destination site requirements.

- No missing components such as dampers, terminal boxes (if any), diffusers, etc…

- HVAC system is operating according to project design (Cause&Effect Matrix).

- Measurement of Pressure Value and record of final values: a pressurization value will be taken by a differential pressure meter to verify an Overpressure of ≥ 50 Pa in the shelter.

The measurement of the Overpressure (positive pressure) inside the shelter , also guarantees the flow direction of the air, which will be from the inside to the outside in case of door opening.
During the functional test the operator shall verify the redundancy of the pressurization and HVAC system (included in Cause & Effect document).
Auto-switch will be verified in case of one air conditioning /ventilation unit failure (Cause & Effect matrix).
The operator shall also verify the Noise level. The Maximum Allowable sound pressure level is 82 dB(A) at 1 m.

Testing simulation of all I/O interface signals with BLPH platform control system to be provided.

Actions Required:
- Switch ON the dummy load until the set point is reached
- The measurements will be taken at the four angles of the shelter and at the center, 1,5 meter height (5 measures)
- Record the average internal temperature with the probe
- When the average internal temperature rises the set point , the HVAC system will switch ON. The system shall be able to keep the average internal temperature under the set point value with the dummy load switched on
- Verify the average internal temperature for 1-hour
- During this test, a pressurization value will also taken by a differential pressure meter in order to verify an overpressure of >/= 50 Pa. (50)

The measurement of the inlet flow rate is detected with special instrumentation. (Air Flow Meter)

9.8.3 Acceptance Criteria

HVAC system has to guarantee the internal design conditions in the shelter.
All the components shall be available as per purchase order and Approved Drawings & data sheet.
HVAC system has to guarantee an average Temperature (as reported in the table) in the shelter with all the dummy loads switched ON..
For each test procedure a set of pass/fail criteria will be defined (it is also possible that each test has a different criteria) in order to establish an acceptance procedure.
Where acceptance and rejection criteria are not established, they shall be defined to the greatest practical by written standards or by samples

The main possibilities are the following:
- All the steps are successfully performed (the test passes)
- Some steps fail but the function under test is verified (the test passes after customer approval)
- Some steps fail but with a dedicated action the correct function shall be recoverable (the test must be repeated)
- Some steps fail whereby the function under test is not verified (the test fails)

If the test fails, a related NCR must be opened.

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	Minimum and Maximum Indoor Conditions	
Module	**Minimum Design Temperature [K]**	**Maximum Design Temperature [K]**
B-100	+5	+35
B-200	+5	+35
B-300	+5	+35
B-400	+15	+25

9.8.4 Measurement Equipment

Meter or equivalent
Multifunction Meter Testo.

9.8.5 Results Table

The results of the measurement (temperature, humidity and pressure) shall be recorded on Mod.1.4.7

* SAMPLE "For Example"

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ALEXSISTEMI spa

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No. Mod 1.4.7
OUR JOB	Date	Page 1/1

VENDOR:	ALEX SISTEMI S.P.A.	JOB:	ALEX SISTEMI OFFER No:
BUYER:		PROJECT REF. No.:	PURCHASE ORDER No.: DATE:
COMPANY:			SCOPE OF WORK:
MATERIAL DESCRIPTION :			

LOCATION: ON SITE ☐
DATE OF TEST:
REFERENCE DRAWING:
REFERENCE DOCUMENT:

Inspection List	PASS	FAIL	N.A.	value
• Verify that required internal temperature is maintained.				
• Verify proper redundancy is ensured.				
• Ensure that only one HVAC Unit is Operating at a time.				
• Verify both the HVAC systems (System 1 and System 2) operate alternatively to ensure both the systems will be in operation one after the other.				
• Verify the total hrs of operation of the HVAC system per day as per the approved power consumption calculation and design considering the design conditions agreed and considered in the calculations are available during testing.				
• Verify power consumption of the HVAC system per as per the approved power consumption calculation and design considering the design conditions agreed and considered in the calculations are available during testing.				

Comments:
For details of the components mentioned above, please refer to the relevant Datasheet.

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other

Mod1.4.7

9.9 FIRE & GAS FUNCTIONAL TEST AND EQUIPMENTS

*** "Scope of work Rosetti Marino"**

9.9.1 Test Scope

Scope of this test is to verify the functionality of F&G Panel and all the F&G equipment installed according to drawings and specifications.

1. Successful energizations of panel
2. F&G Equipment to be wired to F&G Panel
3. Complete Cause & Effects Sequence test
4. F&G Detectors calibration test

Before testing make sure that all circuits and output positions are safe and free of obstructions before switching on;
Power up the main switch and ensure that the contactors/relays are working;
Power up the output switch and make sure that the F&G Panel are working properly.
Switch off LFGS power supply to test battery backup.

9.9.2 Acceptance Criteria

Point listed above will be verified in accordance to the approved Fire & Gas System Layout Drawing, visual evidence and according to "Cause & Effect" F/G document.

9.9.3 Measurement Equipment

Multimeter

9.9.4 Results Table

N/A

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Doc. Name: ELECTRICAL TESTS		Report No.01 Mod 1.4.6
OUR JOB X176-24X	Date 24/07/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** LV (400 V) SWITCH ROOM B-200
S/N: B200	**FAT procedure:** 1724000049-QC-PRO-00056

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST: 24/07/2024

REFERENCE DRAWING:

- 1724000049-AR-DA-00015 - B-200 GENERAL ARRANGMENT DRAWINGS - E&I SHELTERS
- 1724000049-HV-DA-00065 - MODULE B-200 – HVAC SYSTEM–G.A. AND DETAILS
- 1724000049-HV-DA-00027 - B-200 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

REFERENCE DOCUMENT:

- 1724000049-HV-PID-00040 - B-200 PID - E&I SHELTERS
- 1724000049-HV-LIS-00048 - B-200 HVAC COMPONENTS LIST AND DS - E&I SHELTERS
- 1724000049-HV-RE-00055 - HVAC SYST DESCRIPTION (MANAGEMENT LOGICS) - E&I SHELTERS
- 1724000049-QC-PRO-00056 (FAT Procedure)
- ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria

Inspection List	YES	NO	N.A.
Functional Test of Electrical System			
- Check of Lighting System, Control Panel, and socket/switch.	V		
- Cable tag and wiring	V		
- Cable tray and conduit installation	V		
- Grounding System Installation *	V		
Functional Test of Grounding System			
- Check the functionality of Grounding System (less than 200 mΩ) *	V		

Comments: * See Grounding System check report (B200)

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	Other
MATEO MARCHESI	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. 23/10/24			

24/10/2024 Visual check and tag check done with: 1724000049 - HV - DA - 00065 sheet 1 and 2

ALEX SISTEMI spa

Doc. Name: ELECTRICAL TESTS		Report No.01 Mod 1.4.6
OUR JOB X176-24X	Date 24/07/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** HV (66KV 6.6KV) SWITCH ROOM B-100
S/N: B100	**FAT procedure:** 1724000049-QC-PRO-00056

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST: 24/07/2024

REFERENCE DRAWING:

- 1724000049-AR-DA-00014 - B-100 GENERAL ARRANGMENT DRAWINGS - E&I SHELTERS
- 1724000049-HV-DA-00064 - MODULE B-100 – HVAC SYSTEM–G.A. AND DETAILS
- 1724000049-HV-DA-00026 - B-100 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

REFERENCE DOCUMENT:

- 1724000049-HV-PID-00039 - B-100 PID - E&I SHELTERS
- 1724000049-HV-LIS-00047 - B-100 HVAC COMPONENTS LIST AND DS - E&I SHELTERS
- 1724000049-HV-RE-00055 - HVAC SYST DESCRIPTION (MANAGEMENT LOGICS) - E&I SHELTERS
- 1724000049-QC-PRO-00056 (FAT Procedure)
- ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria

Inspection List	YES	NO	N.A.
Functional Test of Electrical System			
- Check of Lighting System, Control Panel, and socket/switch.	✓		
- Cable tag and wiring	✓		
- Cable tray and conduit installation	✓		
- Grounding System Installation *	✓		
Functional Test of Grounding System			
- Check the functionality of Grounding System (less than 200 mΩ) *	✓		

Comments: * See GROUNDING SYSTEM check report (B100)

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	Other
	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. 23/10/24			

Visual check and tag check done with: 1724000049 - HV - DA - 00064 Sheet 1 and 2

Doc. Name: ELECTRICAL TESTS		Report No.01 Mod 1.4.6
OUR JOB X176-24X	Date 26/07/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** AC UPS EQUIPMENT ROOM B-300
S/N: B300	**FAT procedure:** 1724000049-QC-PRO-00056

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST: 26/07/2024

REFERENCE DRAWING:

- 1724000049-AR-DA-00016 - B-300 GENERAL ARRANGMENT DRAWINGS - E&I SHELTERS
- 1724000049-HV-DA-00066 - MODULE B-300 – HVAC SYSTEM–G.A. AND DETAILS
- 1724000049-HV-DA-00028 - B-300 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

REFERENCE DOCUMENT:

- 1724000049-HV-PID-00041 - B-300 PID - E&I SHELTERS
- 1724000049-HV-LIS-00049 - B-300 HVAC COMPONENTS LIST AND DS - E&I SHELTERS
- 1724000049-HV-RE-00055 - HVAC SYST DESCRIPTION (MANAGEMENT LOGICS) - E&I SHELTERS
- 1724000049-QC-PRO-00056 (FAT Procedure)
- ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria

Inspection List	YES	NO	N.A.
Functional Test of Electrical System			
- Check of Lighting System, Control Panel, and socket/switch.	✓		
- Cable tag and wiring	✓		
- Cable tray and conduit installation	✓		
- Grounding System Installation *	✓		
Functional Test of Grounding System			
- Check the functionality of Grounding System (less than 200 mΩ) *	✓		

Comments: * see grounding system check report (B300)

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	Other
MATTEO MARCHESI	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. 23/10/24			

23/10/2024

Visual check and Tag Check done with 1724000049-HV-DA-00066 sheet 1 and 2

ALEX SISTEMI spa

Doc. Name: ELECTRICAL TESTS		Report No.01 Mod 1.4.6
OUR JOB X176-24X	Date 26/07/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** I&T EQUIPMENT ROOM B-400
S/N: B400	**FAT procedure:** 1724000049-QC-PRO-00056

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST: 26/07/2024

REFERENCE DRAWING:

- 1724000049-AR-DA-00017 - B-400 GENERAL ARRANGMENT DRAWINGS - E&I SHELTERS
- 1724000049-HV-DA-00067 - MODULE B-400 – HVAC SYSTEM–G.A. AND DETAILS
- 1724000049-HV-DA-00029 - B-400 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

REFERENCE DOCUMENT:

- 1724000049-HV-PID-00042 - B-400 PID - E&I SHELTERS
- 1724000049-HV-LIS-00050 - B-400 HVAC COMPONENTS LIST AND DS - E&I SHELTERS
- 1724000049-HV-RE-00055 - HVAC SYST DESCRIPTION (MANAGEMENT LOGICS) - E&I SHELTERS
- 1724000049-QC-PRO-00056 (FAT Procedure)
- ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria

Inspection List	YES	NO	N.A.
Functional Test of Electrical System			
- Check of Lighting System, Control Panel, and socket/switch.	PL		
- Cable tag and wiring	✓		
- Cable tray and conduit installation	✓		
- Grounding System Installation *	✓		
Functional Test of Grounding System			
- Check the functionality of Grounding System (less than 200 mΩ) *	✓		

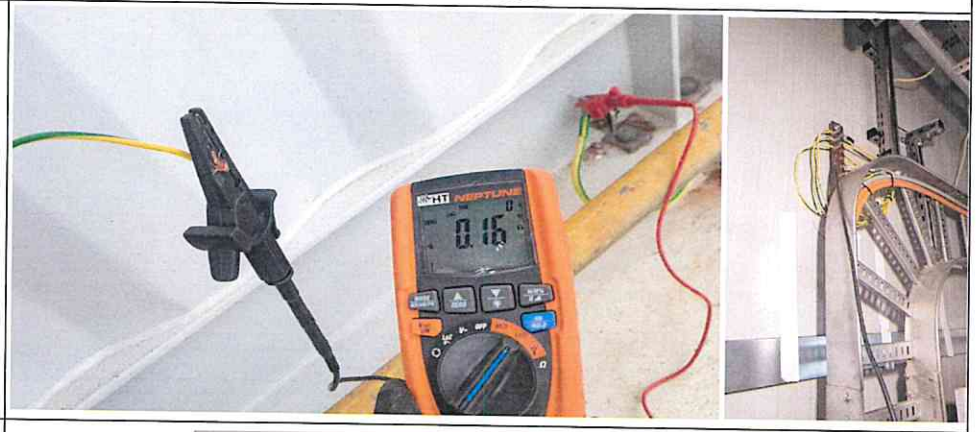
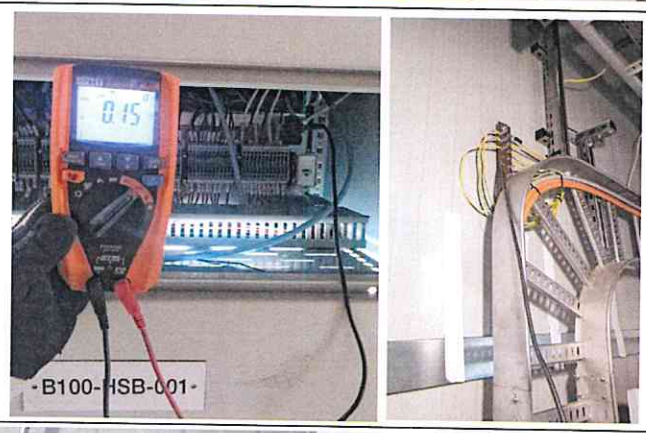
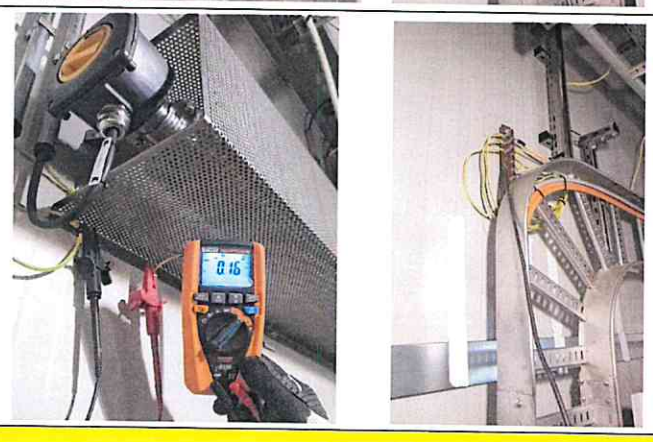
Comments: * See Grounding System check Report (B400)

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	Other
MATTEO MARCHESI	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. 23/10/24			

23/10/2024

Visual check and tag check done with : 1724000049-HV-DA-00067 Sheet 1 and 2

GROUNDING SYSTEM CHECK REPORT (B-100)

Measurement point	Value	Photos
From the external ground cable to the internal BTM	160mΩ	
From panel to BTM	150mΩ	
From the pressure differential instrument to BTM	180mΩ	
From conduit to BTM	150mΩ	
From space heater to BTM	160mΩ	
AVERAGE	**160mΩ**	

All measures were taken in Ω

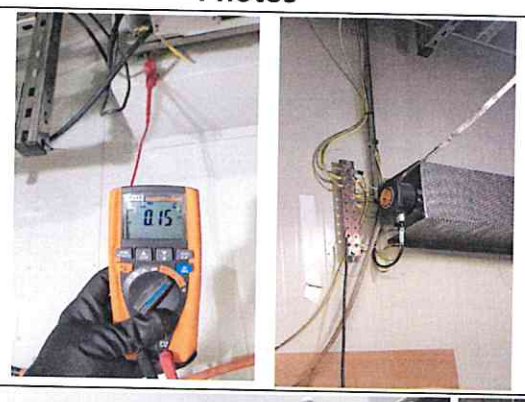
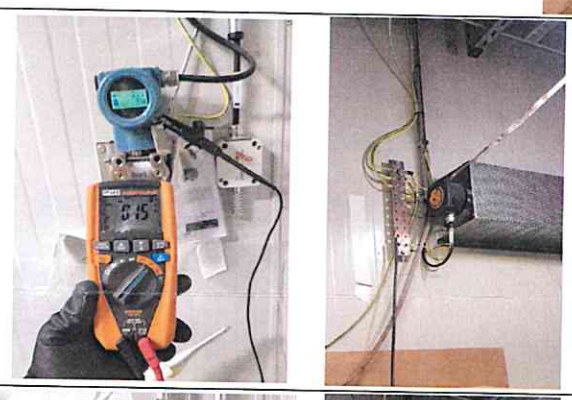
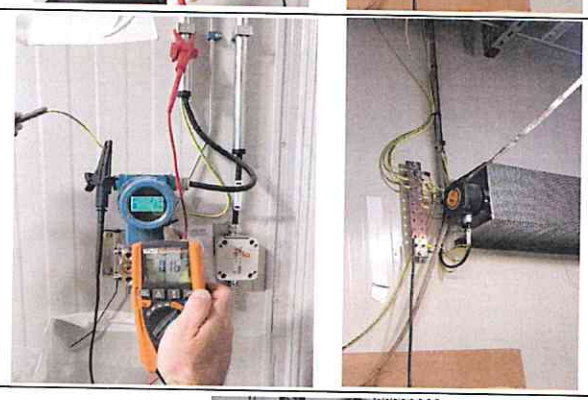
Approval RM

ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
23/10/24

24/10/2024

ALEX SISTEMI:

GROUNDING SYSTEM CHECK REPORT (B-200)

Measurement point	Value	Photos
From HVAC to BTM	150mΩ	
From panel to BTM	150mΩ	
From the pressure differential instrument to BTM	150mΩ	
From conduit to BTM	160mΩ	
From space heater to BTM	150mΩ	
AVERAGE	**152mΩ**	

All measures were taken in Ω

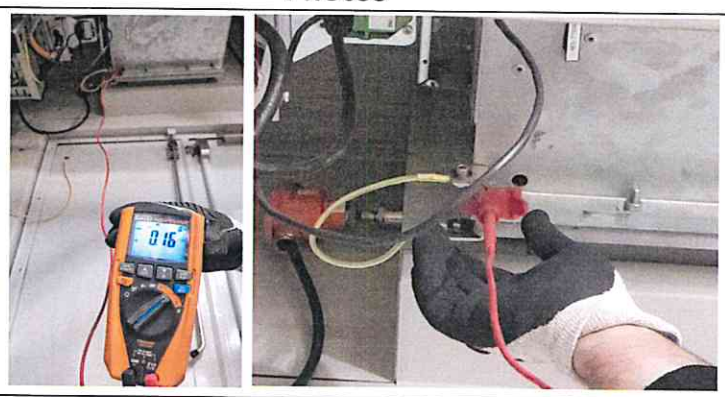
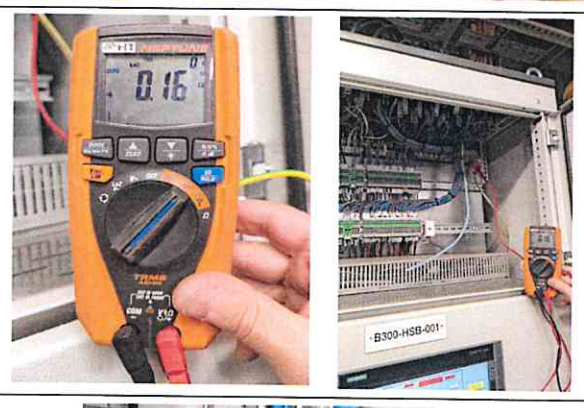
Approval RM

ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
23/10/24

24/10/2024

ALEX SISTEMI :

GROUNDING SYSTEM CHECK REPORT (B-300)

Measurement point	Value	Photos
From HVAC to BTM	160mΩ	
From panel to BTM	160mΩ	
From the pressure differential instrument to BTM	180mΩ	
From conduit to BTM	160mΩ	
From space heater to BTM	160mΩ	
AVERAGE	**164mΩ**	

All measures were taken in Ω

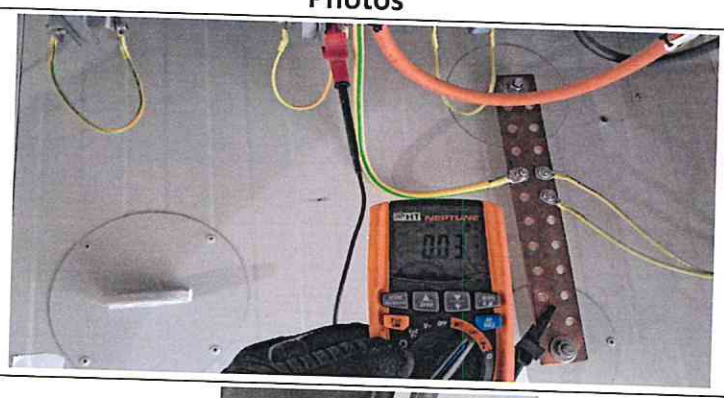
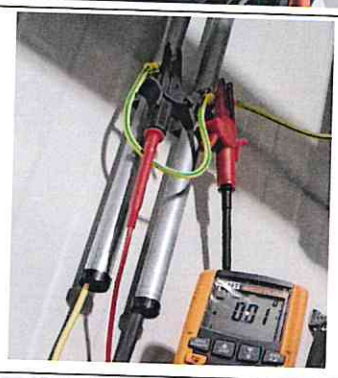
Approval RM

ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
23/10/24

24/10/2024

ALEX SISTEMI: Matteo Lorenzi

GROUNDING SYSTEM CHECK REPORT (B-400)

Measurement point	Value	Photos
From HVAC to BTM	30mΩ	
From conduit to BTM	10mΩ	
From conduit to BTM	30mΩ	
From conduit to BTM	30mΩ	
From space heater to BTM	30mΩ	
AVERAGE	**26mΩ**	

All measures were taken in Ω

Approval RM

ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
23/10/24

24/10/2024

ALEX SISTEMI : Matteo Lorenzini

HHV 77003

testo 440 dP

V 1.0.6 — 83164119

Applicazione: Portata
11/02/2019 16:53:40
Tipo di misura: Media per punti
Punti di misura: 9

Portata 1250,9 m³/h

Num.	Serie Sonda:		20795382
	m³/h	m/s	°C
1	304,0	0,65	22,3
2	224,5	0,48	22,1
3	-149,7	-0,32	22,0
4	425,6	0,91	21,4
5	-149,7	-0,32	21,3
6	654,8	1,40	21,2
7	3484,5	7,45	20,2
8	3283,3	7,02	19,6
9	3180,4	6,80	19,4

Geometria: Area
Area: 129920 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

HHV-77001

testo 440 dP

V 1.0.6 — 83164119

Applicazione: Portata
12/02/2019 17:16:05
Tipo di misura: Media per punti
Punti di misura: 9

Portata 1907,7 m³/h

Num.	Serie Sonda:		20795382
	m³/h	m/s	°C
1	3942,8	8,43	22,5
2	3797,8	8,12	22,7
3	3942,8	8,43	22,7
4	1552,8	3,32	22,6
5	1379,8	2,95	22,5
6	1861,5	3,98	22,5
7	608,0	1,30	22,5
8	257,2	0,55	22,5
9	-173,1	-0,37	22,5

Geometria: Area
Area: 129920 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

HHV 77004

testo 440 dP

V 1.0.6 — 83164119

Applicazione: Portata
11/02/2019 17:13:48
Tipo di misura: Media per punti
Punti di misura: 9

Portata 1589,2 m³/h

Num.	Serie Sonda:		20795382
	m³/h	m/s	°C
1	3222,5	6,89	28,3
2	3222,5	6,89	28,4
3	3250,6	6,95	28,5
4	3138,3	6,71	29,7
5	827,9	1,77	30,0
6	257,2	0,55	29,9
7	102,9	0,22	29,8
8	154,3	0,33	29,7
9	126,3	0,27	29,7

Geometria: Area
Area: 129920 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

HHV 77002

testo 440 dP

V 1.0.6 — 83164119

Applicazione: Portata
12/02/2019 17:26:41
Tipo di misura: Media per punti
Punti di misura: 9

Portata 1760,2 m³/h

Num.	Serie Sonda:		20795382
	m³/h	m/s	°C
1	374,2	0,80	23,7
2	261,9	0,56	23,3
3	-121,6	-0,26	23,3
4	1459,3	3,12	25,5
5	940,1	2,01	25,5
6	884,0	1,89	25,9
7	3961,5	8,47	26,3
8	3938,1	8,42	26,4
9	4143,9	8,86	26,4

Geometria: Area
Area: 129920 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

ROSETTI MARINO SPA
Stefano Linari
Quality Control Dept.

ATEX SISTEMI: Matteo Lazzeri

MAU 77008

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
12/02/2019 11:39:38
Tipo di misura: Media per punti
Punti di misura: 9

Portata 875,5 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	697,0	1,21	19,6
2	944,6	1,64	19,2
3	1157,8	2,01	19,2
4	817,9	1,42	19,1
5	800,6	1,39	18,9
6	956,2	1,66	18,6
7	783,4	1,36	18,4
8	944,6	1,64	18,3
9	777,6	1,35	18,3

Geometria: Area
Area: 160000 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

MAU - 77007

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
12/02/2019 11:28:29
Tipo di misura: Media per punti
Punti di misura: 9

Portata 1554,3 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	1163,6	1,85	22,5
2	1320,9	2,10	22,8
3	1320,9	2,10	22,8
4	1302,0	2,07	22,8
5	1786,3	2,84	23,0
6	1754,9	2,79	23,3
7	1654,2	2,63	23,6
8	1912,1	3,04	23,9
9	1773,8	2,82	24,3

Geometria: Area
Area: 174720 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

MAU - 77006

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
11/02/2019 12:01:46
Tipo di misura: Media per punti
Punti di misura: 8

Portata 1600,8 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	1679,4	2,67	29,6
2	1786,3	2,84	29,9
3	1717,1	2,73	29,8
4	1541,0	2,45	29,9
5	1471,8	2,34	29,9
6	1484,4	2,36	29,7
7	1515,9	2,41	29,6
8	1610,2	2,56	29,8

Geometria: Area
Area: 174720 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

MAU-77005

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
11/02/2019 12:34:49
Tipo di misura: Media per punti
Punti di misura: 8

Portata 571,7 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	593,3	1,03	21,7
2	633,6	1,10	21,6
3	541,4	0,94	21,5
4	524,2	0,91	21,4
5	558,7	0,97	21,2
6	576,0	1,00	21,2
7	581,8	1,01	21,1
8	564,5	0,98	21,0

Geometria: Area
Area: 160000 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
12/02/2019 11:55:22
Tipo di misura: Media per punti
Punti di misura: 6

Portata 1088,4 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	1200,9	2,97	30,7
2	1192,8	2,95	30,9
3	946,2	2,34	30,5
4	1055,4	2,61	30,3
5	1067,5	2,64	30,2
6	1067,5	2,64	30,2

Geometria: Area
Area: 112320 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
12/02/2019 11:30:38
Tipo di misura: Media per punti
Punti di misura: 6

Portata 1265,0 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	974,5	2,41	25,1
2	1087,7	2,69	25,5
3	1326,3	3,28	25,9
4	1293,9	3,20	25,8
5	1451,6	3,59	25,8
6	1455,7	3,60	25,8

Geometria: Area
Area: 112320 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
11/02/2019 12:04:12
Tipo di misura: Media per punti
Punti di misura: 6

Portata 1026,4 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	1023,0	2,53	30,1
2	1200,9	2,97	30,1
3	1055,4	2,61	30,3
4	962,4	2,38	30,4
5	958,3	2,37	30,7
6	958,3	2,37	30,8

Geometria: Area
Area: 112320 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
11/02/2019 12:41:48
Tipo di misura: Media per punti
Punti di misura: 8

Portata 1501,7 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	1421,5	2,26	24,9
2	1547,3	2,46	25,3
3	1320,9	2,10	25,7
4	1534,7	2,44	26,1
5	1559,9	2,48	26,2
6	1503,3	2,39	26,3
7	1585,1	2,52	26,4
8	1541,0	2,45	26,3

Geometria: Area
Area: 174720 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
12/02/2019 11:53:45
Tipo di misura: Media per punti
Punti di misura: 9

Portata 1696,9 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	1773,8	2,82	26,5
2	1729,7	2,75	26,6
3	1629,1	2,59	27,2
4	1641,7	2,61	28,1
5	1868,1	2,97	28,3
6	1635,4	2,60	28,7
7	1748,6	2,78	28,8
8	1616,5	2,57	28,9
9	1629,1	2,59	29,0

Geometria: Area
Area: 174720 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
12/02/2019 11:39:38
Tipo di misura: Media per punti
Punti di misura: 9

Portata 875,5 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	697,0	1,21	19,6
2	944,6	1,64	19,2
3	1157,8	2,01	19,2
4	817,9	1,42	19,1
5	800,6	1,39	18,9
6	956,2	1,66	18,6
7	783,4	1,36	18,4
8	944,6	1,64	18,3
9	777,6	1,35	18,3

Geometria: Area
Area: 160000 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
11/02/2019 12:14:34
Tipo di misura: Media per punti
Punti di misura: 9

Portata 447,4 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	409,0	0,71	23,2
2	455,0	0,79	22,9
3	403,2	0,70	22,7
4	391,7	0,68	22,3
5	472,3	0,82	22,1
6	512,6	0,89	21,9
7	489,6	0,85	21,5
8	460,8	0,80	21,3
9	432,0	0,75	21,2

Geometria: Area
Area: 160000 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

testo 440 dP

V 1.0.6 83164119

Applicazione: Portata
11/02/2019 12:44:09
Tipo di misura: Media per punti
Punti di misura: 8

Portata 1133,7 m³/h

Num.	Serie Sonda: m³/h	m/s	20795382 °C
1	1120,1	2,77	26,6
2	1079,6	2,67	26,7
3	1079,6	2,67	26,9
4	1091,8	2,70	27,0
5	1136,2	2,81	27,0
6	1180,7	2,92	27,4
7	1184,8	2,93	27,5
8	1196,9	2,96	27,7

Geometria: Area
Area: 112320 mm²
Fattore di Correzione: 100%
Pressione atmosferica:
1013,00 hPa

ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
23/10/24

AGEX SISTEMI: Matteo Forchesi

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No.01 Mod 1.4.7
OUR JOB X176-24X	Date 24/10/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** HV (66KV 6.6KV) SWITCH ROOM B-100
S/N: B100	**FAT procedure:** 1724000049-QC-PRO-00056

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST: 24/10/2024

REFERENCE DRAWING:

- 1724000049-AR-DA-00014 - B-100 GENERAL ARRANGMENT DRAWINGS - E&I SHELTERS
- 1724000049-HV-DA-00064 - MODULE B-100 – HVAC SYSTEM–G.A. AND DETAILS
- 1724000049-HV-DA-00026 - B-100 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

REFERENCE DOCUMENT:

- 1724000049-HV-PID-00039 - B-100 PID - E&I SHELTERS
- 1724000049-HV-CA-00035 - B-100 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC) - E&I SHELTERS
- 1724000049-HV-LIS-00047 - B-100 HVAC COMPONENTS LIST AND DS - E&I SHELTERS
- 1724000049-HV-RE-00055 - HVAC SYST DESCRIPTION (MANAGEMENT LOGICS) - E&I SHELTERS
- 1724000049-QC-PRO-00056 (FAT Procedure)
- ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria

Inspection List	PASS	FAIL	N.A.	value
Functional & performance Test of A/C System (HVAC Test):				
• Visual and correct installation of HVAC fans.	x			
• Functional check of fans.	x			
• Check the functionality and performance of A/C System	x			

ALEXSISTEMI spa

QUALITY SYSTEM CERTIFICATION DNV ISO 9001

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No.01 Mod 1.4.7
OUR JOB X176-24X	Date 24/10/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** HV (66KV 6.6KV) SWITCH ROOM B-100
S/N: B100	**FAT procedure:** 1724000049-QC-PRO-00056

Comments:

SAT activities were carried out at the Rosetti Marino yard, after the main HVAC system installation was completed. Following this, all functional tests listed in the above table were conducted, although most of the documentation was in draft form, as it has not yet been officially issued.

Some activities and related tests are still required to finalize SAT and to make the HVAC system supply and installation fully compliant. These remaining tasks will be outlined and sent to Alex Sistemi, along with corrective actions to address them.

The key items that remain outstanding are:

- Completion of detailed engineering documentation
- Completion of the drainage system and heating cable installations
- Completion of the emergency lighting installation (during SAT the lights didn't turn on)

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other
MATTEO MARCHESI Matteo Marchesi 23/10/24	CAVIGLIA LUCA ROSETTI MARINO Luca Caviglia 23/10/24			

ALEXSISTEMI spa

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No.01 Mod 1.4.7
OUR JOB X176-24X	Date 23/10/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** LV (400 V) SWITCH ROOM B-200
S/N: B200	**FAT procedure:** 1724000049-QC-PRO-00056

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST: 23/10/2024

REFERENCE DRAWING:

- 1724000049-AR-DA-00015 - B-200 GENERAL ARRANGMENT DRAWINGS - E&I SHELTERS
- 1724000049-HV-DA-00065 - MODULE B-200 – HVAC SYSTEM–G.A. AND DETAILS
- 1724000049-HV-DA-00027 - B-200 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

REFERENCE DOCUMENT:

- 1724000049-HV-PID-00040 - B-200 PID - E&I SHELTERS
- 1724000049-HV-CA-00036 - B-200 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC) - E&I SHELTERS
- 1724000049-HV-LIS-00048 - B-200 HVAC COMPONENTS LIST AND DS - E&I SHELTERS
- 1724000049-HV-RE-00055 - HVAC SYST DESCRIPTION (MANAGEMENT LOGICS) - E&I SHELTERS
- 1724000049-QC-PRO-00056 (FAT Procedure)
- ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria

Inspection List	PASS	FAIL	N.A.	value
Functional & performance Test of A/C System (HVAC Test):				
• Visual and correct installation of HVAC fans.	x			
• Functional check of fans.	x			
• Check the functionality and performance of A/C System	x			

ALEXSISTEMI spa

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No.01 Mod 1.4.7
OUR JOB X176-24X	Date 23/10/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** LV (400 V) SWITCH ROOM B-200
S/N: B200	**FAT procedure:** 1724000049-QC-PRO-00056

Comments:

SAT activities were carried out at the Rosetti Marino yard, after the main HVAC system installation was completed. Following this, all functional tests listed in the above table were conducted, although most of the documentation was in draft form, as it has not yet been officially issued.

Some activities and related tests are still required to finalize SAT and to make the HVAC system supply and installation fully compliant. These remaining tasks will be outlined and sent to Alex Sistemi, along with corrective actions to address them.

The key items that remain outstanding are:

- Completion of detailed engineering documentation
- Completion of the drainage system and heating cable installations
- Completion of the emergency lighting installation (during SAT the lights didn't turn on)

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other
MATTEO MARENZI 23/10/24	CAVIGLIA LUCA ROSETTI MARINO 23/10/24			

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No.01 Mod 1.4.7
OUR JOB X176-24X	Date 23/10/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** AC UPS EQUIPMENT ROOM B-300
S/N: B300	**FAT procedure:** 1724000049-QC-PRO-00056

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST: 23/10/2024

REFERENCE DRAWING:

- 1724000049-AR-DA-00016 - B-300 GENERAL ARRANGMENT DRAWINGS - E&I SHELTERS
- 1724000049-HV-DA-00066 - MODULE B-300 – HVAC SYSTEM–G.A. AND DETAILS
- 1724000049-HV-DA-00028 - B-300 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

REFERENCE DOCUMENT:

- 1724000049-HV-PID-00041 - B-300 PID - E&I SHELTERS
- 1724000049-HV-CA-00037 - B-300 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC) - E&I SHELTERS
- 1724000049-HV-LIS-00049 - B-300 HVAC COMPONENTS LIST AND DS - E&I SHELTERS
- 1724000049-HV-RE-00055 - HVAC SYST DESCRIPTION (MANAGEMENT LOGICS) - E&I SHELTERS
- 1724000049-QC-PRO-00056 (FAT Procedure)
- ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria

Inspection List	PASS	FAIL	N.A.	value
Functional & performance Test of A/C System (HVAC Test):				
• Visual and correct installation of HVAC fans.	x			
• Functional check of fans.	x			
• Check the functionality and performance of A/C System	x			

ALEXSISTEMI spa

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No.01 Mod 1.4.7
OUR JOB X176-24X	Date 23/10/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** AC UPS EQUIPMENT ROOM B-300
S/N: B300	**FAT procedure:** 1724000049-QC-PRO-00056

Comments:

SAT activities were carried out at the Rosetti Marino yard, after the main HVAC system installation was completed. Following this, all functional tests listed in the above table were conducted, although most of the documentation was in draft form, as it has not yet been officially issued.

Some activities and related tests are still required to finalize SAT and to make the HVAC system supply and installation fully compliant. These remaining tasks will be outlined and sent to Alex Sistemi, along with corrective actions to address them.

The key items that remain outstanding are:

- Completion of detailed engineering documentation
- Completion of the drainage system and heating cable installations

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other
MATTEO MARCHESI 23/10/24	CAVIGLIA LUCA ROSETTI MARINO 23/10/24			

ALEXSISTEMI spa

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No.01 Mod 1.4.7
OUR JOB X176-24X	Date 25/10/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** I&T EQUIPMENT ROOM B-400
S/N: B400	**FAT procedure:** 1724000049-QC-PRO-00056

Comments:

SAT activities were carried out at the Rosetti Marino yard, after the main HVAC system installation was completed. Following this, all functional tests listed in the above table were conducted, although most of the documentation was in draft form, as it has not yet been officially issued.

Some activities and related tests are still required to finalize SAT and to make the HVAC system supply and installation fully compliant. These remaining tasks will be outlined and sent to Alex Sistemi, along with corrective actions to address them.

The key items that remain outstanding are:

- Completion of detailed engineering documentation
- Completion of the drainage system and heating cable installations
- Completion of the emergency lighting installation (during SAT the lights didn't turn on)

ALEX SISTEMI *Quality Assurance*	Customer	Final Customer	3rd Part	other
MATTEO MARCHESI Matteo Marchesi 23/10/24	CAVIGLIA LUCA ROSETTI MARINO Luca Caviglia 23/10/24			

Doc. Name: CHECK AND FUNCTIONAL TEST OF HVAC SYSTEM		Report No.01 Mod 1.4.7
OUR JOB X176-24X	Date 25/10/2024	Page 1/1

Customer: Rosetti Marino	**Project:** BASE LOAD POWER HUB (BLPH)
C/N: CW-I-WPA-2023-05	**Description:** I&T EQUIPMENT ROOM B-400
S/N: B400	**FAT procedure:** 1724000049-QC-PRO-00056

LOCATION: ON SITE ☒ OFF SITE ☐

DATE OF TEST: 24/10/2024

REFERENCE DRAWING:

- 1724000049-AR-DA-00017 - B-400 GENERAL ARRANGMENT DRAWINGS - E&I SHELTERS
- 1724000049-HV-DA-00067 - MODULE B-400 – HVAC SYSTEM–G.A. AND DETAILS
- 1724000049-HV-DA-00029 - B-400 HVAC and LIGHTING PANEL WIRING DRAWINGS and GENERAL ARRANGEMENT (INCL INTERCONNECTING) - E&I SHELTERS

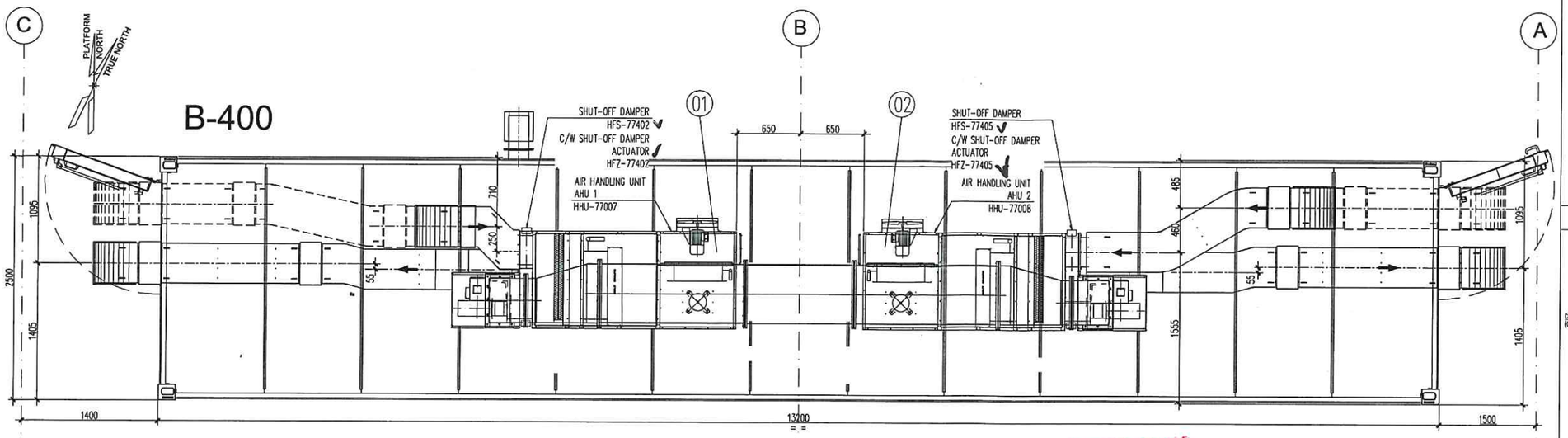
REFERENCE DOCUMENT:

- 1724000049-HV-PID-00042 - B-400 PID - E&I SHELTERS
- 1724000049-HV-CA-00038 - B-400 HVAC CALCULATION REPORT (Incl HVAC SYS CALC and HEAT DISSIPATION CALC) - E&I SHELTERS
- 1724000049-HV-LIS-00050 - B-400 HVAC COMPONENTS LIST AND DS - E&I SHELTERS
- 1724000049-HV-RE-00055 - HVAC SYST DESCRIPTION (MANAGEMENT LOGICS) - E&I SHELTERS
- 1724000049-QC-PRO-00056 (FAT Procedure)
- ECA-00-ELE-DEB-0001 Rev.7 Electrical Design Criteria

Inspection List	PASS	FAIL	N.A.	value
Functional & performance Test of A/C System (HVAC Test):				
• Visual and correct installation of HVAC fans.	x			
• Functional check of fans.	x			
• Check the functionality and performance of A/C System	x			

DRAWING NO. 1724000049-HV-DA-00067_1

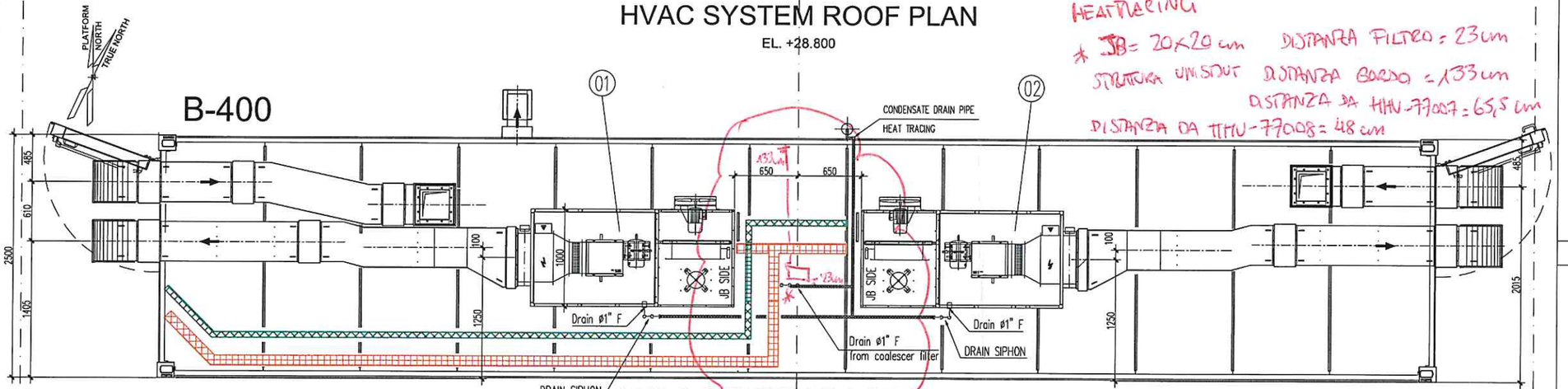
REV. 01



HVAC SYSTEM ROOF PLAN

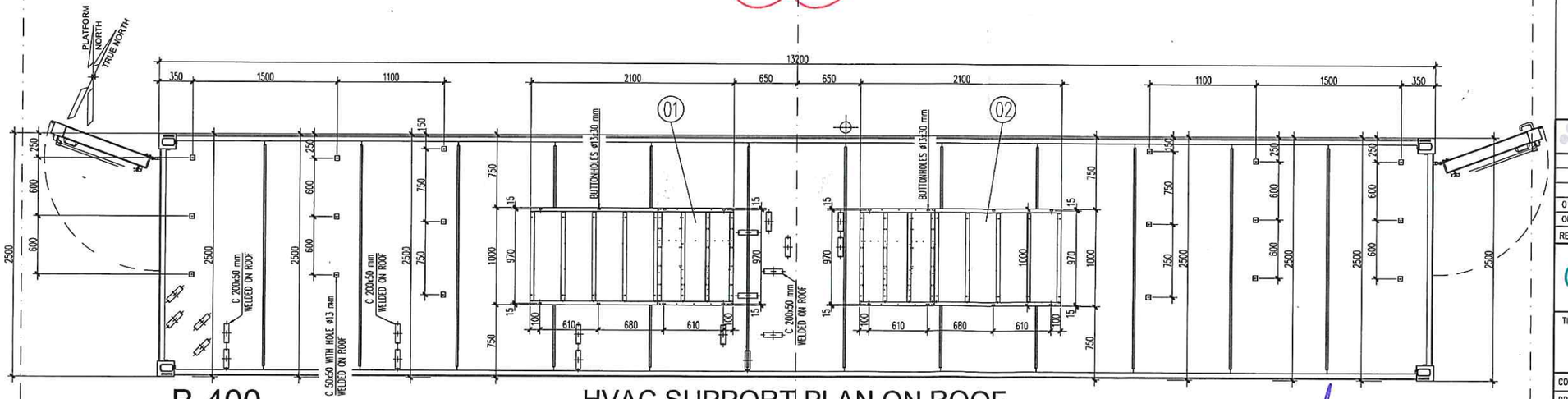
EL. +28.800

HEATTRACING
* JB= 20x20 cm DISTANZA FILTRO = 23cm
STRUTTURA UNISTRUT DISTANZA BORDO = 133cm
DISTANZA DA HHU-77007 = 65,5 cm
DISTANZA DA HHU-77008 = 48 cm



HVAC SYSTEM ROOF PLAN

EL. +28.000

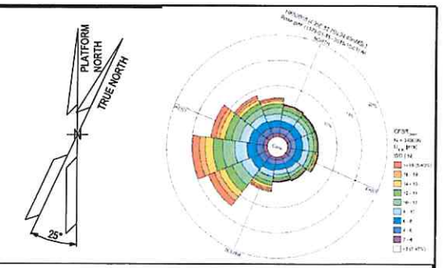


HVAC SUPPORT PLAN ON ROOF

EL. +27.300

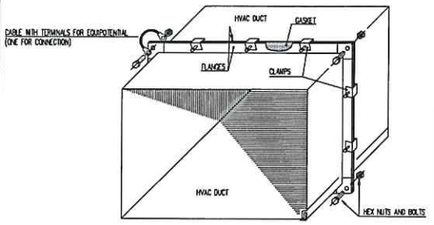
MASTER

ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept. 23/10/24



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



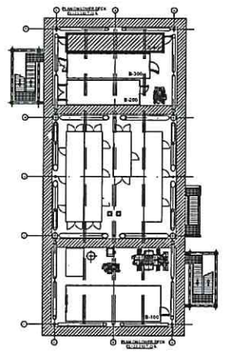
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77007	AIR HANDLING UNIT A	2100	1000	2158	850
02	HHU-77008	AIR HANDLING UNIT B	2100	1000	2158	850

KEY PLAN



ALEXSISTEMI

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE :
S.S.
MODULE B-400
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1 : 25

DRAWN M.G. | CHECKED O.A. | APPROVED C.A. | DATE 18/10/2024

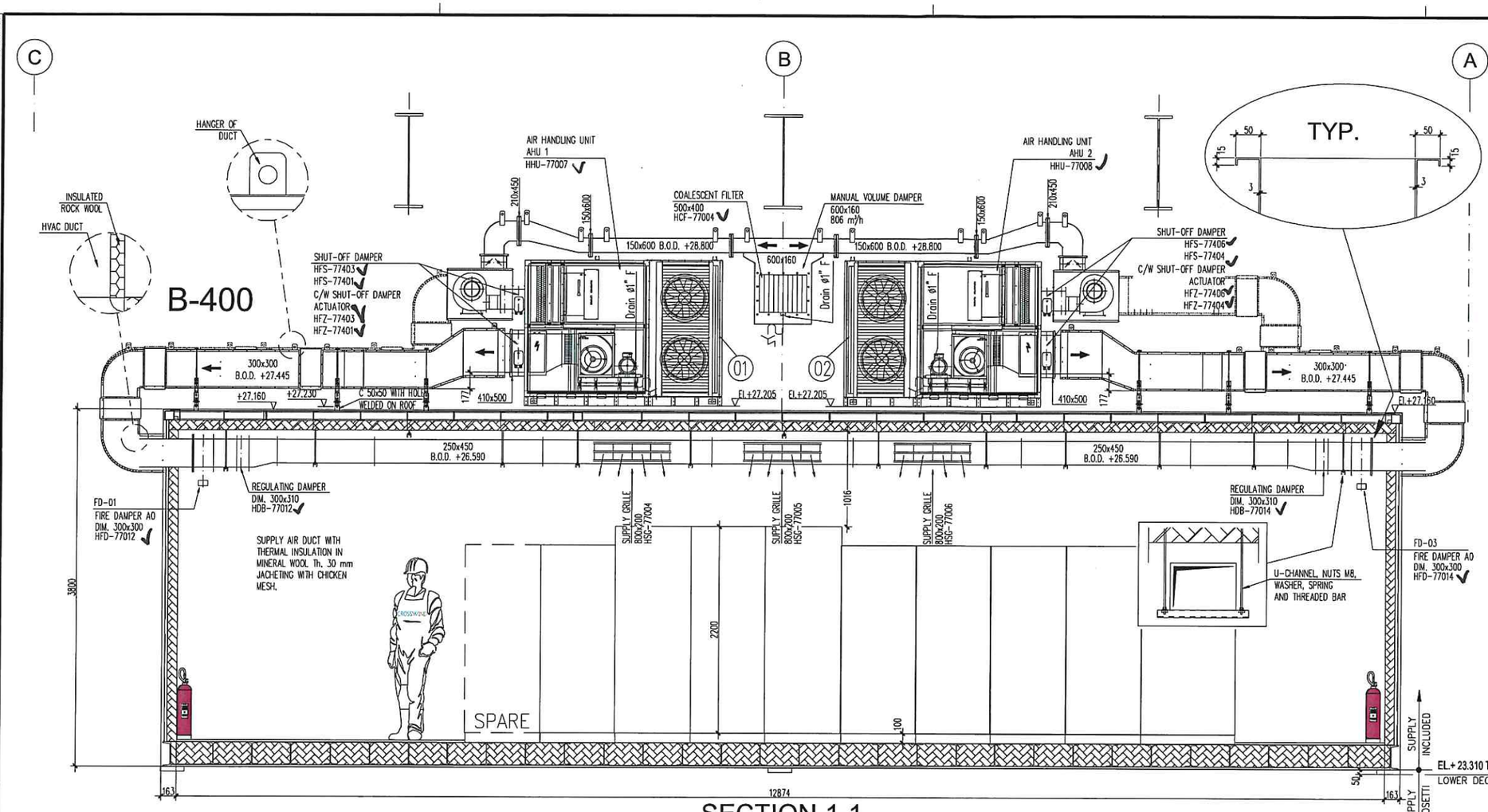
A1 | DRAWING NO. 1724000049-HV-DA-00067 | SHEET 001 | REV. 01

File Name : 1724000049-HV-DA-00067_1

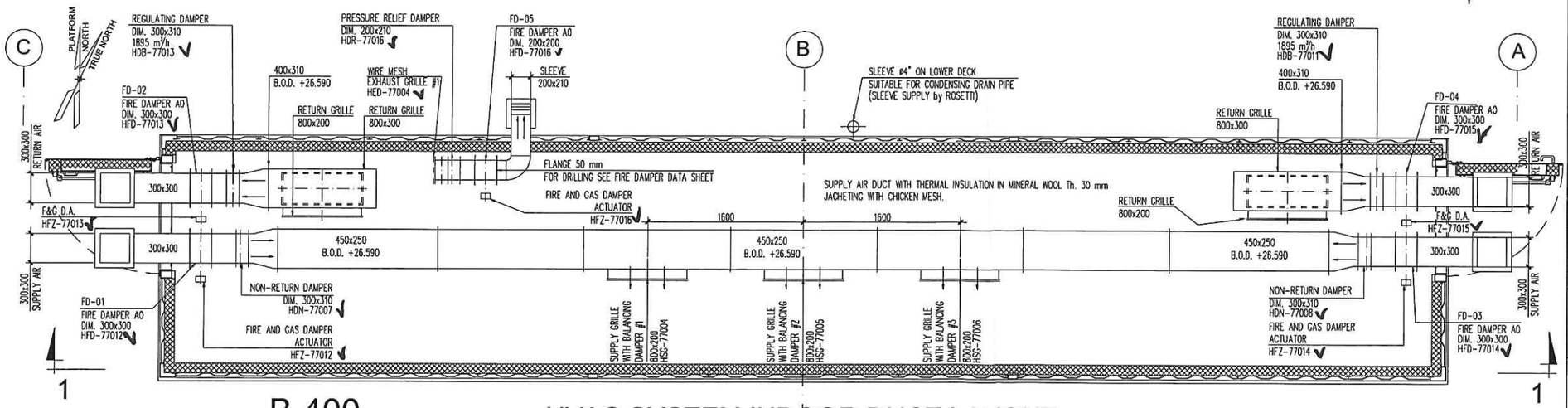
ALEX SISTEMI : Matteo Lorenzini

DRAWING NO. 1724000049-HV-DA-00067_1

REV. 01



SECTION 1-1

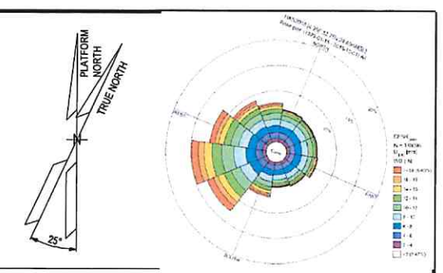


B-400 HVAC SYSTEM INDOOR DUCT LAYOUT

MASTER

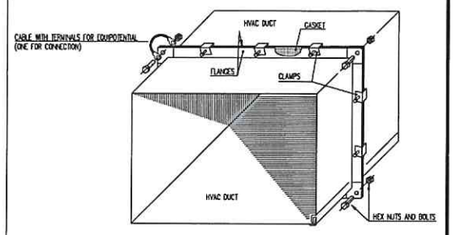
ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
24/10/24

ALEX SISTEMI : Matteo Loredesi



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



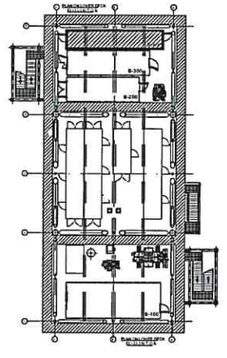
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77007	AIR HANDLING UNIT A	2100	1000	2158	850
02	HHU-77008	AIR HANDLING UNIT B	2100	1000	2158	850

KEY PLAN



ALEXSISTEMI

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

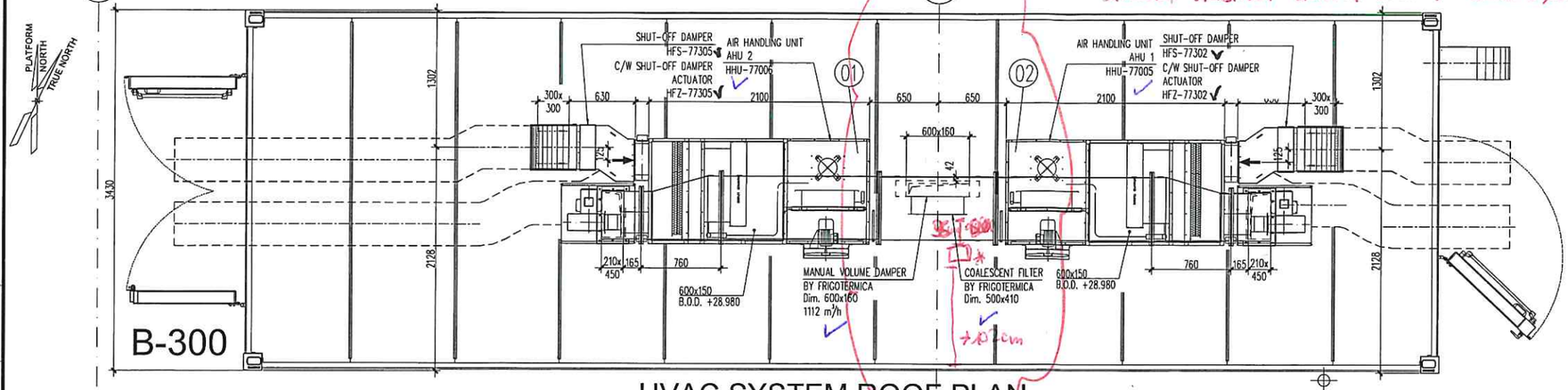
TITLE :
S.S.
MODULE B-400
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 16/10/2024
A1	DRAWING NO. 1724000049-HV-DA-00067	SHEET 002	REV. 01

File Name : 1724000049-HV-DA-00067_1

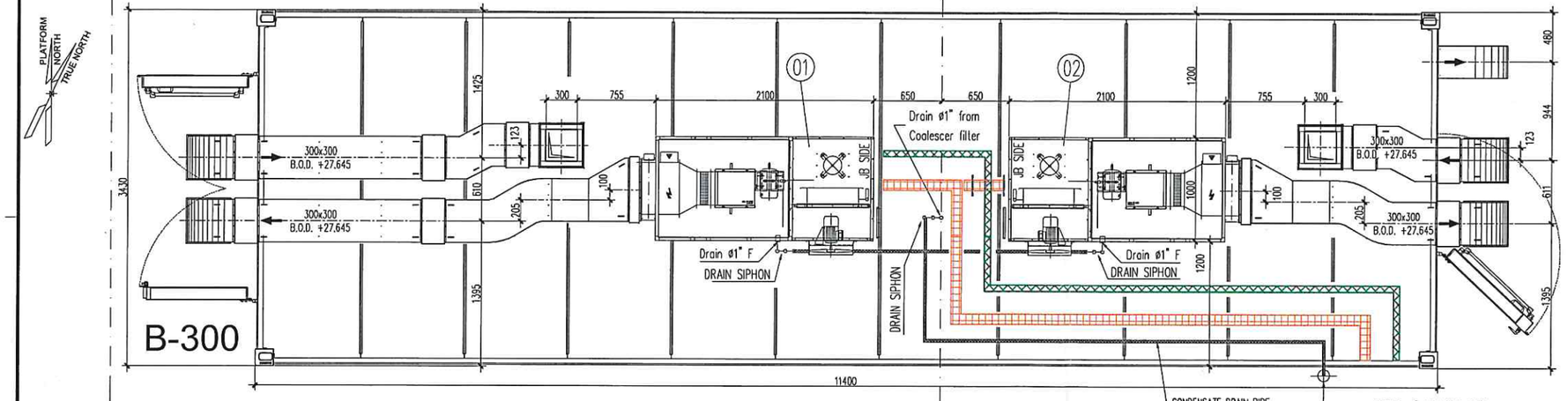
DRAWING NO. 1724000049-HV-DA-00066_1 | REV. 01

HEAT TRACING
SB: 20 x 20 cm DISTANZA FILTRO: 95 cm
STRUTTURA UNISTRUT DISTANZA BORDO MACCHINA: 102 cm



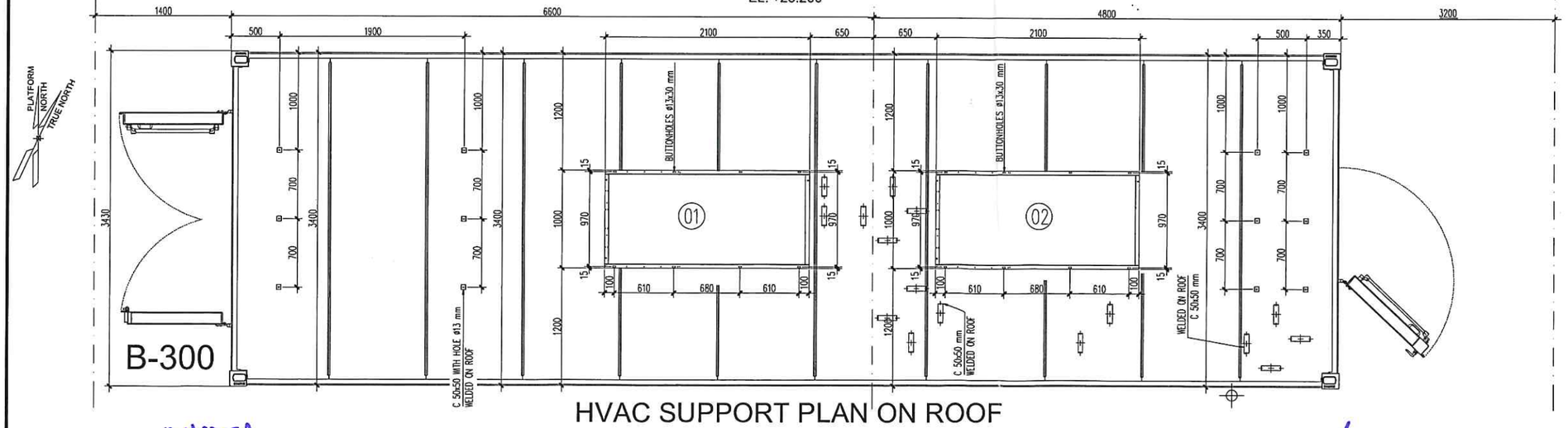
HVAC SYSTEM ROOF PLAN

EL. +28.980



HVAC SYSTEM ROOF PLAN

EL. +28.200



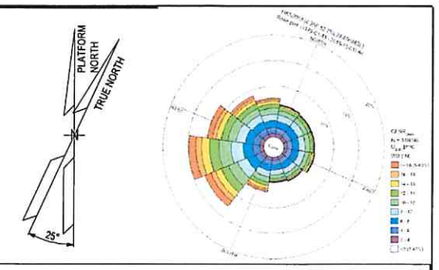
HVAC SUPPORT PLAN ON ROOF

EL. +27.480

MASTER

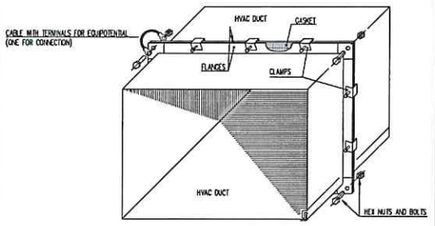
ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
23/10/24

ALEX SISTEMI : Matteo Vecchiet



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



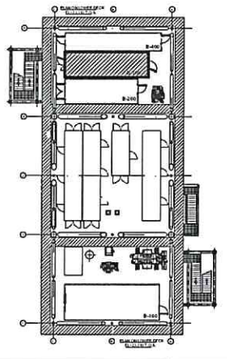
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77005	AIR HANDLING UNIT A	2100	1000	2158	850
02	HHU-77006	AIR HANDLING UNIT B	2100	1000	2158	850

KEY PLAN



ALEX SISTEMI

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE :
S.S.
MODULE B-300
HVAC SYSTEM – G.A. AND DETAILS

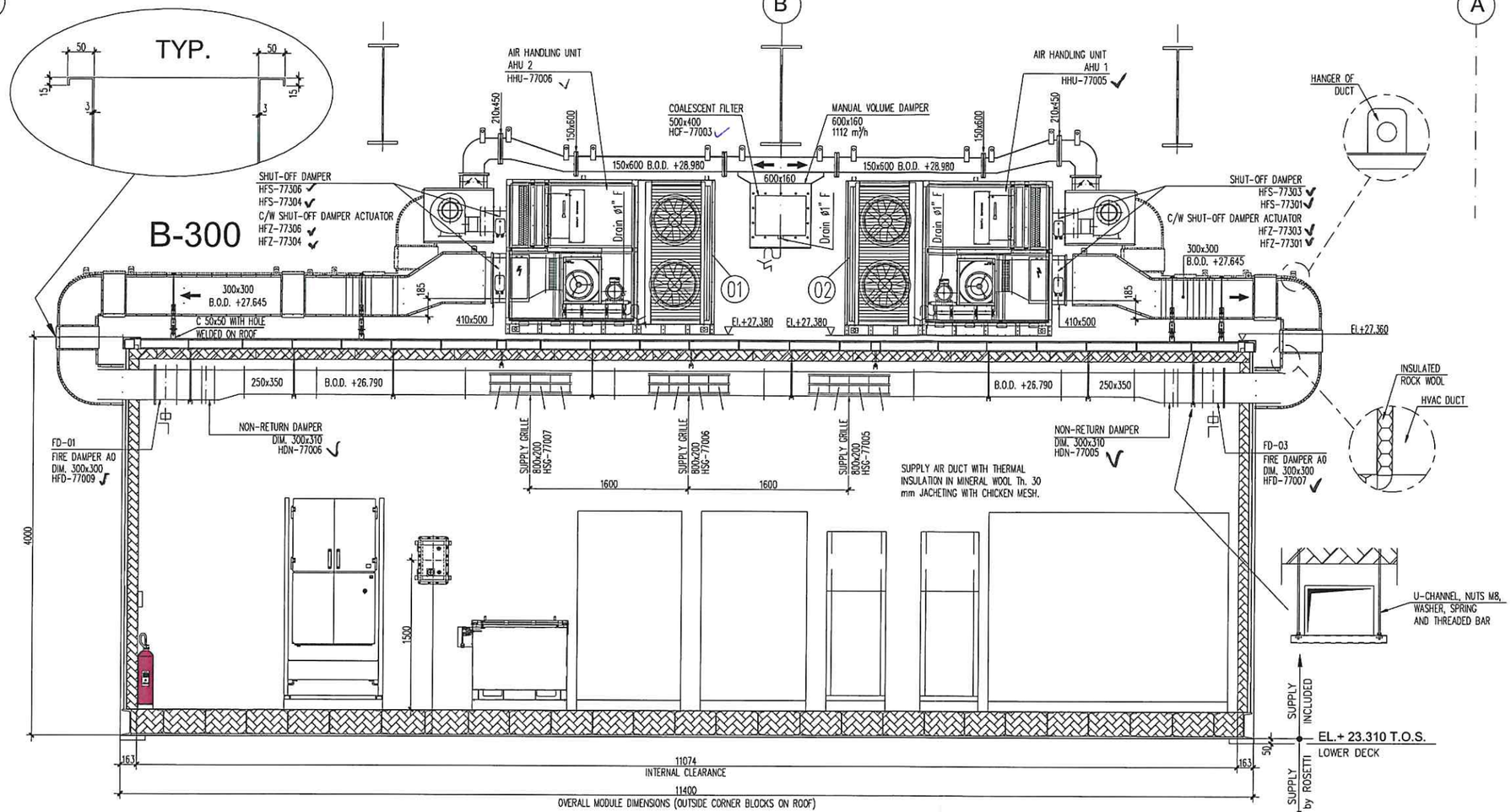
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1 : 25

DRAWN M.G. | CHECKED O.A. | APPROVED C.A. | DATE 18/10/2024

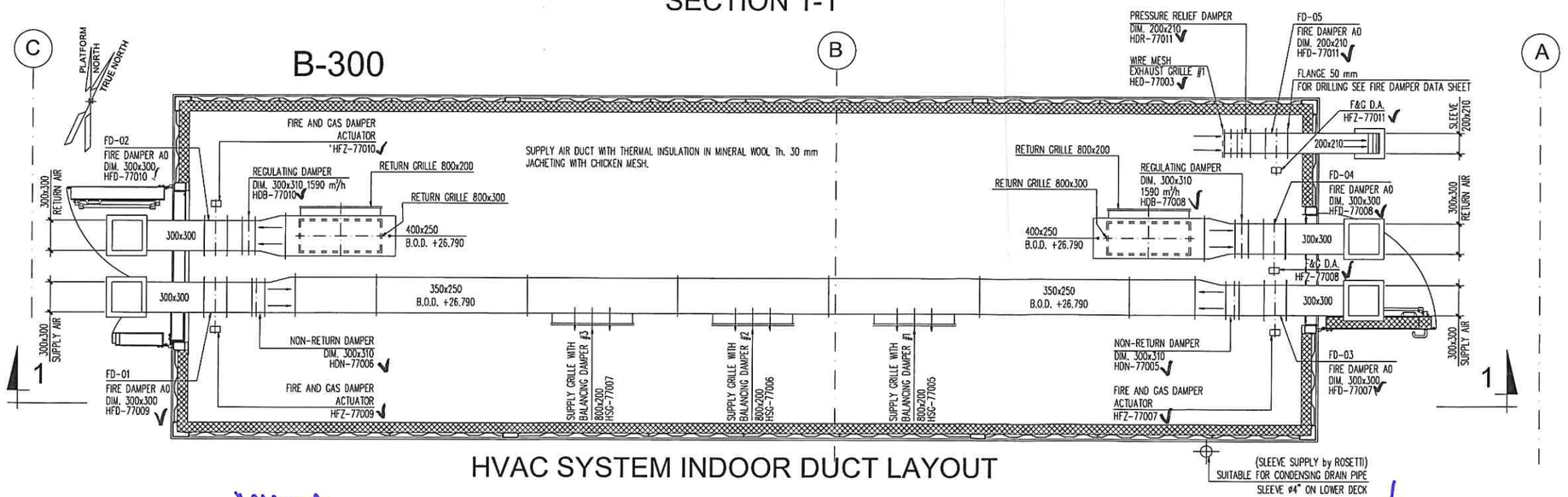
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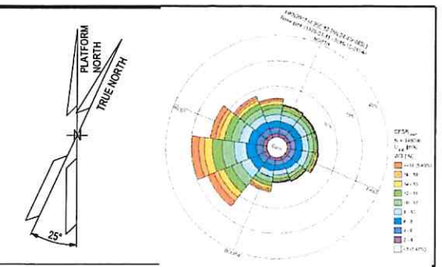
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SECTION 1-1

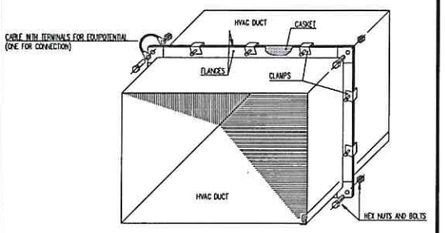


HVAC SYSTEM INDOOR DUCT LAYOUT



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



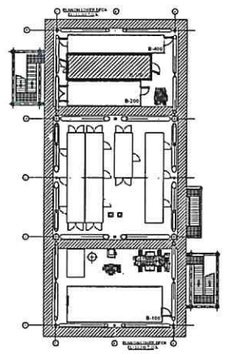
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power
AISI 316L

Basket tray Instrument
AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77005	AIR HANDLING UNIT A	2100	1000	2158	850
02	HHU-77006	AIR HANDLING UNIT B	2100	1000	2158	850

KEY PLAN



ALEX SISTEMI

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE :
S.S.
MODULE B-300
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 18/10/2024
A1	DRAWING NO. 1724000049-HV-DA-00066	SHEET 002	REV. 01

File Name : 1724000049-HV-DA-00066_1

MASTER

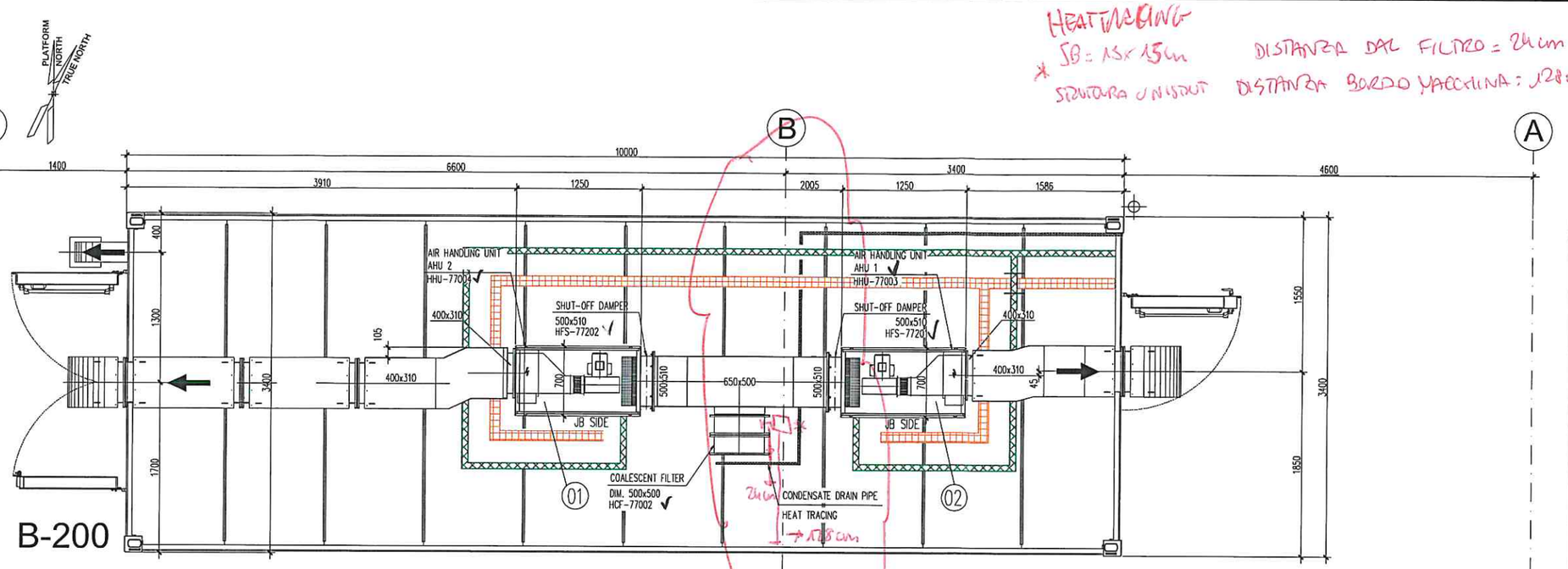
ROSETTI MARINO SpA
Stefano Linari 23/10/24
Quality Control Dept.

ALEX SISTEMI : Matteo Marchesi

DRAWING NO. 1724000049-HV-DA-00065_1

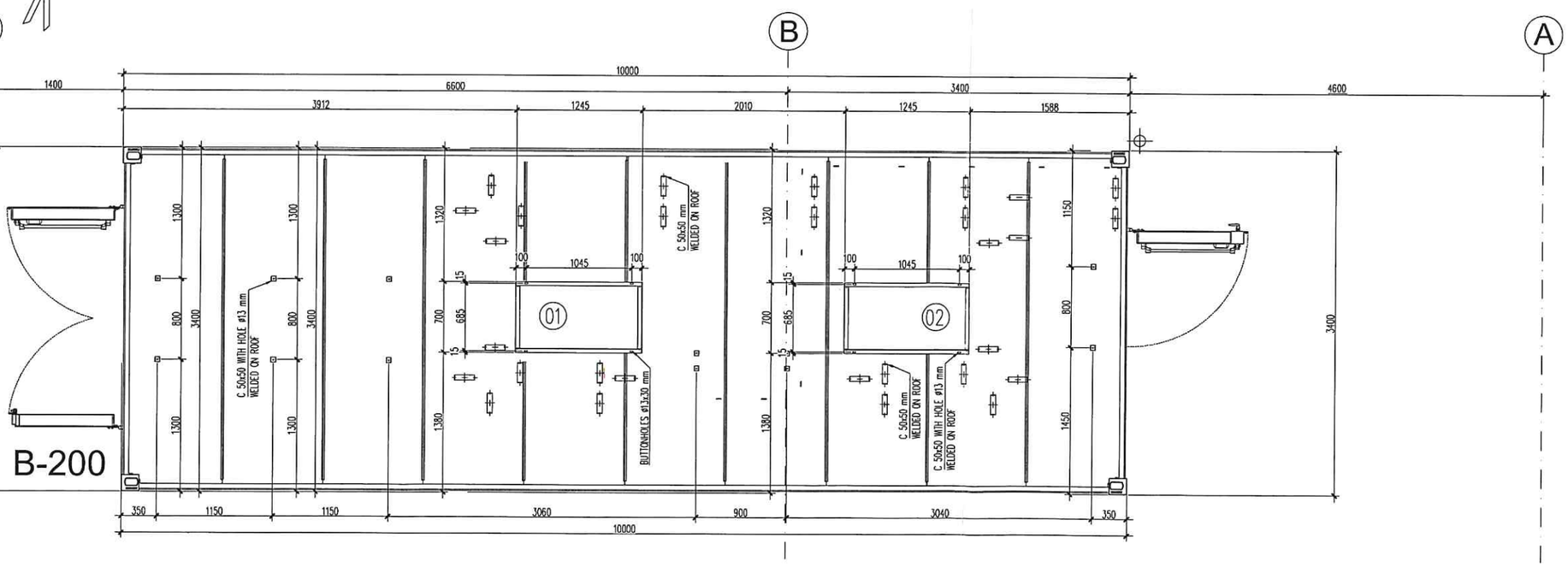
REV. 01

HEATTRACING
* JB = 15x 15cm DISTANZA DAL FILTRO = 24cm
STRUTTURA UNISTRUT DISTANZA BORDO YACHTLINA = 128cm



HVAC SYSTEM ROOF PLAN

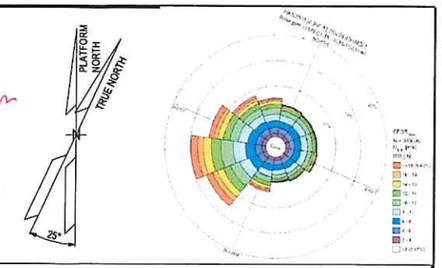
EL. +28.800



HVAC SUPPORT PLAN ON ROOF

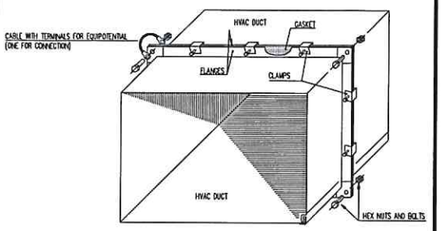
EL. +28.050

MASTER



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



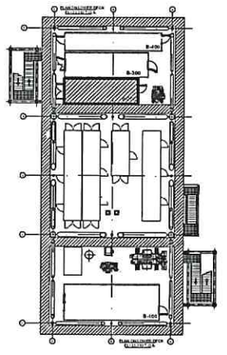
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77003	AIR HANDLING UNIT A	1250	850	900	140
02	HHU-77004	AIR HANDLING UNIT B	1250	850	900	140

KEY PLAN



ALEXSISTEMI

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE :
S.S.
MODULE B-200
HVAC SYSTEM – G.A. AND DETAILS

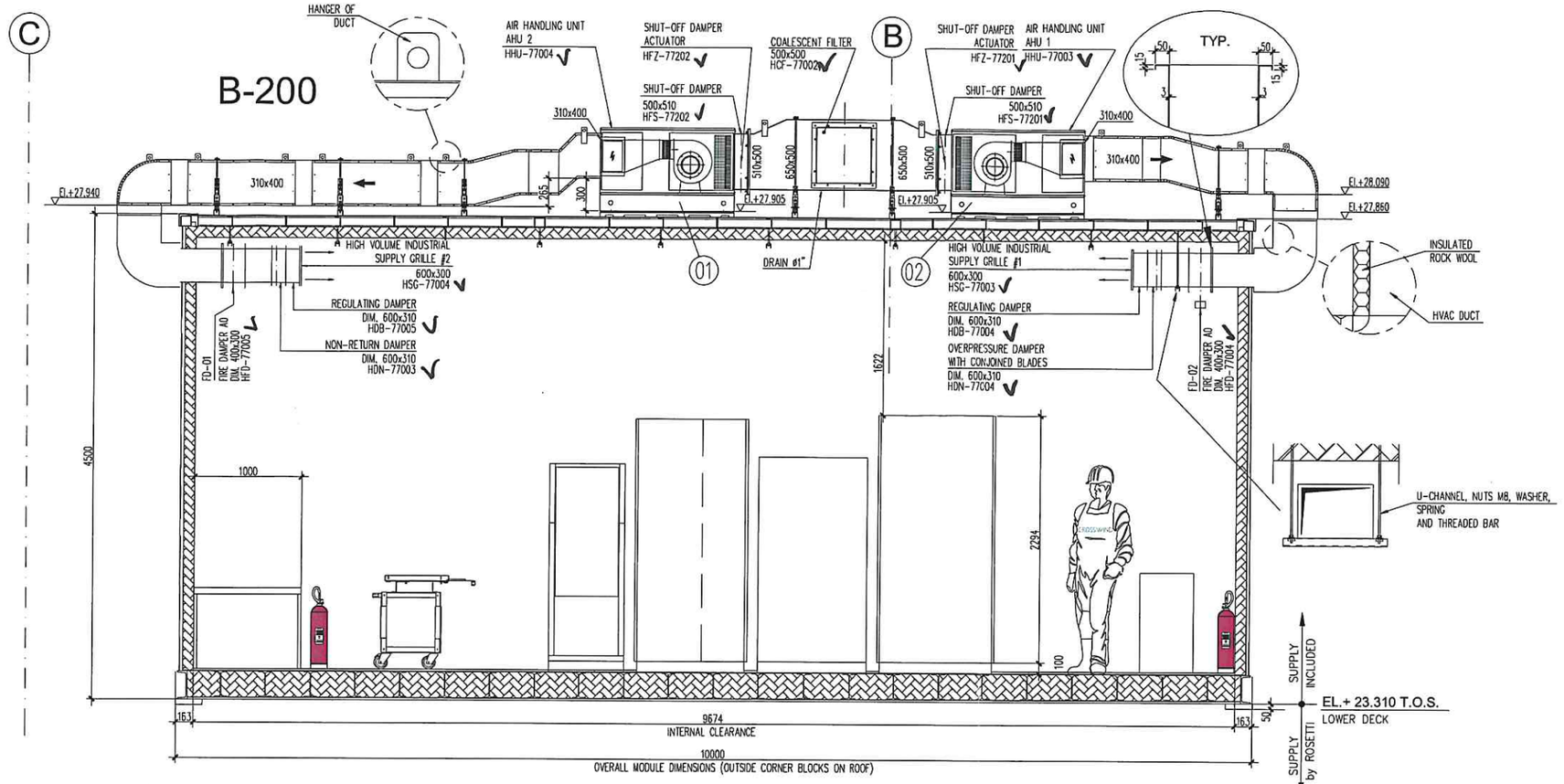
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 18/10/2024
A1	DRAWING NO. 1724000049-HV-DA-00065	SHEET 001	REV. 01

File Name : 1724000049-HV-DA-00065_1

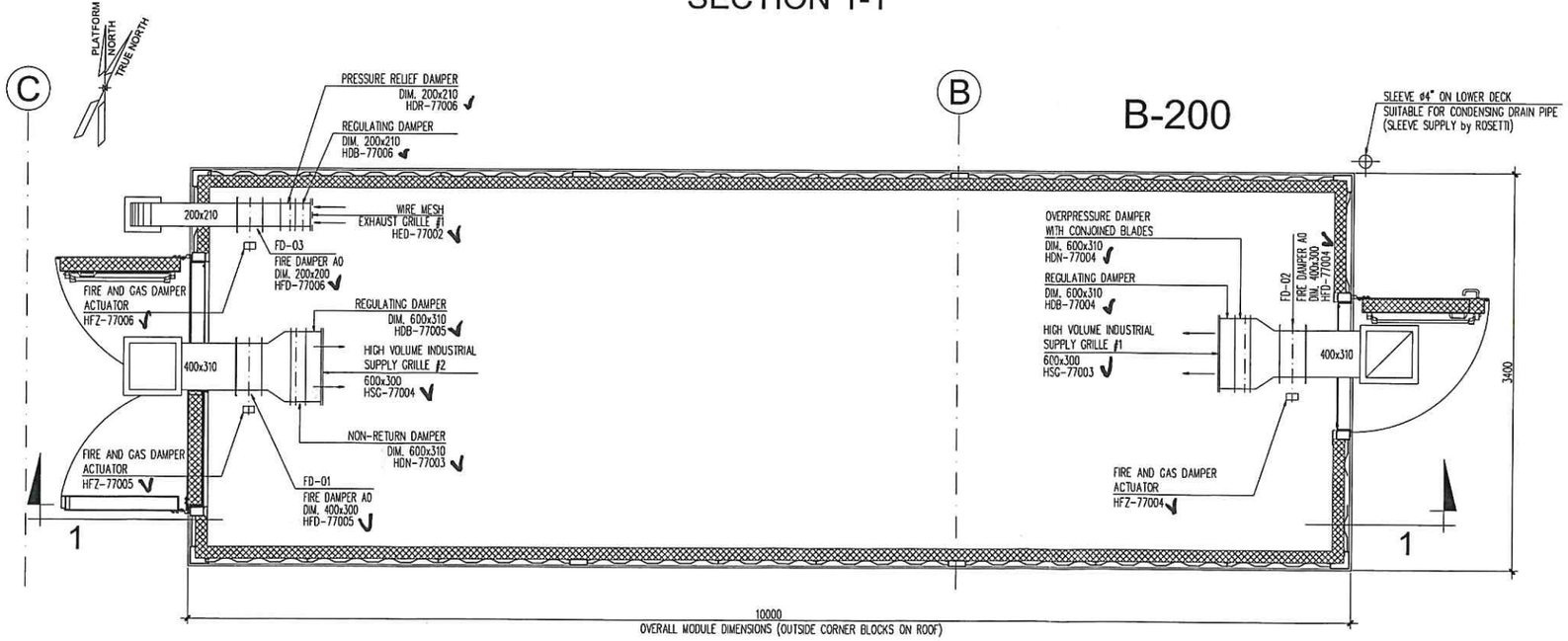
ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
23/10/24

ALEX SISTEMI : Carlo Nardi

DRAWING NO. 1724000049-HV-DA-00065_1 | REV. 01



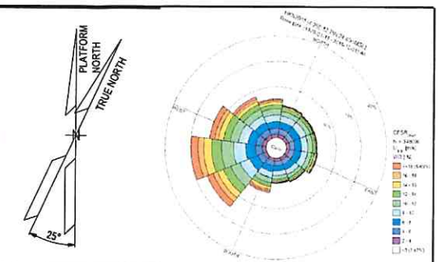
SECTION 1-1



HVAC SYSTEM INDOOR DUCT LAYOUT

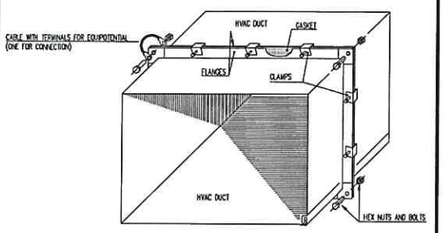
MASTER

ROSETTI MARINO SpA
Stefano Linari 23/10/24
Quality Control Dept.



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



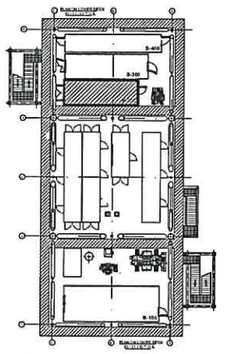
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77003	AIR HANDLING UNIT A	1250	850	900	140
02	HHU-77004	AIR HANDLING UNIT B	1250	850	900	140

KEY PLAN



ALEXSISTEMI

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE :
S.S.
MODULE B-200
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 18/10/2024
A1	DRAWING NO. 1724000049-HV-DA-00065	SHEET 002	REV. 01

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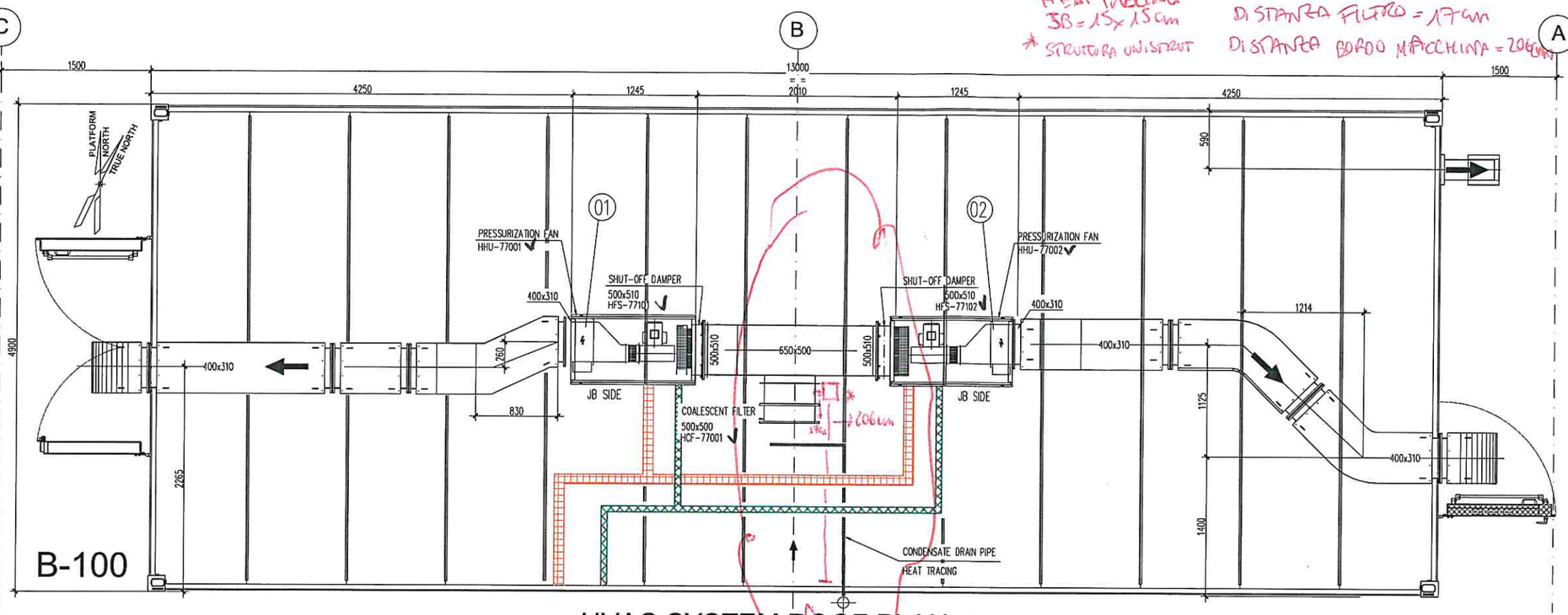
ALEX SISTEMI : Matteo Lazzari

DRAWING NO. 1724000049-HV-DA-00064_1

REV. 01

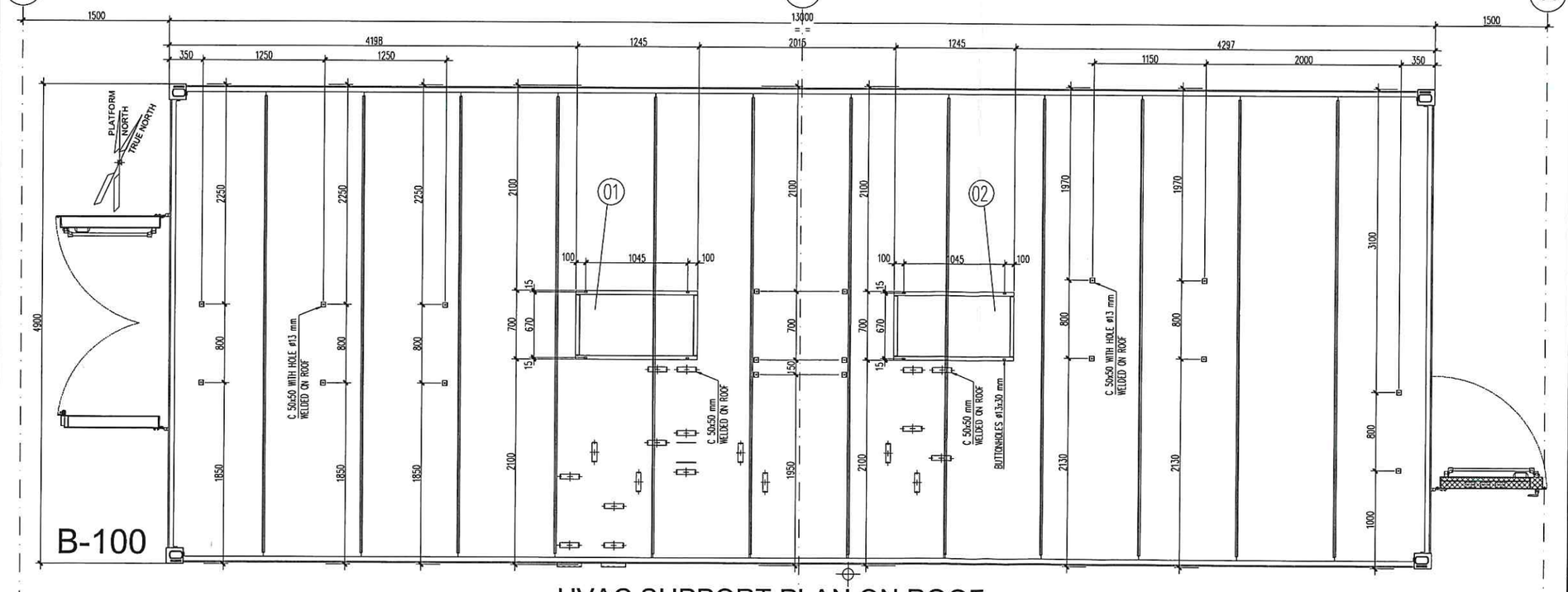
HEAT TRACING
3B = 15x15 cm
* STRUTTURA UNISTRUT

DISTANZA FILTRO = 17cm
DISTANZA BORDO MACCHINA = 206cm



HVAC SYSTEM ROOF PLAN

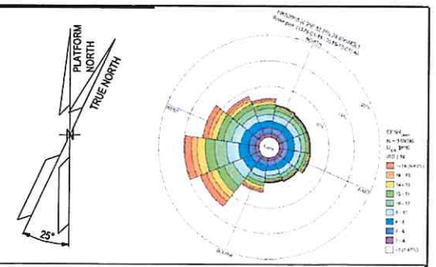
EL. +28.800



HVAC SUPPORT PLAN ON ROOF

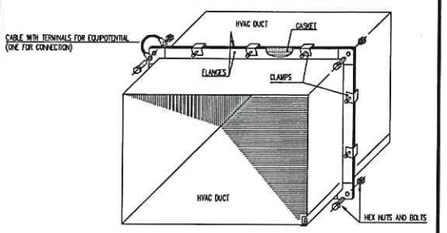
EL. +28.050

MASTER



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



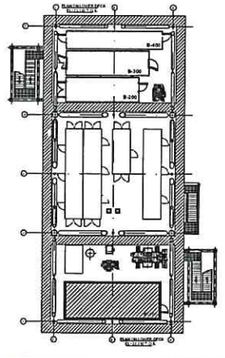
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77001	AIR HANDLING UNIT A	1250	850	900	140
02	HHU-77002	AIR HANDLING UNIT B	1250	850	900	140

KEY PLAN



ALEXSISTEMI

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE :
S.S.
MODULE B-100
HVAC SYSTEM - G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1 : 25

DRAWN M.G. | CHECKED O.A. | APPROVED C.A. | DATE 18/10/2024

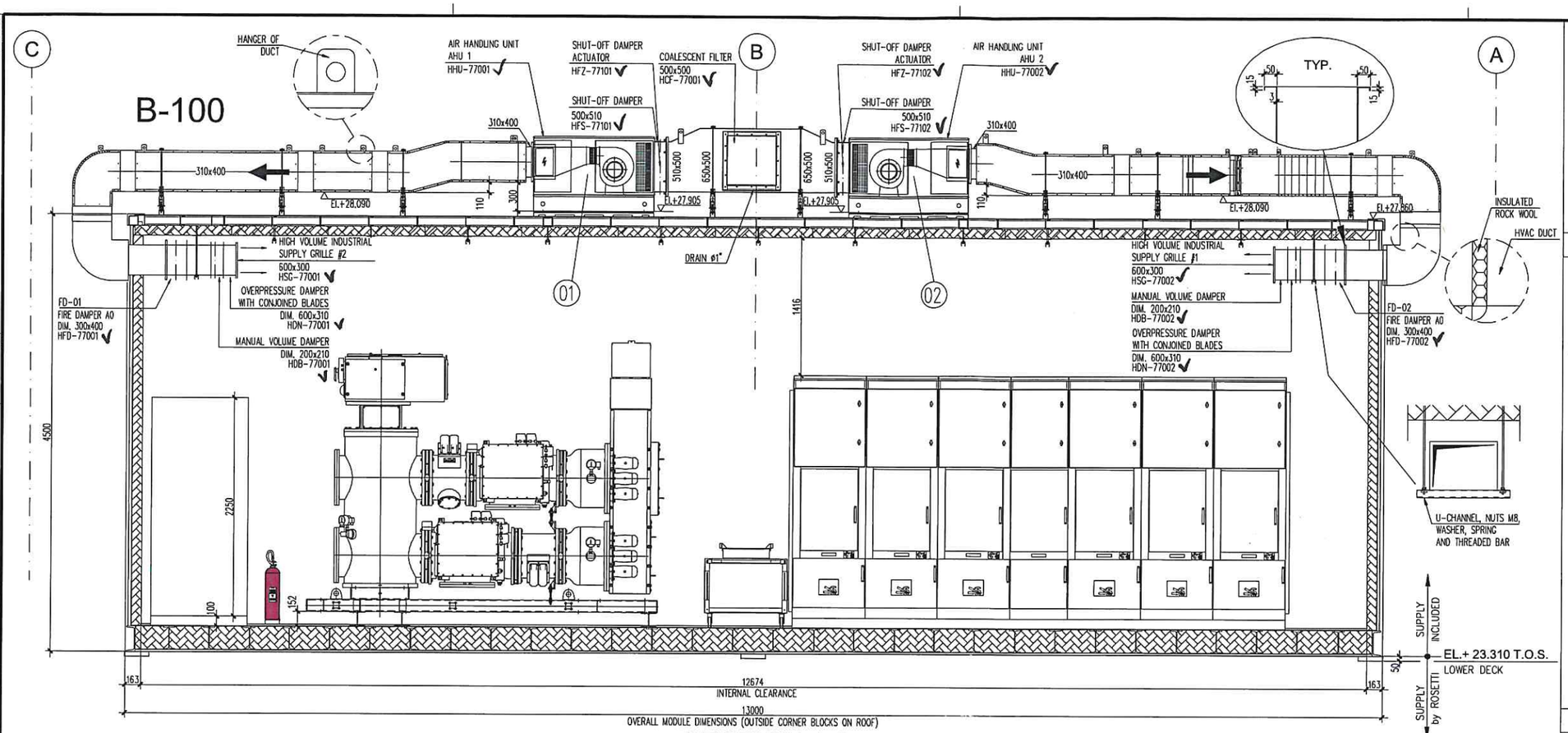
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File Name : 1724000049-HV-DA-00064_1

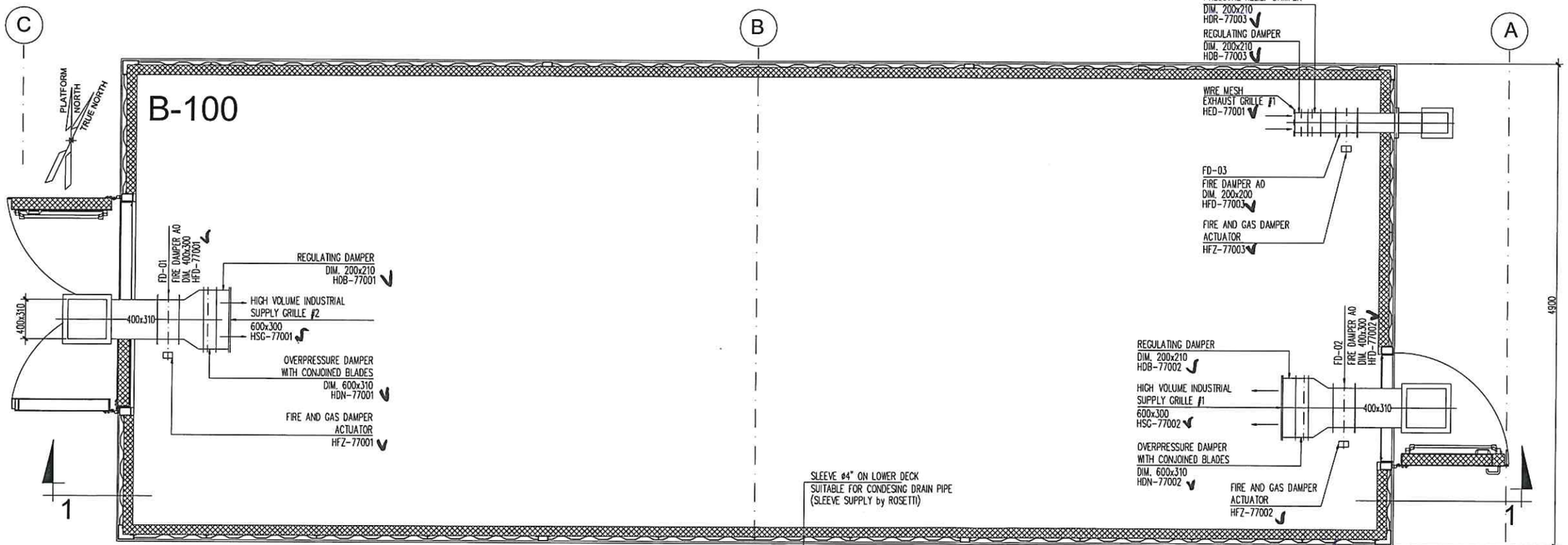
ROSETTI MARINO SpA
Stefano Linari 23/10/24
Quality Control Dept.

ALEX SISTEMI : Matteo Macchi

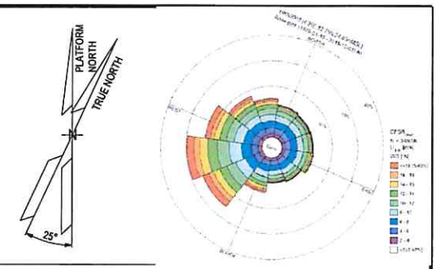
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SECTION 1-1

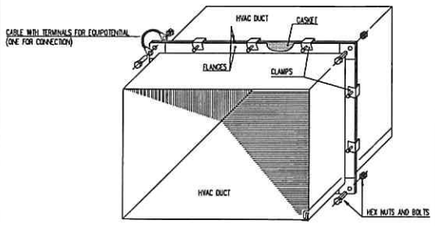


HVAC SYSTEM INDOOR DUCT LAYOUT



NOTES

Outdoor ductwork in stainless steel AISI 316L
Indoor ductwork in galvanized steel Z275



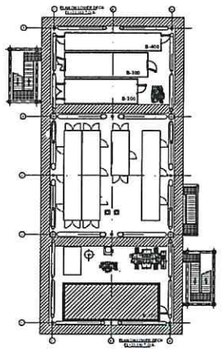
TYPICAL EQUIPOTENTIAL INSTALLING FOR FLANGE CONNECTION INDOOR AIR DUCT

Basket tray Power AISI 316L

Basket tray Instrument AISI 316L

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGTH (Kg)
01	HHU-77001	AIR HANDLING UNIT A	1250	850	900	140
02	HHU-77002	AIR HANDLING UNIT B	1250	850	900	140

KEY PLAN



ALEXSISTEMI

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	18/10/2024	M.G.	O.A.	C.A.	ISSUE FOR REVIEW (IFR)
00	13/06/2024	S.Z.	S.S.	M.G.	ISSUE FOR REVIEW (IFR)

CROSSWIND — ROSETTI MARINO

TITLE :
S.S.
MODULE B-100
HVAC SYSTEM – G.A. AND DETAILS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1 : 25
DRAWN M.G.	CHECKED O.A.	APPROVED C.A.	DATE 18/10/2024
A1	DRAWING NO. 1724000049-HV-DA-00064		SHEET 002 / REV. 01

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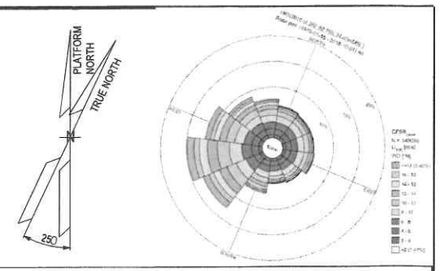
MASTER

ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
23/10/24

ALEX SISTEMI : Matteo Mocchi

DRAWING NO. 123A90-1724000049-HV-PID-00042 | REV. 02

BASE LOAD POWER HUB (BLPH)
B-400 I&IT EQUIPMENT ROOM
P&ID HVAC System



NOTES

LEGEND

HOLDS

frigotermica
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	04/10/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	11/06/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	12/04/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH) B-400 I&IT EQUIPMENT ROOM P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_??
DRAWN DRAWN_BY	CHECKED CHECKED_BY	APPROVED APPROVED_BY	DATE DD/MM/YY

A1	DRAWING NO. 123A90-1724000049-HV-PID-00042	SHEET 001	REV. 03

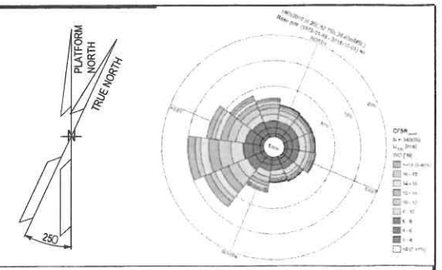
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DRAWING NO. 123A90-1724000049-HV-PID-00042

REV. 02

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
02	001	FRONT PAGE	IFR
02	002	SUMMARY and GENERAL NOTES	IFR
02	003	P&ID HVAC System	IFR

GENERAL NOTES



NOTES

LEGEND

HOLDS

frigotermica
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	04/10/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	11/06/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	12/04/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-400 I&IT EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1_:_??
DRAWN DRAWN_BY | CHECKED CHECKED_BY | APPROVED APPROVED_BY | DATE DD/MM/YY

A1 | DRAWING NO. 123A90-1724000049-HV-PID-00042 | SHEET 002 | REV. 03

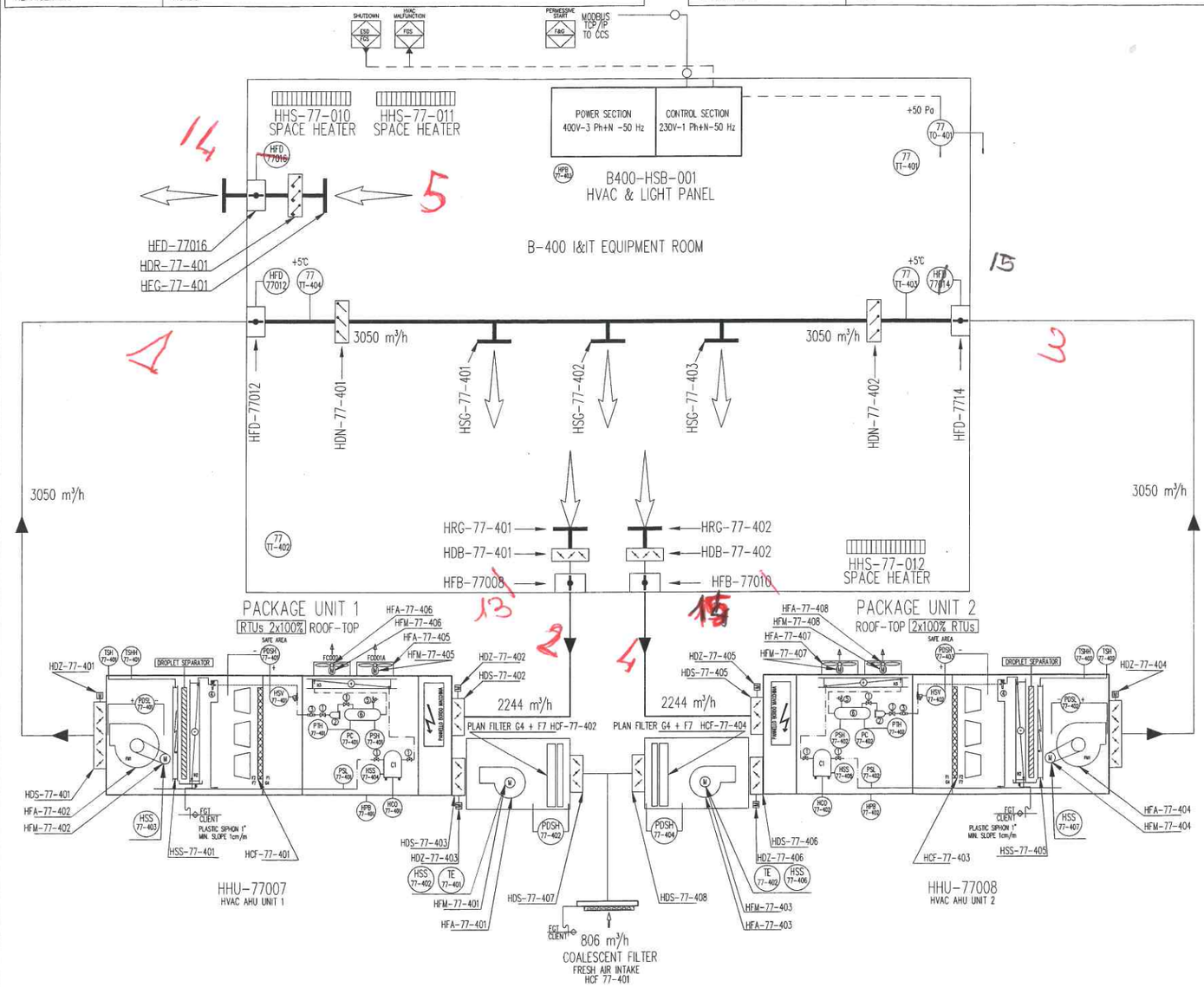
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DRAWING NO. 123A90-1724000049-HV-PID-00042

REV. 02

ITEM	HVAC-ROOF TOP
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-TBA
SUPPLY AIR FLOW	847,2 l/s
COOLING COIL CAPACITY	12 kW AT +26°C Outdoor Temperature
HEATING COIL CAPACITY	8.6 kW
TENSIONE	400 V - 50 Hz - 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	R513a

ITEM	HVAC-PRESSURISING FAN
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-TBA
SUPPLY AIR FLOW	224 l/s
COOLING COIL CAPACITY	N.A.
HEATING COIL CAPACITY	N.A.
TENSIONE	400 V - 50 Hz - 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	N.A.

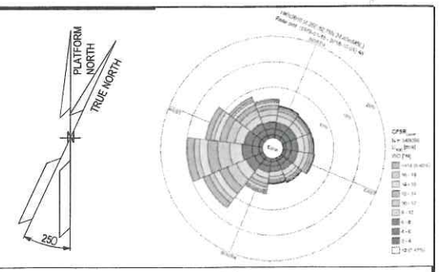


LEGEND	
	MOTORISED DAMPER WITH SPRING RETURN
	REGULATION DAMPER
	OVERPRESSURE DAMPER
	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE
	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE
	TEMPERATURE TRASMITTER
	EMERGENCY PUSH BUTTON
	COMPRESSOR OIL HEATER
	SOLENOID VALVE
	REFRIGERANT COMPRESSOR
F1	AIR FILTER "G4"
F2	BAG FILTER "F8"
	CONDENSING COIL
	CONDENSING FAN
	ELECTRICAL HEATER
	SUPPLY FAN
	GLOBE VALVE
	DRYER FILTER
	SIGHT GLASS
4	THERMOSTATIC VALVE
5	PRESSURE RELIEF VALVE
6	MOTORISED FIRE DAMPER WITH SPRING RETURN
	EVAPORATING COIL
	LIQUID RECEIVER
	MOISTURE TRASMITTER
PSH	HIG PRESSURE TRASDUCER
	COMPRESSOR THERMIC PROTECTION
TSH	SECURITI THERMOSTATE
PSH	HIGH PRESSURE SWITCH
PSL	LOW PRESSURE SWITCH
PS	CONDENSING PRESSURE SWITCH
HE	ELECTRICAL HEATING
KCR	REFRIGERANT COMPRESSOR
KD	MOTORISE DAMPER
TSH	VERY HIGH TEMPERATURE SECURITY THERMOSTATE
	PRESSURE RELIEF DAMPER

NOTES:
- HVAC POWER CABINET will energize what above shown.
- HVAC CONTROL CABINET will control all what above shown.
- HVAC POWER CABINET will energize light and socket.
- Outside drainage system shall be provided of heating cable with anti-freeze funcion to avoid ice inside pipes when outside temeprature reaches values close to 0°C.
- Outdoor air ductworks in stainless steel AISI 316

OUTDOOR DESIGN CONDITIONS
Safe Area
Min. design DB Temp: -8,4°C with RH 100 %
Max. design DB Temp: +25°C with RH 90 %

Module I&IT EQUIPMENT
Safe Area
Indoor min. design temperature: +5°C with RH 30 ÷ 70% ±5
Indor max. design temperature: +35°C with RH 30 ÷ 70% ±5
Min. ACH: 6



NOTES

LEGEND

HOLDS

frigotermica
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	04/10/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	11/06/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	12/04/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-400 I&IT EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1_:_??
DRAWN DRAWN_BY | CHECKED CHECKED_BY | APPROVED APPROVED_BY | DATE DD/MM/YY

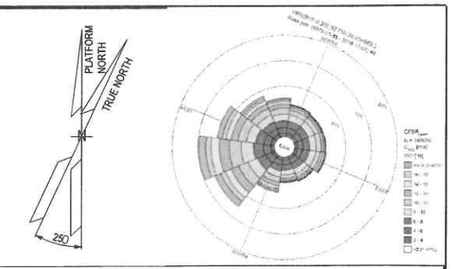
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File Name : 123A90-1724000049-HV-PID-00042

DRAWING NO. 123A90-1724000049-HV-PID-00041

REV. 02

BASE LOAD POWER HUB (BLPH)
B-300 AC UPS EQUIPMENT ROOM
P&ID HVAC System



NOTES

LEGEND

HOLDS

frigoclimica
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	04/10/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	11/06/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	12/04/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-300 AC UPS EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1_:_??

DRAWN DRAWN_BY | CHECKED CHECKED_BY | APPROVED APPROVED_BY | DATE DD/MM/YY

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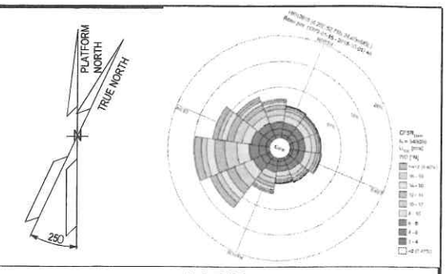
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DRAWING NO. 123A90-1724000049-HV-PID-00041

REV. 02

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
02	001	FRONT PAGE	IFR
02	002	SUMMARY and GENERAL NOTES	IFR
02	003	P&ID HVAC System	IFR

GENERAL NOTES



NOTES

LEGEND

HOLDS

frigoclimatica
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	04/10/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	11/06/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	12/04/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-300 AC UPS EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK				SCALE 1_:_??
DRAWN DRAWN_BY	CHECKED CHECKED_BY	APPROVED APPROVED_BY		DATE DD/MM/YY
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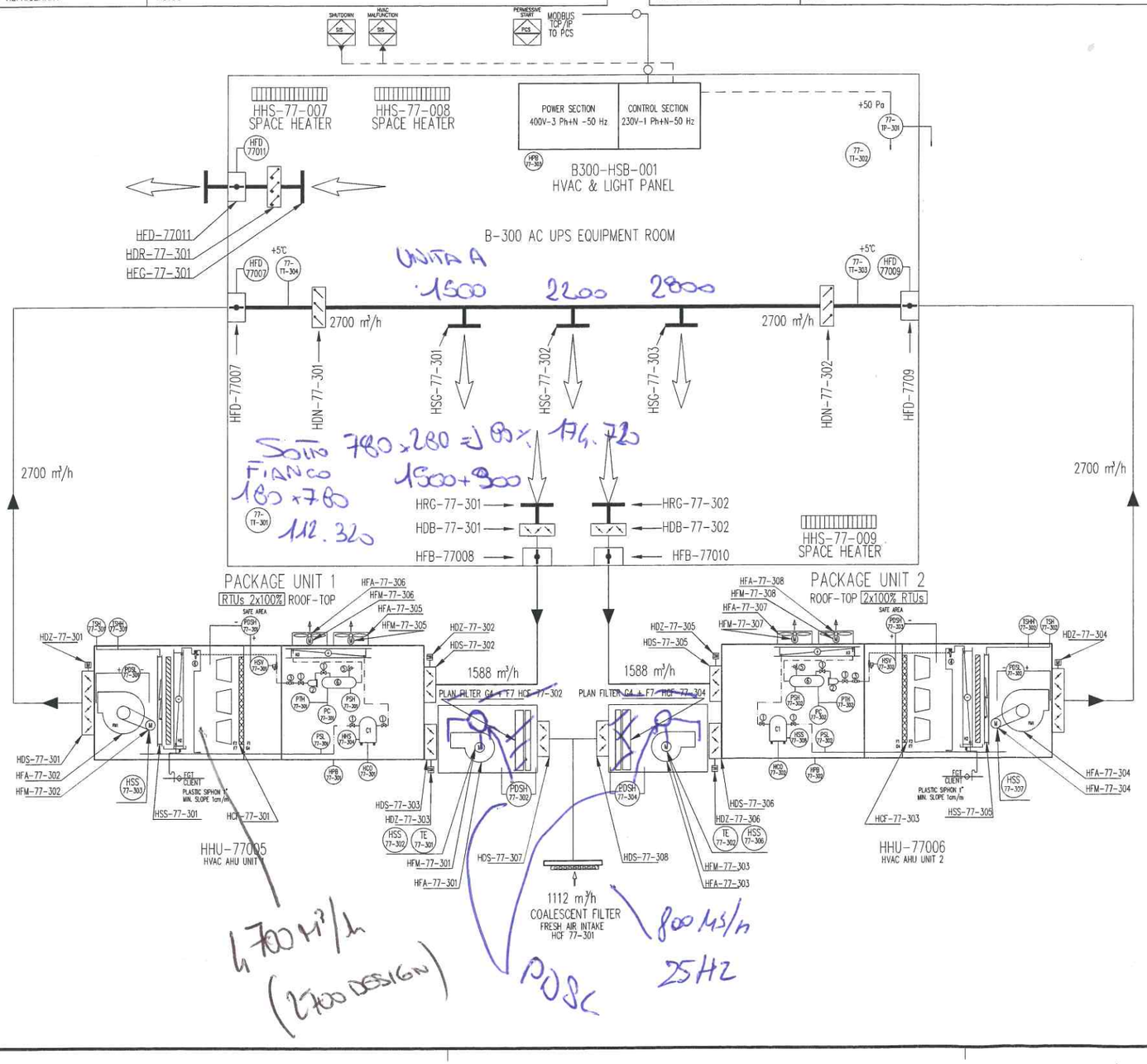
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DRAWING NO. 123A90-1724000049-HV-PID-00041

REV. 02

ITEM	HVAC-ROOF TOP
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-TBA
SUPPLY AIR FLOW	750 l/s
COOLING COIL CAPACITY	12 kW AT +26°C Outdoor Temperature
HEATING COIL CAPACITY	6 kW
TENSIONE	400 V - 50 Hz - 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	R513a

ITEM	HVAC-PRESSURISING FAN
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-TBA
SUPPLY AIR FLOW	281 l/s
COOLING COIL CAPACITY	N.A.
HEATING COIL CAPACITY	N.A.
TENSIONE	400 V - 50 Hz - 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	N.A.



LEGEND	
	MOTORISED DAMPER WITH SPRING RETURN
	REGULATION DAMPER
	OVERPRESSURE DAMPER
PDSH	DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE
PDSL	DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE
TT	TEMPERATURE TRASMITTER
EPB	EMERGENCY PUSH BUTTON
OH	COMPRESSOR OIL HEATER
SV	SOLENOID VALVE
C	REFRIGERANT COMPRESSOR
F1	AIR FILTER "G4"
F2	BAG FILTER "F8"
	CONDENSING COIL
	CONDENSING FAN
	ELECTRICAL HEATER
	SUPPLY FAN
	GLOBE VALVE
	DRYER FILTER
	SIGHT GLASS
4	THERMOSTATIC VALVE
5	PRESSURE RELIEF VALVE
6	MOTORISED FIRE DAMPER WITH SPRING RETURN
	EVAPORATING COIL
	LIQUID RECEIVER
MT	MOISTURE TRASMITTER
PT	HIG PRESSURE TRASDUCER
TP	COMPRESSOR THERMIC PROTECTION
TSH	HIGH TEMPERATURE SECURITY THERMOSTATE
PSH	HIGH PRESSURE SWITCH
PSL	LOW PRESSURE SWITCH
PC	CONDENSING PRESSURE SWITCH
HER	ELECTRICAL HEATING
RC	REFRIGERANT COMPRESSOR
MD	MOTORISE DAMPER
VHT	VERY HIGH TEMPERATURE SECURITY THERMOSTATE
	PRESSURE RELIEF DAMPER

NOTES:

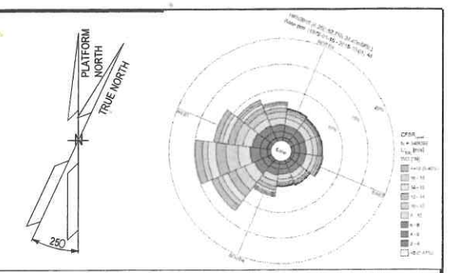
- HVAC POWER CABINET will energize what above shown.
- HVAC CONTROL CABINET will control all what above shown.
- HVAC POWER CABINET will energize light and socket.
- Outside drainage system shall be provided of heating cable with anti-freeze funcion to avoid ice inside pipes when outside temeprature reaches values close to 0°C.
- Outdoor air ductworks in stainless steel AISI 316

OUTDOOR DESIGN CONDITIONS

Safe Area
Min. design DB Temp: -8,4°C with RH 100 %
Max. design DB Temp: +25°C with RH 90 %

Module AC UPS Equipment Room

Safe Area
Indoor min. design temperature: +5°C with RH 30 ÷ 70% ±5
Indor max. design temperature: +35°C with RH 30 ÷ 70% ±5
Min. ACH: 6



NOTES

LEGEND

HOLDS

frigotermica
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	04/10/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	11/06/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	12/04/24	F.M.	S.Z.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

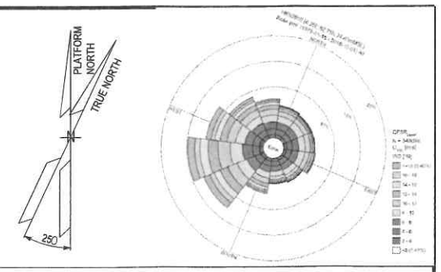
TITLE : BASE LOAD POWER HUB (BLPH)
B-300 AC UPS EQUIPMENT ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1_:_??
DRAWN DRAWN_BY | CHECKED CHECKED_BY | APPROVED APPROVED_BY | DATE DD/MM/YY
A1 | DRAWING NO. 123A90-1724000049-HV-PID-00041 | SHEET 003 | REV. 03

File Name : 123A90-1724000049-HV-PID-00041

DRAWING NO. 123A90-1724000049-HV-PID-00040 | REV. 02

BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
P&ID HVAC System



NOTES

LEGEND

HOLDS

frigoltermica
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	02/10/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	11/06/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	12/04/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1_:_??
DRAWN DRAWN_BY | CHECKED CHECKED_BY | APPROVED APPROVED_BY | DATE DD/MM/YY

A1 | DRAWING NO. 123A90-1724000049-HV-PID-00040 | SHEET 001 | REV. 03

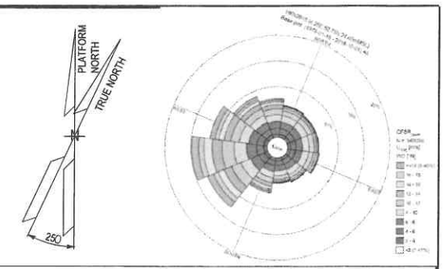
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DRAWING NO. 123A90-1724000049-HV-PID-00040

REV. 02

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
02	001	FRONT PAGE	IFR
02	002	SUMMARY and GENERAL NOTES	IFR
02	003	P&ID HVAC System	IFR

GENERAL NOTES



NOTES

LEGEND

HOLDS

Frigoclimca HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN.	CHKD	APPD	DESCRIPTION
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2	11/06/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
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0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_??
DRAWN DRAWN_BY	CHECKED CHECKED_BY	APPROVED APPROVED_BY	DATE DD/MM/YY
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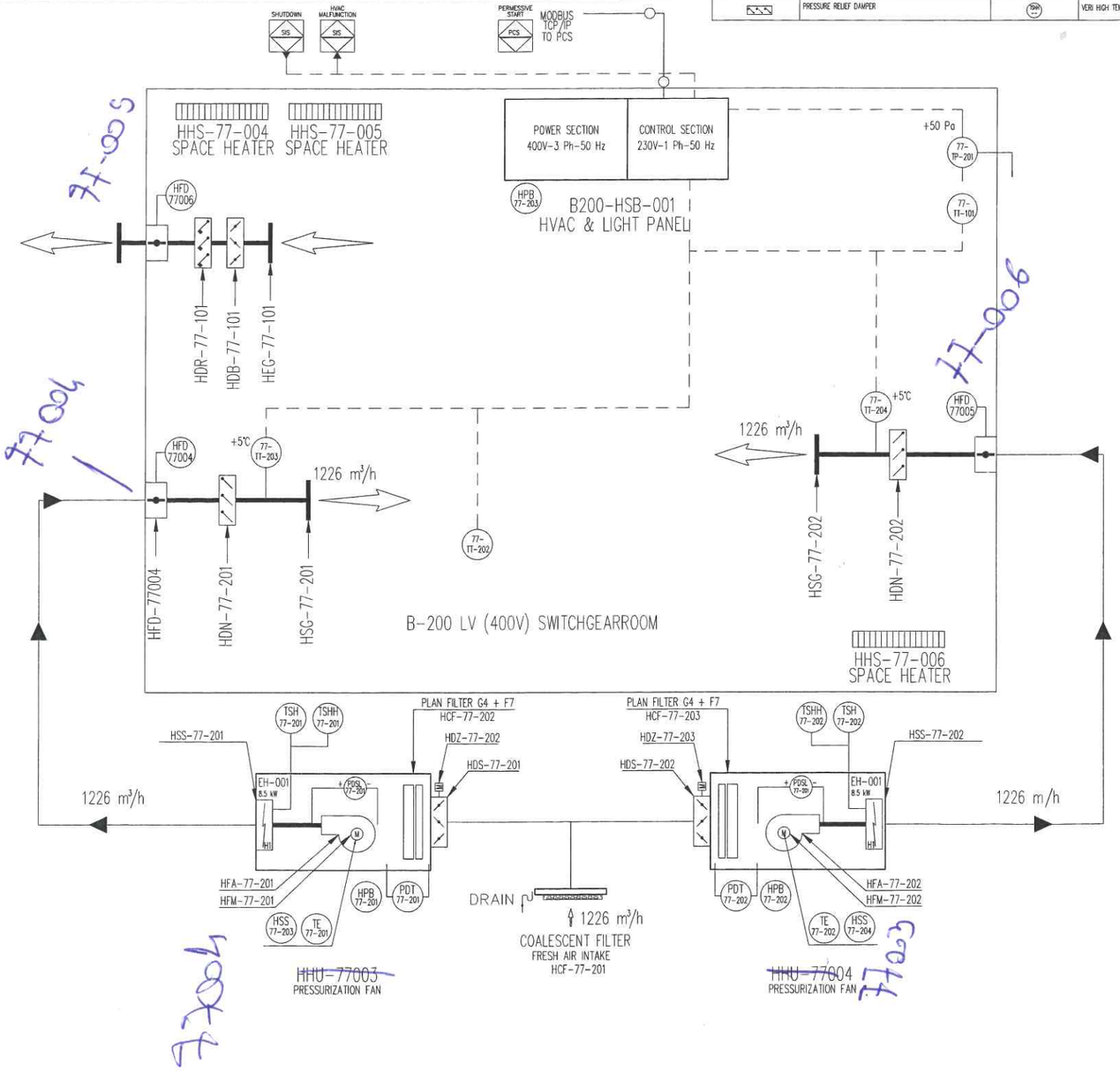
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DRAWING NO. 123A90-1724000049-HV-PID-00040 REV. 02

ITEM	HVAC-PRESSURISING FAN
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-TBA
SUPPLY AIR FLOW	1226 mc/h
COOLING COIL CAPACITY	N.A.
HEATING COIL CAPACITY	8.5 kW
TENSIONE	400 V - 50 Hz - 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	N.A.

LEGENDA

MOTORISED DAMPER WITH SPRING RETURN	F1	AIR FILTER "G4"	MOTORISED FIRE DAMPER WITH SPRING RETURN
REGULATION DAMPER	F2	BAG FILTER "F8"	EVAPORATING COIL
OVERPRESSURE DAMPER		CONDENSING COIL	
DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE		CONDENSING FAN	
DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE		ELECTRICAL HEATER	LIQUID RECEIVER
TEMPERATURE TRASMITTER		SUPPLY FAN	MOISTURE TRASMITTER
EMERGENCY PUSH BUTTON		GLOBE VALVE	HIG PRESSURE TRASDUCER
COMPRESSOR OIL HEATER		DRYER FILTER	COMPRESSOR THERMIC PROTECTION
SOLENOID VALVE		SIGHT GLASS	HIGH TEMPERATURE SECURITY THERMOSTATE
REFRIGERANT COMPRESSOR		THERMOSTATIC VALVE	HIGH PRESSURE SWITCH
PRESSURE RELIEF DAMPER		PRESSURE RELIEF VALVE	LOW PRESSURE SWITCH
		VERI HIGH TEMPERATURE SECURITY THERMOSTATE	CONDENSING PRESSURE SWITCH



OUTDOOR DESIGN CONDITIONS

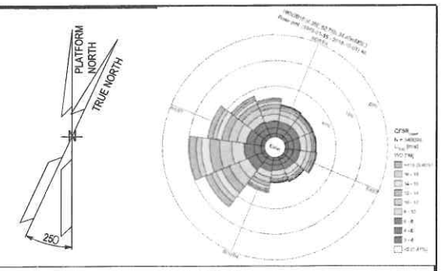
Safe Area
Min. design DB Temp: -8,4°C with RH 100 %
Max. design DB Temp: +25°C with RH 90 %

Module LV (400V)

Safe Area
Indoor min. design temperature: +5°C with RH 30 ÷ 70% ±5
Indor max. design temperature: +35°C with RH 30 ÷ 70% ±5
Min. ACH: 6

NOTES:

- HVAC POWER CABINET will energize what above shown.
- HVAC CONTROL CABINET will control all what above shown.
- HVAC POWER CABINET will energize light and socket.
- Outside drainage system shall be provided of heatng cable with anti-freeze funcion to avoid ice inside pipes when outside temeprature reaches values close to 0°C.
- Outdoor air ductworks in stainless steel AISI 316



NOTES

LEGEND

HOLDS

frigotermica HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	02/07/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	11/06/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	12/04/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-200 LV SWITCHROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1_:_-??
DRAWN DRAWN_BY | CHECKED CHECKED_BY | APPROVED APPROVED_BY | DATE DD/MM/YY

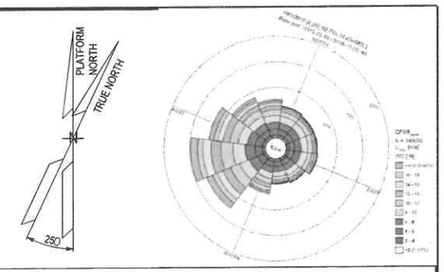
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File Name : 123A90-1724000049-HV-PID-00040

DRAWING NO. 123A90-1724000049-HV-PID-00039

REV. 02

BASE LOAD POWER HUB (BLPH)
B-100 HV Switch Room
P&ID HVAC System



NOTES

LEGEND

HOLDS

frigoclimaca
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	02/10/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	02/07/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_??
DRAWN DRAWN_BY	CHECKED CHECKED_BY	APPROVED APPROVED_BY	DATE DD/MM/YY
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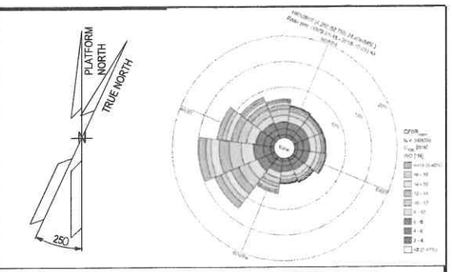
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DRAWING NO. 123A90-1724000049-HV-PID-00039

REV. 01

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
01	001	FRONT PAGE	IFR
01	002	SUMMARY and GENERAL NOTES	IFR
01	003	P&ID HVAC System	IFR

GENERAL NOTES



NOTES

LEGEND

HOLDS

frigoclimica
HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	02/10/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	02/07/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_??
DRAWN DRAWN_BY	CHECKED CHECKED_BY	APPROVED APPROVED_BY	DATE DD/MM/YY
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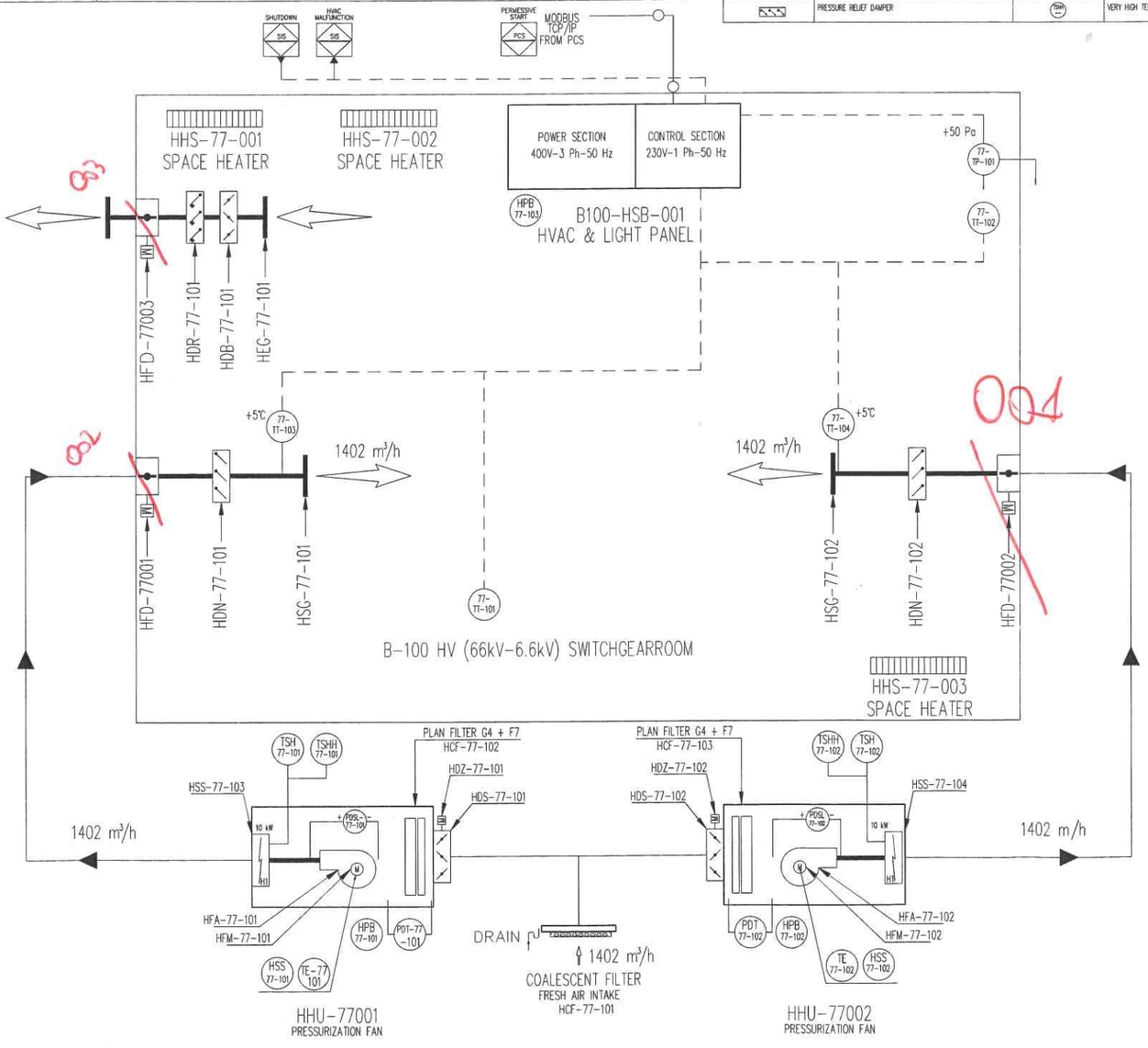
File Name : 123A90-1724000049-HV-PID-00039

DRAWING NO. 123A90-1724000049-HV-PID-00039 REV. 01

ITEM	HVAC-PRESSURISING FAN
DESCRIPTION	HVAC UNIT
MAKER	FRIGOTERMICA srl
MODEL	4112-TBA
SUPPLY AIR FLOW	360 l/s
COOLING COIL CAPACITY	N.A.
HEATING COIL CAPACITY	11 kW
TENSIONE	400 V - 50 Hz - 3 Ph+N
EXECUTION	SAFE AREA
REFRIGERANT	N.A.

LEGENDA

MOTORISED DAMPER WITH SPRING RETURN	F1	AIR FILTER "G4"	MOTORISED FIRE DAMPER WITH SPRING RETURN
REGULATION DAMPER	F2	BAG FILTER "F8"	EVAPORATING COIL
OVERPRESSURE DAMPER		CONDENSING COIL	
DIFFERENTIAL PRESSURE SWITCH HIGH PRESSURE		CONDENSING FAN	
DIFFERENTIAL PRESSURE SWITCH LOW PRESSURE		ELECTRICAL HEATER	LIQUID RECEIVER
TEMPERATURE TRASMITTER		SUPPLY FAN	MOISTURE TRASMITTER
EMERGENCY PUSH BUTTON		GLOBE VALVE	HIG PRESSURE TRASDUCER
COMPRESSOR OIL HEATER		DRYER FILTER	COMPRESSOR THERMIC PROTECTION
SOLENOID VALVE		SIGHT GLASS	SECURITI THERMOSTATE
REFRIGERANT COMPRESSOR		THERMOSTATIC VALVE	HIGH PRESSURE SWITCH
PRESSURE RELIEF DAMPER		PRESSURE RELIEF VALVE	LOW PRESSURE SWITCH
		VERY HIGH TEMPERATURE SECURITY THERMOSTATE	CONDENSING PRESSURE SWITCH



OUTDOOR DESIGN CONDITIONS

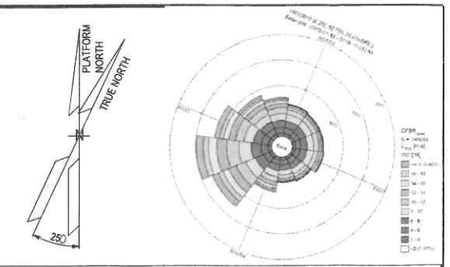
Safe Area
Min. design DB Temp: -8,4°C with RH 100 %
Max. design DB Temp: +25°C with RH 90 %

Module hv (66 kV-6.6 kV)

Safe Area
Indoor min. design temperature: +5°C with RH 30 ÷ 70% ±5
Indor max. design temperature: +35°C with RH 30 ÷ 70% ±5
Min. ACH: 6

NOTES:

- HVAC POWER CABINET will energize what above shown.
- HVAC CONTROL CABINET will control all what above shown.
- HVAC POWER CABINET will energize light and socket.
- Outside drainage system shall be provided of heatng cable with anti-freeze funcion to avoid ice inside pipes when outside temeprature reaches values close to 0°C.
- Outdoor air ductworks in stainless steel AISI 316



NOTES

LEGEND

HOLDS

frigotermica HVAC SYSTEM and EQUIPMENT

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	02/10/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
2	02/07/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
1	10/06/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)
0	13/03/24	S.Z.	S.S.	M.G.	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
B-100 HV SWITCH ROOM
P&ID HVAC System

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1_:_??
DRAWN DRAWN_BY | CHECKED CHECKED_BY | APPROVED APPROVED_BY | DATE DD/MM/YY
A1 | DRAWING NO. 123A90-1724000049-HV-PID-00039 | SHEET 003 | REV. 02

File Name : 123A90-1724000049-HV-PID-00039

ROSETTI MARINO CROSSWIND

Project: **HOLLANDSE KUST NOORD WIND PARK**

JOB Nr.***123A90***

TEST / INSPECTION NOTIFICATION

Nr.: 004

Date: 19/10/2024

For Test details please refer to the following information:

☐ **INTERMEDIATE TEST** X☐ **FINAL TEST**

(double click on the squares to choose one option)

General data

PURCHASE ORDER:	PO 1724000049
SUPPLIER / VENDOR:	Alex Sistemi
ITEM / SUPPLY DESCRIPTION:	HV - B100 / LV - B200 / AC-UPS – B300 / I&T – B400
KIND OF TEST / INSPECTION:	Factory Acceptance Test completion + SAT final
TEST / INSPECTION DATE:	From 23/10/2024 To 25/10/2024
STARTING TIME/DURATION:	9:00
LOCATION:	Yard Piomboni – BLPH Deck
PERSON IN CHARGE:	Stefano Linari / Luca Caviglia / Kristian Castellani / Alex Sistemi / Frigotermica
PHONE NR.:	+39.349/7576678
E-MAIL:	Stefano.linari@rosetti.it

Applicable documentation

TECH. SPEC or DWG'S Nr.:	Rev.
	Rev.
	Rev.
	Rev.
	Rev.
QCP Nr:	Rev.
QCP'S STEPS:	

ADDITIONAL INFO: Docs Ref:

1724000049-COM-PRO-00057 - COMMISSIONING PROCEDURE - E&I SHELTERS

1724000049-QC-PRO-00056 - FAT PROCEDURE - E&I SHELTERS

Prepared by: Stefano Linari Date: 19/10/2024

ROSETTI MARINO

Base Load Power Hub (BLPH)

Punch List Entry Form

CROSSWIND

Sub-system code:

Sub-system description: EQI Shelters B100 / B200 / B300 / B400

Date: 30/10/2024

Category "A" → Items to be cleared before the issuance of the RFCC (Ready for Commissioning Certificate).

Category "B" → Items to be cleared before the issuance of the RFOC (Ready For Operations Certificate).

Item N.	Check sheet ref.	Disc.	Tag Number	Raised By	Defect Description / Corrective Action	Attachments	Cat.	Action By	Duty Phase	Deadline date
1.	B-100 SAT Report	HVAC	HFZ-77001	Linari	Damper actuator is out of order. During SAT activities the actuator did not open the fire and gas damper. Action: it must be replaced.	1724000049-QC-PRO-00056	B	Alex Sistemi		25/11/2024
2.	B-300, B-400 SAT Reports	HVAC	HHS-77-304 HHS-77-308 HHS-77-404 HHS-77-408	Linari	Confirm with the compressor manufacturer whether starting the compressor without preheating the oil could cause damage. Action: based on the manufacturer's response, either take no action or ensure the electric heater is powered by a UPS. If electric heaters are needed, check the feasibility of supplying an amperometric transformer to monitor their absorbed currents.	1724000049-QC-PRO-00056	A	Alex Sistemi		25/11/2024
3.	All SAT Reports	HVAC	Earthing cables inside HVAC panel B10/B200/B300/B400	Linari	Heat shrinks for grounding inside HVAC panel installed of black color instead of yellow-green color as earthing cable itself. Action: Heat shrink tubing to be replaced of yellow-green color type as earthing cable.	1724000049-QC-PRO-00056	B	Alex Sistemi		25/11/2024
4.	All SAT Reports	HVAC	All PLCs	Linari	Add an auxiliary IP address in addition to those already provided for each CPU, to allow communication and signals exchange between HVAC PLCs and PCS System via Modbus also in case of shutdown of a single CPU. Currently, if a CPU goes offline, Modbus communication is interrupted as switching to the standby CPU is not possible; the PCS system can communicate with only one IP address per HVAC panel board. Action: Update software on all PLCs to enable switching to the standby CPU without losing the necessary communications.	1724000049-QC-PRO-00056	B	Alex Sistemi		25/11/2024
5.	All SAT Reports	HVAC	All PLCs	Linari	Install Ethernet port locks on HVAC panels to prevent access by external devices without an authorized permit, as requested by the cybersecurity team. Action: Add Ethernet port locks to all HVAC panel boards.	1724000049-QC-PRO-00056	A	Alex Sistemi		25/11/2024

6.	All SAT Reports	HVAC	All PLCs	Linari	The Modbus I/O Lists have been updated during SAT, due to changes needed. During SAT activities several signals have not been checked. Action: Revise and issue on Fusion Live the HVAC I/O List documents for each HVAC panel. Before commissioning activities, all signals shall be tested one by one at Rosetti yard.	1724000049-QC-PRO-00056	A	Alex Sistemi		25/11/2024
7.	All SAT Reports	HVAC	All HMIs	Linari	Verify for each HVAC panel a perfect correspondence between TAG reported on P&IDs and HMIs. During SAT some TAGs were not matching. Action: Update and issue final P&IDs on Fusion Live and update PLC software to have a perfect match between P&IDs and HMIs.	1724000049-QC-PRO-00056	B	Alex Sistemi		25/11/2024
8.	All SAT Reports	HVAC	All shelters	Linari	During SAT drainage pipes were not completely installed, included heat tracing and related connection to JB. Action: The work described has to be concluded. During commissioning heat tracing will be tested.	1724000049-QC-PRO-00056	B	Alex Sistemi	Closed 31/10/2024 ROSETTI MARINO SpA Stefano Linari Quality Control Dept.	
9.	All SAT Reports	HVAC	HDR-77-101 HDR-77-201 HDR-77-301 HDR-77-401	Linari	None pressure relief damper work properly as per design conditions. They remain closed even though inside the shelters more then 50 Pa have been measured during SAT through the differential pressure transmitters (with fans running). SAT was conducted by manually positioning the dampers as they should appear when operating correctly (slightly open). Action: Investigate the malfunction with the manufacturer and take corrective actions to adjust or replace the pressure relief dampers.	1724000049-QC-PRO-00056	B	Alex Sistemi		25/11/2024
10.	All SAT Reports	HVAC	All HMIs	Linari	Make temperature and differential pressure trends visible on all HMIs. Action: Update PLC software to apply the request.	1724000049-QC-PRO-00056	A	Alex Sistemi		25/11/2024
11.	All SAT Reports	HVAC	All doors	Linari	Several doors present a not perfect closure on the three deadbolts, probably due to a misalignment. Action: Check the doors and fix the closure issue. This activity could be done during commissioning activities.	1724000049-QC-PRO-00056	B	Alex Sistemi		25/11/2024

12	All SAT Reports	HVAC	Drainage pipes and heating cables	Linari	Since the drainage pipe and heating cable datasheets have not yet been sent to RM, the suitability of the materials used cannot be verified. The installed drainage pipe (PVC type and Plastic ties) must be able to withstand the maximum temperature reached by the heating cable. Action: Submit both the drainage pipe and heating cable datasheets (by inserting them in HVAC COMPONENTS LIST AND DS - E&I SHELTERS and ELECTRICAL COMPONENTS LIST AND DS - E&I SHELTERS, for each shelter), clearly indicating the maximum temperature of the heating cable and the maximum temperature tolerance of the plastic drainage pipe. All system is not tested , will be tested during comm phase	1724000049-QC-PRO-00056	A	Alex Sistemi		25/11/2024
13	All SAT Reports	HVAC	Detail Design Documentation	Linari	Most of the documentation is still in draft form. All documents must be finalized and approved by RM before commissioning activities. During revision, all mark-ups made during SAT must be applied. Action: Review and issue all documentation by 15/11/2024 to allow for finalization by the end of November 2024, accounting for the time required by RM to review these documents. * Including last modification in each panel Related to Emergency lighting	1724000049-QC-PRO-00056	A	Alex Sistemi		15/11/2024

Raised by
Contractor / Subcontractor: _____

Checked by
Contractor QA/QC: ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.
30/10/2024

Accepted by
COMPANY: _____

ALEX SISTEMI : Matteo Mondini

ROSETTI MARINO

Base Load Power Hub (BLPH)

Punch List Entry Form

CROSSWIND

Sub-system code:

Sub-system description:

Date: 31/07/2024

Category "A" ⊘ Items to be cleared before the issuance of the RFCC (Ready for Commissioning Certificate).

Category "B" ⊘ Items to be cleared before the issuance of the RFOC (Ready For Operations Certificate).

Category "C" ⊘ Items to be cleared before Sail Away.

Item N.	Check sheet ref.	Disc.	Tag Number	Raised By	Defect Description / Corrective Action	Attachments	Cat.	Action By	Duty Phase	Deadline date
1.	/	MECH	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Handles fixed on external doors, are made by plastic material. Temporary key cylinder and handles to be replaced with ones made by SS material (AISI 316L) To be done at RM yard		B	Alex Sistemi		25/11/2024
2.	/	MECH	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Master key (common for all modules) to be provided		B	Alex Sistemi	Closed 23/10/24 ROSETTI MARINO SpA Stefano Linari Quality Control Dept.	
3.	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Roof-top cables to be fixed with cable ties made by AISI 316L		B	RM		02/11/2024
4.	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Earthing connection to be provided for all space heaters To be done at RM yard		B	Alex Sistemi	Closed 23/10/24 ROSETTI MARINO SpA Stefano Linari Quality Control Dept.	
5.	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Earthing connection to be provided for all HVAC units To be done at RM yard		B	Alex Sistemi	Closed 23/10/24 ROSETTI MARINO SpA Stefano Linari Quality Control Dept.	
6.	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Identification trafolite tag to be provided for all E&I Items (lights, switch, space heaters, etc.) All trafolyte labels missing will be installed at RM yard		B	Alex Sistemi	ROSETTI MARINO SpA Stefano Linari Quality Control Dept.	Closed 23/10/2024
7.	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	HVAC cable tags to be provided on the panel top. Alex Sistemi will supply all loose cable tags. RM will install it		B	~~Alex Sistemi/~~ RM		02/11/2024

8.	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Cable's tag to be provided / fixed at all MCTs (IN/OUT) Alex Sistemi will supply all loose cable tags. RM will install it		B	~~Alex~~ Sistemi/ RM		02/11/24
9.	/	MECH	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Some brass cable glands are overtightened and need to be untightened to avoid cold flow of cables Will be performed a spot check at RM yard		B	Alex Sistemi	Closed 23/10/24 ROSETTI MARINO SpA Stefano Linari Quality Control Dept.	
10.	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	HVAC fixed with screws M8. To be replaced with correct ones, as per drawing Alex Sistemi will supply all final screws. RM will install it during re installation of HVAC		B	Alex Sistemi/ RM	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 29/10/24	
11.	/	HVAC	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	All documentation listed in the SMIR, shall be re issued in final revision and approved by RM and CW		B	Alex Sistemi		
12.	/	HVAC	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	The items to be installed at RM site are coalescent filters and fire dampers. To be completed at RM yard		B	Alex Sistemi	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 29/10/2024	
13.	/	HVAC	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	HVAC Systems to be partially checked on sitefor B-100 and B-200 and completely for B-300and B-400. During FAT activities were tested few logics for B-100 and B-200 HVAC panels: unit changeover (due to fault), space heaters switch-on, overpressure maintaining through VSD control, temperature and differential pressure values reading on HMI). B-300 and B-400 HVAC unitsmust be completed yet. All notes/remarks are indicated in the FAT procedures and reports		B	Alex Sistemi	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 23/10/24	
14.	/	HVAC	~~B-100 / B-200~~ B-300 / B-400	ROSETTI MARINO	B-300 and B-400 HVAC Unit wirings must be completed. To be completed at RM yard		B	Alex Sistemi	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 29/10/24	

15.	/	HVAC	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	TAG on front panels to be updated following last document revisions. In general, all TAG labels to be completely checked; several are missing. All trafolyte labels missing will be installed at RM yard		B	Alex Sistemi	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 23/10/24
16	/	HVAC	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	All balancing and setting activities to be done on site. It was not possible during FAT due to HVAC system installation not completed. All notes/remarks are indicated in the FAT procedures and reports		B	Alex Sistemi	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 23/10/24
17	/	HVAC	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Drainpipes and heating cables are missing, since they must be necessary installed on site to avoid damages. To be completed at RM yard		B	Alex Sistemi	see PL 30/10/2024
18	/	HVAC	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Duct insulation and cladding to be completed on site; it's needed to cover all duct junctions. Alex Sistemi will supply all material RM will install it during re installation of HVAC.		B	Alex Sistemi/ RM	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 23/10/24
19	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Earthing connection to be provided for all electrical conduits. Alex Sistemi will supply all material RM will install it		B	Alex Sistemi/ RM	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 23/10/24
20	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	Teflon to be provided between different materials for Hvac ducts unistrut and supports * (Actions performed by RM)		B	Alex Sistemi	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 23/10/24
21	/	ELE	B-100 / B-200 B-300 / B-400	ROSETTI MARINO	External ducts (inside) welding to be cleaning before re installation		B	RM	ROSETTI MARINO SpA Stefano Linari Quality Control Dept. Closed 23/10/24

Raised by
Contractor / Subcontractor: _____

Checked by
Contractor QA/QC: _____ ROSETTI MARINO SpA Stefano Linari Quality Control Dept.

01-08-24
ALEXSISTEMI
Olimpo Alvisati
31/07/2024

Accepted by
COMPANY: _____ × CROSSWIND
1/08/24

30/10/2024
ROSETTI MARINO SpA
Stefano Linari
Quality Control Dept.

P1/1

ALEX SISTEMI : Matteo Lecchi

Base Load Power Hub (BLPH)

Weld Procedure Specifications (WPS), Weld Procedure Qualification Report (WPQR), Welding Map and Welders Qualifications - E&I SHELTERS

Document Number: 1724000049-WEL-RE-00003

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
D.CENACCHI	31/05/2024

Rev.	Date	Description	Prepared	Reviewed	Approved
03	30/05/2024	Accepted for Construction (AFC)	AD	SK	CA
02	22/04/2024	Accepted for Construction (AFC)	AD	SK	CA
01	26/03/2024	Issue for Review (IFR)	AD	SK	CA
0	19/02/2024	Issue for Review (IFR)	AD	SK	CA

ALEXSISTEMI spa

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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Accepted for Construction (AFC)
03	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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Attachment 1

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

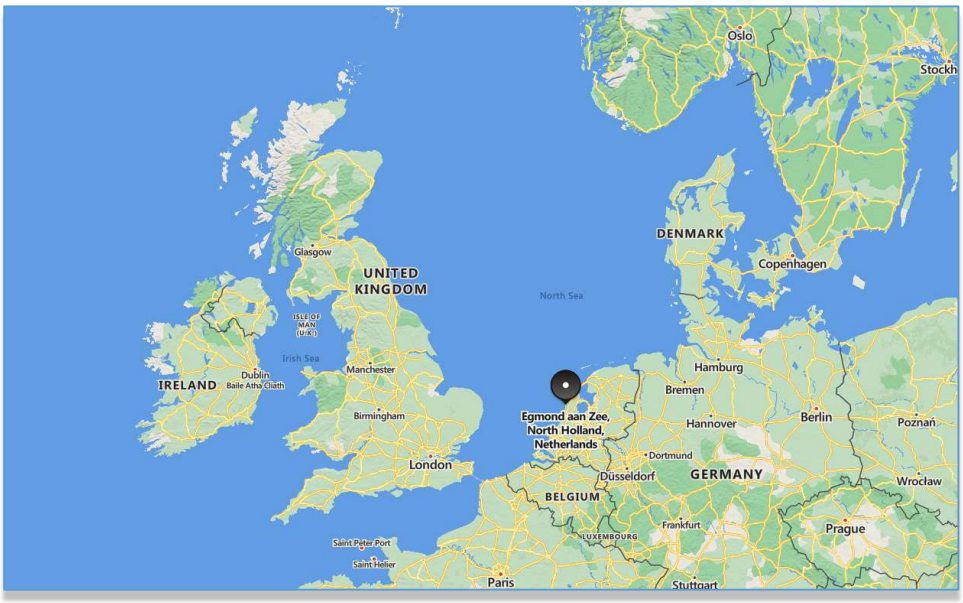


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

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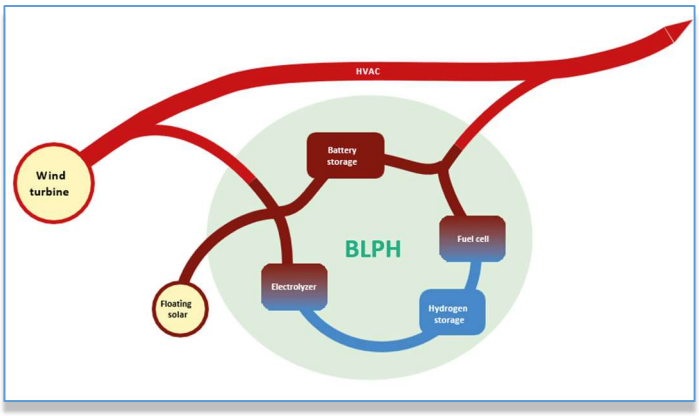


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

The scope of this document is to provide the criteria and the operating ways to verify the quality of the welding in the shelter.The purpose is to give objective evidence that all design and specification requirements related to welding are correctly understood, accounted for, verified and recorded.

2.1 REFERENCES

Doc. No.	Discription
123A90-DDL-AR-MR-10026	Material Requisition for AC UPS fitted with UPS system Equipment Room B-300
123A90-DDL-AR-MR-10019	Material Requisition for I&T Equipment Room B-400
123A90-DDL-AR-MR-10012	Material Requisition for LV (400V) Switchroom
123A90-DDL-AR-MR-10005	Material Requisition for HV-MV (66kV-6.6kV) Switchroom B-100
AWS D1.1 ED 2020	Structural Welding Code - Steel
EEMUA 197	Specitication for the fabrication of NON PRIMARY structural

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
CA	Certification Agency
DS	Surveyor
EXP	Expediting dept.
LOG	Logistic Dept.
NDE	Non Destructive Examination
PQR	Procedure Qualification Record
QC	Quality Control Dept.

QCI	Quality Control Inspector
SC	Sub-contractor
WI	Welding Inspector
WLD	Welding Dept.
WQR	Welder Qualification Record
WPS	Welding Procedure Specification

Table 2 - Definitions and Abbreviations

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3 SUMMARY

3.1 PQR

3.2 WELDERS WPQS

3.3 PRODUCTION WPS

3.4 WELDING IDENTIFICATION MAP

3.5 DRAWINGS

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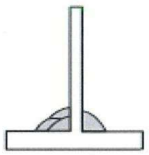
3.1 PQR (According AWS D1.1 also EEMUA 197-EEMUA 158)

ALEX SISTEMI SPA	PROCEDURE QUALIFICATION RECORD PQR according AWS D1.1/D1.1-2020 Annex M – FORM M-1 (Front)	PQR N° RS 07 Rev. 0 WPS N° RS 07	Sheet 1 of 2 Date: 22/02/2022

Base Metals	Specification	Type or Grade	AWS Group N.	Thickness (mm)	Size (NPS)	Schedule	Diameter (mm)
Base Material	EN 10025-2	S355J2+N	N.A.	6			
Welded To	EN 10025-2	S355J2+N	N.A.	6			
Backing Material							
Other							

JOINT DETAILS	
Groove Type	Fillet weld
Groove Angle	0
Root Opening	
Root Face	
Backgouging	
Method	

JOINT DETAILS (sketch)



POST WELD HEAT TREATMENT	
Temperature	N.A.
Time and Temperature	N.A.
Other	

PROCEDURE						
Weld Layer (s)	1	All				
Weld Pass (es)	1	1 to 3				
Process	GMAW	GMAW				
Type (*semiautomatic, Mechanized, etc.*)	Semi-automatic	Semi-automatic				
Position	4F	4F				
Vertical Progression	N.A.	N.A.				
Filler Metal (AWS Spec.)	A5.18	A5.18				
AWS Classification	ER70S-6	ER70S-6				
Diameter	1.2	1.2				
Manufacturer / Trade Name	ELB-SG2	ELB-SG2				
Shielding Gas Composition	Ar: 80% CO2: 20%	Ar: 80% CO2: 20%				
Flow Rate (L/min)	14÷16	14÷16				
Nozzle Size	-	-				
Preheat Temperature	10 °C	10 °C				
Interpass Temperature	N.A.	≤ 200°C				
Electrical Characteristics						
Current Type and Polarity	DC Reverse	DC Reverse				
Transfer Mode (GMAW)	Pulsed arc	Pulsed arc				
Power Source Type (*cc, cv, etc.*)	cc	cc				
Amps	150÷160	240÷260				
Volts	26÷27	26÷27				
Wire Feed Speed (m/min.)	-	-				
Travel Speed (mm/min.)	180	190÷210				
Maximum Heat Input (KJ/mm)	1,30÷1,44	1,97÷2,00				
Technique						
Stringer or Weave	String	String				
Multi or Single pass (*per side*)	Single	Multi				
Oscillation (*Mechanized/Automatic*)	-	-				
Traverse Length	-	-				
Traverse Speed	-	-				
Dwell Time	-	-				
Number of Electrodes	1	1				
Contact Tube to work Distance (mm)	12-15 mm	12-15 mm				
Peening	No	No				
Interpass Cleaning	Brushing and grinding	Brushing and grinding				
Other	-	-				

BUREAU VERITAS ITALIA WELDING 18
IT FILE
DATE
WITNESSED ☒ REVIEW ☐

ALEX SISTEMI SPA	PROCEDURE QUALIFICATION RECORD PQR according AWS D1.1/D1.1-2020 Annex M – FORM M-1 (Back) Test Results.	PQR N° RS 07	Sheet 2 of 2
		Rev. 0	Date:
		WPS N° RS 07	22/02/2022

✓	Type of Tests	Clause/Figure(s) Reference	Acceptance Criteria	Results	Remarks
☑	Visual Inspection	6.10.1	6.10.1.2	Satisfactory	Report n° SND/0126/22
☐	Radiographic Examination	6.10.2.1	6.10.2.2		
☐	Ultrasonic Testing	6.10.2.1	6.10.2.2		
☐	2 Transverse Root Bends	6.10.3.1	6.10.3.3		
☐	2 Transverse Face Bends	6.10.3.1	6.10.3.3		
☐	2 Longitudinal Root Bends	6.10.3.2	6.10.3.3		
☐	2 Longitudinal Face Bends	6.10.3.2	6.10.3.3		
☐	2 Side Bends	6.10.3.1	6.10.3.3		
☐	4 Side Bends	6.10.3.1	6.10.3.3		
☐	2 Tensile Test	6.10.3.4	6.10.3.5		
☑	3 Macroetch	6.10.4	6.10.4.1	Satisfactory	Max fillet single pass: 4,5 mm Min fillet multi pass: 7 mm
☐	4 Macroetch	6.10.4	6.10.4.1		
☐	CVN Tests	6 Part D	6 Part D		
☑	Other test: Penetrant Test	/	/	For Info	Report n° SND/0127/22

TENSILE TEST DETAILS

Specimen Number	Width (mm)	Thickness (mm)	Area (mm^2)	Ultimate Tensile Load (N)	Ultimate Unit Stress (MPa)	Type of Failure and Location

TOUGHNESS TEST DETAILS

Specimen Number	Notch Location	Specimen Size (mm)	Test Temperature °C	Absorbed Energy (J)	Percent Shear	Lateral Expansion	Average

CERTIFICATION		
Welder's Name	ID Number	Stamp Number
DANIELE BAROLI		DB

Tests Conducted By	
Laboratory	OMECO
Test Number	SAM/0056/22
File Number	

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Clause 4 of AWS D1.1/D1.1M, (2020) Structural Welding Code—Steel.

BUREAU VERITAS ITALIA WELDING 18
IT FILE
DATE
WITNESSED ☒ REVIEW ☐

GAUDENZIO OLDANI
WELDING COORDINATOR
O.B.O. ALEX SISTEMI

Title	
Q.C. Manager	
Name	Signature
Daniele Sfenopo	
Date	
22/02/2022	

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Tel. 0399418049 - Fax 0399418051

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Via Madonna delle Rose, 56
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RAPPORTO DI PROVA / *TEST REPORT*
ESAME VISIVO / *VISUAL TESTING*

Numero: *Number:* SND/0126/22 del *date* 14/02/2022
Rif. OMECO: *OMECO Ref.:* 0067/22 Pag. 1 di 2 *Page 1 of 2*
Rif. CLIENTE: *CUSTOMER Ref.:* ORD.220077 - 13/01/2022 Comm. X057-21X

ALEX-SISTEMI S.P.A.
VIA EMILIA, 10
20010 OSSONA MI

Dati forniti dal Cliente / *Data supplied by the Customer:*

Campione: *Sample:* GIUNTO SALDATO AD ANGOLO (F.W.) TIPO LAMIERA Sp. 6 mm DICHIARATO IN EN 10025-2:2019 S355J2 PER QUALIFICA DEL PROCEDIMENTO DI SALDATURA E DEL SALDATORE (AWS D1.1/D1.1M:2020)
WELDED TEST COUPON (F.W.) PLATE Thk 6 mm DECLARED AS EN 10025-2:2019 S355J2 FOR WELDING PROCEDURE AND PERFORMANCE QUALIFICATION (AWS D1.1/D1.1M:2020)

Identificazione: *Identification:*	PQR	Nome Saldatore *Welder's name*	Processo *Process*	Posizione *Position*
1 – DB	RS 07	DANIELE BAROLI	GMAW	4F

Data ricevimento: *Date of receipt:* 17/01/2022
Norme di prova: *Test standards:* AWS D1.1/D1.1M:2020 Part C 8.9
Procedure di prova: *Test Procedures:* ---
Accettabilità: *Acceptance standard:* AWS D1.1/D1.1M:2020 Part C Table 8.1
Materiale: (Dati forniti dal Cliente) ***Material:*** *(data supplied by the Customer)* EN 10025-2:2019 S355J2

Zona esaminata: *Area inspected:* Saldatura *Weld*
Stato superficiale: *Surface condition:* Saldato *as welded*
Estensione del controllo: *Examination coverage:* 100%
Modalità di preparazione/pulizia: *Preparing/Polishment modalities:* ---
Qualifica del procedimento remoto: *Remote procedure validation:* ---
Metodo: *Methods:* Diretto *Direct*
Tipo d'illuminazione: *Illumination type:* Luce artificiale *Artificial light*
Apparecchiature: *Equipment:* Calibro per saldature (SND-0974) ; Lampada a luce bianca (SND-0672) *Weld gauge (SND-0974) ; White light lamp (SND-0672)*

BUREAU VERITAS ITALIA WELDING 18
IT FILE:
DATA:
WITNESSED ☐ REVIEW ☒

ALEX SISTEMI spa
ING. MARCO CASARIL
RESPONSABILE DEL LABORATORIO
TECHNICAL MANAGER
FIRMATO DIGITALMENTE
DIGITALLY SIGNED

Operatore: *Operator:* I.SATTOLO Lev. II
Data esecuzione: *Date of execution:* 07/02/2022 **Presso:** *At:* Lab. OMECO - Monza

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RAPPORTO DI PROVA / *TEST REPORT* **ESAME VISIVO / *VISUAL TESTING***	**Rif. OMECO:** 0067/22 Pag. 2 di 2 ***OMECO Ref.:*** *Page 2 of 2*
Numero: SND/0126/22 del 11/02/2022 ***Number:*** *date*	**Rif. CLIENTE:** ORD.220077 - 13/01/2022 ***CUSTOMER Ref.:*** Comm. X057-21X

LEGENDA DIFETTOSITA': *LEGENDA*:

Sd	Senza difetti apparenti *No apparent defect*	100	Cricca *Crack*	104	Cricca di cratere *Crater crack*		
2017	Pori superficiali *Surface pores*	2025	Cavità di cratere terminale *End crater pipe*	401	Mancanza di fusione *Lack of fusion*	4021	Penetrazione al vertice incompleta *Incomplete root penetration*
502	Sovrammetallo eccessivo *Excess weld metal*	503	Convessità eccessiva *Excessive convexity*	504	Eccesso di penetrazione *Excess penetration*	505	Raccordo difettoso *Incorrect weld toe*
506	Traboccamento *Overlap*	509	Avvallamento *Sagging*	5011 5012 5013	Incisioni *Undercuts / grooves*	510	Sfondamento *Burn through*
511	Riempimento incompleto *Incompletely filled groove*	512	Asimmetria eccessiva *Excessive asymmetry*	515	Insellamento al vertice *Root concavity*	516	Porosità/spugnosità al vertice (fioritura) *Root porosity*
517	Ripresa difettosa *Poor restart*	5213	Altezza di gola insufficiente *Insufficient/ throat thickness*	5214	Altezza di gola eccessiva *Excessive throat thickness*	601	Colpo d'arco *Stray arc*
602	Spruzzo *Spatter*	610	Discolorazione *Discolouration*				

AC = Accettabile / *Acceptable* NA = Non Accettabile / *Not Acceptable*

Identificazione *Identification*	Sd	100	104	2017	2025	401	4021	502	503	504	505	506	509	5011 5012 5013	510	511	512	515	516	517	5213	5214	601	602	610	Valutazione *Evaluation*
1 - DB	X																									AC

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BUREAU VERITAS ITALIA WELDING 18
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RAPPORTO DI PROVA / *TEST REPORT*
ESAME CON LIQUIDI PENETRANTI
PENETRANT TESTING

Numero: SND/0127/22 del 1/02/2022
Number: *date*
Rif. OMECO: 0067/22 Pag. 1 di 2
OMECO Ref.: *Page 1 of 2*
Rif. CLIENTE: ORD.220077 - 13/01/2022
CUSTOMER Ref.: Comm. X057-21X

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VIA EMILIA, 10
20010 OSSONA MI

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Identificazione: ***Identification:***	**PQR**	**Nome Saldatore** ***Welder's name***	**Processo** ***Process***	**Posizione** ***Position***
1 – DB	RS 07	DANIELE BAROLI	GMAW	4F

Data ricevimento: 17/01/2022
Date of receipt:

Norme di prova: AWS D1.1/D1.1M:2020 Part D 8.14
Test standards:

Procedure di prova: ---
Test Procedures:

Accettabilità: AWS D1.1/D1.1M:2020 Part C 8.10
Acceptance standard:

Materiale: (Dati forniti dal Cliente) EN 10025-2:2019 S355J2
Material: (data supplied by the Customer)

Zona esaminata: Saldatura
Area inspected: *Weld*

Stato superficiale: Saldato
Surface condition: *Welded*

Estensione del controllo: 100%
Examination coverage:

Temperatura della superficie: 20°C
Surface temperature:

Metodo: A contrasto di colore - lavabile con acqua
Inspection method: *Colour contrast - water washable*

Illuminazione tipo: Luce artificiale
Type illumination: *Artificial ligth*

Apparecchiature: Termometro (SND-0638) – Lampada a luce Bianca (SND-0672)
Equipments: *Thermometer (SND-0638)- White light lamp (SND-0672)*

ALEXSISTEMI spa

BUREAU VERITAS ITALIA WELDING 18
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ING. MARCO CASARIL
RESPONSABILE DEL LABORATORIO
TECHNICAL MANAGER

FIRMATO DIGITALMENTE
DIGITALLY SIGNED

Operatore: I.SATTOLO Lev. II
Operator:

Data esecuzione: 07/02/2022
Date of execution:

Presso: Lab. OMECO-Monza
At:

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RAPPORTO DI PROVA / *TEST REPORT* ESAME CON LIQUIDI PENETRANTI *PENETRANT TESTING*				Rif. OMECO: 0067/22 *OMECO Ref.:*	Pag. 2 di 2 *Page 2 of 2*
Numero: SND/0127/22 del 11/02/2022 ***Number:*** *date*				**Rif. CLIENTE:** ORD.220077 - 13/01/2022 ***CUSTOMER Ref.:*** Comm. X057-21X	

Fornitore: *Manufacturer:*	NDT ITALIANA				
Pulitore iniziale: *Pre-cleaner:*	BC1	**Bagno n°** *Batch n°*	B190717s	**Tempo di asciugatura:** *Drying time:*	5'
Penetrante: *Penetrant:*	K71B2p	**Bagno n°** *Batch n°*	171002Ps	**Tempo di penetrazione:** *Penetration time:*	20'
Asportatore: *Remover:*	Acqua *Water*	**Bagno n°** *Batch n°*	---	**Tempo di asciugatura:** *Drying time:*	5'
Rivelatore: *Developer:*	D112A	**Bagno n°** *Batch n°*	190725W150s	**Tempo di rivelazione:** *Developing time:*	10'
Pulizia dopo il controllo: *Post cleaning:*	---				

Risultati: Nessuna indicazione da registrare
Test results: *No relevant indications were noticed*

Valutazione: ACCETTABILE
Evaluation: *ACCEPTABLE*

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Via Madonna delle Rose, 56
Tel. 035581016 (r.a.) - Fax 035580153

RAPPORTO DI PROVA
TEST REPORT

Numero: *Number:* SAM/0056/22 del *date* 15/02/2022
Rif. OMECO: *OMECO Ref.:* 0067/22 Pag. 1 di 3 *Page 1 of 3*
Rif. CLIENTE: *CUSTOMER Ref.:* ORD.220077 - 13/01/2022 Comm. X057-21X

ALEX-SISTEMI S.P.A.
VIA EMILIA, 10
20010 OSSONA MI

Dati forniti dal Cliente / *Data supplied by the Customer:*

Campione: GIUNTO SALDATO AD ANGOLO (F.W.) TIPO LAMIERA Sp. 6 mm DICHIARATO IN EN 10025-2:2019 S355J2 PER QUALIFICA DEL PROCEDIMENTO DI SALDATURA E DEL SALDATORE (AWS D1.1/D1.1M:2020)
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Identificazione: *Identification:*	**PQR**	**Nome Saldatore** *Welder's name*	**Processo** *Process*	**Posizione** *Position*
1 – DB	RS 07	DANIELE BAROLI	GMAW	4F

Data ricevimento: *Date of receipt:* 17/01/2022

ALEXSISTEMI SDB

BUREAU VERITAS ITALIA WELDING 18
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ING. MARCO CASARIL
RESPONSABILE DEL LABORATORIO
TECHNICAL MANAGER

FIRMATO DIGITALMENTE
DIGITALLY SIGNED

Data esecuzione: *Date of execution:* 15/02/2022 **Presso:** *At:* Lab. OMECO-Monza

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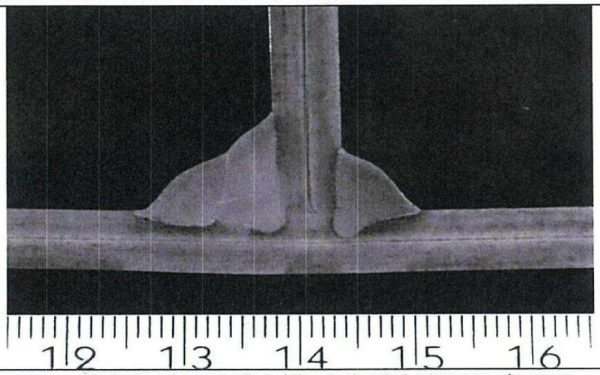
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RAPPORTO DI PROVA *TEST REPORT* **Numero:** SAM/0056/22 del 15/02/2022 ***Number:*** *date:*	**Rif. OMECO:** 0067/22 Pag. 2 di 3 ***OMECO Ref.:*** *Page 2 of 3* **Rif. CLIENTE:** Comm. X057-21X ***CUSTOMER Ref.:***

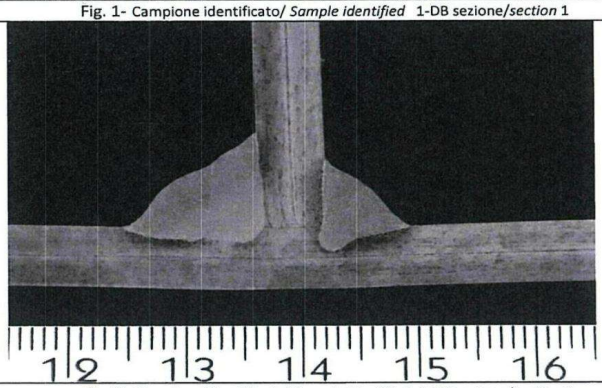
ESAME MACROSCOPICO
MACROSCOPIC EXAMINATION

Metodo di Prova: *Test Method:*	ASTM E340-15	Attacco: *Etching:*	Nitac 10%
Campione N°: *Specimen N°:*	1-DB	Posizione: *Position:*	Trasversale alla saldatura *Trasversal of the weld*



Assenza di difetti di origine metallurgica
Absence of metallurgical defects

Fig. 1- Campione identificato/ *Sample identified* 1-DB sezione/*section* 1 | 1 DIV=1 mm | X 2.0



Assenza di difetti di origine metallurgica
Absence of metallurgical defects

Fig. 2- Campione identificato/ *Sample identified* 1-DB sezione/*section* 2 | 1 DIV=1 mm | X 2.0

Nota: *Note:*	None	
Apparecchiatura: *Equipment:*	SAM-0281	Macchina fotografica – Camera
Tecnico: *Technician:*	P.Inzani	

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IT FILE:
DATA:
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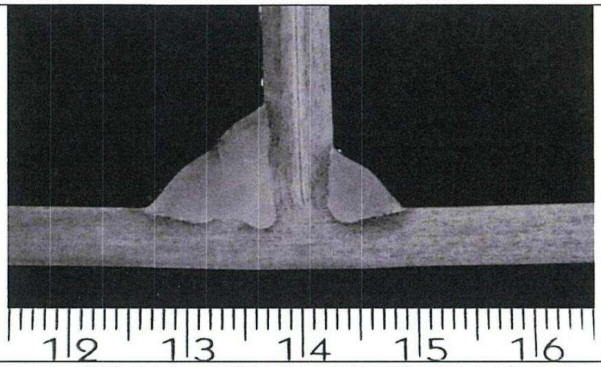
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RAPPORTO DI PROVA *TEST REPORT*	**Rif. OMECO:** 0067/22 Pag. 3 di 3 ***OMECO Ref.:*** *Page 3 of 3*
Numero: SAM/0056/22 del 15/02/2022 ***Number:*** *date:*	**Rif. CLIENTE:** Comm. X057-21X ***CUSTOMER Ref.:***

ESAME MACROSCOPICO
MACROSCOPIC EXAMINATION

Metodo di Prova: *Test Method:*	**ASTM E340-15**	Attacco: *Etching:*	Nitac 10%
Campione N°: *Specimen N°:*	1-DB	Posizione: *Position:*	Trasversale alla saldatura *Trasversal of the weld*



Assenza di difetti di origine metallurgica
Absence of metallurgical defects

Fig. 3- Campione identificato/ *Sample identified* 1-DB sezione/*section* 3 | 1 DIV=1 mm | X 2.0

Nota: *Note:*	None	
Apparecchiatura: *Equipment:*	SAM-0281	Macchina fotografica – Camera
Tecnico: *Technician:*	P.Inzani	

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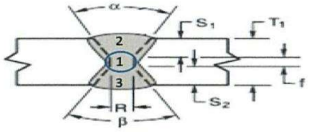
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ALEX SISTEMI SPA	PROCEDURE QUALIFICATION RECORD PQR according AWS D1.1/D1.1-2020 Annex M – FORM M-1 (Front)	PQR N° RS 08 Rev. 0 WPS N° RS 08	Sheet 1 of 2 Date: 22/02/2022

Base Metals	Specification	Type or Grade	AWS Group N.	Thickness (mm)	Size (NPS)	Schedule	Diameter (mm)
Base Material	EN 10025-2	S355J2+N	N.A.	6			
Welded To	EN 10025-2	S355J2+N	N.A.	6			
Backing Material							
Other							

JOINT DETAILS	
Groove Type	Butt Joint Complete Penetration
Groove Angle	60°
Root Opening	2,5
Root Face	1,0
Backgouging	Yes
Method	Gringing to sound metal

JOINT DETAILS (sketch)



POST WELD HEAT TREATMENT	
Temperature	N.A.
Time and Temperature	N.A.
Other	

PROCEDURE							
Weld Layer (s)	3						
Weld Pass (es)	3						
Process	GMAW						
Type (*semiautomatic, Mechanized, etc.*)	Semi-automatic						
Position	1G						
Vertical Progression	N.A.						
Filler Metal (AWS Spec.)	A5.18						
AWS Classification	ER70S-6						
Diameter	1.2						
Manufacturer / Trade Name	ELB-SG2						
Shielding Gas Composition	Ar: 80% CO2: 20%						
Flow Rate (L/min)	14÷16						
Nozzle Size	-						
Preheat Temperature	10 °C						
Interpass Temperature	≤ 200°C						
Electrical Characteristics							
Current Type and Polarity	DC Reverse						
Transfer Mode (GMAW)	Pulsed						
Power Source Type (*cc, cv, etc.*)	cc						
Amps	110 ÷ 120						
Volts	22÷23						
Wire Feed Speed (m/min.)	-						
Travel Speed (mm/min.)	240 ÷ 270						
Maximum Heat Input (KJ/mm)	0.60 ÷ 0.61						
Technique							
Stringer or Weave	String						
Multi or Single pass (*per side*)	Multi						
Oscillation (*Mechanized/Automatic*)	-						
Traverse Length	-						
Traverse Speed	-						
Dwell Time	-						
Number of Electrodes	1						
Contact Tube to work Distance (mm)	12-15 mm						
Peening	No						
Interpass Cleaning	Brushing and grinding						
Other	-						

BUREAU VERITAS ITALIA WELDING 18
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ALEX SISTEMI SPA	PROCEDURE QUALIFICATION RECORD PQR according AWS D1.1/D1.1-2020 Annex M – FORM M-1 (Back) Test Results.	PQR N° RS 08 Rev. 0 WPS N° RS 08	Sheet 2 of 2 Date: 22/02/2022

✓	Type of Tests	Clause/Figure(s) Reference	Acceptance Criteria	Results	Remarks
☑	Visual Inspection	6.10.1	6.10.1.1	Satisfactory	Report n° SND/0128/22
☑	Radiographic Examination	6.10.2.1	6.10.2.2	Satisfactory	Report n° SND/0129/22
☐	Ultrasonic Testing	6.10.2.1	6.10.2.2		
☑	2 Transverse Root Bends	6.10.3.3	6.10.3.3	Satisfactory	Report n° SPT/0133/22
☑	2 Transverse Face Bends	6.10.3.3	6.10.3.3	Satisfactory	Report n° SPT/0133/22
☐	2 Longitudinal Root Bends	6.10.3.3	6.10.3.3		
☐	2 Longitudinal Face Bends	6.10.3.3	6.10.3.3		
☐	2 Side Bends	6.10.3.3	6.10.3.3		
☐	4 Side Bends	6.10.3.3	6.10.3.3		
☑	2 Tensile Test	6.10.3.5	6.10.3.5	Satisfactory	Report n° SPT/0133/22
☐	3 Macroetch	6.10.4.1	6.10.4.1		
☐	4 Macroetch	6.10.4.1	6.10.4.1		
☐	CVN Tests	6 Part D	6 Part D		
☑	Other test: Penetrant Test	/	/	For Info	Report n° SND/0129/22
☑	Other test: Macroetch	/	/	Good Fusion	Report n° SAM/0057/22

TENSILE TEST DETAILS

Specimen Number	Width (mm)	Thickness (mm)	Area (mm²)	Ultimate Tensile Load (N)	Ultimate Unit Stress (MPa)	Type of Failure and Location
125597	19,79	5,62	111,1	57497	517	Ductile fracture – Base material
125598	19,76	5,70	112,6	56123	498	Ductile fracture – Base material

TOUGHNESS TEST DETAILS

Specimen Number	Notch Location	Specimen Size (mm)	Test Temperature °C	Absorbed Energy (J)	Percent Shear	Lateral Expansion	Average

CERTIFICATION		
Welder's Name	ID Number	Stamp Number
SATTI WASEEQ AHMED		SW

Tests Conducted By	
Laboratory	OMECO
Test Number	SPT/0133/22
File Number	

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Clause 4 of AWS D1.1/D1.1M, (2020) Structural Welding Code—Steel.

BUREAU VERITAS ITALIA WELDING 18
IT FILE
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Title	
Q.C. Manager	
Name	Signature
Daniele Sfenopo	ALEXSISTEMI spa
Date	
22/02/2022	

ALEXSISTEMI spa
GAUDENZIO
WELDING COORDINATOR
O.B.O. ALEX SISTEMI

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RAPPORTO DI PROVA / *TEST REPORT*
ESAME VISIVO / *VISUAL TESTING*

Numero: *Number:* SND/0128/22 del *date* 14/02/2022
Rif. OMECO: *OMECO Ref.:* 0067/22 Pag. 1 di 2 *Page 1 of 2*
Rif. CLIENTE: *CUSTOMER Ref.:* ORD.220076 - 13/01/2022 Comm. X068-21X

ALEX-SISTEMI S.P.A.
VIA EMILIA, 10
20010 OSSONA MI

Dati forniti dal Cliente / *Data supplied by the Customer:*

Campione: *Sample:* GIUNTO SALDATO TESTA A TESTA (B.W.) TIPO LAMIERA Sp. 6 mm DICHIARATO IN EN 10025-2:2019 S355J2 PER QUALIFICA DEL PROCEDIMENTO DI SALDATURA E DEL SALDATORE (AWS D1.1/D1.1M:2020)
WELDED TEST COUPON (B.W.) TYPE PLATE Thk 6 mm DECLARED AS EN 10025-2:2019 S355J2 FOR WELDING PROCEDURE AND PERFORMANCE QUALIFICATION (AWS D1.1/D1.1M:2020)

Identificazione: *Identification:*	PQR	Nome Saldatore *Welder's name*	Processo *Process*	Posizione *Position*
2 – SW	RS 08	SATTI WASEEQ AHMED	GMAW	1G

Data ricevimento: *Date of receipt:* 17/01/2022

Norme di prova: *Test standards:* AWS D1.1/D1.1M:2020 Part C 8.9

Procedure di prova: *Test Procedures:* ---

Accettabilità: *Acceptance standard:* AWS D1.1/D1.1M:2020 Part C Table 8.1

Materiale: (Dati forniti dal Cliente) *Material: (data supplied by the Customer)* EN 10025-2:2019 S355J2

Zona esaminata: *Area inspected:* Saldatura *Weld*
Stato superficiale: *Surface condition:* Saldato *as welded*

Estensione del controllo: *Examination coverage:* 100%

Modalità di preparazione/pulizia: *Preparing/Polishment modalities:* ---
Qualifica del procedimento remoto: *Remote procedure validation:* ---

Metodo: *Methods:* Diretto *Direct*
Tipo d'illuminazione: *Illumination type:* Luce artificiale *Artificial light*

Apparecchiature: *Equipment:* Calibro per saldature (SND-0974) ; Lampada a luce bianca (SND-0672)
Weld gauge (SND-0974) ; White light lamp (SND-0672)

BUREAU VERITAS ITALIA WELDING 18
IT FILE:
DATA:
WITNESSED ☐ REVIEW ☒

ALEX-SISTEMI spa
ING. MARCO CASARIL
RESPONSABILE DEL LABORATORIO
TECHNICAL MANAGER

FIRMATO DIGITALMENTE
DIGITALLY SIGNED

Operatore: *Operator:* I.SATTOLO Lev. II

Data esecuzione: *Date of execution:* 07/02/2022 **Presso:** *At:* Lab. OMECO - Monza

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This document concerns only the sample submitted to the test. The sampling operations were performed by the Customer. The test results refers to the sample as received.The Laboratory is not responsible for the data supplied by the Customer

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The samples have to be kept, after the issue of the document): 30 days
Tempo di conservazione delle registrazioni tecniche: 10 anni / *Technical recordings are kept:10 years*

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RAPPORTO DI PROVA / *TEST REPORT* ESAME VISIVO / *VISUAL TESTING*	Rif. OMECO: 0067/22 Pag. 2 di 2 *OMECO Ref.:* *Page 2 of 2*
Numero: *Number:* SND/0128/22 del *date* 11/02/2022	**Rif. CLIENTE:** *CUSTOMER Ref.:* ORD.220077 - 13/01/2022 Comm. X057-21X

LEGENDA DIFETTOSITA': *LEGENDA:*

Sd	Senza difetti apparenti *No apparent defect*	100	Cricca *Crack*	104	Cricca di cratere *Crater crack*		
2017	Pori superficiali *Surface pores*	2025	Cavità di cratere terminale *End crater pipe*	401	Mancanza di fusione *Lack of fusion*	4021	Penetrazione al vertice incompleta *Incomplete root penetration*
502	Sovrammetallo eccessivo *Excess weld metal*	503	Convessità eccessiva *Excessive convexity*	504	Eccesso di penetrazione *Excess penetration*	505	Raccordo difettoso *Incorrect weld toe*
506	Traboccamento *Overlap*	509	Avvallamento *Sagging*	5011 5012 5013	Incisioni *Undercuts / grooves*	510	Sfondamento *Burn through*
511	Riempimento incompleto *Incompletely filled groove*	512	Asimmetria eccessiva *Excessive asymmetry*	515	Insellamento al vertice *Root concavity*	516	Porosità/spugnosità al vertice (fioritura) *Root porosity*
517	Ripresa difettosa *Poor restart*	5213	Altezza di gola insufficiente *Insufficient/ throat thickness*	5214	Altezza di gola eccessiva *Excessive throat thickness*	601	Colpo d'arco *Stray arc*
602	Spruzzo *Spatter*	610	Discolorazione *Discolouration*				

AC = Accettabile / *Acceptable* NA = Non Accettabile / *Not Acceptable*

Identificazione *Identification*	Sd	100	104	2017	2025	401	4021	502	503	504	505	506	509	5011 5012 5013	510	511	512	515	516	517	5213	5214	601	602	610	Valutazione *Evaluation*
2 - SW	X																									AC

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RAPPORTO DI PROVA / *TEST REPORT*
CONTROLLO RADIOGRAFICO
RADIOGRAPHIC TESTING

Numero: *Number:* SND/0129/22 del *date* 14/02/2022
Rif. OMECO: *OMECO Ref.:* 0067/22 Pag. 1 di 2 *Page 1 of 2*
Rif. CLIENTE: *CUSTOMER Ref.:* ORD.220076 - 13/01/2022 Comm. X068-21X

ALEX-SISTEMI S.P.A.
VIA EMILIA, 10
20010 OSSONA MI

Dati forniti dal Cliente / *Data supplied by the Customer:*

Campione: *Sample:* GIUNTO SALDATO TESTA A TESTA (B.W.) TIPO LAMIERA Sp. 6 mm DICHIARATO IN EN 10025-2:2019 S355J2 PER QUALIFICA DEL PROCEDIMENTO DI SALDATURA E DEL SALDATORE (AWS D1.1/D1.1M:2020) / *WELDED TEST COUPON (B.W.) PLATE Thk 6 mm DECLARED AS EN 10025-2:2019 S355J2 FOR WELDING PROCEDURE AND PERFORMANCE QUALIFICATION (AWS D1.1/D1.1M:2020)*

Identificazione: *Identification:*	PQR	Nome Saldatore *Welder's name*	Processo *Process*	Posizione *Position*
2 – SW	RS 08	SATTI WASEEQ AHMED	GMAW	1G

Data ricevimento: *Date of receipt:* 17/01/2022
Norme di prova: *Test standards:* AWS D1.1/D1.1M : 2020 Part E 8.16
Procedure di prova: *Test Procedures:* ---
Accettabilità: *Acceptance standard:* AWS D1.1/D1.1M : 2020 Part C 8.12

Materiale: (Dati forniti dal Cliente) *Material: (data supplied by the Customer)* EN 10025-2:2019 S355J2

Zona esaminata: *Area inspected:* Saldatura *Weld*
Estensione dell'esame: *Examination coverage:* 100%
Spessore nominale: *Nominal Thickness:* 6 mm
Stato superficiale: *Surface condition:* Saldato *Welded*
Processo di saldatura: *Welding process:* GMAW
Spessore metallo d'apporto: *Weld metal thickness:* 7 mm

Apparecchiatura: *Source:* Seifert Eresco 42MF4 (SND-0881)
Dimensione max macchia focale (mm) : *Source Size max (mm) :* 3.0
Tipo di radiazioni: *Radiation energy:* Raggi X *X Ray*
Attività (Gbq): *Activity (GBq):* ---

Pellicole: *Films:* Agfa Gevaert D4 (10x48) FW
Schermi: *Screens:* Pb
Anteriore (mm): *Front (mm):* 0.027
Trattamento: *Processing:* Automatico *Automatic*
Posteriore (mm): *Back (mm):* 0.027

BUREAU VERITAS ITALIA WELDING 18
IT FILE:
DATA:
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ALEX-SISTEMI spa
ING. MARCO CASARIL
RESPONSABILE DEL LABORATORIO
TECHNICAL MANAGER

FIRMATO DIGITALMENTE
DIGITALLY SIGNED

Operatore: *Operator:* M.ROSESTOLATO Lev. II
Data esecuzione: *Date of execution:* 07/02/2022
Presso: *At:* Lab. OMECO - Monza

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RAPPORTO DI PROVA / *TEST REPORT*
CONTROLLO RADIOGRAFICO
RADIOGRAPHIC TESTING

Numero: / ***Number:*** SND/0129/22 del / *date* 11/02/2022

Rif. OMECO: / ***OMECO Ref.:*** 0067/22

Pag. 2 di 2 / *Page 2 of 2*

Rif. CLIENTE: / ***CUSTOMER Ref.:*** ORD.220077 - 13/01/2022 Comm. X057-21X

Tecnica esposizione *Radiographic technique*		Penetrametro *Penetrameter*		D (1)	d (2)	SDF (3)	Ug	Parametri *Parameters*		Tempo Esp. *Exposure time*	Densità (4) *Films density*		Sensibilità *Sensitivity*	
Tipo ripresa *Technique*	Film *Films*	Tipo *Type* ASTM	Lato *Side*	mm	mm	mm	mm	Tensione *Voltage* kV	Corrente *Current* mA	min.	min.	max	Richiesto *Required* Filo N. *Wire N.*	Ottenuto *Obtained* Filo N. *Wire N.*
Fig. 1	*Singolo Single*	1A6	Sorgente *Source*	694	6	700	0.07	120	7.5	2' 00"	2.2	2.8	5	5

(1) Distanza minima sorgente/oggetto
(1) Minimum source-to-object distance
(2) Massima distanza dalla superficie dell'oggetto (lato sorgente) al film alla minima distanza sorgente-oggetto
(2) Maximum distance from source side of object to the film at minimum source-object distance
(3) Distanza fuoco-film
(3) Source-film distance
(4) Densità misurata su film singolo
(4) Films density measured on single film

LEGENDA:

Sd	Senza difetti apparenti *No apparent defect*	**100**	Cricca *Crack*	**2011 2012 2013**	Porosità *Gas porosity*	**2015 2016**	Cavità allungate, Tarli *Elongated cavity, Worm-hole*
202	Cavità di ritiro *Shrinkage cavity*	**301**	Inclusioni di scoria *Slag inclusions*	**3041**	Inclusioni di Tungsteno *Tungsten inclusion*	**401**	Mancanza di fusione *Lack of fusion*
402	Mancanza di penetrazione *Lack of penetration*	**501**	Incisioni *Undercut*	**504**	Eccessiva penetrazione *Excessive penetration*	**511**	Riempimento incompleto *Incompletely filled groove*
515	Insellamento al vertice *Root concavity*	**601**	Colpi d'arco *Arc strike*	**Fd**	Difetti film *Film defects*		

AC = Accettabile / *Acceptable* NA = Non Accettabile / *Not Acceptable*

Marcature in piombo lato sorgente, riportate in modo permanente sul campione a cura della Committente
Permanent marking of the film references (lead references, side film) at Customer charge

Contras. films *Film Ref.*	Ripresa *Technique*	Sd	100	2011 - 2012 2013	2015 - 2016	202	301	3041	401	402	501	504	511	515	601	Fd		Valutazione *Evaluation*
2 - SW																		
1 – 2	Fig. 1			X														AC

BUREAU VERITAS ITALIA WELDING 18
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DATA:
WITNESSED ☐ REVIEW ☑

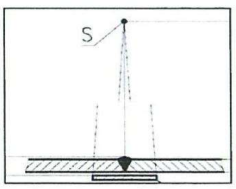


Fig. 1

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PSQ-014/1 Rev.5

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Tel. 039748983 (r.a.) - Fax 039736433
www.omecosrl.it - E-mail: direzione@omecosrl.it - omeco@pec.omecosrl.eu

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Via Milano, 4
Tel. 0399418049 - Fax 0399418051

I-24061 ALBANO S. ALESSANDRO (BG)
Via Madonna delle Rose, 56
Tel. 035581016 (r.a.) - Fax 035580153

RAPPORTO DI PROVA
TEST REPORT

Numero: *Number:* SPT/0133/22 del *date* 14/02/2022
Rif. OMECO: *OMECO Ref.:* 0067/22 Pag. 1 di 2 *Page 1 of 2*
Rif. CLIENTE: *CUSTOMER Ref.:* ORD.220076 - 13/01/2022 Comm. X068-21X

ALEX-SISTEMI S.P.A.
VIA EMILIA, 10
20010 OSSONA MI

Dati forniti dal Cliente / *Data supplied by the Customer:*

Campione: GIUNTO SALDATO TESTA A TESTA (B.W.) TIPO LAMIERA Sp. 6 mm DICHIARATO IN EN 10025-2:2019 S355J2 PER QUALIFICA DEL PROCEDIMENTO DI SALDATURA E DEL SALDATORE (AWS D1.1/D1.1M:2020)
Sample: *WELDED TEST COUPON (B.W.) PLATE Thk 6 mm DECLARED AS EN 10025-2:2019 S355J2 FOR WELDING PROCEDURE AND PERFORMANCE QUALIFICATION (AWS D1.1/D1.1M:2020)*

Identificazione: *Identification:*	**PQR**	**Nome Saldatore** *Welder's name*	**Processo** *Process*	**Posizione** *Position*
2 – SW	RS 08	SATTI WASEEQ AHMED	GMAW	1G

Data ricevimento: *Date of receipt:* 17/01/2022

PROVA DI TRAZIONE TRASVERSALE ALLA SALDATURA
TRANSVERSAL-WELD TENSILE TESTING
AWS D1.1/D1.1M:2020

Identif. N. *Identif. N.*	Dimens. Provetta *Specimen dimens.* (mm)	Area Sezione *Cross Section* (mm^2)	Temperatura *Temperature* (°C)	Carico di rottura *Tensile Strength*		Posizione di rottura e tipo *Break Position and type*
				Totale / *Total* (N)	Rm (N/mm^2)	
					≥ 470	
2 – SW	5.62 x 19.79	111.2	+20	57497	517	M.B. - Duttile *B.M. - Ductile*
2 - SW	5.70 x 19.76	112.6	+20	56123	498	M.B. - Duttile *B.M. - Ductile*

Apparecchiature: *Equipments:*
Macchina prove materiali identificata / *Universal machine identified* SPT-0010
Calibro identificato / Caliper identified SPT-0335

Tecnico/i: *Technician/s:* L. BAI

BUREAU VERITAS ITALIA WELDING 18
IT FILE:
DATA:
WITNESSED ☒ REVIEW ☐

ING. MARCO CASARIL
RESPONSABILE DEL LABORATORIO
TECHNICAL MANAGER

FIRMATO DIGITALMENTE
DIGITALLY SIGNED
ALEX-SISTEMI spa

Data esecuzione: *Date of execution:* 14/02/2022 **Presso:** *At:* Lab. OMECO - Monza

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This document concerns only the sample submitted to the test. The sampling operations were performed by the Customer. The test results refers to the sample as received.The Laboratory is not responsible for the data supplied by the Customer
Tempo di conservazione dei campioni dalla data di emissione del documento: 30 gg.
The samples have to be kept, after the issue of the document): 30 days
Tempo di conservazione delle registrazioni tecniche: 10 anni / *Technical recordings are kept:10 years*

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RAPPORTO DI PROVA *TEST REPORT* **Numero:** SPT/0133/22 del 14/02/2022 ***Number:*** *date:*	**Rif. OMECO:** 0067/22 Pag. 2 di 2 ***OMECO Ref.:*** *Page 2 of 2* **Rif. CLIENTE:** Comm. X068-21X ***CUSTOMER Ref.:***

PROVA DI PIEGA
BEND TEST
AWS D1.1/D1.1M:2020

Identif. N. *Identif. N.*	Dimensione provino *Specimen dimensions (mm)*	Ø Mandrino *Ø Former (mm)*	Distanza tra i rulli *Distance between rollers (mm)*	Angolo *Curvature (α°)*	Senso di piegamento *Bend Test*	Risultati *Results*	Valutazione *Evaluation AWS D1.1/D1.1M:2020*
2 – SW	40 x Sp 40 *x Thk*	24	39	180	DIRITTO *FACE*	Nessuna indicazione da registrare *No relevant indications were noticed*	CONFORME *SATISFACTORY*
2 - SW	40 x Sp 40 *x Thk*	24	39	180	DIRITTO *FACE*	Nessuna indicazione da registrare *No relevant indications were noticed*	CONFORME *SATISFACTORY*
2 – SW	40 x Sp 40 *x Thk*	24	39	180	ROVESCIO *ROOT*	Nessuna indicazione da registrare *No relevant indications were noticed*	CONFORME *SATISFACTORY*
2 - SW	40 x Sp 40 *x Thk*	24	39	180	ROVESCIO *ROOT*	Nessuna indicazione da registrare *No relevant indications were noticed*	CONFORME *SATISFACTORY*

Apparecchiature: ***Equipments:***	Macchina prove materiali identificata *Universal machine identified*	SPT-0007
	Calibro identificato Caliper identified	SPT-0335
Tecnico/i: ***Technician/s:***	L. BAI	

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BUREAU VERITAS ITALIA WELDING 18
IT FILE:
DATA:
WITNESSED ☒ REVIEW ☐

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Via Madonna delle Rose, 56
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RAPPORTO DI PROVA
TEST REPORT

Numero: *Number:* SAM/0057/22 del *date* 15/02/2022
Rif. OMECO: *OMECO Ref.:* 0067/22 Pag. 1 di 2 *Page 1 of 2*
Rif. CLIENTE: *CUSTOMER Ref.:* ORD.220076 - 13/01/2022 Comm. X068-21X

ALEX-SISTEMI S.P.A.
VIA EMILIA, 10
20010 OSSONA MI

Dati forniti dal Cliente / *Data supplied by the Customer:*

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Sample: *WELDED TEST COUPON (B.W.) PLATE Thk 6 mm DECLARED AS EN 10025-2:2019 S355J2 FOR WELDING PROCEDURE AND PERFORMANCE QUALIFICATION (AWS D1.1/D1.1M:2020)*

Identificazione: *Identification:*	**PQR**	**Nome Saldatore** *Welder's name*	**Processo** *Process*	**Posizione** *Position*
2 – SW	RS 08	SATTI WASEEQ AHMED	GMAW	1G

Data ricevimento: *Date of receipt:* 17/01/2022

BUREAU VERITAS ITALIA WELDING 18
IT FILE:
DATA:
WITNESSED ☒ REVIEW ☐

ING. MARCO CASARIL
RESPONSABILE DEL LABORATORIO
TECHNICAL MANAGER

FIRMATO DIGITALMENTE
DIGITALLY SIGNED
ALEX SISTEMI spa

Data esecuzione: *Date of execution:* 15/02/2022 **Presso:** *At:* Lab. OMECO-Monza

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The samples have to be kept, after the issue of the document): 30 days
Tempo di conservazione delle registrazioni tecniche: 10 anni / *Technical recordings are kept:10 years*

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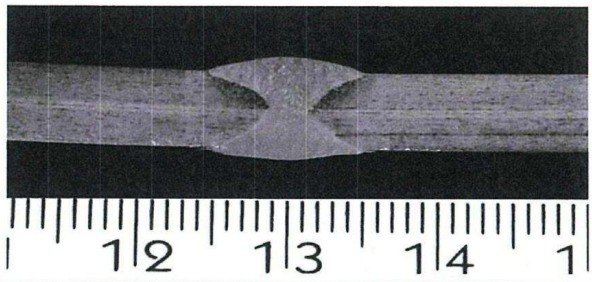
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RAPPORTO DI PROVA *TEST REPORT*	**Rif. OMECO:** 0067/22 Pag. 2 di 2 ***OMECO Ref.:*** *Page 2 of 2*
Numero: SAM/0057/22 del 15/02/2022 ***Number:*** *date:*	**Rif. CLIENTE:** Comm. X068-21X ***CUSTOMER Ref.:***

ESAME MACROSCOPICO
MACROSCOPIC EXAMINATION

Metodo di Prova: *Test Method:*	**ASTM E340-15**	Attacco: *Etching:*	Nitac 10%
Campione N°: *Specimen N°:*	2-SW	Posizione: *Position:*	Trasversale alla saldatura *Trasversal of the weld*



Assenza di difetti di origine metallurgica
Absence of metallurgical defects

Fig. 1- Campione identificato/ *Sample identified* 2-SW | 1 DIV=1 mm | X 2.6

Nota: *Note:*	None	
Apparecchiatura: *Equipment:*	SAM-0281	Macchina fotografica – Camera
Tecnico: *Technician:*	P.Inzani	

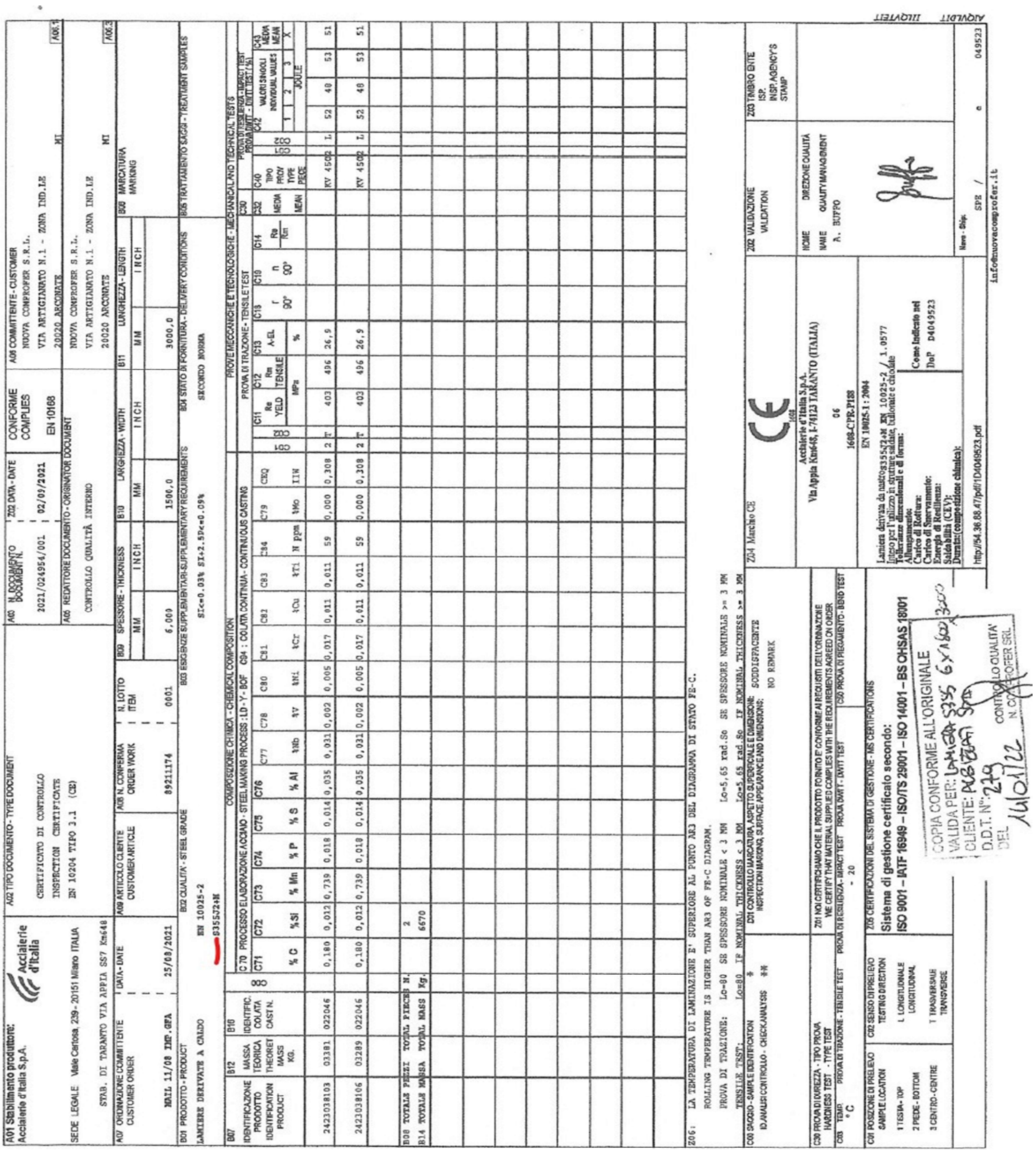
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PSQ-014/1 Rev.5



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elbor Welding Wire

RINA

CERTIFICATO DI COLLAUDO/ CERTIFICAT D'ANALYSE/ TEST CERTIFICATE/ WERKZEUGNIS

CERTIFICATE N°/CERTIFICATO N° 1003045537	Luogo/ Issuing place: Montefredane	Data/ Date: 30/11/2021

CLIENTE/ CUSTOMER:
DATAWELDING SRL
VIA MARCONI 5
20080 VERMEZZO MI

CONSEGNA/DELIVERY:
IDEM

NS. RIFERIMENTO N° /OUR DOC REF.
Fattura 1452 del 29/11/2021

ORDINE N°/ PURCHASE ORDER N°
21/00355+21/00356+21/00459+21/00618

COLATA N°/BATCH N°
122611

QUALITA'/GRADE	NOME DEL PRODOTTO/ TRADEMARK:	DESCRIZIONE MATERIALE/MATERIAL DESCRIPTION:
SG2	ELB-SG2	Diam.: 1.20 mm Quantity: 7560 KG Type: S300/15 KG

NORMA/ STANDARD: EN ISO 14341-A- G42 3 M G3Si1/G 8 2 C G3Si1
Specifica/Specification: AWS A 5.18-05/ER70S-6

ANALISI CHIMICA DI COLATA (Conforme a/ Complice with: EN 10204 3.1)
Chemical Composition/ Analyse de coulée/ Drahtanalyse

C	Si	Mn	P	S	Cu	Cr	Ni	Mo
0,08	0,836	1,44	0,013	0,014	0,04	0,03	0,014	0,001
Al	**N**	**Ti**	**V**	**Zr**	**As**	**Ti+Zr**		
0,003	0,0067	0,01	0,003	0,0034	0,002	0,01		

CARATTERISTICHE MECCANICHE (Conforme a/ Complice with: EN 10204 2.2)
Mechanical properties condition as welded, shielding-gas M21/Propriétés mécaniques / Mechanische Werte, ungeglücht, Schutz-gas M21

Snervamento/ Yield strenght (N/mm²)	Resistenza alla trazione/Tensile strenght (N/mm²)	Allungamento Elongation (A5%)	Resilienza/Resilience Impact strenght	
			TEMP (°C)	Charpy KV (J)
≥ 420	500-640	22	-30	≥ 47

CARATTERISTICHE MECCANICHE (Conforme a/ Complice with: EN 10204 2.2)
Mechanical properties condition as welded, shielding-gas Co_2/ Propriétés mécaniques /Mechanische Werte, ungeglücht, Schutz-gas Co_2

Snervamento/ Yield strenght (N/mm²)	Resistenza alla trazione/Tensile strenght (N/mm²)	Allungamento Elongation (A5%)	Resilienza/Resilience Impact strenght	
			TEMP (°C)	Charpy KV (J)
≥ 380	470-600	22	-20	≥ 47

CE
0035- CPR-C607

QUALITY DPT.

Certificato generato da un sistema informativo valido senza firma
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NOTE:
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It is hereby certify that this product has been manufactured, including packaging/labelling and quality control in full compliance with referred Standards and Specifications. Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.

MOD. P4- 13 REV. 0

3.2 WELDERS WPQS

ALEX SISTEMI SPA	WELDER, WELDING OPERATOR PERFORMANCE QUALIFICATION TEST RECORD Annex J – FORM J-4	Sheet 1 of 1

Name	SATTI WASEEQ AHMED	Optional Photo ID	Test Date	20/01/2022	Rev.
ID Number	-		Record No.	RS 08-SW	0
Stamp No.	SW		Std. Test No.	-	
Company	ALEX SISTEMI SPA		WPS No.	RS 08	0
Division			Qualified To	AWS D1.1 Ed. 2020	

Base Metals	Specification	Type or Grade	AWS Group N.	Thickness (mm)	Size (NPS)	Schedule	Diameter (mm)
Base Material	EN 10025-2	S355J2+N	Unlisted steel	6			
Welded To	EN 10025-2	S355J2+N	Unlisted steel	6			

VARIABLES	Actual Values		RANGE QUALIFIED
Type of Weld Joint	Butt Joint Complete Penetration		Groove, Fillet, Plug, and Slot Welds (T-, Y-, K-Groove PJP only)
Base Metal	Unlisted steel to Unlisted steel		Same combination

	Groove	Fillet		Groove	Fillet
Plate thickness	6 mm			3 to 12	≥ 3
Pipe thickness				≥ 3	Unlimited
Pipe diameter				≥ 600	Unlimited

Welding Process	GMAW		GMAW
Type *(manual, Semiautomatic, Mechanized, Automatic)*	Semiautomatic		Semiautomatic, Mechanized, Automatic
Backing	With		With
Filler Metal (AWS Specification)	A5.18		A5.xx
AWS Classification	ER70S-6		All
F-Number	-		-
Position	1G		
Groove – Plate & Pipe ≥ 24"			F
Groove – Pipe < 24"			
Fillet – Plate & Pipe ≥ 24"			F, H
Fillet - Pipe < 24"			F, H
Progression	N.A.		N.A.
GMAW Transfer Mode	Pulsed Arc		Spray, Pulsed, Globular
Gas / Flux Type	A5.32 SG-AC20		A5.xx Approved

TEST RESULTS			
Type of Test	Acceptance Criteria	Results	Remarks
Visual Examination	6.10.1.1	Acceptable	–
N°1 Transverse Root Bends	6.10.3.3	Acceptable	–
N° Transverse Face Bends	6.10.3.3	Acceptable	–

3.3 WPQR

CERTIFICATION	
Test Conducted by	
Laboratory	OMECO
Test Number	Report n° SPT/0133/22
File Number	-

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Clause 4 of AWS D1.1/D1.1M (2020) Structural Welding Code—Steel.

Manufacturer or Contractor	Authorized By	Date
ALEXSISTEMI spa	BUREAU VERITAS ITALIA WELDING 18 IT FILE DATE WITNESSED ☒ REVIEW ☐	22/02/2022

ALEX SISTEMI SPA	WELDER, WELDING OPERATOR PERFORMANCE QUALIFICATION TEST RECORD Annex J – FORM J-4	Sheet 1 of 1

Name	DANIELE BAROLI	Optional Photo ID	Test Date	20/01/2022	Rev.
ID Number	-		Record No.	RS 08-DB	0
Stamp No.	DB		Std. Test No.	-	
Company	ALEX SISTEMI SPA		WPS No.	RS 08	0
Division			Qualified To	AWS D1.1 Ed. 2020	

Base Metals	Specification	Type or Grade	AWS Group N.	Thickness (mm)	Size (NPS)	Schedule	Diameter (mm)
Base Material	EN 10025-2	S355J2+N	Unlisted steel	6			
Welded To	EN 10025-2	S355J2+N	Unlisted steel	6			

VARIABLES	Actual Values		RANGE QUALIFIED
Type of Weld Joint	Butt Joint Complete Penetration		Groove, Fillet, Plug, and Slot Welds (T-, Y-, K-Groove PJP only)
Base Metal	Unlisted steel to Unlisted steel		Same combination

	Groove	Fillet		Groove	Fillet
Plate thickness	6 mm			3 to 12	≥ 3
Pipe thickness				≥ 3	Unlimited
Pipe diameter				≥ 600	Unlimited

Welding Process	GMAW		GMAW
Type *(manual, Semiautomatic, Mechanized, Automatic)*	Semiautomatic		Semiautomatic, Mechanized, Automatic
Backing	With		With
Filler Metal (AWS Specification)	A5.18		A5.xx
AWS Classification	ER70S-6		All
F-Number	-		-
Position	1G		
Groove – Plate & Pipe ≥ 24"			F
Groove – Pipe < 24"			
Fillet – Plate & Pipe ≥ 24"			F, H
Fillet - Pipe < 24"			F, H
Progression	N.A.		N.A.
GMAW Transfer Mode	Pulsed Arc		Spray, Pulsed, Globular
Gas / Flux Type	A5.32 SG-AC20		A5.xx Approved

TEST RESULTS			
Type of Test	Acceptance Criteria	Results	Remarks
Visual Examination	6.10.1.1	Acceptable	–
N°1 Transverse Root Bends	6.10.3.3	Acceptable	–
N° Transverse Face Bends	6.10.3.3	Acceptable	–

CERTIFICATION	
Test Conducted by	
Laboratory	OMECO
Test Number	
File Number	-

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Manufacturer or Contractor	Authorized By	Date
ALEX SISTEMI spa	BUREAU VERITAS ITALIA WELDING 18 IT FILE DATE WITNESSED ☒ REVIEW ☐	22/02/2022

WELDING WORK HISTORY 2022 & 2023

Std	WPS	PQR#	Process	Material1	Gr.	thk/Ø W	Material2	Gr.	thk/Ø W	WPQ AZ	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
AWS D1.1	D-11-GMAW-275-T-L1-GF-1	R S01	GMAW	EN 10025 S 275 JR	Gr. 1	6mm	EN 10025 S 275 JR	Gr. 1	6mm	S12-CS	S12-CS	S12-CS			S12-CS	S12-CS	S12-CS			S12-CS		
AWS D1.1	D-11-GMAW-275-T-L1-GF	R S02	GMAW	EN 10025 S 275 JR	Gr. 1	12mm	EN 10025 S 275 JR	Gr. 1	12mm	S12-CS	S12-CS	S12-CS			S12-CS						S12-CS	S12-CS
AWS D1.1	D-11-GMAW-275-B-U4b-GF	R S03	GMAW	EN 10025 S 275 JR	Gr. 1	20mm	EN 10025 S 275 JR	Gr. 1	20mm	S12-CS	S12-CS	S12-CS			S12-CS						S12-CS	S12-CS
AWS D1.1	04/13	R 04/13	GTAW+GMAW	EN 10028-3 P 355 NL2	Gr. 1	12mm	EN 10028-3 P 355 NL2	Gr. 1	12mm	S12-CS	S12-CS	S12-CS		S12-CS						S12-CS		
AWS D1.1	05/13	R 05/13	GMAW	EN 10025-2 S 355 J2G3	Gr. 1	10mm	EN 10025-2 S 355 J2G3	Gr. 1	10mm	S04-RR	S04-RR	S04-RR		S04-RR						S04-RR		
AWS D1.1	06/13	R 06/13	GTAW+GMAW	EN 10028-3 P 355 NL2	Gr. 1	25mm	EN 10028-3 P 355 NL2	Gr. 1	25mm	S12-CS	S12-CS	S12-CS		S12-CS						S12-CS		

Welding Operator — Welding Coordinator

BD: BAROLI DANIELE — OG: OLDANI GAUDENZIO

SWA: SATTI WASSEEQ AHMED

ALEXSISTEMI

2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024

Std	WPS	PQR#	Process	Material1	Gr.	thk/Ø W	Material2	Gr.	thk/Ø W	WPQ AZ	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
AWS D1.1	D-11-GMAW-275-T-L1-GF-1	R S01	GMAW	EN 10025 S 275 JR	Gr. 1	6mm	EN 10025 S 275 JR	Gr. 1	6mm	S12-CS	S12-CS	S12-CS			S12-CS	S12-CS	S12-CS			S12-CS		
AWS D1.1	D-11-GMAW-275-T-L1-GF	R S02	GMAW	EN 10025 S 275 JR	Gr. 1	12mm	EN 10025 S 275 JR	Gr. 1	12mm	S12-CS	S12-CS	S12-CS			S12-CS						S12-CS	S12-CS
AWS D1.1	D-11-GMAW-275-B-U4b-GF	R S03	GMAW	EN 10025 S 275 JR	Gr. 1	20mm	EN 10025 S 275 JR	Gr. 1	20mm	S12-CS	S12-CS	S12-CS			S12-CS						S12-CS	S12-CS
AWS D1.1	04/13	R 04/13	GTAW+GMAW	EN 10028-3 P 355 NL2	Gr. 1	12mm	EN 10028-3 P 355 NL2	Gr. 1	12mm	S12-CS	S12-CS	S12-CS		S12-CS						S12-CS		
AWS D1.1	05/13	R 05/13	GMAW	EN 10025-2 S 355 J2G3	Gr. 1	10mm	EN 10025-2 S 355 J2G3	Gr. 1	10mm	S04-RR	S04-RR	S04-RR		S04-RR						S04-RR		
AWS D1.1	06/13	R 06/13	GTAW+GMAW	EN 10028-3 P 355 NL2	Gr. 1	25mm	EN 10028-3 P 355 NL2	Gr. 1	25mm	S12-CS	S12-CS	S12-CS		S12-CS						S12-CS		

Welding Operator — Welding Coordinator

BD: BAROLI DANIELE — OG: OLDANI GAUDENZIO

SWA: SATTI WASSEEQ AHMED

ALEXSISTEMI

2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024

3.3 PRODUCTION WPS (According AWS D1.1 also EEMUA 197)

ALEXSISTEMI spa	WELDING PROCEDURE SPECIFICATION WPS according AWS D1.1/D1.1-2020 / EEMUA 197 Annex M – FORM M-2	WPS N° GMAW-S355J2-1 Rev. 0 Supporting PQR N° RS 07	Sheet 1 Date: 14/03/2022

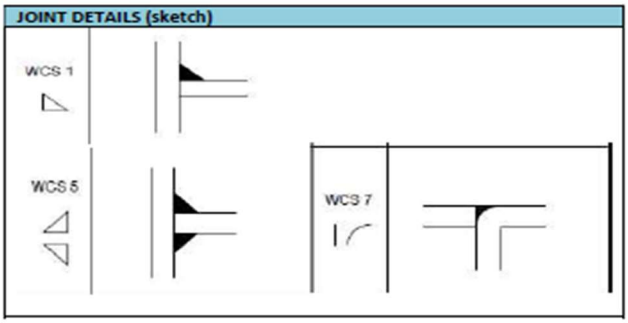
Base Metals	Specification	Type or Grade	AWS Group N.
Base Material	EN 10025-2	S355J2+N	N.A.
Welded To	EN 10025-2	S355J2+N	N.A.
Backing Material	-	-	-
Other			

Base Metal Thickness (mm)	As Welded	With PWHT
CJP Groove Welds	-	-
CJP Groove w/CVN	-	-
PJP Groove Welds	-	-
Fillet Welds	3 – 12 mm	-
Diameter (mm)	none	-

JOINT DETAILS	
Groove Type	Fillet weld
Groove Angle	N.A.
Root Opening (mm)	N.A.
Root Face (mm)	N.A.
Back gouging	N.A.
Method	N.A.

POST WELD HEAT TREATMENT	
Temperature	N.A.
Time and Temperature	N.A.
Other	N.A.

JOINT DETAILS (sketch)



PROCEDURE					
Weld Layer (s)	1 to n				
Weld Pass (es)	1 to n				
Process	GMAW				
Type (*semiautomatic, Mechanized, etc.*)	Semi Automatic				
Position	1F				
Vertical Progression	N.A.				
Filler Metal (AWS Spec.)	A5.18				
AWS Classification	ER70S-6				
Diameter (mm)	1.2				
Manufacturer / Trade Name	ELB-SG2				
Shielding Gas Composition	Ar: 80% CO2: 20%				
Flow Rate (L/min)	14÷16				
Nozzle Size (MM)	-				
Preheat Temperature	10 °C				
Interpass Temperature	≤ 200 °C				
Electrical Characteristics					
Current Type and Polarity	DC Reverse				
Transfer Mode (GMAW)	Pulsed arc				
Power Source Type (*cc, cv, etc.*)	Cc				
Amps	160÷190				
Volts	25÷28				
Wire Feed Speed (m/min.)	-				
Travel Speed (mm/min.)	180				
Maximum Heat Input (KJ/mm)	1.33÷1.77				
Technique					
Stringer or Weave	String				
Multi or Single pass (*per side*)	Multi				
Oscillation (*Mechanized/Automatic*)	-				
Traverse Length	-				
Traverse Speed	-				
Dwell Time	-				
Number of Electrodes	1				
Contact Tube to work Distance (mm)	12-15 mm				
Peening	No				
Interpass Cleaning	Brushing and grinding				
Other	-				

ALEXSISTEMI spa

WELDING PROCEDURE SPECIFICATION

WPS according AWS D1.1/D1.1-2020/EEMUA 197
Annex M – FORM M-2

WPS N°	Sheet
GMAW-S355J2-2	1
Rev. 0	Date:
Supporting PQR N° RS 08	14/03/2022

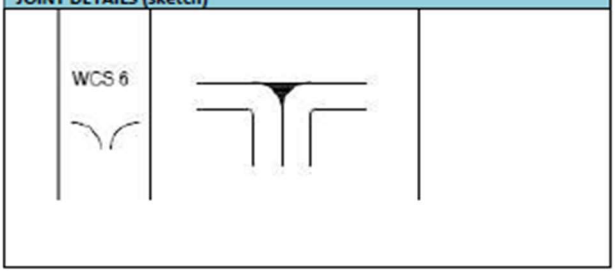
Base Metals	Specification	Type or Grade	AWS Group N.
Base Material	EN 10025-2	S355J2+N	N.A.
Welded To	EN 10025-2	S355J2+N	N.A.
Backing Material	-	-	-
Other			

Base Metal Thickness (mm)	As Welded	With PWHT
CJP Groove Welds	-	-
CJP Groove w/CVN	-	-
PJP Groove Welds	3 – 12 mm	-
Fillet Welds	-	-
Diameter (mm)	none	-

JOINT DETAILS	
Groove Type	Butt Joint Partial Penetration
Groove Angle	45°
Root Opening (mm)	N.A.
Root Face (mm)	N.A.
Back gouging	N.A.
Method	N.A.

POST WELD HEAT TREATMENT	
Temperature	N.A.
Time and Temperature	N.A.
Other	N.A.

JOINT DETAILS (sketch)



PROCEDURE					
Weld Layer (s)	1 to n				
Weld Pass (es)	1 to n				
Process	GMAW				
Type (*semiautomatic, Mechanized, etc.*)	Semi Automatic				
Position	1G				
Vertical Progression	N.A.				
Filler Metal (AWS Spec.)	A5.18				
AWS Classification	ER70S-6				
Diameter (mm)	1.2				
Manufacturer / Trade Name	ELB-SG2				
Shielding Gas Composition	Ar: 80% CO2: 20%				
Flow Rate (L/min)	14÷16				
Nozzle Size (MM)	-				
Preheat Temperature	10 °C				
Interpass Temperature	≤ 200 °C				
Electrical Characteristics					
Current Type and Polarity	DC Reverse				
Transfer Mode (GMAW)	Pulsed				
Power Source Type (*cc, cv, etc.*)	Cc				
Amps	110÷130				
Volts	21÷24				
Wire Feed Speed (m/min.)	-				
Travel Speed (mm/min.)	240÷270				
Maximum Heat Input (KJ/mm)	0.57÷0.69				
Technique					
Stringer or Weave	String				
Multi or Single pass (*per side*)	Multi				
Oscillation (*Mechanized/Automatic*)	-				
Traverse Length	-				
Traverse Speed	-				
Dwell Time	-				
Number of Electrodes	1				
Contact Tube to work Distance (mm)	12-15 mm				
Peening	No				
Interpass Cleaning	Brushing and grinding				
Other	-				

ALEXSISTEMI spa

WELDING PROCEDURE SPECIFICATION

WPS according AWS D1.1/D1.1-2020/EEMUA 197 Annex M – FORM M-2

WPS N°	Sheet
GMAW-S355J2-3	1
Rev. 0	Date:
Supporting PQR N° RS 08	14/03/2022

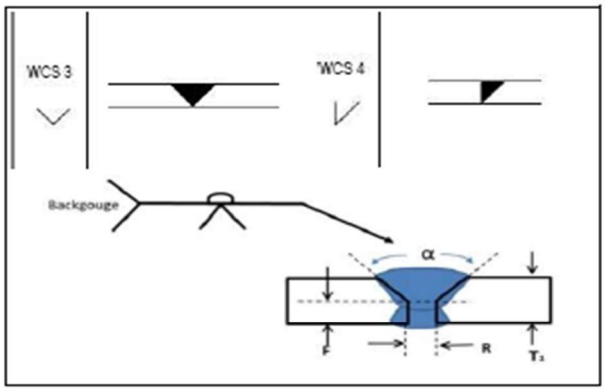
Base Metals	Specification	Type or Grade	AWS Group N.
Base Material	EN 10025-2	S355J2+N	N.A.
Welded To	EN 10025-2	S355J2+N	N.A.
Backing Material	-	-	-
Other			

Base Metal Thickness (mm)	As Welded	With PWHT
CJP Groove Welds	3 – 12 mm	-
CJP Groove w/CVN	-	-
PJP Groove Welds	-	-
Fillet Welds	-	-
Diameter (mm)	none	-

JOINT DETAILS	
Groove Type	Butt Joint Complete Penetration
Groove Angle	45°
Root Opening (mm)	2,5
Root Face (mm)	1,0
Back gouging	N.A.
Method	N.A.

POST WELD HEAT TREATMENT	
Temperature	N.A.
Time and Temperature	N.A.
Other	N.A.

JOINT DETAILS (sketch)



PROCEDURE					
Weld Layer (s)	1 to n				
Weld Pass (es)	1 to n				
Process	GMAW				
Type (*semiautomatic, Mechanized, etc.*)	Semi Automatic				
Position	1G				
Vertical Progression	N.A.				
Filler Metal (AWS Spec.)	A5.18				
AWS Classification	ER70S-6				
Diameter (mm)	1.2				
Manufacturer / Trade Name	ELB-SG2				
Shielding Gas Composition	Ar: 80% CO2: 20%				
Flow Rate (L/min)	14÷16				
Nozzle Size (MM)	-				
Preheat Temperature	10 °C				
Interpass Temperature	≤ 200 °C				
Electrical Characteristics					
Current Type and Polarity	DC Reverse				
Transfer Mode (GMAW)	Pulsed				
Power Source Type (*cc, cv, etc.*)	Cc				
Amps	110÷130				
Volts	21÷24				
Wire Feed Speed (m/min.)	-				
Travel Speed (mm/min.)	240÷270				
Maximum Heat Input (KJ/mm)	0.57÷0.69				
Technique					
Stringer or Weave	String				
Multi or Single pass (*per side*)	Multi				
Oscillation (*Mechanized/Automatic*)	-				
Traverse Length	-				
Traverse Speed	-				
Dwell Time	-				
Number of Electrodes	1				
Contact Tube to work Distance (mm)	12-15 mm				
Peening	No				
Interpass Cleaning	Brushing and grinding				
Other	-				

ALEXSISTEMI	**WELDING PROCEDURE SPECIFICATION** WPS according AWS D1.1/D1.1-2020/EEMUA 197 Annex M – FORM M-2	**WPS N°** GMAW-S355J2-4 **Rev. 0** Supporting PQR N° RS 08	Sheet 1 Date: 14/03/2022

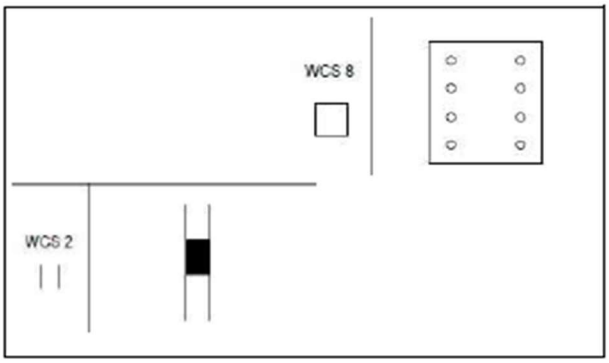
Base Metals	Specification	Type or Grade	AWS Group N.
Base Material	EN 10025-2	S355J2+N	N.A.
Welded To	EN 10025-2	S355J2+N	N.A.
Backing Material	-	-	-
Other			

Base Metal Thickness (mm)	As Welded	With PWHT
CJP Groove Welds	-	-
CJP Groove w/CVN	-	-
PJP Groove Welds	3 – 12 mm	-
Fillet Welds	-	-
Diameter (mm)	none	-

JOINT DETAILS	
Groove Type	Butt Joint Partial Penetration
Groove Angle	0°
Root Opening (mm)	N.A.
Root Face (mm)	N.A.
Back gouging	N.A.
Method	N.A.

POST WELD HEAT TREATMENT	
Temperature	N.A.
Time and Temperature	N.A.
Other	N.A.

JOINT DETAILS (sketch)



PROCEDURE					
Weld Layer (s)	1 to n				
Weld Pass (es)	1 to n				
Process	GMAW				
Type (*semiautomatic, Mechanized, etc.*)	Semi Automatic				
Position	1G				
Vertical Progression	N.A.				
Filler Metal (AWS Spec.)	A5.18				
AWS Classification	ER70S-6				
Diameter (mm)	1.2				
Manufacturer / Trade Name	ELB-SG2				
Shielding Gas Composition	Ar: 80% CO2: 20%				
Flow Rate (L/min)	14÷16				
Nozzle Size (MM)	-				
Preheat Temperature	10 °C				
Interpass Temperature	≤ 200 °C				
Electrical Characteristics					
Current Type and Polarity	DC Reverse				
Transfer Mode (GMAW)	Pulsed				
Power Source Type (*cc, cv, etc.*)	Cc				
Amps	110÷130				
Volts	21÷24				
Wire Feed Speed (m/min.)	-				
Travel Speed (mm/min.)	240÷270				
Maximum Heat Input (KJ/mm)	0.57÷0.69				
Technique					
Stringer or Weave	String				
Multi or Single pass (*per side*)	Multi				
Oscillation (*Mechanized/Automatic*)	-				
Traverse Length	-				
Traverse Speed	-				
Dwell Time	-				
Number of Electrodes	1				
Contact Tube to work Distance (mm)	12-15 mm				
Peening	No				
Interpass Cleaning	Brushing and grinding				
Other	-				

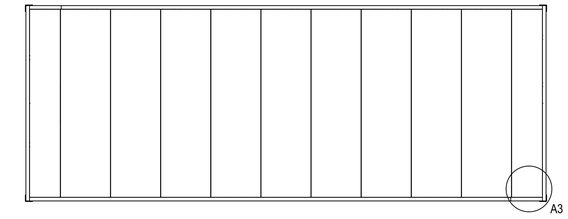
3.4 WELDING IDENTIFICATION MAP

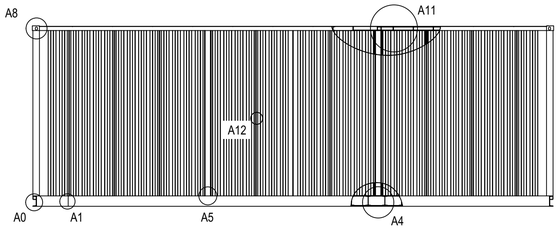
REFERENCE DRAWINGS

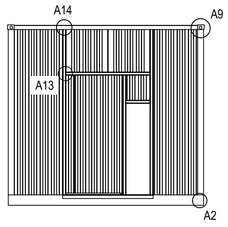
General Arrangement	*X176_GA_00 Rev.0*
Welding Map	*176-A_WELDING MAP Rev.0*
K559-2254-MT-SPE-001	***Structural Fabrication Specification***
EEMUA 158	*Construction Specification for Fixed Offshore Structures*
EEMUA 197	*Specification for the fabrication of non-primary structural steelwork for offshore installations*
ISO 19901-3	*Petroleum and Natural Gas Industrie Specific Requirements for Offshore Structures-Topsides Structure*

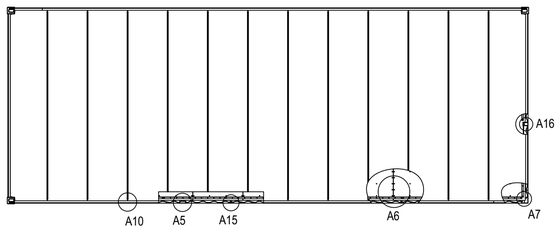
Mark WPS	Weld Type	Production WPS	PQR	Welders Id
WCS 5	**Fillet Weld**	GMAW-S355J2-1	RS 07	DB / SW
WCS 1	**Fillet Weld**	GMAW-S355J2-1	RS 07	DB / SW
WCS 7	**Fillet Weld**	GMAW-S355J2-1	RS 07	DB / SW
WCS 3	**Groove Weld CJP**	GMAW-S355J2-3	RS 08	DB / SW
WCS 2	**Groove Weld PJP**	GMAW-S355J2-4	RS 08	DB / SW
WCS 6	**Groove Weld PJP**	GMAW-S355J2-2	RS 08	DB / SW
WCS 4	**Groove Weld CJP**	GMAW-S355J2-3	RS 08	DB / SW
WCS 8	**Groove Weld PJP**	GMAW-S355J2-4	RS 08	DB / SW

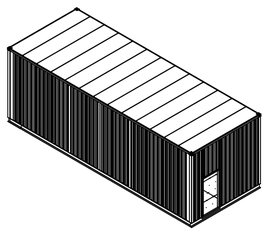
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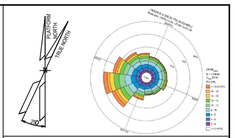












NOTES

WELDING DETAIL

DETAIL N°	SKETCH	DETAIL N°	SKETCH
WCS 1	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 10	WCS 2	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 6
WCS 3	t 1 = S355J0 t 2 = S355J0 THK : 4 ÷ 20	WCS 4	t 1 = S355J0 t 2 = S355J0 THK : 4 ÷ 25
WCS 5	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 10	WCS 6	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 10
WCS 7	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 10	WCS 8	D1 = S355J0 THK : 1.5 ÷ 10

ALEXSISTEMI S.R.L.

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
0	26/02/24	M.G.	M.R.	C.A.	ISSUE FOR REVIEW

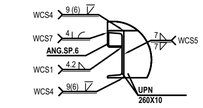
CROSSWIND — ROSETTI MARINO

TITLE : X176-A
WELDING MAP

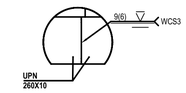
CONTRACT NO./TITLE CONTRACT_NO. 1724000049 — SCALE

DRAWN M.G. | CHECKED M.R. | APPROVED C.A. | DATE 26/02/24

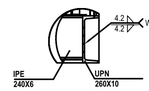
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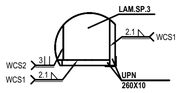
DETAIL A0
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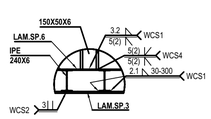
DETAIL A1
SCALE 1 : 10



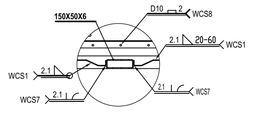
DETAIL A2
SCALE 1 : 10



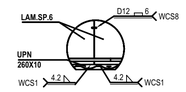
DETAIL A3
SCALE 1 : 30



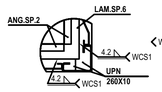
DETAIL A4
SCALE 1 : 20



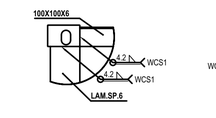
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SCALE 1 : 10



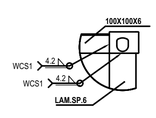
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SCALE 1 : 25



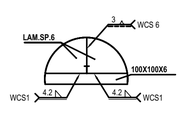
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SCALE 1 : 10



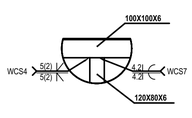
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SCALE 1 : 10



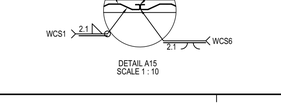
DETAIL A9
SCALE 1 : 10



DETAIL A10
SCALE 1 : 10



DETAIL A14
SCALE 1 : 10



DETAIL A11
SCALE 1 : 15

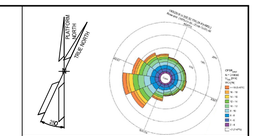
DETAIL A16
SCALE 1 : 10

DETAIL A12
SCALE 1 : 10

DETAIL A13
SCALE 1 : 10



DETAIL A15
SCALE 1 : 10



NOTES

WELDING DETAIL

DETAIL N°	SKETCH	DETAIL N°	SKETCH
WCS 1	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 10	WCS 2	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 6
WCS 3	t 1 = S355J0 t 2 = S355J0 THK : 4 ÷ 20	WCS 4	t 1 = S355J0 t 2 = S355J0 THK : 4 ÷ 25
WCS 5	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 10	WCS 6	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 10
WCS 7	t 1 = S355J0 t 2 = S355J0 THK : 1.5 ÷ 10	WCS 8	D1 = S355J0 THK : 1.5 ÷ 10

ALEXSISTEMI S.R.L.

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
0	26/02/24	M.G.	M.R.	C.A.	ISSUE FOR REVIEW

CROSSWIND — ROSETTI MARINO

TITLE : X176-A
WELDING MAP

CONTRACT NO./TITLE CONTRACT_NO. 1724000049 — SCALE

DRAWN M.G. | CHECKED M.R. | APPROVED C.A. | DATE 26/02/24

A1 — DRAWING NO. — SHEET 2:2 — REV. 00