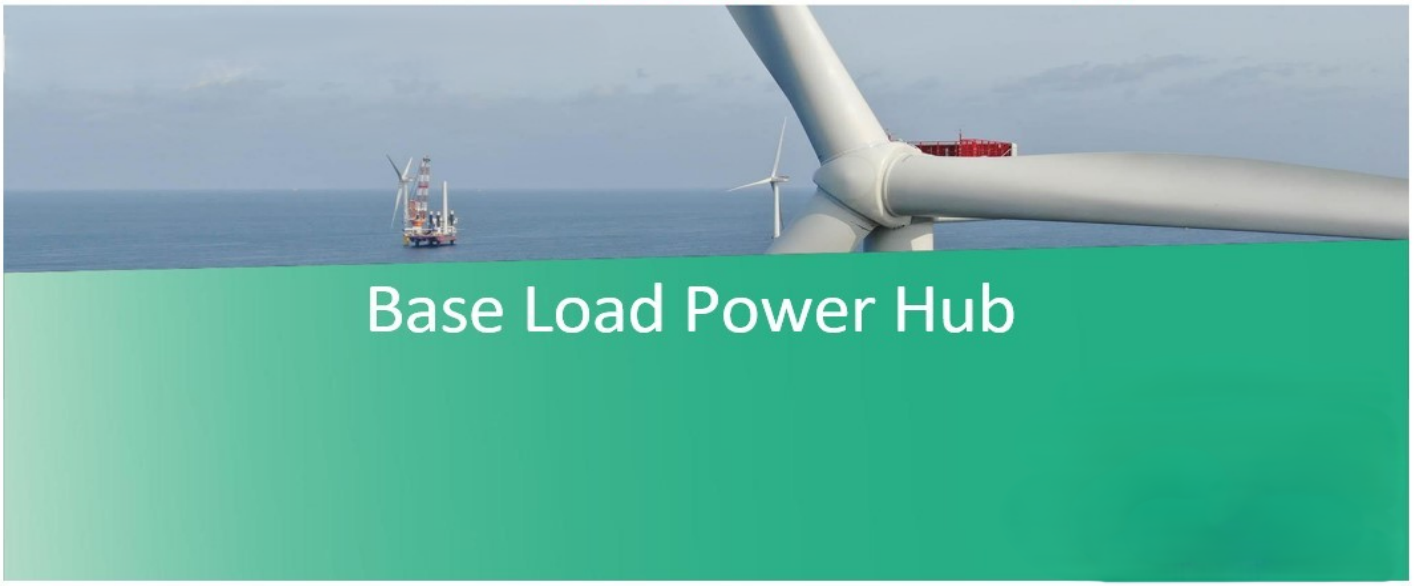
CROSSWIND

ROSETTI MARINO

PROVERLIS

PROJECT **123A90 - HOLLANDSE KUST NOORD WIND PARK**
BLPH Project



COMMISSIONING DOSSIER (ONSHORE)

SYSTEM	82 Main Power Distribution Medium Voltage 6.6 kV
SUBSYSTEM	82-10 Power Transformer 1.25 MVA (1BT1 BESS)

CROSSWIND

123A90 - HOLLANDSE KUST NOORD WIND PARK
BLPH Project

COMMISSIONING DOSSIER INDEX

ROSETTI MARINO

Sub System N°:	82-10	**Tick as appropriate**	ONSHORE	OK
Description:	Power Transformer 1.25 MVA (1BT1 BESS)		OFFSHORE	

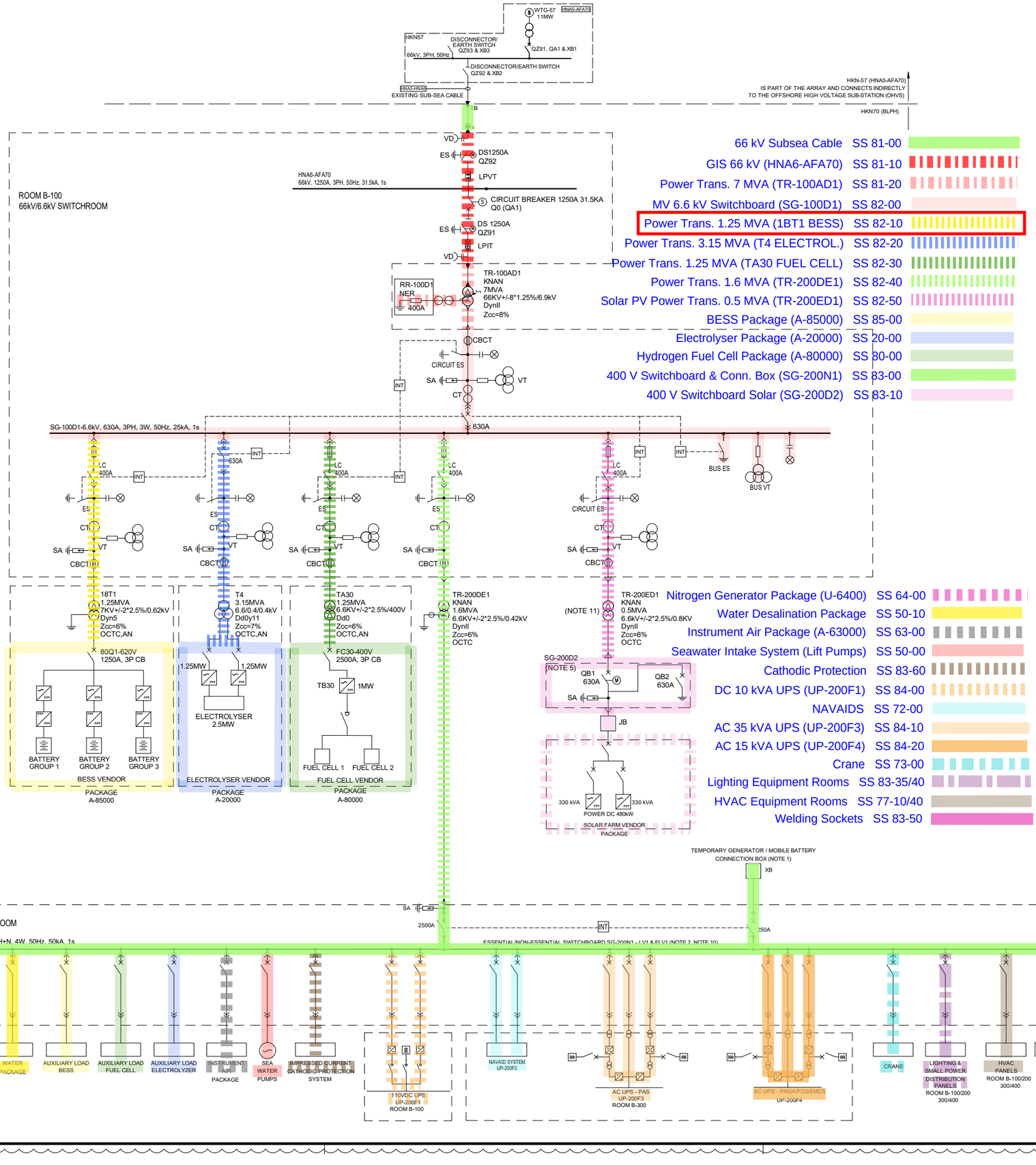
1. *SUB-SYSTEM DEFINITION*	OK
1.1 Sub-System Description / Boundary Limit Drawings	
2. *READY FOR OPERATION CERTIFICATE*	OK
2.1 Achievement Of Ready for Operation Certificate (RFO)	
2.2 Exception Punch Lists (per discipline)	
2.3 “As-Commissioned” P&ID’s / SLD’s / D&ID’s / C&E’s	
3. *CONSOLIDATED PUNCH LISTS*	OK
3.1 Cleared and Residual Items (sorted by discipline)	
4. *FUNCTIONAL TESTS SHEETS*	OK
4.1 Electrical functional test sheets index	
4.2 Electrical “As-Commissioned” interconnection diagrams	
4.3 Instrumentation Functional Test Sheets Index	
4.4 Instrumentation “As-Commissioned” interconnection diagrams	
4.5 Telecommunication Functional Test Sheets Index	
4.6 Telecommunication “As-Commissioned” I.C.D. / TSLD’s	
5. *SITE / OPERATIONAL:*	NA
5.1 Operational Test Procedure	
5.2 Operational Test Certificates	
6. *PIPING AND VESSEL PREPARATION*	NA
6.1 Final Mechanical / Vessel Inspection Checks Index	
6.2 Leak Test / Drying / Inerting Test Sheets Index	
6.3 Chemical Loading & First Fill records Index	
6.4 Chemical Cleaning Reports and Records Index	
6.5 Lubrication Schedule	
7. *VENDORS*	OK
7.1 Vendor Package Summary Index	
7.2 SAT Procedure with associated punch list and reference (Front Page)	
7.3 Vendor Spares & Special Tools lists references	
7.4 Vendor Data / Operations / Maintenance Manuals References	
8. *LIST OF MODIFICATIONS*	NA
8.1 List of changes initiated during the WORKSITE Commissioning phase pertaining to the relevant Sub-System will be incorporated in this section with relevant references (with location and position of blinds/spades, isolation LO & LC valves, list of electrical isolation status, and remaining inhibits and overrides)	
9. *SUPPORTING DOCUMENTS*	NA
9.1 Other supporting documents (as applicable)	

	Contractor Commissioning Site Leader	Company Commissioning Site Leader
Name	Anthony Iveson	Gerry McCann
Date	2025-05-15	2025-05-15
Signature	PROVERLIS Digitaly signed by Anthony Iveson 2025-05-15T08:49:54.718Z	PROVERLIS Digitaly signed by Gerry McCann 2025-05-15T14:25:47.735Z

Section 1 SUB-SYSTEM DEFINITION

DRAWING NO. 123A90-DDL-EL-DG-20158

REV. 01



SYMBOL LEGEND:

- VOLTAGE DETECTOR
- EARTHING SWITCH DISCONNECTOR
- MOTORIZED EARTHING SWITCH
- CIRCUIT BREAKER
- FUSE
- CONTACTOR
- THREE-PHASE TRANSFORMER WITH TAP CHANGER
- THREE-PHASE TRANSFORMER
- CURRENT TRANSFORMER
- THREE-PHASE TRANSFORMER, WITH THREE WINDINGS
- NEUTRAL EARTHING RESISTOR
- SURGE ARRESTER
- CORE BALANCE CURRENT TRANSFORMER
- SURGE ARRESTOR FOR T-CONNECTOR (N.1 FOR EACH PHASE)
- VOLTAGE & CURRENT TRANSFORMER (3Ø X 2) (LPIT TYPE)
- VOLTAGE TRANSFORMER (3Ø X 2) (LPVT TYPE)
- VOLTAGE TRANSFORMER
- CABLE BOX
- T-CONNECTOR CABLE TERMINATION
- CABLE AIR TERMINATION

OLTC	= ON LOAD TAP CHANGER
OCTC	= OPEN CIRCUIT TAP CHANGER
KNAN	= NON-MINERAL OIL NATURAL AIR COOLED
AN	= AIR NATURAL
XB	= CABLE BOX
QZ	= DISCONNECT SWITCH & EARTH SWITCH
QA	= CIRCUIT BREAKER
LC	= LATCHED FUSED CONTACTOR (400A)
INT	= INTERLOCK SYSTEM
SA	= SURGE ARRESTER
CBCT	= CORE BALANCE CURRENT TRANSFORMER
ES	=EARTHING SWITCH
VD	=VOLTAGE DETECTOR
LCP	=LOCAL CONTROL PANEL
LPVT	=LOW POWER VOLTAGE TRANSFORMER
LPCT	=LOW POWER CURRENT TRANSFORMER
LPIT	=LOW POWER INSTRUMENT TRANSFORMER
JB	=JUNCTION BOX

NOTES:

1. TEMPORARY POWER SUPPLY CONNECTION BOX LOCATED ON OUTSIDE WALL OF LV SWITCHROOM / CONTAINER.
2. LOAD DEFINITION 'ESSENTIAL' / 'NON-ESSENTIAL' IS SHOWN IN THE LOAD LIST. THE CCS, EMCS AND 'SMART' SWITCHGEAR WILL OPEN / CLOSE CIRCUIT BREAKERS AS REQUIRED.
3. A COMBINED CCS/EMCS SYSTEM COMPRISES A MICROPROCESSOR BASED SYSTEM, ASSOCIATED SOFTWARE AND REQUIRED PERIPHERALS FOR MONITORING AND CONTROLLING OF ELECTRICAL POWER NETWORK. ALL ELECTRICAL EQUIPMENT AND PACKAGE UNITS SHALL BE CONNECTED TO THE CENTRAL CONTROL SYSTEM .
4. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM SUPPLIED BY COMPANY.
5. THE SOLAR FARM IN-FEED POWER CIRCUIT BREAKERS PANEL IS LOCATED INSIDE THE LV SWITCHGEAR ROOM B-200.
6. DELETED.
7. DELETED.
8. DELETED.
9. CROSSWIND SHALL BE ABLE TO CONTROL THE BLPH 66KV MOTORISED CIRCUIT BREAKER Q0 (QA1) & MOTORISED ELECTRICAL DISCONNECTOR / EARTH SWITCH (QZ92, TYPE B) USING THEIR 'HV-SCADA' SYSTEM. THIS BACK-UP / REDUNDANT CONTROL SHALL BE ADDITIONAL TO THAT PROVIDED BY THE CCS AND BE OF HIGHER PRIORITY OVER A SEPARATE FIBRE OPTIC CABLE (FOC). THE CCS OPERATOR AND 'HV-SCADA' SHALL BOTH BE KEPT FULLY AWARE OF EQUIPMENT STATUS AT ALL TIMES. INTERTRIPPING, INHIBITS & INTERLOCKING FOR BLPH 66KV EQUIPMENT SHALL BE AS PER THE WIND FARM.
10. THE LOADS IN THE LOW VOLTAGE SWITCHGEAR AND THE CURRENT VALUES OF THE CIRCUIT BREAKERS ARE ONLY INDICATIVE.
11. NEUTRAL POINT OF TR-200ED1 SHALL NOT BE GROUNDED AS REQUIRED BY SOLAR FARM SUPPLIER IN 123A90-PML-PM-TQ-00040.

REFERENCES:

1. 123A90-DDL-EL-DG-20014 ELECTRICAL CONTROL, PROTECTION AND METERING DIAGRAMS
2. 123A90-DDL-EL-DG-20015 ELECTRICAL SINGLE LINE DIAGRAM 6.6kV SYSTEMS
3. 123A90-DDL-EL-DG-20159 ELECTRICAL SINGLE LINE DIAGRAMS LV SYSTEM
4. 123A90-DDL-EL-DG-20160 ELECTRICAL SINGLE LINE DIAGRAMS AC UPS SYSTEMS
5. 123A90-DDL-EL-DG-20161 ELECTRICAL SINGLE LINE DIAGRAMS DC UPS SYSTEMS
6. 123A90-DDL-EL-DG-20185 ELECTRICAL SINGLE LINE DIAGRAM HV SYSTEMS
7. 123A90-DDL-EL-DL-20104 ELECTRICAL EQUIPMENT LAYOUT - HV SWITCHROOM
8. 123A90-DDL-EL-DL-20105 ELECTRICAL EQUIPMENT LAYOUT - LV SWITCHROOM
9. 123A90-DDL-EL-LIS-20016 ELECTRICAL LOAD LIST and BALANCE -CCS MODE CHARGING-
10. 123A90-DDL-EL-RE-20152 ELECTRICAL EQUIPMENT SIZING CCALCULATION REPORT
11. 123A90-DDL-EL-RE-20170 ELECTRICAL SYSTEM STUDY REPORT - LOAD FLOW
12. 123A90-DDL-EL-RE-20171 ELECTRICAL SYSTEM STUDY REPORT - SHORT CIRCUIT
13. 123A90-DDL-EL-RE-20172 ELECTRICAL SYSTEM STUDY REPORT - ARC FLASH ENERGY CALCULATION
14. 123A90-DDL-EL-RE-20173 ELECTRICAL SYSTEM STUDY REPORT - HARMONICS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	02/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE :

OVERALL/KEY SINGLE LINE DIAGRAM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE N/A
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 26/03/2023
A1	DRAWING NO. 123A90-DDL-EL-DG-20158	SHEET 001	REV. 01

01

File Name : 123A90-DDL-EL-DG-20158_REV01.dwg

Section 2 READY FOR OPERATION

Section 2.1 Achievement Of Ready for Operation Certificate (RFO)

ROSETTI MARINO

123A90 - HOLLANDSE KUST NOORD WIND PARK
BLPH Project

CROSSWIND

Ready For Operation (RFO) Certificate

COMPLETE	●	PARTIAL	

Revision:	2		Issued on:	2025-05-09	

System:	82	/	Main Power Distribution Medium Voltage 6.6 kV
SubSystem:	82-10	/	Power Transformer 1.25 MVA (1BT1 BESS)

We hereby confirm that all Mechanical Completion (MC) and Pre-Commissioning/Commissioning (Pre-Comm./Comm.) activities for the above-mentioned System/Sub-System have been successfully completed in accordance with project specifications, relevant standards and contractual requirements. The System/Sub-System has been tested and verified to ensure readiness for operation. Issuance of this Certificate shall not release CONTRACTOR from any of his obligations, responsibilities or liabilities under the CONTRACT.

Mechanical Completion: All required MC activities have been completed and approved
Pre-Commissioning & Commissioning: All required Pre-Comm. and Comm. activities and OTPs have been completed and approved (Status Index attached)
Punch List: All Punch items categorized as A and B have been cleared (PL report attached)
Documentation: As-built documentation and Commissioning dossier has been completed, reviewed and approved

PUNCH LIST	PENDING POINTS
Note: All Category "A" and "B" Items must be cleared prior to issuance of the Ready For Operation (RFO) Certificate	B 0'

REMARKS:

	CONTRACTOR Commissioning Manager	**COMPANY** Commissioning Lead
Name	Anthony Iveson	Gerry McCann
Date	2025-05-12	2025-05-14
Signature	PROVERLIS Digitaly signed by Anthony Iveson 2025-05-12T08:50:22.651Z	PROVERLIS Digitaly signed by Gerry McCann 2025-05-14T12:22:52.024Z

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 82-10 & process: COMM

Electrical	82-10 Power Transformer 1.25 MVA (1BT1 BESS)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
SG-100D1-A3-K1	BESS PACKAGE - SG-100D1-A3-K1	ONSHORE	C10002983	FTR-2	100	2024-12-10	RFO 2
		ONSHORE	C10002984	FTR-6	100	2025-02-04	RFO 2

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 82 Main Power Distribution Medium Voltage 6.6 kV

SUBSYSTEM 82-10 Power Transformer 1.25 MVA (1BT1 BESS)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000669	A	82005-CEM-1-L1 C10000485	Cable to be connected both side. Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3	.	Cables have been reconnected. Torque of terminals will be done during	Pschintu 2024-11-20	Ecarotenuto 2024-11-26	2024-11-26	2024-11-26
C30000670	B	82005-CEM-1-L1 C10000485	Missing cable tags on external routing. Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3	.		Pschintu 2024-11-20	2025-02-07	Pschintu 2025-02-07	2025-02-07
C30000671	B	82005-CEM-1-L1 C10000485	Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3	.		Pschintu 2024-11-20	2025-01-03	Ecarotenuto 2025-01-03	2025-01-03

Section 2.2 Exception Punch Lists (per discipline)

Project CROSSWIND

PUNCH LIST REPORT

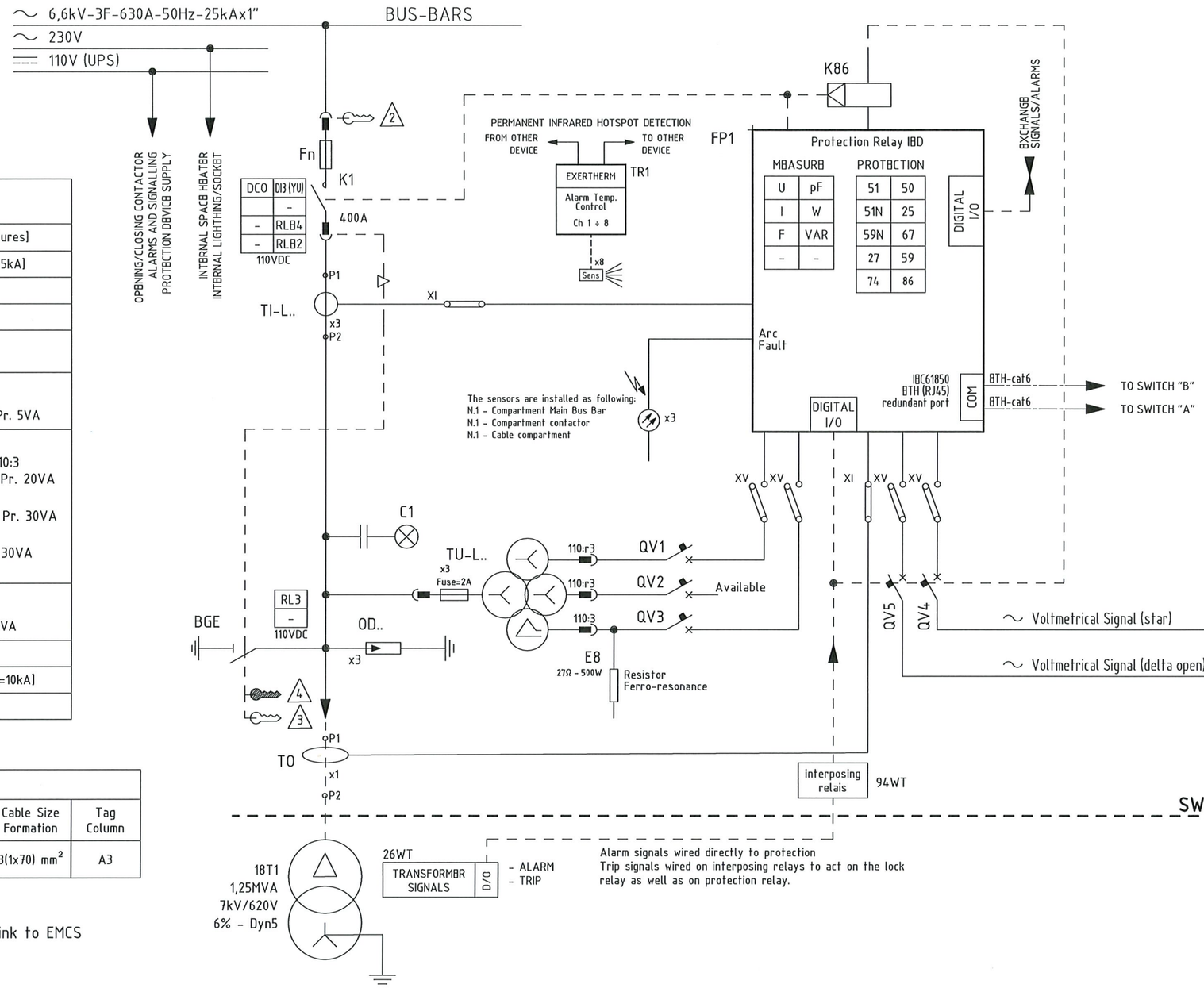
NO DATA AVAILABLE

Section 2.3 “As-Commissioned” P&ID's / SLD's / D&ID's / C&E's

LEGEND:

- Free key with opened Circuit Breaker (Circuit Breaker locked in open position)
- Free key with insolated Circuit Breaker or Contactor (Circuit Breaker or Contactor locked in isolated position)
- Free key with opened Earthing Switch (Earthing Switch locked in open position)
- Free key with closed Earthing Switch (Earthing Switch locked in close position)
- Mechanical interlock
- DCO DOUBLE COMMAND OPERATED

SINGLE LINE DIAGRAM
"FEEDER with CONTACTOR"



MAIN EQUIPMENT
[Additional Features and Auxiliary Components will be inserted on Functional Diagram]

Tag	Desciption Tag	Supplier	Type [Technical Features]
K1	Contactor	ABB	VSC7/P [7,2KV - 400A - 25kA]
Fn	Fuse for Contactor	ABB	CEF 160A
BGE	Earthing Switch	ABB	ST-E [12KV - 25kA]
FP1	Protection Relay	ABB	REX640
TI-L..	Current Transformers	ESITAS	ATB 10-BS 7,2kV - 150/1 - 25kA 1°winding : Cl. 0,5+5P20 - Pr. 5VA
TU-L..	Voltage Transformers + Fuses	ABB	TJP4.3 [7,2kV - 6,6kV:√3/110:√3-110:√3-110:3 1° winding : Cl. 0,5-3P - Pr. 20VA (110:√3) 2° winding : Cl. 0,5-3P - Pr. 30VA (110:√3) 3° winding : Cl. 3P - Pr. 30VA (110:3)
TO	Omopolar Ring Current Transformer (Internal Diameter 150mm)	ESITAS	KAP-150/250-55 1.2kV - 100/1A - 25kA 1° winding : Cl. 5P5 - Pr. 5VA
TR1	Permanent Infrared Hotspot Detection	EXERTHERM	
OD..	Voltage Discharger	DEHN	SBKW 9/DH I-0 [Ur=9kV-In=10kA]
C1	Voltage Presence Indicator	ABB	VPIS [3÷24kV]

USER DETAILS

Tag User	Desciption User	User Power	Current Transformer Ratio	Cable Size Formation	Tag Column
A-85000	BESS PACKAGE	1000 kW	150 / 1A	3(1x70) mm²	A3

NOTE :

For BESS PACKAGE feeder interlocks and intertrips will be managed via serial link to EMCS

AS COMMISSIONED: MATTIA GIANNI
NO MARK UP
27/3/25

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
=					
+					
4	08/08/2024	Santinelli	Giulietti	Sigismondi	As-Built (ASB)
3	26/06/2024	Santinelli	Giulietti	Sigismondi	Accepted for Construction (AFC)
2	14/05/2024	Santinelli	Giulietti	Sigismondi	Issued for review (IFR)
1	14/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	07/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING
DWG n° : 231151/SD/10
Item n° : PF1113279/4

CROSSWIND

ROSETTI MARINO

TITLE : "SG-100D1"

ELECTRICAL SINGLE LINE DIAGRAM
Column A3 : Bess Package A-85000

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00010

SHEET 006

REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00010 Rev. 04

Section 3 CONSOLIDATED PUNCH LISTS

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM	82	Main Power Distribution Medium Voltage 6.6 kV
SUBSYSTEM	82-10	Power Transformer 1.25 MVA (1BT1 BESS)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000669	A	82005-CEM-1-L1 C10000485	Cable to be connected both side. Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3	.	Cables have been reconnected. Torque of terminals will be done during	Pschintu 2024-11-20	Ecarotenuto 2024-11-26	2024-11-26	2024-11-26
C30000670	B	82005-CEM-1-L1 C10000485	Missing cable tags on external routing. Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3	.		Pschintu 2024-11-20	2025-02-07	Pschintu 2025-02-07	2025-02-07
C30000671	B	82005-CEM-1-L1 C10000485	Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3	.		Pschintu 2024-11-20	2025-01-03	Ecarotenuto 2025-01-03	2025-01-03

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000669

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000485	1.4 Discipline	Electrical
1.2 Item	82005-CEM-1-L1		6.6KV HV Switchgear / 6.6/0.62 KV, 1.25MVA Transformer
1.3 Subsystem	82-10		Power Transformer 1.25 MVA (1BT1 BESS)

2 - OBSERVATION

Cable to be connected both side. Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3

Name: Paolo Schintu

Date: 2024-11-20

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Paolo Schintu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-20
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Cables have been reconnected. Torque of terminals will be done during Commissioning activities

Name: Eleonora Carotenuto

Date: 2024-11-26

Signature:

5 - CLEARANCE CHECK

DONE

Name:

Date: 2024-11-26

Signature:

6- CLEARANCE APPROVAL

Name:

Date: 2024-11-26

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000670

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000485	1.4 Discipline	Electrical
1.2 Item	82005-CEM-1-L1		6.6KV HV Switchgear / 6.6/0.62 KV, 1.25MVA Transformer
1.3 Subsystem	82-10		Power Transformer 1.25 MVA (1BT1 BESS)

2 - OBSERVATION

Missing cable tags on external routing. Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3

Name: Paolo Schintu
Date: 2024-11-20
Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Paolo Schintu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-20
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:
Date:
Signature:

5 - CLEARANCE CHECK

INSTALLED

Name: Paolo Schintu
Date: 2025-02-07
Signature:

6- CLEARANCE APPROVAL

Name:
Date:
Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000671

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000485	1.4 Discipline	Electrical
1.2 Item	82005-CEM-1-L1		6.6KV HV Switchgear / 6.6/0.62 KV, 1.25MVA Transformer
1.3 Subsystem	82-10		Power Transformer 1.25 MVA (1BT1 BESS)

2 - OBSERVATION

Missing cable cleats stainless steel with TPE cable protection.
Point valid also for 82005-CEM-1-L2 and 82005-CEM-1-L3

Name: Paolo Schintu
Date: 2024-11-20
Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Paolo Schintu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-20
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:
Date:
Signature:

5 - CLEARANCE CHECK

DONE

Name: Eleonora Carotenuto
Date: 2025-01-03
Signature:

6- CLEARANCE APPROVAL

Name:
Date:
Signature:

Section 4 FUNCTIONAL TESTS SHEETS

Section 4.1 Electrical functional test sheets index

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 82-10 & process: COMM & discipline : E

Electrical	82-10 Power Transformer 1.25 MVA (1BT1 BESS)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
SG-100D1-A3-K1	BESS PACKAGE - SG-100D1-A3-K1	ONSHORE	C10002983	FTR-2	100	2024-12-10	RFO 2
		ONSHORE	C10002984	FTR-6	100	2025-02-04	RFO 2

ITEM	Tag	SG-100D1-A3-K1	: BESS PACKAGE - SG-100D1-A3-K1			Dwg	1723002197-EL-DG-00010
	S/Sys	82-10	: Power Transformer 1.25 MVA (1BT1 BESS)			Module	
TASK	code	C10002983		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form	FTR-2 Protection Relay

FTR2 - Protection relay
Record sheet

RELAY DATA

Manufacturer:	ABB	Serial N°:	1VHR81041854	Relay type:	ABB REX640
Auxiliary supply:	110 Vdc	Location:	B100	Cubicle:	A3
Switchboard:	SG-100D1				

Current transformers

Tag	Number of	Ratio	Location
TI1		150/1A	SG-100D1-A3
TI2		150/1A	SG-100D1-A3
TI3		150/1A	SG-100D1-A3

Voltage transformers

Tag	Number of	Ratio	Location
TU - L1		6600/110V	SG-100D1-A3
TU - L2		6600/110V	SG-100D1-A3
TU - L3		6600/110V	SG-100D1-A3

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay	
				Setting	Trip value
67-1 - DPHLPDOC1	120A	150A		900ms	924ms
67-2 - DPHLPDOC2	120A	150A		100ms	125ms
51N - EFLPTOC1	10A	10.8A		100ms	120ms
50-1 - PHIPTOC1	450A	457A		250ms	258ms
51-1 - PHLPTOC1	105A	181A		1911ms	1922ms

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
OMICRON CMC 356	DJ297G		

Comments: See attachments for full tests.

Page 1/1	Performed by	☐ WITNESS ☑ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Mattia Girotti	Kristian Castellani	Witness waived
Date	2024-12-09	2024-12-09	2024-12-10
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-12-09T15:26:34.318Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-12-09T15:31:29.390Z	PROVERLIS Digitaly signed by Witness waived 2024-12-10T08:28:17.351Z

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

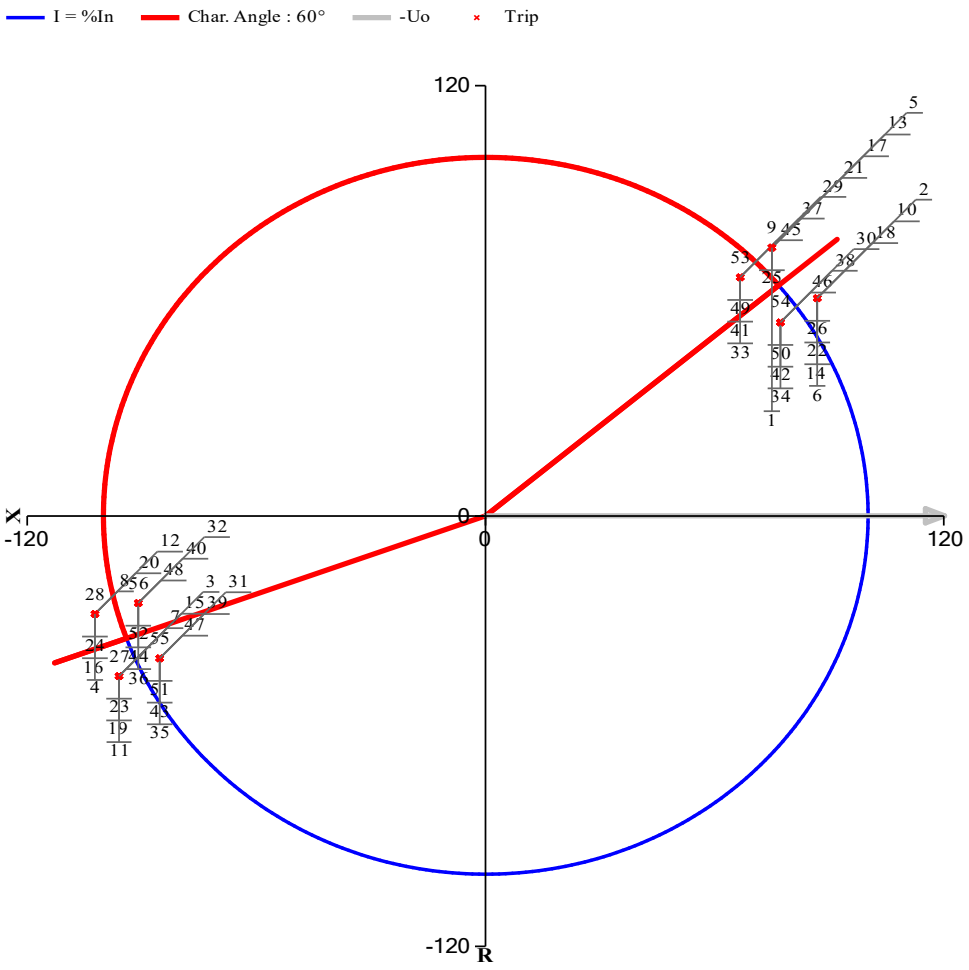
EQUIPMENT DESCRIPTION : -A-85000

ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854



IEC61850 : DPHLPDOC1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
Primary Current : 150 A
Nominal current : 103.1 A
Reset delay time : 20 msec
Minimum operate time : 20 msec
Allow non direction : False
Measurement mode : DFT
Min operate current : 0.01 xIn
Min operate voltage : 0.01 xUn
Num of start phases : 1 Out of 3
Start value : 0.80 xIn
Start value mult. : 1.00
Directional mode : Reverse
Operate curve type : IEC Definite Time
Operate delay time : 900 msec
Type of reset curve : Immediate
Characteristic angle : 60 deg
Max forward angle : 80 deg
Max reverse angle : 80 deg
Min forward angle : 80 deg
Min reverse angle : 80 deg
Voltage Mem time : 40 msec
Pol quantity : Cross Pol

N.	I1"(A)	I1(°)	I2"(A)	I2(°)	I3"(A)	I3(°)	V1"(V)	V1(°)	V2"(V)	V2(°)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	0.847	45	0.847	-75	0.847	165	0.953	0	0.953	240	0.953	120	900	918	2
2	0.847	35	0.847	-85	0.847	155	0.953	0	0.953	240	0.953	120	0	0	0
3	0.847	-155	0.847	85	0.847	-35	0.953	0	0.953	240	0.953	120	0	0	0
4	0.847	-165	0.847	75	0.847	-45	0.953	0	0.953	240	0.953	120	900	922	2.44
5	0.847	75	0.847	-105	0	120	0.953	-20.71	0.953	-99.29	63.509	120	900	922	2.44
6	0.847	65	0.847	-115	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
7	0.847	-125	0.847	55	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
8	0.847	-135	0.847	45	0	120	0.953	-20.71	0.953	-99.29	63.509	120	900	920	2.22
9	0	0	0.847	-45	0.847	135	63.509	0	0.953	-140.71	0.953	140.71	900	924	2.67

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : DPHLPDOC1

N.	I1"(A)	I1(°)	I2"(A)	I2(°)	I3"(A)	I3(°)	V1"(V)	V1(°)	V2"(V)	V2(°)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
10	0	0	0.847	-55	0.847	125	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
11	0	0	0.847	115	0.847	-65	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
12	0	0	0.847	105	0.847	-75	63.509	0	0.953	-140.71	0.953	140.71	900	923	2.56
13	0.847	15	0	240	0.847	-165	0.953	20.71	63.509	240	0.953	99.29	900	920	2.22
14	0.847	5	0	240	0.847	-175	0.953	20.71	63.509	240	0.953	99.29	0	0	0
15	0.847	175	0	240	0.847	-5	0.953	20.71	63.509	240	0.953	99.29	0	0	0
16	0.847	165	0	240	0.847	-15	0.953	20.71	63.509	240	0.953	99.29	900	924	2.67
17	0.847	45	0	0	0	0	0.953	0	63.509	240	63.509	120	900	919	2.11
18	0.847	35	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
19	0.847	-155	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
20	0.847	-165	0	0	0	0	0.953	0	63.509	240	63.509	120	900	920	2.22
21	0	0	0.847	-75	0	0	63.509	0	0.953	240	63.509	120	900	923	2.56
22	0	0	0.847	-85	0	0	63.509	0	0.953	240	63.509	120	0	0	0
23	0	0	0.847	85	0	0	63.509	0	0.953	240	63.509	120	0	0	0
24	0	0	0.847	75	0	0	63.509	0	0.953	240	63.509	120	900	924	2.67
25	0	0	0	0	0.847	165	63.509	0	63.509	240	0.953	120	900	921	2.33
26	0	0	0	0	0.847	155	63.509	0	63.509	240	0.953	120	0	0	0
27	0	0	0	0	0.847	-35	63.509	0	63.509	240	0.953	120	0	0	0
28	0	0	0	0	0.847	-45	63.509	0	63.509	240	0.953	120	900	924	2.67
29	0.753	45	0.753	-75	0.753	165	0.953	0	0.953	240	0.953	120	0	0	0
30	0.753	35	0.753	-85	0.753	155	0.953	0	0.953	240	0.953	120	0	0	0
31	0.753	-155	0.753	85	0.753	-35	0.953	0	0.953	240	0.953	120	0	0	0
32	0.753	-165	0.753	75	0.753	-45	0.953	0	0.953	240	0.953	120	0	0	0
33	0.753	75	0.753	-105	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
34	0.753	65	0.753	-115	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
35	0.753	-125	0.753	55	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
36	0.753	-135	0.753	45	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
37	0	0	0.753	-45	0.753	135	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
38	0	0	0.753	-55	0.753	125	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
39	0	0	0.753	115	0.753	-65	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
40	0	0	0.753	105	0.753	-75	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
41	0.753	15	0	240	0.753	-165	0.953	20.71	63.509	240	0.953	99.29	0	0	0
42	0.753	5	0	240	0.753	-175	0.953	20.71	63.509	240	0.953	99.29	0	0	0
43	0.753	175	0	240	0.753	-5	0.953	20.71	63.509	240	0.953	99.29	0	0	0
44	0.753	165	0	240	0.753	-15	0.953	20.71	63.509	240	0.953	99.29	0	0	0
45	0.753	45	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
46	0.753	35	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
47	0.753	-155	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : DPHLPDOC1

N.	I1"(A)	I1(°)	I2"(A)	I2(°)	I3"(A)	I3(°)	V1"(V)	V1(°)	V2"(V)	V2(°)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
48	0.753	-165	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
49	0	0	0.753	-75	0	0	63.509	0	0.953	240	63.509	120	0	0	0
50	0	0	0.753	-85	0	0	63.509	0	0.953	240	63.509	120	0	0	0
51	0	0	0.753	85	0	0	63.509	0	0.953	240	63.509	120	0	0	0
52	0	0	0.753	75	0	0	63.509	0	0.953	240	63.509	120	0	0	0
53	0	0	0	0	0.753	165	63.509	0	63.509	240	0.953	120	0	0	0
54	0	0	0	0	0.753	155	63.509	0	63.509	240	0.953	120	0	0	0
55	0	0	0	0	0.753	-35	63.509	0	63.509	240	0.953	120	0	0	0
56	0	0	0	0	0.753	-45	63.509	0	63.509	240	0.953	120	0	0	0

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

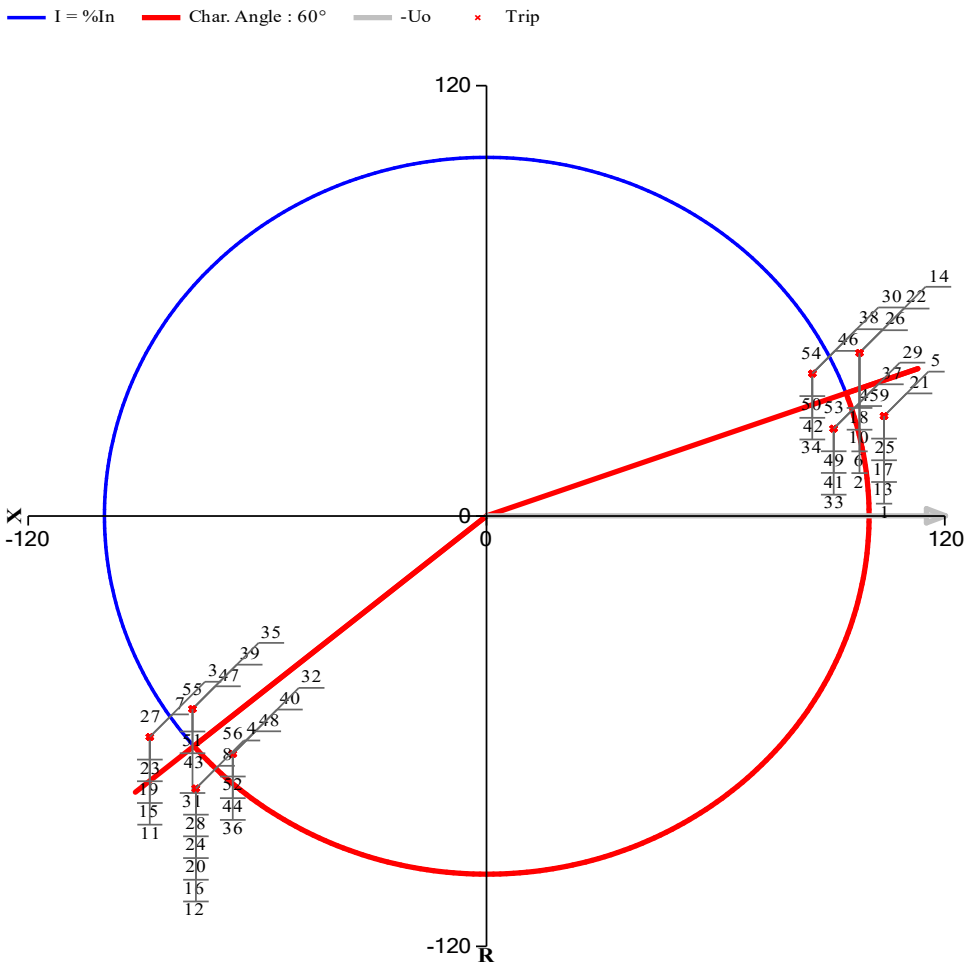
EQUIPMENT DESCRIPTION : -A-85000

ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854



IEC61850 : DPHLPDOC2
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
Primary Current : 150 A
Nominal current : 103.1 A
Reset delay time : 20 msec
Minimum operate time : 20 msec
Allow non direction : False
Measurement mode : DFT
Min operate current : 0.01 xIn
Min operate voltage : 0.01 xUn
Num of start phases : 1 Out of 3
Start value : 0.80 xIn
Start value mult. : 1.00
Directional mode : Forward
Operate curve type : IEC Definite Time
Operate delay time : 100 msec
Type of reset curve : Immediate
Characteristic angle : 60 deg
Max forward angle : 80 deg
Max reverse angle : 80 deg
Min forward angle : 80 deg
Min reverse angle : 80 deg
Voltage Mem time : 40 msec
Pol quantity : Cross Pol

N.	I1"(A)	I1(°)	I2"(A)	I2(°)	I3"(A)	I3(°)	V1"(V)	V1(°)	V2"(V)	V2(°)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	0.861	15	0.861	-105	0.861	135	0.953	0	0.953	240	0.953	120	100	120	20
2	0.861	25	0.861	-95	0.861	145	0.953	0	0.953	240	0.953	120	0	0	0
3	0.861	-145	0.861	95	0.861	-25	0.953	0	0.953	240	0.953	120	0	0	0
4	0.861	-135	0.861	105	0.861	-15	0.953	0	0.953	240	0.953	120	100	120	20
5	0.861	45	0.861	-135	0	120	0.953	-20.71	0.953	-99.29	63.509	120	100	121	21
6	0.861	55	0.861	-125	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
7	0.861	-115	0.861	65	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
8	0.861	-105	0.861	75	0	120	0.953	-20.71	0.953	-99.29	63.509	120	100	123	23
9	0	0	0.861	-75	0.861	105	63.509	0	0.953	-140.71	0.953	140.71	100	124	24

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : DPHLPDOC2

N.	I1"(A)	I1(°)	I2"(A)	I2(°)	I3"(A)	I3(°)	V1"(V)	V1(°)	V2"(V)	V2(°)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
10	0	0	0.861	-65	0.861	115	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
11	0	0	0.861	125	0.861	-55	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
12	0	0	0.861	135	0.861	-45	63.509	0	0.953	-140.71	0.953	140.71	100	125	25
13	0.861	-15	0	240	0.861	165	0.953	20.71	63.509	240	0.953	99.29	100	119	19
14	0.861	-5	0	240	0.861	175	0.953	20.71	63.509	240	0.953	99.29	0	0	0
15	0.861	-175	0	240	0.861	5	0.953	20.71	63.509	240	0.953	99.29	0	0	0
16	0.861	-165	0	240	0.861	15	0.953	20.71	63.509	240	0.953	99.29	100	121	21
17	0.861	15	0	0	0	0	0.953	0	63.509	240	63.509	120	100	120	20
18	0.861	25	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
19	0.861	-145	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
20	0.861	-135	0	0	0	0	0.953	0	63.509	240	63.509	120	100	122	22
21	0	0	0.861	-105	0	0	63.509	0	0.953	240	63.509	120	100	123	23
22	0	0	0.861	-95	0	0	63.509	0	0.953	240	63.509	120	0	0	0
23	0	0	0.861	95	0	0	63.509	0	0.953	240	63.509	120	0	0	0
24	0	0	0.861	105	0	0	63.509	0	0.953	240	63.509	120	100	125	25
25	0	0	0	0	0.861	135	63.509	0	63.509	240	0.953	120	100	124	24
26	0	0	0	0	0.861	145	63.509	0	63.509	240	0.953	120	0	0	0
27	0	0	0	0	0.861	-25	63.509	0	63.509	240	0.953	120	0	0	0
28	0	0	0	0	0.861	-15	63.509	0	63.509	240	0.953	120	100	121	21
29	0.752	15	0.752	-105	0.752	135	0.953	0	0.953	240	0.953	120	0	0	0
30	0.752	25	0.752	-95	0.752	145	0.953	0	0.953	240	0.953	120	0	0	0
31	0.752	-145	0.752	95	0.752	-25	0.953	0	0.953	240	0.953	120	0	0	0
32	0.752	-135	0.752	105	0.752	-15	0.953	0	0.953	240	0.953	120	0	0	0
33	0.752	45	0.752	-135	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
34	0.752	55	0.752	-125	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
35	0.752	-115	0.752	65	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
36	0.752	-105	0.752	75	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
37	0	0	0.752	-75	0.752	105	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
38	0	0	0.752	-65	0.752	115	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
39	0	0	0.752	125	0.752	-55	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
40	0	0	0.752	135	0.752	-45	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
41	0.752	-15	0	240	0.752	165	0.953	20.71	63.509	240	0.953	99.29	0	0	0
42	0.752	-5	0	240	0.752	175	0.953	20.71	63.509	240	0.953	99.29	0	0	0
43	0.752	-175	0	240	0.752	5	0.953	20.71	63.509	240	0.953	99.29	0	0	0
44	0.752	-165	0	240	0.752	15	0.953	20.71	63.509	240	0.953	99.29	0	0	0
45	0.752	15	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
46	0.752	25	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
47	0.752	-145	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : DPHLPDOC2

N.	I1"(A)	I1(°)	I2"(A)	I2(°)	I3"(A)	I3(°)	V1"(V)	V1(°)	V2"(V)	V2(°)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
48	0.752	-135	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
49	0	0	0.752	-105	0	0	63.509	0	0.953	240	63.509	120	0	0	0
50	0	0	0.752	-95	0	0	63.509	0	0.953	240	63.509	120	0	0	0
51	0	0	0.752	95	0	0	63.509	0	0.953	240	63.509	120	0	0	0
52	0	0	0.752	105	0	0	63.509	0	0.953	240	63.509	120	0	0	0
53	0	0	0	0	0.752	135	63.509	0	63.509	240	0.953	120	0	0	0
54	0	0	0	0	0.752	145	63.509	0	63.509	240	0.953	120	0	0	0
55	0	0	0	0	0.752	-25	63.509	0	63.509	240	0.953	120	0	0	0
56	0	0	0	0	0.752	-15	63.509	0	63.509	240	0.953	120	0	0	0

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

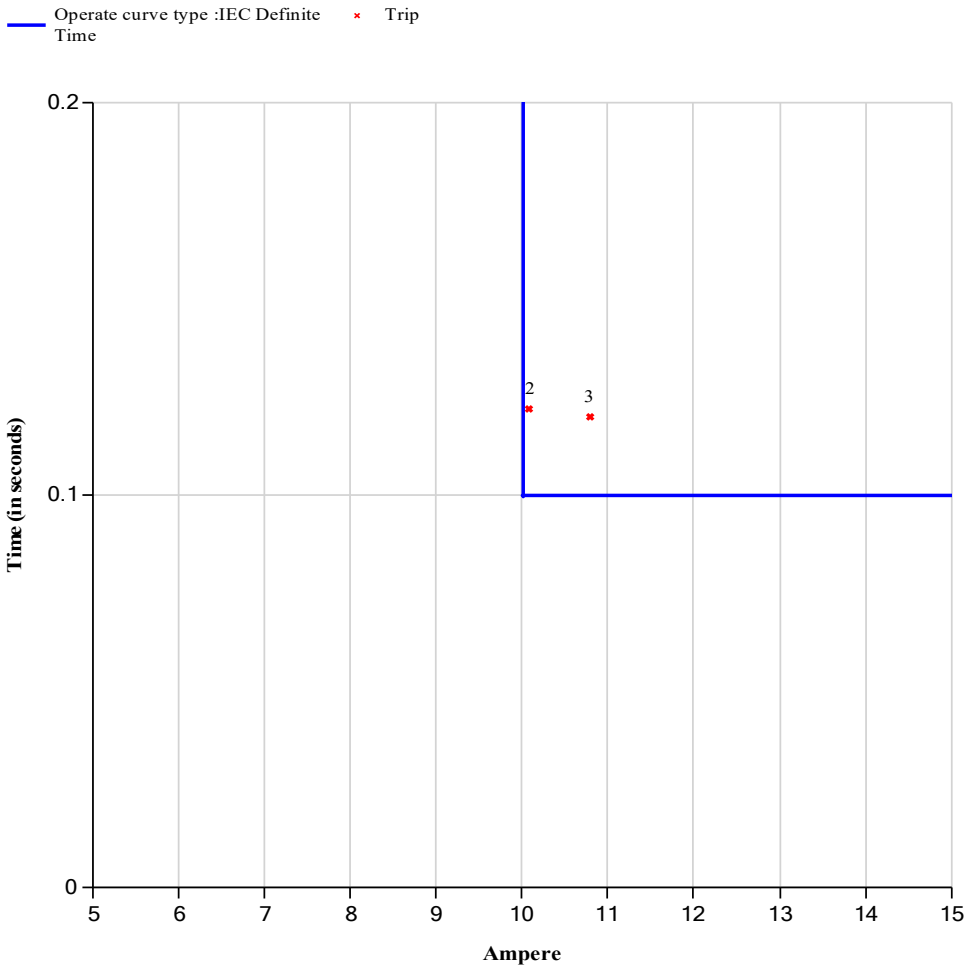
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : EFLPTOC1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
CT RATIO : 100 / 1 A
Nominal current : 103.1 A
Minimum operate time : 100 ms
Measured mode : DFT
Io signal Sel : Measured Io
Start value : 0.100 xIn
Operate delay time : 100 ms
Operate curve type : IEC Definite Time
Type of reset : Immediate



N.	I0	I0"(A)	I0(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	9.854	0.099	0	0	0	0
2	10.078	0.101	0	100	122	22
3	10.791	0.108	0	100	120	20

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI ----------	OMICRON CMC 356 **Sn. :** DJ297G	----------	----------	----------

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

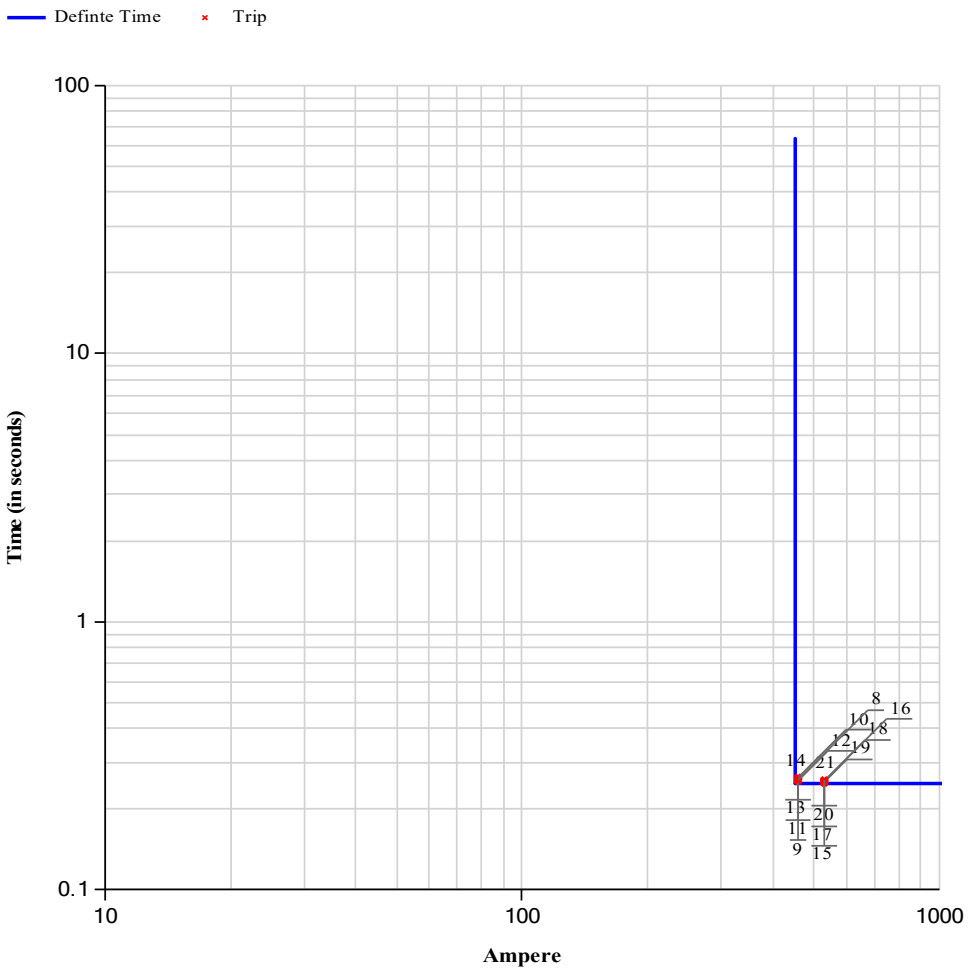
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : PHIPTOC1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
CT RATIO : 150 / 1 A
Nominal current : 103.1 A
Num of start phases : 1 Out of 3
Reset delay time : 20 ms
Start value : 3.00 xIn
Start valure Mult : 1.0
Operate delay time : 250 ms



N.	I1(A)	I1"(A)	I1(°)	I2(A)	I2"(A)	I2(°)	I3(A)	I3"(A)	I3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	436	2.904	0	0	0	0	0	0	0	0	0	0
2	0	0	0	436	2.904	240	0	0	0	0	0	0
3	0	0	0	0	0	0	436	2.904	120	0	0	0
4	436	2.904	0	436	2.904	180	0	0	0	0	0	0
5	0	0	0	436	2.904	240	436	2.904	60	0	0	0
6	436	2.904	300	0	0	0	436	2.904	120	0	0	0
7	436	2.904	0	436	2.904	240	436	2.904	120	0	0	0
8	457	3.048	0	0	0	0	0	0	0	250	258	3.2
9	0	0	0	457	3.048	240	0	0	0	250	255	2

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : PHIPTOC1

N.	I1(A)	I1"(A)	I1(°)	I2(A)	I2"(A)	I2(°)	I3(A)	I3"(A)	I3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
10	0	0	0	0	0	0	457	3.048	120	250	263	5.2
11	457	3.048	0	457	3.048	180	0	0	0	250	259	3.6
12	0	0	0	457	3.048	240	457	3.048	60	250	256	2.4
13	457	3.048	300	0	0	0	457	3.048	120	250	264	5.6
14	457	3.048	0	457	3.048	240	457	3.048	120	250	256	2.4
15	528	3.521	0	0	0	0	0	0	0	250	258	3.2
16	0	0	0	528	3.521	240	0	0	0	250	255	2
17	0	0	0	0	0	0	528	3.521	120	250	253	1.2
18	528	3.521	0	528	3.521	180	0	0	0	250	256	2.4
19	0	0	0	528	3.521	240	528	3.521	60	250	253	1.2
20	528	3.521	300	0	0	0	528	3.521	120	250	251	0.4
21	528	3.521	0	528	3.521	240	528	3.521	120	250	252	0.8

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

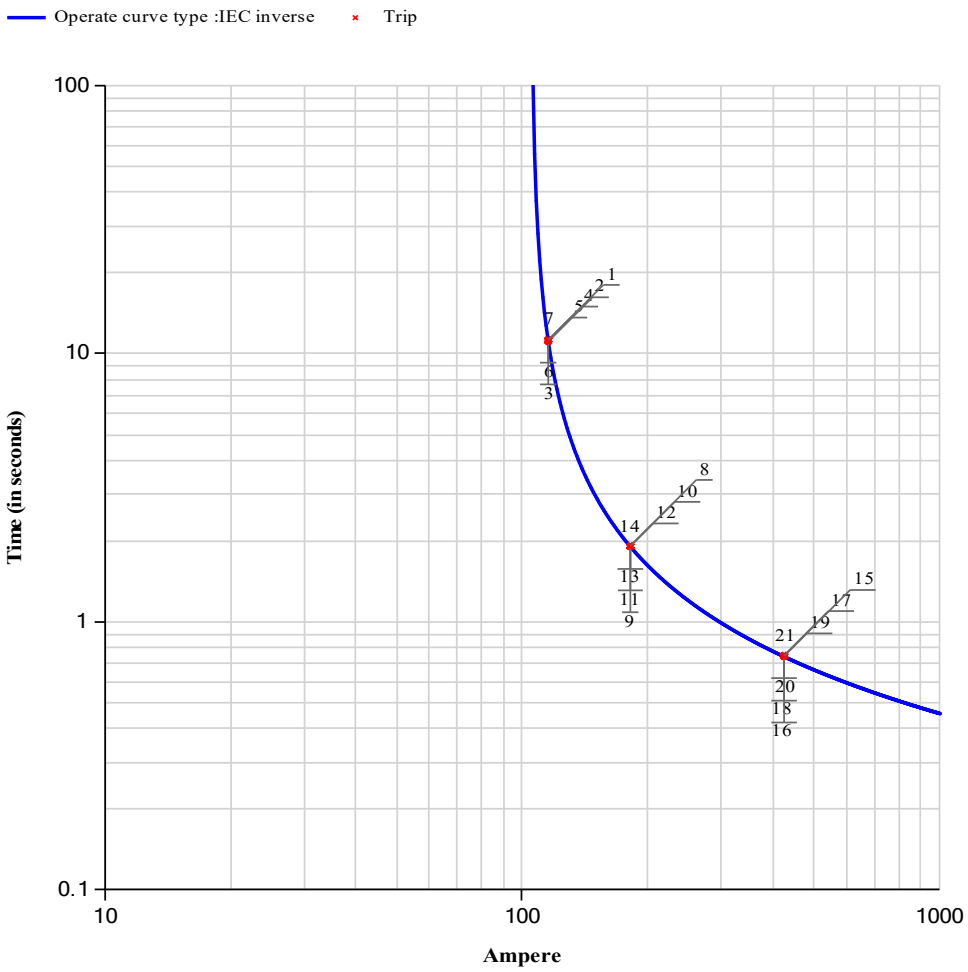
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : PHLPTOC1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
CT RATIO : 150 / 1 A
Nominal current : 103.1 A
Num. start phases : 1 out of 3
Minimum operate time : 250 msec
Reset delay time : 20 msec
Measurement mode : DFT
Start value : 0.70 xIn
Start value mult. : 1.00
Time multiplier : 0.15
Operate curve type : IEC inverse
Type of reset : Immediate



N.	I1(A)	I1"(A)	I1(°)	I2(A)	I2"(A)	I2(°)	I3(A)	I3"(A)	I3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	115	0.769	0	0	0	0	0	0	0	11158	11254	0.86
2	0	0	0	115	0.769	240	0	0	0	11158	11116	0.38
3	0	0	0	0	0	0	115	0.769	120	11158	11256	0.88
4	115	0.769	0	115	0.769	240	0	0	120	11158	11257	0.89
5	0	0	0	115	0.769	240	115	0.769	120	11158	11254	0.86
6	115	0.769	0	0	0	240	115	0.769	120	11158	11258	0.9
7	115	0.769	0	115	0.769	240	115	0.769	120	11158	11253	0.85
8	181	1.209	0	0	0	0	0	0	0	1911	1922	0.58
9	0	0	0	181	1.209	240	0	0	0	1911	1917	0.31

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : PHLPTOC1

N.	I1(A)	I1"(A)	I1(°)	I2(A)	I2"(A)	I2(°)	I3(A)	I3"(A)	I3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
10	0	0	0	0	0	0	181	1.209	120	1911	1918	0.37
11	181	1.209	0	181	1.209	240	0	0	120	1911	1919	0.42
12	0	0	0	181	1.209	240	181	1.209	120	1911	1920	0.47
13	181	1.209	0	0	0	240	181	1.209	120	1911	1916	0.26
14	181	1.209	0	181	1.209	240	181	1.209	120	1911	1915	0.21
15	423	2.822	0	0	0	0	0	0	0	743	747	0.54
16	0	0	0	423	2.822	240	0	0	0	743	744	0.13
17	0	0	0	0	0	0	423	2.822	120	743	751	1.08
18	423	2.822	0	423	2.822	240	0	0	120	743	745	0.27
19	0	0	0	423	2.822	240	423	2.822	120	743	747	0.54
20	423	2.822	0	0	0	240	423	2.822	120	743	750	0.94
21	423	2.822	0	423	2.822	240	423	2.822	120	743	745	0.27

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI ----------	OMICRON CMC 356 **Sn. :** DJ297G	----------	----------	----------

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

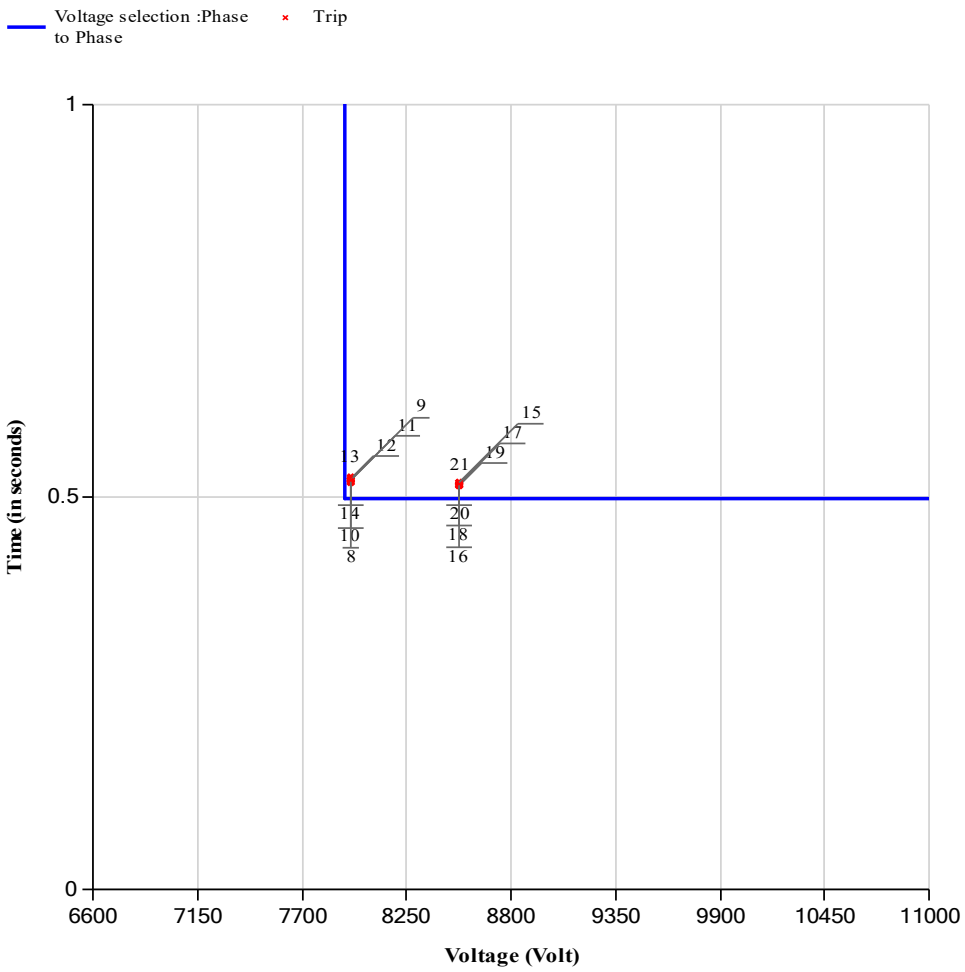
EQUIPMENT DESCRIPTION : -A-85000

ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854



IEC61850 : PHPTOV1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
VT RATIO : 6600 / 110 V
Num of start phases : 1 out of 3
Reset delay time : 20 ms
Voltage selection : Phase to Phase
Relative hysteresis : 4.0 %
Start value : 1.20 xUn
Time multiplier : 1.00
Operate delay time : 500 ms
Operating curve type : IEC Def. Time
Type of reset curve : Immediate
Type of time reset : Freeze Op timer

N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	5252	87.53	0	3811	63.509	240	3811	63.509	120	0	0	0
2	3811	63.509	0	5252	87.528	240	3811	63.509	120	0	0	0
3	3811	63.509	0	3811	63.509	240	5251	87.517	120	0	0	0
4	4550	75.838	0	4550	75.838	240	3811	63.509	120	0	0	0
5	3811	63.509	0	4550	75.837	240	4550	75.837	120	0	0	0
6	4550	75.831	0	3811	63.509	240	4550	75.831	120	0	0	0
7	4550	75.833	0	4550	75.833	240	4550	75.833	120	0	0	0
8	5332	88.872	0	3811	63.509	240	3811	63.509	120	500	520	4
9	3811	63.509	0	5332	88.862	240	3811	63.509	120	500	522	4.4

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : PHPTOV1

N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
10	3811	63.509	0	3811	63.509	240	5333	88.886	120	500	522	4.4
11	4592	76.54	0	4592	76.54	240	3811	63.509	120	500	522	4.4
12	3811	63.509	0	4593	76.545	240	4593	76.545	120	500	524	4.8
13	4592	76.534	0	3811	63.509	240	4592	76.534	120	500	526	5.2
14	4592	76.542	0	4592	76.542	240	4592	76.542	120	500	519	3.8
15	5955	99.244	0	3811	63.509	240	3811	63.509	120	500	519	3.8
16	3811	63.509	0	5955	99.242	240	3811	63.509	120	500	516	3.2
17	3811	63.509	0	3811	63.509	240	5955	99.246	120	500	517	3.4
18	4921	82.024	0	4921	82.024	240	3811	63.509	120	500	516	3.2
19	3811	63.509	0	4922	82.026	240	4922	82.026	120	500	515	3
20	4921	82.025	0	3811	63.509	240	4921	82.025	120	500	519	3.8
21	4922	82.031	0	4922	82.031	240	4922	82.031	120	500	516	3.2

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			
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PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

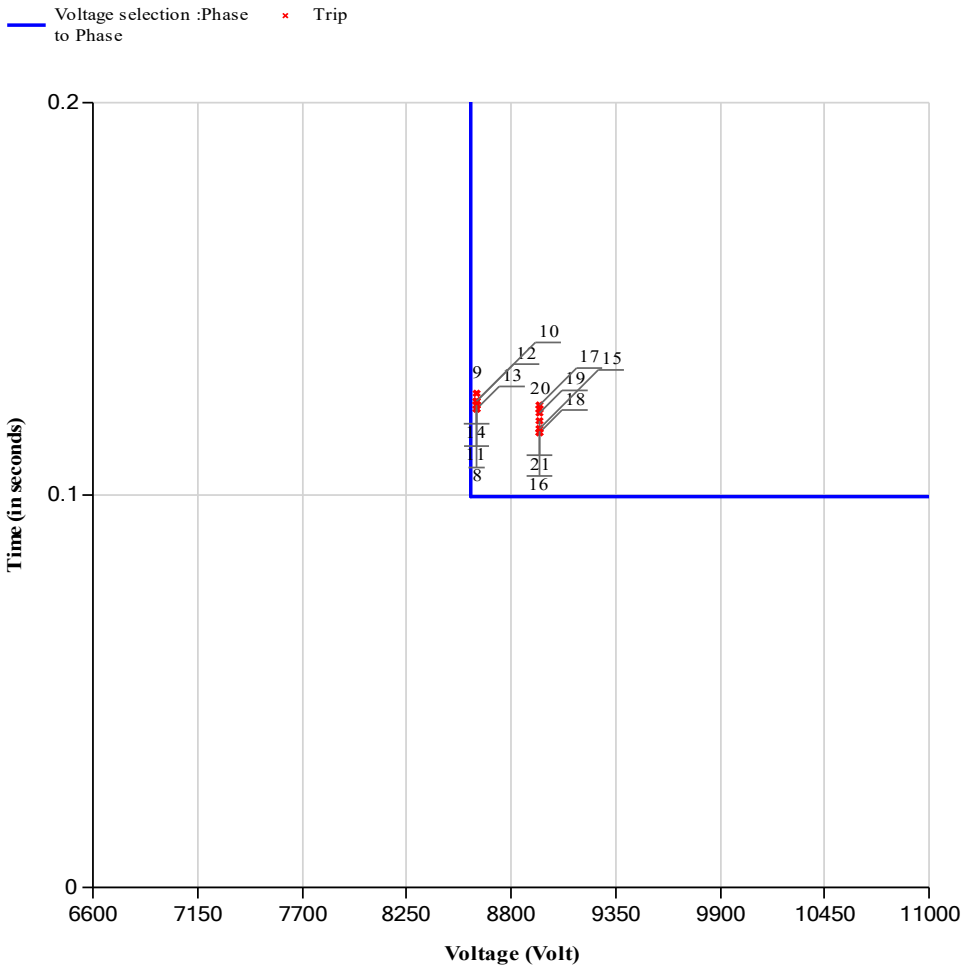
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : PHPTOV2
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
VT RATIO : 6600 / 110 V
Num of start phases : 1 out of 3
Reset delay time : 20 ms
Voltage selection : Phase to Phase
Relative hysteresis : 4.0 %
Start value : 1.30 xUn
Time multiplier : 1.00
Operate delay time : 100 ms
Operating curve type : IEC Def. Time
Type of reset curve : Immediate
Type of time reset : Freeze Op timer



N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	5975	99.582	0	3811	63.509	240	3811	63.509	120	0	0	0
2	3811	63.509	0	5974	99.567	240	3811	63.509	120	0	0	0
3	3811	63.509	0	3811	63.509	240	5975	99.575	120	0	0	0
4	4932	82.207	0	4932	82.207	240	3811	63.509	120	0	0	0
5	3811	63.509	0	4932	82.201	240	4932	82.201	120	0	0	0
6	4933	82.209	0	3811	63.509	240	4933	82.209	120	0	0	0
7	4932	82.208	0	4932	82.208	240	4932	82.208	120	0	0	0
8	6055	100.914	0	3811	63.509	240	3811	63.509	120	100	123	23
9	3811	63.509	0	6054	100.901	240	3811	63.509	120	100	126	26

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			
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PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : PHPTOV2

N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
10	3811	63.509	0	3811	63.509	240	6055	100.912	120	100	124	24
11	4974	82.908	0	4974	82.908	240	3811	63.509	120	100	122	22
12	3811	63.509	0	4975	82.923	240	4975	82.923	120	100	124	24
13	4974	82.908	0	3811	63.509	240	4974	82.908	120	100	122	22
14	4975	82.916	0	4975	82.916	240	4975	82.916	120	100	124	24
15	6412	106.865	0	3811	63.509	240	3811	63.509	120	100	117	17
16	3811	63.509	0	6412	106.862	240	3811	63.509	120	100	119	19
17	3811	63.509	0	3811	63.509	240	6411	106.854	120	100	123	23
18	5166	86.108	0	5166	86.108	240	3811	63.509	120	100	116	16
19	3811	63.509	0	5166	86.096	240	5166	86.096	120	100	121	21
20	5166	86.097	0	3811	63.509	240	5166	86.097	120	100	122	22
21	5166	86.103	0	5166	86.103	240	5166	86.103	120	100	116	16

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

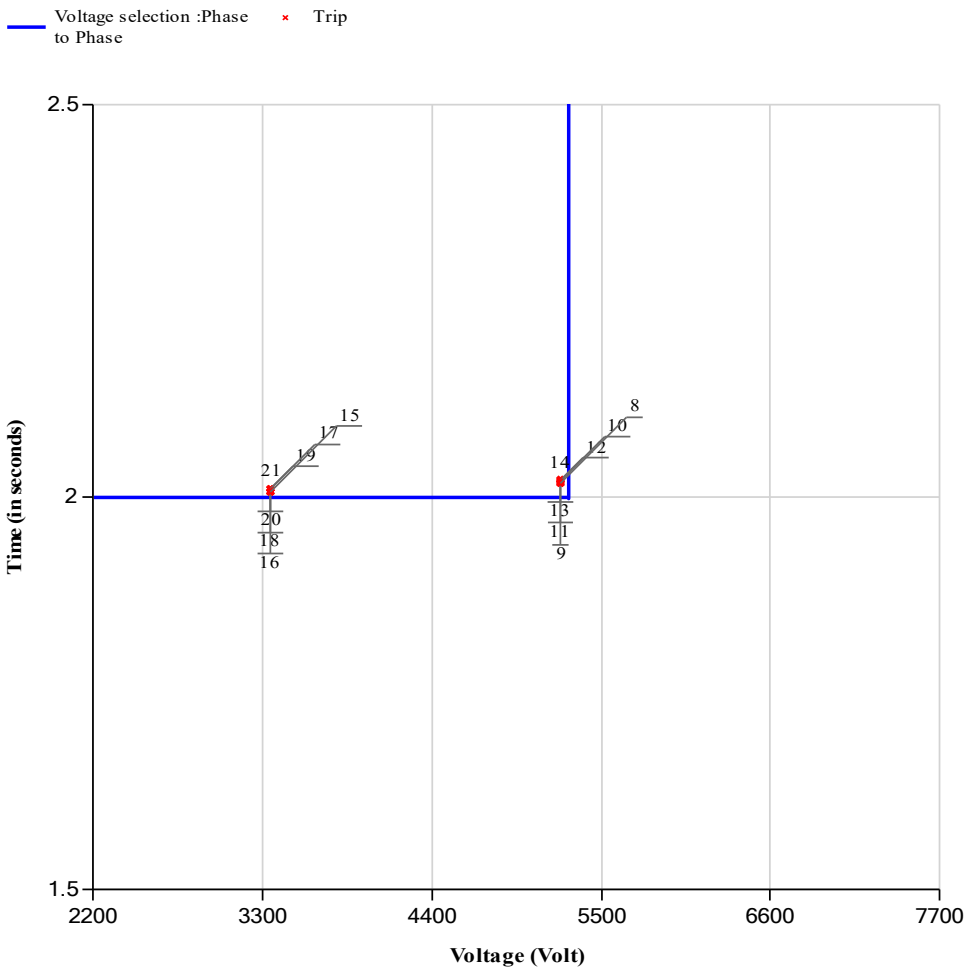
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : PHPTUV1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
VT RATIO : 6600 / 110 V
Num of start phases : 1 Out of 3
Minimum operate time : 60 msec
Reset delay time : 20 msec
Voltage block value : 0.20 xUn
Enable block value : True
Voltage selection : Phase to Phase
Relative hysteresis : 4.0 %
Start value : 0.80 xUn
Time multiplier : 1.00
Operating delay time : 2000 msec
Operate curve type : IEC Def. Time
Type of reset curve : Immediate
Type of time reset : Freeze Op timer



N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	2273	37.884	0	3811	63.509	240	3811	63.509	120	0	0	0
2	3811	63.509	0	2273	37.891	240	3811	63.509	120	0	0	0
3	3811	63.509	0	3811	63.509	240	2272	37.874	120	0	0	0
4	3074	51.237	0	3074	51.237	240	3811	63.509	120	0	0	0
5	3811	63.509	0	3074	51.228	240	3074	51.228	120	0	0	0
6	3074	51.228	0	3811	63.509	240	3074	51.228	120	0	0	0
7	3074	51.232	0	3074	51.232	240	3074	51.232	120	0	0	0
8	2156	35.939	0	3811	63.509	240	3811	63.509	120	2000	2018	0.9
9	3811	63.509	0	2157	35.949	240	3811	63.509	120	2000	2019	0.95

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : PHPTUV1

N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
10	3811	63.509	0	3811	63.509	240	2156	35.937	120	2000	2021	1.05
11	3022	50.361	0	3022	50.361	240	3811	63.509	120	2000	2020	1
12	3811	63.509	0	3021	50.358	240	3021	50.358	120	2000	2022	1.1
13	3021	50.353	0	3811	63.509	240	3021	50.353	120	2000	2023	1.15
14	3021	50.358	0	3021	50.358	240	3021	50.358	120	2000	2018	0.9
15	0	0	0	3811	63.509	240	3811	63.509	120	2000	2007	0.35
16	3811	63.509	0	0	0	240	3811	63.509	120	2000	2008	0.4
17	3811	63.509	0	3811	63.509	240	0	0	120	2000	2011	0.55
18	1933	32.223	0	1933	32.223	240	3811	63.509	120	2000	2007	0.35
19	3811	63.509	0	1934	32.226	240	1934	32.226	120	2000	2011	0.55
20	1934	32.226	0	3811	63.509	240	1934	32.226	120	2000	2011	0.55
21	1934	32.225	0	1934	32.225	240	1934	32.225	120	2000	2007	0.35

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

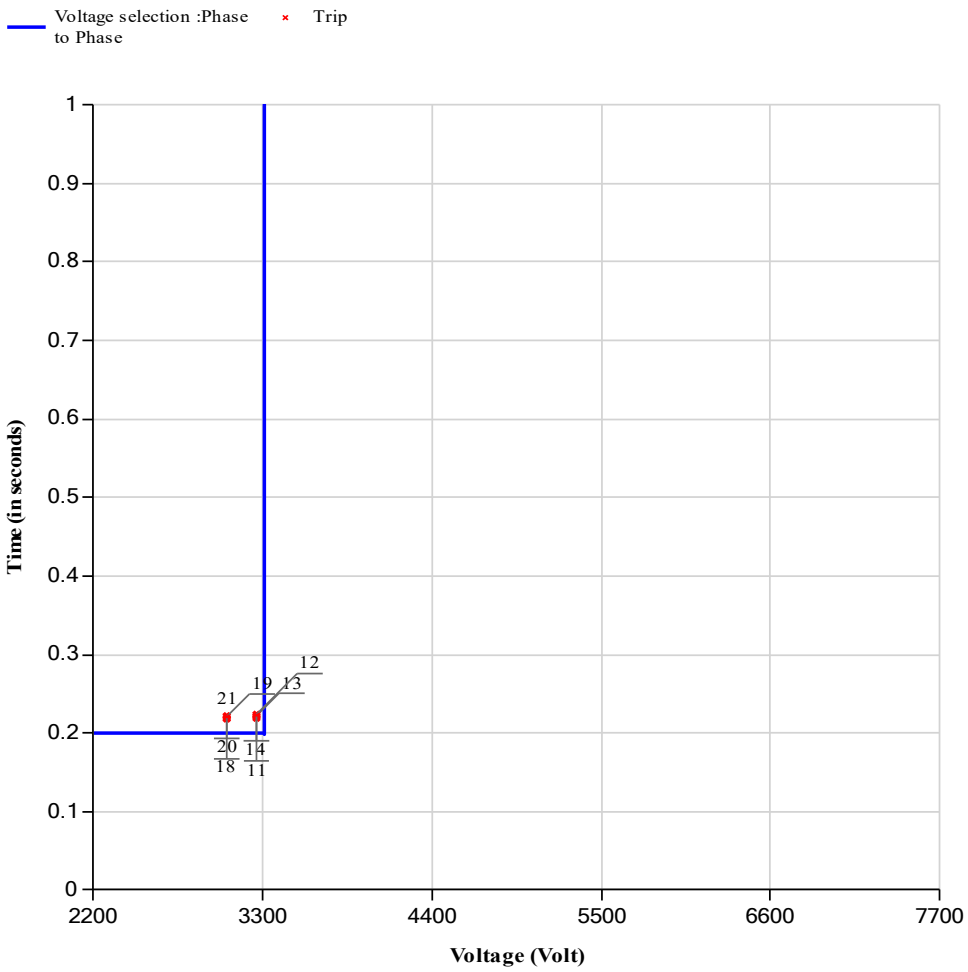
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : PHPTUV2
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
VT RATIO : 6600 / 110 V
Num of start phases : 1 Out of 3
Minimum operate time : 60 msec
Reset delay time : 20 msec
Voltage block value : 0.20 xUn
Enable block value : True
Voltage selection : Phase to Phase
Relative hysteresis : 4.0 %
Start value : 0.50 xUn
Time multiplier : 1.00
Operating delay time : 200 msec
Operate curve type : IEC Def. Time
Type of reset curve : Immediate
Type of time reset : Freeze Op timer



N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
1	0	0	0	3811	63.509	240	3811	63.509	120	0	0	0
2	3811	63.509	0	0	0	240	3811	63.509	120	0	0	0
3	3811	63.509	0	3811	63.509	240	0	0	120	0	0	0
4	1934	32.225	0	1934	32.225	240	3811	63.509	120	0	0	0
5	3811	63.509	0	1933	32.224	240	1933	32.224	120	0	0	0
6	1933	32.225	0	3811	63.509	240	1933	32.225	120	0	0	0
7	1934	32.225	0	1934	32.225	240	1934	32.225	120	0	0	0
8	0	0	0	3811	63.509	240	3811	63.509	120	0	0	0
9	3811	63.509	0	0	0	240	3811	63.509	120	0	0	0

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

RELAY TYPE : ABB REX640

ITEM : UNIT A3

Sn. : 1VHR81041854

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

IEC61850 : PHPTUV2

N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	Exp.(ms)	Trip(ms)	Dev.(%)
10	3811	63.509	0	3811	63.509	240	0	0	120	0	0	0
11	1881	31.351	0	1881	31.351	240	3811	63.509	120	200	221	10.5
12	3811	63.509	0	1881	31.352	240	1881	31.352	120	200	224	12
13	1881	31.35	0	3811	63.509	240	1881	31.35	120	200	222	11
14	1881	31.351	0	1881	31.351	240	1881	31.351	120	200	219	9.5
15	0	0	0	3811	63.509	240	3811	63.509	120	0	0	0
16	3811	63.509	0	0	0	240	3811	63.509	120	0	0	0
17	3811	63.509	0	3811	63.509	240	0	0	120	0	0	0
18	1770	29.496	0	1770	29.496	240	3811	63.509	120	200	219	9.5
19	3811	63.509	0	1770	29.496	240	1770	29.496	120	200	221	10.5
20	1770	29.496	0	3811	63.509	240	1770	29.496	120	200	222	11
21	1770	29.494	0	1770	29.494	240	1770	29.494	120	200	218	9

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

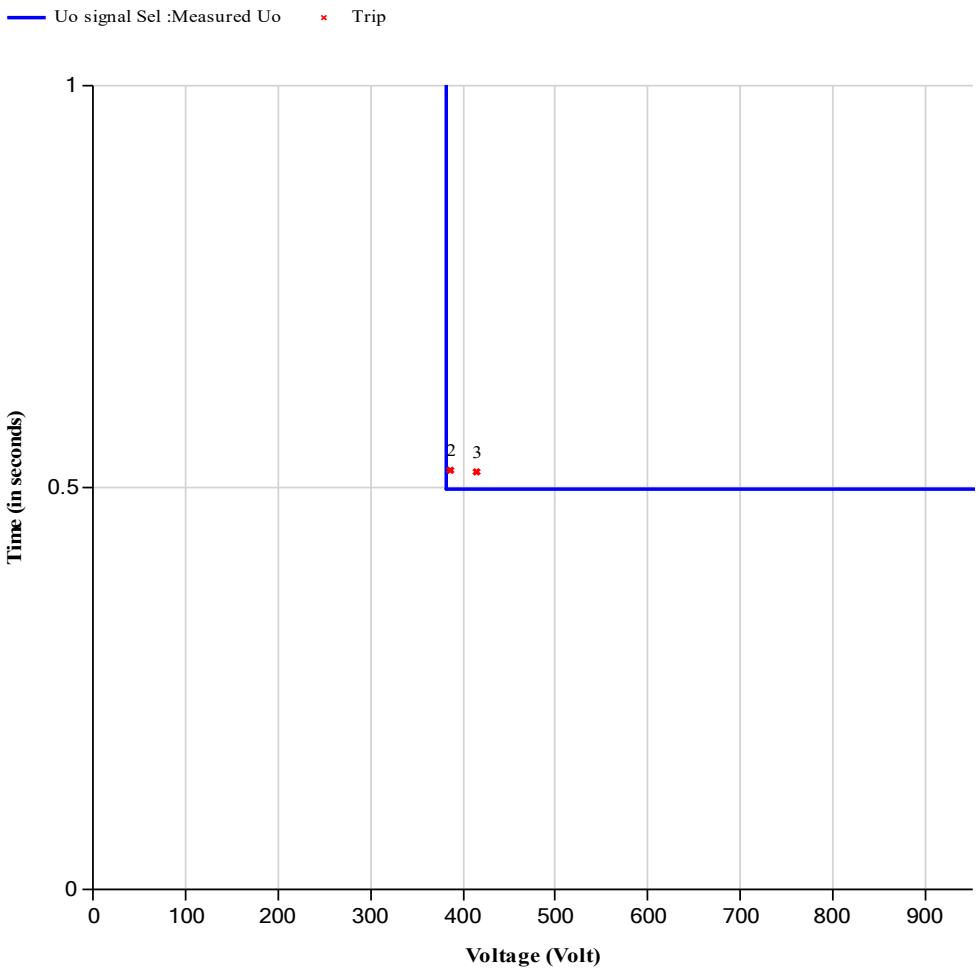
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : ROVPTOV1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
VT RATIO : 6600 / 110 V
Reset delay time : 20 msec
Uo signal Sel : Measured Uo
Start value : 0.10 xUn
Operate delay time : 500 msec



NB : ALARM ONLY

N.	V0(V)	V0(V)	Exp.(ms)	Trip(ms)	Dev.(%)
1	373	10.768	0	0	0
2	386	11.151	500	522	4.4
3	415	11.97	500	520	4

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

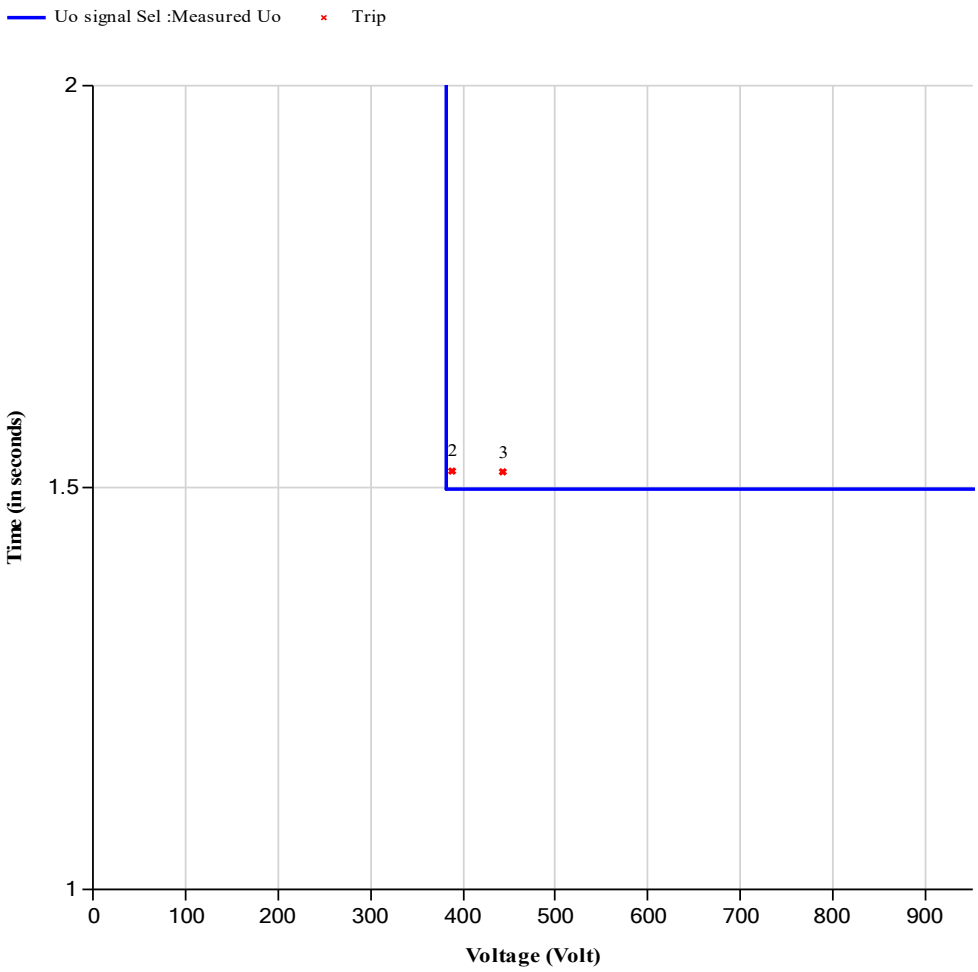
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : ROVPTOV2
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
VT RATIO : 6600 / 110 V
Reset delay time : 20 msec
Uo signal Sel : Measured Uo
Start value : 0.10 xUn
Operate delay time : 1500 msec



N.	V0(V)	V0(V)	Exp.(ms)	Trip(ms)	Dev.(%)
1	373	10.768	0	0	0
2	388	11.205	1500	1521	1.4
3	443	12.789	1500	1520	1.33

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			
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PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

EQUIPMENT DESCRIPTION : -A-85000

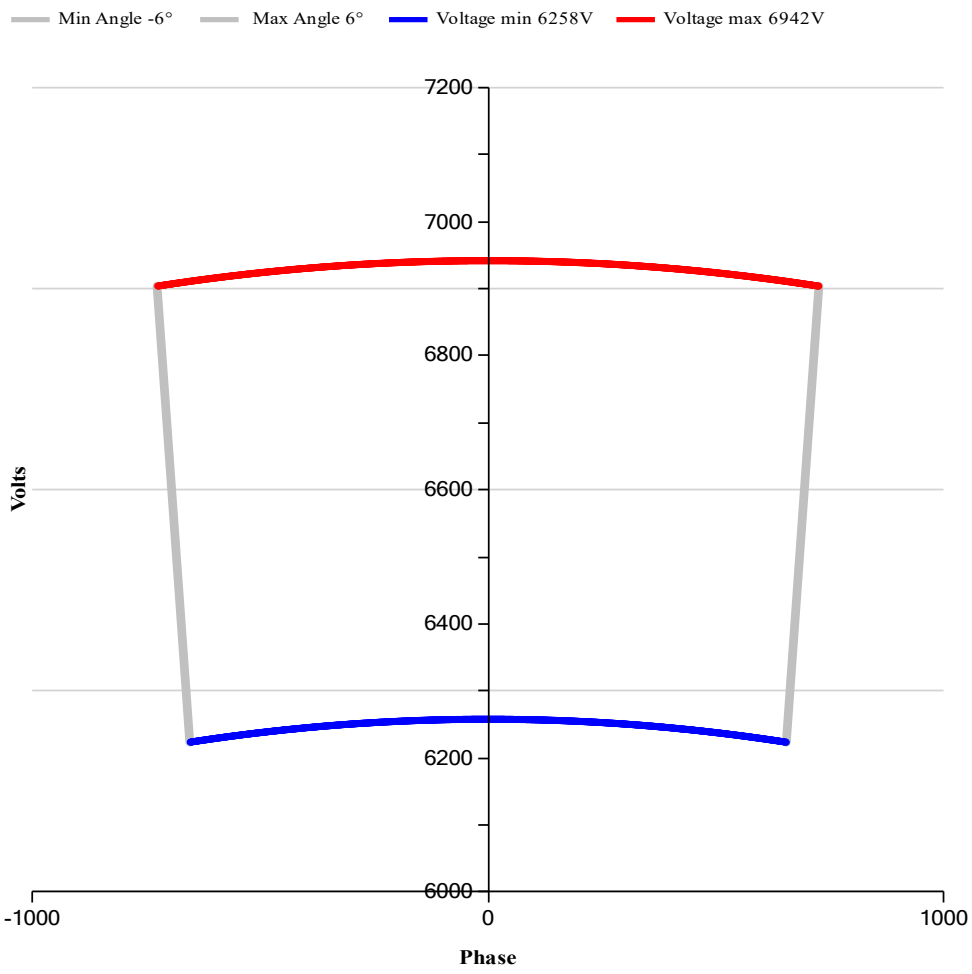
ITEM : UNIT A3

REFERENCE DOCUMENT : 123A90-DDL-EL-RE-20168 Rev.02

RELAY TYPE : ABB REX640

Sn. : 1VHR81041854

IEC61850 : SECRSYN1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
VT RATIO : 6600 / 110 V
Synchro check Mode : Asynchronous
Control Mode : Continuous
Dead line value : 0.10 xUn
Live line value : 0.50 xUn
Dead bus value : 0.10 xUn
Live bus value : 0.50 xUn
Close pulse : 200 ms
Max energizing V : 0.64 xUn
Phase shift : 0 deg
Minimum Syn time : 10000 ms
Maximum Syn time : 5000 ms
Energizing time : 100 ms
Closing time CB : 50 ms
Live dead mode : Not Both Live
Difference voltage : 0.05 xUn
Difference frequency : 0.010 xFn
Difference angle : 5 deg



N.	V1(V)	V1"(V)	V1(°)	V2(V)	V2"(V)	V2(°)	V3(V)	V3"(V)	V3(°)	V4(V)	V4"(V)	V4(°)	F (Hz)
1	3811	63.509	0	3811	63.509	240	3811	63.509	120	6258	104.3	30	50
2	3811	63.509	0	3811	63.509	240	3811	63.509	120	6942	115.7	30	50
3	3811	63.509	0	3811	63.509	240	3811	63.509	120	6600	110	24	50
4	3811	63.509	0	3811	63.509	240	3811	63.509	120	6600	110	36	50
5	3811	63.509	0	3811	63.509	240	3811	63.509	120	6600	110	30	49.5
6	3811	63.509	0	3811	63.509	240	3811	63.509	120	6600	110	30	50.5

VENDOR :	TEST EQUIPMENT :	CONTRACTOR :	YARD :	CLIENT :
DARIO AZZOLARI	OMICRON CMC 356 **Sn. :** DJ297G			

ITEM	Tag	SG-100D1-A3-K1	: BESS PACKAGE - SG-100D1-A3-K1	Dwg	1723002197-EL-DG-00010		
	S/Sys	82-10	: Power Transformer 1.25 MVA (1BT1 BESS)	Module			
TASK	code	C10002984	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form FTR-6	Electrical IO

FTR 6 - Electrical I/O check record sheet

Equipment Tag:	SG-100D1-A3-K1	Instrument Type / Serial N° :	FLUKE 175 / 17140769
Cubicle N°:	NA	Calibration certificate date:	7715-24 / 10-07-2025

Link Type: ● Hardwired ● Communication (strike through unapplicable type)

I/O Type: ● Digital ● Analogic (strike through unapplicable type)

DIGITAL

Item	Signal description	Link Type (Hardwired/ Communication)	I/O Type (Digital/Analogic)	Point of Origin (From)	Point of Receival (to)	Text Labelling Display Satisfactory (Y/N)	Blinking/Static Display Satisfactory (Y/N)	Color Coding Satisfactory (Y/N)	Status Check			Time Stamping Satisfactory (Y/N)	Refresh Time (if >1s)	Appearing in all applicable display (Y/N)
									Event (Y/N)	Alarm (Y/N)	Fault (Y/N)			
1	EMERGENCY OPENING BY SIS	HW	DO	SG-100D1_XM:43-44	B400-SIS-001_TB-XS-000:35-36	NA	NA	NA	NA	Y	NA	NA	NA	NA
2														
3														
4														
5														
6														
7														
8														

ANALOGIC

Item	Signal description	Link Type (Hardwired/ Communication)	I/O Type (Digital/Analogic)	Point of Origin (From)	Point of Receival (to)	Min value sent	Min value received	Max value sent	Max value received	Intermediate value sent	Intermediate value received	Out of scale test (OK, Not OK)	Refresh time (if >2s)	Appearing in all applicable display (Y/N)
1														
2														
3														

Comments: NOTE1: See attachments for full signals and for others information see the OTP: 6,6kV Switchgear & Transformer System PHASE 4.

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2025-02-04	2025-02-04	2025-02-04
Signature	Digitaly signed by Davide Zucconelli 2025-02-04T10:32:10.326Z	Digitaly signed by Kristian Castellani 2025-02-04T13:21:34.012Z	Digitaly signed by Witness waived 2025-02-04T13:40:19.266Z

Step	Description	Result	Verified by	Date
120	Internal Lighting test. The internal lighting is installed only inside the auxiliary compartment. There is a limit switch LS that switch on light with opened door and switch off it with door closed. - Verify and confirm.....☐			
121	Internal space heater test The internal space heater is installed only inside the auxiliary compartment. The thermostat HGR is installed inside the same compartment, its range is -10 ÷ +80°C. Decrease the set point till switch on the space heater and KGR relay will be ON. - Verify and confirm.....☐ - Led-12 "SPACE HEATER ON" on protection relay REX640 HMI will turn to red .....☐			
122	Internal 230Vac Socket test The internal 230Vac Socket XS1 is installed only inside the auxiliary compartment. Take a Multimeter and measure the voltage between socket poles. - Verify and confirm (230Vac).....☐			

5.4.4.4 SIS Safety Instrumented System - I/O signal from SIS to SG-100D1 UNIT A3

The following I/O list represent the hardwired signals that are connected on Unit A3 and they come from the SIS (Emergency Shut Down).

SIGNAL_DESCRIPTION	TYPE ANALOG/DIGITAL	ITEM TAG
BESS FEEDER A-85000 "A3"		
EMERGENCY OPEN BY SIS BESS FEEDER A-85000	DIGITAL	82XS0002

Step	Description	Result	Verified by	Date
123	Confirm correct and positive result of precommissioning Check Sheet for above signals I/O list	Correct and positive results .....☐		

5.4.4.5 EMCS IEC61850 - Electrical Monitoring & Control System

The EMCS will be tested with the 6.6kV SWBD: In detail it will be tested the functionalities provided on I/O lists vendor document 1723002197-EL-LIS-00041 with the A3 Unit BESS PACKAGE.

5.4.4.6 EMCS IEC61850 – A3 Unit I/O List

The following data list is a part of redundant networking in ethernet technology from the electrical PROTECTIONS Relay REX640

DESCRITPION	SIGNAL TYPE	TAG SIGNAL
BESS FEEDER A-85000 "A3"		
PROTECTION TRIPPED "50-1"	DIGITAL	LD0.PHIPTOC1.ST.Op.general
PROTECTION TRIPPED "51-1"	DIGITAL	LD0.PHLPTOC1.ST.Op.general
PROTECTION TRIPPED "51N"	DIGITAL	LD0.EFLPTOC1.ST.Op.general
SYNCHRO "OK"	DIGITAL	LD0.LEDGGIO1.ST.Ind3.stVal
PROTECTION TRIPPED "59N-1"	DIGITAL	LD0.ROVPTOV1.ST.Op.general
PROTECTION TRIPPED "59N-2"	DIGITAL	LD0.ROVPTOV2.ST.Op.general
PROTECTION TRIPPED "27-1"	DIGITAL	LD0.PHPTUV1.ST.Op.general
PROTECTION TRIPPED "27-2"	DIGITAL	LD0.PHPTUV2.ST.Op.general
PROTECTION TRIPPED "59-1"	DIGITAL	LD0.PHPTOV1.ST.Op.general
PROTECTION TRIPPED "59-2"	DIGITAL	LD0.PHPTOV2.ST.Op.general
PROTECTION TRIPPED "67-1"	DIGITAL	LD0.DPHLPDOC1.ST.Op.general
PROTECTION TRIPPED "67-2"	DIGITAL	LD0.DPHLPDOC2.ST.Op.general

DESCRITPION	SIGNAL TYPE	TAG SIGNAL
SELECTOR SWITCH IN LOCAL POSITION	DIGITAL	LD0.MVGAPC1.ST.SPCSO6.stVal
SELECTOR SWITCH IN REMOTE POSITION	DIGITAL	LD0.MVGAPC1.ST.SPCSO7.stVal
Line Current (L1)	ANALOG	LD0.CMMXU1.A.phsA.cVal.mag.f
Line Current (L2)	ANALOG	LD0.CMMXU1.A.phsB.cVal.mag.f
Line Current (L3)	ANALOG	LD0.CMMXU1.A.phsC.cVal.mag.f
Line Volts MAIN BUS BAR (L1-l2)	ANALOG	LD0.VMMXU1.PPV.phsAB.cVal.mag.f
Line Volts MAIN BUS BAR (L2-L3)	ANALOG	LD0.VMMXU1.PPV.phsBC.cVal.mag.f
Line Volts MAIN BUS BAR (L3-L1)	ANALOG	LD0.VMMXU1.PPV.phsCA.cVal.mag.f
Frequency	ANALOG	LD0.FMMXU1.Hz.mag.f
APPARENT POWER (kVA)	ANALOG	LD0.PEMMXU1.TotVA.mag.f
REAL POWER (kW)	ANALOG	LD0.PEMMXU1.TotW.mag.f
REACTIVE POWER (kVAR)	ANALOG	LD0.PEMMXU1.TotVAr.mag.f
POWER FACTOR	ANALOG	LD0.PEMMXU1.TotPF.mag.f
TRANSF. PROTECTION TRIPPED "WINDING TEMPERATURE"	DIGITAL	LD0.SCBIGGIO1.ST.Ind14.stVal
TRANSF. PROTECTION ALARM "WINDING TEMPERATURE	DIGITAL	LD0.SCBIGGIO1.ST.Ind13.stVal
WATCHDOG PROTECTION RELAY	DIGITAL	LD0.LPHD1.PhyHealth.stVal
V.T. HEALTLY CIRCUIT	DIGITAL	LD0.SCBIGGIO1.ST.Ind2.stVal
INTERTRIP SEND TO L.V. SWITCHBOARD	DIGITAL	LD0.MVGAPC1.ST.SPCSO4.stVal
K86 TRIPPED	DIGITAL	LD0.SBBIGGIO1.ST.Ind7.stVal
Contactor CLOSED AND INSERTED	DIGITAL	LD0.MVGAPC1.ST.SPCSO8.stVal
Contactor OPENED OR ISOLATED	DIGITAL	LD0.MVGAPC2.ST.SPCSO2.stVal
MCB'S CLOSED	DIGITAL	LD0.MVGAPC2.ST.SPCSO3.stVal

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File: 123A90-PML-COM-PRO-03046

DESCRITPION	SIGNAL TYPE	TAG SIGNAL
Contactor READY (TCS)	DIGITAL	LD0.TCSSCBR1.ST.CircAlm.stVal
Contactor READY TO CLOSE	DIGITAL	LD0.MVGAPC2.ST.SPCSO1.stVal
OPENING COMMAND	DIGITAL	LD0.SPCGAPC1.SPCSO2.stVal
CLOSING COMMAND	DIGITAL	LD0.SPCGAPC1.SPCSO1.stVal
PROTECTION RELAY UNIT 2 HEALTHY	DIGITAL	LD0.SDBIGGIO1.ST.Ind8.stVal
PROTECTION RELAY UNIT 4 HEALTHY	DIGITAL	LD0.SCBIGGIO1.ST.Ind6.stVal
SELECTOR SWITCH OF OVERRIDE (SIL ENABLED)	DIGITAL	LD0.SDBIGGIO1.ST.Ind9.stVal

Step	Description	Result	Verified by	Date
124	Confirm correct and positive result of precommissioning Check Sheet for above signals I/O list	Correct and positive results.....☐		

5.4.4.7 EMCS MODBUS TCP-IP

The following signals data type represent the thermal temperature of copper BUS BAR and CABLE Unit of the 6.6kV SWBD.

DESCRIPTION	SLAVE ADDRESS	MODBUS REGISTER	UNIT
BESS FEEDER A-85000 "A3"			
Phase L1 - Temperature Detection - cable Compart.	12	40125	ΔT
Phase L2 - Temperature Detection - cable Compart.	12	40126	ΔT
Phase L3 - Temperature Detection - cable Compart.	12	40127	ΔT
Phase L1 - Temperature Detection - Contactor Compart.	12	40128	ΔT

DESCRIPTION	SLAVE ADDRESS	MODBUS REGISTER	UNIT
Phase L2 - Temperature Detection - Contactor Compart.	12	40129	ΔT
Phase L3 - Temperature Detection - Contactor Compart.	12	40130	ΔT
Phase L1 - Temperature Detection - Main Bus Bar	12	40131	ΔT
Phase L3 - Temperature Detection - Main Bus Bar	12	40132	ΔT

Step	Description	Result	Verified by	Date
125	Confirm correct and positive result of precommissioning Check Sheet for above signals I/O list	Correct and positive results.....☐		

Section 4.2 Electrical “As-Commissioned” interconnection diagrams

FROM					TO
DESCRIPTION: 6.6KV HV SWITCHGEAR TAG NUMBER: SG-100D1					DESCRIPTION: 6.6/0.42 KV, 1.6MVA TRANSFORMER NO MARK UP TAG NUMBER: TR-200DE1 MARCO MORETTO 7/3/25
TAG COLUMN: A4	L1	Arm.	BK	82002-CEM-1-L1 1C X 70 mm²	BK — Arm. 1U — HV TERMINAL BOX OF TR-200DE1
	L2		BK	82002-CEM-1-L2 1C X 70 mm²	BK — 1V
	L3		BK	82002-CEM-1-L3 1C X 70 mm²	BK — 1W
					DESCRIPTION: 6.6/0.4 KV, 1.25MVA TRANSFORMER NO MARK UP TAG NUMBER: TA30 MARCO MORETTO 20/3/25
TAG COLUMN: A7	L1	Arm.	BK	82003-CEM-1-L1 1C X 70 mm²	BK — Arm. 1U — HV TERMINAL BOX OF TA30
	L2		BK	82003-CEM-1-L2 1C X 70 mm²	BK — 1V
	L3		BK	82003-CEM-1-L3 1C X 70 mm²	BK — 1W
					DESCRIPTION: 6.6/0.4/0.4 KV, 3.15MVA TRANSFORMER MARCO MORETTO TAG NUMBER: ~~T4~~ TR-01 A100 19/3/25
TAG COLUMN: A1	L1	Arm.	BK	82004-CEM-1-L1 1C X 150 mm²	BK — Arm. 1U — HV TERMINAL BOX OF T4
	L2		BK	82004-CEM-1-L2 1C X 150 mm²	BK — 1V
	L3		BK	82004-CEM-1-L3 1C X 150 mm²	BK — 1W
					DESCRIPTION: 6.6/0.62 KV, 1.25MVA TRANSFORMER NO MARK UP TAG NUMBER: 18T1 MARCO MORETTO 20/3/25
TAG COLUMN: A3	L1	Arm.	BK	82005-CEM-1-L1 1C X 70 mm²	BK — Arm. 1U — HV TERMINAL BOX OF 18T1
	L2		BK	82005-CEM-1-L2 1C X 70 mm²	BK — 1V
	L3		BK	82005-CEM-1-L3 1C X 70 mm²	BK — 1W
					DESCRIPTION: 6.6/0.8 KV, 0.5MVA TRANSFORMER NO MARK UP TAG NUMBER: TR-200ED1 MARCO MORETTO 7/3/25
TAG COLUMN: A2	L1	Arm.	BK	82006-CEM-1-L1 1C X 70 mm²	BK — Arm. 1U — HV TERMINAL BOX OF TR-200ED1
	L2		BK	82006-CEM-1-L2 1C X 70 mm²	BK — 1V
	L3		BK	82006-CEM-1-L3 1C X 70 mm²	BK — 1W

AS COMMISSIONED: MARCO GIBTL 21/3/25

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DG-20149

REV.:	DATE:	SIGNATURE:
2_L	13/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	19/11/24	SAI	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	16/10/24	SAI	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	08/07/24	SAI	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6KV HV SWITCHGEAR

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 016 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20149 Rev. 02

"SG-100D1" MV SWBD 6,6kV

INTERCONNECTING

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
26/03/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
=					
+					
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
2	28/06/2024	Giulietti	Flamminio	Sigismondi	Accepted for construction (AFC)
1	23/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING

DWG n°: 231151/SD/22
Item n°: PF1113279

CROSSWIND

ROSETTI MARINO

TITLE : SG-100D1 – INTERCONNECTING

Cover

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00022

SHEET 1

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00022 Rev.03

AS COMMISSIONED
GIROTTI MATTIA
NO MARKUP
26/03/2025

INDEX

Sheet	Description	Revision 0	1	2	3	4	5	6	7	8
1	Cover	X	X	X	X					
2	Index	X	X	X	X					
3	Table of reference documents	X	X	X	X					
4	Intercolumn Wiring	X	X	X	X					
5	Intercolumn Wiring	X	X	X	X					
6	Intercolumn Wiring	X	X	X	X					
7	Network architecture IEC 61850	X	X	X	X					
8	Network architecture Modbus TCP/IP	X	X	X	X					

Sheet	Description	Revision 0	1	2	3	4	5	6	7	8

=						
+						
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)	
2	28/06/2024	Giulietti	Flamminio	Sigismondi	Accepted for construction (AFC)	
1	23/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)	
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)	
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION	

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

DWG n° : 231151/SD/22

Item n° : PF1113279

TITLE : SG-100D1 – INTERCONNECTING

Index

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00022

SHEET 2

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00022 Rev.03

TABLE OF REFERENCES		
Document nr. Client	Document nr. Supplier	Document title
1723002197-EL-DA-00006	231151/SD/6	SG-100D1 GENERAL ARRANGEMENTS
1723002197-EL-DG-00010	231151/SD/10	SG-100D1 ELECTRICAL SINGLE LINE DIAGRAM
1723002197-EL-DG-00015	231151/SD/15	SG-100D1 MV SWG FUNCTIONAL DIAGRAM - INCOMING FEEDER
1723002197-EL-DG-00016	231151/SD/16	SG-100D1 MV SWG FUNCTIONAL DIAGRAM - BUS BAR METERING
1723002197-EL-DG-00017	231151/SD/17	SG-100D1 MV SWG FUNCTIONAL DIAGRAM - BESS FEEDER
1723002197-EL-DG-00018	231151/SD/18	SG-100D1 MV SWG FUNCTIONAL DIAGRAM - ELECTROLYSER FEEDER
1723002197-EL-DG-00019	231151/SD/19	SG-100D1 MV SWG FUNCTIONAL DIAGRAM - FUEL CELL FEEDER
1723002197-EL-DG-00020	231151/SD/20	SG-100D1 MV SWG FUNCTIONAL DIAGRAM - TRANSFORMER FEEDER TR200ED1
1723002197-EL-DG-00021	231151/SD/21	SG-100D1 MV SWG FUNCTIONAL DIAGRAM - TRANSFORMER FEEDER TR200DE1

NOTE: To better understand this document you have to use in conjuction with the documents listed on the table above

AS COMMISSIONED
CIROTTI MATTIA
NO MARK UP
26/03/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
=					
+					
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CROSSWIND

ROSETTI MARINO

IMESA ELECTRICAL ENGINEERING

DWG n°: 231151/SD/22

Item n°: PF1113279

TITLE : SG-100D1 - INTERCONNECTING

Table of reference documents

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00022

SHEET 3

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00022 Rev.03

	ELECTROLYSER "A1"	SOLAR "A2"	BESS PACKAGE "A3"	TRANSF. 1,6MVA TR-200DE1 "A4"	VT BUS BARS "A5"	INCOMING "A6"	FUEL CELL "A7"
V.aux 110Vdc	1 XC XC-2/A1 2 XC	XC-1/A2 RD 1x6 1 XC XC-2/A2 2 XC	XC-1/A3 1 XC XC-2/A3 2 XC	XC-1/A4 RD 1x6 1 XC XC-2/A4 2 XC	XC-1/A5 RD 1x6 1 XC XC-2/A5 2 XC	XC-1/A6 1 XC XC-2/A6 2 XC	XC-1/A7 RD 1x6 1 XC 2 XC
	3 XC XC-4/A1 4 XC	XC-3/A2 WH 1x6 3 XC XC-4/A2 4 XC	XC-3/A3 3 XC XC-4/A3 4 XC	XC-3/A4 WH 1x6 3 XC XC-4/A4 4 XC	XC-3/A5 WH 1x6 3 XC XC-4/A5 4 XC	XC-3/A6 3 XC XC-4/A6 4 XC	XC-3/A7 WH 1x6 3 XC 4 XC
V.aux 24Vdc	5 XC XC-6/A1 6 XC	XC-5/A2 RD 1x1,5 5 XC XC-6/A2 6 XC	XC-5/A3 5 XC XC-6/A3 6 XC	XC-5/A4 RD 1x1,5 5 XC XC-6/A4 6 XC	XC-5/A5 RD 1x1,5 5 XC XC-6/A5 6 XC	XC-5/A6 5 XC XC-6/A6 6 XC	XC-5/A7 RD 1x1,5 5 XC 6 XC
	7 XC XC-8/A1 8 XC	XC-7/A2 WH 1x1,5 7 XC XC-8/A2 8 XC	XC-7/A3 7 XC XC-8/A3 8 XC	XC-7/A4 WH 1x1,5 7 XC XC-8/A4 8 XC	XC-7/A5 WH 1x1,5 7 XC XC-8/A5 8 XC	XC-7/A6 7 XC XC-8/A6 8 XC	XC-7/A7 WH 1x1,5 7 XC 8 XC
V.aux 230Vac	9 XC XC-10/A1 10 XC	XC-9/A2 BK 1x6 9 XC XC-10/A2 10 XC	XC-9/A3 9 XC XC-10/A3 10 XC	XC-9/A4 BK 1x6 9 XC XC-10/A4 10 XC	XC-9/A5 BK 1x6 9 XC XC-10/A5 10 XC	XC-9/A6 9 XC XC-10/A6 10 XC	XC-9/A7 BK 1x6 9 XC 10 XC
	11 XC XC-12/A1 12 XC	XC-11/A2 BK 1x6 11 XC XC-12/A2 12 XC	XC-11/A3 11 XC XC-12/A3 12 XC	XC-11/A4 BK 1x6 11 XC XC-12/A4 12 XC	XC-11/A5 BK 1x6 11 XC XC-12/A5 12 XC	XC-11/A6 11 XC XC-12/A6 12 XC	XC-11/A7 BK 1x6 11 XC 12 XC
VOLTMETRICAL LINE FROM MAIN BUS BAR 110:1,73Vac	13 XC XC-14/A1 14 XC	XC-13/A2 BK 1x1.5 13 XC XC-14/A2 14 XC	XC-13/A3 13 XC XC-14/A3 14 XC	XC-13/A4 BK 1x1.5 13 XC XC-14/A4 14 XC	XC-13/A5 BK 1x1.5 13 XC XC-14/A5 14 XC	XC-13/A6 13 XC XC-14/A6 14 XC	XC-13/A7 BK 1x1.5 13 XC 14 XC
	15 XC XC-16/A1 16 XC	XC-15/A2 BK 1x1.5 15 XC XC-16/A2 16 XC	XC-15/A3 15 XC XC-16/A3 16 XC	XC-15/A4 BK 1x1.5 15 XC XC-16/A4 16 XC	XC-15/A5 BK 1x1.5 15 XC XC-16/A5 16 XC	XC-15/A6 15 XC XC-16/A6 16 XC	XC-15/A7 BK 1x1.5 15 XC 16 XC
	17 XC XC-18/A1 18 XC	XC-17/A2 BK 1x1.5 17 XC XC-18/A2 18 XC	XC-17/A3 17 XC XC-18/A3 18 XC	XC-17/A4 BK 1x1.5 17 XC XC-18/A4 18 XC	XC-17/A5 BK 1x1.5 17 XC XC-18/A5 18 XC	XC-17/A6 17 XC XC-18/A6 18 XC	XC-17/A7 BK 1x1.5 17 XC 18 XC
	19 XC XC-20/A1 20 XC	XC-19/A2 BK 1x1.5 19 XC XC-20/A2 20 XC	XC-19/A3 19 XC XC-20/A3 20 XC	XC-19/A4 BK 1x1.5 19 XC XC-20/A4 20 XC	XC-19/A5 BK 1x1.5 19 XC XC-20/A5 20 XC	XC-19/A6 19 XC XC-20/A6 20 XC	XC-19/A7 BK 1x1.5 19 XC 20 XC
VOLTMETRICAL LINE FROM MAIN BUS BAR 110:3Vac	21 XC XC-22/A1 22 XC	XC-21/A2 BK 1x1.5 21 XC XC-22/A2 22 XC	XC-21/A3 21 XC XC-22/A3 22 XC	XC-21/A4 BK 1x1.5 21 XC XC-22/A4 22 XC	XC-21/A5 BK 1x1.5 21 XC XC-22/A5 22 XC	XC-21/A6 21 XC XC-22/A6 22 XC	XC-21/A7 BK 1x1.5 21 XC 22 XC
	23 XC XC-24/A1 24 XC	XC-23/A2 BK 1x1.5 23 XC XC-24/A2 24 XC	XC-23/A3 23 XC XC-24/A3 24 XC	XC-23/A4 BK 1x1.5 23 XC XC-24/A4 24 XC	XC-23/A5 BK 1x1.5 23 XC XC-24/A5 24 XC	XC-23/A6 23 XC XC-24/A6 24 XC	XC-23/A7 BK 1x1.5 23 XC 24 XC
EARTH.SWITCH OPEN (VT BUS BARS UNIT)	25 XC XC-25/A1	BK 1x1.5			XC-27/A5 BK 1x1.5 27 XC		
	26 XC XC-26/A1	BK 1x1.5			XC-28/A5 BK 1x1.5 28 XC		
		25 XC XC-25/A2	BK 1x1.5		XC-29/A5 BK 1x1.5 29 XC		
		26 XC XC-26/A2	BK 1x1.5		XC-30/A5 BK 1x1.5 30 XC		
			25 XC XC-25/A3	BK 1x1.5	XC-31/A5 BK 1x1.5 31 XC		
			26 XC XC-26/A3	BK 1x1.5	XC-32/A5 BK 1x1.5 32 XC		

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
26/03/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
=					
+					
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IMESA ELECTRICAL ENGINEERING

DWG n°: 231151/SD/22

Item n°: PF1113279

CROSSWIND

ROSETTI MARINO

TITLE : SG-100D1 – INTERCONNECTING

Intercolumn Wiring

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

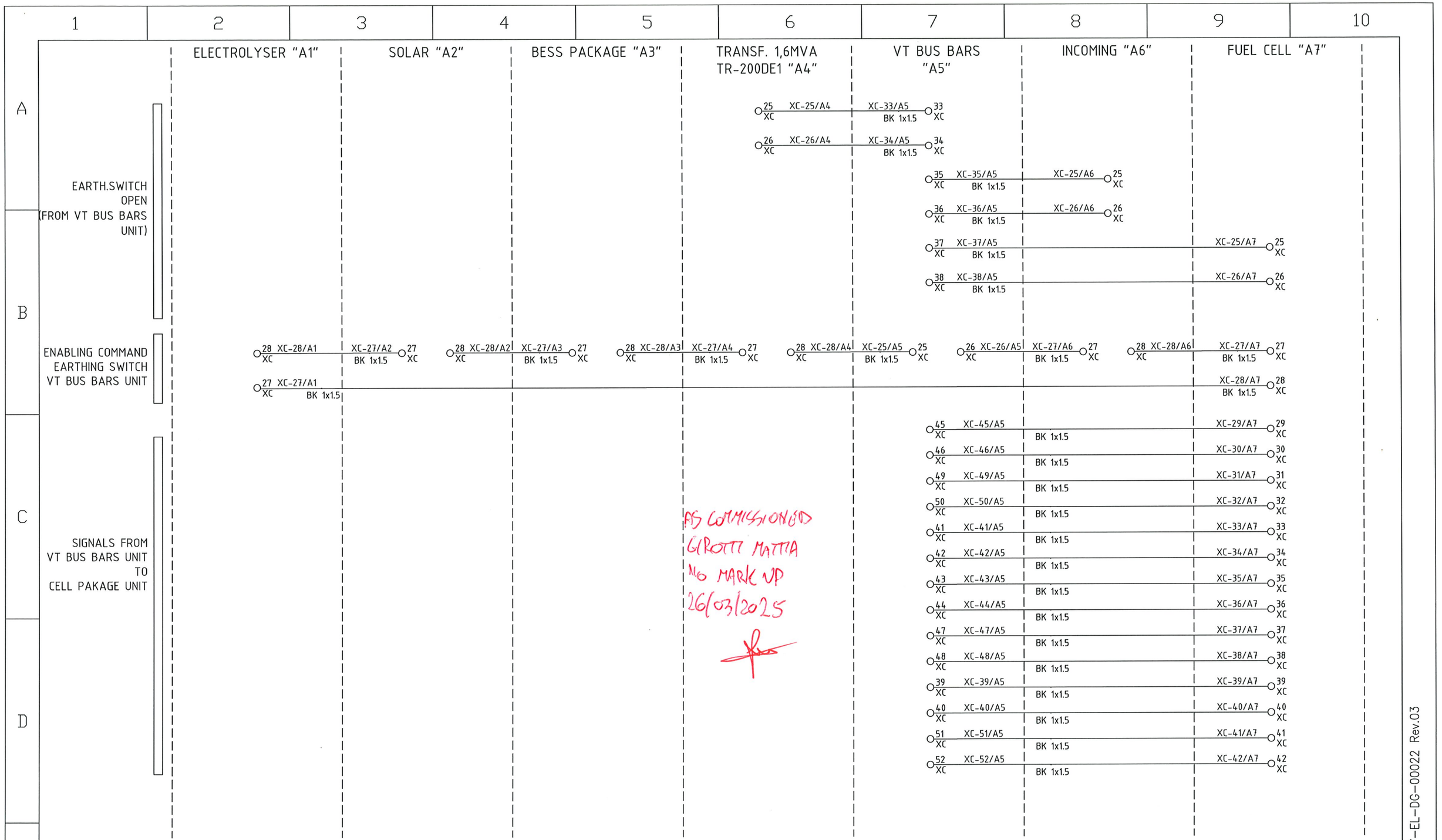
DRAWING NO. 1723002197-EL-DG-00022

SHEET 4

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00022 Rev.03



AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
26/03/2025

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

DWG n°: 231151/SD/22

Item n°: PF1113279

TITLE : SG-100D1 – INTERCONNECTING

Intercolumn Wiring

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00022

SHEET 5

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00022 Rev.03

1	2	3	4	5	6	7	8	9	10
	ELECTROLYSER "A1"	SOLAR "A2"	BESS PACKAGE "A3"	TRANSF. 1,6MVA TR-200DE1 "A4"	VT BUS BARS "A5"		INCOMING "A6"	FUEL CELL "A7"	

A

29 XC XC-29/A1 BK 1x1.5 — XC-47/A7 BK 1x1.5 47 XC

30 XC XC-30/A1 BK 1x1.5 — XC-48/A7 BK 1x1.5 48 XC

B

PROTECTION RELAY HEALTHY

31 XC XC-31/A1 BK 1x1.5 — XC-29/A2 29 XC

32 XC XC-32/A1 BK 1x1.5 — XC-30/A2 30 XC

31 XC XC-31/A2 BK 1x1.5 — XC-29/A3 29 XC

32 XC XC-32/A2 BK 1x1.5 — XC-30/A3 30 XC

31 XC XC-31/A3 BK 1x1.5 — XC-29/A4 29 XC

32 XC XC-32/A3 BK 1x1.5 — XC-30/A4 30 XC

37 XC XC-37/A3 BK 1x1.5 — XC-31/A4 31 XC

38 XC XC-38/A3 BK 1x1.5 — XC-32/A4 32 XC

31 XC XC-31/A6 BK 1x1.5 — XC-45/A7 45 XC

32 XC XC-32/A6 BK 1x1.5 — XC-46/A7 46 XC

C

230Vac AUXILIARY SUPPLY HEALTHY

33 XC XC-33/A1 BK 1x1.5 — XC-33/A2 BK 1x1.5 34 XC

34 XC XC-34/A2 BK 1x1.5 — XC-34/A3 34 XC

33 XC XC-33/A3 BK 1x1.5 — XC-33/A4 33 XC

34 XC XC-34/A4 BK 1x1.5 — XC-54/A5 54 XC

53 XC XC-53/A5 BK 1x1.5 — XC-33/A6 33 XC

34 XC XC-34/A6 BK 1x1.5 — XC-43/A7 43 XC

34 XC XC-34/A1 BK 1x1.5 — XC-44/A7 44 XC

D

OPENING COMMAND FROM INCOMING

35 XC XC-35/A1 BK 1x1.5 — XC-35/A6 35 XC

36 XC XC-36/A1 BK 1x1.5 — XC-36/A6 36 XC

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
26/03/2025

E

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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DWG n°: 231151/SD/22
Item n°: PF1113279

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : SG-100D1 – INTERCONNECTING

Intercolumn Wiring

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

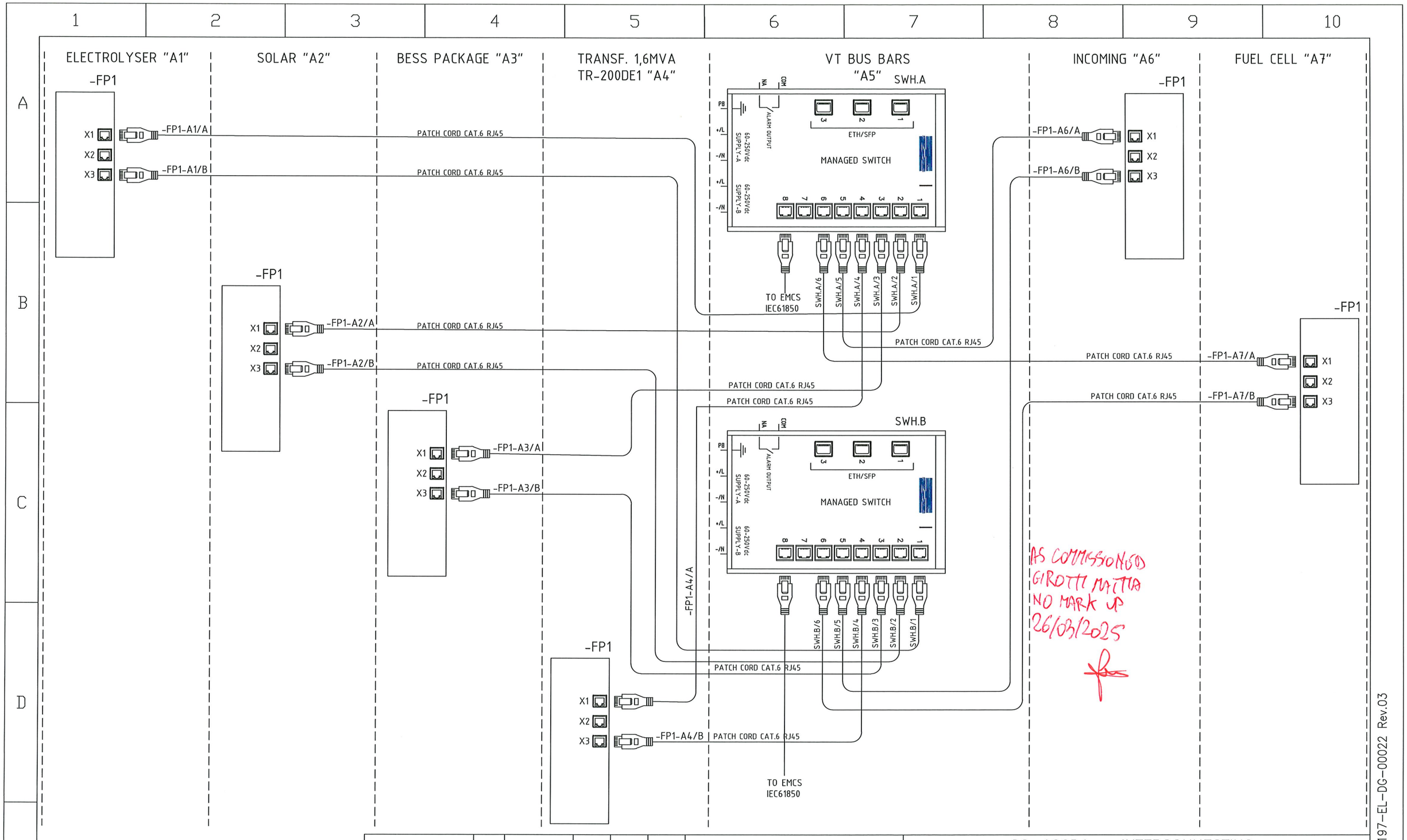
DRAWING NO. 1723002197-EL-DG-00022

SHEET 6

REV. 03

File Name : 1723002197-EL-DG-00022 Rev.03

F.to UNI A3: 420mmx297mm



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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+					
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CROSSWIND

ROSETTI MARINO

IMESA ELECTRICAL ENGINEERING

DWG n°: 231151/SD/22

Item n°: PF1113279

TITLE : SG-100D1 – INTERCONNECTING

Network architecture IEC 61850

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

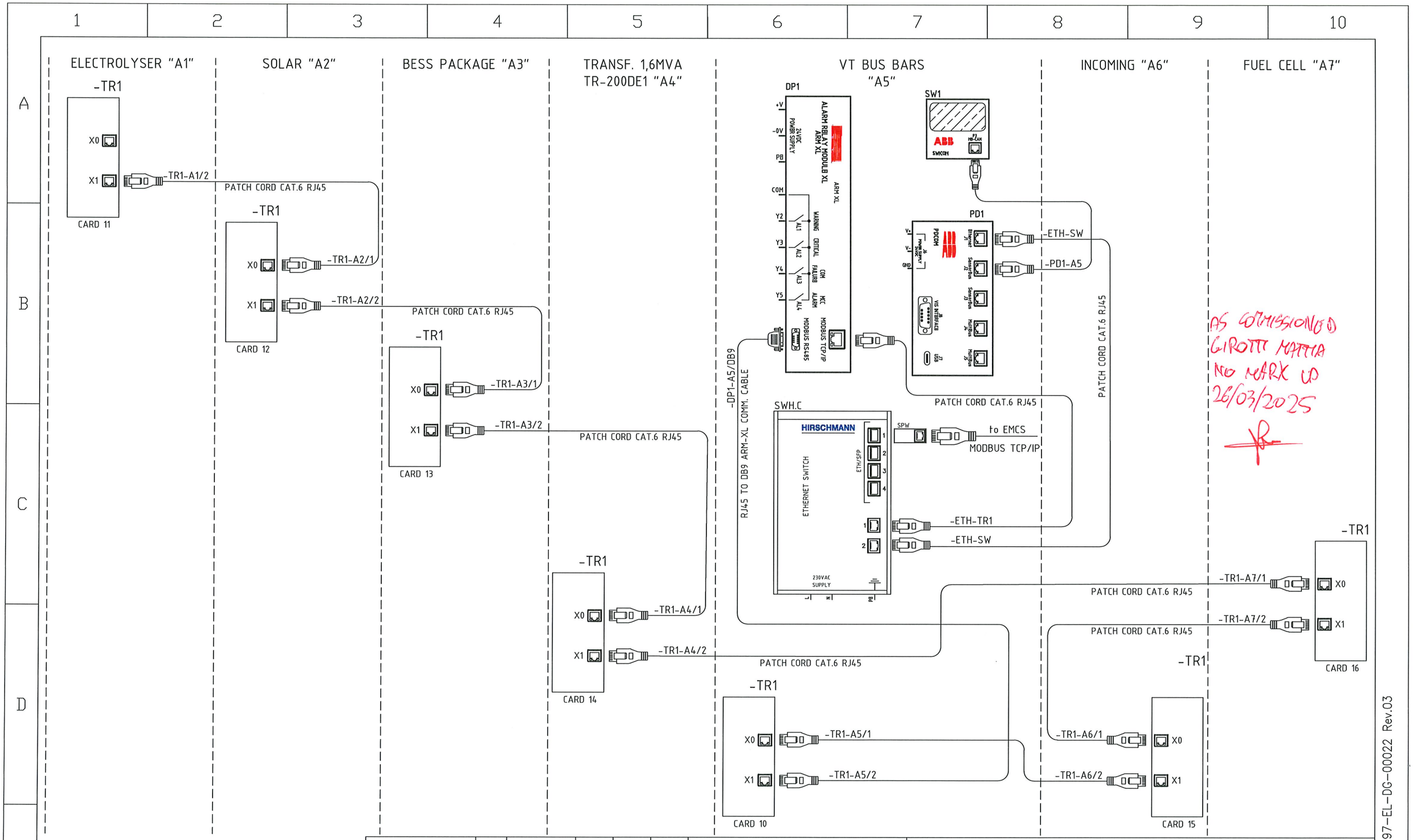
DRAWING NO. 1723002197-EL-DG-00022

SHEET 7

REV. 03

File Name : 1723002197-EL-DG-00022 Rev.03

F.to UNI A3: 420mmx297mm



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

DWG n°: 231151/SD/22

Item n°: PF1113279

TITLE : SG–100D1 – INTERCONNECTING

Network architecture Modbus TCP/IP

CONTRACT NO./TITLE CW–I–WP4–2023–05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197–EL–DG–00022

SHEET 8

REV. 03

File Name : 1723002197–EL–DG–00022 Rev.03

F.to UNI A3: 420mmx297mm

Section 4.3 Instrumentation functional test sheets index

NOT APPLICABLE

Section 4.4 Instrumentation “As-Commissioned” interconnection diagrams

NOT APPLICABLE

Section 4.5 Telecommunication functional test sheets index

NOT APPLICABLE

Section 4.6 Telecommunication “As-Commissioned” I.C.D. / TSLD's

NOT APPLICABLE

Section 5 SITE / OPERATIONAL

Section 5.1 Operational Test Procedure

CROSSWIND	**123A90 - HOLLANDSE KUST NOORD WIND PARK BLPH Project** **COMMISSIONING DOSSIER INDEX**	ROSETTI MARINO

Reference Procedure **123A90-PML-COM-PRO-03046 _ OTP - 6.6 kV Switchgear & Transformer Systems** has been uploaded in the Subsystem **82-00** Commissioning Dossier Sect. 5.1

Section 5.2 Operational Test Certificates

NOT APPLICABLE

Section 6 PIPING AND VESSEL PREPARATION

Section 6.1 Final Mechanical / Vessel Inspection Checks Index

NOT APPLICABLE

Section 6.2 Leak Test / Drying / Inerting Test Sheets Index

NOT APPLICABLE

Section 6.3 Chemical Loading & First Fill records Index

NOT APPLICABLE

Section 6.4 Chemical Cleaning Reports and Records Index

NOT APPLICABLE

Section 6.5 Lubrication Schedule

NOT APPLICABLE

Section 7 VENDOR

Section 7.1 Vendor Package Summary Index

NOT APPLICABLE

Section 7.2 SAT Procedure with associated punch list and reference (Front Page)

NOT APPLICABLE

Section 7.3 Vendor Spares & Special Tools lists references

NOT APPLICABLE

Section 7.4 Vendor Data / Operations / Maintenance Manuals References

RLMU LIST

REV. 03A: Sheets 26

"SG-100D1" HV SWBD 6,6kV (UNIT A3)

FUNCTIONAL DIAGRAM

BESS FEEDER A-85000

NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n° : 231151/SD/17
Item n° : PF1113279

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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Cover

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 1 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

NO MARK UP
AS COMMISSIONED: MATTIA GIRONI 27/3/25

INDEX

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1	Cover	X	X	X	X					
2	Sheets Index	X	X	X	X					
3	Legend	X	X	X	X					
4	Door Layout	X	X	X	X					
5	Protection Display RBX640	X	X	X	X					
6	Selector Switch Diagram	X	X	X	X					
7	Power Diagram	X	X	X	X					
8	Power Diagram	X	X	X	X					
9	Power Diagram	X	X	X	X					
10	Power Diagram	X	X	X	X					
11	110Vdc / 24Vdc Distribution Voltage	X	X	X	X					
12	Composition Relay RBX640	X	X	X	X					
13	230Vac Distribution Voltage	X	X	X	X					
14	110V Protection/Measure Distribution Voltage	X	X	X	X					
15	110V Protection/Measure Distribution Voltage	X	X	X	X					
16	"RBX640"' Protection Wiring	X	X	X	X					
17	"RBX640"' Protection Wiring	X	X	X	X					
18	"RBX640"' Protection Wiring	X	X	X	X					
19	Bxtherm Device	X	X	X	X					
20	Command Circuit	X	X	X	X					
21	Command Circuit	X	X	X	X					
22	Command Circuit	X	X	X	X					
23	"RBX640" Protection Wiring - Digital Input	X	X	X	X					
24	"RBX640" Protection Wiring - Digital Input	X	X	X	X					
25	"RBX640" Protection Wiring - Digital Input	X	X	X	X					
26	Bmergency Opening by "SIS"	X	X	X	X					

Sheet	Description	Revision 0	1	2	3	4	5	6	7	8
27	Availables Signals	X	X	X	X					
28	Terminal stripes	X	X	X	X					
29	Terminal stripes	X	X	X	X					
30	Terminal stripes	X	X	X	X					
31	Terminal stripes	X	X	X	X					
32	Bill of Materials	X	X	X	X					
33	Bill of Materials	X	X	X	X					
34	Bill of Materials	X	X	X	X					

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3
DWG n° : 231151/SD/17
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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Sheets Index

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 2 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

ACRONIMUS LEGEND

ITEM	DESCRIPTION
BB	ARC SENSOR PROTECTION ON MAIN BUS BARS
BGE	EARTHING SWITCH
C1	VOLTAGE PRESENCE
CB	ARC SENSOR PROTECTION ON C.B. / CONTACTOR COMPARTMENT
CC	ARC SENSOR PROTECTION ON CABLE COMPARTMENT
DCO	DOUBLE COMMAND OPERATED CONTACTOR
DI3	UNDERVOLTAGE CONTACTOR
DP1	ALARM RELAY MODULE TEMPERATURE
E1	INTERNAL LIGHT
E8	RESISTOR FERRO-RESONANCE
EH1	INTERNAL SPACE HEATER
Fn	MV FUSE
FP1	PROTECTION RELAY
GS1	DC/DC CONVERTER
HGR	THERMOSTAT
Kn	AUXILIARY RELAY
K1	MV CONTACTOR
K86	BLOCK RELAY
KT1	DE-ENERGIZATION TIMER
LS	MICRO SWITCH ON AUXILIARY DOOR
MAS	MOTOR SPRING CHARGER
MBC	CLOSING COIL
MBO1	OPENING COIL
MBU	UNDERVOLTAGE
ODn	VOLTAGE DISCHARGER
PU1	MEASURING VOLTAGE INSTRUMENT

ITEM	DESCRIPTION
PTT	V.T. TRUCK
QM	MV CIRCUIT-BREAKER
QDn	M.C.B. CIRCUITS PROTECTION
QVn	M.C.B FOR V.T. PROTECTION
RLE1	COIL FOR CONSET CLOSING CIRCUIT-BREAKER
RLE2	COIL FOR UNLOCKING RACK-IN/OUT OPERATION
RLE3	COIL FOR UNLOCKING OPERATION EARTHING
RLE4	COIL FOR UNLOCKING ENCLOSURE DOOR OPERATION
SU1	VOLTAGE SELECTOR
SWH...	ETHERNET SWITCH
TI-Ln	CURRENT TRANSFORMER
TO	OMOPOLAR RING CURRENT TRANSFORMER
TR1	TEMPERATURE CONTROL DEVICE

NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

FUNCTIONAL OF THE PROTECTION RELAY OUTPUT CONTACTS:

SLOT "G":
RF = WATCHDOG RELAY
S01 = EARTHING SWITCH UNLOCKING
S02 = C.B. or CONTACTOR READY TO CLOSE
POSP1 = CLOSING COMMAND
S03 = C.B. or CONTACTOR TRUCK UNLOCKED
PODP1 = OPENING COMMAND
SLOT "B":
S01 = TRIP PROTECTION TO LOCKOUT RELAY
S02 = EARTHING SWITCH CLOSED
S03 = AVAILABLE OUTPUT (ON TERMINAL STRIP)
S04 = RESET LOCKOUT RELAY
SLOT "D":
SP01 = TRIP ARC DETECTOR

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

=
+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Legend

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

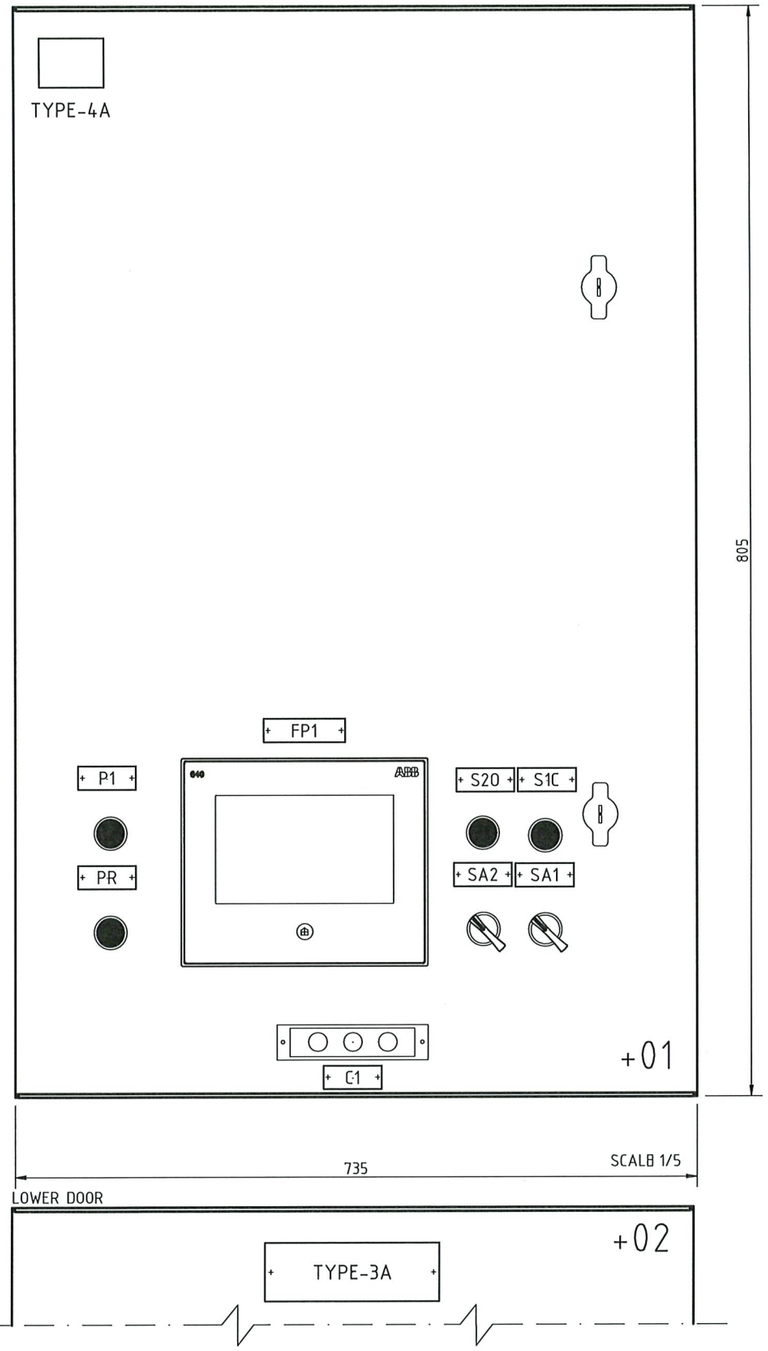
A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 3 | REV. 03

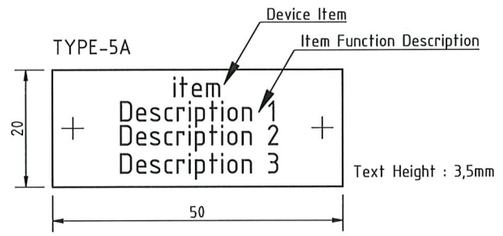
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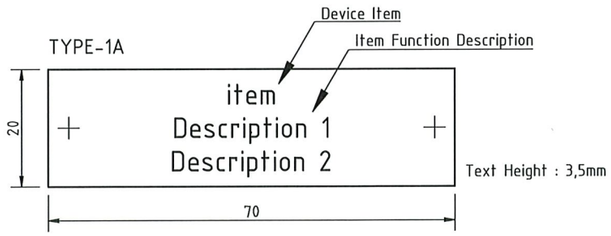
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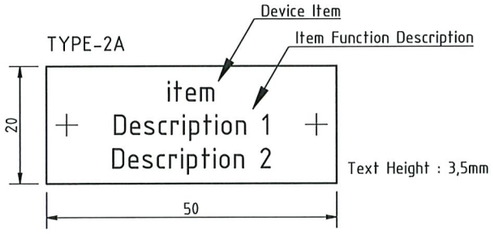
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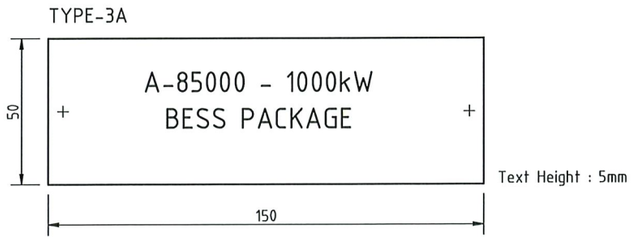
DEVICES name plate					
ITEM	COMPONENT	DESCRIPTION 1	DESCRIPTION 2	DESCRIPTION 3	NOTE
FP1	PROTECTION RELAY	PROTECTION RELAY			TYPE-1A
S2.O	PUSH BUTTON	OPEN	COMMAND	CONTACTOR	TYPE-5A
S1.C	PUSH BUTTON	CLOSE	COMMAND	CONTACTOR	TYPE-5A
SA1	SELECTOR SWITCH	LOCAL / REMOTE			TYPE-2A
SA2	SELECTOE SWITCH	OVERRIDE ESD	OFF - ON		
PR	LIGHT PUSH BUTTON	RESET	LOCK-OUT	TRIP LOCK-OUT	TYPE-5A
C1	PILOT LIGHT	VOLTAGE	PRESENCE		TYPE-2A
P1	PUSH BUTTON	TRUCK-DOOR	ENABLING	ENABLING	TYPE-5A

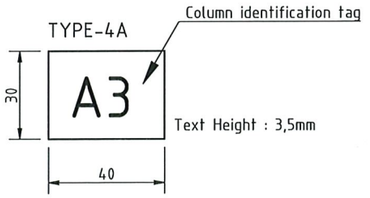












NO MARK UP
AS COMMISSIONED:
MUTUA GIROTH.
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n° : 231151/SD/17
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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Door Layout

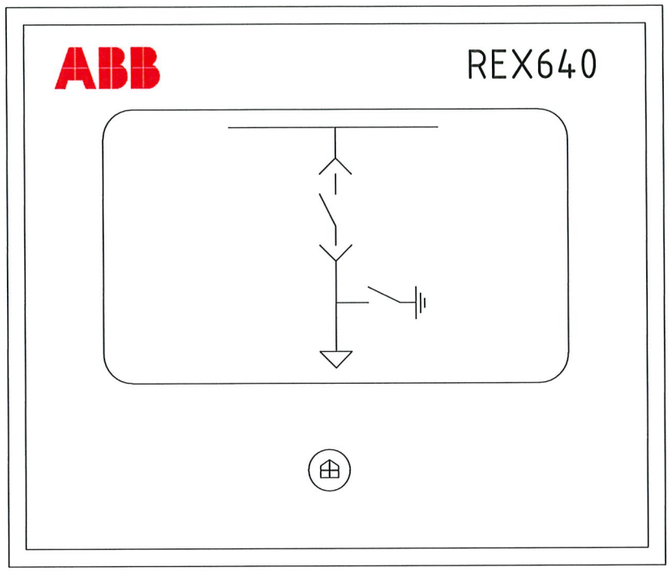
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 4 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

PROTECTION DISPLAY



LHMI - TOUCH DISPLAY

- COMMANDS "CLOSE CONTACTOR " AND "OPEN CONTACTOR" NOT ENABLED
- PUSH BUTTON "REMOTE / LOCAL" NOT ENABLED

NO MARK UP AS COMMISSIONED!
MATTIA GIROTTI
27/3/25

LEDs PAGE 1				
Item	NAME PLATE	COLOUR		Note
		ALARM	OK	
LED-1	27-1/27-2/59-1/59-2 - VOLTAGE PROTECTION	RED	-	ALARM = OVER/UNDER VOLTAGE PROTECTION
LED-2	CONTACTOR READY (TCS)	-	GREEN	OK = TCS OK (CONTACTOR READY)
LED-3	SYNCHRO CHECK		GREEN	OK = SYNCHRONISM
LED-4	CONTACTOR READY TO CLOSE	-	GREEN	OK = CONTACTOR READY TO CLOSE
LED-5	50-1/51-1/67-1/67-2 - TRIPPED	RED	-	ALARM = OVERCURRENT PROTECTION TRIPPED
LED-6	51N/59N-1/59N-2 - TRIPPED	RED	-	ALARM = EARTH PROTECTION TRIPPED
LED-7	EARTHING SWITCH UNLOCKED	-	GREEN	OK = EARTHING SWITCH UNLOCKED
LED-8	RACK-IN/OUT ENABLED	-	GREEN	OK = CONTACTOR TRUCK UNLOCKED
LED-9	ARC PROTECTION TRIPPED	RED	-	ALARM = TRIP ARC PROTECTION
LED-10	GOOSE ALARM	RED	-	ALARM = GOOSE FAULT
LED-11	EMERGENCY OPENING BY SIS (ESD)	RED	-	ALARM = ESD TRIPPED

LEDs PAGE 2				
Item	NAME PLATE	COLOUR		Note
		ALARM	OK	
LED-12	SPACE HEATER "ON"	RED	-	ALARM = SPACE HEATER "ON"
LED-13	TRANSF. PROTECTIONS	RED		ALARM = PROTECTIONS TRIP
LED-14	FUSES TRIP	RED		ALARM = FUSES TRIP
LED-15	TRIP FROM L.V.	RED		ALARM = L.V. TRIP
LED-16				
LED-17				
LED-18				
LED-19				
LED-20				
LED-21				
LED-22				

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

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DWG n° : 231151/SD/17
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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Protection Display REX640

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

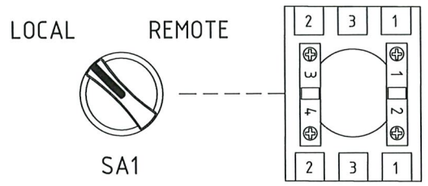
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F.to UNI A3: 420mmx297mm

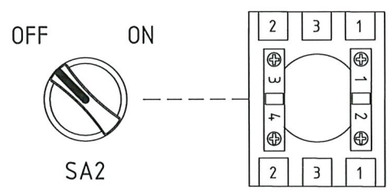
File Name : 1723002197-EL-DG-00017 Rev.03

SELECTORS SWITCH DIAGRAM

REAR VIEW



REAR VIEW



NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

NOTES

THE DIAGRAM INDICATES THE FOLLOWING CONDITIONS:
-INSERTED CONTACTOR IN OPEN POSITION
-DE-ENERGIZED CIRCUITS
-EARTHING SWITCH OPEN

THE AUXILIARY CIRCUITS WILL HAVE THE FOLLOWING CHARACTERISTICS:
-110+ / 24+ 1,5mmq RED TYPE CABLE SH-W
-110- / 24- 1,5mmq WHITE TYPE CABLE SH-W
-AUXILIARY CONTACTS TO TERMINAL STRIP 1,5mmq BLACK TYPE CABLE SH-W
-230Vac 1,5mmq BLACK TYPE SH-W
-VOLTMETRICAL CIRCUITS 1,5mmq BLACK TYPE CABLE SH-W
-AMMETRICAL CIRCUIT 2,5mmq BLACK TYPE CABLE SH-W

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3	
DWG n° :	231151/SD/17
Item n° :	PF1113279

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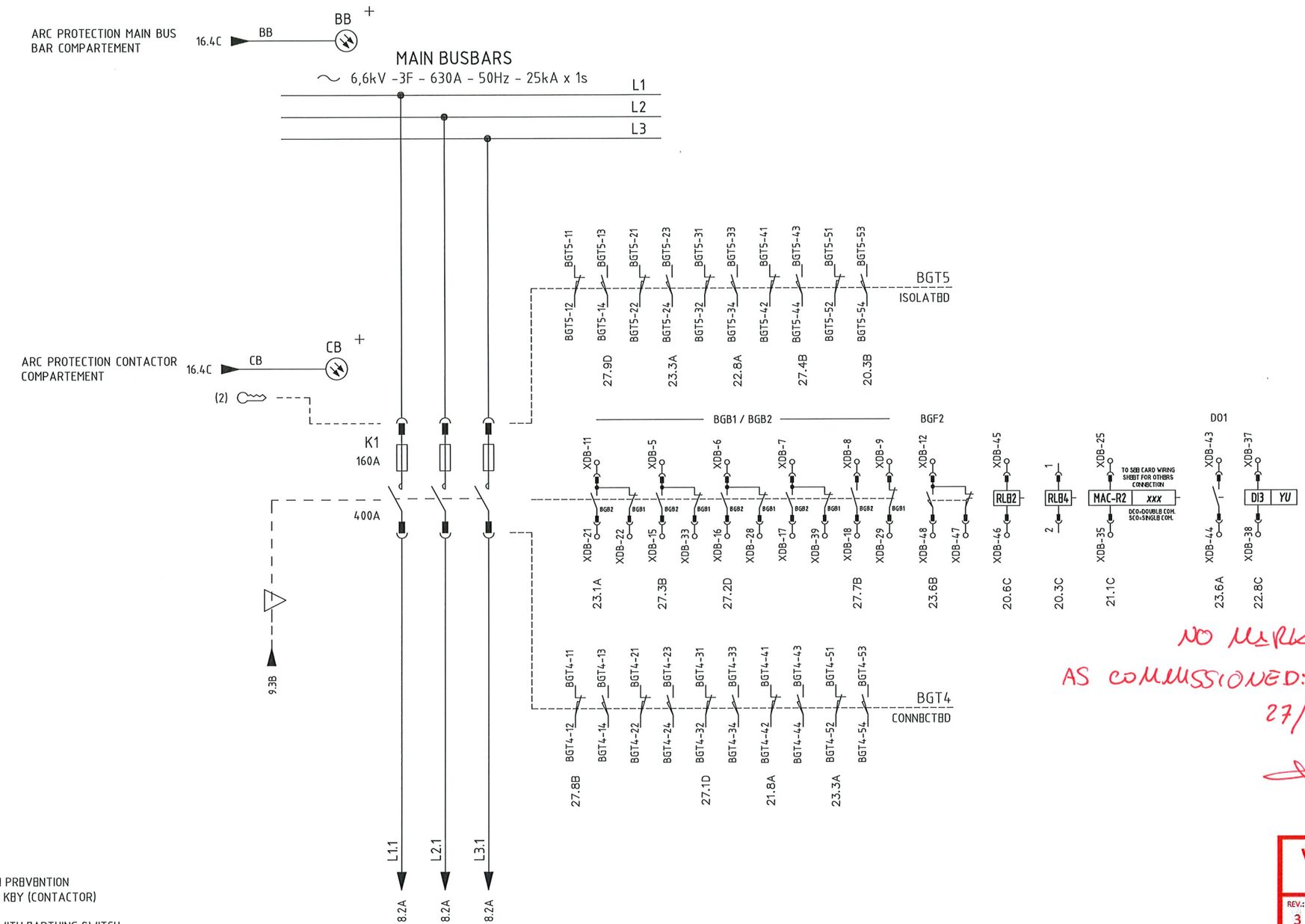
TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Selector Switch Diagram

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 6 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03



NO MARK UP
AS COMMISSIONED: MATIA GIROTTI
27/3/25

(2) RACKING IN PREVENTION LOCK WITH KEY (CONTACTOR)

(3) FREE KEY WITH EARTHING SWITCH IN OPEN POSITION

(4) FREE KEY WITH EARTHING SWITCH IN CLOSED POSITION

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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DWG n° : 231151/SD/17
Item n° : PF1113279

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Power Diagram

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

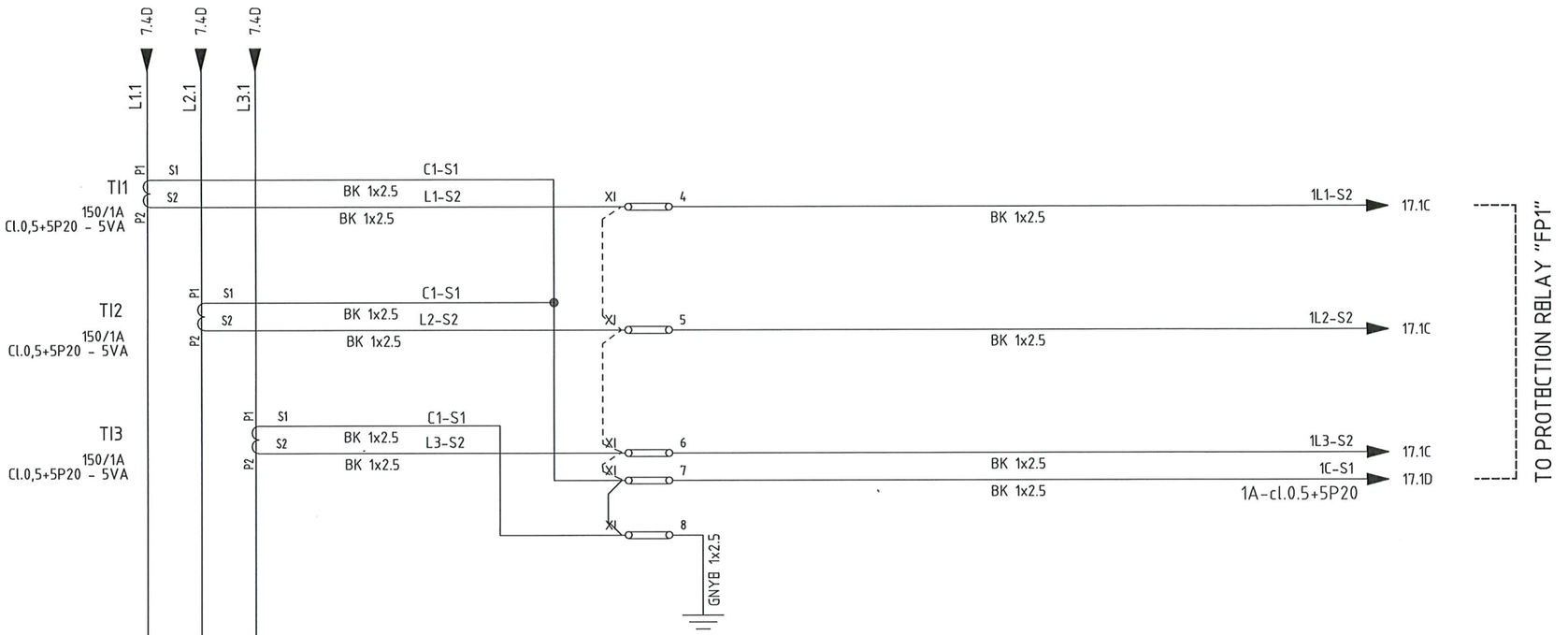
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SHEET 7

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03



NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= +A3
DWG n° : 231151/SD/17
Item n° : PF1113279

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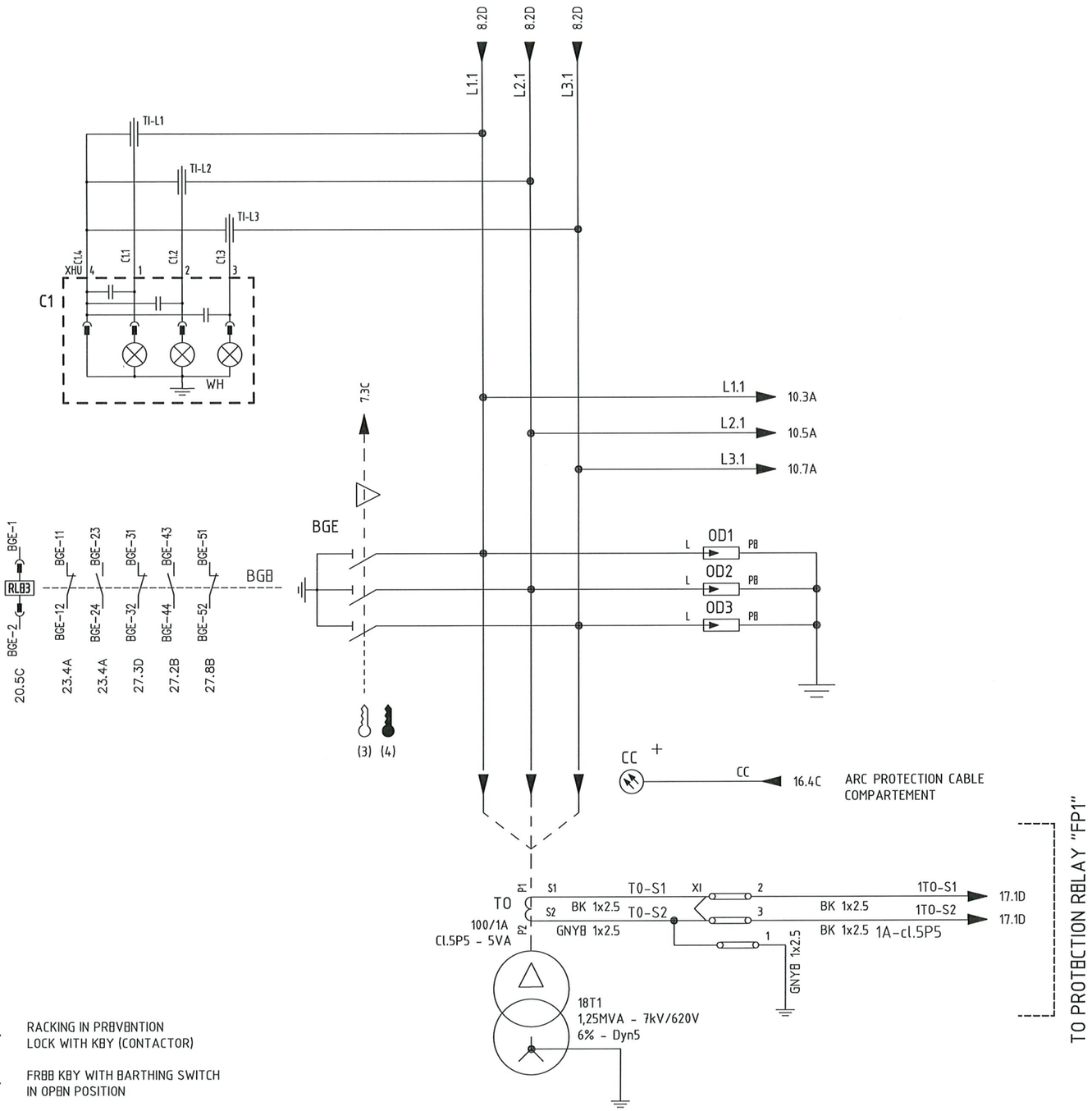
TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Power Diagram

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 8 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03



(2) RACKING IN PREVENTION LOCK WITH KEY (CONTACTOR)

(3) FREE KEY WITH EARTHING SWITCH IN OPEN POSITION

(4) FREE KEY WITH EARTHING SWITCH IN CLOSED POSITION

NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
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123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

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+A3

DWG n° : 231151/SD/17
Item n° : PF1113279

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Power Diagram

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00017

SHEET 9

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

6.600:rad3V/
1° core : 110:rad3V 20VA Cl 0,5/3P
2° core : 110:rad3V 30VA Cl 0,5/3P
3° core : 110:3V 30VA Cl 3P

PTT

FUSE HEALTHY

6600:r3/110:r3-110:r3-110:3 TU-L1

6600:r3/110:r3-110:r3-110:3 TU-L2

6600:r3/110:r3-110:r3-110:3 TU-L3

FF1 2A — 10.9A

FF2 2A — 10.9B

FF3 2A — 10.9B

FF1 10.3A

FF2 10.5A

FF3 10.7A

BT7 ISOLATED

BT6 CONNECTED

N

GV 1x2,5

L1-a1 L1-a2 L1-a3 L1-b3 L2-a1 L2-a2 L2-b3 L3-a1 L3-a2 L3-b3

E8 27ohm-500W

QV1 2A — 24.2A

QV2 2A — 24.2B

QV3 2A — 24.2B

110:rad3 / CL.0,5-3P

AVAILABLE

110:3 / CL.3P

TO PROTECTION RELAY "FP1"

TO PROTECTION RELAY FP1

NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

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SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Power Diagram

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00017

SHEET 1,0

REV. 03

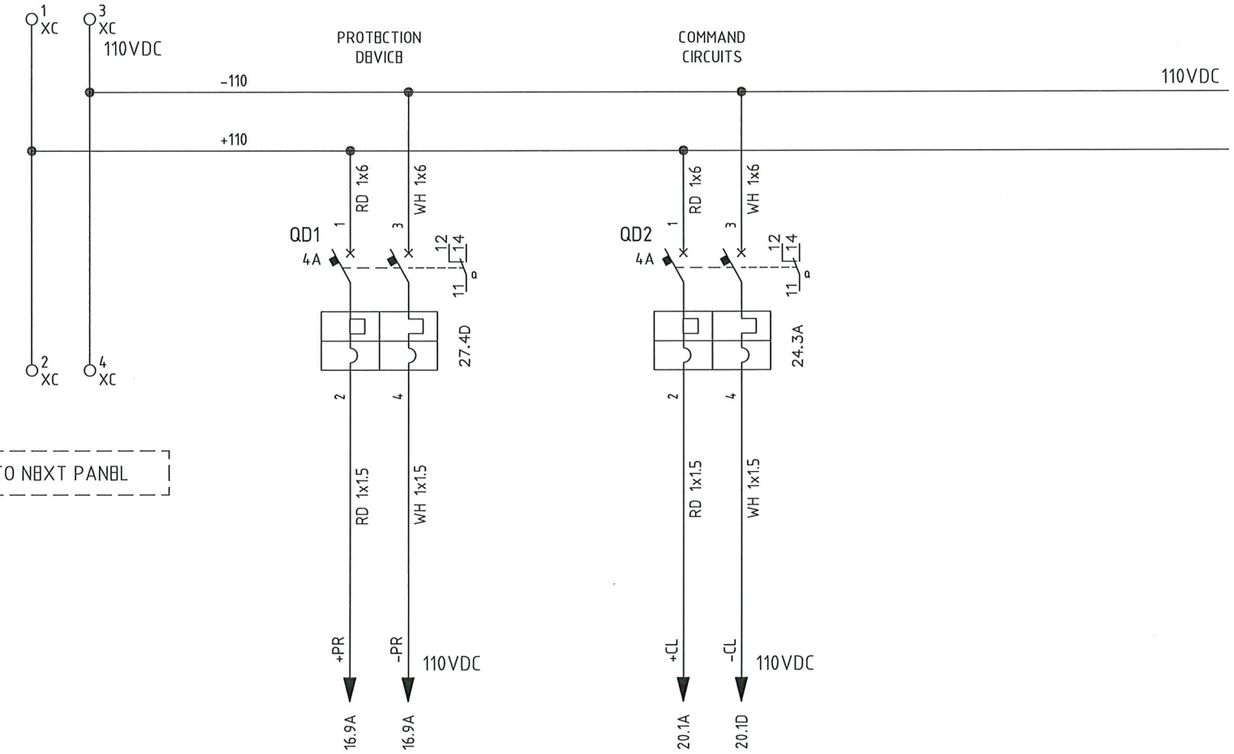
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

110VDC DISTRIBUTION VOLTAGE

110Vdc Auxiliary Voltage
from Measuring Bus Bar Unit

FROM PREVIOUS PANEL

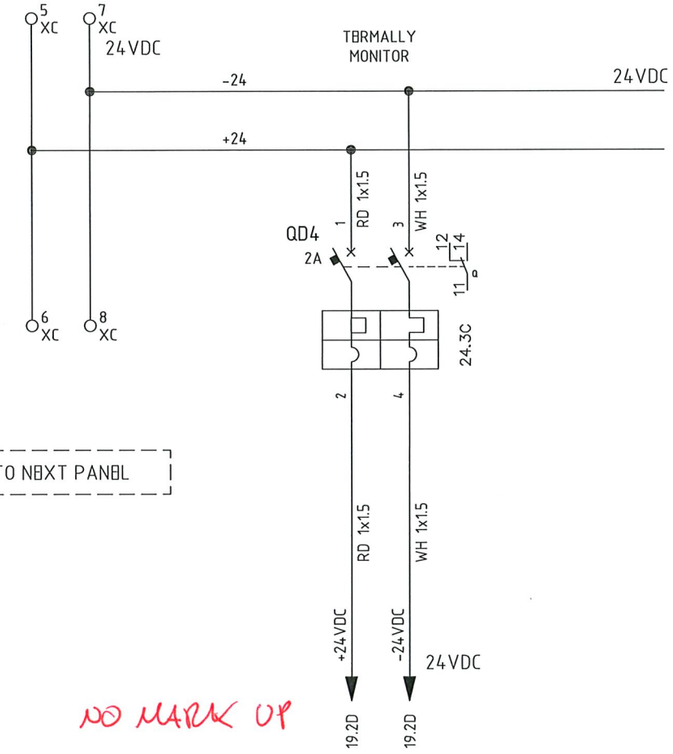


TO NEXT PANEL

24VDC DISTRIBUTION VOLTAGE

24Vdc Auxiliary Voltage
from Measuring Bus Bar Unit

FROM PREVIOUS PANEL



TO NEXT PANEL

NO MARK UP
AS COMMISSIONED: MA m.a GIRO m
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

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TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
110Vdc / 24Vdc Distribution Voltage

CONTRACT NO./TITLE CW-1-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

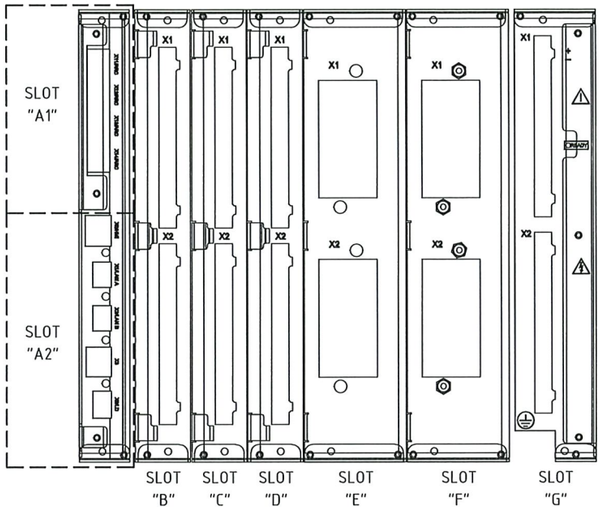
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F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

COMPOSITION RELAY REX640

RACK VIEW



REX640B10NN+COM1+ARC1+BIO1+BIO1+BIO2+AIM1+AIM1+PSM3+MCT1+SCT1+CMP2+LNG1+PCL4

LEGEND		
SLOT	Module Type	Description Module
A1	ARC1001	n° 4 x ARC sensor inputs
A2	COM1001	n° 1 x RJ-45 (LHMI port) + n° 3 x RJ-45 + n° 1 x SFP100M LC
B	BIO1001	n° 14 Binary Input + n° 8 x SO
C	BIO1001	n° 14 Binary Input + n° 8 x SO
D	BIO1002	n° 9 Binary Input + n° 6 x SPO + n° 2 x SPO(TCS)
E	AIM1001	n° 4 x CT + n° 1 x CT (sensitive, for residual current only) + n° 5 x VT
F	AIM1001	n° 4 x CT + n° 1 x CT (sensitive, for residual current only) + n° 5 x VT
G	PSM1003	77...150 VDC, n° 3 x PO (TCS) + n° 2 x PO + n° 3 x SO + n° 2 x SSO
	PO = Power Output SO = Signal Output SPO = Static Power Output SSO = Static Signal Output	

NO MARK UP

AS COMMISSIONED: MARIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

=
+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
2	26/06/2024	Giulietti	Flamminio	Sigismondi	Accepted for Construction (AFC)
1	14/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Composition Relay REX640

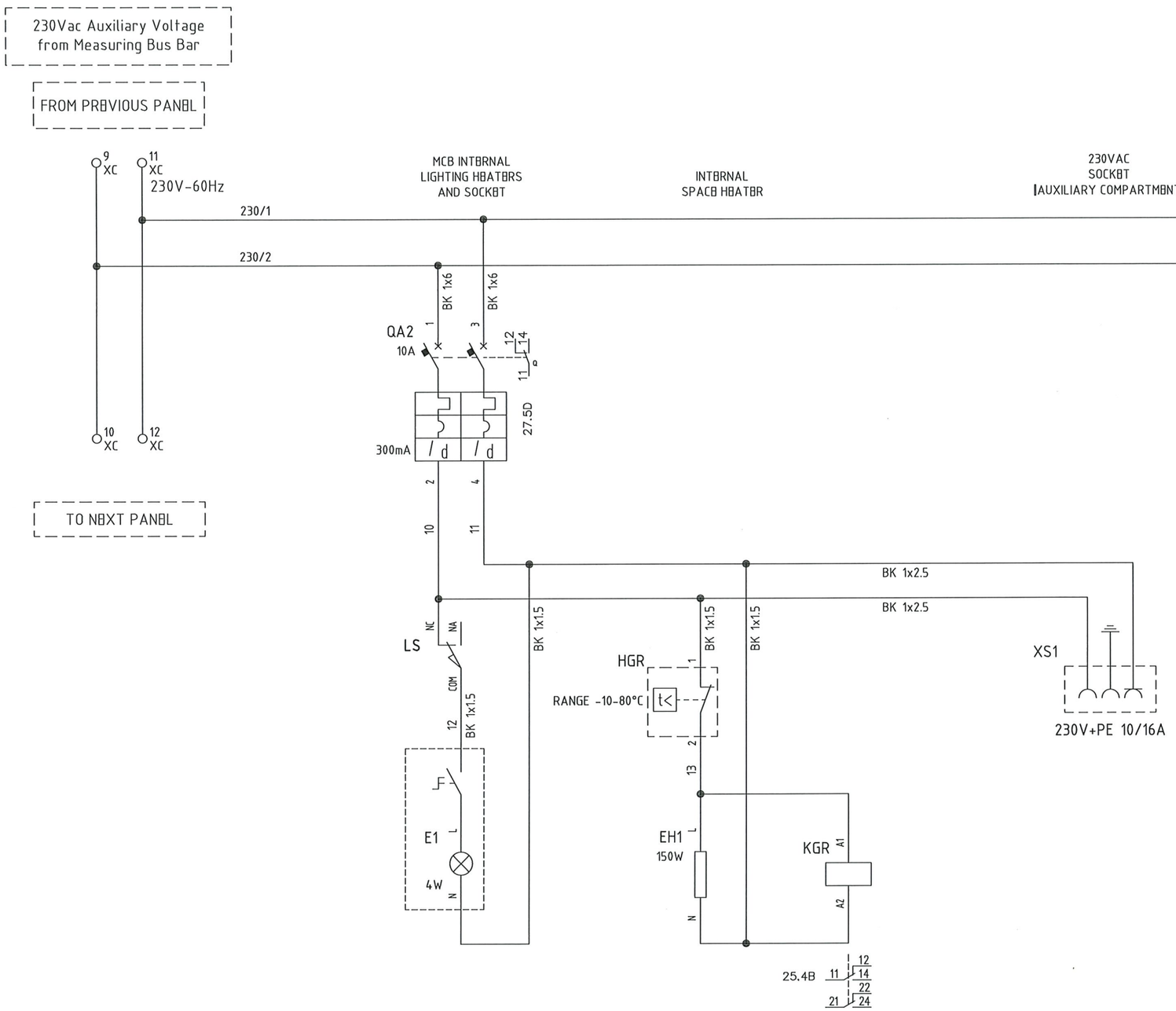
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 12 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

230VAC DISTRIBUTION VOLTAGE



NO MARK UP

AS COMMISSIONED: MATTIA GIROTTI

27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

=	
+A3	
DWG n° :	231151/SD/17
Item n° :	PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :

SG-100D1 – FUNCTIONAL BESS FEEDER A-85000

230Vac Distribution Voltage

CONTRACT NO./TITLE	CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK	SCALE : NTS	
A3	DRAWING NO. 1723002197-EL-DG-00017	SHEET 1,3	REV. 03

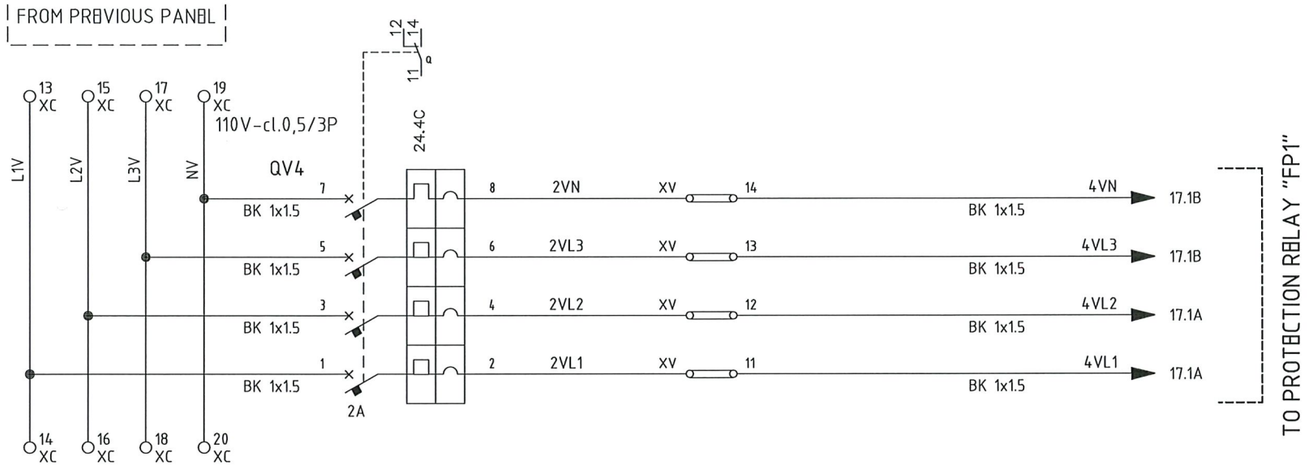
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

110V: 1,73 DISTRIBUTION VOLTAGE VT'S FROM MAIN BUS BAR

MAIN BUS BAR
110:√3V VOLTMETRIC LINE - STAR
(FOR PROTECTION/MEASURE)

FROM PREVIOUS PANEL



TO NEXT PANEL

NO MARK UP
AS COMMISSIONED: MATIA GIROT.
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= +A3
DWG n°: 231151/SD/17
Item n°: PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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1	14/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
110V Protection/Measure Distribution Voltage

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 14 | REV. 03

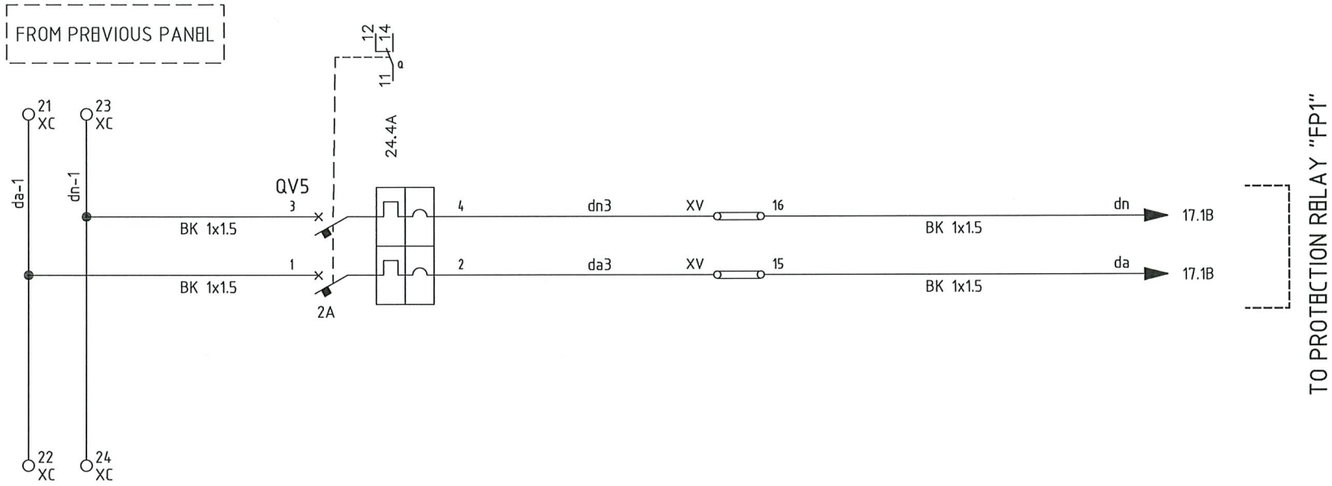
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

110V:3 DISTRIBUTION VOLTAGE VT'S FROM MAIN BUS BAR

MAIN BUS BAR
110:3V VOLTMETRIC LINE - DELTA OPEN (FOR PROTECTION/MEASURE)

FROM PREVIOUS PANEL



TO PROTECTION RELAY "FP1"

TO NEXT PANEL

NO MARK UP
AS COMMISSIONED: MATTIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

=	
+A3	
DWG n° :	231151/SD/17
Item n° :	PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
110V Protection/Measure Distribution Voltage

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	1723002197-EL-DG-00017	15	03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

"RBX640" PROTECTION WIRING

FP1

PSM1003
COM1001
slot G

X1

X1-1 — RD 1x1.5 — 11.2D +PR → +PR 23.1A

X1-2 — WH 1x1.5 — 11.3D -PR → -PR 23.1D

110VDC

Uaux

GND — 1x6 GNYB

PROTECTION FUNCTION

51	50
51N	25
59N	67
27	86
74	59	

ETH PORT (IEC61850)

X1 — PATCH CORD cat.6 RJ45 — FP1-A3/A — FROM MEASURE CUBICLE A5

X2

X3 — PATCH CORD cat.6 RJ45 — FP1-A3/B — FROM MEASURE CUBICLE A5

X0 — PATCH CORD cat.7 RJ45 — ETH.1

640 ABB

X1.1

X3 + −

GNYE 1x6

LHMI
Local HMI
7" color Touch screen

ARC1001
slot A1

ARC DETECTOR SENSOR

X11 — BB → 7.3A — BUS BAR COMPARTEMENT

X12 — CB → 7.3B — C.B. COMPARTEMENT

X13 — CC → 9.5D — CABLE COMPARTEMENT

X14

arc detectors

FP1

PSM1003

RF	SO1	SO2	SSO1	SSO2	POSP1	POSP2	SO3	PODP1	PODP2	PODP3
X1-4 / X1-3	X1-5 / X1-6	X1-7 / X1-8	X1-9 / X1-10	X1-11 / X1-12	X1-13 / X1-14	X1-15 / X1-16	X1-17 / X1-18	X2-2 / X2-3	X2-6 / X2-4 / X2-7	X2-11 / X2-9 / X2-12	X2-16 / X2-14 / X2-17
									TCS1	TCS2	TCS3
	22.9A	20.5C	27.6D			21.10B		20.6B	21.9B		

slot G

RBX640

ABB REX640

NO MARK UP
AS COMMISSIONED:
MATTIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

=
+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
"REX640"' Protection Wiring

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00017

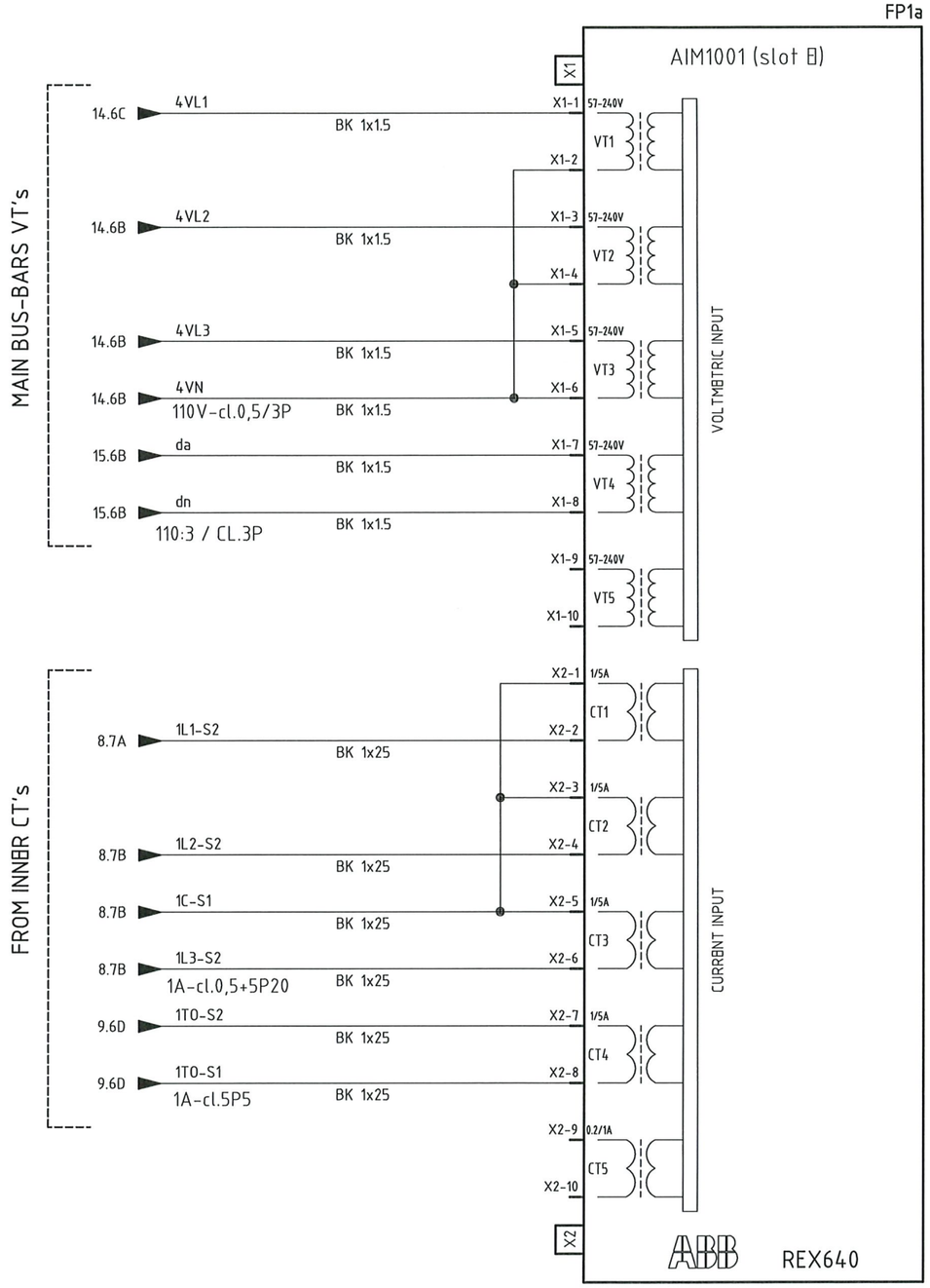
SHEET 16

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

"REX640" PROTECTION WIRING



NO MARK UP
AS COMMISSIONED: MATIA GIROTTI
27/3/26

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

=	
+A3	
DWG n° :	231151/SD/17
Item n° :	PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
"REX640"' Protection Wiring

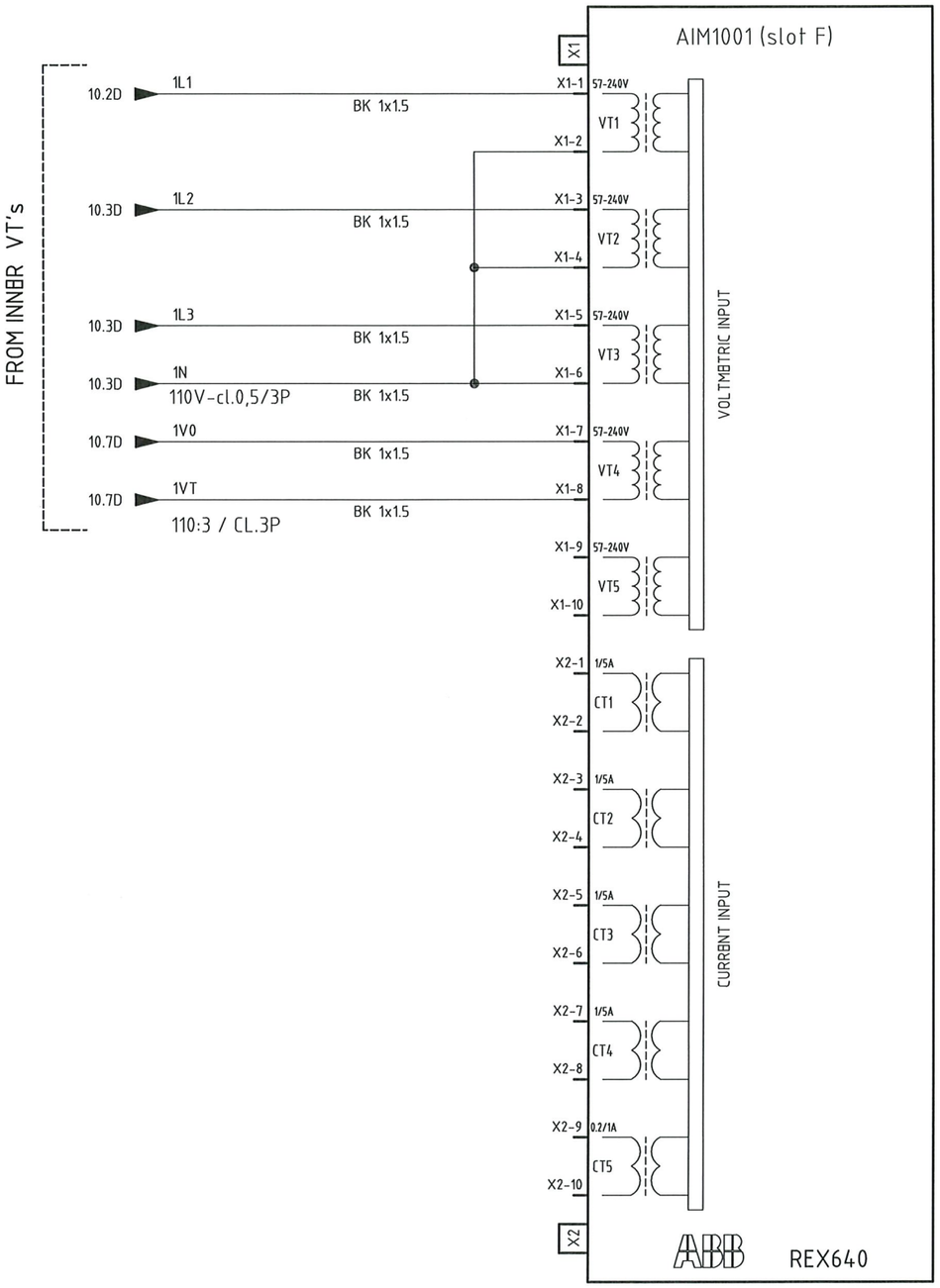
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	1723002197-EL-DG-00017	17	03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

"REX640" PROTECTION WIRING



NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= +A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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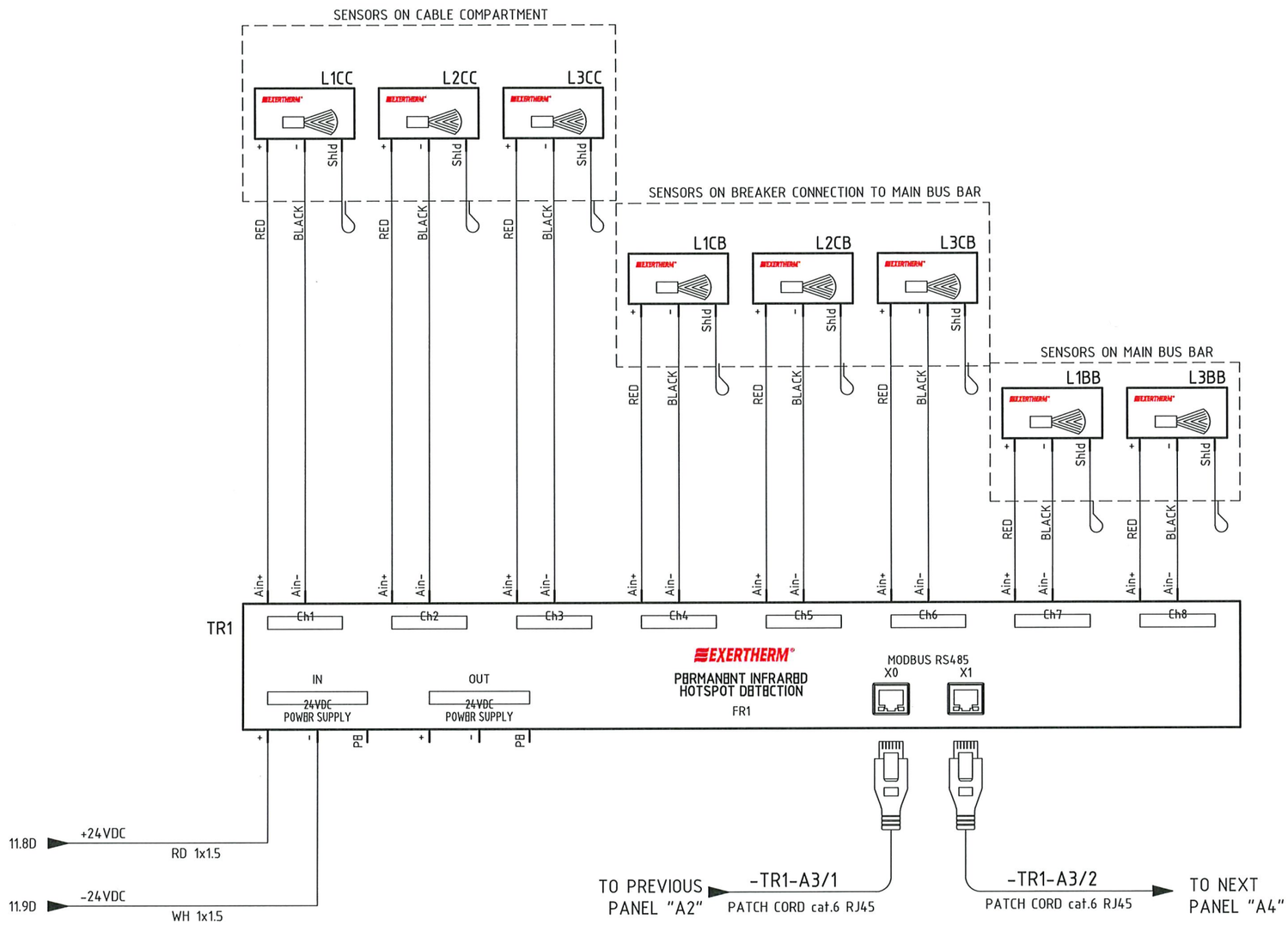
TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
"REX640"' Protection Wiring

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 18 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03



NO MARK UP
AS COMMISSIONED:
MARIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

=
+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Extherm Device

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00017

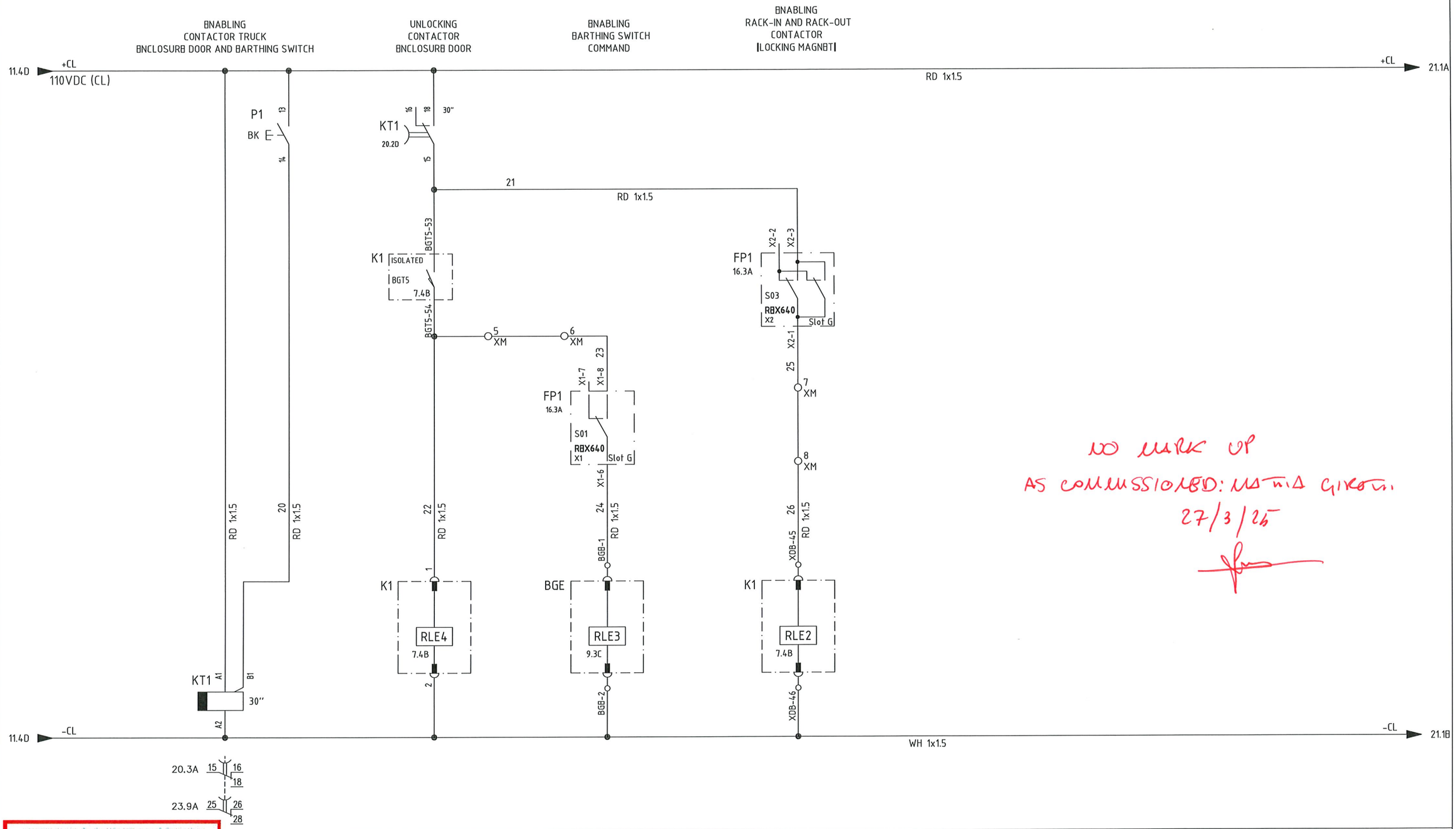
SHEET 19

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

COMMAND CIRCUITS



NO MARK UP
AS COMMISSIONED: MATIA GIKOTI.
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3	
DWG n° :	231151/SD/17
Item n° :	PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Command Circuit

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO.
1723002197-EL-DG-00017

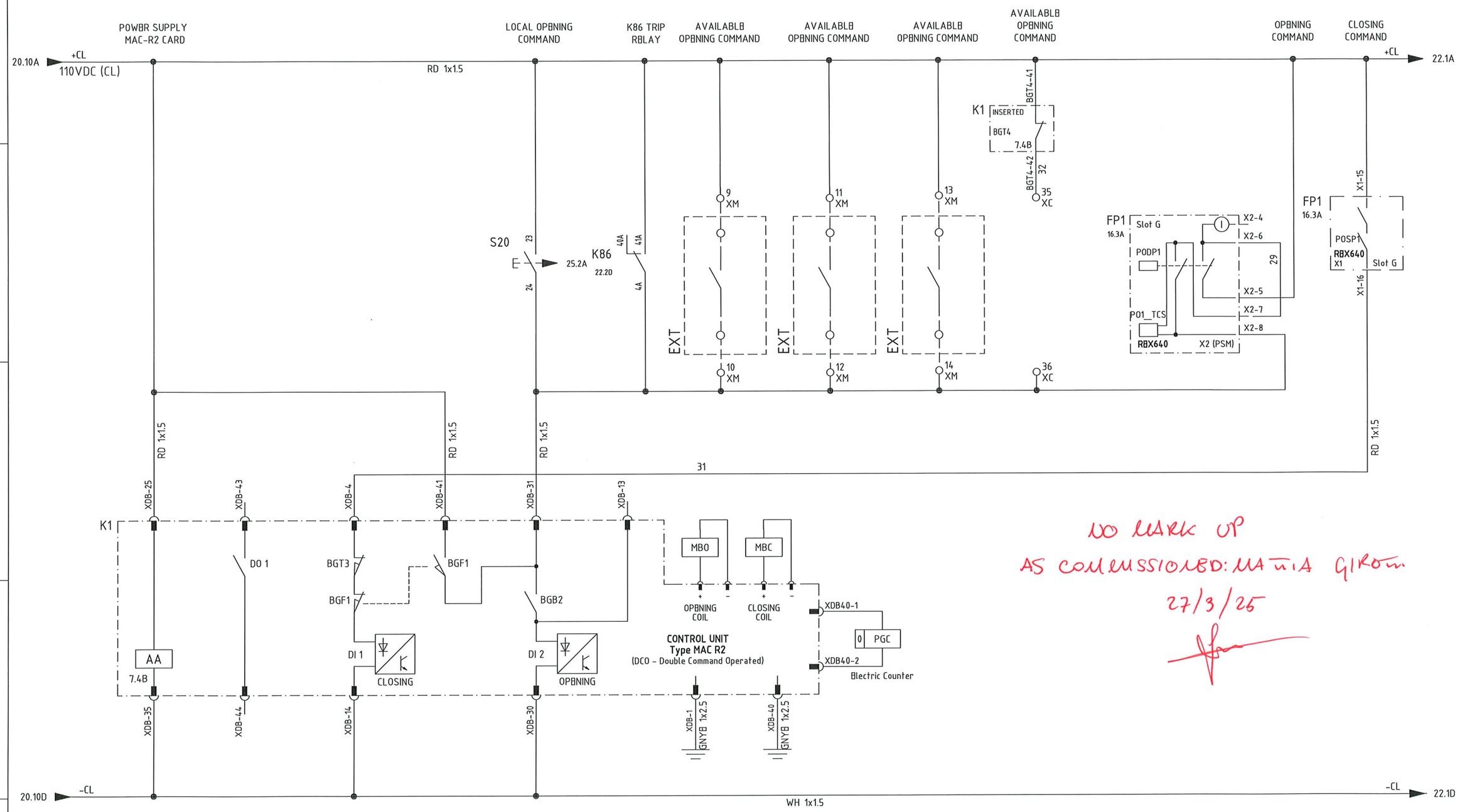
SHEET 20

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

CLOSING/OPENING COMMAND CIRCUITS



NO MARK UP
AS COMMISSIONED: MATIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Command Circuit

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00017

SHEET 21

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

COMMAND CIRCUITS

OUTPUT PROTECTION RELAY · AVAILABLE · AVAILABLE · TRANSFORMER TRIP WINDING TEMPERATURE · LOCAL RESET · REMOTE RESET · TRIP LOCK-OUT RELAY · SELECTOR SWITCH OF OVERRIDE · EMERGENCY OPENING BY SIS · UNDERVOLTAGE · CONTACTOR ISOLATED · WATCHDOG PROTECTION DUPLICATION · TRANSFORMER TRIP WINDING TEMPERATURE

21.10A +CL 110VDC (OP) — RD 1x1.5 — /./

15 XM · 17 XM · 16 XM · 18 XM

FP1c 23.1C — S01 RBX640 X2 Slot B — X2-4 — X2-3 — 35

K94WT 22.10D — 12 14 11 — RD 1x1.5

PR — 13 14 — X1 X2 — 22.5D — RD 1x1.5 — 36

FP1c 23.1C — S04 RBX640 X1 Slot B — X2-10 — X2-9 — RD 1x1.5

K86 22.2D — 40B 41B 48 — RD 1x1.5 — 37

SA2 OFF ON 23 — 25.7B — 24 — RD 1x1.5 — 38

KSIL 26.5B — 13 14 — 20 XM · 19 XM

KIRF 22.9D — 22 24 21 — 39 40 — K86 30B 31B 3B

K1 — BGT5-33 ISOLATED BGT5 7.4B BGT5-34 — RD 1x1.5 — 41

FP1 16.3A — X1-4 X1-5 RF RBX640 X1 Slot G — X1-3 — RD 1x1.5 — 42

65 XM — 49T — 66 XM — RD 1x1.5 — 46

K86 B1 C S B2 — C RESET — 1

PR 22.4A — X1 X2 — RD 1x1.5 — 37

XDB-37 — K1 — DI 3 7.4B OPENING — XDB-38

KIRF A1 A2 · K94WT A1 A2

21.10B -CL — WH 1x1.5 — /./

20A 2A 21A · 30A 3A 31A · 40A 21.5B 4A 41A · 10B 27.6B 1B 11B · 20B 23.5A 2B 21B · 30B 22.8B 3B 31B · 40B 22.5B 4B 41B

27.4D 11 12 14 · 22.8A 21 22 24 · 31 32 34 · 41 42 44

22.3A 11 12 14 · 24.10B 21 22 24 · 31 32 34 · 41 42 44

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A · DATE: 18/03/25 · SIGNATURE: G.Randi
ROSETTI MARINO SpA

NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

=							
+A3							
	3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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	REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

DWG n°: 231151/SD/17
Item n°: PF1113279

CROSSWIND · IMESA ELECTRICAL ENGINEERING · ROSETTI MARINO

TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Command Circuit

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK
SCALE : NTS
A3
DRAWING NO. 1723002197-EL-DG-00017
SHEET 22
REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

"REX640" PROTECTION WIRING - DIGITAL INPUT

CONTACTOR CLOSED | CONTACTOR OPENED | CONTACTOR SERVICE POSITION | CONTACTOR TEST POSITION | EARTH SWITCH OPENED | EARTH SWITCH CLOSED | K86 RELAY TRIPPED | CONTACTOR READY | FUSES TRIPPED | SELECTOR IN LOCAL POSITION | SELECTOR IN REMOTE POSITION | EXTERNAL CLOSING INTERLOCK | FROM L.V. SWBD CB OPENED (CLOSING INTERLOCK) | UNLOCKING EARTHING SWITCH/ TRUCK CONTACTOR

16.10A +PR 110VDC (PR) — +PR 24.1A

RD 1x1.5

XDB-11 XDB-21 XDB-22 XDB-43 XDB-44 XDB-12 XDB-48 XDB-47

K1 BGB1/2 7.4B

K1 CONNECTED BGT4 7.4B — BGT4-51 BGT4-52

K1 ISOLATED BGT5 7.4B — BGT5-23 BGT5-24

BGE — BGB-11 BGB-12 BGE 9.3C

BGE — BGB-23 BGB-24 BGE 9.3C

K86 22.2D — 20B 21B 2B

K1 D01 7.4B

K1 BGF2 7.4B

SA1 11 12 — SA1 13 14

21 XM 22 XM

23 XM 24 XM — L.V.SWITCHBOARD C.B. OPENED

KT1 20.2D — 26 28 30" 25

X1-1 50 RD 1x1.5 — X1-2 51 RD 1x1.5 — X1-3 52 RD 1x1.5 — X1-5 53 RD 1x1.5 — X1-6 54 RD 1x1.5 — X1-7 55 RD 1x1.5 — X1-9 56 RD 1x1.5 — X1-10 57 RD 1x1.5 — X1-11 58 RD 1x1.5 — X1-13 59 RD 1x1.5 — X1-14 60 RD 1x1.5 — X1-15 61 RD 1x1.5 — X1-17 62 RD 1x1.5 — X2-1 63 RD 1x1.5

FP1c BIO1001 SLOT B — ABB REX640

BI1 BI2 BI3 BI4 BI5 BI6 BI7 BI8 BI9 BI10 BI11 BI12 BI13 BI14

X1-4 X1-8 X1-12 X1-16 X1-18 X2-2

16.10A -PR — -PR 24.1B

WH 1x1.5

FP1c BIO1001 SLOT B — S01 S02 S03 S04 S05 S06 S07 S08

X2-4 X2-6 X2-8 X2-10 X2-12 X2-14 X2-16 X2-18

X2-3 X2-5 X2-7 X2-9 X2-11 X2-13 X2-15 X2-17

REX640

NO MARK UP
AS COMMISSIONED: MATIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= +A3

DWG n°: 231151/SD/17

Item n°: PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
2	26/06/2024	Giulietti	Flamminio	Sigismondi	Accepted for Construction (AFC)
1	14/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :

SG-100D1 – FUNCTIONAL BESS FEEDER A-85000

"REX640" Protection Wiring - Digital Input

CONTRACT NO./TITLE CW-1-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00017

SHEET 23

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

DO MARK UP AS COMMISSIONED: MATIA GIROT. 27/5/25

"REX640" PROTECTION WIRING - DIGITAL INPUT

EMERGENCY OPENING BY SIS
VT HEALTY CIRCUIT
BARTING SWITCH OPEN (FROM MEASURING UNIT)
CLOSED AUXILIARY CIRCUIT MCB's
CLOSED AUXILIARY V.T. SECONDARY MCB's
MCB AND WATCHDOG PROTECTION RELAY (A4)
AVAILABLE
AVAILABLE
AVAILABLE
TRANSFORMER ALARM WINDING TEMPERATURE
TRANSFORMER TRIP WINDING TEMPERATURE

23.10A +PR 110VDC (PR) — +PR 25.1A

KSIL 26.5B
QV1 10.2C
QV2 10.4C
QV3 10.7C
PTT 10.2A
QD2 11.4B
QD4 11.8B
QV5 15.2B
QV4 14.2C
QD1
KIRF
FROM UNIT A4
49T
K94WT 22.10D

RD 1x1.5 / BT6-20 / BT6-21 / BT6-22

10.9C 5
10.9C 6

FP1d
BIO1001
SLOT C
ABB REX640
BI1 BI2 BI3 BI4 BI5 BI6 BI7 BI8 BI9 BI10 BI11 BI12 BI13 BI14

23.10D -PR — WH 1x1.5 — -PR 25.1D

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

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IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n°: 231151/SD/17
Item n°: PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
"REX640" Protection Wiring - Digital Input

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 24 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

"REX640" PROTECTION WIRING - DIGITAL INPUT

S1C LOCAL CLOSING COMMAND
S20 LOCAL OPENING COMMAD
FROM L.V. SWBD CB TEST POSITION
FROM L.V. SWBD TRIPPED
SPACE HEATER ON
AVAILABLE REMOTE OPENING COMMAND
AVAILABLE REMOTE OPENING COMMAND
MCB AND WATCHDOG PROTECTION RELAY (A2)
SELECTOR SWITCH OF OVERRIDE (SIL ENABLED)

24.10A +PR 110VDC (PR) — +PR /./

S1C GR 13 14 — S20 21.4B RD 13 14

L.V.SWITCHBOARD C.B. IN TEST POSITION: 35 XM / 36 XM
L.V.SWITCHBOARD TRIP: 37 XM / 38 XM
KGR 13.5D: 12 14 / 11
39 XM / 40 XM
41 XM / 42 XM
QD1: XC 29 / XC 31
KIRF: XC 31 / XC 32 / XC 30
FROM UNIT A2
22.6A SA2 OFF ON 11 12

RD 1x1.5

82 RD 1x1.5 X1-1
83 RD 1x1.5 X1-2
84 RD 1x1.5 X1-3
85 RD 1x1.5 X1-5
86 RD 1x1.5 X1-6
87 RD 1x1.5 X1-7
88 RD 1x1.5 X1-9
89 RD 1x1.5 X1-10
90 RD 1x1.5 X1-11

FP1e
BIO1002
SLOT D
ABB REX640
BI1 BI2 BI3 BI4 BI5 BI6 BI7 BI8 BI9

X1-4 X1-8 X1-12

SP01 SP02 SP03 SP04 SP05 SP06 SP07 SP08
X2-4 X2-6 X2-8 X2-10 X2-12 X2-14 X2-16 X2-18
X2-3 X2-5 X2-7 X2-9 X2-11 X2-13 X2-15 X2-17
TCS6 TCS8
27.5B

24.10B -PR — WH 1x1.5 — -PR /./

NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n°: 231151/SD/17
Item n°: PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
"REX640" Protection Wiring - Digital Input

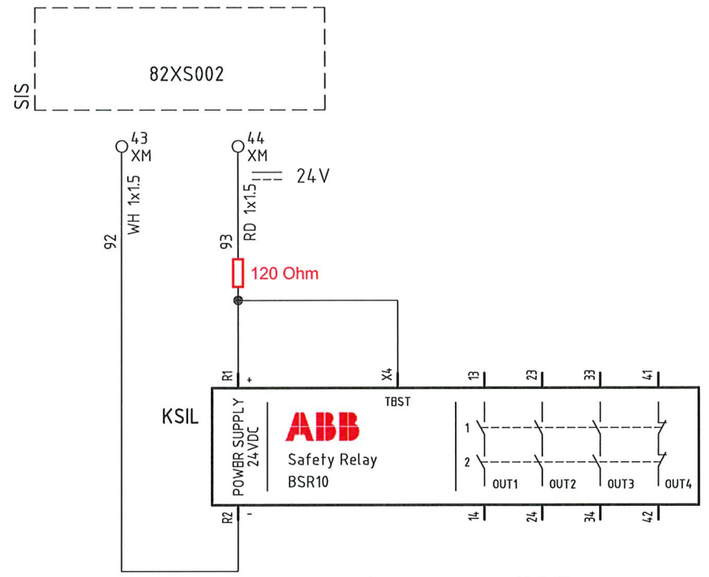
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 25 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

EMERGENCY OPENING BY "SIS"



NO MARK UP
AS COMMISSIONED: MARIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3	
DWG n° :	231151/SD/17
Item n° :	PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
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0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Emergency Opening by "SIS"

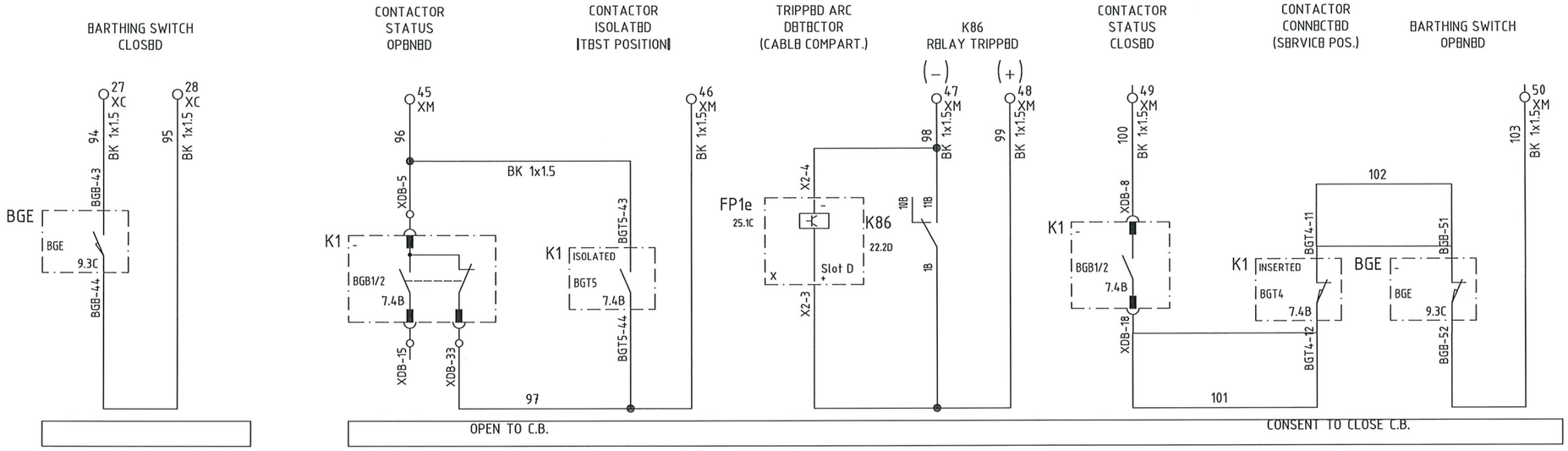
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

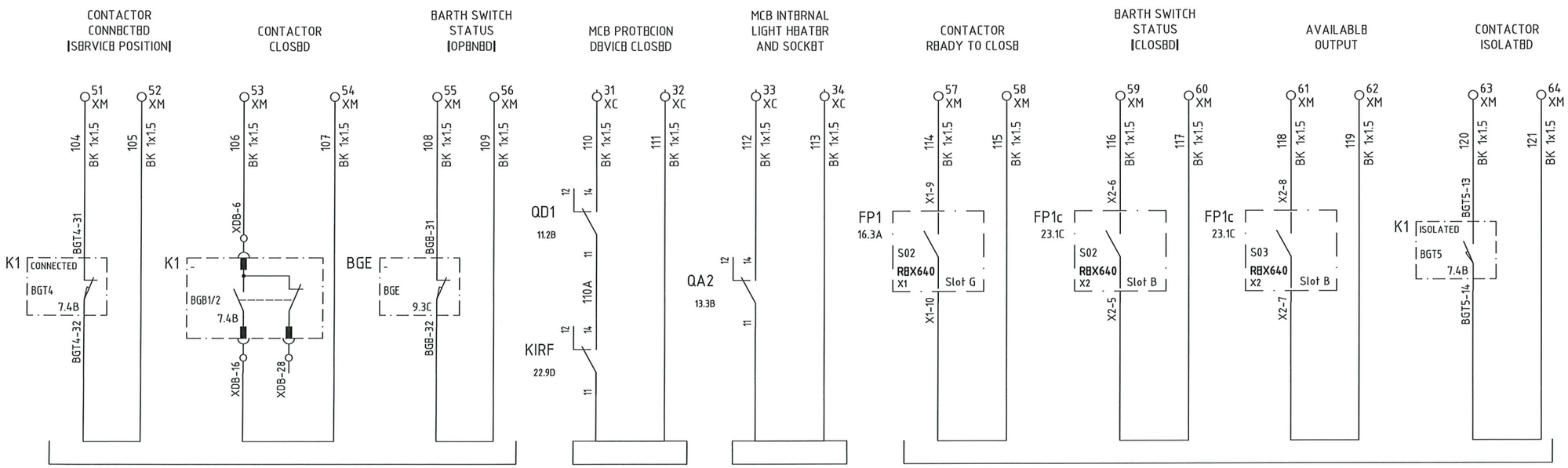
	DRAWING NO.	SHEET	REV.
A3	1723002197-EL-DG-00017	26	03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

AVAILABLE SIGNALS





NO MARK UP AS COMMISSIONED: MARIA GIROTTI 27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

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IMESA ELECTRICAL ENGINEERING

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+A3
DWG n°: 231151/SD/17
Item n°: PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Availables Signals

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 27 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

TYP - BESS
XI
Ammeter Terminals

NumM	Fg.	Sez.	Tipo	Costruttore	Descrizione
1	9.5D	6	HB220GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type
2	9.5D	6	HB220GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type
3	9.5D	6	HB220GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type
			HL201GR	Cabur	HLD.2/PT/GR End section - Grey
4	8.4A	6	HB220GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type
5	8.4B	6	HB220GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type
6	8.4B	6	HB220GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type
7	8.4B	6	HB220GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type
8	8.4B	6	HB220GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type
			HL201GR	Cabur	HLD.2/PT/GR End section - Grey

TYP - BESS
XV
Voltmetric Terminals

NumM	Fg.	Sez.	Tipo	Costruttore	Descrizione
1	10.2D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
2	10.3D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
3	10.3D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
4	10.3D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
			HB201GR	Cabur	HSCB.6/PT/GR End section - Grey
5	10.4D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
6	10.5D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
7	10.5D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
8	10.5D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
			HB201GR	Cabur	HSCB.6/PT/GR End section - Grey
9	10.7D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
10	10.7D	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
			HB201GR	Cabur	HSCB.6/PT/GR End section - Grey
11	14.4C	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
12	14.4B	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
13	14.4B	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
14	14.4B	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
			HB201GR	Cabur	HSCB.6/PT/GR End section - Grey
15	15.4B	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
16	15.4B	6	HB210GR	Cabur	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type
			HB201GR	Cabur	HSCB.6/PT/GR End section - Grey

NO MARK UP
AS COMMISSIONED: MATTIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Terminal stripes

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 28 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

TYP - BESS
XC
Interconnection Terminals

NumM	Fg.	Sez.	Tipo	Costruttore	Descrizione
1	11.1B	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
2	11.1C	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
3	11.1B	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
4	11.1C	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
			HM321GR	Cabur	HMT.6/PT/GR End section - Grey
5	11.7B	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
6	11.7C	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
7	11.7B	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
8	11.7C	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
			HM321GR	Cabur	HMT.6/PT/GR End section - Grey
9	13.1A	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
10	13.1B	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
11	13.2A	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
12	13.2B	6	HM320GR	Cabur	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)
			HM321GR	Cabur	HMT.6/PT/GR End section - Grey
13	14.1B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
14	14.1C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
15	14.1B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
16	14.1C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
17	14.1B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
18	14.1C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
19	14.2B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
20	14.2C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
			HM251GR	Cabur	HMT.4/PT/GR End section - Grey
21	15.1B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
22	15.1C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
23	15.1B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
24	15.1C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
			HM251GR	Cabur	HMT.4/PT/GR End section - Grey
25	24.3A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
26	24.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
27	27.2A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
28	27.2A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
29	25.6A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
30	25.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
31	27.4C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
32	27.4C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
33	27.5C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
34	27.5C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
35	21.8B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
36	21.8C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type

TYP - BESS
XC
Interconnection Terminals

NumM	Fg.	Sez.	Tipo	Costruttore	Descrizione
37	24.5A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
38	24.5C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type

NO MARK UP
AS COMMISSIONED: MATTIA GIRON
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Terminal stripes

CONTRACT NO./TITLE CW-1-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 29 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

TYP - BESS
XM
Interface Terminals

NumM	Fg.	Sez.	Tipo	Costruttore	Descrizione
1	10.4B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
2	10.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
3	10.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
4	10.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
			HM251GR	Cabur	HMT.4/PT/GR End section - Grey
5	20.4B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
6	20.4B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
7	20.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
8	20.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
9	21.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
10	21.5C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
11	21.6B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
12	21.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
13	21.7B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
14	21.7C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
15	22.2A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
16	22.2B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
17	22.3A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
18	22.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
19	22.7B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
20	22.7A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
21	23.8A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
22	23.8B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
23	23.9A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
24	23.9B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
25		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
26		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
27	24.6A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
28	24.6B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
29	24.7A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
30	24.7B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
31	24.8A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
32	24.8B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
33	24.9A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
34	24.9B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
35	25.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
36	25.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
37	25.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
38	25.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
39	25.4B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
40	25.4B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type

NO MARK UP
AS COMMISSIONED: MATTIA GIROTTI
27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
2	26/06/2024	Giulietti	Flamminio	Sigismondi	Accepted for Construction (AFC)
1	14/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Terminal stripes

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 30 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

TYP - BESS
XM
Interface Terminals

NumM	Fg.	Sez.	Tipo	Costruttore	Descrizione
41	25.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
42	25.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
43	26.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
44	26.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
45	27.3A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
46	27.5A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
47	27.6A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
48	27.6A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
49	27.7A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
50	27.9A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
51	27.1C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
52	27.2C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
53	27.2C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
54	27.3C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
55	27.3C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
56	27.3C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
57	27.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
58	27.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
59	27.7C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
60	27.7C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
61	27.8C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
62	27.8C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
63	27.9C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
64	27.9C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
65	22.10A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
66	22.10B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
67		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
68		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
69		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
70		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
71		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
72		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
73		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
74		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
75		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
76		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
			HM251GR	Cabur	HMT.4/PT/GR End section - Grey

NO MARK UP
AS COMMISSIONED: MARIA GIROTTI

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
2	26/06/2024	Giulietti	Flamminio	Sigismondi	Accepted for Construction (AFC)
1	14/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Terminal stripes

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 31 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

NO MARK UP AS COMMISSIONED: MARIA GIROTTI 27/3/25

Nome/Item	Fg/Sh	Tipo/Type	Q.tà	Descrizione/Description	Costruttore/Manufacturer	Ubicazione (descrizione)	Quadro (descrizione)
BB	7	1VCF698000R0012	1	OPTICAL FIBER CABLE PRE-MANUFACT. LENS L=5M	ABB	A3	BESS FEEDER A-85000
BGE	9	1VCF599700R0131	1	EARTHING SWITCH ST-E 17.31 150	ABB	A3	BESS FEEDER A-85000
		1VCF599505R0001	1	5 AUX CONTACTS FOR EARTHING SWITCH	ABB	A3	BESS FEEDER A-85000
		1VCF599504R0063	1	KEY LOCKS ON EARTHING SWITCH	ABB	A3	BESS FEEDER A-85000
		1VCF599700R0290	1	EARTHING SWITCH OPERATING LEVER	ABB	A3	BESS FEEDER A-85000
C1	9	43911082	1	VPIS - DEVICE SIGNALLING VOLTAGE PRESENT KIT	ELECTRONSYSTEM	A3	BESS FEEDER A-85000
CB	7	1VCF698000R0012	1	OPTICAL FIBER CABLE PRE-MANUFACT. LENS L=5M	ABB	A3	BESS FEEDER A-85000
CC	9	1VCF698000R0012	1	OPTICAL FIBER CABLE PRE-MANUFACT. LENS L=5M	ABB	A3	BESS FEEDER A-85000
E1	13	74041	1	LED LAMP 4W 4000K 313x30x22	Beghelli	A3	BESS FEEDER A-85000
E8	10	1VCF501000R0001	1	RESISTOR TR318 27R/J 27ohm 500W L=2,5M	ABB	A3	BESS FEEDER A-85000
EH1	13	R1R150230	1	SPACE HEATER SKR 150W ALIM. 220VCA	Torresan	A3	BESS FEEDER A-85000
FF1	10	1YMB751209M1502	1	FUSE-LINKS FOR VOLTAGE TRANSFORMER PROTECTION 6/12kV 2A 192x53mm - CEF-VT	ABB	A3	BESS FEEDER A-85000
FF2	10	1YMB751209M1502	1	FUSE-LINKS FOR VOLTAGE TRANSFORMER PROTECTION 6/12kV 2A 192x53mm - CEF-VT	ABB	A3	BESS FEEDER A-85000
FF3	10	1YMB751209M1502	1	FUSE-LINKS FOR VOLTAGE TRANSFORMER PROTECTION 6/12kV 2A 192x53mm - CEF-VT	ABB	A3	BESS FEEDER A-85000
FP1	16	1VCF698331R0001	1	REX640B10NN+AIM1+AIM1+ARC1+BIO1+BIO1+BI+O2+CMP2+COM1+LNG1+MCT1+PCL4+PSM3+SCT1	ABB	A3	BESS FEEDER A-85000
HGR	13	TRT-10A230V-NC	1	Regolable Thermostat -10÷80°C 1NC IP20 DIN Mounting	Fandis	A3	BESS FEEDER A-85000
K1	7	1VCF305661R3200	1	VACUUM CONTACTOR VSC7/P 3P 7,2KV 400A DOUBLE COMMAND (DCO)	ABB	A3	BESS FEEDER A-85000
		1VCF309500R3881	1	VACUUM CONTACTOR FITTED FOR DIN E=442mm FUSES	ABB	A3	BESS FEEDER A-85000
		1VCF309500R0882	1	NAMEPLATE IN ENGLISH LANGUAGE	ABB	A3	BESS FEEDER A-85000
		1VCF309500R1881	1	VACUUM CONTACTOR FOR UNIGEAR/UNISEC	ABB	A3	BESS FEEDER A-85000
		1VCF309503R0881	1	MAC-R2 ELECTRONIC CONTROL MODULE TYPE STANDARD	ABB	A3	BESS FEEDER A-85000
		1VCF309503R1881	1	VACUUM CONTACTOR CONFORMS TO THE IRC 62271-106 STANDARDS	ABB	A3	BESS FEEDER A-85000
		1VCF309588R0909	1	POWER SUPPLY VOLTAGE OF MAC-R2 ELECTRONIC CONTROL MODULE 110VDC	ABB	A3	BESS FEEDER A-85000
		1VCF309500R0100	1	OPERATIONS COUNTER FOR VSC/P VERSIONE FOR SHIPPINGS REGISTERS VERSION	ABB	A3	BESS FEEDER A-85000
		1VCF349700R0407	1	MECHANICAL INTERLOCK WITH DOOR	ABB	A3	BESS FEEDER A-85000
		1VCF339700R0291	1	POSITION CONTACTS FOR VD4	ABB	A3	BESS FEEDER A-85000
		1VCF339700R1909	1	LOCKING MAGNET ON THE TRUCK 110Vdc (RLE2)	ABB	A3	BESS FEEDER A-85000
		1VCF309503R0251	1	KIT FOR FUSES DIAMETER 87mm	ABB	A3	BESS FEEDER A-85000
		1VCF309500R0192	1	LIFTING TOOL FOR SHIPPINGS REGISTERS VERSION	ABB	A3	BESS FEEDER A-85000
		1VCF597111R0140	1	POWER CUBE PB1/E L600 12kV 400A 31.5KA 3S	ABB	A3	BESS FEEDER A-85000
		1VCF599700R0882	1	NAMEPLATE IN ENGLISH LANGUAGE FOR POWERCUBE	ABB	A3	BESS FEEDER A-85000
		1VCF599700R5886	1	PB FOR VSC	ABB	A3	BESS FEEDER A-85000
		1VCF599700R4882	1	PAINTED DOOR	ABB	A3	BESS FEEDER A-85000
		1VCF599504R0042	1	LOCK TO PREVENT RACKING-IN WITH EARTHING SWITCH	ABB	A3	BESS FEEDER A-85000
		1VCF599700R0162	1	58 POLES CONNECTOR + ATOXIC WIRING L=0.8mt	ABB	A3	BESS FEEDER A-85000
		1VCF599505R0111	1	FAIL-SAFE SHUTTER ELEMENTS	ABB	A3	BESS FEEDER A-85000
		1VCF579700R0909	1	ELECTROMECHANICAL ISOLATING INTERLOCK CIRCUIT-BREAKER/DOOR 110Vdc (RLE4)	ABB	A3	BESS FEEDER A-85000
		1VCF599700R0280	1	INTERLOCK FOR DOOR EARTHING SWITCH	ABB	A3	BESS FEEDER A-85000
		1YMB711238M4812	1	BACK UP CURRENT LIMINTING FUSE LINK 6/12kV 160A 442x65mm - CEF	ABB	A3	BESS FEEDER A-85000
K86	22	RMBE13-C110T	1	BISTABLE RELAY 110VDC 7SC-5A TROP.	Amra	A3	BESS FEEDER A-85000
		PAVM321	1	SOCKET WITH SCREW TO RELAY TYPE PAVM321	Amra	A3	BESS FEEDER A-85000
K94WT	22	ER 589 2	1	CR-M110DC4L SUPPLY 110VDC 4C/O 250V/6A LED	ABB	A3	BESS FEEDER A-85000
		ER 686 6	1	CR-M4SS SOCKET STANDARD X 2/4 C/O(CR-M)	ABB	A3	BESS FEEDER A-85000
		ER 728 6	1	CR-MH1 METAL RETAINING JUMPER	ABB	A3	BESS FEEDER A-85000

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3
DWG n°: 231151/SD/17
Item n°: PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
2	26/06/2024	Giulietti	Flamminio	Sigismondi	Accepted for Construction (AFC)
1	14/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 – FUNCTIONAL BESS FEEDER A-85000
Bill of Materials

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 32 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

NO WORK UP AS COMMISSIONED - CONFIRMED GIRONI 27/3/25

Nome/Item	Fg/Sh	Tipo/Type	Q.tà	Descrizione/Description	Costruttore/Manufacturer	Ubicazione (descrizione)	Quadro (descrizione)
KGR	13	ER 686 6	1	CR-M4SS SOCKET STANDARD X 2/4 C/O(CR-M)	ABB	A3	BESS FEEDER A-85000
		ER 728 6	1	CR-MH1 METAL RETAINING JUMPER	ABB	A3	BESS FEEDER A-85000
		ER 552 0	1	CR-M230AC2L SUPPLY 230VAC 2C/O 250V/6A LED	ABB	A3	BESS FEEDER A-85000
KIRF	22	ER 589 2	1	CR-M110DC4L SUPPLY 110VDC 4C/O 250V/6A LED	ABB	A3	BESS FEEDER A-85000
		ER 686 6	1	CR-M4SS SOCKET STANDARD X 2/4 C/O(CR-M)	ABB	A3	BESS FEEDER A-85000
		ER 728 6	1	CR-MH1 METAL RETAINING JUMPER	ABB	A3	BESS FEEDER A-85000
KSIL	26	2TLA010040R0000	1	BSR10 Vaux=24VDC SAFETY RELAY	ABB	A3	BESS FEEDER A-85000
KT1	20	H3DKM2ACDC24240	1	MULTIFUNCTION TIMER RELAY Vaux=24÷240Vac/dc - 2SC	Omron	A3	BESS FEEDER A-85000
L1C	19	801100	1	IR SENSOR 10m CABLE	EXERTHERM	A3	BESS FEEDER A-85000
L1I	19	801100	1	IR SENSOR 10m CABLE	EXERTHERM	A3	BESS FEEDER A-85000
L1MS	19	801100	1	IR SENSOR 10m CABLE	EXERTHERM	A3	BESS FEEDER A-85000
L2C	19	801100	1	IR SENSOR 10m CABLE	EXERTHERM	A3	BESS FEEDER A-85000
L2I	19	801100	1	IR SENSOR 10m CABLE	EXERTHERM	A3	BESS FEEDER A-85000
L3C	19	801100	1	IR SENSOR 10m CABLE	EXERTHERM	A3	BESS FEEDER A-85000
L3I	19	801100	1	IR SENSOR 10m CABLE	EXERTHERM	A3	BESS FEEDER A-85000
L3MS	19	801100	1	IR SENSOR 10m CABLE	EXERTHERM	A3	BESS FEEDER A-85000
LS	13	Z15GW2-1-1453270	1	MICROSWITCH 1sc	Omron	A3	BESS FEEDER A-85000
		APB-PG	1	COVER TO MICRO-SWITCH	Omron	A3	BESS FEEDER A-85000
OD1	9	990003	1	MEDIUM VOLTAGE DISCHARGE DMI-9-10-1-L Ur=9kV	DEHN	A3	BESS FEEDER A-85000
OD2	9	990003	1	MEDIUM VOLTAGE DISCHARGE DMI-9-10-1-L Ur=9kV	DEHN	A3	BESS FEEDER A-85000
OD3	9	990003	1	MEDIUM VOLTAGE DISCHARGE DMI-9-10-1-L Ur=9kV	DEHN	A3	BESS FEEDER A-85000
P1	20	KW 080 2	1	MP1-10B BLACK PUSH BUTTON UNSTABLE	ABB	A3	BESS FEEDER A-85000
		EO 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A3	BESS FEEDER A-85000
		EO 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A3	BESS FEEDER A-85000
PR	22	KW 101 6	1	YELLOW LIGHT PUSH BUTTON	ABB	A3	BESS FEEDER A-85000
		KV 022 5	1	MLBL-05W YELLOW LED BLOCK INTEGRATED 110÷130VAC	ABB	A3	BESS FEEDER A-85000
		EO 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A3	BESS FEEDER A-85000
		EO 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A3	BESS FEEDER A-85000
PTT	10	1VCF498412R0100	1	TV/F COMPARTMENT 12/17kV IP4X L=590mm OUTLET ON THE BACK WITH N°3 VT + N°14 MAIN CONTACTS + N°2+2 SERVICE/ISOLATED POSITION CONTACTS	ABB	A3	BESS FEEDER A-85000
		1VCF499800R0302	1	NAMEPLATE IN ENGLISH LANGUAGE FOR TV/F	ABB	A3	BESS FEEDER A-85000
QA2	13	B427917	1	DDA202 AC 25A 300MA BLOCCO DIFFERENZIALE 2P	ABB	A3	BESS FEEDER A-85000
		A563819	1	S2-CS/H6R CONTATTO DI SEGNALAZIONE/AUX 1SC	ABB	A3	BESS FEEDER A-85000
		S550284	1	S202M C10 INTERRUTTORE AUTOMATICO 10KA 2P	ABB	A3	BESS FEEDER A-85000
QD1	11	A563819	1	S2-CS/H6R CONTATTO DI SEGNALAZIONE/AUX 1SC	ABB	A3	BESS FEEDER A-85000
		S550253	1	S202M C 4 INTERRUTTORE AUTOMATICO 10KA 2P	ABB	A3	BESS FEEDER A-85000
QD2	11	S550253	1	S202M C 4 AUTOMATIC CIRCUIT-BREAKER 10KA 2P	ABB	A3	BESS FEEDER A-85000
		a563819	1	S2-CS/H6R AUXILIARY STATE CONTACT	ABB	A3	BESS FEEDER A-85000
QD4	11	A563819	1	S2-CS/H6R AUXILIARY STATE CONTACT 1CO	ABB	A3	BESS FEEDER A-85000
		S550239	1	S202M C 2 AUTOMATIC CIRCUIT BREAKER 10KA 2P	ABB	A3	BESS FEEDER A-85000
QV1	10	S550680	1	S204M C 2 AUTOMATIC CIRCUIT-BREAKER 10KA 4P	ABB	A3	BESS FEEDER A-85000
		A563819	1	S2-CS/H6R AUXILIARY STATE CONTACT 1CO	ABB	A3	BESS FEEDER A-85000
QV2	10	S550680	1	S204M C 2 AUTOMATIC CIRCUIT-BREAKER 10KA 4P	ABB	A3	BESS FEEDER A-85000
		A563819	1	S2-CS/H6R AUXILIARY STATE CONTACT 1CO	ABB	A3	BESS FEEDER A-85000

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00017

REV.:	DATE:	SIGNATURE:
3_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A3
DWG n° : 231151/SD/17
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/08/2024	Giulietti	Flamminio	Sigismondi	As-Built (ASB)
2	26/06/2024	Giulietti	Flamminio	Sigismondi	Accepted for Construction (AFC)
1	14/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 - FUNCTIONAL BESS FEEDER A-85000
Bill of Materials

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 33 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

NO MARK UP AS COMMISSIONED METAL GIROTTI 27/3/25

Nome/Item	Fg/Sh	Tipo/Type	Q.tà	Descrizione/Description	Costruttore/Manufacturer	Ubicazione (descrizione)	Quadro (descrizione)
QV3	10	S550239	1	S202M C 2 AUTOMATIC CIRCUIT BR□AK□R 10KA 2P	ABB	A3	B□SS F□□D□R A-85000
		A563819	1	S2-CS/H6R AUXILIARY STAT□ CONTACT 1CO	ABB	A3	B□SS F□□D□R A-85000
QV4	14	S550680	1	S204M C 2 AUTOMATIC CIRCUIT-BR□AK□R 10KA 4P	ABB	A3	B□SS F□□D□R A-85000
		A563819	1	S2-CS/H6R AUXILIARY STAT□ CONTACT 1CO	ABB	A3	B□SS F□□D□R A-85000
QV5	15	S550239	1	S202M C 2 AUTOMATIC CIRCUIT BR□AK□R 10KA 2P	ABB	A3	B□SS F□□D□R A-85000
		A563819	1	S2-CS/H6R AUXILIARY STAT□ CONTACT 1CO	ABB	A3	B□SS F□□D□R A-85000
S1C	25	□O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A3	B□SS F□□D□R A-85000
		□O 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A3	B□SS F□□D□R A-85000
		KW 076 0	1	MP1-10G PUSH BUTTON GR□□N WITH BLACK RING	ABB	A3	B□SS F□□D□R A-85000
S20	25	KW 075 2	1	MP1-10R PUSH BUTTON R□D WITH BLACK RING	ABB	A3	B□SS F□□D□R A-85000
		□O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A3	B□SS F□□D□R A-85000
		□O 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A3	B□SS F□□D□R A-85000
SA1	23	□O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A3	B□SS F□□D□R A-85000
		□O 571 3	1	MCB-01 CONTACT NC FOR PUSHBUTTOM	ABB	A3	B□SS F□□D□R A-85000
		□O 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A3	B□SS F□□D□R A-85000
		KW 329 3	1	M2SS2-10B HANDL□ S□L□CTOR 2P 90° BLACK RING BLACK	ABB	A3	B□SS F□□D□R A-85000
SA2	22	□O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A3	B□SS F□□D□R A-85000
		□O 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A3	B□SS F□□D□R A-85000
		□O 571 3	1	MCB-01 CONTACT NC FOR PUSHBUTTOM	ABB	A3	B□SS F□□D□R A-85000
		KW 329 3	1	M2SS2-10B HANDL□ S□L□CTOR 2P 90° BLACK RING BLACK	ABB	A3	B□SS F□□D□R A-85000
TI1	8	ATB-10-BS__014	1	CURR□NT TRANSFORM□R 7,2kV 50Hz 150/1A cl.0,5-5P20 (5VA)- 25kA	□SITAS	A3	B□SS F□□D□R A-85000
TI2	8	ATB-10-BS__014	1	CURR□NT TRANSFORM□R 7,2kV 50Hz 150/1A cl.0,5-5P20 (5VA)- 25kA	□SITAS	A3	B□SS F□□D□R A-85000
TI3	8	ATB-10-BS__014	1	CURR□NT TRANSFORM□R 7,2kV 50Hz 150/1A cl.0,5-5P20 (5VA)- 25kA	□SITAS	A3	B□SS F□□D□R A-85000
TO	9	KAP-150/250-55	1	CURR□NT TRANSFORM□R 0,72/3/-kV 100/1 50Hz	□SITAS	A3	B□SS F□□D□R A-85000
TR1	19	800208	1	MODBUS DATACARD 8 CHANN□LS	□xertherm	A3	B□SS F□□D□R A-85000
TU-L1	10	TJP4.3__002	1	VT ON R□SIN 7,2KV 50-60Hz 6600:r3/110:r3-110:r3-110:3 Cl.0,5-3P Pr.20VA, Cl.0,5-3P Pr.30VA, Cl.3P Pr.30VA	ABB	A3	B□SS F□□D□R A-85000
TU-L2	10	TJP4.3__002	1	VT ON R□SIN 7,2KV 50-60Hz 6600:r3/110:r3-110:r3-110:3 Cl.0,5-3P Pr.20VA, Cl.0,5-3P Pr.30VA, Cl.3P Pr.30VA	ABB	A3	B□SS F□□D□R A-85000
TU-L3	10	TJP4.3__002	1	VT ON R□SIN 7,2KV 50-60Hz 6600:r3/110:r3-110:r3-110:3 Cl.0,5-3P Pr.20VA, Cl.0,5-3P Pr.30VA, Cl.3P Pr.30VA	ABB	A3	B□SS F□□D□R A-85000
XC		HM320GR	12	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)	Cabur	A3	B□SS F□□D□R A-85000
		HM250GR	26	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type	Cabur	A3	B□SS F□□D□R A-85000
		HM251GR	2	HMT.4/PT/GR End section - Grey	Cabur	A3	B□SS F□□D□R A-85000
		HM321GR	3	HMT.6/PT/GR End section - Grey	Cabur	A3	B□SS F□□D□R A-85000
XI		HB220GR	8	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type	Cabur	A3	B□SS F□□D□R A-85000
		HL201GR	2	HLD.2/PT/GR End section - Grey	Cabur	A3	B□SS F□□D□R A-85000
XM		HM250GR	76	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type	Cabur	A3	B□SS F□□D□R A-85000
		HM251GR	2	HMT.4/PT/GR End section - Grey	Cabur	A3	B□SS F□□D□R A-85000
XS1	13	B 9447 7	1	SOCK□T	ABB	A3	B□SS F□□D□R A-85000
XV		HB210GR	16	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type	Cabur	A3	B□SS F□□D□R A-85000
		HB201GR	5	HSCB.6/PT/GR End section - Grey	Cabur	A3	B□SS F□□D□R A-85000

VALID FOR CONSTRUCTION
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123A90-FDL-1724002197-EL-DG-00017
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= +A3

DWG n° : 231151/SD/17
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Bill of Materials

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00017 | SHEET 3.4 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00017 Rev.03

Section 8 LIST OF MODIFICATIONS

NOT APPLICABLE

Section 8.1 List of changes

NOT APPLICABLE

Section 9 SUPPORTING DOCUMENTS

NOT APPLICABLE