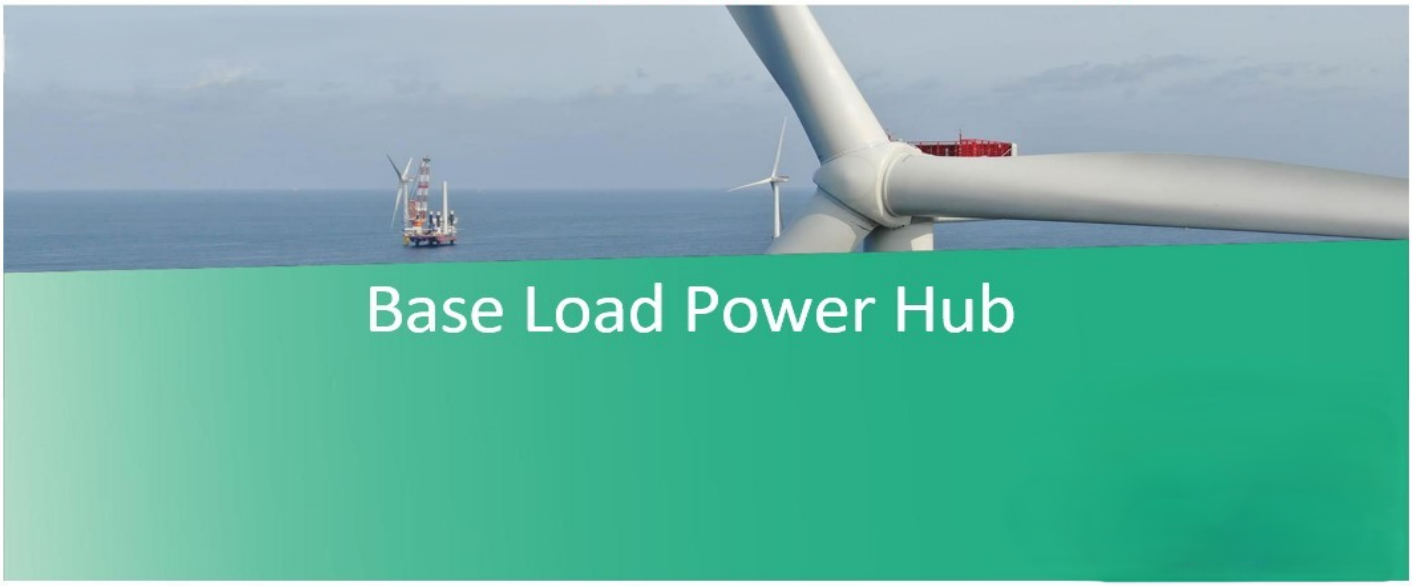
CROSSWIND

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	82-30 Power Transformer 1.25 MVA (TA30 FUEL CELL)

CROSSWIND

123A90 - HOLLANDSE KUST NOORD WIND PARK
BLPH Project

COMMISSIONING DOSSIER INDEX

ROSETTI MARINO

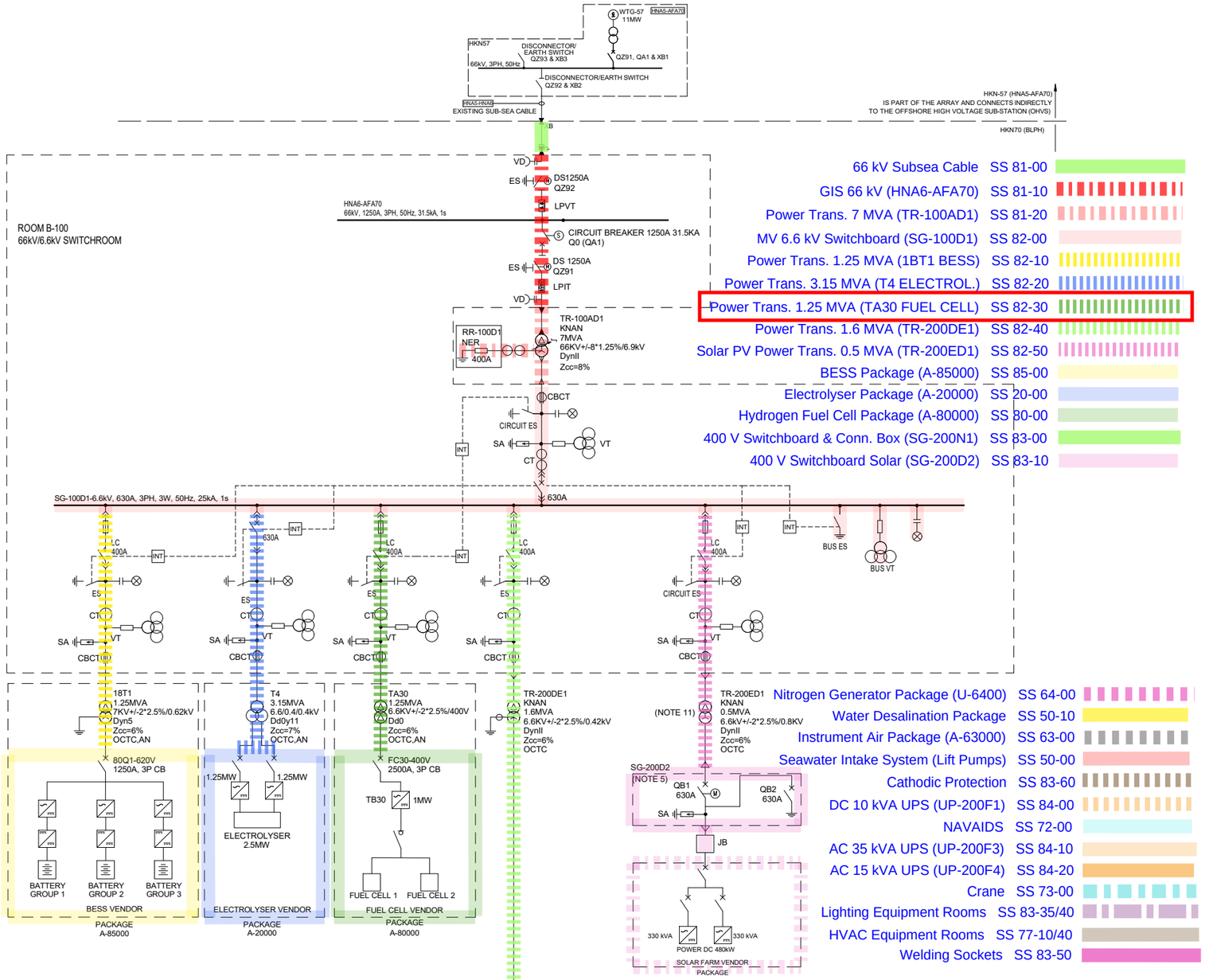
Sub System N°:	82-30	**Tick as appropriate**	ONSHORE	OK
Description:	Power Transformer 1.25 MVA (TA30 FUEL CELL)		OFFSHORE	

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 2025-05-15T08:58:35.749Z	PROVERLIS Digitaly signed by Gerry McCann 2025-05-15T14:26:14.029Z

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:	1		Issued on:	2025-03-29	

System:	82	/	Main Power Distribution Medium Voltage 6.6 kV
SubSystem:	82-30	/	Power Transformer 1.25 MVA (TA30 FUEL CELL)

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	2025-04-05	2025-05-14
Signature	PROVERLIS Digitaly signed by Anthony Iveson 2025-04-05T06:56:09.066Z	PROVERLIS Digitaly signed by Gerry McCann 2025-05-14T12:24:15.455Z

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 82-30 & process: COMM

Electrical	82-30 Power Transformer 1.25 MVA (TA30 FUEL CELL)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
SG-100D1-A7-K1	FUEL CELL PACKAGE - SG-100D1-A7-K1	ONSHORE	C10002981	FTR-2	100	2024-12-10	RFO 1
		ONSHORE	C10002982	FTR-6	100	2025-02-04	RFO 1

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM	82	Main Power Distribution Medium Voltage 6.6 kV
SUBSYSTEM	82-30	Power Transformer 1.25 MVA (TA30 FUEL CELL)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000661	A	82003-CEM-1-L1 C10000479	Cable to be connected both side. Point valid also for 82003-CEM-1-L2 and 82003-CEM-1-L3	.		Pschintu 2024-11-20	2024-11-26	Ecarotenuto 2024-11-26	2024-11-26
C30000662	B	82003-CEM-1-L1 C10000479	Trefoil formation is not as per drawing 123A90-DDL-EL-DD-20092 sh.009	.		Pschintu 2024-11-20	2025-01-24	Pschintu 2025-01-24	2025-01-24
C30000664	B	82003-CEM-1-L1 C10000479	Missing cable tags on external routing. Point valid also for 82003-CEM-1-L2 and 82003-CEM-1-L3	.		Pschintu 2024-11-20	2025-02-07	Pschintu 2025-02-07	2025-02-07
C30000665	B	82003-CEM-1-L1 C10000479	Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82003-CEM-1-L2 and 82003-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

SINGLE LINE DIAGRAM
"FEEDER with CONTACTOR"

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

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-80000	FUEL CELL PACKAGE	1000 kW	150 / 1A	3(1x70) mm²	A7

NOTE :

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

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

=						
+						
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)
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

DWG n° : 231151/SD/10
Item n° : PF1113279/4

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-100D1"

ELECTRICAL SINGLE LINE DIAGRAM
Column A7 : Fuel Cell Package A-80000

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

A3 | DRAWING NO. 1723002197-EL-DG-00010 | SHEET 010 | REV. 04

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

F.to UNI A3: 420mmx297mm

Section 3 CONSOLIDATED PUNCH LISTS

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM	82	Main Power Distribution Medium Voltage 6.6 kV
SUBSYSTEM	82-30	Power Transformer 1.25 MVA (TA30 FUEL CELL)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000661	A	82003-CEM-1-L1 C10000479	Cable to be connected both side. Point valid also for 82003-CEM-1-L2 and 82003-CEM-1-L3	.		Pschintu 2024-11-20	2024-11-26	Ecarotenuto 2024-11-26	2024-11-26
C30000662	B	82003-CEM-1-L1 C10000479	Trefoil formation is not as per drawing 123A90-DDL-EL-DD-20092 sh.009	.		Pschintu 2024-11-20	2025-01-24	Pschintu 2025-01-24	2025-01-24
C30000664	B	82003-CEM-1-L1 C10000479	Missing cable tags on external routing. Point valid also for 82003-CEM-1-L2 and 82003-CEM-1-L3	.		Pschintu 2024-11-20	2025-02-07	Pschintu 2025-02-07	2025-02-07
C30000665	B	82003-CEM-1-L1 C10000479	Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82003-CEM-1-L2 and 82003-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

C30000664

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000479	1.4 Discipline	Electrical
1.2 Item	82003-CEM-1-L1		6.6KV HV Switchgear / 6.6/0.4 KV, 1.25MVA Transformer
1.3 Subsystem	82-30		Power Transformer 1.25 MVA (TA30 FUEL CELL)

2 - OBSERVATION

Missing cable tags on external routing. Point valid also for 82003-CEM-1-L2 and 82003-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

C30000665

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000479	1.4 Discipline	Electrical
1.2 Item	82003-CEM-1-L1		6.6KV HV Switchgear / 6.6/0.4 KV, 1.25MVA Transformer
1.3 Subsystem	82-30		Power Transformer 1.25 MVA (TA30 FUEL CELL)

2 - OBSERVATION

Missing cable cleats stainless steel with TPE cable protection.
Point valid also for 82003-CEM-1-L2 and 82003-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:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000661

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000479	1.4 Discipline	Electrical
1.2 Item	82003-CEM-1-L1		6.6KV HV Switchgear / 6.6/0.4 KV, 1.25MVA Transformer
1.3 Subsystem	82-30		Power Transformer 1.25 MVA (TA30 FUEL CELL)

2 - OBSERVATION

Cable to be connected both side. Point valid also for 82003-CEM-1-L2 and 82003-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

Name:

Date:

Signature:

5 - CLEARANCE CHECK

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

Name: Eleonora Carotenuto

Date: 2024-11-26

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000662

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000479	1.4 Discipline	Electrical
1.2 Item	82003-CEM-1-L1		6.6KV HV Switchgear / 6.6/0.4 KV, 1.25MVA Transformer
1.3 Subsystem	82-30		Power Transformer 1.25 MVA (TA30 FUEL CELL)

2 - OBSERVATION

Trefoil formation is not as per drawing 123A90-DDL-EL-DD-20092 sh.009

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: Paolo Schintu

Date: 2025-01-24

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: 82-30 & process: COMM & discipline : E

Electrical	82-30 Power Transformer 1.25 MVA (TA30 FUEL CELL)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
SG-100D1-A7-K1	FUEL CELL PACKAGE - SG-100D1-A7-K1	ONSHORE	C10002981	FTR-2	100	2024-12-10	RFO 1
		ONSHORE	C10002982	FTR-6	100	2025-02-04	RFO 1

ITEM	Tag	SG-100D1-A7-K1	: FUEL CELL PACKAGE - SG-100D1-A7-K1			Dwg	1723002197-EL-DG-00010
	S/Sys	82-30	: Power Transformer 1.25 MVA (TA30 FUEL CELL)			Module	
TASK	code	C10002981		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°:	1VHR81041855	Relay type:	REX640
Auxiliary supply:	110Vdc	Location:	B100	Cubicle:	A7
Switchboard:	SG-100D1				

Current transformers

Tag	Number of	Ratio	Location
TI - L1		150/1A	SG-100D1-A7
TI - L2		150/1A	SG-100D1-A7
TI - L3		150/1A	SG-100D1-A7

Voltage transformers

Tag	Number of	Ratio	Location
TU-L1		6600/110V	SG-100D1-A7
TU-L2		6600/110V	SG-100D1-A7
TU-L3		6600/110V	SG-100D1-A7

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay	
				Setting	Trip value
67-1 - DPHLPDOC1	120A	150A		700ms	725ms
67-2 - DPHLPDOC1	120A	150A		100ms	125ms
51N - EFLPTOC1	0.1A	0.107A		100ms	120ms
50-1 - PHIPTOC1	450A	462A		250ms	260ms
51-1 - PHLPTOC1	105A	114A		12439ms	12427ms

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	Digitaly signed by Mattia Girotti 2024-12-09T13:59:09.523Z	Digitaly signed by Kristian Castellani 2024-12-09T15:29:26.426Z	Digitaly signed by Witness waived 2024-12-10T08:27:44.317Z

PROTECTION TEST ON ABB RELAY

PROJECT : CROSSWIND

FUNCTIONAL GROUP : BLPH

SYSTEM : SG-100D1

CLIENT : ROSETTI MARINO Group of Companies

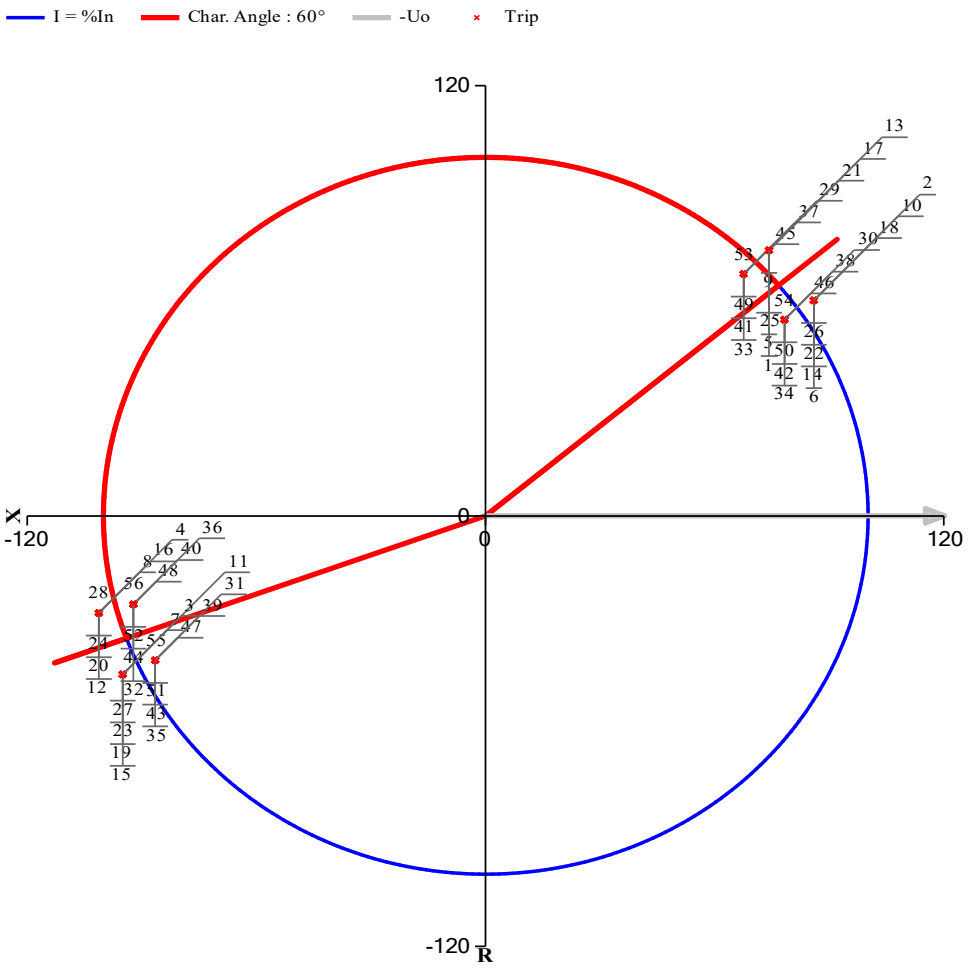
EQUIPMENT DESCRIPTION : -A-80000

ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855



IEC61850 : DPHLPDOC1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
Primary Current : 150 A
Nominal current : 109.3 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 : 700 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	0.838	45	0.838	-75	0.838	165	0.953	0	0.953	240	0.953	120	700	718	2.57
2	0.838	35	0.838	-85	0.838	155	0.953	0	0.953	240	0.953	120	0	0	0
3	0.838	-155	0.838	85	0.838	-35	0.953	0	0.953	240	0.953	120	0	0	0
4	0.838	-165	0.838	75	0.838	-45	0.953	0	0.953	240	0.953	120	700	722	3.14
5	0.838	75	0.838	-105	0	120	0.953	-20.71	0.953	-99.29	63.509	120	700	725	3.57
6	0.838	65	0.838	-115	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
7	0.838	-125	0.838	55	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
8	0.838	-135	0.838	45	0	120	0.953	-20.71	0.953	-99.29	63.509	120	700	721	3
9	0	0	0.838	-45	0.838	135	63.509	0	0.953	-140.71	0.953	140.71	700	720	2.86

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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	0.838	-55	0.838	125	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
11	0	0	0.838	115	0.838	-65	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
12	0	0	0.838	105	0.838	-75	63.509	0	0.953	-140.71	0.953	140.71	700	721	3
13	0.838	15	0	240	0.838	-165	0.953	20.71	63.509	240	0.953	99.29	700	718	2.57
14	0.838	5	0	240	0.838	-175	0.953	20.71	63.509	240	0.953	99.29	0	0	0
15	0.838	175	0	240	0.838	-5	0.953	20.71	63.509	240	0.953	99.29	0	0	0
16	0.838	165	0	240	0.838	-15	0.953	20.71	63.509	240	0.953	99.29	700	723	3.29
17	0.838	45	0	0	0	0	0.953	0	63.509	240	63.509	120	700	723	3.29
18	0.838	35	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
19	0.838	-155	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
20	0.838	-165	0	0	0	0	0.953	0	63.509	240	63.509	120	700	721	3
21	0	0	0.838	-75	0	0	63.509	0	0.953	240	63.509	120	700	722	3.14
22	0	0	0.838	-85	0	0	63.509	0	0.953	240	63.509	120	0	0	0
23	0	0	0.838	85	0	0	63.509	0	0.953	240	63.509	120	0	0	0
24	0	0	0.838	75	0	0	63.509	0	0.953	240	63.509	120	700	721	3
25	0	0	0	0	0.838	165	63.509	0	63.509	240	0.953	120	700	723	3.29
26	0	0	0	0	0.838	155	63.509	0	63.509	240	0.953	120	0	0	0
27	0	0	0	0	0.838	-35	63.509	0	63.509	240	0.953	120	0	0	0
28	0	0	0	0	0.838	-45	63.509	0	63.509	240	0.953	120	700	723	3.29
29	0.763	45	0.763	-75	0.763	165	0.953	0	0.953	240	0.953	120	0	0	0
30	0.763	35	0.763	-85	0.763	155	0.953	0	0.953	240	0.953	120	0	0	0
31	0.763	-155	0.763	85	0.763	-35	0.953	0	0.953	240	0.953	120	0	0	0
32	0.763	-165	0.763	75	0.763	-45	0.953	0	0.953	240	0.953	120	0	0	0
33	0.763	75	0.763	-105	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
34	0.763	65	0.763	-115	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
35	0.763	-125	0.763	55	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
36	0.763	-135	0.763	45	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
37	0	0	0.763	-45	0.763	135	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
38	0	0	0.763	-55	0.763	125	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
39	0	0	0.763	115	0.763	-65	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
40	0	0	0.763	105	0.763	-75	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
41	0.763	15	0	240	0.763	-165	0.953	20.71	63.509	240	0.953	99.29	0	0	0
42	0.763	5	0	240	0.763	-175	0.953	20.71	63.509	240	0.953	99.29	0	0	0
43	0.763	175	0	240	0.763	-5	0.953	20.71	63.509	240	0.953	99.29	0	0	0
44	0.763	165	0	240	0.763	-15	0.953	20.71	63.509	240	0.953	99.29	0	0	0
45	0.763	45	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
46	0.763	35	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
47	0.763	-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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	0.763	-165	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
49	0	0	0.763	-75	0	0	63.509	0	0.953	240	63.509	120	0	0	0
50	0	0	0.763	-85	0	0	63.509	0	0.953	240	63.509	120	0	0	0
51	0	0	0.763	85	0	0	63.509	0	0.953	240	63.509	120	0	0	0
52	0	0	0.763	75	0	0	63.509	0	0.953	240	63.509	120	0	0	0
53	0	0	0	0	0.763	165	63.509	0	63.509	240	0.953	120	0	0	0
54	0	0	0	0	0.763	155	63.509	0	63.509	240	0.953	120	0	0	0
55	0	0	0	0	0.763	-35	63.509	0	63.509	240	0.953	120	0	0	0
56	0	0	0	0	0.763	-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

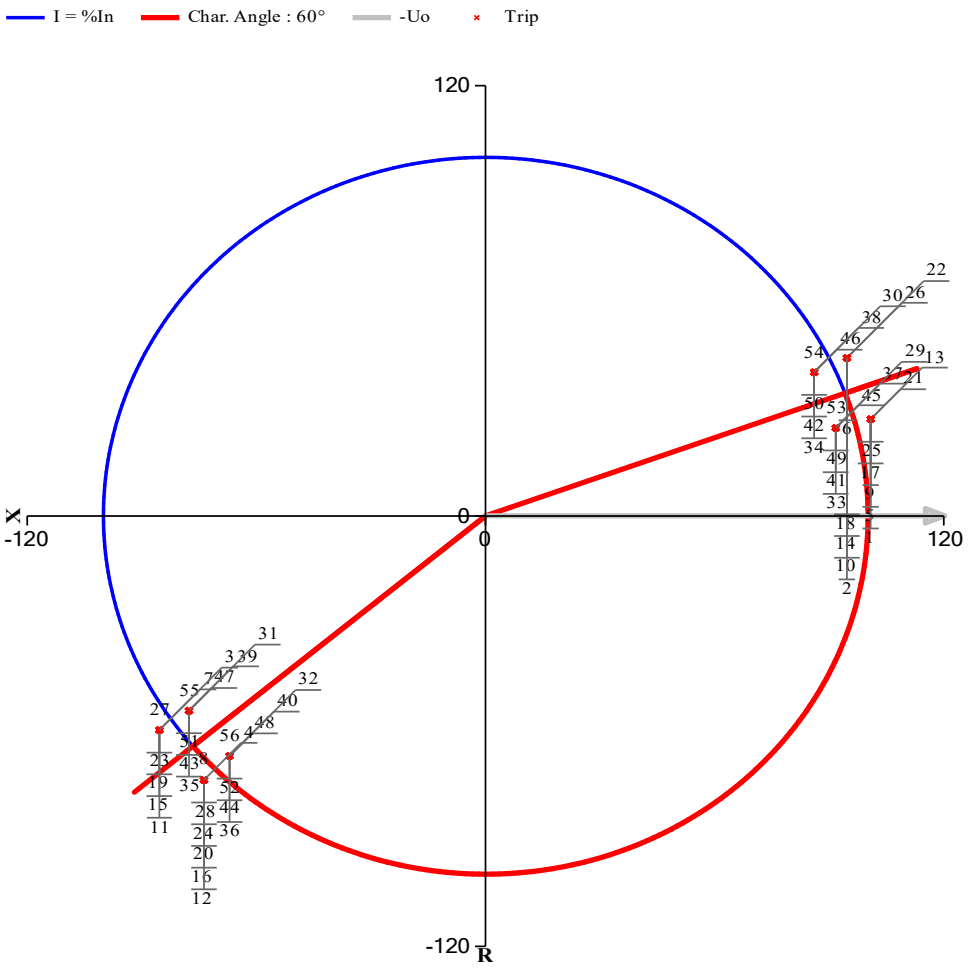
EQUIPMENT DESCRIPTION : -A-80000

ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855



IEC61850 : DPHLPDOC2
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
Primary Current : 150 A
Nominal current : 109.3 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	0.834	15	0.834	-105	0.834	135	0.953	0	0.953	240	0.953	120	100	122	22
2	0.834	25	0.834	-95	0.834	145	0.953	0	0.953	240	0.953	120	0	0	0
3	0.834	-145	0.834	95	0.834	-25	0.953	0	0.953	240	0.953	120	0	0	0
4	0.834	-135	0.834	105	0.834	-15	0.953	0	0.953	240	0.953	120	100	120	20
5	0.834	45	0.834	-135	0	120	0.953	-20.71	0.953	-99.29	63.509	120	100	120	20
6	0.834	55	0.834	-125	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
7	0.834	-115	0.834	65	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
8	0.834	-105	0.834	75	0	120	0.953	-20.71	0.953	-99.29	63.509	120	100	123	23
9	0	0	0.834	-75	0.834	105	63.509	0	0.953	-140.71	0.953	140.71	100	125	25

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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	0.834	-65	0.834	115	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
11	0	0	0.834	125	0.834	-55	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
12	0	0	0.834	135	0.834	-45	63.509	0	0.953	-140.71	0.953	140.71	100	123	23
13	0.834	-15	0	240	0.834	165	0.953	20.71	63.509	240	0.953	99.29	100	122	22
14	0.834	-5	0	240	0.834	175	0.953	20.71	63.509	240	0.953	99.29	0	0	0
15	0.834	-175	0	240	0.834	5	0.953	20.71	63.509	240	0.953	99.29	0	0	0
16	0.834	-165	0	240	0.834	15	0.953	20.71	63.509	240	0.953	99.29	100	120	20
17	0.834	15	0	0	0	0	0.953	0	63.509	240	63.509	120	100	119	19
18	0.834	25	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
19	0.834	-145	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
20	0.834	-135	0	0	0	0	0.953	0	63.509	240	63.509	120	100	121	21
21	0	0	0.834	-105	0	0	63.509	0	0.953	240	63.509	120	100	123	23
22	0	0	0.834	-95	0	0	63.509	0	0.953	240	63.509	120	0	0	0
23	0	0	0.834	95	0	0	63.509	0	0.953	240	63.509	120	0	0	0
24	0	0	0.834	105	0	0	63.509	0	0.953	240	63.509	120	100	124	24
25	0	0	0	0	0.834	135	63.509	0	63.509	240	0.953	120	100	124	24
26	0	0	0	0	0.834	145	63.509	0	63.509	240	0.953	120	0	0	0
27	0	0	0	0	0.834	-25	63.509	0	63.509	240	0.953	120	0	0	0
28	0	0	0	0	0.834	-15	63.509	0	63.509	240	0.953	120	100	120	20
29	0.758	15	0.758	-105	0.758	135	0.953	0	0.953	240	0.953	120	0	0	0
30	0.758	25	0.758	-95	0.758	145	0.953	0	0.953	240	0.953	120	0	0	0
31	0.758	-145	0.758	95	0.758	-25	0.953	0	0.953	240	0.953	120	0	0	0
32	0.758	-135	0.758	105	0.758	-15	0.953	0	0.953	240	0.953	120	0	0	0
33	0.758	45	0.758	-135	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
34	0.758	55	0.758	-125	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
35	0.758	-115	0.758	65	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
36	0.758	-105	0.758	75	0	120	0.953	-20.71	0.953	-99.29	63.509	120	0	0	0
37	0	0	0.758	-75	0.758	105	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
38	0	0	0.758	-65	0.758	115	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
39	0	0	0.758	125	0.758	-55	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
40	0	0	0.758	135	0.758	-45	63.509	0	0.953	-140.71	0.953	140.71	0	0	0
41	0.758	-15	0	240	0.758	165	0.953	20.71	63.509	240	0.953	99.29	0	0	0
42	0.758	-5	0	240	0.758	175	0.953	20.71	63.509	240	0.953	99.29	0	0	0
43	0.758	-175	0	240	0.758	5	0.953	20.71	63.509	240	0.953	99.29	0	0	0
44	0.758	-165	0	240	0.758	15	0.953	20.71	63.509	240	0.953	99.29	0	0	0
45	0.758	15	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
46	0.758	25	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
47	0.758	-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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	0.758	-135	0	0	0	0	0.953	0	63.509	240	63.509	120	0	0	0
49	0	0	0.758	-105	0	0	63.509	0	0.953	240	63.509	120	0	0	0
50	0	0	0.758	-95	0	0	63.509	0	0.953	240	63.509	120	0	0	0
51	0	0	0.758	95	0	0	63.509	0	0.953	240	63.509	120	0	0	0
52	0	0	0.758	105	0	0	63.509	0	0.953	240	63.509	120	0	0	0
53	0	0	0	0	0.758	135	63.509	0	63.509	240	0.953	120	0	0	0
54	0	0	0	0	0.758	145	63.509	0	63.509	240	0.953	120	0	0	0
55	0	0	0	0	0.758	-25	63.509	0	63.509	240	0.953	120	0	0	0
56	0	0	0	0	0.758	-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-80000

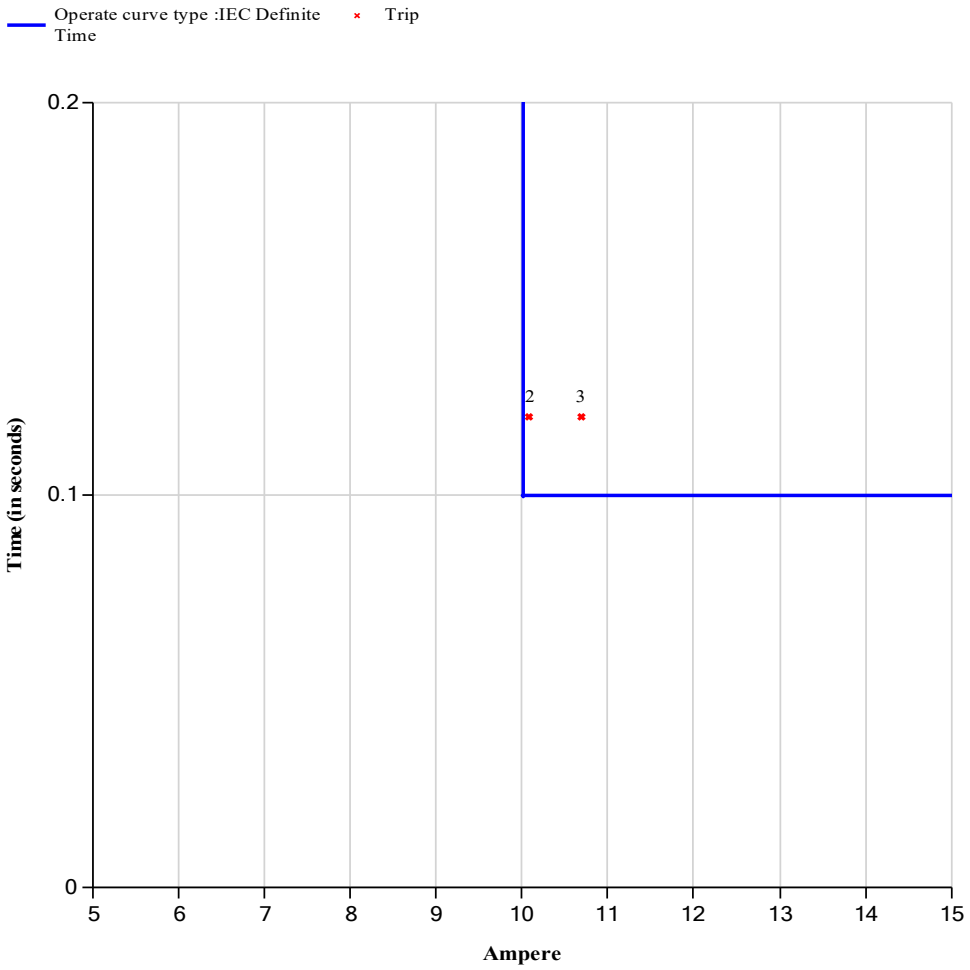
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

IEC61850 : EFLPTOC1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
CT RATIO : 100 / 1 A
Nominal current : 109.3 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	9.752	0.098	0	0	0	0
2	10.078	0.101	0	100	120	20
3	10.689	0.107	0	100	120	20

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-80000

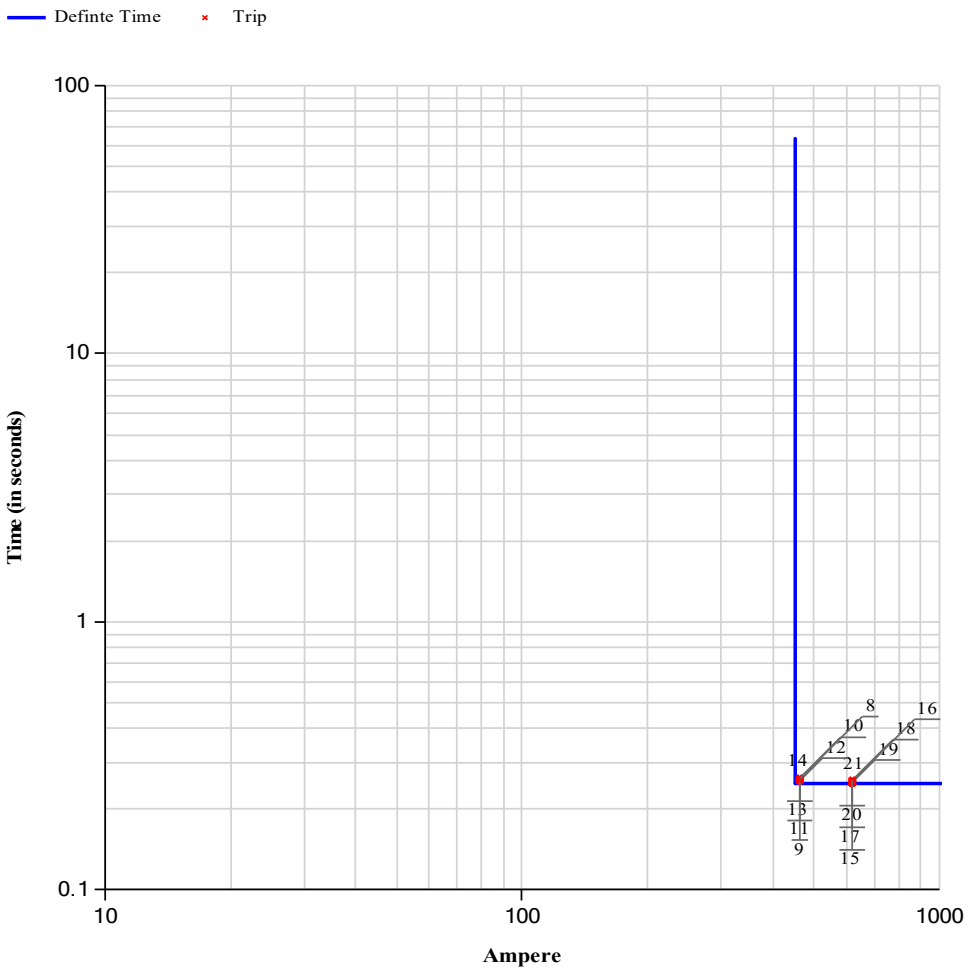
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

IEC61850 : PHIPTOC1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
CT RATIO : 150 / 1 A
Nominal current : 109.3 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	462	3.077	0	0	0	0	0	0	0	250	260	4
9	0	0	0	462	3.077	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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	462	3.077	120	250	262	4.8
11	462	3.077	0	462	3.077	180	0	0	0	250	258	3.2
12	0	0	0	462	3.077	240	462	3.077	60	250	256	2.4
13	462	3.077	300	0	0	0	462	3.077	120	250	261	4.4
14	462	3.077	0	462	3.077	240	462	3.077	120	250	255	2
15	616	4.108	0	0	0	0	0	0	0	250	257	2.8
16	0	0	0	616	4.108	240	0	0	0	250	254	1.6
17	0	0	0	0	0	0	616	4.108	120	250	251	0.4
18	616	4.108	0	616	4.108	180	0	0	0	250	257	2.8
19	0	0	0	616	4.108	240	616	4.108	60	250	252	0.8
20	616	4.108	300	0	0	0	616	4.108	120	250	251	0.4
21	616	4.108	0	616	4.108	240	616	4.108	120	250	250	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-80000

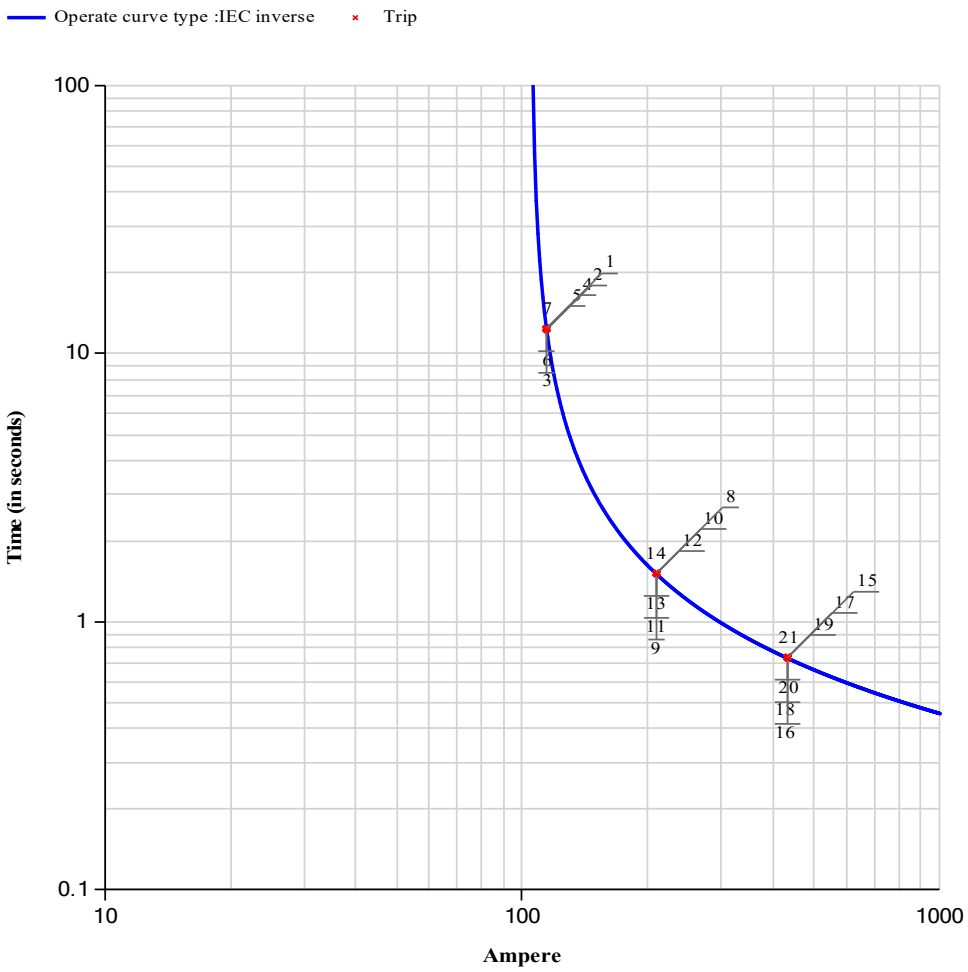
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

IEC61850 : PHLPTOC1
Nominal Voltage : 6600 V
Frequency Nominal : 50 Hz
CT RATIO : 150 / 1 A
Nominal current : 109.3 A
Num. start phases : 1 out of 3
Minimum operate time : 300 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	114	0.762	0	0	0	0	0	0	0	12439	12427	0.1
2	0	0	0	114	0.762	240	0	0	0	12439	12291	1.19
3	0	0	0	0	0	0	114	0.762	120	12439	12431	0.06
4	114	0.762	0	114	0.762	240	0	0	120	12439	12424	0.12
5	0	0	0	114	0.762	240	114	0.762	120	12439	12424	0.12
6	114	0.762	0	0	0	240	114	0.762	120	12439	12427	0.1
7	114	0.762	0	114	0.762	240	114	0.762	120	12439	12423	0.13
8	210	1.397	0	0	0	0	0	0	0	1509	1518	0.6
9	0	0	0	210	1.397	240	0	0	0	1509	1517	0.53

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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	210	1.397	120	1509	1520	0.73
11	210	1.397	0	210	1.397	240	0	0	120	1509	1516	0.46
12	0	0	0	210	1.397	240	210	1.397	120	1509	1515	0.4
13	210	1.397	0	0	0	240	210	1.397	120	1509	1519	0.66
14	210	1.397	0	210	1.397	240	210	1.397	120	1509	1515	0.4
15	431	2.877	0	0	0	0	0	0	0	733	736	0.41
16	0	0	0	431	2.877	240	0	0	0	733	735	0.27
17	0	0	0	0	0	0	431	2.877	120	733	739	0.82
18	431	2.877	0	431	2.877	240	0	0	120	733	735	0.27
19	0	0	0	431	2.877	240	431	2.877	120	733	737	0.55
20	431	2.877	0	0	0	240	431	2.877	120	733	740	0.95
21	431	2.877	0	431	2.877	240	431	2.877	120	733	737	0.55

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-80000

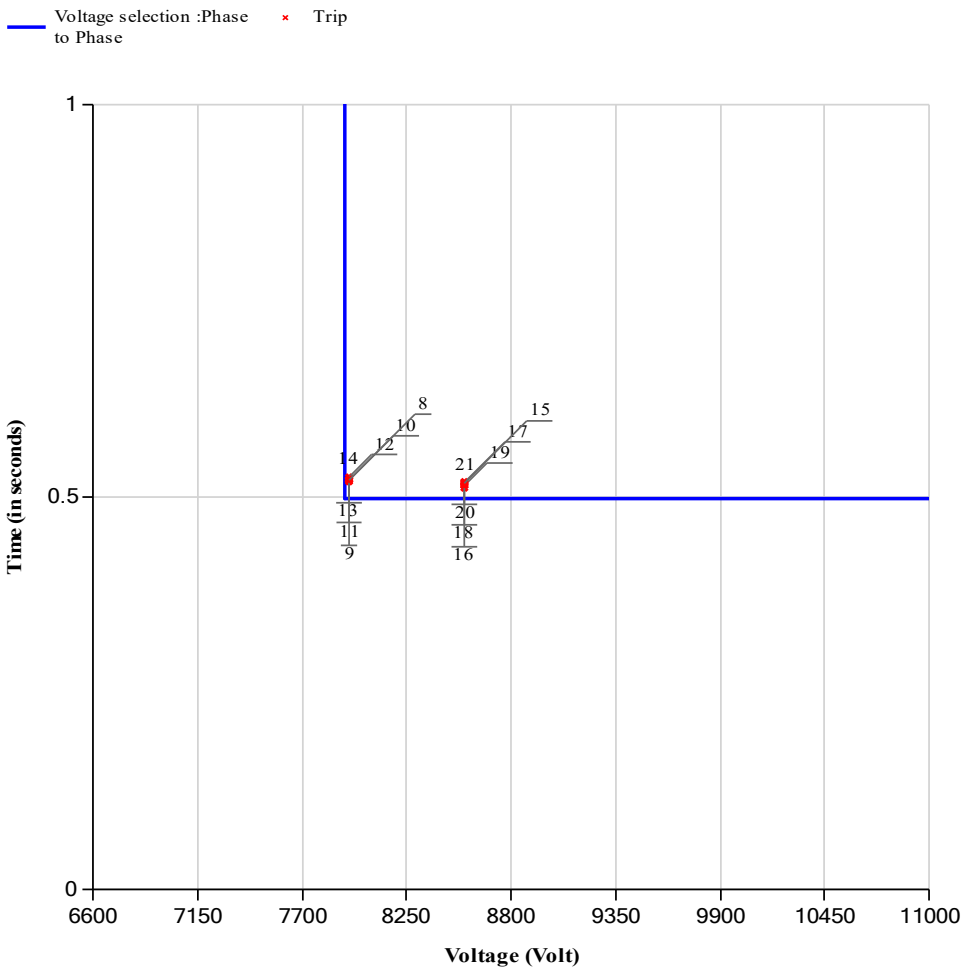
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

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	5261	87.684	0	3811	63.509	240	3811	63.509	120	0	0	0
2	3811	63.509	0	5262	87.7	240	3811	63.509	120	0	0	0
3	3811	63.509	0	3811	63.509	240	5262	87.695	120	0	0	0
4	4555	75.92	0	4555	75.92	240	3811	63.509	120	0	0	0
5	3811	63.509	0	4556	75.928	240	4556	75.928	120	0	0	0
6	4556	75.926	0	3811	63.509	240	4556	75.926	120	0	0	0
7	4555	75.922	0	4555	75.922	240	4555	75.922	120	0	0	0
8	5322	88.7	0	3811	63.509	240	3811	63.509	120	500	522	4.4
9	3811	63.509	0	5323	88.711	240	3811	63.509	120	500	523	4.6

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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	5322	88.693	120	500	522	4.4
11	4587	76.446	0	4587	76.446	240	3811	63.509	120	500	520	4
12	3811	63.509	0	4587	76.452	240	4587	76.452	120	500	526	5.2
13	4587	76.449	0	3811	63.509	240	4587	76.449	120	500	522	4.4
14	4587	76.453	0	4587	76.453	240	4587	76.453	120	500	523	4.6
15	5985	99.754	0	3811	63.509	240	3811	63.509	120	500	518	3.6
16	3811	63.509	0	5985	99.742	240	3811	63.509	120	500	512	2.4
17	3811	63.509	0	3811	63.509	240	5985	99.746	120	500	519	3.8
18	4938	82.303	0	4938	82.303	240	3811	63.509	120	500	517	3.4
19	3811	63.509	0	4937	82.29	240	4937	82.29	120	500	515	3
20	4938	82.298	0	3811	63.509	240	4938	82.298	120	500	520	4
21	4938	82.296	0	4938	82.296	240	4938	82.296	120	500	515	3

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-80000

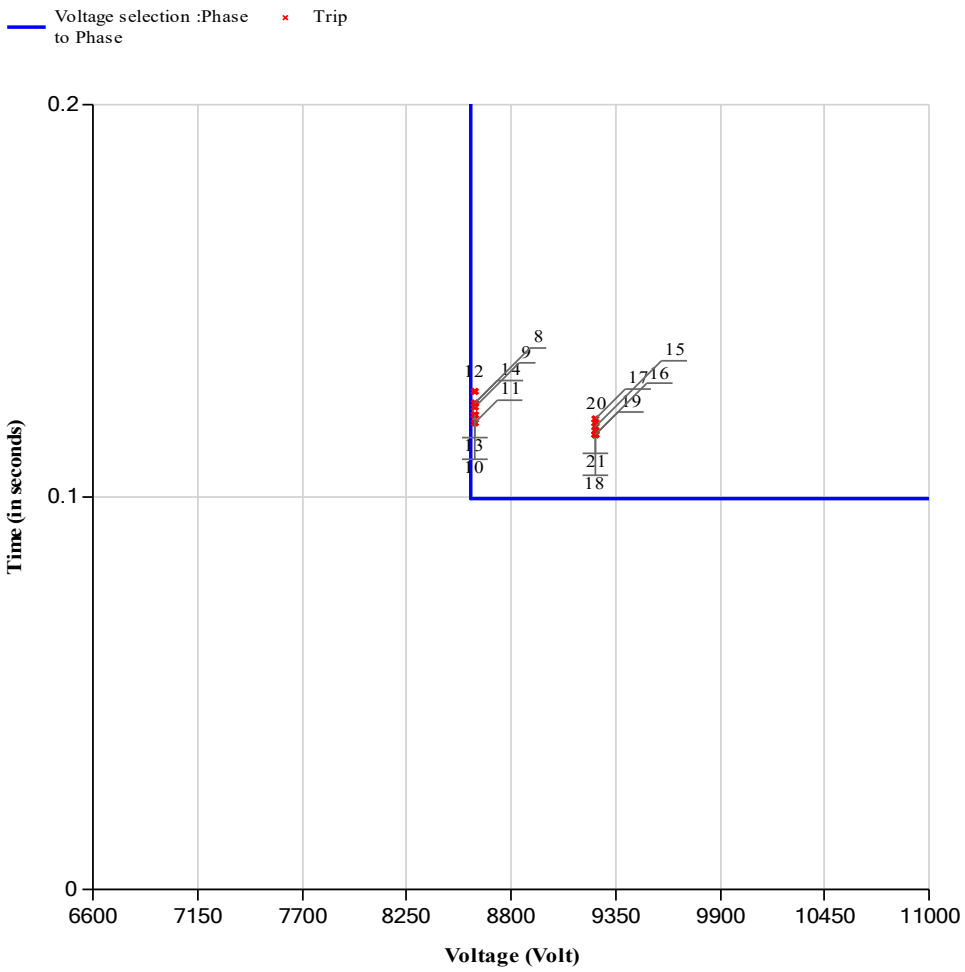
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

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	5984	99.738	0	3811	63.509	240	3811	63.509	120	0	0	0
2	3811	63.509	0	5985	99.749	240	3811	63.509	120	0	0	0
3	3811	63.509	0	3811	63.509	240	5985	99.753	120	0	0	0
4	4938	82.293	0	4938	82.293	240	3811	63.509	120	0	0	0
5	3811	63.509	0	4938	82.298	240	4938	82.298	120	0	0	0
6	4938	82.294	0	3811	63.509	240	4938	82.294	120	0	0	0
7	4938	82.296	0	4938	82.296	240	4938	82.296	120	0	0	0
8	6045	100.748	0	3811	63.509	240	3811	63.509	120	100	124	24
9	3811	63.509	0	6045	100.753	240	3811	63.509	120	100	123	23

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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	6046	100.759	120	100	121	21
11	4970	82.836	0	4970	82.836	240	3811	63.509	120	100	119	19
12	3811	63.509	0	4969	82.824	240	4969	82.824	120	100	127	27
13	4970	82.828	0	3811	63.509	240	4970	82.828	120	100	121	21
14	4970	82.827	0	4970	82.827	240	4970	82.827	120	100	124	24
15	6729	112.144	0	3811	63.509	240	3811	63.509	120	100	118	18
16	3811	63.509	0	6729	112.149	240	3811	63.509	120	100	116	16
17	3811	63.509	0	3811	63.509	240	6729	112.143	120	100	120	20
18	5336	88.934	0	5336	88.934	240	3811	63.509	120	100	116	16
19	3811	63.509	0	5336	88.938	240	5336	88.938	120	100	116	16
20	5336	88.939	0	3811	63.509	240	5336	88.939	120	100	119	19
21	5336	88.936	0	5336	88.936	240	5336	88.936	120	100	117	17

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-80000

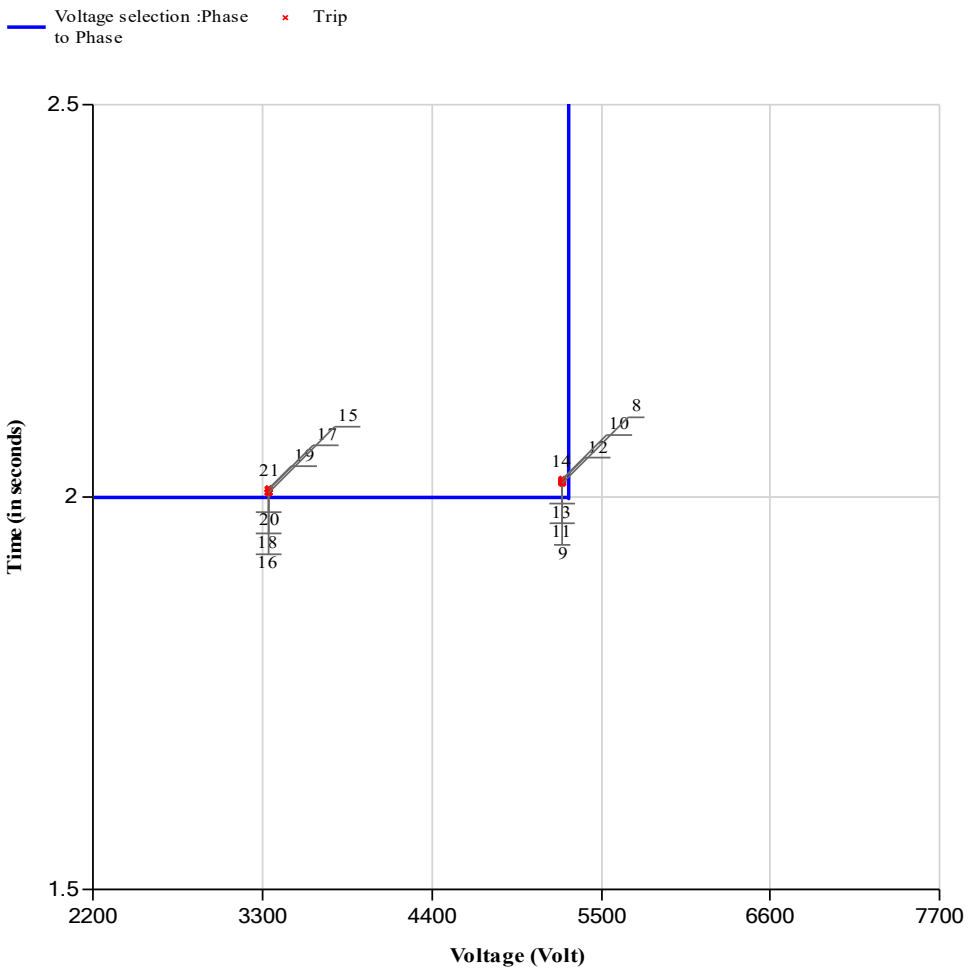
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

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	2258	37.631	0	3811	63.509	240	3811	63.509	120	0	0	0
2	3811	63.509	0	2259	37.643	240	3811	63.509	120	0	0	0
3	3811	63.509	0	3811	63.509	240	2258	37.636	120	0	0	0
4	3067	51.12	0	3067	51.12	240	3811	63.509	120	0	0	0
5	3811	63.509	0	3067	51.118	240	3067	51.118	120	0	0	0
6	3067	51.122	0	3811	63.509	240	3067	51.122	120	0	0	0
7	3067	51.123	0	3067	51.123	240	3067	51.123	120	0	0	0
8	2172	36.192	0	3811	63.509	240	3811	63.509	120	2000	2018	0.9
9	3811	63.509	0	2171	36.181	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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	2171	36.186	120	2000	2023	1.15
11	3028	50.466	0	3028	50.466	240	3811	63.509	120	2000	2019	0.95
12	3811	63.509	0	3028	50.465	240	3028	50.465	120	2000	2022	1.1
13	3028	50.465	0	3811	63.509	240	3028	50.465	120	2000	2021	1.05
14	3028	50.467	0	3028	50.467	240	3028	50.467	120	2000	2020	1
15	0	0	0	3811	63.509	240	3811	63.509	120	2000	2006	0.3
16	3811	63.509	0	0	0	240	3811	63.509	120	2000	2007	0.35
17	3811	63.509	0	3811	63.509	240	0	0	120	2000	2010	0.5
18	1927	32.113	0	1927	32.113	240	3811	63.509	120	2000	2006	0.3
19	3811	63.509	0	1927	32.118	240	1927	32.118	120	2000	2011	0.55
20	1927	32.117	0	3811	63.509	240	1927	32.117	120	2000	2010	0.5
21	1927	32.116	0	1927	32.116	240	1927	32.116	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-80000

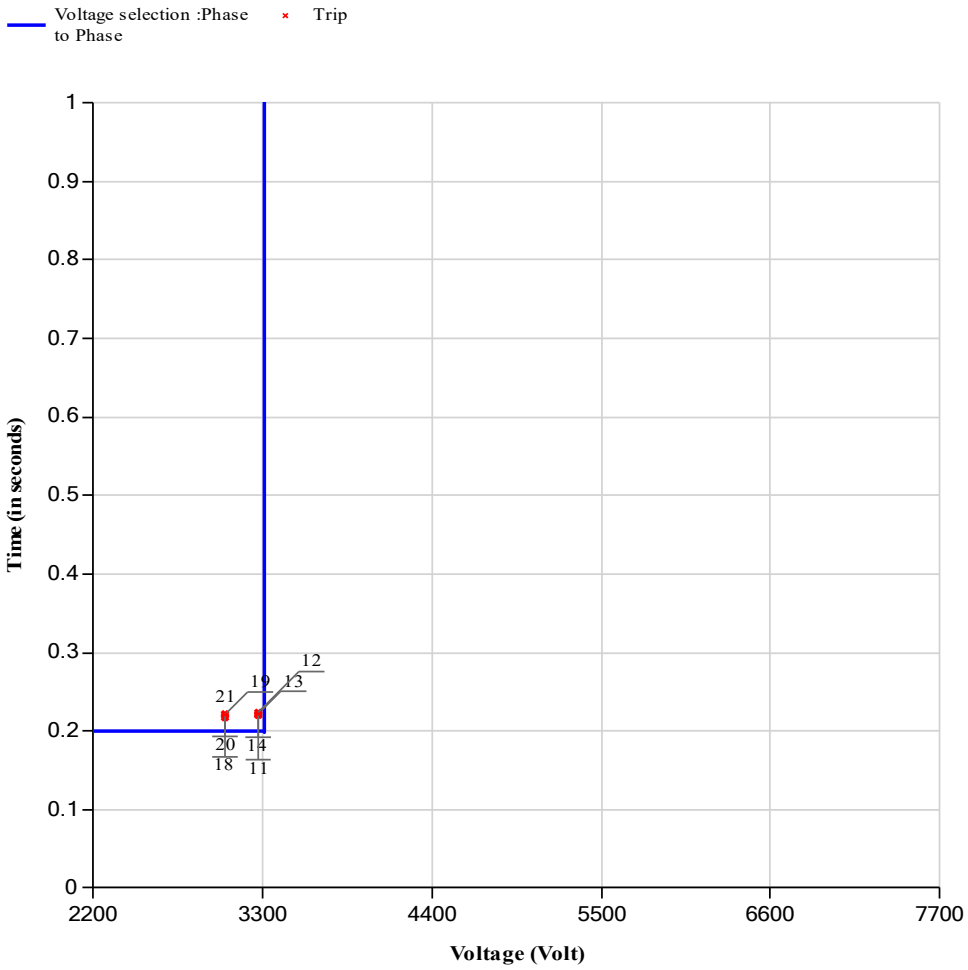
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

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	1921	32.01	0	1921	32.01	240	3811	63.509	120	0	0	0
5	3811	63.509	0	1920	32.007	240	1920	32.007	120	0	0	0
6	1921	32.009	0	3811	63.509	240	1921	32.009	120	0	0	0
7	1920	32.007	0	1920	32.007	240	1920	32.007	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-80000

RELAY TYPE : ABB REX640

ITEM : UNIT A7

Sn. : 1VHR81041855

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	1888	31.46	0	1888	31.46	240	3811	63.509	120	200	220	10
12	3811	63.509	0	1887	31.458	240	1887	31.458	120	200	224	12
13	1888	31.462	0	3811	63.509	240	1888	31.462	120	200	222	11
14	1888	31.461	0	1888	31.461	240	1888	31.461	120	200	221	10.5
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	1763	29.388	0	1763	29.388	240	3811	63.509	120	200	219	9.5
19	3811	63.509	0	1763	29.383	240	1763	29.383	120	200	221	10.5
20	1763	29.386	0	3811	63.509	240	1763	29.386	120	200	222	11
21	1763	29.385	0	1763	29.385	240	1763	29.385	120	200	217	8.5

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-80000

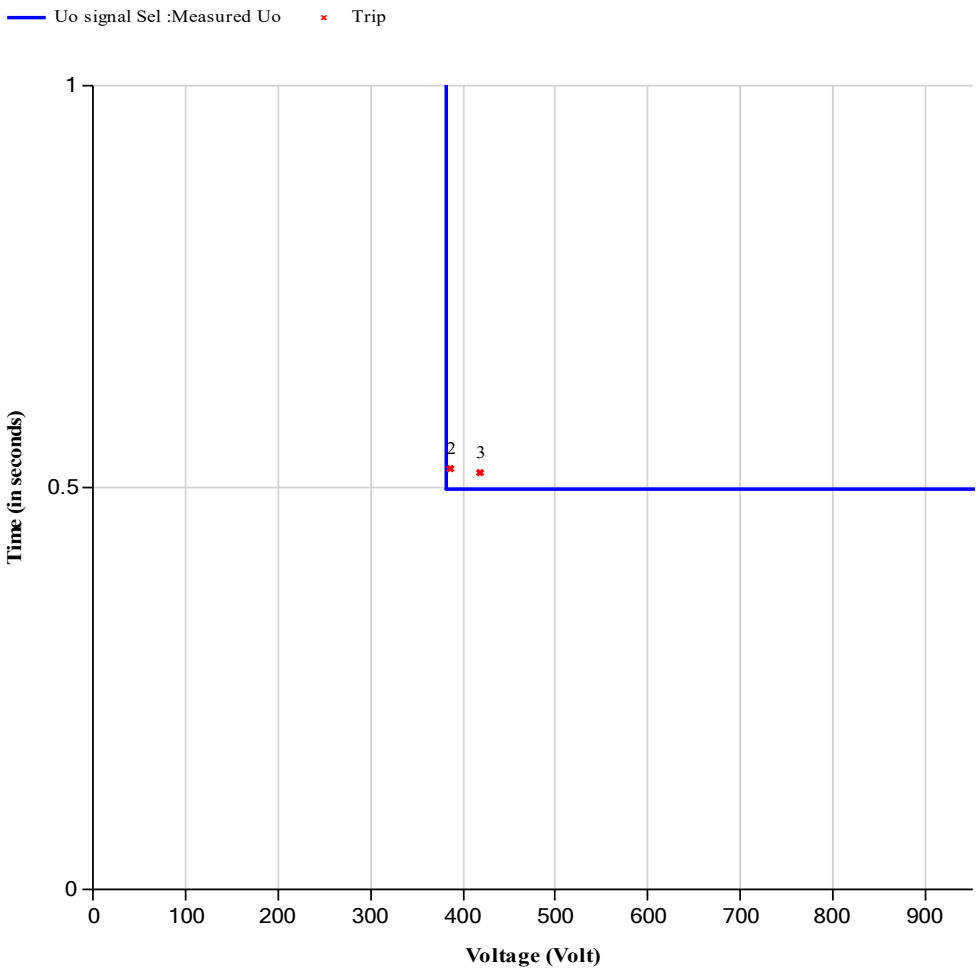
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

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	524	4.8
3	418	12.079	500	519	3.8

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-80000

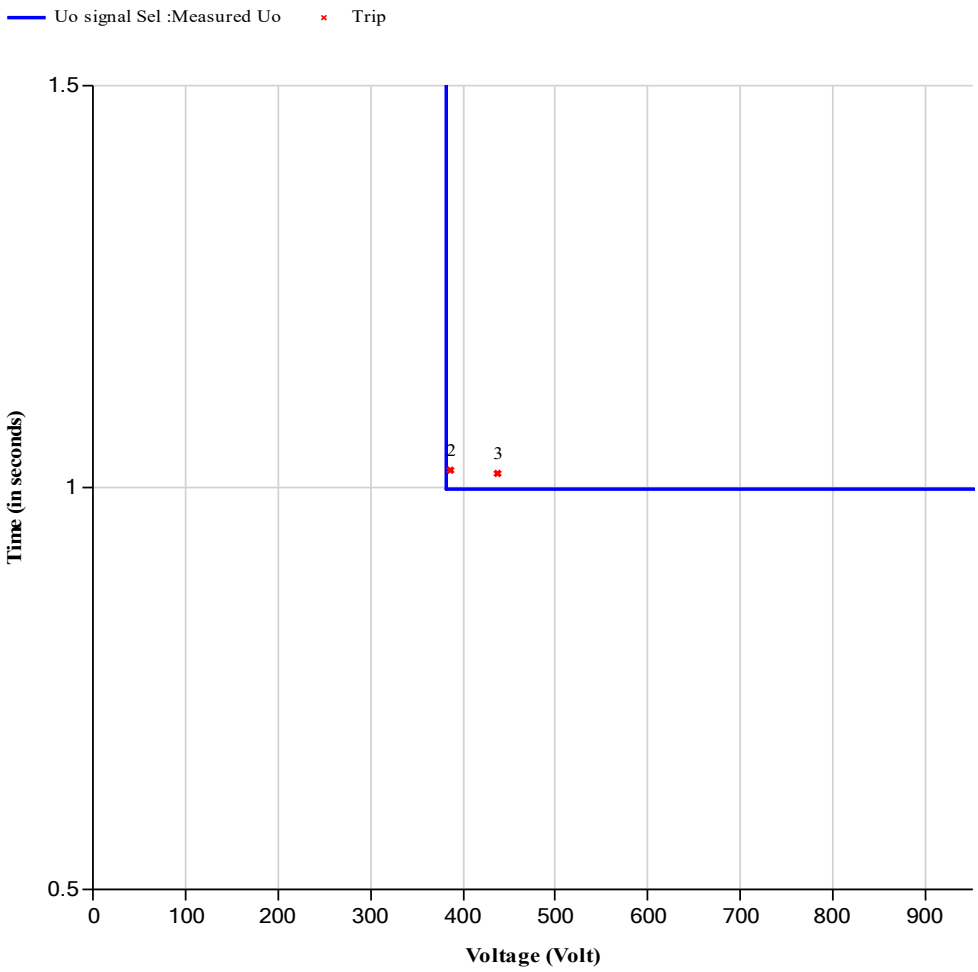
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

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 : 1000 msec



N.	V0(V)	V0(V)	Exp.(ms)	Trip(ms)	Dev.(%)
1	373	10.768	0	0	0
2	386	11.151	1000	1022	2.2
3	437	12.625	1000	1018	1.8

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-80000

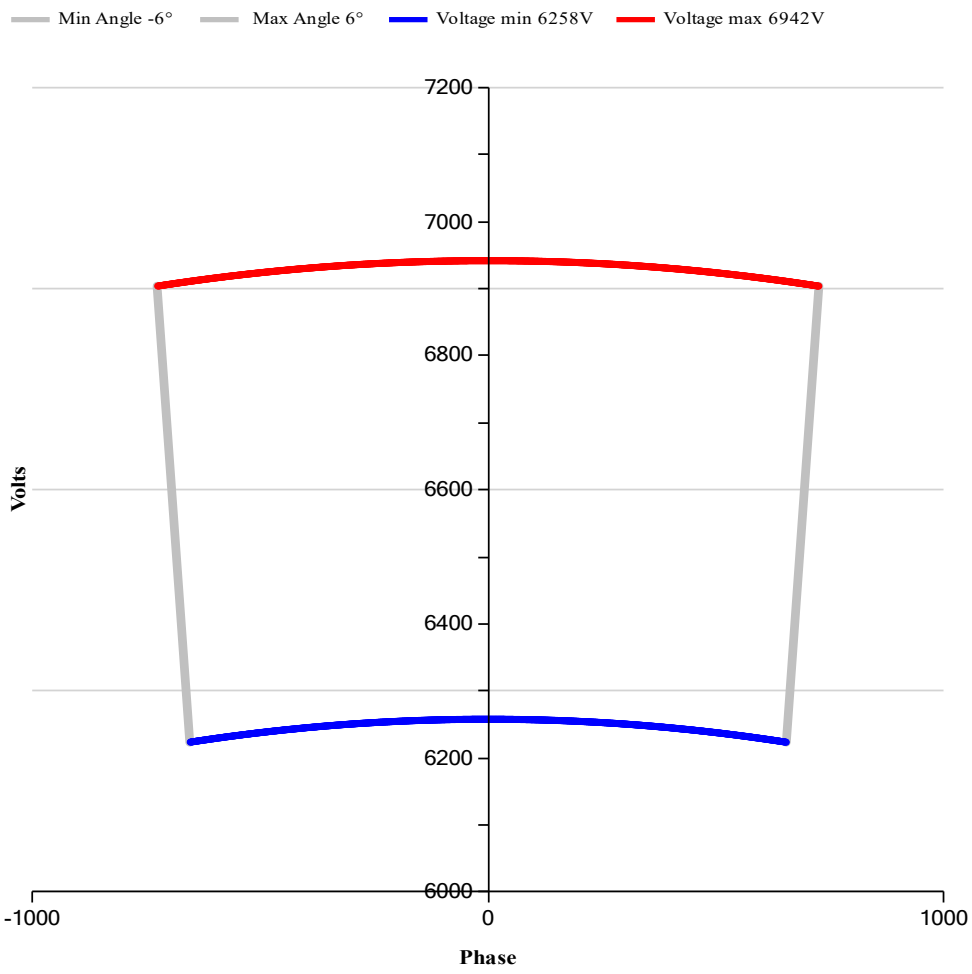
ITEM : UNIT A7

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

RELAY TYPE : ABB REX640

Sn. : 1VHR81041855

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	50.45

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

ITEM	Tag	SG-100D1-A7-K1	: FUEL CELL PACKAGE - SG-100D1-A7-K1	Dwg	1723002197-EL-DG-00010		
	S/Sys	82-30	: Power Transformer 1.25 MVA (TA30 FUEL CELL)	Module			
TASK	code	C10002982	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-A7-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	OPEN FUEL CELL A-80000 INCOMING C.B.	HW	DO	B400-SIS-001/TB-XS-000:37/38	SG-100D1/TB-XM:37/38	NA	NA	NA	Y	Y	NA	NA	NA	NA
2	**NOTE1													
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 5.

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	2025-02-04	2025-02-04	2025-02-04
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2025-02-04T09:56:08.596Z	PROVERLIS Digitaly signed by Kristian Castellani 2025-02-04T12:08:38.811Z	PROVERLIS Digitaly signed by Witness waived 2025-02-04T13:40:02.100Z

DRAWING NO. 123-A90-DDL-IN-DG-40016

REV. 01

FIELD		I&T EQUIPMENT ROOM (ITER)
B-100 - HV SWITCHGEAR ROOM	CABLE NO	MARSHALLING CABINET B400-SIS-001

<01>

OPEN WIND FARM INCOMING CIRCUIT BREAKERS (CP-100E1)	81-XS-001	TB-X13 13 (1BK) 14 (2BK) NOTE-2	C-CP-100E1/B400-SIS-001 2x2.5mm2,ShT+ARM,F.Res,ORANGE,NIS	Shield Bar	TB-XS-000 31 (1BK) 32 (2BK)	81-XS-001
OPEN SOLAR INCOMING CIRCUIT BREAKERS (SG-100D1)	82-XS-001	TB-XM 51 (1BK) 52 (2BK) NOTE-2	C-SG-100D1-001/B400-SIS-001 ~~SG-100D1-001/B400-SIS-001~~ 2x2.5mm2,ShT+ARM,F.Res,ORANGE,NIS	Shield Bar	TB-XS-000 33 (1BK) 34 (2BK)	82-XS-001
OPEN BESS A-85000 INCOMING CIRCUIT BREAKERS (SG-100D1)	82-XS-002	TB-XM 43 (1BK) 44 (2BK) NOTE-2	C-SG-100D1-002/B400-SIS-001 ~~SG-100D1-002/B400-SIS-001~~ 2x2.5mm2,ShT+ARM,F.Res,ORANGE,NIS	Shield Bar	TB-XS-000 35 (1BK) 36 (2BK)	82-XS-002
OPEN FUEL CELL A-80000 INCOMING C. BREAKERS (SG-100D1)	82-XS-003	TB-XM 37 (1BK) 38 (2BK) NOTE-2	C-SG-100D1-003/B400-SIS-001 ~~SG-100D1-003/B400-SIS-001~~ 2x2.5mm2,ShT+ARM,F.Res,ORANGE,NIS	Shield Bar	TB-XS-000 37 (1BK) 38 (2BK)	82-XS-003
DISCONNECT DC UPS BATTERY DC UPS (CB-200F1)	84-XS-006	TB-X3 7 (1BK) 8 (2BK) NOTE-2	C-CB-200F1/B400-SIS-001 ~~CB-200F1/B400-SIS-001~~ 2x2.5mm2,ShT+ARM,F.Res,ORANGE,NIS	Shield Bar	TB-XS-000 39 (1BK) 40 (2BK)	84-XS-006
INHIBIT. BATTERY CHARGING DA UPS (UP-200F1)	84-XS-009	TB-X10 1 (1BK) 2 (2BK) NOTE-2	C-UP-200F1/B400-SIS-001 ~~UP-200F1/B400-SIS-001~~ 2x2.5mm2,ShT+ARM,F.Res,ORANGE,NIS	Shield Bar	TB-XS-000 41 (1BK) 42 (2BK)	84-XS-009

VALID FOR CONSTRUCTION

FDL DWG: **123A90-FDL-IN-DG-40016**

REV.:	DATE:	SIGNATURE:
1_Q	29/01/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE :

BASE LOAD POWER HUB (BLPH)
INSTRUMENT–SAFETY SYSTEM WIRING DIAGRAMS
ELECTRICAL EQUIPMENT – SHUTDOWN

CONTRACT NO./TITLE			SCALE N/A
DRAWN VBA	CHECKED LCA	APPROVED DLO	DATE 23/02/2024

	DRAWING NO.	SHEET	REV.
A3	123A90–DDL–IN–DG–40016	022	01

File Name : 123A90-DDL-IN-DG-40016_Rev.01

Step	Description	Result	Verified by	Date
141	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 .....☐			
142	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).....☐			

5.4.5.4 SIS Safety Instrumented System - I/O signal from SIS to SG-100D1 UNIT A7

The following I/O list represent the hardwired signals that are connected on Unit A7 and they come from the SIS (Emergency Shut Down).

SIGNAL_DESCRIPTION	TYPE ANALOG/DIGITAL	ITEM TAG
FUELL CELL A-80000 "A7"		
EMERGENCY OPEN BY SIS FUEL CELL A-8000	DIGITAL	82XS0003

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

5.4.5.5 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 A7 Unit FUEL CELL PACKAGE.

5.4.5.6 EMCS IEC61850 – A7 Unit I/O List

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

DESCRIPTION	SIGNAL TYPE	SIGNAL TAG
FUELL CELL A-80000 "A7"		
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

DESCRIPTION	SIGNAL TYPE	SIGNAL TAG
PROTECTION TRIPPED "67-2"	DIGITAL	LD0.DPHLPDOC2.ST.Op.general
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

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

DESCRIPTION	SIGNAL TYPE	SIGNAL TAG
MCB'S CLOSED	DIGITAL	LD0.MVGAPC2.ST.SPCSO3.stVal
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 6 HEALTHY	DIGITAL	LD0.SDBIGGIO1.ST.Ind8.stVal
AUXILIARY 230VAC HEALTHY (ALL SWITCHBOARD)	DIGITAL	LD0.SDBIGGIO1.ST.Ind7.stVal
TR-100AD1 GENERAL ALAM	DIGITAL	N.A.
MCB'S CLOSED (FROM MEASURE UNIT A5)	DIGITAL	LD0.SCBIGGIO1.ST.Ind6.stVal
V.T. HEALTLY CIRCUIT (FROM MEASURE UNIT A5)	DIGITAL	LD0.SCBIGGIO1.ST.Ind7.stVal
UPS 110VDC A SUPPLY "ON" (FROM MEASURE UNIT A5)	DIGITAL	LD0.SCBIGGIO1.ST.Ind8.stVal
UPS 110VDC B SUPPLY "ON" (FROM MEASURE UNIT A5)	DIGITAL	LD0.SCBIGGIO1.ST.Ind9.stVal
230VAC SUPPLY "ON" (FROM MEASURE UNIT A5)	DIGITAL	LD0.SCBIGGIO1.ST.Ind10.stVal
24VDC SUPPLY "ON" (FROM MEASURE UNIT A5)	DIGITAL	LD0.SCBIGGIO1.ST.Ind11.stVal
EARTHING SWITCH OPENED (FROM MEASURE UNIT A5)	DIGITAL	LD0.SCBIGGIO1.ST.Ind3.stVal

Step	Description	Result	Verified by	Date
144	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

TAG COLUMN: A4

L1	Arm.	BK	82002-CEM-1-L1 1C X 70 mm²	BK	Arm. 1U
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: 6.6/0.42 KV, 1.6MVA TRANSFORMER NO MARK UP
TAG NUMBER: TR-200DE1 MARCO MORETTO 7/3/25

HV TERMINAL BOX OF TR-200DE1

TAG COLUMN: A7

L1	Arm.	BK	82003-CEM-1-L1 1C X 70 mm²	BK	Arm. 1U
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 KV, 1.25MVA TRANSFORMER NO MARK UP
TAG NUMBER: TA30 MARCO MORETTO 20/3/25

HV TERMINAL BOX OF TA30

TAG COLUMN: A1

L1	Arm.	BK	82004-CEM-1-L1 1C X 150 mm²	BK	Arm. 1U
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: 6.6/0.4/0.4 KV, 3.15MVA TRANSFORMER MARCO MORETTO
TAG NUMBER: ~~T4~~ TR-01 A100 19/3/25

HV TERMINAL BOX OF T4

TAG COLUMN: A3

L1	Arm.	BK	82005-CEM-1-L1 1C X 70 mm²	BK	Arm. 1U
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: 6.6/0.62 KV, 1.25MVA TRANSFORMER NO MARK UP
TAG NUMBER: 18T1 MARCO MORETTO 20/3/25

HV TERMINAL BOX OF 18T1

TAG COLUMN: A2

L1	Arm.	BK	82006-CEM-1-L1 1C X 70 mm²	BK	Arm. 1U
L2		BK	82006-CEM-1-L2 1C X 70 mm²	BK	1V
L3		BK	82006-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

HV TERMINAL BOX OF TR-200ED1

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.	SHEET	REV.
	123A90-DDL-EL-DG-20149	016	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
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+					
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 NO MARK UP
GIROTTI MATTIA 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

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+						
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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

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26/03/2025

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CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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 — 2 XC XC-2/A2	XC-1/A3 1 XC — 2 XC XC-2/A3	XC-1/A4 RD 1x6 1 XC — 2 XC XC-2/A4	XC-1/A5 RD 1x6 1 XC — 2 XC XC-2/A5	XC-1/A6 1 XC — 2 XC XC-2/A6	XC-1/A7 RD 1x6 1 XC — 2 XC
	3 XC XC-4/A1 — 4 XC	XC-3/A2 WH 1x6 3 XC — 4 XC XC-4/A2	XC-3/A3 3 XC — 4 XC XC-4/A3	XC-3/A4 WH 1x6 3 XC — 4 XC XC-4/A4	XC-3/A5 WH 1x6 3 XC — 4 XC XC-4/A5	XC-3/A6 3 XC — 4 XC XC-4/A6	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 — 6 XC XC-6/A2	XC-5/A3 5 XC — 6 XC XC-6/A3	XC-5/A4 RD 1x1,5 5 XC — 6 XC XC-6/A4	XC-5/A5 RD 1x1,5 5 XC — 6 XC XC-6/A5	XC-5/A6 5 XC — 6 XC XC-6/A6	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 — 8 XC XC-8/A2	XC-7/A3 7 XC — 8 XC XC-8/A3	XC-7/A4 WH 1x1,5 7 XC — 8 XC XC-8/A4	XC-7/A5 WH 1x1,5 7 XC — 8 XC XC-8/A5	XC-7/A6 7 XC — 8 XC XC-8/A6	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 — 10 XC XC-10/A2	XC-9/A3 9 XC — 10 XC XC-10/A3	XC-9/A4 BK 1x6 9 XC — 10 XC XC-10/A4	XC-9/A5 BK 1x6 9 XC — 10 XC XC-10/A5	XC-9/A6 9 XC — 10 XC XC-10/A6	XC-9/A7 BK 1x6 9 XC — 10 XC
	11 XC XC-12/A1 — 12 XC	XC-11/A2 BK 1x6 11 XC — 12 XC XC-12/A2	XC-11/A3 11 XC — 12 XC XC-12/A3	XC-11/A4 BK 1x6 11 XC — 12 XC XC-12/A4	XC-11/A5 BK 1x6 11 XC — 12 XC XC-12/A5	XC-11/A6 11 XC — 12 XC XC-12/A6	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 — 14 XC XC-14/A2	XC-13/A3 13 XC — 14 XC XC-14/A3	XC-13/A4 BK 1x1.5 13 XC — 14 XC XC-14/A4	XC-13/A5 BK 1x1.5 13 XC — 14 XC XC-14/A5	XC-13/A6 13 XC — 14 XC XC-14/A6	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 — 16 XC XC-16/A2	XC-15/A3 15 XC — 16 XC XC-16/A3	XC-15/A4 BK 1x1.5 15 XC — 16 XC XC-16/A4	XC-15/A5 BK 1x1.5 15 XC — 16 XC XC-16/A5	XC-15/A6 15 XC — 16 XC XC-16/A6	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 — 18 XC XC-18/A2	XC-17/A3 17 XC — 18 XC XC-18/A3	XC-17/A4 BK 1x1.5 17 XC — 18 XC XC-18/A4	XC-17/A5 BK 1x1.5 17 XC — 18 XC XC-18/A5	XC-17/A6 17 XC — 18 XC XC-18/A6	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 — 20 XC XC-20/A2	XC-19/A3 19 XC — 20 XC XC-20/A3	XC-19/A4 BK 1x1.5 19 XC — 20 XC XC-20/A4	XC-19/A5 BK 1x1.5 19 XC — 20 XC XC-20/A5	XC-19/A6 19 XC — 20 XC XC-20/A6	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 — 22 XC XC-22/A2	XC-21/A3 21 XC — 22 XC XC-22/A3	XC-21/A4 BK 1x1.5 21 XC — 22 XC XC-22/A4	XC-21/A5 BK 1x1.5 21 XC — 22 XC XC-22/A5	XC-21/A6 21 XC — 22 XC XC-22/A6	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 — 24 XC XC-24/A2	XC-23/A3 23 XC — 24 XC XC-24/A3	XC-23/A4 BK 1x1.5 23 XC — 24 XC XC-24/A4	XC-23/A5 BK 1x1.5 23 XC — 24 XC XC-24/A5	XC-23/A6 23 XC — 24 XC XC-24/A6	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				

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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

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

F.to UNI A3: 420mmx297mm

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

B

C

D

E

EARTH.SWITCH OPEN (FROM VT BUS BARS UNIT)

ENABLING COMMAND EARTHING SWITCH VT BUS BARS UNIT

SIGNALS FROM VT BUS BARS UNIT TO CELL PAKAGE UNIT

25 XC — XC-25/A4 — XC-33/A5 BK 1x1.5 — 33 XC

26 XC — XC-26/A4 — XC-34/A5 BK 1x1.5 — 34 XC

35 XC — XC-35/A5 BK 1x1.5 — XC-25/A6 — 25 XC

36 XC — XC-36/A5 BK 1x1.5 — XC-26/A6 — 26 XC

37 XC — XC-37/A5 BK 1x1.5 — XC-25/A7 — 25 XC

38 XC — XC-38/A5 BK 1x1.5 — XC-26/A7 — 26 XC

28 XC — XC-28/A1 — XC-27/A2 BK 1x1.5 — 27 XC

28 XC — XC-28/A2 — XC-27/A3 BK 1x1.5 — 27 XC

28 XC — XC-28/A3 — XC-27/A4 BK 1x1.5 — 27 XC

28 XC — XC-28/A4 — XC-25/A5 BK 1x1.5 — 25 XC

26 XC — XC-26/A5 — XC-27/A6 BK 1x1.5 — 27 XC

28 XC — XC-28/A6 — XC-27/A7 BK 1x1.5 — 27 XC

27 XC — XC-27/A1 BK 1x1.5 — XC-28/A7 BK 1x1.5 — 28 XC

45 XC — XC-45/A5 BK 1x1.5 — XC-29/A7 — 29 XC

46 XC — XC-46/A5 BK 1x1.5 — XC-30/A7 — 30 XC

49 XC — XC-49/A5 BK 1x1.5 — XC-31/A7 — 31 XC

50 XC — XC-50/A5 BK 1x1.5 — XC-32/A7 — 32 XC

41 XC — XC-41/A5 BK 1x1.5 — XC-33/A7 — 33 XC

42 XC — XC-42/A5 BK 1x1.5 — XC-34/A7 — 34 XC

43 XC — XC-43/A5 BK 1x1.5 — XC-35/A7 — 35 XC

44 XC — XC-44/A5 BK 1x1.5 — XC-36/A7 — 36 XC

47 XC — XC-47/A5 BK 1x1.5 — XC-37/A7 — 37 XC

48 XC — XC-48/A5 BK 1x1.5 — XC-38/A7 — 38 XC

39 XC — XC-39/A5 BK 1x1.5 — XC-39/A7 — 39 XC

40 XC — XC-40/A5 BK 1x1.5 — XC-40/A7 — 40 XC

51 XC — XC-51/A5 BK 1x1.5 — XC-41/A7 — 41 XC

52 XC — XC-52/A5 BK 1x1.5 — XC-42/A7 — 42 XC

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REV.	DATE	DRN	CHKD	APPD	DESCRIPTION		

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-29/A1 XC BK 1x1.5						XC-47/A7 BK 1x1.5 47 XC
	30 XC-30/A1 XC BK 1x1.5						XC-48/A7 BK 1x1.5 48 XC
	31 XC-31/A1 XC BK 1x1.5	XC-29/A2 29 XC					
	32 XC-32/A1 XC BK 1x1.5	XC-30/A2 30 XC					
B	PROTECTION RELAY HEALTHY	31 XC-31/A2 XC BK 1x1.5	XC-29/A3 29 XC				
		32 XC-32/A2 XC BK 1x1.5	XC-30/A3 30 XC				
			31 XC-31/A3 XC BK 1x1.5	XC-29/A4 29 XC			
			32 XC-32/A3 XC BK 1x1.5	XC-30/A4 30 XC			
			37 XC-37/A3 XC BK 1x1.5	XC-31/A4 31 XC			
			38 XC-38/A3 XC BK 1x1.5	XC-32/A4 32 XC			
C						31 XC-31/A6 XC BK 1x1.5	XC-45/A7 45 XC
						32 XC-32/A6 XC BK 1x1.5	XC-46/A7 46 XC
	230Vac AUXILIARY SUPPLY HEALTHY	33 XC-33/A1 XC BK 1x1.5	XC-33/A2 BK 1x1.5 34 XC	34 XC-34/A2 XC BK 1x1.5	XC-34/A3 34 XC	33 XC-33/A3 XC BK 1x1.5	XC-33/A4 33 XC
		34 XC-34/A1 XC BK 1x1.5				34 XC-34/A4 XC BK 1x1.5	XC-54/A5 54 XC
						53 XC-53/A5 XC BK 1x1.5	XC-33/A6 33 XC
						34 XC-34/A6 XC BK 1x1.5	XC-43/A7 43 XC
							XC-44/A7 44 XC
D	OPENING COMMAND FROM INCOMING	35 XC-35/A1 XC BK 1x1.5				XC-35/A6 35 XC	
		36 XC-36/A1 XC BK 1x1.5				XC-36/A6 36 XC	

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REV.	DATE	DRN	CHKD	APPD	DESCRIPTION		

CROSSWIND

ROSETTI MARINO

IMESA ELECTRICAL ENGINEERING

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

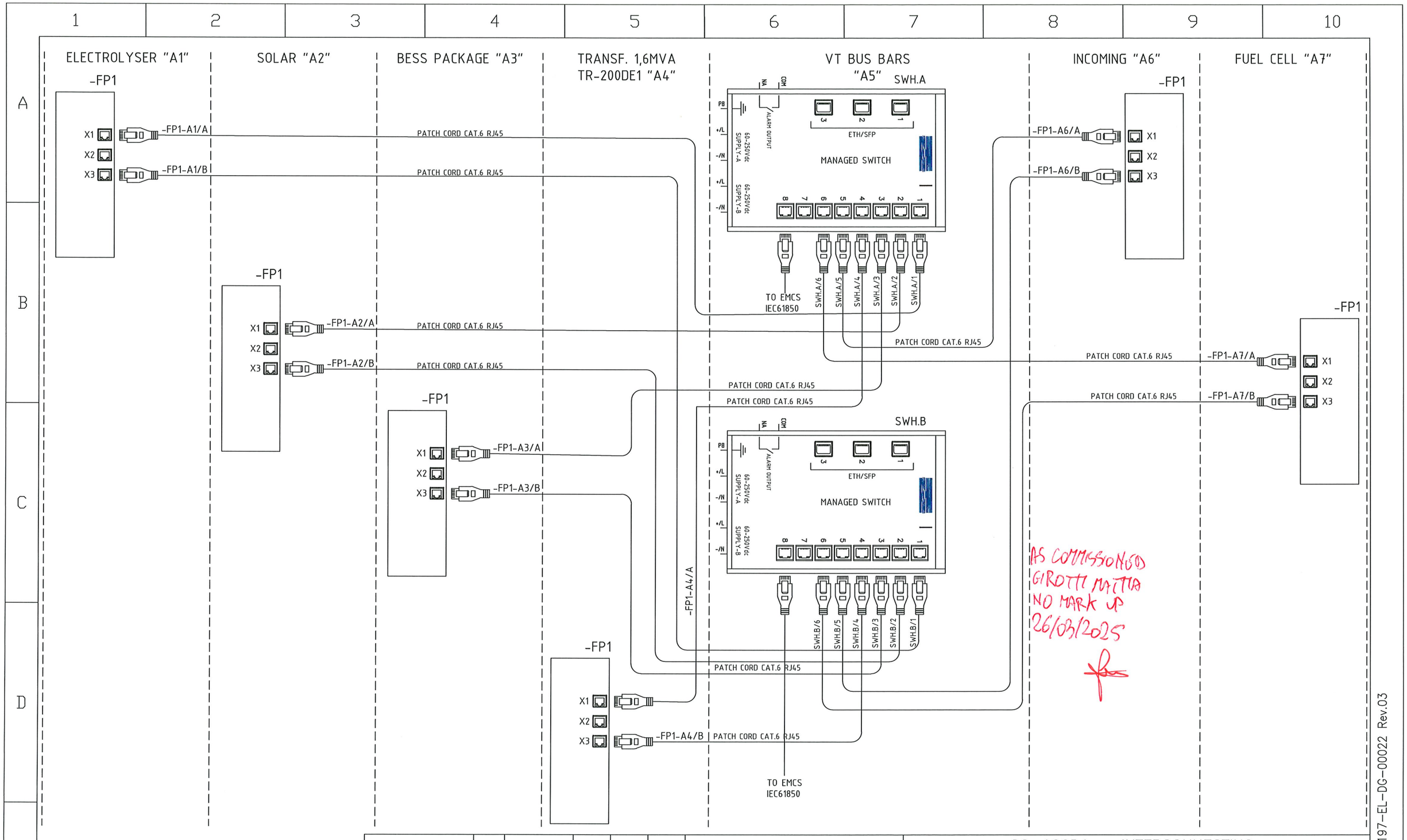
DRAWING NO. 1723002197-EL-DG-00022

SHEET 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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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

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"

-TR1

CARD 11

X0

X1

-TR1-A1/2

PATCH CORD CAT.6 RJ45

-TR1

CARD 12

X0

X1

-TR1-A2/1

-TR1-A2/2

PATCH CORD CAT.6 RJ45

-TR1

CARD 13

X0

X1

-TR1-A3/1

-TR1-A3/2

PATCH CORD CAT.6 RJ45

-TR1

CARD 14

X0

X1

-TR1-A4/1

-TR1-A4/2

PATCH CORD CAT.6 RJ45

DP1

ALARM RELAY MODULE XL
ARM XL

+V

-0V

PB

COM

Y2

Y3

Y4

Y5

MODBUS RS485

MODBUS TCP/IP

-DP1-A5/DB9

RJ45 TO DB9 ARM-XL COMM. CABLE

SW1

ABB
SWICON

PD1

PDCOM

-ETH-SW

-PD1-A5

PATCH CORD CAT.6 RJ45

SWH.C

HIRSCHMANN

ETHERNET SWITCH

ETH/SFP

SPW

to EMCS

MODBUS TCP/IP

-ETH-TR1

-ETH-SW

230VAC
SUPPLY

PATCH CORD CAT.6 RJ45

-TR1

CARD 10

X0

X1

-TR1-A5/1

-TR1-A5/2

-TR1-A6/1

-TR1-A6/2

-TR1

CARD 15

X0

X1

-TR1-A7/1

-TR1-A7/2

PATCH CORD CAT.6 RJ45

-TR1

CARD 16

X0

X1

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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)

CROSSWIND

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 A7)

FUNCTIONAL DIAGRAM

FUEL CELL FEEDER A-80000

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27/03/2025

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DWG n° :	231151/SD/19
Item n° :	PF1113279

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TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Cover

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

SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	1723002197-EL-DG-00019	1	03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

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INDEX

Sheet	Description	Revision 0	1	2	3	4	5	6	7	8
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 REX640	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 REX640	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	"REX640"' Protection Wiring	X	X	X	X					
17	"REX640"' Protection Wiring	X	X	X	X					
18	"REX640"' Protection Wiring	X	X	X	X					
19	Extherm 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	"REX640" Protection Wiring - Digital Input	X	X	X	X					
24	"REX640" Protection Wiring - Digital Input	X	X	X	X					
25	"REX640" Protection Wiring - Digital Input	X	X	X	X					
26	Emergency Opening by "SIS"	X	X	X	X					

Sheet	Description	Revision 0	1	2	3	4	5	6	7	8
27	230Vac Auxiliary General Healtly	X	X	X	X					
28	Availables Signals	X	X	X	X					
29	Terminal strip	X	X	X	X					
30	Terminal strip	X	X	X	X					
31	Terminal strip	X	X	X	X					
32	Terminal strip	X	X	X	X					
33	Terminal strip	X	X	X	X					
34	Bill of Materials	X	X	X	X					
35	Bill of Materials	X	X	X	X					
36	Bill of Materials	X	X	X	X					

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TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Sheets Index

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 2 | REV. 03

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File Name : 1723002197-EL-DG-00019 Rev.03

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

AS COMMISSIONED
MATTIA GIROTTI
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27/03/2025

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

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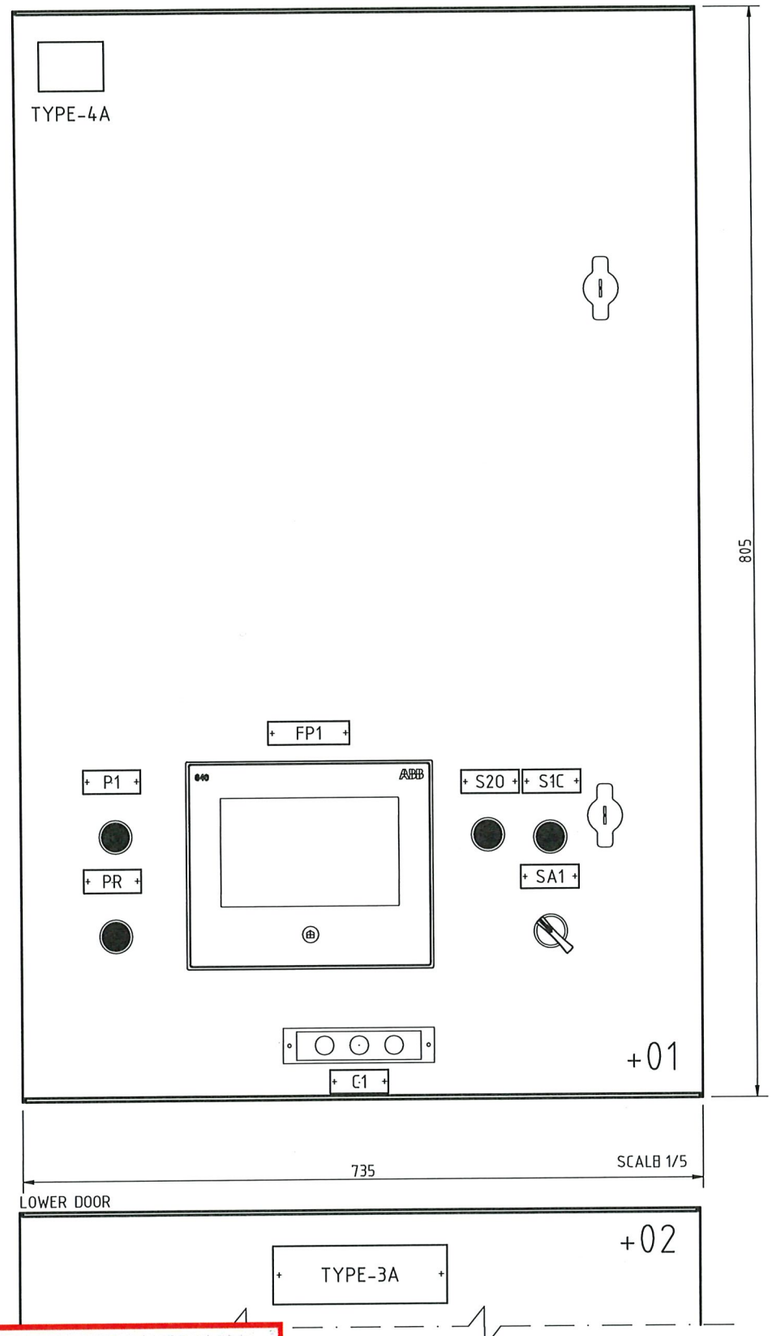
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SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000
Legend

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

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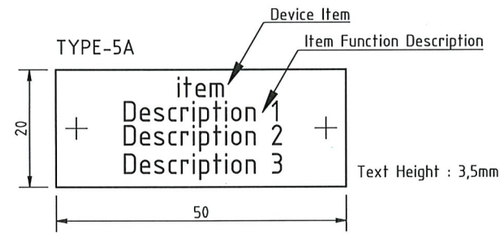
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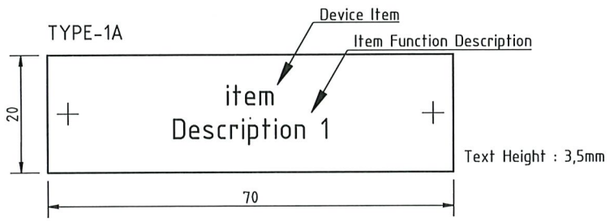
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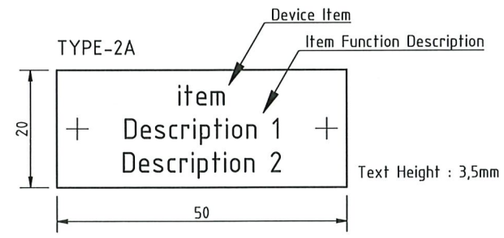


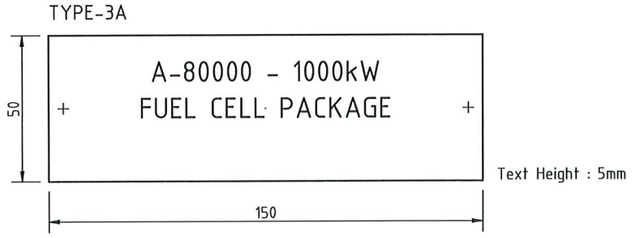
DEVICES name plate					
ITEM	COMPONENT	DESCRIPTION 1	DESCRIPTION 2	DESCRIPTION 3	NOTE
FP1	PROTECTION RELAY	PROTECTION RELAY			TYPE-1A
S2.O	PUSH BUTTON	OPEN	COMMAND	CONTACTOR	TYPE-5A
S1.C	PUSH BUTTON	CLOSE	COMMAND	CONTACTOR	TYPE-5A
SA1	SELECTOR SWITCH	LOCAL / REMOTE			TYPE-2A
PR	LIGHT PUSH BUTTON	RESET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

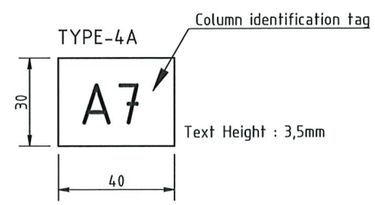
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ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n° :	231151/SD/19
Item n° :	PF1113279

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TITLE :

SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000

Door Layout

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

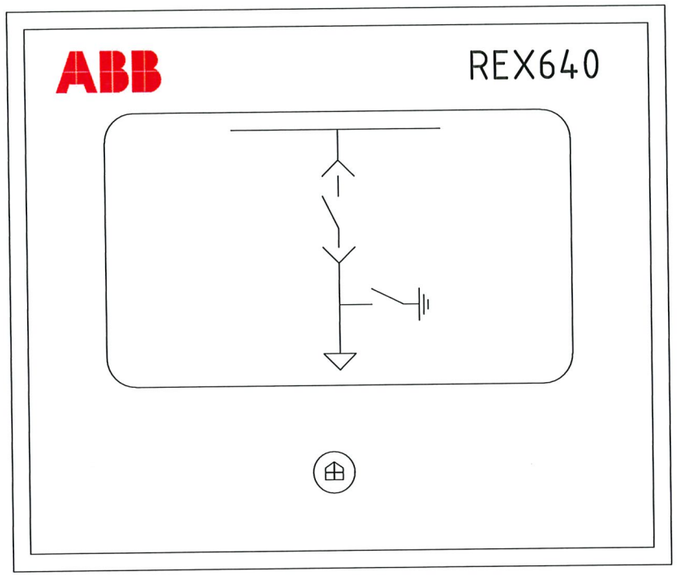
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	1723002197-EL-DG-00019	4	03

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PROTECTION DISPLAY



LHMI - TOUCH DISPLAY

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

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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				

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TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Protection Display REX640

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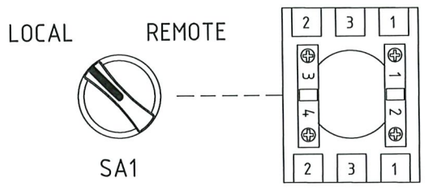
A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 5 | REV. 03

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SELECTORS SWITCH DIAGRAM

REAR VIEW



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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

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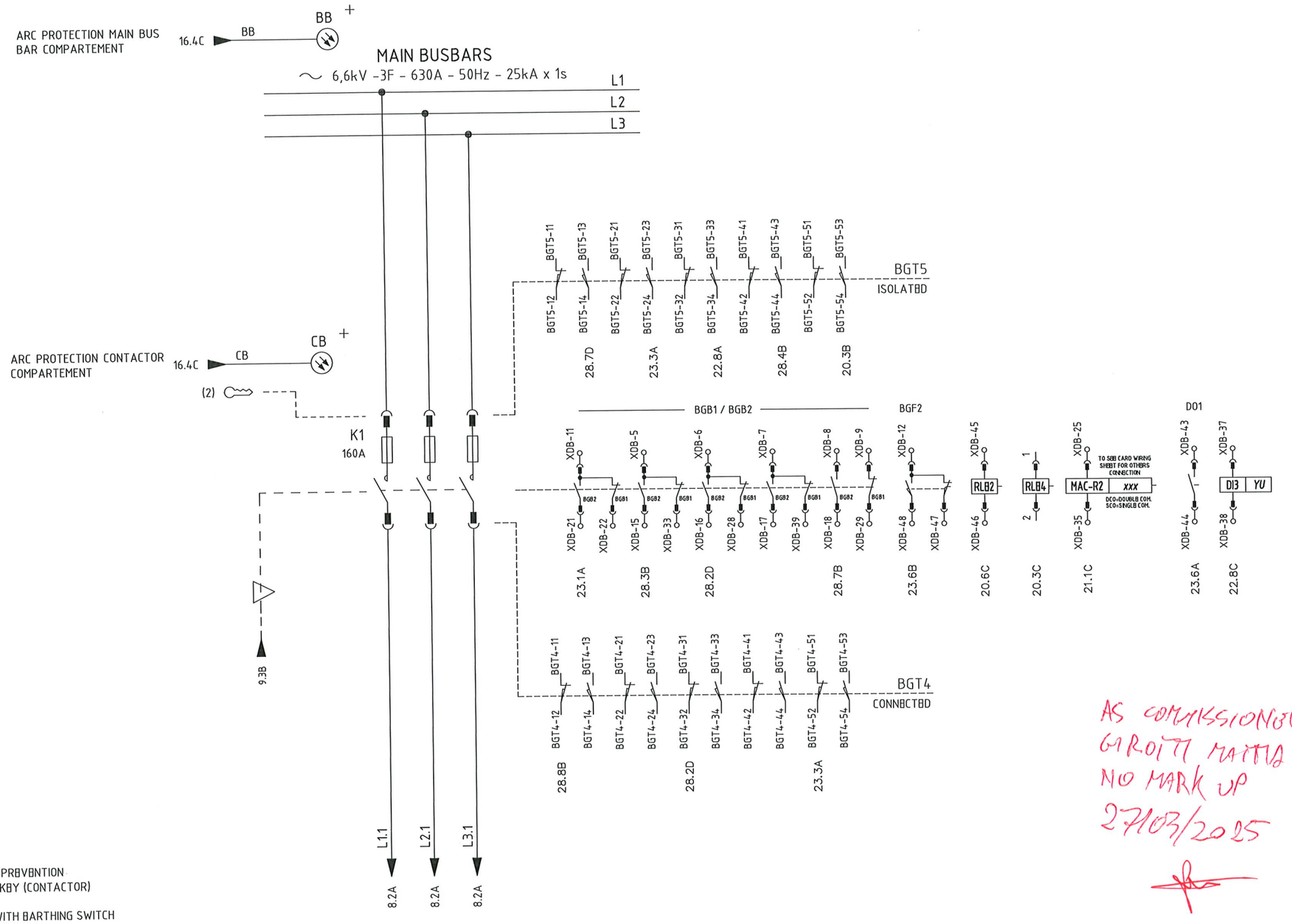
TITLE :
SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000
Selector Switch Diagram

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 6 | REV. 03

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

(3) FREE KEY WITH EARTHING SWITCH IN OPEN POSITION

(4) FREE KEY WITH EARTHING SWITCH

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3_A	18/03/25	G.Randi

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	REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Power Diagram

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

SCALE : NTS

A3

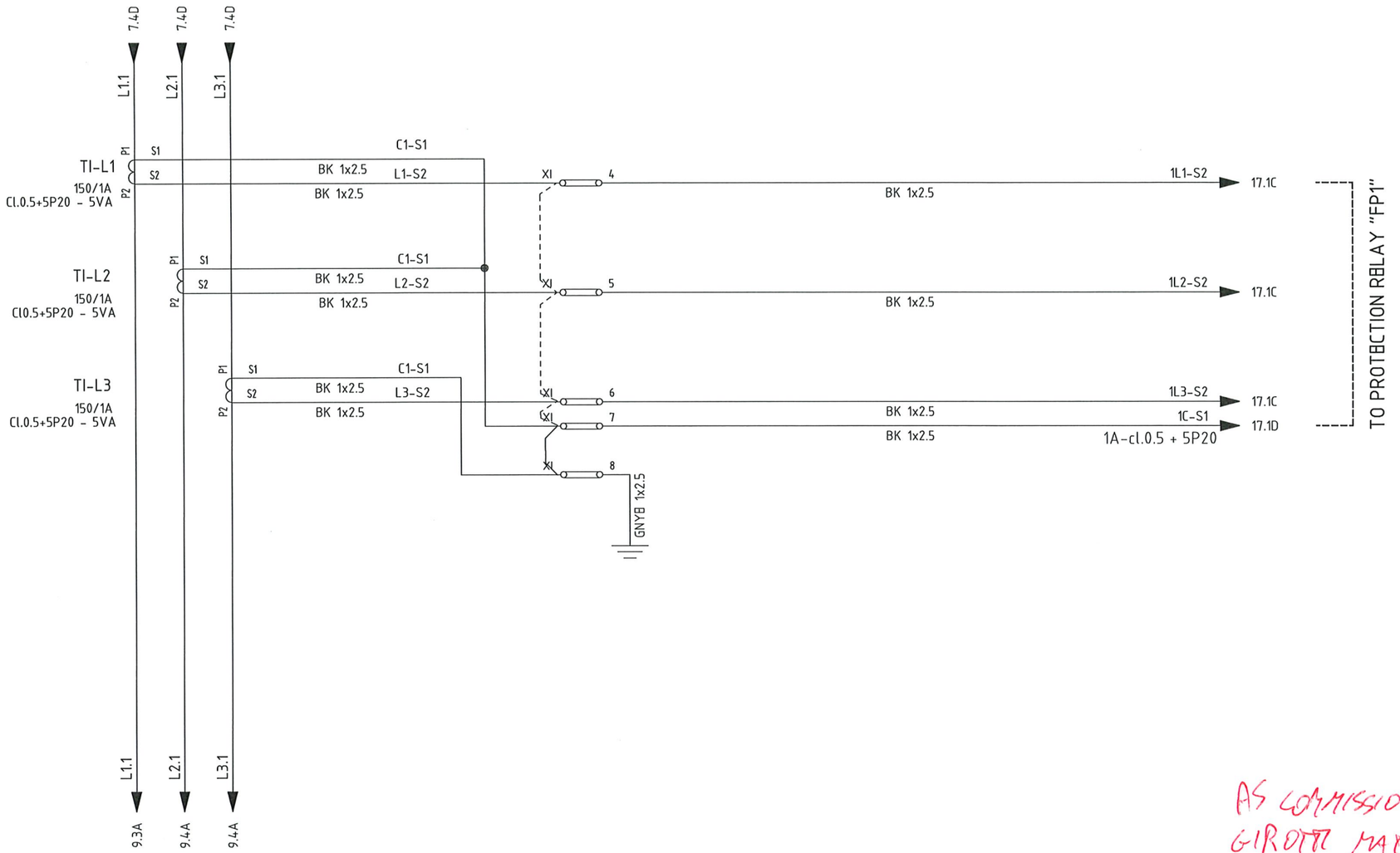
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SHEET 7

REV. 03

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0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Power Diagram

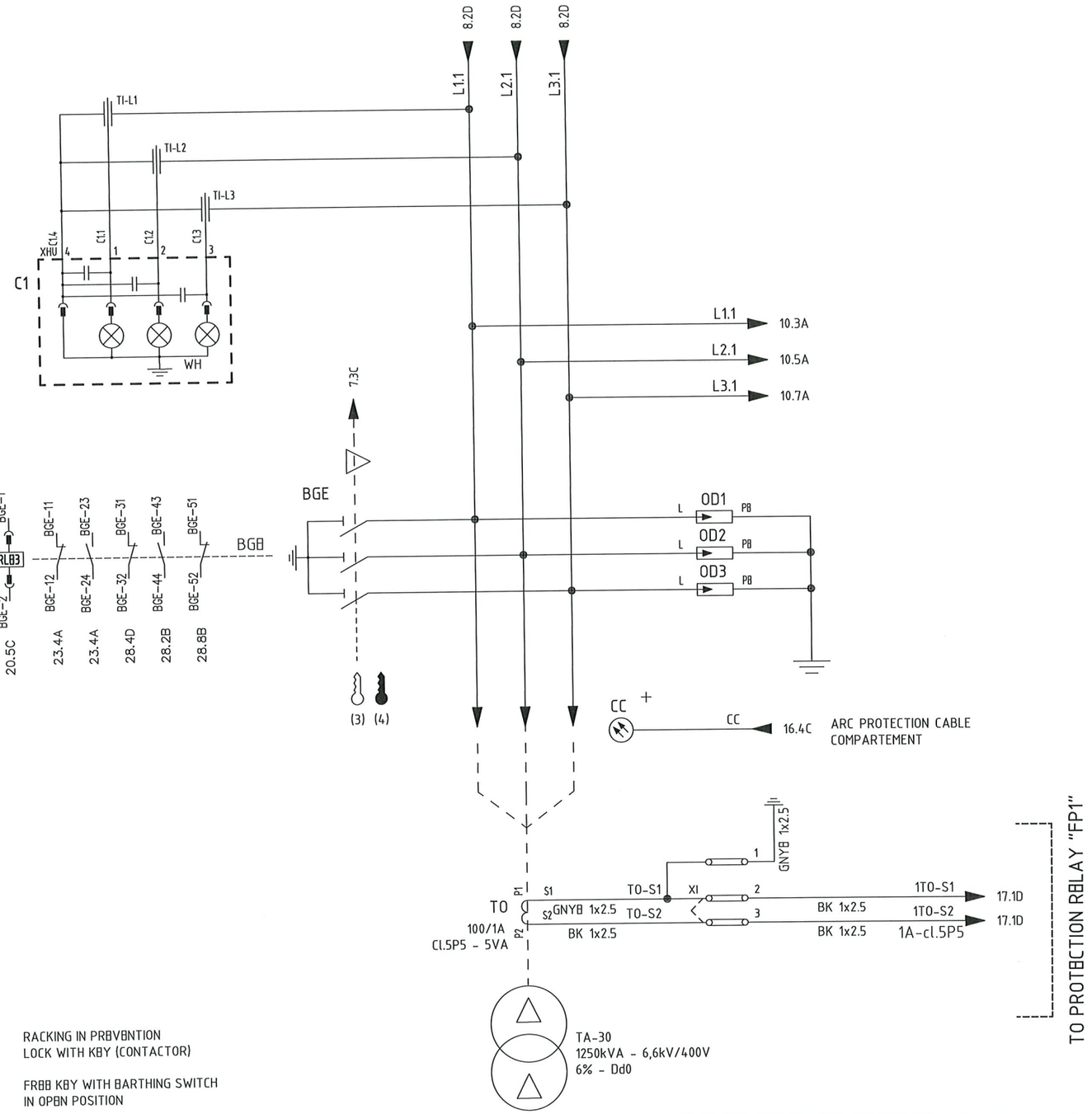
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	1723002197-EL-DG-00019	8	03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 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

AS COMMISSIONED
CIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

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

=
+A7
DWG n°: 231151/SD/19
Item n°: PF1113279

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Power Diagram

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00019

SHEET 9

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 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

FF1 2A
FF2 2A
FF3 2A

6600:r3/110:r3-110:r3-110:3
TU-L1
TU-L2
TU-L3

L1-b3
L1-a3
L1-a2
L2-a1
L3-a1
L2-b3
L3-b3
L1-a1
L2-a2
L3-a2
N
GV 1x2,5

QV1 2A
QV2 2A
QV3 2A

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

TO PROTECTION RELAY "FP1"
TO PROTECTION RELAY FP1

FUSE HEALTHY
FF1 10.3A
FF2 10.5A
FF3 10.7A

BT7 ISOLATED
BT6 CONNECTED

E8 27ohm-500W

AS COMMISSIONED
GIROTTI MATTIA
NO MARK
27/03/2025

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= +A7
DWG n°: 231151/SD/19
Item n°: PF1113279

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TITLE :
SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000
Power Diagram

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK
SCALE : NTS
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DRAWING NO. 1723002197-EL-DG-00019
SHEET 1.0
REV. 03

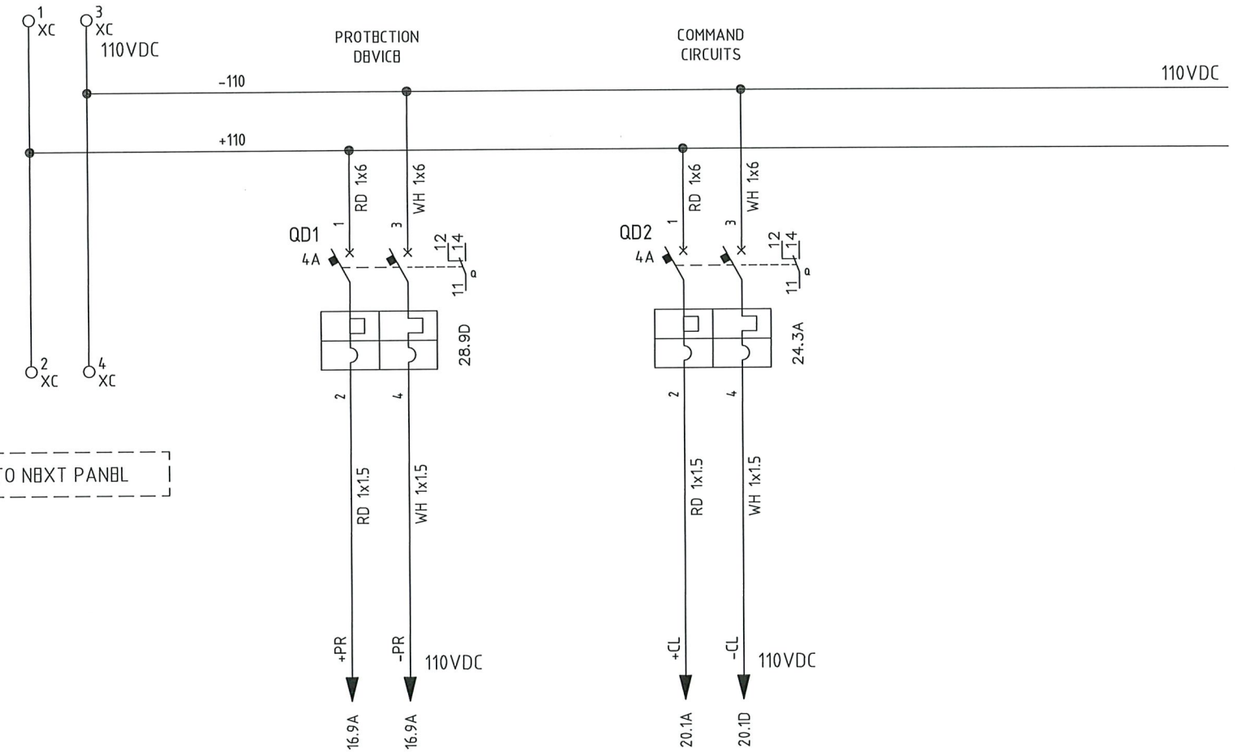
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

110VDC DISTRIBUTION VOLTAGE

110Vdc Auxiliary Voltage from Measuring Bus Bar Unit

FROM PREVIOUS PANEL

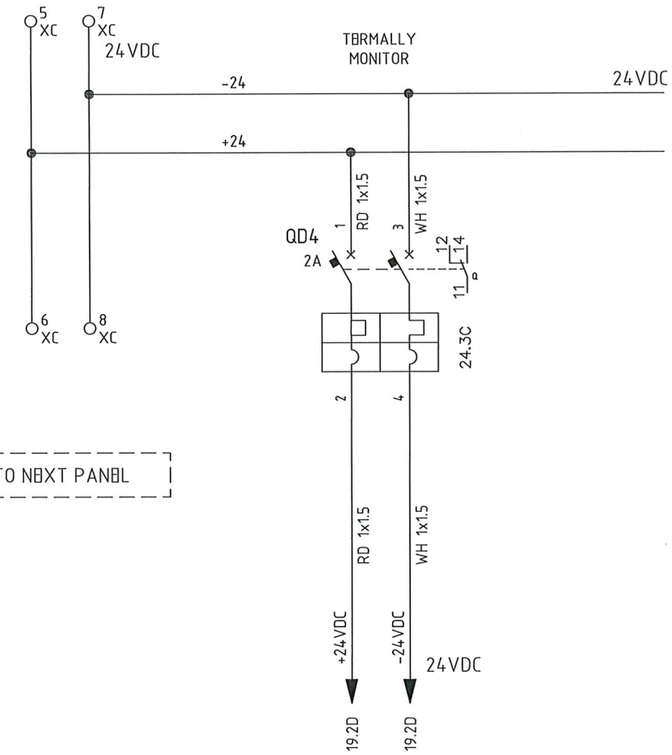


TO NEXT PANEL

24VDC DISTRIBUTION VOLTAGE

24Vdc Auxiliary Voltage from Measuring Bus Bar Unit

FROM PREVIOUS PANEL



TO NEXT PANEL

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7	
DWG n° :	231151/SD/19
Item n° :	PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :

SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000

110Vdc / 24Vdc Distribution Voltage

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

SCALE : NTS

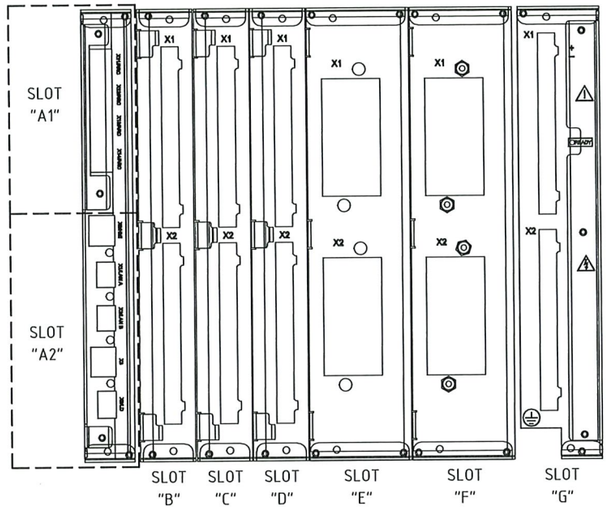
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	1723002197-EL-DG-00019	1.1	03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 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	

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7
DWG n° : 231151/SD/19
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Composition Relay REX640

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 12 | REV. 03

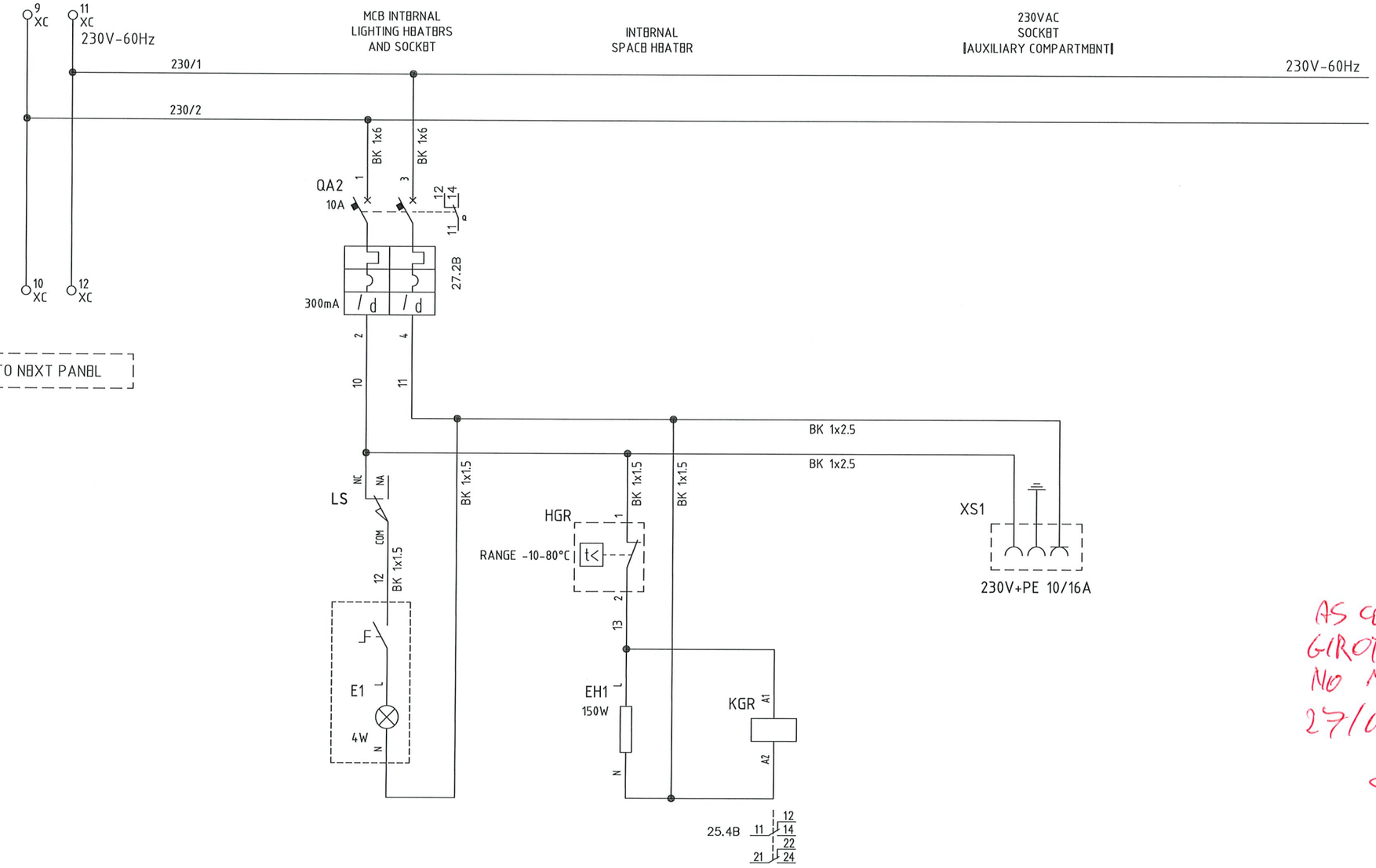
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

230VAC DISTRIBUTION VOLTAGE

230Vac Auxiliary Voltage from Measuring Bus Bar

FROM PREVIOUS PANEL



TO NEXT PANEL

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7

DWG n° : 231151/SD/19
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000
230Vac Distribution Voltage

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 13 | REV. 03

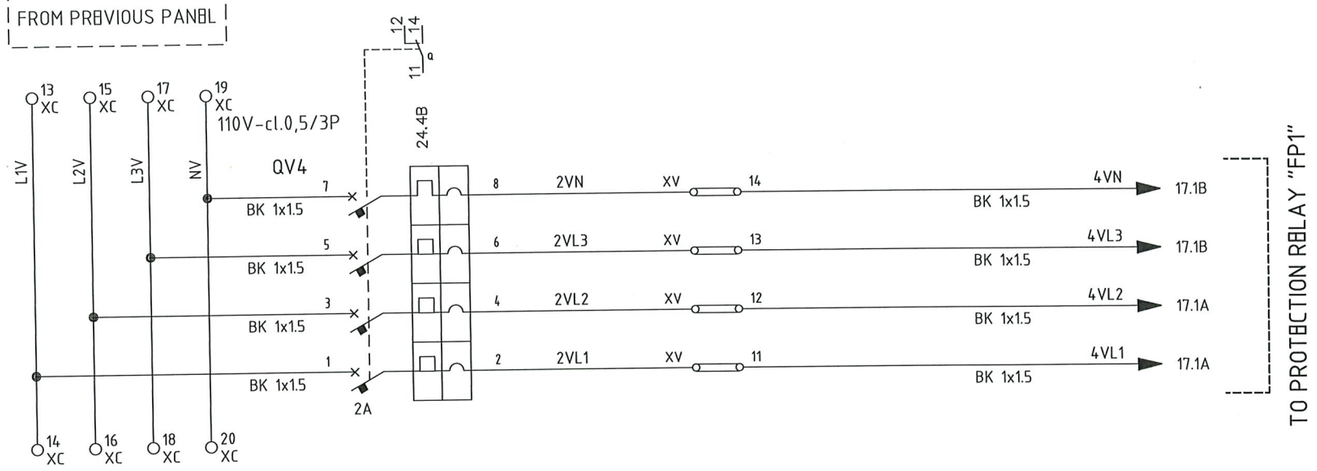
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 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

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7
DWG n°: 231151/SD/19
Item n°: PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
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-00019 | SHEET 14 | REV. 03

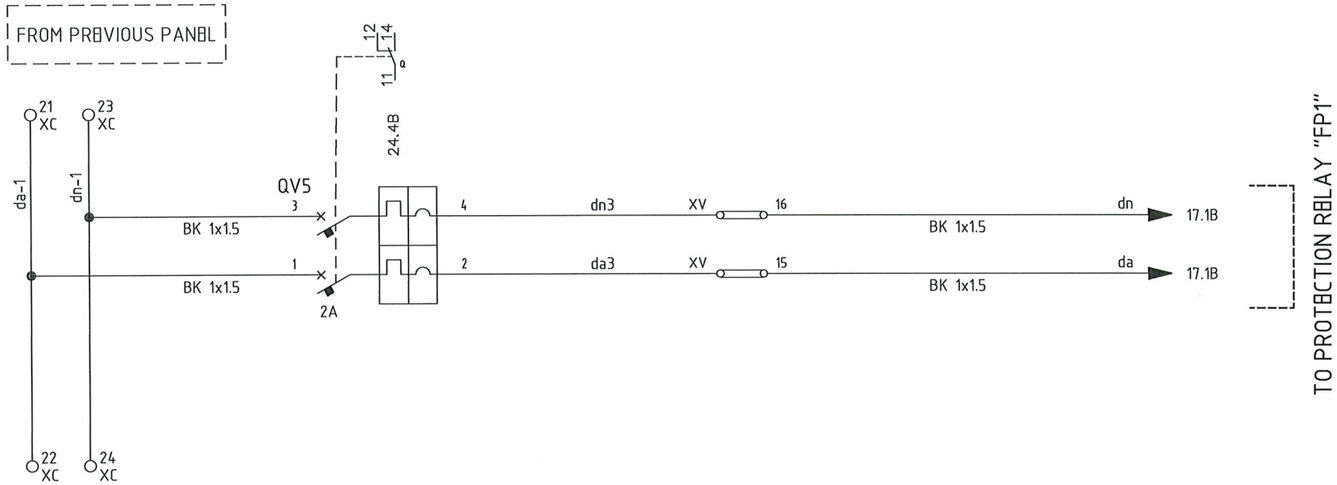
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 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

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7	
DWG n° :	231151/SD/19
Item n° :	PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
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-00019	SHEET 15	REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

"REX640" PROTECTION WIRING

FP1

PSM1003
COM1001
slot G

X1

X1-1 (+) — Uaux — X1-2 (−)

RD 1x1.5

WH 1x1.5

GND — 1x6 GNYB

11.2D +PR → +PR 23.1A
11.3D −PR → −PR 23.1D
110VDC

PROTECTION FUNCTION

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

ETH PORT (IEC61850)

X1 — PATCH CORD cat.6 RJ45 — FROM MEASURE CUBICLE A5
FP1-A7/A

X2

X3 — PATCH CORD cat.6 RJ45 — FROM MEASURE CUBICLE A5
FP1-A7/B

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	arc detectors
X12	CB	7.3B	C.B. COMPARTEMENT	
X13	CC	9.5C	CABLE COMPARTEMENT	
X14				

ABB REX640

FP1

PSM1003

RF	SO1	SO2	SSO1	SSO2	POSP1	POSP2	SO3	PODP1	PODP2	PODP3
X1-4	X1-5	X1-7	X1-8	X1-9	X1-11	X1-13	X1-15	X1-17	X2-2	X2-3
X1-3	X1-6	X1-10	X1-12	X1-14	X1-16	X1-18	X2-1	X2-5	X2-8	X2-10
22.9A	20.5C	28.4D			21.10B		20.6B	21.8B		

X2-4 TCS1 · X2-6 TCS2 · X2-7 TCS3 · X2-9 · X2-11 · X2-12 · X2-13 · X2-14 · X2-15 · X2-16 · X2-17 · X2-18

slot G — REX 640

AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
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123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7
DWG n°: 231151/SD/19
Item n°: PF1113279

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TITLE :
SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000
"REX640"' Protection Wiring

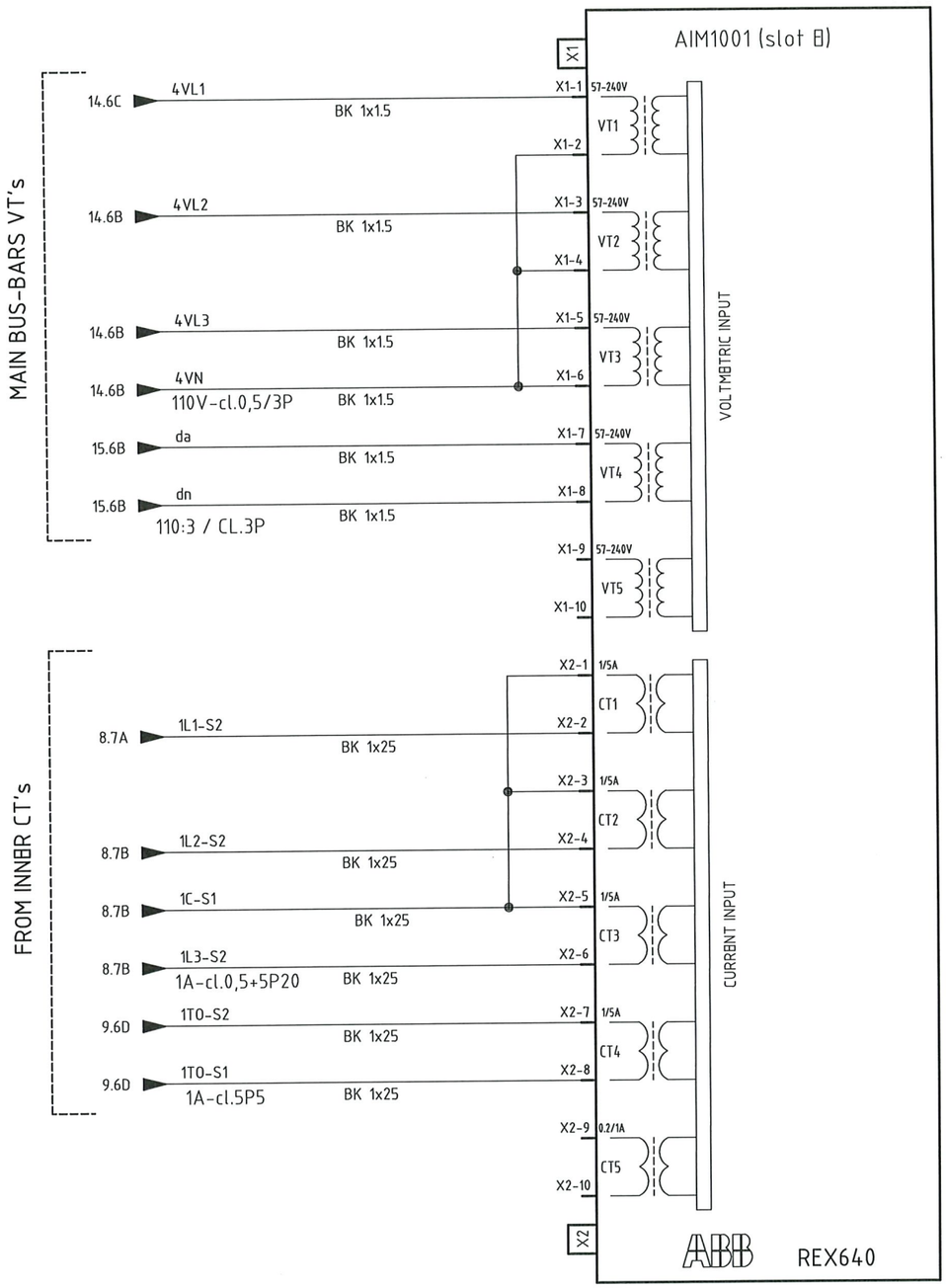
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK
SCALE : NTS

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DRAWING NO. 1723002197-EL-DG-00019
SHEET 16
REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

"REX640" PROTECTION WIRING



AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
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123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n° : 231151/SD/19
Item n° : PF1113279

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SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000
"REX640"' Protection Wiring

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00019

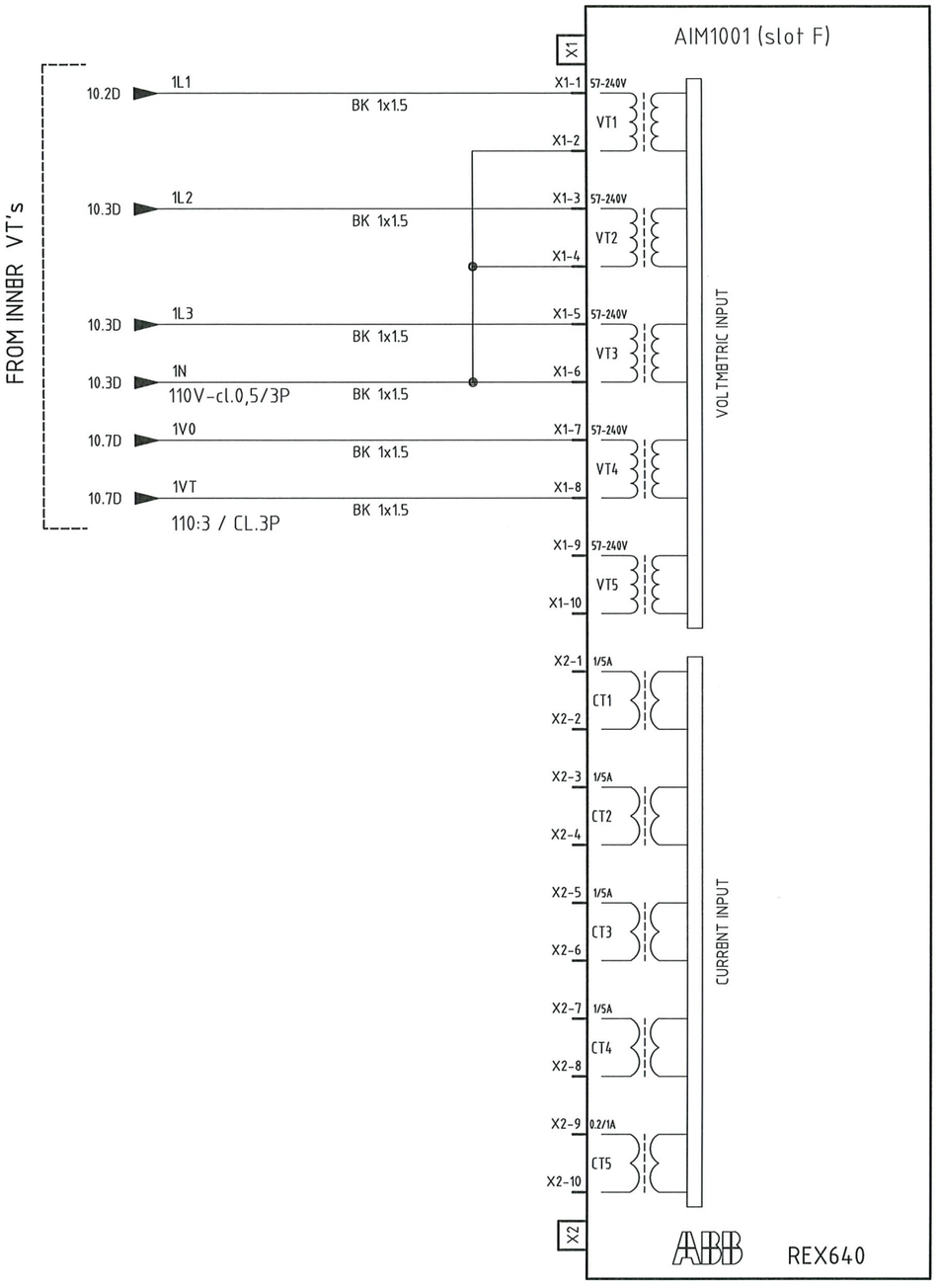
SHEET 17

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

"REX640" PROTECTION WIRING



AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

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CROSSWIND

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+A7
DWG n° : 231151/SD/19
Item n° : PF1113279

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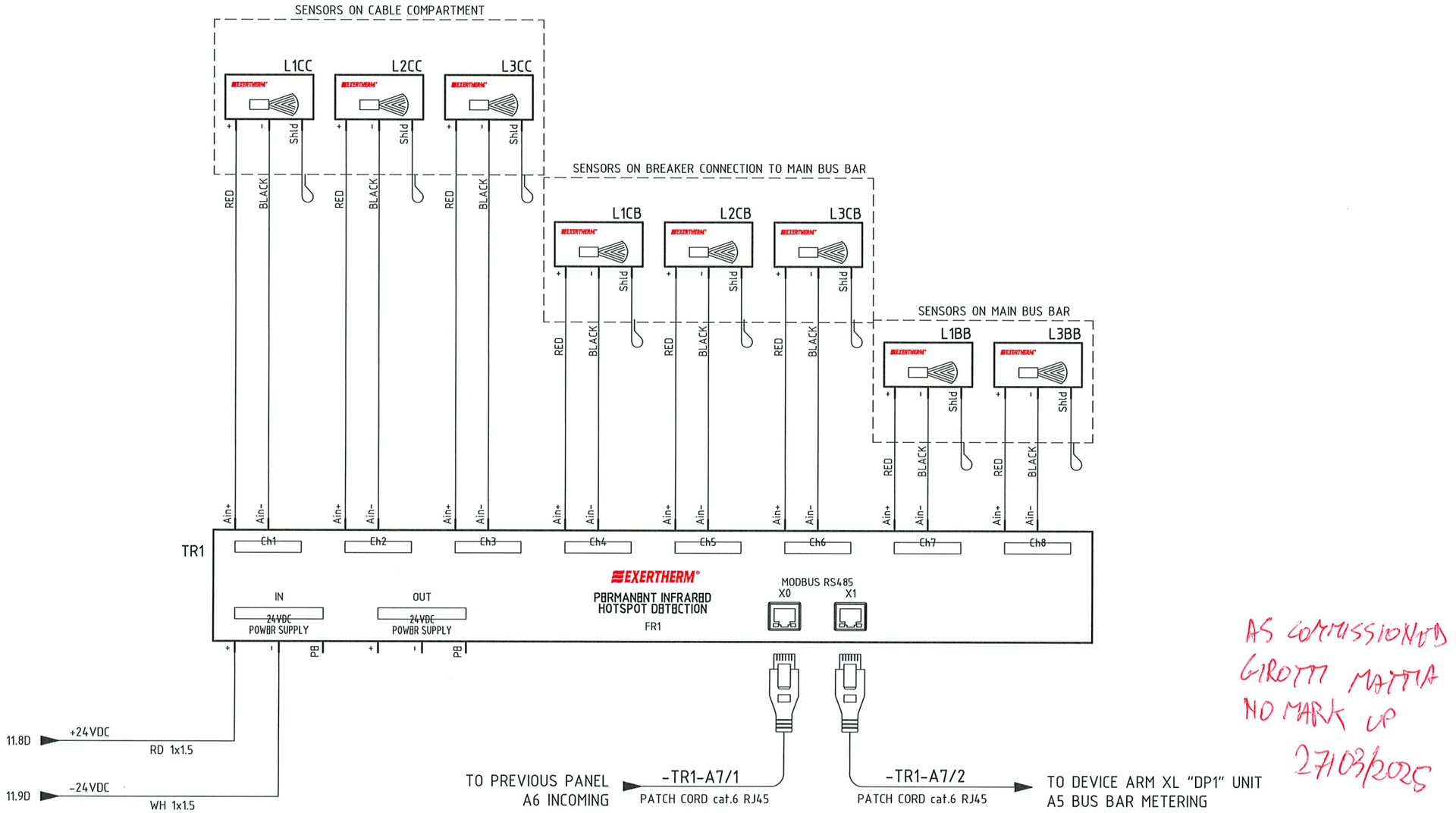
TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
"REX640"' Protection Wiring

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 18 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03



AS COMMISSIONED
GIROTTI MATTIA
NO MARK UP
27/03/2025

VALID FOR CONSTRUCTION
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123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

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0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000
Extherm Device

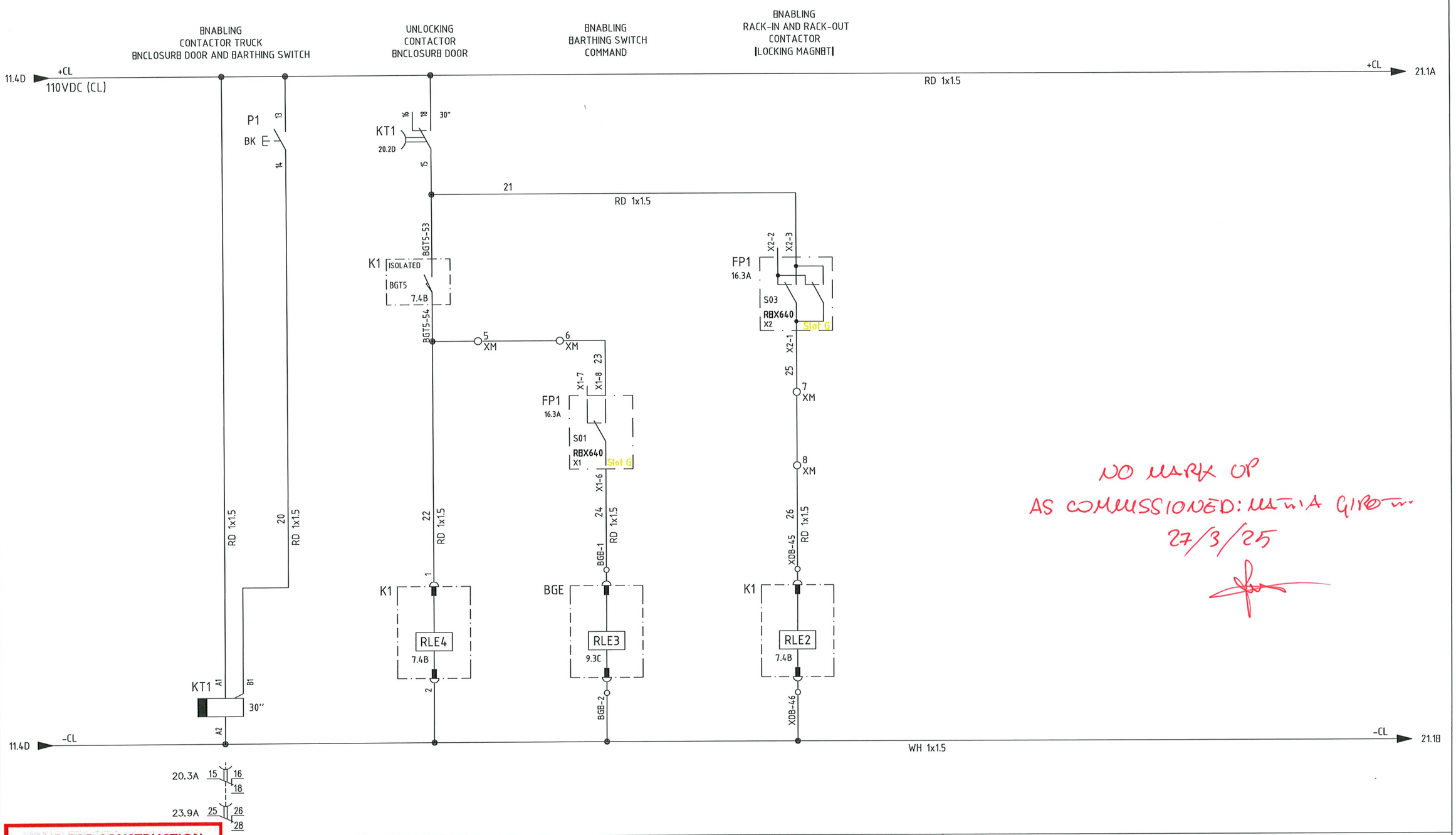
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 19 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

COMMAND CIRCUITS



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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7
DWG n° : 231151/SD/19
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 FUEL CELL FEEDER A-80000
Command Circuit

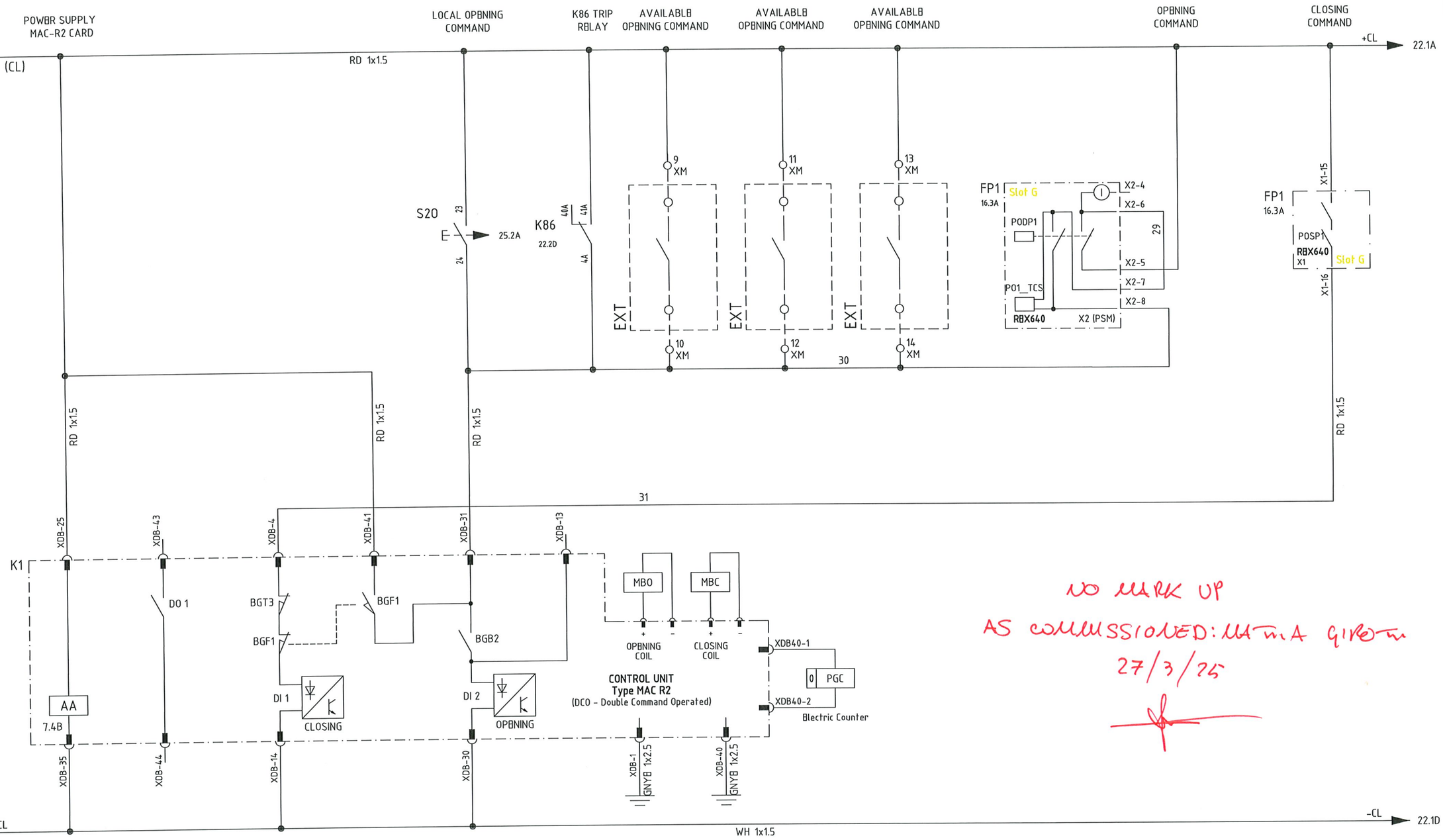
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 20 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

CLOSING/OPENING COMMAND CIRCUITS



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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7	
DWG n° :	231151/SD/19
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 FUEL CELL FEEDER A-80000
Command Circuit

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

SCALE : NTS

A3

DRAWING NO.
1723002197-EL-DG-00019

SHEET 21

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

COMMAND CIRCUITS

OUTPUT PROTECTION RELAY
AVAILABLE
AVAILABLE
TRANSFORMER TRIP WINDING TEMPERATURE
LOCAL RESET
REMOTE RESET
TRIP LOCK-OUT RELAY
CONTACTOR ISOLATED
UNDERVOLTAGE
CONTACTOR ISOLATED
WATCHDOG PROTECTION DUPLICATION
TRANFORMER TRIP WINDING TEMPERATURE

21.10A +CL 110VDC (OP)

RD 1x1.5

FP1c 23.1C X2-4 S01 RBX640 X2 Slot B X2-3 35
15 XM
17 XM
16 XM
18 XM
K94WT 22.10D 12 14 11 RD 1x1.5
PR 13 14 X1 X2 22.6D
FP1c 23.1C X2-10 S04 RBX640 X1 Slot B X2-9
K86 20B 21B 22.2D 28 1x1.5 RD 37
KSIL 26.5B 13 14 38 1x1.5 RD 19 XM 20 XM
39 1x1.5 RD
KIRF 22.9D 22 24 21 40 1x1.5 RD
K86 22.2D 10B 11B 18 XDB-37
K1 DI 3 7.4B UNDERVOLTAGE XDB-38
K1 ISOLATED BGT5 7.4B BGT5-33 BGT5-34 41 1x1.5 RD
FP1 16.3A X1-4 X1-5 RF RBX640 X1 Slot G X1-3 42 1x1.5 RD
21 XM 26WT 22 XM 43 1x1.5 RD
+CL /.//

K86 B1 C S B2 C RESET 1

21.10B -CL WH 1x1.5 -CL /.//

PR 22.4A X1 X2

KIRF A1 A2
K94WT A1 A2

20A
2A 21A
30A
3A 31A
40A
21.5B 4A 41A
10B
22.8B 1B 11B
20B
22.6B 2B 21B
30B
23.5A 3B 31B
40B
28.5B 4B 41B

28.9D 12 11 14
22.7A 21 22 24
32
31 34
42
41 44

22.4A 12 11 14
24.10B 21 22 24
32
31 34
42
41 44

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

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

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)

=
+A7
DWG n°: 231151/SD/19
Item n°: PF1113279

IMESA ELECTRICAL ENGINEERING
CROSSWIND
ROSETTI MARINO

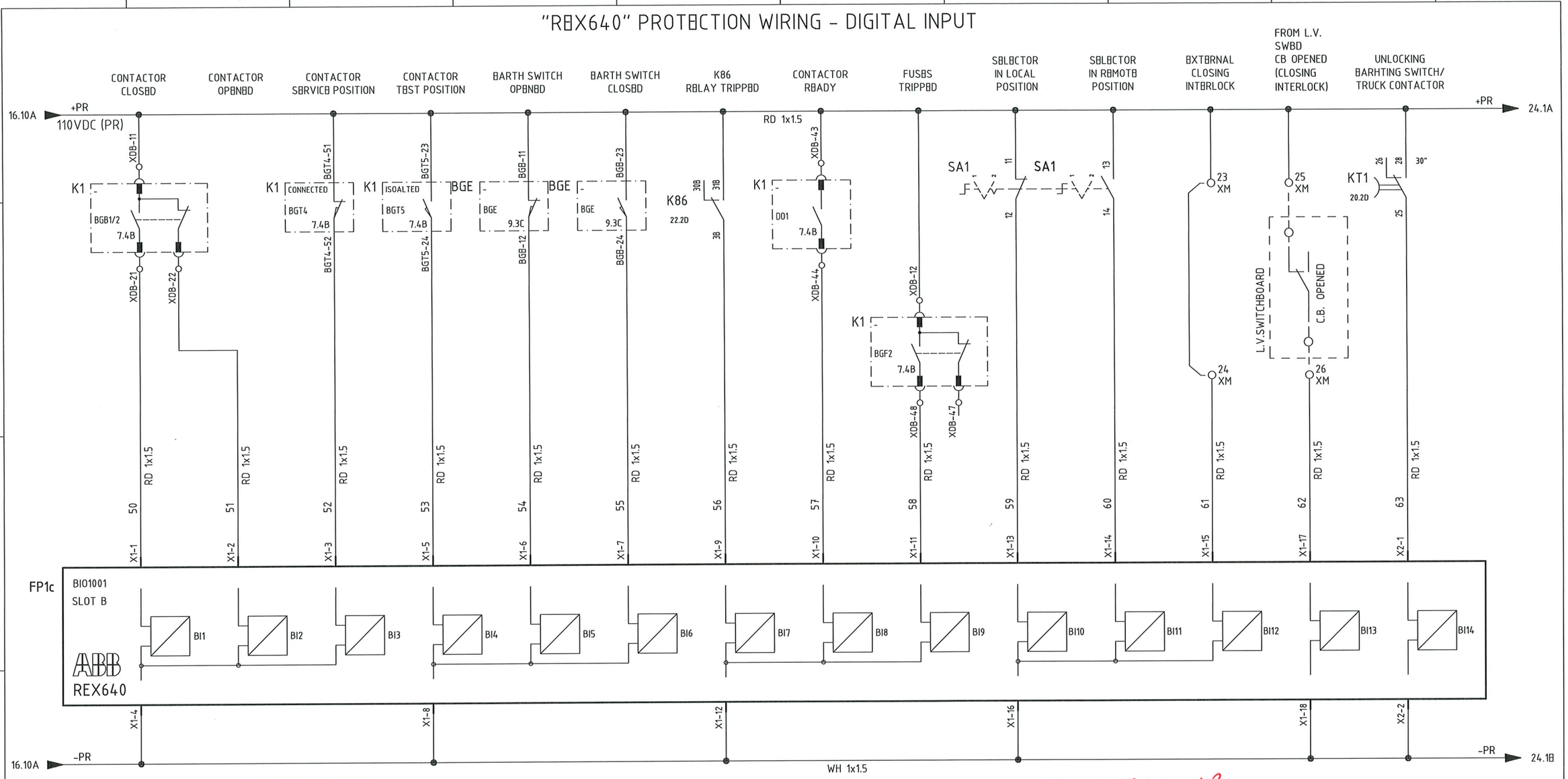
TITLE :
SG-100D1 – FUNCTIONAL FUEL CELL FEEDER A-80000
Command Circuit

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK
SCALE : NTS
A3
DRAWING NO. 1723002197-EL-DG-00019
SHEET 22
REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

"REX640" PROTECTION WIRING - DIGITAL INPUT



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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7	
DWG n° :	231151/SD/19
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 FUEL CELL FEEDER A-80000
"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-00019 | SHEET 23 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

DO MARK UP AS COMMISSIONED: MMS GIROTTI 27/3/25

"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 | FROM MEASURE UNIT A5: CLOSED AUXILIARY CIRCUIT MCB's | VT HEALTY CIRCUIT | UPS 110VDC SUPPLY A "ON" | UPS 110VDC SUPPLY B "ON" | 230VAC SUPPLY "ON" | 24VDC SUPPLY "ON" | SPACE HEATER ON | TRANSFORMER ALARM WINDING TEMPERATURE | TRANSFORMER TRIP WINDING TEMPERATURE

+PR 110VDC (PR) 23.10A → 25.1A +PR

RD 1x1.5

KSIL 26.5B

QV1 10.2C

QV2 10.4C

QV3 10.7C

PTT 10.2A

10.9C 5

10.9C 6

QD2 11.4B

QD4 11.8B

QV5 15.2B

QV4 14.2C

QD5

QD6

QD21

QD22

QV1

QV2

FF1

FF2

FF3

PTT

KA1

KN1

KN2

K230

KA2

KGR

26WT

K94WT 22.10D

FP1d

BIO1001

SLOT C

ABB REX640

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

-PR 23.10D → -PR 25.1D

WH 1x1.5

VALID FOR CONSTRUCTION

VENDOR DOCUMENT - FDL DWG: 123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7

DWG n°: 231151/SD/19

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 FUEL CELL FEEDER A-80000

"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-00019

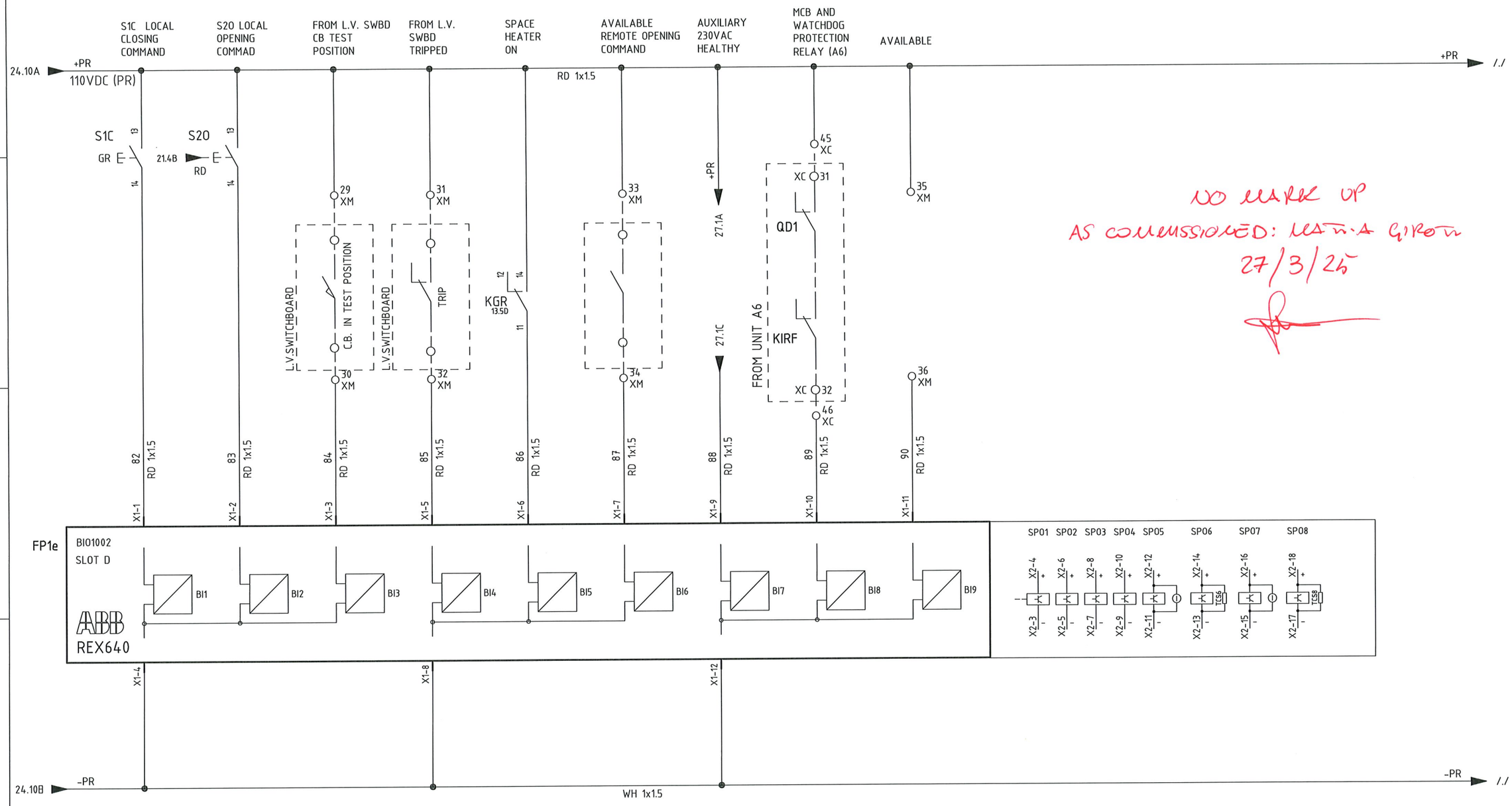
SHEET 24

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

"REX640" PROTECTION WIRING - DIGITAL INPUT



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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7	
DWG n° :	231151/SD/19
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)
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0	04/04/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)

TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
"REX640" Protection Wiring - Digital Input

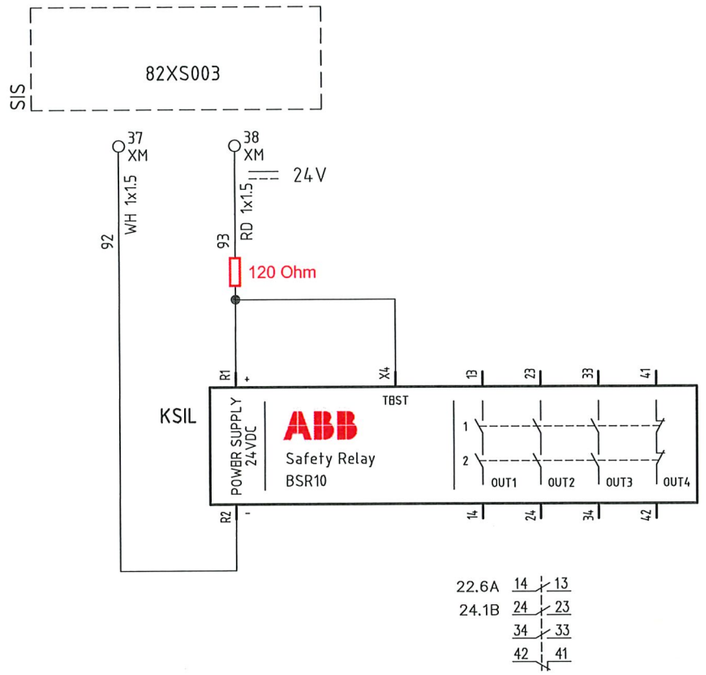
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 25 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

EMERGENCY OPENING BY "SIS"



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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7	
DWG n° :	231151/SD/19
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)

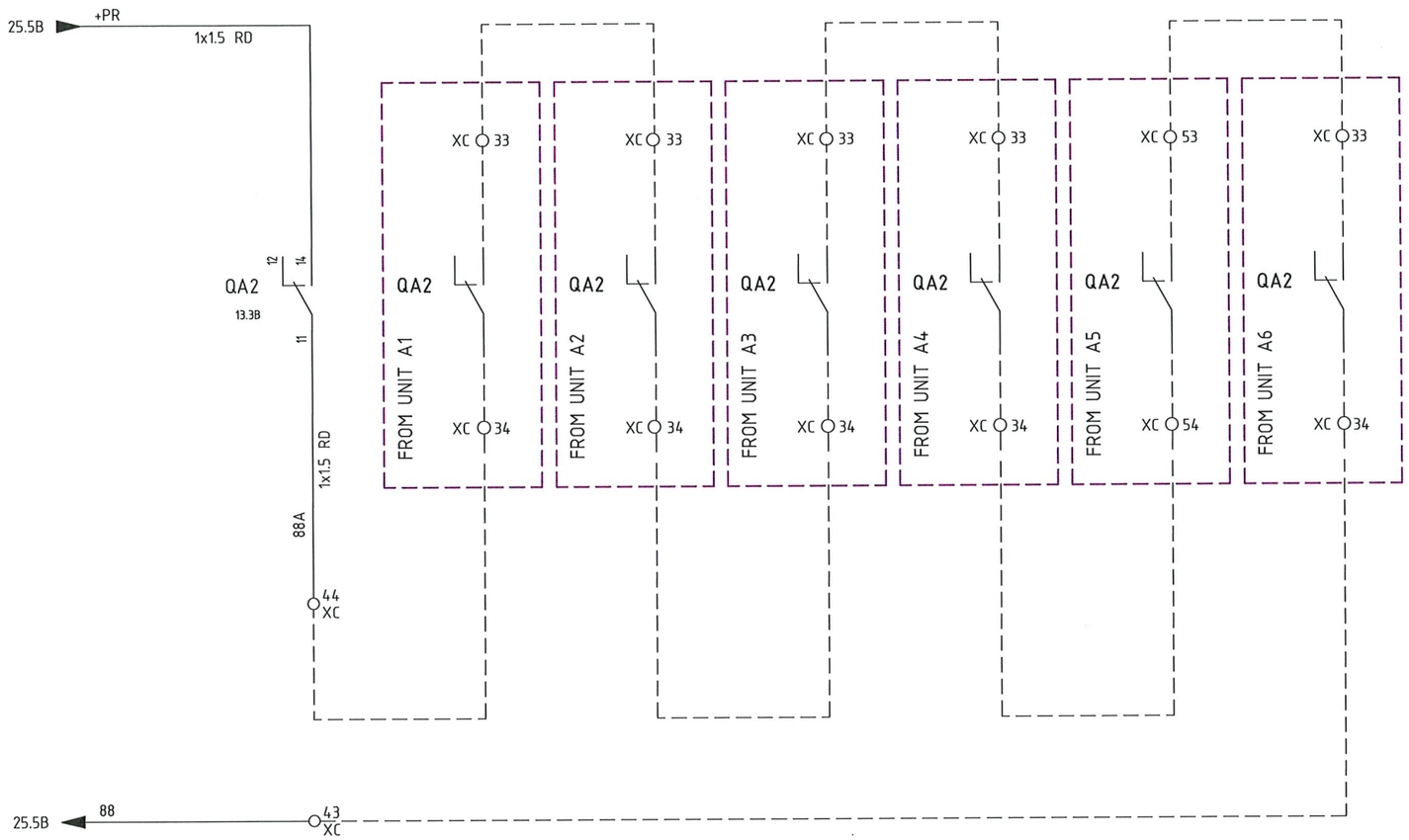
TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Emergency Opening by "SIS"

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 26 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03



NO MARK UP

AS COMMISSIONED: MATHIA GIRZI

27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7

DWG n° : 231151/SD/19
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 FUEL CELL FEEDER A-80000
230Vac Auxiliary General Healtly

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00019

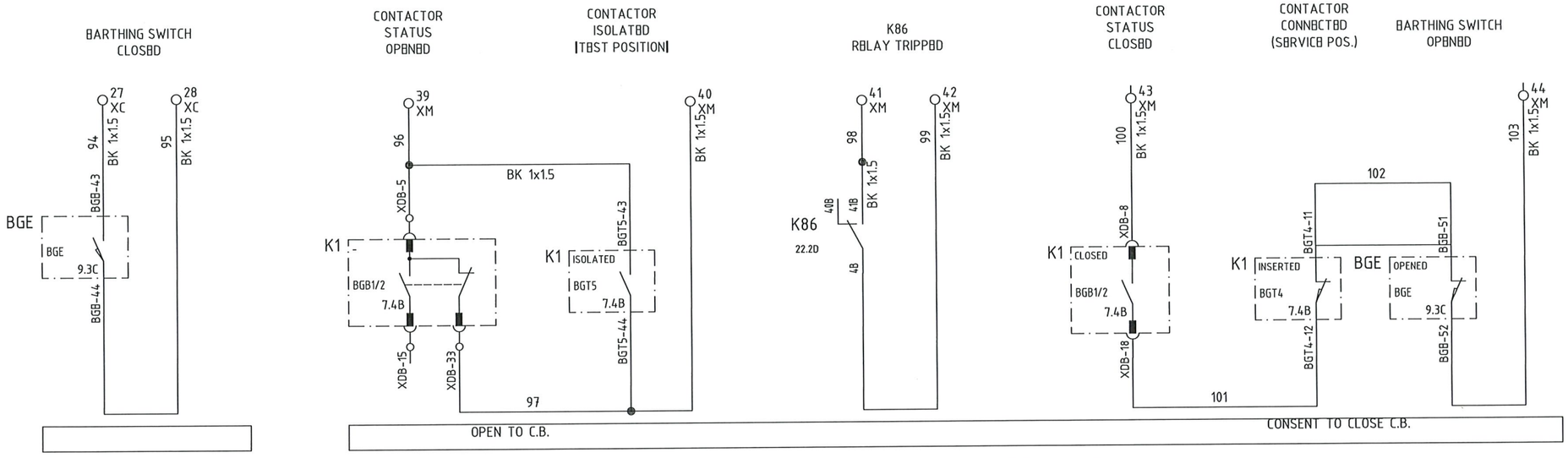
SHEET 27

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

AVAILABLE SIGNALS



No MARK UP

AS COMMISSIONED: MATWA GIRTZ

27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+A7	
DWG n° :	231151/SD/19
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 FUEL CELL FEEDER A-80000
Availables Signals

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 28 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

TYP – FUBL
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 – FUBL
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: NATWA GIROL

27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019
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/19
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 FUEL CELL FEEDER A-80000
Terminal strip

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 29 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

TYP - FUBL

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	28.2A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
28	28.2A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
29	24.5A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
30	24.5C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
31	24.5A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
32	24.5C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
33	24.6A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
34	24.6B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
35	24.7A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
36	24.6B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type

NO MARK UP

AS COMMISSIONED: MATTIA GIBZI

27/3/25

VALID FOR CONSTRUCTION

VENDOR DOCUMENT - FDL DWG:

123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

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+A7

DWG n° : 231151/SD/19

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)

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE :

SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000

Terminal strip

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00019

SHEET 30

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

TYP - FUBL

XC

Interconnection Terminals

NumM	Fg.	Sez.	Tipo	Costruttore	Descrizione
37	24.7A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
38	24.7B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
39	24.8A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
40	24.8B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
41	24.8A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
42	24.8B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
43	27.2C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
44	27.2C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
45	25.6A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
46	25.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
47	28.9C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
48	28.10C	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: NATHA GIBZ

27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n° :	231151/SD/19
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 FUEL CELL FEEDER A-80000

Terminal strip

CONTRACT NO./TITLE	CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK	SCALE : NTS	
A3	DRAWING NO. 1723002197-EL-DG-00019	SHEET 31	REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

TYP - FUBL

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
			HM251GR	Cabur	HMT.4/PT/GR End section - Grey
4	10.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
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	21.5B	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	21.6B	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	21.7B	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	22.6B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
20	22.6B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
21	22.10A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
22	22.10B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
23	23.8A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
24	23.8B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
25	23.9A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
26	23.9B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
27	24.9A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
28	24.9B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
29	25.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
30	25.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
31	25.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
32	25.3B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
33	25.4B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
34	25.4B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
35	25.6B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
36	25.6B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
37	26.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
38	26.5B	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
39	28.3A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
40	28.5A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type

NO MARK UP

AS COMMISSIONED: MATTIA GIOTTI

27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019
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/19
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 FUEL CELL FEEDER A-80000
Terminal strip

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 32 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

TYP - FUBL

XM

Interface Terminals

NumM	Fg.	Sez.	Tipo	Costruttore	Descrizione
41	28.5A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
42	28.6A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
43	28.7A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
44	28.9A	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
45	28.2C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
46	28.2C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
47	28.2C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
48	28.3C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
49	28.4C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
50	28.4C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
51	28.4C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
52	28.5C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
53	28.5C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
54	28.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
55	28.6C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
56	28.7C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
57	28.7C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
58	28.8C	4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
59		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
60		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
61		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
62		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
63		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
64		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
65		4	HM250GR	Cabur	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type
66		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
			HM251GR	Cabur	HMT.4/PT/GR End section - Grey

NO MARK UP

AS COMMISSIONED: MATRIA GIBZ:

27/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019
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/19
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 FUEL CELL FEEDER A-80000
Terminal strip

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 33 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

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	A7	FUEL CELL FEEDER A-80000
BGE	9	1VCF599700R0131	1	EARTHING SWITCH ST-E 17.31 150	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599505R0001	1	5 AUX CONTACTS FOR EARTHING SWITCH	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599504R0063	1	KEY LOCKS ON EARTHING SWITCH	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599700R0290	1	EARTHING SWITCH OPERATING LEVER	ABB	A7	FUEL CELL FEEDER A-80000
C1	9	43931118	1	VPIS 3,3÷36KV - DEVICE SIGNALLING VOLTAGE PRESENT KIT	ELECTRONSYSTEM	A7	FUEL CELL FEEDER A-80000
CB	7	1VCF698000R0012	1	OPTICAL FIBER CABLE PRE-MANUFACT. LENS L=5M	ABB	A7	FUEL CELL FEEDER A-80000
CC	9	1VCF698000R0012	1	OPTICAL FIBER CABLE PRE-MANUFACT. LENS L=5M	ABB	A7	FUEL CELL FEEDER A-80000
E1	13	74041	1	LED LAMP 4W 4000K 313x30x22	Beghelli	A7	FUEL CELL FEEDER A-80000
E8	10	1VCF501000R0001	1	RESISTOR TR318 27R/J 27ohm 500W L=2,5M	ABB	A7	FUEL CELL FEEDER A-80000
EH1	13	R1R150230	1	SPACE HEATER SKR 150W ALIM. 220VCA	Torresan	A7	FUEL CELL FEEDER A-80000
FF1	10	1YMB751209M1502	1	FUSE-LINKS FOR VOLTAGE TRANSFORMER PROTECTION 6/12kV 2A 192x53mm - CEF-VT	ABB	A7	FUEL CELL FEEDER A-80000
FF2	10	1YMB751209M1502	1	FUSE-LINKS FOR VOLTAGE TRANSFORMER PROTECTION 6/12kV 2A 192x53mm - CEF-VT	ABB	A7	FUEL CELL FEEDER A-80000
FF3	10	1YMB751209M1502	1	FUSE-LINKS FOR VOLTAGE TRANSFORMER PROTECTION 6/12kV 2A 192x53mm - CEF-VT	ABB	A7	FUEL CELL FEEDER A-80000
FP1	16	1VCF698331R0001	1	REX640B10NN+AIM1+AIM1+ARC1+BIO1+BIO1+BI+O2+CMP2+COM1+LNG1+MCT1+PCL4+PSM3+SCT	ABB	A7	FUEL CELL FEEDER A-80000
HGR	13	TRT-10A230V-NC	1	Regolable Thermostat -10÷80°C 1NC IP20 DIN Mounting	Fandis	A7	FUEL CELL FEEDER A-80000
K1	7	1VCF305661R3200	1	VACUUM CONTACTOR VSC7/P 3P 7,2KV 400A DOUBLE COMMAND (DCO)	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309500R3881	1	VACUUM CONTACTOR FITTED FOR DIN E=442mm FUSES	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309500R0882	1	NAMEPLATE IN ENGLISH LANGUAGE	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309500R1881	1	VACUUM CONTACTOR FOR UNIGEAR/UNISEC	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309503R0881	1	MAC-R2 ELECTRONIC CONTROL MODULE TYPE STANDARD	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309503R1881	1	VACUUM CONTACTOR CONFORMS TO THE IRC 62271-106 STANDARDS	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309588R0909	1	POWER SUPPLY VOLTAGE OF MAC-R2 ELECTRONIC CONTROL MODULE 110VDC	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309500R0100	1	OPERATIONS COUNTER FOR VSC/P VERSIONE FOR SHIPPINGS REGISTERS VERSION	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF349700R0407	1	MECHANICAL INTERLOCK WITH DOOR	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF339700R0291	1	POSITION CONTACTS FOR VD4	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF339700R1909	1	LOCKING MAGNET ON THE TRUCK 110Vdc (RLE2)	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309503R0251	1	KIT FOR FUSES DIAMETER 87mm	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF309500R0192	1	LIFTING TOOL FOR SHIPPINGS REGISTERS VERSION	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF597111R0140	1	POWER CUBE PB1/E L600 12kV 400A 31.5KA 3S	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599700R0882	1	NAMEPLATE IN ENGLISH LANGUAGE FOR POWERCUBE	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599700R5886	1	PB FOR VSC	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599700R4882	1	PAINTED DOOR	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599504R0042	1	LOCK TO PREVENT RACKING-IN WITH EARTHING SWITCH	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599700R0162	1	58 POLES CONNECTOR + ATOXIC WIRING L=0.8mt	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599505R0111	1	FAIL-SAFE SHUTTER ELEMENTS	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF579700R0909	1	ELECTROMECHANICAL ISOLATING INTERLOCK CIRCUIT-BREAKER/DOOR 110Vdc (RLE4)	ABB	A7	FUEL CELL FEEDER A-80000
		1VCF599700R0280	1	INTERLOCK FOR DOOR EARTHING SWITCH	ABB	A7	FUEL CELL FEEDER A-80000
		1YMB711238M4812	1	BACK UP CURRENT LIMITING FUSE LINK 6/12kV 160A 442x65mm - CEF	ABB	A7	FUEL CELL FEEDER A-80000
K86	22	RMBE13-C110T	1	BISTABLE RELAY 110VDC 7SC-5A TROP.	Amra	A7	FUEL CELL FEEDER A-80000
		PAVM321	1	SOCKET WITH SCREW TO RELAY TYPE PAVM321	Amra	A7	FUEL CELL FEEDER A-80000
K94WT	22	ER 589 2	1	CR-M110DC4L SUPPLY 110VDC 4C/O 250V/6A LED	ABB	A7	FUEL CELL FEEDER A-80000
		ER 686 6	1	CR-M4SS SOCKET STANDARD X 2/4 C/O(CR-M)	ABB	A7	FUEL CELL FEEDER A-80000
		ER 728 6	1	CR-MH1 METAL RETAINING JUMPER	ABB	A7	FUEL CELL FEEDER A-80000

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27/3/25

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VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n°: 231151/SD/19

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)
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TITLE :

SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000

Bill of Materials

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00019

SHEET 3.4

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

Nome/Item	Fg/Sh	Tipo/Type	Q.tà	Descrizione/Description	Costruttore/Manufacturer	Ubicazione (descrizione)	Quadro (descrizione)
KGR	13	⊟R 686 6	1	CR-M4SS SOCK⊟T STANDARD X 2/4 C/O(CR-M)	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		⊟R 728 6	1	CR-MH1 M⊟TAL R⊟TAINING JUMP⊟R	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		⊟R 552 0	1	CR-M230AC2L SUPPLY 230VAC 2C/O 250V/6A L⊟D	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
KIRF	22	⊟R 589 2	1	CR-M110DC4L SUPPLY 110VDC 4C/O 250V/6A L⊟D	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		⊟R 686 6	1	CR-M4SS SOCK⊟T STANDARD X 2/4 C/O(CR-M)	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		⊟R 728 6	1	CR-MH1 M⊟TAL R⊟TAINING JUMP⊟R	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
KSIL	26	2TLA010040R0000	1	BSR10 Vaux=24VDC SAF⊟TY R⊟LAY	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
KT1	20	H3DKM2ACDC24240	1	MULTIFUNCTION TIM⊟R R⊟LAY Vaux=24÷240Vac/dc - 2SC	Omron	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
L1C	19	801100	1	IR S⊟NSOR 10m CABL⊟	⊟X⊟RTH⊟RM	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
L1I	19	801100	1	IR S⊟NSOR 10m CABL⊟	⊟X⊟RTH⊟RM	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
L1MS	19	801100	1	IR S⊟NSOR 10m CABL⊟	⊟X⊟RTH⊟RM	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
L2C	19	801100	1	IR S⊟NSOR 10m CABL⊟	⊟X⊟RTH⊟RM	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
L2I	19	801100	1	IR S⊟NSOR 10m CABL⊟	⊟X⊟RTH⊟RM	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
L3C	19	801100	1	IR S⊟NSOR 10m CABL⊟	⊟X⊟RTH⊟RM	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
L3I	19	801100	1	IR S⊟NSOR 10m CABL⊟	⊟X⊟RTH⊟RM	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
L3MS	19	801100	1	IR S⊟NSOR 10m CABL⊟	⊟X⊟RTH⊟RM	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
LS	13	Z15GW2-1-1453270	1	MICROSWITCH 1sc	Omron	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		APB-PG	1	COV⊟R TO MICRO-SWITCH	Omron	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
OD1	9	990003	1	M⊟DIUM VOLTAG⊟ DISCHARG⊟ DMI-9-10-1-L Ur=9kV	D⊟HN	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
OD2	9	990003	1	M⊟DIUM VOLTAG⊟ DISCHARG⊟ DMI-9-10-1-L Ur=9kV	D⊟HN	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
OD3	9	990003	1	M⊟DIUM VOLTAG⊟ DISCHARG⊟ DMI-9-10-1-L Ur=9kV	D⊟HN	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
P1	20	KW 080 2	1	MP1-10B BLACK PUSH BUTTON UNSTABL⊟	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		⊟O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		⊟O 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
PR	22	KW 101 6	1	Y⊟LLOW LIGHT PUSH BUTTON	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		KV 022 5	1	MLBL-05W Y⊟LLOW L⊟D BLOCK INT⊟GRAT⊟D 110÷130VAC	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		⊟O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		⊟O 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
PTT	10	1VCF498412R0100	1	TV/F COMPARTM⊟NT 12/17kV IP4X L=590mm OUTL⊟T ON TH⊟ BACK WITH N°3 VT + N°14 MAIN CONTACTS + N°2+2 S⊟RVIC⊟/ISOLAT⊟D POSITION CONTACTS	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		1VCF499800R0302	1	NAM⊟PLAT⊟ IN ⊟NGLISH LANGUAG⊟ FOR TV/F	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
QA2	13	B427917	1	DDA202 AC 25A 300MA BLOCCO DIFF⊟R⊟NZIAL⊟ 2P	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		A563819	1	S2-CS/H6R CONTATTO DI S⊟GNALAZION⊟/AUX 1SC	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		S550284	1	S202M C10 INT⊟RRUTTOR⊟ AUTOMATICO 10KA 2P	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
QD1	11	A563819	1	S2-CS/H6R CONTATTO DI S⊟GNALAZION⊟/AUX 1SC	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		S550253	1	S202M C 4 INT⊟RRUTTOR⊟ AUTOMATICO 10KA 2P	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
QD2	11	S550253	1	S202M C 4 AUTOMATIC CIRCUIT-BR⊟AK⊟R 10KA 2P	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		a563819	1	S2-CS/H6R AUXILIARY STAT⊟ CONTACT	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
QD4	11	A563819	1	S2-CS/H6R AUXILIARY STAT⊟ CONTACT 1CO	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		S550239	1	S202M C 2 AUTOMATIC CIRCUIT BR⊟AK⊟R 10KA 2P	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
QV1	10	S550680	1	S204M C 2 AUTOMATIC CIRCUIT-BR⊟AK⊟R 10KA 4P	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		A563819	1	S2-CS/H6R AUXILIARY STAT⊟ CONTACT 1CO	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
QV2	10	S550680	1	S204M C 2 AUTOMATIC CIRCUIT-BR⊟AK⊟R 10KA 4P	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000
		A563819	1	S2-CS/H6R AUXILIARY STAT⊟ CONTACT 1CO	ABB	A7	FU⊟L C⊟LL F⊟⊟D⊟R A-80000

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AS COMMISSIONED: MATTIA GIROTTO

27/3/25

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VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00019

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

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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DWG n° : 231151/SD/19
Item n° : PF1113279

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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1	14/05/2024	Giulietti	Flamminio	Sigismondi	Issued for review (IFR)
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TITLE :
SG-100D1 - FUNCTIONAL FUEL CELL FEEDER A-80000
Bill of Materials

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

A3 | DRAWING NO. 1723002197-EL-DG-00019 | SHEET 35 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

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	A7	FU□L C□LL F□□D□R A-80000
		A563819	1	S2-CS/H6R AUXILIARY STAT□ CONTACT 1CO	ABB	A7	FU□L C□LL F□□D□R A-80000
QV4	14	S550680	1	S204M C 2 AUTOMATIC CIRCUIT-BR□AK□R 10KA 4P	ABB	A7	FU□L C□LL F□□D□R A-80000
		A563819	1	S2-CS/H6R AUXILIARY STAT□ CONTACT 1CO	ABB	A7	FU□L C□LL F□□D□R A-80000
QV5	15	S550239	1	S202M C 2 AUTOMATIC CIRCUIT BR□AK□R 10KA 2P	ABB	A7	FU□L C□LL F□□D□R A-80000
		A563819	1	S2-CS/H6R AUXILIARY STAT□ CONTACT 1CO	ABB	A7	FU□L C□LL F□□D□R A-80000
S1C	25	□O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A7	FU□L C□LL F□□D□R A-80000
		□O 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A7	FU□L C□LL F□□D□R A-80000
		KW 076 0	1	MP1-10G PUSH BUTTON GR□□N WITH BLACK RING	ABB	A7	FU□L C□LL F□□D□R A-80000
S20	25	□O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A7	FU□L C□LL F□□D□R A-80000
		□O 570 5	2	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A7	FU□L C□LL F□□D□R A-80000
		KW 075 2	1	MP1-10R PUSH BUTTON R□D WITH BLACK RING	ABB	A7	FU□L C□LL F□□D□R A-80000
SA1	23	□O 569 7	1	MCBH-00 FIXING SUPPORT 3 CONTACTS	ABB	A7	FU□L C□LL F□□D□R A-80000
		□O 571 3	1	MCB-01 CONTACT NC FOR PUSHBUTTOM	ABB	A7	FU□L C□LL F□□D□R A-80000
		□O 570 5	1	MCB-10 CONTACT NO FOR PUSHBUTTONS	ABB	A7	FU□L C□LL F□□D□R A-80000
		KW 329 3	1	M2SS2-10B HANDL□ S□L□CTOR 2P 90° BLACK RING BLACK	ABB	A7	FU□L C□LL F□□D□R A-80000
TI-L1	8	ATB-10-BS__014	1	CURR□NT TRANSFORM□R 7,2kV 50Hz 150/1A cl.0,5-5P20 (5VA)- 25kA	□SITAS	A7	FU□L C□LL F□□D□R A-80000
TI-L2	8	ATB-10-BS__014	1	CURR□NT TRANSFORM□R 7,2kV 50Hz 150/1A cl.0,5-5P20 (5VA)- 25kA	□SITAS	A7	FU□L C□LL F□□D□R A-80000
TI-L3	8	ATB-10-BS__014	1	CURR□NT TRANSFORM□R 7,2kV 50Hz 150/1A cl.0,5-5P20 (5VA)- 25kA	□SITAS	A7	FU□L C□LL F□□D□R A-80000
TO	9	KAP-150/250-55	1	CURR□NT TRANSFORM□R 0,72/3/-kV 100/1 50Hz	□SITAS	A7	FU□L C□LL F□□D□R A-80000
TR1	19	800208	1	MODBUS DATACARD 8 CHANN□LS	□xertherm	A7	FU□L C□LL F□□D□R A-80000
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	A7	FU□L C□LL F□□D□R A-80000
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	A7	FU□L C□LL F□□D□R A-80000
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	A7	FU□L C□LL F□□D□R A-80000
XC		HM320GR	12	HMM.6/GR Feed-through Terminal Block - Grey (6 mmq)	Cabur	A7	FU□L C□LL F□□D□R A-80000
		HM250GR	36	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type	Cabur	A7	FU□L C□LL F□□D□R A-80000
		HM251GR	3	HMT.4/PT/GR End section - Grey	Cabur	A7	FU□L C□LL F□□D□R A-80000
		HM321GR	3	HMT.6/PT/GR End section - Grey	Cabur	A7	FU□L C□LL F□□D□R A-80000
XI		HB220GR	8	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - spring type	Cabur	A7	FU□L C□LL F□□D□R A-80000
		HL201GR	2	HLD.2/PT/GR End section - Grey	Cabur	A7	FU□L C□LL F□□D□R A-80000
XM		HM250GR	68	HMM.4/GR Feed-through Terminal Block - Grey (4 mmq) - spring type	Cabur	A7	FU□L C□LL F□□D□R A-80000
		HM251GR	2	HMT.4/PT/GR End section - Grey	Cabur	A7	FU□L C□LL F□□D□R A-80000
XS1	13	□ 9447 7	1	SOCK□T	ABB	A7	FU□L C□LL F□□D□R A-80000
XV		HB210GR	16	HSCB.6/GR Disconnect by slide link Terminal Block - Grey (6 mmq) - Spring type	Cabur	A7	FU□L C□LL F□□D□R A-80000
		HB201GR	5	HSCB.6/PT/GR End section - Grey	Cabur	A7	FU□L C□LL F□□D□R A-80000

AS COMMISSIONED: MATTIA GIROTTI

27/3/25

NO MARK UP

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SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00019

SHEET 36

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00019 Rev.03

Section 8 LIST OF MODIFICATIONS

NOT APPLICABLE

Section 8.1 List of changes

NOT APPLICABLE

Section 9 SUPPORTING DOCUMENTS

NOT APPLICABLE