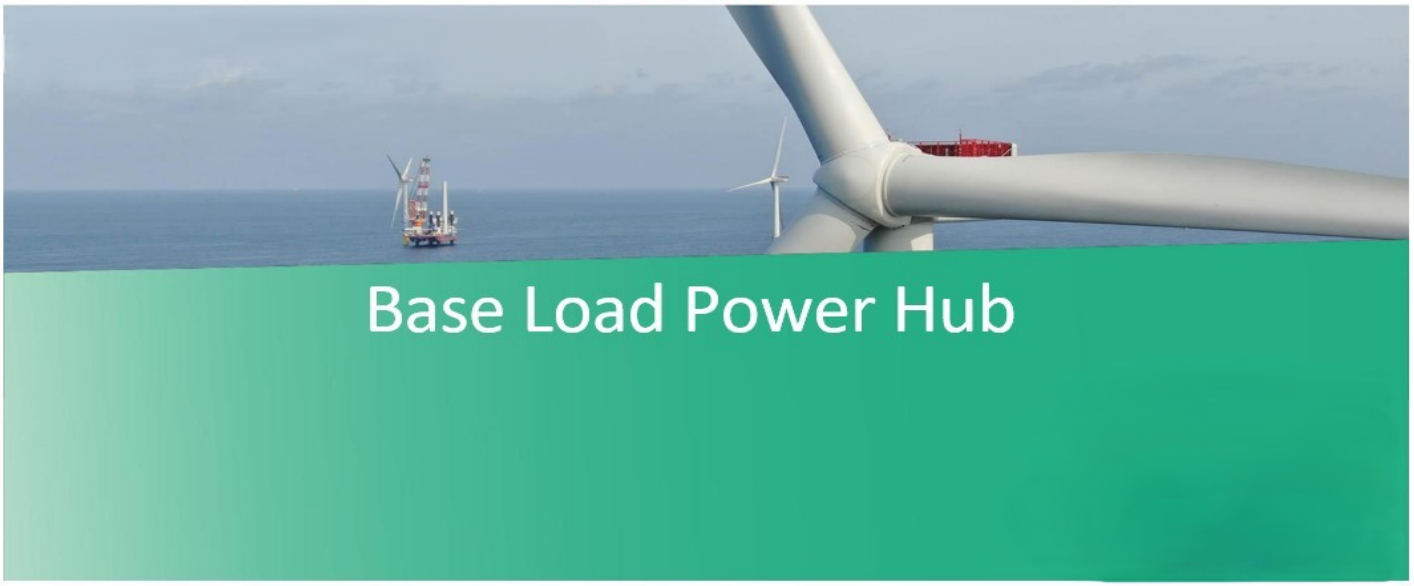
CROSSWIND

ROSETTI MARINO

PROVERLIS

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



COMMISSIONING DOSSIER (ONSHORE)

SYSTEM	84 Battery & No-Break System
SUBSYSTEM	84-10 AC 35 kVA UPS System (UP-200F3)

CROSSWIND

123A90 - HOLLANDSE KUST NOORD WIND PARK
BLPH Project

COMMISSIONING DOSSIER INDEX

ROSETTI MARINO

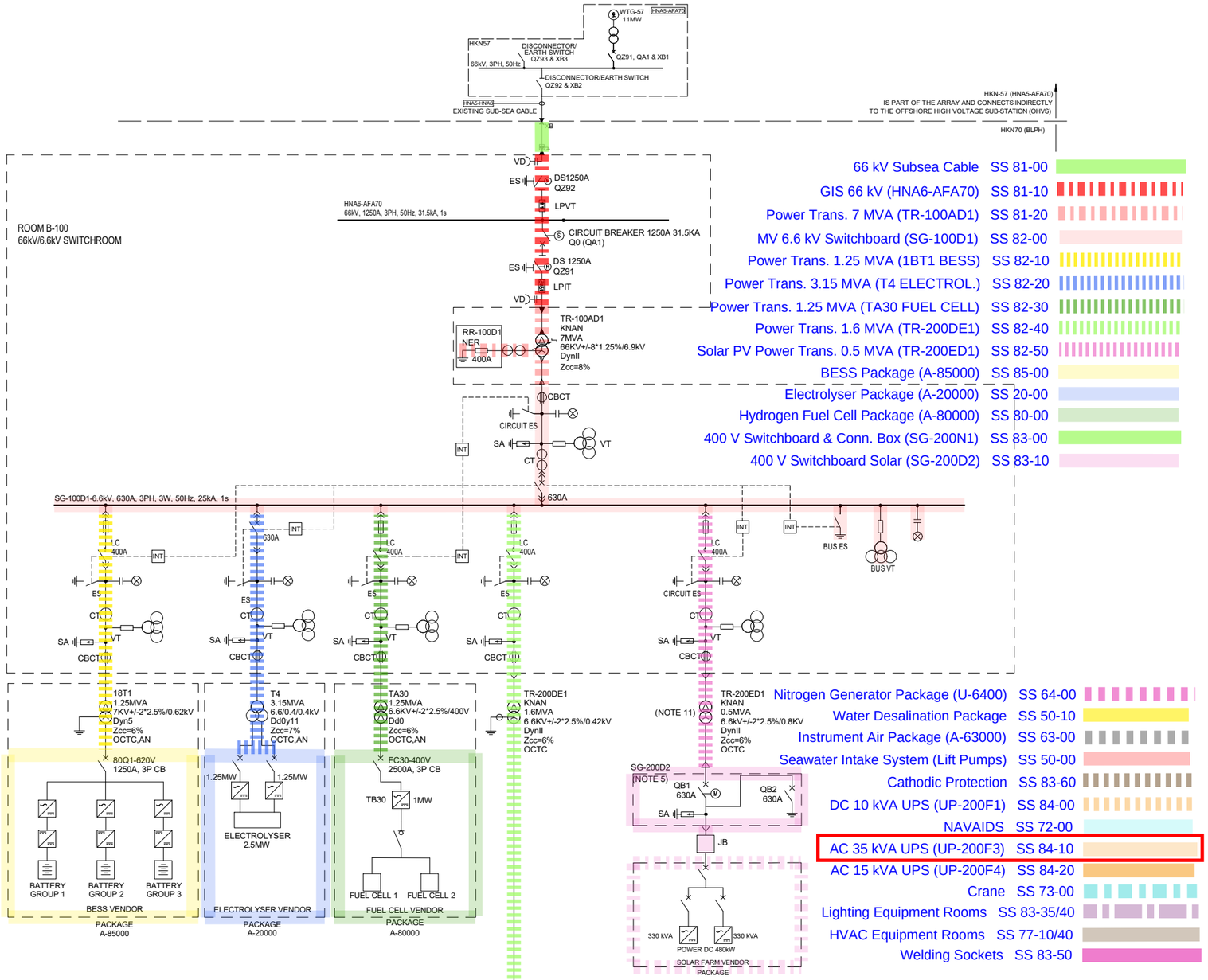
Sub System N°:	84-10	**Tick as appropriate**	ONSHORE	OK
Description:	AC 35 kVA UPS System (UP-200F3)		OFFSHORE	

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:*	OK
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	Martin Taylor
Date	2025-04-26	2025-04-27
Signature	PROVERLIS Digitaly signed by Anthony Iveson 2025-04-26T07:41:21.790Z	PROVERLIS Digitaly signed by Martin Taylor 2025-04-27T16:07:33.584Z

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

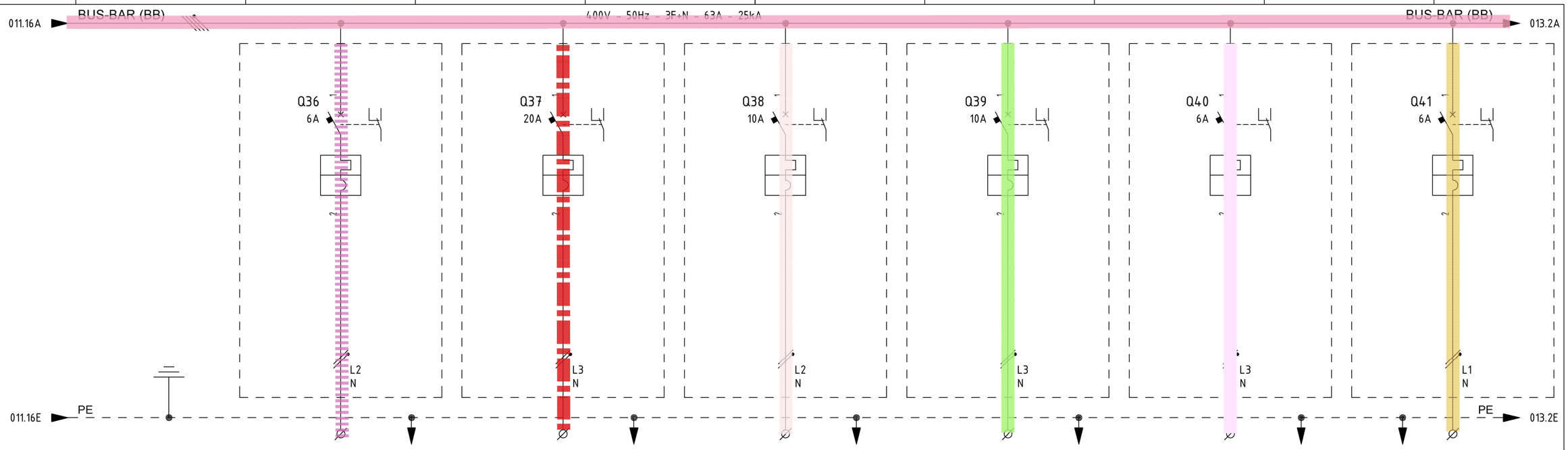
TITLE :

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



ITEM			1	CP-200E2	CP-100E1	SG-100D1	SG-200N1	SG-200D2	UP-200F3
UTILITY			2	AUXILIARY TRAFO SOLARE 0.5MVA	AUXILIARY GIS	AUXILIARY 6.6KV SWITCHBOARD	AUXILIARY LV SWITCHBOARD	AUXILIARY LV SWITCHBOARD 800/460V	AC UPS PAS AUXILIARY
CUBICLE			3	+03	+03	+03	+03	+03	+03
RATED POWER | RATED CURRENT			4/5	0.5 KW | 2.72 A	3 KW | 16.3 A	1 KW | 5.43 A	1 KW | 5.43 A	0.5 KW | 2.72 A	0.2 KW | 0.82 A
TYPICAL FUNCTIONAL			6	-	-	-	-	-	-
CIRCUIT BREAKER (ABB)	TYPE		7	S302P-C6	S302P-C20	S302P-C10	S302P-C10	S302P-C6	S302P-C6
	VERSION		8	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE
	TRIP UNITS		9	In=6A - Curve C	In=20A - Curve C	In=10A - Curve C	In=10A - Curve C	In=6A - Curve C	In=6A - Curve C
	Icu	KA	10	25kA	25kA	25kA	25kA	25kA	25kA
OVERLOAD	L	Range A	11	-	-	-	-	-	-
		Range t	12	-	-	-	-	-	-
SEL. SHORT-CIRCUIT	S	Range A	13	-	-	-	-	-	-
		Range t	14	-	-	-	-	-	-
INST. SHORT-CIRCUIT	I	Range A	15	-	-	-	-	-	-
		Range t	16	-	-	-	-	-	-
EARTH FAULT PROTECTION	G	Range A	17	-	-	-	-	-	-
		Range t	18	-	-	-	-	-	-
CONTACTOR (ABB)			19	-	-	-	-	-	-
THERMAL OVERLOAD RELAY (ABB)			20	-	-	-	-	-	-
SURGE ARRESTERS (DHENN)			21	-	-	-	-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-	-	-	-	-	-
FUSE HOLDER (ABB)			23	-	-	-	-	-	-
TWILIGHT SWITCH (ABB)			24	-	-	-	-	-	-
VOLTMETER (FRER)			25	-	-	-	-	-	-
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-	-	-	-	-	-
	PERFORMANCE/CLASS		27	-	-	-	-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-	-	-	-	-	-
	PERFORMANCE/CLASS		29	-	-	-	-	-	-
POWER TERM. BLOCK (CABUR)		Type/mm²	30	SCREW / 4	SCREW / 6	SCREW / 4	SCREW / 4	SCREW / 4	SCREW / 4
POWER CONDUCTOR		mm²	31	3G2.5	3G6	3G2.5	3G2.5	3G2.5	3G2.5

SUBSYSTEM 82-50 | SUBSYSTEM 81-10 | SUBSYSTEM 82-00 | SUBSYSTEM 83-00 | SUBSYSTEM 83-10 | SUBSYSTEM 84-10

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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+					
3	05/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for construction (AFC)
2	24/04/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	15/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	08/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

DWG n° : 231298/SD/13
Item n° : PF1002888/101

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "DP-200N1"

SINGLE LINE DIAGRAM
Single Line Drawing

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

SCALE : NTS

A3

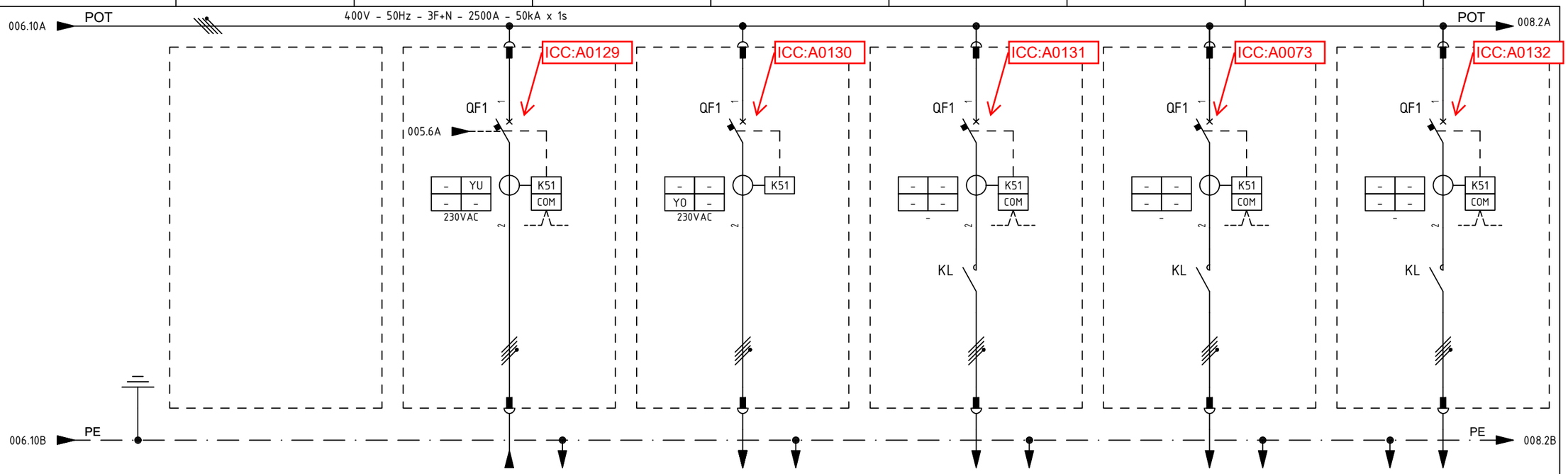
DRAWING NO. 1723002197-EL-DG-00013

SHEET 012

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00013 Rev. 03



ITEM				JB-200E2	UP-200F3	SPARE	DP-200N1	JB-200E3
UTILITY			2	TEMPORARY GENERATOR / MOBILE BATTERY PACK	AC UPS PAS - 30 MIN UP-200F3 - LINE A	SPARE	DB - LIGHTING & SMALL POWER - BoP	CRANE
COLUMN/CUBICLE			3	A2 / +08	A3 / +01	A3 / +02	A3 / +03	A3 / +04
RATED POWER | RATED CURRENT			4/5	138 kW | 210 A	36.0 kW | 57.8 A	- kW | - A	15.35 kW | 23.7 A	25 kW | 37.8 A
TYPICAL FUNCTIONAL			6	LE2-320	L1-100	LK1-40	LK1-100	LK1-63
CIRCUIT BREAKER (ABB)	TYPE		7	XT5S - 400	XT2S - 160	XT2S - 160	XT2S - 160	XT2S - 160
	VERSION		8	4P - FIXED	4P - FIXED	4P - FIXED	4P - FIXED	4P - FIXED
	TRIP UNITS		9	EKIP HI TOUCH LSIG (In = 320A)	EKIP DIP LSIG (In = 100A)	EKIP HI TOUCH LSIG (In = 40A)	EKIP HI TOUCH LSIG (In = 100A)	EKIP HI TOUCH LSIG (In = 63A)
	Icu	KA	10	50 kA	50 kA	50 kA	50 kA	50 kA
OVERLOAD	L	Range A	11	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In
		Range t	12	k/I^2	k/I^2	k/I^2	k/I^2	k/I^2
SEL. SHORT-CIRCUIT	S	Range A	13	(0.6 - 10) x In	(1 - 10) x In	(0.6 - 10) x In	(0.6 - 10) x In	(0.6 - 10) x In
		Range t	14	0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	0.05 - 0,4 sec / k/I^2	0.05 - 0,4 sec / k/I^2	0.05 - 0,4 sec / k/I^2
INST. SHORT-CIRCUIT	I	Range A	15	(1.5 - 15) x In	(1 - 10) x In	(1.5 - 15) x In	(1.5 - 15) x In	(1.5 - 15) x In
		Range t	16	instantaneous	<= 0.02 sec	instantaneous	instantaneous	instantaneous
EARTH FAULT PROTECTION	G	Range A	17	(0.1 - 1) x In	(0.2 - 1) x In	(0.1 - 1) x In	(0.1 - 1) x In	(0.1 - 1) x In
		Range t	18	t=k / t=k/I^2	0.1 - 0.8 sec	t=k / t=k/I^2	t=k / t=k/I^2	t=k / t=k/I^2
CONTACTOR (ABB)			19	-	-	AF40-40-00-13 (70A-AC1); 100-250VAC/DC	AF80-40-00-13 (70A-AC1); 100-250VAC/DC	AF52-40-00-13 (100A-AC1); 100-250VAC/DC
THERMAL OVERLOAD RELAY (ABB)			20	-	-	-	-	-
SURGE ARRESTER (DEHN)			21	-	-	-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-	-	-	-	-
FUSE HOLDER (ITALWEBER)			23	SUBSISTEM 83.00	SUBSISTEM 84.10	SUBSISTEM 83.00	SUBSISTEM 83.20	SUBSISTEM 99.00
INDIRECT PROTECTION (ABB)			24					
VOLTMETER			25					
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-	-	-	-	-
	PERFORMANCE/CLASS		27	-	-	-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-	-	-	-	-
	PERFORMANCE/CLASS		29	-	-	-	-	-
LOCK-OUT RELAY (-)			30	-	-	-	-	-
POWER CONDUCTOR		mmq	31	5 x (1 x 95)	4G35	-	5G50	5G16

/ SYSTEM

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
2	03/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	28/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	15/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

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DWG n° : 231298/SD/11

Item n° : PF1002983/26

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

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

SCALE : NTS

A3

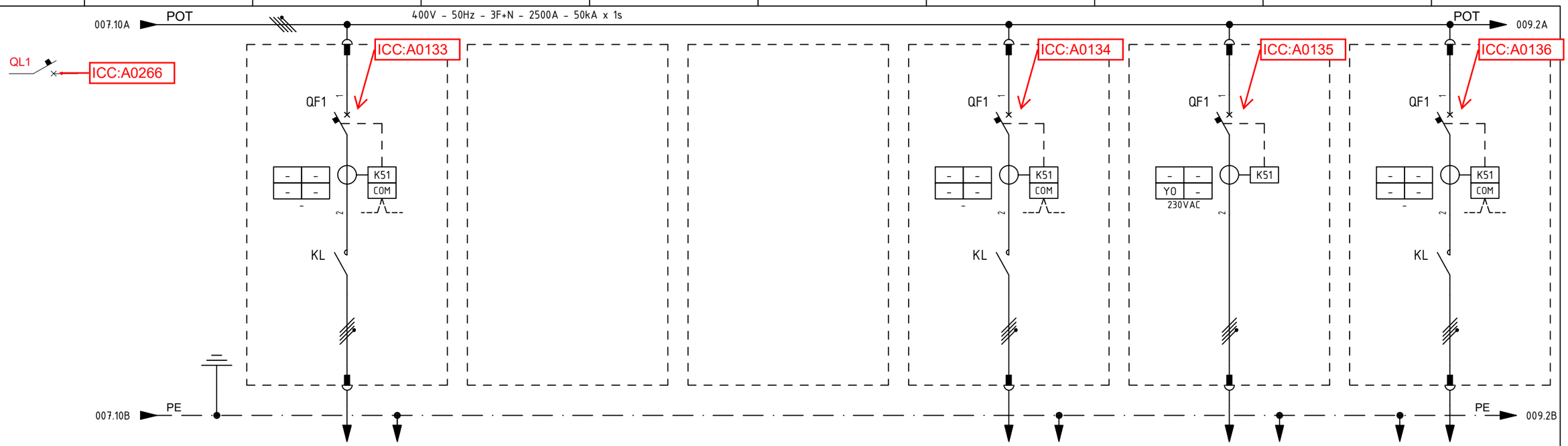
DRAWING NO. 1723002197-EL-DG-00011

SHEET 007

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00011 Rev. 03



ITEM			1	SPARE		-			JB-500E8		UP-200F3		B100-HSB-001	
UTILITY			2	SPARE		FUTURE			WATER PACKAGE		AC UPS PAS - 30 MIN UP-200F3 - LINE B		HVAC PANELS HV ROOM	
COLUMN/CUBICLE			3	A3 / +05		A3 / +06			A3 / +08		A4 / +01		A4 / +02	
RATED POWER | RATED CURRENT			4/5	5.5 kW	9.93 A	-	-		67 kW	107.00 A	36.0 kW	57.8 A	18 kW	34.1 A
TYPICAL FUNCTIONAL			6	LK1-40					LK2-160		L1-100		LK1-40	
CIRCUIT BREAKER (ABB)	TYPE		7	XT2S - 160					XT4S - 250		XT2S - 160		XT2S - 160	
	VERSION		8	4P - FIXED					4P - FIXED		4P - FIXED		4P - FIXED	
	TRIP UNITS		9	EKIP HI TOUCH LSIG (In = 40A)					EKIP HI TOUCH LSIG (In = 160A)		EKIP DIP LSIG (In = 100A)		EKIP HI TOUCH LSIG (In = 40A)	
	Icu	KA	10	50 kA					50 kA		50 kA		50 kA	
OVERLOAD	L	Range A	11	(0.4 - 1) x In					(0.4 - 1) x In		(0.4 - 1) x In		(0.4 - 1) x In	
		Range t	12	k/I^2					k/I^2		k/I^2		k/I^2	
SEL. SHORT-CIRCUIT	S	Range A	13	(0.6 - 10) x In					(0.6 - 10) x In		(1 - 10) x In		(0.6 - 10) x In	
		Range t	14	0.05 - 0,4 sec / k/I^2					0.05 - 0.4 sec / k/I^2		0.05 - 0.4 sec / k/I^2		0.05 - 0,4 sec / k/I^2	
INST. SHORT-CIRCUIT	I	Range A	15	(1.5 - 15) x In					(1.5 - 15) x In		(1 - 10) x In		(1.5 - 15) x In	
		Range t	16	instantaneous					instantaneous		<= 0.02 sec		instantaneous	
EARTH FAULT PROTECTION	G	Range A	17	(0.1 - 1) x In					(0.1 - 1) x In		(0.2 - 1) x In		(0.1 - 1) x In	
		Range t	18	t=k / t=k/I^2					t=k / t=k/I^2		0.1 - 0.8 sec		t=k / t=k/I^2	
CONTACTOR (ABB)			19	AF40-40-00-13 (70A-AC1); 100-250VAC/DC					AF190-40-11-13 (275A-AC1); 100-250 VAC/DC		-		AF40-40-00-13 (70A-AC1); 100-250VAC/DC	
THERMAL OVERLOAD RELAY (ABB)			20	-					-		-		-	
SURGE ARRESTER (DEHN)			21	-					-		-		-	
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-					-		-		-	
FUSE HOLDER (ITALWEBER)			23	SUBSISTEM 83.00					SUBSISTEM 50.10		SUBSISTEM 84.10		SUBSISTEM 77.10	
INDIRECT PROTECTION (ABB)			24											
VOLTMETER			25											
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-					-		-		-	
	PERFORMANCE/CLASS		27	-					-		-		-	
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-					-		-		-	
	PERFORMANCE/CLASS		29	-					-		-		-	
LOCK-OUT RELAY (-)			30	-					-		-		-	
POWER CONDUCTOR		mmq	31	-					5G70		4G35		5G16	

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DWG n° : 231298/SD/11
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
2	03/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	28/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	15/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

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

SCALE : NTS

A3

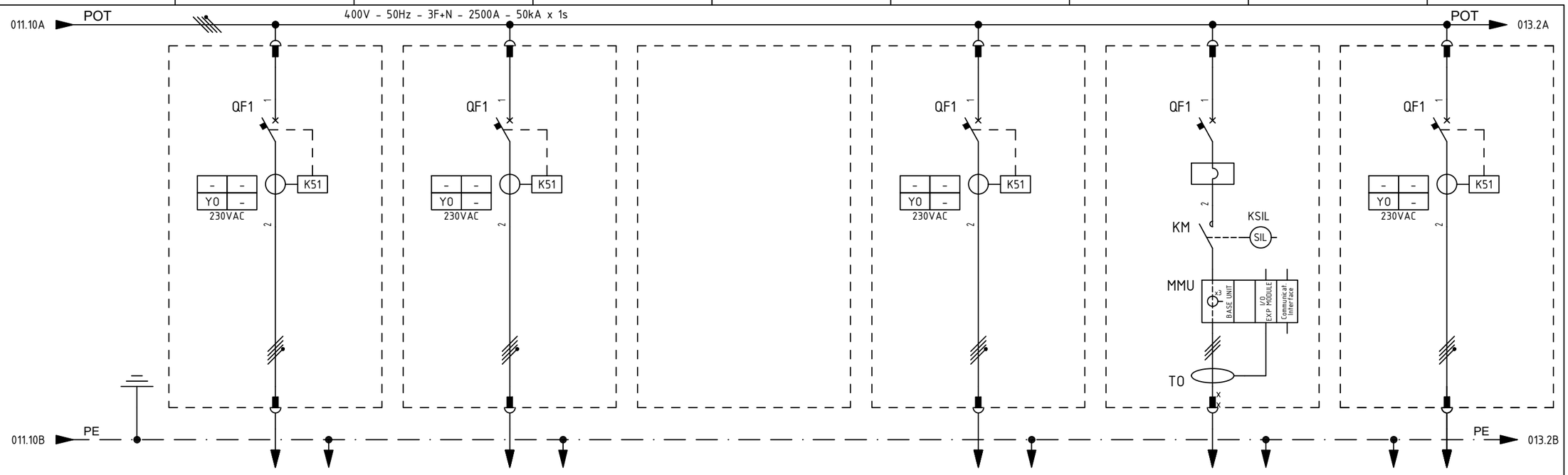
DRAWING NO. 1723002197-EL-DG-00011

SHEET 008

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00011 Rev. 03



ITEM			1	UP-200F4	UP-200F4		ESW-200N1	PM-50001 A	UP-200F3
UTILITY			2	AC UPS F&G - 8 H UP-200F4 - LINE A	AC UPS F&G - 8h UP-200F4 - LINE B		WELDING SOCKETS (TOP DECK)	SEA WATER PUMP A	AC UPS PAS - 30 min. UP-200F3 - BYPASS
COLUMN/CUBICLE			3	A6 / +05	A6 / +06		A6 / +08	A7 / +01	A7 / +02
RATED POWER | RATED CURRENT			4/5	18 kW | 28.9 A	18 kW | 28.9 A		69.84 kW | 126.15 A	6.1 kW | 11.0 A	36 kW | 57.8 A
TYPICAL FUNCTIONAL			6	L1-63	L1-63		L2-160	M1-6	L1-100
CIRCUIT BREAKER (ABB)	TYPE		7	XT2S - 160	XT2S - 160		XT4S - 250	XT2S - 160	XT2S - 160
	VERSION		8	4P - FIXED	4P - FIXED		4P - FIXED	3P - FIXED	4P - FIXED
	TRIP UNITS		9	EKIP DIP LSIG (In = 63A)	EKIP DIP LSIG (In = 63A)		EKIP DIP LSIG (In = 160A)	MA (In = 20A)	EKIP DIP LSIG (In = 100A)
	Icu	KA	10	50 kA	50kA		50kA	-	50 kA
OVERLOAD	L	Range A	11	(0.4 - 1) x In	(0.4 - 1) x In		(0.4 - 1) x In	-	(0.4 - 1) x In
		Range t	12	k/I^2	k/I^2		k/I^2	-	k/I^2
SEL. SHORT-CIRCUIT	S	Range A	13	(1 - 10) x In	(1 - 10) x In		(1 - 10) x In	-	(1 - 10) x In
		Range t	14	0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2		0.05 - 0.4 sec / k/I^2	-	0.05 - 0.4 sec / k/I^2
INST. SHORT-CIRCUIT	I	Range A	15	(1 - 10) x In	(1 - 10) x In		(1 - 10) x In	(6 - 14) x I	(1 - 10) x In
		Range t	16	<= 0.02 sec	<= 0.02 sec		<= 0.02 sec	<= 0.02 sec	<= 0.02 sec
EARTH FAULT PROTECTION	G	Range A	17	(0.2 - 1) x In	(0.2 - 1) x In		(0.2 - 1) x In	-	(0.2 - 1) x In
		Range t	18	0.1 - 0.8 sec	0.1 - 0.8 sec		0.1 - 0.8 sec	-	0.1 - 0.8 sec
CONTACTOR (ABB)			19	-	-		-	AF38-30-00-13 (18.5 kW - AC3) - 100-250Vac/dc	-
THERMAL OVERLOAD RELAY (ABB)			20	-	-		-	UMC100.3 UC (0.24 - 63A)	-
SURGE ARRESTER (DEHN)			21	-	-		-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-	-		-	-	-
FUSE HOLDER (ITALWEBER)			23	SUBSISTEM 84.20	SUBSISTEM 84.20		SUBSISTEM 83.50	SUBSISTEM 50.00	SUBSISTEM 84.10
INDIRECT PROTECTION (ABB)			24						
VOLTMETER			25						
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-	-		-	-	-
	PERFORMANCE/CLASS		27	-	-		-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-	-		-	-	-
	PERFORMANCE/CLASS		29	-	-		-	-	-
LOCK-OUT RELAY (-)			30	-	-		-	-	-
POWER CONDUCTOR		mmq	31	4G35	4G35		5G50	4G4	4G35

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DWG n° : 231298/SD/11
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
2	03/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	28/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	15/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

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

SCALE : NTS

A3

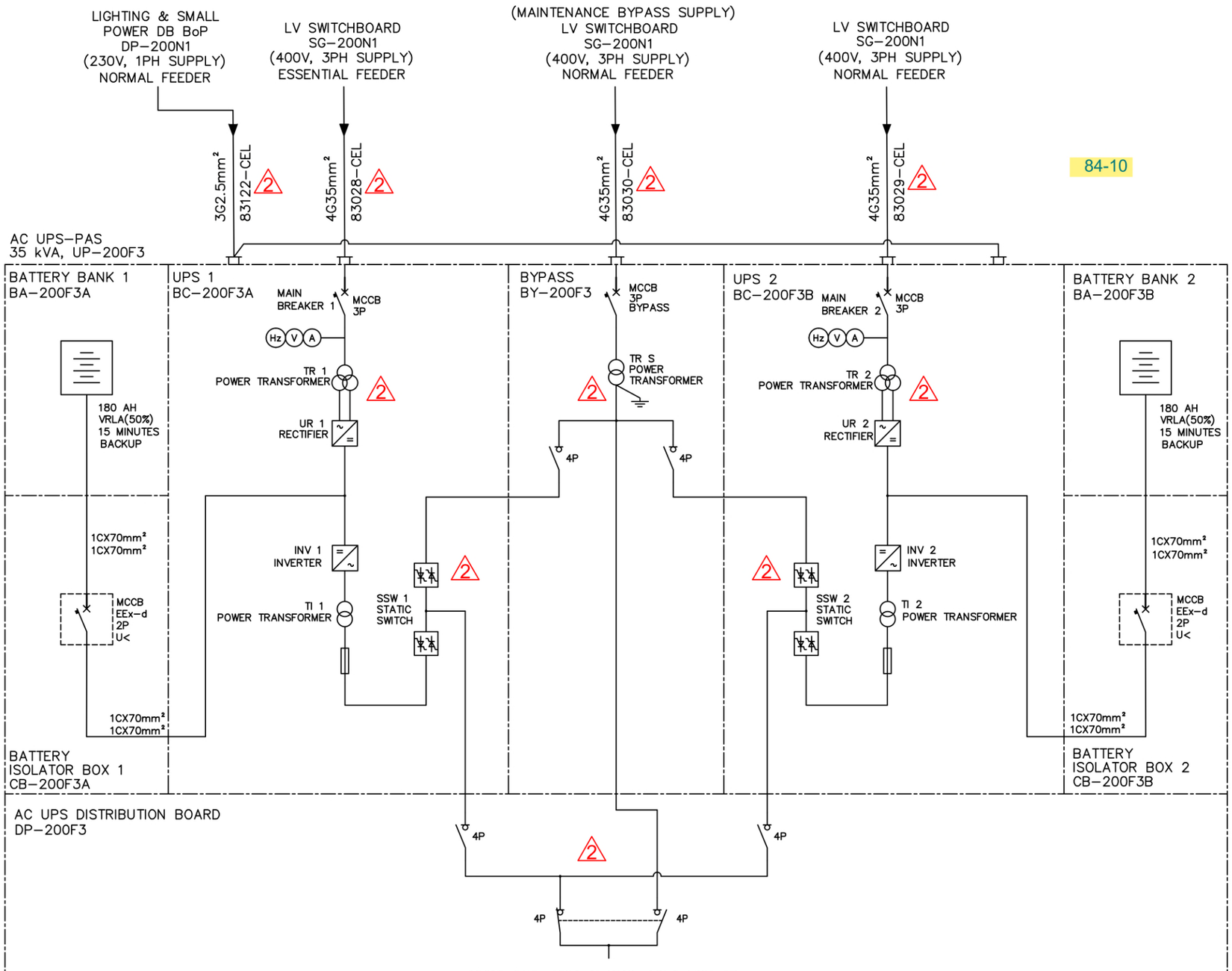
DRAWING NO. 1723002197-EL-DG-00011

SHEET 012

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00011 Rev. 03



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/09/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	12/04/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	14/02/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL SINGLE LINE DIAGRAMS AC UPS SYSTEMS
AC UPS – PAS SINGLE LINE DIAGRAM(UP–200F3)

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

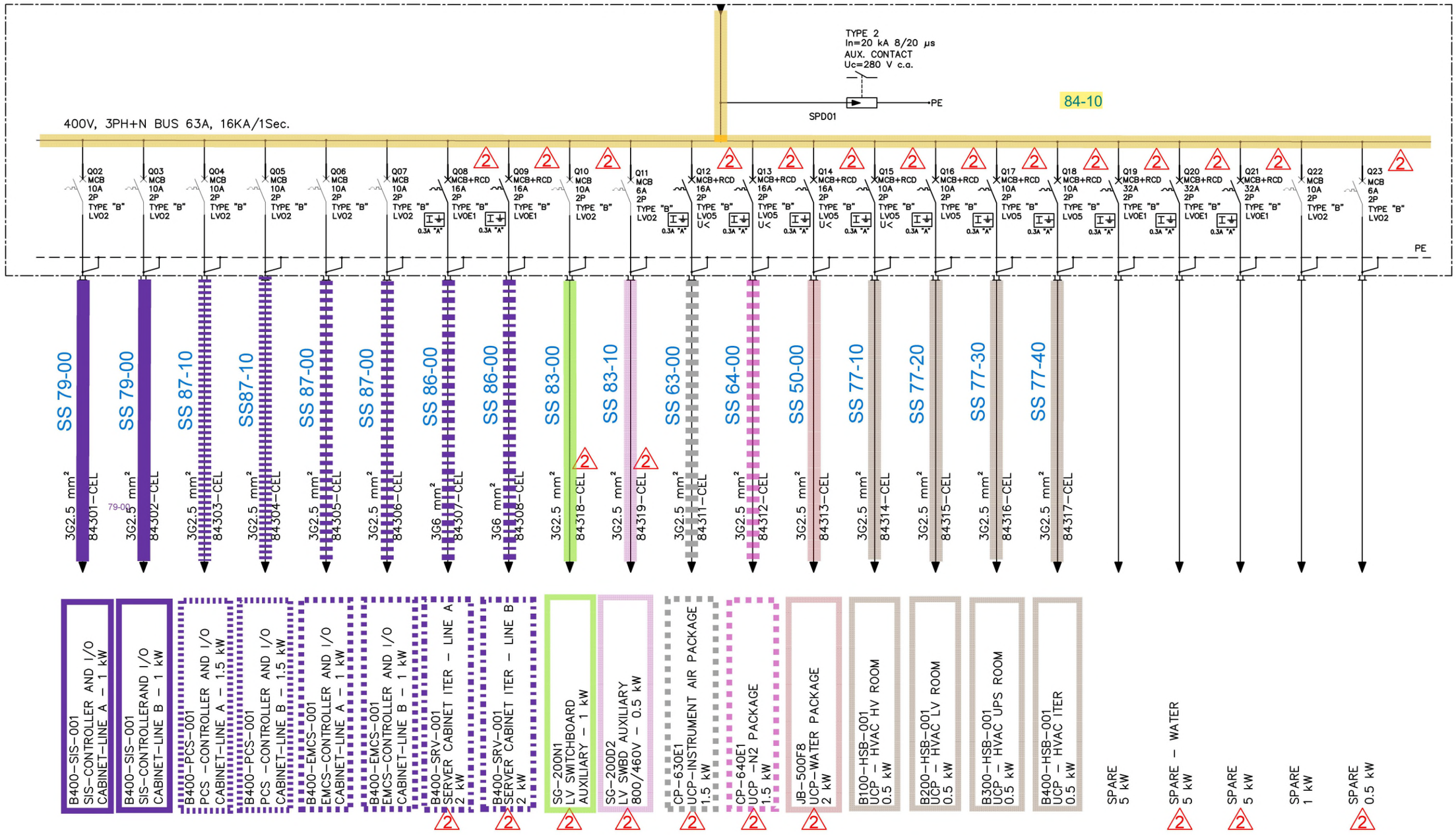
A3 | DRAWING NO. 123A90–DDL–EL–DG–20160 | SHEET 004 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90–DDL–EL–DG–20160 Rev. 02

AC UPS – PAS SINGLE LINE DIAGRAM(UP–200F3) DISTRIBUTION BOARD DETAILS

AC UPS DISTRIBUTION BOARD–PAS
DP–200F3



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/09/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	12/04/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	14/02/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL SINGLE LINE DIAGRAMS AC UPS SYSTEMS
AC UPS – PAS DISTRIBUTION BOARD SLD (UP–200F3)

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

SCALE : 1:X

A3

DRAWING NO. 123A90–DDL–EL–DG–20160

SHEET 005

REV. 02

File Name : 123A90–DDL–EL–DG–20160 Rev. 02

F.to UNI A3: 420mmx297mm

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:	4		Issued on:	2025-04-23	
System:	84	/	Battery & No-Break System		
SubSystem:	84-10	/	AC 35 kVA UPS System (UP-200F3)		

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	Martin Taylor
Date	2025-04-24	2025-04-25
Signature	PROVERLIS Digitaly signed by Anthony Iveson 2025-04-24T08:45:18.191Z	PROVERLIS Digitaly signed by Martin Taylor 2025-04-25T13:56:27.330Z

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10 & process: COMM

Electrical	84-10 AC 35 kVA UPS System (UP-200F3)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
A3/+01-QF1	DRAWER UPS PAS LINE A - A3/+01-QF1	ONSHORE	C10002801	FP00	100	2024-11-08	RFO 4
		ONSHORE	C10002802	FTR-2	100	2024-09-20	RFO 4
		ONSHORE	C10002803	FTR-6	100	2024-10-03	RFO 4
		ONSHORE	C10003007	FTR-5	100	2025-04-22	RFO 4
A4/+01-QF1	DRAWER UPS PAS LINE B - A4/+01-QF1	ONSHORE	C10002798	FP00	100	2024-11-08	RFO 4
		ONSHORE	C10002799	FTR-2	100	2024-09-20	RFO 4
		ONSHORE	C10002800	FTR-6	100	2024-10-03	RFO 4
		ONSHORE	C10003006	FTR-5	100	2025-04-22	RFO 4
A7/+02-QF1	DRAWER UPS PAS-BYPASS - A7/+02-QF1	ONSHORE	C10002804	FP00	100	2024-11-08	RFO 4
		ONSHORE	C10002805	FTR-2	100	2024-09-20	RFO 4
		ONSHORE	C10002806	FTR-6	100	2024-10-02	RFO 4
		ONSHORE	C10003008	FTR-5	100	2025-04-22	RFO 4
BA-200F3A	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	ONSHORE	C10002811	FTR-3	100	2024-11-18	RFO 4
BA-200F3A-C	UPS PAS - BA-200F3A-C	ONSHORE	C10002809	FTR-4	100	2024-11-14	RFO 4
BA-200F3A-D	UPS PAS - BA-200F3A-D	ONSHORE	C10002810	FTR-4	100	2024-11-14	RFO 4
BA-200F3B	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	ONSHORE	C10002814	FTR-3	100	2024-11-18	RFO 4
BA-200F3B-C	UPS PAS - BA-200F3B-C	ONSHORE	C10002812	FTR-4	100	2024-11-14	RFO 4
BA-200F3B-D	UPS PAS - BA-200F3B-D	ONSHORE	C10002813	FTR-4	100	2024-11-18	RFO 4
CB-200F3A-Q2	BATTERY CUTOFF UPS PAS - CB-200F3A-Q2	ONSHORE	C10002795	FTR-2	100	2024-11-08	RFO 4
CB-200F3B-Q2	BATTERY CUTOFF UPS PAS - CB-200F3B-Q2	ONSHORE	C10002796	FTR-2	100	2024-11-08	RFO 4
DP-200N1-Q41	BREAKER AUX UPS PAS - DP-200N1-Q41	ONSHORE	C10002797	FTR-2	100	2024-10-28	RFO 4
UP-200F3	AC UPS 35 kVA Redundant System with By-Pass	ONSHORE	C10002807	FP16A	100	2025-03-12	RFO 4
		ONSHORE	C10002808	FTR-6	100	2025-03-12	RFO 4
UP-200F3-QF31	SPARE	ONSHORE	C10004570	FTR-2	100	2024-11-08	RFO 4
UP-200F3-QF32	SPARE	ONSHORE	C10004571	FTR-2	100	2024-11-08	RFO 4
UP-200F3-QF33	SPARE	ONSHORE	C10004572	FTR-2	100	2024-11-08	RFO 4
UP-200F3-QF50	SPARE	ONSHORE	C10004586	FTR-2	100	2024-11-08	RFO 4
UP-200F3-QF52	SPARE	ONSHORE	C10004588	FTR-2	100	2024-11-08	RFO 4

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10 & process: COMM

Instrumental	84-10 AC 35 kVA UPS System (UP-200F3)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
84-XS-001	ELECT. ISOLATION UPS POWER UCP (WATER TREAT. A-50000)	ONSHORE	C10003823	FJ01D	100	2025-01-28	RFO 4
84-XS-002	ELECT. ISOLATION UPS POWER UCP (NITROGEN A-64000)	ONSHORE	C10003822	FJ01D	100	2025-01-28	RFO 4
84-XS-003	ELECT. ISOLATION UPS POWER UCP (INSTRUMENT AIR A-63000)	ONSHORE	C10003821	FJ01D	100	2025-01-28	RFO 4
84-XS-004	ELECT. ISOLATION UPS POWER UCP HVAC B-100	ONSHORE	C10003820	FJ01D	100	2025-01-28	RFO 4
84-XS-005	ELECT. ISOLATION UPS POWER UCP HVAC B-200	ONSHORE	C10003819	FJ01D	100	2025-01-28	RFO 4
84-XS-007A	DISCONNECT AC UPS UP-200F3 BATTERIES A	ONSHORE	C10003817	FJ01D	100	2025-01-28	RFO 4
84-XS-007B	DISCONNECT AC UPS UP-200F3 BATTERIES B	ONSHORE	C10003816	FJ01D	100	2025-01-28	RFO 4
84-XS-010	INHIBIT. BATTERY CHARGING AC UPS UP-200F3 BATTERIES	ONSHORE	C10003812	FJ01D	100	2025-01-28	RFO 4

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10 & process: COMM

Miscellaneous	84-10 AC 35 kVA UPS System (UP-200F3)

ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
123A90-PML-COM-PRO-03059	OTP - UPS System UP-200F3 35kVA	ONSHORE	C10004628	5300	100	2025-04-19	-
		OFFSHORE	C10004949	5300	0	-	-

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 84 Battery & No-Break System

SUBSYSTEM 84-10 AC 35 kVA UPS System (UP-200F3)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000261	B	83122-CEL C10000641	Cable to be fixed with proper cable ties, after MCT installation of the panel DP-200N1	-		Gtangianu 2024-10-24	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000262	B	83122-CEL C10000641	Wrong core identification tag on both cable's termination	-		Gtangianu 2024-10-24	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000263	B	83122-CEL C10000641	Plastic cable ties to be replaced on external routing	-		Gtangianu 2024-10-24	2025-02-26	Pschintu 2025-02-26	2025-02-26
C30000287	B	UP-200F3 C10000871	Cleaning is required inside and on the top of the panel	.		Gtangianu 2024-11-02	2024-12-14	Ecarotenuto 2024-12-14	2024-12-14
C30000288	B	UP-200F3 C10000871	Missing thermo shrink on internal earthing connections.	.		Gtangianu 2024-11-02	2025-03-06	JKrizanic 2025-03-06	2025-03-06
C30000289	B	83028-CEL C10000553	Missing identification tags on terminal strip (X1 / 1U/1V/1W). See attached photo	.		Gtangianu 2024-11-02	2025-03-06	JKrizanic 2025-03-06	2025-03-06
C30000290	B	83028-CEL C10000553	Identification tag of wire are wrong inside SG-200N1 (A3/+01)	.		Gtangianu 2024-11-02	2024-12-18	Gtangianu 2024-12-18	2024-12-18
C30000291	B	83028-CEL C10000553	Missing cable tags on all routing (MCT of B-200_ B-300_ inside and outside UP-200F3)	.		Gtangianu 2024-11-02	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000292	B	83028-CEL C10000553	Plastic cable ties to be replaced on external routing	.		Gtangianu 2024-11-02	2025-02-26	Pschintu 2025-02-26	2025-02-26

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 84 Battery & No-Break System
SUBSYSTEM 84-10 AC 35 kVA UPS System (UP-200F3)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000293	B	84332-CEL-1-P C10000646	Missing identification number on terminal strip X1+	.		Gtangianu 2024-11-02	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30000294	B	83029-CEL C10000554	Missing cable tags on internal and external side of MCT of B-200/B-300	.		Gtangianu 2024-11-02	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000295	B	83029-CEL C10000554	Plastic cable ties to be replaced on external routing	.		Gtangianu 2024-11-02	2025-02-26	Pschintu 2025-02-26	2025-02-26
C30000296	B	83029-CEL C10000554	Identification tag of wire are wrong inside SG-200N1 (A4/+01) and are missing inside UP-200F3 (X1/3W)	.		Gtangianu 2024-11-02	2024-12-18	Gtangianu 2024-12-18	2024-12-18
C30000297	B	83029-CEL C10000554	Missing identification numbers on terminal strip inside UP-200F3 (X1/3U/3V/3W)	.		Gtangianu 2024-11-02	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30000298	B	83030-CEL C10000555	Identification tag of wire are wrong or missing inside SG-200N1 (A7/+02)	.		Gtangianu 2024-11-02	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000299	B	83030-CEL C10000555	Missing cable tags on internal and external side of MCT (B-200/B-300)	.		Gtangianu 2024-11-02	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000300	B	83030-CEL C10000555	Plastic cable ties to be replaced on external routing	.		Gtangianu 2024-11-02	2025-02-26	Pschintu 2025-02-26	2025-02-26
C30000301	B	84330-CEC C10002343	Missing cable tag inside and outside CB-200F3A and on the top side of BC-200F3A	.		Gtangianu 2024-11-02	2024-12-14	Ecarotenuto 2024-12-14	2024-12-14

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 84 Battery & No-Break System
SUBSYSTEM 84-10 AC 35 kVA UPS System (UP-200F3)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000302	B	84330-CEC C10002343	Missing identification number on terminal strip X15 (inside BC-200F3A)	.		Gtangianu 2024-11-02	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30000303	B	84331-CEL-2-N C10000645	Missing cable tag inside CB-200F3A	.		Gtangianu 2024-11-02	2024-12-14	Ecarotenuto 2024-12-14	2024-12-14
C30000304	B	CB-200F3A C10000855	Missing thermo shrink on internal earthing connections	.		Gtangianu 2024-11-02	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30000305	B	CB-200F3B C10000856	Missing thermo shrink on internal earthing connections	.		Gtangianu 2024-11-02	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30000306	B	BA-200F3A C10000848	Missing tag on battery bank	.		Gtangianu 2024-11-02	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30000307	B	BA-200F3B C10000849	Missing tag on battery bank	.		Gtangianu 2024-11-02	2025-02-04	Gtangianu 2025-02-04	2025-02-04

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM	84	Battery & No-Break System
SUBSYSTEM	84-10	AC 35 kVA UPS System (UP-200F3)

Telecom

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000791	B	UP-200F3/B400 -NET-001.01 C10004370	Identification cable tag missing inside UP-200F3 connection.	.		Gtangianu 2024-11-22	2025-02-21	Gtangianu 2025-02-21	2025-02-21
C30000792	B	UP-200F3/B400 -NET-001.02 C10004371	Identification cable tag missing inside UP-200F3 connection.	.		Gtangianu 2024-11-22	2025-02-21	Gtangianu 2025-02-21	2025-02-21

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 84 Battery & No-Break System

SUBSYSTEM 84-10 AC 35 kVA UPS System (UP-200F3)

Instrumental

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000880	B	C-CB-200F3A/B 400-SIS-001 C10000197	Missing cable tag outside B-400-SIS-001 panel	.		Pschintu 2024-11-25	2024-12-11	Pschintu 2024-12-11	2024-12-11
C30000881	B	C-CB-200F3B/B 400-SIS-001 C10000198	Missing cable tag outside B-400-SIS-001 panel	.		Pschintu 2024-11-25	2024-12-11	Pschintu 2024-12-11	2024-12-11
C30001057	B	UP-200F3/B400 -SIS-001 C10000196	Missing core identification tag by UP-200F3 side	.		Pschintu 2024-11-30	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30001058	B	UP-200F3/B400 -SIS-001 C10000196	Missing SS cable tag	.		Pschintu 2024-11-30	2025-01-31	Gtangianu 2025-01-31	2025-01-31

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

CAE EPLAN Electric P8

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AUXILIARY
From Lighting & Small Power DB BOP DP 200N1
(Cubicle 33 Q41)
100-240V/N/PE~50/60Hz
back-up fuse gG10A 3G2.5mm2

LINE A
From LV Switchgear SG-200N1
(Cubicle A3/Q1)
Mains 400V;3/PE~50Hz
gG63A 4G35mm2

From LV Switchgear SG 200N1
(Cubicle A7/Q2)
Bypass mains 400V;3/PE~50Hz
gG63A 4G35mm2

LINE B
From LV Switchgear SG 200N1
(Cubicle A4/Q1)
Mains 400V;3/PE~50Hz
gG63A 4G35mm2

Not included in the AEG shipment

Code	Description
Q1	Rectifier input mains breaker
T40	Rectifier input isolation transformer
A1	Rectifier
A2	Inverter
T1	Inverter output isolation transformer
A3-A4	Static by-pass switch
A18	Display control module
A85	Heater
H1	Light

+MBC1
BY-200F3
Bypass transformer cabinet 40 kVA
1000007883.020
10039757

-Q10 L=63/65A I=0,8kA Icu=50kA
-T8 400V/400V 40kVA
-X1 1U,1V,1W,PE
-X10 U,V,W,PE
-X13 U,N,PE
-X14 U,N
-A85
-H1

-Q28.1 NC
-Q28.2 NC

+UPS1
BC-200F3A
Protect 8.33 40-400-210-400
1000007883.010
10039756

+UPS2
BC-200F3B
Protect 8.33 40-400-210-400
1000007883.310
10039755

-Q1 L=100/85A I=1,0kA Icu=50kA
-T40
-A1 REC
-A2 INV
-T1
-F1,-F2,-F3
-A3 SBS
-A4
-A18 Display
-A20 Parallel Adapter
-X3 INV CAN
-X5 INV Sync
-L11,-L12,-L13 Parallel preventive choke coil
-A12,-A13 Remote signaling
-A24.1 BLU PRO
-F91

-X1 2U,2V,2W,PE
-X4 1U,1V,1W,1N,PE
-X4 2U,2V,2W,2N,PE
-X1 4U,4V,4W,PE
-X1 3U,3V,3W,PE
-E1-X1 U,V,W,PE
-E4-X4 U,V,W,N,PE
-E2-X2 L-,L+,PE
-E3-X3 U,V,W,N,PE
-X15 2,3
-X130 1,2
-X5 1U,1V,1W,1N,PE
-X5 2U,2V,2W,2N,PE
-X2 3L+,3L-,PE
-X15 5,7
-X91 3M

-Q71 NC
-Q72 NC
-Q29 INV operation / Manual bypass
-F25

DP-200F3
-QF31 B32A 300mA
-QF32 B32A 300mA
-QF33 B32A 300mA
-QF34 B16A 300mA (5pc)
-QF38 B16A 300mA
-QF39 B10A 300mA (4pc)
-QF42 B13A 300mA (8pc)
-QF43 B13A
-QF50 B10A
-QF51 B6A
-QF52 B6A
-X2 2L+,2L-,PE
-X15 4,5
-X91 2M
-X130 1,2,1PE
-X31 U,N,PE
-X32 U,N,PE
-X33 U,N,PE
-X34 U,N,PE
-X38 V,N,PE
-X39 V,N,PE
-X42 W,N,PE
-X43 W,N,PE
-X50 U,N,PE
-X51 V,N,PE
-X52 V,N,PE
-X2 4L+,4L-,PE
-X15 8,9
-X91 4M
-X130 3,4,2PE

Not included in the AEG shipment
max. gG16A
max. gG16A
Load
400/230V;3/N/PE~50Hz

+BFB1
CB-200F3A
Battery fuse box 200 A
-Q2 L=200A
DC 24V max. 300W
2(1x70 mm2)

+BFB2
CB-200F3B
Battery fuse box 200 A
-Q2 L=200A
DC 24V max. 300W
2(1x70 mm2)

+BAT1
BA-200F3A
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-RBTMN

+BAT2
BA-200F3B
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-RBTMN

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724000372-EL-DG-00009

REV.:	DATE:	SIGNATURE:
3_A	15/11/24	G.Randi

ROSETTI MARINO SpA

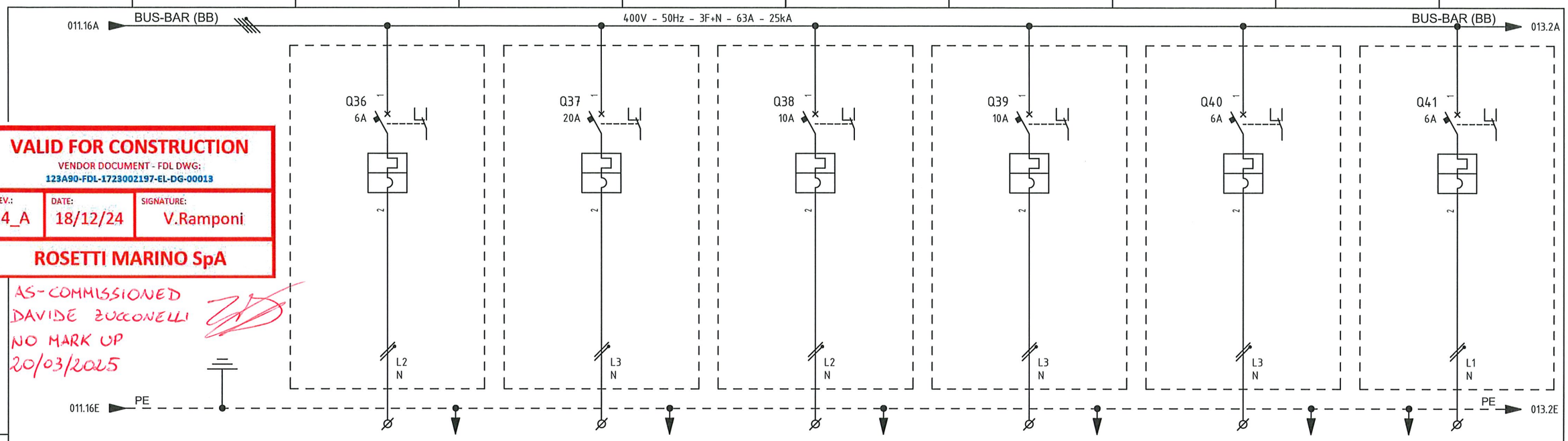
AS-COMMISSIONED
DAVIDE ZUCCONELLI
NO MARK UP
21/03/2025

*1 Attention! In the event of battery undervoltage < 130 V, the UPS automatically switches off battery isolator Q2.
If this happens, switch X15:3 must be switched into the open position (undervoltage trip blocked).
For restart, please refer to the chapter in the UPS operating instructions (charging the DC link capacitors) attached.
Unlock the tripped switch Q2 by switching to open position.
After charging the DC link capacitors, switch on Q2.
Attention! When the battery voltage reaches > 200 V, switch X15:3 must be switched back to the closed position.

*2 Connection cables are not included.

1000007888_010

ROSETTI MARINO
Mohammed Bin Rashid Al Maktoum Port Farm
AEG
System 40 kVA
Single-line diagram
1000007888_310 en
A0



VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1723002197-EL-DG-00013

REV.:	DATE:	SIGNATURE:
4_A	18/12/24	V.Ramponi

ROSETTI MARINO SpA

AS-COMMISSIONED
DAVIDE ZUCCONELLI
NO MARK UP
20/03/2025

ITEM			1	CP-200E2	CP-100E1	SG-100D1	SG-200N1	SG-200D2	UP-200F3
UTILITY			2	AUXILIARY TRAFO SOLARE 0.5MVA	AUXILIARY GIS	AUXILIARY 6.6KV SWITCHBOARD	AUXILIARY LV SWITCHBOARD	AUXILIARY LV SWITCHBOARD 800/460V	AC UPS PAS AUXILIARY
CUBICLE			3	+03	+03	+03	+03	+03	+03
RATED POWER | RATED CURRENT			4/5	0.5 KW | 2.72 A	3 KW | 16.3 A	1 KW | 5.43 A	1 KW | 5.43 A	0.5 KW | 2.72 A	0.2 KW | 0.82 A
TYPICAL FUNCTIONAL			6	-	-	-	-	-	-
CIRCUIT BREAKER (ABB)	TYPE		7	S302P-C6	S302P-C20	S302P-C10	S302P-C10	S302P-C6	S302P-C6
	VERSION		8	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE
	TRIP UNITS		9	In=6A - Curve C	In=20A - Curve C	In=10A - Curve C	In=10A - Curve C	In=6A - Curve C	In=6A - Curve C
	Icu	KA	10	25kA	25kA	25kA	25kA	25kA	25kA
OVERLOAD	L	Range A	11	-	-	-	-	-	-
		Range t	12	-	-	-	-	-	-
SEL. SHORT-CIRCUIT	S	Range A	13	-	-	-	-	-	-
		Range t	14	-	-	-	-	-	-
INST. SHORT-CIRCUIT	I	Range A	15	-	-	-	-	-	-
		Range t	16	-	-	-	-	-	-
EARTH FAULT PROTECTION	G	Range A	17	-	-	-	-	-	-
		Range t	18	-	-	-	-	-	-
CONTACTOR (ABB)			19	-	-	-	-	-	-
THERMAL OVERLOAD RELAY (ABB)			20	-	-	-	-	-	-
SURGE ARRESTERS (DHENN)			21	-	-	-	-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-	-	-	-	-	-
FUSE HOLDER (ABB)			23	-	-	-	-	-	-
TWILIGHT SWITCH (ABB)			24	-	-	-	-	-	-
VOLTMETER (FRER)			25	-	-	-	-	-	-
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-	-	-	-	-	-
	PERFORMANCE/CLASS		27	-	-	-	-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-	-	-	-	-	-
	PERFORMANCE/CLASS		29	-	-	-	-	-	-
POWER TERM. BLOCK (CABUR)		Type/mm²	30	SCREW / 4	SCREW / 6	SCREW / 4	SCREW / 4	SCREW / 4	SCREW / 4
POWER CONDUCTOR		mm²	31	3G2.5	3G6	3G2.5	3G2.5	3G2.5	3G2.5

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DWG n° : 231298/SD/13
Item n° : PF1002888/101

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
3	05/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for construction (AFC)
2	24/04/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	15/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	08/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "DP-200N1"
SINGLE LINE DIAGRAM
Single Line Drawing

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

SCALE : NTS

A3

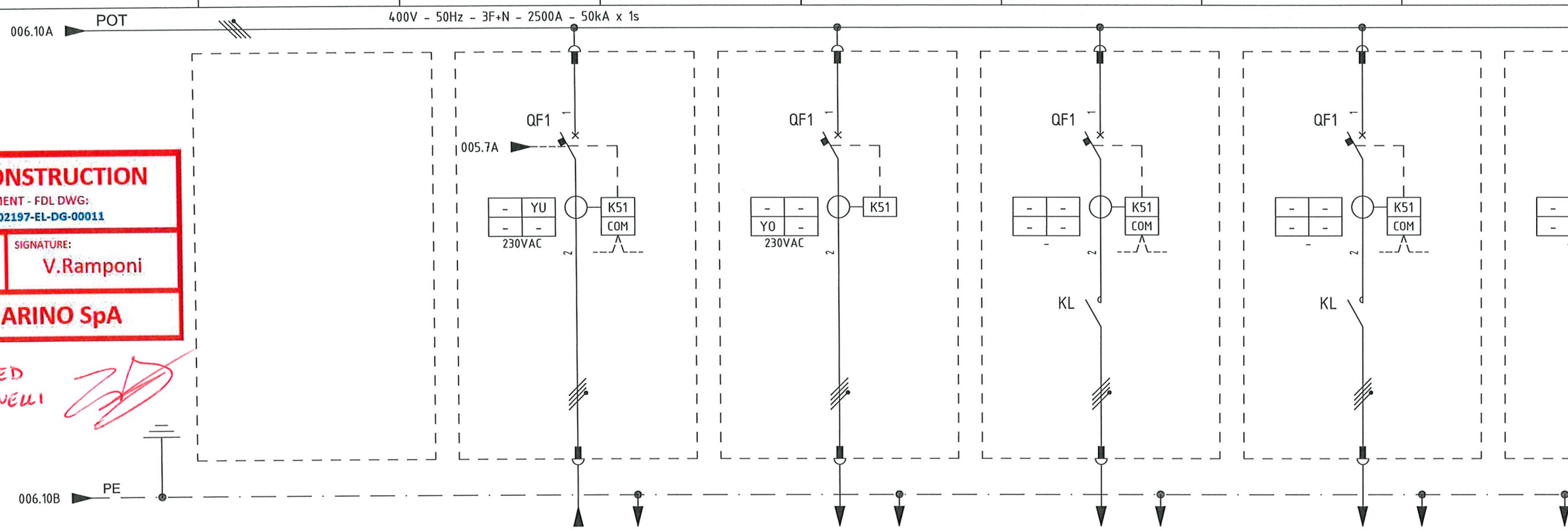
DRAWING NO. 1723002197-EL-DG-00013

SHEET 012

REV. 04

File Name : 1723002197-EL-DG-00013 Rev. 04

F.to UNI A3: 420mmx297mm



VALID FOR CONSTRUCTION

VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1723002197-EL-DG-00011

REV.:	DATE:	SIGNATURE:
4_A	18/12/24	V.Ramponi

ROSETTI MARINO SpA

AS-COMMISSIONED
DAVIDE ZUCCONELLI
20/03/2025
NO MARKUP

ITEM				1	JB-200E2	UP-200F3	SPARE	DP-200N1	
UTILITY				2	TEMPORARY GENERATOR / MOBILE BATTERY PACK	AC UPS PAS - 30 MIN UP-200F3 - LINE A	SPARE	DB - LIGHTING & SMALL POWER - BoP	
COLUMN/CUBICLE				3	A2 / +08	A3 / +01	A3 / +02	A3 / +03	
RATED POWER | RATED CURRENT				4/5	138 kW | 210 A	36.0 kW | 57.8 A	- kW | - A	15.35 kW | 23.7 A	25 kW
TYPICAL FUNCTIONAL				6	LE2-320	L1-100	LK1-40	LK1-100	
CIRCUIT BREAKER (ABB)	TYPE			7	XT5S - 400	XT2S - 160	XT2S - 160	XT2S - 160	
	VERSION			8	4P - FIXED	4P - FIXED	4P - FIXED	4P - FIXED	
	TRIP UNITS			9	EKIP HI TOUCH LSIG (In = 320A)	EKIP DIP LSIG (In = 100A)	EKIP HI TOUCH LSIG (In = 40A)	EKIP HI TOUCH LSIG (In = 100A)	EKIP
	Icu		KA	10	50 kA	50 kA	50 kA	50 kA	
OVERLOAD	L	Range	A	11	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In	
		Range	t	12	k/I^2	k/I^2	k/I^2	k/I^2	
SEL. SHORT-CIRCUIT	S	Range	A	13	(0.6 - 10) x In	(1 - 10) x In	(0.6 - 10) x In	(0.6 - 10) x In	
		Range	t	14	0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	0.05 - 0,4 sec / k/I^2	0.05 - 0,4 sec / k/I^2	
INST. SHORT-CIRCUIT	I	Range	A	15	(1.5 - 15) x In	(1 - 10) x In	(1.5 - 15) x In	(1.5 - 15) x In	
		Range	t	16	instantaneous	<= 0.02 sec	instantaneous	instantaneous	
EARTH FAULT PROTECTION	G	Range	A	17	(0.1 - 1) x In	(0.2 - 1) x In	(0.1 - 1) x In	(0.1 - 1) x In	
		Range	t	18	t=k / t=k/I^2	0.1 - 0.8 sec	t=k / t=k/I^2	t=k / t=k/I^2	
CONTACTOR (ABB)				19	-	-	AF40-40-00-13 (70A-AC1); 100-250VAC/DC	AF80-40-00-13 (70A-AC1); 100-250VAC/DC	AF52-40-0
THERMAL OVERLOAD RELAY (ABB)				20	-	-	-	-	
SURGE ARRESTER (DEHN)				21	-	-	-	-	
TOROIDAL CURRENT TRANSFORMER (FRER)				22	-	-	-	-	
FUSE HOLDER (ITALWEBER)				23	-	-	-	-	
INDIRECT PROTECTION (ABB)				24	-	-	-	-	
VOLTMETER				25	-	-	-	-	
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE			26	-	-	-	-	
	PERFORMANCE/CLASS			27	-	-	-	-	
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE			28	-	-	-	-	
	PERFORMANCE/CLASS			29	-	-	-	-	
LOCK-OUT RELAY (-)				30	-	-	-	-	
POWER CONDUCTOR			mmq	31	5 x (1 x 95)	4G35	-	5G50	

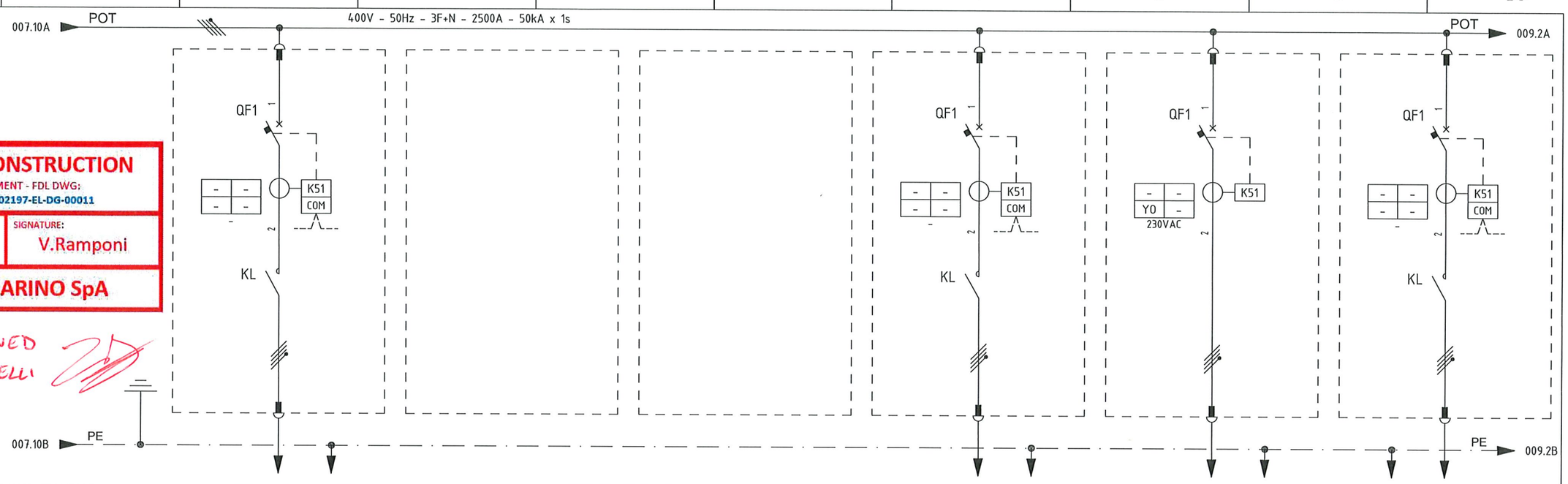
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+	4	28/08/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
DWG n° : 231298/SD/11	3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)

TITLE :

"SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing



VALID FOR CONSTRUCTION

VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1723002197-EL-DG-00011

REV.:	DATE:	SIGNATURE:
4_A	18/12/24	V.Ramponi

ROSETTI MARINO SpA

AS-COMMISSIONED
DAVIDE ZUCCONELLI
20/03/2025
NO MARK UP

ITEM						JB-500E8	UP-200F3	B100-HSB-001
UTILITY			2	SPARE	FUTURE	WATER PACKAGE	AC UPS PAS - 30 MIN UP-200F3 - LINE B	HVAC PANELS HV ROOM
COLUMN/CUBICLE			3	A3 / +05	A3 / +06	A3 / +08	A4 / +01	A4 / +02
RATED POWER | RATED CURRENT			4/5	- kW | - A	- | -	67 kW | 107.00 A	36.0 kW | 57.8 A	18 kW | 34.1 A
TYPICAL FUNCTIONAL			6	LK1-40		LK2-160	L1-100	LK1-40
CIRCUIT BREAKER (ABB)	TYPE		7	XT2S - 160		XT4S - 250	XT2S - 160	XT2S - 160
	VERSION		8	4P - FIXED		4P - FIXED	4P - FIXED	4P - FIXED
	TRIP UNITS		9	EKIP HI TOUCH LSIG (In = 40A)		EKIP HI TOUCH LSIG (In = 160A)	EKIP DIP LSIG (In = 100A)	EKIP HI TOUCH LSIG (In = 40A)
	Icu	KA	10	50 kA		50 kA	50 kA	50 kA
OVERLOAD	L	Range A	11	(0.4 - 1) x In		(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In
		Range t	12	k/I^2		k/I^2	k/I^2	k/I^2
SEL. SHORT-CIRCUIT	S	Range A	13	(0.6 - 10) x In		(0.6 - 10) x In	(1 - 10) x In	(0.6 - 10) x In
		Range t	14	0.05 - 0,4 sec / k/I^2		0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	0.05 - 0,4 sec / k/I^2
INST. SHORT-CIRCUIT	I	Range A	15	(1.5 - 15) x In		(1.5 - 15) x In	(1 - 10) x In	(1.5 - 15) x In
		Range t	16	instantaneous		instantaneous	<= 0.02 sec	instantaneous
EARTH FAULT PROTECTION	G	Range A	17	(0.1 - 1) x In		(0.1 - 1) x In	(0.2 - 1) x In	(0.1 - 1) x In
		Range t	18	t=k / t=k/I^2		t=k / t=k/I^2	0.1 - 0.8 sec	t=k / t=k/I^2
CONTACTOR (ABB)			19	AF40-40-00-13 (70A-AC1); 100-250VAC/DC		AF190-40-11-13 (275A-AC1); 100-250 VAC/DC	-	AF40-40-00-13 (70A-AC1); 100-250VAC/DC
THERMAL OVERLOAD RELAY (ABB)			20	-		-	-	-
SURGE ARRESTER (DEHN)			21	-		-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-		-	-	-
FUSE HOLDER (ITALWEBER)			23	-		-	-	-
INDIRECT PROTECTION (ABB)			24	-		-	-	-
VOLTMETER			25	-		-	-	-
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-		-	-	-
	PERFORMANCE/CLASS		27	-		-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-		-	-	-
	PERFORMANCE/CLASS		29	-		-	-	-
LOCK-OUT RELAY (-)			30	-		-	-	-
POWER CONDUCTOR		mmq	31	-		5G70	4G35	5G16

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DWG n° : 231298/SD/11
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	28/08/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
2	03/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	28/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	15/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00011

SHEET 008

REV. 04

F.to UNI A3: 420mmx297mm

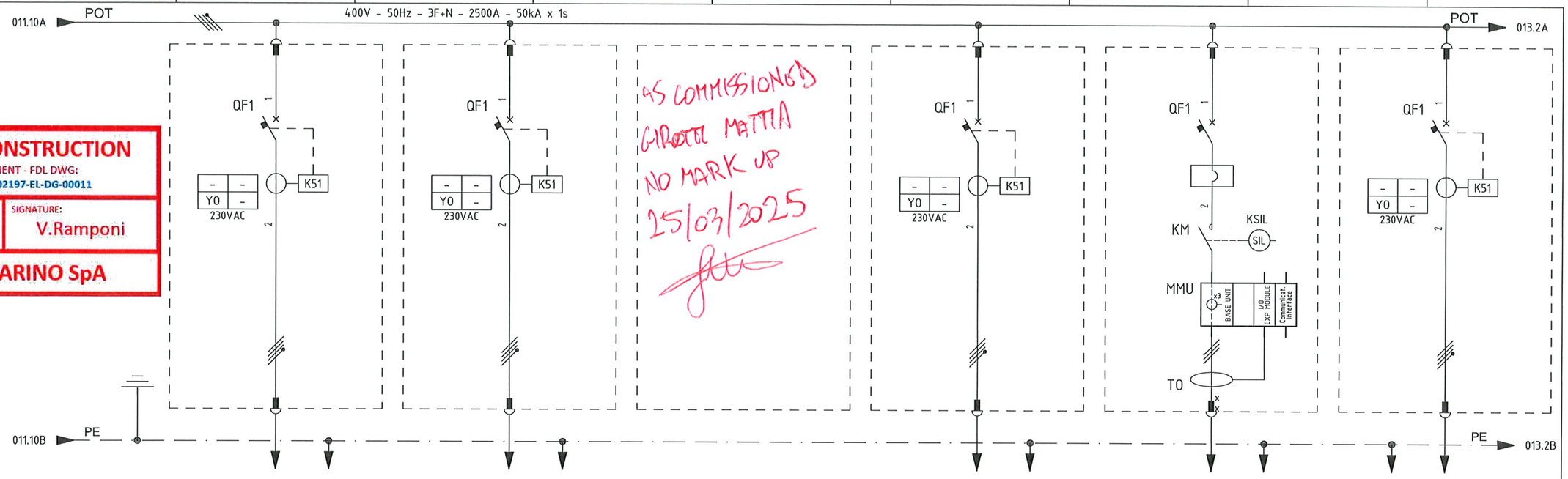
File Name : 1723002197-EL-DG-00011 Rev. 04

VALID FOR CONSTRUCTION

VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1723002197-EL-DG-00011

REV.:	DATE:	SIGNATURE:
4_A	18/12/24	V.Ramponi

ROSETTI MARINO SpA



ITEM			1	UP-200F4	UP-200F4	ESW-200N1	PM-50001 A	UP-200F3
UTILITY			2	AC UPS F&G - 8 H UP-200F4 - LINE A	AC UPS F&G - 8h UP-200F4 - LINE B	WELDING SOCKETS (TOP DECK)	SEA WATER PUMP A	AC UPS PAS - 30 min. UP-200F3 - BYPASS
COLUMN/CUBICLE			3	A6 / +05	A6 / +06	A6 / +08	A7 / +01	A7 / +02
RATED POWER | RATED CURRENT			4/5	18 kW | 28.9 A	18 kW | 28.9 A	69.84 kW | 126.15 A	6.1 kW | 11.0 A	36 kW | 57.8 A
TYPICAL FUNCTIONAL			6	L1-63	L1-63	L2-160	M1-6	L1-100
CIRCUIT BREAKER (ABB)	TYPE		7	XT2S - 160	XT2S - 160	XT4S - 250	XT2S - 160	XT2S - 160
	VERSION		8	4P - FIXED	4P - FIXED	4P - FIXED	3P - FIXED	4P - FIXED
	TRIP UNITS		9	EKIP DIP LSIG (In = 63A)	EKIP DIP LSIG (In = 63A)	EKIP DIP LSIG (In = 160A)	MA (In = 20A)	EKIP DIP LSIG (In = 100A)
	Icu	KA	10	50 kA	50kA	50kA	-	50 kA
OVERLOAD	L	Range A	11	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In	-	(0.4 - 1) x In
		Range t	12	k/I^2	k/I^2	k/I^2	-	k/I^2
SEL. SHORT-CIRCUIT	S	Range A	13	(1 - 10) x In	(1 - 10) x In	(1 - 10) x In	-	(1 - 10) x In
		Range t	14	0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	-	0.05 - 0.4 sec / k/I^2
INST. SHORT-CIRCUIT	I	Range A	15	(1 - 10) x In	(1 - 10) x In	(1 - 10) x In	(6 - 14) x I	(1 - 10) x In
		Range t	16	<= 0.02 sec	<= 0.02 sec	<= 0.02 sec	<= 0.02 sec	<= 0.02 sec
EARTH FAULT PROTECTION	G	Range A	17	(0.2 - 1) x In	(0.2 - 1) x In	(0.2 - 1) x In	-	(0.2 - 1) x In
		Range t	18	0.1 - 0.8 sec	0.1 - 0.8 sec	0.1 - 0.8 sec	-	0.1 - 0.8 sec
CONTACTOR (ABB)			19	-	-	-	AF38-30-00-13 (18.5 kW - AC3) - 100-250Vac/dc	-
THERMAL OVERLOAD RELAY (ABB)			20	-	-	-	UMC100.3 UC (0.24 - 63A)	-
SURGE ARRESTER (DEHN)			21	-	-	-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-	-	-	-	-
FUSE HOLDER (ITALWEBER)			23	-	-	-	-	-
INDIRECT PROTECTION (ABB)			24	-	-	-	-	-
VOLTMETER			25	-	-	-	-	-
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-	-	-	-	-
	PERFORMANCE/CLASS		27	-	-	-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-	-	-	-	-
	PERFORMANCE/CLASS		29	-	-	-	-	-
LOCK-OUT RELAY (-)			30	-	-	-	-	-
POWER CONDUCTOR		mmq	31	4G35	4G35	5G50	4G4	4G35

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DWG n° : 231298/SD/11
Item n° : PF1002983/26

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	28/08/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
2	03/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	28/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	15/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00011

SHEET 012

REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00011 Rev. 04

Section 3 CONSOLIDATED PUNCH LISTS

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 84 Battery & No-Break System

SUBSYSTEM 84-10 AC 35 kVA UPS System (UP-200F3)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000261	B	83122-CEL C10000641	Cable to be fixed with proper cable ties, after MCT installation of the panel DP-200N1	-		Gtangianu 2024-10-24	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000262	B	83122-CEL C10000641	Wrong core identification tag on both cable's termination	-		Gtangianu 2024-10-24	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000263	B	83122-CEL C10000641	Plastic cable ties to be replaced on external routing	-		Gtangianu 2024-10-24	2025-02-26	Pschintu 2025-02-26	2025-02-26
C30000287	B	UP-200F3 C10000871	Cleaning is required inside and on the top of the panel	.		Gtangianu 2024-11-02	2024-12-14	Ecarotenuto 2024-12-14	2024-12-14
C30000288	B	UP-200F3 C10000871	Missing thermo shrink on internal earthing connections.	.		Gtangianu 2024-11-02	2025-03-06	JKrizanic 2025-03-06	2025-03-06
C30000289	B	83028-CEL C10000553	Missing identification tags on terminal strip (X1 / 1U/1V/1W). See attached photo	.		Gtangianu 2024-11-02	2025-03-06	JKrizanic 2025-03-06	2025-03-06
C30000290	B	83028-CEL C10000553	Identification tag of wire are wrong inside SG-200N1 (A3/+01)	.		Gtangianu 2024-11-02	2024-12-18	Gtangianu 2024-12-18	2024-12-18
C30000291	B	83028-CEL C10000553	Missing cable tags on all routing (MCT of B-200_ B-300_ inside and outside UP-200F3)	.		Gtangianu 2024-11-02	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000292	B	83028-CEL C10000553	Plastic cable ties to be replaced on external routing	.		Gtangianu 2024-11-02	2025-02-26	Pschintu 2025-02-26	2025-02-26

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 84 Battery & No-Break System

SUBSYSTEM 84-10 AC 35 kVA UPS System (UP-200F3)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000293	B	84332-CEL-1-P C10000646	Missing identification number on terminal strip X1+	.		Gtangianu 2024-11-02	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30000294	B	83029-CEL C10000554	Missing cable tags on internal and external side of MCT of B-200/B-300	.		Gtangianu 2024-11-02	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000295	B	83029-CEL C10000554	Plastic cable ties to be replaced on external routing	.		Gtangianu 2024-11-02	2025-02-26	Pschintu 2025-02-26	2025-02-26
C30000296	B	83029-CEL C10000554	Identification tag of wire are wrong inside SG-200N1 (A4/+01) and are missing inside UP-200F3 (X1/3W)	.		Gtangianu 2024-11-02	2024-12-18	Gtangianu 2024-12-18	2024-12-18
C30000297	B	83029-CEL C10000554	Missing identification numbers on terminal strip inside UP-200F3 (X1/3U/3V/3W)	.		Gtangianu 2024-11-02	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30000298	B	83030-CEL C10000555	Identification tag of wire are wrong or missing inside SG-200N1 (A7/+02)	.		Gtangianu 2024-11-02	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000299	B	83030-CEL C10000555	Missing cable tags on internal and external side of MCT (B-200/B-300)	.		Gtangianu 2024-11-02	2025-01-31	Gtangianu 2025-01-31	2025-01-31
C30000300	B	83030-CEL C10000555	Plastic cable ties to be replaced on external routing	.		Gtangianu 2024-11-02	2025-02-26	Pschintu 2025-02-26	2025-02-26
C30000301	B	84330-CEC C10002343	Missing cable tag inside and outside CB-200F3A and on the top side of BC-200F3A	.		Gtangianu 2024-11-02	2024-12-14	Ecarotenuto 2024-12-14	2024-12-14

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 84 Battery & No-Break System
SUBSYSTEM 84-10 AC 35 kVA UPS System (UP-200F3)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000302	B	84330-CEC C10002343	Missing identification number on terminal strip X15 (inside BC-200F3A)	.		Gtangianu 2024-11-02	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30000303	B	84331-CEL-2-N C10000645	Missing cable tag inside CB-200F3A	.		Gtangianu 2024-11-02	2024-12-14	Ecarotenuto 2024-12-14	2024-12-14
C30000304	B	CB-200F3A C10000855	Missing thermo shrink on internal earthing connections	.		Gtangianu 2024-11-02	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30000305	B	CB-200F3B C10000856	Missing thermo shrink on internal earthing connections	.		Gtangianu 2024-11-02	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30000306	B	BA-200F3A C10000848	Missing tag on battery bank	.		Gtangianu 2024-11-02	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30000307	B	BA-200F3B C10000849	Missing tag on battery bank	.		Gtangianu 2024-11-02	2025-02-04	Gtangianu 2025-02-04	2025-02-04

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM	84	Battery & No-Break System
SUBSYSTEM	84-10	AC 35 kVA UPS System (UP-200F3)

Telecom

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000791	B	UP-200F3/B400 -NET-001.01 C10004370	Identification cable tag missing inside UP-200F3 connection.	.		Gtangianu 2024-11-22	2025-02-21	Gtangianu 2025-02-21	2025-02-21
C30000792	B	UP-200F3/B400 -NET-001.02 C10004371	Identification cable tag missing inside UP-200F3 connection.	.		Gtangianu 2024-11-22	2025-02-21	Gtangianu 2025-02-21	2025-02-21

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 84 Battery & No-Break System

SUBSYSTEM 84-10 AC 35 kVA UPS System (UP-200F3)

Instrumental

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000880	B	C-CB-200F3A/B 400-SIS-001 C10000197	Missing cable tag outside B-400-SIS-001 panel	.		Pschintu 2024-11-25	2024-12-11	Pschintu 2024-12-11	2024-12-11
C30000881	B	C-CB-200F3B/B 400-SIS-001 C10000198	Missing cable tag outside B-400-SIS-001 panel	.		Pschintu 2024-11-25	2024-12-11	Pschintu 2024-12-11	2024-12-11
C30001057	B	UP-200F3/B400 -SIS-001 C10000196	Missing core identification tag by UP-200F3 side	.		Pschintu 2024-11-30	2025-03-06	Gtangianu 2025-03-06	2025-03-06
C30001058	B	UP-200F3/B400 -SIS-001 C10000196	Missing SS cable tag	.		Pschintu 2024-11-30	2025-01-31	Gtangianu 2025-01-31	2025-01-31

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000307

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000849	1.4 Discipline	Electrical
1.2 Item	BA-200F3B	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing tag on battery bank

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	VND Vendor	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-04

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000791

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10004370	1.4 Discipline	Telecom
1.2 Item	UP-200F3/B400-NET-001.01	COMMUNICATION / EMCS SYSTEM	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Identification cable tag missing inside UP-200F3 connection.

Name: Giovanni Tangianu

Date: 2024-11-22

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-22
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-21

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000792

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10004371	1.4 Discipline	Telecom
1.2 Item	UP-200F3/B400-NET-001.02	COMMUNICATION / EMCS SYSTEM	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Identification cable tag missing inside UP-200F3 connection.

Name: Giovanni Tangianu

Date: 2024-11-22

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-22
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-21

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000880

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000197	1.4 Discipline	Instrumental
1.2 Item	C-CB-200F3A/B400-SIS-001	TRIP SIGNAL / MARSHALLING PCS	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing cable tag outside B-400-SIS-001 panel

Name: Paolo Schintu

Date: 2024-11-25

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	2024-11-25
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Done.

Name: Paolo Schintu

Date: 2024-12-11

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000881

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000198	1.4 Discipline	Instrumental
1.2 Item	C-CB-200F3B/B400-SIS-001	TRIP SIGNAL / MARSHALLING PCS	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing cable tag outside B-400-SIS-001 panel

Name: Paolo Schintu

Date: 2024-11-25

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	2024-11-25
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Done.

Name: Paolo Schintu

Date: 2024-12-11

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001057

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000196	1.4 Discipline	Instrumental
1.2 Item	UP-200F3/B400-SIS-001	TRIP SIGNAL / MARSHALLING PCS	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing core identification tag by UP-200F3 side

Name: Paolo Schintu

Date: 2024-11-30

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	2024-11-30
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Punch accepted by RM (Rosetti Marino).

Name: Giovanni Tangianu

Date: 2025-03-06

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001058

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000196	1.4 Discipline	Instrumental
1.2 Item	UP-200F3/B400-SIS-001	TRIP SIGNAL / MARSHALLING PCS	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing SS cable tag

Name: Paolo Schintu

Date: 2024-11-30

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	2024-11-30
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-01-31

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000261

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000641	1.4 Discipline	Electrical
1.2 Item	83122-CEL		Lighting & Small Power DB BoP / AC UPS PAS AUXILIARY
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Cable to be fixed with proper cable ties, after MCT installation of the panel DP-200N1

Name: Giovanni Tangianu

Date: 2024-10-24

Signature:

3 - DEFECT ASSESSMENT

-

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-10-24
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

fixed.

Name: Giovanni Tangianu

Date: 2025-01-31

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000262

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000641	1.4 Discipline	Electrical
1.2 Item	83122-CEL		Lighting & Small Power DB BoP / AC UPS PAS AUXILIARY
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Wrong core identification tag on both cable's termination

Name: Giovanni Tangianu

Date: 2024-10-24

Signature:

3 - DEFECT ASSESSMENT

-

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-10-24
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-01-31

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000263

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000641	1.4 Discipline	Electrical
1.2 Item	83122-CEL		Lighting & Small Power DB BoP / AC UPS PAS AUXILIARY
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Plastic cable ties to be replaced on external routing

Name: Giovanni Tangianu

Date: 2024-10-24

Signature:

3 - DEFECT ASSESSMENT

-

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-10-24
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-26

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000287

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000871	1.4 Discipline	Electrical
1.2 Item	UP-200F3	AC UPS 35 kVA Redundant System with By-Pass	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Cleaning is required inside and on the top of the panel

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

done

Name: Eleonora Carotenuto

Date: 2024-12-14

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000288

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000871	1.4 Discipline	Electrical
1.2 Item	UP-200F3	AC UPS 35 kVA Redundant System with By-Pass	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing thermo shrink on internal earthing connections.

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	PRE-COMM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

ACCEPTED BY ROSETTI MARINO

Name: Josip Krizanic

Date: 2025-03-06

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000289

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000553	1.4 Discipline	Electrical
1.2 Item	83028-CEL	LV Switchgear / AC UPS PAS - 30min - Line A	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing identification tags on terminal strip (X1 / 1U/1V/1W). See attached photo

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	VND Vendor	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

ACCEPTED BY ROSETTI MARINO

Name: Josip Krizanic

Date: 2025-03-06

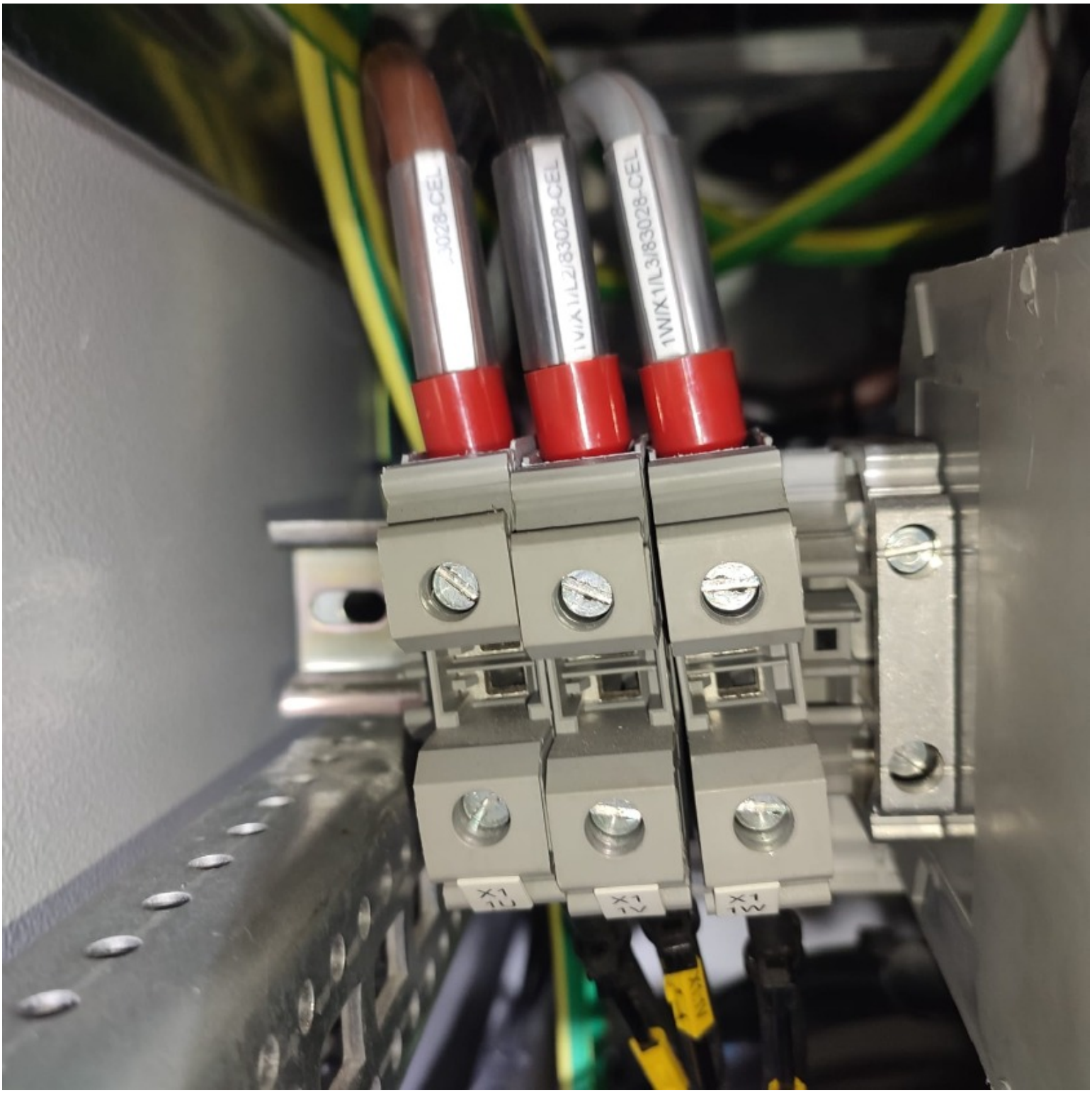
Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:


1W/X1/L3/83028-CEL
X1
X1
X1

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000290

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000553	1.4 Discipline	Electrical
1.2 Item	83028-CEL		LV Switchgear / AC UPS PAS - 30min - Line A
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Identification tag of wire are wrong inside SG-200N1 (A3/+01)

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

installed.

Name: Giovanni Tangianu

Date: 2024-12-18

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000291

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000553	1.4 Discipline	Electrical
1.2 Item	83028-CEL	LV Switchgear / AC UPS PAS - 30min - Line A	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing cable tags on all routing (MCT of B-200_ B-300_ inside and outside UP-200F3)

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-01-31

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000292

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000553	1.4 Discipline	Electrical
1.2 Item	83028-CEL		LV Switchgear / AC UPS PAS - 30min - Line A
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Plastic cable ties to be replaced on external routing

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-26

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000293

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000646	1.4 Discipline	Electrical
1.2 Item	84332-CEL-1-P		AC UPS PAS- Charger-B / AC UPS PAS - Battery Isolator-B
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Missing identification number on terminal strip X1+

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	VND Vendor	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Punch accepted by RM (Rosetti Marino).

Name: Giovanni Tangianu

Date: 2025-03-06

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000294

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000554	1.4 Discipline	Electrical
1.2 Item	83029-CEL	LV Switchgear / AC UPS PAS - 30min - Line B	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing cable tags on internal and external side of MCT of B-200/B-300

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-01-31

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000295

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000554	1.4 Discipline	Electrical
1.2 Item	83029-CEL	LV Switchgear / AC UPS PAS - 30min - Line B	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Plastic cable ties to be replaced on external routing

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-26

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000296

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000554	1.4 Discipline	Electrical
1.2 Item	83029-CEL	LV Switchgear / AC UPS PAS - 30min - Line B	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Identification tag of wire are wrong inside SG-200N1 (A4/+01) and are missing inside UP-200F3 (X1/3W)

Name: Giovanni Tangianu
Date: 2024-11-02
Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:
Date:
Signature:

5 - CLEARANCE CHECK

installed.

Name: Giovanni Tangianu
Date: 2024-12-18
Signature:

6- CLEARANCE APPROVAL

Name:
Date:
Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000297

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000554	1.4 Discipline	Electrical
1.2 Item	83029-CEL	LV Switchgear / AC UPS PAS - 30min - Line B	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing identification numbers on terminal strip inside UP-200F3 (X1/3U/3V/3W)

Name: Giovanni Tangianu
Date: 2024-11-02
Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	VND Vendor	Signature	

4 - PERFORMED ACTION

Name:
Date:
Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu
Date: 2025-02-04
Signature:

6- CLEARANCE APPROVAL

Name:
Date:
Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000298

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000555	1.4 Discipline	Electrical
1.2 Item	83030-CEL		LV Switchgear / AC UPS PAS - 30min - Bypass
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Identification tag of wire are wrong or missing inside SG-200N1 (A7/+02)

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-01-31

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000299

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000555	1.4 Discipline	Electrical
1.2 Item	83030-CEL		LV Switchgear / AC UPS PAS - 30min - Bypass
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Missing cable tags on internal and external side of MCT (B-200/B-300)

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-01-31

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000300

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000555	1.4 Discipline	Electrical
1.2 Item	83030-CEL		LV Switchgear / AC UPS PAS - 30min - Bypass
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Plastic cable ties to be replaced on external routing

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-26

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000301

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002343	1.4 Discipline	Electrical
1.2 Item	84330-CEC		Isolator Battery Box for AC UPS 35 kVA / AC UPS 35 kVA Redundant System with By-Pass
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Missing cable tag inside and outside CB-200F3A and on the top side of BC-200F3A

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

done

Name: Eleonora Carotenuto

Date: 2024-12-14

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000302

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002343	1.4 Discipline	Electrical
1.2 Item	84330-CEC		Isolator Battery Box for AC UPS 35 kVA / AC UPS 35 kVA Redundant System with By-Pass
1.3 Subsystem	84-10		AC 35 kVA UPS System (UP-200F3)

2 - OBSERVATION

Missing identification number on terminal strip X15 (inside BC-200F3A)

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	VND Vendor	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Punch accepted by RM (Rosetti Marino).

Name: Giovanni Tangianu

Date: 2025-03-06

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000303

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000645	1.4 Discipline	Electrical
1.2 Item	84331-CEL-2-N	AC UPS PAS - Battery Isolator-A / AC UPS PAS - Battery-A	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing cable tag inside CB-200F3A

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	RM_CONSTR RM	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

done

Name: Eleonora Carotenuto

Date: 2024-12-14

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000304

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000855	1.4 Discipline	Electrical
1.2 Item	CB-200F3A	Isolator Battery Box for AC UPS 35 kVA	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing thermo shrink on internal earthing connections

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	VND Vendor	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Punch accepted by RM (Rosetti Marino).

Name: Giovanni Tangianu

Date: 2025-03-06

Signature:

6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000305

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000856	1.4 Discipline	Electrical
1.2 Item	CB-200F3B	Isolator Battery Box for AC UPS 35 kVA	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing thermo shrink on internal earthing connections

Name: Giovanni Tangianu
Date: 2024-11-02
Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	VND Vendor	Signature	

4 - PERFORMED ACTION

Name:
Date:
Signature:

5 - CLEARANCE CHECK

Punch accepted by RM (Rosetti Marino).

Name: Giovanni Tangianu
Date: 2025-03-06
Signature:

6- CLEARANCE APPROVAL

Name:
Date:
Signature:

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000306

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000848	1.4 Discipline	Electrical
1.2 Item	BA-200F3A	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	
1.3 Subsystem	84-10	AC 35 kVA UPS System (UP-200F3)	

2 - OBSERVATION

Missing tag on battery bank

Name: Giovanni Tangianu

Date: 2024-11-02

Signature:

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-11-02
3.5 Action by	VND Vendor	Signature	

4 - PERFORMED ACTION

Name:

Date:

Signature:

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-04

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: 84-10 & process: COMM & discipline : E

Electrical	84-10 AC 35 kVA UPS System (UP-200F3)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
A3/+01-QF1	DRAWER UPS PAS LINE A - A3/+01-QF1	ONSHORE	C10002801	FP00	100	2024-11-08	RFO 4
		ONSHORE	C10002802	FTR-2	100	2024-09-20	RFO 4
		ONSHORE	C10002803	FTR-6	100	2024-10-03	RFO 4
		ONSHORE	C10003007	FTR-5	100	2025-04-22	RFO 4
A4/+01-QF1	DRAWER UPS PAS LINE B - A4/+01-QF1	ONSHORE	C10002798	FP00	100	2024-11-08	RFO 4
		ONSHORE	C10002799	FTR-2	100	2024-09-20	RFO 4
		ONSHORE	C10002800	FTR-6	100	2024-10-03	RFO 4
		ONSHORE	C10003006	FTR-5	100	2025-04-22	RFO 4
A7/+02-QF1	DRAWER UPS PAS-BYPASS - A7/+02-QF1	ONSHORE	C10002804	FP00	100	2024-11-08	RFO 4
		ONSHORE	C10002805	FTR-2	100	2024-09-20	RFO 4
		ONSHORE	C10002806	FTR-6	100	2024-10-02	RFO 4
		ONSHORE	C10003008	FTR-5	100	2025-04-22	RFO 4
BA-200F3A	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	ONSHORE	C10002811	FTR-3	100	2024-11-18	RFO 4
BA-200F3A-C	UPS PAS - BA-200F3A-C	ONSHORE	C10002809	FTR-4	100	2024-11-14	RFO 4
BA-200F3A-D	UPS PAS - BA-200F3A-D	ONSHORE	C10002810	FTR-4	100	2024-11-14	RFO 4
BA-200F3B	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	ONSHORE	C10002814	FTR-3	100	2024-11-18	RFO 4
BA-200F3B-C	UPS PAS - BA-200F3B-C	ONSHORE	C10002812	FTR-4	100	2024-11-14	RFO 4
BA-200F3B-D	UPS PAS - BA-200F3B-D	ONSHORE	C10002813	FTR-4	100	2024-11-18	RFO 4
CB-200F3A-Q2	BATTERY CUTOFF UPS PAS - CB-200F3A-Q2	ONSHORE	C10002795	FTR-2	100	2024-11-08	RFO 4
CB-200F3B-Q2	BATTERY CUTOFF UPS PAS - CB-200F3B-Q2	ONSHORE	C10002796	FTR-2	100	2024-11-08	RFO 4
DP-200N1-Q41	BREAKER AUX UPS PAS - DP-200N1-Q41	ONSHORE	C10002797	FTR-2	100	2024-10-28	RFO 4
UP-200F3	AC UPS 35 kVA Redundant System with By-Pass	ONSHORE	C10002807	FP16A	100	2025-03-12	RFO 4
		ONSHORE	C10002808	FTR-6	100	2025-03-12	RFO 4
UP-200F3-QF31	SPARE	ONSHORE	C10004570	FTR-2	100	2024-11-08	RFO 4
UP-200F3-QF32	SPARE	ONSHORE	C10004571	FTR-2	100	2024-11-08	RFO 4
UP-200F3-QF33	SPARE	ONSHORE	C10004572	FTR-2	100	2024-11-08	RFO 4
UP-200F3-QF50	SPARE	ONSHORE	C10004586	FTR-2	100	2024-11-08	RFO 4
UP-200F3-QF52	SPARE	ONSHORE	C10004588	FTR-2	100	2024-11-08	RFO 4

ITEM	Tag	CB-200F3A-Q2	: BATTERY CUTOFF UPS PAS - CB-200F3A-Q2			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002795		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°:	NA	Relay type:	NA
Auxiliary supply:	NA	Location:	B300	Cubicle:	NA
Switchboard:	CB-200F3				

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
I	250	NA	FIXED	NA	NA

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
IFLUKE 1663	10A5380144	7727/24	08/07/2025

Comments:

Page 1/1	Performed by	☐ WITNESS ☉ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-11-08	2024-11-08	2024-11-08
Signature	Digitaly signed by Davide Zucconelli 2024-11-08T14:18:46.007Z	Digitaly signed by Kristian Castellani 2024-11-08T14:56:45.162Z	Digitaly signed by Witness waived 2024-11-08T16:22:50.141Z

ITEM	Tag	CB-200F3B-Q2	: BATTERY CUTOFF UPS PAS - CB-200F3B-Q2			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002796		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°:	NA	Relay type:	NA
Auxiliary supply:	NA	Location:	B300	Cubicle:	NA
Switchboard:	CB-200F3				

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
I	250A	NA	NA	FIXED	NA

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	08/07/2025

Comments:

Page 1/1	Performed by	☐ WITNESS ☉ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-11-08	2024-11-08	2024-11-08
Signature	Digitaly signed by Davide Zucconelli 2024-11-08T14:18:59.327Z	Digitaly signed by Kristian Castellani 2024-11-08T14:58:05.227Z	Digitaly signed by Witness waived 2024-11-08T16:23:03.277Z

ITEM	Tag	DP-200N1-Q41	: BREAKER AUX UPS PAS - DP-200N1-Q41			Dwg	1723002197-EL-DG-00013
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002797		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°:	NA	Relay type:	NA
Auxiliary supply:	NA	Location:	B200	Cubicle:	+03
Switchboard:	DP-200N1				

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
I	6A	NA	NA	FIXED	NA

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	10/07/2025

Comments:

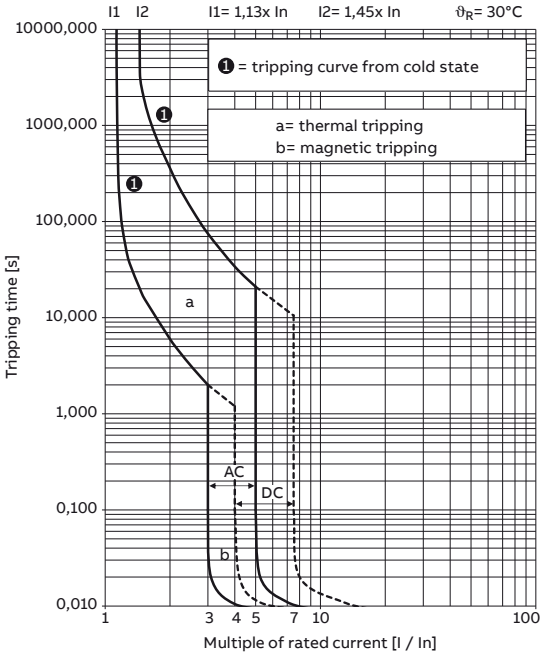
	Performed by	☐ WITNESS ☉ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-10-28	2024-10-28	2024-10-28
Signature	Digitaly signed by Davide Zucconelli 2024-10-28T11:06:32.542Z	Digitaly signed by Kristian Castellani 2024-10-28T12:55:01.518Z	Digitaly signed by Witness waived 2024-10-28T13:26:20.246Z

Miniature Circuit breakers S300P

Tripping characteristics

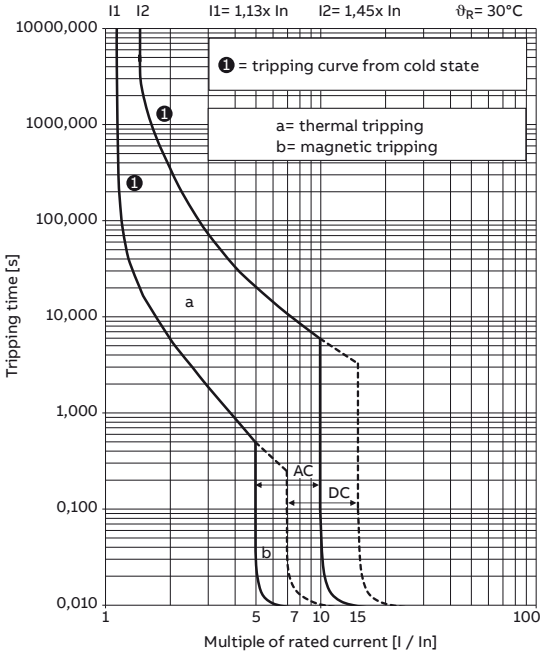
MCB Type S300P - B (3 ... 5 x I_n AC)

Tripping Characteristic IEC/EN 60898-1



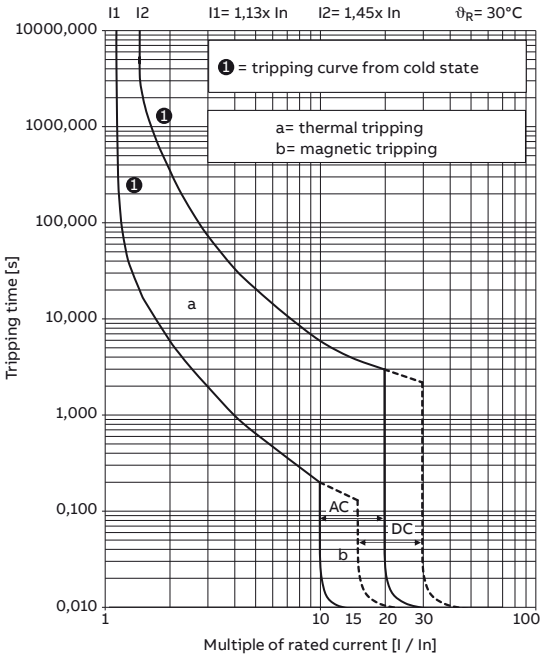
MCB Type S300P - C (5 ... 10 x I_n AC)

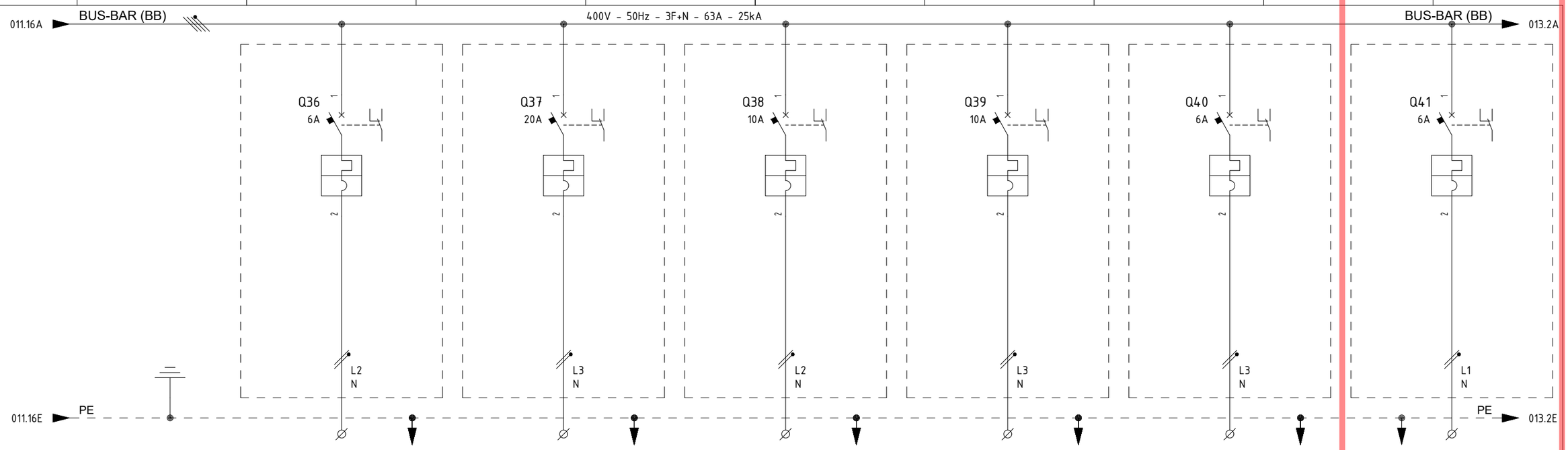
Tripping Characteristic IEC/EN 60898-1



MCB Type S300P - D (10 ... 20 x I_n AC)

Tripping Characteristic IEC/EN 60898-1





ITEM			1	CP-200E2		CP-100E1		SG-100D1		SG-200N1		SG-200D2		UP-200F3	
UTILITY			2	AUXILIARY TRAFO SOLARE 0.5MVA		AUXILIARY GIS		AUXILIARY 6.6KV SWITCHBOARD		AUXILIARY LV SWITCHBOARD		AUXILIARY LV SWITCHBOARD 800/460V		AC UPS PAS AUXILIARY	
CUBICLE			3	+03		+03		+03		+03		+03		+03	
RATED POWER	RATED CURRENT		4/5	0.5 KW	2.72 A	3 KW	16.3 A	1 KW	5.43 A	1 KW	5.43 A	0.5 KW	2.72 A	0.2 KW	0.82 A
TYPICAL FUNCTIONAL			6	-		-		-		-		-		-	
CIRCUIT BREAKER (ABB)	TYPE		7	S302P-C6		S302P-C20		S302P-C10		S302P-C10		S302P-C6		S302P-C6	
	VERSION		8	2P / MINIATURE		2P / MINIATURE		2P / MINIATURE		2P / MINIATURE		2P / MINIATURE		2P / MINIATURE	
	TRIP UNITS		9	In=6A - Curve C		In=20A - Curve C		In=10A - Curve C		In=10A - Curve C		In=6A - Curve C		In=6A - Curve C	
	Icu	KA	10	25kA		25kA		25kA		25kA		25kA		25kA	
OVERLOAD	L	Range A	11	-		-		-		-		-		-	
		Range t	12	-		-		-		-		-		-	
SEL. SHORT-CIRCUIT	S	Range A	13	-		-		-		-		-		-	
		Range t	14	-		-		-		-		-		-	
INST. SHORT-CIRCUIT	I	Range A	15	-		-		-		-		-		-	
		Range t	16	-		-		-		-		-		-	
EARTH FAULT PROTECTION	G	Range A	17	-		-		-		-		-		-	
		Range t	18	-		-		-		-		-		-	
CONTACTOR (ABB)			19	-		-		-		-		-		-	
THERMAL OVERLOAD RELAY (ABB)			20	-		-		-		-		-		-	
SURGE ARRESTERS (DHENN)			21	-		-		-		-		-		-	
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-		-		-		-		-		-	
FUSE HOLDER (ABB)			23	-		-		-		-		-		-	
TWILIGHT SWITCH (ABB)			24	-		-		-		-		-		-	
VOLTMETER (FRER)			25	-		-		-		-		-		-	
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-		-		-		-		-		-	
	PERFORMANCE/CLASS		27	-		-		-		-		-		-	
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-		-		-		-		-		-	
	PERFORMANCE/CLASS		29	-		-		-		-		-		-	
POWER TERM. BLOCK (CABUR)		Type/mm²	30	SCREW / 4		SCREW / 6		SCREW / 4		SCREW / 4		SCREW / 4		SCREW / 4	
POWER CONDUCTOR		mm²	31	3G2.5		3G6		3G2.5		3G2.5		3G2.5		3G2.5	

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
=					
+					
3	05/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for construction (AFC)
2	24/04/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	15/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	08/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

DWG n° : 231298/SD/13
Item n° : PF1002888/101

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "DP-200N1"

SINGLE LINE DIAGRAM
Single Line Drawing

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

SCALE : NTS

A3

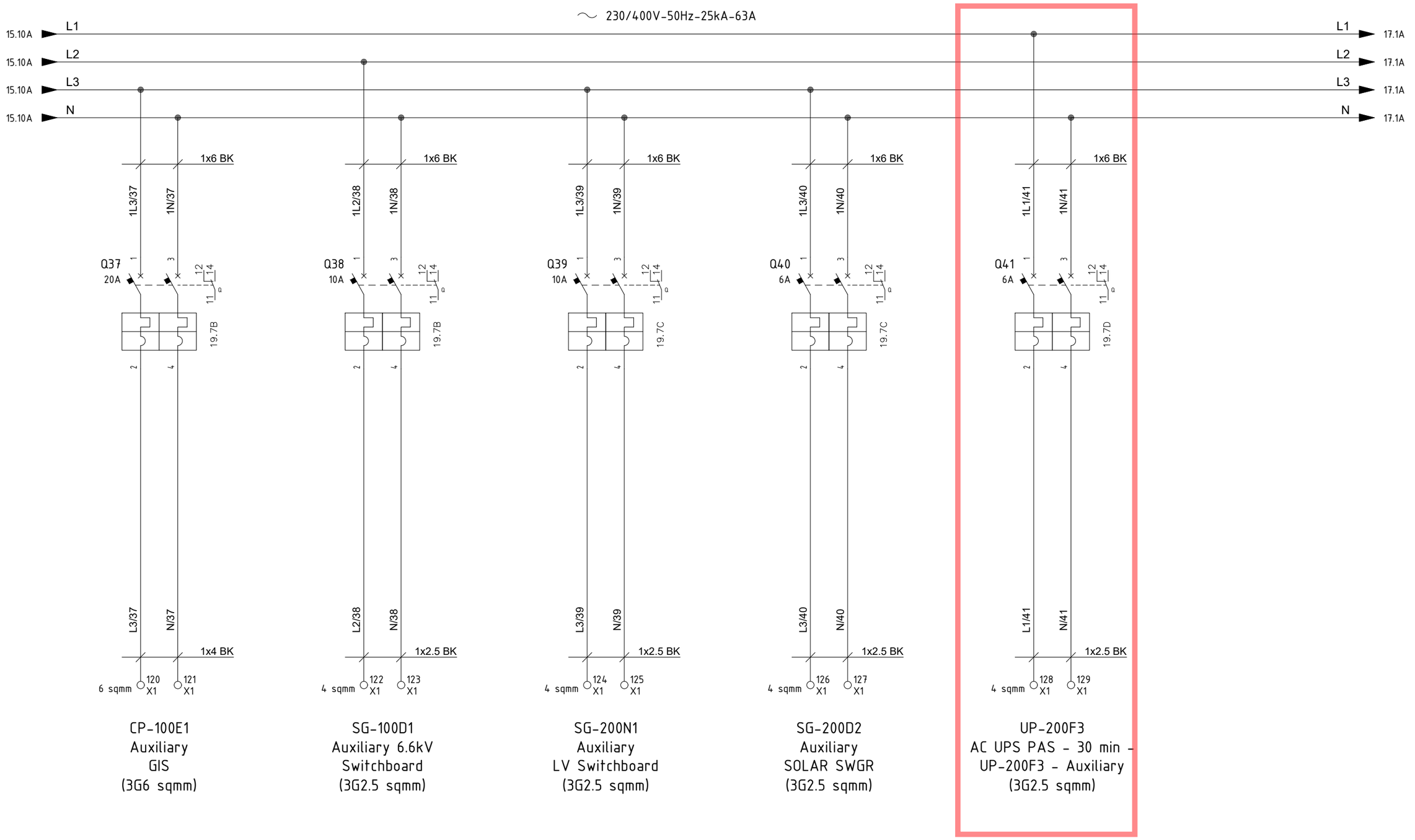
DRAWING NO. 1723002197-EL-DG-00013

SHEET 012

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00013 Rev. 03



CP-100E1
Auxiliary
GIS
(3G6 sqmm)

SG-100D1
Auxiliary 6.6kV
Switchboard
(3G2.5 sqmm)

SG-200N1
Auxiliary
LV Switchboard
(3G2.5 sqmm)

SG-200D2
Auxiliary
SOLAR SWGR
(3G2.5 sqmm)

UP-200F3
AC UPS PAS - 30 min -
UP-200F3 - Auxiliary
(3G2.5 sqmm)

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
=					
+					
1	05/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for construction (AFC)
0	29/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

DWG n° : 231298/SD/33
Item n° : PF1002888/101

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

TITLE : "DP-200N1"
LV SWBD FUNCTIONAL DIAGRAMS
Functional Drawing

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00033

SHEET 1.6

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00033 Rev. 01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	A4/+01-QF1	: DRAWER UPS PAS LINE B - A4/+01-QF1			Dwg	1723002197-EL-DG-00011
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002798		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form	FP00 Miscellaneous electrical Consumer

DATA

Switchboard	SG-200N1	Circuit ref:	A4/+01-QF1
Breaker rating (A)	57.8A	Nominal current (A)	100A

FUNCTION TEST REQUIREMENT

1	Check pre-commissioning activities have been carried out				OK
2	Check equipment for cleaness				OK
3	Measure I/R value of equipment and feeder cable at 1000V (Min value: 10 Mohm)	59	MΩ		OK
4	Energise control of equipment feeder				OK
5	Full test feeder breaker operation in test position				OK
6	Check protection setting				OK
7	Test interface trips and signals (remote alarms & status). Check the relevant ITR presence in the system				OK
8	Test control and safety functions according to manufacturer's procedure.				OK
9	Energize				OK
10	Measure Voltage and Current values at feeder breaker	398	V	0.2 A	OK
11	Attach test procedure, if any				NA

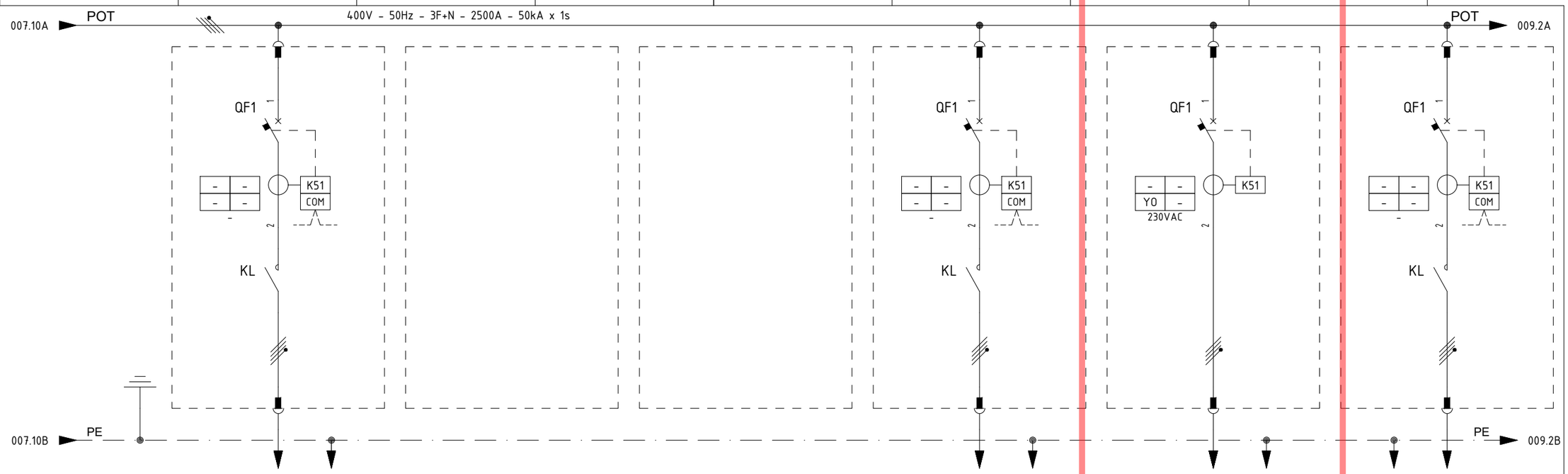
FUNCTION TEST REQUIREMENT	RESULT

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	10/07/2025
FLUKE 376	A1711003	7710/24	10/07/2025

Comments:

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	2024-11-08	2024-11-08	2024-11-08
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-08T10:30:11.717Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-08T14:58:54.379Z	PROVERLIS Digitaly signed by Witness waived 2024-11-08T16:23:25.831Z



ITEM				SPARE	-		JB-500E8	UP-200F3	B100-HSB-001
UTILITY			2	SPARE	FUTURE		WATER PACKAGE	AC UPS PAS - 30 MIN UP-200F3 - LINE B	HVAC PANELS HV ROOM
COLUMN/CUBICLE			3	A3 / +05	A3 / +06		A3 / +08	A4 / +01	A4 / +02
RATED POWER | RATED CURRENT			4/5	- kW | - A	- | -		67 kW | 107.00 A	36.0 kW | 57.8 A	18 kW | 34.1 A
TYPICAL FUNCTIONAL			6	LK1-40			LK2-160	L1-100	LK1-40
CIRCUIT BREAKER (ABB)	TYPE		7	XT2S - 160			XT4S - 250	XT2S - 160	XT2S - 160
	VERSION		8	4P - FIXED			4P - FIXED	4P - FIXED	4P - FIXED
	TRIP UNITS		9	EKIP HI TOUCH LSIG (In = 40A)			EKIP HI TOUCH LSIG (In = 160A)	EKIP DIP LSIG (In = 100A)	EKIP HI TOUCH LSIG (In = 40A)
	Icu	KA	10	50 kA			50 kA	50 kA	50 kA
OVERLOAD	L	Range A	11	(0.4 - 1) x In			(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In
		Range t	12	k/I^2			k/I^2	k/I^2	k/I^2
SEL. SHORT-CIRCUIT	S	Range A	13	(0.6 - 10) x In			(0.6 - 10) x In	(1 - 10) x In	(0.6 - 10) x In
		Range t	14	0.05 - 0,4 sec / k/I^2			0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	0.05 - 0,4 sec / k/I^2
INST. SHORT-CIRCUIT	I	Range A	15	(1.5 - 15) x In			(1.5 - 15) x In	(1 - 10) x In	(1.5 - 15) x In
		Range t	16	instantaneous			instantaneous	<= 0.02 sec	instantaneous
EARTH FAULT PROTECTION	G	Range A	17	(0.1 - 1) x In			(0.1 - 1) x In	(0.2 - 1) x In	(0.1 - 1) x In
		Range t	18	t=k / t=k/I^2			t=k / t=k/I^2	0.1 - 0.8 sec	t=k / t=k/I^2
CONTACTOR (ABB)			19	AF40-40-00-13 (70A-AC1); 100-250VAC/DC			AF190-40-11-13 (275A-AC1); 100-250 VAC/DC	-	AF40-40-00-13 (70A-AC1); 100-250VAC/DC
THERMAL OVERLOAD RELAY (ABB)			20	-			-	-	-
SURGE ARRESTER (DEHN)			21	-			-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-			-	-	-
FUSE HOLDER (ITALWEBER)			23	-			-	-	-
INDIRECT PROTECTION (ABB)			24	-			-	-	-
VOLTMETER			25	-			-	-	-
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-			-	-	-
	PERFORMANCE/CLASS		27	-			-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-			-	-	-
	PERFORMANCE/CLASS		29	-			-	-	-
LOCK-OUT RELAY (-)			30	-			-	-	-
POWER CONDUCTOR		mmq	31	-			5G70	4G35	5G16

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DWG n° : 231298/SD/11

Item n° : PF1002983/26

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	28/08/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
2	03/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	28/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	15/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00011

SHEET 008

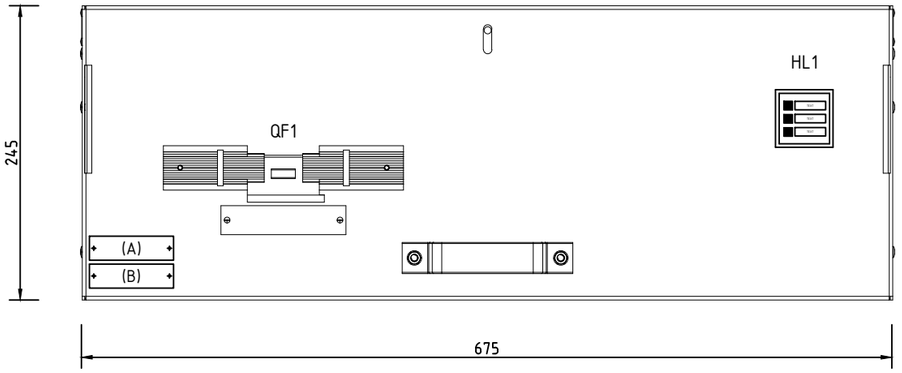
REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00011 Rev. 04

DOOR FRONT LAY-OUT

TYPICAL : LINE FEEDER "L1-n"

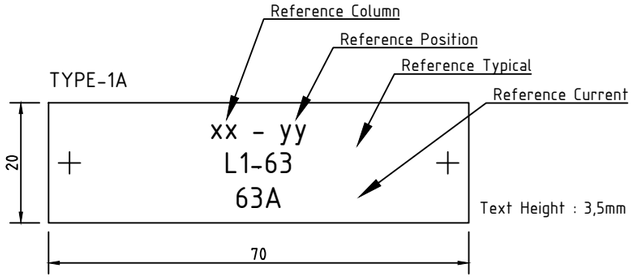


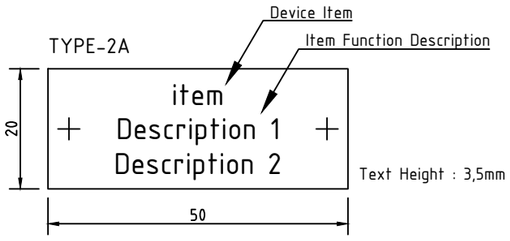
NOTE :

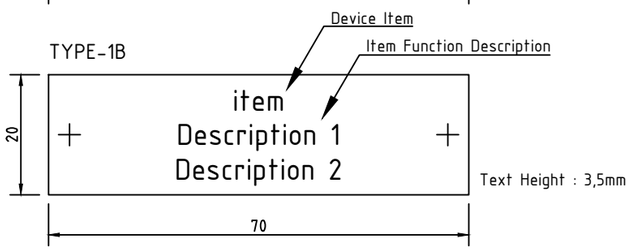
A) IDENTIFICATION name plate (type-1A) , with :
- Drawer position [Column / Position inside SWB]
- Typical name [reference applicability typical used]
- Power [reference applicability typical used]

B) USER name plate (type-1B), with :
- Item User [to see SLD diagrams]
- User Description [to see SLD diagrams]

DEVICES name plate			
ITEM	DESCRIPTION 1	DESCRIPTION 2	NOTE
QF1	Circuit Breaker	Signalling	NO plate
HL1	Multiled	Signalling	NO plate







= TYPICAL
+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Door Front Lay-Out - Typical "L1-n" & "L2-n"

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

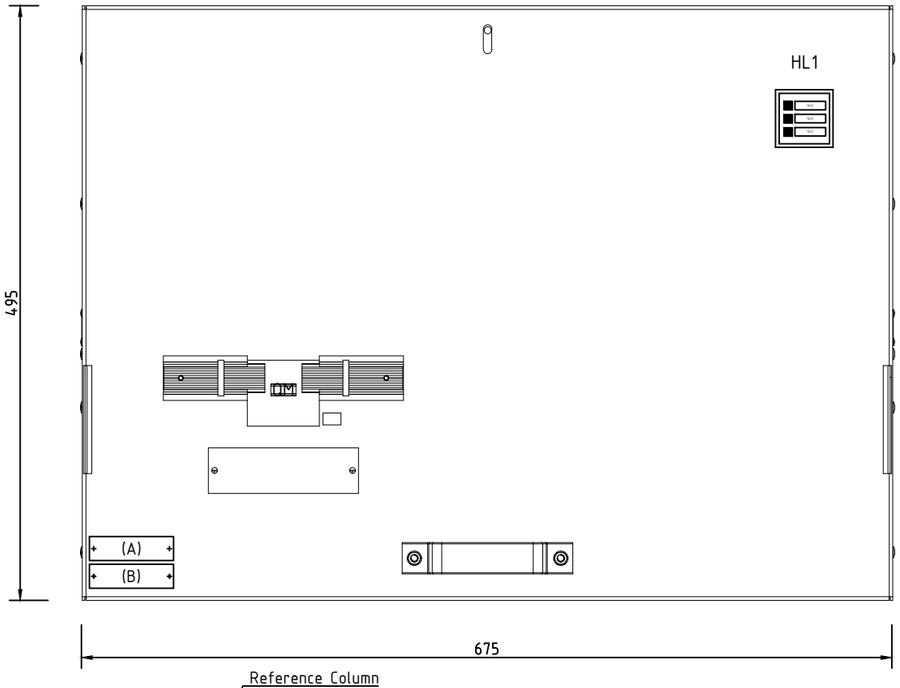
A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 023 | REV. 02

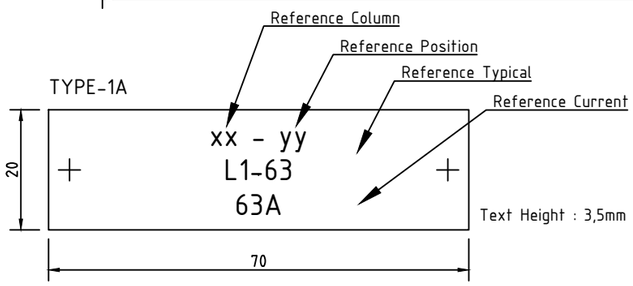
F.to UNI A3: 420mmx297mm

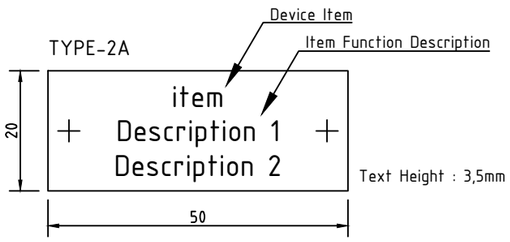
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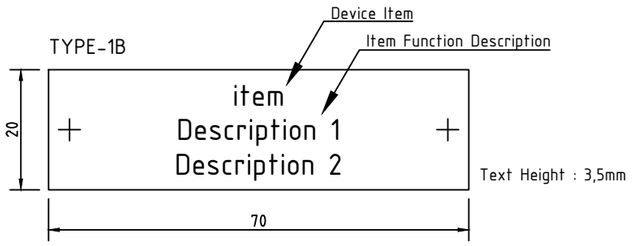
DOOR FRONT LAY-OUT

TYPICAL : LINE FEEDER "L2-n"









NOTE :

A) IDENTIFICATION name plate (type-1A) , with :
- Drawer position [Column / Position inside SWB]
- Typical name [reference applicability typical used]
- Power [reference applicability typical used]

B) USER name plate (type-1B), with :
- Item User [to see SLD diagrams]
- User Description [to see SLD diagrams]

DEVICES name plate

ITEM	DESCRIPTION 1	DESCRIPTION 2	NOTE
QF1	Circuit Breaker	Signalling	NO plate
HL1	Multiled	Signalling	NO plate

=	TYPICAL
+	L-x

DWG n° : 231298/SD/31

Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Door Front Lay-Out - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 024 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

USERS LEGEND

TYPICAL : LINE FEEDER "L1-n" & "L2-n"

TYPICAL APPLICABILITY					
ITEM	ITEM TAG	DESCRIPTION TAG	REFERENCE POSITION (written on name name plate "type-1A)	REFERENCE NOMINAL CURRENT C.B. TRIP UNIT (written on name name plate "type-1A)	REFERENCE TYPICAL (written on name name plate "type-1A)
1	UP-200F4	AC UPS F&G - 8H UP-200F4 - BYPASS	A2 / +04	63A	L1-63
2	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 - LINE A	A3 / +01	100A	L1-100
3	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 - LINE B	A4 / +01	100A	L1-100
4	UP-200F4	AC UPS F&G - 8H UP-200F4 - LINE A	A6 / +05	63A	L1-63
5	UP-200F4	AC UPS F&G - 8H UP-200F4 - LINE B	A6 / +06	63A	L1-63
6	ESW-200N1	WELDING SOCKETS (TOP DECK)	A6 / +08	160A	L2-160
7	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 (BYPASS)	A7 / +02	100A	L1-100
8	UP-200F1	DC BATTERY SYSTEM SWTG CONTROL - FEEDER A	A7 / +03	63A	L1-63
9	UP-200F1	DC BATTERY SYSTEM SWTG CONTROL - FEEDER B	A7 / +04	63A	L1-63
10	UP-200F2	NAVAID SYSTEM FEEDER A	A7 / +05	63A	L1-63
11	UP-200F2	NAVAID SYSTEM FEEDER B	A7 / +06	63A	L1-63
12	ESW-200N2	WELDING SOCKETS (LOWER DECK)	A7 / +08	160A	L2-160

= TYPICAL
+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

IMESA ELECTRICAL ENGINEERING

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Users Legend - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 025

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

ITEMS ACRONYM

TYPICAL : LINE FEEDER "L1-n" & "L2-n"

Composition of Typical :

L-x = Common Parts
L1-"nn" or L2-"nn"= Specific Parts

Example for Composition of L1-63:
- to take "L-x" plus "L1-63"

Example for Composition of L2-160:
- to take "L-x" plus "L2-160"

	ACRONYM ITEMS [Comun parts]	ACRONYM ITEMS [Specific parts]				
	L-x	L1-40 [In=40A] [Current Trip Unit]	L1-63 [In=63A] [Current Trip Unit]	L1-100 [In=100A] [Current Trip Unit]	L2-160 [In=160A] [Current Trip Unit]	
ASSOCIATED TYPICAL	This Item include all devices that are comun for both "Specific Parts" Items	This Items include only devices that are detail for "Specific Parts" Items				
L1-40	X	X				
L1-63	X		X			
L1-100	X			X		
L2-160	X				X	

=	TYPICAL					
+	L-x					
DWG n° :	231298/SD/31					
Item n° :	PF1002983/26					
		2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Items Acronym - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

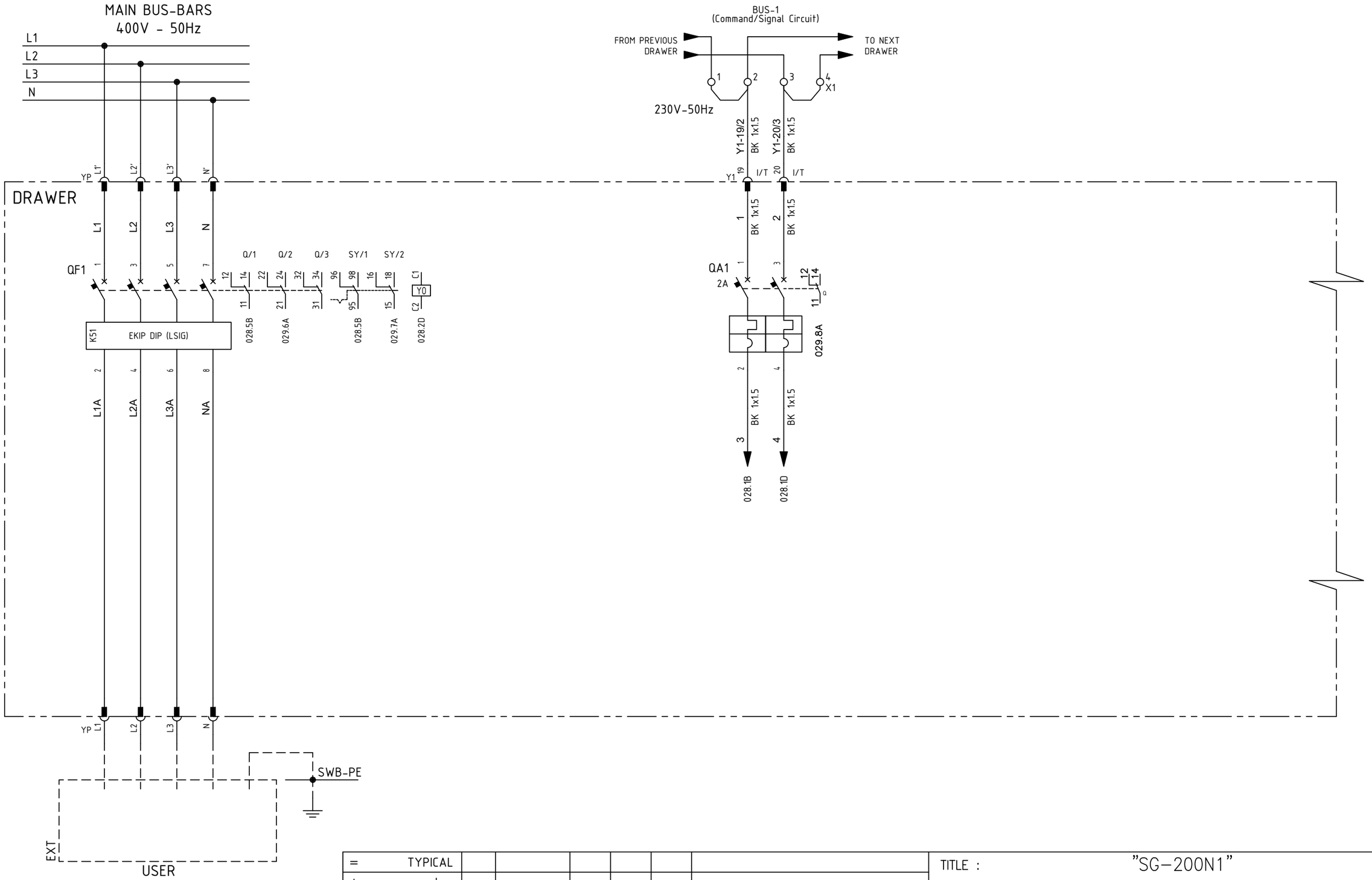
DRAWING NO. 1723002197-EL-DG-00031

SHEET 026

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



=	TYPICAL					
+	L-x					
DWG n° :	231298/SD/31					
Item n° :	PF1002983/26					
		2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

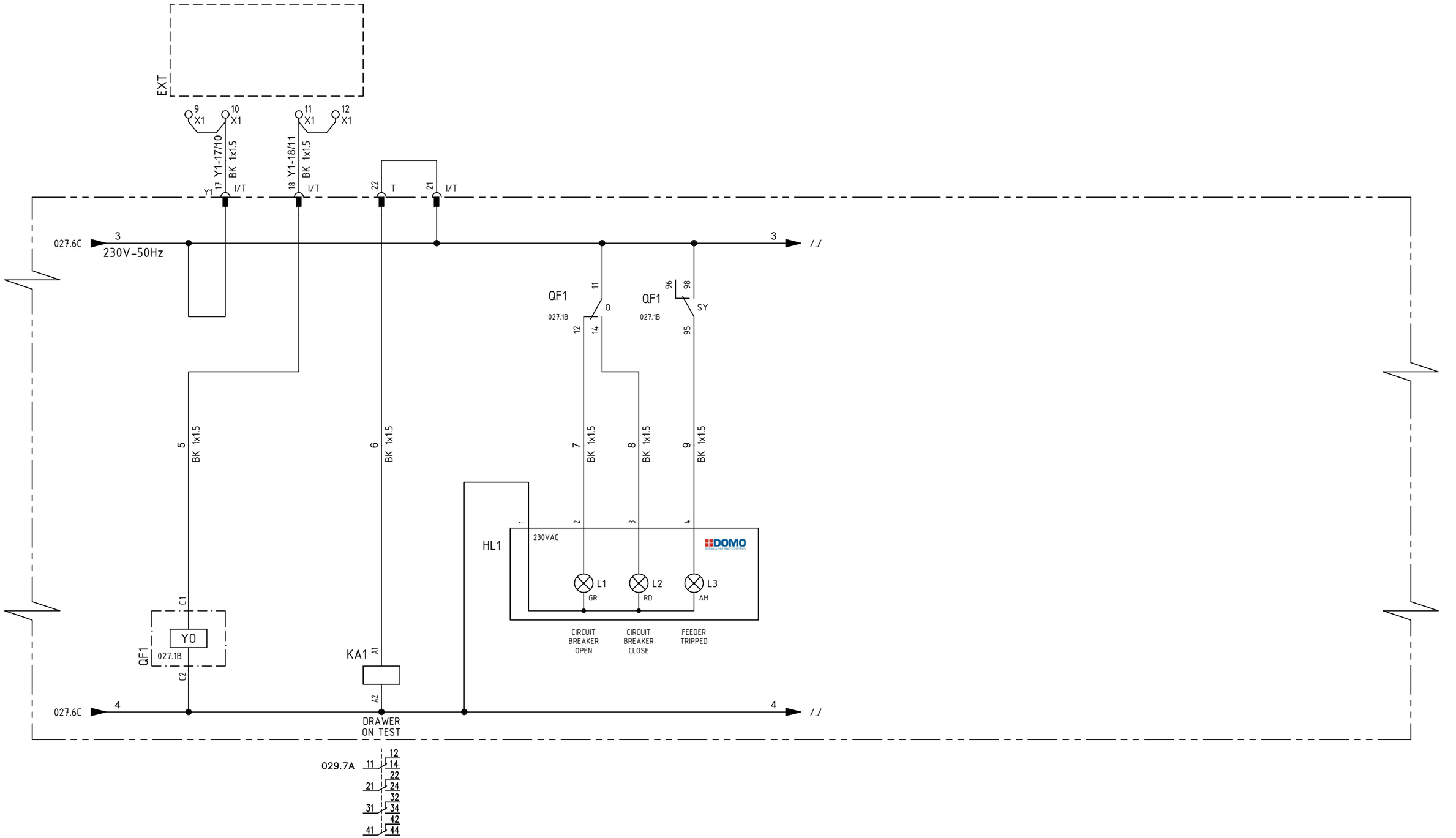
DRAWING NO. 1723002197-EL-DG-00031

SHEET 027

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



= TYPICAL							
+ L-x							
DWG n° : 231298/SD/31							
Item n° : PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
	1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
	0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
	REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

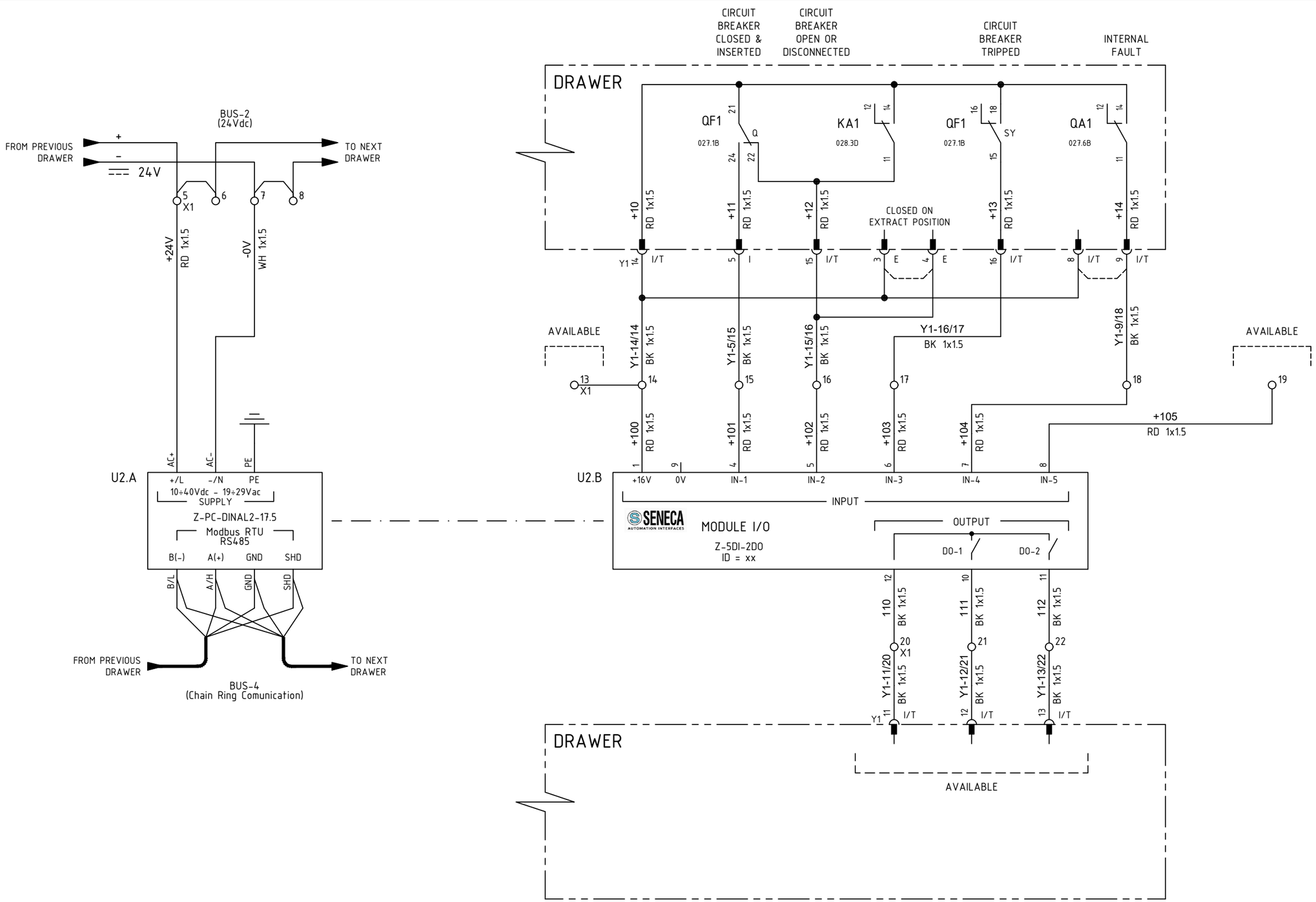
DRAWING NO. 1723002197-EL-DG-00031

SHEET 028

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



=	TYPICAL						
+	L-x						
DWG n° :	231298/SD/31						
Item n° :	PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 029

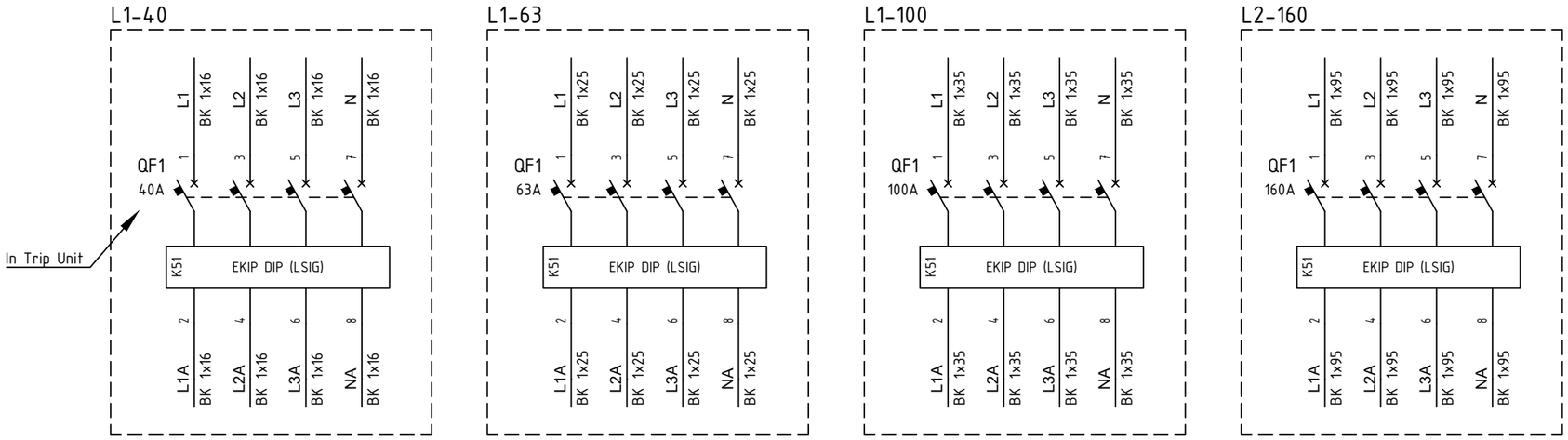
REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

SPECIFIC PARTS

TYPICAL : LINE FEEDER "L1-n" & "L2-n"



= TYPICAL							
+ L-x							
DWG n° : 231298/SD/31							
Item n° : PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)	
	1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)	
	0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)	
	REV.	DATE	DRN	CHKD	APPD	DESCRIPTION	

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 030 | REV. 02

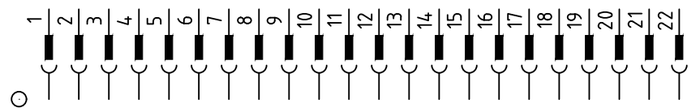
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

TYPICAL - L-x - Y1

AUXILIARY SOCKET
136450/001 (PF – 1 pcs) + 136458/004 (PM – 1 pcs)

N° PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
JUMP			●	●				●	●													
RACKED-OUT			X	X				X	X													
TEST								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RACKED-IN					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
PIN USED			029.6B	029.7B	029.6B			029.8B	029.8B		029.7D	029.7D	029.8D	029.5B	029.6B	029.7B	028.2B	028.3B	027.6A	027.6A	028.4B	028.3B



← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN RACKED-OUT POSITION

← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN TEST POSITION

← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN RACKED-IN POSITION

← CROS-REFERENCE USED PIN

= TYPICAL						
+ L-x						
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)	
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)	
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)	
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION	

DWG n° : 231298/SD/31
Item n° : PF1002983/26

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 031

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

TYPICAL - L-x

X1

NumM	Fg.	Sez.	Tipo	Descrizione	Costruttore
			BT003	BT/3 End bracket	Cabur
1	027.5A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
2	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
3	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
4	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
5	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
6	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
7	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
8	029.3A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
			HD101GR	HMD/PT/GR End section - Grey	Cabur
9	028.2A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
10	028.2A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
11	028.3A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
12	028.3A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
13	029.4B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
14	029.5B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
15	029.6B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
16	029.6B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
17	029.7B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
18	029.8B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
19	029.9B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
20	029.7D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
21	029.7D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
22	029.8D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
			HD201GR	HMD.1/PT/GR End section - Grey	Cabur
			BT003	BT/3 End bracket	Cabur

= TYPICAL

\+ L-x

DWG n° : 231298/SD/31

Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 032

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
HL1	028	ML22/483L230STLTTR	1	MULTILED 48x48 - 3 LED - Vaux=230Vac/dc + LAMP TEST + TROP	DOMO	TYPICAL L-x
KA1	028	ER 592 6	1	CR-M230AC4L SUPPLY 230VAC 4C/O 250V/6A LED	ABB	TYPICAL L-x
		ER 609 8	1	CR-MH HOLDER FOR CR-M RELAY	ABB	TYPICAL L-x
		ER 686 6	1	CR-M4SS SOCKET STANDARD X 2/4 C/O(CR-M)	ABB	TYPICAL L-x
QA1	027	S550239	1	S202M C 2 AUTOMATIC CIRCUIT BREAKER 10KA 2P	ABB	TYPICAL L-x
		A563819	1	S2-CS/H6R AUXILIARY STATE CONTACT 1CO	ABB	TYPICAL L-x
U2.A	029	Z-PC-DINAL2-17.5	1	DIN RAIL 2SLOT WITH HEAD FOR "Z-5DI-2DO"	SENECA	TYPICAL L-x
U2.B	029	Z-5DI-2DO	1	I/O MODUL 5DI+2DO modbus RS485 Vaux=10÷40Vdc 19÷28Vac	SENECA	TYPICAL L-x
X1		HD100GR__	8	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur	TYPICAL L-x
		HD400GR__	14	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur	TYPICAL L-x
		BT003	2	BT/3 End bracket	Cabur	TYPICAL L-x
		HD101GR	1	HMD/PT/GR End section - Grey	Cabur	TYPICAL L-x
		HD201GR	1	HMD.1/PT/GR End section - Grey	Cabur	TYPICAL L-x

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S40LSIG4	1	XT2S 160 Ekip LSIG In=40A 4p F F	ABB	TYPICAL L1-40
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-40
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-40

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S63LSIG4	1	XT2S 160 Ekip LSIG In=63A 4p F F	ABB	TYPICAL L1-63
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-63
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-63

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S100LSIG4	1	XT2S 160 Ekip LSIG In=100A 4p F F	ABB	TYPICAL L1-100
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-100
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-100

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	1SDA068179R1	1	XT4S 250 BREAKING PART 4p F F	ABB	TYPICAL L2-160
		1SDA067536R1	1	SG.EL.Ekip LSIG In=160A XT4 4p	ABB	TYPICAL L2-160
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L2-160
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L2-160

= TYPICAL
\+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING
CROSSWIND
ROSETTI MARINO

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 033 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

ITEM	Tag	A4/+01-QF1	: DRAWER UPS PAS LINE B - A4/+01-QF1	Dwg	1723002197-EL-DG-00011		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module			
TASK	code	C10002799	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°:	E216918002521070	Relay type:	EKIP DIP LSIG
Auxiliary supply:	24Vdc	Location:	B200	Cubicle:	A4/+01
Switchboard:	SG-200N1				

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay	
				Setting	Trip value
L	62A			3s	
S	300A	500A		0.1s	396ms
I	600A	1000A		INSTANT	30ms
G	20A			0.1s	

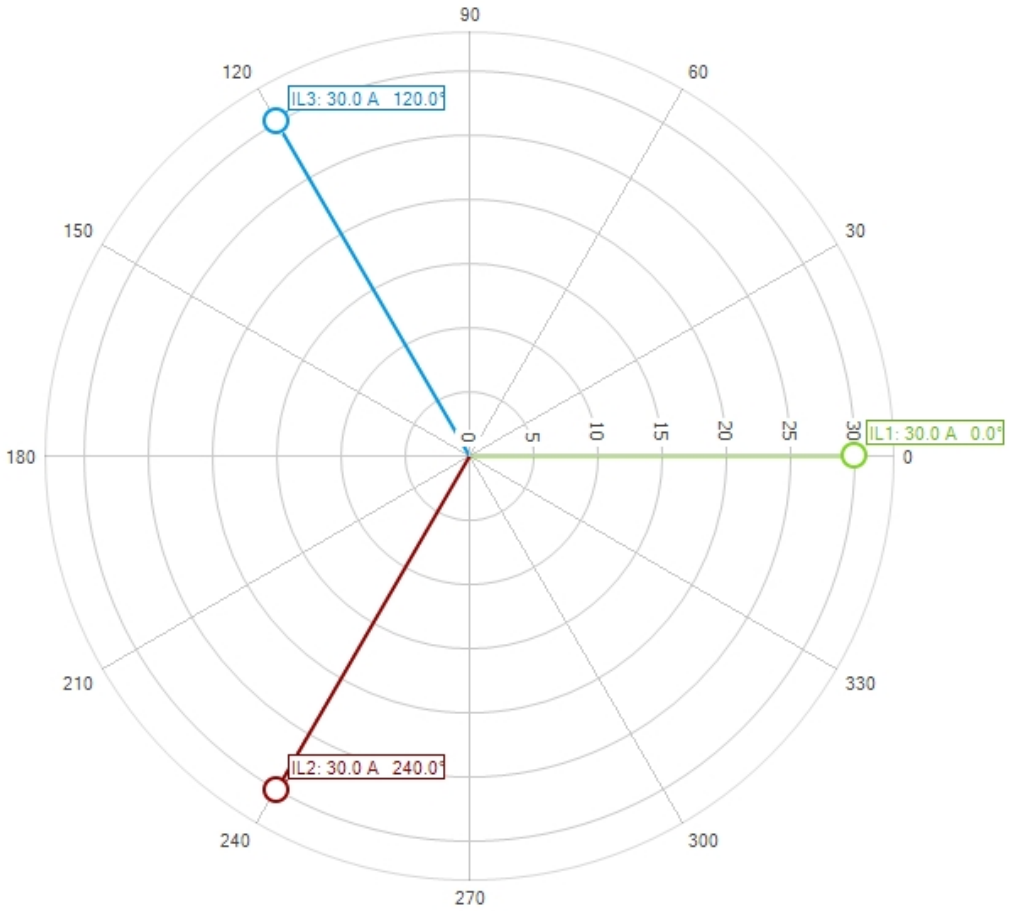
Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
ABB EKIP T&P	E34013804410W050		

Comments: See the 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	2024-09-18	2024-09-18	2024-09-20
Signature	Digitaly signed by Mattia Girotti 2024-09-18T08:06:56.298Z	Digitaly signed by Kristian Castellani 2024-09-18T12:47:56.592Z	Digitaly signed by Witness waived 2024-09-20T06:23:29.137Z

Page Name	Group Name	Variable Name	Variable Value	Variable Unit
Electronic protection parameters				
	Electronic/Manual parameters selection			
		Electronic/Manual parameters selectio	ELECTRONIC	
	Electronic L protection			
		Trip unit nominal current In	100	
		L threshold	0.62	In
		L time	3.00	s
		Thermal memory	Disabled	
	Electronic S protection			
		S status	Enabled	
		Curve type	t=k/i^2	
		Threshold (t=k/i^2)	3.00	In
		Time (t=k/i^2)	0.10	s
	Electronic I protection			
		I status	Enabled	
		I threshold	6.00	In
	Electronic G protection			
		G status	Enabled	
		G threshold	0.20	In
		G time	0.10	s
	Electronic LC protection			
		Iw status	Disabled	
		Iw threshold	0.30	In
		LC1 status	Disabled	
		LC1 threshold	0.50	I1
		LC2 status	Disabled	
		LC2 threshold	0.50	I1



Test

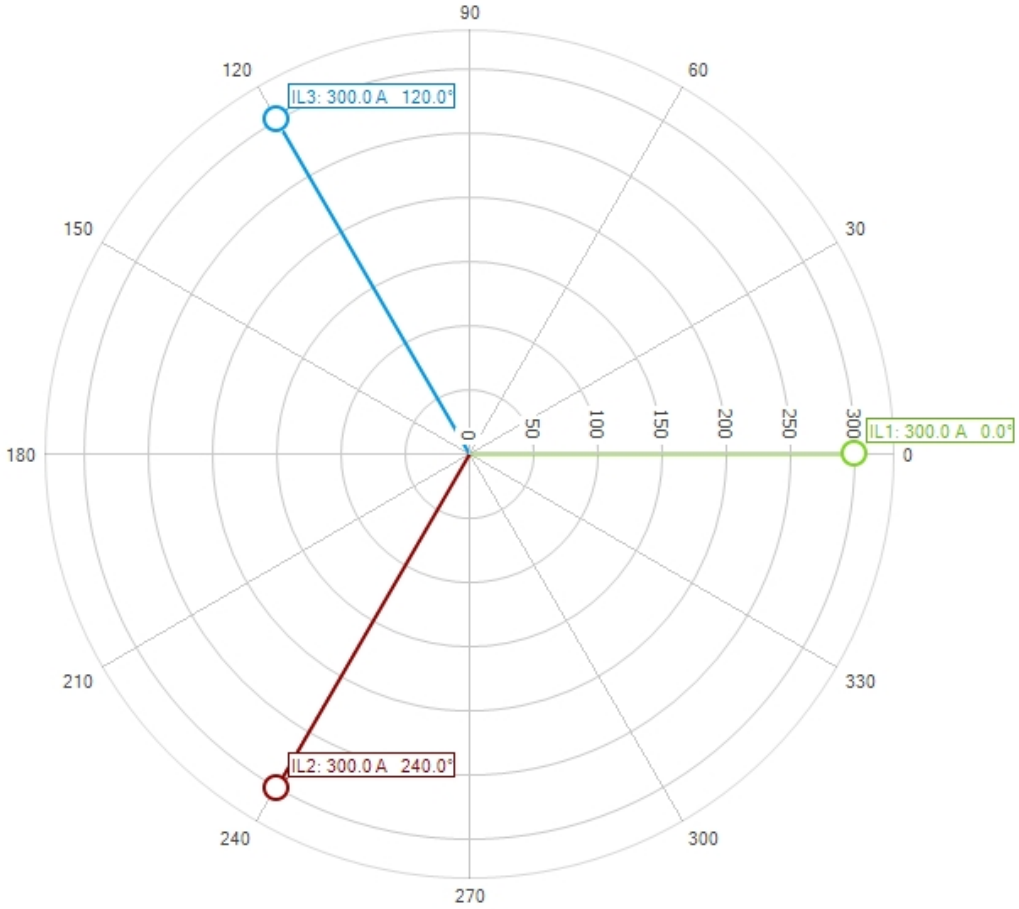
Name	Automatic test 1
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A4/01
Relay Serial Number	E216918002521070
Circuit Breaker Serial Number	EF70168060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

⚠ Test completed without any trip in 3000 ms.



Test

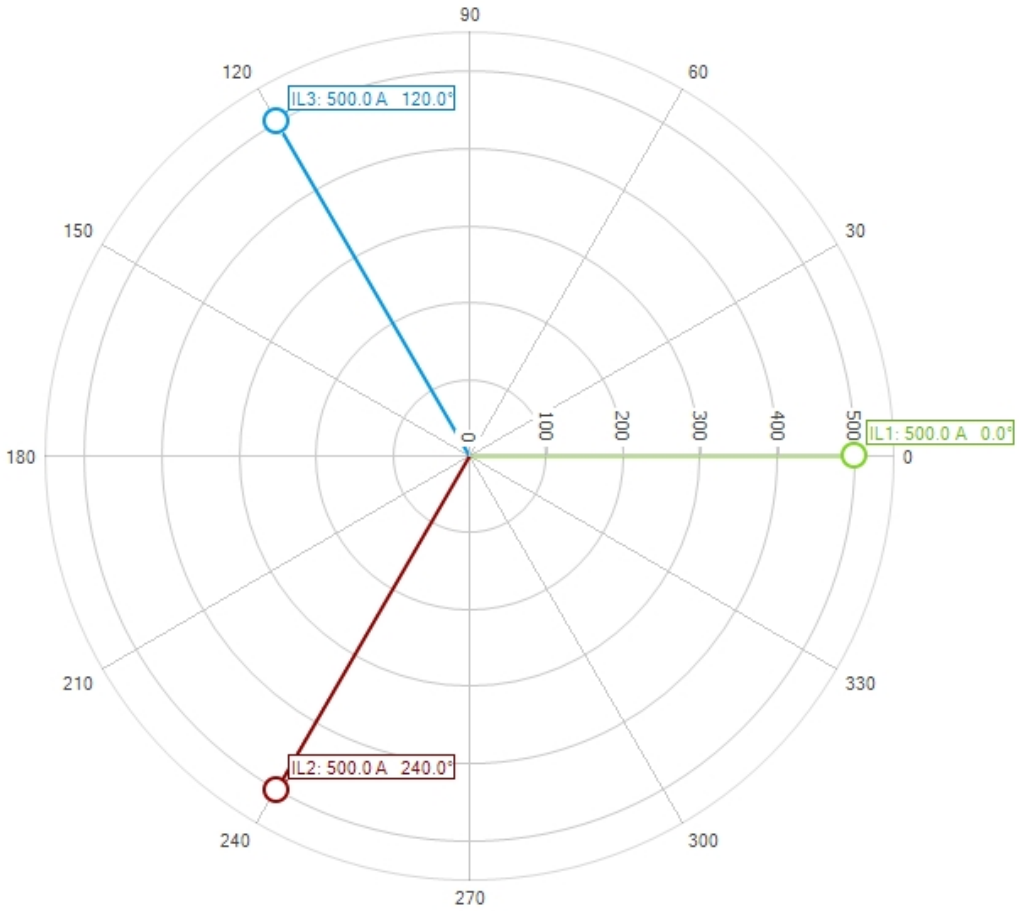
Name	Automatic test 2
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A4/01
Relay Serial Number	E216918002521070
Circuit Breaker Serial Number	EF70168060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

⚠ Test completed with trip but out of time. Protection L tripped in 1194 ms.
Trip time must be between 0 ms and 1000 ms.



Test

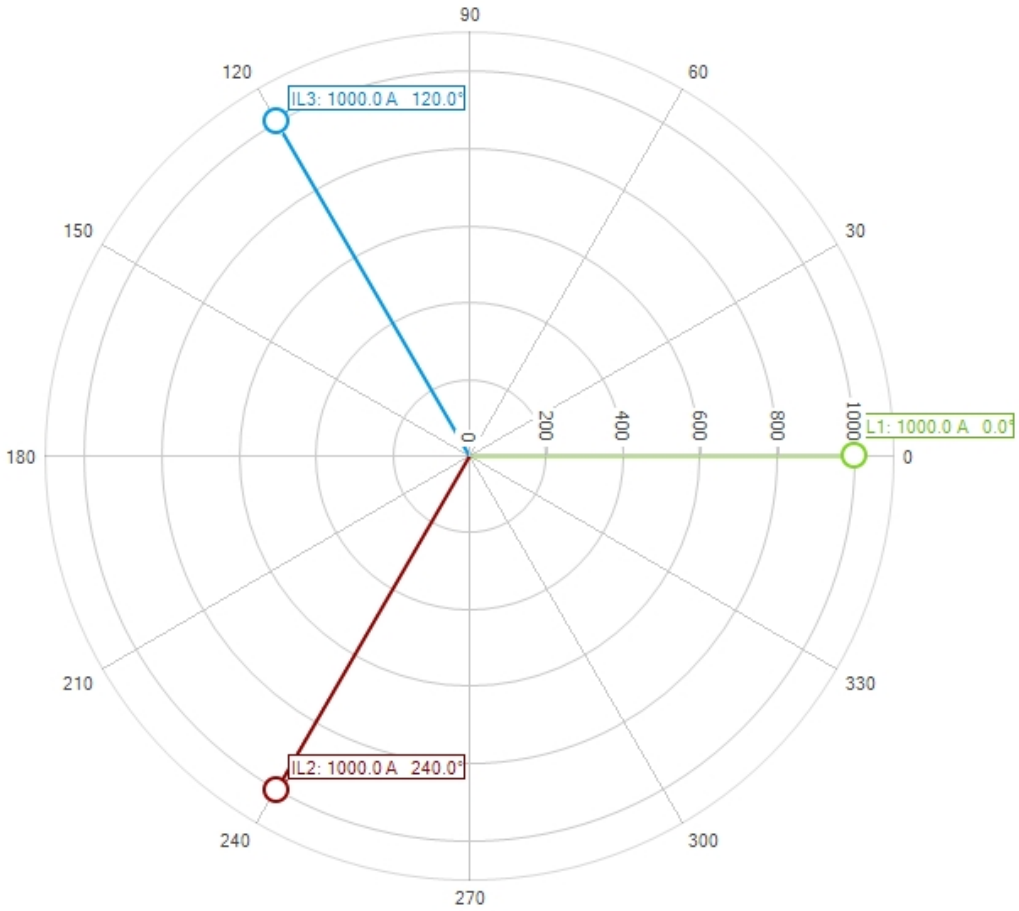
Name	Automatic test 3
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A4/01
Relay Serial Number	E216918002521070
Circuit Breaker Serial Number	EF70168060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

Test completed with trip. Protection S tripped in 396 ms.
Trip time must be between 0 ms and 1000 ms.



Test

Name	Automatic test 4
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A4/01
Relay Serial Number	E216918002521070
Circuit Breaker Serial Number	EF70168060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

Test completed with trip. Protection I tripped in 30 ms.
Trip time must be between 0 ms and 1000 ms.

ITEM	Tag	A4/+01-QF1	: DRAWER UPS PAS LINE B - A4/+01-QF1	Dwg	1723002197-EL-DG-00011		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module			
TASK	code	C10002800	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:	UPS PAS LINE B	Instrument Type / Serial N° :	FLUKE 175_17140769
Cubicle N°:	A4/+01	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	CB CLOSED & INSERTED	HW	DI	A4/+01 - QF1/21-24	A4/+01 - X1/14-15	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
2	CB OPEN OR DISCONNECTED	HW	DI	A4/+01 - QF1/21-22	A4/+01 - X1/14-16	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
3	DRAWER ON TEST	HW	DI	A4/+01 - KA1/11-14	A4/+01 - X1/14-16	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
4	CB TRIPPED	HW	DI	A4/+01 - QF1/15-18	A4/+01 - X1/14-17	N/A	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
5	INTERNAL FAULT	HW	DI	A4/+01 - QA1/11-14	A4/+01 - X1/14-18	N/A	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
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: The test of the cubicle was carried out on a test bench.

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-10-03	2024-10-03	2024-10-03
Signature	PROVERLIS Digitaly signed by Davide Zucconelli 2024-10-03T08:36:48.963Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-10-03T13:49:25.545Z	PROVERLIS Digitaly signed by Witness waived 2024-10-03T14:26:24.506Z

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	A3/+01-QF1	: DRAWER UPS PAS LINE A - A3/+01-QF1			Dwg	1723002197-EL-DG-00011
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002801		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form	FP00 Miscellaneous electrical Consumer

DATA

Switchboard	SG-200N1	Circuit ref:	A3/+01-QF1
Breaker rating (A)	57.8A	Nominal current (A)	100A

FUNCTION TEST REQUIREMENT

1	Check pre-commissioning activities have been carried out					OK
2	Check equipment for cleaness					OK
3	Measure I/R value of equipment and feeder cable at 1000V (Min value: 10 Mohm)	150	MΩ			OK
4	Energise control of equipment feeder					OK
5	Full test feeder breaker operation in test position					OK
6	Check protection setting					OK
7	Test interface trips and signals (remote alarms & status). Check the relevant ITR presence in the system					OK
8	Test control and safety functions according to manufacturer's procedure.					OK
9	Energize					OK
10	Measure Voltage and Current values at feeder breaker	399	V	0.3	A	OK
11	Attach test procedure, if any					NA

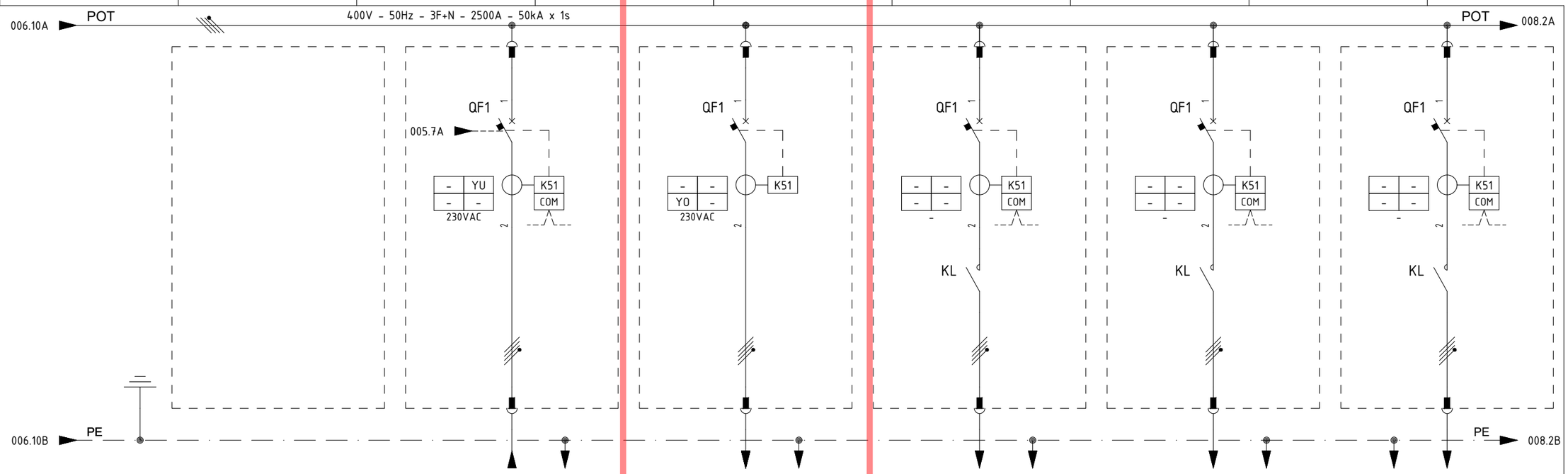
FUNCTION TEST REQUIREMENT	RESULT

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	10/07/2025
FLUKE 376	A1711003	7710/24	10/07/2025

Comments:

	Performed by	☐ WITNESS ☑ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Mattia Girotti	Kristian Castellani	Witness waived
Date	2024-11-08	2024-11-08	2024-11-08
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-08T10:43:14.930Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-08T15:00:09.667Z	PROVERLIS Digitaly signed by Witness waived 2024-11-08T16:23:53.133Z



ITEM			1	JB-200E2	UP-200F3	SPARE	DP-200N1	JB-200E3
UTILITY			2	TEMPORARY GENERATOR / MOBILE BATTERY PACK	AC UPS PAS - 30 MIN UP-200F3 - LINE A	SPARE	DB - LIGHTING & SMALL POWER - BoP	CRANE
COLUMN/CUBICLE			3	A2 / +08	A3 / +01	A3 / +02	A3 / +03	A3 / +04
RATED POWER | RATED CURRENT			4/5	138 kW | 210 A	36.0 kW | 57.8 A	- kW | - A	15.35 kW | 23.7 A	25 kW | 37.8 A
TYPICAL FUNCTIONAL			6	LE2-320	L1-100	LK1-40	LK1-100	LK1-63
CIRCUIT BREAKER (ABB)	TYPE		7	XT5S - 400	XT2S - 160	XT2S - 160	XT2S - 160	XT2S - 160
	VERSION		8	4P - FIXED	4P - FIXED	4P - FIXED	4P - FIXED	4P - FIXED
	TRIP UNITS		9	EKIP HI TOUCH LSIG (In = 320A)	EKIP DIP LSIG (In = 100A)	EKIP HI TOUCH LSIG (In = 40A)	EKIP HI TOUCH LSIG (In = 100A)	EKIP HI TOUCH LSIG (In = 63A)
	Icu KA		10	50 kA	50 kA	50 kA	50 kA	50 kA
OVERLOAD	L	Range A	11	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In
		Range t	12	k/I^2	k/I^2	k/I^2	k/I^2	k/I^2
SEL. SHORT-CIRCUIT	S	Range A	13	(0.6 - 10) x In	(1 - 10) x In	(0.6 - 10) x In	(0.6 - 10) x In	(0.6 - 10) x In
		Range t	14	0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	0.05 - 0,4 sec / k/I^2	0.05 - 0,4 sec / k/I^2	0.05 - 0,4 sec / k/I^2
INST. SHORT-CIRCUIT	I	Range A	15	(1.5 - 15) x In	(1 - 10) x In	(1.5 - 15) x In	(1.5 - 15) x In	(1.5 - 15) x In
		Range t	16	instantaneous	<= 0.02 sec	instantaneous	instantaneous	instantaneous
EARTH FAULT PROTECTION	G	Range A	17	(0.1 - 1) x In	(0.2 - 1) x In	(0.1 - 1) x In	(0.1 - 1) x In	(0.1 - 1) x In
		Range t	18	t=k / t=k/I^2	0.1 - 0.8 sec	t=k / t=k/I^2	t=k / t=k/I^2	t=k / t=k/I^2
CONTACTOR (ABB)			19	-	-	AF40-40-00-13 (70A-AC1); 100-250VAC/DC	AF80-40-00-13 (70A-AC1); 100-250VAC/DC	AF52-40-00-13 (100A-AC1); 100-250VAC/DC
THERMAL OVERLOAD RELAY (ABB)			20	-	-	-	-	-
SURGE ARRESTER (DEHN)			21	-	-	-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-	-	-	-	-
FUSE HOLDER (ITALWEBER)			23	-	-	-	-	-
INDIRECT PROTECTION (ABB)			24	-	-	-	-	-
VOLTMETER			25	-	-	-	-	-
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-	-	-	-	-
	PERFORMANCE/CLASS		27	-	-	-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-	-	-	-	-
	PERFORMANCE/CLASS		29	-	-	-	-	-
LOCK-OUT RELAY (-)			30	-	-	-	-	-
POWER CONDUCTOR mmq			31	5 x (1 x 95)	4G35	-	5G50	5G16

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DWG n° : 231298/SD/11

Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	28/08/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
2	03/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	28/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	15/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00011

SHEET 007

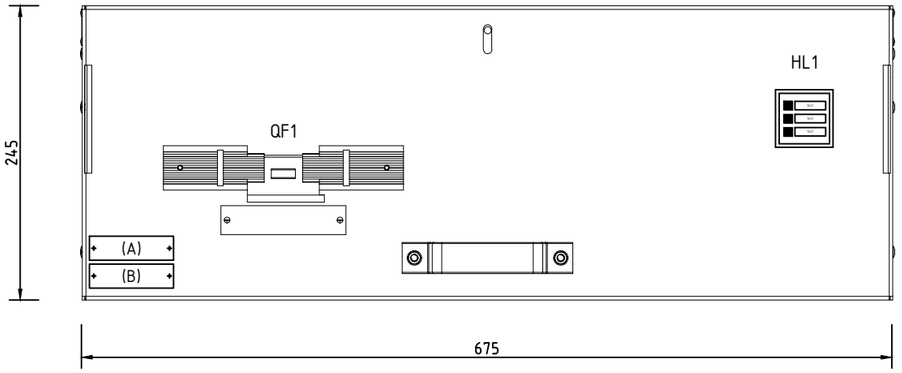
REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00011 Rev. 04

DOOR FRONT LAY-OUT

TYPICAL : LINE FEEDER "L1-n"

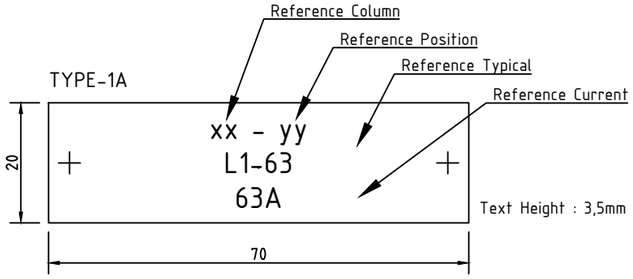


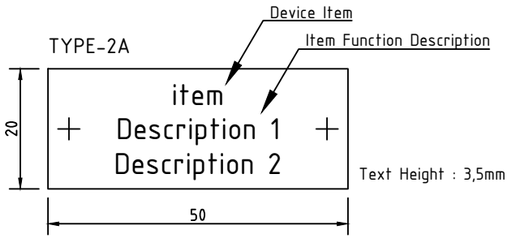
NOTE :

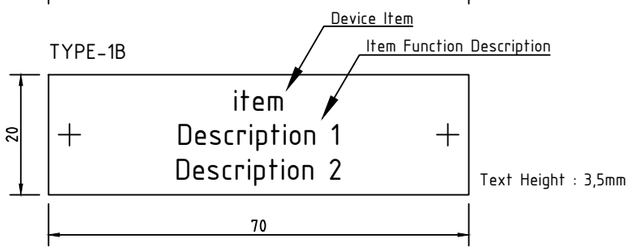
A) IDENTIFICATION name plate (type-1A) , with :
- Drawer position [Column / Position inside SWB]
- Typical name [reference applicability typical used]
- Power [reference applicability typical used]

B) USER name plate (type-1B), with :
- Item User [to see SLD diagrams]
- User Description [to see SLD diagrams]

DEVICES name plate			
ITEM	DESCRIPTION 1	DESCRIPTION 2	NOTE
QF1	Circuit Breaker	Signalling	NO plate
HL1	Multiled	Signalling	NO plate







= TYPICAL
+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Door Front Lay-Out - Typical "L1-n" & "L2-n"

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

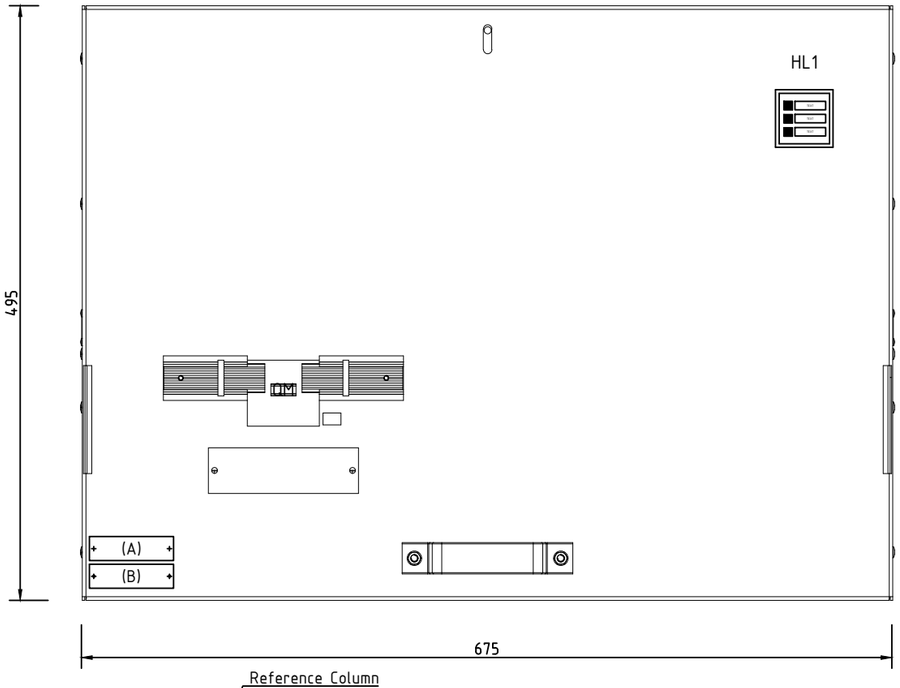
A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 023 | REV. 02

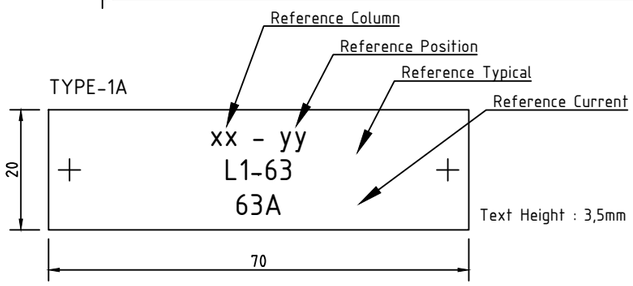
F.to UNI A3: 420mmx297mm

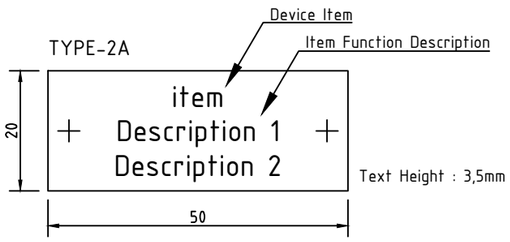
File Name : 1723002197-EL-DG-00031 Rev. 02

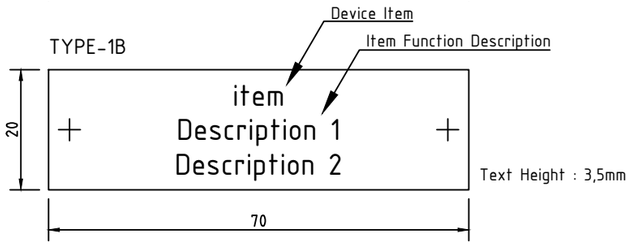
DOOR FRONT LAY-OUT

TYPICAL : LINE FEEDER "L2-n"









NOTE :

A) IDENTIFICATION name plate (type-1A) , with :
- Drawer position [Column / Position inside SWB]
- Typical name [reference applicability typical used]
- Power [reference applicability typical used]

B) USER name plate (type-1B), with :
- Item User [to see SLD diagrams]
- User Description [to see SLD diagrams]

DEVICES name plate

ITEM	DESCRIPTION 1	DESCRIPTION 2	NOTE
QF1	Circuit Breaker	Signalling	NO plate
HL1	Multiled	Signalling	NO plate

=	TYPICAL
+	L-x

DWG n° : 231298/SD/31

Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Door Front Lay-Out - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 024 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

USERS LEGEND

TYPICAL : LINE FEEDER "L1-n" & "L2-n"

TYPICAL APPLICABILITY					
ITEM	ITEM TAG	DESCRIPTION TAG	REFERENCE POSITION (written on name name plate "type-1A)	REFERENCE NOMINAL CURRENT C.B. TRIP UNIT (written on name name plate "type-1A)	REFERENCE TYPICAL (written on name name plate "type-1A)
1	UP-200F4	AC UPS F&G - 8H UP-200F4 - BYPASS	A2 / +04	63A	L1-63
2	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 - LINE A	A3 / +01	100A	L1-100
3	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 - LINE B	A4 / +01	100A	L1-100
4	UP-200F4	AC UPS F&G - 8H UP-200F4 - LINE A	A6 / +05	63A	L1-63
5	UP-200F4	AC UPS F&G - 8H UP-200F4 - LINE B	A6 / +06	63A	L1-63
6	ESW-200N1	WELDING SOCKETS (TOP DECK)	A6 / +08	160A	L2-160
7	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 (BYPASS)	A7 / +02	100A	L1-100
8	UP-200F1	DC BATTERY SYSTEM SWTG CONTROL - FEEDER A	A7 / +03	63A	L1-63
9	UP-200F1	DC BATTERY SYSTEM SWTG CONTROL - FEEDER B	A7 / +04	63A	L1-63
10	UP-200F2	NAVAID SYSTEM FEEDER A	A7 / +05	63A	L1-63
11	UP-200F2	NAVAID SYSTEM FEEDER B	A7 / +06	63A	L1-63
12	ESW-200N2	WELDING SOCKETS (LOWER DECK)	A7 / +08	160A	L2-160

= TYPICAL
+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

IMESA ELECTRICAL ENGINEERING

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Users Legend - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 025

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

ITEMS ACRONYM

TYPICAL : LINE FEEDER "L1-n" & "L2-n"

Composition of Typical :

L-x = Common Parts
L1-"nn" or L2-"nn"= Specific Parts

Example for Composition of L1-63:
- to take "L-x" plus "L1-63"

Example for Composition of L2-160:
- to take "L-x" plus "L2-160"

	ACRONYM ITEMS [Comun parts]	ACRONYM ITEMS [Specific parts]				
	L-x	L1-40 [In=40A] [Current Trip Unit]	L1-63 [In=63A] [Current Trip Unit]	L1-100 [In=100A] [Current Trip Unit]	L2-160 [In=160A] [Current Trip Unit]	
ASSOCIATED TYPICAL	This Item include all devices that are comun for both "Specific Parts" Items	This Items include only devices that are detail for "Specific Parts" Items				
L1-40	X	X				
L1-63	X		X			
L1-100	X			X		
L2-160	X				X	

=	TYPICAL					
+	L-x					
DWG n° :	231298/SD/31					
Item n° :	PF1002983/26					
		2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Items Acronym - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

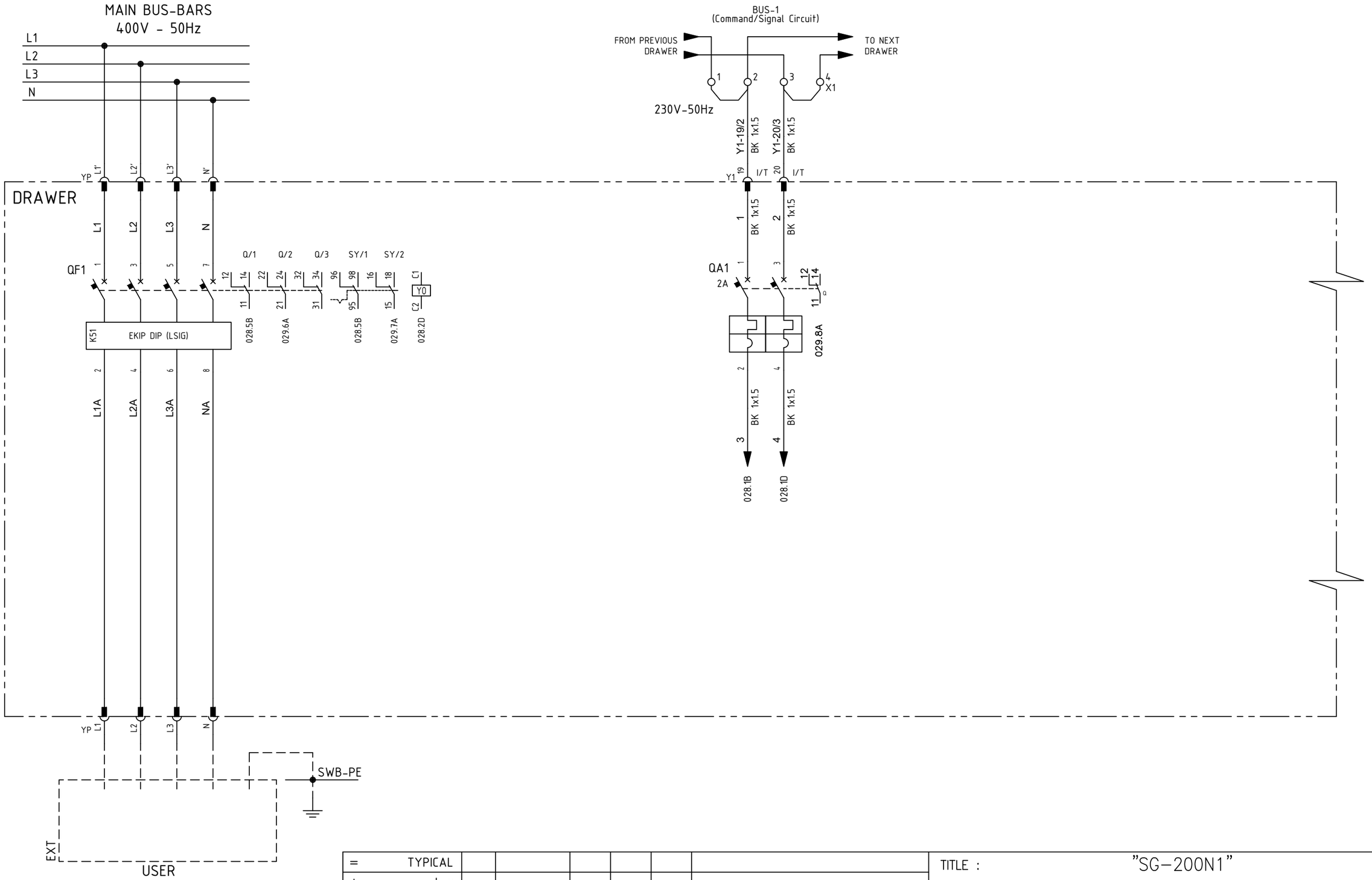
DRAWING NO. 1723002197-EL-DG-00031

SHEET 026

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



=	TYPICAL					
+	L-x					
DWG n° :	231298/SD/31					
Item n° :	PF1002983/26					
		2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

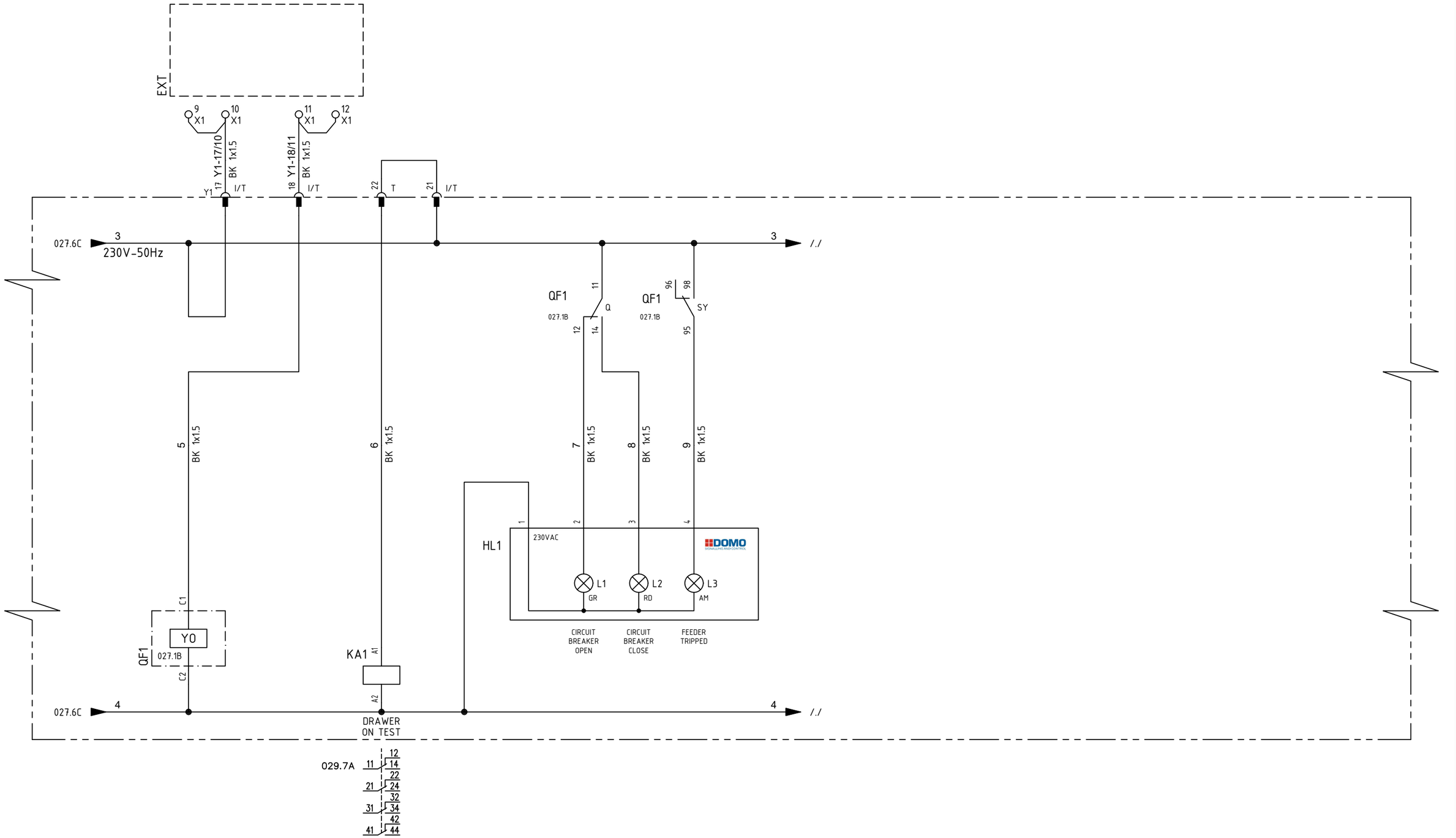
DRAWING NO. 1723002197-EL-DG-00031

SHEET 027

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



= TYPICAL							
+ L-x							
DWG n° : 231298/SD/31							
Item n° : PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
	1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
	0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
	REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

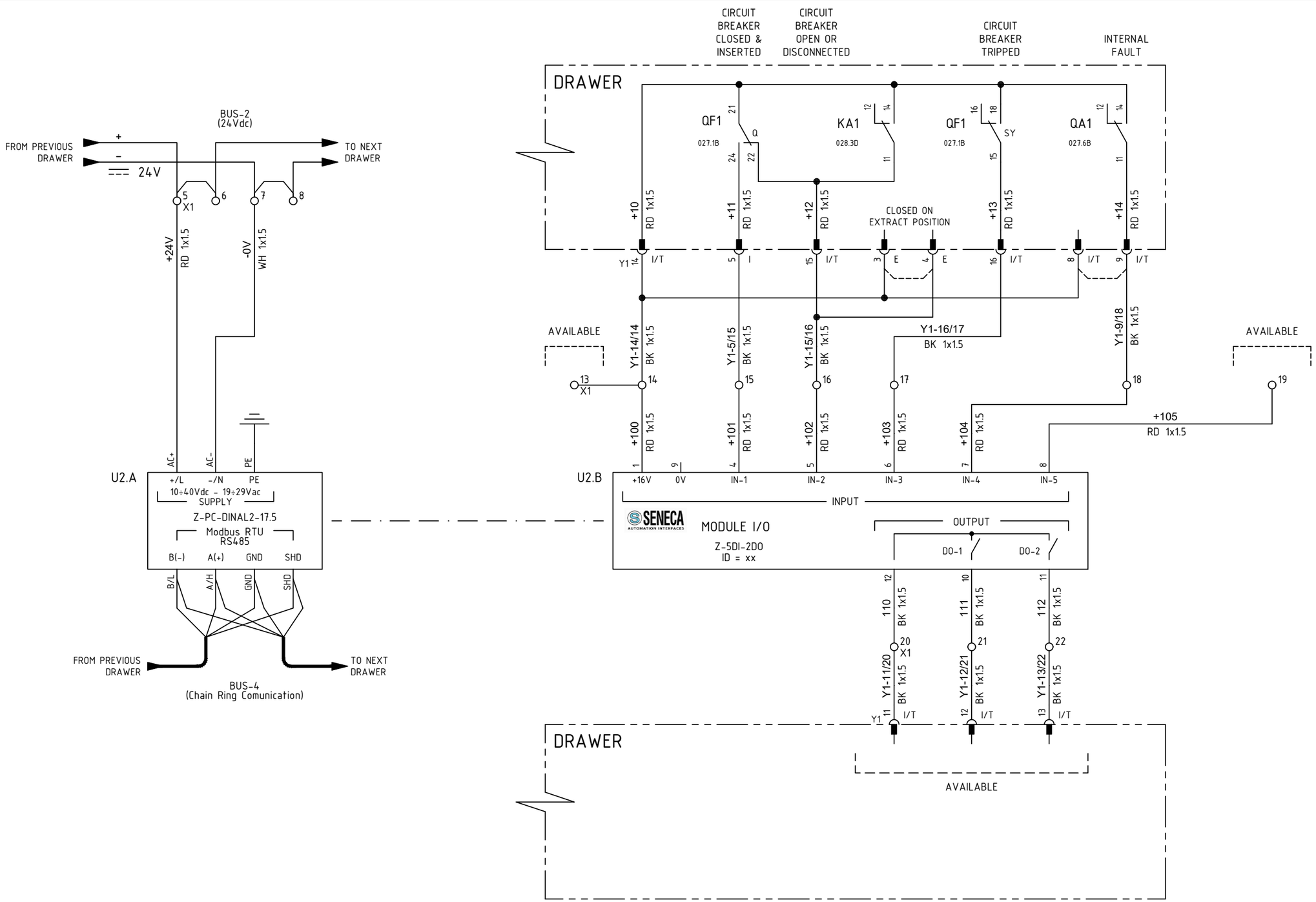
DRAWING NO. 1723002197-EL-DG-00031

SHEET 028

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



=	TYPICAL						
+	L-x						
DWG n° :	231298/SD/31						
Item n° :	PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 029

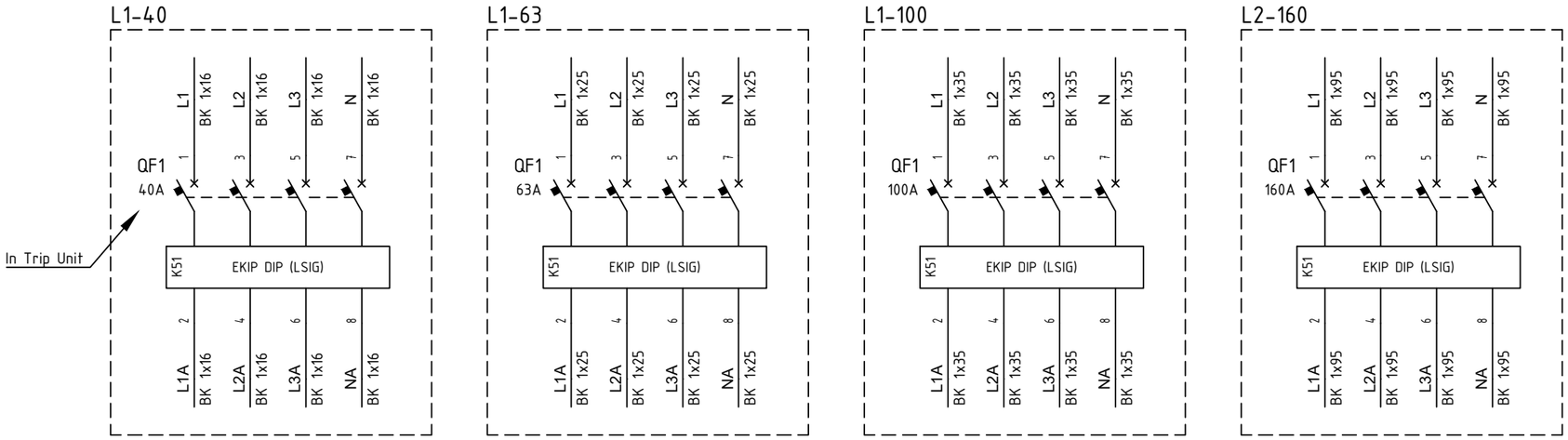
REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

SPECIFIC PARTS

TYPICAL : LINE FEEDER "L1-n" & "L2-n"



= TYPICAL							
+ L-x							
DWG n° : 231298/SD/31							
Item n° : PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)	
	1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)	
	0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)	
	REV.	DATE	DRN	CHKD	APPD	DESCRIPTION	

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 030 | REV. 02

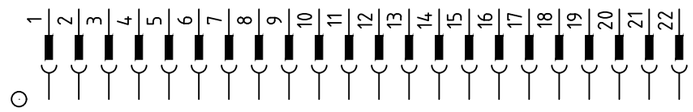
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

TYPICAL - L-x - Y1

AUXILIARY SOCKET
136450/001 (PF – 1 pcs) + 136458/004 (PM – 1 pcs)

N° PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
JUMP			●	●				●	●													
RACKED-OUT			X	X				X	X													
TEST								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RACKED-IN					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
PIN USED			029.6B	029.7B	029.6B			029.8B	029.8B		029.7D	029.7D	029.8D	029.5B	029.6B	029.7B	028.2B	028.3B	027.6A	027.6A	028.4B	028.3B



← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN RACKED-OUT POSITION

← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN TEST POSITION

← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN RACKED-IN POSITION

← CROS-REFERENCE USED PIN

= TYPICAL						
+ L-x						
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)	
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)	
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)	
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION	

DWG n° : 231298/SD/31
Item n° : PF1002983/26

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 031

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

TYPICAL - L-x

X1

NumM	Fg.	Sez.	Tipo	Descrizione	Costruttore
			BT003	BT/3 End bracket	Cabur
1	027.5A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
2	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
3	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
4	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
5	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
6	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
7	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
8	029.3A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
			HD101GR	HMD/PT/GR End section - Grey	Cabur
9	028.2A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
10	028.2A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
11	028.3A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
12	028.3A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
13	029.4B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
14	029.5B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
15	029.6B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
16	029.6B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
17	029.7B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
18	029.8B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
19	029.9B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
20	029.7D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
21	029.7D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
22	029.8D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
			HD201GR	HMD.1/PT/GR End section - Grey	Cabur
			BT003	BT/3 End bracket	Cabur

= TYPICAL

\+ L-x

DWG n° : 231298/SD/31

Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 032

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
HL1	028	ML22/483L230STLTTR	1	MULTILED 48x48 - 3 LED - Vaux=230Vac/dc + LAMP TEST + TROP	DOMO	TYPICAL L-x
KA1	028	ER 592 6	1	CR-M230AC4L SUPPLY 230VAC 4C/O 250V/6A LED	ABB	TYPICAL L-x
		ER 609 8	1	CR-MH HOLDER FOR CR-M RELAY	ABB	TYPICAL L-x
		ER 686 6	1	CR-M4SS SOCKET STANDARD X 2/4 C/O(CR-M)	ABB	TYPICAL L-x
QA1	027	S550239	1	S202M C 2 AUTOMATIC CIRCUIT BREAKER 10KA 2P	ABB	TYPICAL L-x
		A563819	1	S2-CS/H6R AUXILIARY STATE CONTACT 1CO	ABB	TYPICAL L-x
U2.A	029	Z-PC-DINAL2-17.5	1	DIN RAIL 2SLOT WITH HEAD FOR "Z-5DI-2DO"	SENECA	TYPICAL L-x
U2.B	029	Z-5DI-2DO	1	I/O MODUL 5DI+2DO modbus RS485 Vaux=10÷40Vdc 19÷28Vac	SENECA	TYPICAL L-x
X1		HD100GR__	8	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur	TYPICAL L-x
		HD400GR__	14	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur	TYPICAL L-x
		BT003	2	BT/3 End bracket	Cabur	TYPICAL L-x
		HD101GR	1	HMD/PT/GR End section - Grey	Cabur	TYPICAL L-x
		HD201GR	1	HMD.1/PT/GR End section - Grey	Cabur	TYPICAL L-x

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S40LSIG4	1	XT2S 160 Ekip LSIG In=40A 4p F F	ABB	TYPICAL L1-40
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-40
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-40

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S63LSIG4	1	XT2S 160 Ekip LSIG In=63A 4p F F	ABB	TYPICAL L1-63
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-63
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-63

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S100LSIG4	1	XT2S 160 Ekip LSIG In=100A 4p F F	ABB	TYPICAL L1-100
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-100
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-100

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	1SDA068179R1	1	XT4S 250 BREAKING PART 4p F F	ABB	TYPICAL L2-160
		1SDA067536R1	1	SG.EL.Ekip LSIG In=160A XT4 4p	ABB	TYPICAL L2-160
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L2-160
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L2-160

= TYPICAL
\+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING
CROSSWIND
ROSETTI MARINO

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 033 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

ITEM	Tag	A3/+01-QF1	: DRAWER UPS PAS LINE A - A3/+01-QF1	Dwg	1723002197-EL-DG-00011		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module			
TASK	code	C10002802	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°:	E216850002521070	Relay type:	EKIP DIP LSIG
Auxiliary supply:	24Vdc	Location:	B200	Cubicle:	A3/+01
Switchboard:	SG-200N1				

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
L	62A	300A		3s	1190ms
S	300A	500A		0.1s	400ms
I	600A	1000A		INSTANT	24ms
G	20A			0.1s	

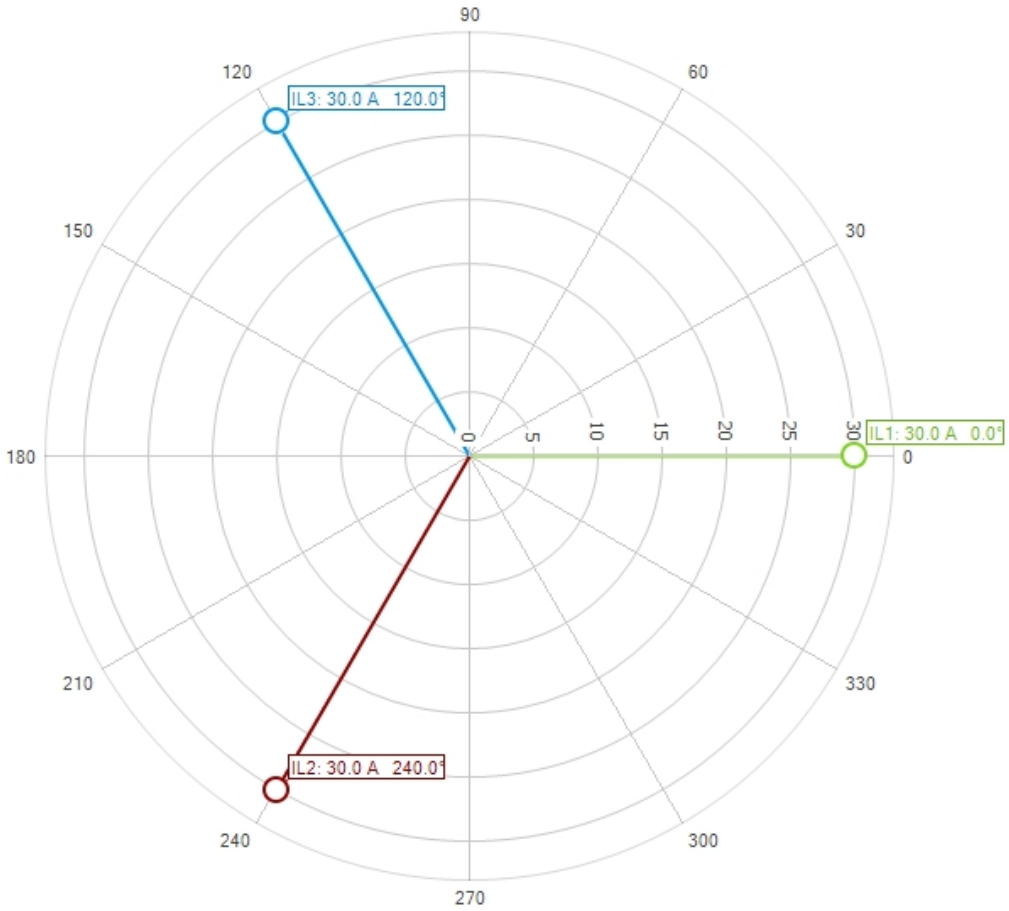
Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
ABB EKIP T&P	E34013804410W050		

Comments: See the 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	2024-09-19	2024-09-19	2024-09-20
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-09-19T07:03:05.344Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-09-19T07:53:40.071Z	PROVERLIS Digitaly signed by Witness waived 2024-09-20T06:23:52.605Z

Page Name	Group Name	Variable Name	Variable Value	Variable Unit
Electronic protection parameters				
	Electronic/Manual parameters selection			
		Electronic/Manual parameters selectio	ELECTRONIC	
	Electronic L protection			
		Trip unit nominal current In	100	
		L threshold	0.62	In
		L time	3.00	s
		Thermal memory	Disabled	
	Electronic S protection			
		S status	Enabled	
		Curve type	t=k/i^2	
		Threshold (t=k/i^2)	3.00	In
		Time (t=k/i^2)	0.10	s
	Electronic I protection			
		I status	Enabled	
		I threshold	6.00	In
	Electronic G protection			
		G status	Enabled	
		G threshold	0.20	In
		G time	0.10	s
	Electronic LC protection			
		Iw status	Disabled	
		Iw threshold	0.30	In
		LC1 status	Disabled	
		LC1 threshold	0.50	I1
		LC2 status	Disabled	
		LC2 threshold	0.50	I1



Test

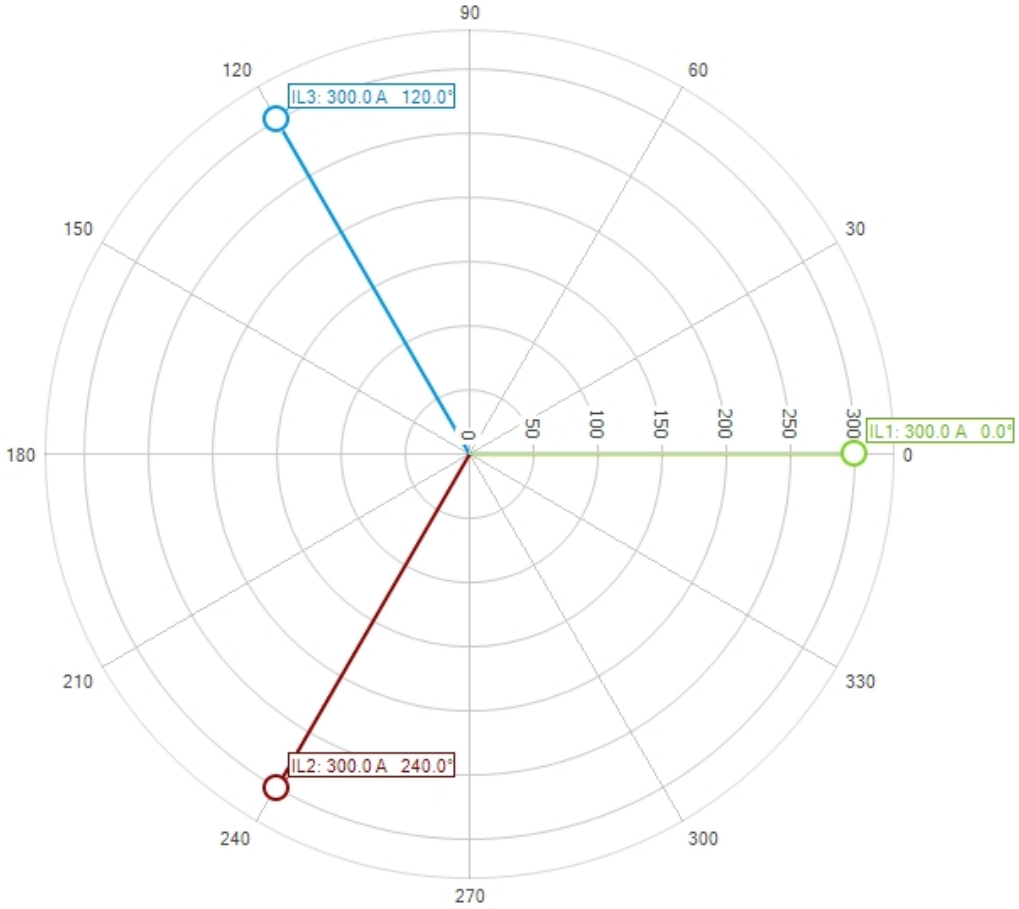
Name	Automatic test 1
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A3/01
Relay Serial Number	E216850002521070
Circuit Breaker Serial Number	EF70166060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

⚠ Test completed without any trip in 3000 ms.



Test

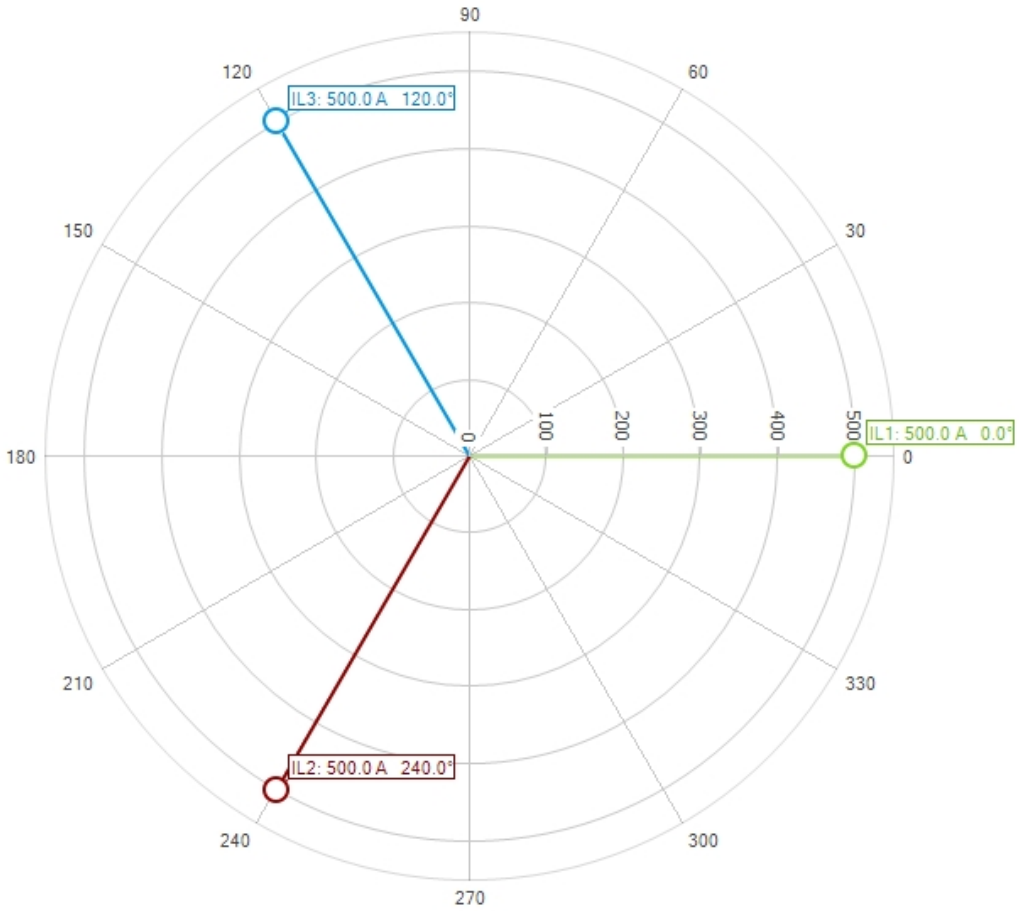
Name	Automatic test 2
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A3/01
Relay Serial Number	E216850002521070
Circuit Breaker Serial Number	EF70166060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

⚠ Test completed with trip but out of time. Protection L tripped in 1190 ms.
Trip time must be between 0 ms and 1000 ms.



Test

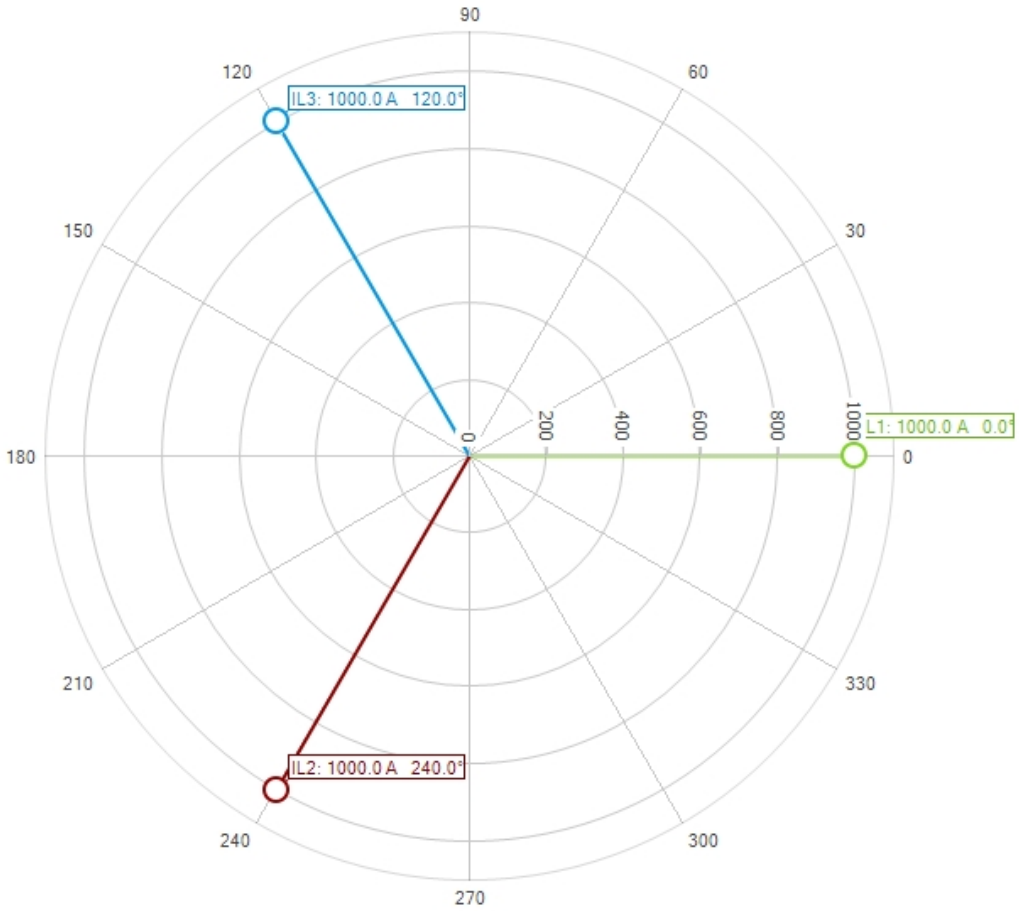
Name	Automatic test 3
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A3/01
Relay Serial Number	E216850002521070
Circuit Breaker Serial Number	EF70166060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

Test completed with trip. Protection S tripped in 400 ms.
Trip time must be between 0 ms and 1000 ms.



Test

Name	Automatic test 4
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A3/01
Relay Serial Number	E216850002521070
Circuit Breaker Serial Number	EF70166060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

Test completed with trip. Protection I tripped in 24 ms.
Trip time must be between 0 ms and 1000 ms.

ITEM	Tag	A3/+01-QF1	: DRAWER UPS PAS LINE A - A3/+01-QF1	Dwg	1723002197-EL-DG-00011		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module			
TASK	code	C10002803	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:	UPS PAS LINE A	Instrument Type / Serial N° :	FLUKE 175_17140769
Cubicle N°:	A3/+01	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	CB CLOSED & INSERTED	HW	DI	A3/+01 - QF1/21-24	A3/+01 - X1/14-15	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
2	CB OPEN OR DISCONNECTED	HW	DI	A3/+01 - QF1/21-22	A3/+01 - X1/14-16	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
3	DRAWER ON TEST	HW	DI	A3/+01 - KA1/11-14	A3/+01 - X1/14-16	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
4	CB TRIPPED	HW	DI	A3/+01 - QF1/15-18	A3/+01 - X1/14-17	N/A	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
5	INTERNAL FAULT	HW	DI	A3/+01 - QA1/11-14	A3/+01 - X1/14-18	N/A	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
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: The test of the cubicle was carried out on a test bench.

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	rm comm	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-10-02	2024-10-03	2024-10-03
Signature	Digitaly signed by Davide Zucconelli 2024-10-02T13:40:29.627Z	Digitaly signed by Kristian Castellani 2024-10-03T07:11:15.016Z	Digitaly signed by Witness waived 2024-10-03T14:26:41.194Z

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	A7/+02-QF1	: DRAWER UPS PAS-BYPASS - A7/+02-QF1			Dwg	1723002197-EL-DG-00011
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002804		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form	FP00 Miscellaneous electrical Consumer

DATA

Switchboard	SG-200N1	Circuit ref:	A7/+02-QF1
Breaker rating (A)	57.8A	Nominal current (A)	100A

FUNCTION TEST REQUIREMENT

1	Check pre-commissioning activities have been carried out				OK
2	Check equipment for cleaness				OK
3	Measure I/R value of equipment and feeder cable at 1000V (Min value: 10 Mohm)	257	MΩ		OK
4	Energise control of equipment feeder				OK
5	Full test feeder breaker operation in test position				OK
6	Check protection setting				OK
7	Test interface trips and signals (remote alarms & status). Check the relevant ITR presence in the system				OK
8	Test control and safety functions according to manufacturer's procedure.				OK
9	Energize				OK
10	Measure Voltage and Current values at feeder breaker	401	V	0.4 A	OK
11	Attach test procedure, if any				NA

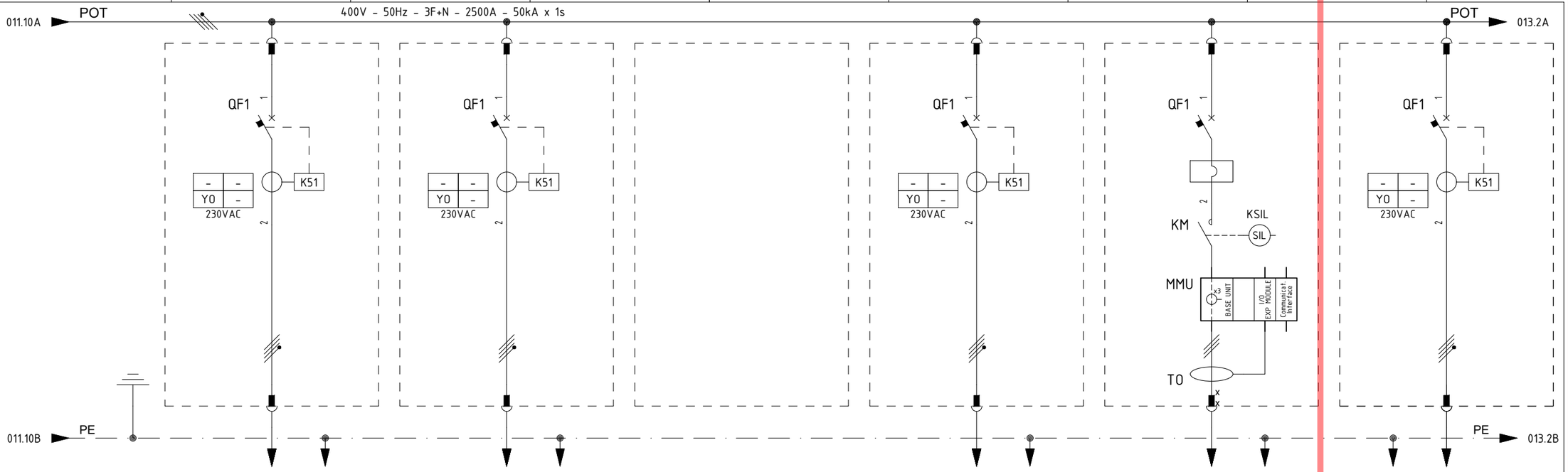
FUNCTION TEST REQUIREMENT	RESULT

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	10/07/2025
FLUKE 376	A1711003	7710/24	10/07/2025

Comments:

Page 1/1	Performed by	☐ WITNESS ☑ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM		CPY NOT PRESENT
Name	Mattia Girotti	Kristian Castellani	Witness waived
Date	2024-11-08	2024-11-08	2024-11-08
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-08T11:34:38.304Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-08T15:01:41.061Z	PROVERLIS Digitaly signed by Witness waived 2024-11-08T16:24:20.642Z



ITEM			1	UP-200F4	UP-200F4	ESW-200N1	PM-50001 A	UP-200F3
UTILITY			2	AC UPS F&G - 8 H UP-200F4 - LINE A	AC UPS F&G - 8h UP-200F4 - LINE B	WELDING SOCKETS (TOP DECK)	SEA WATER PUMP A	AC UPS PAS - 30 min. UP-200F3 - BYPASS
COLUMN/CUBICLE			3	A6 / +05	A6 / +06	A6 / +08	A7 / +01	A7 / +02
RATED POWER | RATED CURRENT			4/5	18 kW | 28.9 A	18 kW | 28.9 A	69.84 kW | 126.15 A	6.1 kW | 11.0 A	36 kW | 57.8 A
TYPICAL FUNCTIONAL			6	L1-63	L1-63	L2-160	M1-6	L1-100
CIRCUIT BREAKER (ABB)	TYPE		7	XT2S - 160	XT2S - 160	XT4S - 250	XT2S - 160	XT2S - 160
	VERSION		8	4P - FIXED	4P - FIXED	4P - FIXED	3P - FIXED	4P - FIXED
	TRIP UNITS		9	EKIP DIP LSIG (In = 63A)	EKIP DIP LSIG (In = 63A)	EKIP DIP LSIG (In = 160A)	MA (In = 20A)	EKIP DIP LSIG (In = 100A)
	Icu	KA	10	50 kA	50kA	50kA	-	50 kA
OVERLOAD	L	Range A	11	(0.4 - 1) x In	(0.4 - 1) x In	(0.4 - 1) x In	-	(0.4 - 1) x In
		Range t	12	k/I^2	k/I^2	k/I^2	-	k/I^2
SEL. SHORT-CIRCUIT	S	Range A	13	(1 - 10) x In	(1 - 10) x In	(1 - 10) x In	-	(1 - 10) x In
		Range t	14	0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	0.05 - 0.4 sec / k/I^2	-	0.05 - 0.4 sec / k/I^2
INST. SHORT-CIRCUIT	I	Range A	15	(1 - 10) x In	(1 - 10) x In	(1 - 10) x In	(6 - 14) x I	(1 - 10) x In
		Range t	16	<= 0.02 sec	<= 0.02 sec	<= 0.02 sec	<= 0.02 sec	<= 0.02 sec
EARTH FAULT PROTECTION	G	Range A	17	(0.2 - 1) x In	(0.2 - 1) x In	(0.2 - 1) x In	-	(0.2 - 1) x In
		Range t	18	0.1 - 0.8 sec	0.1 - 0.8 sec	0.1 - 0.8 sec	-	0.1 - 0.8 sec
CONTACTOR (ABB)			19	-	-	-	AF38-30-00-13 (18.5 kW - AC3) - 100-250Vac/dc	-
THERMAL OVERLOAD RELAY (ABB)			20	-	-	-	UMC100.3 UC (0.24 - 63A)	-
SURGE ARRESTER (DEHN)			21	-	-	-	-	-
TOROIDAL CURRENT TRANSFORMER (FRER)			22	-	-	-	-	-
FUSE HOLDER (ITALWEBER)			23	-	-	-	-	-
INDIRECT PROTECTION (ABB)			24	-	-	-	-	-
VOLTMETER			25	-	-	-	-	-
CURRENT TRANSFORMER FOR MEASURE (FRER)	TYPE		26	-	-	-	-	-
	PERFORMANCE/CLASS		27	-	-	-	-	-
VOLTAGE TRANSFORMER FOR MEASURE (FRER)	TYPE		28	-	-	-	-	-
	PERFORMANCE/CLASS		29	-	-	-	-	-
LOCK-OUT RELAY (-)			30	-	-	-	-	-
POWER CONDUCTOR		mmq	31	4G35	4G35	5G50	4G4	4G35

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+

DWG n° : 231298/SD/11

Item n° : PF1002983/26

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	28/08/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
3	08/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
2	03/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
1	28/03/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
0	15/02/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00011

SHEET 012

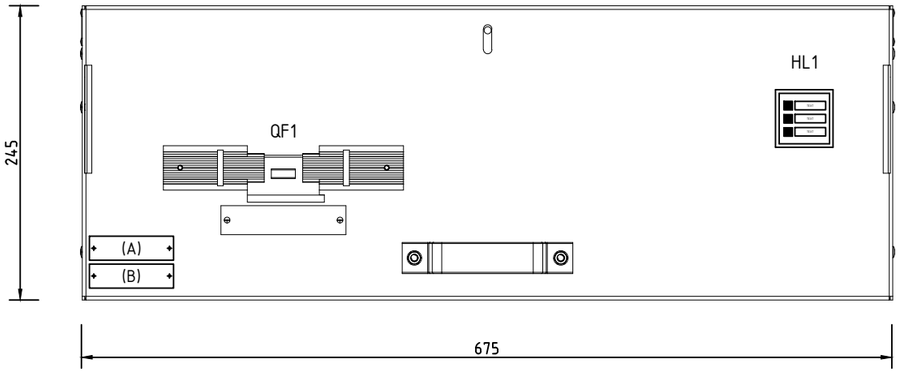
REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00011 Rev. 04

DOOR FRONT LAY-OUT

TYPICAL : LINE FEEDER "L1-n"

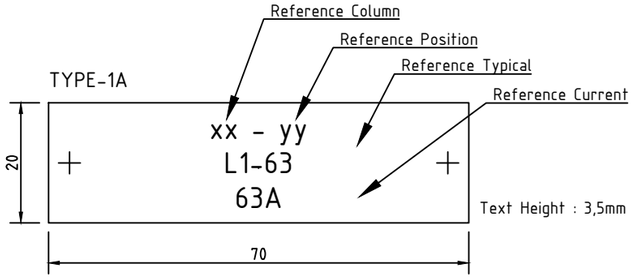


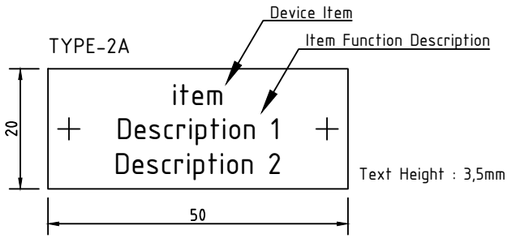
NOTE :

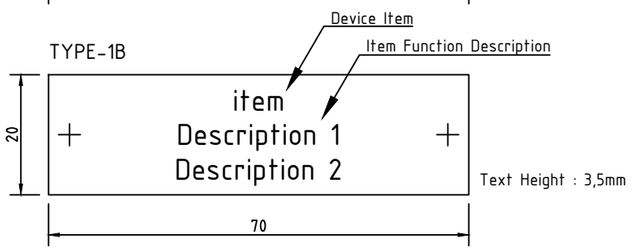
A) IDENTIFICATION name plate (type-1A) , with :
- Drawer position [Column / Position inside SWB]
- Typical name [reference applicability typical used]
- Power [reference applicability typical used]

B) USER name plate (type-1B), with :
- Item User [to see SLD diagrams]
- User Description [to see SLD diagrams]

DEVICES name plate			
ITEM	DESCRIPTION 1	DESCRIPTION 2	NOTE
QF1	Circuit Breaker	Signalling	NO plate
HL1	Multiled	Signalling	NO plate







= TYPICAL
+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Door Front Lay-Out - Typical "L1-n" & "L2-n"

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

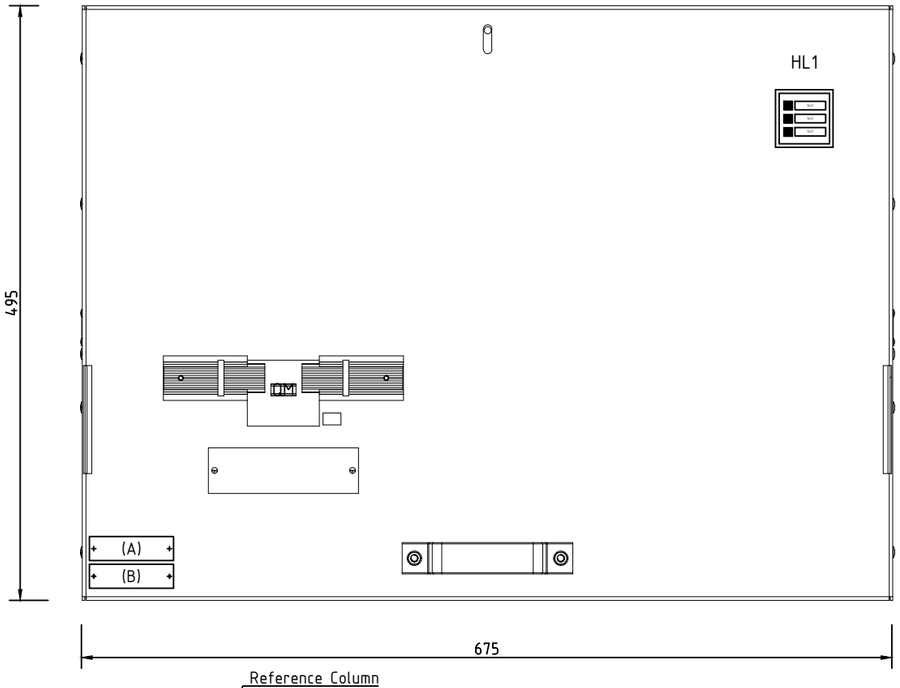
A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 023 | REV. 02

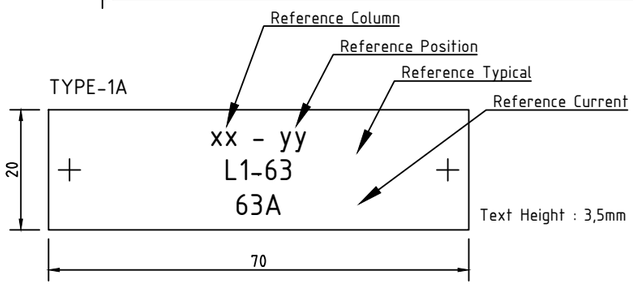
F.to UNI A3: 420mmx297mm

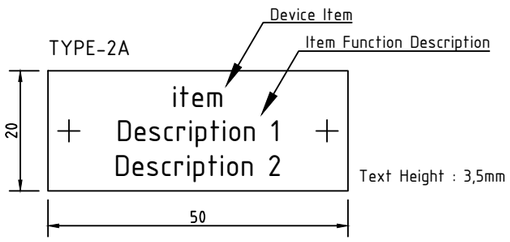
File Name : 1723002197-EL-DG-00031 Rev. 02

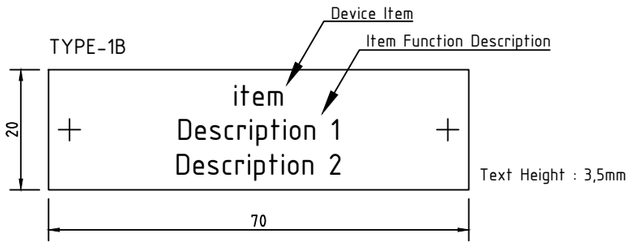
DOOR FRONT LAY-OUT

TYPICAL : LINE FEEDER "L2-n"









NOTE :

A) IDENTIFICATION name plate (type-1A) , with :
- Drawer position [Column / Position inside SWB]
- Typical name [reference applicability typical used]
- Power [reference applicability typical used]

B) USER name plate (type-1B), with :
- Item User [to see SLD diagrams]
- User Description [to see SLD diagrams]

DEVICES name plate

ITEM	DESCRIPTION 1	DESCRIPTION 2	NOTE
QF1	Circuit Breaker	Signalling	NO plate
HL1	Multiled	Signalling	NO plate

=	TYPICAL
+	L-x

DWG n° : 231298/SD/31

Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Door Front Lay-Out - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 024 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

USERS LEGEND

TYPICAL : LINE FEEDER "L1-n" & "L2-n"

TYPICAL APPLICABILITY					
ITEM	ITEM TAG	DESCRIPTION TAG	REFERENCE POSITION (written on name name plate "type-1A)	REFERENCE NOMINAL CURRENT C.B. TRIP UNIT (written on name name plate "type-1A)	REFERENCE TYPICAL (written on name name plate "type-1A)
1	UP-200F4	AC UPS F&G - 8H UP-200F4 - BYPASS	A2 / +04	63A	L1-63
2	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 - LINE A	A3 / +01	100A	L1-100
3	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 - LINE B	A4 / +01	100A	L1-100
4	UP-200F4	AC UPS F&G - 8H UP-200F4 - LINE A	A6 / +05	63A	L1-63
5	UP-200F4	AC UPS F&G - 8H UP-200F4 - LINE B	A6 / +06	63A	L1-63
6	ESW-200N1	WELDING SOCKETS (TOP DECK)	A6 / +08	160A	L2-160
7	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 (BYPASS)	A7 / +02	100A	L1-100
8	UP-200F1	DC BATTERY SYSTEM SWTG CONTROL - FEEDER A	A7 / +03	63A	L1-63
9	UP-200F1	DC BATTERY SYSTEM SWTG CONTROL - FEEDER B	A7 / +04	63A	L1-63
10	UP-200F2	NAVAID SYSTEM FEEDER A	A7 / +05	63A	L1-63
11	UP-200F2	NAVAID SYSTEM FEEDER B	A7 / +06	63A	L1-63
12	ESW-200N2	WELDING SOCKETS (LOWER DECK)	A7 / +08	160A	L2-160

= TYPICAL
+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

ROSETTI MARINO

IMESA ELECTRICAL ENGINEERING

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Users Legend - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 025

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

ITEMS ACRONYM

TYPICAL : LINE FEEDER "L1-n" & "L2-n"

Composition of Typical :

L-x = Common Parts
L1-"nn" or L2-"nn"= Specific Parts

Example for Composition of L1-63:
- to take "L-x" plus "L1-63"

Example for Composition of L2-160:
- to take "L-x" plus "L2-160"

	ACRONYM ITEMS [Comun parts]	ACRONYM ITEMS [Specific parts]				
	L-x	L1-40 [In=40A] [Current Trip Unit]	L1-63 [In=63A] [Current Trip Unit]	L1-100 [In=100A] [Current Trip Unit]	L2-160 [In=160A] [Current Trip Unit]	
ASSOCIATED TYPICAL	This Item include all devices that are comun for both "Specific Parts" Items	This Items include only devices that are detail for "Specific Parts" Items				
L1-40	X	X				
L1-63	X		X			
L1-100	X			X		
L2-160	X				X	

=	TYPICAL					
+	L-x					
DWG n° :	231298/SD/31					
Item n° :	PF1002983/26					
		2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Items Acronym - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

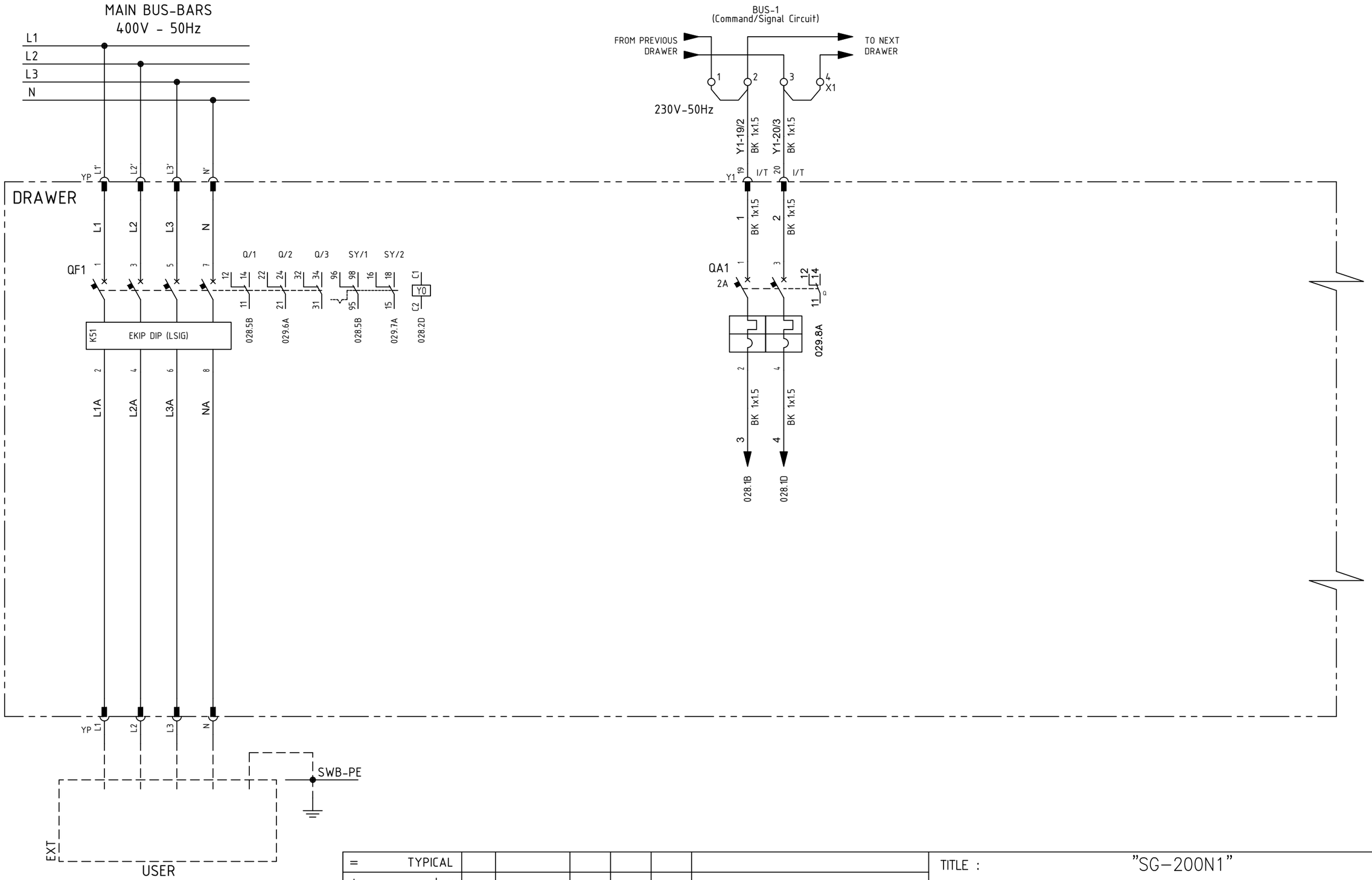
DRAWING NO. 1723002197-EL-DG-00031

SHEET 026

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



=	TYPICAL					
+	L-x					
DWG n° :	231298/SD/31					
Item n° :	PF1002983/26					
		2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

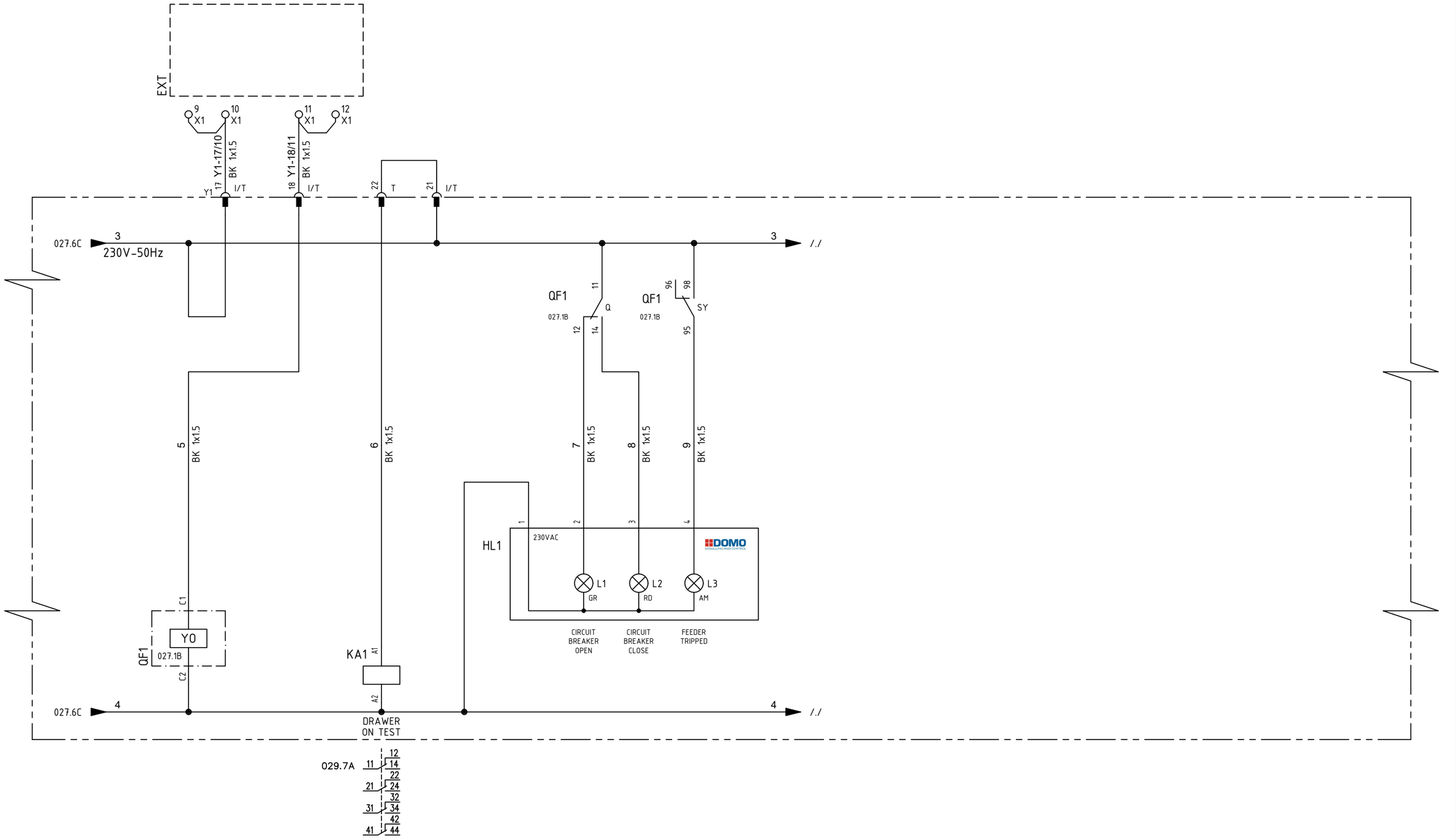
DRAWING NO. 1723002197-EL-DG-00031

SHEET 027

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



= TYPICAL							
+ L-x							
DWG n° : 231298/SD/31							
Item n° : PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
	1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
	0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
	REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

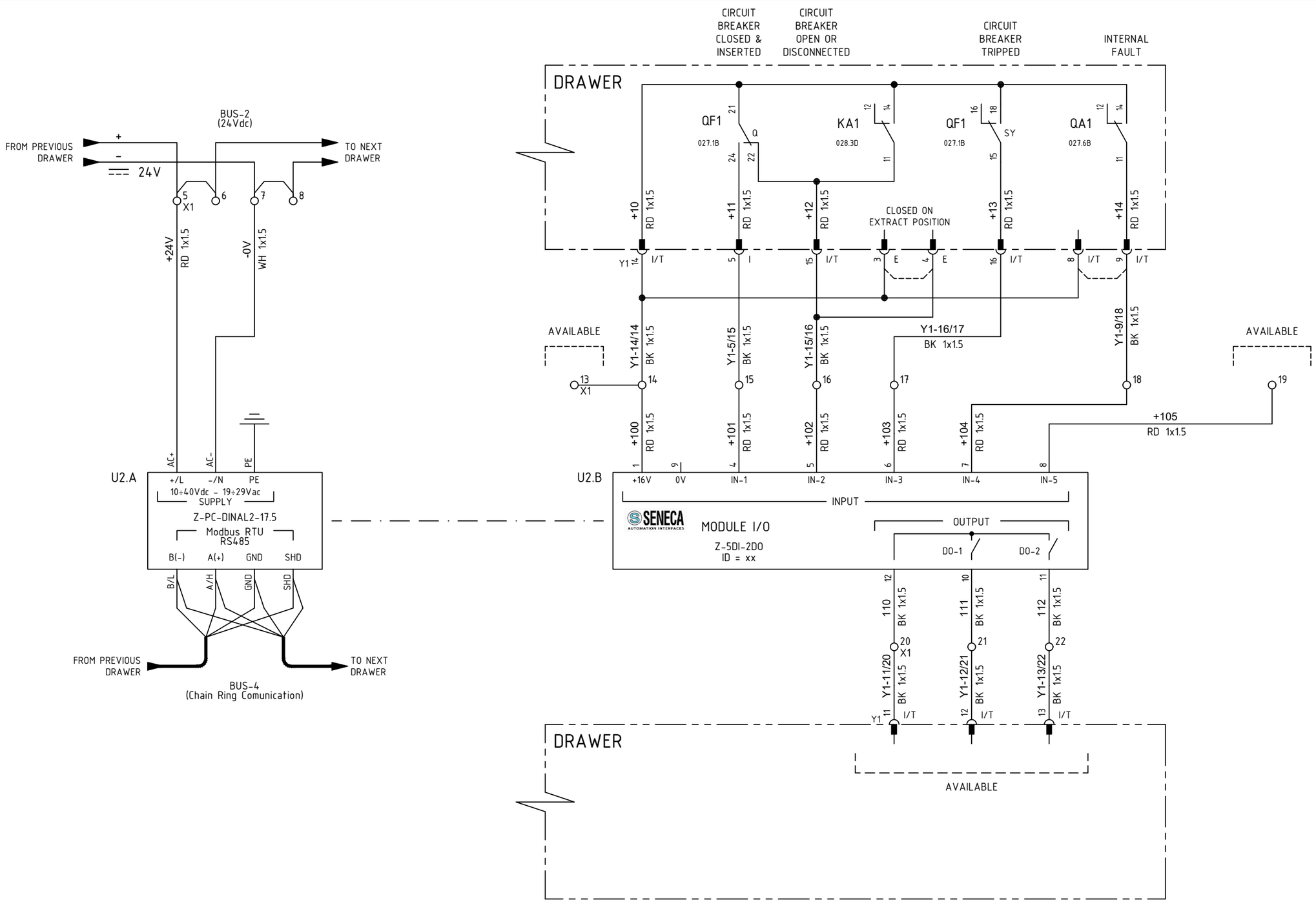
DRAWING NO. 1723002197-EL-DG-00031

SHEET 028

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



=	TYPICAL						
+	L-x						
DWG n° :	231298/SD/31						
Item n° :	PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
		1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
		0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)
		REV.	DATE	DRN	CHKD	APPD	DESCRIPTION

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 029

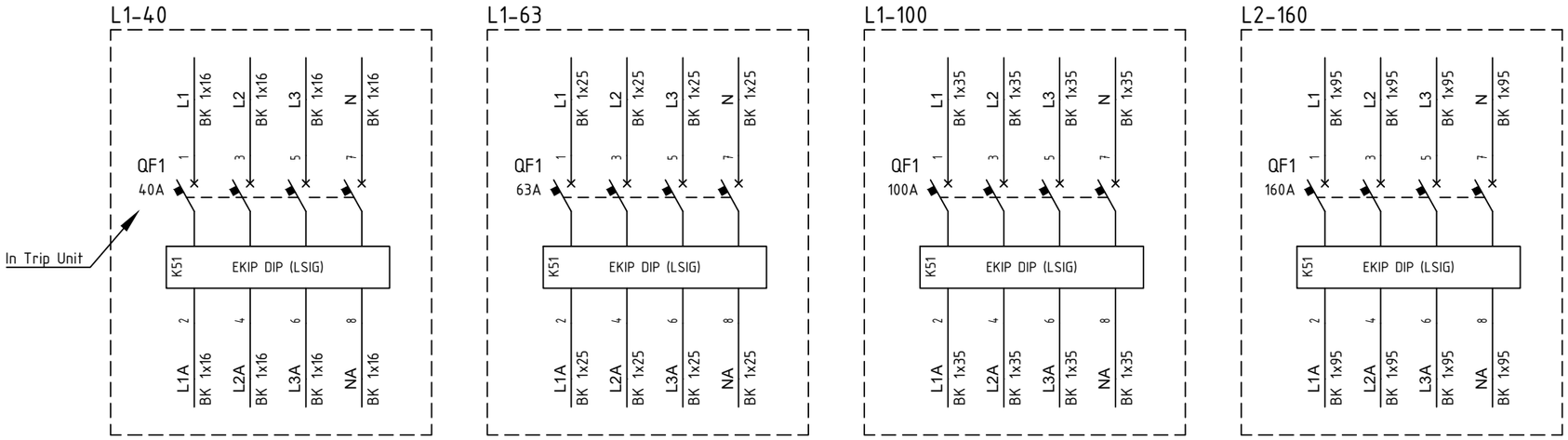
REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

SPECIFIC PARTS

TYPICAL : LINE FEEDER "L1-n" & "L2-n"



= TYPICAL							
+ L-x							
DWG n° : 231298/SD/31							
Item n° : PF1002983/26	2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)	
	1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)	
	0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)	
	REV.	DATE	DRN	CHKD	APPD	DESCRIPTION	

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 030 | REV. 02

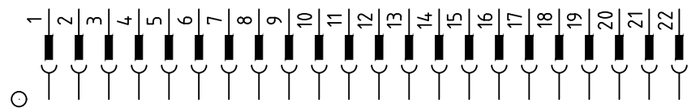
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

TYPICAL - L-x - Y1

AUXILIARY SOCKET
136450/001 (PF – 1 pcs) + 136458/004 (PM – 1 pcs)

N° PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
JUMP			●	●				●	●													
RACKED-OUT			X	X				X	X													
TEST								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RACKED-IN					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
PIN USED			029.6B	029.7B	029.6B			029.8B	029.8B		029.7D	029.7D	029.8D	029.5B	029.6B	029.7B	028.2B	028.3B	027.6A	027.6A	028.4B	028.3B



← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN RACKED-OUT POSITION

← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN TEST POSITION

← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN RACKED-IN POSITION

← CROS-REFERENCE USED PIN

= TYPICAL						
+ L-x						
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)	
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)	
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)	
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION	

DWG n° : 231298/SD/31
Item n° : PF1002983/26

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 031

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

TYPICAL - L-x

X1

NumM	Fg.	Sez.	Tipo	Descrizione	Costruttore
			BT003	BT/3 End bracket	Cabur
1	027.5A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
2	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
3	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
4	027.6A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
5	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
6	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
7	029.2A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
8	029.3A	2.5	HD100GR__	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
			HD101GR	HMD/PT/GR End section - Grey	Cabur
9	028.2A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
10	028.2A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
11	028.3A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
12	028.3A	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
13	029.4B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
14	029.5B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
15	029.6B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
16	029.6B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
17	029.7B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
18	029.8B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
19	029.9B	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
20	029.7D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
21	029.7D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
22	029.8D	2.5	HD400GR__	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
			HD201GR	HMD.1/PT/GR End section - Grey	Cabur
			BT003	BT/3 End bracket	Cabur

= TYPICAL

\+ L-x

DWG n° : 231298/SD/31

Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

TITLE : "SG-200N1"

LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS

Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 032

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
HL1	028	ML22/483L230STLTTR	1	MULTILED 48x48 - 3 LED - Vaux=230Vac/dc + LAMP TEST + TROP	DOMO	TYPICAL L-x
KA1	028	ER 592 6	1	CR-M230AC4L SUPPLY 230VAC 4C/O 250V/6A LED	ABB	TYPICAL L-x
		ER 609 8	1	CR-MH HOLDER FOR CR-M RELAY	ABB	TYPICAL L-x
		ER 686 6	1	CR-M4SS SOCKET STANDARD X 2/4 C/O(CR-M)	ABB	TYPICAL L-x
QA1	027	S550239	1	S202M C 2 AUTOMATIC CIRCUIT BREAKER 10KA 2P	ABB	TYPICAL L-x
		A563819	1	S2-CS/H6R AUXILIARY STATE CONTACT 1CO	ABB	TYPICAL L-x
U2.A	029	Z-PC-DINAL2-17.5	1	DIN RAIL 2SLOT WITH HEAD FOR "Z-5DI-2DO"	SENECA	TYPICAL L-x
U2.B	029	Z-5DI-2DO	1	I/O MODUL 5DI+2DO modbus RS485 Vaux=10÷40Vdc 19÷28Vac	SENECA	TYPICAL L-x
X1		HD100GR__	8	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur	TYPICAL L-x
		HD400GR__	14	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur	TYPICAL L-x
		BT003	2	BT/3 End bracket	Cabur	TYPICAL L-x
		HD101GR	1	HMD/PT/GR End section - Grey	Cabur	TYPICAL L-x
		HD201GR	1	HMD.1/PT/GR End section - Grey	Cabur	TYPICAL L-x

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S40LSIG4	1	XT2S 160 Ekip LSIG In=40A 4p F F	ABB	TYPICAL L1-40
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-40
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-40

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S63LSIG4	1	XT2S 160 Ekip LSIG In=63A 4p F F	ABB	TYPICAL L1-63
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-63
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-63

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S100LSIG4	1	XT2S 160 Ekip LSIG In=100A 4p F F	ABB	TYPICAL L1-100
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-100
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-100

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	1SDA068179R1	1	XT4S 250 BREAKING PART 4p F F	ABB	TYPICAL L2-160
		1SDA067536R1	1	SG.EL.Ekip LSIG In=160A XT4 4p	ABB	TYPICAL L2-160
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L2-160
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L2-160

= TYPICAL
\+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING
CROSSWIND
ROSETTI MARINO

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 033 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

ITEM	Tag	A7/+02-QF1	: DRAWER UPS PAS-BYPASS - A7/+02-QF1	Dwg	1723002197-EL-DG-00011		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module			
TASK	code	C10002805	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°:	E155615002521070	Relay type:	EKIP DIP LSIG
Auxiliary supply:	24Vdc	Location:	B200	Cubicle:	A7/+02
Switchboard:	SG-200N1				

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
L	62A	300A		3s	1195ms
S	300A	500A		0.1s	394ms
I	600A	1000A		INSTANT	27ms
G	20A			0.1s	

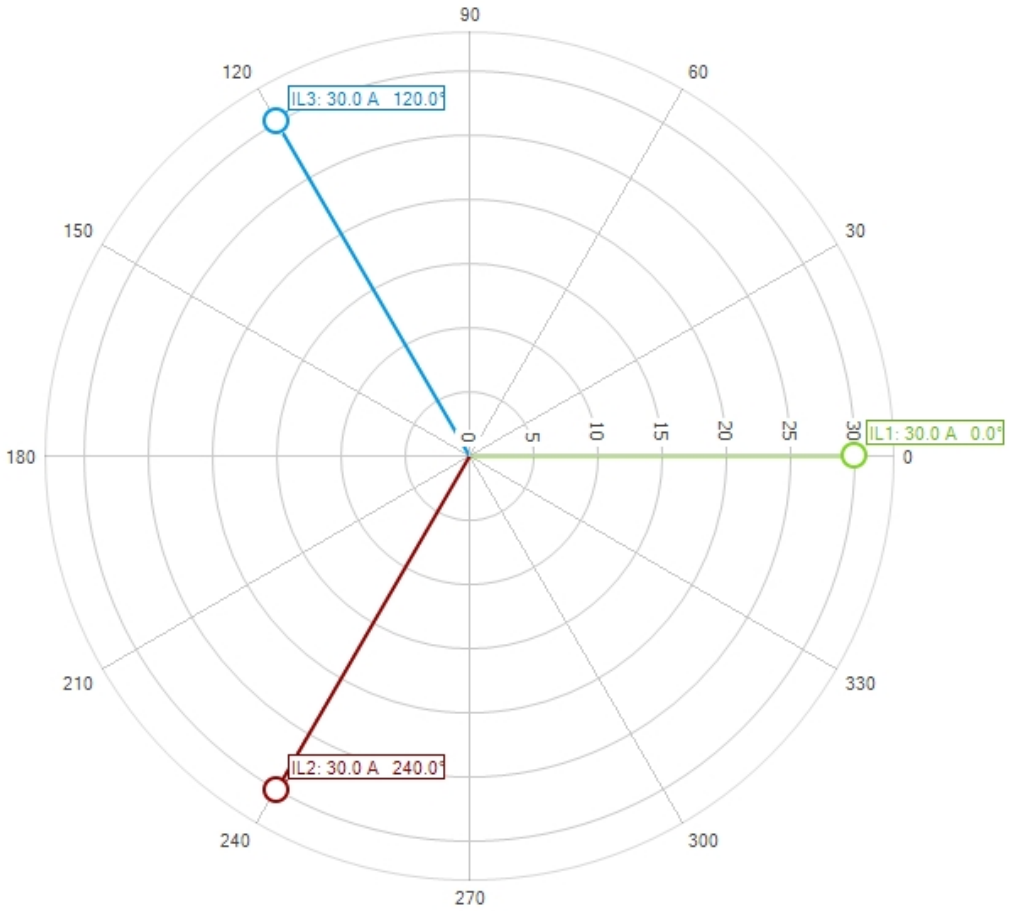
Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
ABB EKIP T&P	E34013804410W050		

Comments: See the 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	2024-09-18	2024-09-18	2024-09-20
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-09-18T08:44:42.727Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-09-18T12:49:35.091Z	PROVERLIS Digitaly signed by Witness waived 2024-09-20T06:24:32.913Z

Page Name	Group Name	Variable Name	Variable Value	Variable Unit
Electronic protection parameters				
	Electronic/Manual parameters selection			
		Electronic/Manual parameters selectio	ELECTRONIC	
	Electronic L protection			
		Trip unit nominal current In	100	
		L threshold	0.62	In
		L time	3.00	s
		Thermal memory	Disabled	
	Electronic S protection			
		S status	Enabled	
		Curve type	t=k/i^2	
		Threshold (t=k/i^2)	3.00	In
		Time (t=k/i^2)	0.10	s
	Electronic I protection			
		I status	Enabled	
		I threshold	6.00	In
	Electronic G protection			
		G status	Enabled	
		G threshold	0.20	In
		G time	0.10	s
	Electronic LC protection			
		Iw status	Disabled	
		Iw threshold	0.30	In
		LC1 status	Disabled	
		LC1 threshold	0.50	I1
		LC2 status	Disabled	
		LC2 threshold	0.50	I1



Test

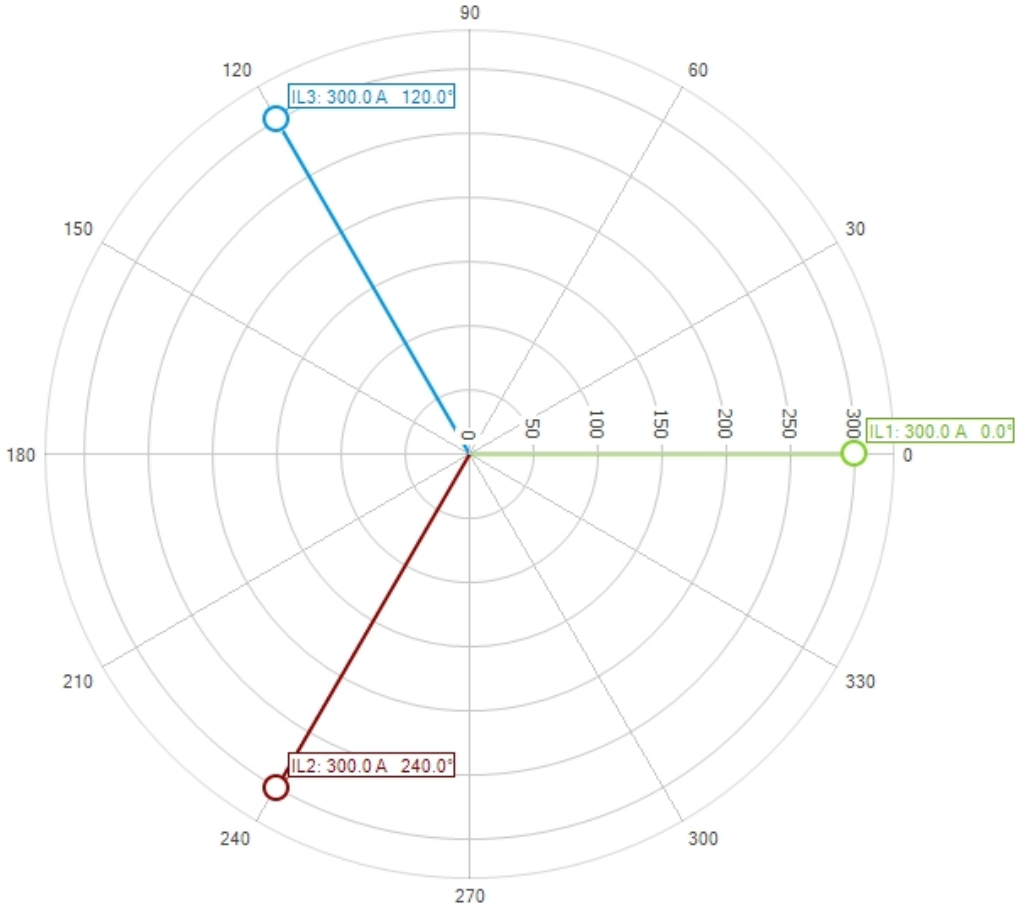
Name	Automatic test 1
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A7/02
Relay Serial Number	E155615002521070
Circuit Breaker Serial Number	EF70167060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

⚠ Test completed without any trip in 3000 ms.



Test

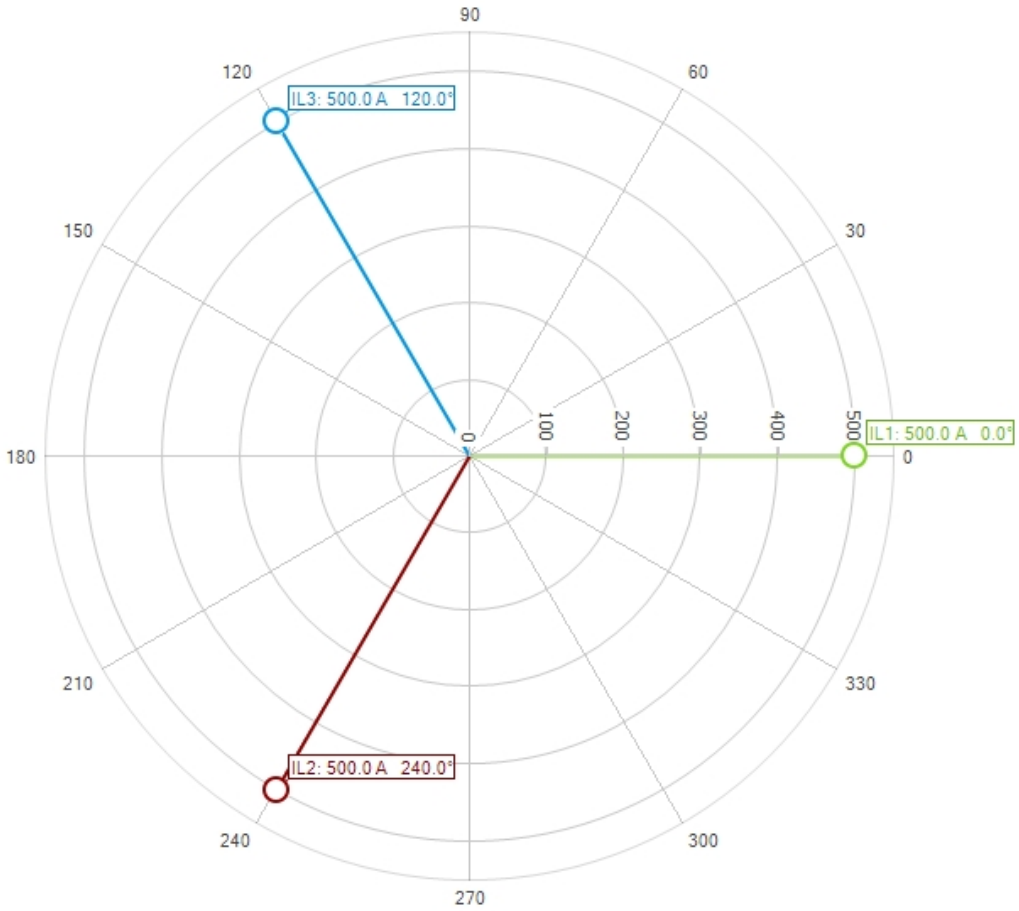
Name	Automatic test 2
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A7/02
Relay Serial Number	E155615002521070
Circuit Breaker Serial Number	EF70167060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

⚠ Test completed with trip but out of time. Protection L tripped in 1195 ms.
Trip time must be between 0 ms and 1000 ms.



Test

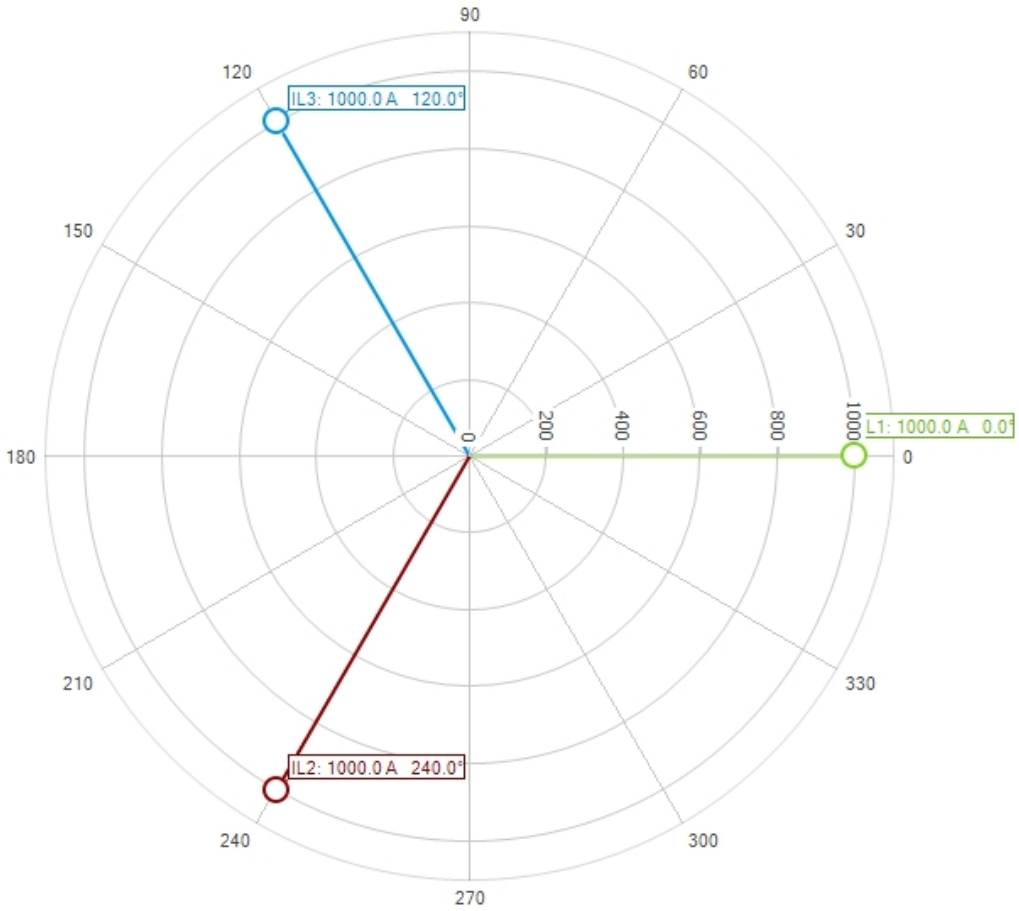
Name	Automatic test 3
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A7/02
Relay Serial Number	E155615002521070
Circuit Breaker Serial Number	EF70167060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

Test completed with trip. Protection S tripped in 394 ms.
Trip time must be between 0 ms and 1000 ms.



Test

Name	Automatic test 4
Session	Default session
Customer	
Location	
Operator	

Device

Tag name	A7/02
Relay Serial Number	E155615002521070
Circuit Breaker Serial Number	EF70167060400010
	Ekip LSIG
Device settings	In = 100 A
Protection Settings	Protection = L Threshold = 0.62 In Time = 3.00 s Protection = S Curve type = t=k/i^2 Threshold = 3.00 In Time = 0.10 s Protection = I Threshold = 6.00 In Protection = G Threshold = 0.20 In Time = 0.10 s
Preconditions	All preconditions satisfied.

Test result

Test completed with trip. Protection I tripped in 27 ms.
Trip time must be between 0 ms and 1000 ms.

ITEM	Tag	A7/+02-QF1	: DRAWER UPS PAS-BYPASS - A7/+02-QF1	Dwg	1723002197-EL-DG-00011		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module			
TASK	code	C10002806	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:	UPS PAS-BYPASS	Instrument Type / Serial N° :	FLUKE 175_17140769
Cubicle N°:	A7/+02	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	CB CLOSED & INSERTED	HW	DI	A7/+02 - QF1/21-24	A7/+02 - X1/14-15	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
2	CB OPEN OR DISCONNECTED	HW	DI	A7/+02 - QF1/21-22	A7/+02 - X1/14-16	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
3	DRAWER ON TEST	HW	DI	A7/+02 - KA1/11-14	A7/+02 - X1/14-16	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A
4	CB TRIPPED	HW	DI	A7/+02 - QF1/15-18	A7/+02 - X1/14-17	N/A	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
5	INTERNAL FAULT	HW	DI	A7/+02 - QA1/11-14	A7/+02 - X1/14-18	N/A	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
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:

Page 1/1	Performed by	☐ WITNESS ☑ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	rm comm	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-10-02	2024-10-02	2024-10-02
Signature	Digitaly signed by Davide Zucconelli 2024-10-02T08:29:35.783Z	Digitaly signed by Kristian Castellani 2024-10-02T08:47:27.469Z	Digitaly signed by Witness waived 2024-10-02T09:19:21.289Z

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	UP-200F3	: AC UPS 35 kVA Redundant System with By-Pass	Dwg	123A90-DDL-EL-DS-20032		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module	LD_B-300		
TASK	code	C10002807	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	PRE-COMM	Activity	FTS	Discipline	Electrical	Form	FP16A	AC UPS

DATA

Manufacturer	AEG	Rating kVA	40KVA	Input V	400Vac
Serial N°	1010863/001_1010863/002	Frequency Hz	50Hz	Output V	400Vac

FUNCTION TEST REQUIREMENT

1	Check MC activities have been carried out	OK
2	Check equipment for cleaness	OK
3	Energise control of UPS feeders	OK
4	Full test feeder breaker operations in test position.	OK
5	Test breakers interface trips and signals (remote alarms & status). Check the ITR presence in the system	Note
6	Check protection setting on all upstream feeder protective devices.	Note
7	Carry out detailed tests of UPS system as per manufacturer's test procedure and record on attached manufacturer test sheets.	OK
	These tests include as minimum:	
8	Output voltages adjustment	OK
9	Permanent insulation monitor test (if any)	NA
10	Alarms checking	OK
11	Remote input/output signals	OK
12	Parallel operation	OK
13	Automatic and manual transfer sequences	OK
14	Test UPS interface trips and signals (remote alarms & status). Check the ITR presence in the system	OK
15	Perform battery charge / discharge tests according to Manufacturer's instructions. Check the ITR presence in the systen	OK
16	Perform battery autonomy test at rated power. Check the ITR presence in the system	OK

Comments: NOTE 1 POINT 5: See the ITR FTR-5 Remote signalling sheet Sub System 84-10.
NOTE 2 POINT 6: See the ITR FTR-2 Protection relay Sub System 84-10, TASK NUMBER:C10002805/C10002802/C10002799.

Page 1/1	Performed by	☐ WITNESS ☑ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2025-03-11	2025-03-11	2025-03-12
Signature	PROVERLIS Digitaly signed by Davide Zucconelli 2025-03-11T13:59:27.700Z	PROVERLIS Digitaly signed by Kristian Castellani 2025-03-11T15:02:19.136Z	PROVERLIS Digitaly signed by Witness waived 2025-03-12T07:11:04.993Z

CAE EPLAN Electric P8
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AUXILIARY
From Lighting & Small Power DB BOP DP-200N1
(Cubicle 03-Q41)
100-240V/N/PE~50/60Hz
back-up fuse gG10A 3G2.5mm2

LINE A
From LV Switchgear SG-200N1
(Cubicle A3/01)
Mains 400V;3/PE~50Hz
gG80A 4G35mm2

From LV Switchgear SG-200N1
(Cubicle A7/02)
Bypass mains 400V;3/PE~50Hz
gG63A 4G35mm2

LINE B
From LV Switchgear SG-200N1
(Cubicle A4/01)
Mains 400V;3/PE~50Hz
gG80A 4G35mm2

Not included in the AEG shipment

Code	Description
Q1	Rectifier input mains breaker
T40	Rectifier input isolation transformer
A1	Rectifier
A2	Inverter
T1	Inverter output isolation transformer
A3-A4	Static by-pass switch
A18	Display control module
A85	Heater
H1	Light

+MBC1
BY-200F3
Bypass transformer cabinet 40 kVA
100000788B.020
10009757

-X1 1U,1V,1W,PE
-X10 U,V,W,PE
-X13 U,N,PE
-X14 U,N
-X1 3U,3V,3W,PE
-Q10 L=80/85A I=0,8kA Icu=50kA
-A85
-H1
-T8 400V/400V 40kVA
-Q28.1 NC
-Q28.2 NC
-X1 2U,2V,2W,PE
-X4 1U,1V,1W,1N,PE
-X4 2U,2V,2W,2N,PE
-X1 4U,4V,4W,PE

+UPS1
BC-200F3A
Protect 8.33 40-400-210-400
100000788B.010
10009756

+UPS2
BC-200F3B
Protect 8.33 40-400-210-400
100000788B.010
10009756

-E1-X1 U,V,W,PE
-E4-X4 U,V,W,N,PE
-Q1 L=100/85A I=1,0kA Icu=50kA
-T40
-A1 REC
-A2 INV
-T1
-F1,-F2,-F3
-A3 SBS
-A4
-A18 Display
-A20 Parallel Adapter
INV CAN -X3 1-3 → 203 / 1.6
INV Sync -X5 1-4 → 205 / 1.6
1.5 / 203 → -X3 1-3 INV CAN
1.5 / 205 → -X5 1-4 INV Sync
-L11,-L12,-L13 Parallel preventive choke coil
-A24.1 BLÜ-PRO
-F91
-A12 ,-A13 Remote signaling
-E2-X2 L-,L+,PE
-X15 2,3
-X130 1,2
-E3-X3 U,V,W,N,PE

*2

-X2 1L+,1L-,PE
-X15 2,3
-X91 1M
-X5 1U,1V,1W,1N,PE
-X5 2U,2V,2W,2N,PE
-X2 3L+,3L-,PE
-X15 6,7
-X91 3M
-Q71 NC
-Q72 NC
A / 1.6
1.5 / A
-Q29 INV operation Manual bypass
-F25
DP-200F3
-QF31 B32A 300mA
-QF32 B32A ^^0mA
-QF33 B32A 300mA
-QF34 B16A 300mA
5pc
-QF38 B16A 300mA
-QF39 B10A 300mA
4pc
-QF42 B10A 300mA
-QF43 B10A
8pc
-QF50 B10A
-QF51 B6A
-QF52 B6A
-X2 2L+,2L-,PE
-X15 4,5
-X91 2M
-X130 1,2,1PE
-X31 U,N,PE
-X32 U,N,PE
-X33 U,N,PE
-X34 U,N,PE
-X38 V,N,PE
-X39 V,N,PE
-X42 W,N,PE
-X43 W,N,PE
-X50 U,N,PE
-X51 V,N,PE
-X52 V,N,PE
-X2 4L+,4L-,PE
-X15 8,9
-X91 4M
-X130 3,4,2PE

2(1x70 mm2)

+BFB1
CB-200F3A
Battery fuse box 200 A
*1
-Q2 L=200A
DC 24V max. 300W

+BFB2
CB-200F3B
Battery fuse box 200 A
*1
-Q2 L=200A
DC 24V max. 300W

Not included in the AEG shipment
max. gG16A
max. gG16A
Load
400/230V;3/N/PE~50Hz

+BAT1
BA-200F3A
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-R81

+BAT2
BA-200F3B
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-R81

*1 Attention! In the event of battery undervoltage < 130 V, the UPS automatically switches off battery isolator Q2.
If this happens, switch X15:3 must be switched into the open position (undervoltage trip blocked).
For restart, please refer to the chapter in the UPS operating instructions (charging the DC link capacitors) attached.
Unlock the tripped switch Q2 by switching to open position.
After charging the DC link capacitors, switch on Q2.
Attention! When the battery voltage reaches > 200 V, switch X15:3 must be switched back to the closed position.

*2 Connection cables are not included.

ITEM	Tag	UP-200F3	: AC UPS 35 kVA Redundant System with By-Pass	Dwg	123A90-DDL-EL-DS-20032		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module	LD_B-300		
TASK	code	C10002808	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:	UP-200F3	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	Disconnected AC UPS UP-200F3 Battery A (CB-20	HW	DO	B-300-UPS ROOM_TB-X3:7-8	B400-SIS-001_TB-XS-000:03-04	NA	NA	NA	NA	Y	NA	NA	NA	NA
2	Disconnected AC UPS UP-200F3 Battery B (CB-20	HW	DO	B-300-UPS ROOM_TB-X3:7-8	B400-SIS-001_TB-XS-000:11-12	NA	NA	NA	NA	Y	NA	NA	NA	NA
3	Battery room fan fault-charge inhibit	HW	DO	B-300-UPS ROOM_TB-120:1-2	B400-SIS-001_TB-UP-200F3:11-12	NA	NA	NA	NA	Y	NA	NA	NA	NA
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: NOTE 1: See attachments for full signals and for others information see the OTP: UPS System UP-200F3 35KVA PHASE 3.

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2025-03-11	2025-03-11	2025-03-12
Signature	Digitaly signed by Davide Zucconelli 2025-03-11T14:00:06.886Z	Digitaly signed by Kristian Castellani 2025-03-11T15:03:04.516Z	Digitaly signed by Witness waived 2025-03-12T07:11:28.305Z

5.4.4 OTP Steps WORKSITE - PHASE 3

It is foreseen that previous chapters are successfully performed.

All systems fed from SWBD SG-200N1 and from DB DP-200N1 are available and ready to work, all necessary tests are performed and accepted for those systems.
All Cables are pulled up, tested and temporary power supply is completed and available.
LV Power Distribution Switchboards and Distribution Boards is working in normal operation and no alarm pending.

In the following steps will be defined the tests of all signals from/to UPS and SIS hardwired and via Modbus TCP-IP between PCS and UPS.

All I/O signals were tested and recorded through dedicated ITR-B precommissioning check sheets.
Verify and confirm that all related check sheets have been performed successfully.

5.4.5 Test Preparation

Verification of systems UPS UP-200F3.
All systems and subsystems involved in this procedure must be ready for commissioning and available.

To perform the signals test is mandatory that PCS Cabinet – Modbus TCP-IP network system - are already energized, available and ready to work.

To test all signals, refer to specific electrical pre-commissioning check sheets, they will be used for the specific validation of all I/O signals.

5.4.5.1 UPS UP-200F3 - I/O Instrumental I/O list

To test all signals, refer to specific electrical pre-commissioning check sheets, they will be the specific functioning of all I/O.

Following I/O signals groups List to be verified.

This I/O list concern the alarm, feedback and command reading.

Cabinet	FROM	SIGNAL_DESCRIPTION	TYPE ANALOG/DIGITAL	TERMINALS	Note
BOX BATTERY	SIS (ESD)	Disconnect AC UPS UP-200F3 Battery A	DO	84-XS-007A	0 TRIP
BOX BATTERY		Disconnect AC UPS UP-200F3 Battery B	DO	84-XS-007B	0 TRIP
UPSA/B		Battery room fan fault-charge inhibit	DO	84-XS-010	0 INIBIT

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

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5.4.5.2 UPS UP-200F3 - I/O Modbus TCP-IP list

With reference all register Modbus TCP-IP for PCS system, it attached the Modbus status list

Alarms:
Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Reg.	Bit no.	Type	Name	Description (1=active)
2	0	WORD	NonCriticalFault	W: Collective warning
3	0	WORD	CriticalFault	A: Collective alarm
4	0	WORD	Userdef_DigIn1Active	W: "O"
5	0	WORD	Userdef_DigIn2Active	W: "O"
6	0	WORD	Userdef_DigIn3Active	W: "O"
7	0	WORD	EmergencySwitchOff	A: UPS output off "O"
8	0	WORD	DouCanFault	W: DOU CAN fault
9	0	WORD	MainsFault	W: Rectifier/bypass mains fault
10	0	WORD	RectifierWarning	W: Rectifier warning
11	0	WORD	RectifierFault	A: Rectifier fault
12	0	WORD	BatteryAlarm	A: Battery fault
13	0	WORD	InverterWarning	W: Inverter warning
14	0	WORD	InverterFault	A: Inverter fault
15	0	WORD	SBSWarning	W: Bypass warning
16	0	WORD	SBSFault	A: Bypass fault
17	0	WORD	EqualisingCharge	I: Charger status – equalising charging
18	0	WORD	Charge	I: Charger status – charging
19	0	WORD	TrickleCharge	I: Charger status – trickle charging
20	0	WORD	GenSetOperation	I: Charger status: Em. power supply "O"
21	0	WORD	BattTemp.SensFault	W: Battery temp. sensor "O"
22	0	WORD	BatteryTemp.ToHigh	W: Battery temp. too high "O"
23	0	WORD	CircuitBreaker	W: Circuit-breaker tripped "O"
24	0	WORD	BatteryWarning	W: Battery warning
25	0	WORD	BatteryLow	W: Battery undervoltage
26	0	WORD	Overload	W: Inverter overload
27	0	WORD	FanFault	W: Fan fault
28	0	WORD	Overload	A: Inverter overload
29	0	WORD	ShortCircuit	A: Inverter short-circuit
30	0	WORD	DcUnderVoltage	A: Inverter DC undervoltage
31	0	WORD	DcOverVoltage	A: Inverter DC overvoltage
32	0	WORD	PowerStackOverTemp	A: Inverter stack fault
33	0	WORD	SBSReady	I: Bypass ready
34	0	WORD	SBSMainsFault	W: Bypass mains fault
35	0	WORD	SBSBlocked	W: Bypass blocked
36	0	WORD	RectifierOn	I: Rectifier on
37	0	WORD	InverterOn	I: Inverter on
38	0	WORD	SBSOn	I: Bypass on

Table 6: Modbus TCP-IP PCS

ITEM	Tag	BA-200F3A-C	: UPS PAS - BA-200F3A-C			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002809		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form	FTR-4 Battery Charge/Discharge

FTR4 - Battery charge / discharge
Record sheet

BATTERY DATA

Manufacturer:	FAAM	Serial N°:	NA	Type	FLG 12-150
Rated voltage	220V	Battery capacity (Ah):	150	Number of cells	18
Rated autonomy (min)			720		

Test type

Important notice:

Discharge and charge (if required) must be performed according to manufacturer's instructions

Manufacturer:	FAAM	Serial N°:	NA	Type	FLG 12-150
Test type: Charge ● Discharge		Duration	12h	Time	10:45 / 7:40
CdNi	constant current	Current(A)	1.3A	Ambiant T°	NA
Pb ●	constant voltage	Volt/Cell	NA	Initial T° 18.7°	Final T° 23.4°

N° Hours	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	...	24
Time (hh:mm)	NOTE																				
Charge Voltage (V)																					
Charge Current (A)																					
Ambient Temp. (°C)																					
Battery Cell Temp. (°C)																					
Battery Cell N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)
1	NOTE																				
2																					
3																					
4																					
5																					
...																					
N																					

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 62 MAX	53172376WS	7716/24	10/07/2025
FLUKE 376	A1711003	7710/24	10/07/2025
FLUKE 175	17140769	7715/24	10/07/2025

Comments: NOTE: See attachment for full measures.

	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Mattia Girotti	Kristian Castellani	Witness waived
Date	2024-11-13	2024-11-14	2024-11-14
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-13T14:32:28.712Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-14T08:10:00.174Z	PROVERLIS Digitaly signed by Witness waived 2024-11-14T08:38:06.827Z

CROSSWIND

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

UP-200F3 [ANNEX001]

SUBSYSTEM 84-10: BATTERY FIRST CHARGE RECORD SHEET DURATION 12HOURS

ROSETTI MARINO

	BATTERY 'A' RACK' UPS-BAT-1A																								Note:
	12h CAPACITY CHARGE TEST RECORD																								
N° Hours	0,00	0,30	1,00	1,30	2,00	2,30	3,00	3,30	4,00	4,30	5,00	5,30	6,00	...	...	...	...	...	...	...	...	...	...	20,30	21,00	
Time (hh:mm)	10:45	11:15	11:45	12:15	12:45	13:15	13:45	14:15	14:45	15:15	15:45	16:15	16:45											7:10	7:40	
Charge Voltage (V)	226,9	256,2	256,3	256,2	256,3	256,4	255,8	256,3	256,6	256,7	256,8	255,6	255,8											255,6	255,8	14,4 V ~ 15,0 V at 20°C NA V
Charge Current (A)	0	3,8	3,5	3,8	3,9	4,1	3,8	3,9	4,1	3,8	3,9	3,1	3,0											0,2	0,2	INITIAL CHARGING CURRENT < 45A 3,8 A
Ambient Temp. (°C)	13,5	13,1	13,2	13,1	13,8	13,9	15,2	15,3	15,5	15,8	16,3	16,6	17,0											13,1	13,2	
Battery Cell Temp. (°C)	13,6	12,9	12,8	13,4	13,8	14,5	14,8	15,0	15,1	15,2	15,9	15,9	16,1											16,2	16,3	

Battery N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	
1	12,52	13,31	13,36	13,48	13,56	13,62	13,69	13,74	13,73	13,74	13,76	13,75	13,76											13,73	13,75	FAAM BATTERY,TYPE FLG 12-150 Ah
2	12,59	13,76	13,96	14,03	14,05	14,04	14,01	13,98	13,96	13,97	13,90	13,95	13,98											13,97	13,99	FAAM BATTERY,TYPE FLG 12-150 Ah
3	12,61	14,80	14,73	14,56	14,47	14,46	14,46	14,47	14,46	14,42	14,41	14,27	14,26											14,25	14,23	FAAM BATTERY,TYPE FLG 12-150 Ah
4	12,69	13,24	13,28	13,39	13,46	13,56	13,60	13,63	13,66	13,67	13,70	13,71	13,70											13,71	13,71	FAAM BATTERY,TYPE FLG 12-150 Ah
5	12,64	14,70	14,70	14,78	14,72	14,70	14,74	14,73	14,70	14,70	14,65	14,66	14,64											14,68	14,65	FAAM BATTERY,TYPE FLG 12-150 Ah
6	12,57	14,32	14,18	14,09	14,06	14,08	14,13	14,15	13,89	14,13	14,17	14,10	14,11											14,10	14,10	FAAM BATTERY,TYPE FLG 12-150 Ah
7	12,62	13,62	13,91	14,04	14,05	14,04	14,01	13,70	14,56	14,05	14,08	14,03	14,51											14,01	14,04	FAAM BATTERY,TYPE FLG 12-150 Ah
8	12,60	13,71	13,87	14,05	13,98	13,93	13,98	14,03	14,17	14,06	14,08	14,04	14,15											14,06	14,06	FAAM BATTERY,TYPE FLG 12-150 Ah
9	12,56	13,43	13,55	13,98	13,72	13,80	13,83	13,86	13,87	13,87	13,88	13,87	13,88											13,87	13,85	FAAM BATTERY,TYPE FLG 12-150 Ah
10	12,62	14,20	14,42	13,72	14,04	14,05	14,07	14,12	14,11	14,15	14,11	13,18	14,13											13,18	13,20	FAAM BATTERY,TYPE FLG 12-150 Ah
11	12,64	14,82	14,76	14,04	14,60	14,63	14,61	14,56	13,98	14,56	14,52	14,58	14,07											14,62	14,69	FAAM BATTERY,TYPE FLG 12-150 Ah
12	12,63	14,38	14,38	14,60	15,01	14,36	14,20	14,22	14,04	14,15	14,16	14,23	14,05											14,19	14,18	FAAM BATTERY,TYPE FLG 12-150 Ah
13	12,65	14,73	14,75	14,62	14,65	14,62	14,73	14,76	14,69	14,66	14,70	14,61	14,68											14,60	14,53	FAAM BATTERY,TYPE FLG 12-150 Ah
14	12,64	14,83	14,59	14,51	14,56	14,48	14,42	14,43	14,38	14,31	14,36	14,33	14,33											14,33	14,35	FAAM BATTERY,TYPE FLG 12-150 Ah
15	12,57	14,21	14,17	14,17	14,02	14,04	14,08	14,08	14,08	14,07	14,08	14,08	14,06											14,09	14,07	FAAM BATTERY,TYPE FLG 12-150 Ah
16	12,65	14,65	14,58	14,63	14,62	14,66	14,66	14,65	14,59	13,86	14,61	14,54	14,57											14,50	14,50	FAAM BATTERY,TYPE FLG 12-150 Ah
17	12,66	15,11	15,05	15,01	14,95	14,95	14,93	14,82	14,81	14,78	14,72	14,70	14,70											14,74	14,70	FAAM BATTERY,TYPE FLG 12-150 Ah
18	12,61	14,26	13,97	13,92	13,93	13,98	14,01	14,01	14,08	14,01	14,02	14,07	14,07											14,07	14,11	FAAM BATTERY,TYPE FLG 12-150 Ah
TERMINAL VOLT. n.1~n.18																										

11/11/24

NOME : MATTIA GIROTTI

FIRMA:

ITEM	Tag	BA-200F3A-D	: UPS PAS - BA-200F3A-D			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002810	Location	Onshore Activities		User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form FTR-4	Battery Charge/Discharge

FTR4 - Battery charge / discharge
Record sheet

BATTERY DATA

Manufacturer:	FAAM	Serial N°:	NA	Type	FLG 12-150
Rated voltage	220V	Battery capacity (Ah):	150Ah	Number of cells	18
Rated autonomy (min)			600min		

Test type

Important notice:

Discharge and charge (if required) must be performed according to manufacturer's instructions

Manufacturer:		Serial N°:	NA	Type	FLG 12-150
Test type: Charge	Discharge ●	Duration	10h	Time	START: 8:10 STOP: 18:10
CdNi	constant current ●	Current(A)	15A	Ambiant T°	NA
Pb ●	constant voltage	Volt/Cell	NA	Initial T° 19.5°	Final T° 23.5°

N° Hours	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	...	24
Time (hh:mm)																					
Charge Voltage (V)																					
Charge Current (A)																					
Ambient Temp. (°C)																					
Battery Cell Temp. (°C)																					
Battery Cell N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)
1																					
2																					
3																					
4																					
5																					
...																					
N																					

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 175	17140769	7715/24	10/07/2025
FLUKE 376	A1711003	7710/24	10/07/2025
LOAD BANK MAREL XP 250.250	517		

Comments:

	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-11-13	2024-11-14	2024-11-14
Signature	PROVERLIS Digitaly signed by Davide Zucconelli 2024-11-13T13:15:09.409Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-14T08:11:08.591Z	PROVERLIS Digitaly signed by Witness waived 2024-11-14T08:38:45.483Z

CROSSWIND

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

UPS UP-200F3 [ANNEX 005]
SUBSYSTEM 84-10: BATTERY DISCHARGE RECORD SHEET

ROSETTI MARINO

BATTERY 'A' RACK' UPS-BAT-1A

10h CAPACITY DISCHARGE TEST RECORD WITH APPLIED RESISTIVE LOAD BANK

N° Hours	0,00	0,30	1,00	1,30	2,00	2,30	3,00	3,30	4,00	4,30	5,00	5,30	6,00	6,30	7,00	7,30	8,00	8,30	9,00	9,30	10,00	Note:
Time (hh:mm)	8:10	8:40	9:10	9:40	10:10	10:40	11:10	11:40	12:10	12:40	13:10	13:40	14:10	14:40	15:10	15:40	16:10	16:40	17:10	17:40	18:10	
Discharge ~~Power~~ VOLTAGE (W) (V)	231,7	227,3	225,5	223,9	222,1	220,8	219,8	218,5	217,5	216,4	215,2	213,8	212,2	211,1	209,7	208,1	206,1	204,0	202	201	200,8	179W .....W
Discharge Current (A)	0,2	16,2	15,9	15,8	15,7	14,8	15,7	15,4	15,3	15,3	14,9	15,1	14,9	14,9	15,0	14,6	14,8	14,4	14,6	14,8	14,8	13,50A. .....A
Ambient Temp. (°C)	18,5°	19,8	20,6	21,2	21,7	22,1	22,4	22,5	22,2	22,3	23,6	24,0	23,9	23,9	24,0	21,8	22,2	22,1	23,0	23,3	23,5	
Battery Cell Temp. (°C)	20°	20,1	20,8	21,0	21,5	21,9	21,8	21,7	21,5	21,9	22,5	23,2	23,0	23,0	23,1	21,9	22,1	22,3	23,2	23,6	23,4	

Battery Cell N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	
1	13,53	12,57	12,47	12,38	12,28	12,22	12,14	12,06	12,01	11,96	11,88	11,80	11,72	11,65	11,57	11,47	11,35	11,24	11,08	11,19	11,08	
2	13,67	12,64	12,53	12,44	12,33	12,28	12,20	12,12	12,07	12,02	11,94	11,87	11,78	11,72	11,64	11,56	11,44	11,34	11,12	11,19	11,03	
3	13,67	12,62	12,51	12,42	12,32	12,26	12,20	12,12	12,07	12,01	11,94	11,87	11,78	11,72	11,64	11,56	11,44	11,36	11,18	11,18	11,10	
4	13,47	12,52	12,41	12,32	12,23	12,16	12,09	12,01	11,95	11,88	11,81	11,71	11,62	11,54	11,45	11,37	11,25	11,07	11,00	10,95	10,90	
5	13,74	12,65	12,55	12,45	12,35	12,30	12,22	12,15	12,10	12,05	11,97	11,89	11,81	11,75	11,59	11,58	11,47	11,38	11,13	11,28	11,04	
6	13,56	12,62	12,52	12,42	12,32	12,27	12,19	12,11	12,06	12,01	11,92	11,85	11,77	11,71	11,52	11,53	11,41	11,31	11,15	11,18	11,08	
7	13,73	12,66	12,56	12,46	12,35	12,30	12,23	12,16	12,10	12,05	11,97	11,90	11,82	11,76	11,68	11,60	11,48	11,40	11,13	11,15	11,06	
8	13,78	12,59	12,48	12,39	12,29	12,24	12,16	12,08	12,02	11,97	11,89	11,83	11,72	11,66	11,57	11,47	11,4	11,23	11,21	11,28	11,03	
9	13,59	12,60	12,50	12,41	12,31	12,25	12,18	12,11	12,12	11,98	11,92	11,84	11,75	11,67	11,57	11,51	11,48	11,28	11,15	11,22	11,10	
10	13,75	12,62	12,49	12,42	12,38	12,21	12,20	12,13	12,13	12,01	11,94	11,87	11,78	11,71	11,64	11,55	11,43	11,34	11,12	11,16	11,12	
11	13,68	12,67	12,57	12,48	12,38	12,27	12,25	12,17	12,13	12,08	12,00	11,93	11,84	11,78	11,71	11,62	11,51	11,43	11,13	11,18	11,14	
12	13,60	12,67	12,57	12,48	12,38	12,33	12,26	12,18	12,13	12,08	12,00	11,93	11,85	11,79	11,71	11,63	11,52	11,44	11,21	11,22	11,9	
13	13,71	12,68	12,56	12,49	12,38	12,33	12,26	12,19	12,07	12,08	12,00	11,93	11,85	11,79	11,72	11,63	11,52	11,44	11,21	11,29	11,13	
14	13,72	12,67	12,57	12,48	12,33	12,33	12,26	12,19	12,14	12,08	12,00	11,93	11,84	11,79	11,72	11,63	11,52	11,44	11,25	11,22	11,9	
15	13,53	12,61	12,51	12,42	12,36	12,27	12,20	12,13	12,08	12,01	11,94	11,86	11,77	11,70	11,62	11,53	11,40	11,30	11,21	11,15	11,11	
16	13,70	12,67	12,54	12,46	12,39	12,33	12,26	12,19	12,12	12,07	12,01	11,93	11,84	11,78	11,71	11,63	11,52	11,44	11,15	11,22	11,14	
17	13,73	12,68	12,59	12,49	12,37	12,34	12,27	12,20	12,10	12,09	12,01	11,94	11,86	11,80	11,73	11,64	11,54	11,46	11,16	11,21	11,06	
18	13,67	12,65	12,55	12,45	12,36	12,31	12,23	12,16	12,07	12,05	11,97	11,89	11,81	11,75	11,68	11,58	11,47	11,40	11,15	11,22	11,09	
TERMINAL VOLT. n.1~n.18																						

12/11/2024 DAVIDE ZUCCONELLI :

ITEM	Tag	BA-200F3A	:	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	Dwg	123A90-DDL-EL-DS-20032
	S/Sys	84-10	:	AC 35 kVA UPS System (UP-200F3)	Module	LD_B-300
TASK	code	C10002811	Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity	FTS	Discipline	Electrical	Form	FTR-3		Battery Autonomy

FTR3 - Battery autonomy
Record sheet

BATTERY DATA					
Manufacturer:	FAAM	Serial N°:	NA	Type	FLG 12-150
Rated voltage	220V	Battery capacity (Ah):	150	Number of cells	18
Rated autonomy (min):	600				

Battery autonomy test			
Floating battery voltage:	2.27V V	Test load (kW):	3.3 kW

Time	0'	15"	30"	45"	1'	1'30"	2'	3'	4'	5'	6'	7'
Battery voltage	NOTE											
Discharge current	NOTE											

Time	8'	9'	10'	15'	20'	25'	30'	35'	40'	45'	50'	55'
Battery voltage												
Discharge current												

Time	60'	70'	80'	90'	100'	110'	120'					
Battery voltage												
Discharge current												

Battery stopping voltage			
Design	18 x FLG 12-150	Measured	10.9V

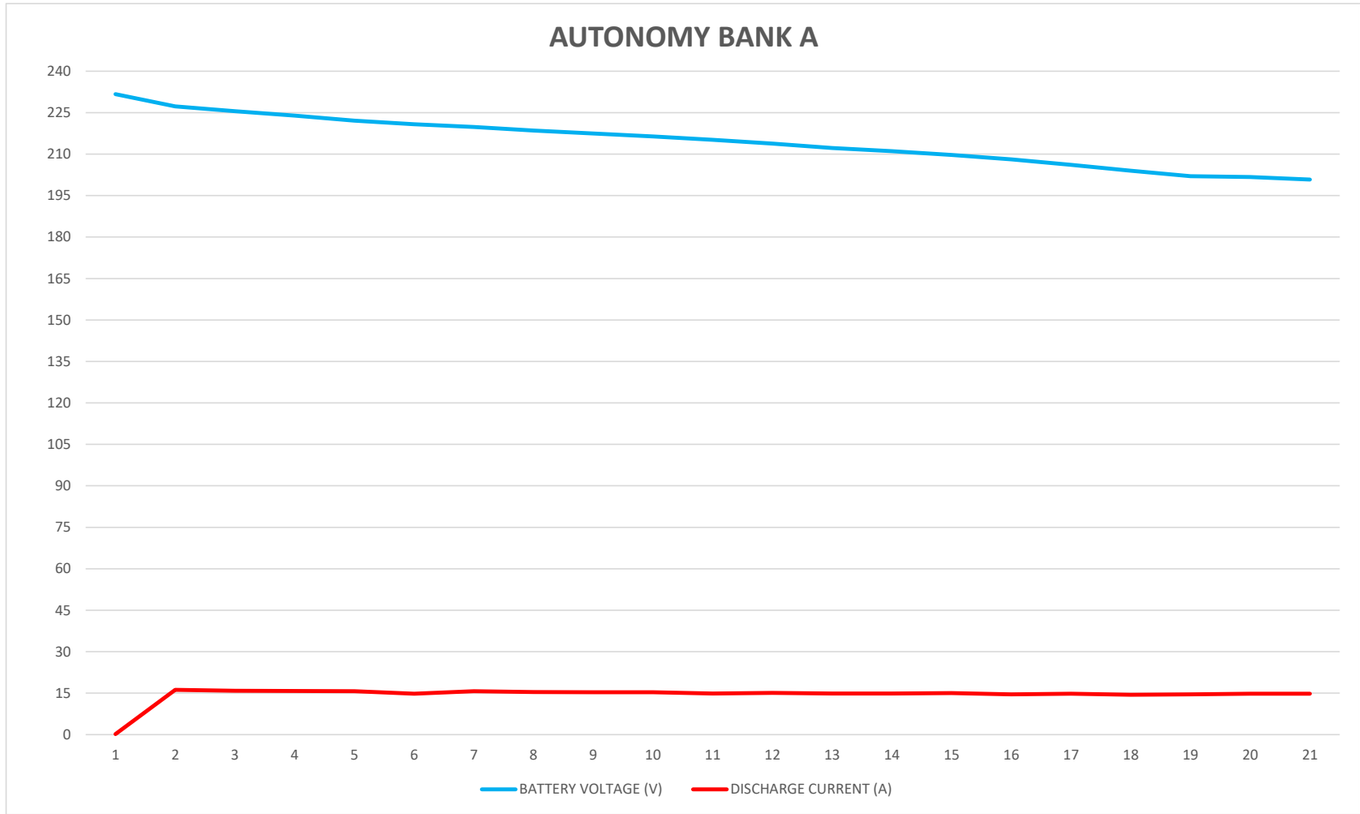
Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 175	17140769	7715/24	10/07/2025
LOAD BANK - MAREL XP 250.250	517		

Comments: NOTE: See the attachment for full measures

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	2024-11-14	2024-11-15	2024-11-18
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-14T09:23:36.435Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-15T08:05:38.035Z	PROVERLIS Digitaly signed by Witness waived 2024-11-18T13:09:37.523Z

	TIME	BATTERY VOLTAGE (V)	DISCHARGE CURRENT (A)
1	08:10	231,7	0,2
2	08:40	227,3	16,2
3	09:10	225,5	15,9
4	09:40	223,9	15,8
5	10:10	222,1	15,7
6	10:40	220,8	14,8
7	11:10	219,8	15,7
8	11:40	218,5	15,4
9	12:10	217,5	15,3
10	12:40	216,4	15,3
11	13:10	215,2	14,9
12	13:40	213,8	15,1
13	14:10	212,2	14,9
14	14:40	211,1	14,9
15	15:10	209,7	15
16	15:40	208,1	14,6
17	16:10	206,1	14,8
18	16:40	204	14,4
19	17:10	202	14,6
20	17:40	201,7	14,8
21	18:10	200,81	14,8



Target discharge rate in Amperes to 1,8 Vpc at 20°C = 13,5

The result is OK and for every cell battery the minimum Vpc registered is 1,863V > 1,8V

ITEM	Tag	BA-200F3B-C	: UPS PAS - BA-200F3B-C			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002812		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form	FTR-4 Battery Charge/Discharge

FTR4 - Battery charge / discharge
Record sheet

BATTERY DATA

Manufacturer:	FAAM	Serial N°:	NA	Type	FLG 12-150
Rated voltage	220V	Battery capacity (Ah):	150	Number of cells	18
Rated autonomy (min)			720		

Test type

Important notice:

Discharge and charge (if required) must be performed according to manufacturer's instructions

Manufacturer:	FAAM	Serial N°:	NA	Type	FLG 12-150
Test type: Charge ● Discharge		Duration	12h	Time	8:30 / 7:45
CdNi	constant current	Current(A)	1.3A	Ambiant T°	NA
Pb ●	constant voltage	Volt/Cell	NA	Initial T° 18.7°	Final T° 23.4°

N° Hours	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	...	24
Time (hh:mm)	NOTE																				
Charge Voltage (V)																					
Charge Current (A)																					
Ambient Temp. (°C)																					
Battery Cell Temp. (°C)																					
Battery Cell N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)
1	NOTE																				
2																					
3																					
4																					
5																					
...																					
N																					

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 62 MAX	53172376WS	7716/24	10/07/2025
FLUKE 376	A1711003	7710/24	10/07/2025
FLUKE 175	17140769	7715/24	10/07/2025

Comments: NOTE: See attachment for full measures.

	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Mattia Girotti	Kristian Castellani	Witness waived
Date	2024-11-13	2024-11-14	2024-11-14
Signature	Digitaly signed by Mattia Girotti 2024-11-13T14:32:22.566Z	Digitaly signed by Kristian Castellani 2024-11-14T08:12:28.158Z	Digitaly signed by Witness waived 2024-11-14T08:39:14.214Z

B

CROSSWIND

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

UP-200F3 [ANNEX002]

SUBSYSTEM 84-10: BATTERY FIRST CHARGE RECORD SHEET DURATION 12HOURS

ROSETTI MARINO

	BATTERY 'B' RACK' UPS-BAT-1B																		12h CAPACITY CHARGE TEST RECORD						
N° Hours	0,00	0,30	1,00	1,30	2,00	2,30	3,00	3,30	4,00	4,30	5,00	5,30	6,00	6,30	7,00	7,30	8,00	8,30	9,00	~~9,30~~	~~10,00~~	~~10,30~~	~~11,00~~	~~14,30~~	~~12,00~~
Time (hh:mm)	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30					7:15	7:45
Charge Voltage (V)	245,3	253,2	255,8	255,7	255,6	255,7	255,8	255,8	255,8	255,8	255,8	255,7	255,6	255,7	256,6	255,8	255,8	255,8	256					255,8	256,6
Charge Current (A)	0,7	1,2	1,3	1,3	1,2	1,3	1,3	1,2	1,1	1,3	1,3	1,2	1,3	1,1	1,2	1,3	1,2	1,3	1,3					1,3	1,3
Ambient Temp. (°C)	19,6	20,9	21,1	21,4	21,9	21,7	21,6	21,8	22,1	22,2	24,0	23,8	23,6	23,8	22,0	22,3	22,5	23,1	23,2					19,7	20,8
Battery Cell Temp. (°C)	18,7	19,1	19,6	21,1	21,5	21,4	21,1	21,8	21,9	22,1	23,1	22,5	22,8	22,7	21,2	21,6	21,8	23,2	23,3					23,5	23,4

Battery N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	
1	13,76	14,82	15,25	15,25	15,24	15,20	15,20	15,18	15,14	15,08	15,05	15,01	14,93	14,82	14,83	14,84	14,72	14,71	14,70					14,68	14,80	FAAM BATTERY,TYPE FLG 12-150 Ah
2	13,52	13,67	13,80	13,80	13,80	13,80	13,81	13,82	13,83	13,83	13,82	13,85	13,87	13,86	13,88	13,88	13,80	14,01	14,05					14,01	13,80	FAAM BATTERY,TYPE FLG 12-150 Ah
3	13,61	13,88	14,02	14,04	14,05	14,06	14,06	14,06	14,06	14,07	14,09	14,09	14,09	14,08	14,12	14,10	14,12	14,11	14,10					14,11	14,12	FAAM BATTERY,TYPE FLG 12-150 Ah
4	13,64	13,87	14,06	14,06	14,07	14,07	14,08	14,08	14,10	14,12	14,10	14,12	14,14	14,15	14,16	14,17	14,17	14,20	14,18					14,22	14,16	FAAM BATTERY,TYPE FLG 12-150 Ah
5	13,50	13,62	13,90	13,90	13,89	13,90	13,91	13,92	13,94	13,94	13,94	14,96	13,98	13,98	13,98	14,01	14,03	14,05	14,07					14,03	14,01	FAAM BATTERY,TYPE FLG 12-150 Ah
6	13,54	13,71	14,00	13,98	13,99	14,00	14,01	14,03	14,03	14,03	14,02	14,03	14,06	14,03	14,08	14,09	14,11	14,09	14,07					14,11	14,06	FAAM BATTERY,TYPE FLG 12-150 Ah
7	13,48	13,82	13,91	13,91	13,91	13,92	13,94	13,96	13,98	13,97	13,98	13,99	14,01	14,03	14,04	14,02	14,07	14,11	14,13					14,15	14,05	FAAM BATTERY,TYPE FLG 12-150 Ah
8	13,48	13,77	13,93	13,93	13,93	13,95	13,95	13,97	13,97	13,98	14,00	14,01	14,02	14,03	14,04	14,01	14,07	14,09	14,10					14,05	14,03	FAAM BATTERY,TYPE FLG 12-150 Ah
9	13,39	13,82	14,38	14,38	14,40	14,39	14,40	14,40	14,41	14,42	14,40	14,42	14,42	14,42	14,42	14,38	14,41	14,31	14,30					14,31	14,40	FAAM BATTERY,TYPE FLG 12-150 Ah
10	13,41	13,69	13,84	13,84	13,85	13,86	13,87	13,88	13,89	13,90	13,90	13,92	13,93	13,92	13,95	14,03	13,96	14,01	14,03					14,01	13,99	FAAM BATTERY,TYPE FLG 12-150 Ah
11	13,52	13,88	14,63	14,62	14,63	14,62	14,62	14,62	14,64	14,63	14,61	14,61	14,62	14,63	14,61	14,52	14,55	14,31	14,28					14,31	14,60	FAAM BATTERY,TYPE FLG 12-150 Ah
12	13,53	13,88	14,80	14,79	14,76	14,73	14,69	14,65	14,62	14,58	14,60	14,56	14,51	14,51	14,46	14,42	14,43	14,40	14,31					14,45	14,46	FAAM BATTERY,TYPE FLG 12-150 Ah
13	13,40	13,71	13,85	13,86	13,86	13,87	13,88	13,89	13,90	13,91	13,82	13,94	13,95	13,96	13,87	13,88	14,00	14,03	14,05					14,03	13,88	FAAM BATTERY,TYPE FLG 12-150 Ah
14	13,48	13,88	14,80	14,77	14,78	14,77	14,77	14,71	14,58	14,52	14,53	14,76	14,92	14,62	14,60	14,46	14,43	14,38	14,37					14,33	14,38	FAAM BATTERY,TYPE FLG 12-150 Ah
15	13,40	13,72	13,85	13,85	13,87	13,88	13,89	13,88	13,92	13,94	13,92	13,95	13,98	14,00	14,01	13,99	14,03	14,08	14,07					14,00	14,01	FAAM BATTERY,TYPE FLG 12-150 Ah
16	13,38	13,56	13,80	13,82	13,82	13,82	13,83	13,84	13,85	13,85	13,83	13,86	13,89	13,88	13,82	13,87	13,83	14,03	14,03					14,03	13,92	FAAM BATTERY,TYPE FLG 12-150 Ah
17	13,50	13,88	15,04	15,31	15,03	15,01	15,01	15,01	15,01	14,93	14,88	14,96	14,92	14,80	14,86	14,83	14,79	14,31	14,40					14,59	14,80	FAAM BATTERY,TYPE FLG 12-150 Ah
18	13,43	13,72	13,90	13,91	13,91	13,92	13,92	13,93	13,95	13,96	13,98	14,00	14,00	14,01	14,02	14,01	14,05	14,08	14,13					14,08	13,98	FAAM BATTERY,TYPE FLG 12-150 Ah
TERMINAL VOLT. n.1~n.18																										

Note:

14,4 V ~ 15,0 V at 20°C V

INITIAL CHARGING CURRENT < 45A .....A

12/11/24

NOME: MATTIA GIROTTI

FIRMA:

ITEM	Tag	BA-200F3B-D	: UPS PAS - BA-200F3B-D			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10002813		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity FTS	Discipline	Electrical	Form	FTR-4 Battery Charge/Discharge

FTR4 - Battery charge / discharge
Record sheet

BATTERY DATA

Manufacturer:	FAAM	Serial N°:	NA	Type	FLG 12-150
Rated voltage	220V	Battery capacity (Ah):	150Ah	Number of cells	18
Rated autonomy (min)			600		

Test type

Important notice:

Discharge and charge (if required) must be performed according to manufacturer's instructions

Manufacturer:		Serial N°:	NA	Type	FLG 12-150
Test type: Charge	Discharge ●	Duration	10h	Time	START: 8:15 STOP: 18:15
CdNi	constant current ●	Current(A)	15A	Ambiant T°	NA
Pb ●	constant voltage	Volt/Cell	NA	Initial T° 19.8°	Final T° 21.7°

N° Hours	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	...	24
Time (hh:mm)																					
Charge Voltage (V)																					
Charge Current (A)																					
Ambient Temp. (°C)																					
Battery Cell Temp. (°C)																					
Battery Cell N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)
1																					
2																					
3																					
4																					
5																					
...																					
N																					

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 175	17140769	7715/24	10/07/2025
FLUKE 376	A1711003	7710/24	10/07/2025

Comments:

	Performed by	☐ WITNESS ● REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-11-14	2024-11-15	2024-11-18
Signature	Digitaly signed by Davide Zucconelli 2024-11-14T08:09:46.165Z	Digitaly signed by Kristian Castellani 2024-11-15T08:07:12.321Z	Digitaly signed by Witness waived 2024-11-18T13:10:03.788Z

CROSSWIND

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

UPS UP-200F3 [ANNEX 005]

SUBSYSTEM 84-10: BATTERY DISCHARGE RECORD SHEET

ROSETTI MARINO

	BATTERY 'B' RACK' UPS-BAT-1B														10h CAPACITY DISCHARGE TEST RECORD WITH APPLIED RESISTIVE LOAD BANK							Note:
N° Hours	0,00	0,30	1,00	1,30	2,00	2,30	3,00	3,30	4,00	4,30	5,00	5,30	6,00	6,30	7,00	7,30	8,00	8,30	9,00	9,30	10,00	
Time (hh:mm)	08:15	8:45	9:15	9:45	10:15	10:45	11:15	11:45	12:15	12:45	13:15	13:45	14:15	14:45	15:15	15:45	16:15	16:45	17:15	17:45	18:15	
Discharge Power (W) (V)	2438	229,1	227,7	226,4	224,8	223,5	224,2	221,1	219,8	218,7	218,3	217,2	216,2	215,0	214,1	213,0	211,1	209,6	208,9	207,2	203,9	179W .....W
Discharge Current (A)	0,0	15,6	15,6	15,5	15,6	15,3	15,3	15,3	15,3	15,1	15,1	15,0	11,8	11,8	11,8	11,7	14,4	14,3	14,5	14,8	14,9	13,50A. .....A
Ambient Temp. (°C)	19,8	20,4	20,8	21,1	21,5	21,8	21,8	22,7	22,7	22,8	22,9	23,3	22,3	22,2	22,5	22,4	20,8	20,9	21,6	21,7	21,7	
Battery Cell Temp. (°C)	24,5	25,1	25,7	25,4	25,3	25,3	25,7	25,2	24,6	24,8	24,9	25,2	24,8	23,7	24,1	24,2	23,4	23,7	24,0	24,2	23,9	

Battery Cell N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	
1	13,69	12,75	12,68	12,58	12,51	12,43	12,36	12,31	12,24	12,18	12,12	12,07	12,04	11,98	11,93	11,87	11,77	11,70	11,68	11,50	11,21	
2	13,57	12,69	12,67	12,53	12,45	12,37	12,29	12,22	12,16	12,08	12,05	11,98	11,94	11,87	11,82	11,75	11,64	11,55	11,82	11,45	11,18	
3	13,57	12,73	12,67	12,59	12,51	12,43	12,36	12,29	12,22	12,15	12,11	12,06	12,01	11,95	11,90	11,84	11,69	11,67	11,60	11,51	11,22	
4	13,56	12,70	12,63	12,54	12,47	12,38	12,31	12,24	12,17	12,10	12,08	12,00	11,95	11,90	11,84	11,77	11,67	11,58	11,54	11,45	11,18	
5	13,58	12,71	12,64	12,56	12,47	12,38	12,32	12,26	12,19	12,12	12,11	12,02	11,98	11,92	11,87	11,81	11,73	11,63	11,40	11,31	11,20	
6	13,60	12,72	12,65	12,57	12,48	12,40	12,33	12,27	12,20	12,13	12,09	12,03	11,99	11,93	11,87	11,81	11,71	11,63	11,58	11,40	11,21	
7	13,54	12,71	12,63	12,55	12,46	12,38	12,31	12,24	12,18	12,12	12,11	12,00	11,96	11,90	11,84	11,77	11,71	11,58	11,55	11,43	11,19	
8	13,52	12,71	12,64	12,56	12,48	12,40	12,32	12,26	12,19	12,13	12,12	12,02	11,98	11,92	11,87	11,80	11,66	11,62	11,61	11,48	11,27	
9	13,48	12,76	12,69	12,52	12,55	12,47	12,40	12,33	12,26	12,20	12,18	12,10	12,06	11,99	11,95	11,88	11,70	11,71	11,67	11,41	11,12	
10	13,45	12,73	12,63	12,55	12,48	12,40	12,33	12,26	12,19	12,15	12,13	12,02	11,97	11,91	11,86	11,78	11,79	11,60	11,50	11,40	11,23	
11	13,63	12,76	12,70	12,62	12,54	12,46	12,39	12,33	12,27	12,20	12,18	12,09	12,06	11,99	11,95	11,88	11,68	11,71	11,61	11,49	11,15	
12	13,65	12,57	12,72	12,64	12,56	12,48	12,41	12,35	12,28	12,22	12,19	12,11	12,08	12,02	11,97	11,91	11,78	11,73	11,63	11,50	11,21	
13	13,50	12,69	12,61	12,53	12,45	12,37	12,29	12,23	12,16	12,09	12,07	11,98	11,95	11,88	11,82	11,75	11,80	11,56	11,40	11,38	11,21	
14	13,61	12,78	12,72	12,64	12,56	12,48	12,41	12,35	12,28	12,22	12,18	12,12	12,08	12,02	11,97	11,91	11,81	11,74	11,65	11,40	11,21	
15	13,48	12,72	12,75	12,58	12,49	12,41	12,34	12,26	12,19	12,15	12,13	12,02	11,98	11,92	11,86	11,78	11,68	11,60	11,55	11,42	11,18	
16	13,47	12,73	12,66	12,63	12,51	12,43	12,36	12,29	12,22	12,15	12,14	12,05	12,00	11,95	11,90	11,83	11,73	11,65	11,40	11,33	11,15	
17	13,62	12,78	12,71	12,61	12,55	12,48	12,41	12,35	12,28	12,21	12,19	12,11	12,08	11,99	11,96	11,90	11,80	11,73	11,60	11,50	11,28	
18	13,56	12,77	12,69	12,62	12,53	12,46	12,38	12,32	12,26	12,18	12,13	12,08	12,05	11,99	11,94	11,87	11,76	11,70	11,61	11,48	11,21	
TERMINAL VOLT. n.1~n.18																						

13/11/24

NOME: DAVIDE ZUCCONELLI FIRMA:

ITEM	Tag	BA-200F3B	:	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	Dwg	123A90-DDL-EL-DS-20032
	S/Sys	84-10	:	AC 35 kVA UPS System (UP-200F3)	Module	LD_B-300
TASK	code	C10002814	Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	PRE-COMM	Activity	FTS	Discipline	Electrical	Form	FTR-3		Battery Autonomy

FTR3 - Battery autonomy
Record sheet

BATTERY DATA					
Manufacturer:	FAAM	Serial N°:	NA	Type	FLG 12-150
Rated voltage	220V	Battery capacity (Ah):	150	Number of cells	18
Rated autonomy (min):	600				

Battery autonomy test			
Floating battery voltage:	2.27 V	Test load (kW):	3.3 kW

Time	0'	15"	30"	45"	1'	1'30"	2'	3'	4'	5'	6'	7'
Battery voltage	NOTE											
Discharge current	NOTE											

Time	8'	9'	10'	15'	20'	25'	30'	35'	40'	45'	50'	55'
Battery voltage												
Discharge current												

Time	60'	70'	80'	90'	100'	110'	120'					
Battery voltage												
Discharge current												

Battery stopping voltage			
Design	18 x FLG 12-150	Measured	11.12V

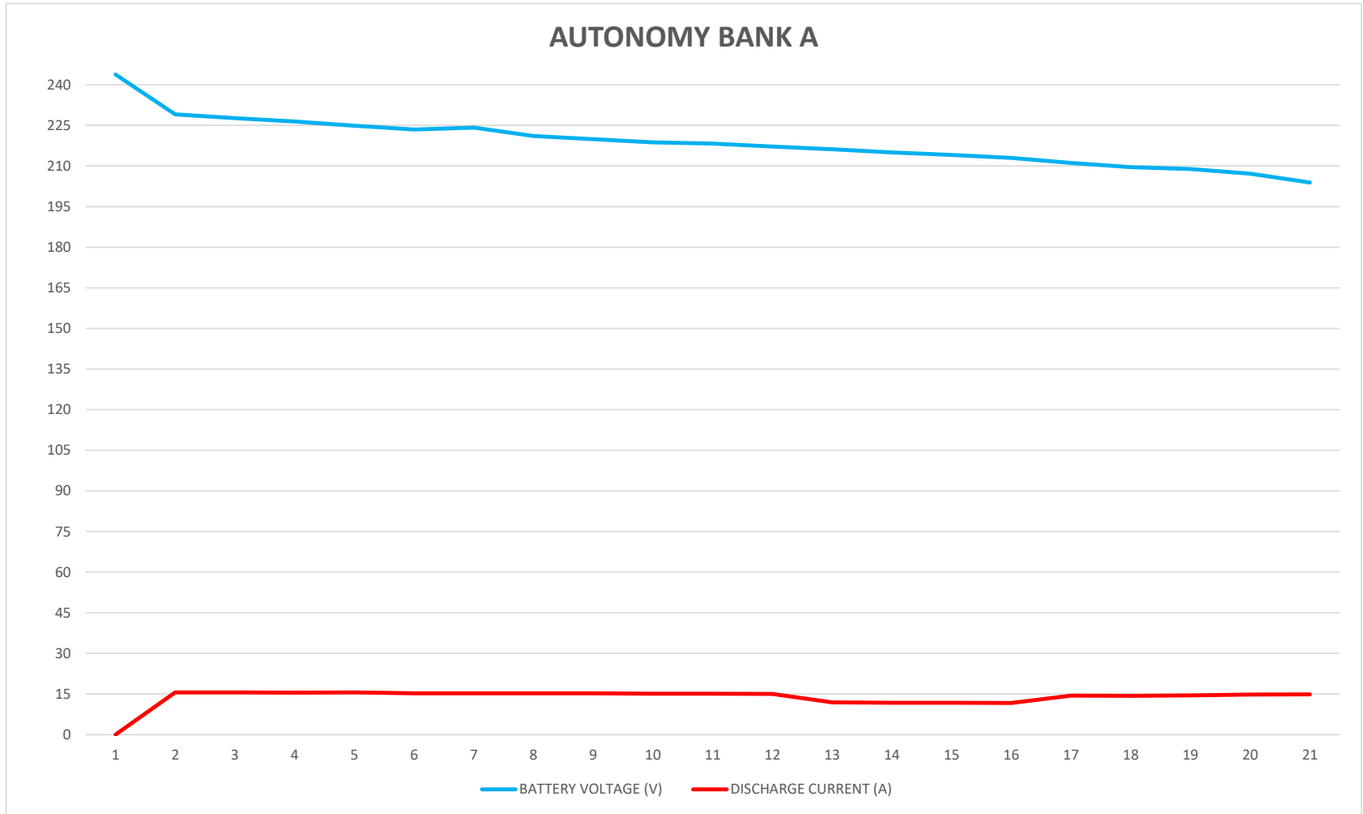
Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 175	17140769	7715/24	10/07/2025
LOAD BANK - MAREL XP 250.250	517		

Comments: NOTE: See attachemnt for full measures

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	2024-11-14	2024-11-15	2024-11-18
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-14T09:50:28.726Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-15T08:08:02.567Z	PROVERLIS Digitaly signed by Witness waived 2024-11-18T13:10:20.681Z

	TIME	BATTERY VOLTAGE (V)	DISCHARGE CURRENT (A)
1	08:15	243,8	0
2	08:45	229,1	15,6
3	09:15	227,7	15,6
4	09:45	226,4	15,5
5	10:15	224,9	15,6
6	10:45	223,5	15,3
7	11:15	224,2	15,3
8	11:45	221,1	15,3
9	12:15	219,9	15,3
10	12:45	218,7	15,1
11	13:15	218,3	15,1
12	13:45	217,2	15
13	14:15	216,2	11,9
14	14:45	215	11,8
15	15:15	214,1	11,8
16	15:45	213	11,7
17	16:15	211,1	14,4
18	16:45	209,6	14,3
19	17:15	208,9	14,5
20	17:45	207,2	14,8
21	18:15	203,9	14,9



Target discharge rate in Amperes to 1,8 Vpc at 20°C = 13,5A

The result is OK and for every cell battery the minimum Vpc registered is 1,853V > 1,8V

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	A4/+01-QF1	: DRAWER UPS PAS LINE B - A4/+01-QF1			Dwg	1723002197-EL-DG-00011
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003006		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Electrical	Form	FTR-5 Remote Signalling

FTR5 - Remote signalling
Record sheet

DATA

Switchboard:	SG-200N1	Cubicle N°:	A4/+01

FUNCTION TEST

	Order/Inputs		Status/Output					
	Start order	Stop order	Run	Fault	Stop Signalisation	Available/Ready to start	TRIP	CB OPEN/CLOSE
UCP								
ECS								
SSS								
PSS								
PCS				● ●			● ●	● ●
Control Station								
Control Panel								
HVAC Panel								
MCC							● ●	● ●

Column 1 (To check) to be filled during commissioning preparation stage - black if the check is asked
Column 2 (Checked) to be filled black if check is Ok

Comments:

	Performed by	☐ WITNESS ● REVIEW	● WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Com
Name	Davide Zucconelli	Kristian Castellani	Jamie McAllister
Date	2025-04-22	2025-04-22	2025-04-22
Signature	PROVERLIS Digitaly signed by Davide Zucconelli 2025-04-22T09:00:58.881Z	PROVERLIS Digitaly signed by Kristian Castellani 2025-04-22T14:34:14.773Z	PROVERLIS Digitaly signed by Jamie McAllister 2025-04-22T15:08:18.767Z

ITEM	Tag	A3/+01-QF1	: DRAWER UPS PAS LINE A - A3/+01-QF1	Dwg	1723002197-EL-DG-00011		
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)	Module			
TASK	code	C10003007	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	COMM	Activity FTS	Discipline	Electrical	Form FTR-5	Remote Signalling

FTR5 - Remote signalling
Record sheet

DATA

Switchboard:	SG-200N1	Cubicle N°:	A3/+01

FUNCTION TEST

	Order/Inputs		Status/Output					
	Start order	Stop order	Run	Fault	Stop Signalisation	Available/Ready to start	TRIP	CB OPEN/CLOSE
UCP								
ECS								
SSS								
PSS								
PCS				● ●			● ●	● ●
Control Station								
Control Panel								
HVAC Panel								
MCC							● ●	● ●

Column 1 (To check) to be filled during commissioning preparation stage - black if the check is asked
Column 2 (Checked) to be filled black if check is Ok

Comments:

Page 1/1	Performed by	☐ WITNESS ☉ REVIEW	☉ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Com
Name	Davide Zucconelli	Kristian Castellani	Jamie McAllister
Date	2025-04-22	2025-04-22	2025-04-22
Signature	Digitaly signed by Davide Zucconelli 2025-04-22T09:01:42.100Z	Digitaly signed by Kristian Castellani 2025-04-22T14:34:59.335Z	Digitaly signed by Jamie McAllister 2025-04-22T15:09:44.067Z

ITEM	Tag	A7/+02-QF1	: DRAWER UPS PAS-BYPASS - A7/+02-QF1			Dwg	1723002197-EL-DG-00011
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003008		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Electrical	Form	FTR-5 Remote Signalling

FTR5 - Remote signalling
Record sheet

DATA

Switchboard:	SG-200N1	Cubicle N°:	A7/+02

FUNCTION TEST

	Order/Inputs		Status/Output					
	Start order	Stop order	Run	Fault	Stop Signalisation	Available/Ready to start	TRIP	CB OPEN/CLOSE
UCP								
ECS								
SSS								
PSS								
PCS				● ●			● ●	● ●
Control Station								
Control Panel								
HVAC Panel								
MCC							● ●	● ●

Column 1 (To check) to be filled during commissioning preparation stage - black if the check is asked
Column 2 (Checked) to be filled black if check is Ok

Comments:

	Performed by	☐ WITNESS ☉ REVIEW	☉ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Com
Name	Davide Zucconelli	Kristian Castellani	Jamie McAllister
Date	2025-04-22	2025-04-22	2025-04-22
Signature	PROVERLIS Digitaly signed by Davide Zucconelli 2025-04-22T09:02:28.851Z	PROVERLIS Digitaly signed by Kristian Castellani 2025-04-22T14:36:11.144Z	PROVERLIS Digitaly signed by Jamie McAllister 2025-04-22T15:10:38.934Z

ITEM	Tag	UP-200F3-QF31	: SPARE			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10004570		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°: NA	Relay type: A TYPE
Auxiliary supply: NA	Location: B300	Cubicle: QF31
Switchboard: UP-200F3		

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
64	300mA	300mA	240mA	FIXED	37,7ms

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	10/07/2025

Comments:

	Performed by	☐ WITNESS ☉ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Mattia Girotti	Kristian Castellani	Witness waived
Date	2024-11-08	2024-11-08	2024-11-08
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-08T13:35:08.473Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-08T15:11:22.173Z	PROVERLIS Digitaly signed by Witness waived 2024-11-08T16:26:26.213Z

ITEM	Tag	UP-200F3-QF32	: SPARE			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10004571		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°:	NA	Relay type:	A-TYPE
Auxiliary supply:	NA	Location:	B300	Cubicle:	QF32
Switchboard:	UP-200F3				

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
64	300mA	300mA	240mA	FIXED	27.5ms

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	10/07/2025

Comments:

	Performed by	☐ WITNESS ☉ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Mattia Girotti	Kristian Castellani	Witness waived
Date	2024-11-08	2024-11-08	2024-11-08
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-08T14:01:03.065Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-08T15:12:11.459Z	PROVERLIS Digitaly signed by Witness waived 2024-11-08T16:26:36.431Z

ITEM	Tag	UP-200F3-QF33	: SPARE			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10004572		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°:	NA	Relay type:	A-TYPE
Auxiliary supply:	NA	Location:	B300	Cubicle:	QF33
Switchboard:	UP-200F3				

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay	
				Setting	Trip value
64	300mA	300mA	240mA	FIXED	36.7ms

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	10/07/2025

Comments:

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	2024-11-08	2024-11-08	2024-11-08
Signature	PROVERLIS Digitaly signed by Mattia Girotti 2024-11-08T14:19:29.836Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-08T15:12:56.401Z	PROVERLIS Digitaly signed by Witness waived 2024-11-08T16:26:48.976Z

ITEM	Tag	UP-200F3-QF50	: SPARE			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10004586		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°: NA	Relay type: NA
Auxiliary supply: NA	Location: B300	Cubicle: NA
Switchboard: UP-200F3		

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
I	10A	NA	NA	FIXED	NA

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	08/07/2025

Comments:

Page 1/1	Performed by	☐ WITNESS ☑ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-11-08	2024-11-08	2024-11-08
Signature	Digitaly signed by Davide Zucconelli 2024-11-08T14:23:20.539Z	Digitaly signed by Kristian Castellani 2024-11-08T15:20:06.882Z	Digitaly signed by Witness waived 2024-11-08T16:29:02.562Z

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AUXILIARY
From Lighting & Small Power DB BOP DP-200N1
(Cubicle 03-Q41)
100-240V/N/PE~50/60Hz
back-up fuse gG10A 3G2.5mm2

LINE A
From LV Switchgear SG-200N1
(Cubicle A3/01)
Mains 400V;3/PE~50Hz
gG80A 4G35mm2

From LV Switchgear SG-200N1
(Cubicle A7/02)
Bypass mains 400V;3/PE~50Hz
gG63A 4G35mm2

LINE B
From LV Switchgear SG-200N1
(Cubicle A4/01)
Mains 400V;3/PE~50Hz
gG80A 4G35mm2

Not included in the AEG shipment

Code	Description
Q1	Rectifier input mains breaker
T40	Rectifier input isolation transformer
A1	Rectifier
A2	Inverter
T1	Inverter output isolation transformer
A3-A4	Static by-pass switch
A18	Display control module
A85	Heater
H1	Light

+MBC1
BY-200F3
Bypass transformer cabinet 40 kVA
10000007888.020
10009757

-X1 1U,1V,1W,PE
-X10 U,V,W,PE
-X13 U,N,PE
-X14 U,N
-X1 3U,3V,3W,PE
-A85
-H1
-Q10 L=80/85A I=0,8kA Icu=50kA
-T8 400V/400V 40kVA
-Q28.1 NC
-Q28.2 NC
-X1 2U,2V,2W,PE
-X4 1U,1V,1W,1N,PE
-X4 2U,2V,2W,2N,PE
-X1 4U,4V,4W,PE

+UPS1
BC-200F3A
Protect 8.33 40-400-210-400
10000007888.010
10009756

+UPS2
BC-200F3B
Protect 8.33 40-400-210-400
10000007888.010
10009756

-E1-X1 U,V,W,PE
-E4-X4 U,V,W,N,PE
-Q1 L=100/85A I=1,0kA Icu=50kA
-T40
-A1 REC
-A2 INV
-T1
-F1,-F2,-F3
-A3 SBS
-A4
-A18 Display
-A20 Parallel Adapter
INV CAN -X3 1-3 → 203 / 1.6
INV Sync -X5 1-4 → 205 / 1.6
1.5 / 203 → -X3 1-3 INV CAN
1.5 / 205 → -X5 1-4 INV Sync
-L11,-L12,-L13 Parallel preventive choke coil
-A24.1 BLÜ-PRO
-F91
-A12 ,-A13 Remote signaling
-E2-X2 L-,L+,PE
-X15 2,3
-X130 1,2
-E3-X3 U,V,W,N,PE

*2

-X2 1L+,1L-,PE
-X15 2,3
-X91 1M
-X5 1U,1V,1W,1N,PE
-X5 2U,2V,2W,2N,PE
-X2 3L+,3L-,PE
-X15 6,7
-X91 3M
-Q71 NC
-Q72 NC
A / 1.6
1.5 / A
INV operation
Manual bypass
-Q29
-F25
DP-200F3
-QF31 B32A 300mA
-QF32 B32A ^^0mA
-QF33 B32A 300mA
-QF34 B16A 300mA
5pc
-QF38 B16A 300mA
-QF39 B10A 300mA
4pc
-QF42 B10A 300mA
-QF43 B10A
8pc
-QF50 B10A
-QF51 B6A
-QF52 B6A
-X2 2L+,2L-,PE
-X15 4,5
-X91 2M
-X130 1,2,1PE
-X31 U,N,PE
-X32 U,N,PE
-X33 U,N,PE
-X34 U,N,PE
-X38 V,N,PE
-X39 V,N,PE
-X42 W,N,PE
-X43 W,N,PE
-X50 U,N,PE
-X51 V,N,PE
-X52 V,N,PE
-X2 4L+,4L-,PE
-X15 8,9
-X91 4M
-X130 3,4,2PE

2(1x70 mm2)

Not included in the AEG shipment

max. gG16A
max. gG16A
Load
400/230V;3/N/PE~50Hz

+BFB1
CB-200F3A
Battery fuse box 200 A
*1
-Q2 L=200A
DC 24V max. 300W

+BFB2
CB-200F3B
Battery fuse box 200 A
*1
-Q2 L=200A
DC 24V max. 300W

+BAT1
BA-200F3A
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-R81

+BAT2
BA-200F3B
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-R81

*1 Attention! In the event of battery undervoltage < 130 V, the UPS automatically switches off battery isolator Q2.
If this happens, switch X15:3 must be switched into the open position (undervoltage trip blocked).
For restart, please refer to the chapter in the UPS operating instructions (charging the DC link capacitors) attached.
Unlock the tripped switch Q2 by switching to open position.
After charging the DC link capacitors, switch on Q2.
Attention! When the battery voltage reaches > 200 V, switch X15:3 must be switched back to the closed position.

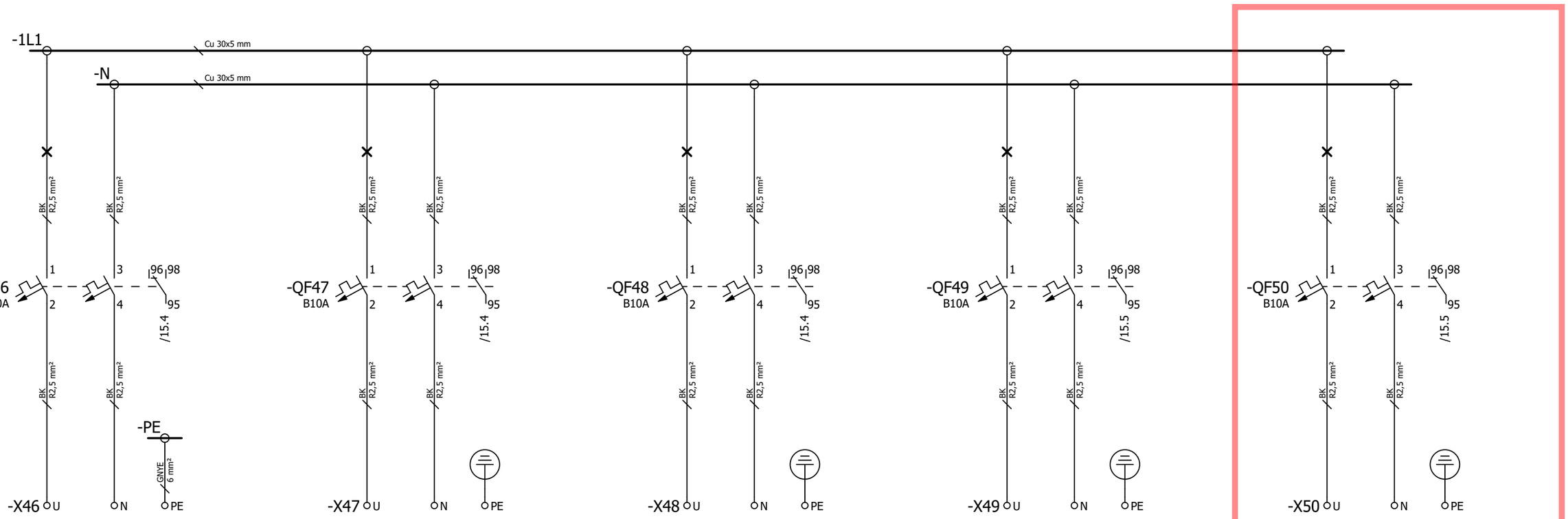
*2 Connection cables are not included.

					Date	14.05.2024			
01	500000002053	13.08.2024	Beckschäfer	Editor	EEC	ROSETTI MARINO	AEG POWER SOLUTIONS	System 40 kVA	=
02	500000002089	27.08.2024	Beckschäfer	Checked	Ch.Peck	Hollandse Kust Noord (HKN) wind farm		Single-line diagram	+
Stat	Alteration	Date	Name	Norm				1000007888_010 en	- EFA

A0 | sheet 1 | sheets

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Load
230V/N/PE~50Hz

B400-PCS-001
PCS-CONTROLLER AND I/O
CABINET-LINE B - 1.5KW

Load
230V/N/PE~50Hz

B400-EMCS-001
EMCS-CONTROLLER AND I/O
CABINET-LINE A - 1KW

Load
230V/N/PE~50Hz

B400-EMCS-001
EMCS-CONTROLLER AND I/O
CABINET-LINE B - 1KW

Load
230V/N/PE~50Hz

SG-200-N1
LV SWITCHBOARD AUXILIARY
1KW

Load
230V/N/PE~50Hz

SPARE

1000007888_010

				Date	23.05.2024	ROSETTI MARINO Hollandse Kust Noord (HKN) wind farm	AEG POWER SOLUTIONS
01	500000002053	13.08.2024	Beckschäfer	Editor	Beckschäfer		
02	500000002089	27.08.2024	Beckschäfer	Checked	Ch.Peck		
Stat	Alteration	Date	Name	Norm			

Load
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

1000007888.020
10009757

1000007888_010 en

=
+ MBC1
& EFS

A3

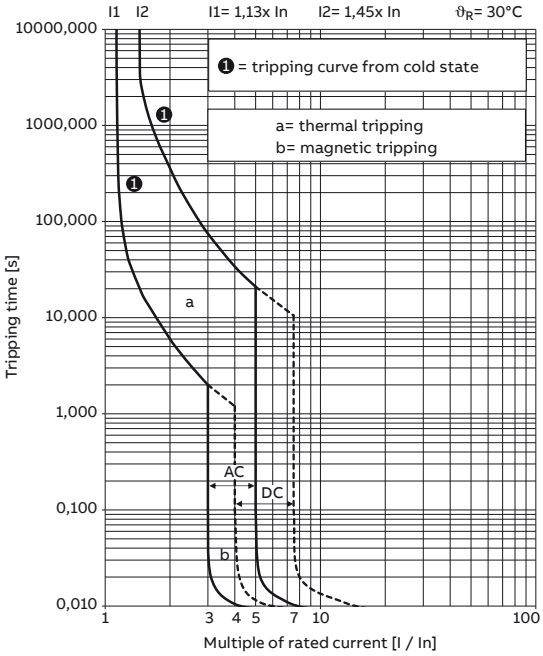
sheet 10
sheets 17

Miniature Circuit breakers S300P

Tripping characteristics

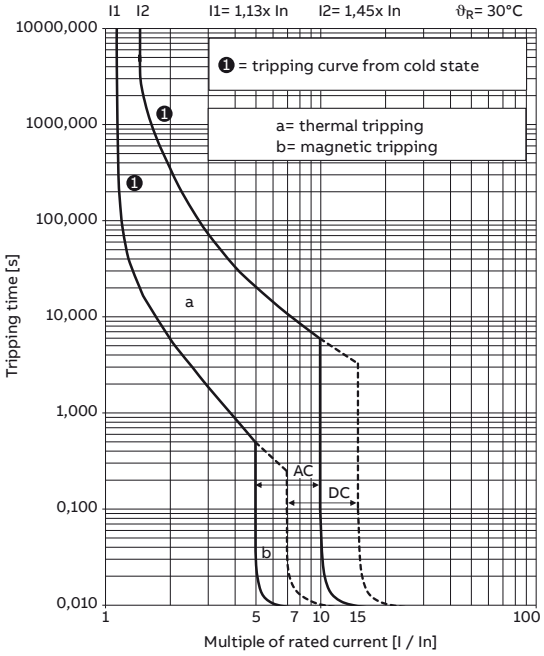
MCB Type S300P - B (3 ... 5 x I_n AC)

Tripping Characteristic IEC/EN 60898-1



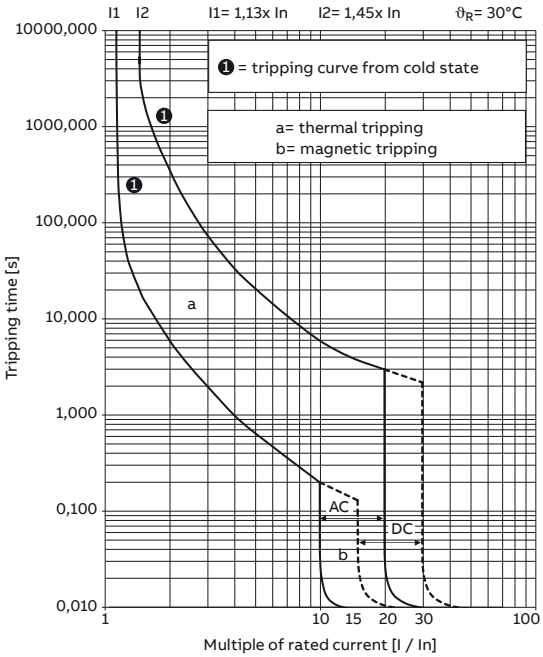
MCB Type S300P - C (5 ... 10 x I_n AC)

Tripping Characteristic IEC/EN 60898-1



MCB Type S300P - D (10 ... 20 x I_n AC)

Tripping Characteristic IEC/EN 60898-1



ITEM	Tag	UP-200F3-QF52	: SPARE			Dwg	1724000372-EL-DG-00009
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10004588		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°: NA	Relay type: NA
Auxiliary supply: NA	Location: B300	Cubicle: NA
Switchboard: UP-200F3		

Current transformers

Tag	Number of	Ratio	Location

Voltage transformers

Tag	Number of	Ratio	Location

Test result (refer to manufacturer's procedure)

ANSI function	Setting	Injection	Trip value	Time delay Setting	Time delay Trip value
I	6A	NA	NA	FIXED	NA

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
FLUKE 1663	5380144	7727/24	08/07/2025

Comments:

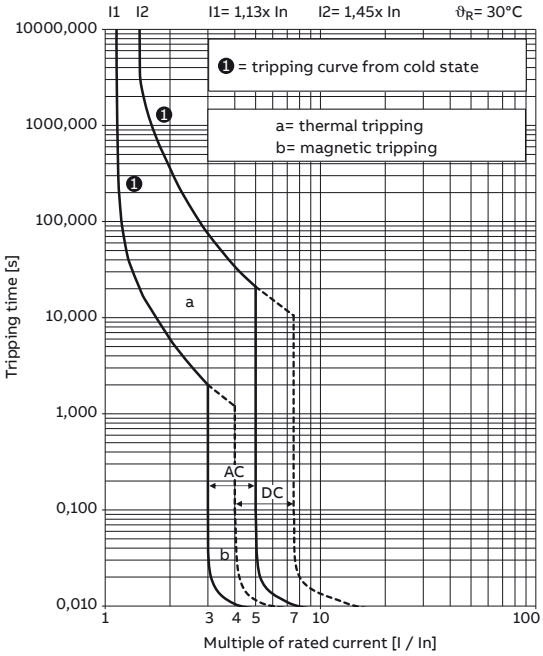
	Performed by	☐ WITNESS ☉ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CPY NOT PRESENT
Name	Davide Zucconelli	Kristian Castellani	Witness waived
Date	2024-11-08	2024-11-08	2024-11-08
Signature	PROVERLIS Digitaly signed by Davide Zucconelli 2024-11-08T14:24:25.514Z	PROVERLIS Digitaly signed by Kristian Castellani 2024-11-08T15:22:04.245Z	PROVERLIS Digitaly signed by Witness waived 2024-11-08T16:29:43.316Z

Miniature Circuit breakers S300P

Tripping characteristics

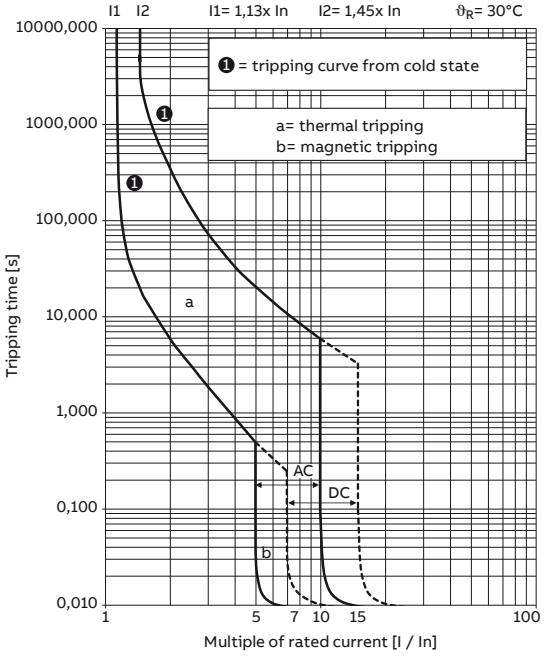
MCB Type S300P - B (3 ... 5 x I_n AC)

Tripping Characteristic IEC/EN 60898-1



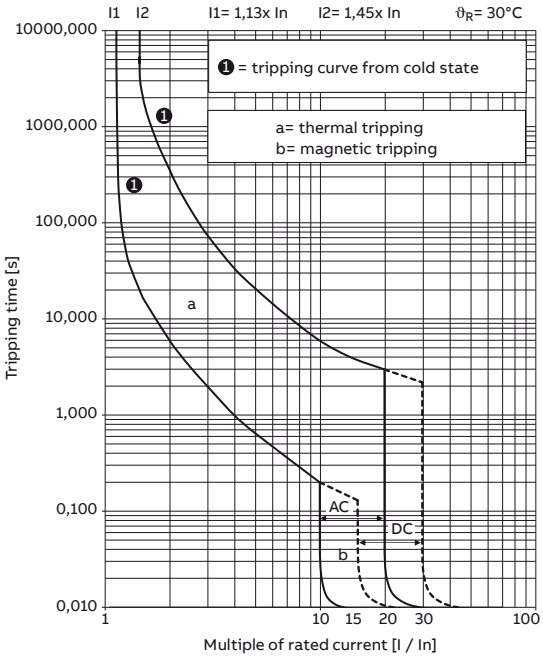
MCB Type S300P - C (5 ... 10 x I_n AC)

Tripping Characteristic IEC/EN 60898-1



MCB Type S300P - D (10 ... 20 x I_n AC)

Tripping Characteristic IEC/EN 60898-1



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AUXILIARY
From Lighting & Small Power DB BOP DP-200N1
(Cubicle 03-Q41)
100-240V/N/PE~50/60Hz
back-up fuse gG10A 3G2.5mm2

LINE A
From LV Switchgear SG-200N1
(Cubicle A3/01)
Mains 400V;3/PE~50Hz
gG80A 4G35mm2

From LV Switchgear SG-200N1
(Cubicle A7/02)
Bypass mains 400V;3/PE~50Hz
gG63A 4G35mm2

LINE B
From LV Switchgear SG-200N1
(Cubicle A4/01)
Mains 400V;3/PE~50Hz
gG80A 4G35mm2

Not included in the AEG shipment

Code	Description
Q1	Rectifier input mains breaker
T40	Rectifier input isolation transformer
A1	Rectifier
A2	Inverter
T1	Inverter output isolation transformer
A3-A4	Static by-pass switch
A18	Display control module
A85	Heater
H1	Light

+MBC1
BY-200F3
Bypass transformer cabinet 40 kVA
10000007888.020
10009757

-X1 1U,1V,1W,PE
-X10 U,V,W,PE
-X13 U,N,PE
-X14 U,N
-X1 3U,3V,3W,PE
-A85
-H1
-Q10 L=80/85A I=0,8kA Icu=50kA
-T8 400V/400V 40kVA
-Q28.1 NC
-Q28.2 NC
-X1 2U,2V,2W,PE
-X4 1U,1V,1W,1N,PE
-X4 2U,2V,2W,2N,PE
-X1 4U,4V,4W,PE

+UPS1
BC-200F3A
Protect 8.33 40-400-210-400
10000007888.010
10009756

+UPS2
BC-200F3B
Protect 8.33 40-400-210-400
10000007888.010
10009756

-E1-X1 U,V,W,PE
-E4-X4 U,V,W,N,PE
-Q1 L=100/85A I=1,0kA Icu=50kA
-T40
-A1 REC
-A2 INV
-T1
-F1,-F2,-F3
-A3 SBS
-A4
-A18 Display
-A20 Parallel Adapter
INV CAN -X3 1-3 → 203 / 1.6
INV Sync -X5 1-4 → 205 / 1.6
1.5 / 203 → -X3 1-3 INV CAN
1.5 / 205 → -X5 1-4 INV Sync
-L11,-L12,-L13 Parallel preventive choke coil
-A24.1 BLÜ-PRO
-F91
-A12 ,-A13 Remote signaling
-E2-X2 L-,L+,PE
-X15 2,3
-X130 1,2
-E3-X3 U,V,W,N,PE
-X2 1L+,1L-,PE
-X91 1M
-X5 1U,1V,1W,1N,PE
-X2 2L+,2L-,PE
-X91 2M
-X130 1,2,1PE
-X5 2U,2V,2W,2N,PE
-X2 3L+,3L-,PE
-X91 3M
-X2 4L+,4L-,PE
-X91 4M
-X130 3,4,2PE
-Q71 NC
-Q72 NC
1.5 / A → A / 1.6
-Q29 INV operation Manual bypass
-F25
DP-200F3
-QF31 B32A 300mA
-QF32 B32A ^^0mA
-QF33 B32A 300mA
-QF34 B16A 300mA
5pc
-QF38 B16A 300mA
-QF39 B10A 300mA
4pc
-QF42 B10A 300mA
-QF43 B10A
8pc
-QF50 B10A
-QF51 B6A
-QF52 B6A
-X31 U,N,PE
-X32 U,N,PE
-X33 U,N,PE
-X34 U,N,PE
-X38 V,N,PE
-X39 V,N,PE
-X42 W,N,PE
-X43 W,N,PE
-X50 U,N,PE
-X51 V,N,PE
-X52 V,N,PE
-X15 6,7
-X15 8,9
-X15 4,5
2(1x70 mm2)
Not included in the AEG shipment
max. gG16A
Load 400/230V;3/N/PE~50Hz

+BFB1
CB-200F3A
Battery fuse box 200 A
-Q2 L=200A
DC 24V max. 300W

+BFB2
CB-200F3B
Battery fuse box 200 A
-Q2 L=200A
DC 24V max. 300W

+BAT1
BA-200F3A
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-R81

+BAT2
BA-200F3B
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-R81

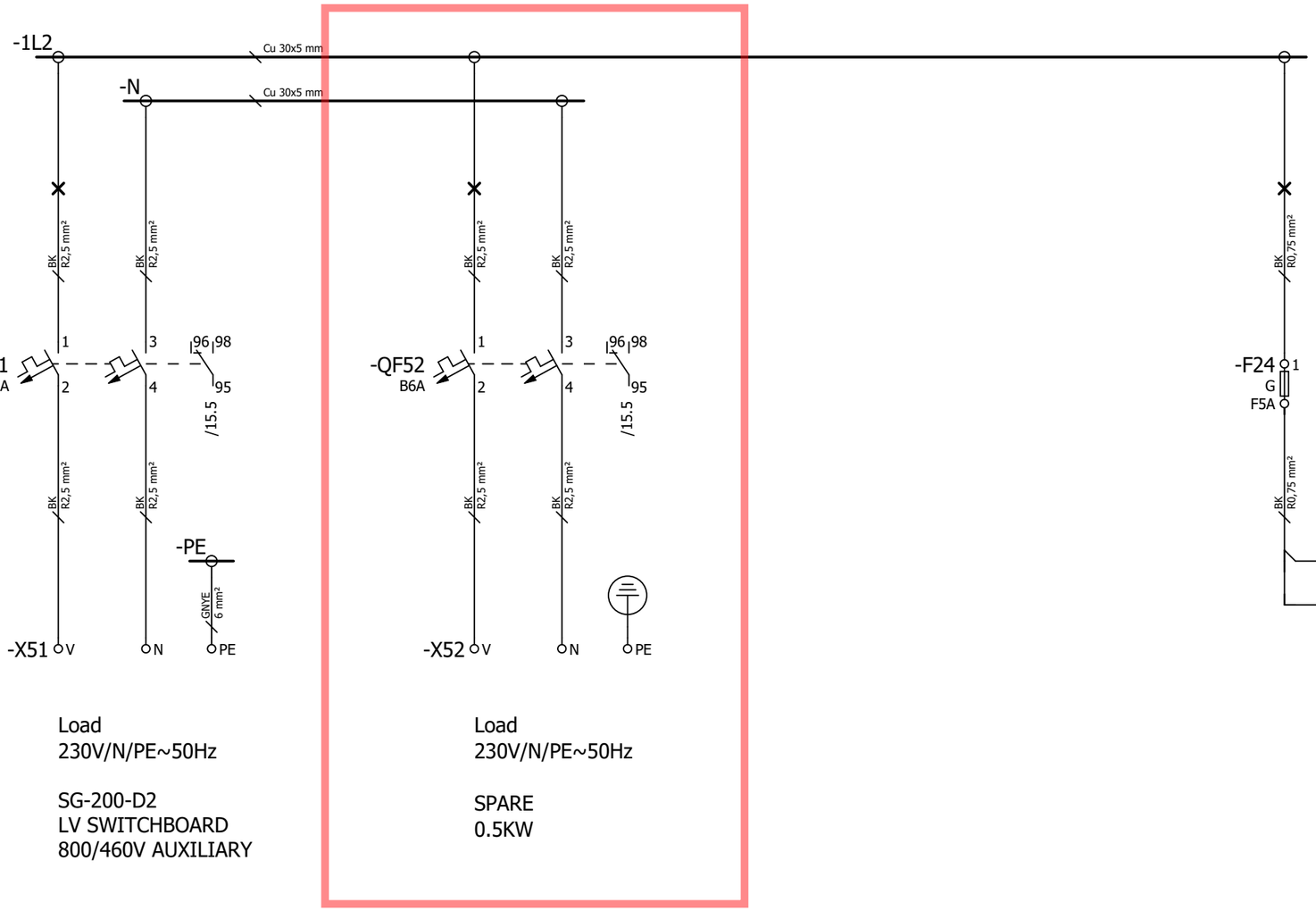
*1 Attention! In the event of battery undervoltage < 130 V, the UPS automatically switches off battery isolator Q2.
If this happens, switch X15:3 must be switched into the open position (undervoltage trip blocked).
For restart, please refer to the chapter in the UPS operating instructions (charging the DC link capacitors) attached.
Unlock the tripped switch Q2 by switching to open position.
After charging the DC link capacitors, switch on Q2.
Attention! When the battery voltage reaches > 200 V, switch X15:3 must be switched back to the closed position.

*2 Connection cables are not included.

					Date	14.05.2024				
01	500000002053	13.08.2024	Beckschäfer	Editor	EEC	ROSETTI MARINO	AEG POWER SOLUTIONS	System 40 kVA	=	
02	500000002089	27.08.2024	Beckschäfer	Checked	Ch.Peck	Hollandse Kust Noord (HKN) wind farm		Single-line diagram	+	
Stat	Alteration	Date	Name	Norm				1000007888_010 en	- EFA	A0 sheet 1 sheets

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Load
230V/N/PE~50Hz

SG-200-D2
LV SWITCHBOARD
800/460V AUXILIARY

Load
230V/N/PE~50Hz

SPARE
0.5KW

1000007888_010

				Date	13.08.2024
01	500000002053	13.08.2024	Beckschäfer	Editor	Beckschäfer
02	500000002089	27.08.2024	Beckschäfer	Checked	Ch.Peck
Stat	Alteration	Date	Name	Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Load
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

1000007888.020
10009757

1000007888_010 en

=
+ MBC1
& EFS

A3

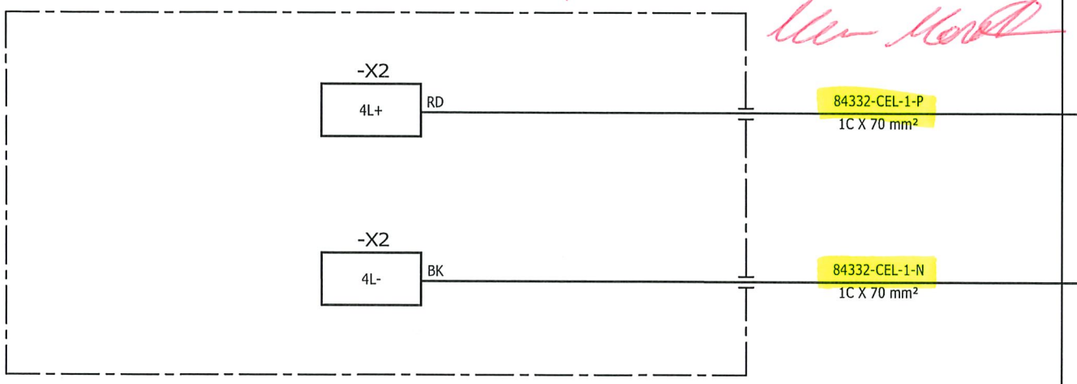
sheet 11
sheets 17

Section 4.2 Electrical
“As-Commissioned” interconnection diagrams

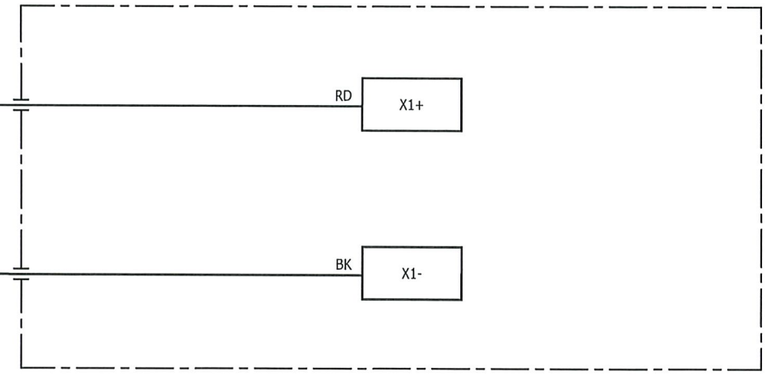
FROM	TO

MARCO MORETTO 20/3/25

DESCRIPTION: AC UPS PAS- CHARGER-B
TAG NUMBER: ~~BC-200F3B~~ UP-200F3 BY PASS

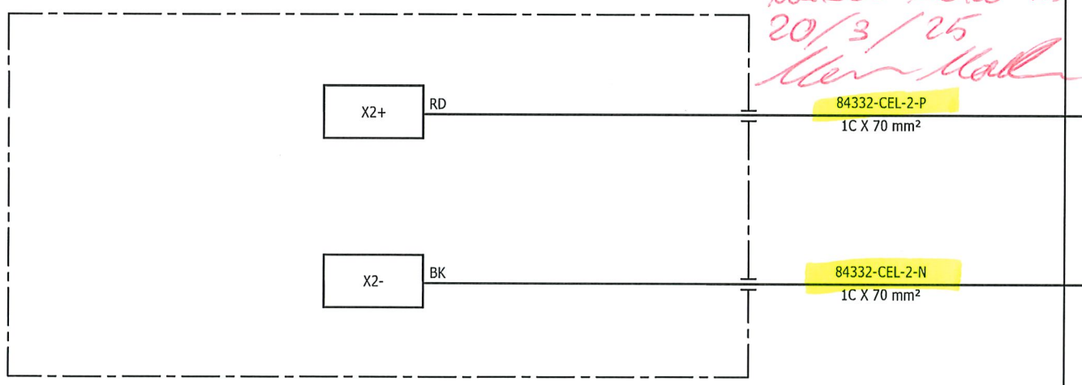


DESCRIPTION: AC UPS PAS - BATTERY ISOLATOR-B
TAG NUMBER: CB-200F3B

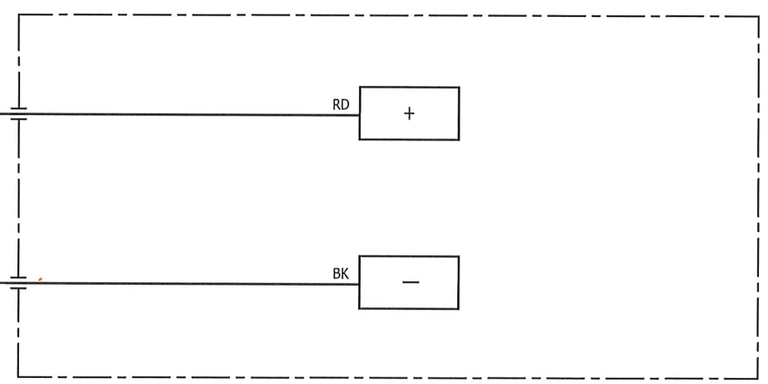


DESCRIPTION: AC UPS PAS - BATTERY ISOLATOR-B
TAG NUMBER: CB-200F3B

NO MARK UP
MARCO MORETTO
20/3/25



DESCRIPTION: AC UPS PAS - BATTERY-B
TAG NUMBER: BA-200F3B



AS COMMISSIONED: MATTIA GINOTI

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

REV.:	DATE:	SIGNATURE:
2_F	09/01/25	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
AC UPS PAS – CHARGER-B & BATTERY ISOLATOR-B

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

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 062 | REV. 02

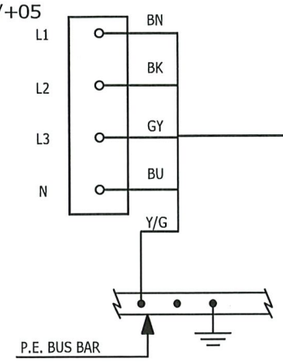
F.to UNI A3: 420mmx297mm

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

FROM	TO

DESCRIPTION: LV Switchgear
TAG NUMBER: SG-200N1

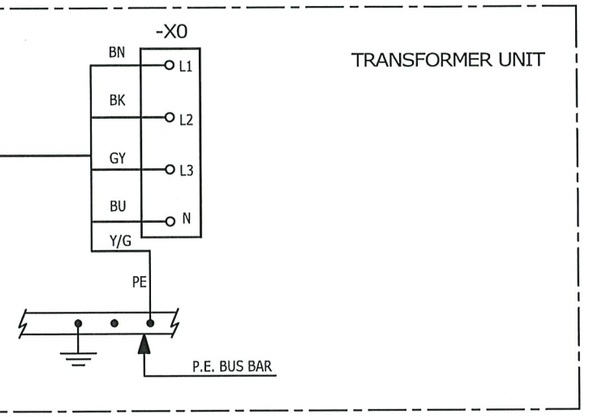
COLUMN/CUBIC.: A5/+05



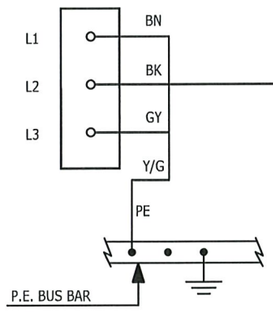
83027-CEL
5G16 mm²

NO MARK UP
MARCO MORETTO
20/3/25

DESCRIPTION: IMPRESSED CURRENT CATHODIC PROTECTION (ICCP) SYSTEM
TAG NUMBER: CN-200N1



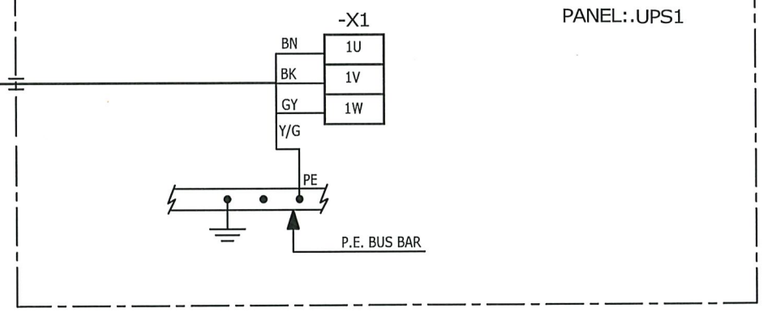
COLUMN/CUBIC.: A3/+01



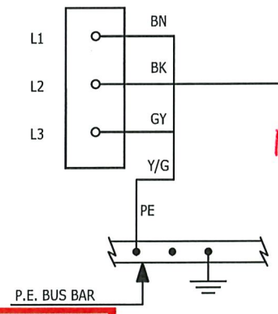
83028-CEL
4G35 mm²

MARCO MORETTO
20/3/25

DESCRIPTION: AC UPS PAS - 30MIN - LINE A
TAG NUMBER: UP-200F3 BY PASS



COLUMN/CUBIC.: A4/+01

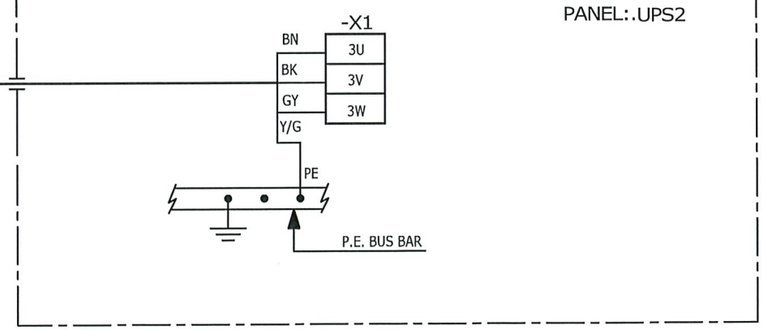


83029-CEL
4G35 mm²

AS COMMISSIONED: NATWA GIBBL

MARCO MORETTO
20/3/25

DESCRIPTION: AC UPS PAS - 30MIN - LINE B
TAG NUMBER: UP-200F3 BY PASS



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

REV.:	DATE:	SIGNATURE:
2_F	09/01/25	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
LV SWITCHGEAR SG-200N1

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	027	02

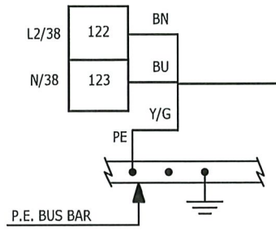
F.to UNI A3: 420mmx297mm

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

FROM	TO

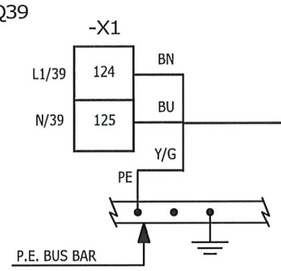
DESCRIPTION: LIGHTING & SMALL POWER DB BOP
TAG NUMBER: DP-200N1

CUBICLE/CB: +03/Q38



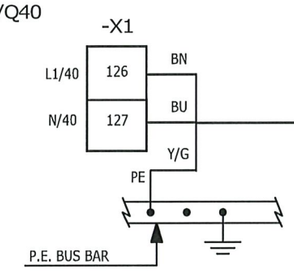
83119-CEL
3G2.5 mm²

CUBICLE/CB: +03/Q39



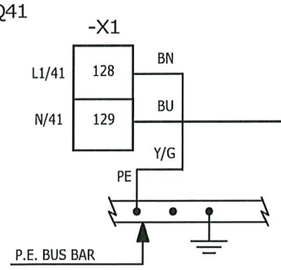
83120-CEL
3G2.5 mm²

CUBICLE/CB: +03/Q40



83121-CEL
3G2.5 mm²

CUBICLE/CB: +03/Q41



83122-CEL
3G2.5 mm²

NO MARK UP
18/3/25

MARCO MORETTO

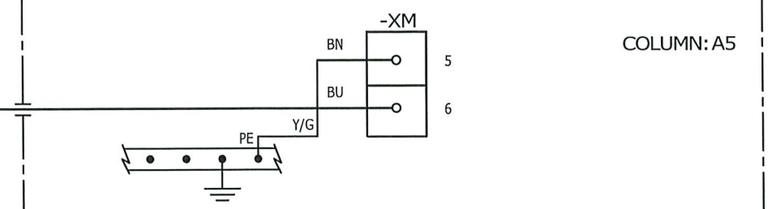
NO MARK UP
18/3/25

MARCO MORETTO

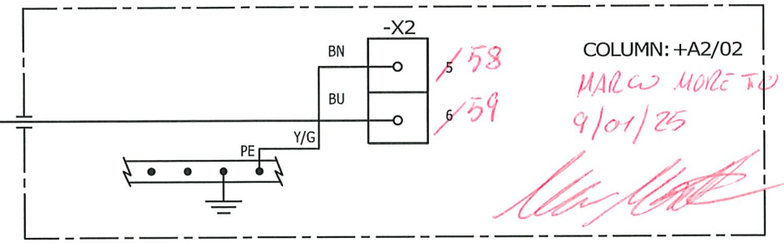
MARCO MORETTO
20/3/25

AS COMMISSIONED: MATTIA GIROTTI

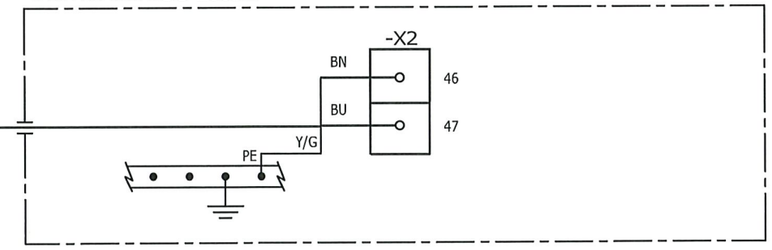
DESCRIPTION: AUXILIARY 6.6KV SWITCHBOARD
TAG NUMBER: SG-100D1



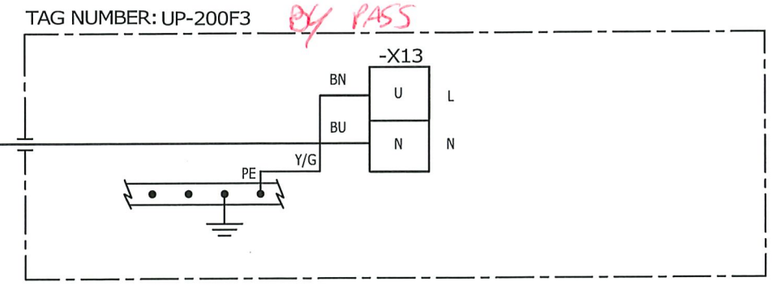
DESCRIPTION: AUXILIARY LV
TAG NUMBER: SG-200N1



DESCRIPTION: LV SWBD 800/460V AUXILIARY
TAG NUMBER: SG-200D2



DESCRIPTION: AC UPS PAS AUXILIARY
TAG NUMBER: UP-200F3 BY PASS



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

REV.:	DATE:	SIGNATURE:
2_F	09/01/25	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
LIGHTING & SMALL POWER DB BOP

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	056	02

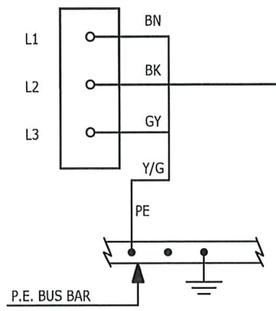
F.to UNI A3: 420mmx297mm

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

FROM	TO

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A7/+02

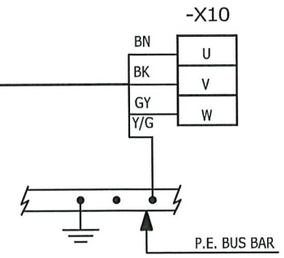


83030-CEL
4G35 mm²

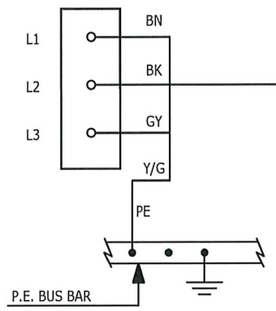
MARCO MORETTO
20/3/25

DESCRIPTION: AC UPS PAS - 30MIN - BYPASS
TAG NUMBER: UP-200F3 BY PASS

PANEL:.BYPASS



COLUMN/CUBIC.: A6/+05

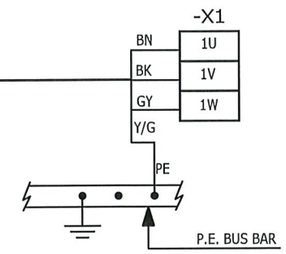


83031-CEL
4G35 mm²

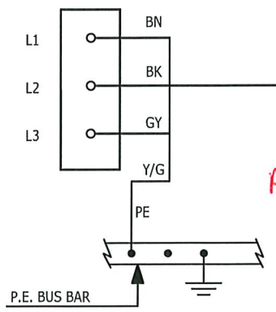
MARCO MORETTO
20/3/25

DESCRIPTION: AC UPS F&G - 8H - LINE A
TAG NUMBER: UP-200F4 BY PASS

PANEL:.UPS1



COLUMN/CUBIC.: A6/+06



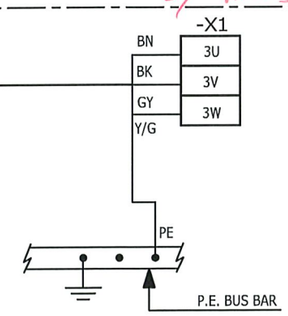
83032-CEL
4G35 mm²

AS COMMISSIONED: NATWA GIRZ

MARCO MORETTO
20/3/25

DESCRIPTION: AC UPS F&G - 8H - LINE B
TAG NUMBER: UP-200F4 BY PASS

PANEL:.UPS2



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

REV.:	DATE:	SIGNATURE:
2_F	09/01/25	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
LV SWITCHGEAR SG-200N1

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

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

SHEET 028

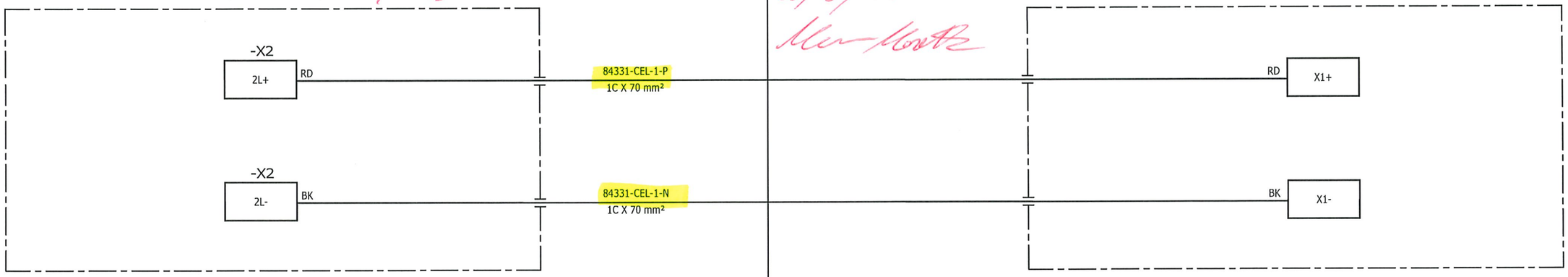
REV. 02

F.to UNI A3: 420mmx297mm

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

FROM	TO

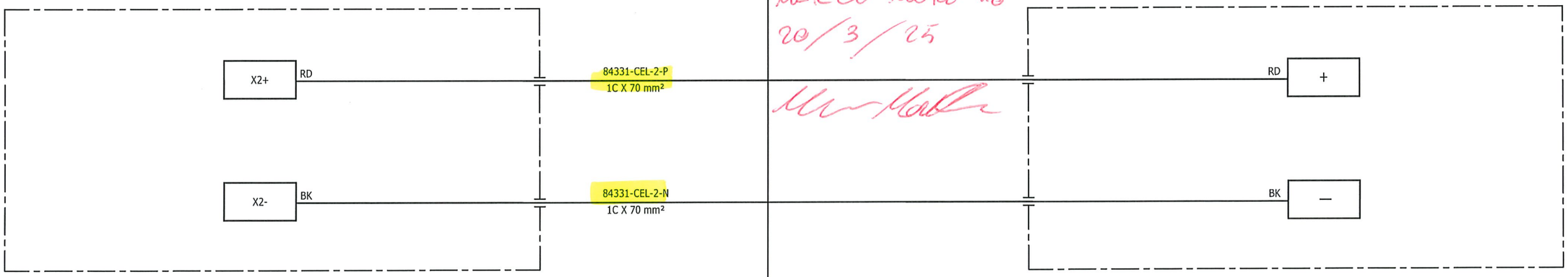
DESCRIPTION: AC UPS PAS - CHARGER-A
TAG NUMBER: ~~BC-200F3A~~ UP-200 F3 BY PASS



MARCO MORETTO
20/3/25

DESCRIPTION: AC UPS PAS - BATTERY ISOLATOR-A
TAG NUMBER: CB-200F3A

DESCRIPTION: AC UPS PAS - BATTERY ISOLATOR-A
TAG NUMBER: CB-200F3A



NO MARK UP
MARCO MORETTO
20/3/25

DESCRIPTION: AC UPS PAS - BATTERY-A
TAG NUMBER: BA-200F3A

AS COMMISSIONED: MATTIA GIROTTI

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

REV.:	DATE:	SIGNATURE:
2_F	09/01/25	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
AC UPS PAS – CHARGER-A & BATTERY ISOLATOR-A

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	061	02

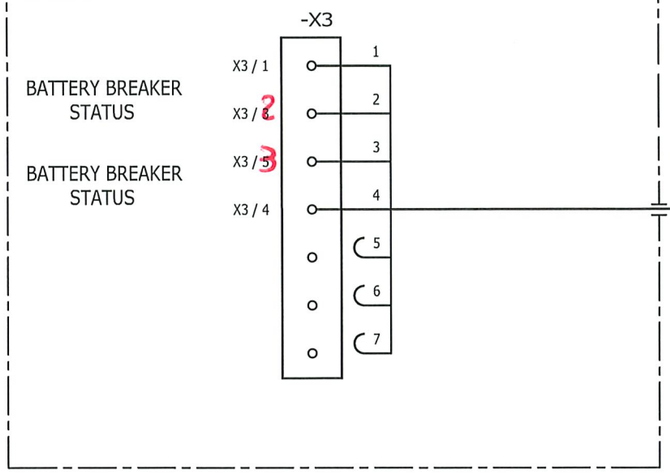
F.to UNI A3: 420mmx297mm

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

FROM	TO

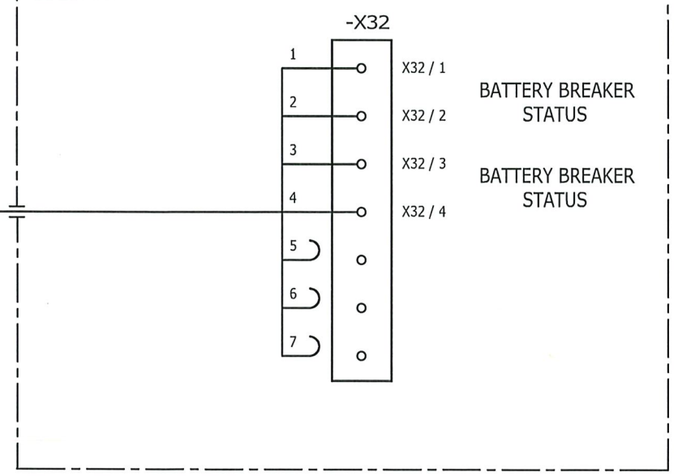
DESCRIPTION: DC UPS - BATTERY ISOLATOR
TAG NUMBER: CB-200F1

COLUMN: -



DESCRIPTION: DC UPS - CHARGER
TAG NUMBER: ~~BC-200F1B~~ (UP-200F1B)

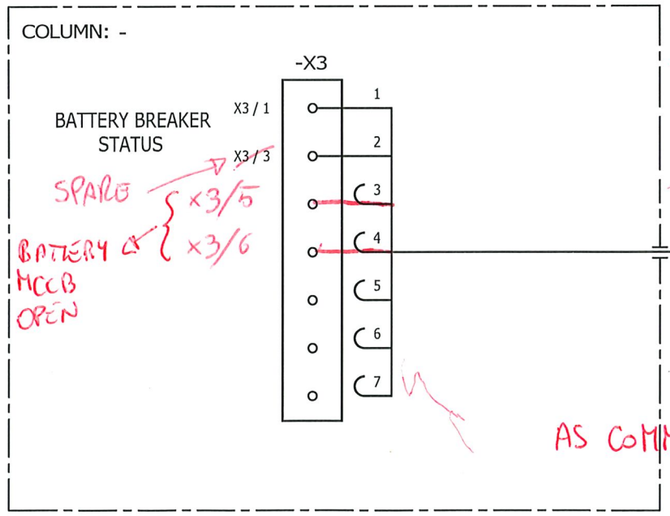
COLUMN: -



MARCO MORETTO
19/3/25

DESCRIPTION: AC UPS PAS - BATTERY ISOLATOR-A
TAG NUMBER: CB-200F3A

COLUMN: -

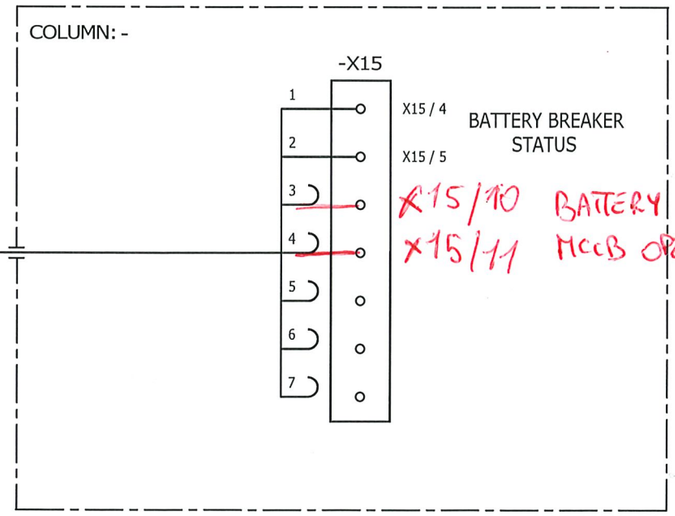


SPARE ~~X3/5~~ X3/6
BATTERY MCCB OPEN

MARCO MORETTO
20/3/25

DESCRIPTION: AC UPS PAS - CHARGER-A
TAG NUMBER: ~~BC-200F3A~~ UP-200 F4 BY PASS

COLUMN: -



~~X15/10~~ BATTERY
X15/11 MCCB OPEN

AS COMMISSIONED: NATCHA BIRGI

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

REV.:	DATE:	SIGNATURE:
2_F	09/01/25	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
SIGNALS FOR CONTROL SYSTEM

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	089	02

F.to UNI A3: 420mmx297mm

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

FROM	TO

DESCRIPTION: AC UPS PAS - BATTERY ISOLATOR-B
TAG NUMBER: CB-200F3B

COLUMN: -

-X3

BATTERY BREAKER STATUS

X3 / 4
X3 / 5

1
2
3
4
5
6
7

MARCO MORETTO
20/3/25

BATTERY MCCB OPEN
X3/3
X3/5
X3/6

BK

84331-CEC
7C X 1.5 mm²

BK

DESCRIPTION: AC UPS PAS - CHARGER-B
TAG NUMBER: ~~BC-200F3B~~ UP-200F3 BY PASS

COLUMN: -

-X15

1
2
3
4
5
6
7

X15 / 8
X15 / 9

BATTERY BREAKER STATUS

X15/14 BATTERY
X15/15 MCCB OPEN

DESCRIPTION: AC UPS F&G - BATTERY ISOLATOR-A
TAG NUMBER: CB-200F4A

COLUMN: -

-X3

BATTERY BREAKER STATUS

X3 / 1
X3 / 3

1
2
3
4
5
6
7

MARCO MORETTO
20/3/25

BATTERY MCCB OPEN
X3/5
X3/6

BK

84410-CEC
7C X 1.5 mm²

BK

AS COMMISSIONED: NATALIA GIROTTI

DESCRIPTION: AC UPS F&G - CHARGER-A
TAG NUMBER: ~~BC-200F4A~~ UP-200 F4 BY PASS

COLUMN: -

-X15

1
2
3
4
5
6
7

X15 / 4
X15 / 5

BATTERY BREAKER STATUS

X15/10 BATTERY
X15/11 MCCB OPEN

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

REV.:	DATE:	SIGNATURE:
2_F	09/01/25	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
SIGNALS FOR CONTROL SYSTEM

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

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 090 | REV. 02

F.to UNI A3: 420mmx297mm

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

Section 4.3 Instrumentation functional test sheets index

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10 & discipline : I

Instrumental	84-10 AC 35 kVA UPS System (UP-200F3)

ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
84-XS-001	ELECT. ISOLATION UPS POWER UCP (WATER TREAT. A-50000)	ONSHORE	C10003823	FJ01D	100	2025-01-28	RFO 4
84-XS-002	ELECT. ISOLATION UPS POWER UCP (NITROGEN A-64000)	ONSHORE	C10003822	FJ01D	100	2025-01-28	RFO 4
84-XS-003	ELECT. ISOLATION UPS POWER UCP (INSTRUMENT AIR A-63000)	ONSHORE	C10003821	FJ01D	100	2025-01-28	RFO 4
84-XS-004	ELECT. ISOLATION UPS POWER UCP HVAC B-100	ONSHORE	C10003820	FJ01D	100	2025-01-28	RFO 4
84-XS-005	ELECT. ISOLATION UPS POWER UCP HVAC B-200	ONSHORE	C10003819	FJ01D	100	2025-01-28	RFO 4
84-XS-007A	DISCONNECT AC UPS UP-200F3 BATTERIES A	ONSHORE	C10003817	FJ01D	100	2025-01-28	RFO 4
84-XS-007B	DISCONNECT AC UPS UP-200F3 BATTERIES B	ONSHORE	C10003816	FJ01D	100	2025-01-28	RFO 4
84-XS-010	INHIBIT. BATTERY CHARGING AC UPS UP-200F3 BATTERIES	ONSHORE	C10003812	FJ01D	100	2025-01-28	RFO 4

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	84-XS-010	: INHIBIT. BATTERY CHARGING AC UPS UP-200F3 BATTERIES			Dwg	123A90-DDL-IN-LIS-40089
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003812		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Instrumental	Form	FJ01D Digital Loop

LOOP DATA

Loop TAG	84-XS-010					TSLD	123A90-DDL-IN-DG-40014 rev. 1_A		
IO Type	Input	No	Output	Yes		Energy by transmitter	No	Energy by system	Yes
Marshalling	B400-SIS-001	Terminal	07A/07B	Slot	05	Rack	03	Chanel	07

LOOP TEST

1	Check earth isolation of the loop.					OK
2	Connect loop to terminal					OK
3	Energise Loop (close loop) and record status	Normal	Yes	Alarm/trip	No	OK
4	De-Energise Loop (open loop) and record status	Normal	No	Alarm/trip	Yes	OK
5	Record Fail Safe position	Open	NA	Closed	NA	NA

LOOP SERVICE

		Action	Alarm / Control			Display	
		Trip	GA	DCS	SOE	DCS	
6	Loop energized	No		Yes		OK	OK
7	Loop not energized	Yes		Yes		OK	OK
8	Checking of line monitoring	No		No		OK	OK
9	Checking of Maintenance Inhibition	NA	NA	NA	NA	NA	NA
10	Associated safety Level / bar						OK
11	Associated outputs						

LOOP DOCUMENTATION

12	Loop diagram is marked up and attached to this test sheet	OK
13	Cause and effect chart is highlighted accordingly	
14	Any defect is recorded for punch list issuance	

TESTING & MEASUREMENT INSTRUMENT USED

Type	Serial N.	Calibration Certificate	Validity
MULTIMETER FLUKE 175	AW1/018 17140769	7715/24	10/07/2025

Comments:

	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW OPS
Name	Marco Di Maria	Giandonato Delmissier	Jamie McAllister
Date	2025-01-27	2025-01-28	2025-01-28

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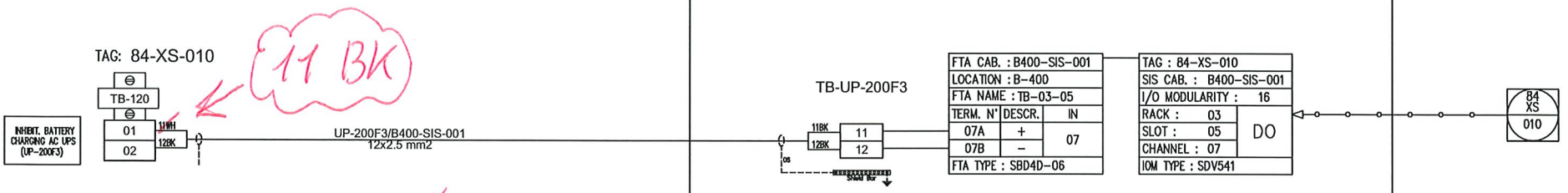
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PROVERLIS Digitaly signed by Jamie McAllister 2025-01-28T08:56:20.502Z

Signature			

DRAWING NO. 123A90-DDL-IN-DG-40014 REV. 01

FIELD	ITER – B400	CENTRAL CONTROL ROOM
	SAFETY INSTRUMENTED SYSTEM	OPERATOR CONSOLE



21/01/25

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/12/2024	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	23/10/2024	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-IN-DG-40014
REV: 1_A | DATE: 20/12/24 | SIGNATURE: C.Pilato
ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : INSTRUMENT LOOP DIAGRAM
84-XS-010
INHIBIT. BATTERY CHARGING AC UPS UP-200F3 BATTERIES

CONTRACT NO./TITLE CONTRACT_NO.			SCALE 1:1
DRAWN: VBA	CHECKED: LCA	APPROVED: DLO	DATE 23/10/2024
A3	DRAWING NO. 123A90-DDL-IN-DG-40014	SHEET 164	REV. 01

File Name : 123A90-DDL-IN-DG-40014_REV.01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	84-XS-007B	: DISCONNECT AC UPS UP-200F3 BATTERIES B		Dwg	123A90-DDL-IN-LIS-40089	
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)		Module		
TASK	code	C10003816	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	COMM	Activity FTS	Discipline Instrumental	Form	FJ01D	Digital Loop

LOOP DATA

Loop TAG	84-XS-007B			TSLD	123A90-DDL-IN-DG-40014 rev. 1_A		
IO Type	Input	No	Output Yes	Energy by transmitter	No	Energy by system	Yes
Marshalling	B400-SIS-001	Terminal	02A/02B	Slot	05	Rack 02	Chanel 02

LOOP TEST

1	Check earth isolation of the loop.					OK
2	Connect loop to terminal					OK
3	Energise Loop (close loop) and record status	Normal	Yes	Alarm/trip	No	OK
4	De-Energise Loop (open loop) and record status	Normal	No	Alarm/trip	Yes	OK
5	Record Fail Safe position	Open	NA	Closed	NA	NA

LOOP SERVICE

		Action	Alarm / Control			Display	
		Trip	GA	DCS	SOE	DCS	
6	Loop energized	No		Yes		OK	OK
7	Loop not energized	Yes		Yes		OK	OK
8	Checking of line monitoring	No		No		OK	OK
9	Checking of Maintenance Inhibition	NA	NA	NA	NA	NA	NA
10	Associated safety Level / bar						OK
11	Associated outputs						

LOOP DOCUMENTATION

12	Loop diagram is marked up and attached to this test sheet	OK
13	Cause and effect chart is highlighted accordingly	
14	Any defect is recorded for punch list issuance	

TESTING & MEASUREMENT INSTRUMENT USED

Type	Serial N.	Calibration Certificate	Validity
MULTIMETER FLUKE 175	AW1/018 17140769	7715/24	10/07/2025

Comments:

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW OPS
Name	Marco Di Maria	Giandonato Delmissier	Jamie McAllister
Date	2025-01-27	2025-01-28	2025-01-28

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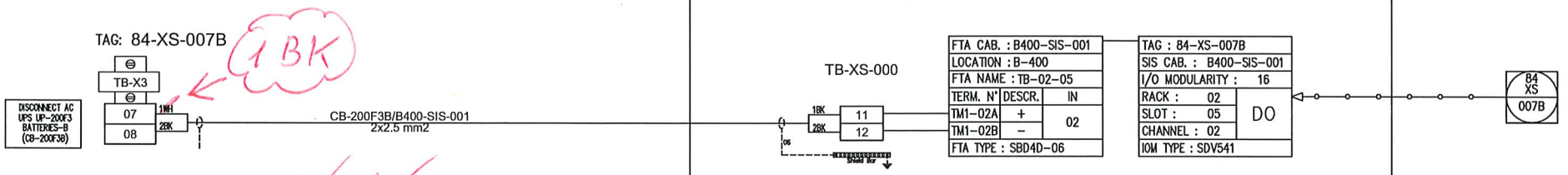
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Signature			

DRAWING NO. 123A90-DDL-IN-DG-40014 REV. 01

FIELD	ITER – B400	CENTRAL CONTROL ROOM
	SAFETY INSTRUMENTED SYSTEM	OPERATOR CONSOLE



21/01/25

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/12/2024	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	23/10/2024	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-IN-DG-40014
REV: 1_A | DATE: 20/12/24 | SIGNATURE: C.Pilato
ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : INSTRUMENT LOOP DIAGRAM
84-XS-007B
DISCONNECT AC UPS UP-200F3 BATTERIES B

CONTRACT NO./TITLE CONTRACT_NO.			SCALE 1:1
DRAWN: VBA	CHECKED: LCA	APPROVED: DLO	DATE 23/10/2024
A3	DRAWING NO. 123A90-DDL-IN-DG-40014	SHEET 168	REV. 01

File Name : 123A90-DDL-IN-DG-40014_REV.01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	84-XS-007A	: DISCONNECT AC UPS UP-200F3 BATTERIES A			Dwg	123A90-DDL-IN-LIS-40089
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003817		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Instrumental	Form	FJ01D Digital Loop

LOOP DATA

Loop TAG	84-XS-007A				TSLD	123A90-DDL-IN-DG-40014 rev. 1_A			
IO Type	Input	No	Output	Yes	Energy by transmitter	No	Energy by system	Yes	
Marshalling	B400-SIS-001	Terminal	02A/02B		Slot	05	Rack	01	Chanel 02

LOOP TEST

1	Check earth isolation of the loop.					OK
2	Connect loop to terminal					OK
3	Energise Loop (close loop) and record status	Normal	Yes	Alarm/trip	No	OK
4	De-Energise Loop (open loop) and record status	Normal	No	Alarm/trip	Yes	OK
5	Record Fail Safe position	Open	NA	Closed	NA	NA

LOOP SERVICE

		Action	Alarm / Control			Display	
		Trip	GA	DCS	SOE	DCS	
6	Loop energized	No		Yes		OK	OK
7	Loop not energized	Yes		Yes		OK	OK
8	Checking of line monitoring	No		No		OK	OK
9	Checking of Maintenance Inhibition	NA	NA	NA	NA	NA	NA
10	Associated safety Level / bar						OK
11	Associated outputs						

LOOP DOCUMENTATION

12	Loop diagram is marked up and attached to this test sheet	OK
13	Cause and effect chart is highlighted accordingly	
14	Any defect is recorded for punch list issuance	

TESTING & MEASUREMENT INSTRUMENT USED

Type	Serial N.	Calibration Certificate	Validity
MULTIMETER FLUKE 175	AW1/018 17140769	7715/24	10/07/2025

Comments:

	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Ops
Name	Marco Di Maria	Giandonato Delmissier	Jamie McAllister
Date	2025-01-27	2025-01-28	2025-01-28

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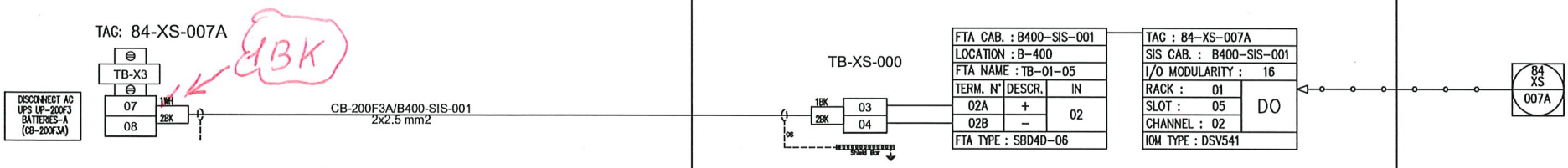
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Signature			

DRAWING NO. 123A90-DDL-IN-DG-40014 REV. 01

FIELD	ITER – B400	CENTRAL CONTROL ROOM
	SAFETY INSTRUMENTED SYSTEM	OPERATOR CONSOLE



21/01/25

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/12/2024	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	23/10/2024	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-IN-DG-40014
REV: 1_A | DATE: 20/12/24 | SIGNATURE: C.Pilato
ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : INSTRUMENT LOOP DIAGRAM
84-XS-008A
DISCONNECT AC UPS UP-200F3 BATTERIES A

CONTRACT NO./TITLE CONTRACT_NO.			SCALE 1:1
DRAWN: VBA	CHECKED: LCA	APPROVED: DLO	DATE 23/10/2024

A3	DRAWING NO. 123A90-DDL-IN-DG-40014	SHEET 167	REV. 01

File Name : 123A90-DDL-IN-DG-40014_REV.01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	84-XS-005	: ELECT. ISOLATION UPS POWER UCP HVAC B-200			Dwg	123A90-DDL-IN-LIS-40089
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003819		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Instrumental	Form	FJ01D Digital Loop

LOOP DATA

Loop TAG	84-XS-005				TSLD	123A90-FDL-IN-DG-40014 rev.1A			
IO Type	Input	No	Output	Yes	Energy by transmitter	No	Energy by system	Yes	
Marshalling	B400-SIS-001	Terminal	04A/04B		Slot	05	Rack	03	Chanel 04

LOOP TEST

1	Check earth isolation of the loop.					OK
2	Connect loop to terminal					OK
3	Energise Loop (close loop) and record status	Normal	Yes	Alarm/trip	No	OK
4	De-Energise Loop (open loop) and record status	Normal	No	Alarm/trip	Yes	OK
5	Record Fail Safe position	Open	NA	Closed	NA	NA

LOOP SERVICE

		Action	Alarm / Control			Display	
		Trip	GA	DCS	SOE	DCS	
6	Loop energized	No		Yes		OK	OK
7	Loop not energized	Yes		Yes		OK	OK
8	Checking of line monitoring	No		No		OK	OK
9	Checking of Maintenance Inhibition	NA	NA	NA	NA	NA	NA
10	Associated safety Level / bar						
11	Associated outputs						

LOOP DOCUMENTATION

12	Loop diagram is marked up and attached to this test sheet	OK
13	Cause and effect chart is highlighted accordingly	
14	Any defect is recorded for punch list issuance	

TESTING & MEASUREMENT INSTRUMENT USED

Type	Serial N.	Calibration Certificate	Validity
MULTIMETER FLUKE 175	AW1/018 17140769	7715/24	10/07/2025

Comments:

Page 1/1

	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Ops
Name	Laurentiu Grozavu	Giandonato Delmissier	Jamie McAllister
Date	2025-01-27	2025-01-28	2025-01-28

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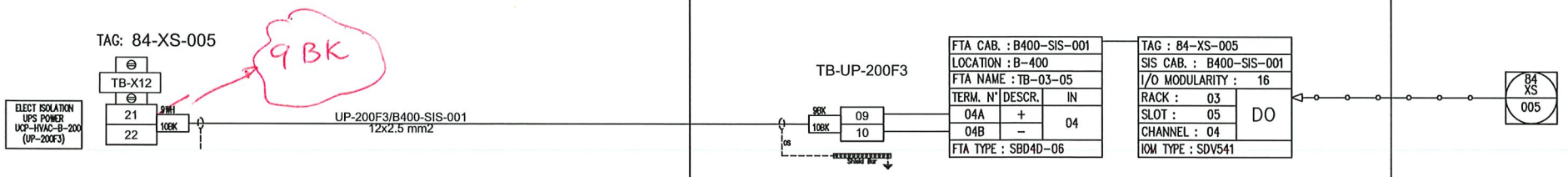
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Signature			

DRAWING NO. 123A90-DDL-IN-DG-40014 REV. 01

FIELD	ITER – B400	CENTRAL CONTROL ROOM
	SAFETY INSTRUMENTED SYSTEM	OPERATOR CONSOLE



21/09/25

Longam

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/12/2024	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	23/10/2024	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-IN-DG-40014
REV: 1_A | DATE: 20/12/24 | SIGNATURE: C.Pilato
ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : INSTRUMENT LOOP DIAGRAM
84-XS-005
ELECT. ISOLATION UPS POWER UCP HVAC B-200

CONTRACT NO./TITLE CONTRACT_NO.			SCALE 1:1
DRAWN: VBA	CHECKED: LCA	APPROVED: DLO	DATE 23/10/2024

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-IN-DG-40014	163	01

File Name : 123A90-DDL-IN-DG-40014_REV.01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	84-XS-004	: ELECT. ISOLATION UPS POWER UCP HVAC B-100			Dwg	123A90-DDL-IN-LIS-40089
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003820		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Instrumental	Form	FJ01D Digital Loop

LOOP DATA

Loop TAG	84-XS-004				TSLD	123A90-FDL-IN-DG-40014 rev.1A			
IO Type	Input	No	Output	Yes	Energy by transmitter	No	Energy by system	Yes	
Marshalling	B400-SIS-001	Terminal	03A/03B		Slot	05	Rack	03	Chanel 03

LOOP TEST

1	Check earth isolation of the loop.					OK
2	Connect loop to terminal					OK
3	Energise Loop (close loop) and record status	Normal	Yes	Alarm/trip	No	OK
4	De-Energise Loop (open loop) and record status	Normal	No	Alarm/trip	Yes	OK
5	Record Fail Safe position	Open	NA	Closed	NA	NA

LOOP SERVICE

		Action	Alarm / Control			Display	
		Trip	GA	DCS	SOE	DCS	
6	Loop energized	No		Yes		OK	OK
7	Loop not energized	Yes		Yes		OK	OK
8	Checking of line monitoring	No		No		OK	OK
9	Checking of Maintenance Inhibition	NA	NA	NA	NA	NA	NA
10	Associated safety Level / bar						
11	Associated outputs						

LOOP DOCUMENTATION

12	Loop diagram is marked up and attached to this test sheet	OK
13	Cause and effect chart is highlighted accordingly	
14	Any defect is recorded for punch list issuance	

TESTING & MEASUREMENT INSTRUMENT USED

Type	Serial N.	Calibration Certificate	Validity
MULTIMETER FLUKE 175	AW1/018 17140769	7715/24	10/07/2025

Comments:

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Ops
Name	Laurentiu Grozavu	Giandonato Delmissier	Jamie McAllister
Date	2025-01-27	2025-01-28	2025-01-28

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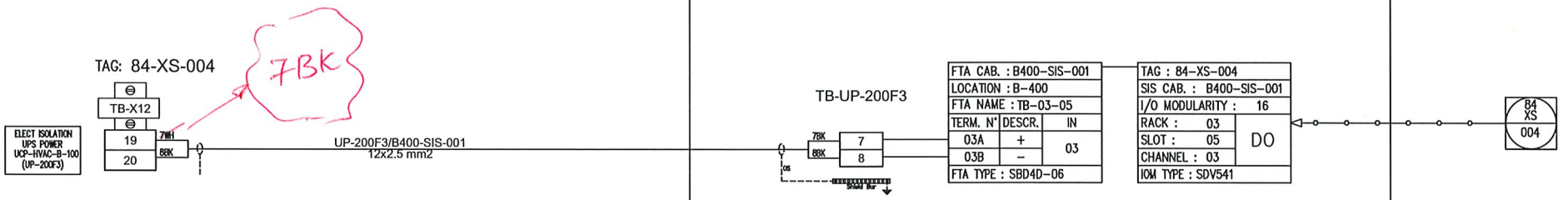
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Signature			

DRAWING NO. 123A90-DDL-IN-DG-40014 REV. 01

FIELD	ITER – B400	CENTRAL CONTROL ROOM
	SAFETY INSTRUMENTED SYSTEM	OPERATOR CONSOLE



21/01/25

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/12/2024	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	23/10/2024	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-IN-DG-40014
REV: 1_A | DATE: 20/12/24 | SIGNATURE: C.Pilato
ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : INSTRUMENT LOOP DIAGRAM
84-XS-004
ELECT. ISOLATION UPS POWER UCP HVAC B-100

CONTRACT NO./TITLE CONTRACT_NO.			SCALE 1:1
DRAWN: VBA	CHECKED: LCA	APPROVED: DLO	DATE 23/10/2024

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-IN-DG-40014	162	01

File Name : 123A90-DDL-IN-DG-40014_REV.01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	84-XS-003	: ELECT. ISOLATION UPS POWER UCP (INSTRUMENT AIR A-63000)			Dwg	123A90-DDL-IN-LIS-40089
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003821		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Instrumental	Form	FJ01D — Digital Loop

LOOP DATA

Loop TAG	84-XS-003					TSLD	123A90-FDL-IN-DG-40014 rev.1A		
IO Type	Input	No	Output	Yes		Energy by transmitter	No	Energy by system	Yes
Marshalling	B400-SIS-001	Terminal	02A/02B	Slot	05	Rack	03	Chanel	02

LOOP TEST

1	Check earth isolation of the loop.					OK
2	Connect loop to terminal					OK
3	Energise Loop (close loop) and record status	Normal	Yes	Alarm/trip	No	OK
4	De-Energise Loop (open loop) and record status	Normal	No	Alarm/trip	Yes	OK
5	Record Fail Safe position	Open	NA	Closed	NA	NA

LOOP SERVICE

		Action	Alarm / Control			Display	
		Trip	GA	DCS	SOE	DCS	
6	Loop energized	No		Yes		OK	OK
7	Loop not energized	Yes		Yes		OK	OK
8	Checking of line monitoring	No		No		OK	OK
9	Checking of Maintenance Inhibition	NA	NA	NA	NA	NA	NA
10	Associated safety Level / bar						
11	Associated outputs						

LOOP DOCUMENTATION

12	Loop diagram is marked up and attached to this test sheet	OK
13	Cause and effect chart is highlighted accordingly	
14	Any defect is recorded for punch list issuance	

TESTING & MEASUREMENT INSTRUMENT USED

Type	Serial N.	Calibration Certificate	Validity
MULTIMETER FLUKE 175	AW1/018 17140769	7715/24	10/07/2025

Comments:

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Ops
Name	Laurentiu Grozavu	Giandonato Delmissier	Jamie McAllister
Date	2025-01-27	2025-01-28	2025-01-28

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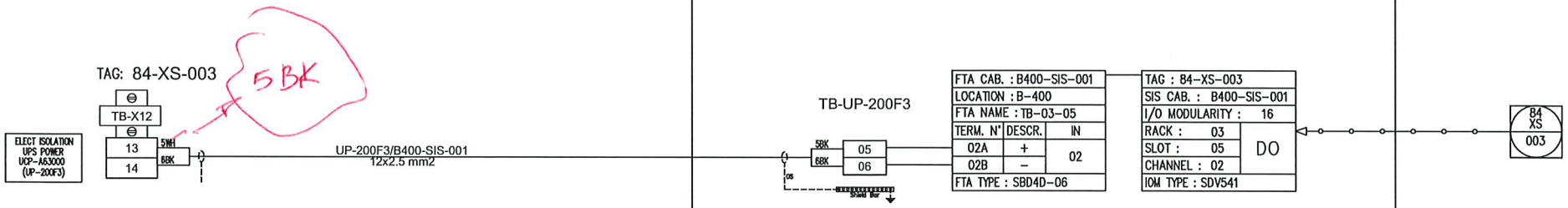
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Signature			

DRAWING NO. 123A90-DDL-IN-DG-40014 REV. 01

FIELD	ITER – B400	CENTRAL CONTROL ROOM
	SAFETY INSTRUMENTED SYSTEM	OPERATOR CONSOLE



21/01/25

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REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/12/2024	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	23/10/2024	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-IN-DG-40014
REV: 1_A | DATE: 20/12/24 | SIGNATURE: C.Pilato
ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : INSTRUMENT LOOP DIAGRAM
84-XS-003
ELECT. ISOLATION UPS POWER UCP (INSTRUMENT AIR A-63000)

CONTRACT NO./TITLE CONTRACT_NO.			SCALE 1:1
DRAWN: VBA	CHECKED: LCA	APPROVED: DLO	DATE 23/10/2024
A3	DRAWING NO. 123A90-DDL-IN-DG-40014	SHEET 161	REV. 01

File Name : 123A90-DDL-IN-DG-40014_REV.01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	84-XS-002	: ELECT. ISOLATION UPS POWER UCP (NITROGEN A-64000)			Dwg	123A90-DDL-IN-LIS-40089
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003822		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Instrumental	Form	FJ01D — Digital Loop

LOOP DATA

Loop TAG	84-XS-002				TSLD	123A90-FDL-IN-DG-40014 rev.1A			
IO Type	Input	No	Output	Yes	Energy by transmitter	No	Energy by system	Yes	
Marshalling	B400-SIS-001	Terminal	01A/01B		Slot	05	Rack	03	Chanel 01

LOOP TEST

1	Check earth isolation of the loop.					OK
2	Connect loop to terminal					OK
3	Energise Loop (close loop) and record status	Normal	Yes	Alarm/trip	No	OK
4	De-Energise Loop (open loop) and record status	Normal	No	Alarm/trip	Yes	OK
5	Record Fail Safe position	Open	NA	Closed	NA	NA

LOOP SERVICE

		Action	Alarm / Control		Display	
		Trip	GA	DCS	SOE	DCS	
6	Loop energized	No		Yes		OK	OK
7	Loop not energized	Yes		Yes		OK	OK
8	Checking of line monitoring	No		No		OK	OK
9	Checking of Maintenance Inhibition	NA	NA	NA	NA	NA	NA
10	Associated safety Level / bar						
11	Associated outputs						

LOOP DOCUMENTATION

12	Loop diagram is marked up and attached to this test sheet	OK
13	Cause and effect chart is highlighted accordingly	
14	Any defect is recorded for punch list issuance	

TESTING & MEASUREMENT INSTRUMENT USED

Type	Serial N.	Calibration Certificate	Validity
MULTIMETER FLUKE 175	AW1/018 17140769	7715/24	10/07/2025

Comments:

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Ops
Name	Laurentiu Grozavu	Giandonato Delmissier	Jamie McAllister
Date	2025-01-27	2025-01-28	2025-01-28

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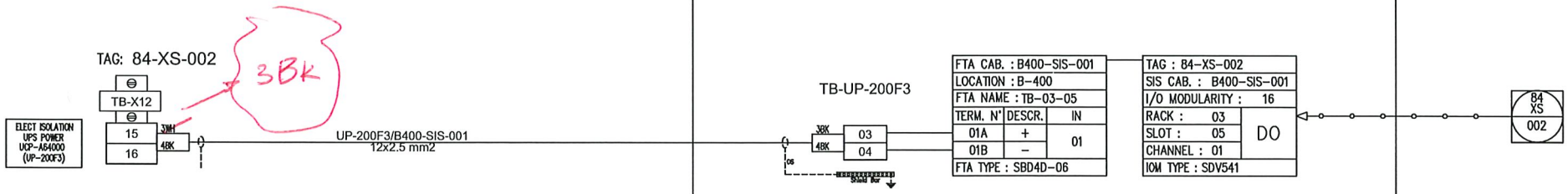
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PROVERLIS Digitaly signed by Jamie McAllister 2025-01-28T09:38:13.466Z

Signature			

DRAWING NO. 123A90-DDL-IN-DG-40014 REV. 01

FIELD	ITER – B400	CENTRAL CONTROL ROOM
	SAFETY INSTRUMENTED SYSTEM	OPERATOR CONSOLE



21/01/25

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/12/2024	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	23/10/2024	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-IN-DG-40014
REV: 1_A | DATE: 20/12/24 | SIGNATURE: C.Pilato
ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : INSTRUMENT LOOP DIAGRAM
84-XS-002
ELECT. ISOLATION UPS POWER UCP (NITROGEN A-64000)

CONTRACT NO./TITLE CONTRACT_NO.			SCALE 1:1
DRAWN: VBA	CHECKED: LCA	APPROVED: DLO	DATE 23/10/2024

A3	DRAWING NO. 123A90-DDL-IN-DG-40014	SHEET 160	REV. 01

File Name : 123A90-DDL-IN-DG-40014_REV.01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	84-XS-001	: ELECT. ISOLATION UPS POWER UCP (WATER TREAT. A-50000)			Dwg	123A90-DDL-IN-LIS-40089
	S/Sys	84-10	: AC 35 kVA UPS System (UP-200F3)			Module	
TASK	code	C10003823		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity FTS	Discipline	Instrumental	Form	FJ01D — Digital Loop

LOOP DATA

Loop TAG	84-XS-001				TSLD	123A90-FDL-IN-DG-40014 rev.1A			
IO Type	Input	No	Output	Yes	Energy by transmitter	No	Energy by system	Yes	
Marshalling	B400-SIS-001	Terminal	12A/12B		Slot	07	Rack	02	Chanel 12

LOOP TEST

1	Check earth isolation of the loop.					OK
2	Connect loop to terminal					OK
3	Energise Loop (close loop) and record status	Normal	Yes	Alarm/trip	No	OK
4	De-Energise Loop (open loop) and record status	Normal	No	Alarm/trip	Yes	OK
5	Record Fail Safe position	Open	NA	Closed	NA	NA

LOOP SERVICE

		Action	Alarm / Control			Display	
		Trip	GA	DCS	SOE	DCS	
6	Loop energized	No		Yes		OK	OK
7	Loop not energized	Yes		Yes		OK	OK
8	Checking of line monitoring	No		No		OK	OK
9	Checking of Maintenance Inhibition	NA	NA	NA	NA	NA	NA
10	Associated safety Level / bar						
11	Associated outputs						

LOOP DOCUMENTATION

12	Loop diagram is marked up and attached to this test sheet	OK
13	Cause and effect chart is highlighted accordingly	
14	Any defect is recorded for punch list issuance	

TESTING & MEASUREMENT INSTRUMENT USED

Type	Serial N.	Calibration Certificate	Validity
MULTIMETER FLUKE 175	AW1/018 17140769	7715/24	10/07/2025

Comments:

	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	RM COMM	RM COMM	CW Ops
Name	Laurentiu Grozavu	Giandonato Delmissier	Jamie McAllister
Date	2025-01-27	2025-01-28	2025-01-28

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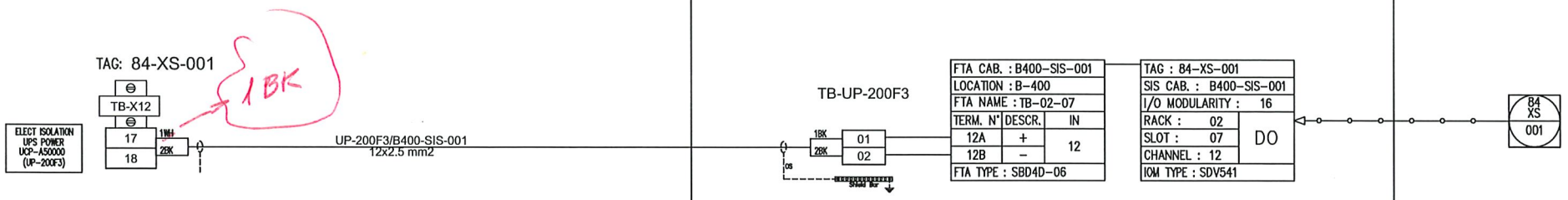
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Signature			

DRAWING NO. 123A90-DDL-IN-DG-40014 REV. 01

FIELD	ITER – B400	CENTRAL CONTROL ROOM
	SAFETY INSTRUMENTED SYSTEM	OPERATOR CONSOLE



21/01/25

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/12/2024	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	23/10/2024	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-IN-DG-40014
REV: 1_A | DATE: 20/12/24 | SIGNATURE: C.Pilato
ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE :
INSTRUMENT LOOP DIAGRAM
84-XS-001
ELECT. ISOLATION UPS POWER UCP (WATER TREAT. A-50000)

CONTRACT NO./TITLE CONTRACT_NO.			SCALE 1:1
DRAWN: VBA	CHECKED: LCA	APPROVED: DLO	DATE 23/10/2024

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-IN-DG-40014	159	01

File Name : 123A90-DDL-IN-DG-40014_REV.01

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

Section 5.2 Operational Test Certificates

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10

Miscellaneous	84-10 AC 35 kVA UPS System (UP-200F3)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
123A90-PML-COM-PRO-03059	OTP - UPS System UP-200F3 35kVA	ONSHORE	C10004628	5300	100	2025-04-19	-
		OFFSHORE	C10004949	5300	0	-	-

ITEM	Tag	123A90-PML-COM-PRO-03059 : OTP - UPS System UP-200F3 35kVA				Dwg	123A90-PML-COM-PRO-03059
	S/Sys	84-10 : AC 35 kVA UPS System (UP-200F3)				Module	
TASK	code	C10004628		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	COMM	Activity OTS	Discipline	Miscellaneous Form 5300		Operational Test Procedure

OTP - OPERATIONAL TEST PROCEDURE

Attached procedure number: 123A90-PML-COM-PRO-03059

Associated subsystems: 84-10

Completion date: 15/04/2025

Comments/Remarks:

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
	COMMISSIONING DISCIPLINE LEAD	RM COMMISSIONING MANAGER	CPY COMMISSIONING MANAGER
Name	Kristian Castellani	Anthony Iveson	Martin Taylor
Date	2025-04-15	2025-04-15	2025-04-19
Signature	PROVERLIS Digitaly signed by Kristian Castellani 2025-04-15T12:28:55.593Z	PROVERLIS Digitaly signed by Anthony Iveson 2025-04-15T12:54:09.443Z	PROVERLIS Digitaly signed by Martin Taylor 2025-04-19T04:44:39.534Z

Base Load Power Hub (BLPH)

OTP: UPS System UP-200F3 35kVA

Document Number: 123A90-PML-COM-PRO-03059

Document Class: 2

02	15/11/2024	Accepted for Construction (AFC)	K.CASTELLANI	A.IVESON	M.BRUNELLI
01	31/10/2024	Accepted for Construction (AFC)	K.CASTELLANI	A.IVESON	M.BRUNELLI
00	12/09/2024	Issue for Review (IFR)	K.CASTELLANI	A.IVESON	M.BRUNELLI
Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)
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HOLDS LIST

No.	Description
1	
2	
3	
4	

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1 INTRODUCTION

1.1 Project Overview

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

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

1.2 Project Location

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



Figure 1 - HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

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

1.3 Project Concept

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

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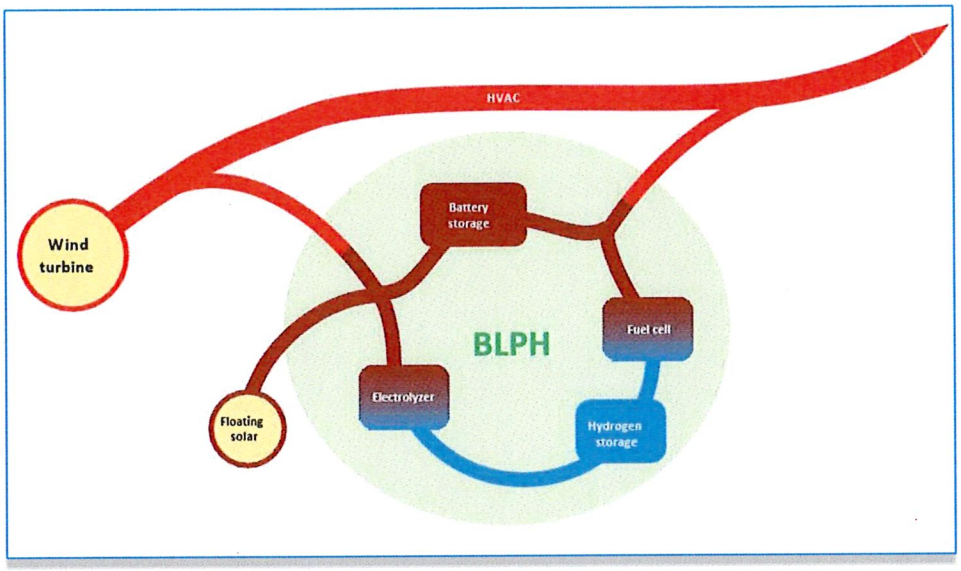


Figure 3 - BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.
The purpose of the BLPH is to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with CrossWind's control room.

2 DOCUMENT SCOPE

The purpose of this document is to describe the methodology and the planned actions to be implemented for the preparation and execution of Mechanical Completion, Pre-commissioning, Commissioning & Start-Up activities to be performed on the PLANT, including COMPANY PROVIDED ITEMS, at the onshore premises of CONTRACTOR located in Milan (Italy) offices and Piomboni yard - Marina di Ravenna (Italy).

CONTRACTOR, pursuant to CONTRACT and PROJECT requirements, shall implement an exacting methodology, complete with a distinct set of tools and documentation to meet the following key objectives:
Perform the Mechanical Completion, Pre-commissioning and Commissioning on the WORKSITE to the maximum extent possible so as to minimise the commissioning operations on SITE;

- Ensure safety for the people, environment and facilities during the execution of the Commissioning activities at WORKSITE,
- Ensure integrity and operation of the equipment for their lifetime in accordance with PROJECT design and specifications,
- Plan a smooth and flawless execution of the Commissioning activities avoiding unforeseen downtimes and delays.

Achievement of the above objectives shall be obtained by:

- Defining and prioritizing a predetermined sequence of the Mechanical Completion checks, Pre-commissioning and Commissioning tests and tasks,
- Checking, testing systematically and exhaustively all the components of PLANT in compliance with PROJECT approved procedures and CONTRACT terms, managed by a dedicated team of inspectors, technicians and field engineers who will perform the Mechanical Completion, Pre-commissioning, Commissioning and Start-Up tasks and subsequently record the results via discipline specific check, inspection and test sheets (ITR's) & where applicable via discrete Operational Test Procedures (OTP's).
- Ensuring full traceability of the performed checks and tests, through implementation of a dedicated Project Completions Management System (CMS) containing individual references to all tagged items.

3 OTP SUMMARY

3.1 Test Objective

The operating test of UPS AC system is executed to ensure that the system is started up in a safe and controlled manner and to verify the correct operation according to the project requirements.

Activities shall be developed as follows:

- Onshore pre-commissioning and commissioning activities at Contractor site (WORKSITE)
    - **PHASE 1:** UPS START UP with battery banks first charging and discharging tests
    - **PHASE 2:** UPS OPERATIONAL AND FUNCTIONAL TESTS
    - **PHASE 3:** COMMUNICATION TESTS with PCS and ESD systems.
- Offshore commissioning (SITE)
    - Visual inspection of all components, UPS start up with Black Start.

3.2 System Boundary Limits

See below the affected systems and subsystems on the Overall Single Line Diagram

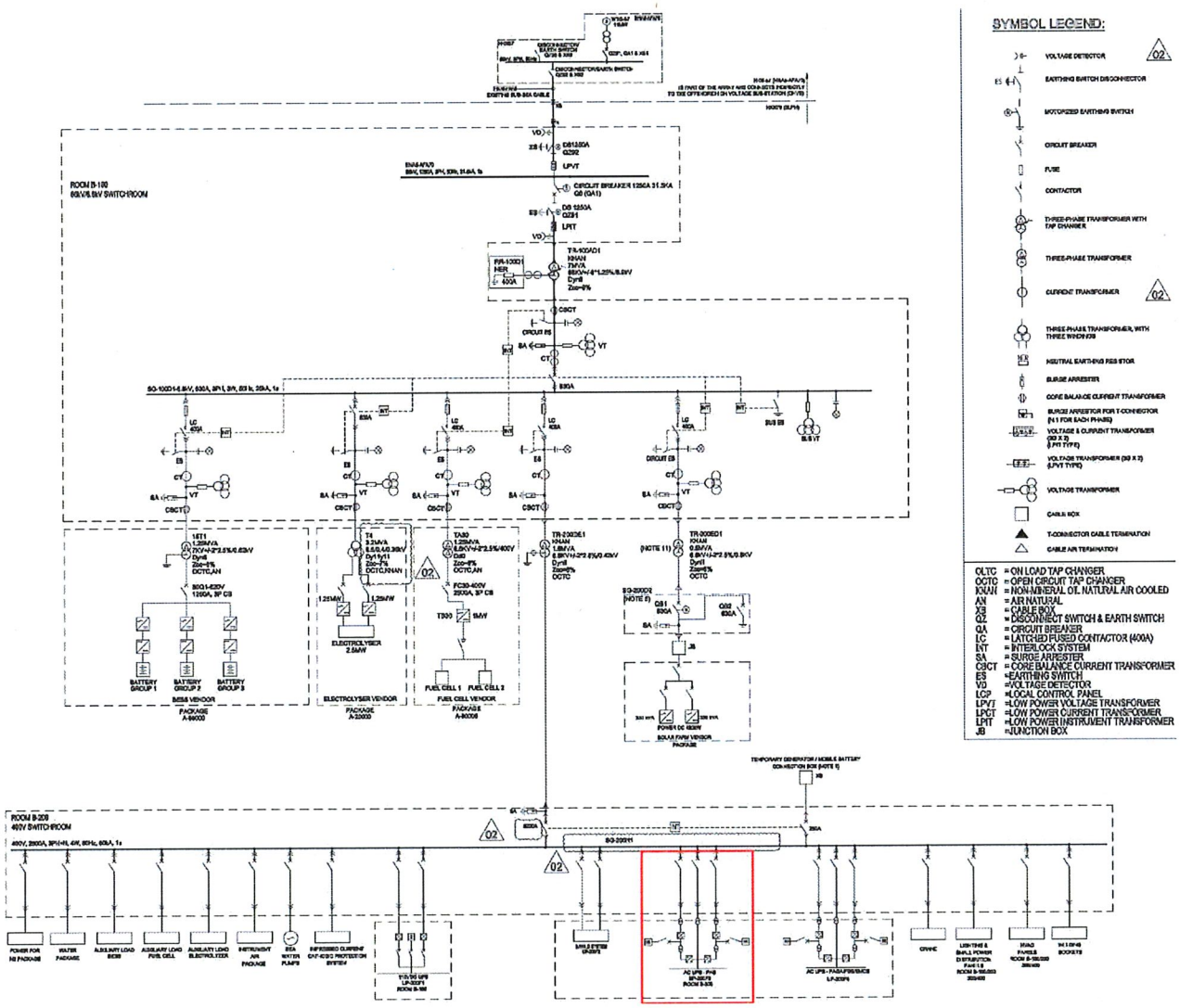


Figure 4 – OTP System Boundary Limits

.3 Test and System Description

his document is related to the following systems/ subsystems:

- 83-00: 400/230V Switchboard SG-200N1
- 83-20: 400/230V Distribution Board DP-200N1
- 84-10: 230V AC UPS - 35KVA (UP-200F3)
- 84-10: 230V UPS DISTRIBUTION BOARD (UP-200F3)

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- 84-10: UPS BATTERY RACK BANK (BA-200F3A & BA-200F3B)
- 84-10: UPS CUT OFF BREAKER (CB-200F3A/CB-200F3B)
- 79-00: EMERGENCY SHUTDOWN SYSTEMS (SIS)
- 87-10: PROCESS CONTROL SYSTEM (PCS)

All equipment is installed inside Technical Room B-300.

These parts of the system shall be tested at worksite and at site.

The UPS are metal enclosed prefabricated self-supporting type, for floor installation in compliance to the requirements of IEC 61439 1&2.

The UPS main data are the following:

GENERAL CHARACTERISTICS CLIMATIC CONDITION:
- Installation: Marine Offshore-Indoor
- Design Ambient Temperature: -8,4+40°C
- Rel. Humidity average 95%

ENCLOSURES:
- Type: Floor Standing
- Cell Type: MCC/F
- Finish Colour: RAL 7035

CONNECTIONS:
- Cable Compartment Access: Front (Incoming & Outgoing)
- Cable Entry From: Top
- Cabinet Access: Front

POWER SUPPLY:
- Rated Service Voltage: 400V
- Rated Frequency: 50 Hz
- Cabinet Rated Current: A

BUSBARS:
- Busbars: 3P+PE
- Maximum Operating Temperature: 70°C
- Protection: External IP 31

BATTERY:
- Configuration 2x50%
- Autonomy :15 MIN/BANK
- Temp. Design: -8,4 - 40 °C
- Humidity :95%
- Lead ACID VLRA GEL
- Capacity 150 Ah
- Recharge: 10h
- Float Charge: 2,25 V
- Boost Charge: 2,25 V

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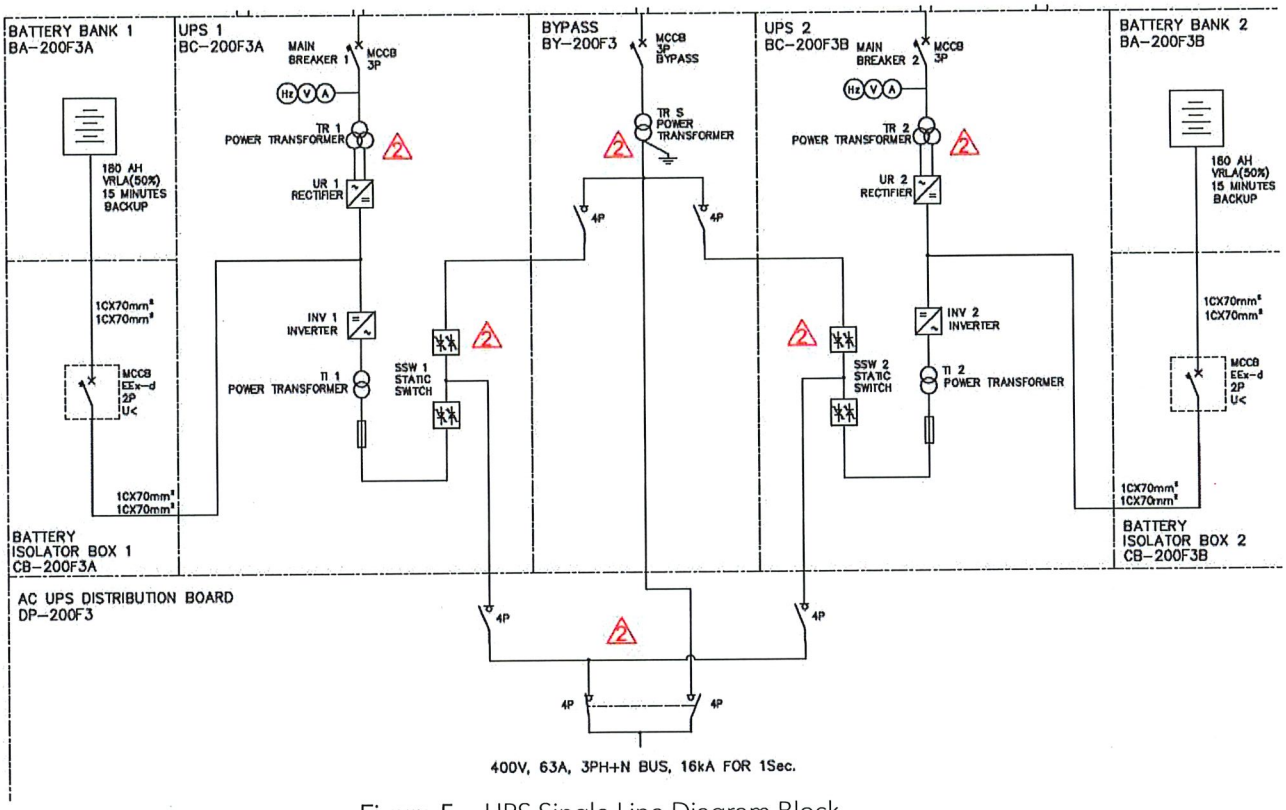


Figure 5 - UPS Single Line Diagram Block

The basic Single Line Diagram of the UPS and relevant connections is shown in the document 123A90-DDL-EL-DG-20158 "Overall/Key Single Line Electrical Diagram".

3.4 Safety Devices

- Appropriate Personnel Protective Equipment (PPE) and safety equipment e.g., safety shoes, safety glasses, hand gloves, helmet, earplugs etc. are available and must be used in line with the site requirements.
- Warning safety signs are to be posted with restricted access to essential personnel only.
- Adequate firefighting equipment.
- Specific details will be provided as part of the individual activity risk assessment prepared for each Permit to Work, which is a mandatory requirement for energizing items of equipment. Arc flash protection is not foreseen during execution of this OTP.
- PPE Will be Arc Flash Cat. 1.

3.5 HSE Management

All necessary safety precautions must be taken to avoid any risk for personnel injury.

- All personnel involved in this operational test shall be competent for the tasks they will be required to undertake
- Place safety / warning signs and segregate the entire area with barrier tapes (safety barriers) of a colour distinguished (blue and white) from those used for construction activities
- Restrict access into area only to authorized personnel
- Conduct "Toolbox Talk" with all personnel prior to starting test work

- Appropriate Personnel Protective Equipment (PPE) and safety equipment e.g. safety shoes, hand gloves, helmet, earplugs etc. are available and must be used in line with the site requirements
- All activities carried out on the project shall be performed in accordance with the "Permit to Work" system Doc. PRO-HSE-23
- Electrical and mechanical isolations are to be assured as per Doc. PRO-HSE-08 and "Commissioning and start-up operation" procedure.
- Observe and enforce all international codes and regulations to safeguard personnel, plant and environment.
- Ensure that the working area is clean, tidy, well illuminated and that access and escape routes are free from obstructions.

Before starting work on any of the activities in this OTP it is the responsibility of the persons performing the work to:

- Familiarize themselves with the plant/equipment to be worked on
- Ensure they are aware of all other work activities that are taking place, or due to take place
- If necessary, re-plan any situation/activity
- Ensure proper communications between parties involved in the execution of the OTP
- Read the relevant Vendor documentation for the equipment covered by this OTP and observe any special requirements and limitations recommended or imposed by Vendor
- Verify that all personnel involved in the implementation of this procedure are familiar with its content as well as the associated safety requirements (Toolbox Talk)

3.6 Acceptance Criteria (Functional & Communication Tests)

Before Power ON:
Visual inspection and verification are a crucial step to identify any obvious issues with the installation, such as loose connections, missing components, or damage to the equipment.

Crosschecking the installation with engineering documentation ensures that the installation is done correctly and according to the manufacturer's guidelines. These steps can help identify any missing or incorrect components, and wrong connections.

Applicable panels:

- SS80-00 UPS-200F3

Refer Overall SLD with Marked-up Sub-systems, ref. Sub-system boundary limit diagrams doc n° 123A90-PML-COM-DG-03012.

After Power ON:
Powering ON the unit is an essential step to verify that the equipment is functioning correctly. Observing if everything is OK and any alarm will help detect possible errors or malfunctions.

Phase 1 UPS START UP

will prove:

- UPS energization and start up with battery banks first charging and discharging

Phase 2 UPS OPERATIONAL AND FUNCTIONAL TESTS

will prove:

- Unit Synchronization
- Powering of one unit at the time will show A in normal operation and B in stand-by and vice versa.
- Installation and functionality of Battery breakers

- Inverter output voltage within tolerance
- Unit changes to Battery operation
- Unit changes to By-pass operation
- Functionality of Manual By-pass Switch
- Output / Distribution as per specification
- Black Start Operation

Phase 3 COMMUNICATION TESTS with PCS and ESD systems
will prove:

- Test functionality of UPS and Test communication Modbus TCP-IP with PCS

4 DOCUMENTS REFERENCES AND ABBREVIATIONS

4.1 Reference Documents

4.1.1 Company Documents and Standards

Document ID	Document Title
[1] K559-2254-CG-PHI-001	Commissioning Philosophy
[2] K559-2254-EL-ELL-002	BLPH Electrical Load List (CCS MODE 2(A) 'HOT STANDBY')
[3] K559-2254-EL-ELL-003	BLPH Electrical Load List (CCS MODE 3(C) 'DISCHARGING')
[4] K559-2254-EL-ELL-004	BLPH Electrical Load List (CCS MODE 4(A) 'COLD STANDBY')
[5] K559-2254-EL-ELL-005	BLPH Electrical Load List (CCS MODE 4A(D) 'EMERGENCY MODE (Island))
[6] K559-2254-EL-ELL-006	BLPH Electrical Load List (CCS MODE 5(D) 'POWER OUT (Blackout))
[7] K559-2254-PR-PHI-001	Main process control philosophy

Table 1: Company Key Reference Documentation

4.1.2 Project Documents

Document ID	Document Title
[1] 123A90-PML-PM-LIS-01001	Master Document Register
[2] 123A90-PML-PM-PL-00001	Project Execution Plan
[3] 123A90-PML-QHSE-PL-00001	Project HSE Plan
[4] 123A90-PRO-HSE-23	RM Yard Permit To Work Procedure
[5] 123A90-PML-COM-PL-03002	Mechanical Completion & Comm. Execution Plan
[6] 123A90-PML-COM-LIS-03011	System/Sub-Systems List
[7] 123A90-PML-COM-LIS-03012	System/Sub-System Boundary Limit Diagrams

Document ID	Document Title
[8] 123A90-PML-COM-PRO-03038	Leak Test Procedure
[9] 123A90-PML-COM-SP-03032	Pre-Commissioning Functional Test Sheet Template Collection (ITR-B)
[10]123A90-PML-COM-SP-03014	Commissioning TDS - Temporary Equipment & Facilities
[11]123A90-PML-COM-PRO-03019	OTP – Onshore Performance & Integrated Test Procedure
[12]123A90-PML-COM-LIS-03034	Inhibit-Override Register
[13]123A90-PML-COM-LIS-03035	PSV Calibration Register
[14]123A90-PML-COM-PRO-03036	OTP - Black Start Procedure
[15]123A90-PML-COM-LIS-03024	Commissioning Spare Parts and Consumables List
[16]123A90-PML-COM-PRO-03022	Initial offshore START-UP procedures
[17]123A90-PML-COM-SP-03057	Worksite WEF (Work Execution Flow Scheme)
[18]123A90-PML-COM-SP-03058	Site WEF (Work Execution Flow Scheme)
[19]123A90-PML-COM-RE-03001	Commissioning Final Dossier (ITR-B)
[20]123A90-PML-QHSE-PRO-00116	Flushing and Cleaning Procedures
[21]123A90-PML-QHSE-SP-00118	Mechanical Completion Check Sheet Template Collection (ITR-A)
[22]123A90-PML-QHSE-RE-00115	Mechanical Completion Final Dossier (ITR-A)
[23]123A90-PML-QHSE-PRO-00117	Punch list Management Procedure
[24]123A90- 123A90-PML-COM-PRO-03041	OTP - Hydrogen Storage & Venting Systems
[25]123A90- 123A90-PML-COM-PRO-03042	OTP - Sea Water Intake & Fresh Water Treatment Syst.
[26]123A90- 123A90-PML-COM-PRO-03043	OTP - Instrument Air System
[27]123A90- 123A90-PML-COM-PRO-03055	OTP - Nitrogen Generation System
[28]123A90- 123A90-PML-COM-PRO-03045	OTP - HV Switchgear & 66 kV Transformer Systems
[29]123A90- 123A90-PML-COM-PRO-03046	OTP - 6.6 kV Switchgear & Transformer Systems
[30]123A90- 123A90-PML-COM-PRO-03047	OTP - LV Switch Boards & LV Distribution Board Syst.
[31]123A90- 123A90-PML-COM-PRO-03048	OTP - Lighting & Small Power Systems
[32]123A90- 123A90-PML-COM-PRO-03049	OTP - Electrical Heat Tracing Systems
[33]123A90- 123A90-PML-COM-PRO-03050	OTP - DC UPS System 10kVA UP-200F1
[34]123A90- 123A90-PML-COM-PRO-03051	OTP - Data Network Systems
[35]123A90- 123A90-PML-COM-PRO-03053	OTP - Navaid System
[36]123A90- 123A90-PML-COM-PRO-03054	OTP - F&G and ESD C&E Logics

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Document ID	Document Title
[37]123A90-PML-QHSE-PRO-00120	Proverlis Management Procedure
[38]123A90-PML-COM-PRO-03056	OTP – Document Template
[39]123A90-PML-COM-PRO-03059	OTP - AC UPS System 35kVA UP-200F3
[40]123A90-PML-COM-PRO-03060	OTP - AC UPS System 15kVA UP-200F4
[41]123A90-PML-COM-PRO-03007	Commissioning Strategy

Table 2: Reference Project Deliverables

4.1.3 Vendor Documents

Document ID	Document Title
[1] 1723002197-COM-LIS-00001	SPARE PART INDEX REGISTER (COMMISSIONING AND OPERATION)
[2] 172400372-QC-ITP-00002	INSPECTION AND TEST PLAN
[3] 1724000372-EL-DA-00004	GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS
[4] 1724000372-EL-DS-00005	UPS & BATTERIES TECHNICAL DATA SHEET
[5] 1724000372-EL-DG-00007	AC UPS SINGLE LINE DIAGRAM AND INTERCONNECTING DIAGRAM
[6] 1724000372-EL-DG-00009	AC UPS-WIRING DIAGRAM & TERMINAL SCHEDULE INCLUDING EQUIPMENTS LIST &BILL OF MATERIAL
[7] 1724000372-EL-DG-00011	AC UPS-BATTERY LAYOUT AND INTERCONNECTING DIAGRAM
[8] 1724000372-EL-CAL-00012	BATTERY SIZING CALCULATION
[9] 1724000372-EL-CAL-00013	HEAT DISSIPATION
[10] 1724000372-EL-LIS-000014	I/O LIST
[11] 1724000372-EL-PRO-00015	PAINTING PROCEDURE
[12] 1724000372-EL-PRO-00017	UPS-FACTORY ACCEPTANCE TEST PROCEDURE
[13] 1724000372-EL-PRO-00019	UPS-SITE ACCEPTANCE TEST PROCEDURE/PRE - COMMISSIONING/COMMISSIONING PROCEDURE
[14] 1724000372-QC-LIS-00020	EQUIPMENT MANUFACTURE RECORD BOOK (FINAL DOSSIER)-INDEX
[15] 1723002197-QC-LIS-00021	EX CERTIFICATION LIST
[16] 1723002197-EL-LIS-00022	ATEX DOCUMENTATION
[17] 1723002197-QC-PRO-00055	PACKING, SHIPPING, HANDLING AND STORAGE PROCEDURES
[18] 1724000372-EL-MAN-00025	INSTALLATION, OPERATING AND MAINTENANCE MANUAL (INCLUDING SITE ERECTION INSTRUCTIONS AND PROCEDURES)

Table 3: Vendor Reference Documentation

4.2 Acronyms and Abbreviations

Acronyms / Abbreviations	Description
AIS	Automatic Identification System
AHU	Air Handling Unit

Acronyms / Abbreviations	Description
AOC	Achievement of Commissioning
C&E	Cause & Effects
CCS	Central Control System
CCTV	Closed Circuit Television
CMS	Completions Management System
CPI	Company Provided Item
CRS	Comments Response Sheet
CSU	Commissioning & Start-Up
E&I	Electrical & Instrumentation
EMCS	Electrical Monitoring & Control System
ESD	Emergency Shut Down
FAT	Factory Acceptance Test
FT	Functional Test
F&G	Fire & Gas
GALT	Gross Air Leak Test
HAZID	Hazard Identification Studies
HAZOP	Hazard and Operability Studies
HKN	Hollandse Kust Noord
HV	High Voltage
HVAC	Heating, Ventilation and Air Conditioning
HSE	Health, Safety, & Environment
ICSS	Integrated Control and Safety System
ITR	Inspection & Test Record
LC	Locked Closed
LO	Locked Open
LoSH	Limits of System Handover
LOTO	Lock-Out / Tag-Out
LV	Low Voltage
MC	Mechanical Completion
MDR	Master Document Register
MOC	Management of Change
NUI	Normally Unmanned Installation
OEM	Original Equipment Manufacturer
OMAR	Operating Modes Assurance Review
OTP	Operational Test Procedure (Commissioning)

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Acronyms / Abbreviations	Description
OR	Operations Readiness
ORR	Operations Readiness Review
PACO	Process Automation, Control and Optimisation
PCS	Process Control System
PID (P&ID)	Piping and Instrumentation Diagram
PSV	Pressure Safety Valve
PTW	Permit to Work
PVP	Piping and Vessels Preparation
PC&C	Pre-Commissioning & Commissioning
PSUA	Pre Start-Up Audit
PSSR	Pre Start-up Safety Review
RFC	Ready for Commissioning
RFO	Ready for Operation
RFSA	Ready For Sail Away
RFSU	Ready For Start-Up
SAT	Site Acceptance test
SECE	Safety Environmental Critical Element
SIF	Safety Instrumentation Function
SIL	Safety Integrity Level
SIMOPS	Simultaneous Operations & Maintenance
SIS	Safety Instrumented System
SLD	Single Line Diagram
SoF	Statement of Fitness
TA	Technical Authority
TQ	Technical Query
TIV	Technical Integrity verification
UPS	Uninterruptible Power Supply
VHF	Very High Frequency
VSAT	Very Small Aperture Terminal

Table 4: Acronyms and Abbreviations

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5 OTP AT ONSHORE WORKSITE

This chapter refer to the activities on the Contractor worksite (construction yard).

5.1 Planning and Manpower

5.1.1 Planned tasks with estimated manpower

Estimated manpower for the entire duration of the Test:

- 1 E&I commissioning superintendent
- 1 E&I commissioning supervisor from Contractor
- 1 E&I commissioning technicians from Contractor
- 1 Vendor technician
- 1 PCS/ESD Workstation Operators (phase 3)

5.1.2 Test duration estimate

The test duration should be as follows:

- 5 days approx.

If necessary, the estimated time can be extended in order to complete all required pre-commissioning and commissioning activities.

5.1.3 Vendor Assistance

Equipment vendor 3W Power S.p.A. will provide a qualified specialist to assist with all aspects of commissioning of the UPS-200F3 system.

5.1.4 Items Postponed to C&E OTP

Not applicable

5.1.5 HOLDS

Not applicable

5.2 OTP Test Requirements – Onshore WORKSITE

5.2.1 Pre-Commissioning Achievement

Prior the commissioning operation starts, the relevant pre-commissioning ITR's should be fully signed.
Specific details shall be reviewed on the completion management database Proverlis in order to access the latest updated status in real time.

5.2.2 Commissioning Achievement

The commissioning achievement will be the successful operation, functionality and safeguarding test of UPS, installed and put in operation during the WORKSITE phase:

- 83-00: 400V Switchboard SG-200N1
- 83-20: 400V Distribution Board DP-200N1

- 84-10:230V UPS AC UP-200F3

5.2.3 Status of Required Associated Subsystems

PHASE 1 UPS START UP with battery banks first charging and discharging tests
Subsystems required RFC for Commissioning of UPS

- 83-00 400V Switchboard SG200N1
- 83-20 Distribution board DP-200N1
- 88-00: Earthing System
- 83-99: Temporary Yard 400/230V Main and auxiliary power supplies
- 84-10: UPS AC UP-200F3

PHASE 2 UPS OPERATIONAL AND FUNCTIONAL TESTS
Subsystems required RFC for Commissioning of LV Power Distribution:

- 83-00 400V Switchboard SG200N1
- 83-20 Distribution board DP-200N1
- 88-00: Earthing System
- 83-99: Temporary Yard 400/230V Main and auxiliary power supplies
- 84-10: UPS AC UP-200F3

PHASE 3 COMMUNICATION TESTS with PCS and ESD systems
Subsystems required RFC for Commissioning of UPS:

- 83-00 400V Switchboard SG200N1
- 83-20 Distribution board DP-200N1
- 88-00: Earthing System
- 83-99: Temporary Yard 400/230V Main and auxiliary power supplies
- 84-10: UPS AC UP-200F3
- 79-00: SIS (ESD)
- 87-10: Process Control System (PCS)

5.2.4 Special Tools & Test Equipment

The following special tool and Test Equipment are required (see vendor document 1723002197-EL-LIS-00053):

- Voltage, frequency, continuity tester (Multimeter)
- Phases sequence tester
- Infrared temperature instrument
- Temporary Load Bank (Rated 35kVA)
- Portable radios
- 230VAC/24VDC temporary stabilized power supply

TESTING & MEASUREMENT INSTRUMENT USED			
Type	Serial N.	Calibration certificate	Validity

5.2.5 Consumable List

Not applicable

5.2.6 Commissioning Spare Parts

Reference is made to 3W document 1723002197-COM-LIS-00052 "Commissioning and operation Spare Parts Index Register" regarding the UPS spare parts.

Item Number	Total number of identical spares installed	Description of recommended spare parts	Parts/drawing ref.	
			Project Datasheet no.	Project Detail dwg. no.
	7	8	9	10
1	36	FUSE 6,3 X 32 F5A 500VAC	1724000372-EL-DS-00005	1724000372-EL-DG-00009
2	16	G-FUSE 6,3 X 32 F4A 440V KTA/UL	1724000372-EL-DS-00005	1724000372-EL-DG-00009
3	4	FUSE 6,3 X 32 T8A 500VAC KTA	1724000372-EL-DS-00005	1724000372-EL-DG-00009
4	4	G-FUSE 6,3 X 32 M2A 500V	1724000372-EL-DS-00005	1724000372-EL-DG-00009
5	4	619 ADD. REMOTE SIGNAL. OPTION-2 F UPS	1724000372-EL-DS-00005	1724000372-EL-DG-00009
6	4	261 SBS INTERFACE P8 3-PHASE	1724000372-EL-DS-00005	1724000372-EL-DG-00009
7	4	261 INVERTER INTERFACE P8 3-PHASE	1724000372-EL-DS-00005	1724000372-EL-DG-00009
8	4	261 RECTIFIER INTERFACE P8	1724000372-EL-DS-00005	1724000372-EL-DG-00009
9	32	FUSE CER. 5 X 20 T3,15A 250VAC	1724000372-EL-DS-00005	1724000372-EL-DG-00008
10	8	CYL. FUSE 5 X 20 2,5A SP 380V S	1724000372-EL-DS-00005	1724000372-EL-DG-00008
11	2	PCB EQUIP. GCAU V3 VERNISH	1724000372-EL-DS-00005	1724000372-EL-DG-00008
12	2	PCB RELAY PROTECT RCS VARNISH	1724000372-EL-DS-00005	1724000372-EL-DG-00008

Table 5: Spare part List

5.2.7 Temporary Facilities

Phase 1 and Phase2: Temporary Load Bank for battery discharge tests and UPS functional test with rating 35kVA.

5.3 OTP Description – Onshore WORKSITE

5.3.1 OTP Test Preparation

Step	Description	Result	Verified by	Date
1	System Ready for Commissioning Certificate (RFC) is issued and approved.	ok		07/11/2024
2	No Mechanical Completion or Pre-commissioning punch list 'A' items are outstanding against the system to be commissioned.	ok		07/11/2024

Step	Description	Result	Verified by	Date
3	Factory Acceptance Test Procedure has been carried out successfully (refer to Doc. 1723002197-QC-PRO-00045)	Ok		07/11/2024
4	All personnel involved in the implementation of this procedure are familiar with its content as well as with associated safety requirements (Toolbox Talk to be conducted before initiation of activities).	Ok		07/11/2024
5	A final walkdown of the system has been completed, to ensure that the system and the area are ready for commissioning.	Ok		07/11/2024
6	Check that areas are free for work and escape routes are clear of any obstructions.	Ok		07/11/2024
7	All safety barriers and warning signs have been installed. All specific safety requirements will be detailed within HSE risk assessment mandatory for every Permit to Work (PTW).	Ok		07/11/2024
8	Ensure that proper communications have been established between parties involved in the implementation of the procedure.	Ok		07/11/2024
9	Verify availability of test equipment and consumables as per section 3.2.4.	Ok		07/11/2024
10	System(s) isolations as per LOTO procedure defined within HSSE Permits to Work and Commissioning procedures duly prepared and approved. Particular attention will be given to LOTO isolation of UPS outgoing MCB feeders.	Ok		07/11/2024
11	All yard personnel have been duly notified by dedicated LUN (Livening Up Notification) that the system(s) is ready for commissioning.	Ok		07/11/2024

5.3.2 Electrical Preparation

Step	Description	Result	Verified by	Date
12	Check related punch list 'B' items and confirm acceptability for start of commissioning activities.	Ok		07/11/2024
13	Verify that all relevant associated systems / subsystems are completed.	Ok		07/11/2024
14	Check that grounding and bonding are in accordance with applicable documents.	Ok		07/11/2024
15	Review and confirmation of protection settings on up-stream LV Switchboards feeder power supply circuit breakers.	Ok		07/11/2024

Step	Description	Result	Verified by	Date
16	Verify finalization of UPS '1', '2' and 'By-Pass' Units internal power and auxiliary circuit connections in accordance with manufacturers documentation.	OK		07/11/2024
17	Verify finalization of the auxiliary contact connection between UP-200F3 UPS Unit '1' (Inverter) and UPS MAIN DISTRIBUTION SWITCHBOARD SG-200N1 related to acquisition of the simultaneous CLOSED status of three circuit breakers INCOMER UPS '1', IN-COMER UPS '2'	OK		07/11/2024

5.3.3 Mechanical Preparation

Not applicable.

5.3.4 Instrument Preparation

Step	Description	Result	Verified by	Date
18	Check related punch list 'B' items and confirm acceptability for start of commissioning activities.	OK		07/11/2024
19	Verify that all relevant associated systems / subsystems are ready.	OK		07/11/2024
20	Check Inhibit and Override register has been prepared and validated.	OK		07/11/2024
21	Verify that relevant equipment/ components are available and in operation for start of commissioning activities.	OK		07/11/2024

5.3.5 Piping Preparation

Not applicable

5.3.6 Additional Discipline Preparation

Not applicable.

5.4 OTP Test Steps – Onshore WORKSITE - PHASE 1

During the PHASE 1 will be tested:

- Startup UPS '1' and '2' and bypass
- First charge of battery racks 'A' and 'B' (12 hours each)
- Discharge of battery racks 'A' and 'B' (10 hours each)
- Second recharge racks 'A' and 'B' (battery banks in normal operation)

5.4.1 Test Preparation

Need to Verify:

- 400V Power supply is available
- All systems and subsystems involved in this procedure must be ready for commissioning and available.

5.4.1.1 UPS Start-Up Procedure

Step	Description	Result	Verified by	Date
START-UP UPS				
	Preparation before start-up:			
1	*Before start-up, check that the default equipment data tallies with the battery data*	OK		14/11
2	*Before start-up, check that the equipment is earthed in accordance with regulations*	OK		14/11
3	*Make sure that the ventilation grids are never covered during operation*	OK		14/11
4	Check the battery cut off breaker Q2 is open.	ok		14/11
5	Set the load interrupter switch Q1 to the "OFF" position.	OK		14/11
6	Set the manual bypass switch Q29 to position "3 - Manual bypass".	ok		14/11
7	Remove the protective cover from the connection panel	OK		14/11
8	Check connection of the mains voltage for the rectifier.	OK		14/11
9	Measure the mains voltage at connection terminal X1 (outer conductor/outer conductor): the mains voltage is U~ = 400 V	ok		14/11
10	Measure the mains voltage at connection terminal X4 (outer conductor/neutral conductor): the mains voltage is U~ = 230 V	OK		14/11
11	Check the Phase rotation at connection terminal X1: L1, L2 and L3 clockwise rotation	Ok		14/11

Step	Description	Result	Verified by	Date
12	Disconnect the mains voltage for the rectifier	OK		14/11/2024
13	Resolve any problems identified	OK		14/11/2024
14	Replace the protective cover on the connection panel.	OK		14/11/2024
15	Confirm absence of anomalies preventing UPS start-up.	OK		14/11/2024
Starting UP the UPS				
16	Set the load interrupter switch Q1 to the "OFF" position	OK		14/11/2024
17	- Set the manual bypass switch Q29 to position "2 - Service operation".	OK		14/11/2024
18	Connect the mains voltage for the rectifier.	OK		14/11/2024
19	Connect the mains voltage for the bypass circuit	OK		14/11/2024
20	Check status: The bypass is starting up, *the green and yellow LEDs are flashing. LCD: "Main menu" is displayed*	OK		14/11/2024
21	Wait for status: The bypass is ready, *the green LED is flashing. LCD: "Bypass symbol OK" is displayed*	OK		14/11/2024
22	Set the manual bypass switch Q29 to position "1 - Inverter operation". *The green and yellow LEDs flash.*	OK		14/11/2024
23	Set the load interrupter switch Q1 to the "ON" position.	OK		14/11/2024
24	Wait for status: The REC is ready, *the green LED is flashing. LCD: "INV symbol OK" is displayed*	OK		14/11/2024
25	Check the battery cut off breaker Q2 voltage and polarity	OK		14/11/2024
26	Close the battery cut off breaker Q2	OK		14/11/2024
27	Press the "~I" key on the HMI. *LCD: "INV symbol" flashes*	OK		14/11/2024
28	Wait for status: Bypass switches to normal operation, *green LED lights up. LCD: "Energy flow display via INV" is displayed*	OK		14/11/2024

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Step	Description	Result	Verified by	Date
29	The first UPS unit is now in operation, repeat the above STEPS to start the second UPS unit.	OK		14/11/2024

5.4.1.2 Charge And Discharge Battery

Here follows the installed battery type datasheet:

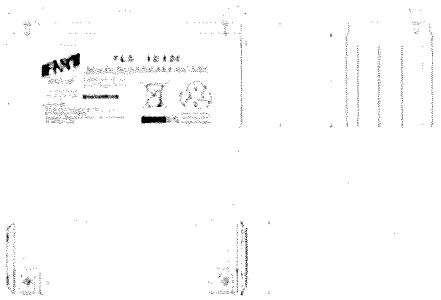
FAAM

FLG 12-150

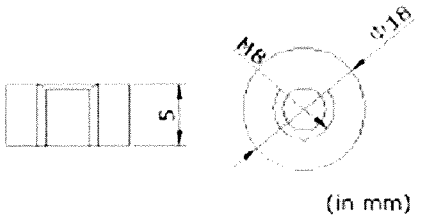
DIMENSIONAL FEATURES

Nominal Voltage Nominal Capacity (20 hours)		12V 150Ah (Vfin 1,85pc at 20°C)
Dimensions	Length Width Box Height Total Height	485±2mm 172±2mm 240±2mm 240±2mm
Drawing n° 4 00327-0		Weight 47,5 Kg ± 5%
Standard Terminal		Female screw type : M8

Nominal Capacity (100Hr) 229Ah (Vfin 1,8pc at 20°C)
Gel technology VRLA (Valve Regulated Lead Acid)
ABS FV-0 container and lid
Battery sealed no maintenance
Design life >12 years (at 20°C) "Long Life"
Standards: IEC EN 60896 Parts 21 and 22



Bolt-and-nut terminal
Bolt Type:M8



(in mm)

ELECTRIC FEATURES

Characteristics

Capacity	20 hours rate (Vfin 1,8pc at 20°C)	150,00Ah
	10 hours rate (Vfin 1,8pc at 20°C)	135,00Ah
	5 hours rate (Vfin 1,75pc at 20°C)	118,60Ah
	3 hours rate (Vfin 1,75pc at 20°C)	103,95Ah
	1 hour rate (Vfin 1,6pc at 20°C)	86,01Ah
Capacity affected by temperature	40°C	102%
	20°C	100%
	0°C	85%
Internal Resistance 3,9 mΩ ±10%		SCC 3250 A ±10%
Constant Voltage Charge	Cycle use	Initial Charging Current less than 45 A Voltage 14,4÷15,0V at 20°C Temperature Coefficient -30 mV/°C
	Stand by use	No limit on Initial Charging Current Voltage 13,5÷13,8V at 20°C Temperature Coefficient -20 mV/°C

Discharge curves @ 20°C



Constant Current(Amp) and Constant Power (Watt/Cell) Discharge Table at 20°C

Final V./Time		5min	15min	30min	60min	90min	120min	180min	300min	480min	600min
9,9V	A	204,28	144,89	101,40	85,79	67,98	57,46	34,72	23,82	16,42	14,18
	W	554,04	416,51	274,48	176,47	142,95	107,70	70,94	48,71	36,42	30,49
10,2V	A	185,64	143,39	98,38	70,44	55,82	47,18	34,65	23,72	16,35	13,97
	W	538,86	403,20	265,95	170,99	138,51	104,36	70,52	48,43	36,21	30,43
10,8V	A	149,11	124,90	93,46	68,80	54,51	46,08	34,26	23,34	16,09	13,50
	W	505,97	380,38	250,90	161,31	130,67	98,45	69,14	47,48	35,50	29,83

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Step	Description	Result	Verified by	Date
Battery bank FIRST Charging operation (commissioning charge)				
In charger only mode the rectifier is on and charging the battery. There is no output voltage and the load is not supplied.				
This mode can be used to fully charge the battery before operation. This activity will be performed with Vendor Technician.				
Verification of system status for CHARGING:				
30	Perform first full commissioning charge of Battery Bank A with duration 12 hours. N.B. The UPS unit must be recalibrated by vendor field engineer for the purpose of the test. Commissioning charge voltage seting equal to: .....V With reference to Annex 001 '12h Capacity charge test record' start recording measurements at beginning of charging cycle every 30 minutes. ANNEX 001 12H CAPACITY CHARGE TEST RECORD	OK		14/11/2024
31	Perform first full commissioning charge of Battery Bank B with duration 12 hours. N.B. The UPS unit must be recalibrated by vendor field engineer for the purpose of the test. Commissioning charge voltage setting equal to: .....V With reference to Annex 002 '12h Capacity charge test record' start recording measurements at beginning of charging cycle every 30 minutes. ANNEX 002 12H CAPACITY CHARGE TEST RECORD	OK		14/11/2024
After successful completion of above steps record Battery Bank A and B terminal voltages.				

Step	Description	Result	Verified by	Date
32	Record Battery Bank A Terminal voltage. Record results in: "ANNEX 003 - BEFORE DISCHARGE BANK A"	OK		14/11/2024
33	Record Battery Bank B Terminal voltage. Record results in: "ANNEX 004 - BEFORE DISCHARGE BANK B"	OK		14/11/2024
After successful completion of above steps prepare for Battery Banks Discharge tests.				
Verification for system status for DISCHARGING:				
34	Verify that Batteries are disconnected from UPS, cut off breakers are open.	ok		14/11/2024
35	With vendor field service engineer connect temporary load bank to AC output of UPS.	ok		14/11/2024
36	The Discharge tests will be performed with a constant discharge current of 13,5A for the duration of the 10h test.	OK		14/11/2024
37	Verify that all connections between UPS and temporary Load Bank are correct	OK		14/11/2024
38	Verify and confirm that auxiliary power supply for Load Bank is OK.			14/11/2024
After completion of above verification steps continue with following steps and record results in relevant attached ANNEX documents. Perform each Battery Bank discharge test separately, First Battery Bank A and then Battery Bank B. Records measurements in intervals of 30 minutes. During each measurement record ambient temperature.				
39	Perform discharge of Battery Bank A for 10h. Record results in: "ANNEX 05 - DISCHARGE BANK A"	ok		14/11/2024
40	Perform discharge of Battery Bank B for 10h. Record results in: "ANNEX 06 - DISCHARGE BANK B"	ok		14/11/2024

Step	Description	Result	Verified by	Date
	Battery Re-Charge			
	Verification for system status for CHARGING:			
41	N.B. The UPS unit must now be recalibrated by vendor field engineer to the normal volatge value for the UPS normal operation. UPS'1' Normal Voltage battery charging calibration equal to: 255/259 .....V UPS'2' Normal Voltage battery charging calibration equal to: 257/259 V	OK		15/11/2024
42	Proceed with recharging of battery bank A under normal operation UPS '1' charging conditions and monitor periodically battery voltages for a period of 10 h. Confirm normal operation of UPS '1' with no alarms and battery bank A voltages after 10 hours period.	OK		15/11/2024
43	Proceed with recharging of battery bank B under normal operation UPS '2' charging conditions and monitor periodically battery voltages for a period of 10 h. Confirm normal operation of UPS '2' with no alarms and battery bank B voltages after 10 hours period.	OK		15/11/2024

5.4.2 OT WORKSITE Phase 1 - Tests Notes and Remarks

5.4.2.1 OTP Worksite Phase 1 - Tests Certifying Authority Table of Attendances

Name and Surname	Certifying Authority	Position	Signature

5.4.2.2 OTP WORKSITE Phase 1 - Tests Final Signatures and Company Acceptance

Name and Surname	Company Representative	Position	Signature
KRISTIAN CASTELLANI	ROSETTI M.	LEAD E/C COMM.	
MARCO TARCHI	CROSSWIND	COMM MANAGER	
ANTHONY IVERSON	ROSETTI MARINO	COMM. MGR.	

5.4.3 OTP Steps WORKSITE - PHASE 2

It is foreseen that previous sections are successfully performed.

The cabinet UPS is available, and all necessary tests are performed and accepted for that system.
All Cables are pulled up, tested and yard temporary power supply is completed and available.
UPS AC is working in normal operation and no alarm pending.

In the following steps the functionality of UPS shall be tested for:

- SS 83-00: 400V Switchboard SG-200N1 Main power supply feeders
- SS 83-20: 400V Distribution Board DP-200N1 Aux. power supply feeder
- SS 87-10: 230V UPS UP-200F3

Powering ON the unit is an essential step to verify that the equipment is functioning correctly. Observing if everything is OK and any alarm will help detect possible errors or malfunctions.

PHASE 2 will be performed through permanent power supply feeder arrangements.
PHASE 2 will prove correct:

- Voltage, frequency and phase sequence to the terminals of Incoming 1&2 (Rectifier) and Bypass are according to specification.
- Unit Synchronization
- Powering of one unit at the time will show UPS'1' in normal operation and UPS'2' in stand-by and vice versa.
- Installation and functionality of Battery breakers
- Charging of batteries and battery current
- Inverter output voltage within tolerance
- Functionality of Manual By-pass Switch
- Black start operation
- Output / Distribution as per specification

5.4.3.1 Verify UPS Unit'1'

These steps are required for initial verification of the UPS Unit '1'.

The following power supplies are available:

- Auxiliaries power supply from DP-200N1
- Main power supplies from SG-200N1

Step	Description	Result	Verified by	Date
SS 84-10 UPS SYSTEM INITIAL VERIFICATION				
1	Verify all metallic parts are correctly earthed as per engineering documentation	OK		19/11/2024
2	Verify that all UPS internal circuit breakers and fuses are in the close / on position and UPS healthy with no alarms	ok		19/11/2024

Step	Description	Result	Verified by	Date
3	Verify that the battery cut-off breaker related to Battery Bank 'A' Q2 is in the close / on position	ok		14/11/2024
4	Verify and confirm availability of temporary power supply on main input terminals	ok		14/11/2024

5.4.3.2 Verify UPS UNIT 'BYPASS'

These steps are required for initial verification of the UPS Unit 'By-Pass'.

The following power supplies are available:
- Auxiliaries power supply from DP-200N1
- Main power supplies from SG-200N1

Step	Description	Result	Verified by	Date
SS 84-10 UPS SYSTEM INITIAL VERIFICATION				
5	Verify all metallic parts are correctly earthed as per engineering documentation	ok		19/11/2024
6	Verify that all UPS internal circuit breakers and fuses are in the close / on position	ok		19/11/2024
7	Verify all metallic parts are correctly earthed as per engineering documentation	ok		19/11/2024

5.4.3.3 Verify UPS UNIT'2'

These steps are required for initial verification of the UPS Unit '2'.

The following power supplies are available:
- Auxiliaries power supply from DP-200N1
- Main power supplies from SG-200N1

Step	Description	Result	Verified by	Date
SS 84-10 UPS SYSTEM INITIAL VERIFICATION				
8	Verify all metallic parts are correctly earthed as per engineering documentation	OK		14/11/2024
9	Verify that all UPS internal circuit breakers and fuses are in the close / on position	OK		14/11/2024
10	Verify and confirm availability of temporary power supply on main input terminals	OK		14/11/2024

5.4.3.4 Verify UPS Functional Test

Step	Description	Result	Verified by	Date
UPS '1' & '2' and Bypass Functional test				
1.	Confirm that main breaker QF1 on both Incoming 1 & 2 are CLOSED (A3/+01 SG200N1) & (A4/+01 SG200N1)	Ok		14/11/2024
2.	Confirm that main breaker QF1 on Bypass is CLOSED (A7/+02 SG200N1)	Ok		
3.	Confirm that Battery banks are powered ON, and Battery MCCB box 1&2 are overridden from ESD (selector switch S2 in position Override) and both breakers Q2 are CLOSED	Ok		
4.	Confirm there is no alarms present on HMI UPS UP-200F3.	Ok		
5.	Breaker status: Q29 – Manual Bypass CLOSED UPS '1' Q1 – CLOSED UPS '2' Q1 – CLOSED UPS '1' Q2 – CLOSED (Battery) UPS '2' Q2 – CLOSED (Battery)	Ok		
RECTIFIER A1 OF UPS '1' MAINS FAILURE.				
This check is performed for one unit at a time, starting with unit 1. Afterwards unit 1 is in standby and unit 2 is in normal operation, with load connected of 35kVA.				
6.	Open the MCCB in A3/+01 of SG-200N1 SWBD			
7.	Check the incoming AC voltage on terminals X1: 1U,1V,1W. (Expected Value 0 V) Vin =.....V Check the incoming AC current through UPS '1' control panel HMI -A18 (Expected value 0 A): Ain = ...A Check the AC voltage in output on terminals X3: U,V,W (Expected Value 400V) Vout= ..... V Check the output AC current through UPS '1' control panel HMI -A18 (Expect Value Equal to 50 % of Nominal Current):	Ok		

Step	Description	Result	Verified by	Date
	Aout=.....A Verify the Normal operation of INVERTER A2 of UPS'1' via Battery Bank BAT1.	OK		19/11/2024
RECTIFIER A1 OF UPS '1' MAINS RETURN				
8.	Close the MCCB in A3/+01 of SG-200N1 SWBD			
9.	Check the incoming AC voltage on terminals X1: 1U,1V,1W. (Expected Value 400 V) Vin =.....V Check the incoming AC current through UPS '1' control panel HMI -A18 (Expected value Equal to 50% of Nominal Current): Ain = ...A Check the AC voltage in output on terminals X3: U,V,W (Expected Value 400V) Vout= ..... V Check the output AC current through UPS '1' control panel HMI -A18 (Expect Value Equal to 50% of Nominal Current): Aout=.....A Verify the Normal operation of INVERTER A2 of UPS'1' via Battery Bank BAT1.	OK		
INVERTER A2 OF UPS '1' FAILURE – Transfer from Inverter to UPS2 PARALLEL OPERATION				
10.	Switch off Inverter A2 via HMI -A18			

Step	Description	Result	Verified by	Date
11.	Record AC Load Voltage and AC Load current at terminals X3 and UPS'2' terminals X4. Check the AC voltage on terminals X3: U, V, W (Expected Value 400 V) Vout= ..... V Check the output AC current through Inverter A2 in UPS '1' control panel HMI -A18 (Expected Value 0 A): Aout=.....A Check the AC voltage on terminals X4: U, V, W (Expected Value 400 V) Vout= ..... V Check the UPS'2' AC current on control panel HMI -A18 (Expected Value 100% of Nominal Current) Aout=.....A	OK	M Patella	14/11/2024
INVERTER A2 OF UPS 1 RESTORATION - Transfer of load from UPS2 to Inverter				
12.	Switch ON the Inverter A2 via HMI -A18			
13.	Recording of AC Load Voltage and AC Load current at terminals X3 and UPS'2' terminals X4. Check the AC voltage on terminals X3: U,V,W (Expected Value 400 V) Vout= ..... V Check the output AC current through Inverter A2 in UPS '1' control panel HMI -A18 (Expected Value 50% of Nominal Current): Aout=.....A Check the AC voltage on terminals X4: U, V, W (Expected Value 400 V) Vout= ..... V Check the bypass AC current on control panel HMI -A18 (Expected Value 0 A). Aout=.....A	OK	M Patella	14/11/2024
PARALLEL OPERATION UPS1 and UPS2 Switching OFF UPS2 via MCCB of SG200N1				
14.	Open MCB of A4/+01 of the UPS '2' in SG-200N1			

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15.	Switch off Inverter A2 of UPS '2' with MCB Q2			
16.	Verify UPS1 takes over 100% Load via HMI -A18: AC Load voltage and AC load current and SBS current by screen shot.	ok		19/11/2024
RECTIFIER A1 OF UPS '2' MAINS FAILURE				
17.	This check is performed for one unit at a time, starting with unit 1. Afterwards unit 2 is in standby and unit 1 is in normal operation, with load connected of 35kVA.	ok		19/11/2024
18.	Open the MCCB in A4/+01 of SG-200N1 SWBD	ok		19/11/2024
19.	Check the incoming AC voltage on terminals X1: 2U,2V,2W.(Expected Value 0 V) Vin =.....V Check the incoming AC current through UPS '2QQ' control panel HMI -A18 (Expected value 0 A) : Ain = ...A Check the AC voltage in output on terminals X3: U,V,W (Expected Value 400V) Vout= ..... V Check the output AC current through UPS '2' control panel HMI -A18 (Expect Value Equal to 50% of Nominal Current): Aout=.....A Verify the Normal operation of INVERTER A2 of UPS'1' via Battery Bank BAT2.	ok		
RECTIFIER A1 OF UPS '2' MAINS RETURN				
20.	Close the MCB in A4/+01 of SG-200N1 SWBD	ok		19/11/2024

21.	Check the incoming AC voltage on terminals X1: 2U,2V,2W. (Expected Value 400 V) Vin =.....V Check the incoming AC current through UPS '2' control panel HMI -A18 (Expected value 50% of nominal current A) : Ain = ...A Check the AC voltage in output on terminals X3: U,V,W (Expected Value 400V) Vout= ..... V Check the output AC current through UPS '1' control panel HMI -A18 (Expect Value Equal to 50% of Nominal Current): Aout=.....A Verify the Normal operation of INVERTER A2 of UPS'2' via Battery Bank BAT2.	OK	M Bielli	19/11/2024
INVERTER A2 OF UPS '2' FAILURE – Transfer from Inverter to UPS1				
22.	Switch off Inverter A2 via HMI			
23.	Record AC Load Voltage and AC Load current at terminals X3 and UPS'1' terminals X2. Check the AC voltage on terminals X3: U, V,W (Expected Value 400 V) Vout= ..... V Check the output AC current through Inverter A2 in UPS '2' control panel HMI -A18 (Expected Value 0 A): Aout=.....A Check the AC voltage on terminals X4: U, V,W (Expected Value 400 V) Vout= ..... V Check the UPS'1' AC current on control panel HMI -A18 (Expected Value 100% of Nominal Current) Aout=.....A	OK	M Bielli	19/11/2024

INVERTER A2 OF UPS "2" RESTORATION - Transfer of load from UPS'1' Mains to Inverter				
24.	Switch ON the Inverter A2 via HMI			
25.	Recording of AC Load Voltage and AC Load current at terminals X3 and UPS'1' terminals X4. Check the AC voltage on terminals X3: U,V,W (Expected Value 400 V) Vout= ..... V Check the output AC current through Inverter A2 in UPS '2' control panel HMI -A18 (Expected Value 50% of Nominal Current): Aout=.....A Check the AC voltage on terminals X4: U, V,W (Expected Value 400 V) Vout= ..... V Check the bypass AC current on control panel HMI -A18 (Expected Value 0 A). Aout=.....A	OK		19/11/2024
PARALLEL OPERATION UPS1 AND UPS2 Switchin OFF UPS1 AND UPS 2 via MCCB of SG200N1				
26.	Open MCCB of A3/+01 of the UPS '1' in SG-200N1	OK		19/11/2024
27.	Switch off Inverter A2 of UPS '1' with MCB Q2	OK		19/11/2024
28.	Verify UPS '2' takes over 100% Load via HMI-A18: AC Load voltage and AC load current and SBS current by screen shot	OK		19/11/2024

29.	Open MCCB of A4/+01 of the UPS '2' in SG-200N1	OK		
30.	Switch off Inverter A2 of UPS '2' with MCB Q2	OK		
31.	Verify Bypass takes over 100% Load via HMI-A18: AC Load voltage and AC load current.	OK		
UPS1 RESTORATION				
32.	Close MCCB of A3/+01 of the UPS'1' in SG200N1	OK		
33.	Switch ON Inverter A2 of UPS'1' with MCB Q2			
UPS 2 RESTORATION				
34.	Close MCCB of A4/+01 of the UPS'2' in SG200N1	OK		
35.	Switch ON Inverter A2 of UPS'2' with MCB Q2	OK		

5.4.3.5 Black Start Operation

Step	Description	Result	Verified by	Date
Black Start				

Step	Description	Result	Verified by	Date
With Black Start it is possible to start the system with only the batteries when the rectifier mains and bypass mains are unavailable. UPS is switched OFF at start of this test.				
Verification for system status				
1.	Verify that Rectifier mains breaker(s) Q1 (UPS 1 and UPS 2) for Incoming 1 and Incoming 2 are in: **Open position** The rectifier main supplies are not available.	ok		19/11/2024
2.	Measure and record battery banks A & B terminal voltages, confirm suitability to perform Black Start procedure, minimum voltage >195V: Bank A: ..... V Bank B: V	ok		19/11/2024
3.	Verify that Bypass mains input breaker Q10 is in: **Open position** The bypass main supply is not available	ok		19/11/2024
4.	Verify that Output breaker(s) Q31, Q32, Q33,Q34,Q35,Q36,Q37,Q38,Q39,Q40,Q41,Q42 ,Q43,Q44,Q45,Q46, Q47,Q48,Q49 are in: **Open position** Consumers must be volt free	ok		19/11/2024
Black Start procedure				
IMPORTANT: The DC capacitors must be charged before connecting the load to the batteries.				
5.	**BLACK START UPS'1'** With reference to battery cut off breaker enclosures **(CB-200F3A/CB-200F3B)** locate the following: - Selector switch S1 ON-OFF - Selector switch S2 NORMAL-OVERRIDE	ok		19/11/2024
6.	Rotate selector switch S2 from position NORMAL to position OVERRIDE (ESD healthy signal not available).	ok		19/11/2024
7.	Rotate the selector switch S1 from position OFF to position ON (shunt resistor internally	ok		19/11/2024

Step	Description	Result	Verified by	Date
	connected to enable precharging of UPS capacitors)	OK		19/09/2024
8.	Confirm power up of UPS'1' controller HMI -A18 within 10 seconds of rotated selector switch S1 to ON position	OK		
9.	When, and only when the controller HMI -A18 will be powered up proceed to close battery cut off breaker Q2.	OK		
10.	The inverter A2 will now be operational and AC output voltage available for essential loads. Proceed to close the followings MCBs: Q31,Q32,Q33,Q34,Q35,Q36,Q37,Q38,Q39,Q40 ,Q41,Q42,Q43,Q44,Q45,Q46, Q47,Q48,Q49	OK		
11.	Once essential loads will be operational and platform operational status normal it will be possible to reset the black start scenario.	OK		
12.	With reference the battery cut off breaker enclosure **CB-200F3A** rotate the selector switches as follows: - Selector switch S1 OFF - Selector switch S2 NORMAL	OK		
13.	The battery cut off breaker should remain closed and connected as per normal UPS operation.	OK		
14.	**BLACK START UPS'2'** With reference to battery cut off breaker enclosures **(CB-200F3A/CB-200F3B)** locate the following: - Selector switch S1 ON-OFF Selector The inverter A2 will now be operational and AC output voltage available for essential loads switch S2 NORMAL-OVERRIDE	OK		
15.	Rotate selector switch S2 from position NORMAL to position OVERRIDE (ESD healthy signal not available).	OK		
16.	Rotate the selector switch S1 from position OFF to position ON (shunt resistor internally connected to enable precharging of UPS capacitors)	OK		

Step	Description	Result	Verified by	Date
17.	Confirm power up of UPS'2' controller HMI -A18 within 10 seconds of rotated selector switch S1 to ON position	OK		14/11/2024
18.	When, and only when the controller HMI -A18 will be powered up proceed to close battery cut off breaker Q2.	OK		
19.	The inverter A2 will now be operational and AC output voltage available for essential loads.	OK		
20.	Proceed to close the followings MCBs: Q31,Q32,Q33,Q34,Q35,Q36,Q37,Q38,Q39,Q40 ,Q41,Q42,Q43,Q44,Q45,Q46, Q47,Q48,Q49	OK		
21.	Once essential loads will be operational and platform operational status normal it will be possible to reset the black start scenario.	OK		
22.	With reference the battery cut off breaker enclosure **CB-200F3**B rotate the selector switches as follows: - Selector switch S1 OFF - Selector switch S2 NORMAL	OK		
23.	The battery cut off breaker should remain closed and connected as per normal UPS operation.	OK		

5.4.3.6 OTP Worksite Phase 2 Tests Notes and Remarks

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5.4.3.7 OTP Worksite Phase 2 - Tests Certifying Authority Table of Attendances

Name and Surname	Certifying Authority	Position	Signature

5.4.3.8 OTP WORKSITE Phase 2 - Tests Final Signatures and Company Acceptance

Name and Surname	Company Representative	Position	Signature
KRISTIAN CASTELLANI	ROSETTI M.	LEAD E/E PCMM	
MARCO TAFICO	CROSSWIND	COMM MANAGER	
ANTHONY NOSON	ROSETTI MARINO	COMM. MGR.	

5.4.4 OTP Steps WORKSITE - PHASE 3

It is foreseen that previous chapters are successfully performed.

All systems fed from SWBD SG-200N1 and from DB DP-200N1 are available and ready to work, all necessary tests are performed and accepted for those systems.
All Cables are pulled up, tested and temporary power supply is completed and available.
LV Power Distribution Switchboards and Distribution Boards is working in normal operation and no alarm pending.

In the following steps will be defined the tests of all signals from/to UPS and SIS hardwired and via Modbus TCP-IP between PCS and UPS.

All I/O signals were tested and recorded through dedicated ITR-B precommissioning check sheets.
Verify and confirm that all related check sheets have been performed successfully.

5.4.5 Test Preparation

Verification of systems UPS UP-200F3.
All systems and subsystems involved in this procedure must be ready for commissioning and available.

To perform the signals test is mandatory that PCS Cabinet – Modbus TCP-IP network system - are already energized, available and ready to work.

To test all signals, refer to specific electrical pre-commissioning check sheets, they will be used for the specific validation of all I/O signals.

5.4.5.1 UPS UP-200F3 - I/O Instrumental I/O list

To test all signals, refer to specific electrical pre-commissioning check sheets, they will be the specific functioning of all I/O.

Following I/O signals groups List to be verified.

This I/O list concern the alarm, feedback and command reading.

Cabinet	FROM	SIGNAL_DESCRIPTION	TYPE ANALOG/DIGITAL	~~TERMINALS~~ TAG	Note
BOX BATTERY	SIS (ESD)	Disconnect AC UPS UP-200F3 Battery A	DO	XS007A	0 TRIP
BOX BATTERY		Disconnect AC UPS UP-200F3 Battery B	DO	XS007B	0 TRIP
UPSA/B		Battery room fan fault-charge inhibit	DO	~~X4/1-2~~ XS010	0 INIBIT

Step	Description	Result	Verified by	Date
1	Confirm correct and positive result of precommissioning Check Sheet for above signals I/O list Correct and positive results..... ☑	ok		03/03/2025

5.4.5.2 UPS UP-200F3 - I/O Modbus TCP-IP list

With reference all register Modbus TCP-IP for PCS system, it attached the Modbus status list

Alarms:
Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Reg.	Bit no.	Type	Name	Description (1=active)	
2	0	WORD	NonCriticalFault	W: Collective warning	DM
3	0	WORD	CriticalFault	A: Collective alarm	
4	0	WORD	Userdef_DigIn1Active	W: "O"	
5	0	WORD	Userdef_DigIn2Active	W: "O"	
6	0	WORD	Userdef_DigIn3Active	W: "O"	
7	0	WORD	EmergencySwitchOff	A: UPS output off "O"	
8	0	WORD	DouCanFault	W: DOU CAN fault	
9	0	WORD	MainsFault	W: Rectifier/bypass mains fault	DM
10	0	WORD	RectifierWarning	W: Rectifier warning	
11	0	WORD	RectifierFault	A: Rectifier fault	
12	0	WORD	BatteryAlarm	A: Battery fault	
13	0	WORD	InverterWarning	W: Inverter warning	
14	0	WORD	InverterFault	A: Inverter fault	
15	0	WORD	SBSWarning	W: Bypass warning	
16	0	WORD	SBSFault	A: Bypass fault	DM
17	0	WORD	EqualisingCharge	I: Charger status – equalising charging	
18	0	WORD	Charge	I: Charger status – charging	
19	0	WORD	TrickleCharge	I: Charger status – trickle charging	DM
20	0	WORD	GenSetOperation	I: Charger status: Em. power supply "O"	
21	0	WORD	BattTemp.SensFault	W: Battery temp. sensor "O"	
22	0	WORD	BatteryTemp.ToHigh	W: Battery temp. too high "O"	
23	0	WORD	CircuitBreaker	W: Circuit-breaker tripped "O"	DM
24	0	WORD	BatteryWarning	W: Battery warning	
25	0	WORD	BatteryLow	W: Battery undervoltage	
26	0	WORD	Overload	W: Inverter overload	
27	0	WORD	FanFault	W: Fan fault	DM
28	0	WORD	Overload	A: Inverter overload	
29	0	WORD	ShortCircuit	A: Inverter short-circuit	
30	0	WORD	DcUnderVoltage	A: Inverter DC undervoltage	
31	0	WORD	DcOverVoltage	A: Inverter DC overvoltage	
32	0	WORD	PowerStackOverTemp	A: Inverter stack fault	
33	0	WORD	SBSReady	I: Bypass ready	DM
34	0	WORD	SBSMainsFault	W: Bypass mains fault	DM
35	0	WORD	SBSBlocked	W: Bypass blocked	DM
36	0	WORD	RectifierOn	I: Rectifier on	DM
37	0	WORD	InverterOn	I: Inverter on	DM
38	0	WORD	SBSOn	I: Bypass on	

Table 6: Modbus TCP-IP PCS

Step	Description	Result	Verified by	Date
2	Confirm correct and positive result of precommissioning Check Sheet for above signals I/O list Correct and positive results. ..... ☑	ok	[signature]	03/03/2025

5.4.5.3 OTP WORKSITE Phase 3 - Tests Notes and Remarks

5.4.5.4 OTP WORKSITE Phase 3 - Tests Certifying Authority Table of Attendances

Name and Surname	Certifying Authority	Position	Signature

5.4.5.5 OTP WORKSITE Phase 3 - Tests Final Signatures and Company Acceptance

Name and Surname	Company Representative	Position	Signature
KRISTIAN CASTELLAN	ROSETTI M.	LEAD T/C COMMISSIONING	
DAVE MUSGROVE	CW	OPERATIONS ENG	
ANTHONY IVESON	ROSETTI MARINO	COMM. MGR.	

SEE ATTACHED MARKED UP I/O LIST

5.5 Post-test Conditions

All the electrical contacts which were disconnected for the testing purposes must be reconnected.
After functional tests have been completed, system / sub-systems are left in healthy and safety condition and that they are operational.

5.6 Reinstatement and Preservation Tasks

Generally, the system/ sub-system shall be reinstated at its initial condition; and the following activities must be carried out as minimum:

- all inhibition done for the test shall be removed (as per Inhibit / Override List)
- all equipment/devices shall be returned in healthy functional conditions.

Note: all preservation routines identified and required will be included in relevant Preservation ITR within the Proverlis Completions System.

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6 OTP AT SITE

6.1 Planning and Manpower

6.1.1 Offshore Site overview

It is expected that all pre-commissioning tests, systems energization and commissioning steps will have been successfully performed during the Onshore Phases.
Consequently, during the offshore SITE phase, the respective systems will be inspected prior to re-energization. No additional test steps will be required on these items of equipment, correct operation and functioning will be verified.

6.1.2 Planned tasks with estimated manpower

Estimated manpower for the entire duration of the Test:

- 1 E&I commissioning superintendent
- 1 E&I commissioning supervisor from Contractor
- 1 E&I commissioning technicians from Contractor

6.1.3 Test duration estimate

The test duration should be as follows:

- 0,5 days approx.

If necessary, the estimated time can be extended to complete all required pre-commissioning and commissioning activities.

6.1.4 Vendor Assistance

- Not applicable

6.1.5 Items Postponed to C&E OTP

- Not Applicable

6.1.6 HOLDS

- Not Applicable

6.2 OTP Test Requirements – Offshore SITE

6.2.1 Pre-Commissioning Achievement

- Not applicable

6.2.2 Commissioning Achievement

The commissioning achievement will be the successful operation, functionality and safeguarding test of Power distribution System LV, installed and put in operation during the WORKSITE phase:

The successful commissioning result, achieved during the WORKSITE commissioning phase for the functionality and safeguard of the UPS system, will allow for a smoother commissioning phase of the offshore SITE.
The systems and subsystems involved:

- 88-00: Earthing System
- 84-10: UPS System UP-200F3

- 83-00: 400V Switchboard SG-200N1
- 83-20: 400V Distribution board DP-200N1
- 79-00: SIS (ESD)
- 87-10: Process Control System (PCS)
- 86-00: Data Network - MODBUS RTU Network Switchboard Medium Voltage and Low Voltage

6.2.3 Status of Required Associated Subsystems

The systems involved has been already energized and commissioned in WORKSITE Phase

6.2.4 Special Tools & Test Equipment

The following special tool and Test Equipment are required (see vendor document 1723002197-EL-LIS-00053):

- Voltage, frequency, continuity tester (Multimeter)
- Phases sequence tester
- Portable

TESTING & MEASUREMENT INSTRUMENT USED			
Type	Serial N.	Calibration certificate	Validity

6.2.5 Consumable List

- Not applicable

6.2.6 Commissioning Spare Parts

Reference is made to 3W document 1723002197-COM-LIS-00052 "Commissioning and operation Spare Parts Index Register" regarding the UPS spare parts.

6.2.7 Temporary Facilities

- Not applicable

6.3 OTP Description – SITE

In SITE (offshore) phase the first energization of main SWBD SG-200N1 will be done feeding the drawer A2/+08 via Temporary Diesel Generator and will be performed all steps starting with first energization.
NOTE: When it's confirmed the availability of permanent 66kV high voltage, the temporary power supply from the Temporary Diesel Generator will be removed. A final check on the correct functioning of the UPS system will be performed when BLPH will be energized via the permanent high voltage supply

N.B.: Kindly note that this procedure this note detail any activities related to BLACK START, consequently reference is made to dedicated document n. 123A90-PML-COM-PRO-03036.

6.3.1 OTP Test Preparation

Step	Description	Result	Verified by	Date
1	System Ready for Operation (RFO) from WORKSITE Certificate is issued and approved.			
2	No blocking punch list items are outstanding against the system to be commissioned.			
3	System(s), (de)isolations as per LOTO procedure enclosed within commissioning Work Permits procedures prepared and approved			
4	Verify and confirm that all steps performed at WORKSITE of this procedure are completed without any pending issues that would prevent from proceeding with the offshore SITE PROCEDURE			
5	All personnel involved in the implementation of this procedure are familiar with this procedure as well as with associated safety requirements (Toolbox Talk to be conducted before initiation of activities).			
6	A final walkdown after hook-up of the system has been completed, any preservation items have been removed and to ensure that the system and the area are ready for energization for following items: UP-200F3 230V AC UPS SG-200N1 Main Switchboard DP-200N1 Distribution board			
7	Check that areas are free for work and escape routes are clear of any obstructions.			
8	Ensure that proper communications have been established between parties involved in the implementation of the procedure.			
9	Verify availability of test equipment and consumables as per chapters 6.2.4.			
10	Verify and confirm that the Temporary Diesel Generator is ready to start, that the diesel fuel tank is full.			
11	All personnel have been duly notified during dedicated daily SIMOPS meetings that the system(s) is ready for commissioning.			

6.3.2 Electrical Preparation

Step	Description	Result	Verified by	Date
12	No blocking punch list items are outstanding against the system to be commissioned.			
13	Review and confirm no changes are required to be performed on existing protection settings.			
14	Verify and confirm that the Temporary Diesel Generator power cables connections have been tested with correct phase rotation before sail away. Perform walk down on Diesel Generator for a final check before energization			

6.3.3 Mechanical Preparation

Not applicable.

6.3.4 Instrument Preparation

Step	Description	Result	Verified by	Date
15	No blocking punch list items are outstanding against the system to be commissioned.			
16	Verify that all relevant associated control and protection systems / subsystems are ready.			
17	Verify as relevant Inhibit and Override list has been prepared and validated (as per JSA).			

6.3.5 Piping Preparation

Not applicable

6.3.6 Additional Discipline Preparation

Not applicable.

6.4 OTP Test Steps – Offshore SITE

The previous chapters must be successfully performed prior to commissioning of the UPS System.

In the next steps, the functionality of the UPS system will be tested:

- SS 84-10:230V UPS SYSTEM

6.4.1 Test Preparation

Verification of system and subsystem UPS.
Conduct system walkdown and thorough visual inspection of all related components.
Confirm no impediment to proceed with energization.

6.4.2 Energization of UPS UP-200F3.

Step	Description	Result	Verified by	Date
UPS "1" & "2" and Bypass Functional test				
1	Confirm that diesel generator power supply is energized to upstream switchboard SG-200N1.			
2	Set the load interrupter switch Q1 to the "OFF" position			
3	- Set the manual bypass switch Q29 to position "2 - Service operation".			
4	Connect the mains voltage for the rectifier.			
5	Connect the mains voltage for the bypass circuit			
6	Check status: The bypass is starting up, *the green and yellow LEDs are flashing. LCD: "Main menu" is displayed*			
7	Wait for status: The bypass is ready, *the green LED is flashing. LCD: "Bypass symbol OK" is displayed*			
8	Set the manual bypass switch Q29 to position "1 - Inverter operation". *The green and yellow LEDs flash.*			
9	Set the load interrupter switch Q1 to the "ON" position.			
10	Wait for status: The REC is ready, *the green LED is flashing. LCD: "INV symbol OK" is displayed*			
11	Check the battery cut off breaker Q2 voltage and polarity			
12	Locate selector switch S2			
13	Rotate selector switch S2 from position NORMAL to position OVERRIDE (ESD healthy signal not available at this time).			
14	Close the battery cut off breaker Q2			
15	Press the "~I" key on the HMI. *LCD: "INV symbol" flashes*			
16	Wait for status: Bypass switches to normal operation, *green LED lights up. LCD: "Energy flow display via INV" is displayed*			

Step	Description	Result	Verified by	Date
17	The first UPS unit is now in operation, repeat the above STEPS to start the second UPS unit.			
18	Proceed to close on board MCBs to energize BLPH essential loads.			
19	Once ESD protection system will be operational, deactivate battery cut-off breakers override via switch S2, consequently confirm correct UPS start-up without any alarms.			

6.4.3 OTP SITE Tests Notes and Remarks

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6.4.4 OTP SITE Tests Certifying Authority Table of Attendances

Name and Surname	Certifying Authority	Position	Signature

6.4.5 OTP SITE - Tests Final Signatures and Company Acceptance

Name and Surname	Company Representative	Position	Signature

6.5 Post-test Conditions

All the electrical contacts which were disconnected for the testing purposes must be reconnected.
After functional tests have been completed, system / sub-systems are left in healthy and safety condition and that they are operational.

6.6 Reinstatement tasks

Generally, the system/ sub-system shall be reinstated at its initial condition; and the following activities must be carried out as minimum:

- all inhibition done for the test shall be removed (as per Inhibit / Override List)
- all equipment/devices shall be returned in healthy functional conditions.

7 APPENDICES

7.1 Vendor SAT Procedure

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Base Load Power Hub (BLPH)

AC UPS - SITE ACCEPTANCE TEST PROCEDURE / PRE-COMMISSIONING / COMMISSIONING PROCEDURES

Document Number: 1724000372-QC-PRO-00019

Document Class: 2

01	01/02/2025	Accepted for Construction (AFC)	DA	DA	AD
00	21/10/2024	Issue for Review (IFR)	DA	DA	AD
Rev.	Date	Description	Prepared	Reviewed	Approved

3W power | a company of AEG POWER SOLUTIONS

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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Base Load Power Hub (BLPH)

AC UPS PAS - TAG: UP-200F3

SITE ACCEPTANCE TEST / PRE-COMMISSIONING / COMMISSIONING PROCEDURE

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AEG POWER SOLUTIONS

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Project name: Hollandse Kust Noord (HKN) wind farm	Order-No.: 4400007525

Configuration and Serial No.: **Installed:**

BC-200F3-A - UPS Protect 8.33 / 40-400-216-400-RP-IP43 - Serial No.: 1010863/001 ☒

BC-200F3-B - UPS Protect 8.33 / 40-400-216-400-RP-IP43 - Serial No.: 1010863/002 ☒

BY-200F3 - By-Pass Transformer Cabinet 40 kVA 400/400V - Serial No.: ☒

CB-200F3-A - Battery Fuse Box 200A - Serial No.: 24/86529 ☒

CB-200F3-B - Battery Fuse Box 200A - Serial No.: 24/86530 ☒

BA-200F3-A - Battery 216V-150Ah 18 x FLG12-150 ☒

BA-200F3-B - Battery 216V-150Ah 18 x FLG12-150 ☒

Participants:	Company:	Date / Signature:
1. ANTHONY IVESON	ROSETTI MARINO	
2. [illegible] CASTELLANI	ROSETTI MARINO	
3. MATTIA GIROTTI	ROSETTI MARINO	
4. DAVIDE ZUCCONELLI	ROSETTI MARINO	
5.		

Remark:

Site Acceptance Test must be performed by a skilled AEG technician.

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Content:

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2. Visual Inspection....6
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4. Functional tests UPS / Load Transfer Tests: 12
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Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

1. Informations and Basic Datas:

SCOPE This procedure describes the methods for checking the AC UPS system, once installed on site, to ensure that it works correctly and it meets the operational requirements
REFERENCE DOCUMENTS 1724000372-EL-DA-00004 AC UPS - GENERAL ARRANGEMENT 1724000372-EL-DG-00007 AC UPS - SINGLE LINE DIAGRAM 1724000372-EL-DG-00009 AC UPS - WIRING DIAGRAM & TERMINAL SCHEDULE 1724000372-EL-DG-00011 AC UPS - BATTERY LAYOUT AND INTERCONNECTION
TESTING EQUIPMENT & ACCESSORIES Digital Multimeter, Clamp-meter and Dummy Load

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

UPS A

RECTIFIER

Input voltage (V) 400 Frequency (Hz) 50 Number of phases 3

Float voltage (V) +/- 10% Charge voltage (V) 26

Output current (A) 58 Battery current limit (A) —

INVERTER

DC Input range (V) 220 AC Output voltage (V) 400

Output frequency (Hz) 50 Number of phases 3

Rated power (kVA) 35kVA Power factor 0,8

ALTERNATIVE LINE

Input voltage (V) 400 Frequency (Hz) 50 Number of phases 3

BATTERY

Type FLG 12-150 Capacity (Ah) 150 Number of strings / cells 18

Autonomy 15 min @ Load 35kVA

CONFIGURATION

Single unit ☐ Redundant system ☐ Redundant parallel system ☒

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

UPS B

RECTIFIER

Input voltage (V) ...400..... Frequency (Hz) .....50..... Number of phases ..3.....
Float voltage (V) .....+/- 10%..... Charge voltage (V) .....220.....
Output current (A) .....58 A..... Battery current limit (A) .....-.....

INVERTER

DC Input range (V) ..220..... AC Output voltage (V) ....400....
Output frequency (Hz) ..50..... Number of phases .....3.....
Rated power (kVA) ....35 kVA..... Power factor .....0,8.....

ALTERNATIVE LINE

Input voltage (V) .....400..... Frequency (Hz) .....50..... Number of phases ..3....

BATTERY

Type FLG 12-150... Capacity (Ah) 150... Number of strings / cells ....18.....
Autonomy 15 MIN..... @ Load ..35 kVA..

CONFIGURATION

Single unit ☐ Redundant system ☐ Redundant parallel system ☒

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

2. Visual Inspection

1) Visual Check	Check
• Equipment installation aspects and details	✓
• Cleanliness of cabinets (internally and externally)	✓
• Fuses and Circuit breakers rating and related connection cables	✓
• Control switches and push-buttons	✓
• Components identification	✓
• Alarms identification	✓
• All connections fully tightened	✓
• Grounding connection	✓
• All labels correct	✓
2) Pre-Energization Check	
• Electronic cards and related connections	✓
• Relays	✓
• Cooling fans	✓
• Wiring and plugs connections	✓
• Fuses and fuse alarm contacts	✓
• Instruments	✓
• Power switches, circuit breakers and contacts	✓
• Marking of components	✓
• Cable polarity marking	✓
• Input phase marking	✓

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

3. Starting

Rectifier start	Result
Input phase sequence	OK CW
Float voltage correct setting	OK +/- 10%
High-rate voltage correct setting	OK

Inverter start	Result
DC input voltage	221 V
AC output voltage	400 V
Frequency	50 Hz

Alternate mains start	Result
AC output voltage	400 V
Frequency	50 Hz

For the starting and shut-down procedure please refer to the following pages.

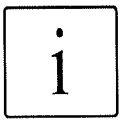
INITIAL START-UP

Prior to starting the unit, check whether the preset unit data complies with the system data by referring to the technical data sheet.

Parallel units are adjusted by the factory with regard to their current distribution. Since the local cabling affects the current distribution of the parallel units (cable cross-sections, cable lengths, cable routing and inductivities of the load distribution board), a new adjustment can be required following installation. The equalizing current of idle parallel units should be less than 5% of the inverter's nominal current. The current distribution must be controlled during start-up. Any adjustment necessary must only be carried out by appropriately trained expert personnel.



ATTENTION:
Improperly adjusted systems can in certain circumstances (individual batteries charged, i.e. 100% capacity and idle inverter) damage the battery.



NOTE:
The start-up instructions of the battery manufacturer must be complied with. Any necessary parameter modifications must be made by our service personnel or via the DOU. If changing the parameters via the DOU, ensure that these changes are applied to all units.

A phase-rotation indicator and a voltmeter are required for the following steps.



CAUTION:
When the mains is connected, potentially fatal voltages are applied to the terminals.
Always observe the safety regulations!

5.1 Preparing Initial Start-Up of a Parallel System

Step	ID No.	Action
1	1 to 2	Input breaker Q1, SBS circuit and battery isolator MCCB (external) to the "**OFF**" position.
2	1 to 2	Open Q71, Q72 inverter output isolators.
3	1 to 2	Distribution breakers to the "OFF" position, Q29 (manual by-pass) to the "OFF" position.
4	1 to 2	Remove connection cover.
5	1 to 2	Check the cable cross sections and fuse protection (refer to the operating instructions of the individual unit). Check the proper earthing of the units (all cubicles must be screwed to one another and earthed).
6	1 to 2	Connect the mains voltage for the rectifier circuit and SBS circuit.
7	1 to 2	Measure the mains voltage at terminals X1 and X4 (X1 phase-to-phase and X4 phase/zero). Refer to the technical data sheet for the nominal voltage.
8	1 to 2	Check the rotating fields at terminals X1 and X4. L1, L2 and L3 clockwise rotation.
9	1 to 2	Switch on input breaker Q1 and wait until the DC nominal voltage is reached.
10	1 to 2	Switch on the inverters.
11	1 to 2	Check the voltage between the parallel units at the inverter output isolators Q71, Q72. The voltage difference of the inverters should not be more than 2 V. (If you measure more than 2 V then adjustment is required which can only be performed by trained expert personnel.)
12	1 to 2	Switch off the inverters.
13	1 to 2	Switch off the mains voltage for the rectifier circuit and SBS circuit.
14	1 to 2	Rectify any errors if necessary and repeat the steps.
15	1 to 2	Replace the connection cover.

5.2 Initial Start-Up of a Parallel System

Step	ID No. 1 to n	Action	DOU	
			LED	Display
1	1 to 2	Input breaker Q1, SBS circuit and battery isolator MCCB (external) to the **"OFF"** position. INV output isolators Q71 and Q72 set to **"ON"**.	None	OFF
2	1 to 2	Load breakers to the "OFF" position, Q29 (manual by-pass) to the "OFF" position.		
3	1 to 2	Connect the mains voltage for the rectifier circuit and SBS circuit.		
4	1 to 2	Move Q1 to the **"ON"** position. The rectifier starts automatically. In systems with a central battery it only starts when the necessary number of rectifiers for the required capacity are switched on. The DC voltage increases.	Red/yellow/ green changing	Self-test
5	1 to 2	The DC voltage reaches its final value and the inverter is supplied with power. (In systems with a central battery the voltage of 2V/Pb cell or 1.2V/NiCd can be present at the output terminals of the individual RECs (safety operation), as the battery isolators are not yet closed).	Yellow flashing	Current flow symbol via REC to INV ON (black)
6	1 to 2	When the polarity on the battery isolator (REC voltage – battery voltage) has been checked, the battery isolator MCCB (external) in the **"ON"** position. The batteries are charged.		
7	1 to 2	Connect the SBS circuit. The SBS only fire when the necessary number for the required capacity are supplied with power.	Green, flashing	Current flow symbol via SBS to loads ON (black)
8	1 to 2	Switch on inverter.		INV symbol flashes
9	1 to 2	The respective AC voltage reaches its final value. As soon as the necessary number of INVs for the required capacity are switched on, the INV output contactors close.	Green ON	Current flow symbol via INV to loads ON (black), via SBS OFF
		There is no fault indication.		
11	1 to 2	Compare equalizing currents of the INVs. The equalizing currents of the INVs when idle should be less than 5% of the INV nominal current.		
12	1 to 2	Switch off INV.		
13	1 to 2	Load breakers to the "ON" position, Q29 (manual by-pass) to the "OFF" position.		
14	1 to 2	Switch on the INV and supply the loads.		

NOTE:
For all additional functions and operating modes please refer to the operating instructions of the individual units.

6 DISCONNECTING

6.1 Disconnecting the Parallel System

In order to extend, service or repair a parallel system, it may be necessary to disconnect this entire parallel system. dDuring this time the loads can be supplied via the manual bypass. The switchover of the loads from the parallel system to the manual bypass and back takes place without any interruption.

NOTE:
Maintenance and repair work must only be performed by authorised expert personnel.

6.1.1 Disconnecting a Parallel System

Step	ID No. 1 to n	Action	DOU	
			LED	Display
1	1 to 2	Control availability of the SBS (SBS ready).	Green	SBS symbol static
2	1 to 2	Switch off the inverter with the **"~0"** key on the DOU and confirm with "yes". As soon as the remaining number of INVs falls below the specified redundancy, the entire parallel system is switched over to the SBS.	Green, flashing	Current flow symbol via SBS
3		Manual bypass switch Q29 to the "ON" position		
4		Load breakers to the **"OFF"** position.		
5	1 to 2	Switch off the rectifier using the **"=0"** key on the DOU and confirm with "yes".	Yellow, green flashing	
6	1 to 2	Rectifier input breaker Q1 to the **"OFF"** position.		
7	1 to 2	Battery isolator MCCB (external) to the **"OFF"** position.	Red, yellow, green flashing	
8	1 to 2	SBS circuit "OFF"	None	OFF

CAUTION:

Even when disconnected, capacitors in the unit can still carry voltage. **Always observe the safety regulations!**

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

4. Functional tests UPS / Load Transfer Tests:

Incorporates Tests for:

Rectifier Mains Failure – continued Inverter operation via Battery
Rectifier Mains Return – auto start of the rectifier
Inverter Failure – transfer of load from Inverter to Bypass Mains
Inverter Restoration – transfer of load from Bypass Mains to Inverter
Manual Bypass Switch – transfer of load directly to Bypass Mains

The tests are performed with dummy load.

Acceptance Criteria:

Rectifier Mains Failure:	No disruption to the Inverter operation.
Rectifier Mains Return:	Auto start of the rectifier and charging of the Battery
Transfer Inverter to Static Bypass:	No-break transfers

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A) Rectifier Mains Failure

Switch OFF rectifier Mains via Rectifier input isolator Q1

Recording of Rectifier AC current at X1 and AC load voltage and AC load current at X3

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

B) Rectifier Mains Return

Switch ON rectifier mains via Rectifier input isolator Q1

Recording of Rectifier AC current at X1 and AC load voltage and AC load current at X3

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

C) Transfer inverter-SBS mains

Switch OFF Inverter via Display

Recording of AC load voltage and AC load current at X3 and Bypass current at X4

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

D) **Transfer SBS mains-inverter**
Switch ON Inverter via Display
Recording of AC load voltage and AC load current at X3 and Bypass current at X4

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

E) Parallel Operation (load transfer test)

Parallel operation UPS n.1 and UPS n.2 - Switching OFF UPS n.2 via Display A18 on the door of the UPS

UPS n.1 takes over 100% Load

and in addition repeat the test as following indicated:

Parallel operation UPS n.1 and UPS n.2

Switching OFF UPS n.2 via de-energization of its upstream power supply

UPS n.1 takes over 100% Load

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Switching OFF UPS n.1 via Display A18 on the door of the UPS

Transfer to Bypass operation

and in addition repeat the test as following indicated:

Switching OFF UPS n.1 via de-energization of its upstream power supply

Transfer to Bypass operation

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Bypass operation - Switching ON UPS n.2 via Display A18 on the door of of the UPS

UPS n.2 takes over 100% load

and in addition repeat the test as following indicated:

Bypass operation - Switching ON UPS n.2 via re-energization of its upstream power supply

UPS n.2 takes over 100% load

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Switching ON UPS n.1 via Display A18 on the door of of the UPS
Load sharing 50%

Parallel operation with load sharing 50% of UPS n.1 and UPS n.2

and in addition repeat the test as following indicated:

Switching ON UPS n.1 via re-energization of its upstream power supply
Load sharing 50%

Parallel operation with load sharing 50% of UPS n.1 and UPS n.2

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

F) Parallel Operation (functional sequence test)

Starting condition: UPS redundant system working in normal operation with By-Pass input and both Rectifier inputs n.1 and n.2 all energized. UPS n.1 and UPS n.2 synchronized with the By-Pass

1. De-energize upstream power supply to Rectifier input n.2
2. De-energize upstream power supply to By-Pass
3. Confirm the normal operation of UPS n.1 at the correct load
4. Re-energize upstream power supply to Rectifier input n.2
5. Confirm the correct synchronization and normal operation of both UPS n.1 and n.2 with load sharing activated
6. Re-energize upstream power supply to By-Pass
7. Confirm reinstatement and normal operation of all UPS unit functions.
8. At each test step, validate correct functioning of hardwired I/O signals

G) Parallel Operation (functional sequence test)

Starting condition: UPS redundant system working in normal operation with By-Pass input and both Rectifier inputs n.1 and n.2 all energized. UPS n.1 and UPS n.2 synchronized with the By-Pass

1. De-energize upstream power supply to Rectifier input n.1
2. De-energize upstream power supply to By-Pass
3. Confirm the normal operation of UPS n.2 at the correct load
4. Re-energize upstream power supply to Rectifier input n.1
5. Confirm the correct synchronization and normal operation of both UPS n.1 and n.2 with load sharing activated
6. Re-energize upstream power supply to By-Pass
7. Confirm reinstatement and normal operation of all UPS unit functions.
8. At each test step, validate correct functioning of hardwired I/O signals

Result: PASSED

5. MODBUS Adapter

Incorporates Tests for:
A29.1 MODBUS Adapter

Test to be performed for chosen failure messages, status messages and measuring values.

Designation	Source	Terminals	Checked
MODBUS Adapter	A29.1	A29.1	ok

For the Modbus Registers please refer to the following pages.

Unit profile of a three-phase UPS

Status: Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Reg.	Bit no.	Type	Name	Description
1	3-0	WORD	UPSStatus	UPS status: 1=Normal mode 2=Bypass mode 3=Battery mode 4=Eco mode "O" 6=Deactivation is imminent 7=Off

Alarms:

Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Reg.	Bit no.	Type	Name	Description (1=active)
2	0	WORD	NonCriticalFault	W: Collective warning
3	0	WORD	CriticalFault	A: Collective alarm
4	0	WORD	Userdef_DigIn1Active	W: "O"
5	0	WORD	Userdef_DigIn2Active	W: "O"
6	0	WORD	Userdef_DigIn3Active	W: "O"
7	0	WORD	EmergencySwitchOff	A: UPS output off "O"
8	0	WORD	DouCanFault	W: DOU CAN fault
9	0	WORD	MainsFault	W: Rectifier/bypass mains fault
10	0	WORD	RectifierWarning	W: Rectifier warning
11	0	WORD	RectifierFault	A: Rectifier fault
12	0	WORD	BatteryAlarm	A: Battery fault
13	0	WORD	InverterWarning	W: Inverter warning
14	0	WORD	InverterFault	W: Inverter fault
15	0	WORD	SBSWarning	W: Bypass warning
16	0	WORD	SBSFault	A: Bypass fault
17	0	WORD	EqualisingCharge	I: Charger status – equalising charging
18	0	WORD	Charge	I: Charger status – charging
19	0	WORD	TrickleCharge	I: Charger status – trickle charging
20	0	WORD	GenSetOperation	I: Charger status: Em. power supply "O"
21	0	WORD	BattTemp.SensFault	W: Battery temp. sensor "O"
22	0	WORD	BatteryTemp.ToHigh	W: Battery temp. too high "O"
23	0	WORD	CircuitBreaker	W: Circuit-breaker tripped "O"
24	0	WORD	BatteryWarning	W: Battery warning
25	0	WORD	BatteryLow	W: Battery undervoltage
26	0	WORD	Overload	W: Inverter overload
27	0	WORD	FanFault	W: Fan fault
28	0	WORD	Overload	A: Inverter overload
29	0	WORD	ShortCircuit	A: Inverter short-circuit
30	0	WORD	DcUnderVoltage	A: Inverter DC undervoltage
31	0	WORD	DcOverVoltage	A: Inverter DC overvoltage
32	0	WORD	PowerStackOverTemp	A: Inverter stack fault
33	0	WORD	SBSReady	I: Bypass ready
34	0	WORD	SBSMainsFault	W: Bypass mains fault
35	0	WORD	SBSBlocked	W: Bypass blocked
36	0	WORD	RectifierOn	I: Rectifier on
37	0	WORD	InverterOn	I: Inverter on
38	0	WORD	SBSOn	I: Bypass on

- Unit profile of a three-phase UPS

Measured values:

Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Rectifier mains:

Register	Bit no.	Type	Name	Value range
39	15-0	WORD10	RectMainsFreq.	0.0 - 99.0 Hz
40	15-0	WORD	RectMainsVoltL1	0 - 999 V
41	15-0	WORD	RectMainsVoltL2	0 - 999 V
42	15-0	WORD	RectMainsVoltL3	0 - 999 V

Bypass mains:

Register	Bit no.	Type	Name	Value range
43	15-0	WORD10	SBSMainsFreq.	0.0 – 99.9 Hz
44	15-0	WORD	SBSMainsVoltL1	0 – 999 V
45	15-0	WORD	SBSMainsVoltL2	0 – 999 V
46	15-0	WORD	SBSMainsVoltL3	0 – 999 V

Battery values:

Register	Bit no.	Type	Name	Value range
47	15-0	WORD	BatteryVoltage	0 - 999 V
48	15-0	INT10	BatteryCurrent	+- 0.0 - 3000.0 A
49	15-0	WORD10	AutonomyTime	0.0 – 999.0 min
50	15-0	WORD	BatteryCapacity	0 - 100%
51	15-0	INT10	BatteryTemperature	+- 0.0 - 99.9 °C "O"

UPS output:

Register	Bit no.	Type	Name	Value range
52	15-0	WORD10	OutputFreq.	0.0 – 99.0 Hz
53	15-0	WORD	OutputVoltageL1	0 – 999 V
54	15-0	WORD	OutputLoadL1	0 – 100 %
55	15-0	WORD	OutputCurrentL1	0 – 9999 A
56	15-0	WORD10	OutputPowerL1	0.0 – 1000.0 kW
57	15-0	WORD	OutputVoltageL2	0 – 999 V
58	15-0	WORD	OutputLoadL2	0 – 100 %
59	15-0	WORD	OutputCurrentL2	0 – 9999 A
60	15-0	WORD10	OutputPowerL2	0.0 – 1000.0 kW
61	15-0	WORD	OutputVoltageL3	0 – 999 V
62	15-0	WORD	OutputLoadL3	0 – 100 %
63	15-0	WORD	OutputCurrentL3	0 – 9999 A
64	15-0	WORD10	OutputPowerL3	0.0 – 1000.0 kW

LifeCheck:

Register	Bit no.	Type	Name	Value range
65	0	WORD	LifeCheck	Bit 0-1 toggled 1x per minute

- Unit profile of a three-phase UPS

Auxiliary signals (for units with user-definable signals):

Reg.	Bit no.	Type	Name	Description
66	0	WORD	Userdef_AUX1 – Rect.	"0"
67	0	WORD	Userdef_AUX2 – Rect.	"0"
68	0	WORD	Userdef_AUX3 – Rect.	"0"
69	0	WORD	Userdef_AUX4 – Rect.	"0"
70	0	WORD	Userdef_AUX5 – Rect.	"0"
71	0	WORD	Userdef_AUX6 – Rect.	"0"
72	0	WORD	Userdef_AUX7– Rect.	"0"
73	0	WORD	Userdef_AUX1 – Inv.	"0"
74	0	WORD	Userdef_AUX2 – Inv.	"0"
75	0	WORD	Userdef_AUX3 – Inv.	"0"
76	0	WORD	Userdef_AUX4 – Inv.	"0"
77	0	WORD	Userdef_AUX5 – Inv.	"0"
78	0	WORD	Userdef_AUX6 – Inv.	"0"
79	0	WORD	Userdef_AUX7 – Inv.	"0"
80	0	WORD	Userdef_AUX1 – SBS	"0"
81	0	WORD	Userdef_AUX2 – SBS	"0"
82	0	WORD	Userdef_AUX3 – SBS	"0"
83	0	WORD	Userdef_AUX4 – SBS	"0"
84	0	WORD	Userdef_AUX5 – SBS	"0"
85	0	WORD	Userdef_AUX6 – SBS	"0"
86	0	WORD	Userdef_AUX7 – SBS	"0"

Date/time:

Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Write: Fct.-Code 6 (Write single Holding Register) or Fct.-Code 16 (Write multiple Holding Register)

Reg.	Bit no.	Type	Name	Description
150	15-0	WORD	Real time (decimal)	Year (20xx)
151	15-0	WORD		Day (0-31)
152	15-0	WORD		Month (1-12)
153	15-0	WORD		Hour (0-23)
154	15-0	WORD		Minute (0-59)
155	15-0	WORD		Second (0-59)
156	15-0	WORD		Millisecond (0-999)
157	15-0	WORD		Weekday 1 = Monday, 2 = Tuesday, …

- Unit profile of a three-phase UPS

Unit control:

Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Write: Fct.-Code 6 (Write single Holding Register)

Reg.	Bit no.	Type	Name	Description
1000	15-0	WORD	Rectifier Control	0 = - 1 = ON 2 = OFF 9 = acknowledge fault 10 = equalising charging 11 = charge 12 = trickle charging
1001	15-0	WORD	Inverter Control	0 = - 1 = ON 2 = OFF 3 = Eco mode "O" 9 = acknowledge fault
1002	15-0	WORD	SBS Control	0 = - 9 = acknowledge fault
1003	15-0	WORD	**Battery Quick Test** – Control (LB) | Status (HB)	Control (LB) : 0x__00 = - 0x__01 = Start test 0x__02 = Cancel test Status (HB) : 0x00__ = Test not implemented 0x01__ = Test impl., waiting for approval 0x02__ = Test approved 0x03__ = Test running 0x04__ = Test successful 0x05__ = Test cancelled 0x06__ = Test warning 0x07__ = Test error
1004	15-0	WORD	**Battery Capacity Test** (with current load or constant current) – Control (LB) | Status (HB)	Control (LB) : 0x__00 = - 0x__01 = Start test 0x__02 = Cancel test Status (HB) : 0x00__ = Test not implemented 0x01__ = Test impl., waiting for approval 0x02__ = Test approved 0x03__ = Test running 0x04__ = Test successful 0x05__ = Test cancelled 0x06__ = Test warning 0x07__ = Test error
1005	15-0	WORD10	**Battery Capacity Test - RemainingTime**	0.0-6553.0 min

Control: The last accepted control command is read out; if the command failed, the read-out is 0.



In order to guarantee high availability of the load supply, some control commands are only executed if the system meets certain requirements:

Rectifier off => inverter must be off

Inverter off => switching to bypass must be guaranteed

Battery test => the entire system must be in a normal state

- Unit profile of a three-phase UPS

Battery tests:

In low byte, the battery test registers contain the control commands and in high byte, the associated statuses of the battery tests. Depending on the unit configuration, different battery tests can be initiated:

The **Battery Quick Test** consists of briefly testing the battery charging circuit. This test is also performed cyclically by the unit.

The **Battery Capacity Test** consists of testing the battery capacity. For this purpose, the battery is discharged with the connected load or by a constant current and the battery status is evaluated.
The remaining time of the capacity test can be read in the **Remaining Time** register.

Control battery test (LB):
0x00: The test has never been started via Modbus.
0x01/2: The test has been started/cancelled (the control command remains in place until the next command).
Battery test status (HB):
0x00: The test is not implemented in the unit.
0x01: The test is implemented, but is presently not approved, or the start conditions to execute the test are lacking.
0x02: The test is approved and can be started.
0x03-7: The test result remains in place for a short time until another test is approved.

Example of battery cap. test 1004/1005:
0x0000 0000 Test not implemented, no cap. test approved
0x0100 1000 Test is implemented, not approved, waiting for approval, max. runtime 100.0min
0x0200 1000 Test is approved, max. runtime 100.0min
0x0301 805 Test running; max. remaining runtime 80.5min
0x0401 0000 Test successful, new test not possible
0x0201 1000 Test is re-approved (after approx. 30s)

For further information on the battery tests, see the unit operating instructions.

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

6. Alarm Test:

Incorporates Tests for:

Remote Alarm signalling on Boards A12/A13
System Operational Check

Acceptance Criteria:

Technical datasheet (TD)

Designation	Terminals	Relay/Opto	Result
Inverter operation 1)	UPS A12-X3: 1, 2, 3	**A12K21**	OK
SBS operation 1)	UPS A12-X3: 4, 5, 6	**A12K22**	OK
Rec Fault / Rec mains fault 1)	UPS A12-X3: 7, 8, 9	**A12K23**	OK
Battery undervoltage 1)	UPS A12-X3: 10, 11, 12	**A12K24**	OK
Common fault 2)	UPS A12-X4: 1, 2, 3	**A12K25**	OK
SBS blocked 1)	UPS A13-X3: 1, 2, 3	**A13K26**	OK
Fan fault 1)	UPS A13-X3: 4, 5, 6	**A13K27**	OK
BAT room fan on 1)	UPS A13-X3: 7, 8, 9	**A13K28**	OK
INV remote off 3)	UPS A12-X5: 1, 2	**A12Opto1**	OK
BAT room fan fault 3)	UPS A13-X4: 1, 2	**A13Opto2**	OK
Not parameterised 3)	UPS A13-X4: 3, 4	**A13Opto3**	OK
Fan fault 1)	Bypass X12: 7, 8, 9	**N/A**	OK
Common fault 1)	Bypass X12: 10, 11, 12	**N/A**	OK

1) Remote signal / close on the terminals with the lower number
2) Remote signal / close on the terminals with the higher number

OPTO Input test

Check battery boost charge inhibit (external signal) in case of high battery temperature

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

7. Battery test:

BATTERY UPS A	UP-200F3	SHEET NR.: 1	REV.	OUR. RIF.:
CUSTOMER: Rosetti Marino	DISCHARGE TEST (Capacity test)	BATTERY TYPE:		CAPACITY Ah
		ELECTROLYTE TYPE:		DENSITY:
Nr. of blocks	Type : *			

TIME (hour : min)	00:00	00:20	00:40	01:00	01:20	01:40	02:00	02:20	02:40	03:00	03:20	03:40	04:00	04:20	04:40	05:00
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3																
4																
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TIME (hour : min)	05:00	05:20	05:40	06:00	06:20	06:40	07:00	07:20	07:40	08:00	08:20	08:40	09:00	09:20	09:40	10:00
BLOCK N°	BLOCK / VOLTAGE															
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Ref: C1000281

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

BATTERY UPS B	UP-200F3	SHEET NR.: 1	REV.	OUR. RIF.:
CUSTOMER: Rosetti Marino	DISCHARGE TEST (Capacity test)	BATTERY TYPE:		CAPACITY Ah
		ELECTROLYTE TYPE:		DENSITY:
Nr. of blocks	Type : *			

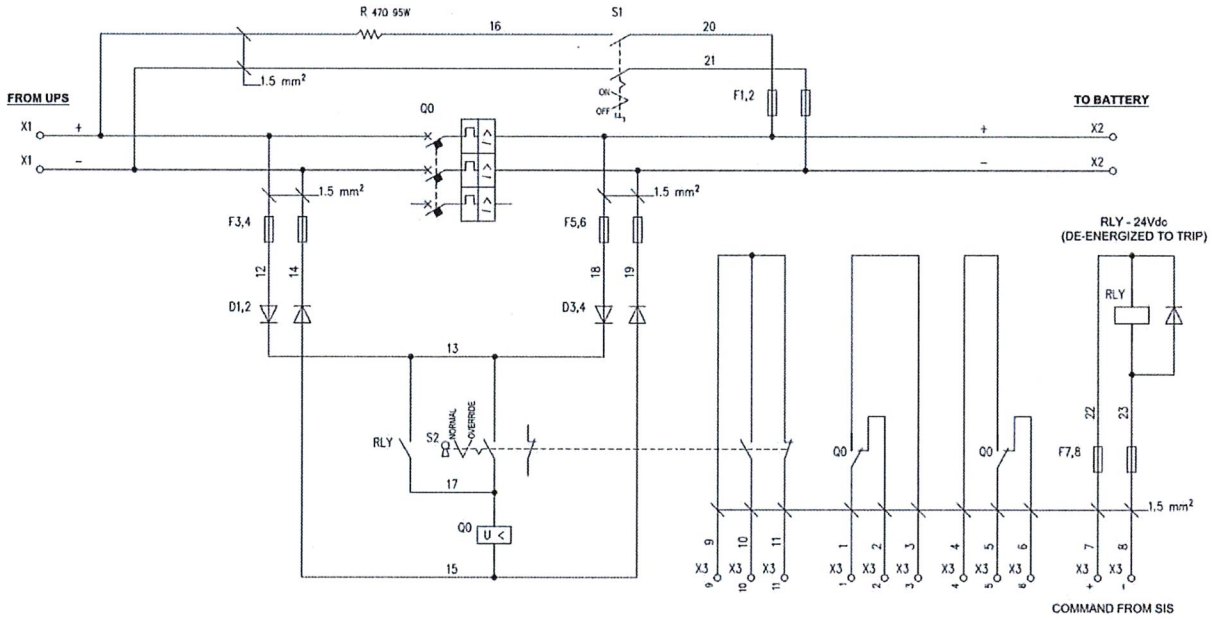
TIME (hour : min)	00:00	00:20	00:40	01:00	01:20	01:40	02:00	02:20	02:40	03:00	03:20	03:40	04:00	04:20	04:40	05:00
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TEMP. ELE. °C																

TIME (hour : min)	05:00	05:20	05:40	06:00	06:20	06:40	07:00	07:20	07:40	08:00	08:20	08:40	09:00	09:20	09:40	10:00
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Ref: C1000 7813

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

8. Black start procedure validation test:



Black Start procedure

The target is to allow the energization of the loads from the battery, while the battery charger being still de-energized.

- The operator shall put the selector S2 on "override" position (contact closed)
- The operator shall close the selector S1 to pre-charge the charger output DC capacitors
- Once the charger DC capacitors are charged and the voltage across Q0 power contacts is close to 0V (and at least >80% of the system DC nominal voltage), the operator shall close the breaker Q0
- The operator shall open the selector S1
- The site safety and SCADA systems restart and the RLY relay is automatically energized when all safety conditions are fulfilled. The charger is energized through its AC supply and then it can restart
- The operator shall put the selector S2 on "normal" position (contact open)
- The system returns to normal working conditions

Designation	Checked
BLACK START procedure UPS-A	✓
BLACK START procedure UPS-B	✓

7.2 Proverlis Summary System Reports

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10

Electrical	84-10 AC 35 kVA UPS System (UP-200F3)

ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
83028-CEL	LV Switchgear / AC UPS PAS - 30min - Line A	ONSHORE	C10000553	CPX09	100	2024-11-02	RFC 1
83029-CEL	LV Switchgear / AC UPS PAS - 30min - Line B	ONSHORE	C10000554	CPX09	100	2024-11-02	RFC 1
83030-CEL	LV Switchgear / AC UPS PAS - 30min - Bypass	ONSHORE	C10000555	CPX09	100	2024-11-02	RFC 1
83122-CEL	Lighting & Small Power DB BoP / AC UPS PAS AUXILIARY	ONSHORE	C10000641	CPX09	100	2024-10-24	RFC 1
84330-CEC	Isolator Battery Box for AC UPS 35 kVA / AC UPS 35 kVA Redundant System with By-Pass	ONSHORE	C10002343	CPX10	100	2024-11-02	RFC 1
84331-CEC	Isolator Battery Box for AC UPS 35 kVA / AC UPS 35 kVA Redundant System with By-Pass	ONSHORE	C10002344	CPX10	100	2024-11-02	RFC 1
84331-CEL-1-N	AC UPS PAS - Charger-A / AC UPS PAS - Battery Isolator-A	ONSHORE	C10000643	CPX09	100	2024-11-02	RFC 1
84331-CEL-1-P	AC UPS PAS - Charger-A / AC UPS PAS - Battery Isolator-A	ONSHORE	C10000642	CPX09	100	2024-11-02	RFC 1
84331-CEL-2-N	AC UPS PAS - Battery Isolator-A / AC UPS PAS - Battery-A	ONSHORE	C10000645	CPX09	100	2024-11-02	RFC 1
84331-CEL-2-P	AC UPS PAS - Battery Isolator-A / AC UPS PAS - Battery-A	ONSHORE	C10000644	CPX09	100	2024-11-02	RFC 1
84332-CEL-1-N	AC UPS PAS- Charger-B / AC UPS PAS - Battery Isolator-B	ONSHORE	C10000647	CPX09	100	2024-11-02	RFC 1
84332-CEL-1-P	AC UPS PAS- Charger-B / AC UPS PAS - Battery Isolator-B	ONSHORE	C10000646	CPX09	100	2024-11-02	RFC 1
84332-CEL-2-N	AC UPS PAS - Battery Isolator-B / AC UPS PAS - Battery-B	ONSHORE	C10000649	CPX09	100	2024-11-02	RFC 1
84332-CEL-2-P	AC UPS PAS - Battery Isolator-B / AC UPS PAS - Battery-B	ONSHORE	C10000648	CPX09	100	2024-11-02	RFC 1
A3/+01-QF1	DRAWER UPS PAS LINE A - A3/+01-QF1	ONSHORE	C10002801	FP00	100	2024-11-08	-
		ONSHORE	C10002802	FTR-2	100	2024-09-20	-
		ONSHORE	C10002803	FTR-6	100	2024-10-03	-
		ONSHORE	C10003007	FTR-5	0	-	-
A4/+01-QF1	DRAWER UPS PAS LINE B - A4/+01-QF1	ONSHORE	C10002798	FP00	100	2024-11-08	-
		ONSHORE	C10002799	FTR-2	100	2024-09-20	-
		ONSHORE	C10002800	FTR-6	100	2024-10-03	-
		ONSHORE	C10003006	FTR-5	0	-	-
A7/+02-QF1	DRAWER UPS PAS-BYPASS - A7/+02-QF1	ONSHORE	C10002804	FP00	100	2024-11-08	-
		ONSHORE	C10002805	FTR-2	100	2024-09-20	-
		ONSHORE	C10002806	FTR-6	100	2024-10-02	-
		ONSHORE	C10003008	FTR-5	0	-	-
BA-200F3A	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	ONSHORE	C10000848	CPX17	100	2024-11-02	RFC 1
		ONSHORE	C10002811	FTR-3	100	2024-11-18	-
BA-200F3A-C	UPS PAS - BA-200F3A-C	ONSHORE	C10002809	FTR-4	100	2024-11-14	-

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10

Electrical	84-10 AC 35 kVA UPS System (UP-200F3)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
BA-200F3A-D	UPS PAS - BA-200F3A-D	ONSHORE	C10002810	FTR-4	100	2024-11-14	-
BA-200F3B	Battery Rack GEL VRLA-7Y for AC UPS 35 kVA	ONSHORE	C10000849	CPX17	100	2024-11-02	RFC 1
		ONSHORE	C10002814	FTR-3	100	2024-11-18	-
BA-200F3B-C	UPS PAS - BA-200F3B-C	ONSHORE	C10002812	FTR-4	100	2024-11-14	-
BA-200F3B-D	UPS PAS - BA-200F3B-D	ONSHORE	C10002813	FTR-4	100	2024-11-18	-
CB-200F3A	Isolator Battery Box for AC UPS 35 kVA	ONSHORE	C10000855	CPX00	100	2024-11-02	RFC 1
CB-200F3A-Q2	BATTERY CUTOFF UPS PAS - CB-200F3A-Q2	ONSHORE	C10002795	FTR-2	100	2024-11-08	-
CB-200F3B	Isolator Battery Box for AC UPS 35 kVA	ONSHORE	C10000856	CPX00	100	2024-11-02	RFC 1
CB-200F3B-Q2	BATTERY CUTOFF UPS PAS - CB-200F3B-Q2	ONSHORE	C10002796	FTR-2	100	2024-11-08	-
DP-200N1-Q41	BREAKER AUX UPS PAS - DP-200N1-Q41	ONSHORE	C10002797	FTR-2	100	2024-10-28	-
UP-200F3	AC UPS 35 kVA Redundant System with By-Pass	ONSHORE	C10000871	CPX16	100	2024-11-02	RFC 1
		ONSHORE	C10002807	FP16A	100	2025-03-12	-
		ONSHORE	C10002808	FTR-6	100	2025-03-12	-
UP-200F3-QF31	SPARE	ONSHORE	C10004570	FTR-2	100	2024-11-08	-
UP-200F3-QF32	SPARE	ONSHORE	C10004571	FTR-2	100	2024-11-08	-
UP-200F3-QF33	SPARE	ONSHORE	C10004572	FTR-2	100	2024-11-08	-
UP-200F3-QF50	SPARE	ONSHORE	C10004586	FTR-2	100	2024-11-08	-
UP-200F3-QF52	SPARE	ONSHORE	C10004588	FTR-2	100	2024-11-08	-

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10

Instrumental	84-10 AC 35 kVA UPS System (UP-200F3)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
84-XS-001	ELECT. ISOLATION UPS POWER UCP (WATER TREAT. A-50000)	ONSHORE	C10003823	FJ01D	100	2025-01-28	-
84-XS-002	ELECT. ISOLATION UPS POWER UCP (NITROGEN A-64000)	ONSHORE	C10003822	FJ01D	100	2025-01-28	-
84-XS-003	ELECT. ISOLATION UPS POWER UCP (INSTRUMENT AIR A-63000)	ONSHORE	C10003821	FJ01D	100	2025-01-28	-
84-XS-004	ELECT. ISOLATION UPS POWER UCP HVAC B-100	ONSHORE	C10003820	FJ01D	100	2025-01-28	-
84-XS-005	ELECT. ISOLATION UPS POWER UCP HVAC B-200	ONSHORE	C10003819	FJ01D	100	2025-01-28	-
84-XS-007A	DISCONNECT AC UPS UP-200F3 BATTERIES A	ONSHORE	C10003817	FJ01D	100	2025-01-28	-
84-XS-007B	DISCONNECT AC UPS UP-200F3 BATTERIES B	ONSHORE	C10003816	FJ01D	100	2025-01-28	-
84-XS-010	INHIBIT. BATTERY CHARGING AC UPS UP-200F3 BATTERIES	ONSHORE	C10003812	FJ01D	100	2025-01-28	-
C-CB-200F3A/B400-SIS-001	TRIP SIGNAL / MARSHALLING PCS	ONSHORE	C10000197	CJX10	100	2024-11-25	RFC 2
C-CB-200F3B/B400-SIS-001	TRIP SIGNAL / MARSHALLING PCS	ONSHORE	C10000198	CJX10	100	2024-11-25	RFC 2
UP-200F3/B400-SIS-001	TRIP SIGNAL / MARSHALLING PCS	ONSHORE	C10000196	CJX10	100	2024-11-30	RFC 2

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10

Telecom	84-10 AC 35 kVA UPS System (UP-200F3)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
UP-200F3/B400-NET-001.01	COMMUNICATION / EMCS SYSTEM	ONSHORE	C10004370	CIX09	100	2024-11-22	RFC 2
UP-200F3/B400-NET-001.02	COMMUNICATION / EMCS SYSTEM	ONSHORE	C10004371	CIX09	100	2024-11-22	RFC 2

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 84-10

Miscellaneous	84-10 AC 35 kVA UPS System (UP-200F3)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
123A90-PML-COM-PRO-03059	OTP - UPS System UP-200F3 35kVA	ONSHORE	C10004628	5300	99	-	-
		OFFSHORE	C10004949	5300	0	-	-

7.3 Equipment Related Technical Queries

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7.4 As Built Documentation

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7.5 Management of Change – Summary Table of Tasks and Details of Affected Related Documentation

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7.6 ANNEX CHARGE-DISCHARGE BATTERY RECORDS

7.6.1 ANNEX 001 12h CAPACITY CHARGE TEST RECORD

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

UP-200F3 [ANNEX001]
SUBSYSTEM 84-10: BATTERY FIRST CHARGE RECORD SHEET DURATION 12HOURS

BATTERY 'A' RACK' UPS-BAT-1A | 12h CAPACITY CHARGE TEST RECORD

N° Hours	0,00	0,30	1,00	1,30	2,00	2,30	3,00	3,30	4,00	4,30	5,00	5,30	6,00	6,30	7,00	7,30	8,00	8,30	9,00	9,30	10,00	10,30	11,00	11,30	12,00	Note:
Time (hh:mm)																										
Charge Voltage (V)																										14,4 V ÷15,0 V at 20°C
Charge Current (A)																										INITIAL CHARGING CURRENT < 45A
Ambient Temp. (°C)																										
Battery Cell Temp. (°C)																										
Battery N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	
11																										FAAM BATTERY,TYPE FLG 12-150
12																										FAAM BATTERY,TYPE FLG 12-150
13																										FAAM BATTERY,TYPE FLG 12-150
14																										FAAM BATTERY,TYPE FLG 12-150
15																										FAAM BATTERY,TYPE FLG 12-150
16																										FAAM BATTERY,TYPE FLG 12-150
17																										FAAM BATTERY,TYPE FLG 12-150
18																										FAAM BATTERY,TYPE FLG 12-150
TERMINAL VOLT. n.1°n.18																										

Table 7: DATA RECORD SHEET CHARGE BATTERY BANK A

7.6.2 ANNEX 002 12h CAPACITY CHARGE TEST RECORD

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

UP-200F3 [ANNEX002]
SUBSYSTEM 84-10: BATTERY FIRST CHARGE RECORD SHEET DURATION 12HOURS

BATTERY 'B' RACK' UPS-BAT-1B | 12h CAPACITY CHARGE TEST RECORD

N° Hours	0,00	0,30	1,00	1,30	2,00	2,30	3,00	3,30	4,00	4,30	5,00	5,30	6,00	6,30	7,00	7,30	8,00	8,30	9,00	9,30	10,00	10,30	11,00	11,30	12,00	Note:
Time (hh:mm)																										
Charge Voltage (V)																										14,4 V ÷ 15,0 V a 20°C V
Charge Current (A)																										INITIAL CHARGING CURRENT < 45A .....A
Ambient Temp. (°C)																										
Battery Cell Temp. (°C)																										
Battery N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	
4																										FAAM BATTERY,TYPE FLG 12-150 Ah
5																										FAAM BATTERY,TYPE FLG 12-150 Ah
6																										FAAM BATTERY,TYPE FLG 12-150 Ah
7																										FAAM BATTERY,TYPE FLG 12-150 Ah
8																										FAAM BATTERY,TYPE FLG 12-150 Ah
9																										FAAM BATTERY,TYPE FLG 12-150 Ah
10																										FAAM BATTERY,TYPE FLG 12-150 Ah
11																										FAAM BATTERY,TYPE FLG 12-150 Ah
12																										FAAM BATTERY,TYPE FLG 12-150 Ah
13																										FAAM BATTERY,TYPE FLG 12-150 Ah
14																										FAAM BATTERY,TYPE FLG 12-150 Ah
15																										FAAM BATTERY,TYPE FLG 12-150 Ah
16																										FAAM BATTERY,TYPE FLG 12-150 Ah
17																										FAAM BATTERY,TYPE FLG 12-150 Ah
18																										FAAM BATTERY,TYPE FLG 12-150 Ah
TERMINAL VOLT. n.1°n.18																										

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Table 8: DATA RECORD SHEET CHARGE BATTERY BANK B

7.6.3 ANNEX 003 BEFORE DISCHARGE

CROSSWIND

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

ROSETTI MARINO

UP-200F3 [ANNEX 003]
SUBSYSTEM 84-10: BATTERY CHARGE / DISCHARGE RECORD SHEET

EQUIPMENT	BATTERY 'A' RACK UP-200F3	TEST MEASUREMENT:	ANNEX XX: BEFORE DISCHARGE

BATTERY BANK A TERMINAL VOLTAGE
AMBIENT TEMPERATURE .....°C BATTERY TEMPERATURE .....°C

CELL N°	TAG UTILITY / TYPE	MANIFACTURER	MODEL	LOCATION	VOLTAGE (V)	DATE	TIME	REMARKS
7	FAAM,TYPE FLG 12-150 Ah							
8	FAAM,TYPE FLG 12-150 Ah							
9	FAAM,TYPE FLG 12-150 Ah							
10	FAAM,TYPE FLG 12-150 Ah							
11	FAAM,TYPE FLG 12-150 Ah							
12	FAAM,TYPE FLG 12-150 Ah							
13	FAAM,TYPE FLG 12-150 Ah							
14	FAAM,TYPE FLG 12-150 Ah							
15	FAAM,TYPE FLG 12-150 Ah							
16	FAAM,TYPE FLG 12-150 Ah							
17	FAAM,TYPE FLG 12-150 Ah							
18	FAAM,TYPE FLG 12-150 Ah							
19	TERMINAL VOLT. n.1'n.18							

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Table 9: DATA RECORD SHEET BEFORE DISCHARGE BATTERY BANK A

7.6.4 ANNEX 004 BEFORE DISCHARGE

CROSSWIND

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

ROSETTI MARINO

UP-200F3 [ANNEX 004]
SUBSYSTEM 84-10: BATTERY CHARGE / DISCHARGE RECORD SHEET

EQUIPMENT	BATTERY 'B' RACK UP-200F3	TEST MEASUREMENT:	ANNEX XX: BEFORE DISCHARGE

BATTERY BANK B TERMINAL VOLTAGE
AMBIENT TEMPERATURE .....°C BATTERY TEMPERATURE .....°C

CELL N°	TAG UTILITY / TYPE	MANIFACTURER	MODEL	LOCATION	VOLTAGE (V)	DATE	TIME	REMARKS
7	FAAM,TYPE FLG 12-150 Ah							
8	FAAM,TYPE FLG 12-150 Ah							
9	FAAM,TYPE FLG 12-150 Ah							
10	FAAM,TYPE FLG 12-150 Ah							
11	FAAM,TYPE FLG 12-150 Ah							
12	FAAM,TYPE FLG 12-150 Ah							
13	FAAM,TYPE FLG 12-150 Ah							
14	FAAM,TYPE FLG 12-150 Ah							
15	FAAM,TYPE FLG 12-150 Ah							
16	FAAM,TYPE FLG 12-150 Ah							
17	FAAM,TYPE FLG 12-150 Ah							
18	FAAM,TYPE FLG 12-150 Ah							
19	TERMINAL VOLT. n.1°n.18							

Pagina 1

Table 10: *DATA RECORD SHEET BEFORE DISCHARGE BATTERY BANK B*

7.6.5 ANNEX 005 BATTERY DISCHARGE TEST RECORD WITH APPLIED LOAD RESISTIVE BANK

CROSSWIND

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

UPS UP-200F3 [ANNEX 005]
SUBSYSTEM 84-10: BATTERY DISCHARGE RECORD SHEET

ROSETTI MARINO

	BATTERY 'A' RACK' UPS-BAT-1A													10h CAPACITY DISCHARGE TEST RECORD WITH							
N° Hours	0,00	0,30	1,00	1,30	2,00	2,30	3,00	3,30	4,00	4,30	5,00	5,30	6,00	6,30	7,00	7,30	8,00	8,30	9,00	9,30	10,00	Note:
Time (hh:mm)																						
Discharge Power (W)																						179W ..... W
Discharge Current (A)																						13,50A ..... A
Ambient Temp. (°C)																						
Battery Cell Temp. (°C)																						
Battery Cell N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	
11																						
12																						
13																						
14																						
15																						
16																						
17																						
18																						
TERMINAL VOLT. n.1°n.18																						

Table 11: DATA RECORD SHEET DISCHARGE BATTERY BANK A

7.6.6 ANNEX 006 BATTERY DISCHARGE TEST RECORD WITH APPLIED LOAD RESISTIVE BANK

CROSSWIND

CROSSWIND BLPH PROJECT - COMMISSIONING PROCEDURE OF UPS SYSTEM UP-200F3 35kVA

UPS UP-200F3 [ANNEX 005]
SUBSYSTEM 84-10: BATTERY DISCHARGE RECORD SHEET

ROSETTI MARINO

	BATTERY 'B' RACK' UPS-BAT-1B													10h CAPACITY DISCHARGE TEST RECORD WITH APPLIED RESISTIVE LOAD BANK							
N° Hours	0,00	0,30	1,00	1,30	2,00	2,30	3,00	3,30	4,00	4,30	5,00	5,30	6,00	6,30	7,00	7,30	8,00	8,30	9,00	9,30	10,00	Note:
Time (hh:mm)																						
Discharge Power (W)																						179W ..... W
Discharge Current (A)																						13,50A ..... A
Ambient Temp. (°C)																						
Battery Cell Temp. (°C)																						
Battery Cell N°	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	(V)	
11																						
12																						
13																						
14																						
15																						
16																						
17																						
18																						
TERMINAL VOLT. n.1°n.18																						

Table 12: *DATA RECORD SHEET DISCHARGE BATTERY BANK B*

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)

Base Load Power Hub (BLPH)

AC UPS PAS - TAG: UP-200F3

SITE ACCEPTANCE TEST / PRE-COMMISSIONING / COMMISSIONING PROCEDURE

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Description	Sheet
COVER	1
REVISION / CHANGE LOG	2
HOLDS LIST	2
TABLE OF CONTENTS	3
AC UPS PAS - TAG: UP-200F3	4
AC UPS F&G - TAG: UP-200F4	36

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AEG POWER SOLUTIONS

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Project name: Hollandse Kust Noord (HKN) wind farm	Order-No.: 4400007525

Configuration and Serial No.: **Installed:**

BC-200F3-A - UPS Protect 8.33 / 40-400-216-400-RP-IP43 - Serial No.: 1010863/001 ☒

BC-200F3-B - UPS Protect 8.33 / 40-400-216-400-RP-IP43 - Serial No.: 1010863/002 ☒

BY-200F3 - By-Pass Transformer Cabinet 40 kVA 400/400V - Serial No.: ☒

CB-200F3-A - Battery Fuse Box 200A - Serial No.: 24/86529 ☒

CB-200F3-B - Battery Fuse Box 200A - Serial No.: 24/86530 ☒

BA-200F3-A - Battery 216V-150Ah 18 x FLG12-150 ☒

BA-200F3-B - Battery 216V-150Ah 18 x FLG12-150 ☒

Participants:	Company:	Date / Signature:
1. ANTHONY IVESON	ROSETTI MARINO	
2. [illegible] CASTELLANI	ROSETTI MARINO	
3. MATTIA GIROTTI	ROSETTI MARINO	
4. DAVIDE ZUCCONELLI	ROSETTI MARINO	
5.		

Remark:

Site Acceptance Test must be performed by a skilled AEG technician.

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Content:

1. Informations and Basic Datas: 3
2. Visual Inspection....6
3. Starting 7
4. Functional tests UPS / Load Transfer Tests: 12
5. MODBUS Adapter 22
6. Alarm Test: 28
7. Battery test: 29
8. Black start procedure validation test: 31

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

1. Informations and Basic Datas:

SCOPE This procedure describes the methods for checking the AC UPS system, once installed on site, to ensure that it works correctly and it meets the operational requirements
REFERENCE DOCUMENTS 1724000372-EL-DA-00004 AC UPS - GENERAL ARRANGEMENT 1724000372-EL-DG-00007 AC UPS - SINGLE LINE DIAGRAM 1724000372-EL-DG-00009 AC UPS - WIRING DIAGRAM & TERMINAL SCHEDULE 1724000372-EL-DG-00011 AC UPS - BATTERY LAYOUT AND INTERCONNECTION
TESTING EQUIPMENT & ACCESSORIES Digital Multimeter, Clamp-meter and Dummy Load

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

UPS A

RECTIFIER

Input voltage (V) 400 Frequency (Hz) 50 Number of phases 3

Float voltage (V) +/- 10% Charge voltage (V) 26

Output current (A) 58 Battery current limit (A) —

INVERTER

DC Input range (V) 220 AC Output voltage (V) 400

Output frequency (Hz) 50 Number of phases 3

Rated power (kVA) 35kVA Power factor 0,8

ALTERNATIVE LINE

Input voltage (V) 400 Frequency (Hz) 50 Number of phases 3

BATTERY

Type FLG 12-150 Capacity (Ah) 150 Number of strings / cells 18

Autonomy 15 min @ Load 35kVA

CONFIGURATION

Single unit ☐ Redundant system ☐ Redundant parallel system ☒

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

UPS B

RECTIFIER

Input voltage (V) ...400..... Frequency (Hz) .....50..... Number of phases ..3.....
Float voltage (V) .....+/- 10%..... Charge voltage (V) .....220.....
Output current (A) .....58 A..... Battery current limit (A) .....-.....

INVERTER

DC Input range (V) ..220..... AC Output voltage (V) ....400....
Output frequency (Hz) ..50..... Number of phases .....3.....
Rated power (kVA) ....35 kVA..... Power factor .....0,8.....

ALTERNATIVE LINE

Input voltage (V) .....400..... Frequency (Hz) .....50..... Number of phases ..3....

BATTERY

Type FLG 12-150... Capacity (Ah) 150... Number of strings / cells ....18.....
Autonomy 15 MIN..... @ Load ..35 kVA..

CONFIGURATION

Single unit ☐ Redundant system ☐ Redundant parallel system ☒

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

2. Visual Inspection

1) Visual Check	Check
• Equipment installation aspects and details	✓
• Cleanliness of cabinets (internally and externally)	✓
• Fuses and Circuit breakers rating and related connection cables	✓
• Control switches and push-buttons	✓
• Components identification	✓
• Alarms identification	✓
• All connections fully tightened	✓
• Grounding connection	✓
• All labels correct	✓
2) Pre-Energization Check	
• Electronic cards and related connections	✓
• Relays	✓
• Cooling fans	✓
• Wiring and plugs connections	✓
• Fuses and fuse alarm contacts	✓
• Instruments	✓
• Power switches, circuit breakers and contacts	✓
• Marking of components	✓
• Cable polarity marking	✓
• Input phase marking	✓

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

3. Starting

Rectifier start	Result
Input phase sequence	OK CW
Float voltage correct setting	OK +/- 10%
High-rate voltage correct setting	OK

Inverter start	Result
DC input voltage	221 V
AC output voltage	400 V
Frequency	50 Hz

Alternate mains start	Result
AC output voltage	400 V
Frequency	50 Hz

For the starting and shut-down procedure please refer to the following pages.

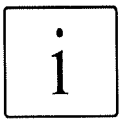
INITIAL START-UP

Prior to starting the unit, check whether the preset unit data complies with the system data by referring to the technical data sheet.

Parallel units are adjusted by the factory with regard to their current distribution. Since the local cabling affects the current distribution of the parallel units (cable cross-sections, cable lengths, cable routing and inductivities of the load distribution board), a new adjustment can be required following installation. The equalizing current of idle parallel units should be less than 5% of the inverter's nominal current. The current distribution must be controlled during start-up. Any adjustment necessary must only be carried out by appropriately trained expert personnel.



ATTENTION:
Improperly adjusted systems can in certain circumstances (individual batteries charged, i.e. 100% capacity and idle inverter) damage the battery.



NOTE:
The start-up instructions of the battery manufacturer must be complied with. Any necessary parameter modifications must be made by our service personnel or via the DOU. If changing the parameters via the DOU, ensure that these changes are applied to all units.

A phase-rotation indicator and a voltmeter are required for the following steps.



CAUTION:
When the mains is connected, potentially fatal voltages are applied to the terminals.
Always observe the safety regulations!

5.1 Preparing Initial Start-Up of a Parallel System

Step	ID No.	Action
1	1 to 2	Input breaker Q1, SBS circuit and battery isolator MCCB (external) to the "**OFF**" position.
2	1 to 2	Open Q71, Q72 inverter output isolators.
3	1 to 2	Distribution breakers to the "OFF" position, Q29 (manual by-pass) to the "OFF" position.
4	1 to 2	Remove connection cover.
5	1 to 2	Check the cable cross sections and fuse protection (refer to the operating instructions of the individual unit). Check the proper earthing of the units (all cubicles must be screwed to one another and earthed).
6	1 to 2	Connect the mains voltage for the rectifier circuit and SBS circuit.
7	1 to 2	Measure the mains voltage at terminals X1 and X4 (X1 phase-to-phase and X4 phase/zero). Refer to the technical data sheet for the nominal voltage.
8	1 to 2	Check the rotating fields at terminals X1 and X4. L1, L2 and L3 clockwise rotation.
9	1 to 2	Switch on input breaker Q1 and wait until the DC nominal voltage is reached.
10	1 to 2	Switch on the inverters.
11	1 to 2	Check the voltage between the parallel units at the inverter output isolators Q71, Q72. The voltage difference of the inverters should not be more than 2 V. (If you measure more than 2 V then adjustment is required which can only be performed by trained expert personnel.)
12	1 to 2	Switch off the inverters.
13	1 to 2	Switch off the mains voltage for the rectifier circuit and SBS circuit.
14	1 to 2	Rectify any errors if necessary and repeat the steps.
15	1 to 2	Replace the connection cover.

5.2 Initial Start-Up of a Parallel System

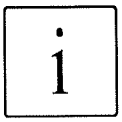
Step	ID No. 1 to n	Action	DOU	
			LED	Display
1	1 to 2	Input breaker Q1, SBS circuit and battery isolator MCCB (external) to the **"OFF"** position. INV output isolators Q71 and Q72 set to **"ON"**.	None	OFF
2	1 to 2	Load breakers to the "OFF" position, Q29 (manual by-pass) to the "OFF" position.		
3	1 to 2	Connect the mains voltage for the rectifier circuit and SBS circuit.		
4	1 to 2	Move Q1 to the **"ON"** position. The rectifier starts automatically. In systems with a central battery it only starts when the necessary number of rectifiers for the required capacity are switched on. The DC voltage increases.	Red/yellow/ green changing	Self-test
5	1 to 2	The DC voltage reaches its final value and the inverter is supplied with power. (In systems with a central battery the voltage of 2V/Pb cell or 1.2V/NiCd can be present at the output terminals of the individual RECs (safety operation), as the battery isolators are not yet closed).	Yellow flashing	Current flow symbol via REC to INV ON (black)
6	1 to 2	When the polarity on the battery isolator (REC voltage – battery voltage) has been checked, the battery isolator MCCB (external) in the **"ON"** position. The batteries are charged.		
7	1 to 2	Connect the SBS circuit. The SBS only fire when the necessary number for the required capacity are supplied with power.	Green, flashing	Current flow symbol via SBS to loads ON (black)
8	1 to 2	Switch on inverter.		INV symbol flashes
9	1 to 2	The respective AC voltage reaches its final value. As soon as the necessary number of INVs for the required capacity are switched on, the INV output contactors close.	Green ON	Current flow symbol via INV to loads ON (black), via SBS OFF
		There is no fault indication.		
11	1 to 2	Compare equalizing currents of the INVs. The equalizing currents of the INVs when idle should be less than 5% of the INV nominal current.		
12	1 to 2	Switch off INV.		
13	1 to 2	Load breakers to the "ON" position, Q29 (manual by-pass) to the "OFF" position.		
14	1 to 2	Switch on the INV and supply the loads.		

NOTE:
For all additional functions and operating modes please refer to the operating instructions of the individual units.

6 DISCONNECTING

6.1 Disconnecting the Parallel System

In order to extend, service or repair a parallel system, it may be necessary to disconnect this entire parallel system. dDuring this time the loads can be supplied via the manual bypass. The switchover of the loads from the parallel system to the manual bypass and back takes place without any interruption.



NOTE:
Maintenance and repair work must only be performed by authorised expert personnel.

6.1.1 Disconnecting a Parallel System

Step	ID No. 1 to n	Action	DOU	
			LED	Display
1	1 to 2	Control availability of the SBS (SBS ready).	Green	SBS symbol static
2	1 to 2	Switch off the inverter with the **"~0"** key on the DOU and confirm with "yes". As soon as the remaining number of INVs falls below the specified redundancy, the entire parallel system is switched over to the SBS.	Green, flashing	Current flow symbol via SBS
3		Manual bypass switch Q29 to the "ON" position		
4		Load breakers to the **"OFF"** position.		
5	1 to 2	Switch off the rectifier using the **"=0"** key on the DOU and confirm with "yes".	Yellow, green flashing	
6	1 to 2	Rectifier input breaker Q1 to the **"OFF"** position.		
7	1 to 2	Battery isolator MCCB (external) to the **"OFF"** position.	Red, yellow, green flashing	
8	1 to 2	SBS circuit "OFF"	None	OFF



CAUTION:

Even when disconnected, capacitors in the unit can still carry voltage. **Always observe the safety regulations!**

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

4. Functional tests UPS / Load Transfer Tests:

Incorporates Tests for:

Rectifier Mains Failure – continued Inverter operation via Battery
Rectifier Mains Return – auto start of the rectifier
Inverter Failure – transfer of load from Inverter to Bypass Mains
Inverter Restoration – transfer of load from Bypass Mains to Inverter
Manual Bypass Switch – transfer of load directly to Bypass Mains

The tests are performed with dummy load.

Acceptance Criteria:

Rectifier Mains Failure:	No disruption to the Inverter operation.
Rectifier Mains Return:	Auto start of the rectifier and charging of the Battery
Transfer Inverter to Static Bypass:	No-break transfers

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

A) Rectifier Mains Failure

Switch OFF rectifier Mains via Rectifier input isolator Q1

Recording of Rectifier AC current at X1 and AC load voltage and AC load current at X3

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

B) Rectifier Mains Return

Switch ON rectifier mains via Rectifier input isolator Q1

Recording of Rectifier AC current at X1 and AC load voltage and AC load current at X3

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

C) Transfer inverter-SBS mains

Switch OFF Inverter via Display

Recording of AC load voltage and AC load current at X3 and Bypass current at X4

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

D) **Transfer SBS mains-inverter**
Switch ON Inverter via Display
Recording of AC load voltage and AC load current at X3 and Bypass current at X4

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

E) Parallel Operation (load transfer test)

Parallel operation UPS n.1 and UPS n.2 - Switching OFF UPS n.2 via Display A18 on the door of the UPS

UPS n.1 takes over 100% Load

and in addition repeat the test as following indicated:

Parallel operation UPS n.1 and UPS n.2

Switching OFF UPS n.2 via de-energization of its upstream power supply

UPS n.1 takes over 100% Load

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Switching OFF UPS n.1 via Display A18 on the door of the UPS

Transfer to Bypass operation

and in addition repeat the test as following indicated:

Switching OFF UPS n.1 via de-energization of its upstream power supply

Transfer to Bypass operation

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Bypass operation - Switching ON UPS n.2 via Display A18 on the door of of the UPS

UPS n.2 takes over 100% load

and in addition repeat the test as following indicated:

Bypass operation - Switching ON UPS n.2 via re-energization of its upstream power supply

UPS n.2 takes over 100% load

Result	PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

Switching ON UPS n.1 via Display A18 on the door of of the UPS
Load sharing 50%

Parallel operation with load sharing 50% of UPS n.1 and UPS n.2

and in addition repeat the test as following indicated:

Switching ON UPS n.1 via re-energization of its upstream power supply
Load sharing 50%

Parallel operation with load sharing 50% of UPS n.1 and UPS n.2

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

F) Parallel Operation (functional sequence test)

Starting condition: UPS redundant system working in normal operation with By-Pass input and both Rectifier inputs n.1 and n.2 all energized. UPS n.1 and UPS n.2 synchronized with the By-Pass

1. De-energize upstream power supply to Rectifier input n.2
2. De-energize upstream power supply to By-Pass
3. Confirm the normal operation of UPS n.1 at the correct load
4. Re-energize upstream power supply to Rectifier input n.2
5. Confirm the correct synchronization and normal operation of both UPS n.1 and n.2 with load sharing activated
6. Re-energize upstream power supply to By-Pass
7. Confirm reinstatement and normal operation of all UPS unit functions.
8. At each test step, validate correct functioning of hardwired I/O signals

G) Parallel Operation (functional sequence test)

Starting condition: UPS redundant system working in normal operation with By-Pass input and both Rectifier inputs n.1 and n.2 all energized. UPS n.1 and UPS n.2 synchronized with the By-Pass

1. De-energize upstream power supply to Rectifier input n.1
2. De-energize upstream power supply to By-Pass
3. Confirm the normal operation of UPS n.2 at the correct load
4. Re-energize upstream power supply to Rectifier input n.1
5. Confirm the correct synchronization and normal operation of both UPS n.1 and n.2 with load sharing activated
6. Re-energize upstream power supply to By-Pass
7. Confirm reinstatement and normal operation of all UPS unit functions.
8. At each test step, validate correct functioning of hardwired I/O signals

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

5. MODBUS Adapter

Incorporates Tests for:
A29.1 MODBUS Adapter

Test to be performed for chosen failure messages, status messages and measuring values.

Designation	Source	Terminals	Checked
MODBUS Adapter	A29.1	A29.1	ok

For the Modbus Registers please refer to the following pages.

Unit profile of a three-phase UPS

Status: Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Reg.	Bit no.	Type	Name	Description
1	3-0	WORD	UPSStatus	UPS status: 1=Normal mode 2=Bypass mode 3=Battery mode 4=Eco mode "O" 6=Deactivation is imminent 7=Off

Alarms:

Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Reg.	Bit no.	Type	Name	Description (1=active)
2	0	WORD	NonCriticalFault	W: Collective warning
3	0	WORD	CriticalFault	A: Collective alarm
4	0	WORD	Userdef_DigIn1Active	W: "O"
5	0	WORD	Userdef_DigIn2Active	W: "O"
6	0	WORD	Userdef_DigIn3Active	W: "O"
7	0	WORD	EmergencySwitchOff	A: UPS output off "O"
8	0	WORD	DouCanFault	W: DOU CAN fault
9	0	WORD	MainsFault	W: Rectifier/bypass mains fault
10	0	WORD	RectifierWarning	W: Rectifier warning
11	0	WORD	RectifierFault	A: Rectifier fault
12	0	WORD	BatteryAlarm	A: Battery fault
13	0	WORD	InverterWarning	W: Inverter warning
14	0	WORD	InverterFault	W: Inverter fault
15	0	WORD	SBSWarning	W: Bypass warning
16	0	WORD	SBSFault	A: Bypass fault
17	0	WORD	EqualisingCharge	I: Charger status – equalising charging
18	0	WORD	Charge	I: Charger status – charging
19	0	WORD	TrickleCharge	I: Charger status – trickle charging
20	0	WORD	GenSetOperation	I: Charger status: Em. power supply "O"
21	0	WORD	BattTemp.SensFault	W: Battery temp. sensor "O"
22	0	WORD	BatteryTemp.ToHigh	W: Battery temp. too high "O"
23	0	WORD	CircuitBreaker	W: Circuit-breaker tripped "O"
24	0	WORD	BatteryWarning	W: Battery warning
25	0	WORD	BatteryLow	W: Battery undervoltage
26	0	WORD	Overload	W: Inverter overload
27	0	WORD	FanFault	W: Fan fault
28	0	WORD	Overload	A: Inverter overload
29	0	WORD	ShortCircuit	A: Inverter short-circuit
30	0	WORD	DcUnderVoltage	A: Inverter DC undervoltage
31	0	WORD	DcOverVoltage	A: Inverter DC overvoltage
32	0	WORD	PowerStackOverTemp	A: Inverter stack fault
33	0	WORD	SBSReady	I: Bypass ready
34	0	WORD	SBSMainsFault	W: Bypass mains fault
35	0	WORD	SBSBlocked	W: Bypass blocked
36	0	WORD	RectifierOn	I: Rectifier on
37	0	WORD	InverterOn	I: Inverter on
38	0	WORD	SBSOn	I: Bypass on

- Unit profile of a three-phase UPS

Measured values:

Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Rectifier mains:

Register	Bit no.	Type	Name	Value range
39	15-0	WORD10	RectMainsFreq.	0.0 - 99.0 Hz
40	15-0	WORD	RectMainsVoltL1	0 - 999 V
41	15-0	WORD	RectMainsVoltL2	0 - 999 V
42	15-0	WORD	RectMainsVoltL3	0 - 999 V

Bypass mains:

Register	Bit no.	Type	Name	Value range
43	15-0	WORD10	SBSMainsFreq.	0.0 – 99.9 Hz
44	15-0	WORD	SBSMainsVoltL1	0 – 999 V
45	15-0	WORD	SBSMainsVoltL2	0 – 999 V
46	15-0	WORD	SBSMainsVoltL3	0 – 999 V

Battery values:

Register	Bit no.	Type	Name	Value range
47	15-0	WORD	BatteryVoltage	0 - 999 V
48	15-0	INT10	BatteryCurrent	+- 0.0 - 3000.0 A
49	15-0	WORD10	AutonomyTime	0.0 – 999.0 min
50	15-0	WORD	BatteryCapacity	0 - 100%
51	15-0	INT10	BatteryTemperature	+- 0.0 - 99.9 °C "O"

UPS output:

Register	Bit no.	Type	Name	Value range
52	15-0	WORD10	OutputFreq.	0.0 – 99.0 Hz
53	15-0	WORD	OutputVoltageL1	0 – 999 V
54	15-0	WORD	OutputLoadL1	0 – 100 %
55	15-0	WORD	OutputCurrentL1	0 – 9999 A
56	15-0	WORD10	OutputPowerL1	0.0 – 1000.0 kW
57	15-0	WORD	OutputVoltageL2	0 – 999 V
58	15-0	WORD	OutputLoadL2	0 – 100 %
59	15-0	WORD	OutputCurrentL2	0 – 9999 A
60	15-0	WORD10	OutputPowerL2	0.0 – 1000.0 kW
61	15-0	WORD	OutputVoltageL3	0 – 999 V
62	15-0	WORD	OutputLoadL3	0 – 100 %
63	15-0	WORD	OutputCurrentL3	0 – 9999 A
64	15-0	WORD10	OutputPowerL3	0.0 – 1000.0 kW

LifeCheck:

Register	Bit no.	Type	Name	Value range
65	0	WORD	LifeCheck	Bit 0-1 toggled 1x per minute

- Unit profile of a three-phase UPS

Auxiliary signals (for units with user-definable signals):

Reg.	Bit no.	Type	Name	Description
66	0	WORD	Userdef_AUX1 – Rect.	"0"
67	0	WORD	Userdef_AUX2 – Rect.	"0"
68	0	WORD	Userdef_AUX3 – Rect.	"0"
69	0	WORD	Userdef_AUX4 – Rect.	"0"
70	0	WORD	Userdef_AUX5 – Rect.	"0"
71	0	WORD	Userdef_AUX6 – Rect.	"0"
72	0	WORD	Userdef_AUX7– Rect.	"0"
73	0	WORD	Userdef_AUX1 – Inv.	"0"
74	0	WORD	Userdef_AUX2 – Inv.	"0"
75	0	WORD	Userdef_AUX3 – Inv.	"0"
76	0	WORD	Userdef_AUX4 – Inv.	"0"
77	0	WORD	Userdef_AUX5 – Inv.	"0"
78	0	WORD	Userdef_AUX6 – Inv.	"0"
79	0	WORD	Userdef_AUX7 – Inv.	"0"
80	0	WORD	Userdef_AUX1 – SBS	"0"
81	0	WORD	Userdef_AUX2 – SBS	"0"
82	0	WORD	Userdef_AUX3 – SBS	"0"
83	0	WORD	Userdef_AUX4 – SBS	"0"
84	0	WORD	Userdef_AUX5 – SBS	"0"
85	0	WORD	Userdef_AUX6 – SBS	"0"
86	0	WORD	Userdef_AUX7 – SBS	"0"

Date/time:

Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Write: Fct.-Code 6 (Write single Holding Register) or Fct.-Code 16 (Write multiple Holding Register)

Reg.	Bit no.	Type	Name	Description
150	15-0	WORD	Real time (decimal)	Year (20xx)
151	15-0	WORD		Day (0-31)
152	15-0	WORD		Month (1-12)
153	15-0	WORD		Hour (0-23)
154	15-0	WORD		Minute (0-59)
155	15-0	WORD		Second (0-59)
156	15-0	WORD		Millisecond (0-999)
157	15-0	WORD		Weekday 1 = Monday, 2 = Tuesday, …

- Unit profile of a three-phase UPS

Unit control:

Read: Fct.-Code 3 (Read Holding Register) or Fct.-Code 4 (Read Input Register)

Write: Fct.-Code 6 (Write single Holding Register)

Reg.	Bit no.	Type	Name	Description
1000	15-0	WORD	Rectifier Control	0 = - 1 = ON 2 = OFF 9 = acknowledge fault 10 = equalising charging 11 = charge 12 = trickle charging
1001	15-0	WORD	Inverter Control	0 = - 1 = ON 2 = OFF 3 = Eco mode "O" 9 = acknowledge fault
1002	15-0	WORD	SBS Control	0 = - 9 = acknowledge fault
1003	15-0	WORD	**Battery Quick Test** – Control (LB) | Status (HB)	Control (LB) : 0x__00 = - 0x__01 = Start test 0x__02 = Cancel test Status (HB) : 0x00__ = Test not implemented 0x01__ = Test impl., waiting for approval 0x02__ = Test approved 0x03__ = Test running 0x04__ = Test successful 0x05__ = Test cancelled 0x06__ = Test warning 0x07__ = Test error
1004	15-0	WORD	**Battery Capacity Test** (with current load or constant current) – Control (LB) | Status (HB)	Control (LB) : 0x__00 = - 0x__01 = Start test 0x__02 = Cancel test Status (HB) : 0x00__ = Test not implemented 0x01__ = Test impl., waiting for approval 0x02__ = Test approved 0x03__ = Test running 0x04__ = Test successful 0x05__ = Test cancelled 0x06__ = Test warning 0x07__ = Test error
1005	15-0	WORD10	**Battery Capacity Test - RemainingTime**	0.0-6553.0 min

Control: The last accepted control command is read out; if the command failed, the read-out is 0.



In order to guarantee high availability of the load supply, some control commands are only executed if the system meets certain requirements:

Rectifier off => inverter must be off

Inverter off => switching to bypass must be guaranteed

Battery test => the entire system must be in a normal state

- Unit profile of a three-phase UPS

Battery tests:

In low byte, the battery test registers contain the control commands and in high byte, the associated statuses of the battery tests. Depending on the unit configuration, different battery tests can be initiated:

The **Battery Quick Test** consists of briefly testing the battery charging circuit. This test is also performed cyclically by the unit.

The **Battery Capacity Test** consists of testing the battery capacity. For this purpose, the battery is discharged with the connected load or by a constant current and the battery status is evaluated.
The remaining time of the capacity test can be read in the **Remaining Time** register.

Control battery test (LB):
0x00: The test has never been started via Modbus.
0x01/2: The test has been started/cancelled (the control command remains in place until the next command).
Battery test status (HB):
0x00: The test is not implemented in the unit.
0x01: The test is implemented, but is presently not approved, or the start conditions to execute the test are lacking.
0x02: The test is approved and can be started.
0x03-7: The test result remains in place for a short time until another test is approved.

Example of battery cap. test 1004/1005:
0x0000 0000 Test not implemented, no cap. test approved
0x0100 1000 Test is implemented, not approved, waiting for approval, max. runtime 100.0min
0x0200 1000 Test is approved, max. runtime 100.0min
0x0301 805 Test running; max. remaining runtime 80.5min
0x0401 0000 Test successful, new test not possible
0x0201 1000 Test is re-approved (after approx. 30s)

For further information on the battery tests, see the unit operating instructions.

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

6. Alarm Test:

Incorporates Tests for:

Remote Alarm signalling on Boards A12/A13
System Operational Check

Acceptance Criteria:

Technical datasheet (TD)

Designation	Terminals	Relay/Opto	Result
Inverter operation 1)	UPS A12-X3: 1, 2, 3	**A12K21**	OK
SBS operation 1)	UPS A12-X3: 4, 5, 6	**A12K22**	OK
Rec Fault / Rec mains fault 1)	UPS A12-X3: 7, 8, 9	**A12K23**	OK
Battery undervoltage 1)	UPS A12-X3: 10, 11, 12	**A12K24**	OK
Common fault 2)	UPS A12-X4: 1, 2, 3	**A12K25**	OK
SBS blocked 1)	UPS A13-X3: 1, 2, 3	**A13K26**	OK
Fan fault 1)	UPS A13-X3: 4, 5, 6	**A13K27**	OK
BAT room fan on 1)	UPS A13-X3: 7, 8, 9	**A13K28**	OK
INV remote off 3)	UPS A12-X5: 1, 2	**A12Opto1**	OK
BAT room fan fault 3)	UPS A13-X4: 1, 2	**A13Opto2**	OK
Not parameterised 3)	UPS A13-X4: 3, 4	**A13Opto3**	OK
Fan fault 1)	Bypass X12: 7, 8, 9	**N/A**	OK
Common fault 1)	Bypass X12: 10, 11, 12	**N/A**	OK

1) Remote signal / close on the terminals with the lower number
2) Remote signal / close on the terminals with the higher number

OPTO Input test

Check battery boost charge inhibit (external signal) in case of high battery temperature

Result: PASSED

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

7. Battery test:

BATTERY UPS A	UP-200F3	SHEET NR.: 1	REV.	OUR. RIF.:
CUSTOMER: Rosetti Marino	DISCHARGE TEST (Capacity test)	BATTERY TYPE:		CAPACITY Ah
		ELECTROLYTE TYPE:		DENSITY:
Nr. of blocks	Type : *			

TIME (hour : min)	00:00	00:20	00:40	01:00	01:20	01:40	02:00	02:20	02:40	03:00	03:20	03:40	04:00	04:20	04:40	05:00
BLOCK N°	BLOCK / VOLTAGE															
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2																
3																
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5																
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18																
TEMP. ELE. °C																

TIME (hour : min)	05:00	05:20	05:40	06:00	06:20	06:40	07:00	07:20	07:40	08:00	08:20	08:40	09:00	09:20	09:40	10:00
BLOCK N°	BLOCK / VOLTAGE															
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TEMP. ELE. °C																

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Ref: C1000281

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

BATTERY UPS B	UP-200F3	SHEET NR.: 1	REV.	OUR. RIF.:
CUSTOMER: Rosetti Marino	DISCHARGE TEST (Capacity test)	BATTERY TYPE:		CAPACITY Ah
		ELECTROLYTE TYPE:		DENSITY:
Nr. of blocks	Type : *			

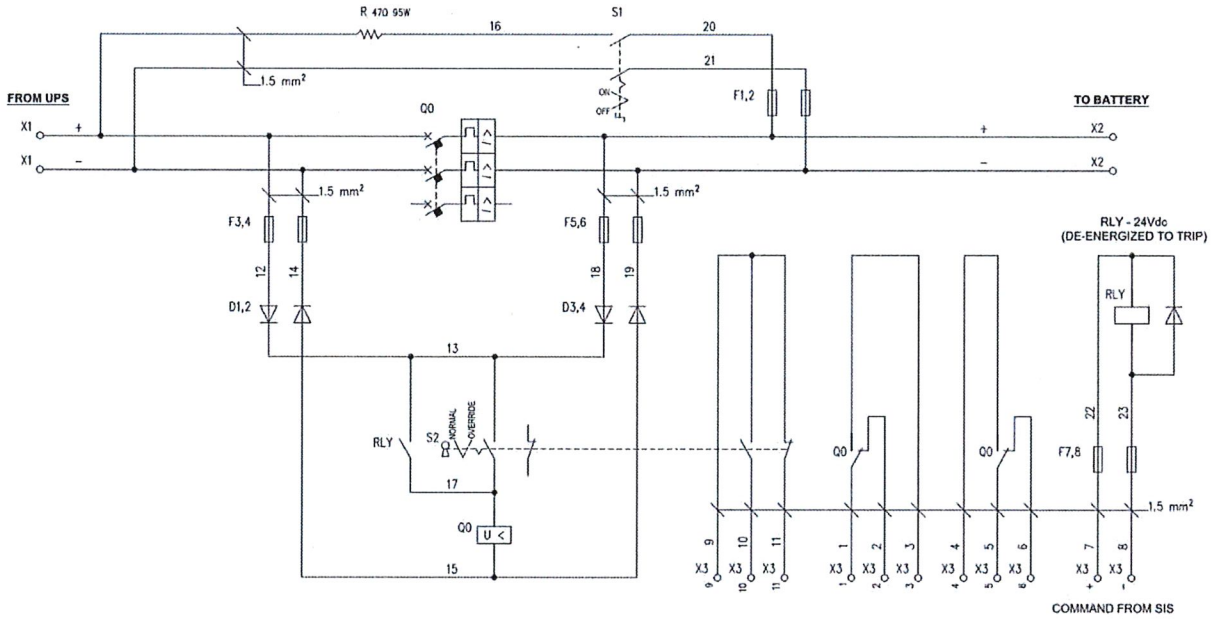
TIME (hour : min)	00:00	00:20	00:40	01:00	01:20	01:40	02:00	02:20	02:40	03:00	03:20	03:40	04:00	04:20	04:40	05:00
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TEMP. ELE. °C																

TIME (hour : min)	05:00	05:20	05:40	06:00	06:20	06:40	07:00	07:20	07:40	08:00	08:20	08:40	09:00	09:20	09:40	10:00
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Ref: C1000 7813

Site Acceptance Test Report		Document-No.: 14188_SAT_1_00
Type:	AC UPS System PAS	Tag No.: UP-200F3

8. Black start procedure validation test:



Black Start procedure

The target is to allow the energization of the loads from the battery, while the battery charger being still de-energized.

- The operator shall put the selector S2 on "override" position (contact closed)
- The operator shall close the selector S1 to pre-charge the charger output DC capacitors
- Once the charger DC capacitors are charged and the voltage across Q0 power contacts is close to 0V (and at least >80% of the system DC nominal voltage), the operator shall close the breaker Q0
- The operator shall open the selector S1
- The site safety and SCADA systems restart and the RLY relay is automatically energized when all safety conditions are fulfilled. The charger is energized through its AC supply and then it can restart
- The operator shall put the selector S2 on "normal" position (contact open)
- The system returns to normal working conditions

Designation	Checked
BLACK START procedure UPS-A	✓
BLACK START procedure UPS-B	✓

Section 7.3 Vendor Spares & Special Tools lists references

ROSETTI MARINO

SPARE PARTS LIST

CROSSWIND

Document Title	COMMISSIONING AND 2-YEARS SPARE PARTS LIST				
The document relates to	HOLLANDSE KUST NOORD WIND PARK Project - Base Load Power Hub (BLPH)				Contract: CW-I-WP4-2023-05
Project ID	123A90	Doc. n°	1724000372-EL-LIS-00026	Rev.: ISSUED FOR REVIEW (IFR)	Rev. Date: 00 - 10/10/2024	Status: IFR	Class: 2

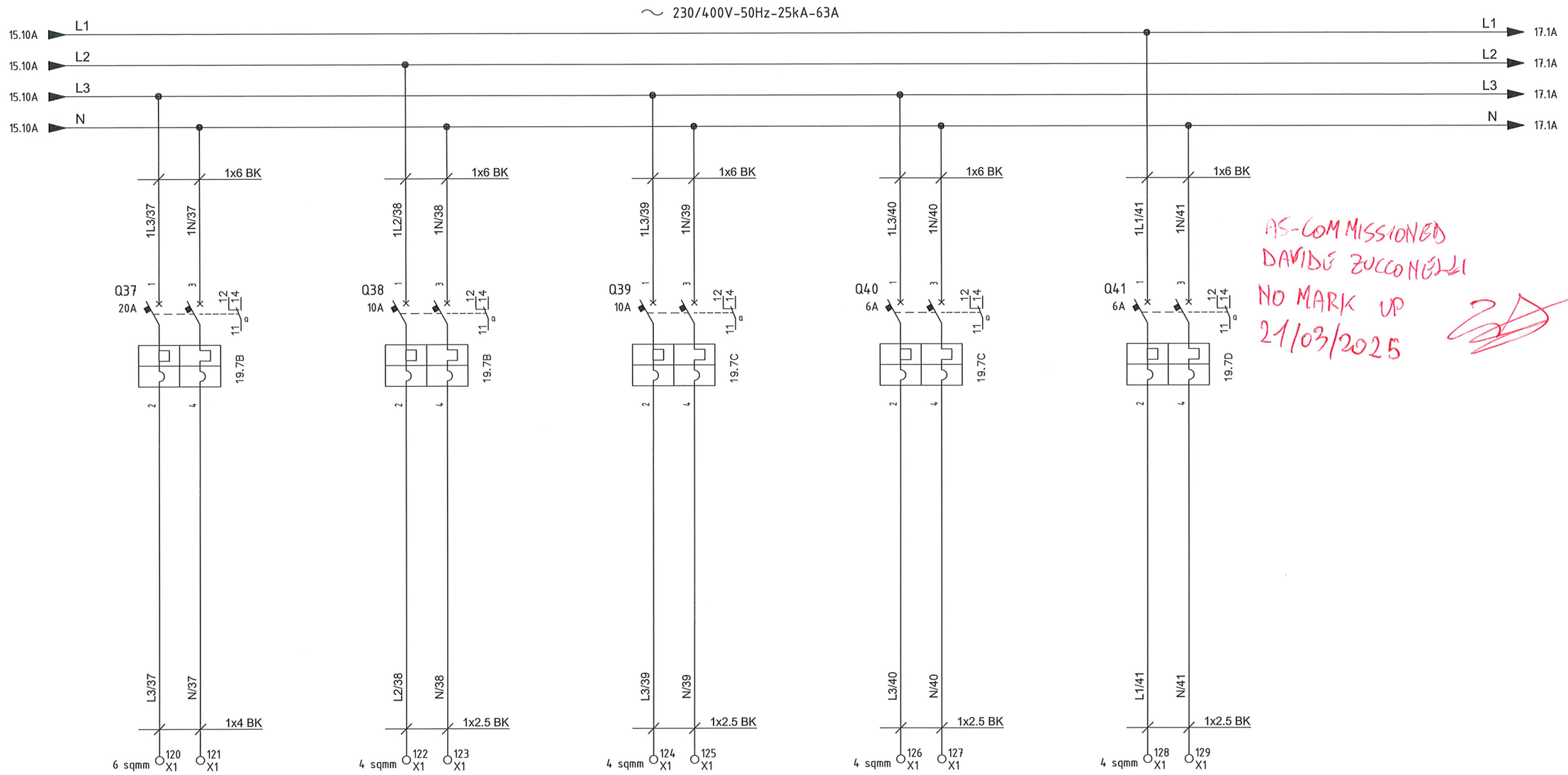
The equipment consists of the following units/components

1	Tag no.	UP-200F3 A/B	UP-200F4 A/B	UP-200F1 A/B		
2	Tag description	PROTECT 8.33 S10 40KVA IP43	PROTECT 8.33 S10 20KVA IP43	PROTECT RCS TPRE 110V-100A		
3	Manufacturer model/type no.	PROTECT 8.33 S10 40KVA	PROTECT 8.33 S10 20KVA	PROTECT RCS TPRE 110V-100A		
4	Manufacturer serial no.					
5	No. of units	2	2	2		
6	Quantity of parts FITTED / INSTALLED per unit/component	18	18	-	-	-
		8	8	-	-	-
		2	2	-	-	-
		2	2	-	-	-
		2	2	-	-	-
		2	2	-	-	-
		2	2	-	-	-
		2	2	-	-	-
		-	-	32	-	-
		-	-	8	-	-
		-	-	2	-	-
		-	-	2	-	-

Supplier:	AEG POWER SOLUTIONS / 3W POWER S.p.A.																											
Address:	VIA ROMA 108 CASSINA DE' PECCHI (MI) ITALY																											
PO Number:	1724000372 123A90A																											
PO description:	AC AND DC UPS SYSTEMS																											
Supplier telephone no:	+39 348 1567 197																											
E-mail:	alberto.dall_asta@aegps.com																											
Contact name:	Mr. ALBERTO DALL'ASTA																											
Contact mobile no:																												
WEBSITE	www.aegps.com																											
General Information:																												

	MATERIALS DATA																						Commissioning spares	2 Years spares	
Item Number	Total number of identical spares installed	Description of recommended spare parts	Parts/drawing ref.			Material	Certificate Type (if applicable)	Certificate Reference (if applicable)	Shelf life (years)	Weight (net)	Weight (gross)	Volume	HS Code	ECCN Code	% US Content	Country of origin	Supplier part no.	Manufacturer part no.	Manufacturername	Quantity ordered	Quantity ordered	Remarks
			Project Datasheet no.	Project Detail dwg. no.	Item ref.																	
7		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	36	FUSE 6,3 X 32 F5A 500VAC	1724000372-EL-DS-00005	1724000372-EL-DG-00009	-	FUSE	-		5								40000167	40000167	AEG POWER SOLUTIONS	20	-	REF: A8-A92.1-F1/F2/F3 - A8-A92.2-F1/F2/F3/F6/F7/F8
2	16	G-FUSE 6,3 X 32 F4A 440V KTA/UL	1724000372-EL-DS-00005	1724000372-EL-DG-00009	-	FUSE	-		5								40000185	40000185	AEG POWER SOLUTIONS	20	-	REF: A8-A92.1-F4/F5 - A8-A92.2-F4/F5
3	4	FUSE 6,3 X 32 T8A 500VAC KTA	1724000372-EL-DS-00005	1724000372-EL-DG-00009	-	FUSE	-		5								40003889	40003889	AEG POWER SOLUTIONS	20	-	REF: A8-A92.1-F6
4	4	G-FUSE 6,3 X 32 M2A 500V	1724000372-EL-DS-00005	1724000372-EL-DG-00009	-	FUSE	-		5								40007485	40007485	AEG POWER SOLUTIONS	20	-	REF: A8-A92.1-F9
5	4	619 ADD. REMOTE SIGNAL. OPTION-2 F UPS	1724000372-EL-DS-00005	1724000372-EL-DG-00009	-	BOARD	-		5								20001839	20001839	AEG POWER SOLUTIONS	-	2	REF: A13
6	4	261 SBS INTERFACE P8 3-PHASE	1724000372-EL-DS-00005	1724000372-EL-DG-00009	-	BOARD	-		5								20000239	20000239	AEG POWER SOLUTIONS	-	2	REF: A16
7	4	261 INVERTER INTERFACE P8 3-PHASE	1724000372-EL-DS-00005	1724000372-EL-DG-00009	-	BOARD	-		5								20000240	20000240	AEG POWER SOLUTIONS	-	2	REF: A17
8	4	261 RECTIFIER INTERFACE P8	1724000372-EL-DS-00005	1724000372-EL-DG-00009	-	BOARD	-		5								20000235	20000235	AEG POWER SOLUTIONS	-	2	REF: A20
9	32	FUSE CER. 5 X 20 T3,15A 250VAC	1724000372-EL-DS-00005	1724000372-EL-DG-00008	-	FUSE	-		5								ES274292	ES274292	AEG POWER SOLUTIONS	10	-	REF: A30-F1/F5/F12/F13/F22/F23/F31/F73/F100
10	8	CYL. FUSE 5 X 20 2,5A SP 380V S	1724000372-EL-DS-00005	1724000372-EL-DG-00008	-	FUSE	-		5								ES213368	ES213368	AEG POWER SOLUTIONS	10	-	REF: F25/F32
11	2	PCB EQUIP. GCAU V3 VERNISH	1724000372-EL-DS-00005	1724000372-EL-DG-00008	-	BOARD	-		5								ES272500	ES272500	AEG POWER SOLUTIONS	-	1	REF: A1
12	2	PCB RELAY PROTECT RCS VARNISH	1724000372-EL-DS-00005	1724000372-EL-DG-00008	-	BOARD	-		5								ES228540	ES228540	AEG POWER SOLUTIONS	-	1	REF: CR1-A5
13																						
14																						
15																						
16																						
17																						
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25																						
26																						
27																						
28																						
29																						
30																						

Section 7.4 Vendor Data / Operations / Maintenance Manuals References



CP-100E1
Auxiliary
GIS
(3G6 sqmm)

SG-100D1
Auxiliary 6.6kV
Switchboard
(3G2.5 sqmm)

SG-200N1
Auxiliary
LV Switchboard
(3G2.5 sqmm)

SG-200D2
Auxiliary
SOLAR SWGR
(3G2.5 sqmm)

UP-200F3
AC UPS PAS - 30 min -
UP-200F3 - Auxiliary
(3G2.5 sqmm)

AS-COMMISSIONED
DAVIDE ZUCCONELLI
NO MARK UP
21/03/2025

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00033
REV.: 3_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

DWG n° : 231298/SD/33
Item n° : PF1002888/101

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
=					
+					
3	12/03/2025	Santinelli	Flamminio	Sigismondi	Replaced Twiligh Switch TW1
2	19/08/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	05/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for construction (AFC)
0	29/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "DP-200N1"
LV SWBD FUNCTIONAL DIAGRAMS
Functional Drawing

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

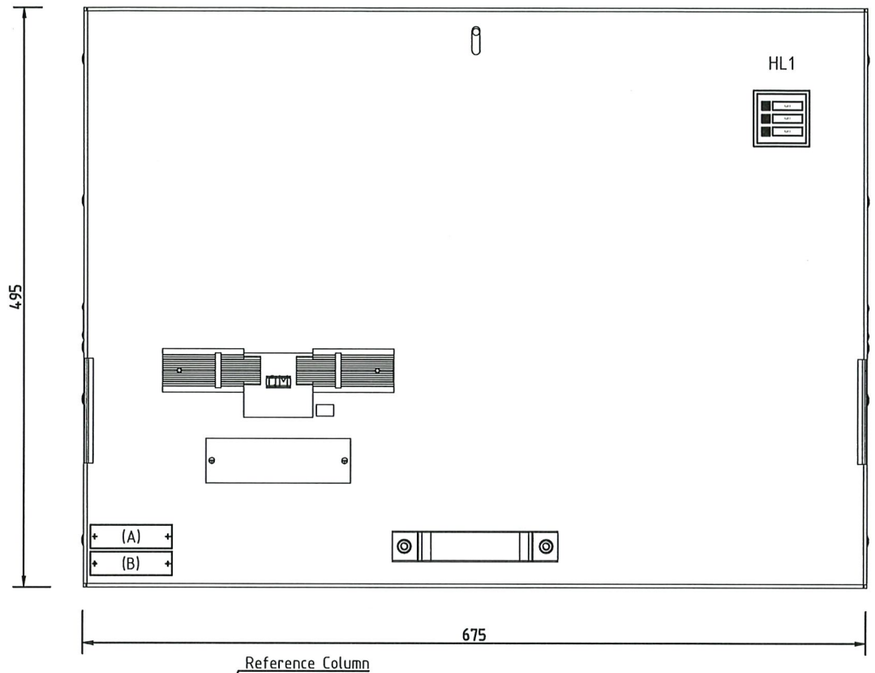
A3 | DRAWING NO. 1723002197-EL-DG-00033 | SHEET 1.6 | REV. 03

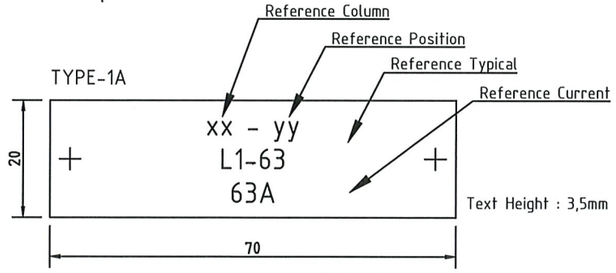
F.to UNI A3: 420mmx297mm

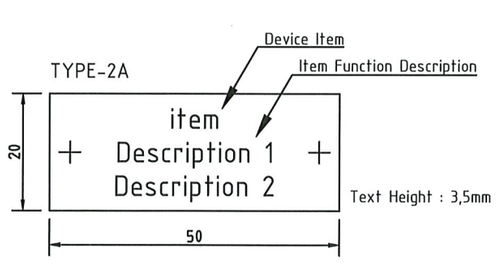
File Name : 1723002197-EL-DG-00033 Rev. 03

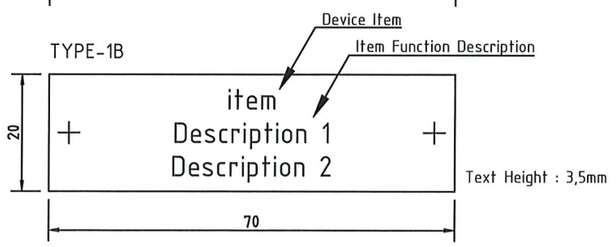
DOOR FRONT LAY-OUT

TYPICAL : LINE FEEDER "L2-n"









NOTE :

A) IDENTIFICATION name plate (type-1A) , with :
- Drawer position [Column / Position inside SWB]
- Typical name [reference applicability typical used]
- Power [reference applicability typical used]

B) USER name plate (type-1B), with :
- Item User [to see SLD diagrams]
- User Description [to see SLD diagrams]

DEVICES name plate			
ITEM	DESCRIPTION 1	DESCRIPTION 2	NOTE
QF1	Circuit Breaker	Signalling	NO plate
HL1	Multiled	Signalling	NO plate

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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00031
REV.: 2_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= TYPICAL
+ L-x
DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Door Front Lay-Out - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 024 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

USERS LEGEND

TYPICAL : LINE FEEDER "L1-n" & "L2-n"

TYPICAL APPLICABILITY					
ITEM	ITEM TAG	DESCRIPTION TAG	REFERENCE POSITION (written on name name plate "type-1A)	REFERENCE NOMINAL CURRENT C.B. TRIP UNIT (written on name name plate "type-1A)	REFERENCE TYPICAL (written on name name plate "type-1A)
1	UP-200F4	AC UPS F&G - 8H UP-200F4 - BYPASS	A2 / +04	63A	L1-63
2	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 - LINE A	A3 / +01	100A	L1-100
3	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 - LINE B	A4 / +01	100A	L1-100
4	UP-200F4	AC UPS F&G - 8H UP-200F4 - LINE A	A6 / +05	63A	L1-63
5	UP-200F4	AC UPS F&G - 8H UP-200F4 - LINE B	A6 / +06	63A	L1-63
6	ESW-200N1	WELDING SOCKETS (TOP DECK)	A6 / +08	160A	L2-160
7	UP-200F3	AC UPS PAS - 30 MIN UP-200F3 (BYPASS)	A7 / +02	100A	L1-100
8	UP-200F1	DC BATTERY SYSTEM SWTG CONTROL - FEEDER A	A7 / +03	63A	L1-63
9	UP-200F1	DC BATTERY SYSTEM SWTG CONTROL - FEEDER B	A7 / +04	63A	L1-63
10	UP-200F2	NAVAID SYSTEM FEEDER A	A7 / +05	63A	L1-63
11	UP-200F2	NAVAID SYSTEM FEEDER B	A7 / +06	63A	L1-63
12	ESW-200N2	WELDING SOCKETS (LOWER DECK)	A7 / +08	160A	L2-160

NO MARK UP
AS COMMISSIONED: MATTIA GIRETTI
25/3/25

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00031
REV.: 2_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= TYPICAL
+ L-x
DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Users Legend - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 025 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

ITEMS ACRONYM

TYPICAL : LINE FEEDER "L1-n" & "L2-n"

Composition of Typical :

L-x = Common Parts
L1-"nn" or L2-"nn"= Specific Parts

Example for Composition of L1-63:
- to take "L-x" plus "L1-63"

Example for Composition of L2-160:
- to take "L-x" plus "L2-160"

	ACRONYM ITEMS (Comun parts)	ACRONYM ITEMS (Specific parts)				
	L-x	L1-40 (In=40A) (Current Trip Unit)	L1-63 (In=63A) (Current Trip Unit)	L1-100 (In=100A) (Current Trip Unit)	L2-160 (In=160A) (Current Trip Unit)	
ASSOCIATED TYPICAL	This Item include all devices that are comun for both "Specific Parts" Items	This Items include only devices that are detail for "Specific Parts" Items				
L1-40	X	X				
L1-63	X		X			
L1-100	X			X		
L2-160	X				X	

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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00031
REV.: 2_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= TYPICAL
+ L-x
DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

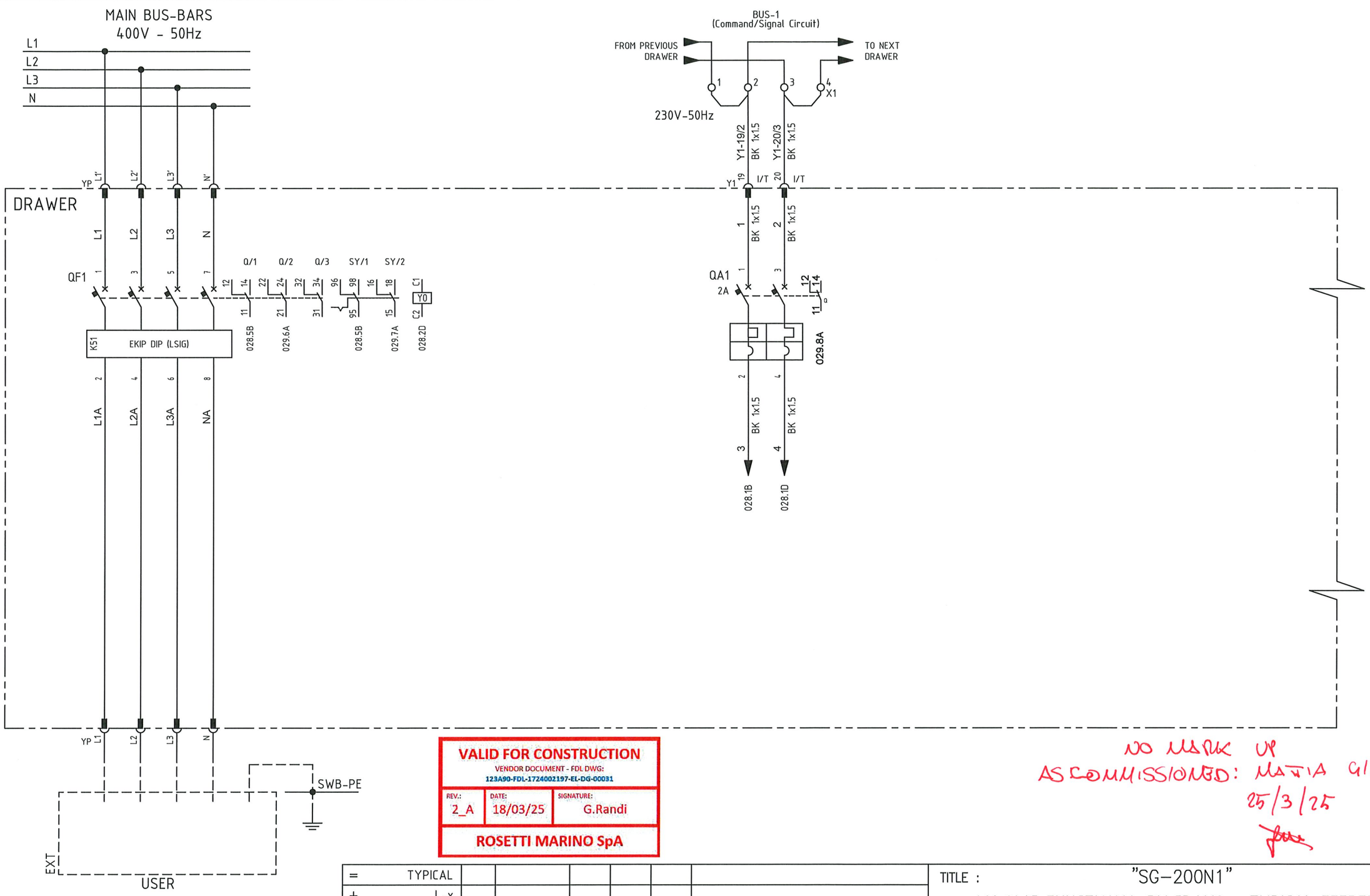
TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Items Acronym - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 026 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00031

REV.:	DATE:	SIGNATURE:
2_A	18/03/25	G.Randi

ROSETTI MARINO SpA

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

=	TYPICAL
+	L-x
DWG n° :	231298/SD/31
Item n° :	PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00031

SHEET 027

REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

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

EXT

9 X1 — 10 X1 — Y1-17/10 BK 1x1.5 — Y1 17 I/T
11 X1 — 12 X1 — Y1-18/11 BK 1x1.5 — 18 I/T
22 T — 21 I/T

027.6C 3 230V-50Hz

3 /.//

QF1 027.1B — 11 Q 12 14
QF1 027.1B — 96 98 SY 95

5 BK 1x1.5
6 BK 1x1.5
7 BK 1x1.5
8 BK 1x1.5
9 BK 1x1.5

HL1 230VAC — 1 2 3 4 — DOMO
L1 GR — CIRCUIT BREAKER OPEN
L2 RD — CIRCUIT BREAKER CLOSE
L3 AM — FEEDER TRIPPED

C1 — YO — C2
QF1 027.1B

KA1 A1 A2

027.6C 4 /.// 4

DRAWER ON TEST

029.7A 11 12 14 21 22 24 31 32 34 41 42 44

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00031

REV.:	DATE:	SIGNATURE:
2_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= TYPICAL
+ L-x
DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

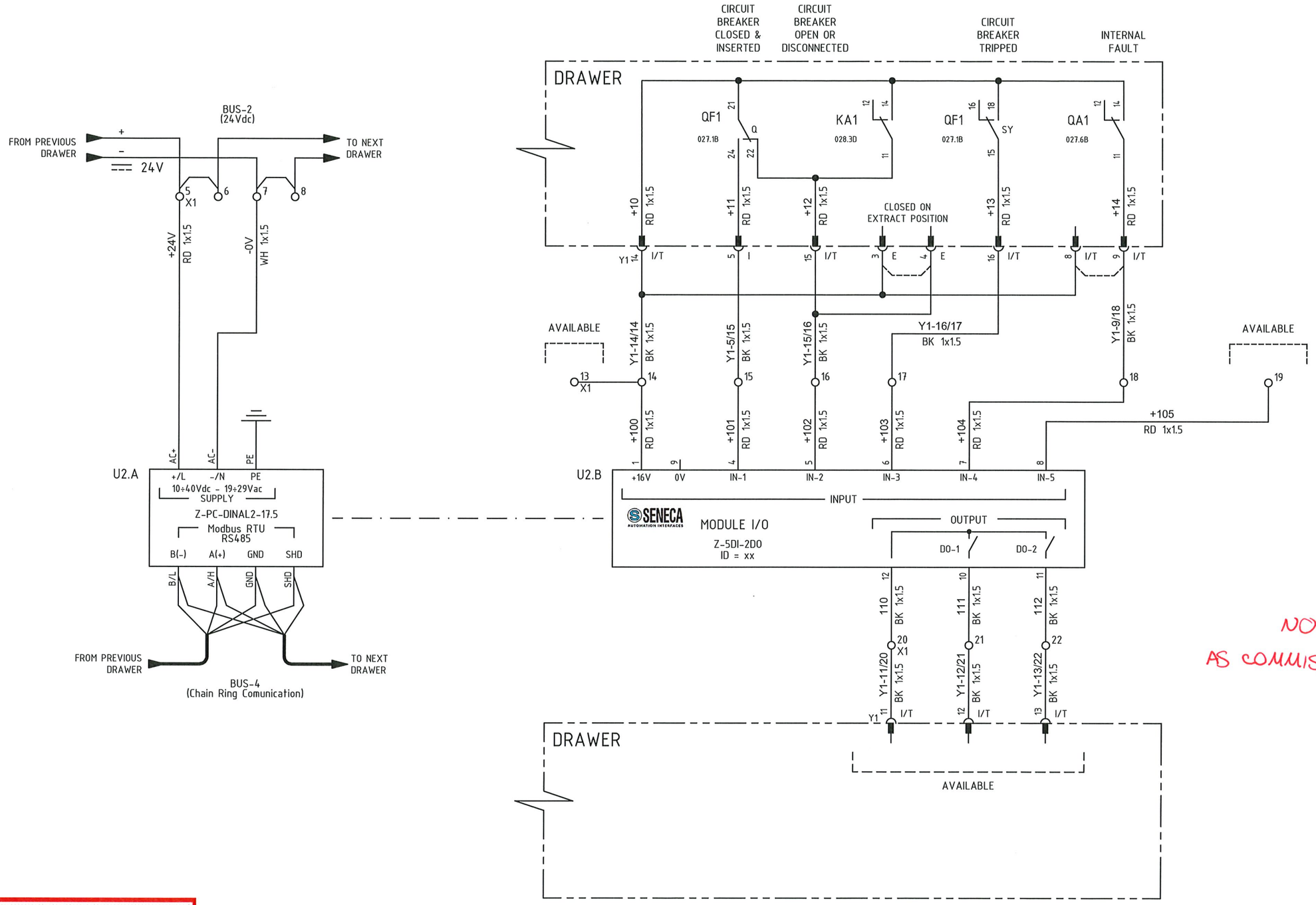
TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02



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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00031

REV.:	DATE:	SIGNATURE:
2_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= TYPICAL
\+ L-x

DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

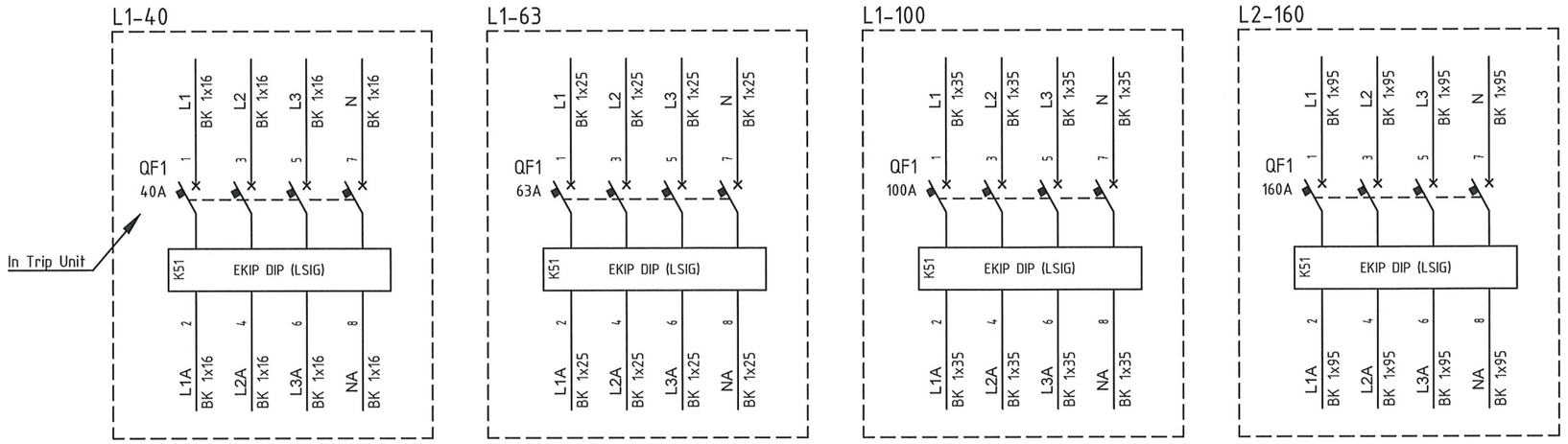
A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 029 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

SPECIFIC PARTS

TYPICAL : LINE FEEDER "L1-n" & "L2-n"



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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00031

REV.:	DATE:	SIGNATURE:
2_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= TYPICAL
+ L-x
DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 030 | REV. 02

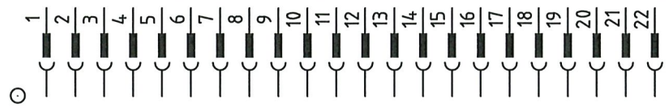
F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

AUXILIARY SOCKET

136450/001 (PF – 1 pcs) + 136458/004 (PM – 1 pcs)

N° PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
JUMP			●	●				●	●													
RACKED–OUT			X	X				X	X													
TEST								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RACKED–IN					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
PIN USED			029.6B	029.7B	029.6B			029.8B	029.8B		029.7D	029.7D	029.8D	029.5B	029.6B	029.7B	028.2B	028.3B	027.6A	027.6A	028.4B	028.3B



← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN RACKED-OUT POSITION

← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN TEST POSITION

← FIELD WHIT "X" - CONTACT CLOSE WHEN DRAWER IS IN RACKED-IN POSITION

← CROS-REFERENCE USED PIN

TYPICAL - L-x - Y1

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

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724002197-EL-DG-00031
REV.: 2_A | DATE: 18/03/25 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= TYPICAL
+ L-x
DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
1	10/07/2024	Santinelli	Flamminio	Sigismondi	Accepted for Construction (AFC)
0	09/05/2024	Santinelli	Flamminio	Sigismondi	Issued for review (IFR)

TITLE : "SG–200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197–EL–DG–00031 | SHEET 031 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197–EL–DG–00031 Rev. 02

TYPICAL - L-x

X1

NumM	Fg.	Sez.	Tipo	Descrizione	Costruttore
			BT003	BT/3 End bracket	Cabur
1	027.5A	2.5	HD100GR_	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
2	027.6A	2.5	HD100GR_	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
3	027.6A	2.5	HD100GR_	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
4	027.6A	2.5	HD100GR_	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
5	029.2A	2.5	HD100GR_	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
6	029.2A	2.5	HD100GR_	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
7	029.2A	2.5	HD100GR_	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
8	029.3A	2.5	HD100GR_	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
			HD101GR	HMD/PT/GR End section - Grey	Cabur
9	028.2A	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
10	028.2A	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
11	028.3A	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
12	028.3A	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
13	029.4B	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
14	029.5B	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
15	029.6B	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
16	029.6B	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
17	029.7B	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
18	029.8B	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
19	029.9B	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
20	029.7D	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
21	029.7D	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
22	029.8D	2.5	HD400GR_	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur
			HD201GR	HMD.1/PT/GR End section - Grey	Cabur
			BT003	BT/3 End bracket	Cabur

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25/3/25

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CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

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+ L-x
DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 032 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
HL1	028	ML22/483L230STLTTR	1	MULTILED 48x48 - 3 LED - Vaux=230Vac/dc + LAMP TEST + TROP	DOMO	TYPICAL L-x
KA1	028	ER 592 6	1	CR-M230AC4L SUPPLY 230VAC 4C/O 250V/6A LED	ABB	TYPICAL L-x
		ER 609 8	1	CR-MH HOLDER FOR CR-M RELAY	ABB	TYPICAL L-x
		ER 686 6	1	CR-M4SS SOCKET STANDARD X 2/4 C/O(CR-M)	ABB	TYPICAL L-x
QA1	027	S550239	1	S202M C 2 AUTOMATIC CIRCUIT BREAKER 10KA 2P	ABB	TYPICAL L-x
		A563819	1	S2-CS/H6R AUXILIARY STATE CONTACT 1CO	ABB	TYPICAL L-x
U2.A	029	Z-PC-DINAL2-17.5	1	DIN RAIL 2SLOT WITH HEAD FOR "Z-5DI-2DO"	SENECA	TYPICAL L-x
U2.B	029	Z-5DI-2DO	1	I/O MODUL 5DI+2DO modbus RS485 Vaux=10÷40Vdc 19÷28Vac	SENECA	TYPICAL L-x
X1		HD100GR_	8	HMD.2/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur	TYPICAL L-x
		HD400GR_	14	HMD.2N/GR Two-level feed-through Terminal Block - Grey (2.5 mmq) - Spring type	Cabur	TYPICAL L-x
		BT003	2	BT/3 End bracket	Cabur	TYPICAL L-x
		HD101GR	1	HMD/PT/GR End section - Grey	Cabur	TYPICAL L-x
		HD201GR	1	HMD.1/PT/GR End section - Grey	Cabur	TYPICAL L-x

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AS COMMISSIONED : MATIA GIROTTI
25/3/25

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S40LSIG4	1	XT2S 160 Ekip LSIG In=40A 4p F F	ABB	TYPICAL L1-40
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-40
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-40

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S63LSIG4	1	XT2S 160 Ekip LSIG In=63A 4p F F	ABB	TYPICAL L1-63
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-63
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-63

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	XT2S100LSIG4	1	XT2S 160 Ekip LSIG In=100A 4p F F	ABB	TYPICAL L1-100
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L1-100
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L1-100

Nome/Item	Fg/Sh	Tipo/Type	Q.ta/Q.ty	Descrizione/Description	Costruttore/Manufacturer	Quadro (descrizione)
QF1	030	1SDA068179R1	1	XT4S 250 BREAKING PART 4p F F	ABB	TYPICAL L2-160
		1SDA067536R1	1	SG.EL.Ekip LSIG In=160A XT4 4p	ABB	TYPICAL L2-160
		1SDA066436R1	1	AUX-C 3Q+2SY 250Vac/dc XT2-XT4 F/P	ABB	TYPICAL L2-160
		1SDA066325R1	1	SOR-C XT1..XT4 F/P 220-240Vac-220-250Vdc	ABB	TYPICAL L2-160

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VENDOR DOCUMENT - FDL DWG:
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REV.:	DATE:	SIGNATURE:
2_A	18/03/25	G.Randi

ROSETTI MARINO SpA

CROSSWIND

IMESA ELECTRICAL ENGINEERING

ROSETTI MARINO

= TYPICAL
+ L-x
DWG n° : 231298/SD/31
Item n° : PF1002983/26

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
2	18/09/2024	Santinelli	Flamminio	Sigismondi	As Built (ASB)
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TITLE : "SG-200N1"
LV SWG FUNCTIONAL DIAGRAMS - TYPICAL FEEDERS
Functional Drawing - Typical "L1-n" & "L2-n"

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

A3 | DRAWING NO. 1723002197-EL-DG-00031 | SHEET 033 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00031 Rev. 02

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	AC UPS - WIRING DIAGRAM & TERMINAL SCHEDULE INCLUDING EQUIPMENTS LIST & BILL OF MATERIAL	Sheet 4 of 303 Date: 03/10/2024 Rev: 03

Base Load Power Hub (BLPH)

AC UPS PAS - TAG: UP-200F3

WIRING DIAGRAM & TERMINAL SCHEDULE

NO MARK UP

AS COMMISSIONED: MATIA GIROTTI

26/3/25

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123A90-FDL-1724000372-EL-DG-00009

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AEG

POWER SOLUTIONS

Manufacturer (company) Manufacturer (address)	AEG Power Solutions GmbH Emil-Siepmann-Straße 32 59581 Warstein
Phone	+49(0)2902/763-0 www.aegps.com

Project name	1000007888_010
Customer	ROSETTI MARINO
Key word	Hollandse Kust Noord (HKN) wind farm

System	AC UPS PAS - TAG: UP-200F3
Systems Type	System 40 kVA
Responsible for project	Ch.Peck

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AS COMMISSIONED: MASSIMO GIROTTO
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Created on	23.05.2024	from	Beckschäfer
Last Revision	27.08.2024	from	Beckschäfer

Number of pages 153

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				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
Stat	Alteration	Date	Name	Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

System 40 kVA

Title page/Cover page

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sheet 1
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		2	Table of contents	System 40 kVA	Beckschäfer	02	27.08.2024	Beckschäfer
		3	Table of contents	System 40 kVA	Beckschäfer	01	13.08.2024	Beckschäfer
		4	Table of contents	System 40 kVA	Beckschäfer	01	13.08.2024	Beckschäfer
		5	Table of contents	System 40 kVA	Beckschäfer	01	13.08.2024	Beckschäfer
		6	Table of contents	System 40 kVA	Beckschäfer	01	13.08.2024	Beckschäfer
		1	Structure identifier overview	System 40 kVA	Beckschäfer			
		1	Single-line diagram	System 40 kVA	EEC	02	27.08.2024	Beckschäfer
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	MBC1	1	Terminal diagram	Terminal diagram =+MBC1-PE	Beckschäfer	01	13.08.2024	Beckschäfer
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01	500000002053	13.08.2024	Beckschäfer	Editor	Beckschäfer
02	500000002089	27.08.2024	Beckschäfer	Checked	Ch.Peck
Stat	Alteration	Date	Name	Norm	

Date: 27.08.2024

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

System 40 kVA

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sheet 1
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	MBC1	15	Terminal diagram	Terminal diagram =+MBC1-X35	Beckschäfer	01	13.08.2024	Beckschäfer
	MBC1	16	Terminal diagram	Terminal diagram =+MBC1-X36	Beckschäfer	02	27.08.2024	Beckschäfer
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ROSETTI MARINO SpA

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				Date	27.08.2024
01	500000002053	13.08.2024	Beckschäfer	Editor	Beckschäfer
02	500000002089	27.08.2024	Beckschäfer	Checked	Ch.Peck
Stat	Alteration	Date	Name	Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

System 40 kVA

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	UPS1	2	Circuit diagram	Power section rectifier	EEC			
	UPS1	3	Circuit diagram	Power section rectifier	EEC			
	UPS1	4	Circuit diagram	Battery connection	EEC			
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	UPS1	6	Circuit diagram	Inverter output	EEC			
	UPS1	7	Circuit diagram	Inverter output	EEC			
	UPS1	8	Circuit diagram	Load output / SBS circuit	EEC			
	UPS1	9	Circuit diagram	Inverter output contactor	EEC			
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	UPS1	11	Circuit diagram	Fuse boards	EEC			
	UPS1	12	Circuit diagram	Rectifier control	EEC			
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	UPS1	17	Circuit diagram	Fan control/monitoring	EEC			
	UPS1	18	Circuit diagram	Fan control/monitoring	EEC			
	UPS1	19	Circuit diagram	battery charging circuit monitoring	EEC			
	UPS1	20	Circuit diagram	MultiCom	EEC			
	UPS1	21	Circuit diagram	Remote signaling	EEC			
	UPS1	22	Circuit diagram	Remote signaling	Beckschäfer			
	UPS1	23	Circuit diagram	external connection	EEC			
	UPS1	1	Terminal diagram	Terminal diagram =+UPS1-A9-A12-X3	Beckschäfer			

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01	500000002053	13.08.2024	Beckschäfer	Checked	Ch.Peck			
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	UPS1	3	Terminal diagram	Terminal diagram =+UPS1-A9-A12-X5	Beckschäfer			
	UPS1	4	Terminal diagram	Terminal diagram =+UPS1-A9-A12-X6	Beckschäfer			
	UPS1	5	Terminal diagram	Terminal diagram =+UPS1-A9-A29.1-X2	Beckschäfer			
	UPS1	6	Terminal diagram	Terminal diagram =+UPS1-A9-A29.1-X4	Beckschäfer			
	UPS1	7	Terminal diagram	Terminal diagram =+UPS1-A9-A29.1-X5	Beckschäfer			
	UPS1	8	Terminal diagram	Terminal diagram =+UPS1-A20-X3	Beckschäfer			
	UPS1	9	Terminal diagram	Terminal diagram =+UPS1-A20-X4	Beckschäfer			
	UPS1	10	Terminal diagram	Terminal diagram =+UPS1-A20-X5	Beckschäfer			
	UPS1	11	Terminal diagram	Terminal diagram =+UPS1-A20-X6	Beckschäfer			
	UPS1	12	Terminal diagram	Terminal diagram =+UPS1-E1-X1	Beckschäfer			
	UPS1	13	Terminal diagram	Terminal diagram =+UPS1-E2-X2	Beckschäfer			
	UPS1	14	Terminal diagram	Terminal diagram =+UPS1-E3-X3	Beckschäfer			
	UPS1	15	Terminal diagram	Terminal diagram =+UPS1-E4-X4	Beckschäfer			
	UPS1	16	Terminal diagram	Terminal diagram =+UPS1-F120	Beckschäfer			
	UPS1	17	Terminal diagram	Terminal diagram =+UPS1-F121	Beckschäfer			
	UPS1	18	Terminal diagram	Terminal diagram =+UPS1-PE	Beckschäfer			
	UPS1	19	Terminal diagram	Terminal diagram =+UPS1-X12	Beckschäfer			
	UPS1	20	Terminal diagram	Terminal diagram =+UPS1-X13	Beckschäfer			
	UPS1	21	Terminal diagram	Terminal diagram =+UPS1-X14	Beckschäfer			
	UPS1	22	Terminal diagram	Terminal diagram =+UPS1-X15	Beckschäfer			
	UPS1	23	Terminal diagram	Terminal diagram =+UPS1-X120	Beckschäfer			
	UPS2	1	Circuit diagram	Rectifier input	Beckschäfer			
	UPS2	2	Circuit diagram	Power section rectifier	Beckschäfer			
	UPS2	3	Circuit diagram	Power section rectifier	Beckschäfer			
	UPS2	4	Circuit diagram	Battery connection	Beckschäfer			
	UPS2	5	Circuit diagram	Power section inverter	Beckschäfer			
	UPS2	6	Circuit diagram	Inverter output	Beckschäfer			

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

System 40 kVA

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	UPS2	10	Circuit diagram	Power section SBS	Beckschäfer			
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	UPS2	20	Circuit diagram	MultiCom	Beckschäfer			
	UPS2	21	Circuit diagram	Remote signaling	Beckschäfer			
	UPS2	22	Circuit diagram	Remote signaling	Beckschäfer			
	UPS2	23	Circuit diagram	external connection	Beckschäfer			
	UPS2	1	Terminal diagram	Terminal diagram =+UPS2-A9-A12-X3	Beckschäfer			
	UPS2	2	Terminal diagram	Terminal diagram =+UPS2-A9-A12-X4	Beckschäfer			
	UPS2	3	Terminal diagram	Terminal diagram =+UPS2-A9-A12-X5	Beckschäfer			
	UPS2	4	Terminal diagram	Terminal diagram =+UPS2-A9-A12-X6	Beckschäfer			
	UPS2	5	Terminal diagram	Terminal diagram =+UPS2-A9-A29.1-X2	Beckschäfer			
	UPS2	6	Terminal diagram	Terminal diagram =+UPS2-A9-A29.1-X4	Beckschäfer			
	UPS2	7	Terminal diagram	Terminal diagram =+UPS2-A9-A29.1-X5	Beckschäfer			
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	UPS2	9	Terminal diagram	Terminal diagram =+UPS2-A20-X4	Beckschäfer			
	UPS2	10	Terminal diagram	Terminal diagram =+UPS2-A20-X5	Beckschäfer			
	UPS2	11	Terminal diagram	Terminal diagram =+UPS2-A20-X6	Beckschäfer			

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	UPS2	12	Terminal diagram	Terminal diagram =+UPS2-E1-X1	Beckschäfer			
	UPS2	13	Terminal diagram	Terminal diagram =+UPS2-E2-X2	Beckschäfer			
	UPS2	14	Terminal diagram	Terminal diagram =+UPS2-E3-X3	Beckschäfer			
	UPS2	15	Terminal diagram	Terminal diagram =+UPS2-E4-X4	Beckschäfer			
	UPS2	16	Terminal diagram	Terminal diagram =+UPS2-F120	Beckschäfer			
	UPS2	17	Terminal diagram	Terminal diagram =+UPS2-F121	Beckschäfer			
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	UPS2	21	Terminal diagram	Terminal diagram =+UPS2-X14	Beckschäfer			
	UPS2	22	Terminal diagram	Terminal diagram =+UPS2-X15	Beckschäfer			
	UPS2	23	Terminal diagram	Terminal diagram =+UPS2-X114	Beckschäfer			
	UPS2	24	Terminal diagram	Terminal diagram =+UPS2-X120	Beckschäfer			

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CAE EPLAN Electric P8

Structure identifier overview

Full designation	Labeling	Structure description
+BAT1	Installation location	Battery cabinet
+MBC1	Installation location	Bypass transformer cabinet with manual bypass 40 kVA
+UPS1	Installation location	Protect 8.33 40-400-210-400
+UPS2	Installation location	Protect 8.33 40-400-210-400
&EAA	Document type	Title page/Cover page
&EAB	Document type	Table of contents
&EDB	Document type	Structure identifier overview
&EFA	Document type	Single-line diagram
&EFS	Document type	Circuit diagram
&EMA	Document type	Terminal diagram

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Code	Description
Q1	Rectifier input mains breaker
T40	Rectifier input isolation transformer
A1	Rectifier
A2	Inverter
T1	Inverter output isolation transformer
A3-A4	Static by-pass switch
A18	Display control module
A85	Heater
H1	Light

AUXILIARY
From Lighting & Small Power DB BOP DP 200N1
(Cubicle 33-Q41)
100-240V/N/PE~50/60Hz
back-up fuse gG10A 3G2.5mm2

LINE A
From LV Switchgear SG-200N1
(Cubicle A3/Q1)
Mains 400V;3/PE~50Hz
gG63A 4G35mm2

From LV Switchgear SG 200N1
(Cubicle A7/Q2)
Bypass mains 400V;3/PE~50Hz
gG63A 4G35mm2

LINE B
From LV Switchgear SG-200N1
(Cubicle A4/Q1)
Mains 400V;3/PE~50Hz
gG63A 4G35mm2

Not included in the AEG shipment

+MBC1
BY-200F3
Bypass transformer cabinet 40 kVA
1000007888.320
10309757

-Q10 L=80/65A I=0,8kA Icu=50kA
-T8 400V/400V 40kVA
-X1 1U,1V,1W,PE
-X10 U,V,W,PE
-X13 U,N,PE
-X14 U,N
-X1 3U,3V,3W,PE
-A85
-H1

+UPS1
BC-200F3A
Protect 8.33 40 400 210 400
1000007888.010
10309756

-Q1 L=100/85A I=1,3kA Icu=50kA
-T40
-A1 REC
-A2 INV
-T1
-F1,-F2,-F3
-A4
-A18 Display
-A20 Parallel Adapter
INV CAN -X3 1 3 → 203/1.8
INV Sync -X5 1 4 → 205/1.8
-A3 SBS
-L11,-L12,-L13 Parallel preventive choke coil
-A24.1 BLU PRO
-F91
-A12,-A13 Remote signaling
-Q28.1 NC
-Q28.2 NC
-X1 2U,2V,2W,PE
-X4 1U,1V,1W,1N,PE
-X4 2U,2V,2W,2N,PE
-X1 4U,4V,4W,PE
-E1-X1 U,V,W,PE
-E4-X4 U,V,W,N,PE
-E2-X2 L-,L+,PE
-E3-X3 U,V,W,N,PE
-X15 2,3
-X130 1,2
-X2 1L+,1L-,PE
-X91 1M
-X5 1U,1V,1W,1N,PE
-X2 2L+,2L-,PE
-X15 4,5
-X91 2M
-X130 1,2,PE
-Q71 NC
-Q72 NC
-Q29 INV operation / Manual bypass
-F25
DP-200F3
-QF31 B32A 300mA
-QF32 B32A 300mA
-QF33 B32A 300mA
-QF34 B16A 300mA
5pc
-QF38 B16A 300mA
-QF39 B10A 300mA
4pc
-QF42 B13A 300mA
-QF43 B13A
8pc
-QF50 B10A
-QF51 B6A
-QF52 B6A
-X31 U,N,PE
-X32 U,N,PE
-X33 U,N,PE
-X34 U,N,PE
-X38 V,N,PE
-X39 V,N,PE
-X42 W,N,PE
-X43 W,N,PE
-X50 U,N,PE
-X51 V,N,PE
-X52 V,N,PE
-X2 4L+,4L-,PE
-X15 8,9
-X91 4M
-X130 3,4,2PE
Not included in the AEG shipment
max. gG16A
max. gG16A
Load 400/230V;3/N/PE~50Hz

+UPS2
BC-200F3B
Protect 8.33 40 400 210 400
1000007888.310
10309755

2(1x70 mm2)

+BFB1
CB-200F3A
Battery fuse box 200 A
-Q2 L=200A
DC 24V max. 300W
*1

+BFB2
CB-200F3B
Battery fuse box 200 A
-Q2 L=200A
DC 24V max. 300W
*1

+BAT1
BA-200F3A
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-R8

+BAT2
BA-200F3B
Batteries installed on rack
18 x FLG 12-150
Battery voltage 216V
Battery capacity 150Ah
string 1
-R8

*1 Attention! In the event of battery undervoltage < 130 V, the UPS automatically switches off battery isolator Q2.
If this happens, switch X15:3 must be switched into the open position (undervoltage trip blocked).
For restart, please refer to the chapter in the UPS operating instructions (charging the DC link capacitors) attached.
Unlock the tripped switch Q2 by switching to open position.
After charging the DC link capacitors, switch on Q2.
Attention! When the battery voltage reaches > 200 V, switch X15:3 must be switched back to the closed position.

*2 Connection cables are not included.

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21	1000007888	18.10.2024	R.Randi	Date	14.06.2024	ROSETTI MARINO	AEG	System 40 kVA			
20	1000007888	17.10.2024	R.Randi	Engineering	EEC	Ravenna (RAVENNA) Italy		System wiring diagram			
Rev.	Modification	Date	Name	Dept.	Ex-Parte				1000007888_010 en	S.DIN	A0

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REC mains

UPS1

Top entry

-X1 1U 1V 1W

-PE — Cu 40x5 mm — PE busbar

Door — GNYE 6 mm² — Rack

Rack

BK R16 mm² (1U)

BK R16 mm² (1V)

BK R16 mm² (1W)

GNYE R35 mm²

Bottom entry

-PE — Cu 40x5 mm

-X1 2U 2V 2W

GZ1_1 +UPS1/1.2

GZ1_2 +UPS1/1.2

GZ1_3 +UPS1/1.2

+UPS1
Protect 8.33 40-400-210-400
1000007888.010
10009756

REC mains

UPS2

Top entry

-X1 3U 3V 3W

-PE

BK R16 mm² (3U)

BK R16 mm² (3V)

BK R16 mm² (3W)

Bottom entry

-PE

-X1 4U 4V 4W

GZ1_1 +UPS2/1.2

GZ1_2 +UPS2/1.2

GZ1_3 +UPS2/1.2

+UPS2
Protect 8.33 40-400-210-400
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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

REC mains
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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+ MBC1
& EFS

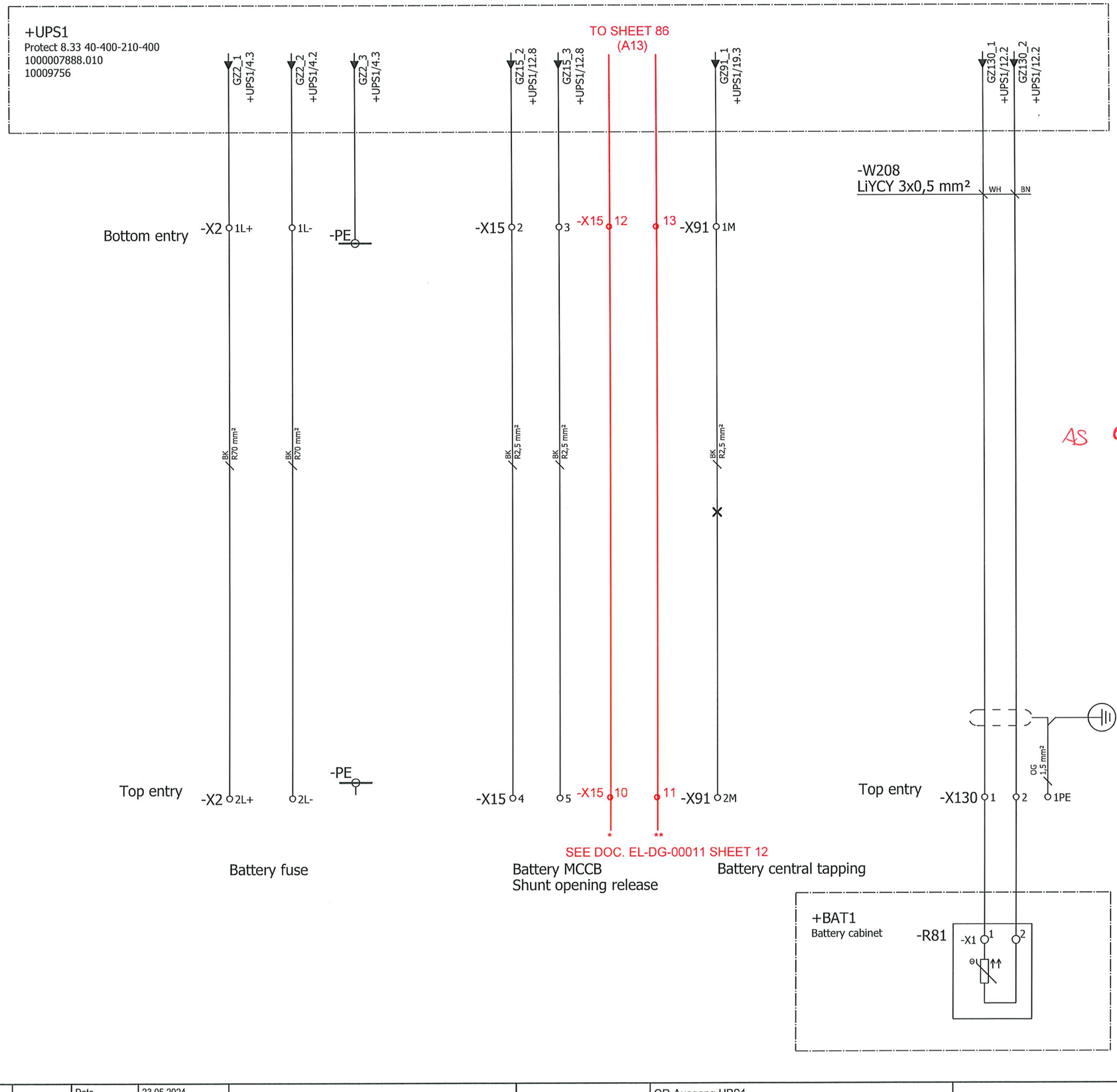
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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

GR-Ausgang UPS1
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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+ MBC1
& EFS

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+UPS2
Protect 8.33 40-400-210-400
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GZ2_1 +UPS2/4.3
GZ2_2 +UPS2/4.2
GZ2_3 +UPS2/4.3
GZ15_2 +UPS2/12.8
GZ15_3 +UPS2/12.8
GZ91_1 +UPS2/19.3
GZ130_1
GZ130_2

TO SHEET 132
(A13)

-W209
LiYCY 3x0,5 mm²
WH
BN

Bottom entry
-X2 3L+
3L-
-PE
-X15 6
7
-X15 12
13
-X91 3M

BK R70 mm²
BK R70 mm²
BK R2,5 mm²
BK R2,5 mm²
BK R2,5 mm²

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Top entry
-X2 4L+
4L-
-PE
-X15 8
9
-X15 10
11
-X91 4M

* **

SEE DOC. EL-DG-00011 SHEET 12

Battery fuse
Battery MCCB
Shunt opening release
Battery central tapping

Top entry
-X130 3
4
2PE
OG 1.5 mm²

+BAT2
Battery cabinet
-R81
-X1 1
2

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

GR-Ausgang UPS2
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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& EFS

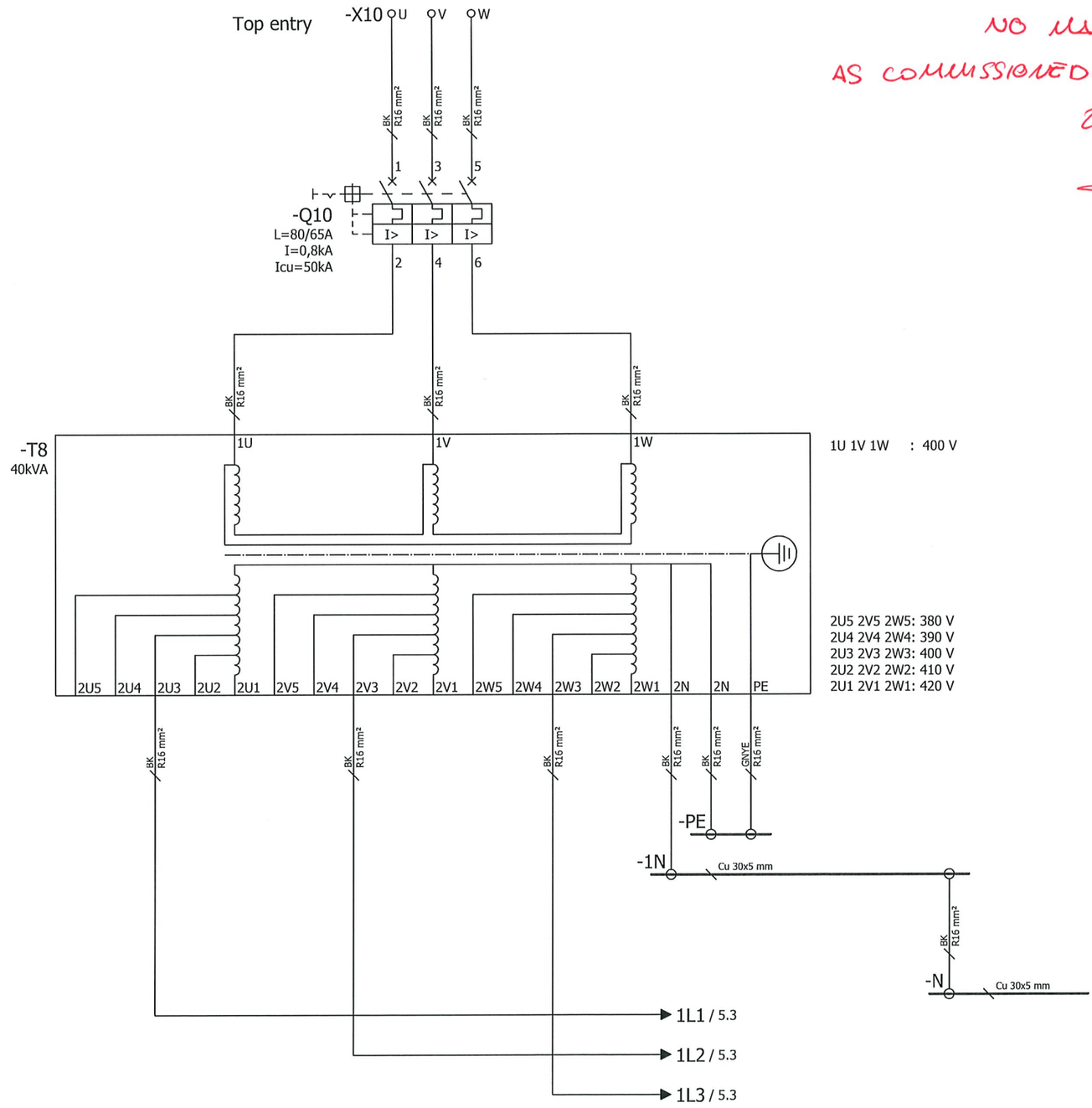
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Mains
400V;3/PE~50Hz



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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Bypass Transformator
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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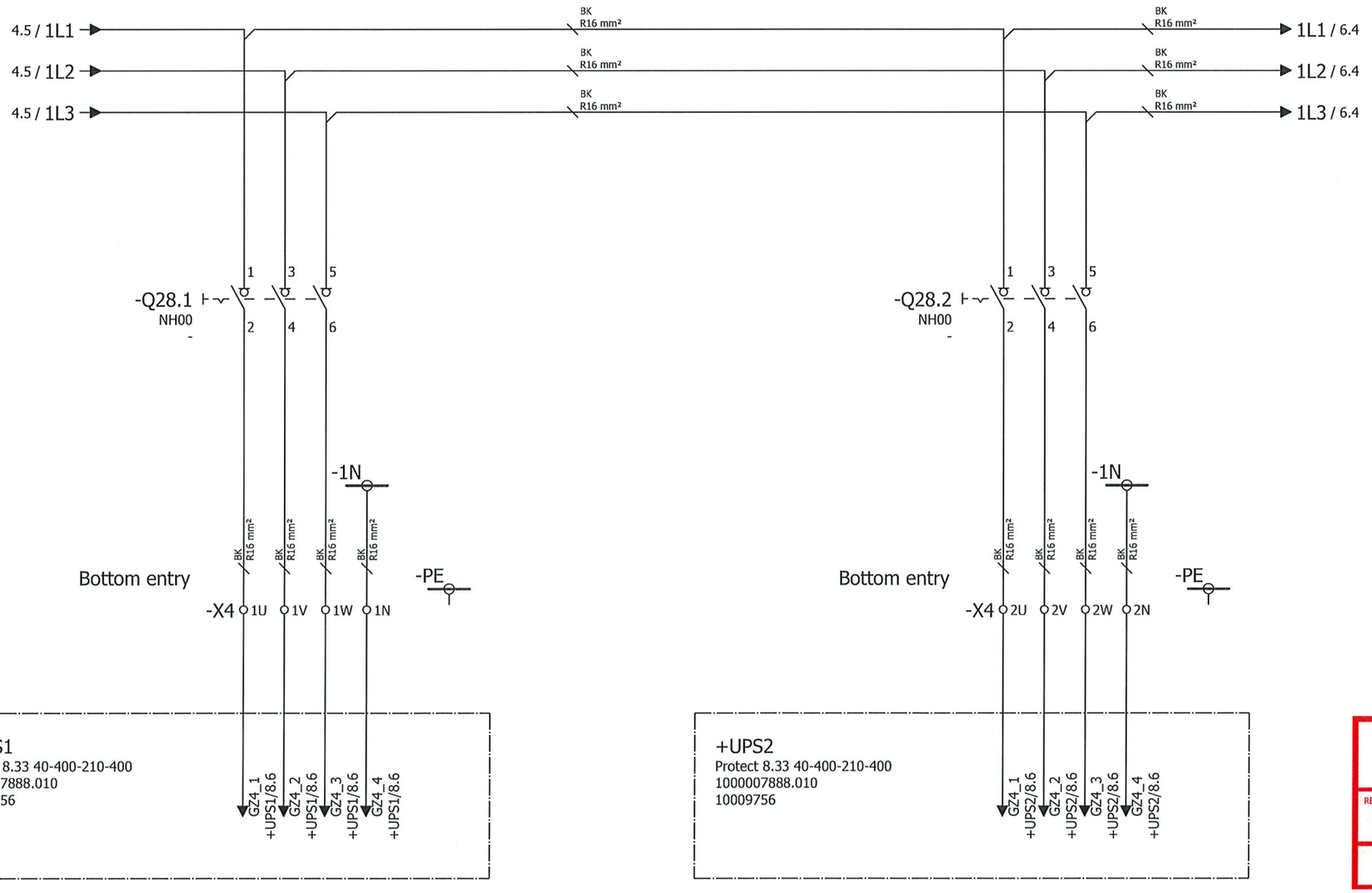
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				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

SBS mains
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

1000007888.020
10009757

1000007888_010 en

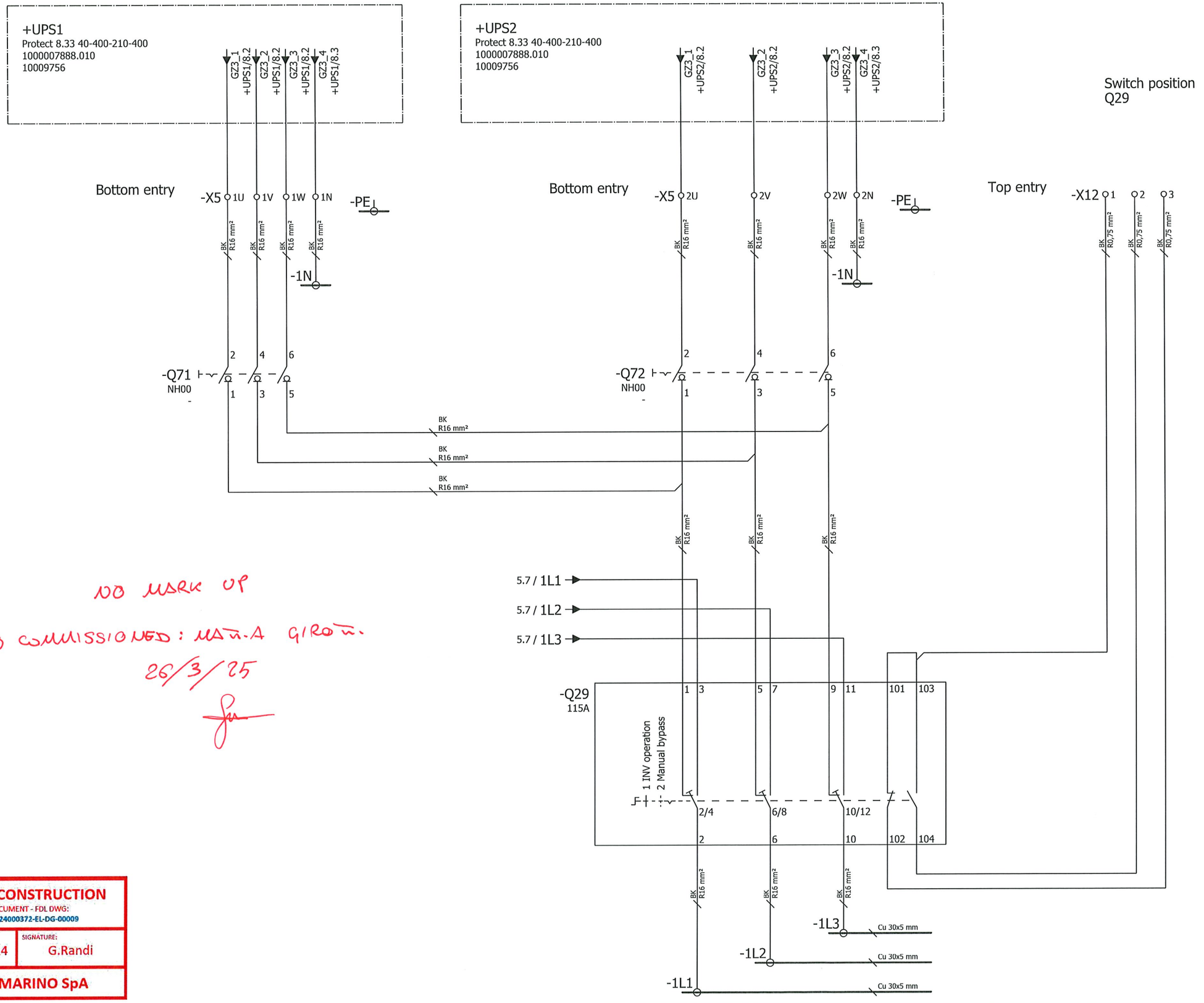
=
+ MBC1
& EFS

A3

sheet 5
sheets 17

CAE EPLAN Electric P8

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Manual bypass
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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+ MBC1
& EFS

A3

sheet 6
sheets 17

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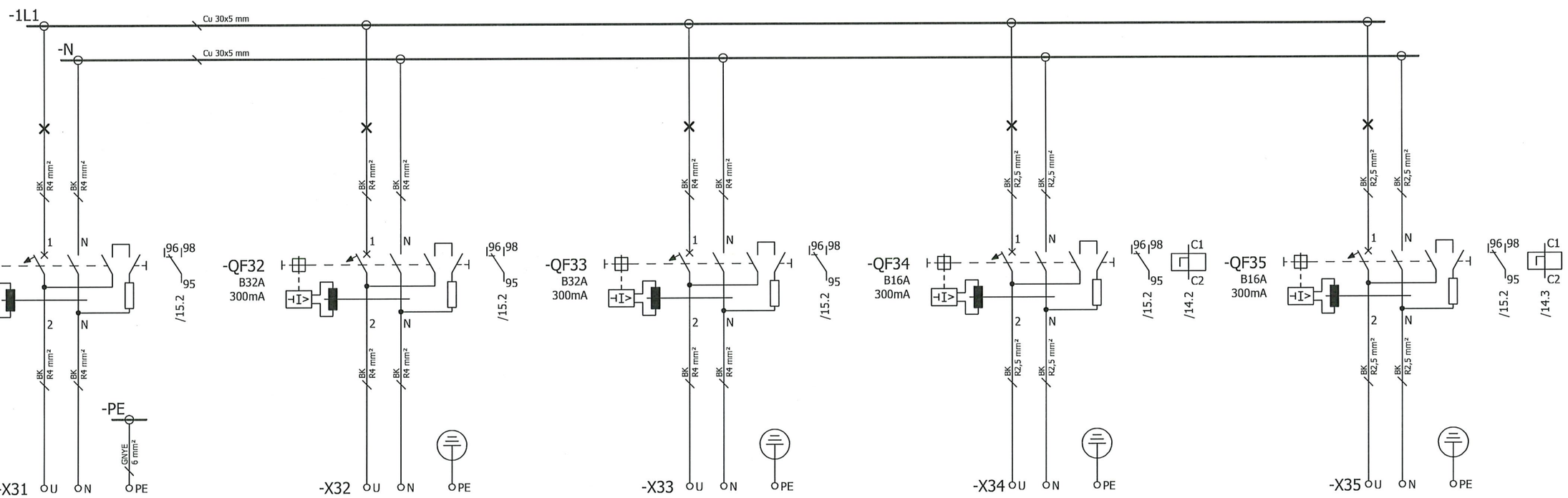
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ROSETTI MARINO SpA

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AS COMMISSIONED: MARIA GIRONI

24/3/25



Load
230V/N/PE~50Hz

SPARE

Load
230V/N/PE~50Hz

SPARE

Load
230V/N/PE~50Hz

SPARE

Load
230V/N/PE~50Hz

CP-630-E1
UCP-INSTRUMENT AIR PACKAGE
1.5KW

Load
230V/N/PE~50Hz

CP-640-E1
UCP-N2 PACKAGE
1.5KW

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Load
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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+ MBC1
& EFS

A3

sheet 7
sheets 17

CAE EPLAN Electric P8

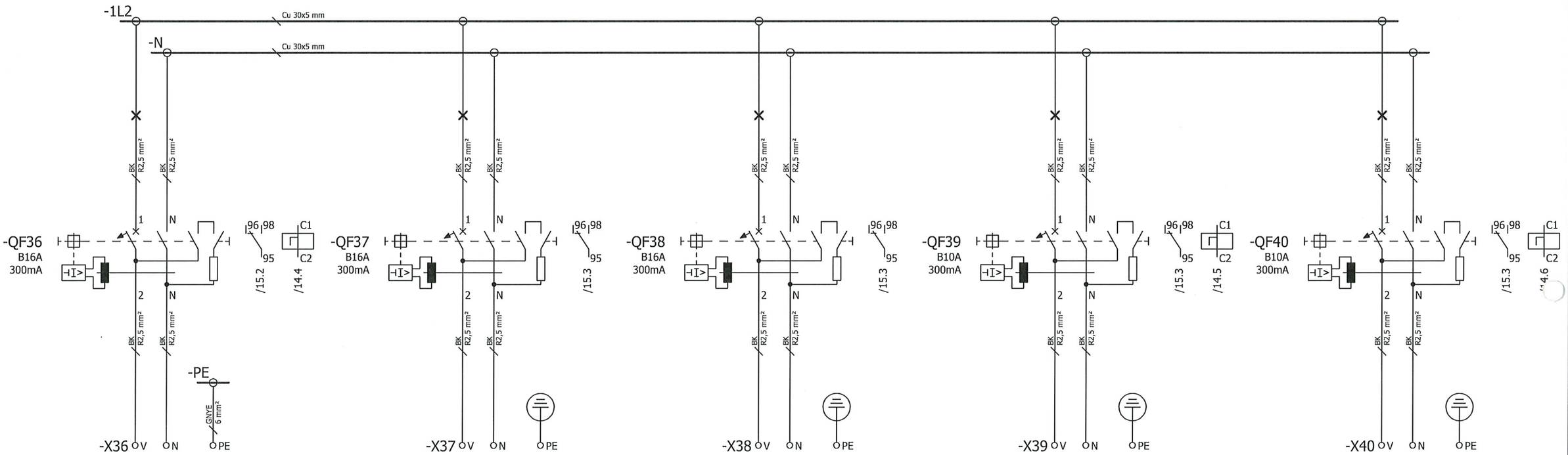
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ROSETTI MARINO SpA

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24/3/25



Load
230V/N/PE~50Hz

JB-500-F8
UCP WATER PACKAGE
2KW

Load
230V/N/PE~50Hz

B400-SRV-001
SERVER CABINET ITER - LINE A

Load
230V/N/PE~50Hz

B400-SRV-001
SERVER CABINET ITER - LINE B

Load
230V/N/PE~50Hz

B100-HSB-001
UCP-HVAC HV ROOM
0.5KW

Load
230V/N/PE~50Hz

B200-HSB-001
UCP-HVAC LV ROOM
0.5KW

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Load
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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+ MBC1
& EFS

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sheet 8
sheets 17

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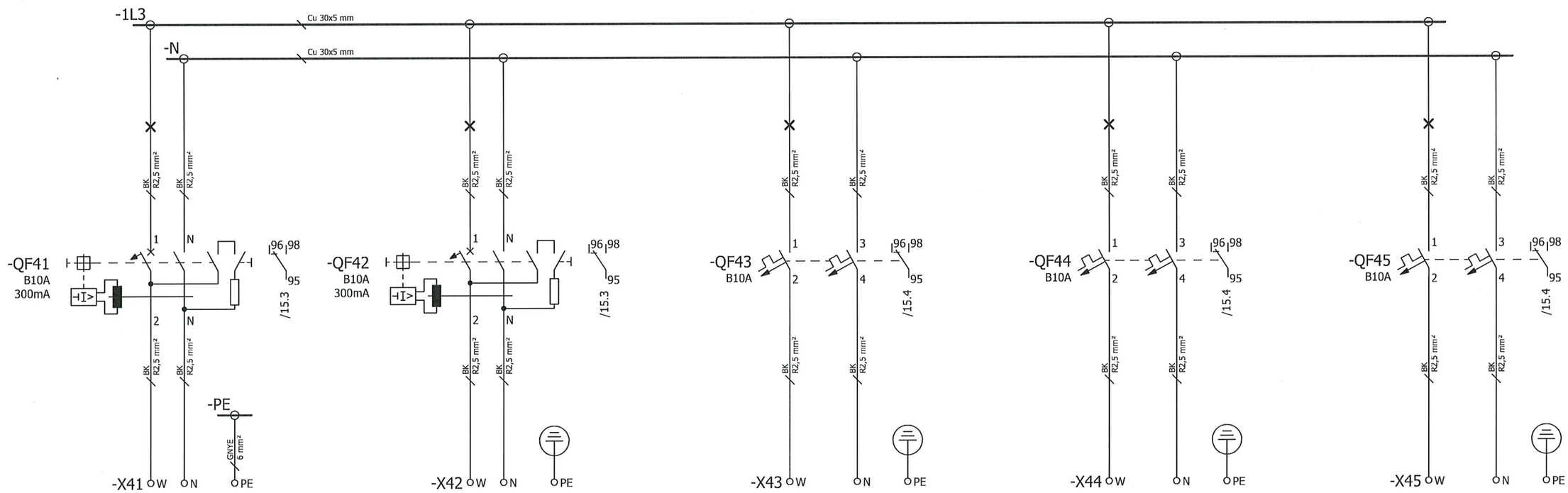
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Load
230V/N/PE~50Hz

B300-HSB-001
UCP-HVAC UPS ROOM
0.5KW

Load
230V/N/PE~50Hz

B300-HSB-001
UCP-HVAC ITER
0.5KW

Load
230V/N/PE~50Hz

B400-SIS-001
SIS-CONTROLLER AND I/O
CABINET-LINE A - 1KW

Load
230V/N/PE~50Hz

B400-SIS-001
SIS-CONTROLLER AND I/O
CABINET-LINE B - 1KW

Load
230V/N/PE~50Hz

B400-PCS-001
PCS-CONTROLLER AND I/O
CABINET-LINE A - 1.5KW

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Load
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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+ MBC1
& EFS

A3

sheet 9
sheets 17

CAE EPLAN Electric P8

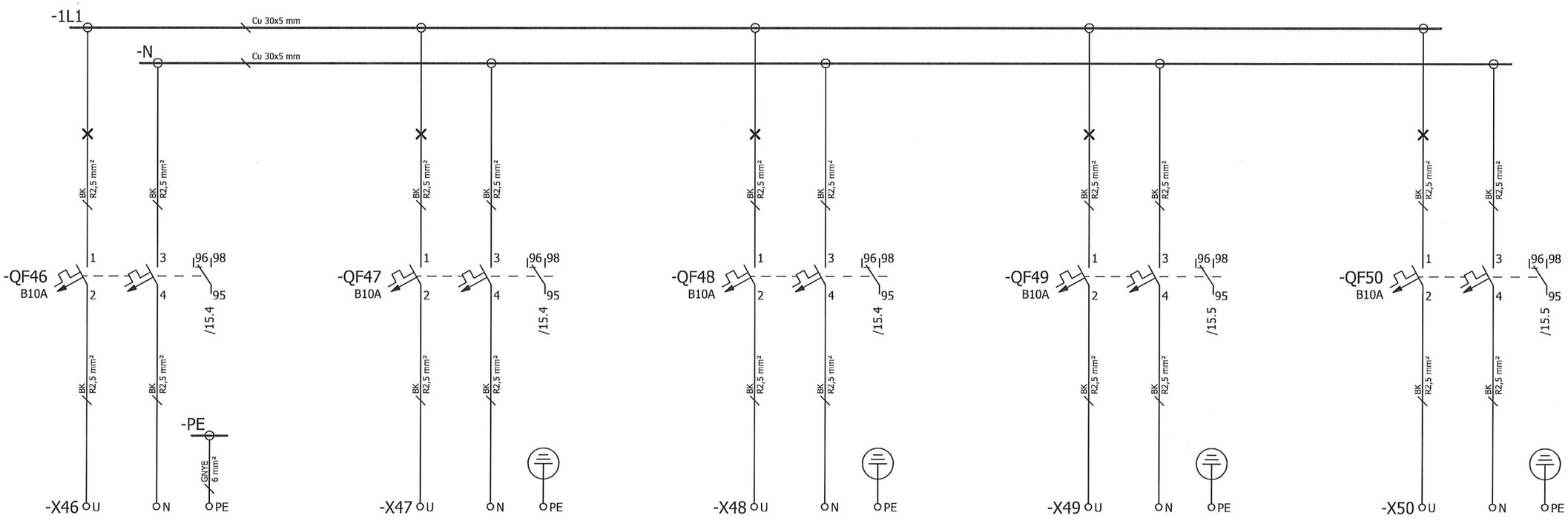
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ROSETTI MARINO SpA

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DAVIDE ZUCCONELLI
NO MARK UP
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Load
230V/N/PE~50Hz

B400-PCS-001
PCS-CONTROLLER AND I/O
CABINET-LINE B - 1.5KW

Load
230V/N/PE~50Hz

B400-EMCS-001
EMCS-CONTROLLER AND I/O
CABINET-LINE A - 1KW

Load
230V/N/PE~50Hz

B400-EMCS-001
EMCS-CONTROLLER AND I/O
CABINET-LINE B - 1KW

Load
230V/N/PE~50Hz

SG-200-N1
LV SWITCHBOARD AUXILIARY
1KW

Load
230V/N/PE~50Hz

SPARE

1000007888_010

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Load
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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+ MBC1
& EFS

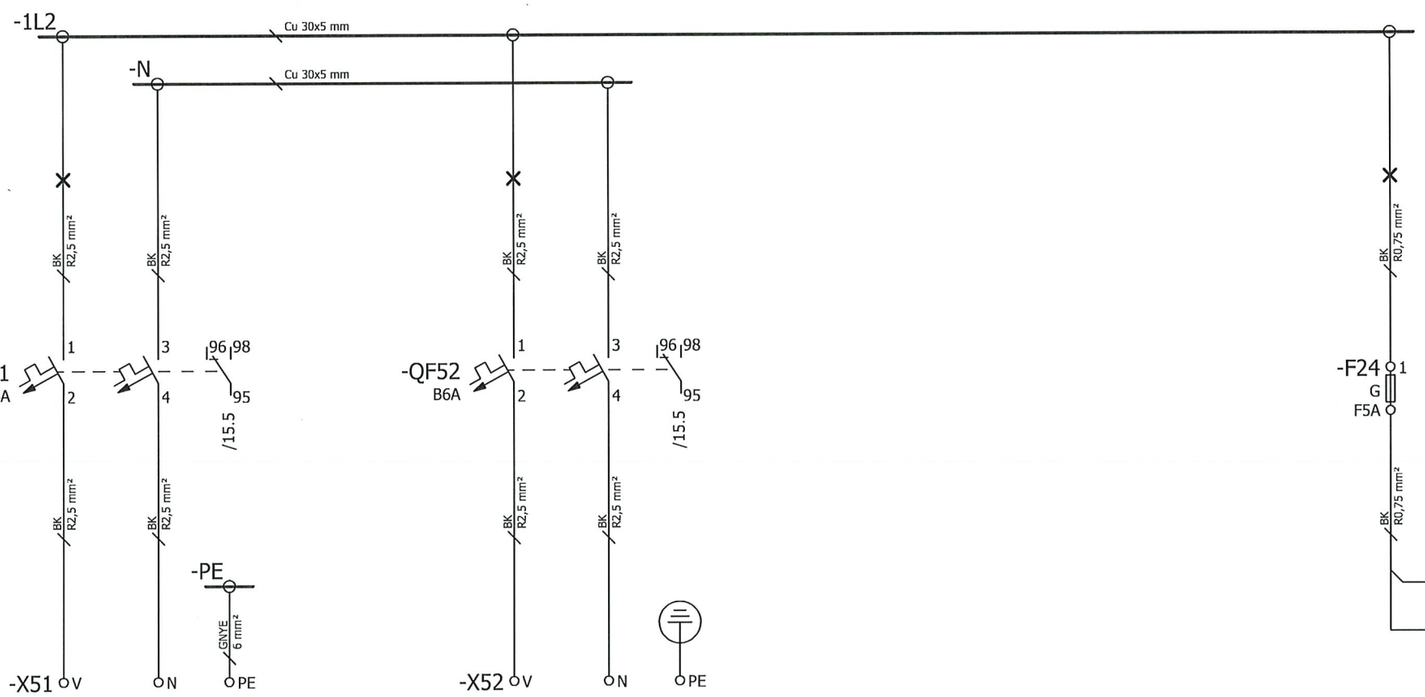
A3

sheet 10
sheets 17

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26/3/25



Load
230V/N/PE~50Hz

SG-200-D2
LV SWITCHBOARD
800/460V AUXILIARY

Load
230V/N/PE~50Hz

SPARE
0.5KW

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Stat	Alteration	Date	Name	Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Load
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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+ MBC1
& EFS

A3

sheet 11
sheets 17

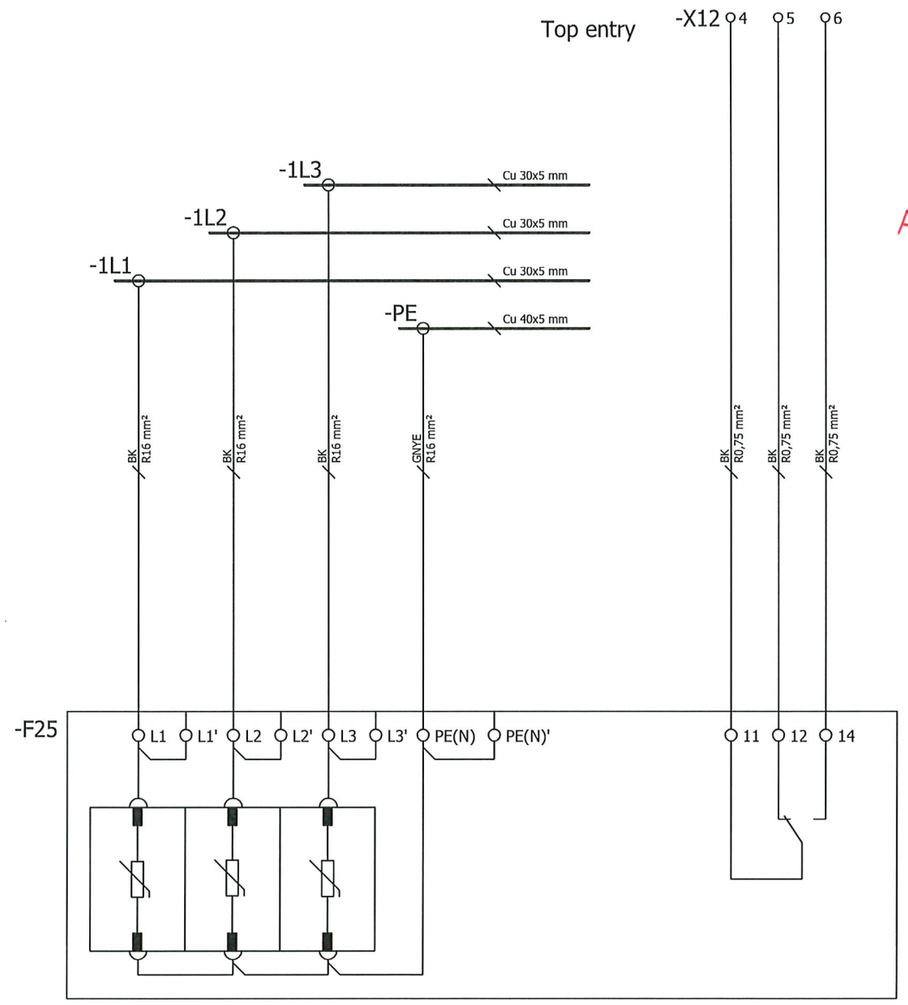
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status
Surge arrester

Top entry



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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Surge arrester
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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=
+ MBC1
& EFS

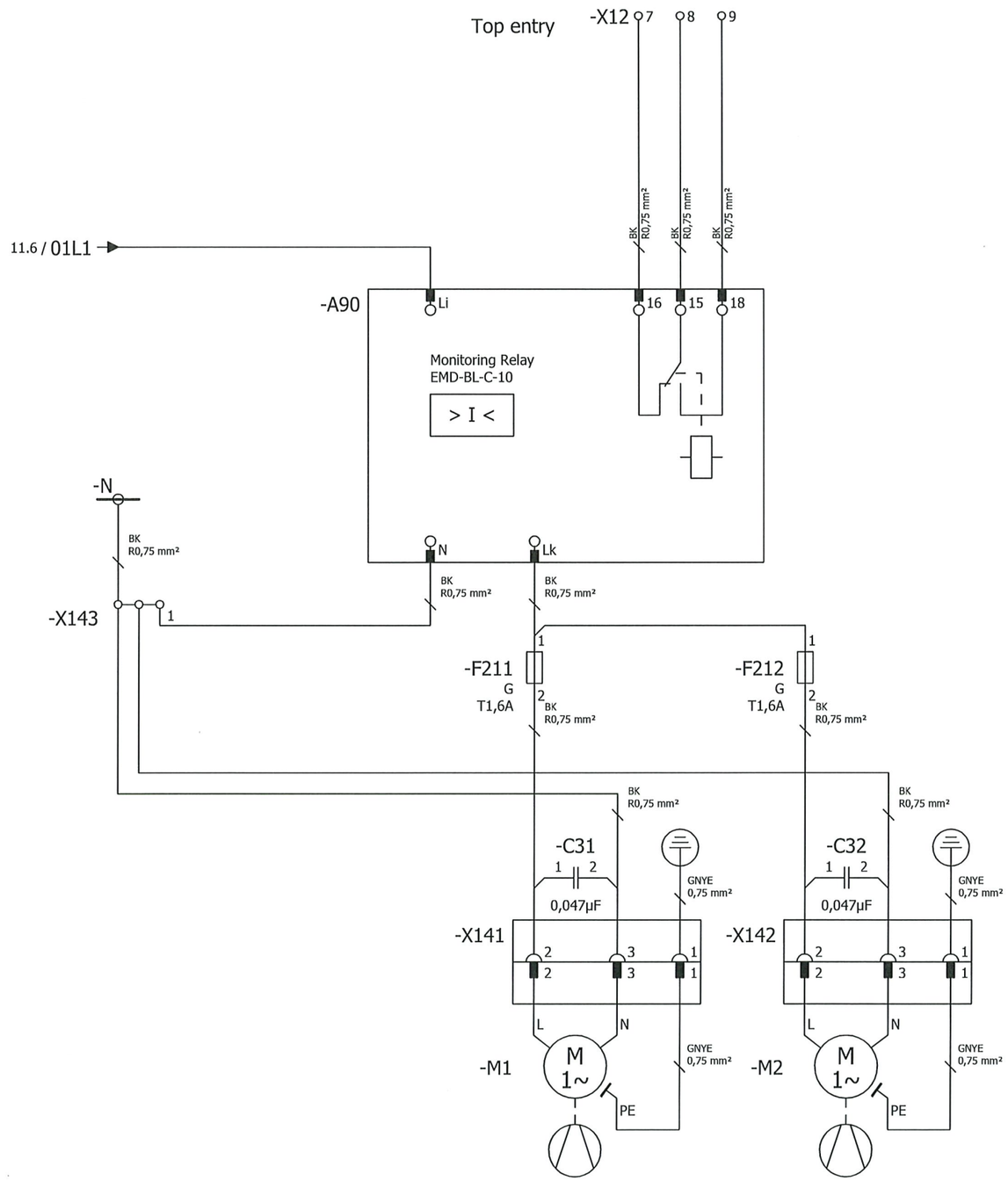
A3

sheet 12
sheets 17

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Fan fault



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Stat	Alteration	Date	Name	Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Fan control
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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=
+ MBC1
& EFS

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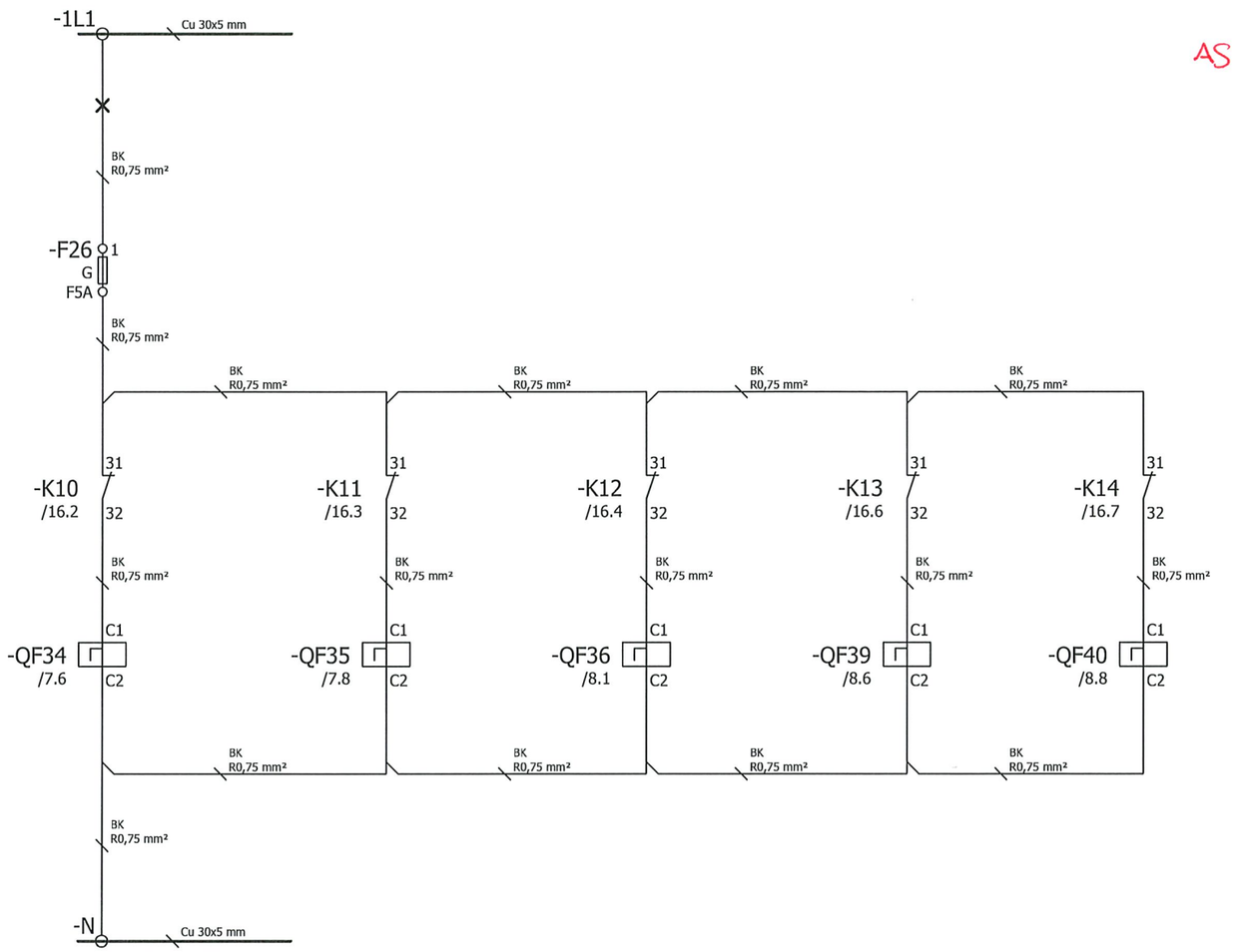
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sheets 17

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Stat	Alteration	Date	Name	Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Tripping
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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=
+ MBC1
& EFS

A3

sheet 14
sheets 17

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11.6 / 02L1

BK R0,75 mm²

-QF31 /7.2
-QF32 /7.3
-QF33 /7.4
-QF34 /7.6
-QF35 /7.8
-QF36 /8.1
-QF37 /8.3
-QF38 /8.5
-QF39 /8.6
-QF40 /8.8
-QF41 /9.2
-QF42 /9.3
-QF43 /9.4
-QF44 /9.6
-QF45 /9.7
-QF46 /10.2
-QF47 /10.3
-QF48 /10.4
-QF49 /10.6
-QF50 /10.7
-QF51 /11.2
-QF52 /11.3

-K1 A1(+) A2(-)
-K2 A1(+) A2(-)
-N

PXC.2966207_PLC-RSC-230UC/21
14 – 11 /15.7
12

Common fault

QF31 - QF52

Top entry

-X12 10 11 12

-K1 /15.3
-K2 /15.5

no mark up

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			Editor	Beckschäfer	
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AEG POWER SOLUTIONS

Common fault
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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=
+ MBC1
& EFS

A3

sheet 15
sheets 17

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QF34 (C16A)

24V DC is permanently present in fault-free operation

QF35 (C16A)

24V DC is permanently present in fault-free operation

QF36 (C16A)

24V DC is permanently present in fault-free operation

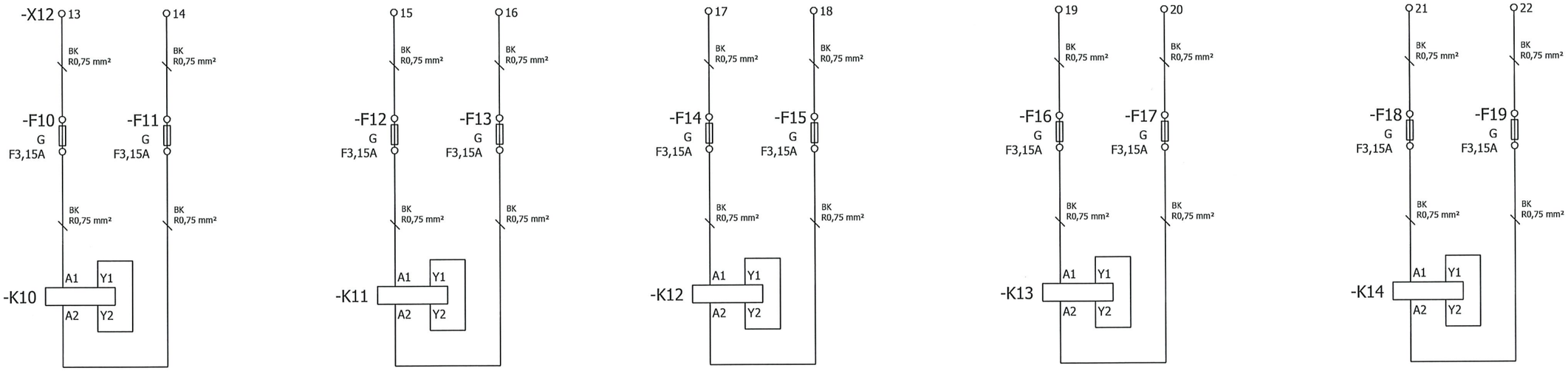
QF39(C10A)

24V DC is permanently present in fault-free operation

QF40(C10A)

24V DC is permanently present in fault-free operation

Top entry



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PXC.2981020_PSR-SCP- 24DC/ESP4/2X1/1X2
13 — 14
23 — 24
31 — 32 /14.2

PXC.2981020_PSR-SCP- 24DC/ESP4/2X1/1X2
13 — 14
23 — 24
31 — 32 /14.3

PXC.2981020_PSR-SCP- 24DC/ESP4/2X1/1X2
13 — 14
23 — 24
31 — 32 /14.4

PXC.2981020_PSR-SCP- 24DC/ESP4/2X1/1X2
13 — 14
23 — 24
31 — 32 /14.5

PXC.2981020_PSR-SCP- 24DC/ESP4/2X1/1X2
13 — 14
23 — 24
31 — 32 /14.6

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Remote signaling
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

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=
+ MBC1
& EFS

A3

sheet 16
sheets 17

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+UPS1
Protect 8.33 40-400-210-400
1000007888.010
10009756

GZ13_1 +UPS1/23.7
GZ13_2 +UPS1/23.7

+UPS2
Protect 8.33 40-400-210-400
1000007888.010
10009756

GZ13_1 +UPS2/23.2
GZ13_2 +UPS2/23.3

BK R1,5 mm²
BK R1,5 mm²

Top entry -X13: U U N N PE PE

BK R0,75 mm²
BK R0,75 mm²

-F100 1
G
T6,3A

BK R0,75 mm²

-F85 L
I 3 2

BK R0,75 mm²

-A85 -X1 3 2
-R1

Top entry -X14: U U N N

BK R0,75 mm²

-F110 1
G
T6,3A 2

BK R0,75 mm²
BK R0,75 mm²

-X114 U N

-W100
H05VV
2x1 mm²
3 m

L N
-H1
Enclosure light

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				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

external connection
Bypass transformer cabinet
with manual bypass 40 kVA
Circuit diagram

1000007888.020
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=
+ MBC1
& EFS

A3

sheet 17
sheets 17

1000007888_010

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Terminal diagram

bar
=+MBC1-PE

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				PE						+MBC1&EFS/1.3
				PE						+MBC1&EFS/1.3
				PE						+MBC1&EFS/1.6
				PE						+MBC1&EFS/1.6
		+UPS1-PE	PE	PE						+MBC1&EFS/2.3
				PE						+MBC1&EFS/2.3
		+UPS2-PE	PE	PE						+MBC1&EFS/3.3
				PE						+MBC1&EFS/3.3
				PE						+MBC1&EFS/5.4
				PE						+MBC1&EFS/5.7
				PE						+MBC1&EFS/6.3
				PE						+MBC1&EFS/6.6

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AS COMMISSIONED: MATIA GIROTTI 26/3/25

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-PE
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

1000007888_010 en

=
+ MBC1
& EMA

A3 | sheet 1 | sheets 34

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Terminal diagram

bar

=+MBC1-X1

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable type	Cable name	Position / Page
				1U	'	-X1	2U			+MBC1&EFS/1.3
				1V	'	-X1	2V			+MBC1&EFS/1.3
				1W	'	-X1	2W			+MBC1&EFS/1.3
		+UPS1-E1-X1	U	2U	'	-X1	1U			+MBC1&EFS/1.3
		+UPS1-E1-X1	V	2V	'	-X1	1V			+MBC1&EFS/1.3
		+UPS1-E1-X1	W	2W	'	-X1	1W			+MBC1&EFS/1.3
				3U	'	-X1	4U			+MBC1&EFS/1.6
				3V	'	-X1	4V			+MBC1&EFS/1.6
				3W	'	-X1	4W			+MBC1&EFS/1.6
		+UPS2-E1-X1	U	4U	'	-X1	3U			+MBC1&EFS/1.6
		+UPS2-E1-X1	V	4V	'	-X1	3V			+MBC1&EFS/1.6
		+UPS2-E1-X1	W	4W	'	-X1	3W			+MBC1&EFS/1.6

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X1
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

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sheet 2
sheets 34

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Terminal diagram

bar

=+MBC1-X2

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		+UPS1-E2-X2	L+	1L+	'	-X2	2L+			+MBC1&EFS/2.2
		+UPS1-E2-X2	L-	1L-	'	-X2	2L-			+MBC1&EFS/2.3
				2L+	'	-X2	1L+			+MBC1&EFS/2.2
				2L-	'	-X2	1L-			+MBC1&EFS/2.3
		+UPS2-E2-X2	L+	3L+	'	-X2	4L+			+MBC1&EFS/3.2
		+UPS2-E2-X2	L-	3L-	'	-X2	4L-			+MBC1&EFS/3.3
				4L+	'	-X2	3L+			+MBC1&EFS/3.2
				4L-	'	-X2	3L-			+MBC1&EFS/3.3

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X2
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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sheet 3
sheets 34

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Terminal diagram

bar

=+MBC1-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		+UPS1-E4-X4	U	1U	'	-Q28.1	2			+MBC1&EFS/5.3
		+UPS1-E4-X4	V	1V	'	-Q28.1	4			+MBC1&EFS/5.3
		+UPS1-E4-X4	W	1W	'	-Q28.1	6			+MBC1&EFS/5.3
		+UPS1-E4-X4	N	1N	'	-1N				+MBC1&EFS/5.4
		+UPS2-E4-X4	U	2U	'	-Q28.2	2			+MBC1&EFS/5.6
		+UPS2-E4-X4	V	2V	'	-Q28.2	4			+MBC1&EFS/5.6
		+UPS2-E4-X4	W	2W	'	-Q28.2	6			+MBC1&EFS/5.6
		+UPS2-E4-X4	N	2N	'	-1N				+MBC1&EFS/5.6

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X4
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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sheets 34

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Terminal diagram

bar

=+MBC1-X5

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		+UPS1-E3-X3	U	1U	'	-Q71	2			+MBC1&EFS/6.3
		+UPS1-E3-X3	V	1V	'	-Q71	4			+MBC1&EFS/6.3
		+UPS1-E3-X3	W	1W	'	-Q71	6			+MBC1&EFS/6.3
		+UPS1-E3-X3	N	1N	'	-1N				+MBC1&EFS/6.3
		+UPS2-E3-X3	U	2U	'	-Q72	2			+MBC1&EFS/6.5
		+UPS2-E3-X3	V	2V	'	-Q72	4			+MBC1&EFS/6.5
		+UPS2-E3-X3	W	2W	'	-Q72	6			+MBC1&EFS/6.6
		+UPS2-E3-X3	N	2N	'	-1N				+MBC1&EFS/6.6

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X5
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

bar

=+MBC1-X10

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-Q10	1			+MBC1&EFS/4.4
				V	'	-Q10	3			+MBC1&EFS/4.5
				W	'	-Q10	5			+MBC1&EFS/4.5

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

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Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

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=+MBC1-X12

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1	'	-Q29	103			+MBC1&EFS/6.7
				2	'	-Q29	104			+MBC1&EFS/6.7
				3	'	-Q29	102			+MBC1&EFS/6.7
				4	'	-F25	11			+MBC1&EFS/12.6
				5	'	-F25	12			+MBC1&EFS/12.6
				6	'	-F25	14			+MBC1&EFS/12.6
				7	'	-A90	16			+MBC1&EFS/13.4
				8	'	-A90	15			+MBC1&EFS/13.4
				9	'	-A90	18			+MBC1&EFS/13.4
				10	'	-K1	12			+MBC1&EFS/15.7
				11	'	-K1	11			+MBC1&EFS/15.7
				12	'	-K2	14			+MBC1&EFS/15.7
				13	'	-F10	1:1			+MBC1&EFS/16.2
				14	'	-F11	1:1			+MBC1&EFS/16.2
				15	'	-F12	1:1			+MBC1&EFS/16.3
				16	'	-F13	1:1			+MBC1&EFS/16.3
				17	'	-F14	1:1			+MBC1&EFS/16.4
				18	'	-F15	1:1			+MBC1&EFS/16.5
				19	'	-F16	1:1			+MBC1&EFS/16.6
				20	'	-F17	1:1			+MBC1&EFS/16.6
				21	'	-F18	1:1			+MBC1&EFS/16.7
				22	'	-F19	1:1			+MBC1&EFS/16.8

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X12
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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sheet 7
sheets 34

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Terminal diagram

bar

=+MBC1-X13

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		+UPS1-X14	U	U	●	-F100	1:1			+MBC1&EFS/17.2
		-X14	U	U	●					+MBC1&EFS/17.2
		+UPS1-X14	N	N	●	-A85	-X1:2			+MBC1&EFS/17.3
		-X14	N	N	●					+MBC1&EFS/17.3
				PE	'					+MBC1&EFS/17.3
				PE	'					+MBC1&EFS/17.3

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Terminal diagram =+MBC1-X13
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

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=+MBC1-X14

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		-X13	U	U		-F110	1:2			+MBC1&EFS/17.6
		+UPS2-X13	U	U						+MBC1&EFS/17.6
		-X13	N	N		-X114	N			+MBC1&EFS/17.7
		+UPS2-X13	N	N						+MBC1&EFS/17.7

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X14
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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A3 | sheet 9 | sheets 34

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Terminal diagram

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=+MBC1-X15

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable type	Cable name	Position / Page
		+UPS1-X15	2	2	'	-X15	4			+MBC1&EFS/2.4
		+UPS2-X15	2	6	'	-X15	8			+MBC1&EFS/3.4
				4	'	-X15	2			+MBC1&EFS/2.4
				8	'	-X15	6			+MBC1&EFS/3.4
		+UPS1-X15	3	3	'	-X15	5			+MBC1&EFS/2.4
		+UPS2-X15	3	7	'	-X15	9			+MBC1&EFS/3.4
				5	'	-X15	3			+MBC1&EFS/2.4
				9	'	-X15	7			+MBC1&EFS/3.4

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X15
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

Cable name	bar =+MBC1-X31						Cable name				Position / Page
Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable type				
			U	'	-QF31	2					+MBC1&EFS/7.2
			N	'	-QF31	N					+MBC1&EFS/7.2
			PE	'	-PE						+MBC1&EFS/7.2

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Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

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=+MBC1-X32

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-QF32	2			+MBC1&EFS/7.3
				N	'	-QF32	N			+MBC1&EFS/7.3
				PE	'					+MBC1&EFS/7.3

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X32
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

bar

=+MBC1-X33

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-QF33	2			+MBC1&EFS/7.4
				N	'	-QF33	N			+MBC1&EFS/7.5
				PE	'					+MBC1&EFS/7.5

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Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

bar

=+MBC1-X34

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-QF34	2			+MBC1&EFS/7.6
				N	'	-QF34	N			+MBC1&EFS/7.6
				PE						+MBC1&EFS/7.6

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Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

bar

=+MBC1-X35

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-QF35	2			+MBC1&EFS/7.8
				N	'	-QF35	N			+MBC1&EFS/7.8
				PE						+MBC1&EFS/7.8

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

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Bypass transformer cabinet
with manual bypass 40 kVA
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Terminal diagram

bar

=+MBC1-X36

Cable name				Cable name				
Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable type	Position / Page
			V	'	-QF36	2		+MBC1&EFS/8.1
			N	'	-QF36	N		+MBC1&EFS/8.2
	-PE		PE					+MBC1&EFS/8.2

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X36
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

1000007888_010 en

=
+ MBC1
& EMA

A3

sheet 16
sheets 34

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Terminal diagram

bar

=+MBC1-X37

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				V	'	-QF37	2			+MBC1&EFS/8.3
				N	'	-QF37	N			+MBC1&EFS/8.3
				PE						+MBC1&EFS/8.3

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X37
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

1000007888_010 en

=
+ MBC1
& EMA

A3

sheet 17
sheets 34

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Terminal diagram

bar

=+MBC1-X38

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				V	'	-QF38	2			+MBC1&EFS/8.5
				N	'	-QF38	N			+MBC1&EFS/8.5
				PE						+MBC1&EFS/8.5

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X38
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

A3

sheet 18
sheets 34

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Terminal diagram

bar

=+MBC1-X39

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				V	'	-QF39	2			+MBC1&EFS/8.6
				N	'	-QF39	N			+MBC1&EFS/8.6
				PE						+MBC1&EFS/8.6

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AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X39
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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= + MBC1 & EMA

A3 | sheet 19 | sheets 34

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Terminal diagram

bar

=+MBC1-X40

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				V	'	-QF40	2			+MBC1&EFS/8.8
				N	'	-QF40	N			+MBC1&EFS/8.8
				PE						+MBC1&EFS/8.8

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X40
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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=
+ MBC1
& EMA

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sheet 20
sheets 34

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Terminal diagram

bar

=+MBC1-X41

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				W	'	-QF41	2			+MBC1&EFS/9.2
				N	'	-QF41	N			+MBC1&EFS/9.2
		-PE		PE						+MBC1&EFS/9.2

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X41
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

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sheet 21
sheets 34

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Terminal diagram

bar

=+MBC1-X42

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				W	'	-QF42	2			+MBC1&EFS/9.3
				N	'	-QF42	N			+MBC1&EFS/9.3
				PE						+MBC1&EFS/9.3

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X42
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

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sheet 22
sheets 34

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Terminal diagram

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bar
=+MBC1-X43

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				W	'	-QF43	2			+MBC1&EFS/9.4
				N	'	-QF43	4			+MBC1&EFS/9.5
				PE						+MBC1&EFS/9.5

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AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X43
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

A3 | sheet 23 | sheets 34

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Terminal diagram

bar

=+MBC1-X44

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				W	'	-QF44	2			+MBC1&EFS/9.6
				N	'	-QF44	4			+MBC1&EFS/9.6
				PE						+MBC1&EFS/9.6

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X44
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

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Terminal diagram

bar

=+MBC1-X45

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				W	'	-QF45	2			+MBC1&EFS/9.7
				N	'	-QF45	4			+MBC1&EFS/9.8
				PE						+MBC1&EFS/9.8

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X45
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

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sheets 34

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Terminal diagram

bar
=+MBC1-X46

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable type	Cable name	Position / Page
				U	'	-QF46	2			+MBC1&EFS/10.2
				N	'	-QF46	4			+MBC1&EFS/10.2
		-PE		PE						+MBC1&EFS/10.2

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X46
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

bar

=+MBC1-X47

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-QF47	2			+MBC1&EFS/10.3
				N	'	-QF47	4			+MBC1&EFS/10.3
				PE						+MBC1&EFS/10.4

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				Date	27.08.2024	ROSETTI MARINO Hollandse Kust Noord (HKN) wind farm	AEG POWER SOLUTIONS	Terminal diagram =+MBC1-X47 Bypass transformer cabinet with manual bypass 40 kVA Terminal diagram	=
				Editor	Beckschäfer				+ MBC1
01	500000002053	13.08.2024	Beckschäfer	Checked	Ch.Peck				& EMA
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Terminal diagram

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bar
=+MBC1-X48

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-QF48	2			+MBC1&EFS/10.4
				N	'	-QF48	4			+MBC1&EFS/10.5
				PE						+MBC1&EFS/10.5

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X48
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

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sheet 28
sheets 34

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Terminal diagram

bar
=+MBC1-X49

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-QF49	2			+MBC1&EFS/10.6
				N	'	-QF49	4			+MBC1&EFS/10.6
				PE						+MBC1&EFS/10.6

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AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X49
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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Terminal diagram

bar

=+MBC1-X50

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U	'	-QF50	2			+MBC1&EFS/10.7
				N	'	-QF50	4			+MBC1&EFS/10.8
				PE						+MBC1&EFS/10.8

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X50
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

A3 | sheet 30 | sheets 34

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Terminal diagram

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bar
=+MBC1-X51

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				V	'	-QF51	2			+MBC1&EFS/11.2
				N	'	-QF51	4			+MBC1&EFS/11.2
		-PE		PE						+MBC1&EFS/11.2

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X51
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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& EMA

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Terminal diagram

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bar
=+MBC1-X52

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 1 2 3	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				V	'	-QF52	2			+MBC1&EFS/11.3
				N	'	-QF52	4			+MBC1&EFS/11.3
				PE						+MBC1&EFS/11.4

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X52
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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& EMA

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sheets 34

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Terminal diagram

bar

=+MBC1-X91

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable type	Cable name	Position / Page
		+UPS1-F91	1	1M	'	-X91	2M			+MBC1&EFS/2.5
				2M	'	-X91	1M			+MBC1&EFS/2.5
		+UPS2-F91	1	3M	'	-X91	4M			+MBC1&EFS/3.5
				4M	'	-X91	3M			+MBC1&EFS/3.5

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X91
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

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+ MBC1
& EMA

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Terminal diagram

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bar

=+MBC1-X130

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge 123	Destination mark Internal	Connection	Cable name	-W208	-W100		Position / Page
									LiYCY 3x0,5 mm²	H05VV 2x1 mm²		
		+BAT1-R81-X1	1	1	'	+UPS1-X130	1		WH			+MBC1&EFS/2.6
		+BAT2-R81-X1	1	3	'							+MBC1&EFS/3.6
		+BAT1-R81-X1	2	2	'	+UPS1-X130	2		BN			+MBC1&EFS/2.6
		+BAT2-R81-X1	2	4	'							+MBC1&EFS/3.6
				1PE	'					OG		+MBC1&EFS/2.6
				2PE	'					OG		+MBC1&EFS/3.6

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01	500000002053	13.08.2024	Checked	Ch.Peck	
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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+MBC1-X130
Bypass transformer cabinet
with manual bypass 40 kVA
Terminal diagram

1000007888_010 en

=
+ MBC1
& EMA

A3

sheet 34
sheets 34

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Three-phase input
Attention! Observe sequence of wires, L1, L2, L3 -->
See technical data sheet for required mains fuses

Power section rectifier

mains transformer

Note: Reinforced insulated wire
0,75 mm² unmarked wires

-L61 N=2

Measurement REC Interface -A9-A50-X2
01L1 / 12.6
01L2 / 12.6
01L3 / 12.6

Supply REC Interface -A9-A50-X3
02L1 / 11.1
02L2 / 11.1
02L3 / 11.1

-L22 -T40 -L85.1

1L1 / 2.1
1L2 / 2.1
1L3 / 2.1
2L1 / 3.1
2L2 / 3.1
2L3 / 3.1

-L85.2

-C101.1 -C101.2 -C101.3

-Q3 /12.3

-L23 -L24 -L25

-C23 -C24 -C25 -R23 -R24 -R25

-Q1
L=100/85A
I=1,0kA
Icu=50kA

C1 C2 /12.4

3xR6 mm²

-A80 -A81
Suppression
-R86 -R87 -R88
-R81 -R82 -R83
-V81.1-V81.6
-R84.1 -R84.2
-C84 -C85

-E1
-X1 U V W
-A2 EMI capacitor 4-pole 8000022634 STR
-C4 -C5 -C1 -C6 -C2 -C7 -C3 -C8 -C9 -C10
-X1 -X2 -X3

-L92

-A1 EMI capacitor 4-pole 8000022634 STR

Mains
400V;3/PE~50Hz

+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
1000007888.020
10009757

GZ1_1 +MBC1/1.3
GZ1_2 +MBC1/1.3
GZ1_3 +MBC1/1.3

-PE PE busbar Cu 40x5 mm
Rack
Rack GNYE 6 mm²
Tür links
Rack GNYE 6 mm²
Pivot plate

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Rectifier input
Protect 8.33 40-400-210-400

Circuit diagram

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= + UPS1 & EFS

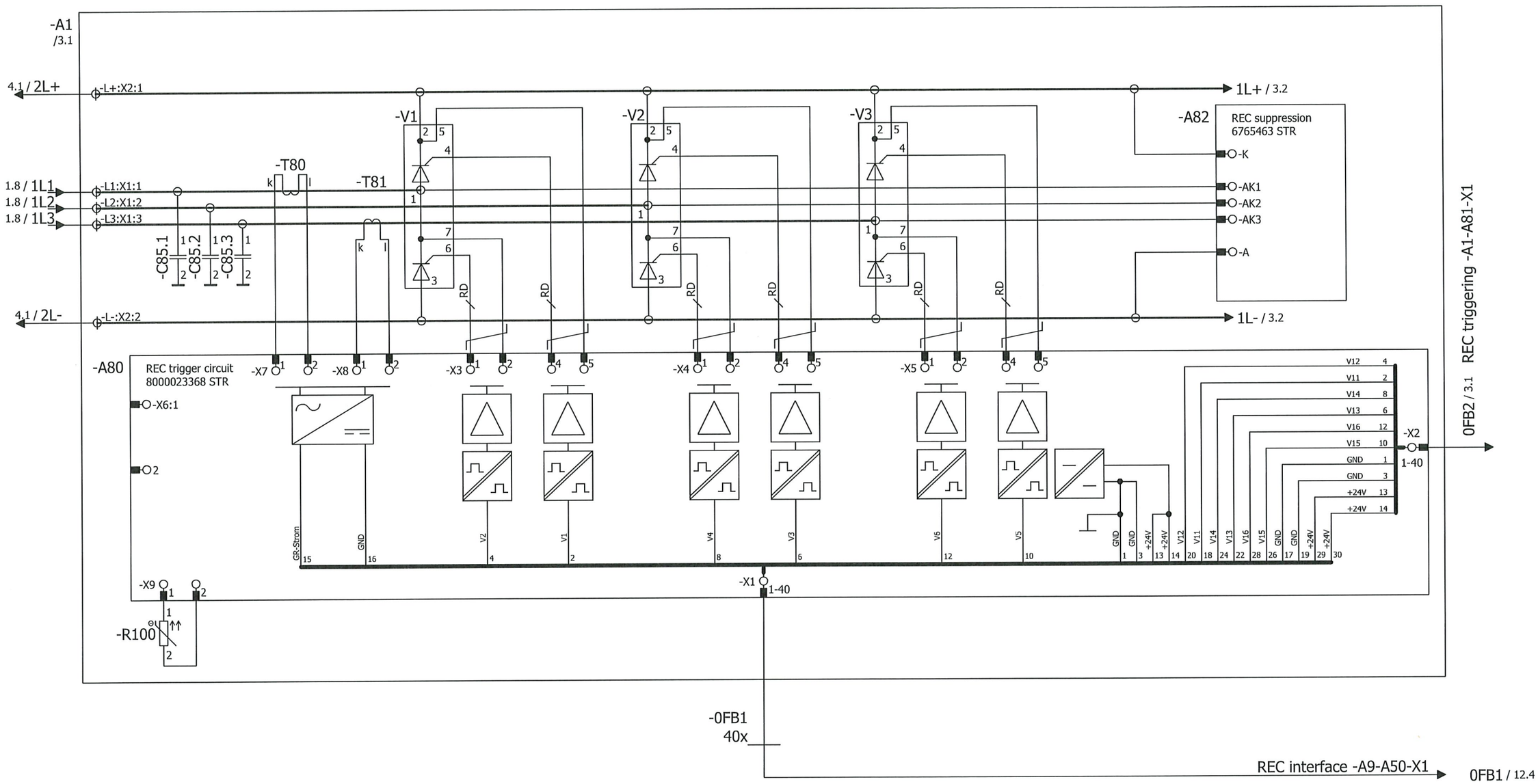
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sheet 1
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Power section rectifier

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Power section rectifier
Protect 8.33 40-400-210-400

Circuit diagram

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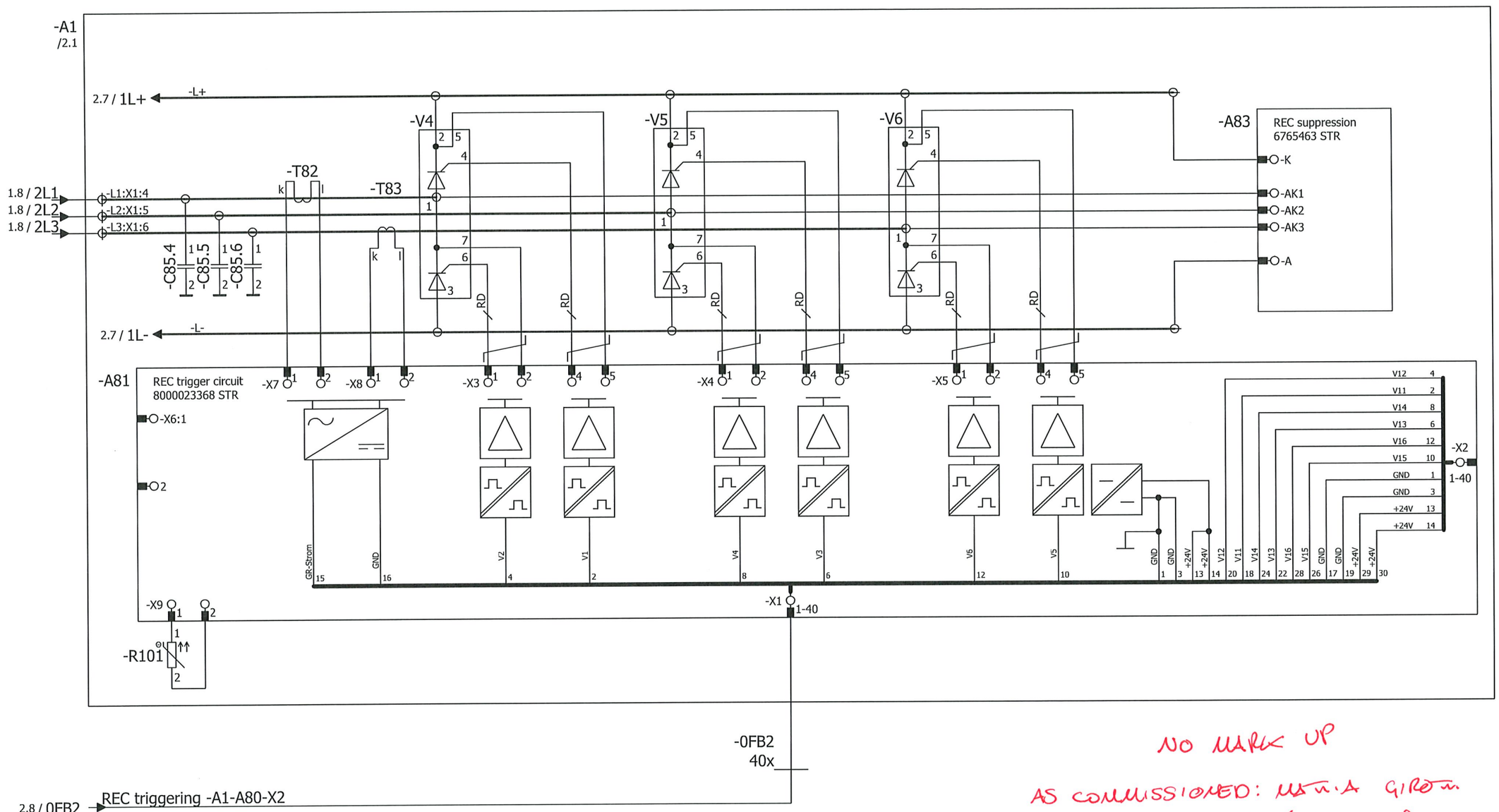
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Power section rectifier

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Power section rectifier
Protect 8.33 40-400-210-400

Circuit diagram

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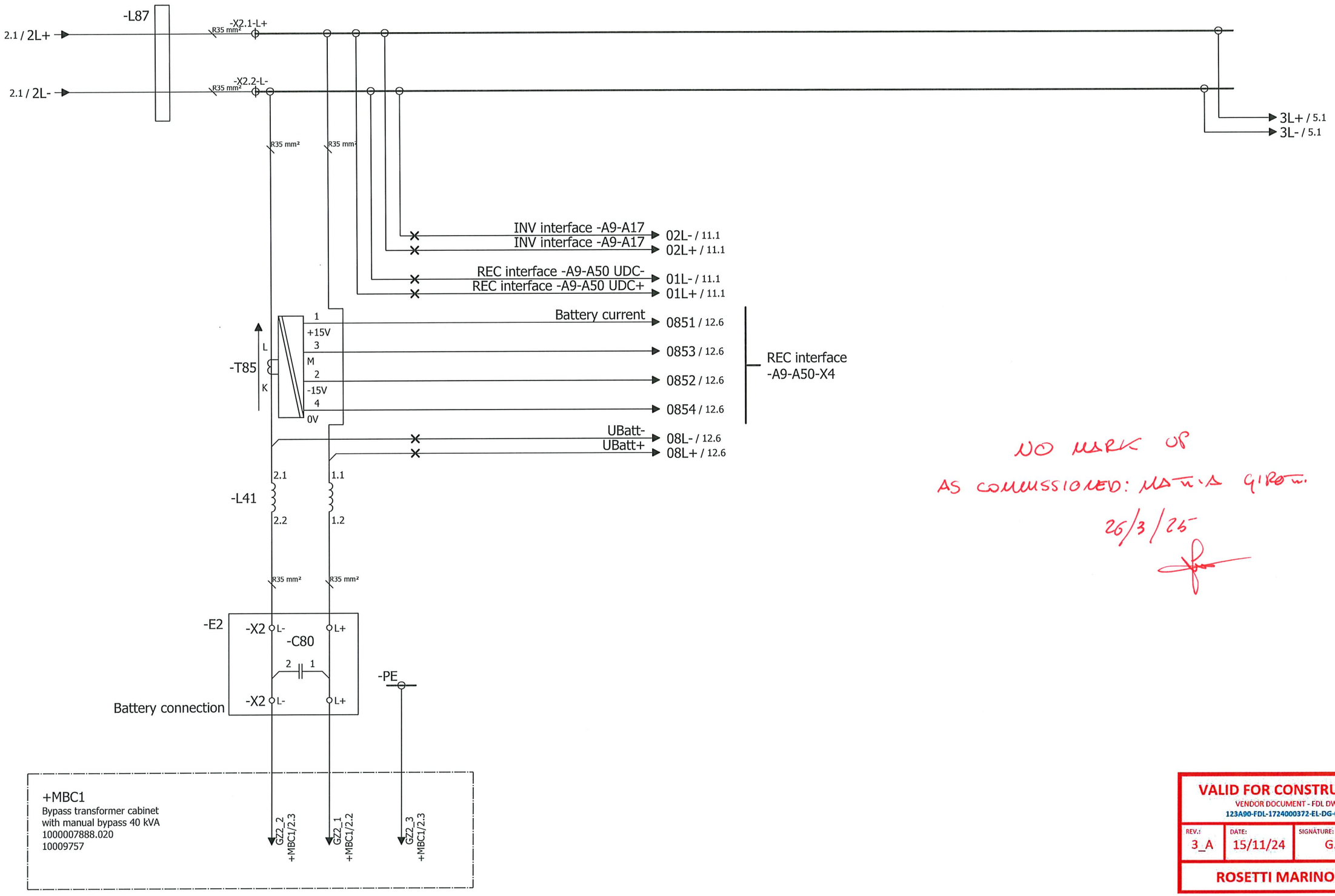
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Power section rectifier
Battery connection

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Battery connection
Protect 8.33 40-400-210-400

Circuit diagram

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sheets 23

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Power section inverter

-A2

4.8 3L+ -L+:X2:1

-V11 -V12 -V13

-C86.1 -C86.2 -R42 -C42

6.1 / 3L1 -X3:1
6.1 / 3L2 -X3:2
6.1 / 3L3 -X3:3

4.8 3L- -L-:X2:2

-A1

INV. trigger circuit
8000021689 STR

-X31 -X32 -X41 -X42 -X51 -X52

-X6:1

3

4 / 5.7 2 / 5.7 8 / 5.7 6 / 5.7 12 / 5.7 10 / 5.7

IMP1 ZWST1 IMP2 IMP3 ZWST2 IMP4 IMP5 ZWST3 IMP6 ZWST4 ZWST5 ZWST6 GND +24V

5.3 / 2 IMP2 2
5.2 / 4 IMP1 4
5.5 / 6 IMP4 6
5.4 / 8 IMP3 8
5.7 / 10 IMP6 10
5.6 / 12 IMP5 12
ZWST4 16
ZWST5 14
ZWST6 15
GND 1
+24V 19
+24V 20

-X2 1-34

-X7 -R100

-X1 1-34

-0FB3 34x

INV interface -A9-A17-X10

0FB3 / 13.1

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Power section inverter
Protect 8.33 40-400-210-400

Circuit diagram

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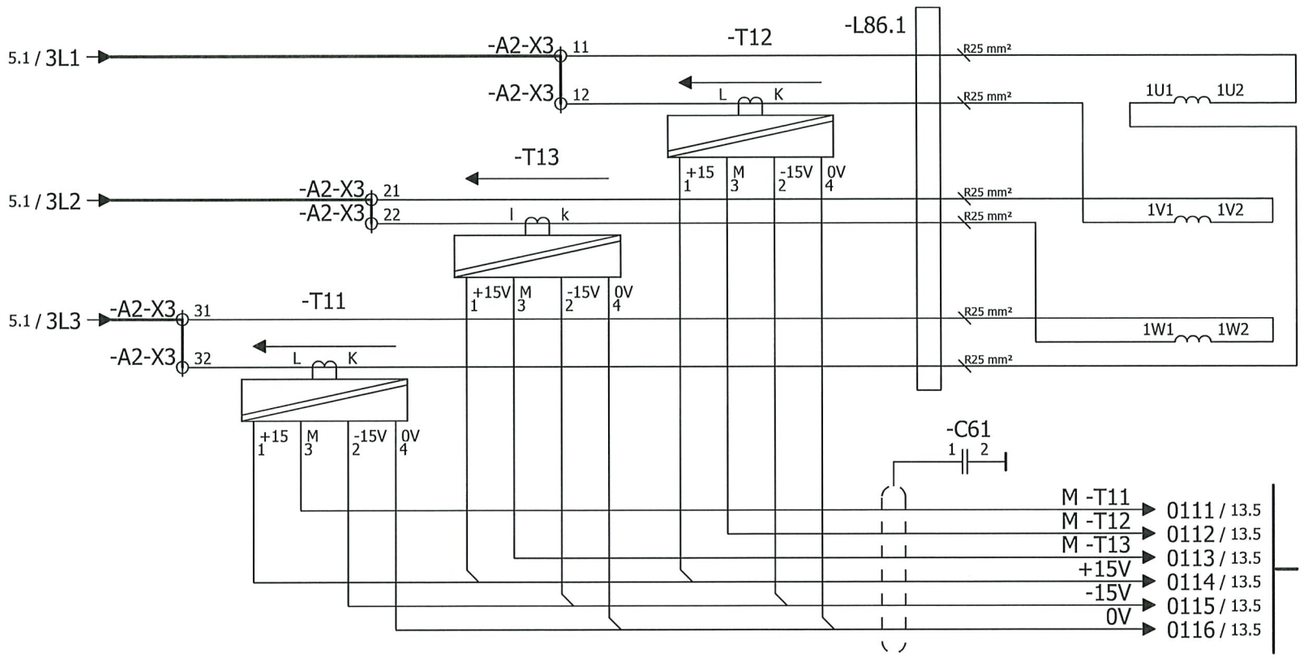
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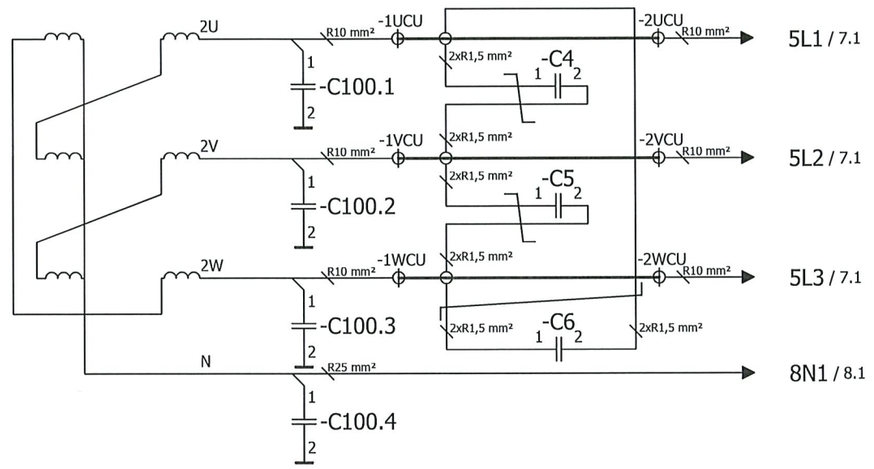
Power section inverter

Measuring INV current dynamic



INV interface
-A9-A17-X19

-T1



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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Inverter output
Protect 8.33 40-400-210-400

Circuit diagram

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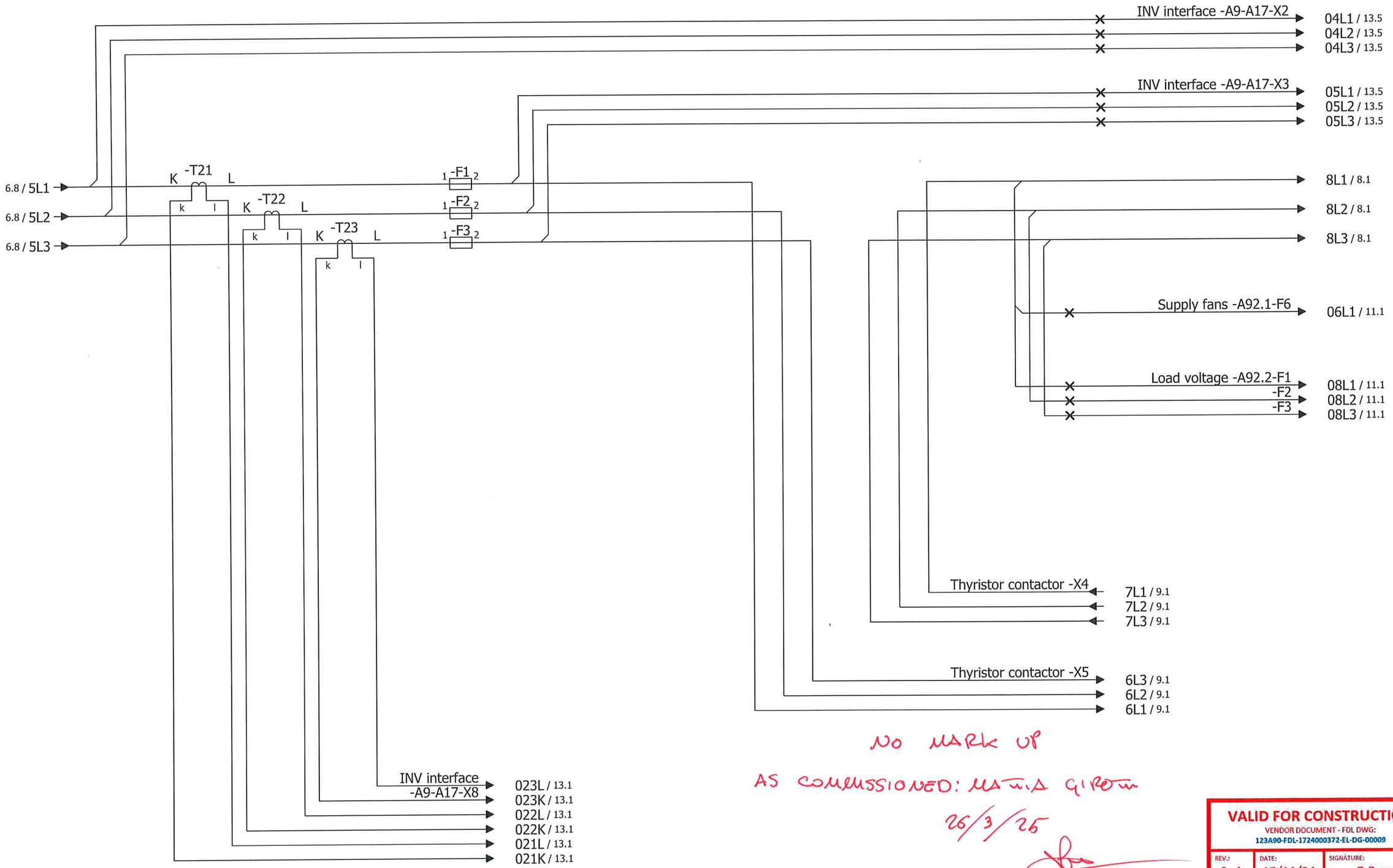
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Power section inverter

Measurement INV current static

Output fuse



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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Inverter output
Protect 8.33 40-400-210-400

Circuit diagram

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Power section inverter

Parallel preventive choke coil

7.8 / 8L1
7.8 / 8L2
7.8 / 8L3
6.8 / 8N1

R10 mm²

-L11 -L12 -L13

SBS Output
10L1 / 10.1
10L2 / 10.1
10L3 / 10.1

-A105
-C56 -C57 -C58
-X1 -X2 -X3 -X4

SBS Input
9L1 / 10.1
9L2 / 10.1
9L3 / 10.1

fan neutral conductor
0451N1 / 17.1

neutral conductor
-A9
04N1 / 13.5

R25 mm²

-E3
-X3 U V W N
-A4
-X4
EMI capacitor 4-pole 8000022634 STR
-C4 -C5 -C1 -C6 -C2 -C7 -C3 -C8 -C9 -C10
-X1 -X2 -X3

-L93

-A3
-X4
EMI capacitor 4-pole 8000022634 STR
-C4 -C5 -C1 -C6 -C2 -C7 -C3 -C8 -C9 -C10
-X1 -X2 -X3

2xR35 mm²

Load
400V;3/N/PE~50Hz
-X3 U V W N

-PE

-E4
-X4 U V W N
-A4
-X4
EMI capacitor 4-pole 8000022634 STR
-C4 -C5 -C1 -C6 -C2 -C7 -C3 -C8 -C9 -C10
-X1 -X2 -X3

-L94

-A3
-X4
EMI capacitor 4-pole 8000022634 STR
-C4 -C5 -C1 -C6 -C2 -C7 -C3 -C8 -C9 -C10
-X1 -X2 -X3

Mains
400V;3/N/PE~50Hz
-X4 U V W N

+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
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GZ3_1 +MBC1/6.3
GZ3_2 +MBC1/6.3
GZ3_3 +MBC1/6.3
GZ3_4 +MBC1/6.3

GZ4_1 +MBC1/5.3
GZ4_2 +MBC1/5.3
GZ4_3 +MBC1/5.3
GZ4_4 +MBC1/5.4

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Load output / SBS circuit
Protect 8.33 40-400-210-400

Circuit diagram

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Power section inverter
Inverter output contactor

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-A4

-A37 SBS suppression 8000028996 STR

-A3 -K3 -AK3 -A2 -K2 -AK2 -A1 -K1 -AK1

-V31 -V33 -V35

7.7 / 7L1
7.7 / 7L2
7.7 / 7L3

-X4:1A -X4:1 -X4:1K
-X4:2A -X4:2 -X4:2K
-X4:3A -X4:3 -X4:3K

A K AK G2 K2 K1 G1

RD

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-X2 -X3 -X4 1 2 5 4

-A36 SBS trigger circuit 8000028563 STR

-X5:1
2

GND EUE_EIN GND GND +24V +24V 1 2 3 4 5 6 7 8 9 10

-X6 1 2
-R100 1 2
-X1 1-10
-0FB10 10x

-X6 5
-X6 6
-X6 3
-X6 4
-X6 1
-X6 2

7.7 / 6L3 → -X5:3
7.7 / 6L2 → -X5:2
7.7 / 6L1 → -X5:1

INV interface -A9-A17-X1 → 0FB10 / 13.1

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Inverter output contactor
Protect 8.33 40-400-210-400

Circuit diagram

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Power section SBS

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-A3

SBS mains voltage -A92.2-F6 → 010L1 / 11.1
-A92.2-F7 → 010L2 / 11.1
-A92.2-F8 → 010L3 / 11.1

8.8 / 9L1 → SBS mains
8.8 / 9L2 → SBS mains
8.8 / 9L3 → SBS mains

-A37 SBS suppression 8000028996 STR
-A3 -K3 -AK3 -A2 -K2 -AK2 -A1 -K1 -AK1

-V31
-X4:1A -X4:1 -X4:1K
A K AK
G2 K2 K1 G1

-V33
-X4:2A -X4:2 -X4:2K
A K AK
G2 K2 K1 G1

-V35
-X4:3A -X4:3 -X4:3K
A K AK
G2 K2 K1 G1

RD

-A36 SBS trigger circuit 8000028563 STR
-X2 -X3 -X4 1 2 5 4

-X5:1
2

GND EUE_EIN GND GND +24V +24V 1 2 3 4 5 6 7 8 9 10

-X1 1-10

-X6 1 2
-R100 1 2

SBS interface -A9-A16-X1 → 0FB9 / 14.3

-X6 5
-X6 6
-X6 3
-X6 4
-X6 1
-X6 2

8.8 / 10L3 ← UPS Output
8.8 / 10L2 ← -X5:3
8.8 / 10L1 ← -X5:2
-X5:1

SBS interface -A9-A16-X4 → 03151L / 14.3
-A9-A16-X4 → 03151K / 14.3
-A9-A16-X4 → 03352L / 14.3
-A9-A16-X4 → 03352K / 14.3
-A9-A16-X4 → 03553L / 14.3
-A9-A16-X4 → 03553K / 14.3

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Power section SBS
Protect 8.33 40-400-210-400

Circuit diagram

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Fuse boards

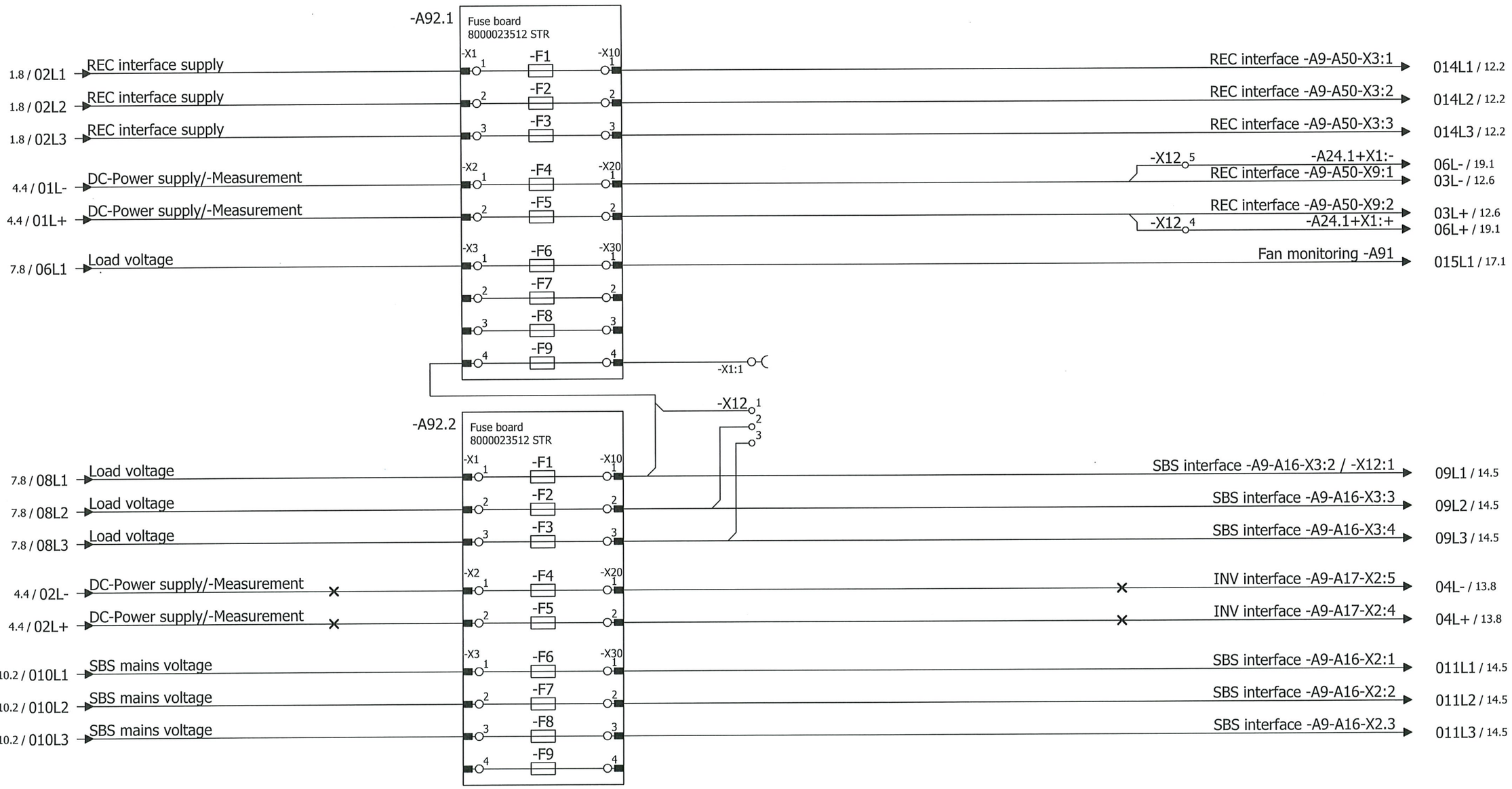
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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Fuse boards
Protect 8.33 40-400-210-400

Circuit diagram

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Rectifier control

-A9
/16.1

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4.4 / 0854
4.4 / 0851
4.4 / 0853
4.4 / 0852
Battery current transformer -T85

4.4 / 08L+
4.4 / 08L-
UBatt+
UBatt-

11.8 / 03L+
11.8 / 03L-
UIC+ A92.1-F5
UIC- A92.1-F4

1.8 / 01L3
1.8 / 01L2
1.8 / 01L1
-Q1 REC input voltage

11.8 / 014L3
11.8 / 014L2
11.8 / 014L1
-T40 sec. supply REC

2.8 / 0FB1
REC trigger circuit -A1-A80-X1

-A50
/16.2
REC interface
8000022025 STR

-X3 1 2 3
-X5 7 8
-X1 1-40
-X2 1 3 5
-X9 1 2
3 4
-X4 2 3 1 4
-15V +15V

GND V1 GND V2 V3 V4 V5 V6 +24V +24V GND V11 GND V12 V13 V14 V15 V16 +24V +24V REC current
+24V
+24V

-R204 GND REC current
-R206 GND REC current
REC current stack A1
REC current stack A2

-X11 1-50
-A50X11 50x
-X12 1-50
-A50X12 50x

-A1
REC control
8000014119 STR
-X11 1-50
-X12 1-50

-X19 1 2 3
-X15 1 4
-X8 1 2 3
-X5 3 4
+24V DC
-X8 4 5 6
-X5 5 6

-X130 1 2
-X12 10 11 15
-Q3
/1.4
96 98
95
-Q1
C1
C2

BK R1,5 mm²
-C711 220000µF
-C712 220000µF
BK R2,5 mm²
BK R1,5 mm²
BK R1,5 mm²
0V
BK R2,5 mm²
-X15 1 1
-X15 2 2 3
(+) (-)
*1

+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
1000007888.020
10009757

GZ130_1 +MBC1/2.6
GZ130_2 +MBC1/2.6

*1 Attention! In the event of battery undervoltage < 130 V, the UPS automatically switches off battery isolator Q2.
If this happens, switch X15:3 must be switched into the open position (undervoltage trip blocked).
For restart, please refer to the chapter in the UPS operating instructions (charging the DC link capacitors).
Unlock the tripped switch Q2 by switching to open position.
After charging the DC link capacitors, switch on Q2.
Attention! When the battery voltage reaches > 200 V, switch X15:3 must be switched back to the closed position.

+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
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GZ15_2 +MBC1/2.4
GZ15_3 +MBC1/2.4

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Rectifier control
Protect 8.33 40-400-210-400

Circuit diagram

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=
+ UPS1
& EFS

A3

sheet 12
sheets 23

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Inverter control

INV current static

Transformer -T23
7.3 / 023L
7.3 / 023K

Transformer -T22
7.3 / 022L
7.3 / 022K

Transformer -T21
7.3 / 021L
7.3 / 021K

INV. trigger circuit
-A2-A1-X1
5.8 / 0FB3

Trigger circuit
-A4-A36-X1
9.7 / 0FB10

INV current dynamic

INV output voltage reference
7.8 / 05L1
7.8 / 05L2
7.8 / 05L3

neutral conductor
8.8 / 04N1 → N → 05N1 / 14.5

INV output voltage
7.8 / 04L1
7.8 / 04L2
7.8 / 04L3

Transformer -T11...-T13
6.5 / 0116
6.5 / 0115
6.5 / 0113
6.5 / 0112
6.5 / 0111
6.5 / 0114

11.8 / 04L+ → UIC+
11.8 / 04L- → UIC-

-A9
/16.1

-A17
/16.3
INV interface
8000022441 STR

-X1 1-10
GND, SBS_ON, GND, GND, +24V, +24V → +24V

-X10 1-34
IMP1, IMP2, IMP5, IMP6, ZWST1, ZWST3, +24V, +24V, GND → +24V

-X4 1 2 3 4 5 6 -X8 6
-X13 2 3 1 4 -15V +15V
-X20 4 1 2 3 5 6 +15V -15V
-X19 4 1 2 3 5 6 +15V -15V

-S201
-S202
-S203

-R203
-R204
-R205
-R206
-R207
-R208

INV current static

INV current dynamic

-X2 1W 2V 3U 1N 2U 3V 4W
-X3 1U 2V 3W

-X2 5 4

-X11 1-50
48 14 13 12 17 21 23 49

-X12 1-50
47 45 49 32 29 30 31 39 38 37 1 2

27 28 21 22 19 20 23 48 46 50

-A17X11 50x
-A17X12 50x

-A1
INV control
8000042636 STR

-X11 1-50
48 14 13 12 17 21 23 49

-X12 1-50
47 45 49 32 29 30 31 39 38 37 1 2

27 28 21 22 19 20 23 48 46 50

-X15 1 4

-X5 1 2 (+)

-X5 5 6 (+)

-X8 8 7

-X5 3 4 (+)

-X8 1 2

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Hollandse Kust Noord (HKN) wind farm

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Inverter control
Protect 8.33 40-400-210-400

Circuit diagram

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Control SBS

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-A9 /16.1

10.4 / 03553L Transformer -T35
10.4 / 03553K
10.4 / 03352L Transformer -T33
10.4 / 03352K
10.4 / 03151L Transformer -T31
10.4 / 03151K

11.8 / 09L1 Load voltage
11.8 / 09L2
11.8 / 09L3

13.8 / 05N1 neutral conductor → -X1:3, -X12 6

11.8 / 011L1 SBS mains voltage
11.8 / 011L2
11.8 / 011L3

10.2 / 0FB9 SBS trigger circuit -A3-A36-X1

-L62

-A16 /16.4 SBS interface 8000022378 STR

-X1 1-10: 1 GND, 2 SBS_ON, 3 GND, 4 GND, 5 +24V, 6 +24V, 7 8 9 10; +24V

-X4 1 2 3 4 5 6 — SBS current

-X2 1U 2V 3W -X3 1N 2U 3V 4W

-R201 -R203 -R205
-R202 -R204 -R206

-X12 12 → -X8 7
7 → 5
8 → 4
9 → 6
-X18 1
-R120 1 2
2

-X11 1-50: 15 16 26 17 21 29 30 27 45 46 35 36 33 41 42 39
-X12 1-50: 15 16 26 17 21 29 30 27 45 46 35 36 33 41 42 39

-A16X11 50x
-A16X12 50x

-A1 SBS control 8000008845 STR
-X11 1-50
-X12 1-50

-X15 1 2 3 +24V 4 5

Fan control -A92.1-X6
091.11 / 17.7
091.12 / 17.7
091.13 / 17.7
091.14 / 17.7
091.15 / 17.7

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Control SBS
Protect 8.33 40-400-210-400

Circuit diagram

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& EFS

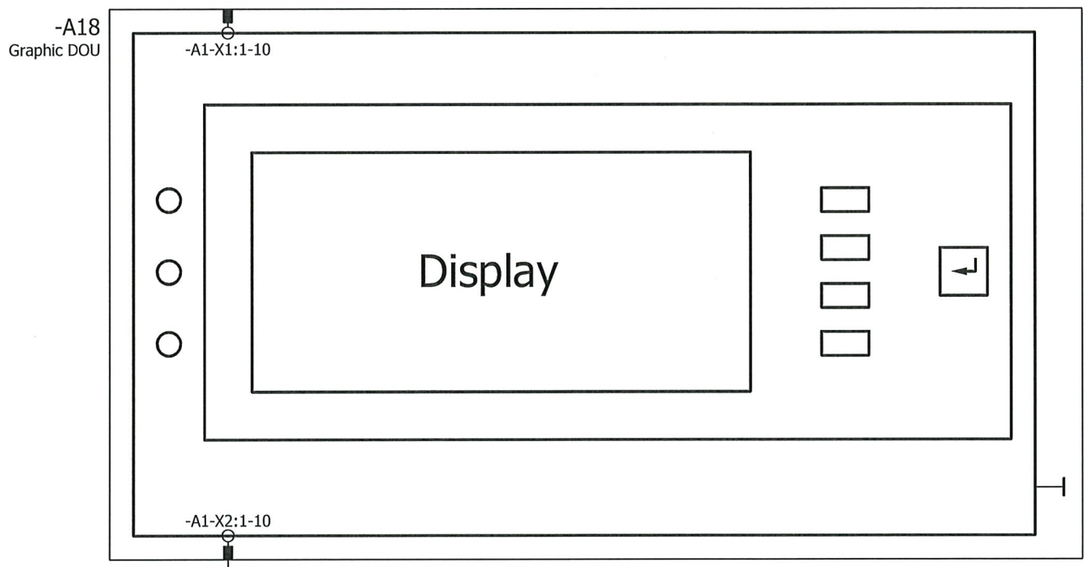
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Control

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DOU-CAN → A / 16.1

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DOU
Protect 8.33 40-400-210-400

Circuit diagram

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+UPS2
Protect 8.33 40-400-210-400
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GZ20_3 +UPS2/16.6
GZ20_5 +UPS2/16.7

INV -CAN
INV -sync

-A9
/12.1
/13.1
/14.2
/20.1
/21.1
/22.1

-A50
/12.1
REC interface
8000022025 STR

-A17
/13.1
INV interface
8000022441 STR

-A16
/14.2
SBS interface
8000022378 STR

-A20
Parallel Adapter
8000023378 STR

-X3 1-3 -X4 1-3 -X5 1-4 -X6 1-2

-X6 1-10 -X7 1-16
-X6 1-10 -X7 1-16
-X6 1-10 -X7 1-16
-X1 1-16 -X2 1-16 -X11 1-10 -X12 1-10 -X13 1-10 -X14 1-10

Parallel CAN INV
Parallel CAN REC
DOU-CAN

15.8 / A
A / 20.1
L / 19.1

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Fan control/monitoring

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11.8 / 015L1 → 016L1 / 18.1

8.8 / 0451N1 → 0452N1 / 18.1

-A91.2-X6 → 091.21 / 18.7, 091.22 / 18.7, 091.23 / 18.7, 091.24 / 18.7, 091.25 / 18.7

-A91.1 Fan control 8000022841 STR

-X5 1 2 3

-R5 -C5

-S1 -S2

Logical evaluation fan fault

-X7 1 2 3 4 5

Fan speed +24V

-R50 -R51 -R60 -R61 -R70 -R71 -R80 -R81

P1 P2 P3 P4 P5 P6 P7 P8

-R1 PTC -R2 PTC -R3 PTC -R4 PTC

-X1 -X2 -X3 -X4 2 1

-X6 1 2 3 4 5

-C31 -C32 -C33 -C34

-X91 -X92 -X93 -X94 2 3 1 N L PE

-M1 -M2 -M3 -M4 M 1~

14.6 / 091.11
14.6 / 091.12
14.6 / 091.13
14.6 / 091.14
14.6 / 091.15
SBS interface -A9-A16-X15

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Fan control/monitoring
Protect 8.33 40-400-210-400

Circuit diagram

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Fan control/monitoring

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17.8 / 016L1

17.8 / 0452N1

-A91.2

Fan control
8000022841 STR

-X5 1 2 3

-R5

-C5

P2 P4 P6 P8

-R50 -R51 -R60 -R61 -R70 -R71 -R80 -R81

P1 P3 P5 P7

= 1 = 1 = 1

-S1 -S2

Logical evaluation
fan fault

-X7 1 2 3 4 5

Fan speed

+24V

-R1 PTC -R2 PTC -R3 PTC -R4 PTC

-X1 2 1 -X2 2 1 -X3 2 1 -X4 2 1

-X6 1 2 3 4 5

-C35 -C36

-X95 -X96

N L PE

-M5 -M6

M 1~

17.8 / 091.21
17.8 / 091.22
17.8 / 091.23
17.8 / 091.24
17.8 / 091.25
-A92.1-X7

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Hollandse Kust Noord (HKN) wind farm

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Fan control/monitoring
Protect 8.33 40-400-210-400

Circuit diagram

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Control

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+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
1000007888.020
10009757

GZ91_1
+MBC1/2.5

-F91 1
G
F3,15A 2

11.8 / 06L+

-A24.1
Battery charge monitoring
BLÜ-PRO
(Option)

-X1 +
M
-
-
-
-
0 ... 5V
-X1 -
-X3 1-16
-X4 1-10

16.8 / L

11.8 / 06L-

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Hollandse Kust Noord (HKN) wind farm

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battery charging circuit monitoring
Protect 8.33 40-400-210-400

Circuit diagram

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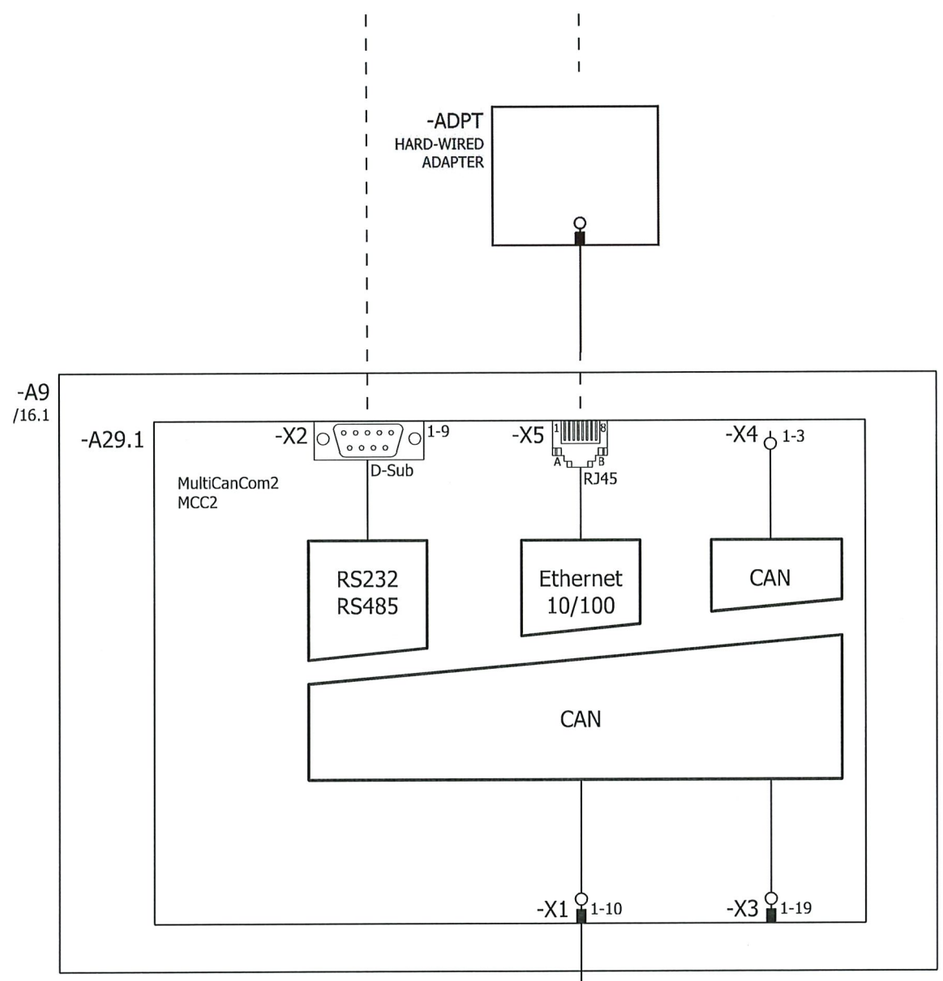
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Control

SNMP adapter
CompuWatch
Service Tools
Modbus

Modbus



16.8 / A → DOU-CAN → A / 21.1

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MultiCom
Protect 8.33 40-400-210-400

Circuit diagram

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Remote signaling

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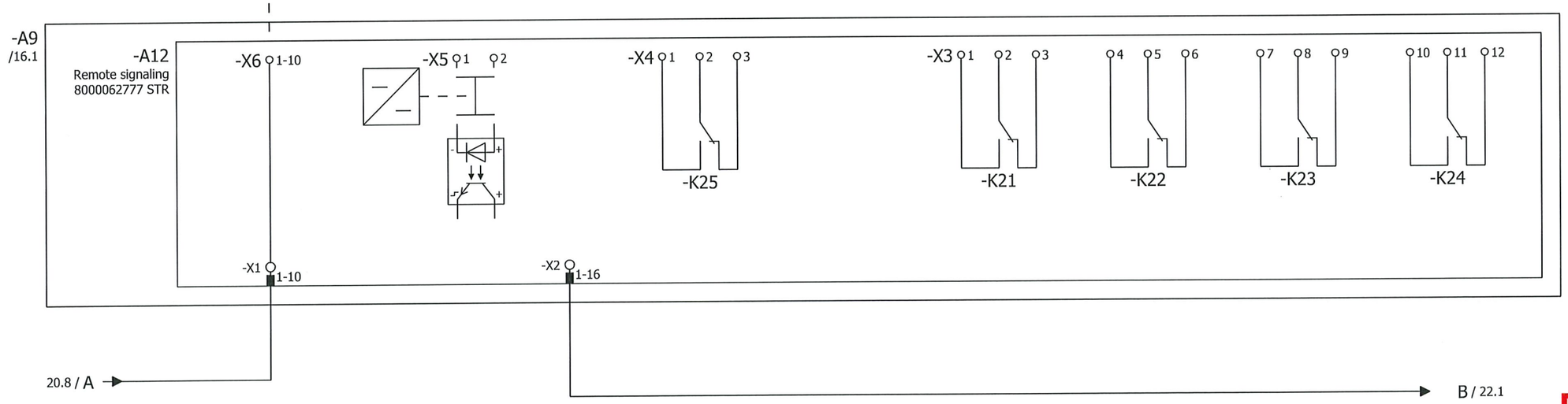
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CAN Service

Configuration remote signals
see techn. data sheet

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INV remote off
Common fault
Inverter operation
SBS operation
REC fault
REC mains fault
Battery low



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Hollandse Kust Noord (HKN) wind farm

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Remote signaling
Protect 8.33 40-400-210-400

Circuit diagram

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& EFS

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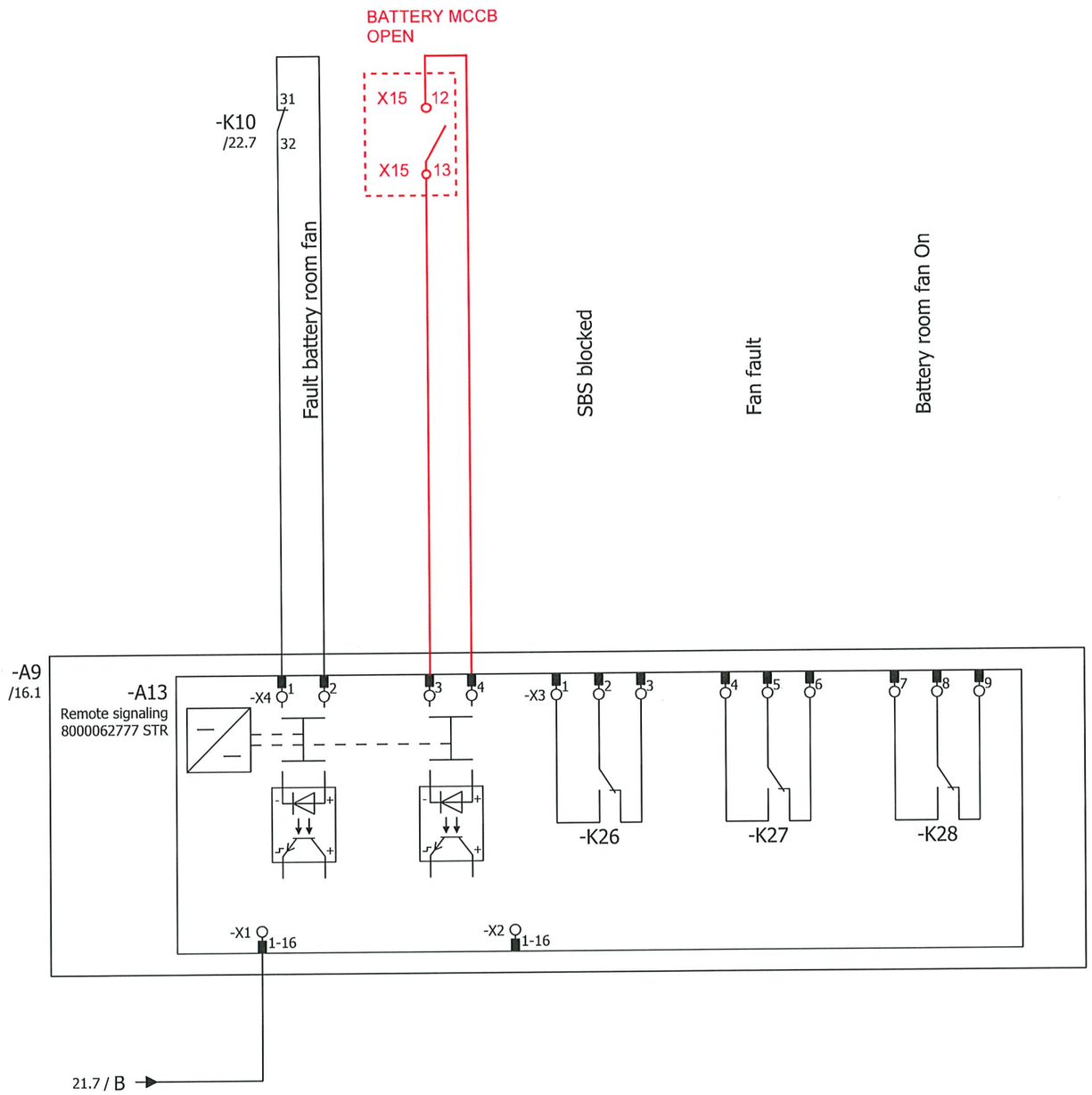
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Remote signaling

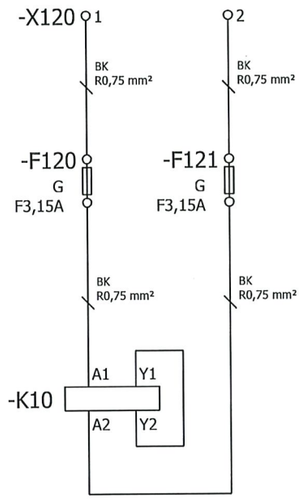
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Configuration remote signals
see techn. data sheet



24V DC is permanently present
in fault-free operation



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PXC.2981020_PSR-SCP- 24DC/ESP4/2X1/1X2

13 — 14
23 — 24
31 — 32 /22.2

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Remote signaling
Protect 8.33 40-400-210-400

Circuit diagram

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+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
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GZ13_1 +MBC1/17.2

GZ13_2 +MBC1/17.3

Control cabinet heating
Mains
110-250V/N/PE~50/60Hz

back-up fuse
gG 10A

BK R1,5 mm²

BK R1,5 mm²

-X13 U U N N PE PE

BK 0,75 mm²

-F100 1
G
T6,3A 2

BK 0,75 mm²

BK 0,75 mm²

L
-F85
I 3 2

-A85 -X1 3 2
-R1

-X14 U U N N

BK 0,75 mm²

-F110 1
G
T6,3A 2

BK 0,75 mm²

BK 0,75 mm²

-X114 U N

-W100
H05VV
2x1 mm²
3 m

L N
-H1
Enclosure light

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

external connection
Protect 8.33 40-400-210-400

Circuit diagram

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+ UPS1
& EFS

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sheets 23

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Terminal diagram

terminal

=+UPS1-A9-A12-X3

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1						+UPS1&EFS/21.5
				2						+UPS1&EFS/21.5
				3						+UPS1&EFS/21.5
				4						+UPS1&EFS/21.5
				5						+UPS1&EFS/21.6
				6						+UPS1&EFS/21.6
				7						+UPS1&EFS/21.6
				8						+UPS1&EFS/21.6
				9						+UPS1&EFS/21.6
				10						+UPS1&EFS/21.7
				11						+UPS1&EFS/21.7
				12						+UPS1&EFS/21.7

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-A9-A12-X3
Protect 8.33 40-400-210-400

Terminal diagram

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& EMA

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sheets 23

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Terminal diagram

terminal

=+UPS1-A9-A12-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1						+UPS1&EFS/21.4
				2						+UPS1&EFS/21.4
				3						+UPS1&EFS/21.4

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-A9-A12-X4
Protect 8.33 40-400-210-400

Terminal diagram

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sheet 2
sheets 23

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Terminal diagram

terminal

=+UPS1-A9-A12-X5

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1						+UPS1&EFS/21.3
				2						+UPS1&EFS/21.3

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				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-A9-A12-X5
Protect 8.33 40-400-210-400

Terminal diagram

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=
+ UPS1
& EMA

A3 | sheet 3 | sheets 23

CAE EPLAN Electric P8

Terminal diagram

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terminal
=+UPS1-A9-A12-X6

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1-10		-A9-A12-X1				+UPS1&EFS/21.2

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				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-A9-A12-X6
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS1
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sheet 4
sheets 23

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Terminal diagram

terminal

=+UPS1-A9-A29.1-X2

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1-9						+UPS1&EFS/20.2

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Terminal diagram

terminal
=+UPS1-A9-A29.1-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1-3						+UPS1&EFS/20.3

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-A9-A29.1-X4
Protect 8.33 40-400-210-400

Terminal diagram

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sheet 6
sheets 23

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Terminal diagram

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terminal
=+UPS1-A9-A29.1-X5

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable type	Cable name	Position / Page
				1-8						+UPS1&EFS/20.3

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-A9-A29.1-X5
Protect 8.33 40-400-210-400

Terminal diagram

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Terminal diagram

terminal
=+UPS1-A20-X3

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		+UPS2-A20-X3	1-3	1-3						+UPS1&EFS/16.6

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Terminal diagram

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terminal
=+UPS1-A20-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1-3						+UPS1&EFS/16.7

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-A20-X4
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS1
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sheet 9
sheets 23

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Terminal diagram

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terminal

=+UPS1-A20-X5

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable type	Cable name	Position / Page
		+UPS2-A20-X5	1-4	1-4						+UPS1&EFS/16.7

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-A20-X5
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS1
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Terminal diagram

terminal
=+UPS1-A20-X6

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1-2						+UPS1&EFS/16.7

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Hollandse Kust Noord (HKN) wind farm

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Terminal diagram

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& EMA

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sheets 23

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Terminal diagram

terminal
=+UPS1-E1-X1

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U		-E1-X1	U			+UPS1&EFS/1.2
						-Q1	2			
		+MBC1-X1	2U	U		-E1-X1	U			+UPS1&EFS/1.2
				V		-E1-X1	V			+UPS1&EFS/1.2
						-Q1	4			
		+MBC1-X1	2V	V		-E1-X1	V			+UPS1&EFS/1.2
				W		-E1-X1	W			+UPS1&EFS/1.2
						-Q1	6			
		+MBC1-X1	2W	W		-E1-X1	W			+UPS1&EFS/1.2

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-E1-X1
Protect 8.33 40-400-210-400

Terminal diagram

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Terminal diagram

terminal

=+UPS1-E2-X2

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				L+		-L41	1.2			+UPS1&EFS/4.3
		+MBC1-X2	1L+	L+						+UPS1&EFS/4.3
				L-		-L41	2.2			+UPS1&EFS/4.2
		+MBC1-X2	1L-	L-						+UPS1&EFS/4.2

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				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-E2-X2
Protect 8.33 40-400-210-400

Terminal diagram

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sheets 23

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Terminal diagram

terminal

=+UPS1-E3-X3

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U		-E3-X3	U			+UPS1&EFS/8.2
						-L11	2			
		+MBC1-X5	1U	U		-E3-X3	U			+UPS1&EFS/8.2
				V		-E3-X3	V			+UPS1&EFS/8.2
						-L12	2			
		+MBC1-X5	1V	V		-E3-X3	V			+UPS1&EFS/8.2
				W		-E3-X3	W			+UPS1&EFS/8.2
						-L13	2			
		+MBC1-X5	1W	W		-E3-X3	W			+UPS1&EFS/8.2
				N		-E3-X3	N			+UPS1&EFS/8.3
		+MBC1-X5	1N	N		-E3-X3	N			+UPS1&EFS/8.3

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				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-E3-X3
Protect 8.33 40-400-210-400

Terminal diagram

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sheet 14
sheets 23

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Terminal diagram

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terminal
=+UPS1-E4-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable type	Cable name	Position / Page
				U		-E4-X4	U			+UPS1&EFS/8.6
						-A3-X4	1			
		+MBC1-X4	1U	U		-E4-X4	U			+UPS1&EFS/8.6
				V		-E4-X4	V			+UPS1&EFS/8.6
						-A3-X4	2			
		+MBC1-X4	1V	V		-E4-X4	V			+UPS1&EFS/8.6
				W		-E4-X4	W			+UPS1&EFS/8.6
						-A3-X4	3			
		+MBC1-X4	1W	W		-E4-X4	W			+UPS1&EFS/8.6
				N		-E4-X4	N			+UPS1&EFS/8.6
		+MBC1-X4	1N	N		-E4-X4	N			+UPS1&EFS/8.6
		+MBC1-X4	1N	N		-E4-X4	N			+UPS1&EFS/8.6

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-E4-X4
Protect 8.33 40-400-210-400

Terminal diagram

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& EMA

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sheet 15
sheets 23

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Terminal diagram

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terminal
=+UPS1-F120

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		-K10	A1	1		-X120	1			+UPS1&EFS/22.7

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				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-F120
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS1
& EMA

A3

sheet 16
sheets 23

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Terminal diagram

terminal

=+UPS1-F121

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		-K10	A2	1		-X120	2			+UPS1&EFS/22.8

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				Norm	

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-F121
Protect 8.33 40-400-210-400

Terminal diagram

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sheet 17
sheets 23

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Terminal diagram

terminal
=+UPS1-PE

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		+MBC1-PE	PE	PE						+UPS1&EFS/4.3
				PE						+UPS1&EFS/8.4
				PE						+UPS1&EFS/1.4

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-PE
Protect 8.33 40-400-210-400

Terminal diagram

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sheet 18
sheets 23

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Terminal diagram

terminal

=+UPS1-X12

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1		-A92.1-X3	4			+UPS1&EFS/11.5
				2		-A92.2-X10	2			+UPS1&EFS/11.5
				3		-A92.2-X10	3			+UPS1&EFS/11.5
		-A24.1-X1	+	4	'	-A92.1-X20	2			+UPS1&EFS/11.7
		-A24.1-X1	-	5	'	-A92.1-X20	1			+UPS1&EFS/11.7
				6		-CU	N			+UPS1&EFS/14.7
				7		-A9-A16-X8	5			+UPS1&EFS/14.2
				8		-A9-A16-X8	4			+UPS1&EFS/14.2
				9		-A9-A16-X8	6			+UPS1&EFS/14.2
				10		-A9-A50-X8	1			+UPS1&EFS/12.3
				11		-A9-A50-X8	2			+UPS1&EFS/12.3
						-Q3	96			
				12		-A9-A16-X8	7			+UPS1&EFS/14.2
				15		-A9-A50-X8	3			+UPS1&EFS/12.3
						-Q3	95			

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-X12
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS1
& EMA

A3

sheet 19
sheets 23

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Terminal diagram

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terminal
=+UPS1-X13

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U		-F100	1:2			+UPS1&EFS/23.2
		-X14	U	U						+UPS1&EFS/23.2
				N		-A85-X1	2			+UPS1&EFS/23.2
		-X14	N	N						+UPS1&EFS/23.3
				PE						+UPS1&EFS/23.3
				PE						+UPS1&EFS/23.3

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Terminal diagram =+UPS1-X13
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS1
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Terminal diagram

terminal

=+UPS1-X14

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		-X13	U	U		-F110	1:2			+UPS1&EFS/23.7
		+MBC1-X13	U	U						+UPS1&EFS/23.7
		-X13	N	N		-X114	N			+UPS1&EFS/23.7
		+MBC1-X13	N	N						+UPS1&EFS/23.7

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-X14
Protect 8.33 40-400-210-400

Terminal diagram

1000007888_010 en

=
+ UPS1
& EMA

A3

sheet 21
sheets 23

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Terminal diagram

terminal
=+UPS1-X15

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1		-A9-A50-X8	4			+UPS1&EFS/12.6
				1		-C711				+UPS1&EFS/12.7
				2		-C712				+UPS1&EFS/12.7
		+MBC1-X15	2	2		-A9-A50-X5	5			+UPS1&EFS/12.8
		+MBC1-X15	3	3		-A9-A50-X5	6			+UPS1&EFS/12.8

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS1-X15
Protect 8.33 40-400-210-400

Terminal diagram

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= + UPS1 & EMA

A3

sheet 22
sheets 23

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Terminal diagram

terminal

=+UPS1-X120

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1	'	-F120	1:1			+UPS1&EFS/22.7
				2	'	-F121	1:1			+UPS1&EFS/22.8

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Hollandse Kust Noord (HKN) wind farm

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Terminal diagram =+UPS1-X120
Protect 8.33 40-400-210-400

Terminal diagram

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& EMA

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sheet 23
sheets 23

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Three-phase input
Attention! Observe sequence of wires, L1, L2, L3 -->
See technical data sheet for required mains fuses

Power section rectifier

mains transformer

Note: Reinforced insulated wire
0,75 mm² unmarked wires

-L61
N=2

Measurement REC Interface -A9-A50-X2
01L1 / 12.6
01L2 / 12.6
01L3 / 12.6

Supply REC Interface -A9-A50-X3
02L1 / 11.1
02L2 / 11.1
02L3 / 11.1

-L22
U2 U1
V2 V1
W2 W1
R25 mm²

-T40
1U 1V 1W
2U 2V 2W
3U 3V 3W

-L85.1
R16 mm²
1L1 / 2.1
1L2 / 2.1
1L3 / 2.1
2L1 / 3.1
2L2 / 3.1
2L3 / 3.1
-L85.2

-C101.1
-C101.2
-C101.3

-Q3
R6 mm²
96 98 95
/12.3

-L23 -L24 -L25
-R23 -R24 -R25
-C23 -C24 -C25
3xR6 mm²

-Q1
L=100/85A
I=1,0kA
Icu=50kA
I> I> I>
C1 C2
/12.4

-A80
Suppression
81 82 83
-R86 -R87 -R88
-R81 -R82 -R83
-V81.1-V81.6
-R84.1 -R84.2
90 89
C84

-A81
Suppression
81 82 83
-R86 -R87 -R88
-R81 -R82 -R83
-V81.1-V81.6
-R84.1 -R84.2
90 89
C85

-E1
-X1 U V W
-A2
-X4
EMI capacitor 4-pole 8000022634 STR
-C4 -C5 -C1 -C6 -C2 -C7 -C3 -C8 -C9 -C10
-X1 -X2 -X3

-L92

-A1
-X4
EMI capacitor 4-pole 8000022634 STR
-C4 -C5 -C1 -C6 -C2 -C7 -C3 -C8 -C9 -C10
-X1 -X2 -X3

2xR35 mm²
R25 mm²

Mains
400V;3/PE~50Hz

+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
1000007888.020
10009757

GZ1_1 +MBC1/1.6
GZ1_2 +MBC1/1.6
GZ1_3 +MBC1/1.6

Rack
-PE
PE busbar
Cu 40x5 mm

Rack
GNYE
6 mm²
Tür links

Rack
GNYE
6 mm²
Pivot plate

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Rectifier input
Protect 8.33 40-400-210-400

Circuit diagram

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=
+ UPS2
& EFS

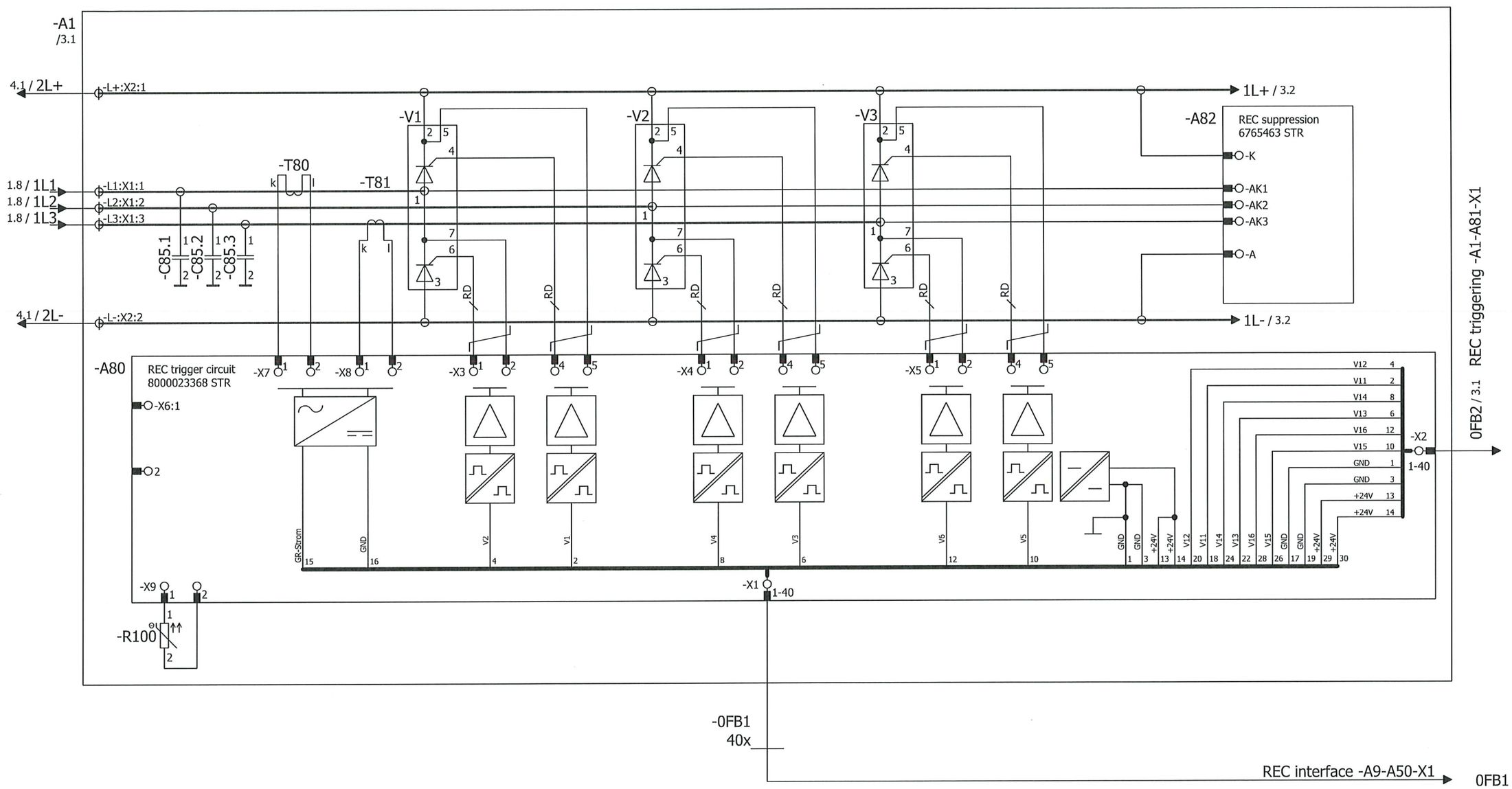
A3 | sheet 1 | sheets 23

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Power section rectifier



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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Power section rectifier
Protect 8.33 40-400-210-400

Circuit diagram

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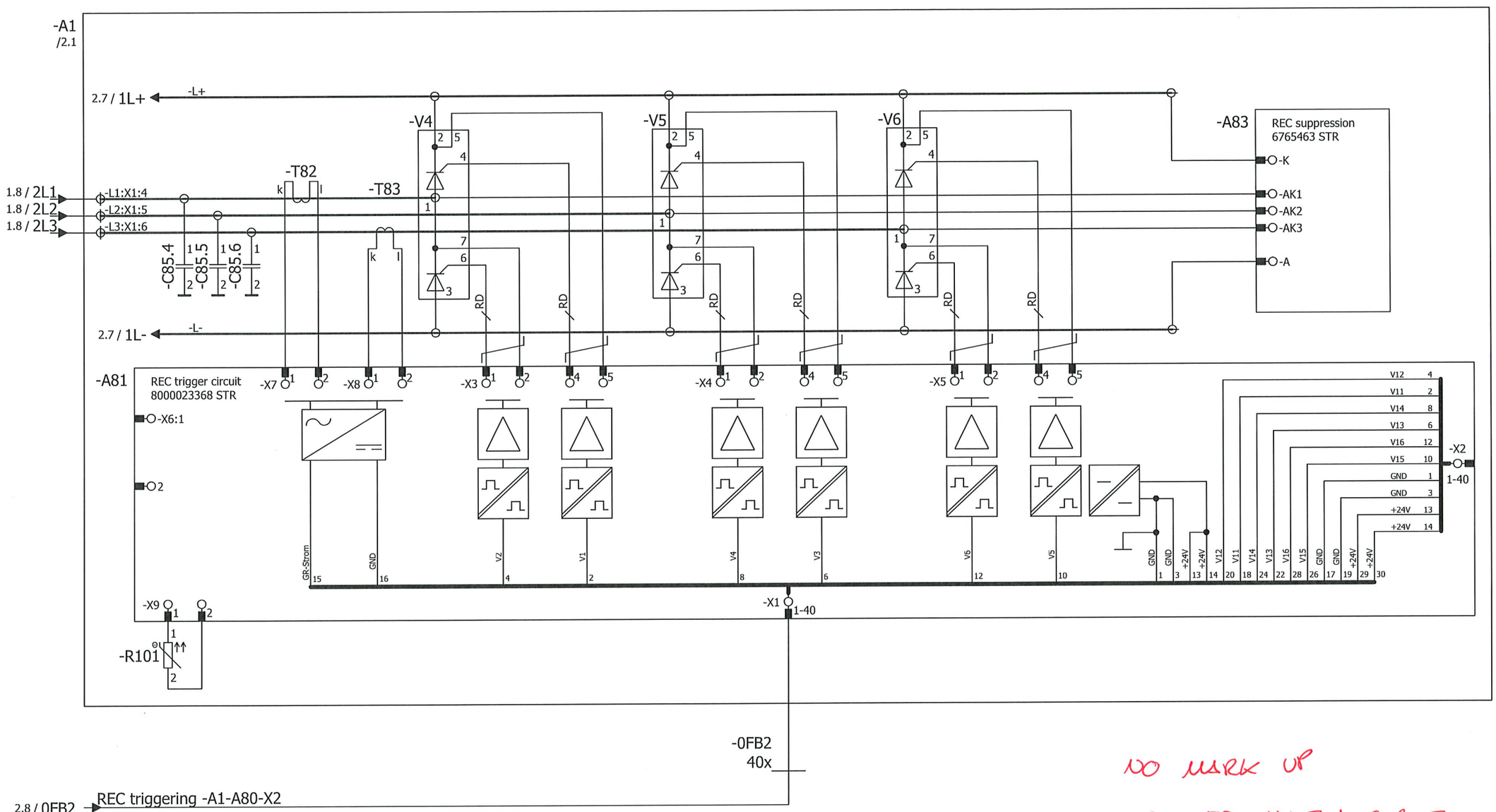
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Power section rectifier

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Hollandse Kust Noord (HKN) wind farm

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Power section rectifier
Protect 8.33 40-400-210-400

Circuit diagram

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+ UPS2
& EFS

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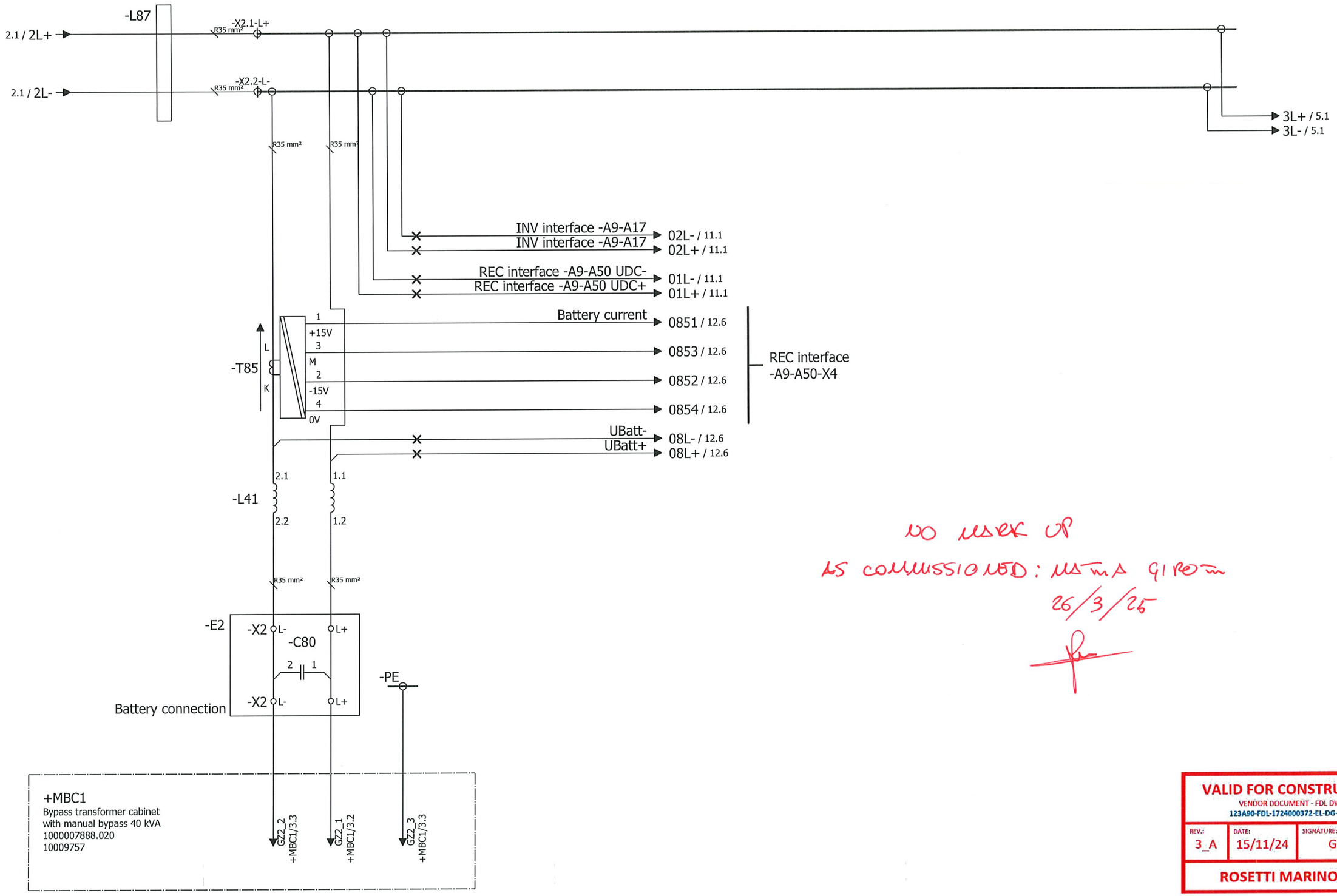
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Power section rectifier
Battery connection

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Battery connection
Protect 8.33 40-400-210-400

Circuit diagram

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& EFS

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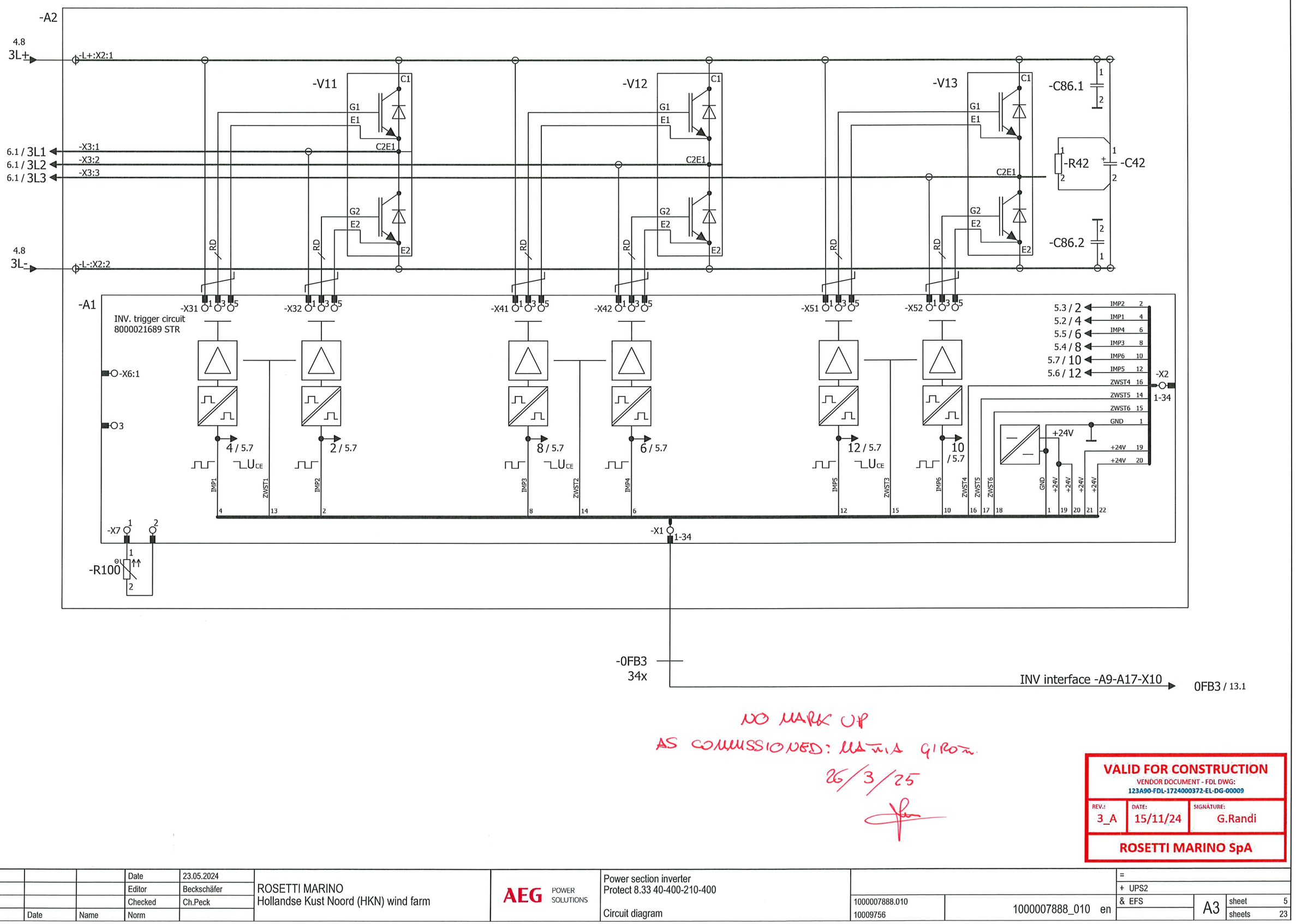
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Power section inverter

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Power section inverter
Protect 8.33 40-400-210-400

Circuit diagram

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A3

sheet 5
sheets 23

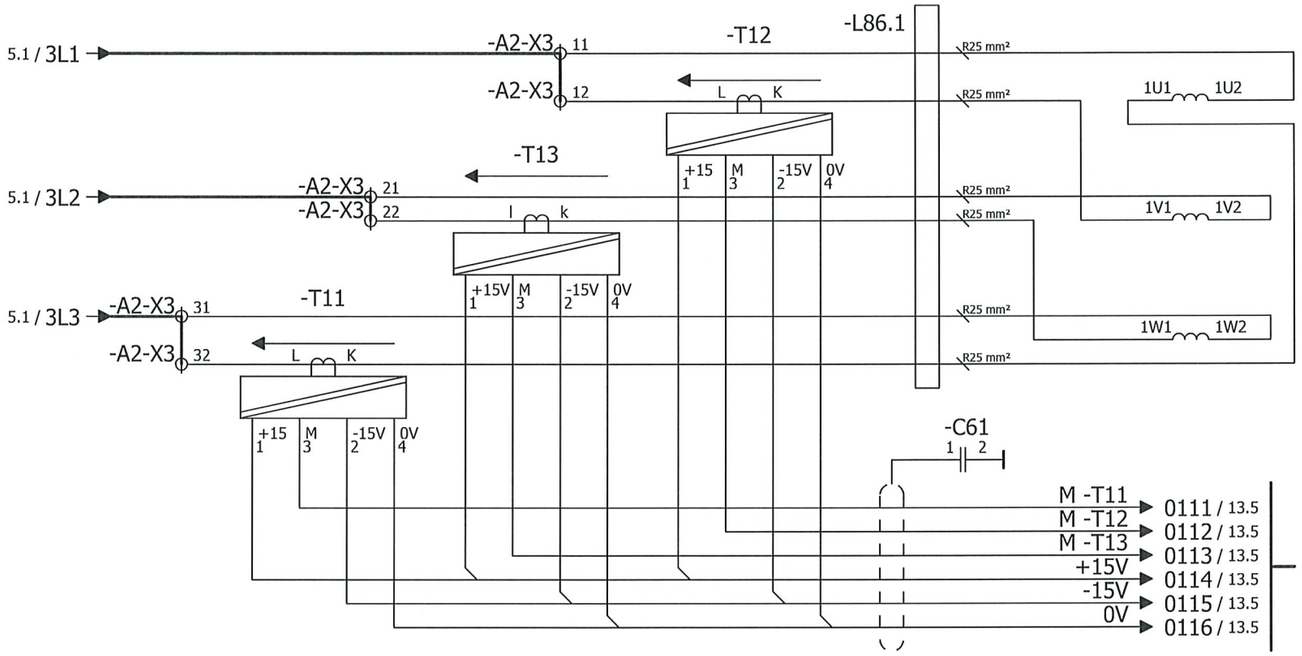
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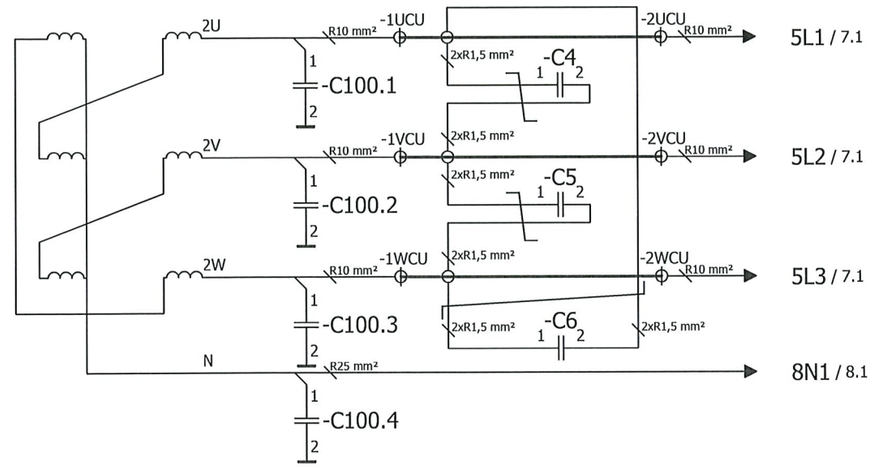
Power section inverter

Measuring INV current dynamic



INV interface
-A9-A17-X19

-T1



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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Inverter output
Protect 8.33 40-400-210-400

Circuit diagram

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& EFS

A3

sheet 6
sheets 23

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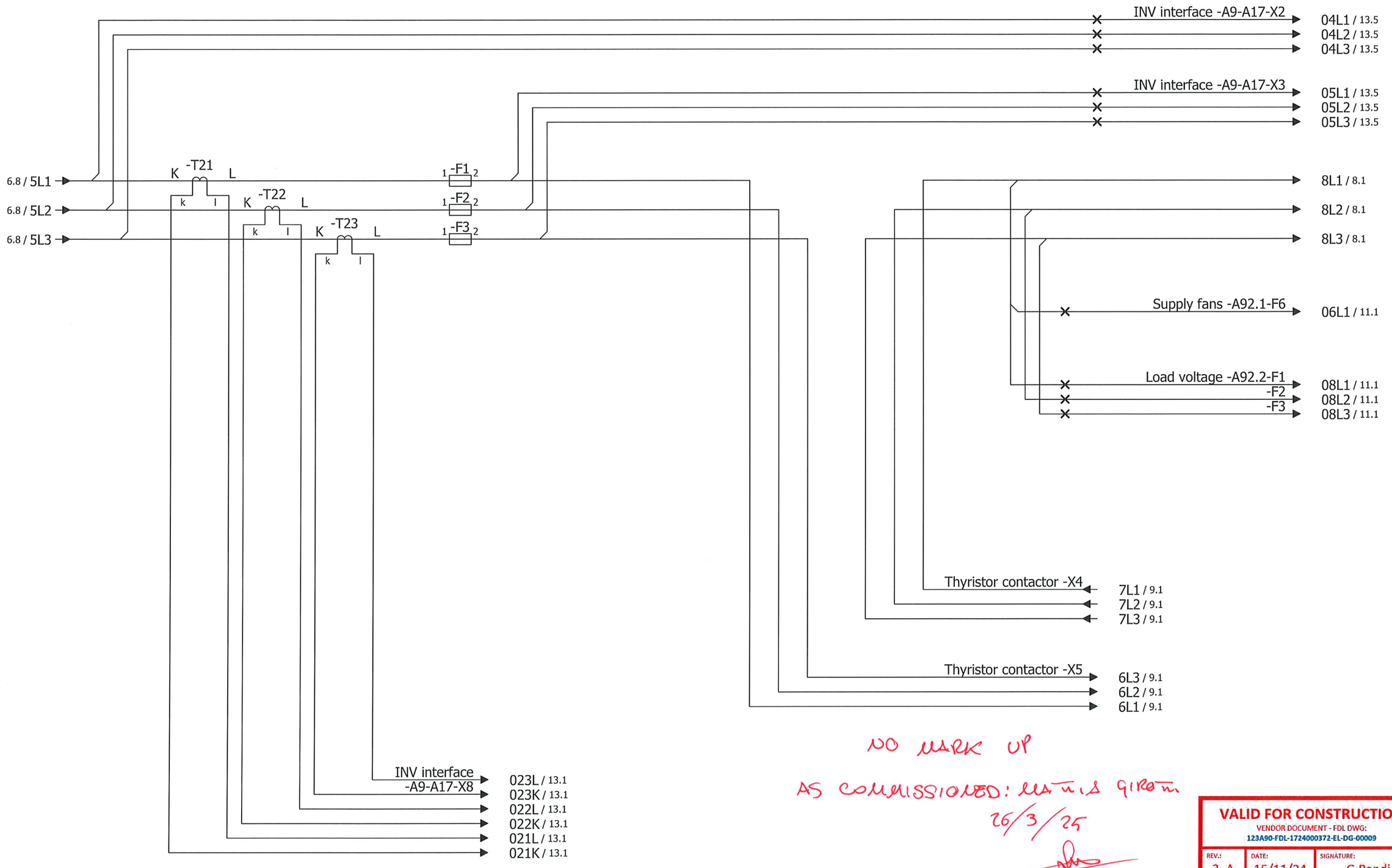
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Power section inverter

Measurement INV current static

Output fuse



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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Inverter output
Protect 8.33 40-400-210-400

Circuit diagram

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Power section inverter

Parallel preventive choke coil

7.8 / 8L1
7.8 / 8L2
7.8 / 8L3
6.8 / 8N1

R10 mm² R25 mm² R35 mm² 2xR35 mm²

-L11 -L12 -L13 -L93 -L94

-A105
-C56 -C57 -C58
-X1 -X2 -X3 -X4

-E3 -E4
-X3 -X4 U V W N
-A4 -A3
EMI capacitor 4-pole 8000022634 STR
-C1 -C2 -C3 -C4 -C5 -C6 -C7 -C8 -C9 -C10
-X1 -X2 -X3

-PE

SBS Output → 10L1 / 10.1, 10L2 / 10.1, 10L3 / 10.1

SBS Input → 9L1 / 10.1, 9L2 / 10.1, 9L3 / 10.1

fan neutral conductor → 0451N1 / 17.1

neutral conductor → 04N1 / 13.5

-A9

Load
400V;3/N/PE~50Hz

Mains
400V;3/N/PE~50Hz

GZ3_1 +MBC1/6.5
GZ3_2 +MBC1/6.5
GZ3_3 +MBC1/6.6
GZ3_4 +MBC1/6.6
GZ4_1 +MBC1/5.6
GZ4_2 +MBC1/5.6
GZ4_3 +MBC1/5.6
GZ4_4 +MBC1/5.6

+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Load output / SBS circuit
Protect 8.33 40-400-210-400

Circuit diagram

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Power section inverter
Inverter output contactor

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ROSETTI MARINO SpA

-A4

-A37 SBS suppression 8000028996 STR
-A3 -K3 -AK3 -A2 -K2 -AK2 -A1 -K1 -AK1

-V31 -V33 -V35
-X4:1A -X4:1 -X4:1K
-X4:2A -X4:2 -X4:2K
-X4:3A -X4:3 -X4:3K
A K AK G2 K2 K1 G1

7.7 / 7L1
7.7 / 7L2
7.7 / 7L3

RD

-X2 -X3 -X4 1 2 5 4

-A36 SBS trigger circuit 8000028563 STR

-X5:1
2

EIN GND GND GND +24V +24V
1 2 3 4 5 6 7 8 9 10

-X6 1 2
-R100
-X1 1-10
-0FB10 10x

-X6 5 6 3 4 1 2

7.7 / 6L3
7.7 / 6L2
7.7 / 6L1
-X5:3 -X5:2 -X5:1

INV interface -A9-A17-X1 → 0FB10 / 13.1

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Inverter output contactor
Protect 8.33 40-400-210-400
Circuit diagram

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A3
sheet 9
sheets 23

Power section SBS

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-A3

SBS mains voltage -A92.2-F6 → 010L1 / 11.1
-A92.2-F7 → 010L2 / 11.1
-A92.2-F8 → 010L3 / 11.1

8.8 / 9L1 → SBS mains
8.8 / 9L2 → SBS mains
8.8 / 9L3 → SBS mains

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ROSETTI MARINO SpA

-A37 SBS suppression 8000028996 STR

-A3 -K3 -AK3 -A2 -K2 -AK2 -A1 -K1 -AK1

-V31
-X4:1A
-X4:1
-X4:1K
A K AK
G2 K2 K1 G1

-V33
-X4:2A
-X4:2
-X4:2K
A K AK
G2 K2 K1 G1

-V35
-X4:3A
-X4:3
-X4:3K
A K AK
G2 K2 K1 G1

RD

-A36 SBS trigger circuit 8000028563 STR

-X2 -X3 -X4 1 2 5 4

-X5:1
2

GND EUE_EIN GND GND +24V +24V
1 2 3 4 5 6 7 8 9 10

-X1 1-10

-X6 1 2
-R100 1 2

SBS interface -A9-A16-X1 → 0FB9 / 14.3

-X6 5
-X6 6
-X6 3
-X6 4
-X6 1
-X6 2

8.8 / 10L3 ← UPS Output
8.8 / 10L2 ←
8.8 / 10L1 ←

-X5:3
-X5:2
-X5:1

SBS interface -A9-A16-X4 → 03151L / 14.3
-A9-A16-X4 → 03151K / 14.3
-A9-A16-X4 → 03352L / 14.3
-A9-A16-X4 → 03352K / 14.3
-A9-A16-X4 → 03553L / 14.3
-A9-A16-X4 → 03553K / 14.3

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Power section SBS
Protect 8.33 40-400-210-400
Circuit diagram

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+ UPS2
& EFS

A3

sheet 10
sheets 23

Fuse boards

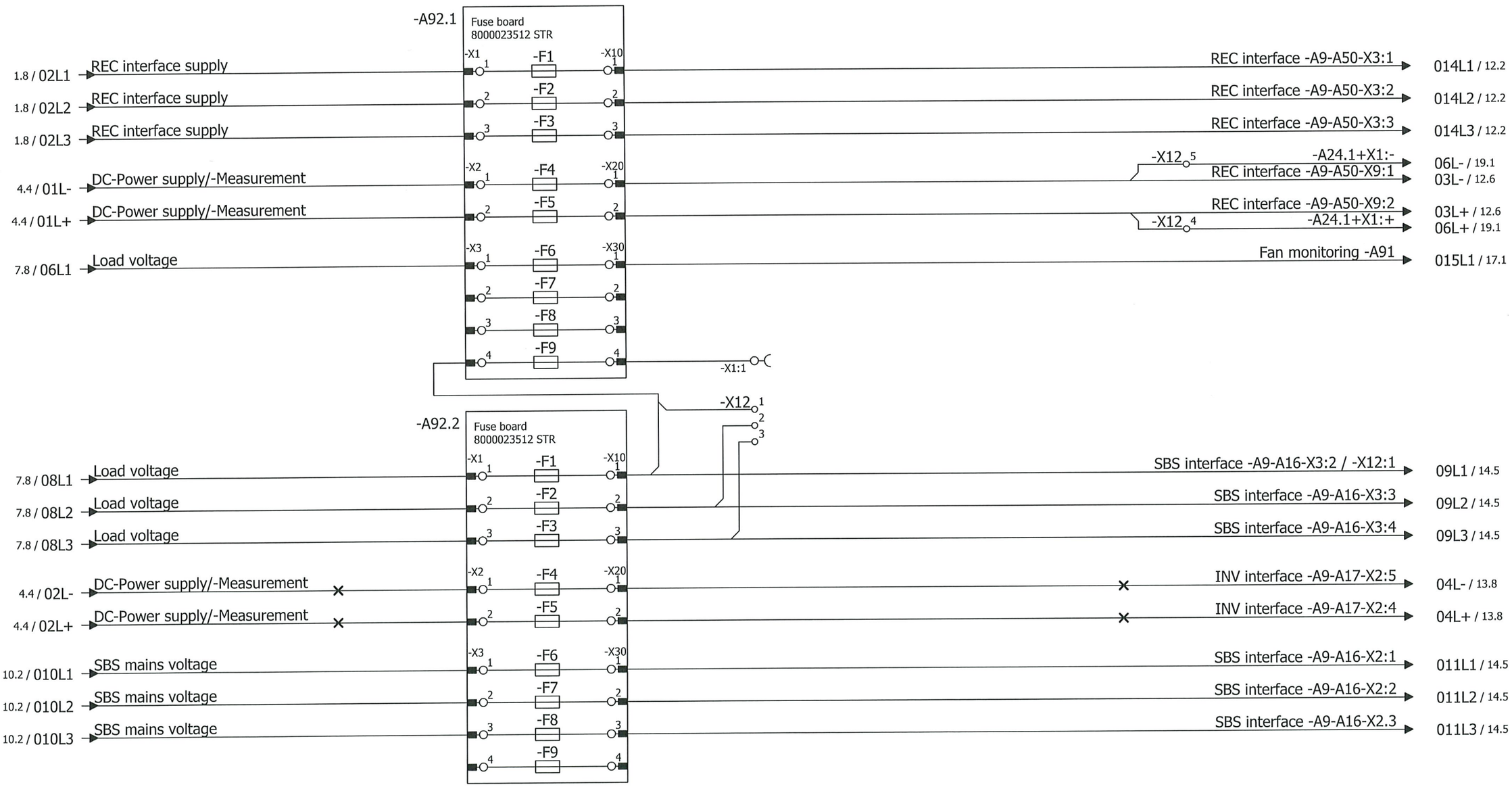
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Hollandse Kust Noord (HKN) wind farm

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Fuse boards
Protect 8.33 40-400-210-400

Circuit diagram

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A3

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Rectifier control

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-A9
/16.1

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724000372-EL-DG-00009

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26/3/25

4.4 / 0854
4.4 / 0851
4.4 / 0853
4.4 / 0852
Battery current transformer -T85

4.4 / 08L+
4.4 / 08L-
UBatt+
UBatt-

11.8 / 03L+
11.8 / 03L-
UIC+ A92.1-F5
UIC- A92.1-F4

1.8 / 01L3
1.8 / 01L2
1.8 / 01L1
-Q1 REC input voltage

2.8 / 0FB1
REC trigger circuit -A1-A80-X1

11.8 / 014L3
11.8 / 014L2
11.8 / 014L1
-T40 sec. supply REC

-A50
/16.2
REC interface
8000022025 STR

-X3 1 2 3
-X5 7 8
-X1 1-40
-X2 1 3
-X9 5 1 2 3
-X4 4 2 3 1 4
-15V +15V

GND V1 GND V2 V3 V4 V5 V6 +24V +24V GND V11 GND V12 V13 V14 V15 V16 +24V +24V REC current GND REC current GND
1 2 3 4 6 8 10 12 13 14 17 18 19 20 22 24 26 28 29 30 15 16 31 32

+24V
+24V
-R204
-R206
REC current stack A1
REC current stack A2

15 19 18 31 32 33 34 35 36 39 40 41 42 43 44
40 39 36 35 34 33 44 43 42 41 38

-X11 1-50
-A50X11 50x
-X12 1-50
-A50X12 50x

-A1
REC control
8000014119 STR

15 18 19 31 32 33 34 35 36 39 40 41 42 43 44
40 39 36 35 34 33 44 43 42 41 38

-X19 1 2 3
-X15 1 4
-X8 1 2 3
-X5 3 4
+24V DC
-X8 4 5 6
-X5 5 6

-X130 1 2
-X12 10 11 15
-Q3
/1.4
96 98
95
-Q1
C1
C2

BK R1,5 mm²
-C711 220000µF
-C712 220000µF
BK R2,5 mm²
BK R1,5 mm²
BK R1,5 mm²
0V
BK R2,5 mm²
-X15 1 1
-X15 2 2 (+) (-) 3
*1

+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
1000007888.020
10009757
GZ130_1
GZ130_2

*1 Attention! In the event of battery undervoltage < 130 V, the UPS automatically switches off battery isolator Q2.
If this happens, switch X15:3 must be switched into the open position (undervoltage trip blocked).
For restart, please refer to the chapter in the UPS operating instructions (charging the DC link capacitors).
Unlock the tripped switch Q2 by switching to open position.
After charging the DC link capacitors, switch on Q2.
Attention! When the battery voltage reaches > 200 V, switch X15:3 must be switched back to the closed position.

+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
1000007888.020
10009757
GZ15_2 +MBC1/3.4
GZ15_3 +MBC1/3.4

1000007888_010

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Rectifier control
Protect 8.33 40-400-210-400

Circuit diagram

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10009756

1000007888_010 en

=
+ UPS2
& EFS

A3

sheet 12
sheets 23

CAE EPLAN Electric P8

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Inverter control

INV current static

7.3 / 023L Transformer -T23
7.3 / 023K
7.3 / 022L Transformer -T22
7.3 / 022K
7.3 / 021L Transformer -T21
7.3 / 021K

INV. trigger circuit
-A2-A1-X1
5.8 / 0FB3

Trigger circuit
-A4-A36-X1
9.7 / 0FB10

INV current dynamic

7.8 / 05L1 INV output voltage reference
7.8 / 05L2
7.8 / 05L3
8.8 / 04N1 neutral conductor
7.8 / 04L1 INV output voltage
7.8 / 04L2
7.8 / 04L3

N → 05N1 / 14.5

6.5 / 0116 Transformer -T11...-T13
6.5 / 0115
6.5 / 0113
6.5 / 0112
6.5 / 0111
6.5 / 0114

11.8 / 04L+ UIC+
11.8 / 04L- UIC-

-A9
/16.1

-A17
/16.3
INV interface
8000022441 STR

-X1 1-10
GND 1 | SBS_ON 2 | GND 3 | GND 4 | +24V 5 | +24V 6
+24V

-X10 1-34
IMP1 4 | IMP2 2 | IMP5 12 | IMP6 10 | ZWST1 13 | ZWST3 15 | +24V 19 | +24V 20 | GND 1 | 33
+24V

-X4 1 2 3 4 5 6 -X8 6
-X13 2 3 1 4
-15V +15V

-R203 -R205 -R207
-R204 -R206 -R208

INV current static

-X20 4 1 2 3 5 6
+15V -15V

-S201
-S202
-S203

-X19 4 1 2 3 5 6
+15V -15V

INV current dynamic

-X2 1W 2V 3U -X3 1N 2U 3V 4W

-X2 5 4

48 14 13 12 17 21 23 49
27 28 21 22 19 20 23 48 46 50 47 45 49 32 29 30 31 39 38 37 1 2

-X11 1-50
-A17X11___50x

-X12 1-50
-A17X12___50x

-A1
INV control
8000042636 STR

-X11 1-50
-X12 1-50

-X15 1 4
-X5 1 2 (+)
-X5 5 6 (+)
-X8 8 7
-X5 3 4 (+)
-X8 1 2

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Inverter control
Protect 8.33 40-400-210-400

Circuit diagram

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= + UPS2 & EFS

A3

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Control SBS

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-A9 /16.1

10.4 / 03553L Transformer -T35
10.4 / 03553K
10.4 / 03352L Transformer -T33
10.4 / 03352K
10.4 / 03151L Transformer -T31
10.4 / 03151K

11.8 / 09L1 Load voltage
11.8 / 09L2
11.8 / 09L3

13.8 / 05N1 neutral conductor → -X1:3, -X12 6

11.8 / 011L1 SBS mains voltage
11.8 / 011L2
11.8 / 011L3

10.2 / 0FB9 SBS trigger circuit -A3-A36-X1

-L62

-A16 /16.4 SBS interface 8000022378 STR

-X1 1-10: 1 GND, 2 SBS_ON, 3 GND, 4 GND, 5 +24V, 6 +24V, 7 8 9 10, +24V

-X4 1 2 3 4 5 6 — SBS current

-X2 1U 2V 3W — -X3 1N 2U 3V 4W

-X12 12 → -X8 7

-R201 -R203 -R205
-R202 -R204 -R206

7 8 → 5 4
9 → 6
-X18 1 → -R120 (1, 2) → 2

-X11 1-50: 15 16 26 17
-X12 1-50: 21 29 30 27 45 46 35 36 33 41 42 39

-A16X11 50x
-A16X12 50x

-A1 SBS control 8000008845 STR

-X15 1 2 3 +24V 4 5

Fan control -A92.1-X6
091.11 / 17.7
091.12 / 17.7
091.13 / 17.7
091.14 / 17.7
091.15 / 17.7

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Control SBS
Protect 8.33 40-400-210-400

Circuit diagram

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& EFS

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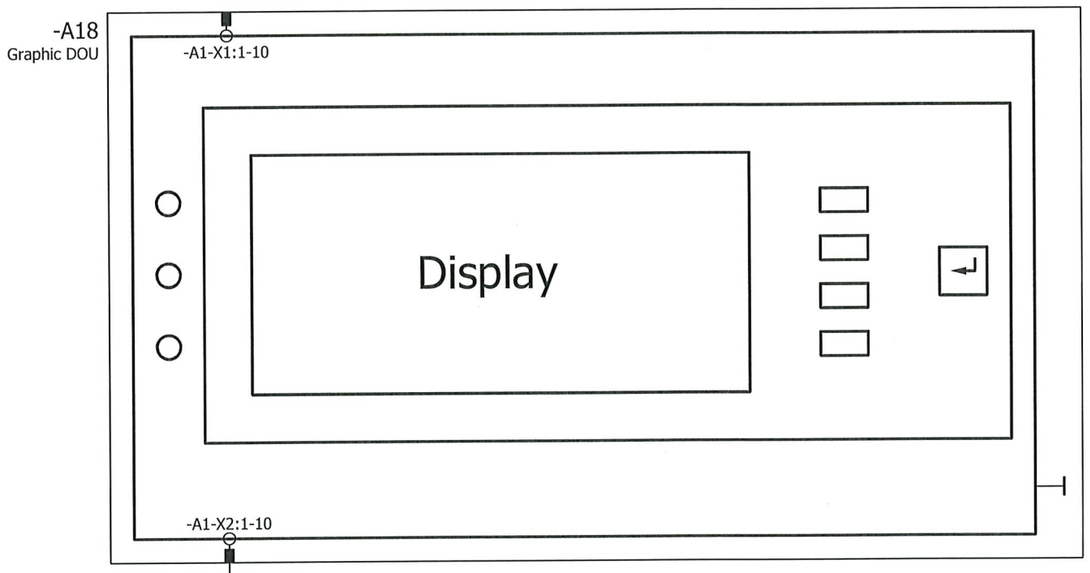
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DOU-CAN → A / 16.1

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Hollandse Kust Noord (HKN) wind farm

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DOU
Protect 8.33 40-400-210-400

Circuit diagram

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+UPS2
Protect 8.33 40-400-210-400
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GZ20_3 +UPS1/16.6
GZ20_5 +UPS1/16.7

INV -CAN
INV -sync

-A9
/12.1
/13.1
/14.2
/20.1
/21.1
/22.1

-A50
/12.1
REC interface
8000022025 STR
-X6 1-10
-X7 1-16

-A17
/13.1
INV interface
8000022441 STR
-X6 1-10
-X7 1-16

-A16
/14.2
SBS interface
8000022378 STR
-X6 1-10
-X7 1-16

-A20
Parallel Adapter
8000023378 STR
-X3 1-3
-X4 1-3
-X5 1-4
-X6 1-2
-X1 1-16
-X2 1-16
-X11 1-10
-X12 1-10
-X13 1-10
-X14 1-10

Parallel CAN INV
Parallel CAN REC
DOU-CAN

15.8 / A
A / 20.1
L / 19.1

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Hollandse Kust Noord (HKN) wind farm

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Control CAN
Protect 8.33 40-400-210-400

Circuit diagram

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Fan control/monitoring

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11.8 / 015L1 → 016L1 / 18.1

8.8 / 0451N1 → 0452N1 / 18.1

-A91.2-X6 → 091.21 / 18.7, 091.22 / 18.7, 091.23 / 18.7, 091.24 / 18.7, 091.25 / 18.7

-A91.1 Fan control 8000022841 STR

-X5 1 2 3

-R5 -C5

-S1 -S2 = 1

Logical evaluation fan fault

-X7 1 2 3 4 5

Fan speed +24V

-R50 -R51 -R60 -R61 -R70 -R71 -R80 -R81 P1 P2 P3 P4 P5 P6 P7 P8

-R1 PTC -R2 PTC -R3 PTC -R4 PTC

-X1 -X2 -X3 -X4 2 1

-C31 -C32 -C33 -C34

-X91 -X92 -X93 -X94 2 3 1 N L PE

-M1 -M2 -M3 -M4 M 1~

-X6 1 2 3 4 5

14.6 / 091.11
14.6 / 091.12
14.6 / 091.13
14.6 / 091.14
14.6 / 091.15
SBS interface -A9-A16-X15

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Fan control/monitoring
Protect 8.33 40-400-210-400
Circuit diagram

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sheets 23

Fan control/monitoring

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17.8 / 016L1

17.8 / 0452N1

-A91.2

Fan control
8000022841 STR

-X5 1 2 3

-R5

-C5

-S1

-S2

Logical evaluation
fan fault

-X7 1 2 3 4 5

= 1

P2 P1 -R50 -R51

P4 P3 -R60 -R61

P6 P5 -R70 -R71

P8 P7 -R80 -R81

-R1 PTC -X1 2 1

-R2 PTC -X2 2 1

-R3 PTC -X3 2 1

-R4 PTC -X4 2 1

-X6 1 2 3 4 5

Fan speed

+24V

-C35 1 2

-X95 2 3 1

N L

-M5 M 1~

PE

-C36 1 2

-X96 2 3 1

N L

-M6 M 1~

PE

17.8 / 091.21
17.8 / 091.22
17.8 / 091.23
17.8 / 091.24
17.8 / 091.25
-A92.1-X7

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Hollandse Kust Noord (HKN) wind farm

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Fan control/monitoring
Protect 8.33 40-400-210-400

Circuit diagram

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& EFS

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sheet 18
sheets 23

Control

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+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
1000007888.020
10009757

GZ91_1
+MBC1/3.5

-F91 1
G
F3,15A 2

11.8 / 06L+

-A24.1
Battery charge monitoring
BLÜ-PRO
(Option)

-X1 +
M
-
-
-
-
0 ... 5V
-X1 -
-X3 1-16
-X4 1-10

16.8 / L

11.8 / 06L-

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

battery charging circuit monitoring
Protect 8.33 40-400-210-400

Circuit diagram

1000007888.010
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+ UPS2
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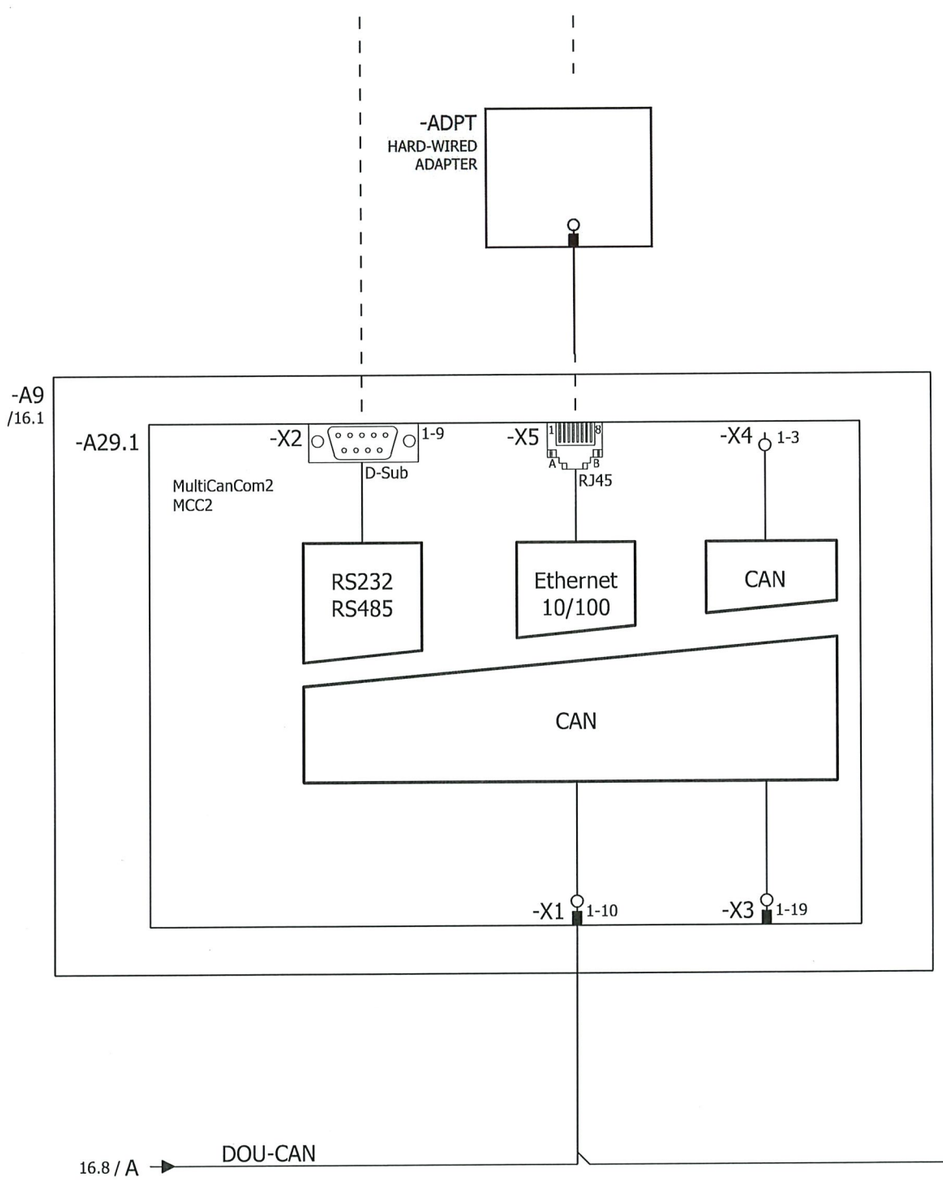
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Control

SNMP adapter
CompuWatch
Service Tools
Modbus

Modbus



16.8 / A → DOU-CAN → A / 21.1

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Hollandse Kust Noord (HKN) wind farm

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MultiCom
Protect 8.33 40-400-210-400

Circuit diagram

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Remote signaling

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CAN Service

Configuration remote signals
see techn. data sheet

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INV remote off
Common fault
Inverter operation
SBS operation
REC fault
REC mains fault
Battery low

-A9
/16.1

-A12
Remote signaling
8000062777 STR

-X6 1-10
-X5 1 2
-X4 1 2 3
-X3 1 2 3
4 5 6
7 8 9
10 11 12

-K25
-K21
-K22
-K23
-K24

-X1 1-10
-X2 1-16

20.8 / A

B / 22.1

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Remote signaling
Protect 8.33 40-400-210-400

Circuit diagram

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=
+ UPS2
& EFS

A3

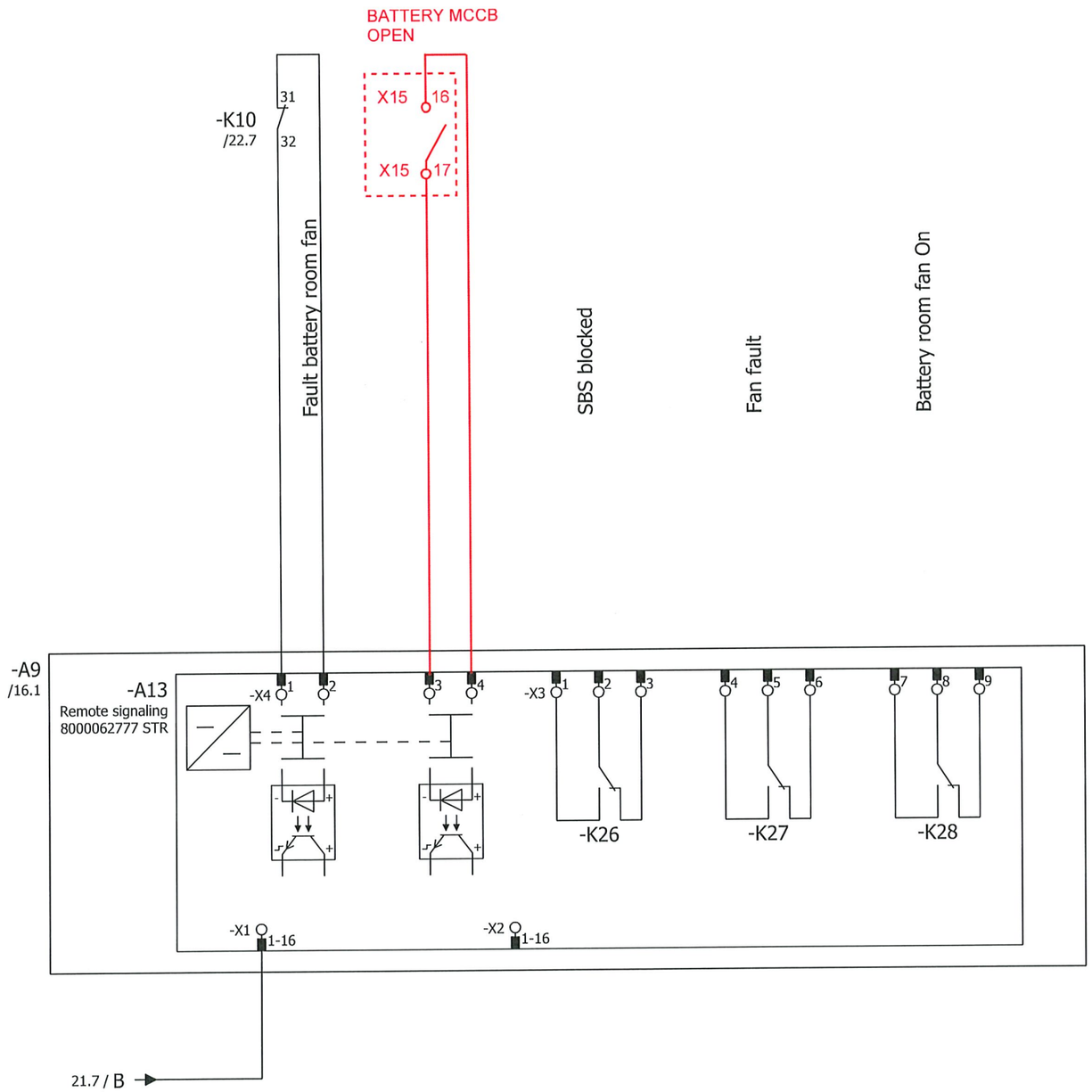
sheet 21
sheets 23

Remote signaling

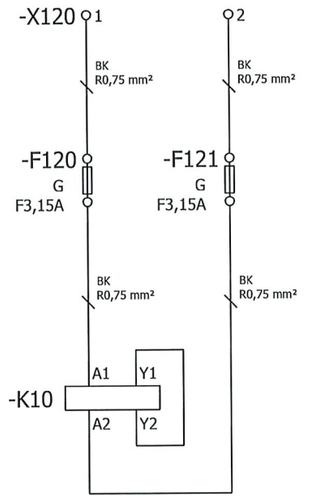
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Configuration remote signals
see techn. data sheet



24V DC is permanently present
in fault-free operation



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PXC.2981020_PSR-SCP- 24DC/ESP4/2X1/1X2
13 — 14
23 — 24
31 — 32 /22.2

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Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Remote signaling
Protect 8.33 40-400-210-400

Circuit diagram

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=
+ UPS2
& EFS

A3

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sheets 23

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+MBC1
Bypass transformer cabinet
with manual bypass 40 kVA
1000007888.020
10009757

GZ13_1
+MBC1/17.6

GZ13_2
+MBC1/17.7

BK
R1,5 mm²

BK
R1,5 mm²

-X13 U U N N PE PE

BK
0,75 mm²

-F100 1
G
T6,3A 2

BK
0,75 mm²

BK
0,75 mm²

L
-F85
I 3 2

-A85 -X1 3 2
-R1

-X14 U U N N

BK
0,75 mm²

-F110 1
G
T6,3A 2

BK
0,75 mm²

BK
0,75 mm²

-X114 U N

-W100
H05VV
2x1 mm²
3 m

L N
-H1
Enclosure light

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ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

external connection
Protect 8.33 40-400-210-400

Circuit diagram

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& EFS

A3

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Terminal diagram

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terminal
=+UPS2-A9-A12-X3

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1						+UPS2&EFS/21.5
				2						+UPS2&EFS/21.5
				3						+UPS2&EFS/21.5
				4						+UPS2&EFS/21.5
				5						+UPS2&EFS/21.6
				6						+UPS2&EFS/21.6
				7						+UPS2&EFS/21.6
				8						+UPS2&EFS/21.6
				9						+UPS2&EFS/21.6
				10						+UPS2&EFS/21.7
				11						+UPS2&EFS/21.7
				12						+UPS2&EFS/21.7

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3_A	15/11/24	G.Randi

ROSETTI MARINO SpA

Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A9-A12-X3
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
& EMA

A3

sheet 1
sheets 24

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NO MARK UP

AS COMMISSIONED: MATRIA GIRO m. 26/3/25

Terminal diagram

terminal

=+UPS2-A9-A12-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1						+UPS2&EFS/21.4
				2						+UPS2&EFS/21.4
				3						+UPS2&EFS/21.4

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REV.:	DATE:	SIGNATURE:
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Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A9-A12-X4
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
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sheet 2
sheets 24

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Terminal diagram

terminal
=+UPS2-A9-A12-X5

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1						+UPS2&EFS/21.3
				2						+UPS2&EFS/21.3

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123A90-FDL-1724000372-EL-DG-00009
REV.: 3_A
DATE: 15/11/24
SIGNATURE: G.Randi
ROSETTI MARINO SpA

Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A9-A12-X5
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
& EMA

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sheet 3
sheets 24

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AS COMMISSIONED: MA MA GIROTTI 26/3/25

Terminal diagram

terminal
=+UPS2-A9-A12-X6

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type			Position / Page
				1-10		-A9-A12-X1						+UPS2&EFS/21.2

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				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A9-A12-X6
Protect 8.33 40-400-210-400

Terminal diagram

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Terminal diagram

terminal

=+UPS2-A9-A29.1-X2

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1-9						+UPS2&EFS/20.2

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AS COMMISSIONED: MARIA GIROTTI 26/3/25

Terminal diagram

terminal

=+UPS2-A9-A29.1-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type			Position / Page
				1-3								+UPS2&EFS/20.3

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Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A9-A29.1-X4
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
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sheet 6
sheets 24

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Terminal diagram

terminal

=+UPS2-A9-A29.1-X5

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1-8						+UPS2&EFS/20.3

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Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A9-A29.1-X5
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
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sheet 7
sheets 24

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Terminal diagram

terminal
=+UPS2-A20-X3

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		+UPS1-A20-X3	1-3	1-3						+UPS2&EFS/16.6

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				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A20-X3
Protect 8.33 40-400-210-400

Terminal diagram

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sheet 8
sheets 24

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Terminal diagram

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terminal
=+UPS2-A20-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type			Position / Page
				1-3								+UPS2&EFS/16.7

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Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A20-X4
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
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sheet 9
sheets 24

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Terminal diagram

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													Cable name	terminal =+UPS2-A20-X5						Cable name			
													Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable type			Position / Page
														+UPS1-A20-X5	1-4	1-4							+UPS2&EFS/16.7

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Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A20-X5
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
& EMA

A3

sheet 10
sheets 24

NO MARK UP

AS COMMISSIONED: MARIA GIRO m. 26/3/24

Terminal diagram

terminal

=+UPS2-A20-X6

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type			Position / Page
				1-2								+UPS2&EFS/16.7

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Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-A20-X6
Protect 8.33 40-400-210-400

Terminal diagram

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sheet 11
sheets 24

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Terminal diagram

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terminal
=+UPS2-E1-X1

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U		-E1-X1	U			+UPS2&EFS/1.2
						-Q1	2			
		+MBC1-X1	4U	U		-E1-X1	U			+UPS2&EFS/1.2
				V		-E1-X1	V			+UPS2&EFS/1.2
						-Q1	4			
		+MBC1-X1	4V	V		-E1-X1	V			+UPS2&EFS/1.2
				W		-E1-X1	W			+UPS2&EFS/1.2
						-Q1	6			
		+MBC1-X1	4W	W		-E1-X1	W			+UPS2&EFS/1.2

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Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-E1-X1
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
& EMA

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sheet 12
sheets 24

CAE EPLAN Electric P8

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AS COMMISSIONED: MARIO GIRO 26/3/25

Terminal diagram

terminal

=+UPS2-E2-X2

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				L+		-L41	1.2			+UPS2&EFS/4.3
		+MBC1-X2	3L+	L+						+UPS2&EFS/4.3
				L-		-L41	2.2			+UPS2&EFS/4.2
		+MBC1-X2	3L-	L-						+UPS2&EFS/4.2

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Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-E2-X2
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
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sheet 13
sheets 24

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AS COMMISSIONED: MARIA GIRO 26/3/25

Terminal diagram

terminal

=+UPS2-E3-X3

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U		-E3-X3	U			+UPS2&EFS/8.2
						-L11	2			
		+MBC1-X5	2U	U		-E3-X3	U			+UPS2&EFS/8.2
				V		-E3-X3	V			+UPS2&EFS/8.2
						-L12	2			
		+MBC1-X5	2V	V		-E3-X3	V			+UPS2&EFS/8.2
				W		-E3-X3	W			+UPS2&EFS/8.2
						-L13	2			
		+MBC1-X5	2W	W		-E3-X3	W			+UPS2&EFS/8.2
				N		-E3-X3	N			+UPS2&EFS/8.3
		+MBC1-X5	2N	N		-E3-X3	N			+UPS2&EFS/8.3

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Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-E3-X3
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
& EMA

A3

sheet 14
sheets 24

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Terminal diagram

terminal
=+UPS2-E4-X4

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				U		-E4-X4	U			+UPS2&EFS/8.6
						-A3-X4	1			
		+MBC1-X4	2U	U		-E4-X4	U			+UPS2&EFS/8.6
				V		-E4-X4	V			+UPS2&EFS/8.6
						-A3-X4	2			
		+MBC1-X4	2V	V		-E4-X4	V			+UPS2&EFS/8.6
				W		-E4-X4	W			+UPS2&EFS/8.6
						-A3-X4	3			
		+MBC1-X4	2W	W		-E4-X4	W			+UPS2&EFS/8.6
				N		-E4-X4	N			+UPS2&EFS/8.6
		+MBC1-X4	2N	N		-E4-X4	N			+UPS2&EFS/8.6

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REV.:	DATE:	SIGNATURE:
3_A	15/11/24	G.Randi

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Stat	Alteration	Date	Name		
				Date	23.05.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-E4-X4
Protect 8.33 40-400-210-400

Terminal diagram

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& EMA

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sheet 15
sheets 24

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AS COMMISSIONED: M. M.A GIROTTI 26/3/25

Terminal diagram

terminal

=+UPS2-F120

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		-K10	A1	1		-X120	1			+UPS2&EFS/22.7

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Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-F120
Protect 8.33 40-400-210-400

Terminal diagram

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+ UPS2
& EMA

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sheet 16
sheets 24

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AS COMMISSIONED: MARIA GIRON 26/3/25

Terminal diagram

terminal

=+UPS2-F121

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		-K10	A2	1		-X120	2			+UPS2&EFS/22.8

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ROSETTI MARINO SpA

Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-F121
Protect 8.33 40-400-210-400

Terminal diagram

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sheets 24

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Terminal diagram

terminal
=+UPS2-PE

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type			Position / Page
		+MBC1-PE	PE	PE								+UPS2&EFS/4.3
				PE								+UPS2&EFS/8.4
				PE								+UPS2&EFS/1.4

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REV.:	DATE:	SIGNATURE:
3_A	15/11/24	G.Randi

ROSETTI MARINO SpA

Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-PE
Protect 8.33 40-400-210-400

Terminal diagram

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Terminal diagram

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terminal
=+UPS2-X12

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1		-A92.1-X3	4			+UPS2&EFS/11.5
				2		-A92.2-X10	2			+UPS2&EFS/11.5
				3		-A92.2-X10	3			+UPS2&EFS/11.5
		-A24.1-X1	+	4	'	-A92.1-X20	2			+UPS2&EFS/11.7
		-A24.1-X1	-	5	'	-A92.1-X20	1			+UPS2&EFS/11.7
				6		-CU	N			+UPS2&EFS/14.7
				7		-A9-A16-X8	5			+UPS2&EFS/14.2
				8		-A9-A16-X8	4			+UPS2&EFS/14.2
				9		-A9-A16-X8	6			+UPS2&EFS/14.2
				10		-A9-A50-X8	1			+UPS2&EFS/12.3
				11		-A9-A50-X8	2			+UPS2&EFS/12.3
						-Q3	96			
				12		-A9-A16-X8	7			+UPS2&EFS/14.2
				15		-A9-A50-X8	3			+UPS2&EFS/12.3
						-Q3	95			

VALID FOR CONSTRUCTION
VENDOR DOCUMENT - FDL DWG:
123A90-FDL-1724000372-EL-DG-00009

REV.:	DATE:	SIGNATURE:
3_A	15/11/24	G.Randi

ROSETTI MARINO SpA

1000007888_010

Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-X12
Protect 8.33 40-400-210-400

Terminal diagram

1000007888_010 en

=
+ UPS2
& EMA

A3

sheet 19
sheets 24

CAE EPLAN Electric P8

Terminal diagram

NO MARK UP
AS COMMISSIONED: MARINA GIROTTI 26/3/25

terminal
=+UPS2-X13

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		+MBC1-X14	U	U		-F100	1:2			+UPS2&EFS/23.2
		-X14	U	U						+UPS2&EFS/23.3
		+MBC1-X14	N	N		-A85-X1	2			+UPS2&EFS/23.3
		-X14	N	N						+UPS2&EFS/23.3
				PE						+UPS2&EFS/23.3
				PE						+UPS2&EFS/23.3

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ROSETTI MARINO SpA

				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
Stat	Alteration	Date	Name	Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-X13
Protect 8.33 40-400-210-400

Terminal diagram

1000007888_010 en

=
+ UPS2
& EMA

A3

sheet 20
sheets 24

CAE EPLAN Electric P8

Terminal diagram

NO MARK UP

AS COMMISSIONED: MA MA GIRO Ni 26/3/25

terminal

=+UPS2-X14

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
		-X13	U	U		-F110	1:2			+UPS2&EFS/23.7
				U						+UPS2&EFS/23.7
		-X13	N	N		-X114	N			+UPS2&EFS/23.7
				N						+UPS2&EFS/23.7

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ROSETTI MARINO SpA

Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-X14
Protect 8.33 40-400-210-400

Terminal diagram

1000007888_010 en

=
+ UPS2
& EMA

A3

sheet 21
sheets 24

CAE EPLAN Electric P8

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AS COMMISSIONED: MARIA GIRON. 26/3/25

Terminal diagram

terminal
=+UPS2-X15

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type	Position / Page
				1		-A9-A50-X8	4			+UPS2&EFS/12.6
				1		-C711				+UPS2&EFS/12.7
				2		-C712				+UPS2&EFS/12.7
		+MBC1-X15	6	2		-A9-A50-X5	5			+UPS2&EFS/12.8
		+MBC1-X15	7	3		-A9-A50-X5	6			+UPS2&EFS/12.8

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REV.: 3_A | DATE: 15/11/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-X15
Protect 8.33 40-400-210-400

Terminal diagram

1000007888_010 en

=
+ UPS2
& EMA

A3 | sheet 22 | sheets 24

1000007888_010

NO MARK UP
AS COMMISSIONED: MARIA GIRON. 26/3/25

Terminal diagram

terminal
=+UPS2-X114

Cable name			Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	-W100		Position / Page
Cable type									Cable type	H05VV 2x1 mm²		
					N		-H1	N				+UPS2&EFS/23.7
							-X14	N				
					U		-H1	L				+UPS2&EFS/23.7
							-F110	1				

CAE EPLAN Electric P8

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ROSETTI MARINO SpA

Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-X114
Protect 8.33 40-400-210-400

Terminal diagram

1000007888_010 en

= +UPS2 & EMA

A3

sheet 23
sheets 24

CAE EPLAN Electric P8

NO MARK UP
AS COMMISSIONED: M.A.T.A GIROTTI 26/3/25

Terminal diagram

terminal
=+UPS2-X120

Cable name	Cable type	Destination mark External	Connection	Terminal	Bridge	Destination mark Internal	Connection	Cable name	Cable type		Position / Page
				1	'	-F120	1:1				+UPS2&EFS/22.7
				2	'	-F121	1:1				+UPS2&EFS/22.8

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123A90-FDL-1724000372-EL-DG-00009

REV.:	DATE:	SIGNATURE:
3_A	15/11/24	G.Randi

ROSETTI MARINO SpA

Stat	Alteration	Date	Name		
				Date	03.06.2024
				Editor	Beckschäfer
				Checked	Ch.Peck
				Norm	

ROSETTI MARINO
Hollandse Kust Noord (HKN) wind farm

AEG POWER SOLUTIONS

Terminal diagram =+UPS2-X120
Protect 8.33 40-400-210-400

Terminal diagram

1000007888_010 en

=
+ UPS2
& EMA

A3

sheet 24
sheets 24

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	AC UPS - BATTERY LAYOUT AND INTERCONNECTION DIAGRAM	Sheet 1 of 19 Date: 02/02/2025 Rev: 06

Base Load Power Hub (BLPH)

AC UPS - BATTERY LAYOUT AND INTERCONNECTION DIAGRAM

Document Number: 1724000372-EL-DG-00011

Document Class: 2

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

Rev.	Date	Description	Prepared	Reviewed	Approved
06	02/02/2025	As-Built (ASB)	DA	DA	AD
05	17/12/2024	As-Built (ASB)	DA	DA	AD
04	05/10/2024	Accepted for Construction (AFC)	DA	DA	AD
03	04/08/2024	Accepted for Construction (AFC)	DA	DA	AD
02	01/06/2024	Accepted for Construction (AFC)	DA	DA	AD
01	15/05/2024	Accepted for Construction (AFC)	DA	DA	AD
00	20/04/2024	Issue for Review (IFR)	DA	DA	AD

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	AC UPS - BATTERY LAYOUT AND INTERCONNECTION DIAGRAM	Sheet 2 of 19 Date: 02/02/2025 Rev: 06

Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)
02	Accepted for Construction (AFC)
03	Accepted for Construction (AFC)
04	Accepted for Construction (AFC)
05	As-Built (ASB)
06	As-Built (ASB)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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26/03/2025

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	AC UPS - BATTERY LAYOUT AND INTERCONNECTION DIAGRAM	Sheet 3 of 19 Date: 02/02/2025 Rev: 06

Table of contents

Description	Sheet
COVER	1
REVISION / CHANGE LOG	2
HOLDS LIST	2
TABLE OF CONTENTS	3
AC UPS PAS - TAG: UP-200F3	4
AC UPS F&G - TAG: UP-200F4	7
AC UPS PAS - TAG: UP-200F3 - BATTERY PROTECTION BOX	10
AC UPS PAS - TAG: UP-200F3 - BLACK START PROCEDURE	13
AC UPS F&G - TAG: UP-200F4 - BATTERY PROTECTION BOX	15
AC UPS F&G - TAG: UP-200F4 - BLACK START PROCEDURE	18

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Document Title:	AC UPS - BATTERY LAYOUT AND INTERCONNECTION DIAGRAM	Sheet 4 of 19 Date: 02/02/2025 Rev: 06

Base Load Power Hub (BLPH)

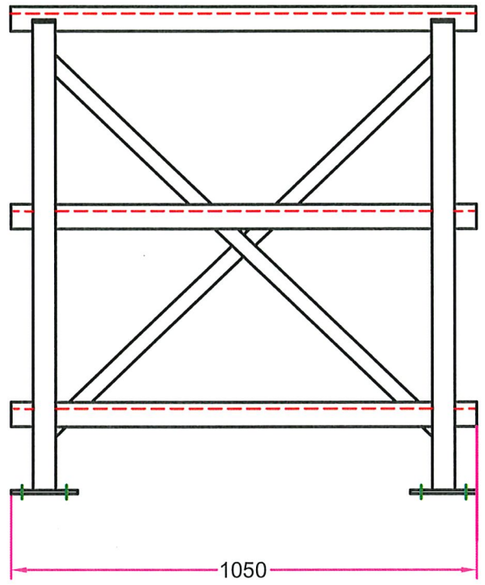
AC UPS PAS - TAG: UP-200F3

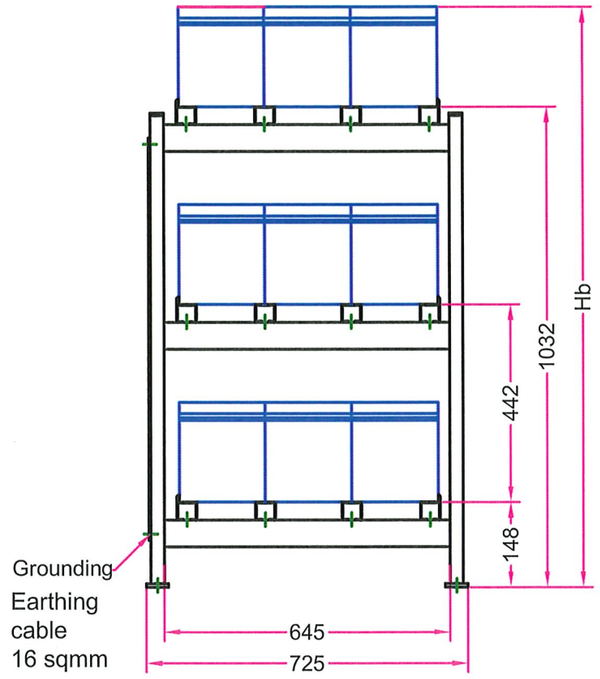
BATTERY LAYOUT AND INTERCONNECTION DIAGRAM

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

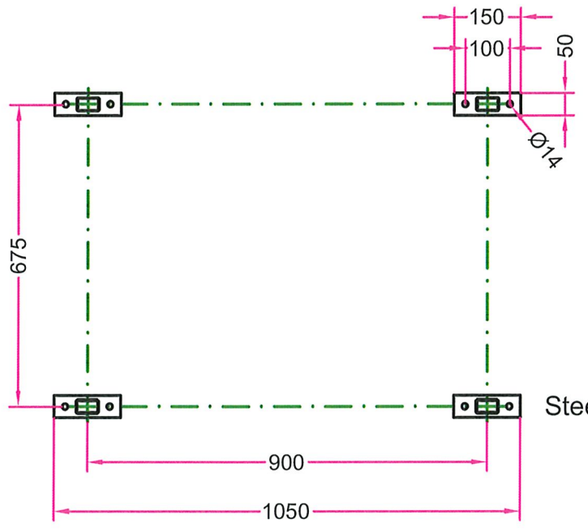
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Battery Rack
BA-200F3 A/B





Foot-Print:



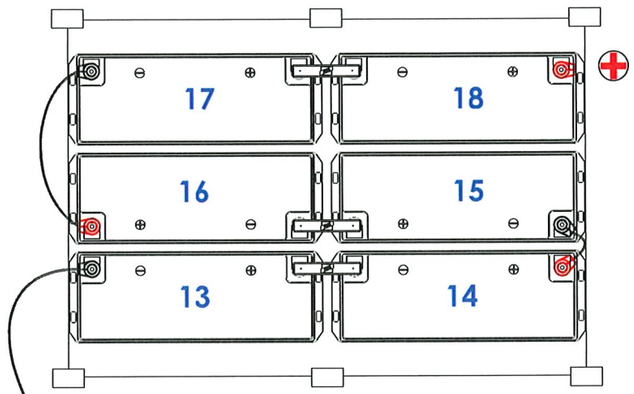
Steel made

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26/03/2025

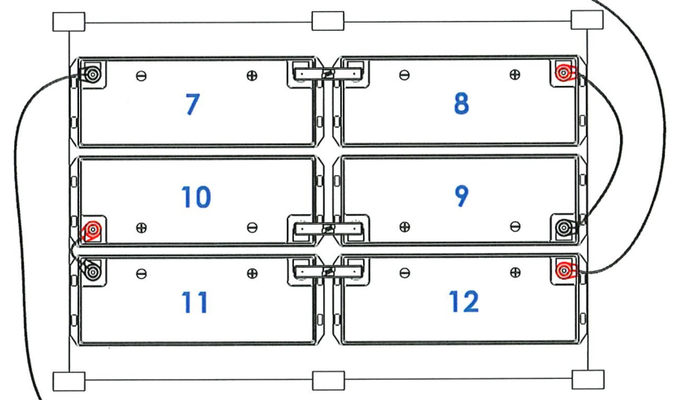
Rack weight : 54,7 kg
Battery weight : 855,0 kg
Total weight : 909,7 kg

Material:	S235 JR EN 10025 (St-37-2)		Date	Name	Checked	Execution: Rack, Standard	Drawing-/Article No: 3L3115	Rev: 00
Coating:	Plastic Coated		16/24	Riedel	St.Selig			
Tolerance:	DIN ISO 2768 "C"					Type: 3E-PGL 3-17 with FIX002		
Battery:			Scale: none			Production Details:	Welding execution according to	

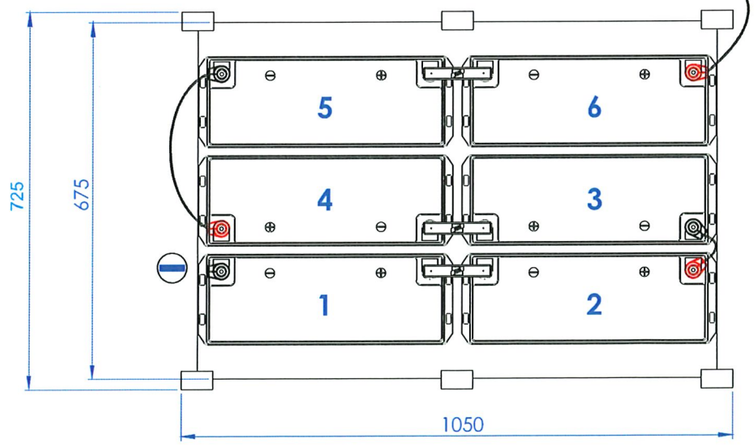
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TIER 3



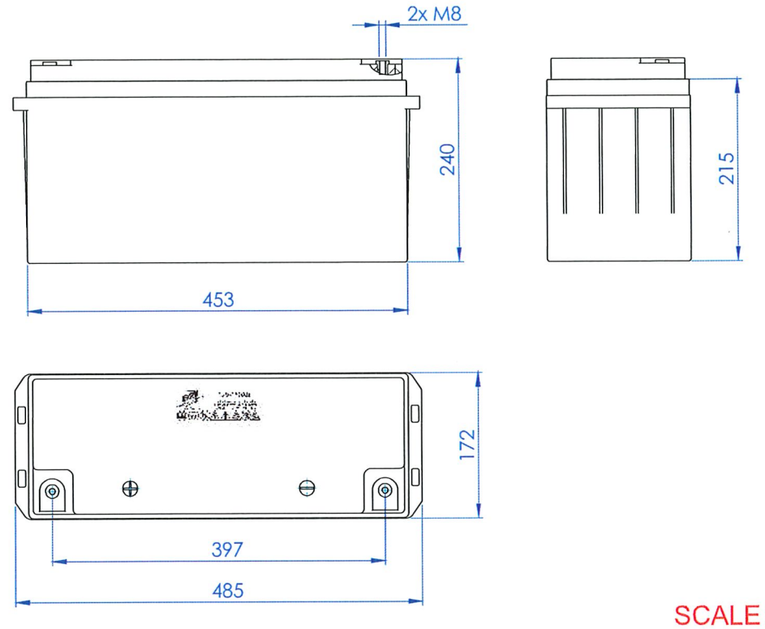
TIER 2



TIER 1

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GIROTTI MATTIA
NO MARK UP
26/03/2025

BATTERY BLOCK : FLG12-150



SCALE 1:5

BILL OF MATERIALS	CODE	WEIGHT (kg)	Q.TY
CELL FLG 12-150	11000495	47,50	18
COPPER TIN STRIP FLL-FHP serie	41000222	0,04	9
CONNECTION AND AGM COVER CENTER DISTANCE 100	41000251	0,01	9
CELLS CONNECTION CABLE 50 mm 2	21000191	0,5	7 m
CABLE LUG F8 X 50	41005167	0,3	18
CABLE LUG COVER BLACK 50040	41000243	0,008	9
CABLE LUG COVER RED 50039	41000244	0,008	9

TOLLERANZE GENERALI GENERAL ALLOWANCES: NORMA UNI EN 22768-mk		855.42 kg	P. VECCHIARELLI
NORMA UNI ISO 1302			P. VECCHIARELLI
NORMA UNI ISO 1101	18 FLG12-150	47.50 kg	F. PAGLIARINI
1:8	A2	11000495	10/04/2024
		layout 18 x FLG 12-150	1

FAAM

1724000372-EL-DG-00011

AC UPS 35kVA - 18 x FLG 12-150

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	AC UPS - BATTERY LAYOUT AND INTERCONNECTION DIAGRAM	Sheet 7 of 19 Date: 02/02/2025 Rev: 06

Base Load Power Hub (BLPH)

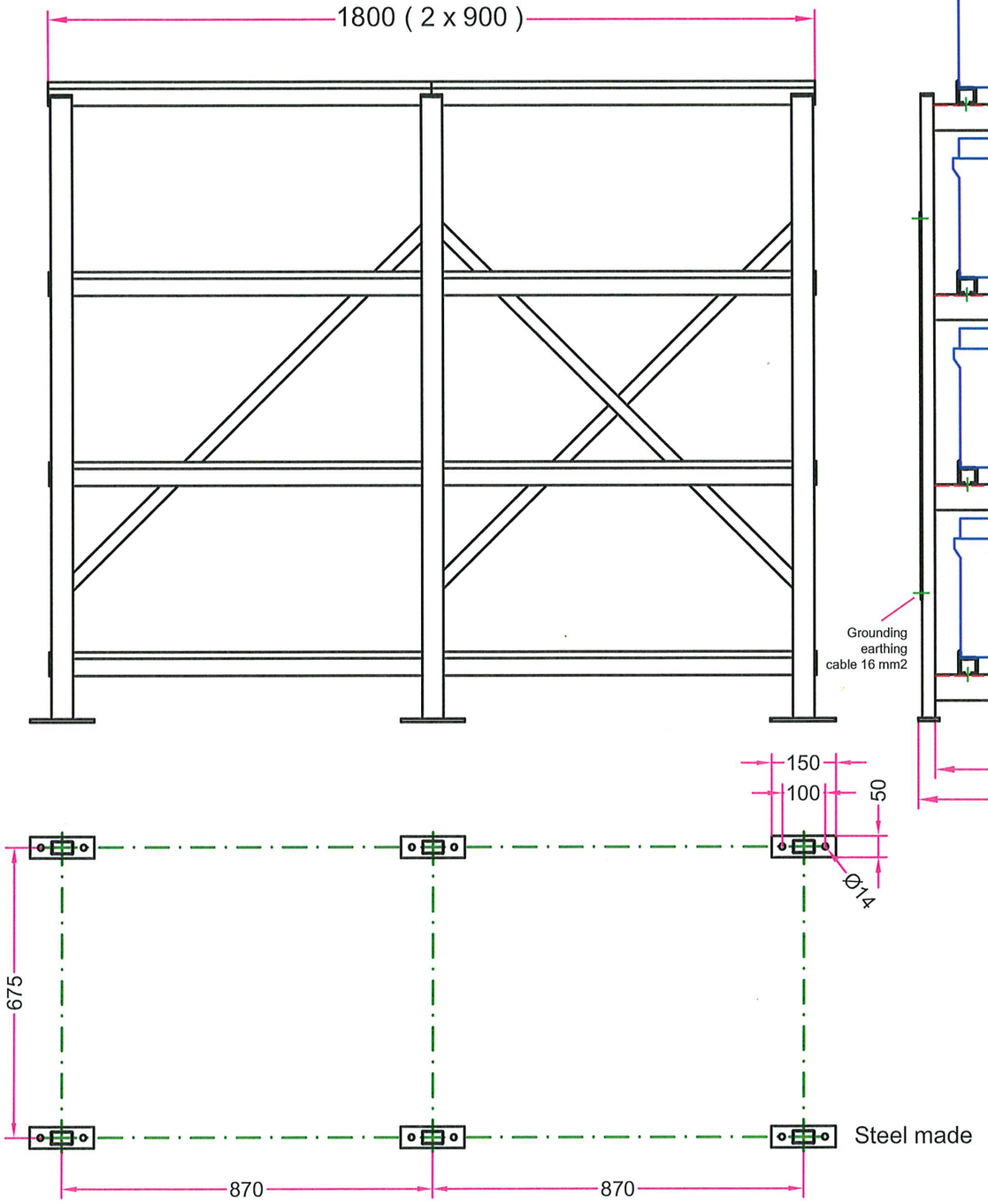
AC UPS F&G - TAG: UP-200F4

BATTERY LAYOUT AND INTERCONNECTION DIAGRAM

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NO MARK UP
26/03/2025

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Battery Rack
BA-200F4 A/B



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26/03/2025

Rack weight : 100,6 kg
Battery weight : 2.295,0 kg
Total weight : 2.395,6 kg

Material:	S235 JR EN 10025 (St-37-2)
Coating:	Plastic Coated
Tolerance:	DIN ISO 2768 "C"
Battery:	

Date	Name	Checked
16/24	Riedel	St.Selig

Scale: none

Execution: Rack, Standard

Drawing-/Article No: 4U1187FT

Rev: 00

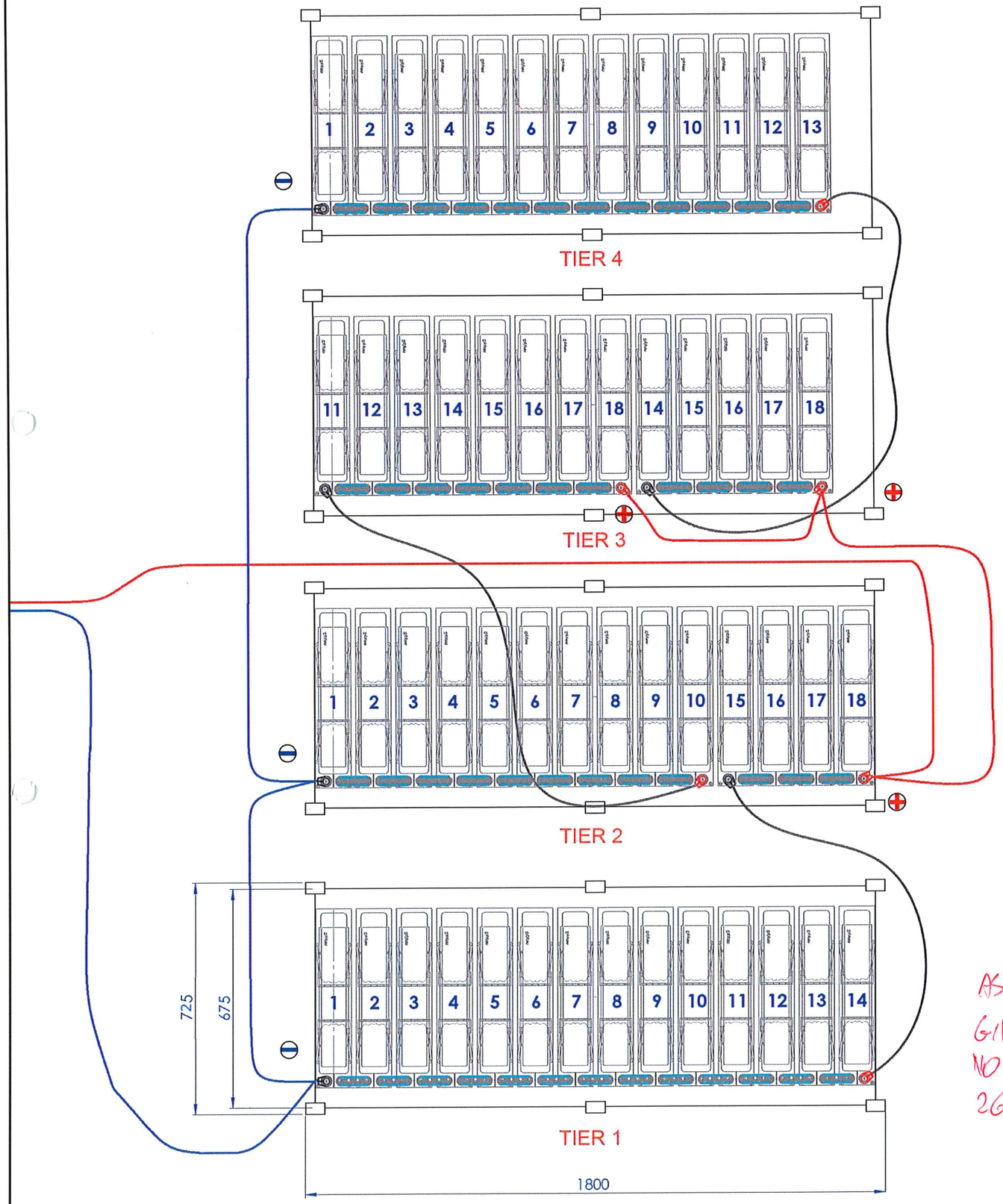
Type: 4E-PGU 1-18 HH FT with FIX002

Production Details: PPCS-01 rev. 0

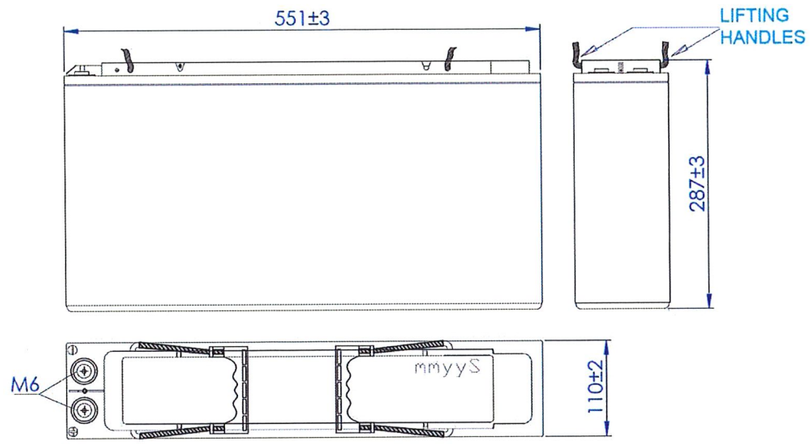
Welding execution according to WD0002

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EN 1090 EXC 3



BATTERY BLOCK : FTG12-120



SCALA 1 : 5

BILL OF MATERIALS	CODE	WEIGHT (kg)	Q.TY
CELL FTG12-120	11017386	42,5	54
CELLS CONNECTION CABLE 50mm2	21000191	0,5	15 m
CABLE LUG F6 X 50	41005168	0,3	12
CABLE LUG COVER BLACK 50040	41000243	0,008	6
CABLE LUG COVER RED 50039	41000244	0,008	6

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NO MARK UP
26/03/2025

REV./REV.:	DATA/DATE	PROGETTISTA/DESIGNER	DISEGNATO/DRAWN	APPROVATO/APPROVED	DESCRIZIONE MODIFICHE/DESCRIPTION REVISIONS

TOLLERANZE GENERALI/GENERAL ALLOWANCES: NORMA UNI EN 22768-mk	CARATTERISTICHE ELETTRICHE/ELETTRIC CHARACTERISTICS:	PESO BATT./BTR. WEIGHT: 2295 kg	PROGETTISTA/DESIGNER: P. VECCHIARELLI
RUGOSITA' SUPERFICIALE/SUPERFICIAL ROUGHNESS: NORMA UNI ISO 1302	TIPO ELEMENTO/CELL TYPE: 3x18 FTG12-120	PESO EL./CELL WEIGHT: 42,5 kg	DISEGNATO/DRAWN: P. VECCHIARELLI
FORME E POSIZIONE/FORMS AND POSITION: NORMA UNI ISO 1101	CODICE SAP EL./CELL SAP CODE: 11017386		APPROVATO/APPROVED: F. PAGLIARINI
SCALA/SCALE: 1:10 · PROIEZIONE/PROJECTION · FOGLIO/SHEET: A2			DATA/DATE: 09/04/2024
DESCRIZIONE/DESCRIPTION:		FILE-DISEGNO/FILE-DRAWING: layout 3x18 FTG 12-120	TAV./TAB.: 1

FAAM

1724000372-EL-DG-00011

AC UPS 15kVA - 3 x 18 x FTG 12-120

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Document Title:	AC UPS - BATTERY LAYOUT AND INTERCONNECTION DIAGRAM	Sheet 10 of 19 Date: 02/02/2025 Rev: 06

Base Load Power Hub (BLPH)

AC UPS PAS - TAG: UP-200F3
BATTERY PROTECTION BOX

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MODEL C-225 REV.1

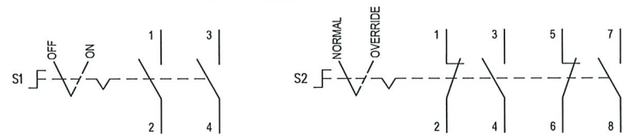
GENERAL NOTES:

-ENCLOSURE: EJBC-5
-MATERIAL: COPPER FREE ALUMINIUM ALLOY
-EXTERNAL PAINTING: RAL7035
-INTERNAL PAINTING: /
-ALL DIMENSION ARE IN mm
-WEIGHT: ≈57kg

BATTERY PROTECTION BOX

CB-200F3 A/B

SELECTOR SWITCHES DETAIL



TRUE TABLE

POSITION	CONTACT	
	1-2	3-4
OFF	O	O
ON	X	X

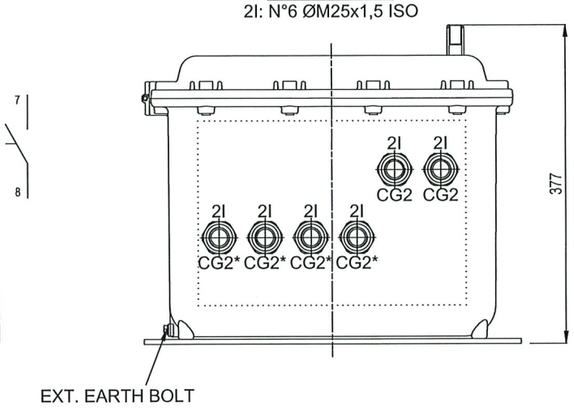
O	CONTACT OPEN
X	CONTACT CLOSED

TRUE TABLE

POSITION	CONTACT			
	1-2	3-4	5-6	7-8
NORMAL	X	O	X	O
OVERRIDE	O	X	O	X

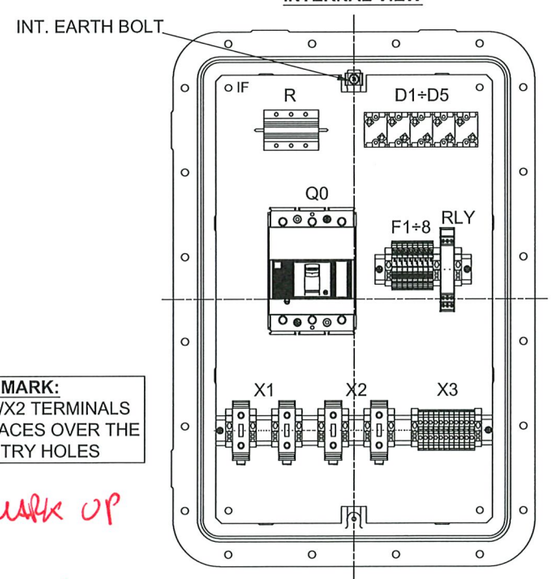
O	CONTACT OPEN
X	CONTACT CLOSED

BOTTOM VIEW
2I: N°6 ØM25x1,5 ISO



N°	Q.TY	CODE	DESCRIPTION
IF	1	BFE-5	ALUMINIUM INTERNAL FRAME
X1	2	UKH70	PHOENIX TERMINALS SUITABLE FOR 70mm² CABLE
X2	2	UKH70	PHOENIX TERMINALS SUITABLE FOR 70mm² CABLE
X3	11	UT4	PHOENIX TERMINALS SUITABLE FOR 4mm² CABLE
Q0	1	XT3N200TMD3	ABB XT3 MCCB, 3P, 200A, 36kA
	1	1SDA066399R1	220-240Vac/dc UNDERVOLTAGE RELEASE COIL
	2	1SDA066423R1	2NO AS PER TBE AUX CONTACTS FREE VOLTAGE
	1	M-0439/V1 + M-1044	PADLOCKABLE EXTERNAL HANDLE
F1,F2	2	UT4-HESI	PHOENIX FUSE HOLDER TERMINALS SUITABLE FOR 4mm² CABLE WITH 4A FUSE
	2	FUS5X20/4	
F3÷F8	6	UT4-HESI	PHOENIX FUSE HOLDER TERMINALS SUITABLE FOR 4mm² CABLE WITH 2,5A FUSE
	6	FUS5X20/2,5	
RLY	1	PHO2986575	PHOENIX SECURITY RELAY, 24Vcc, 3 EXCHANGE CONTACTS
R	1	RS1752429	47Ω RESISTOR, 95W, NOT ADJUSTABLE
D1÷D5	5	RS3959141	40A, 1000V, DIODES
S1	1	A2-10E/R	SELECTOR SWITCH, 2P, 16A, SCHEME I "OFF-ON"
	1	M-0553	EXTERNAL HANDLE
S2	1	WS2-10E/R	SELECTOR SWITCH, 4P, 16A, SCHEME 2Z "NORMAL-OVERRIDE"
	1	M-093/CF	KEY LOCK EXTERNAL HANDLE
CG2*	4	NEV25IB	NICKEL PLATED BRASS CABLE GLANDS ØM25 FOR ARMORED CABLE Øint. 11-20mm Øext. 20-27,5mm, ARMOR THICKNESS 0,2-1,6mm
CG2	2	NAV25IB	NICKEL PLATED BRASS CABLE GLANDS ØM25 FOR NOT-ARMORED CABLE Ø11-20mm

INTERNAL VIEW

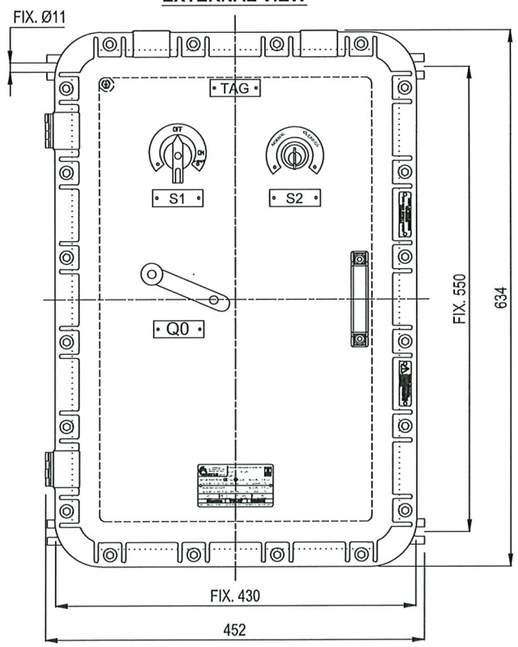


REMARK:
X1/X2 TERMINALS PLACES OVER THE ENTRY HOLES

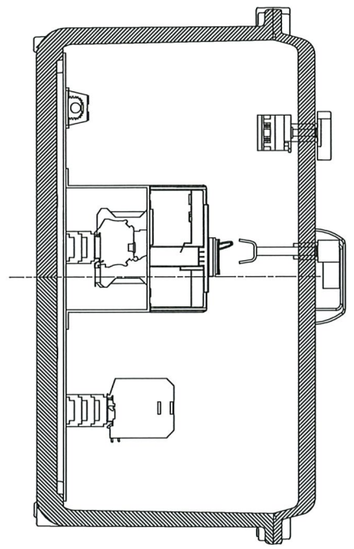
NO MARK UP

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EXTERNAL VIEW



INT. LEFT SIDE VIEW



CERTIFICATE NAMEPLATE



TAG NAMEPLATE
MATERIAL: TRAPHOLITE
DIMENSIONS: 60X20
BLACK TEXT ON WHITE BACKGROUND

N°	TAG N°
TAG	CB-200F4 A
	CB-200F4 B
	CB-200F3 A
	CB-200F3 B
S1	S1
S2	S2
Q0	Q0

REV.	DATE	PREP'D	CHK'D	APP'D	DESCRIPTION
1	24/05/2024	GRATTON	GIUSTI	GRATTON	MODIFIED AND REISSUED FOR APPROVAL
0	13/05/2024	BOGAR	GIUSTI	GRATTON	ISSUED FOR APPROVAL

DRAWING TITLE: AC UPS - TAG: UP-200F3
001 EJBC-5/C2401778/10.
ITEM 10
EXT/INT. LAYOUT

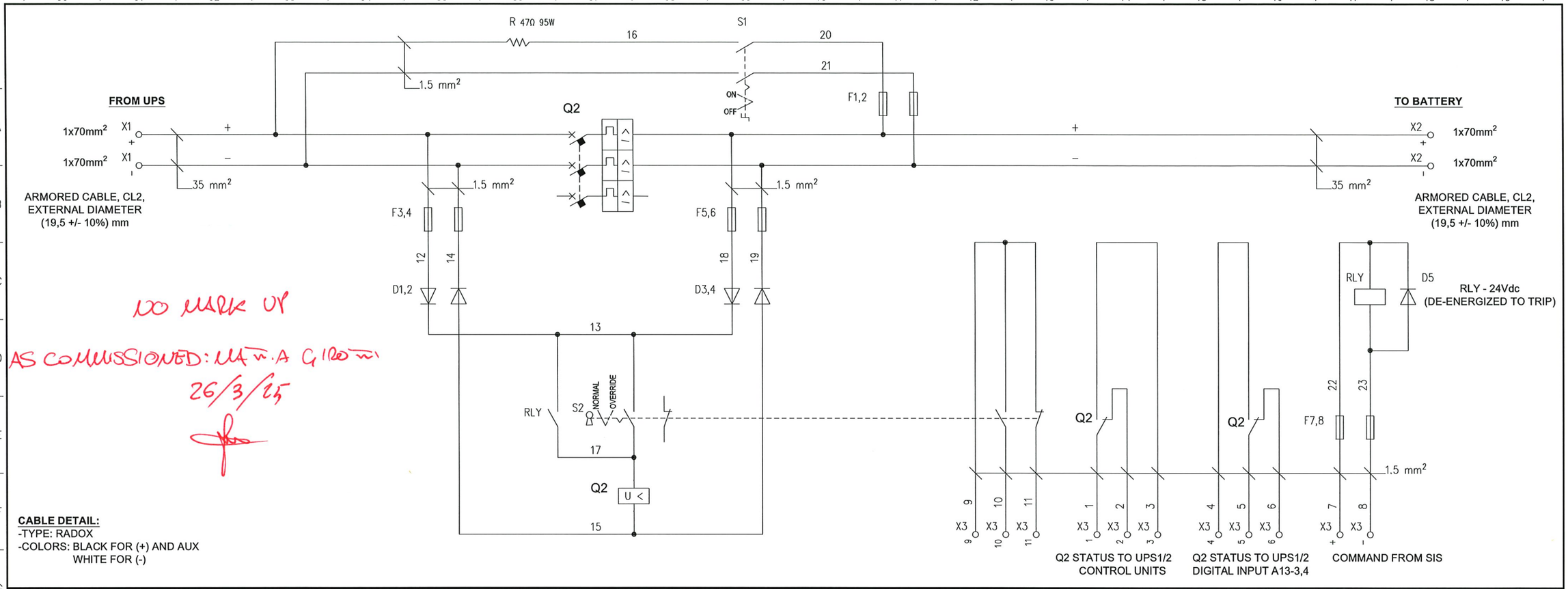
CORTEM JOB: COV2401778
DRAWING SCALE: /
DRAWING NUMBER: A3-C 27438
SHEET 1 NEXT 2
TOT. 4

CORTEM GROUP
cortem FONDISONZO ELFIT

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MODEL C-225 REV.1



NO MARK UP

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CABLE DETAIL:
-TYPE: RADOX
-COLORS: BLACK FOR (+) AND AUX
WHITE FOR (-)

CIRCUIT	DESCRIPTION			F3,4		Q2		F5,6		F1,2							F7,8						
	NUMBER																						
	PHASE	POWER	kW	+ -		+ -		+ -		+ -							+ -						
SWITCH	MANUFACTURER					ABB																	
	TYPE					XT3N200TMD3																	
	POLE N.	In	A			3	200																
	Idn A	CURVE																					
	Pdi kA	JUNCTION BOX N°				36kA																	
FUSE	TYPE			FUS5X20				FUS5X20		FUS5X20							FUS5X20						
	CURRENT		A	2,5				2,5		4							2,5						
CONTACTOR	TYPE																						
	In A	Pn	kW																				
THERMAL RELAY	TYPE																						
	CURRENT		A																				
TERMINALS CABLES	TERMINAL TYPE											UT				UT				UT			
	TERMINAL SECTION		mm²									4				4				4			
	TERMINAL NUMBER																						
	CABLE SECTION		mm²																				

REV.	DATE	PREP'D	CHK'D	APP'D	DESCRIPTION
1	24/05/2024	GRATTON	GIUSTI	GRATTON	MODIFIED AND REISSUED FOR APPROVAL
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DRAWING TITLE: AC UPS - TAG: UP-200F3

001 EJBC-5/C2401778/10.
ITEM 10
INTERNAL WIRING

CORTEM JOB: COV2401778
DRAWING SCALE: /
DRAWING NUMBER: A3-C 27438
SHEET 2 NEXT 3
TOT. 4

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contem
FONDISONZO
ELFIT

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AUTHORIZATION

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	AC UPS - BATTERY LAYOUT AND INTERCONNECTION DIAGRAM	Sheet 13 of 19 Date: 02/02/2025 Rev: 06

Base Load Power Hub (BLPH)

AC UPS PAS - TAG: UP-200F3

BLACK START PROCEDURE

NO MARK UP

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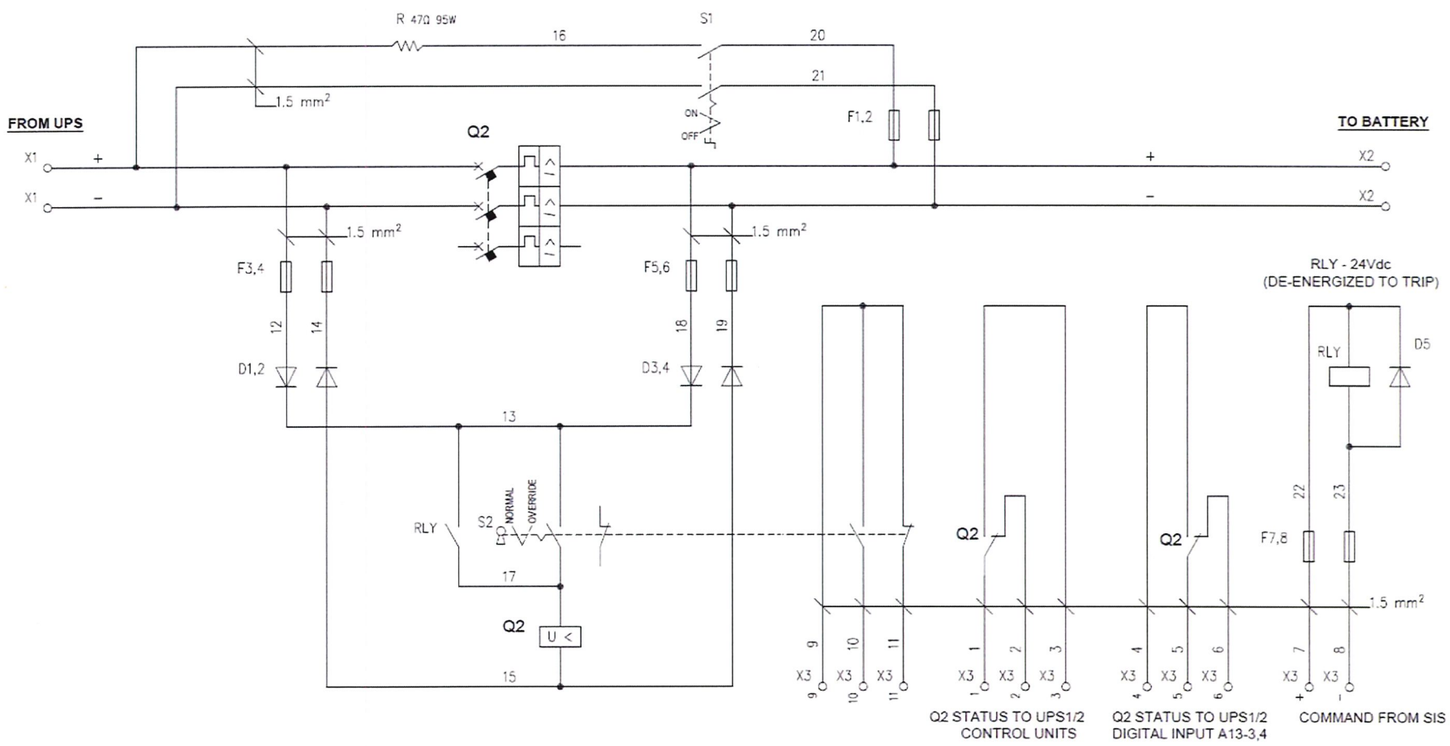
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AEG

POWER
SOLUTIONS

BLACK START PROCEDURE



Black Start procedure

The target is to allow the energization of the loads from the battery, while the battery charger being still de-energized.

- The operator shall put the selector S2 on "override" position (contact closed)
- The operator shall close the selector S1 to pre-charge the charger output DC capacitors
- Once the charger DC capacitors are charged and the voltage across Q2 power contacts is close to 0V (and at least >80% of the system DC nominal voltage), the operator shall close the breaker Q2
- The operator shall open the selector S1
- The site safety and SCADA systems restart and the RLY relay is automatically energized when all safety conditions are fulfilled. The charger is energized through its AC supply and then it can restart
- The operator shall put the selector S2 on "normal" position (contact open)
- The system returns to normal working conditions

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26/3/25

Section 8 LIST OF MODIFICATIONS

NOT APPLICABLE

Section 8.1 List of changes

NOT APPLICABLE

Section 9 SUPPORTING DOCUMENTS

NOT APPLICABLE