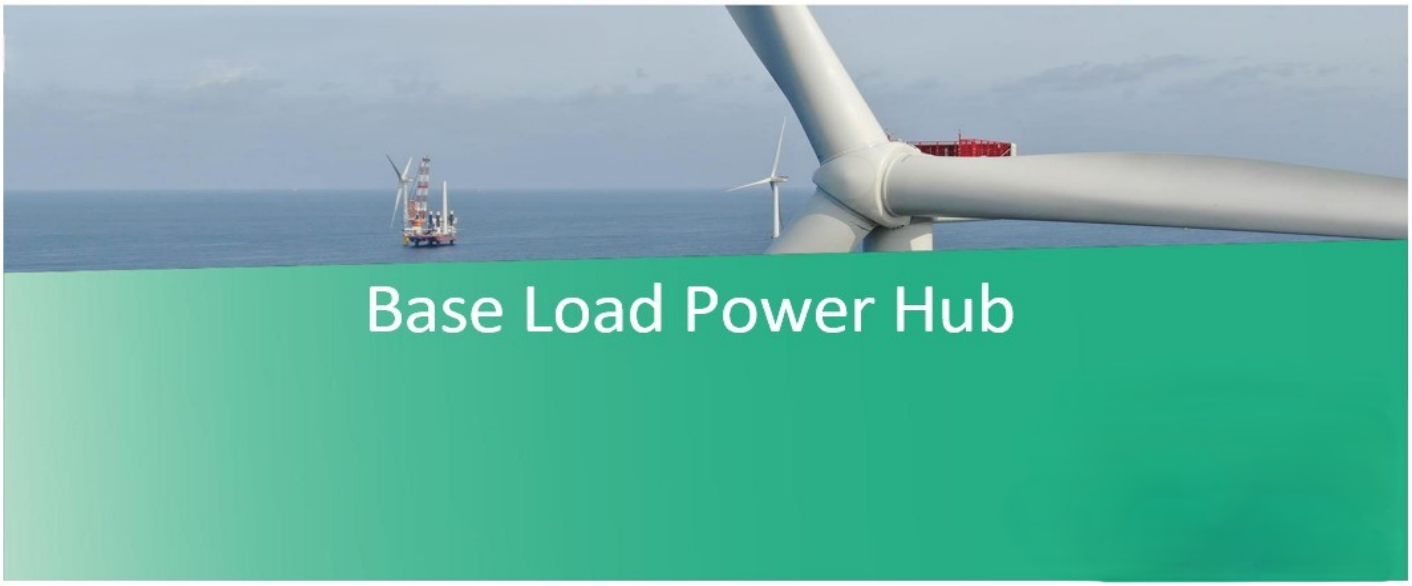
CROSSWIND

ROSETTI MARINO

PROVERLIS

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



MECHANICAL COMPLETION DOSSIER (ONSHORE)

SYSTEM	81 Main Power Distribution High Voltage 66 kV
SUBSYSTEM	81-20 Power Transformer 7 MVA (TR-100AD1)

CROSSWIND	123A90 - HOLLANDSE KUST NOORD WIND PARK BLPH Project MECHANICAL COMPLETION DOSSIER INDEX	ROSETTI MARINO

Sub System N°:	81-20	Tick as appropriate	ONSHORE	O
Description:	Power Transformer 7 MVA (TR-100AD1)		OFFSHORE	NA

1.	***READY FOR COMMISSIONING CERTIFICATE*** *Ready For Commissioning Certificate (RFC)*	O
2.	***CONSOLIDATED PUNCH LISTS*** *Cleared and Residual Items*	O
3.	***SYSTEM/SUB-SYSTEM LIMIT DRAWINGS*** *Mark-up drawings showing the limits of the relevant System/Sub-System*	O
4.	***MECHANICAL COMPLETION STATUS INDEX – BUILDING DISCIPLINE*** *Building Sub-System Status Index (Print out) and Check/Test sheets*	NA
5.	***MECHANICAL COMPLETION STATUS INDEX – ELECTRICAL DISCIPLINE*** *Electrical Sub-System Status Index (Print out) and Check/Test Sheets* *Hazardous Area Equipment Detailed Inspection*	O
6.	***MECHANICAL COMPLETION STATUS INDEX - INSTRUMENTAL DISCIPLINE*** *Instrumental Sub-System Status Index (Print out) and Check/Test Sheets*	NA
7.	***MECHANICAL COMPLETION STATUS INDEX - MECHANICAL DISCIPLINE*** *Mechanical SubSystem Status Index (Print out) and Check/Test Sheets*	NA
8.	***MECHANICAL COMPLETION STATUS INDEX - TELECOMMUNICATION DISCIPLINE*** *Telecommunication Sub-System Status Index (Print out) and Check/Test Sheets*	O
9.	***MECHANICAL COMPLETION STATUS INDEX - HVAC DISCIPLINE*** *HVAC Sub-System Status Index (Print out) and Check/Test Sheets*	NA
10.	***MECHANICAL COMPLETION STATUS INDEX - PIPING DISCIPLINE*** *Piping Sub-System Status Index and Check/Test Sheets*	NA
11.	***MECHANICAL COMPLETION INDEX - SAFETY DISCIPLINE*** *Safety Sub-System Status Index (Print out) and Check/Test Sheets*	NA
12.	***FAT / VENDOR REPORTS*** *Fat reports issued by vendors and/or vendor reports*	OK
13.	***MECHANICAL COMPLETION CHANGES / MARK-UPS*** *A copy of the changes initiated during the Mechanical Completion process pertaining to the relevant Sub-System will be incorporated in this section*	NA

Note: Under the generic terminology “Building” are also covered the following disciplines: **Structural, Painting**

Under the generic terminology “Instrumental” is also covered the following discipline: **Fire & Gas**

ROSETTI MARINO

123A90 - HOLLANDSE KUST NOORD WIND PARK
BLPH Project

CROSSWIND

Ready For Commissioning (RFC) Certificate

COMPLETE	●	PARTIAL	

Revision:	3		Issued on:	2025-05-28	
System:	81	/	Main Power Distribution High Voltage 66 kV		
SubSystem:	81-20	/	Power Transformer 7 MVA (TR-100AD1)		

1	COMPANY has, at its option and if required, reviewed the mechanical completion associated with the above-named system/sub-system of the SCOPE and observed that such functional sub-system has been brought into readiness for commencement of the associated pre-commissioning and commissioning activities, but for the outstanding punch list items, if any, attached and referred in this Certificate.
2	Issuance of this Certificate shall not release CONTRACTOR from any of his obligations, responsibilities or liabilities under the CONTRACT.
3	Mechanical Completion Status Index attached (per Discipline) Punch List report attached (Outstanding and Cleared)

PUNCH LIST	PENDING POINTS	
Note: All Category "A" Items must be cleared prior to issue a Ready For Commissioning (RFC) Certificate	A	B
	'0	2

REMARKS:

	CONTRACTOR Construction Manager	**CONTRACTOR** Commissioning Manager	**COMPANY** Construction Lead (if required)	**COMPANY** Commissioning Lead (if required)
Name	Wolmer Borghi	Anthony Iveson	CPY NOT PRESENT	CPY NOT PRESENT
Date	2025-05-28	2025-05-29	2025-05-29	2025-05-29
Signature	PROVERLIS Digitaly signed by Wolmer Borghi 2025-05-28T20:34:13.770Z	PROVERLIS Digitaly signed by Anthony Iveson 2025-05-29T08:54:30.945Z	PROVERLIS Digitaly signed by CPY NOT PRESEN 2025-05-29T11:38:26.495Z	PROVERLIS Digitaly signed by CPY NOT PRESEN 2025-05-29T11:38:34.185Z

CROSSWIND

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Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 81-20 & process: MC

Electrical	81-20 Power Transformer 7 MVA (TR-100AD1)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
81001-CEC	66kV, 7MVA Transformer / LCP GIS	ONSHORE	C10002120	CPX10	100	2025-01-18	RFC 3
81002-CEC	Auxiliary Trafo 7 MVA Local Control Panel / 66 kV GIS Local Control Panel	ONSHORE	C10003046	CPX10	100	2025-01-18	RFC 3
81002-CEH-L1	66kV GIS / 66/6.6 kV, 7MVA Transformer	ONSHORE	C10000465	CPX08	100	2025-02-26	RFC 3
81002-CEH-L2	66kV GIS / 66/6.6 kV, 7MVA Transformer	ONSHORE	C10000466	CPX08	100	2025-02-26	RFC 3
81002-CEH-L3	66kV GIS / 66/6.6 kV, 7MVA Transformer	ONSHORE	C10000467	CPX08	100	2025-02-26	RFC 3
81003-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002122	CPX10	100	2024-12-09	RFC 3
81004-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002123	CPX10	100	2024-12-09	RFC 3
81005-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002124	CPX10	100	2024-12-09	RFC 3
81006-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002125	CPX10	100	2024-12-09	RFC 3
81007-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002126	CPX10	100	2024-12-09	RFC 3
81008-CEC	66kV, 7MVA Transformer Step-up AVR / 6.6KV HV Switchgear	ONSHORE	C10002127	CPX10	100	2025-01-20	RFC 3
81012-CEC	LCP GIS / 6.6KV HV Switchgear	ONSHORE	C10002128	CPX10	100	2025-01-20	RFC 3
81013-CEC	LCP GIS / 6.6KV HV Switchgear	ONSHORE	C10002142	CPX10	100	2025-01-20	RFC 3
82001-CEC	6.6KV HV Switchgear / LCP GIS	ONSHORE	C10002129	CPX10	100	2025-01-20	RFC 3
82001-CEM-1-L1	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000468	CPX08	100	2025-04-11	RFC 3
82001-CEM-1-L2	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000470	CPX08	100	2025-04-11	RFC 3
82001-CEM-1-L3	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000472	CPX08	100	2025-04-11	RFC 3
82001-CEM-1-N	66kV, 7MVA Transformer / NER	ONSHORE	C10000474	CPX08	100	2025-04-11	RFC 3
82001-CEM-2-L1	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000469	CPX08	100	2025-04-11	RFC 3
82001-CEM-2-L2	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000471	CPX08	100	2025-04-11	RFC 3
82001-CEM-2-L3	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000473	CPX08	100	2025-04-11	RFC 3
82001-CEM-2-N	NER / NER Earth Point	ONSHORE	C10000475	CPX09	100	2024-12-19	RFC 3
82002-CEC	6.6KV HV Switchgear / 66/6.6 kV, 7MVA Transformer	ONSHORE	C10002130	CPX10	100	2024-12-17	RFC 3
82010-CEC	6.6KV HV Switchgear / LCP GIS	ONSHORE	C10002131	CPX10	100	2025-01-20	RFC 3
82011-CEC	6.6KV HV Switchgear / LCP GIS	ONSHORE	C10002132	CPX10	100	2025-01-20	RFC 3
82012-CEC	6.6KV HV Switchgear / LCP GIS	ONSHORE	C10002133	CPX10	100	2025-01-20	RFC 3
82014-CEC	NER / 6.6KV HV Switchgear	ONSHORE	C10002320	CPX10	100	2024-12-09	RFC 3
83112-CEL	Lighting & Small Power DB BoP / Auxiliary Trafo OLTC	ONSHORE	C10000631	CPX09	100	2024-12-03	RFC 3
83113-CEL	Lighting & Small Power DB BoP / Auxiliary Trafo AVR	ONSHORE	C10000632	CPX09	100	2024-12-03	RFC 3

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 81-20 & process: MC

Electrical	81-20 Power Transformer 7 MVA (TR-100AD1)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
83114-CEL	Lighting & Small Power DB BoP / Auxiliary Trafo 7MVA	ONSHORE	C10000633	CPX09	100	2024-12-03	RFC 3
83115-CEL	Lighting & Small Power DB BoP / Auxiliary NER	ONSHORE	C10000634	CPX09	100	2024-12-03	RFC 3
RR-100D1	Neutral Earthing Resistor	ONSHORE	C10000863	CPX21	100	2024-09-13	RFC 3
TR-100AD1	66 / 6.9 kV 7 MVA Transformer	ONSHORE	C10000867	CPX02	100	2024-09-13	RFC 3

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 81-20 & process: MC

Telecom	81-20 Power Transformer 7 MVA (TR-100AD1)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
TR-100AD1AVR/B400-NET-001	66 / 6.9 kV 7 MVA Transformer / Network Cabinet / EMCS System	ONSHORE	C10004374	CIX09	100	2024-11-27	RFC 3

CROSSWIND

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Project CROSSWIND

PUNCH LIST REPORT

SYSTEM	81	Main Power Distribution High Voltage 66 kV
SUBSYSTEM	81-20	Power Transformer 7 MVA (TR-100AD1)

Telecom

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000968	A	TR-100AD1AVR /B400-NET-001 C10004374	The cable gland suit not for cable type. (should be type M20S)	.		APolo 2024-11-27	2025-01-27	Ecarotenuto 2025-01-27	2025-01-27
C30000964	B	TR-100AD1AVR /B400-NET-001 C10004374	The copper conductor of the cable armor must be individually connected to the earthing bar. See 123A90-DDL-EL-DD-20090. (B400-NET-001)	.		APolo 2024-11-27	2025-02-04	APolo 2025-02-04	2025-02-04
C30000965	B	TR-100AD1AVR /B400-NET-001 C10004374	The cable is not supported and fixed to the rack (outside TR-100AD1AVR)	.		APolo 2024-11-27	2025-01-22	APolo 2025-01-22	2025-01-22
C30000966	B	TR-100AD1AVR /B400-NET-001 C10004374	Missing cable tag SS project, side TR-100AD1AVR.	.		APolo 2024-11-27	2025-01-02	Ecarotenuto 2025-01-02	2025-01-02
C30000967	B	TR-100AD1AVR /B400-NET-001 C10004374	Missing cable tag , inside pannel TR-100AD1AVR .	.		APolo 2024-11-27	2025-02-25	APolo 2025-02-25	2025-02-25

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV
SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001552	A	82014-CEC C10002320	the cable is not protected before entering the panel . (SG-100D1) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001570	A	81007-CEC C10002126	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001574	A	81006-CEC C10002125	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001578	A	81005-CEC C10002124	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001582	A	81004-CEC C10002123	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001586	A	81003-CEC C10002122	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30004146	A	81002-CEH-L1 C10000465	Cable gland on trasformer side needs be tightened	.		JKrizanic 2025-02-26	2025-05-23	Gtangianu 2025-05-23	2025-05-23
C30004148	A	81002-CEH-L2 C10000466	Cable glands on the trasformer side needs be tightened	.		JKrizanic 2025-02-26	2025-05-23	Gtangianu 2025-05-23	2025-05-23
C30004150	A	81002-CEH-L3 C10000467	Cable gland on the trasformer side needs be tightened	.		JKrizanic 2025-02-26	2025-05-23	Gtangianu 2025-05-23	2025-05-23

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV
SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001170	B	83115-CEL C10000634	Missing core identification tag RR-100D1 side	.		Pschintu 2024-12-03	2025-03-26	Gtangianu 2025-03-26	2025-03-26
C30001171	B	83115-CEL C10000634	Missing SS cable tag	.		Pschintu 2024-12-03	2025-01-30	APolo 2025-01-30	2025-01-30
C30001172	B	83112-CEL C10000631	Missing core identification tag both side	.		Pschintu 2024-12-03			
C30001173	B	83112-CEL C10000631	Missing SS cable tag.	.		Pschintu 2024-12-03	2025-01-30	APolo 2025-01-30	2025-01-30
C30001174	B	83113-CEL C10000632	Missing core identification tags both side	.		Pschintu 2024-12-03	2025-02-19	AAndreani 2025-02-19	2025-02-19
C30001175	B	83113-CEL C10000632	Missing SS cable tag	.		Pschintu 2024-12-03	2025-02-04	Pschintu 2025-02-04	2025-02-04
C30001176	B	83114-CEL C10000633	Missing SS cable tag	.		Pschintu 2024-12-03	2025-02-04	Pschintu 2025-02-04	2025-02-04
C30001177	B	83114-CEL C10000633	Missing core identification tags both side	.		Pschintu 2024-12-03			
C30001549	B	82014-CEC C10002320	Missing cable tags both side . (82014-CEC)	.		Gtangianu 2024-12-09	2025-01-30	APolo 2025-01-30	2025-01-30

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV
SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001550	B	82014-CEC C10002320	Missing cable tags on routing, inside and outside the panels	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001551	B	82014-CEC C10002320	Spare cores to be properly isolated both side the cable. (RR-100D1/SG-100D1)	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001569	B	81007-CEC C10002126	Identification tag wire missing both side the cable (TR-100AD1/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001571	B	81007-CEC C10002126	Spare cores to be properly isolated both side the cable. (TR-100AD1/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001572	B	81007-CEC C10002126	Missing cable tags on routing, inside and outside the panels TR-100AD1/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-02-21	Gtangianu 2025-02-21	2025-02-21
C30001573	B	81006-CEC C10002125	Identification tag wires missing both side the cable (TR-100AD1/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001575	B	81006-CEC C10002125	Spare cores to be properly isolated both side the cable. (TR-100AD1/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-01-30	APolo 2025-01-30	2025-01-30
C30001576	B	81006-CEC C10002125	Missing cable tags on routing, inside and outside the panels TR-100AD1/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001577	B	81005-CEC C10002124	Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-19	AAndreani 2025-02-19	2025-02-19

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV
SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001579	B	81005-CEC C10002124	Spare cores to be properly isolated both side the cable. (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001580	B	81005-CEC C10002124	Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-02-21	Gtangianu 2025-02-21	2025-02-21
C30001581	B	81004-CEC C10002123	Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001583	B	81004-CEC C10002123	Spare cores to be properly isolated both side the cable. (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001584	B	81004-CEC C10002123	Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-02-21	Gtangianu 2025-02-21	2025-02-21
C30001585	B	81003-CEC C10002122	Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001587	B	81003-CEC C10002122	Spare cores to be properly isolated both side the cable. (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-01-30	APolo 2025-01-30	2025-01-30
C30001588	B	81003-CEC C10002122	Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-01-30	APolo 2025-01-30	2025-01-30
C30001889	B	82001-CEM-1-L1 C10000468	Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82001-CEM-1-L2 and 82001-CEM-1-L3	.		Pschintu 2024-12-16	2025-01-03	Ecarotenuto 2025-01-03	2025-01-03

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Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV

SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001890	B	82001-CEM-1-L1 C10000468	Missing cable tag on routing. Point valid also for 82001-CEM-1-L2, 82001-CEM-1-L3, 82001-CEM-2-L1, 82001-CEM-2-L2,	.		Pschintu 2024-12-16	2025-02-26	Pschintu 2025-02-26	2025-02-26
C30001938	B	82002-CEC C10002130	Missing cable tag CP-100E3 Transformer side	.		Pschintu 2024-12-17	2025-02-07	Pschintu 2025-02-07	2025-02-07
C30001939	B	82002-CEC C10002130	Missing core identification tag CP-100E3 Transformer side	.		Pschintu 2024-12-17	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30002020	B	82001-CEM-2-L1 C10000469	Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82001-CEM-2-L2 and 82001-CEM-2-L3	.		Pschintu 2024-12-19	2025-02-07	Pschintu 2025-02-07	2025-02-07
C30004144	B	81002-CEH-L1 C10000465	Missing cable Tag along the cable routing	.		JKrizanic 2025-02-26	2025-03-13	JKrizanic 2025-03-13	2025-03-13
C30004145	B	81002-CEH-L1 C10000465	Inside cabine B100 cable is touching panel GIS need be better dresed "see attached foto"	.		JKrizanic 2025-02-26	2025-05-05	Gtangianu 2025-05-05	2025-05-05
C30004147	B	81002-CEH-L2 C10000466	Missing cable Tag along the cable routing	.		JKrizanic 2025-02-26	2025-03-13	JKrizanic 2025-03-13	2025-03-13
C30004149	B	81002-CEH-L3 C10000467	Missing cable Tag along the cable routing	.		JKrizanic 2025-02-26	2025-03-13	JKrizanic 2025-03-13	2025-03-13
C30004151	B	81002-CEH-L3 C10000467	Cable touching structural support on the side trasformer "see foto"	.		JKrizanic 2025-02-26	2025-05-05	Gtangianu 2025-05-05	2025-05-05

Section 2 CONSOLIDATED PUNCH LISTS

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM	81	Main Power Distribution High Voltage 66 kV
SUBSYSTEM	81-20	Power Transformer 7 MVA (TR-100AD1)

Telecom

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30000968	A	TR-100AD1AVR /B400-NET-001 C10004374	The cable gland suit not for cable type. (should be type M20S)	.		APolo 2024-11-27	2025-01-27	Ecarotenuto 2025-01-27	2025-01-27
C30000964	B	TR-100AD1AVR /B400-NET-001 C10004374	The copper conductor of the cable armor must be individually connected to the earthing bar. See 123A90-DDL-EL-DD-20090. (B400-NET-001)	.		APolo 2024-11-27	2025-02-04	APolo 2025-02-04	2025-02-04
C30000965	B	TR-100AD1AVR /B400-NET-001 C10004374	The cable is not supported and fixed to the rack (outside TR-100AD1AVR)	.		APolo 2024-11-27	2025-01-22	APolo 2025-01-22	2025-01-22
C30000966	B	TR-100AD1AVR /B400-NET-001 C10004374	Missing cable tag SS project, side TR-100AD1AVR.	.		APolo 2024-11-27	2025-01-02	Ecarotenuto 2025-01-02	2025-01-02
C30000967	B	TR-100AD1AVR /B400-NET-001 C10004374	Missing cable tag , inside pannel TR-100AD1AVR .	.		APolo 2024-11-27	2025-02-25	APolo 2025-02-25	2025-02-25

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV

SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001552	A	82014-CEC C10002320	the cable is not protected before entering the panel . (SG-100D1) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001570	A	81007-CEC C10002126	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001574	A	81006-CEC C10002125	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001578	A	81005-CEC C10002124	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001582	A	81004-CEC C10002123	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30001586	A	81003-CEC C10002122	The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-	.		Gtangianu 2024-12-09	2024-12-30	Gtangianu 2024-12-30	2024-12-30
C30004146	A	81002-CEH-L1 C10000465	Cable gland on trasformer side needs be tightened	.		JKrizanic 2025-02-26	2025-05-23	Gtangianu 2025-05-23	2025-05-23
C30004148	A	81002-CEH-L2 C10000466	Cable glands on the trasformer side needs be tightened	.		JKrizanic 2025-02-26	2025-05-23	Gtangianu 2025-05-23	2025-05-23
C30004150	A	81002-CEH-L3 C10000467	Cable gland on the trasformer side needs be tightened	.		JKrizanic 2025-02-26	2025-05-23	Gtangianu 2025-05-23	2025-05-23

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV

SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001170	B	83115-CEL C10000634	Missing core identification tag RR-100D1 side	.		Pschintu 2024-12-03	2025-03-26	Gtangianu 2025-03-26	2025-03-26
C30001171	B	83115-CEL C10000634	Missing SS cable tag	.		Pschintu 2024-12-03	2025-01-30	APolo 2025-01-30	2025-01-30
C30001172	B	83112-CEL C10000631	Missing core identification tag both side	.		Pschintu 2024-12-03			
C30001173	B	83112-CEL C10000631	Missing SS cable tag.	.		Pschintu 2024-12-03	2025-01-30	APolo 2025-01-30	2025-01-30
C30001174	B	83113-CEL C10000632	Missing core identification tags both side	.		Pschintu 2024-12-03	2025-02-19	AAndreani 2025-02-19	2025-02-19
C30001175	B	83113-CEL C10000632	Missing SS cable tag	.		Pschintu 2024-12-03	2025-02-04	Pschintu 2025-02-04	2025-02-04
C30001176	B	83114-CEL C10000633	Missing SS cable tag	.		Pschintu 2024-12-03	2025-02-04	Pschintu 2025-02-04	2025-02-04
C30001177	B	83114-CEL C10000633	Missing core identification tags both side	.		Pschintu 2024-12-03			
C30001549	B	82014-CEC C10002320	Missing cable tags both side . (82014-CEC)	.		Gtangianu 2024-12-09	2025-01-30	APolo 2025-01-30	2025-01-30

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV

SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001550	B	82014-CEC C10002320	Missing cable tags on routing, inside and outside the panels	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001551	B	82014-CEC C10002320	Spare cores to be properly isolated both side the cable. (RR-100D1/SG-100D1)	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001569	B	81007-CEC C10002126	Identification tag wire missing both side the cable (TR-100AD1/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001571	B	81007-CEC C10002126	Spare cores to be properly isolated both side the cable. (TR-100AD1/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001572	B	81007-CEC C10002126	Missing cable tags on routing, inside and outside the panels TR-100AD1/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-02-21	Gtangianu 2025-02-21	2025-02-21
C30001573	B	81006-CEC C10002125	Identification tag wires missing both side the cable (TR-100AD1/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001575	B	81006-CEC C10002125	Spare cores to be properly isolated both side the cable. (TR-100AD1/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-01-30	APolo 2025-01-30	2025-01-30
C30001576	B	81006-CEC C10002125	Missing cable tags on routing, inside and outside the panels TR-100AD1/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001577	B	81005-CEC C10002124	Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-19	AAndreani 2025-02-19	2025-02-19

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV

SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001579	B	81005-CEC C10002124	Spare cores to be properly isolated both side the cable. (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001580	B	81005-CEC C10002124	Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-02-21	Gtangianu 2025-02-21	2025-02-21
C30001581	B	81004-CEC C10002123	Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001583	B	81004-CEC C10002123	Spare cores to be properly isolated both side the cable. (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-04	Gtangianu 2025-02-04	2025-02-04
C30001584	B	81004-CEC C10002123	Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-02-21	Gtangianu 2025-02-21	2025-02-21
C30001585	B	81003-CEC C10002122	Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30001587	B	81003-CEC C10002122	Spare cores to be properly isolated both side the cable. (CP-100E4/SG-100D1 Panel A6).	.		Gtangianu 2024-12-09	2025-01-30	APolo 2025-01-30	2025-01-30
C30001588	B	81003-CEC C10002122	Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)	.		Gtangianu 2024-12-09	2025-01-30	APolo 2025-01-30	2025-01-30
C30001889	B	82001-CEM-1-L1 C10000468	Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82001-CEM-1-L2 and 82001-CEM-1-L3	.		Pschintu 2024-12-16	2025-01-03	Ecarotenuto 2025-01-03	2025-01-03

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

PUNCH LIST REPORT

SYSTEM 81 Main Power Distribution High Voltage 66 kV

SUBSYSTEM 81-20 Power Transformer 7 MVA (TR-100AD1)

Electrical

CODE	CAT	ITEM	DEFECT DESCRIPTION	CORRECTIVE ACTION	PERFORMED ACTION	ISSUED	CARRIED	CHECKED	APPROVED
C30001890	B	82001-CEM-1-L1 C10000468	Missing cable tag on routing. Point valid also for 82001-CEM-1-L2, 82001-CEM-1-L3, 82001-CEM-2-L1, 82001-CEM-2-L2,	.		Pschintu 2024-12-16	2025-02-26	Pschintu 2025-02-26	2025-02-26
C30001938	B	82002-CEC C10002130	Missing cable tag CP-100E3 Transformer side	.		Pschintu 2024-12-17	2025-02-07	Pschintu 2025-02-07	2025-02-07
C30001939	B	82002-CEC C10002130	Missing core identification tag CP-100E3 Transformer side	.		Pschintu 2024-12-17	2025-02-15	AAndreani 2025-02-15	2025-02-15
C30002020	B	82001-CEM-2-L1 C10000469	Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82001-CEM-2-L2 and 82001-CEM-2-L3	.		Pschintu 2024-12-19	2025-02-07	Pschintu 2025-02-07	2025-02-07
C30004144	B	81002-CEH-L1 C10000465	Missing cable Tag along the cable routing	.		JKrizanic 2025-02-26	2025-03-13	JKrizanic 2025-03-13	2025-03-13
C30004145	B	81002-CEH-L1 C10000465	Inside cabine B100 cable is touching panel GIS need be better dresed "see attached foto"	.		JKrizanic 2025-02-26	2025-05-05	Gtangianu 2025-05-05	2025-05-05
C30004147	B	81002-CEH-L2 C10000466	Missing cable Tag along the cable routing	.		JKrizanic 2025-02-26	2025-03-13	JKrizanic 2025-03-13	2025-03-13
C30004149	B	81002-CEH-L3 C10000467	Missing cable Tag along the cable routing	.		JKrizanic 2025-02-26	2025-03-13	JKrizanic 2025-03-13	2025-03-13
C30004151	B	81002-CEH-L3 C10000467	Cable touching structural support on the side trasformer "see foto"	.		JKrizanic 2025-02-26	2025-05-05	Gtangianu 2025-05-05	2025-05-05

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000964

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10004374	1.4 Discipline	Telecom
1.2 Item	TR-100AD1AVR/B400-NET-001	66 / 6.9 kV 7 MVA Transformer / Network Cabinet / EMCS System	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

The copper conductor of the cable armor must be individually connected to the earthing bar. See 123A90-DDL-EL-DD-20090. (B400-NET-001)

Name: Alessio Polo

Date: 2024-11-27

Signature: Digitaly signed by Alessio Polo 2024-11-27T10:25:24.503Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Alessio Polo
3.4 Activity code	MC Mechanical Completion	Date	2024-11-27
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Alessio Polo 2024-11-27T10:25:38.209Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-02-04

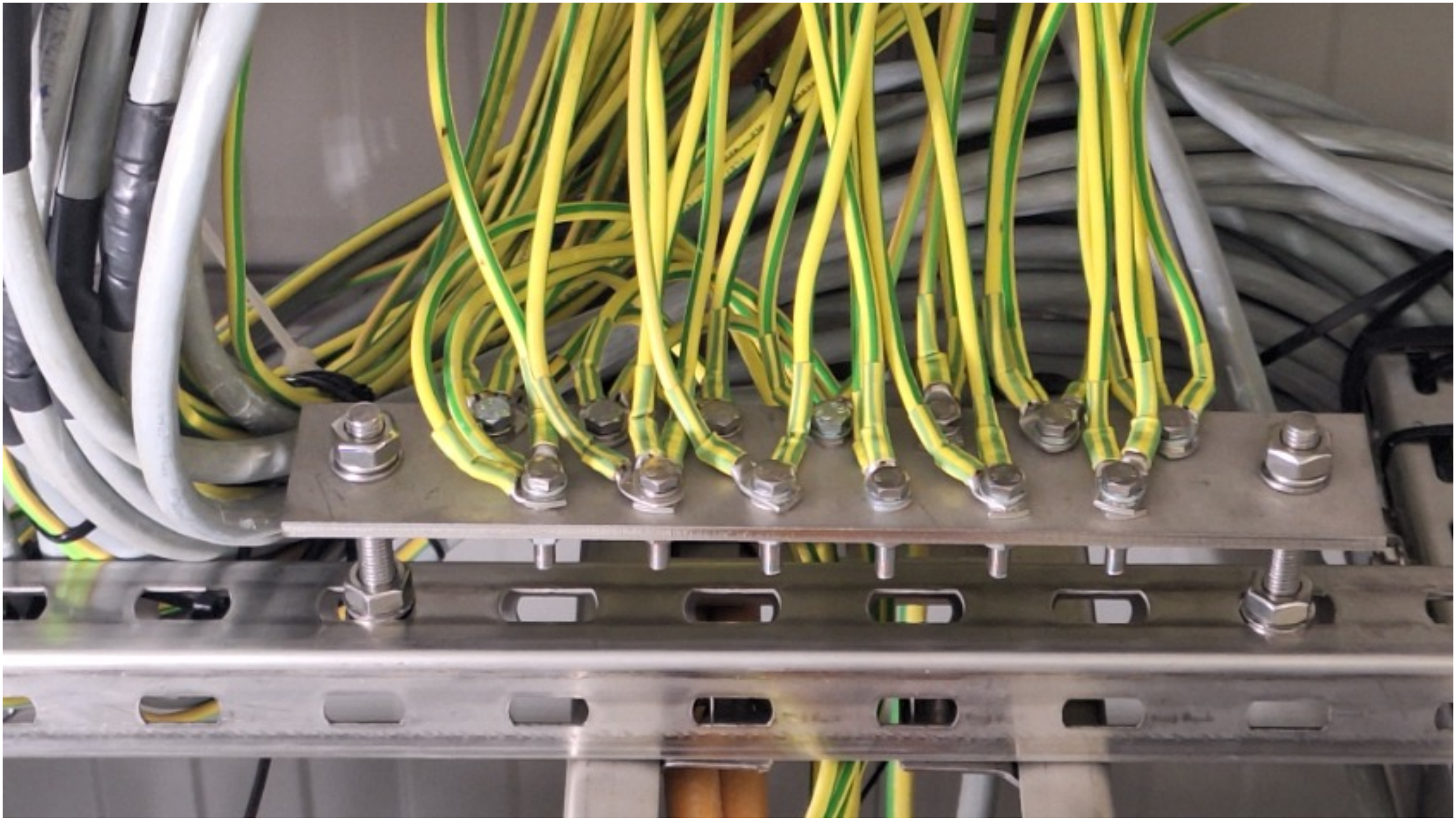
Signature: Digitaly signed by Alessio Polo 2025-02-04T12:37:41.326Z

6- CLEARANCE APPROVAL

Name

Date

Signature



ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000965

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10004374	1.4 Discipline	Telecom
1.2 Item	TR-100AD1AVR/B400-NET-001	66 / 6.9 kV 7 MVA Transformer / Network Cabinet / EMCS System	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

The cable is not supported and fixed to the rack (outside TR-100AD1AVR)

Name: Alessio Polo

Date: 2024-11-27

Signature: Digitaly signed by Alessio Polo 2024-11-27T10:27:38.247Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Alessio Polo
3.4 Activity code	MC Mechanical Completion	Date	2024-11-27
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Alessio Polo 2024-11-27T10:27:48.414Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-01-22

Signature: Digitaly signed by Alessio Polo 2025-01-22T16:07:07.645Z

6- CLEARANCE APPROVAL

Name

Date

Signature


Novace
Fiber


0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 CE

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000966

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10004374	1.4 Discipline	Telecom
1.2 Item	TR-100AD1AVR/B400-NET-001	66 / 6.9 kV 7 MVA Transformer / Network Cabinet / EMCS System	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

Missing cable tag SS project, side TR-100AD1AVR.

Name: Alessio Polo

Date: 2024-11-27

Signature: Digitaly signed by Alessio Polo 2024-11-27T10:29:56.182Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Alessio Polo
3.4 Activity code	MC Mechanical Completion	Date	2024-11-27
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Alessio Polo 2024-11-27T10:30:10.048Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Eleonora Carotenuto

Date: 2025-01-02

Signature: Digitaly signed by Eleonora Carotenuto 2025-01-02T12:47:19.097Z

6- CLEARANCE APPROVAL

Name

Date

Signature



ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000967

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10004374	1.4 Discipline	Telecom
1.2 Item	TR-100AD1AVR/B400-NET-001	66 / 6.9 kV 7 MVA Transformer / Network Cabinet / EMCS System	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

Missing cable tag , inside pannel TR-100AD1AVR .

Name: Alessio Polo

Date: 2024-11-27

Signature: Digitaly signed by Alessio Polo 2024-11-27T10:42:08.992Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Alessio Polo
3.4 Activity code	MC Mechanical Completion	Date	2024-11-27
3.5 Action by	VND Vendor	Signature	Digitaly signed by Alessio Polo 2024-11-27T10:42:29.973Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-02-25

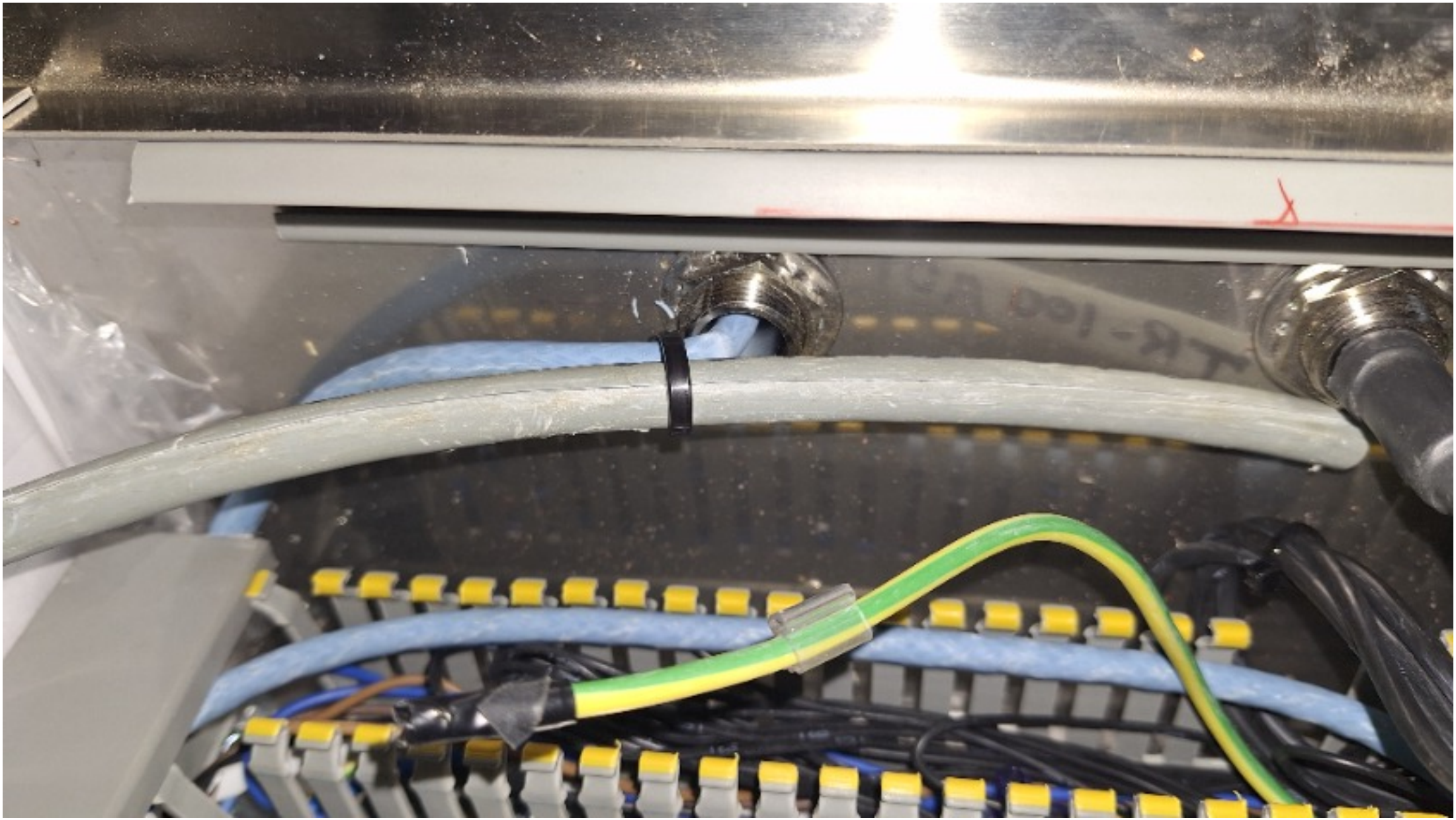
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6- CLEARANCE APPROVAL

Name

Date

Signature



ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30000968

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10004374	1.4 Discipline	Telecom
1.2 Item	TR-100AD1AVR/B400-NET-001	66 / 6.9 kV 7 MVA Transformer / Network Cabinet / EMCS System	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

The cable gland suit not for cable type. (should be type M20S)

Name: Alessio Polo

Date: 2024-11-27

Signature: Digitaly signed by Alessio Polo 2024-11-27T10:51:27.094Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Alessio Polo
3.4 Activity code	MC Mechanical Completion	Date	2024-11-27
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Alessio Polo 2024-11-27T10:51:54.796Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Cable gland has been replaced and test has been re-done. (see attached file)

Name: Eleonora Carotenuto

Date: 2025-01-27

Signature: Digitaly signed by Eleonora Carotenuto 2025-01-27T15:06:24.584Z

6- CLEARANCE APPROVAL

Name

Date

Signature



Cable ID: TR-100AD1AVR/B400-NET-001

Test Summary: PASS

Test Limit: ISO11801 PL2 Class Ea
Limits Version: V7.6
Date / Time: 27-01-2025 14:24:20
Headroom 2.7 dB (NEXT 4,5-7,8)
Cable Type: Cat 6A U/UTP
NVP: 68.2%

Main: Versiv
S/N: 2226344
Software Version: V6.7 Build 1
Calibration Date: 12-12-2022
Adapter: DSX-8000 (DSX-PLA804)
S/N: 22340257

Remote: Versiv
S/N: 2226336
Software Version: V6.7 Build 1
Calibration Date: 12-12-2022
Adapter: DSX-8000R (DSX-PLA804)
S/N: 22340270

Length (m), Limit 90.0	[Pair 4,5]	66.9
Prop. Delay (ns), Limit 496	[Pair 1,2]	334
Delay Skew (ns), Limit 43	[Pair 1,2]	7
Resistance (ohms), Limit 20.60	[Pair 1,2]	11.52
Insertion Loss Margin (dB)	[Pair 1,2]	5.1
Frequency (MHz)	[Pair 1,2]	500.0
Limit (dB)	[Pair 1,2]	41.6

	Worst Case Margin		Worst Case Value	
PASS	MAIN	SR	MAIN	SR
Worst Pair	4,5-7,8	3,6-4,5	4,5-7,8	3,6-4,5
NEXT (dB)	2.7	6.8	5.6	7.5
Freq. (MHz)	338.0	399.0	484.0	500.0
Limit (dB)	32.9	31.4	29.5	29.2
Worst Pair	4,5	4,5	4,5	4,5
PS NEXT (dB)	4.0	6.6	5.9	6.6
Freq. (MHz)	338.0	500.0	484.0	500.0
Limit (dB)	30.2	26.4	26.7	26.4

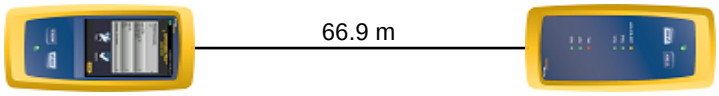
PASS	MAIN	SR	MAIN	SR
Worst Pair	4,5-7,8	7,8-4,5	7,8-4,5	7,8-4,5
ACR-F (dB)	13.2	12.9	13.9	13.9
Freq. (MHz)	294.0	286.0	500.0	500.0
Limit (dB)	15.9	16.1	11.3	11.3
Worst Pair	4,5	4,5	4,5	4,5
PS ACR-F (dB)	14.5	14.7	15.7	15.7
Freq. (MHz)	290.0	265.0	500.0	500.0
Limit (dB)	13.0	13.8	8.3	8.3

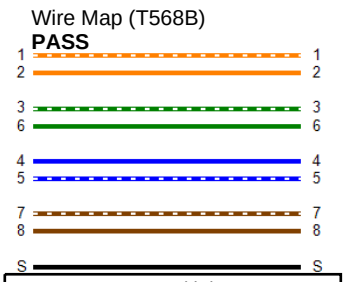
PASS	MAIN	SR	MAIN	SR
Worst Pair	4,5-7,8	3,6-4,5	4,5-7,8	3,6-4,5
ACR-N (dB)	6.4	11.0	11.0	12.6
Freq. (MHz)	168.5	169.5	484.0	500.0
Limit (dB)	15.0	14.9	-11.3	-12.4
Worst Pair	4,5	3,6	4,5	4,5
PS ACR-N (dB)	7.5	11.0	11.6	11.8
Freq. (MHz)	168.5	171.0	499.0	500.0
Limit (dB)	12.4	12.1	-15.2	-15.3

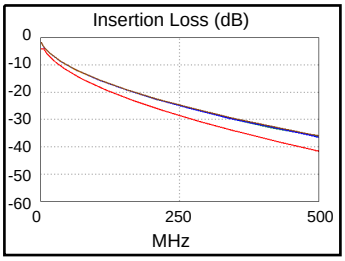
PASS	MAIN	SR	MAIN	SR
Worst Pair	1,2	4,5	1,2	4,5
RL (dB)	5.1	2.1	8.4	2.1
Freq. (MHz)	4.8	496.0	500.0	496.0
Limit (dB)	21.0	8.0	8.0	8.0

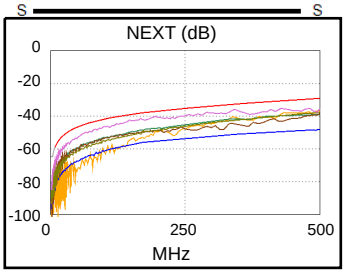
Compliant Network Standards:

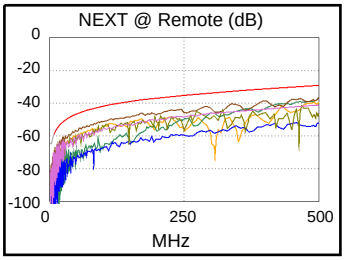
10BASE-T	100BASE-TX	100BASE-T4
1000BASE-T	2.5GBASE-T	5GBASE-T
10GBASE-T	ATM-25	ATM-51
ATM-155	100VG-AnyLan	TR-4
TR-16 Active	TR-16 Passive	

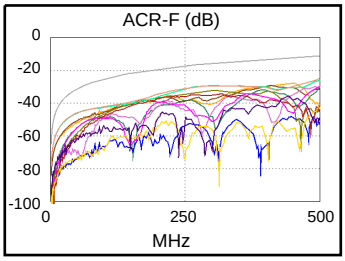


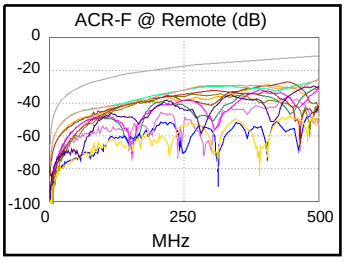


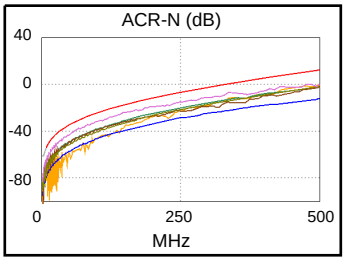


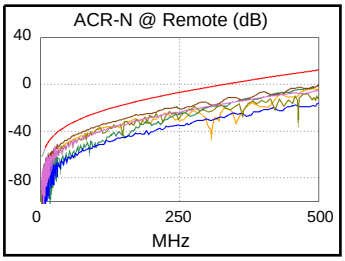


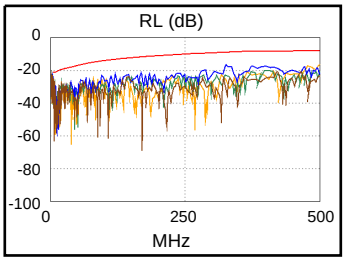


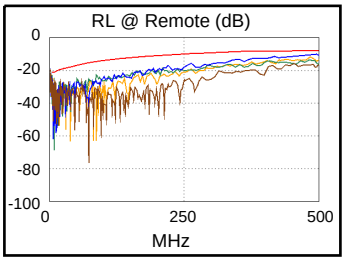












LinkWare™ PC Version 11.4

Project: CROSSWIND
Site: Not Set
Floor: Not Set
Rack: Not Set
CrossWind.flw

Building: Not Set
Room: Not Set
Patch: Not Set

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001170

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000634	1.4 Discipline	Electrical
1.2 Item	83115-CEL		Lighting & Small Power DB BoP / Auxiliary NER
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing core identification tag RR-100D1 side

Name: Paolo Schintu

Date: 2024-12-03

Signature: Digitaly signed by Paolo Schintu 2024-12-03T13:39:19.158Z

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	2024-12-03
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-03T13:39:38.229Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-03-26

Signature: Digitaly signed by Giovanni Tangianu 2025-03-26T09:10:21.366Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001171

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000634	1.4 Discipline	Electrical
1.2 Item	83115-CEL		Lighting & Small Power DB BoP / Auxiliary NER
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing SS cable tag

Name: Paolo Schintu

Date: 2024-12-03

Signature: Digitaly signed by Paolo Schintu 2024-12-03T13:39:56.291Z

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	2024-12-03
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-03T13:40:07.029Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-01-30

Signature: Digitaly signed by Alessio Polo 2025-01-30T16:30:20.800Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001173

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000631	1.4 Discipline	Electrical
1.2 Item	83112-CEL		Lighting & Small Power DB BoP / Auxiliary Trafo OLTC
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing SS cable tag.

Name: Paolo Schintu

Date: 2024-12-03

Signature: Digitaly signed by Paolo Schintu 2024-12-03T13:50:42.875Z

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	2024-12-03
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-03T13:51:06.018Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-01-30

Signature: Digitaly signed by Alessio Polo 2025-01-30T16:30:27.662Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001174

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000632	1.4 Discipline	Electrical
1.2 Item	83113-CEL		Lighting & Small Power DB BoP / Auxiliary Trafo AVR
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing core identification tags both side

Name: Paolo Schintu

Date: 2024-12-03

Signature: Digitaly signed by Paolo Schintu 2024-12-03T13:53:32.245Z

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	2024-12-03
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-03T13:53:47.854Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-19

Signature: Digitaly signed by Andrea Andreani 2025-02-19T15:44:43.923Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001175

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000632	1.4 Discipline	Electrical
1.2 Item	83113-CEL		Lighting & Small Power DB BoP / Auxiliary Trafo AVR
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing SS cable tag

Name: Paolo Schintu

Date: 2024-12-03

Signature: Digitaly signed by Paolo Schintu 2024-12-03T13:54:07.284Z

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	2024-12-03
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-03T13:54:20.460Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-04

Signature: Digitaly signed by Paolo Schintu 2025-02-04T11:26:46.794Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001176

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000633	1.4 Discipline	Electrical
1.2 Item	83114-CEL		Lighting & Small Power DB BoP / Auxiliary Trafo 7MVA
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing SS cable tag

Name: Paolo Schintu

Date: 2024-12-03

Signature: Digitaly signed by Paolo Schintu 2024-12-03T13:57:16.574Z

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	2024-12-03
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-03T13:57:27.741Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-04

Signature: Digitaly signed by Paolo Schintu 2025-02-04T11:26:53.305Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001549

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002320	1.4 Discipline	Electrical
1.2 Item	82014-CEC	NER / 6.6KV HV Switchgear	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

Missing cable tags both side . (82014-CEC)

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T07:38:21.680Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T07:38:44.997Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-01-30

Signature: Digitaly signed by Alessio Polo 2025-01-30T16:30:42.073Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001550

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002320	1.4 Discipline	Electrical
1.2 Item	82014-CEC	NER / 6.6KV HV Switchgear	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

Missing cable tags on routing, inside and outside the panels

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T07:41:13.180Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T07:41:34.155Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-04

Signature: Digitaly signed by Giovanni Tangianu 2025-02-04T12:47:14.122Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001551

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002320	1.4 Discipline	Electrical
1.2 Item	82014-CEC	NER / 6.6KV HV Switchgear	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

Spare cores to be properly isolated both side the cable.
(RR-100D1/SG-100D1)

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T07:50:23.204Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T07:55:15.401Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

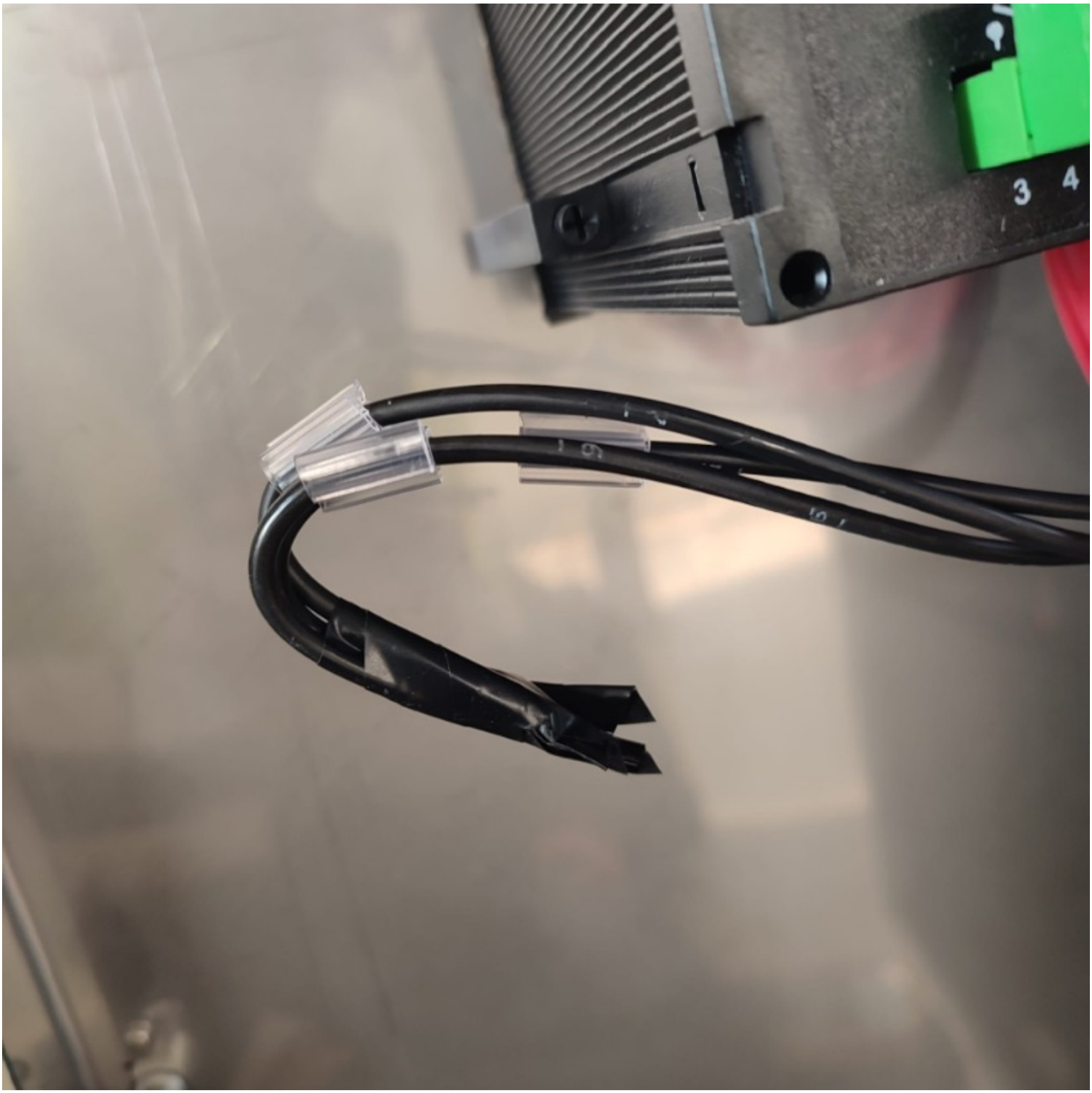
Signature: Digitaly signed by Andrea Andreani 2025-02-15T17:23:14.691Z

6- CLEARANCE APPROVAL

Name

Date

Signature


3
4

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001552

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002320	1.4 Discipline	Electrical
1.2 Item	82014-CEC	NER / 6.6KV HV Switchgear	
1.3 Subsystem	81-20	Power Transformer 7 MVA (TR-100AD1)	

2 - OBSERVATION

the cable is not protected before entering the panel . (SG-100D1)
See attached photo-

Name: Giovanni Tangianu
Date: 2024-12-09
Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T08:01:37.250Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T08:02:05.454Z

4 - PERFORMED ACTION

Name
Date
Signature

5 - CLEARANCE CHECK

Done.

Name: Giovanni Tangianu
Date: 2024-12-30
Signature: Digitaly signed by Giovanni Tangianu 2024-12-30T12:38:34.460Z

6- CLEARANCE APPROVAL

Name
Date
Signature


81012-CEC

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001569

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002126	1.4 Discipline	Electrical
1.2 Item	81007-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Identification tag wire missing both side the cable (TR-100AD1/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:02:27.371Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:02:46.119Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

Signature: Digitaly signed by Andrea Andreani 2025-02-15T17:24:10.369Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001570

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002126	1.4 Discipline	Electrical
1.2 Item	81007-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:04:51.227Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:05:13.121Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE.

Name: Giovanni Tangianu

Date: 2024-12-30

Signature: Digitaly signed by Giovanni Tangianu 2024-12-30T12:38:49.733Z

6- CLEARANCE APPROVAL

Name

Date

Signature


81012-CEC

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001571

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002126	1.4 Discipline	Electrical
1.2 Item	81007-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Spare cores to be properly isolated both side the cable.
(TR-100AD1/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:06:30.808Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:06:47.267Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

Signature: Digitaly signed by Andrea Andreani 2025-02-15T17:24:16.842Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001572

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002126	1.4 Discipline	Electrical
1.2 Item	81007-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable tags on routing, inside and outside the panels TR-100AD1/SG-100D1 Panel A6)

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:07:50.564Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:08:28.791Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-21

Signature: Digitaly signed by Giovanni Tangianu 2025-02-21T15:39:07.561Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001573

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002125	1.4 Discipline	Electrical
1.2 Item	81006-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Identification tag wires missing both side the cable (TR-100AD1/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:11:51.815Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:12:09.012Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-04

Signature: Digitaly signed by Giovanni Tangianu 2025-02-04T12:47:02.152Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001574

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002125	1.4 Discipline	Electrical
1.2 Item	81006-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:12:48.565Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:13:06.480Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE.

Name: Giovanni Tangianu

Date: 2024-12-30

Signature: Digitaly signed by Giovanni Tangianu 2024-12-30T12:39:00.100Z

6- CLEARANCE APPROVAL

Name

Date

Signature


81012-CEC

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001575

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002125	1.4 Discipline	Electrical
1.2 Item	81006-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Spare cores to be properly isolated both side the cable.
(TR-100AD1/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:13:33.739Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:13:54.915Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-01-30

Signature: Digitaly signed by Alessio Polo 2025-01-30T16:30:48.809Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001576

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002125	1.4 Discipline	Electrical
1.2 Item	81006-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable tags on routing, inside and outside the panels TR-100AD1/SG-100D1 Panel A6)

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:14:28.060Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:14:44.438Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-04

Signature: Digitaly signed by Giovanni Tangianu 2025-02-04T12:46:46.806Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001577

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002124	1.4 Discipline	Electrical
1.2 Item	81005-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:22:22.367Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:22:37.961Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-19

Signature: Digitaly signed by Andrea Andreani 2025-02-19T15:45:42.274Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001578

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002124	1.4 Discipline	Electrical
1.2 Item	81005-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:23:20.492Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:23:36.475Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE.

Name: Giovanni Tangianu

Date: 2024-12-30

Signature: Digitaly signed by Giovanni Tangianu 2024-12-30T12:39:11.505Z

6- CLEARANCE APPROVAL

Name

Date

Signature


81012-CEC

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001579

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002124	1.4 Discipline	Electrical
1.2 Item	81005-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Spare cores to be properly isolated both side the cable.
(CP-100E4/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:24:23.835Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:24:40.843Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

spare core is properly isolated.

Name: Giovanni Tangianu

Date: 2025-02-04

Signature: Digitaly signed by Giovanni Tangianu 2025-02-04T12:46:04.293Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001580

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002124	1.4 Discipline	Electrical
1.2 Item	81005-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:25:52.222Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:26:09.044Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-21

Signature: Digitaly signed by Giovanni Tangianu 2025-02-21T15:39:16.973Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001581

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002123	1.4 Discipline	Electrical
1.2 Item	81004-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:28:52.529Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:29:18.646Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

Signature: Digitaly signed by Andrea Andreani 2025-02-15T17:24:23.998Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001582

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002123	1.4 Discipline	Electrical
1.2 Item	81004-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:30:02.048Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:30:18.224Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE.

Name: Giovanni Tangianu

Date: 2024-12-30

Signature: Digitaly signed by Giovanni Tangianu 2024-12-30T12:39:22.240Z

6- CLEARANCE APPROVAL

Name

Date

Signature


81012-CEC

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001583

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002123	1.4 Discipline	Electrical
1.2 Item	81004-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Spare cores to be properly isolated both side the cable.
(CP-100E4/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:30:44.927Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:31:00.266Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Isolated.

Name: Giovanni Tangianu

Date: 2025-02-04

Signature: Digitaly signed by Giovanni Tangianu 2025-02-04T12:46:07.591Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001584

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002123	1.4 Discipline	Electrical
1.2 Item	81004-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:31:31.337Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:31:56.994Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

Installed.

Name: Giovanni Tangianu

Date: 2025-02-21

Signature: Digitaly signed by Giovanni Tangianu 2025-02-21T15:39:26.122Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001585

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002122	1.4 Discipline	Electrical
1.2 Item	81003-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Identification tag wires missing both side the cable (CP-100E4/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:34:08.395Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:34:22.771Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

Signature: Digitaly signed by Andrea Andreani 2025-02-15T17:24:31.118Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001586

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002122	1.4 Discipline	Electrical
1.2 Item	81003-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

The cable is not protected before entering the panel . (SG-100D1 panel A6) See attached photo-

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:35:07.852Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Giovanni Tangianu
3.4 Activity code	MC Mechanical Completion	Date	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:35:22.953Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE.

Name: Giovanni Tangianu

Date: 2024-12-30

Signature: Digitaly signed by Giovanni Tangianu 2024-12-30T12:39:32.541Z

6- CLEARANCE APPROVAL

Name

Date

Signature


81012-CEC

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001587

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002122	1.4 Discipline	Electrical
1.2 Item	81003-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Spare cores to be properly isolated both side the cable.
(CP-100E4/SG-100D1 Panel A6).

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:36:05.422Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:36:19.287Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-01-30

Signature: Digitaly signed by Alessio Polo 2025-01-30T16:30:55.294Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001588

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002122	1.4 Discipline	Electrical
1.2 Item	81003-CEC		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable tags on routing, inside and outside the panels CP-100E4/SG-100D1 Panel A6)

Name: Giovanni Tangianu

Date: 2024-12-09

Signature: Digitaly signed by Giovanni Tangianu 2024-12-09T09:37:55.642Z

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	2024-12-09
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Giovanni Tangianu 2024-12-09T09:38:16.860Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-01-30

Signature: Digitaly signed by Alessio Polo 2025-01-30T16:31:03.026Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001889

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000468	1.4 Discipline	Electrical
1.2 Item	82001-CEM-1-L1		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable cleats stainless steel with TPE cable protection.
Point valid also for 82001-CEM-1-L2 and 82001-CEM-1-L3

Name: Paolo Schintu

Date: 2024-12-16

Signature: Digitaly signed by Paolo Schintu 2024-12-16T12:58:40.719Z

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	2024-12-16
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-16T12:58:50.281Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Eleonora Carotenuto

Date: 2025-01-03

Signature: Digitaly signed by Eleonora Carotenuto 2025-01-03T17:01:13.454Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001890

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000468	1.4 Discipline	Electrical
1.2 Item	82001-CEM-1-L1		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable tag on routing. Point valid also for 82001-CEM-1-L2, 82001-CEM-1-L3, 82001-CEM-2-L1, 82001-CEM-2-L2, 82001-CEM-2-L3

Name: Paolo Schintu

Date: 2024-12-16

Signature: Digitaly signed by Paolo Schintu 2024-12-16T13:20:00.895Z

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	2024-12-16
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-16T13:20:13.772Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-26

Signature: Digitaly signed by Paolo Schintu 2025-02-26T13:01:14.995Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001938

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002130	1.4 Discipline	Electrical
1.2 Item	82002-CEC		6.6KV HV Switchgear / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable tag CP-100E3 Transformer side

Name: Paolo Schintu

Date: 2024-12-17

Signature: Digitaly signed by Paolo Schintu 2024-12-17T07:51:40.180Z

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	2024-12-17
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-17T07:51:50.088Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

INSTALLED

Name: Paolo Schintu

Date: 2025-02-07

Signature: Digitaly signed by Paolo Schintu 2025-02-07T09:11:12.197Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30001939

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10002130	1.4 Discipline	Electrical
1.2 Item	82002-CEC		6.6KV HV Switchgear / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing core identification tag CP-100E3 Transformer side

Name: Paolo Schintu

Date: 2024-12-17

Signature: Digitaly signed by Paolo Schintu 2024-12-17T07:55:15.673Z

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	2024-12-17
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-17T07:55:26.374Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

Signature: Digitaly signed by Andrea Andreani 2025-02-15T17:24:37.914Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30002020

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000469	1.4 Discipline	Electrical
1.2 Item	82001-CEM-2-L1		66kV, 7MVA Transformer / 6.6KV HV Switchgear
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable cleats stainless steel with TPE cable protection.
Point valid also for 82001-CEM-2-L2 and 82001-CEM-2-L3

Name: Paolo Schintu

Date: 2024-12-19

Signature: Digitaly signed by Paolo Schintu 2024-12-19T15:50:07.175Z

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	2024-12-19
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Paolo Schintu 2024-12-19T15:50:16.580Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

INSTALLED

Name: Paolo Schintu

Date: 2025-02-07

Signature: Digitaly signed by Paolo Schintu 2025-02-07T09:11:20.701Z

6- CLEARANCE APPROVAL

Name

Date

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30004144

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000465	1.4 Discipline	Electrical
1.2 Item	81002-CEH-L1		66kV GIS / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable Tag along the cable routing

Name: Josip Krizanic

Date: 2025-02-26

Signature: Digitaly signed by Josip Krizanic 2025-02-26T08:22:00.600Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Josip Krizanic
3.4 Activity code	MC Mechanical Completion	Date	2025-02-26
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Josip Krizanic 2025-02-26T08:22:21.363Z

4 - PERFORMED ACTION

Name

Date: 2025-03-13

Signature

5 - CLEARANCE CHECK

DONE

Name: Josip Krizanic

Date: 2025-03-13

Signature: Digitaly signed by Josip Krizanic 2025-03-13T15:42:40.267Z

6- CLEARANCE APPROVAL

Name

Date: 2025-03-13

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30004145

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000465	1.4 Discipline	Electrical
1.2 Item	81002-CEH-L1		66kV GIS / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Inside cabine B100 cable is touching panel GIS need be better dresed "see attached foto"

Name: Josip Krizanic

Date: 2025-02-26

Signature: Digitaly signed by Josip Krizanic 2025-02-26T08:24:52.480Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Josip Krizanic
3.4 Activity code	MC Mechanical Completion	Date	2025-02-26
3.5 Action by	VND Vendor	Signature	Digitaly signed by Josip Krizanic 2025-02-26T08:25:11.879Z

4 - PERFORMED ACTION

Name

Date: 2025-05-05

Signature

5 - CLEARANCE CHECK

All the cables have been arranged.See attached photo.

Name: Giovanni Tangianu

Date: 2025-05-05

Signature: Digitaly signed by Giovanni Tangianu 2025-05-05T10:46:53.984Z

6- CLEARANCE APPROVAL

Name

Date: 2025-05-05

Signature




81001-CEH-L1
81001-CEH-L3
81001-CEH-L2


81002-CEH-L1
81002-CEH-L3
81002-CEH-L2

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30004146

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000465	1.4 Discipline	Electrical
1.2 Item	81002-CEH-L1		66kV GIS / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Cable gland on trasformer side needs be tightened

Name: Josip Krizanic

Date: 2025-02-26

Signature: Digitaly signed by Josip Krizanic 2025-02-26T08:30:54.457Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Josip Krizanic
3.4 Activity code	MC Mechanical Completion	Date	2025-02-26
3.5 Action by	VND Vendor	Signature	Digitaly signed by Josip Krizanic 2025-02-26T08:38:53.519Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

“Accepted by RM as per attached Technical Assessment Report”

Name: Giovanni Tangianu

Date: 2025-05-23

Signature: Digitaly signed by Giovanni Tangianu 2025-05-23T07:56:01.807Z

6- CLEARANCE APPROVAL

Name

Date

Signature

Technical Assessment Report – HV Cable Gland Installation

Subject: Evaluation and Conditional Acceptance of HV Cable Entry – Transformer Side (Item Code: 81002-CEH-L1/L2/L3)

Prepared by: Raffaele Degli Esposti – PQM

Reviewed by: Sofia Marchetti – E/I CM

Reviewed by: Claudia Giunchi - PEM

1. Background

During installation activities, the MC raised punch list items regarding the adequacy of the cable glands installed on the transformer HV side (PL Numbers C30004146, C30004148, and C30004150). The main concern was that the M63 cable glands did not provide sufficient tightening, allowing a cable tie to be inserted through the gap.

An alternative solution has been implemented on-site to address the issue without necessitating the removal and replacement of the HV cables, which would be technically complex due to space limitations and cable shortages.

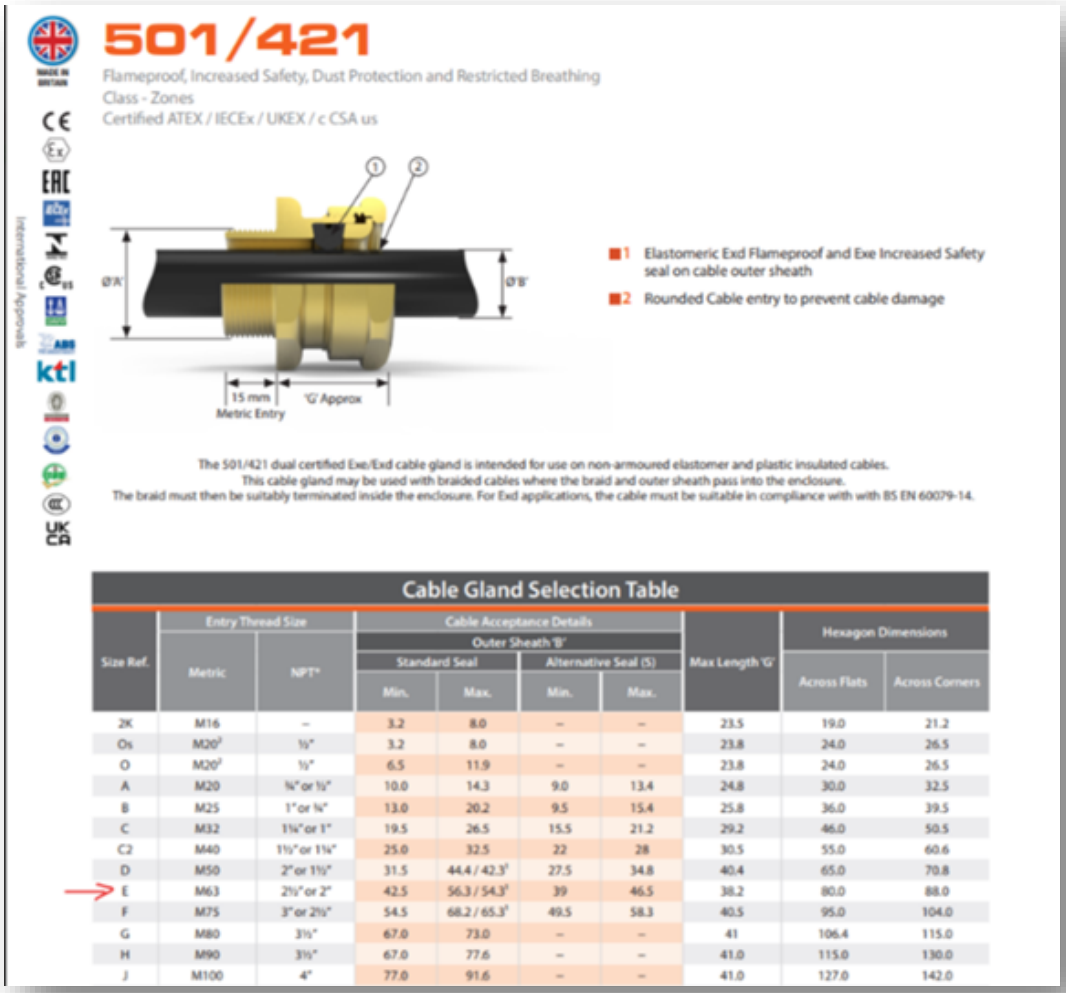
2. Site Conditions and Constraints

The following constraints supported the decision to avoid cable withdrawal:
- The installation area is extremely confined, making mechanical reworking impractical.
- Additional cable length is unavailable, and no spare cable is foreseen in the routing.
- The HV cable supplier was responsible for cable laying and terminations and did not raise any objection during or after completion.
- Disconnection and re-termination would pose a significant risk to cable integrity and require additional QA/QC verifications.

3. Installation Configuration

Based on the technical datasheet of the 501/421 cable gland (M63 size), the standard sealing range begins at 42.5 mm. The installed cable has an outer sheath diameter of approximately 42.3 ± 1 mm, as specified in the HV cable data sheet. This places it at the lower end of the sealing range, likely explaining the slight gap observed during inspection (e.g., the ability to insert a cable tie). The gland remains within its valid operating range, and the installation is technically acceptable.

Figure 1 – Technical datasheet extract for 501/421 cable gland (M63).



501/421

Flameproof, Increased Safety, Dust Protection and Restricted Breathing
Class - Zones
Certified ATEX / IECEx / UKEX / c CSA us

1 Elastomeric Exd Flameproof and Exe Increased Safety seal on cable outer sheath
2 Rounded Cable entry to prevent cable damage

The 501/421 dual certified Exe/Exd cable gland is intended for use on non-armoured elastomer and plastic insulated cables.
This cable gland may be used with braided cables where the braid and outer sheath pass into the enclosure.
The braid must then be suitably terminated inside the enclosure. For Exd applications, the cable must be suitable in compliance with with BS EN 60079-14.

Cable Gland Selection Table

Size Ref.	Entry Thread Size		Cable Acceptance Details – Outer Sheath 'B'				Max Length 'G'	Hexagon Dimensions	
	Metric	NPT*	Standard Seal		Alternative Seal (5)			Across Flats	Across Corners
			Min.	Max.	Min.	Max.			
2K	M16	–	3.2	8.0	–	–	23.5	19.0	21.2
Os	M20[3]	½"	3.2	8.0	–	–	23.8	24.0	26.5
O	M20[3]	½"	6.5	11.9	–	–	23.8	24.0	26.5
A	M20	¾" or ½"	10.0	14.3	9.0	13.4	24.8	30.0	32.5
B	M25	1" or ¾"	13.0	20.2	9.5	15.4	25.8	36.0	39.5
C	M32	1¼" or 1"	19.5	26.5	15.5	21.2	29.2	46.0	50.5
C2	M40	1½" or 1¼"	25.0	32.5	22	28	30.5	55.0	60.6
D	M50	2" or 1½"	31.5	44.4 / 42.3[1]	27.5	34.8	40.4	65.0	70.8
E	M63	2½" or 2"	42.5	56.3 / 54.3[1]	39	46.5	38.2	80.0	88.0
F	M75	3" or 2½"	54.5	68.2 / 65.3[1]	49.5	58.3	40.5	95.0	104.0
G	M80	3½"	67.0	73.0	–	–	41	106.4	115.0
H	M90	3½"	67.0	77.6	–	–	41.0	115.0	130.0
J	M100	4"	77.0	91.6	–	–	41.0	127.0	142.0

The as-built installation is configured as follows:

- The M63 cable glands are used not as clamping glands, but as simple mechanical entries, effectively functioning as pass-through devices.
- The required IP56 protection degree is ensured by the proper installation of the cable gland components, complemented externally by a silicone split-type heat-shrinkable sleeve, designed to restore sealing continuity around the cable.
- The sleeve installation was completed after gland assembly, encompassing both the cable and gland body, eliminating potential ingress paths.

4. Mechanical Stress and Cable Support Evaluation

To assess the mechanical reliability of the solution, the following aspects were inspected and verified:

- Visual inspection confirmed that the HV cables exit the gland in a straight and relaxed configuration, with a minimum of 10 cm of linear run.
- No signs of cable distortion or overbending were observed.
- The cables are properly supported with fixed clamps within 20–30 cm of the gland entries.
- During manual checks, no cable movement or play was detected, suggesting the routing is adequately stabilised.

5. Functional Evaluation

The current setup achieves the core functional requirements for this type of installation:

- IP56 rating is considered met through the use of cable gland components and an external sleeve.
- External supports and proper routing provide mechanical strain relief.
- No deviations from electrical design or termination integrity are introduced.
- The cable manufacturer has implicitly accepted the installation by completing terminations without objections.

6. Acceptance Criteria and Recommendation

Based on the findings, the following conclusions are drawn:

- The installation is technically acceptable under specific site conditions.
- The solution is a controlled deviation and must be documented and approved.
- Recommended actions:
  - Retain photographic records.
  - Archive the sleeve installation manual.
  - Include this configuration in the as-built documentation and plan a follow-up inspection.

Note on Protection Functions: The T-connector provides protection against gas and moisture ingress along the high-voltage connection (e.g., Euromold 430TB), which ensures electrical insulation and environmental sealing between the cable and the equipment.
Conversely, the ingress protection of the transformer protection box (e.g., IP56 or IP65 as specified) is guaranteed by the cable gland (e.g., M63), which prevents external dust and water from entering the enclosure.
Therefore, compliance with the specified IP rating for the box directly depends on the cable gland's proper installation and sealing performance.

7. Final Conclusion

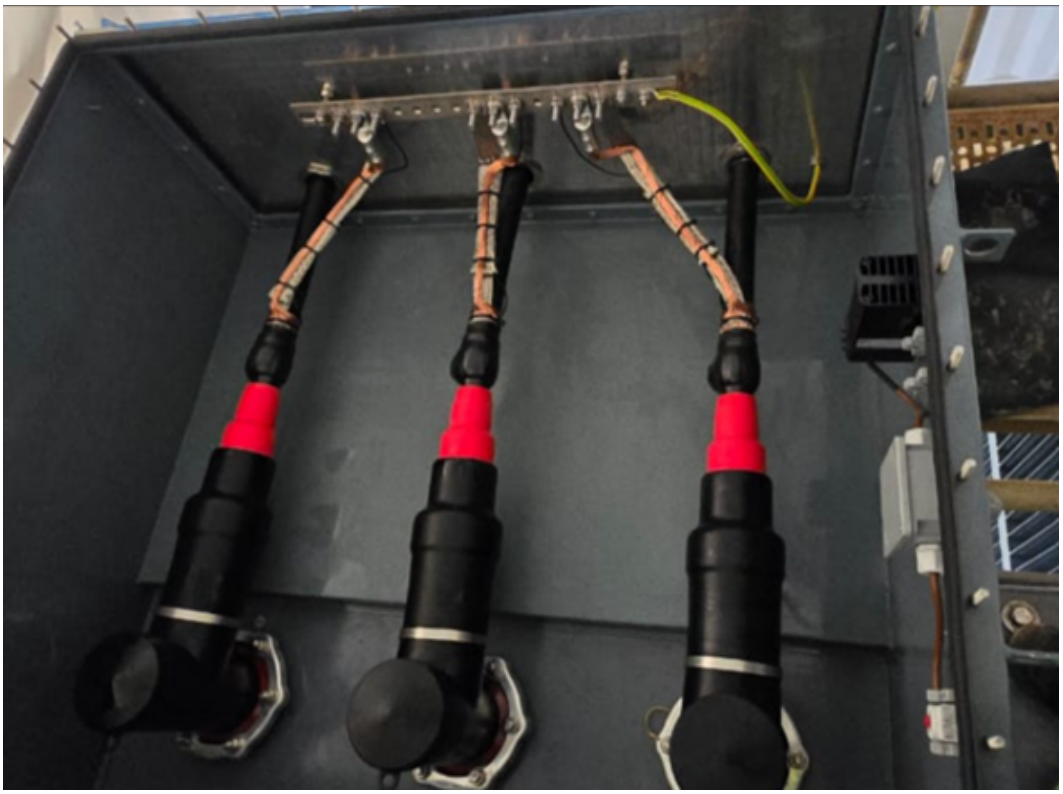
The HV cable gland installation, as modified with the use of a silicone heat-shrink sleeve and supported by evidence of good mechanical routing and absence of strain, is considered acceptable for service. Installation constraints justify the solution and can be formally closed as resolved punch items.

Annexe A – Installation Photo Documentation

Figure 2 – Restricted space area during HV cable installation.



Figure 3 – Final HV cable termination inside transformer box.



ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30004147

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000466	1.4 Discipline	Electrical
1.2 Item	81002-CEH-L2		66kV GIS / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable Tag along the cable routing

Name: Josip Krizanic

Date: 2025-02-26

Signature: Digitaly signed by Josip Krizanic 2025-02-26T08:40:13.580Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Josip Krizanic
3.4 Activity code	MC Mechanical Completion	Date	2025-02-26
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Josip Krizanic 2025-02-26T08:40:27.129Z

4 - PERFORMED ACTION

Name

Date: 2025-03-13

Signature

5 - CLEARANCE CHECK

DONE

Name: Josip Krizanic

Date: 2025-03-13

Signature: Digitaly signed by Josip Krizanic 2025-03-13T15:42:50.461Z

6- CLEARANCE APPROVAL

Name

Date: 2025-03-13

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30004148

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000466	1.4 Discipline	Electrical
1.2 Item	81002-CEH-L2		66kV GIS / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Cable glands on the trasformer side needs be tightened

Name: Josip Krizanic

Date: 2025-02-26

Signature: Digitaly signed by Josip Krizanic 2025-02-26T08:41:06.584Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Josip Krizanic
3.4 Activity code	MC Mechanical Completion	Date	2025-02-26
3.5 Action by	VND Vendor	Signature	Digitaly signed by Josip Krizanic 2025-02-26T08:41:20.069Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

“Accepted by RM as per attached Technical Assessment Report”

Name: Giovanni Tangianu

Date: 2025-05-23

Signature: Digitaly signed by Giovanni Tangianu 2025-05-23T07:58:36.743Z

6- CLEARANCE APPROVAL

Name

Date

Signature

Technical Assessment Report – HV Cable Gland Installation

Subject: Evaluation and Conditional Acceptance of HV Cable Entry – Transformer Side (Item Code: 81002-CEH-L1/L2/L3)

Prepared by: Raffaele Degli Esposti – PQM

Reviewed by: Sofia Marchetti – E/I CM

Reviewed by: Claudia Giunchi - PEM

1. Background

During installation activities, the MC raised punch list items regarding the adequacy of the cable glands installed on the transformer HV side (PL Numbers C30004146, C30004148, and C30004150). The main concern was that the M63 cable glands did not provide sufficient tightening, allowing a cable tie to be inserted through the gap.

An alternative solution has been implemented on-site to address the issue without necessitating the removal and replacement of the HV cables, which would be technically complex due to space limitations and cable shortages.

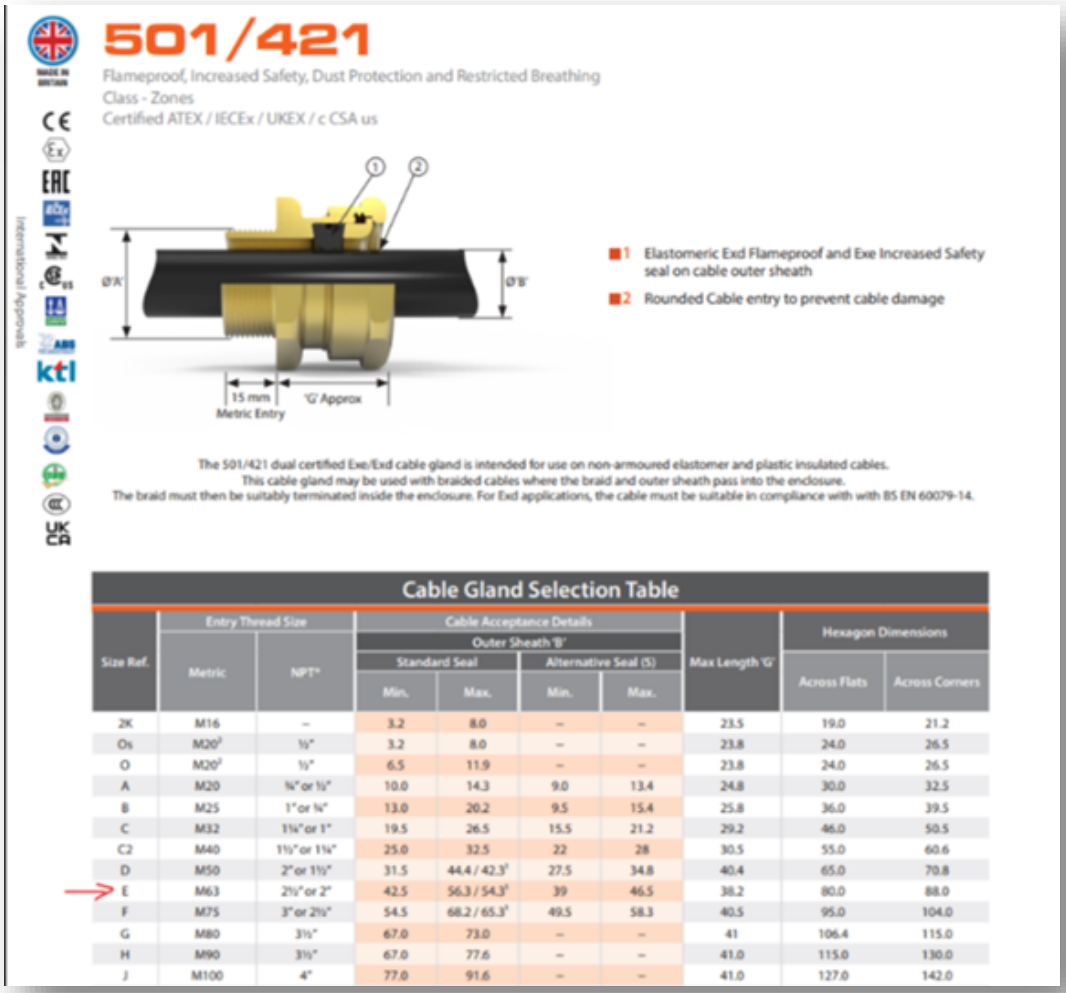
2. Site Conditions and Constraints

The following constraints supported the decision to avoid cable withdrawal:
- The installation area is extremely confined, making mechanical reworking impractical.
- Additional cable length is unavailable, and no spare cable is foreseen in the routing.
- The HV cable supplier was responsible for cable laying and terminations and did not raise any objection during or after completion.
- Disconnection and re-termination would pose a significant risk to cable integrity and require additional QA/QC verifications.

3. Installation Configuration

Based on the technical datasheet of the 501/421 cable gland (M63 size), the standard sealing range begins at 42.5 mm. The installed cable has an outer sheath diameter of approximately 42.3 ± 1 mm, as specified in the HV cable data sheet. This places it at the lower end of the sealing range, likely explaining the slight gap observed during inspection (e.g., the ability to insert a cable tie). The gland remains within its valid operating range, and the installation is technically acceptable.

Figure 1 – Technical datasheet extract for 501/421 cable gland (M63).



501/421

Flameproof, Increased Safety, Dust Protection and Restricted Breathing
Class - Zones
Certified ATEX / IECEx / UKEX / c CSA us

1 Elastomeric Exd Flameproof and Exe Increased Safety seal on cable outer sheath
2 Rounded Cable entry to prevent cable damage

The 501/421 dual certified Exe/Exd cable gland is intended for use on non-armoured elastomer and plastic insulated cables.
This cable gland may be used with braided cables where the braid and outer sheath pass into the enclosure.
The braid must then be suitably terminated inside the enclosure. For Exd applications, the cable must be suitable in compliance with with BS EN 60079-14.

Cable Gland Selection Table

Size Ref.	Entry Thread Size		Cable Acceptance Details – Outer Sheath 'B'				Max Length 'G'	Hexagon Dimensions	
	Metric	NPT*	Standard Seal		Alternative Seal (5)			Across Flats	Across Corners
			Min.	Max.	Min.	Max.			
2K	M16	–	3.2	8.0	–	–	23.5	19.0	21.2
Os	M20[3]	½"	3.2	8.0	–	–	23.8	24.0	26.5
O	M20[3]	½"	6.5	11.9	–	–	23.8	24.0	26.5
A	M20	¾" or ½"	10.0	14.3	9.0	13.4	24.8	30.0	32.5
B	M25	1" or ¾"	13.0	20.2	9.5	15.4	25.8	36.0	39.5
C	M32	1¼" or 1"	19.5	26.5	15.5	21.2	29.2	46.0	50.5
C2	M40	1½" or 1¼"	25.0	32.5	22	28	30.5	55.0	60.6
D	M50	2" or 1½"	31.5	44.4 / 42.3[1]	27.5	34.8	40.4	65.0	70.8
E	M63	2½" or 2"	42.5	56.3 / 54.3[1]	39	46.5	38.2	80.0	88.0
F	M75	3" or 2½"	54.5	68.2 / 65.3[1]	49.5	58.3	40.5	95.0	104.0
G	M80	3½"	67.0	73.0	–	–	41	106.4	115.0
H	M90	3½"	67.0	77.6	–	–	41.0	115.0	130.0
J	M100	4"	77.0	91.6	–	–	41.0	127.0	142.0

The as-built installation is configured as follows:

- The M63 cable glands are used not as clamping glands, but as simple mechanical entries, effectively functioning as pass-through devices.
- The required IP56 protection degree is ensured by the proper installation of the cable gland components, complemented externally by a silicone split-type heat-shrinkable sleeve, designed to restore sealing continuity around the cable.
- The sleeve installation was completed after gland assembly, encompassing both the cable and gland body, eliminating potential ingress paths.

4. Mechanical Stress and Cable Support Evaluation

To assess the mechanical reliability of the solution, the following aspects were inspected and verified:

- Visual inspection confirmed that the HV cables exit the gland in a straight and relaxed configuration, with a minimum of 10 cm of linear run.
- No signs of cable distortion or overbending were observed.
- The cables are properly supported with fixed clamps within 20–30 cm of the gland entries.
- During manual checks, no cable movement or play was detected, suggesting the routing is adequately stabilised.

5. Functional Evaluation

The current setup achieves the core functional requirements for this type of installation:

- IP56 rating is considered met through the use of cable gland components and an external sleeve.
- External supports and proper routing provide mechanical strain relief.
- No deviations from electrical design or termination integrity are introduced.
- The cable manufacturer has implicitly accepted the installation by completing terminations without objections.

6. Acceptance Criteria and Recommendation

Based on the findings, the following conclusions are drawn:

- The installation is technically acceptable under specific site conditions.
- The solution is a controlled deviation and must be documented and approved.
- Recommended actions:
  - Retain photographic records.
  - Archive the sleeve installation manual.
  - Include this configuration in the as-built documentation and plan a follow-up inspection.

Note on Protection Functions: The T-connector provides protection against gas and moisture ingress along the high-voltage connection (e.g., Euromold 430TB), which ensures electrical insulation and environmental sealing between the cable and the equipment.
Conversely, the ingress protection of the transformer protection box (e.g., IP56 or IP65 as specified) is guaranteed by the cable gland (e.g., M63), which prevents external dust and water from entering the enclosure.
Therefore, compliance with the specified IP rating for the box directly depends on the cable gland's proper installation and sealing performance.

7. Final Conclusion

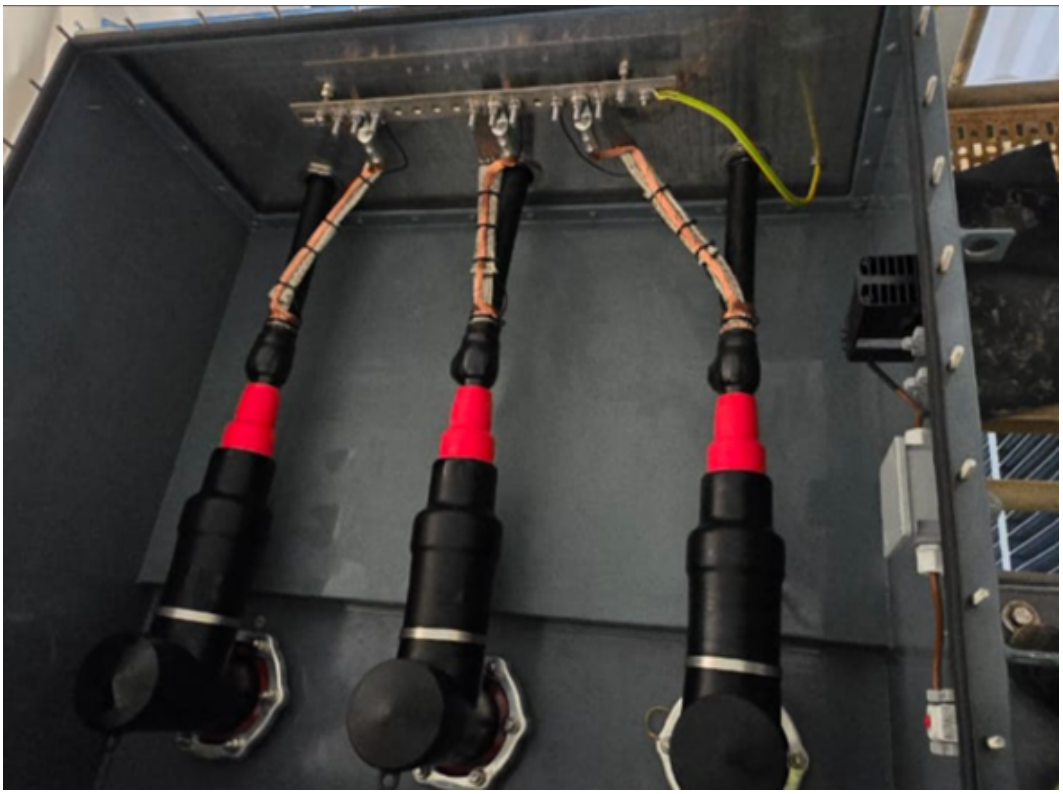
The HV cable gland installation, as modified with the use of a silicone heat-shrink sleeve and supported by evidence of good mechanical routing and absence of strain, is considered acceptable for service. Installation constraints justify the solution and can be formally closed as resolved punch items.

Annexe A – Installation Photo Documentation

Figure 2 – Restricted space area during HV cable installation.



Figure 3 – Final HV cable termination inside transformer box.



ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30004149

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000467	1.4 Discipline	Electrical
1.2 Item	81002-CEH-L3		66kV GIS / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Missing cable Tag along the cable routing

Name: Josip Krizanic

Date: 2025-02-26

Signature: Digitaly signed by Josip Krizanic 2025-02-26T08:42:39.611Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Josip Krizanic
3.4 Activity code	MC Mechanical Completion	Date	2025-02-26
3.5 Action by	RM_CONSTR RM	Signature	Digitaly signed by Josip Krizanic 2025-02-26T08:42:58.093Z

4 - PERFORMED ACTION

Name

Date: 2025-03-13

Signature

5 - CLEARANCE CHECK

DONE

Name: Josip Krizanic

Date: 2025-03-13

Signature: Digitaly signed by Josip Krizanic 2025-03-13T15:43:23.361Z

6- CLEARANCE APPROVAL

Name

Date: 2025-03-13

Signature

ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30004150

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000467	1.4 Discipline	Electrical
1.2 Item	81002-CEH-L3		66kV GIS / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Cable gland on the trasformer side needs be tightened

Name: Josip Krizanic

Date: 2025-02-26

Signature: Digitaly signed by Josip Krizanic 2025-02-26T08:43:43.898Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	A PL A	Name	Josip Krizanic
3.4 Activity code	MC Mechanical Completion	Date	2025-02-26
3.5 Action by	VND Vendor	Signature	Digitaly signed by Josip Krizanic 2025-02-26T08:43:58.736Z

4 - PERFORMED ACTION

Name

Date

Signature

5 - CLEARANCE CHECK

“Accepted by RM as per attached Technical Assessment Report”

Name: Giovanni Tangianu

Date: 2025-05-23

Signature: Digitaly signed by Giovanni Tangianu 2025-05-23T07:59:14.014Z

6- CLEARANCE APPROVAL

Name

Date

Signature

Technical Assessment Report – HV Cable Gland Installation

Subject: Evaluation and Conditional Acceptance of HV Cable Entry – Transformer Side (Item Code: 81002-CEH-L1/L2/L3)

Prepared by: Raffaele Degli Esposti – PQM

Reviewed by: Sofia Marchetti – E/I CM

Reviewed by: Claudia Giunchi - PEM

1. Background

During installation activities, the MC raised punch list items regarding the adequacy of the cable glands installed on the transformer HV side (PL Numbers C30004146, C30004148, and C30004150). The main concern was that the M63 cable glands did not provide sufficient tightening, allowing a cable tie to be inserted through the gap.

An alternative solution has been implemented on-site to address the issue without necessitating the removal and replacement of the HV cables, which would be technically complex due to space limitations and cable shortages.

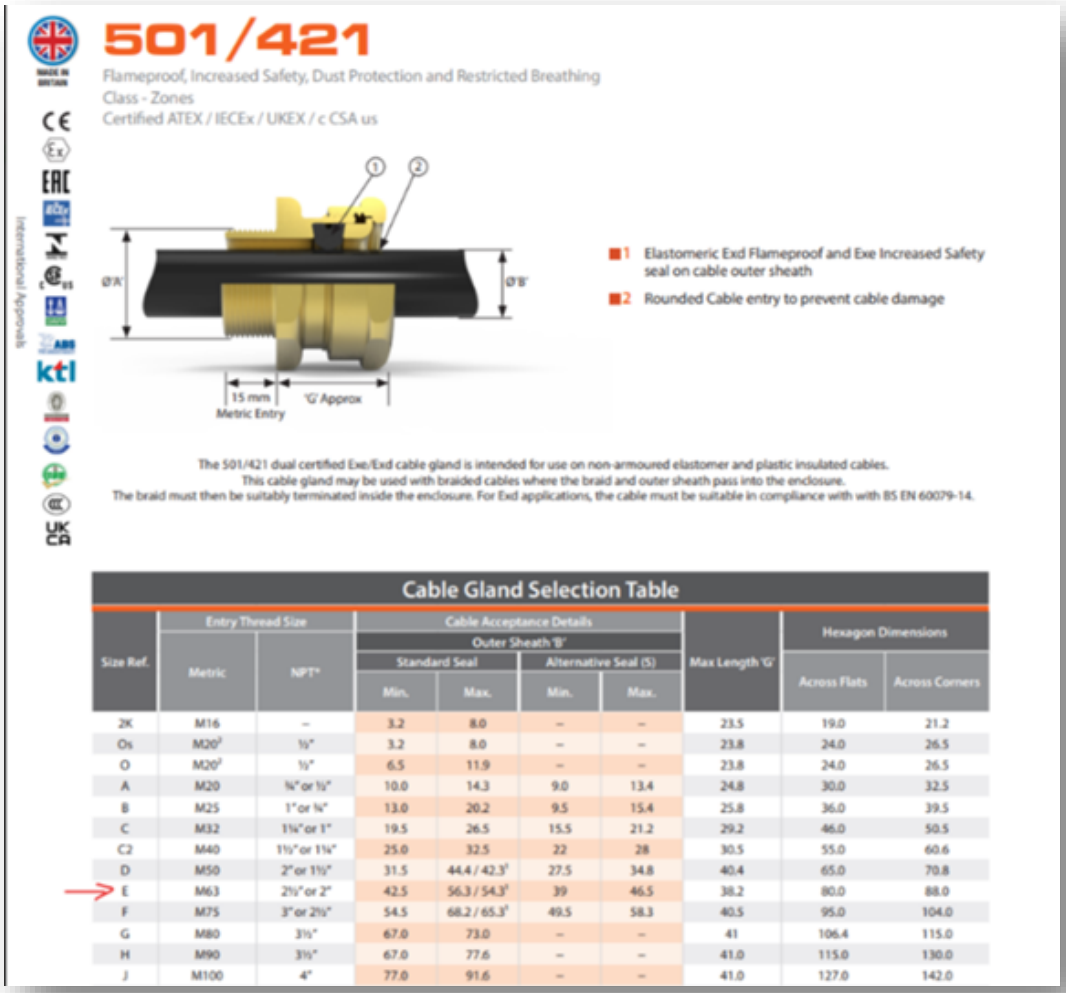
2. Site Conditions and Constraints

The following constraints supported the decision to avoid cable withdrawal:
- The installation area is extremely confined, making mechanical reworking impractical.
- Additional cable length is unavailable, and no spare cable is foreseen in the routing.
- The HV cable supplier was responsible for cable laying and terminations and did not raise any objection during or after completion.
- Disconnection and re-termination would pose a significant risk to cable integrity and require additional QA/QC verifications.

3. Installation Configuration

Based on the technical datasheet of the 501/421 cable gland (M63 size), the standard sealing range begins at 42.5 mm. The installed cable has an outer sheath diameter of approximately 42.3 ± 1 mm, as specified in the HV cable data sheet. This places it at the lower end of the sealing range, likely explaining the slight gap observed during inspection (e.g., the ability to insert a cable tie). The gland remains within its valid operating range, and the installation is technically acceptable.

Figure 1 – Technical datasheet extract for 501/421 cable gland (M63).



501/421

Flameproof, Increased Safety, Dust Protection and Restricted Breathing
Class - Zones
Certified ATEX / IECEx / UKEX / c CSA us

1 Elastomeric Exd Flameproof and Exe Increased Safety seal on cable outer sheath
2 Rounded Cable entry to prevent cable damage

The 501/421 dual certified Exe/Exd cable gland is intended for use on non-armoured elastomer and plastic insulated cables.
This cable gland may be used with braided cables where the braid and outer sheath pass into the enclosure.
The braid must then be suitably terminated inside the enclosure. For Exd applications, the cable must be suitable in compliance with with BS EN 60079-14.

Cable Gland Selection Table

Size Ref.	Entry Thread Size		Cable Acceptance Details – Outer Sheath 'B'				Max Length 'G'	Hexagon Dimensions	
	Metric	NPT*	Standard Seal		Alternative Seal (5)			Across Flats	Across Corners
			Min.	Max.	Min.	Max.			
2K	M16	–	3.2	8.0	–	–	23.5	19.0	21.2
Os	M20[3]	½"	3.2	8.0	–	–	23.8	24.0	26.5
O	M20[3]	½"	6.5	11.9	–	–	23.8	24.0	26.5
A	M20	¾" or ½"	10.0	14.3	9.0	13.4	24.8	30.0	32.5
B	M25	1" or ¾"	13.0	20.2	9.5	15.4	25.8	36.0	39.5
C	M32	1¼" or 1"	19.5	26.5	15.5	21.2	29.2	46.0	50.5
C2	M40	1½" or 1¼"	25.0	32.5	22	28	30.5	55.0	60.6
D	M50	2" or 1½"	31.5	44.4 / 42.3[1]	27.5	34.8	40.4	65.0	70.8
E	M63	2½" or 2"	42.5	56.3 / 54.3[1]	39	46.5	38.2	80.0	88.0
F	M75	3" or 2½"	54.5	68.2 / 65.3[1]	49.5	58.3	40.5	95.0	104.0
G	M80	3½"	67.0	73.0	–	–	41	106.4	115.0
H	M90	3½"	67.0	77.6	–	–	41.0	115.0	130.0
J	M100	4"	77.0	91.6	–	–	41.0	127.0	142.0

The as-built installation is configured as follows:

- The M63 cable glands are used not as clamping glands, but as simple mechanical entries, effectively functioning as pass-through devices.
- The required IP56 protection degree is ensured by the proper installation of the cable gland components, complemented externally by a silicone split-type heat-shrinkable sleeve, designed to restore sealing continuity around the cable.
- The sleeve installation was completed after gland assembly, encompassing both the cable and gland body, eliminating potential ingress paths.

4. Mechanical Stress and Cable Support Evaluation

To assess the mechanical reliability of the solution, the following aspects were inspected and verified:

- Visual inspection confirmed that the HV cables exit the gland in a straight and relaxed configuration, with a minimum of 10 cm of linear run.
- No signs of cable distortion or overbending were observed.
- The cables are properly supported with fixed clamps within 20–30 cm of the gland entries.
- During manual checks, no cable movement or play was detected, suggesting the routing is adequately stabilised.

5. Functional Evaluation

The current setup achieves the core functional requirements for this type of installation:

- IP56 rating is considered met through the use of cable gland components and an external sleeve.
- External supports and proper routing provide mechanical strain relief.
- No deviations from electrical design or termination integrity are introduced.
- The cable manufacturer has implicitly accepted the installation by completing terminations without objections.

6. Acceptance Criteria and Recommendation

Based on the findings, the following conclusions are drawn:

- The installation is technically acceptable under specific site conditions.
- The solution is a controlled deviation and must be documented and approved.
- Recommended actions:
  - Retain photographic records.
  - Archive the sleeve installation manual.
  - Include this configuration in the as-built documentation and plan a follow-up inspection.

Note on Protection Functions: The T-connector provides protection against gas and moisture ingress along the high-voltage connection (e.g., Euromold 430TB), which ensures electrical insulation and environmental sealing between the cable and the equipment.
Conversely, the ingress protection of the transformer protection box (e.g., IP56 or IP65 as specified) is guaranteed by the cable gland (e.g., M63), which prevents external dust and water from entering the enclosure.
Therefore, compliance with the specified IP rating for the box directly depends on the cable gland's proper installation and sealing performance.

7. Final Conclusion

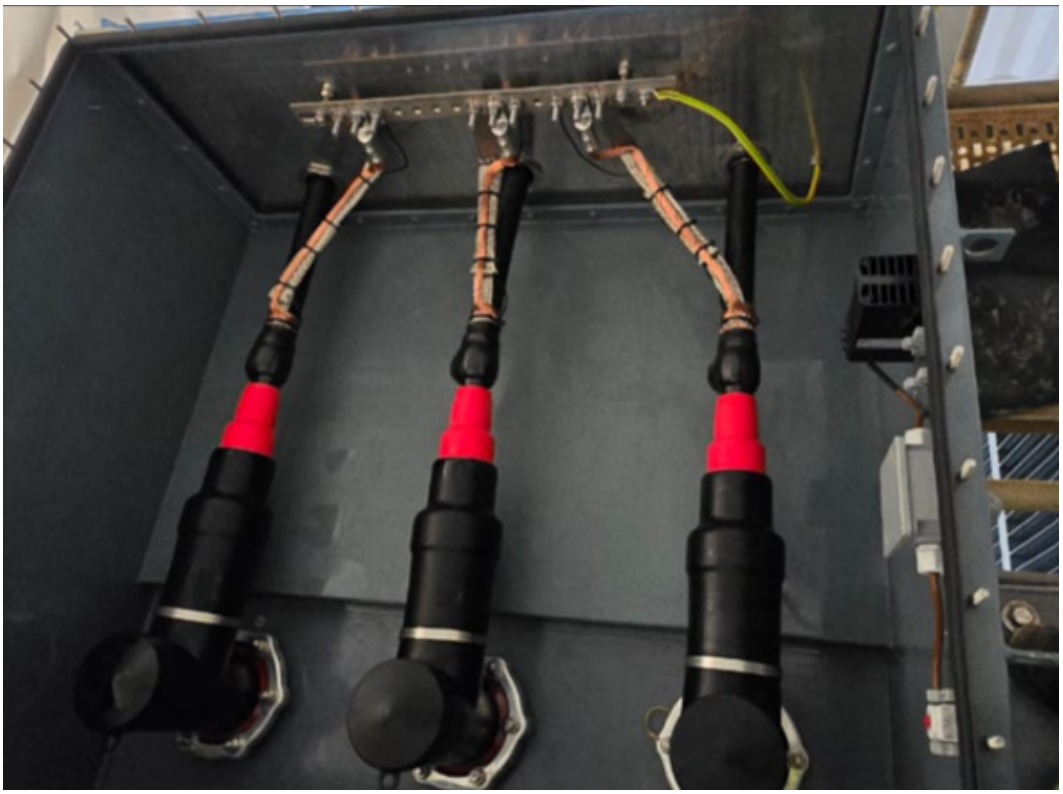
The HV cable gland installation, as modified with the use of a silicone heat-shrink sleeve and supported by evidence of good mechanical routing and absence of strain, is considered acceptable for service. Installation constraints justify the solution and can be formally closed as resolved punch items.

Annexe A – Installation Photo Documentation

Figure 2 – Restricted space area during HV cable installation.



Figure 3 – Final HV cable termination inside transformer box.



ROSETTI MARINO
CROSSWIND

PUNCH ITEM ENTRY / CLEARANCE FORM

C30004151

PROVERLIS

1 -ELEMENT IDENTIFICATION

1.1 Task	C10000467	1.4 Discipline	Electrical
1.2 Item	81002-CEH-L3		66kV GIS / 66/6.6 kV, 7MVA Transformer
1.3 Subsystem	81-20		Power Transformer 7 MVA (TR-100AD1)

2 - OBSERVATION

Cable touching structural support on the side trasformer "see foto"

Name: Josip Krizanic

Date: 2025-02-26

Signature: Digitaly signed by Josip Krizanic 2025-02-26T08:48:22.789Z

3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

3.3 Priority	B PL B	Name	Josip Krizanic
3.4 Activity code	MC Mechanical Completion	Date	2025-02-26
3.5 Action by	VND Vendor	Signature	Digitaly signed by Josip Krizanic 2025-02-26T08:48:43.464Z

4 - PERFORMED ACTION

Name

Date: 2025-05-05

Signature

5 - CLEARANCE CHECK

The cable was insulated from the structure. See attached photo.

Name: Giovanni Tangianu

Date: 2025-05-05

Signature: Digitaly signed by Giovanni Tangianu 2025-05-05T12:46:36.323Z

6- CLEARANCE APPROVAL

Name

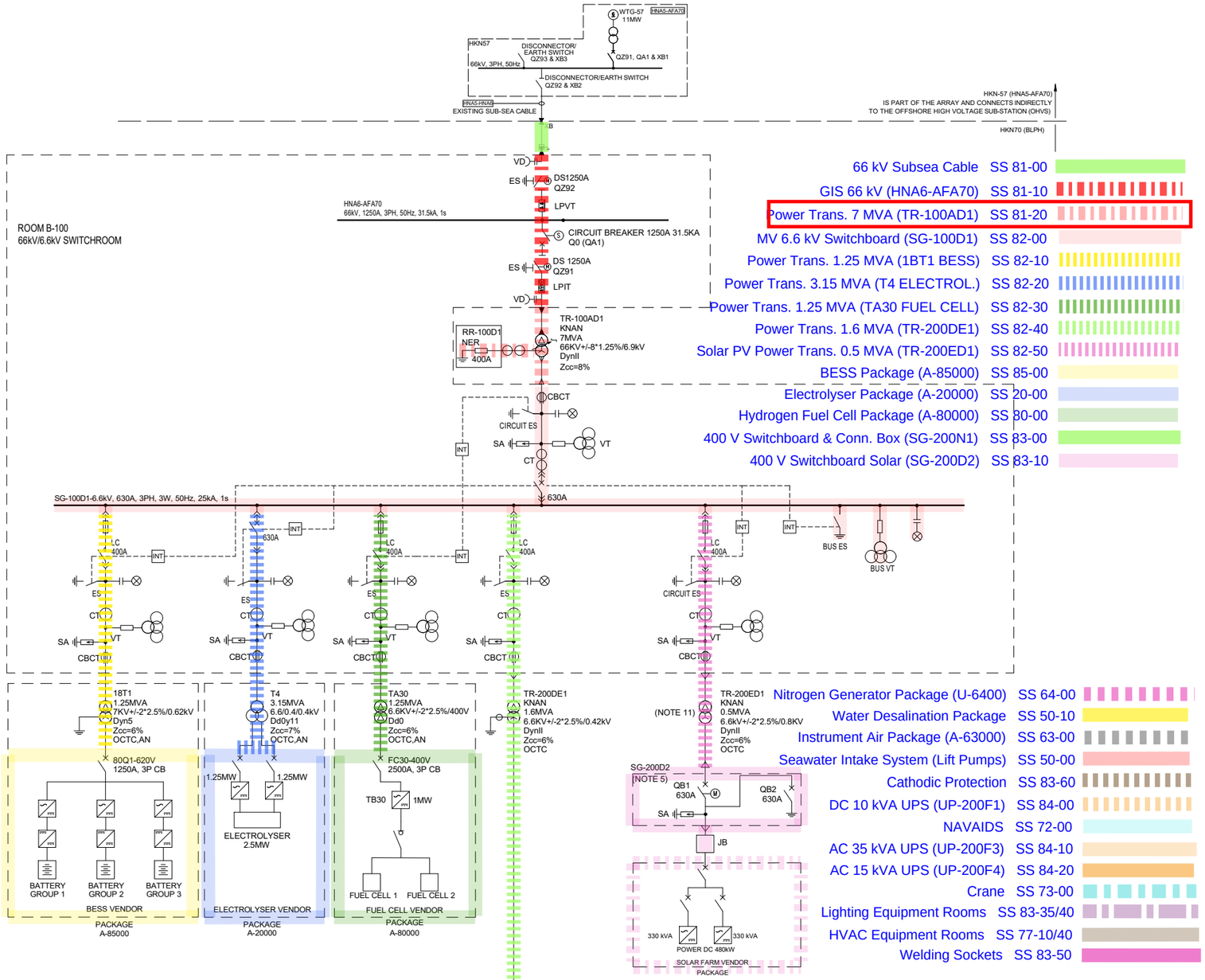
Date: 2025-05-05

Signature



Section 3 SYSTEM,SUB-SYSTEM LIMIT DRAWINGS

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 :

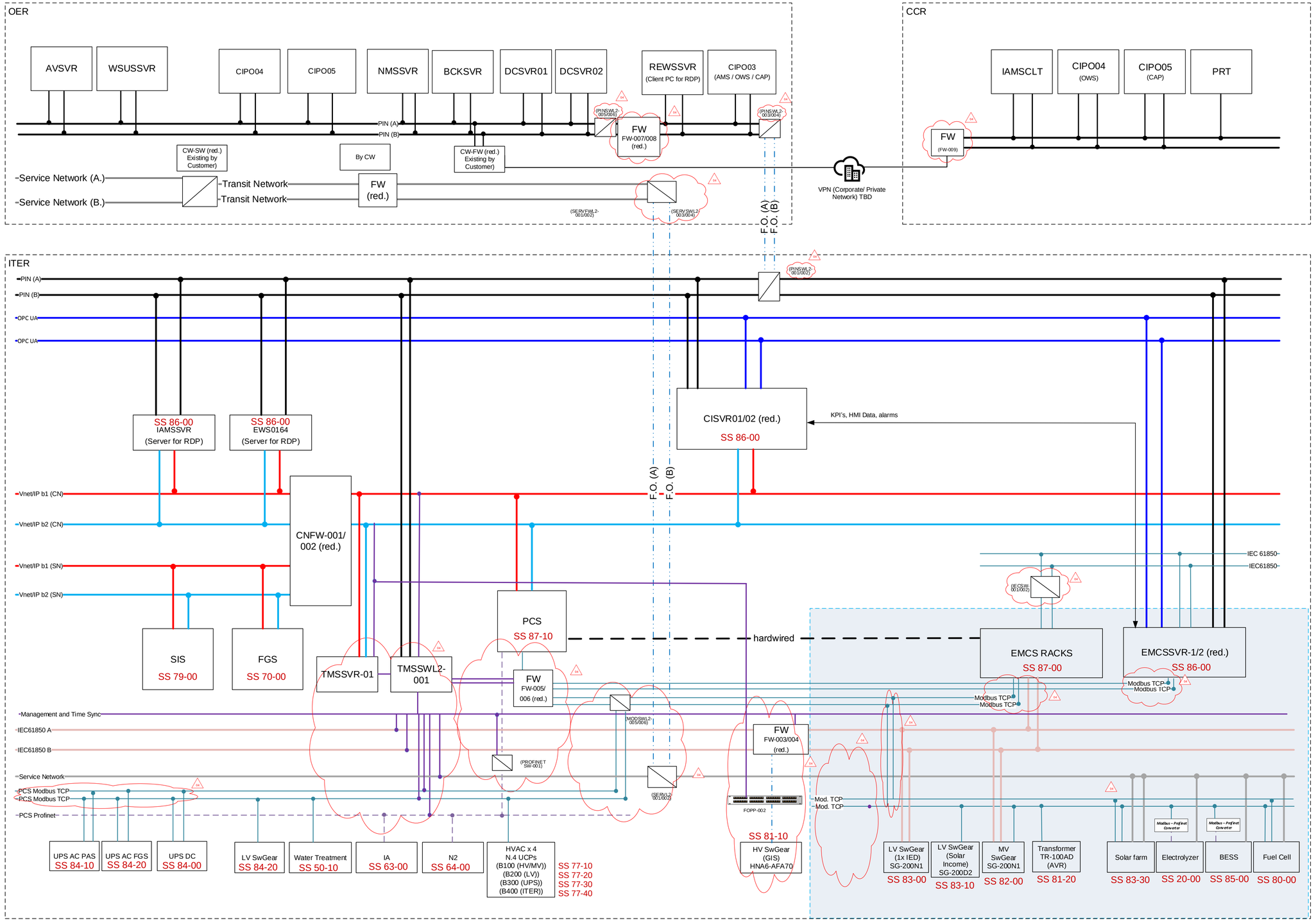
OVERALL/KEY SINGLE LINE DIAGRAM

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

CROSSWIND BLPH PROJECT - SYSTEM BLOCK DIAGRAM



AMS	: Alarm Management System	FCS	: Field Control Station
AV	: Anti-virus	FGS	: Fire & Gas System
BCK	: Backup Server	FO	: Fiber Optic
BESS	: Battery Energy Storage System	FOPP	: Fiber Optic Patch Panel (by others)
BLPH	: Base Load Power Hub	FTA	: Field Termination Assembly
CAP	: Critical Alarm Panel	HIST	: Historian
CCR	: Central Control Room	HKN	: Hollandse Kust Noord
CI	: Collaborative Infomation	IAMS	: Instrument Asset Management System
CN	: Control Network	ITER	: Instrument & Telecom Equipment Room
DC	: Domain Controller	LHVS	: Land High Voltage Station
DMZ	: De-militarized Zone	MCC	: Motor Control Center
ESB	: IO communication bus	MODB	: Modbus
EWS	: Engineering Work Station	MQTT	: Message Queuing Telemetry Transport
FC	: Field Communication (Vnet/IP)	NMS	: Network Management System
OER	: Onshore Equipment Room		
OHVS	: Offshore High Voltage Station		
OWS	: Operator Work Station		
PIN	: Plant Information Network		
PKG	: Package		
RDP	: Remote Desktop Protocol		
SCS	: Safety Control Station		
SIS	: Safety Instrumented System		
SN	: Safety Network		
SW	: Switch		
UCP	: Unit Control Panel (3rd party systems)		
VM	: Virtual Machine		
Vnet/IP	: Yokogawa's Control network		
WSUS	: Windows Security Update Services		

LEGEND:

- PIN (Plant Information Network)
- Vnet/IP BUS 1 PCS
- Vnet/IP BUS 2 PCS
- Vnet/IP BUS 1 SIS/FGS
- Vnet/IP BUS 2 SIS/FGS
- ESB bus connection
- IEC61850 connection
- OPC UA connection
- Service Network connection
- Modbus TCP connection
- Profinet (non redundant)
- Fiber Optic Patch Cords
- Fiber Optic connection (core by Crosswind)
- Fiber Optic backbone (by Crosswind)
- System Cable connection
- Management and Time sync.

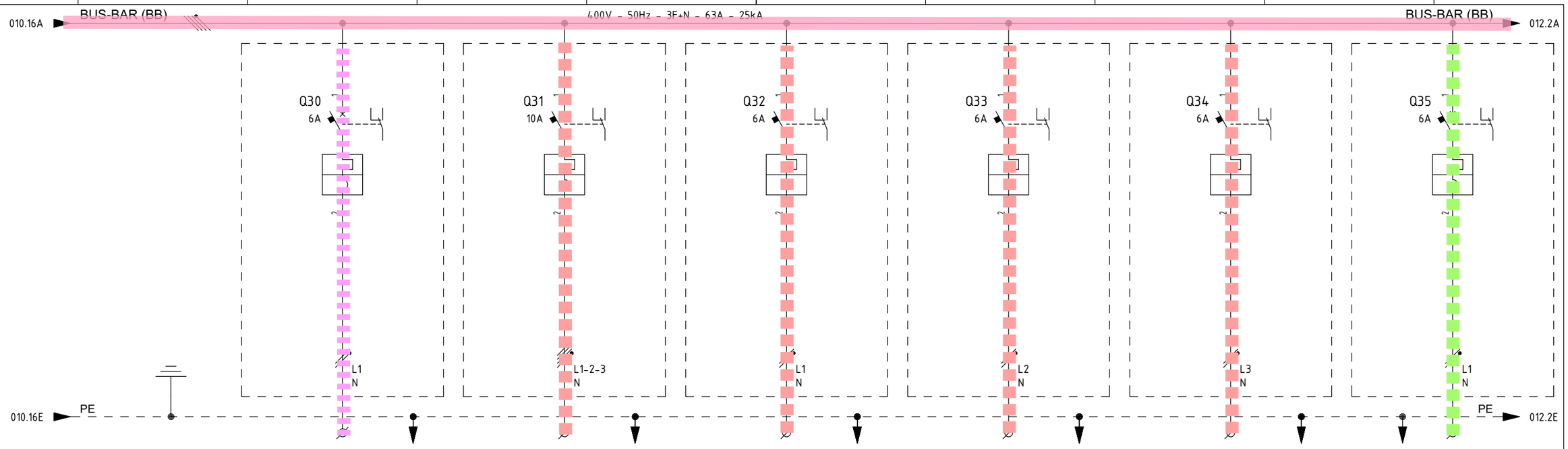
Note 1 : Exact assignment of Servers per cabinet to be defined in cabinet General Arrangement Drawing.
Note 2 : For IP Addresses refer to 1724000594-IN-RE-00043 Cyber Security Settings
Note 3 : All Network Components will be installed in Network Cabinet.
Note 4 : Supply of Console Desk in CCR is in Customer Scope.
Note 5 : All Network Switches and Firewall is configured in VLAN.
Note 6 : Intermediate FO Connection between HNA5 and OER Intentionally not shown.

Zone-1	: PCS Control Zone	Zone-2	: Safety Control Zone
Zone-3	: PCS Zone	Zone-4	: Application Server Facility Zone
Zone-5	: Security Management Zone-1	Zone-6	: Security Management Zone-2
Zone-7	: Demilitirized Zone	Zone-8	: Croswind Zone
Zone-9	: Service Network Zone	Zone-10	: Application Server Facility Zone-OD
Zone-11	: Third Party System Zone		: Out of Scope

REV	DWG BY	CHK BY	APP BY	DATE
04	SKR	MP/AB	SC	12-Feb-25
03	SKR	MP/AB	SC	26-Aug-24
02	SKR	MP/AB	SC	28-Jun-24
01	SKR	MP/AB	SC	24-May-24
00	SKR	AB	SC	23-Apr-24

Doc No : 1724000594-IN-DD-00015
Doc Name : System Architecture

ROSETTI MARINO
HOLLANDSE KUST NOORD WIND PART Project
CROSSWIND
YOKOGAWA



ITEM			1	CP-640F1	CP-100E2	CP-100E3	CP-100E4	RR-100D1	CP-200E1
UTILITY			2	UCP - N2 PACKAGE - AUXILIARY	AUXILIARY TRAFO OLTC	AUXILIARY TRAFO AVR	AUXILIARY TRAFO 7MVA	AUXILIARY NER	AUXILIARY TRAFO 1.6MVA
CUBICLE			3	+03	+03	+03	+03	+03	+03
RATED POWER | RATED CURRENT			4/5	0.5 KW | 2.72 A	1 KW | 1.81 A	0.3 KW | 1.63 A	0.5 KW | 2.72 A	0.3 KW | 1.63 A	0.5 KW | 2.72 A
TYPICAL FUNCTIONAL			6	-	-	-	-	-	-
CIRCUIT BREAKER (ABB)	TYPE		7	S302P-C6	S304P-C10	S302P-C6	S302P-C6	S302P-C6	S302P-C6
	VERSION		8	2P / MINIATURE	4P / MINIATURE	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE	2P / MINIATURE
	TRIP UNITS		9	In=6A - Curve C	In=10A - Curve C	In=6A - Curve C	In=6A - 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 / 4	SCREW / 4	SCREW / 4	SCREW / 4	SCREW / 4
POWER CONDUCTOR		mm²	31	3G2.5	5G4	3G2.5	3G2.5	3G2.5	3G2.5

SUBSYSTEM 64-00 | SUBSYSTEM 81-20 | SUBSYSTEM 81-20 | SUBSYSTEM 81-20 | SUBSYSTEM 81-20 | SUBSYSTEM 82-40

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 011

REV. 03

F.to UNI A3: 420mmx297mm

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

Section 4 MECHANICAL COMPLETION STATUS INDEX - BUILDING DISCIPLINE

NOT APPLICABLE

Section 5 MECHANICAL COMPLETION STATUS INDEX - ELECTRICAL DISCIPLINE

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 81-20 & process: MC & discipline : E

Electrical	81-20 Power Transformer 7 MVA (TR-100AD1)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
81001-CEC	66kV, 7MVA Transformer / LCP GIS	ONSHORE	C10002120	CPX10	100	2025-01-18	RFC 3
81002-CEC	Auxiliary Trafo 7 MVA Local Control Panel / 66 kV GIS Local Control Panel	ONSHORE	C10003046	CPX10	100	2025-01-18	RFC 3
81002-CEH-L1	66kV GIS / 66/6.6 kV, 7MVA Transformer	ONSHORE	C10000465	CPX08	100	2025-02-26	RFC 3
81002-CEH-L2	66kV GIS / 66/6.6 kV, 7MVA Transformer	ONSHORE	C10000466	CPX08	100	2025-02-26	RFC 3
81002-CEH-L3	66kV GIS / 66/6.6 kV, 7MVA Transformer	ONSHORE	C10000467	CPX08	100	2025-02-26	RFC 3
81003-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002122	CPX10	100	2024-12-09	RFC 3
81004-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002123	CPX10	100	2024-12-09	RFC 3
81005-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002124	CPX10	100	2024-12-09	RFC 3
81006-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002125	CPX10	100	2024-12-09	RFC 3
81007-CEC	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10002126	CPX10	100	2024-12-09	RFC 3
81008-CEC	66kV, 7MVA Transformer Step-up AVR / 6.6KV HV Switchgear	ONSHORE	C10002127	CPX10	100	2025-01-20	RFC 3
81012-CEC	LCP GIS / 6.6KV HV Switchgear	ONSHORE	C10002128	CPX10	100	2025-01-20	RFC 3
81013-CEC	LCP GIS / 6.6KV HV Switchgear	ONSHORE	C10002142	CPX10	100	2025-01-20	RFC 3
82001-CEC	6.6KV HV Switchgear / LCP GIS	ONSHORE	C10002129	CPX10	100	2025-01-20	RFC 3
82001-CEM-1-L1	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000468	CPX08	100	2025-04-11	RFC 3
82001-CEM-1-L2	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000470	CPX08	100	2025-04-11	RFC 3
82001-CEM-1-L3	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000472	CPX08	100	2025-04-11	RFC 3
82001-CEM-1-N	66kV, 7MVA Transformer / NER	ONSHORE	C10000474	CPX08	100	2025-04-11	RFC 3
82001-CEM-2-L1	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000469	CPX08	100	2025-04-11	RFC 3
82001-CEM-2-L2	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000471	CPX08	100	2025-04-11	RFC 3
82001-CEM-2-L3	66kV, 7MVA Transformer / 6.6KV HV Switchgear	ONSHORE	C10000473	CPX08	100	2025-04-11	RFC 3
82001-CEM-2-N	NER / NER Earth Point	ONSHORE	C10000475	CPX09	100	2024-12-19	RFC 3
82002-CEC	6.6KV HV Switchgear / 66/6.6 kV, 7MVA Transformer	ONSHORE	C10002130	CPX10	100	2024-12-17	RFC 3
82010-CEC	6.6KV HV Switchgear / LCP GIS	ONSHORE	C10002131	CPX10	100	2025-01-20	RFC 3
82011-CEC	6.6KV HV Switchgear / LCP GIS	ONSHORE	C10002132	CPX10	100	2025-01-20	RFC 3
82012-CEC	6.6KV HV Switchgear / LCP GIS	ONSHORE	C10002133	CPX10	100	2025-01-20	RFC 3
82014-CEC	NER / 6.6KV HV Switchgear	ONSHORE	C10002320	CPX10	100	2024-12-09	RFC 3
83112-CEL	Lighting & Small Power DB BoP / Auxiliary Trafo OLTC	ONSHORE	C10000631	CPX09	100	2024-12-03	RFC 3
83113-CEL	Lighting & Small Power DB BoP / Auxiliary Trafo AVR	ONSHORE	C10000632	CPX09	100	2024-12-03	RFC 3

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 81-20 & process: MC & discipline : E

Electrical	81-20 Power Transformer 7 MVA (TR-100AD1)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
83114-CEL	Lighting & Small Power DB BoP / Auxiliary Trafo 7MVA	ONSHORE	C10000633	CPX09	100	2024-12-03	RFC 3
83115-CEL	Lighting & Small Power DB BoP / Auxiliary NER	ONSHORE	C10000634	CPX09	100	2024-12-03	RFC 3
RR-100D1	Neutral Earthing Resistor	ONSHORE	C10000863	CPX21	100	2024-09-13	RFC 3
TR-100AD1	66 / 6.9 kV 7 MVA Transformer	ONSHORE	C10000867	CPX02	100	2024-09-13	RFC 3

ITEM	Tag	81002-CEH-L1	: 66kV GIS / 66/6.6 kV, 7MVA Transformer			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100/LD
TASK	code	C10000465		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1Cx240mm² | Color: BLACK

From: HNA6-AFA70 | To: TR-100AD1

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	PL
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	PL
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	NA
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	81002-CEH-L1	: 66kV GIS / 66/6.6 kV, 7MVA Transformer		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100/LD	
TASK	code	C10000465	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS		
1	CORE CONTINUITY	mΩ	Note
2	SCREEN CONTINUITY	mΩ	Note
3	ARMOUR CONTINUITY	mΩ	Note
	1st INSULATION TEST		
	Voltage applied:	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	MΩ	Note
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	MΩ	Note
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	MΩ	Note
	HV TEST 15 min		
	Voltage applied:	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	µA	Note
	2nd INSULATION TEST		
	Voltage applied:	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	MΩ	Note
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	MΩ	Note
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	MΩ	Note
	RE-CONNECT TERMINATIONS		
13	Tightening torque	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	See attached certificate	TYPE / SERIAL N°
Calibration certificate N° and date:	See attached certificate	Calibration certificate N° and date:
TYPE / SERIAL N°	See attached certificate	TYPE / SERIAL N°
Calibration certificate N° and date:	See attached certificate	Calibration certificate N° and date:

Comments:

Note test: See attached report

	Performed by	☉ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	REYNARD	RM (ROSETTI MARINO)	
Name	Dimitrios Aravantinos	Josip Krizanic	
Date	2025-02-25	2025-02-26	
Signature	PROVERLIS Digitaly signed by Dimitrios Aravantinos 2025-02-25T10:53:13.124Z	PROVERLIS Digitaly signed by Josip Krizanic 2025-02-26T08:27:45.397Z	

Report - TE RSTF-72B

Project	Report	Location
Rosetti Power Hub Platform Crosswind	TE RSTF-72B	GIS

Cable	Manufacturer	Type
GIS-Transformer	TKF	240mm2

Cable ID

L1 Cable ID	L2 Cable ID	L3 Cable ID
5126600005	5126600005	5126600005

TE RSTF-72B Serial Numbers

T-connector Type
TE RSTF-72B

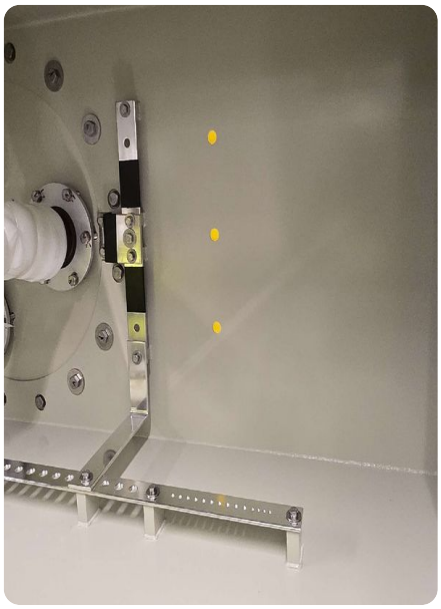
L1 Serial No. Connector Body	L2 Serial No. Connector Body	L3 Serial No. Connector Body
2024-1578	2024-1591	2024-1596

L1 Serial No. Stress Cone	L2 Serial No. Stress Cone	L3 Serial No. Stress Cone
ADE34-230865	ADE34-230851	ADE34-230859

L1 Serial No. Cable Lug	L2 Serial No. Cable Lug	L3 Serial No. Cable Lug
TE 56689	TE 56689	TE 36113

Electrical Cabinet Pre-installation Checks

Electrical Cabinet



L1 Bushing



L2 Bushing

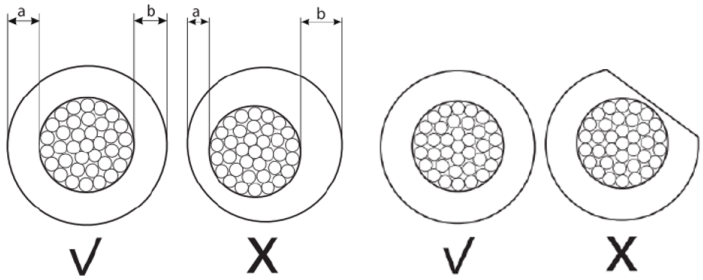


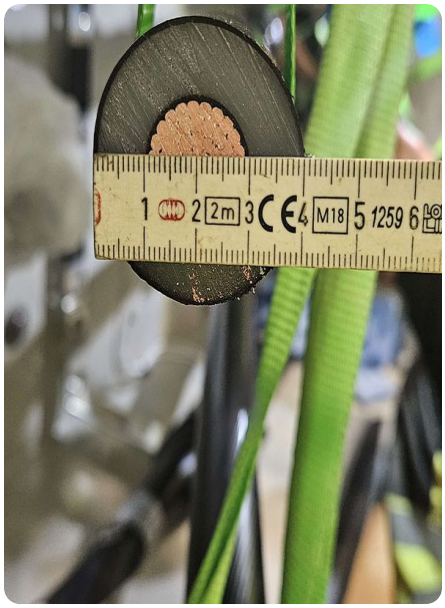
L3 Bushing



Eccentricity & Flattening Checks

Eccentricity & Flattening Diagram:



L1 Cross Section Cable	L2 Cross Section Cable	L3 Cross Section Cable
		

L1 measurement in mm (A)	L1 measurement in mm (B)
10	10

L2 measurement in mm (A)	L2 measurement in mm (B)
10	10

L3 measurement in mm (A)	L3 measurement in mm (B)
10	10

Heating & Straightening

L1 Cable Heating	L2 Cable Heating	L3 Cable Heating
		

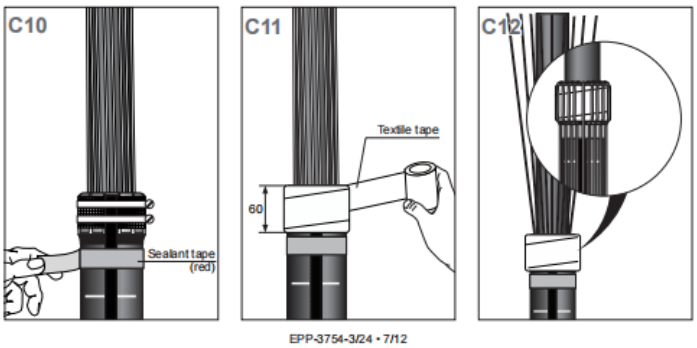
L1 Straightening	L2 Straightening	L3 Straightening
		

Marking Reference Lines

L1 Reference Line	L2 Reference Line	L3 Reference Line
		

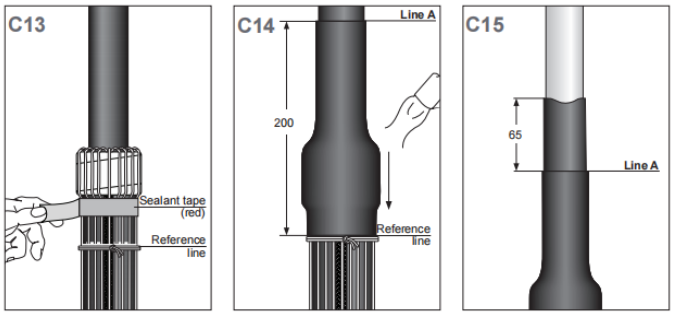
Preparation of Cable Screen/Sheath

Wrap 2 additional turns of red sealant tape around the cable on top of the copper braid and the other sealant tape layer. Press the layers together to avoid air gaps around the moisture block.
Apply 5 layers of textile tape to cover the support ring and all of the laminated foil over a length of 60 mm as shown. Make sure that all sharp edges are covered.
Bend the screen wires back over the textile tape and onto the oversheath. Push them into the sealant tape.

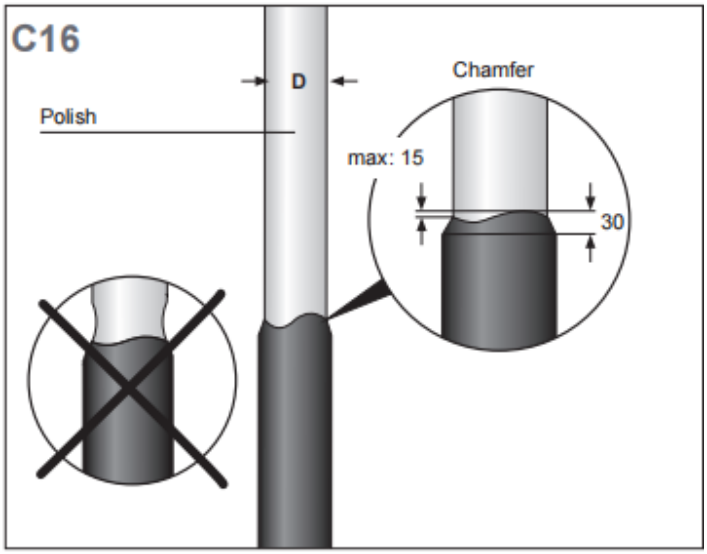


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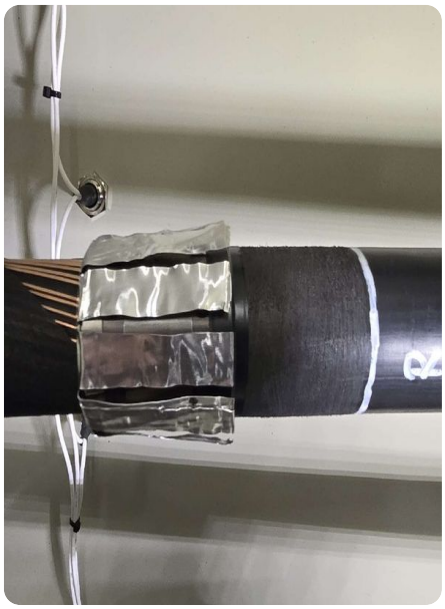
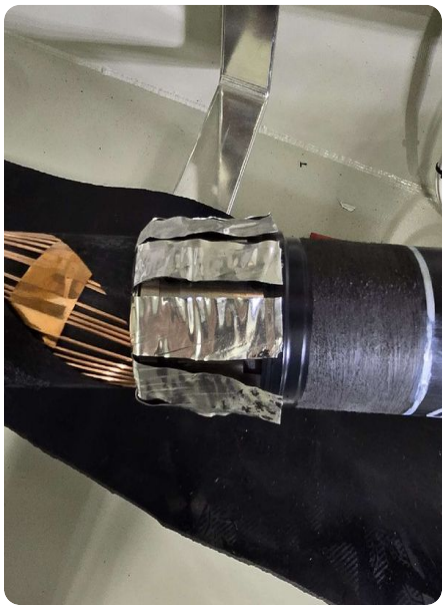
Wrap another 2 turns of red sealant tape around the cable on top of the copper wires and the other sealant tape layers.Fix the earth lead and copper wires onto the oversheath with a wire binder just below the 'Reference line'.
Mark Line A 200 mm up from Reference line and start shrinking the tube from the top (Line A) Start shrinking from the Line A as shown in the drawing.
Remove the core screen with appropriate screen removal tool according to the drawing.The surface of the insulation should be free from all traces of conductive material.

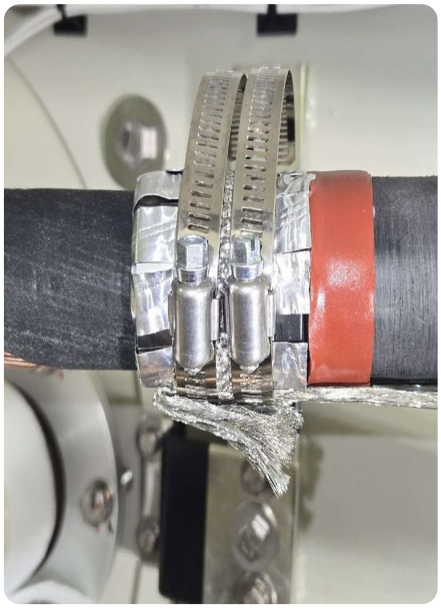
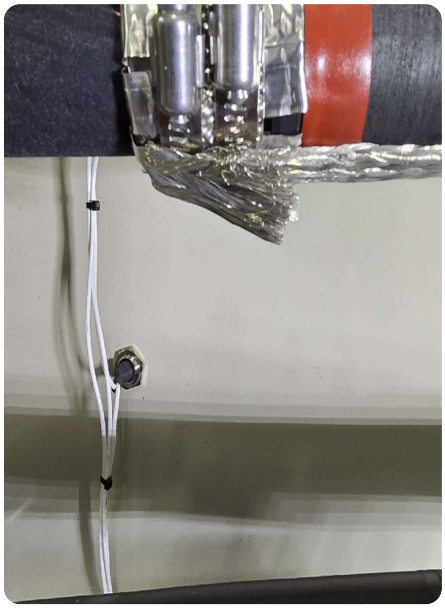
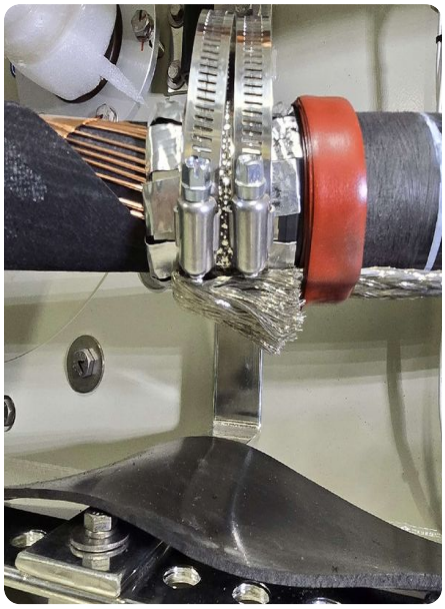


Make sure the semicon transition wave shape is in accordance with the values shown in the drawing.
Clean and degrease the insulation with the supplied cleanser in direction of the semicon to prevent contamination. Take care to
ensure that the diameter of the insulation is not reduced close to the transition to the semiconducting layer.
Check dimension D. The finally prepared diameter over insulation shall be within the application range of the stress cone,
marked at the rubber body.

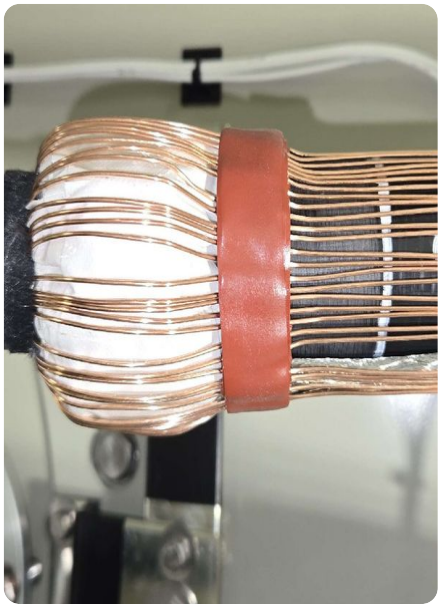


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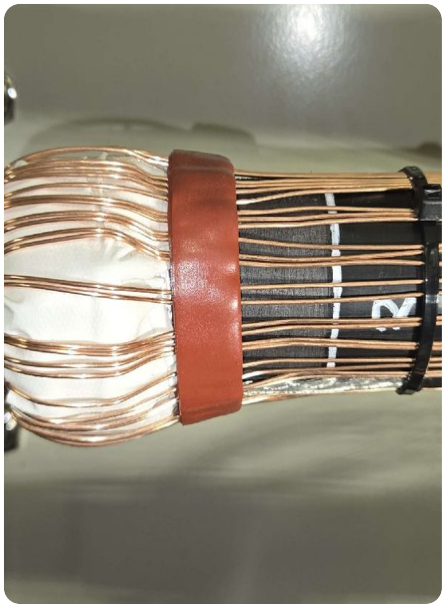
L1 Support Ring (C6)	L2 Support Ring (C6)	L3 Support Ring (C6)
		

L1 Contact Plate (C9)	L2 Contact Plate (C9)	L3 Contact Plate (C9)
		

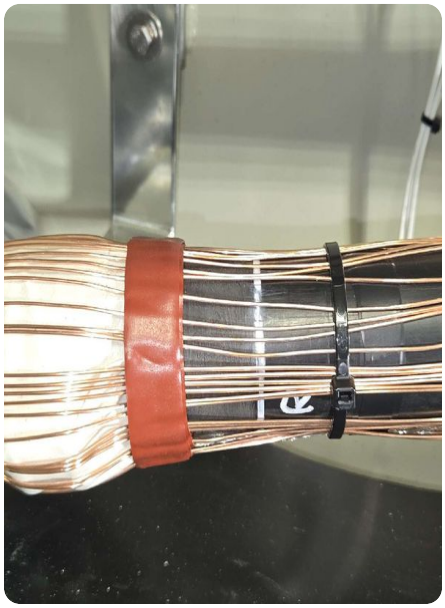
L1 Copper wires and Sealant Tape (C13)



L2 Copper wires and Sealant Tape (C13)



L3 Copper wires and Sealant Tape (C13)



L1 Heat Shrink Tube (C14)

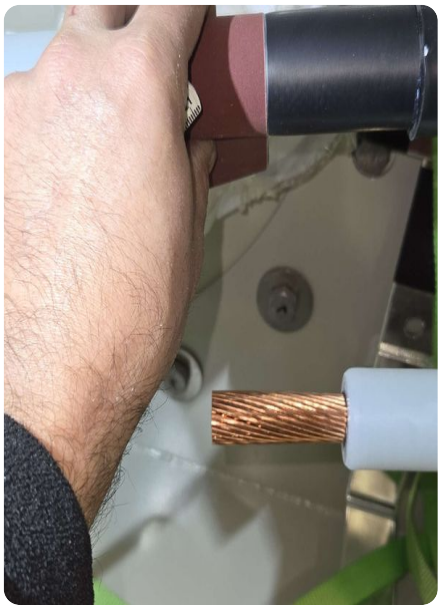
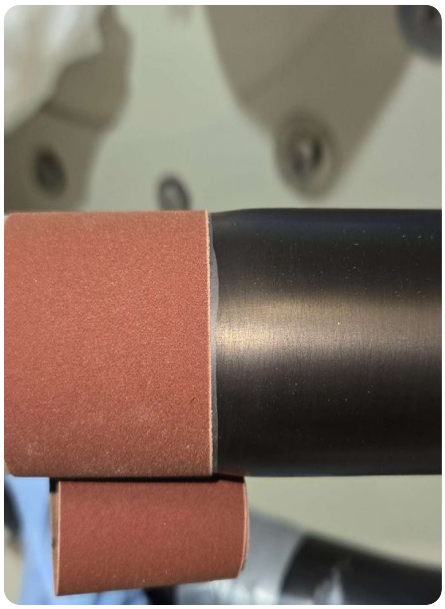


L2 Heat Shrink Tube (C14)



L3 Heat Shrink Tube (C14)



L1 Insulation Screen (C16)	L Insulation Screen (C16)	L1 Insulation Screen (C16)
		

Cut-Back Insulation and Conductor

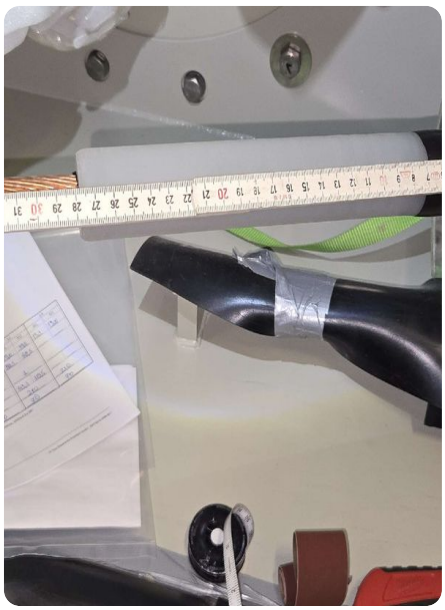
Cable Lug Type
BLMC-150/400

Dimension C (mm). Table 2	Dimension K (mm). Table 2	Dimension I (mm). Table 2
345	70	275

L1 Prepared Insulation and Conductor



L2 Prepared Insulation and Conductor



L3 Prepared Insulation and Conductor



Pre-Instalation and Cable Lug installation

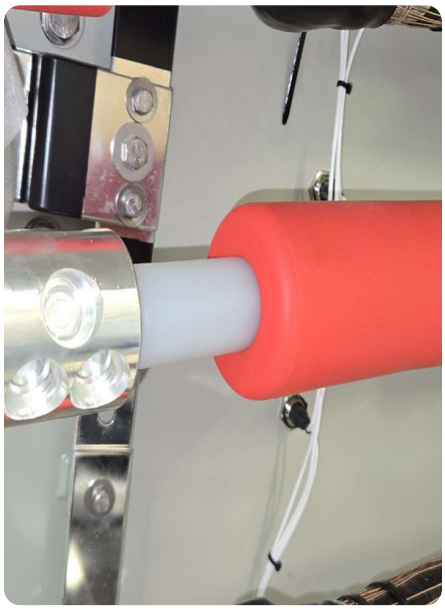
L1 Pre-Installation completed



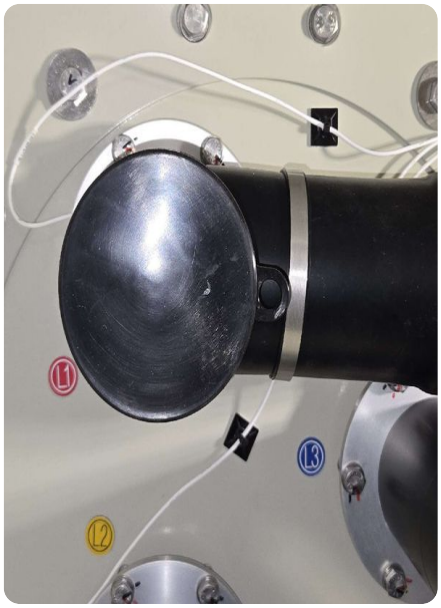
L1 Pre-Installation completed



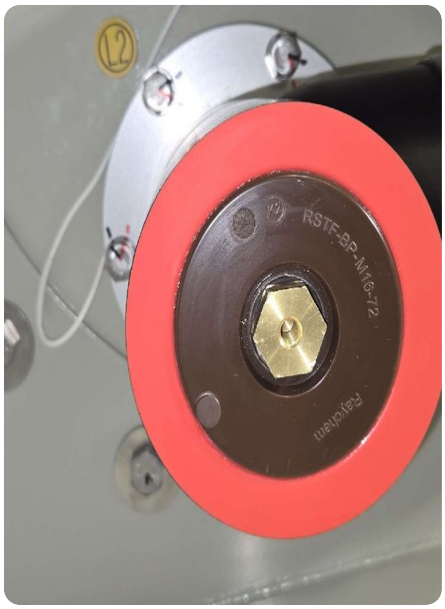
L1 Pre-Installation completed



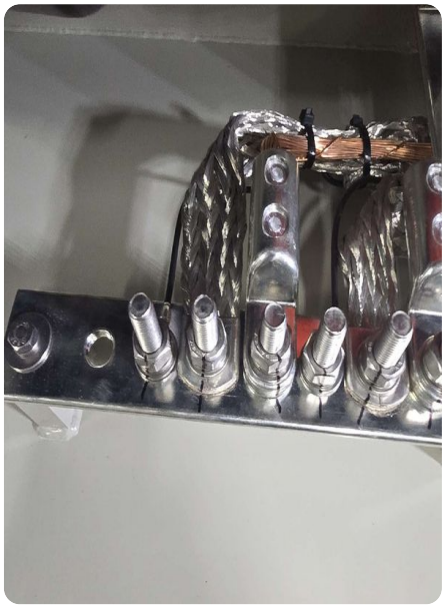
Installation of Base Connector

L1 Screen Connector Body Installed	L2 Screen Connector Body Installed	L3 Screen Connector Body Installed
		

L1 Nordlock Washer and Hex nut Installed	L2 Nordlock Washer and Hex nut Installed	L3 Nordlock Washer and Hex nut Installed
		

L1 Back Plug Installed	L2 Back Plug Installed	L3 Back Plug Installed
		

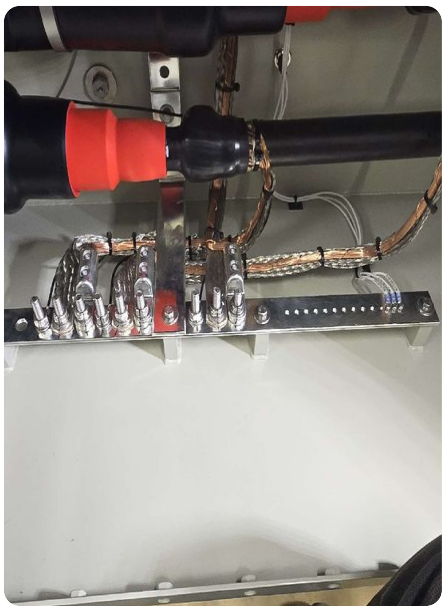
Grounding and Screening

L1 Gounding/Screening Installed	L2 Gounding/Screening Installed	L3 Gounding/Screening Installed
		

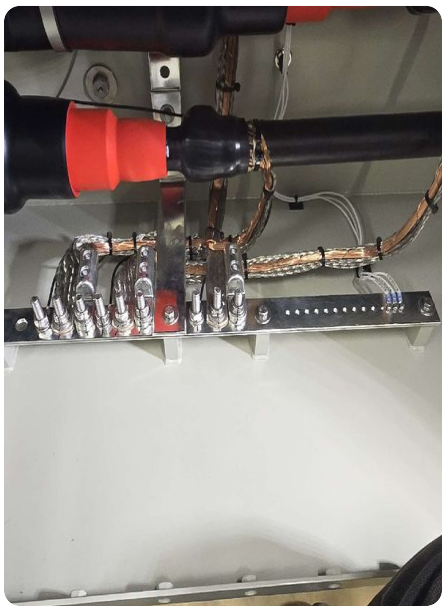
L1 Gounding/Screening Installed(Optional)



L2 Gounding/Screening Installed(Optional)

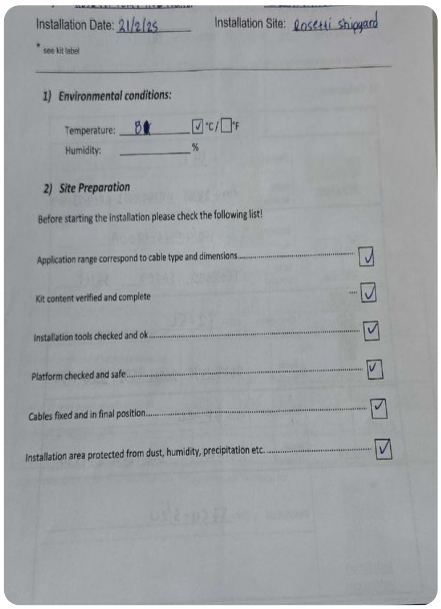


L3 Gounding/Screening Installed(Optional)



Installation Protocol

Installation Protocol Page 1



Installation Date: 21/2/25 Installation Site: Rosetti Shipyard

* see kit label

1) Environmental conditions:

Temperature: 8 ☑ °C/☐ °F

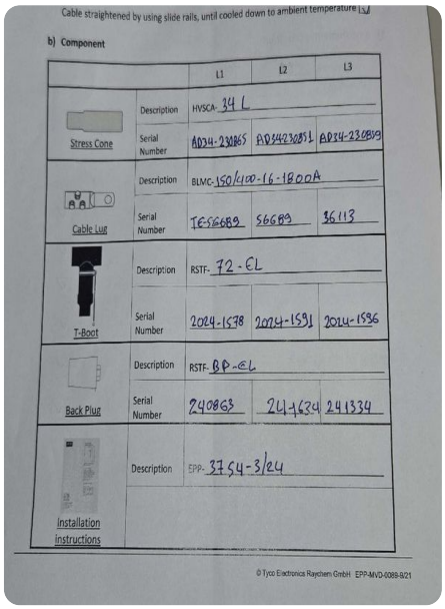
Humidity: _____ %

2) Site Preparation

Before starting the installation please check the following list!

- Application range correspond to cable type and dimensions ☑
- Kit content verified and complete ☑
- Installation tools checked and ok ☑
- Platform checked and safe ☑
- Cables fixed and in final position ☑
- Installation area protected from dust, humidity, precipitation etc. ☑

Installation Protocol Page 2



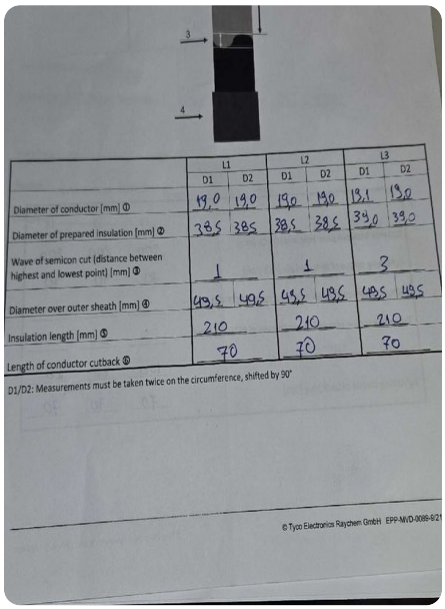
Cable straightened by using slide rails, until cooled down to ambient temperature ☑

b) Component

		L1	L2	L3
Stress Cone	Description	HVSCA- 34 L		
	Serial Number	AD24-23086	AD24230851	AD24-23089
Cable Lug	Description	BLMC-150/400-16-1800A		
	Serial Number	TE-56089	56089	36113
T-Boot	Description	RSTF- 72-EL		
	Serial Number	2024-1578	2024-1591	2024-1596
Back Plug	Description	RSTF- BP-EL		
	Serial Number	240863	241634	241334
Installation instructions	Description	EPP- 3754-3/24		

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Installation Protocol Page 3

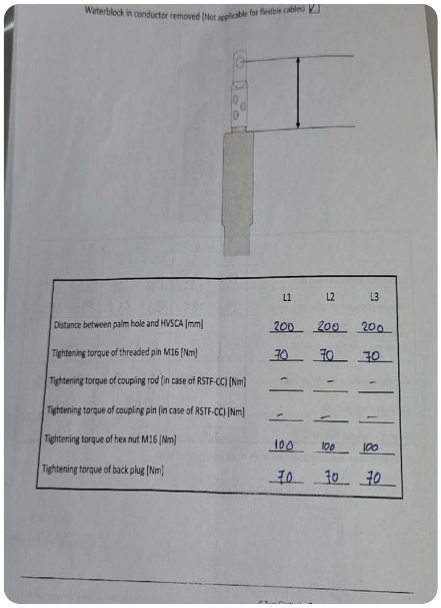


	L1		L2		L3	
	D1	D2	D1	D2	D1	D2
Diameter of conductor [mm] ①	19,0	19,0	19,0	19,0	19,1	19,0
Diameter of prepared insulation [mm] ②	38,5	38,5	38,5	38,5	39,0	39,0
Wave of semicon cut (distance between highest and lowest point) [mm] ③	1		1		3	
Diameter over outer sheath [mm] ④	49,5	49,5	49,5	49,5	49,5	49,5
Insulation length [mm] ⑤	210		210		210	
Length of conductor cutback ⑥	70		70		70	

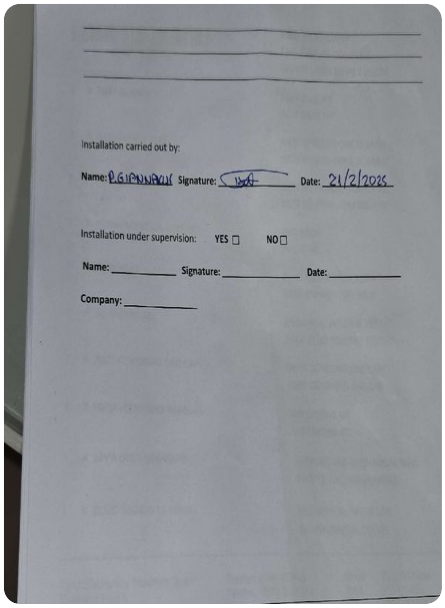
D1/D2: Measurements must be taken twice on the circumference, shifted by 90°

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Installation Protocol Page 4

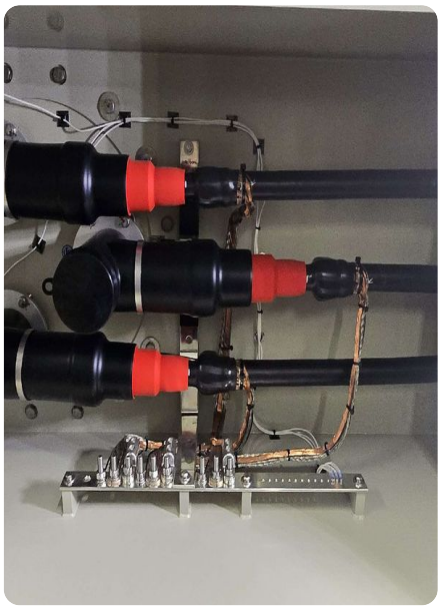


Installation Protocol Page 5



Final Overview

Cabinet Overview (Inside)



Cabinet Overview (Doors Closed)



[Optional] Client Rep Sign-off

Sign-Off

Panagiotis Giannaklis
24-02-2025





Certificate

te.com



Cert-Nr: 202490

Name **Panagiotis, Giannaklis**

Company **Reynard High Voltage Solutions (V&SH Offshore)**

Trained on **21.06 - 21.06.2023** **Valid until:** **6.2025**

Topic of training

RSTF on TKF cable 890113 and 890115 for HKN Project

Participated the theoretical and practical session successful.

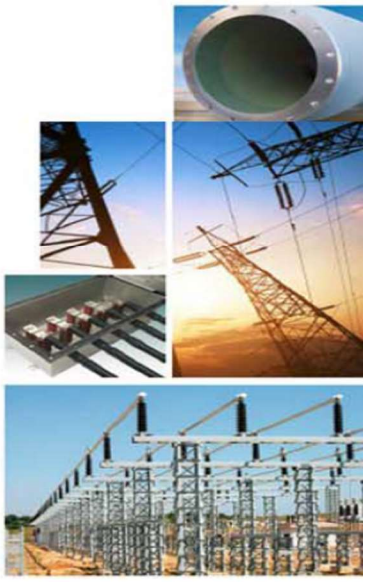
Content of training:

Installation of RSTF on TKF cable 890115 (800 mm²) with shifted Ligarex for HKN Project
RSTF-72B-M-P-E-45-NL06

The certificate can be extended by a minimum number of TE cable accessories were installed by the certificate holder since the date of issuance of this certificate.
This certificate qualifies for assembly and installation, but does not qualify to train third parties. The validity of this certificate is bounded to the above mentioned

21.06.2023

Benny Verley
Field Application Engineer Benelux
Energy Business Unit
TE Connectivity



Raychem
from TE Connectivity

te.com/trainingcenter

Report - Post-Term Test

Project	Report	Location
Rosetti Power Hub Platform Crosswind	Post-Term Test	GIS

Cable	Manufacturer	Type
GIS-Transformer	TKF	240mm2

Pre-testing Checks

Serial Number IR Tester

10211387

Expiry Date Calibration

2026-01-01

Area Safe and Secured?

true

L1 Insulation Resistance @5kV for 5min

L1 Test Voltage

5kV ☑

L1 Test Duration

5 Minutes ☑

L1 GΩ Recorded

1036

L1 Image of Screen IR tester



L1 Pass/Fail

Pass

L2 Insulation Resistance @5kV for 5min

L2 Test Voltage

5kV ☑

L2 Test Duration

5 minutes ☑

L2 GΩ Recorded

1134

L2 Image of Screen IR Tester



L2 Pass/Fail

Pass

L3 Insulation Resistance @5kV for 5min

L3 Test Voltage

5kV ☑

L3 Test Duration

5 Minutes ☑

L3 GΩ Recorded

1113

L3 Image of Screen IR Tester

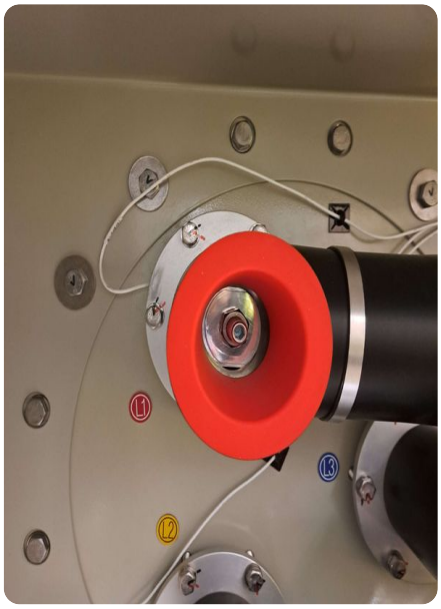


L3 Pass/Fail

Pass

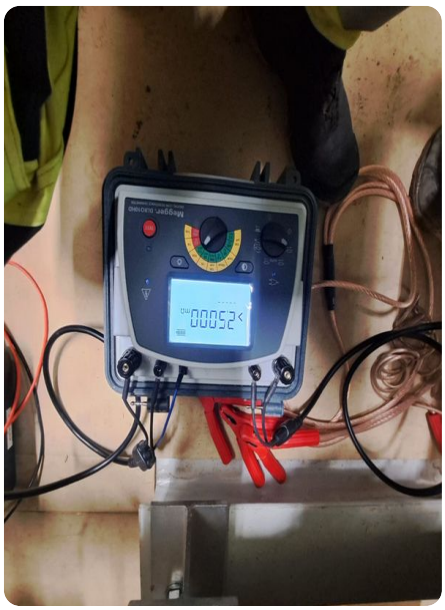
Phase ID

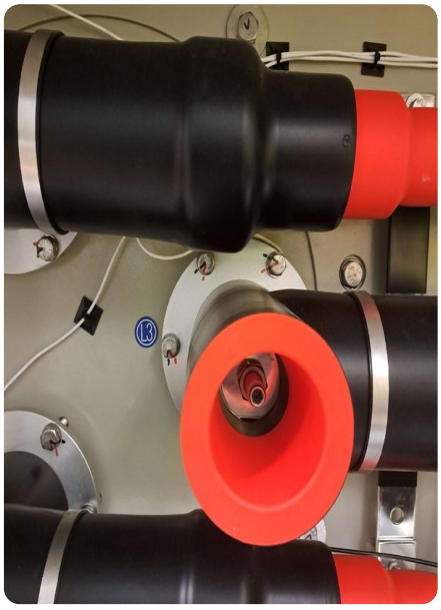
Phase ID L1 (Color Code etc.)



Phase ID L1 (Measurment)



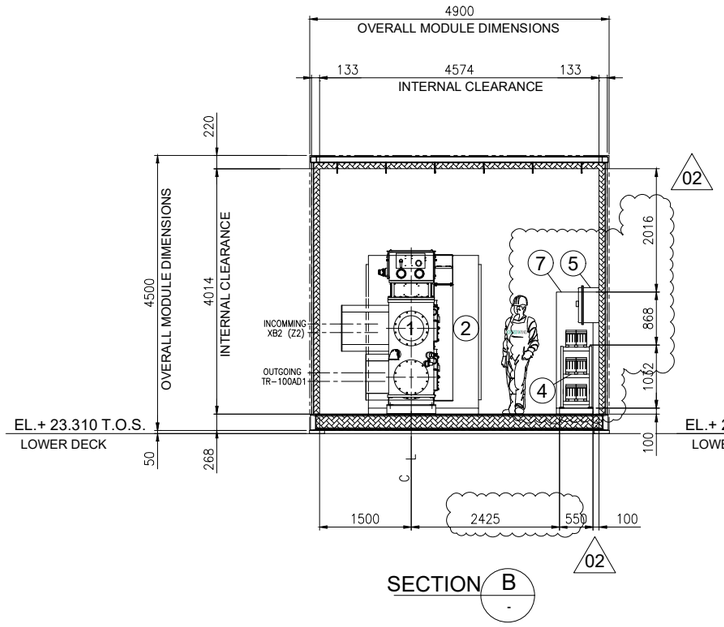
Phase ID L2 (Color Code etc.)	Phase ID L2 (Measurment)
	

Phase ID L3 (Color Code etc.)	Phase ID L3 (Measurment)
	

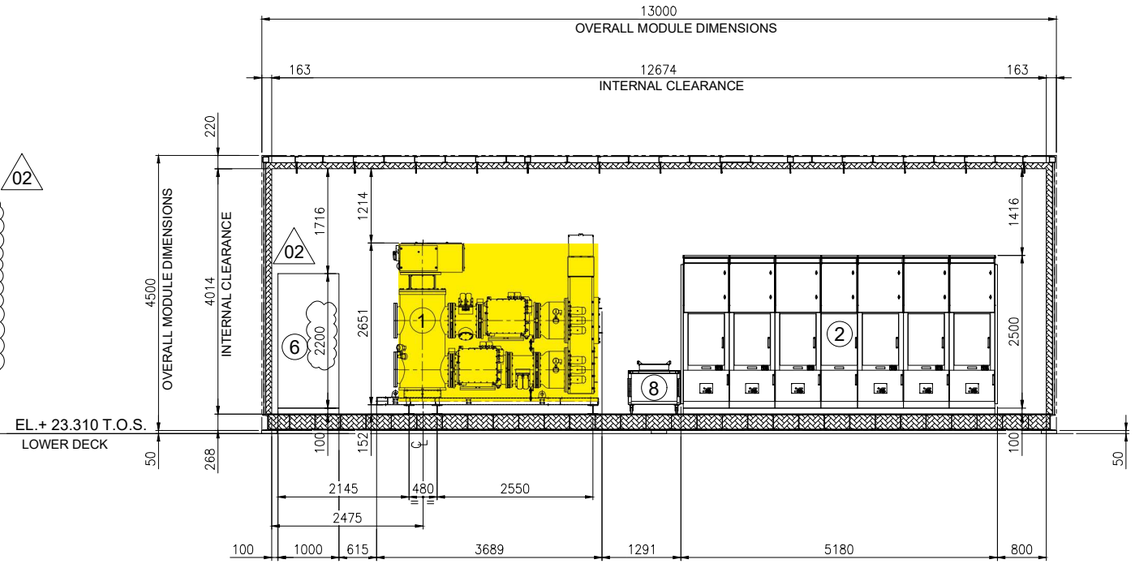
Sign-Off

Dimitrios Aravantinos
24-02-2025

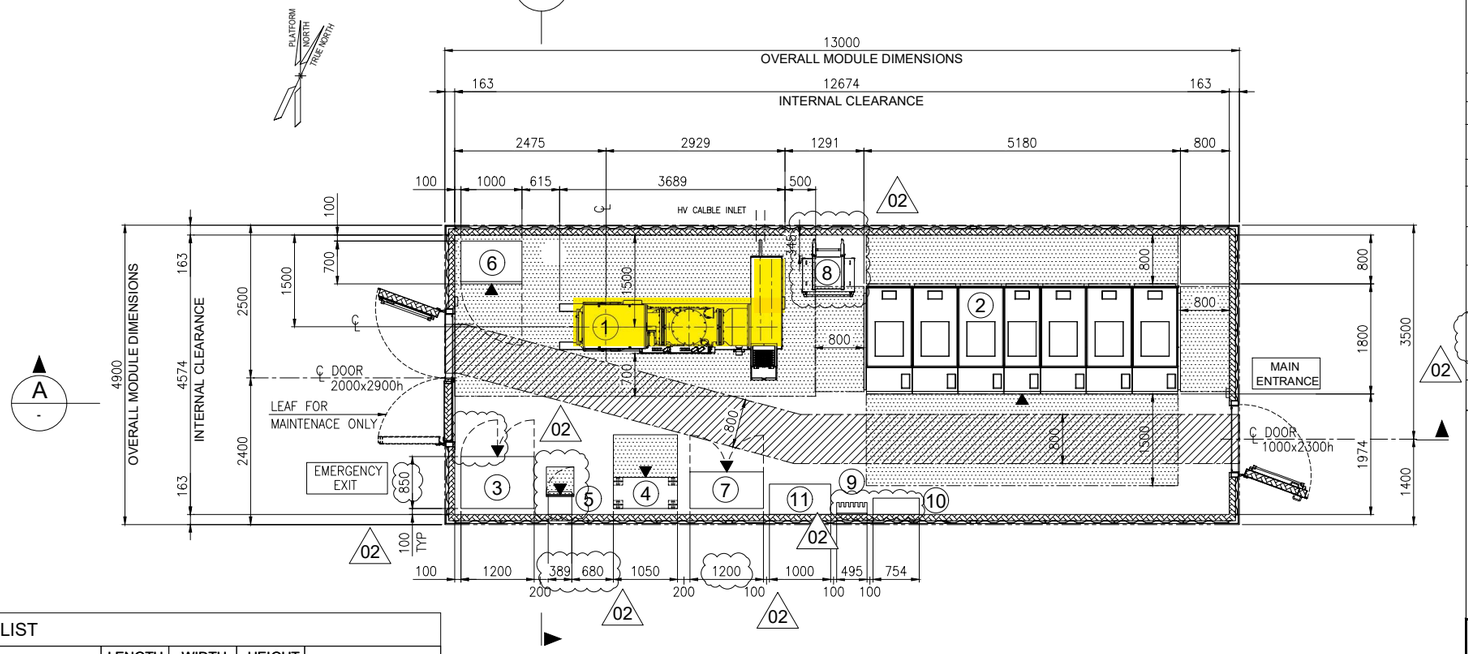
DRAWING NO. 123A90-DDL-EL-DL-20104 | REV. 02



SECTION B -



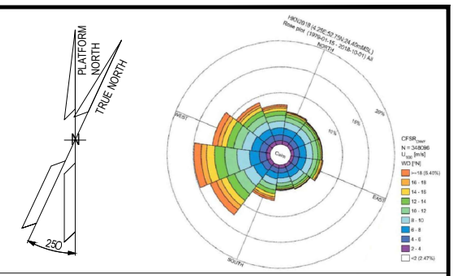
SECTION A -



A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

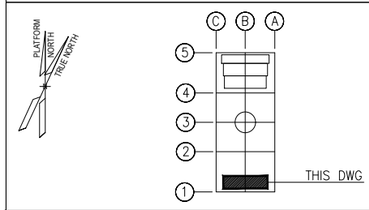
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

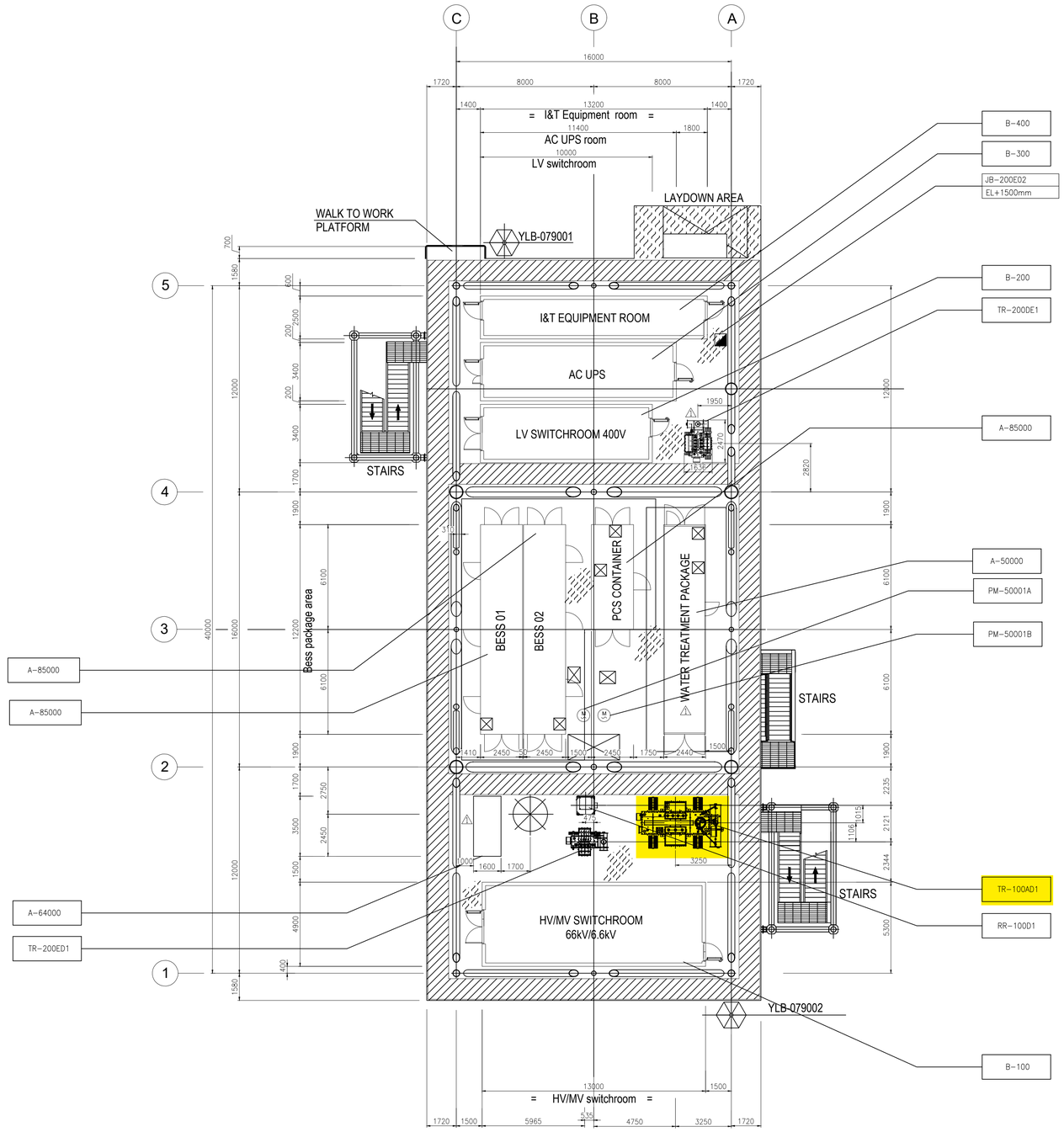
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

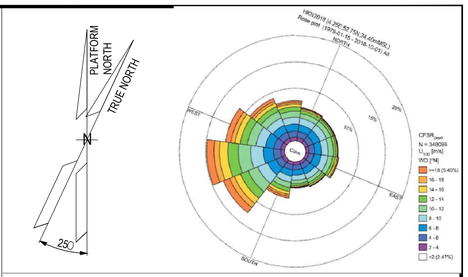
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

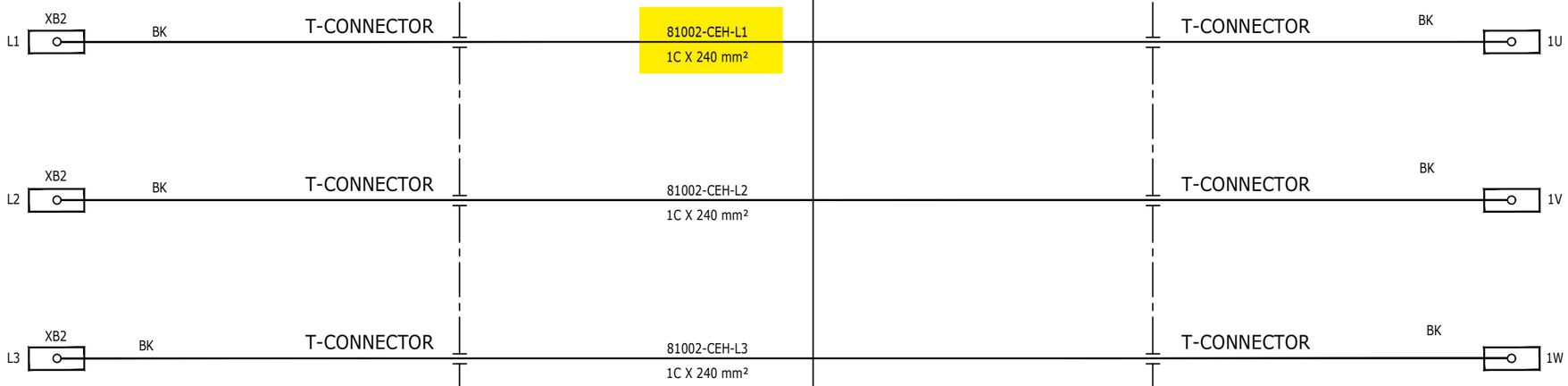
FROM	TO

DESCRIPTION: 66kV SWITCHGEAR (GIS)
TAG NUMBER: HNA6-AFA70

QZ91

DESCRIPTION: 66/6.9 KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1

HV TERMINAL BOX OF
TR-100AD1



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

REV.:	DATE:	SIGNATURE:
2_K	12/02/25	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
66kV GIS SWGR

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	011	02

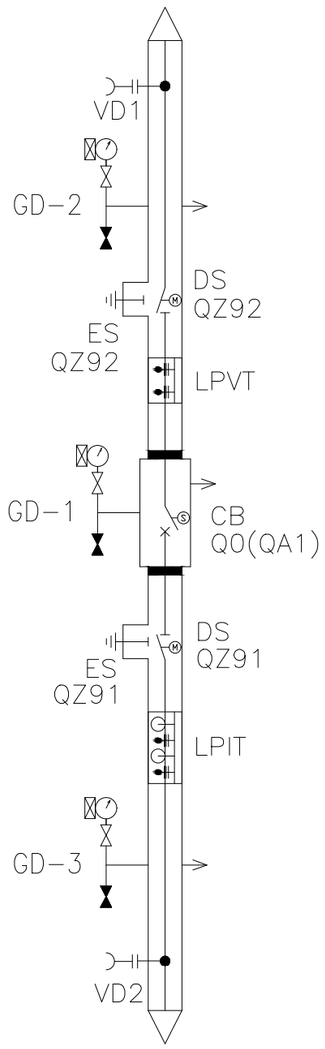
F.to UNI A3: 420mmx297mm

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

DRAWING NO. 1723001595-EL-DG-00014

REV. 00

XB2 (Z2)



TR-100AD1

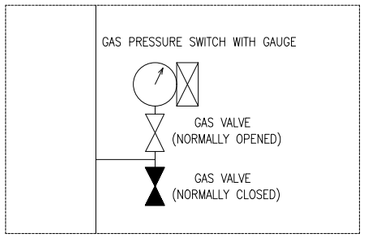
❑ RATED GAS (DRY AIR) PRESSURE

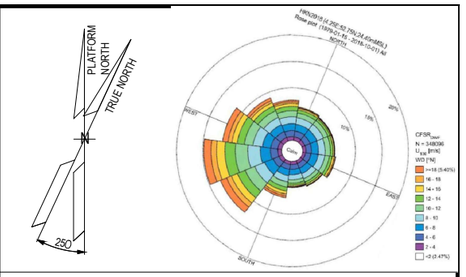
- CIRCUIT BREAKER COMPARTMENT : 5 bar.G
- OTHERS COMPARTMENT : 5 bar.G

❑ PRESSURE OF GAS AND ALARM SETTING

		PRESSURE SETTINGS : bar.G at 20°C			DESIGNATION
		RATED	ALARM ON	RESET	
CB	LOW 1'ST STAGE	5	4.7	4.9	GD-1
	LOW 2'ND STAGE		4.5	4.7	
OTHERS	LOW 1'ST STAGE	5	4.7	4.9	GD-2, GD-3
	LOW 2'ND STAGE		4.5	4.7	

❑ DETAIL-A(TYPICAL) FOR GAS VALVE & GAS PRESSURE SWITCH WITH GAUGE





NOTES

1. DESCRIPTION of ABBREVIATIONS.
   - CB : CIRCUIT BREAKER
   - DS : DISCONNECTING SWITCH
   - ES : EARTHING SWITCH
   - VD : VOLTAGE DETECTOR
   - LPIT : LOW POWER INSTRUMENT TRANSFORMER
   - ECVT : ELECTRONIC CT AND VT
   - EVT : ELECTRONIC VT

LEGEND

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER (SPRING OPERATION)
	COMBINED WITH DS(ISOLATOR) AND ES(EARTHING SWITCH) (MOTOR DRIVEN OPERATION)
	VOLTAGE & CURRENT TRANSFORMER (3ø X 2) (LPIT TYPE)
	VOLTAGE TRANSFORMER (3ø X 2) (LPVT TYPE)
	T-CONNECTOR
	GAS DENSITY MONITOR (PRESSURE SWITCH WITH GAUGE)
	GAS VALVE (NORMALLY CLOSED)-NON RETURN TYPE
	GAS VALVE (NORMALLY OPENED)-NON RETURN TYPE
	GAS TIGHT SPACER (BARRIER)
	RUPTURE DISK
	VOLTAGE DETECTING SENSOR

HOLDS

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	REVISED AS PER COMMENT
1	29/12/23	Y.D.LEE	Y.W.LEE	S.J.CHO	REVISED AS PER COMMENT
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

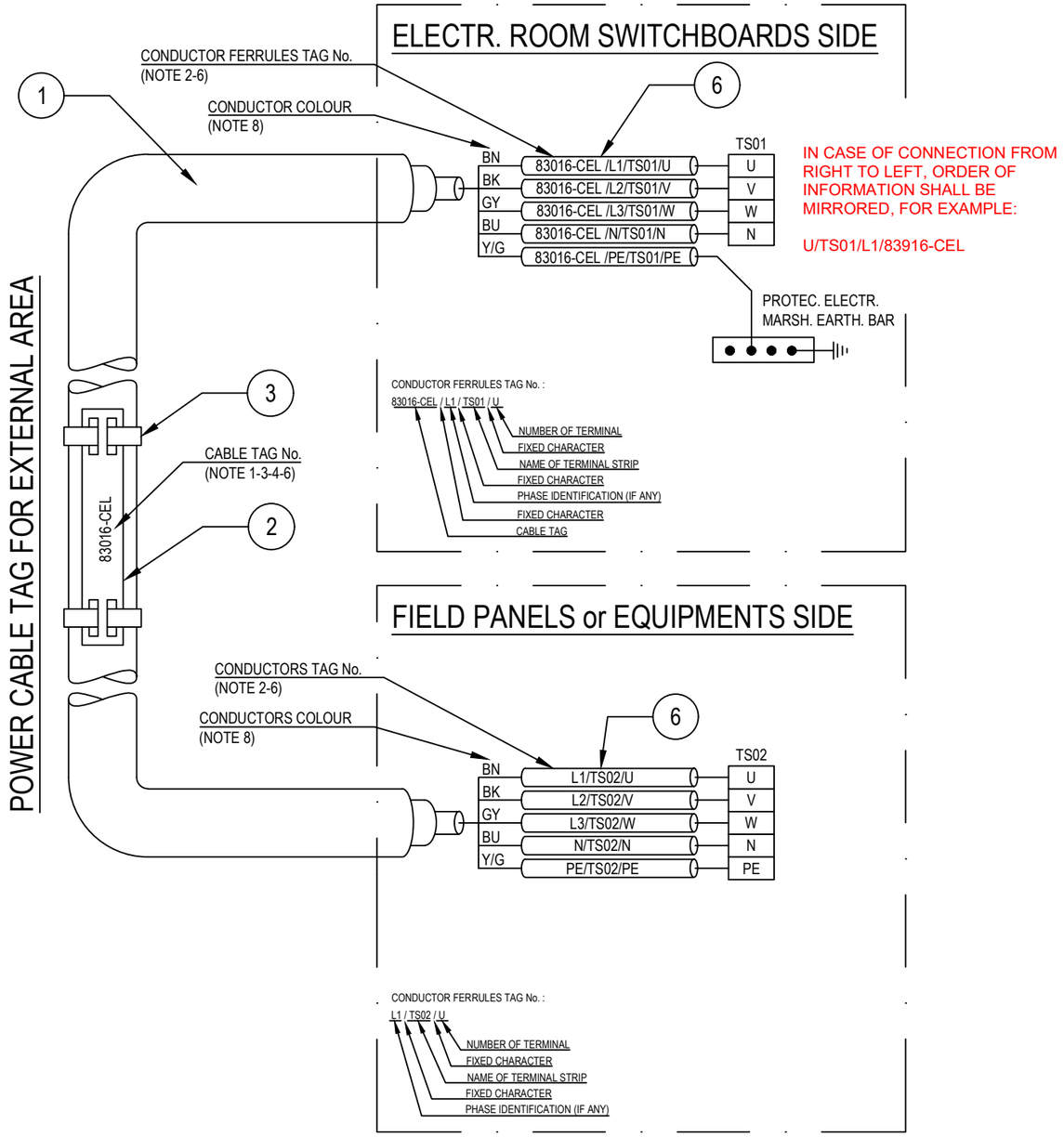
ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
GAS SINGLE LINE DIAGRAM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 10/11/23
A1	DRAWING NO. 1723001595-EL-DG-00014	SHEET 001	REV. 03

File Name : DRAWING_NO.

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

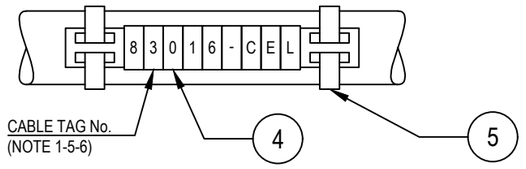
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

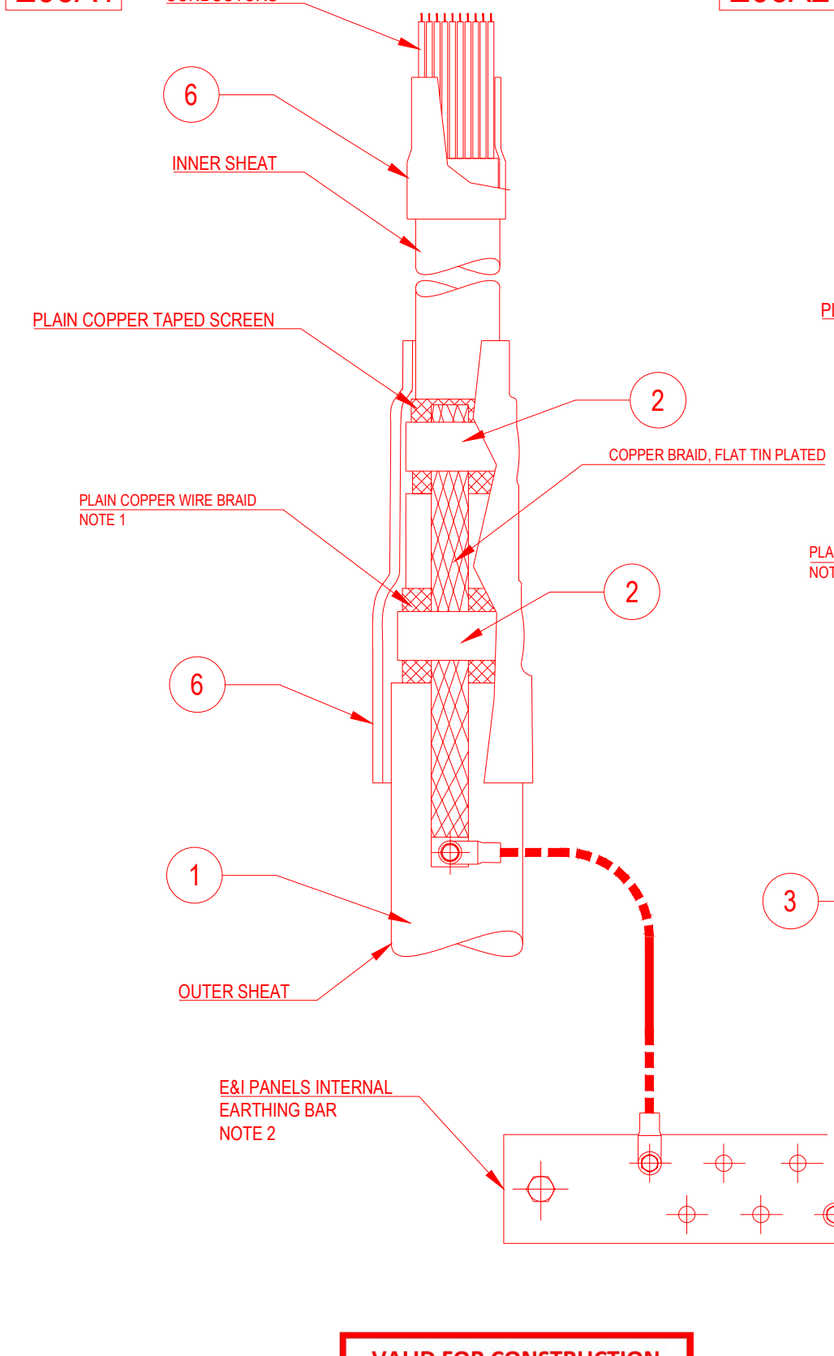
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

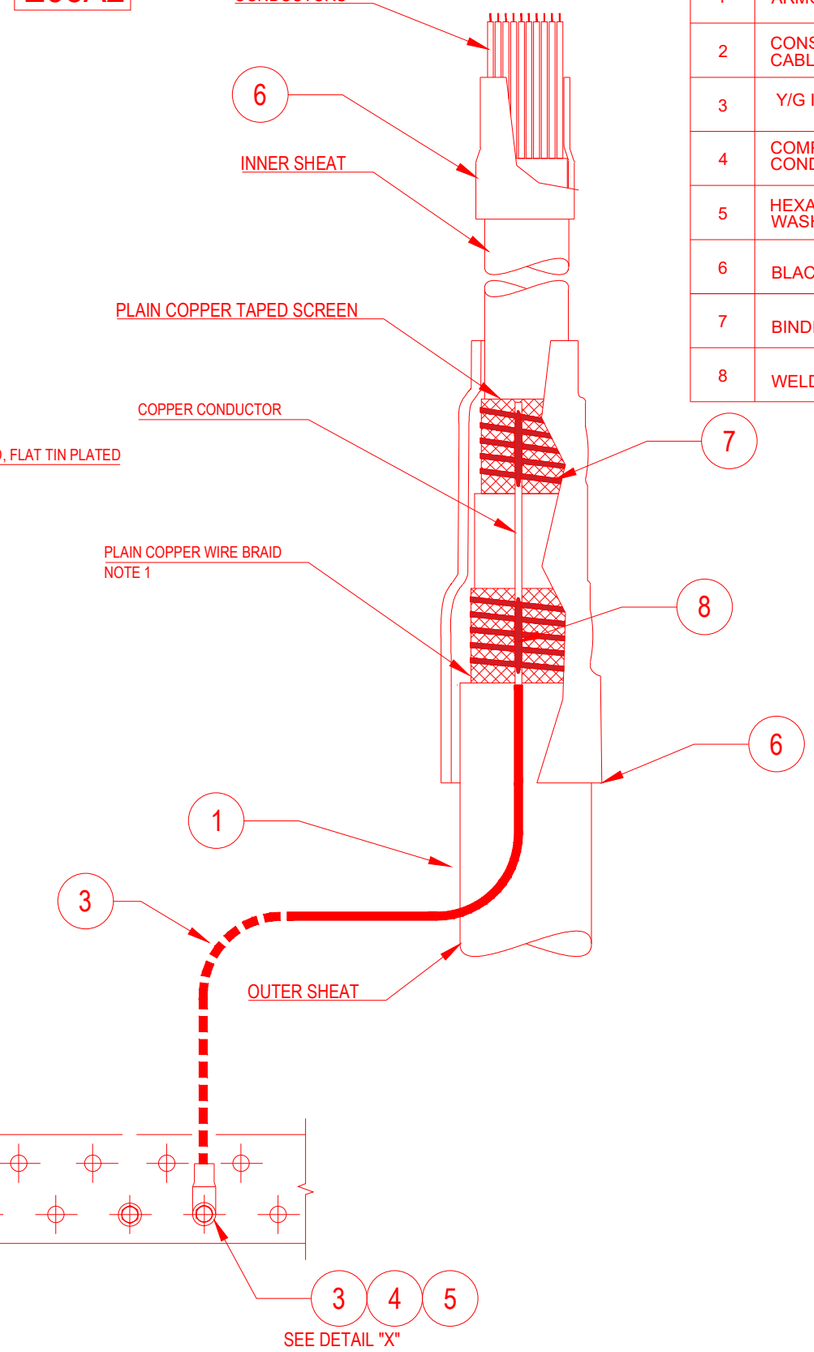
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

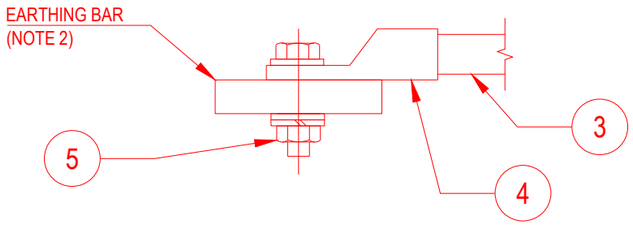


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Info	Category	Discipl	Eng Status	NativeDoc	Service	Entity Type	Main Function	Module	Area	From Tag	From Main Fund	From Tag Section	To Tag	To Main Funct	To Tag Sectio	Material ID	Material Desc.	Gland St	From Glan	From Entry	From Fittin	To Gland	To Entry	To Fitting	Routing	Routing Manual
81002-CEH-L1		Cable	EL	VFC	20148						HNA6-AFA70	66 kV GIS	QZ91	TR-100AD1	MVA	Box	ELECV00-1X240	Cable Cu Cl.2/EPR/LSZH 36/66kV 1Cx240mm^2 - Red	M63	n.a.			ngle				E-MCT-101 / L-300-101-HVT-003

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 | 03-07-2024

Description

1 x 240 / 50



* This image may differ from the actual product.

Trading information

Product group	Power cable >= 1 kV, for permanent installation
Type	Cu/XLPE/CWS/LAT/LSZH 36/66 kV
Net. Weight	4.11 kg/m
Sheath marking	{Length} TKF - Cu/XLPE/CWS/LAT/LSZH 36/66 kV 1 x 240/50 IEC 60840 - {Year} {Batch}

Trade lengths

	Minimal order
(58239 / 8713182481131)	1 MTR

Construction characteristics

Standardization	IEC 60840
Number of cores	1
Nominal cross section conductor	240 mm²
Conductor material	Copper
Conductor surface	Bare

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Construction characteristics

Standardization conductor material	IEC 60228
Shape of conductor	Round
Conductor category	Class 2c = stranded & compacted
Conductor shield	Semiconductive Compound
Material core insulation	XLPE++
Insulation shield	Semiconductive compound with semiconductive swellable tape
Earthscreen construction	Copper round wire + copper tape counter spiral
Nominal earthscreen cross section	50 mm²
Material outer sheath	LSZH
Colour outer sheath	Black
Diameter conductor	18.6 mm
Insulation thickness	9.5 mm
Diameter over insulation	39.2 mm
Aluminium sheath thickness	0.2 mm
Diameter shield wires	1.15 mm
Diameter over shield	41.7 mm
Outer sheath thickness	2.5 mm
Outer diameter approx.	48.1 mm

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Properties

Flame retardant	IEC 60332-3-24 Cat. C
Halogen free	IEC 60754-1 / IEC 60754-2
Low smoke	IEC 61034-1 & IEC 61034-2
Longitudinal water blocking	Yes
Radial water blocking	Yes
Radial watertight construction	Al/PE
UV resistant	Yes
UV protection	NEN EN 50289-4-17A

Technical characteristics

Min. bending radius during installation	870 mm
Min. bending radius after installation	755 mm
Tensile force with pullinghead	12,000 N
Tensile force with pullingsleeve	4,620 N
Max. conductor temperature	90 °C
Max. operating temperature	70 °C
Minimum installation temperature	-10 °C

Electrical characteristics

Nominal voltage U0	36 kV
Nominal voltage U	60 kV
Nominal voltage Umax	72.5 kV
Conductor DC resistance @ 20°C	0.0754 Ohm/km
Conductor AC resistance @ max. cont. Conductor temp.	0.0973 Ohm/km
Shield DC resistance	0.387 Ohm/km

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Electrical characteristics

Mutual capacitance (Nominal)	0.21 µF/km
Max. thermal short-circuit current conductor 0,5 sec	48.5 kA
Max. thermal short-circuit current conductor 1 sec	34.3 kA
Max. short-circuit temperature conductor	250 °C
Max. thermal short-circuit current shield 0,5 sec	10.51 kA
Max. thermal short-circuit current shield 1 sec	7.43 kA
Max. short-circuit temperature shield	250 °C
E-Max fieldstrength	5.38 kV/mm
E-Min fieldstrength	2.77 kV/mm
Charging current per core	2.373 A/km
Frequency	50 Hz
Operating reactance trefoil arrangement	0.12 Ohm/km
Operating reactance flat arrangement	0.18 Ohm/km
*) Theoretical calculated values	Depends on application
Maximum current buried trefoil arrangement	455 A
Maximum current buried flat arrangement	455 A
Maximum current in air trefoil arrangement	630 A
Maximum current in air flat arrangement	730 A
Homopolar resistance Ro (trefoil) *)	2.1899 Ohm/km
Homopolar resistance Ro (flat) *)	2.1894 Ohm/km
Homopolar reactance Xo (trefoil) *)	0.3877 Ohm/km
Homopolar reactance Xo (flat) *)	0.6233 Ohm/km
Homopolar impedance Zo (trefoil) *)	2.2239 Ohm/km
Homopolar impedance Zo (flat) *)	2.2764 Ohm/km

Subject to technical modifications | No rights can be derived from this information

Spinnerstraat 15 | P.O. Box 6 | 7481 KJ Haaksbergen | Nederland | Phone: +31 (0)53 573 22 55 | E-mail: info@tkf.nl

ITEM	Tag	81002-CEH-L2	: 66kV GIS / 66/6.6 kV, 7MVA Transformer		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100/LD	
TASK	code	C10000466	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type: Cu Cl.2/EPR/LSZH Cores/Size mm²: 1Cx240mm² Color: BLACK

From: HNA6-AFA70 To: TR-100AD1

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	PL
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	PL
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	NA
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	81002-CEH-L2	: 66kV GIS / 66/6.6 kV, 7MVA Transformer		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100/LD	
TASK	code	C10000466	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS		
1	CORE CONTINUITY	mΩ	Note
2	SCREEN CONTINUITY	mΩ	Note
3	ARMOUR CONTINUITY	mΩ	Note
	1st INSULATION TEST		
	Voltage applied:	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	MΩ	Note
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	MΩ	Note
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	MΩ	Note
	HV TEST 15 min		
	Voltage applied:	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	µA	Note
	2nd INSULATION TEST		
	Voltage applied:	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	MΩ	Note
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	MΩ	Note
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	MΩ	Note
	RE-CONNECT TERMINATIONS		
13	Tightening torque	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	See attached certificate	TYPE / SERIAL N°	
Calibration certificate N° and date:	See attached certificate	Calibration certificate N° and date:	
TYPE / SERIAL N°	See attached certificate	TYPE / SERIAL N°	
Calibration certificate N° and date:	See attached certificate	Calibration certificate N° and date:	

Comments:

Note test: See attached report

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	REYNARD	RM (ROSETTI MARINO)	
Name	Dimitrios Aravantinos	Josip Krizanic	
Date	2025-02-25	2025-02-26	
Signature	PROVERLIS Digitaly signed by Dimitrios Aravantinos 2025-02-25T10:52:56.697Z	PROVERLIS Digitaly signed by Josip Krizanic 2025-02-26T08:49:08.488Z	

Report - TE RSTF-72B

Project	Report	Location
Rosetti Power Hub Platform Crosswind	TE RSTF-72B	GIS

Cable	Manufacturer	Type
GIS-Transformer	TKF	240mm2

Cable ID

L1 Cable ID	L2 Cable ID	L3 Cable ID
5126600005	5126600005	5126600005

TE RSTF-72B Serial Numbers

T-connector Type
TE RSTF-72B

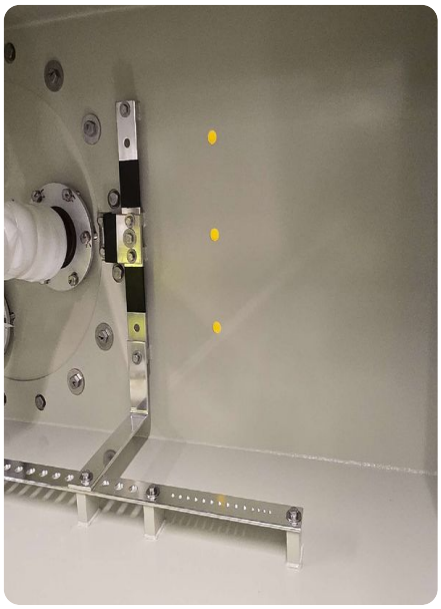
L1 Serial No. Connector Body	L2 Serial No. Connector Body	L3 Serial No. Connector Body
2024-1578	2024-1591	2024-1596

L1 Serial No. Stress Cone	L2 Serial No. Stress Cone	L3 Serial No. Stress Cone
ADE34-230865	ADE34-230851	ADE34-230859

L1 Serial No. Cable Lug	L2 Serial No. Cable Lug	L3 Serial No. Cable Lug
TE 56689	TE 56689	TE 36113

Electrical Cabinet Pre-installation Checks

Electrical Cabinet



L1 Bushing



L2 Bushing

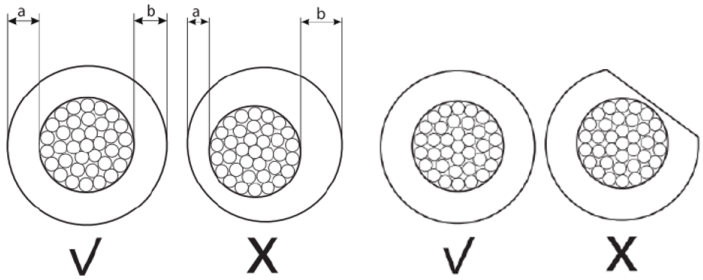


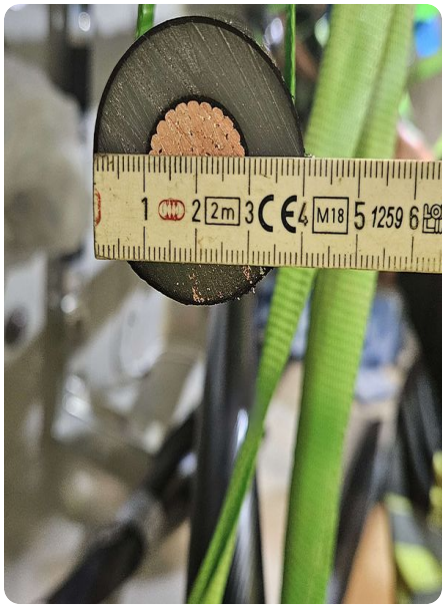
L3 Bushing



Eccentricity & Flattening Checks

Eccentricity & Flattening Diagram:



L1 Cross Section Cable	L2 Cross Section Cable	L3 Cross Section Cable
		

L1 measurement in mm (A)	L1 measurement in mm (B)
10	10

L2 measurement in mm (A)	L2 measurement in mm (B)
10	10

L3 measurement in mm (A)	L3 measurement in mm (B)
10	10

Heating & Straightening

L1 Cable Heating	L2 Cable Heating	L3 Cable Heating
		

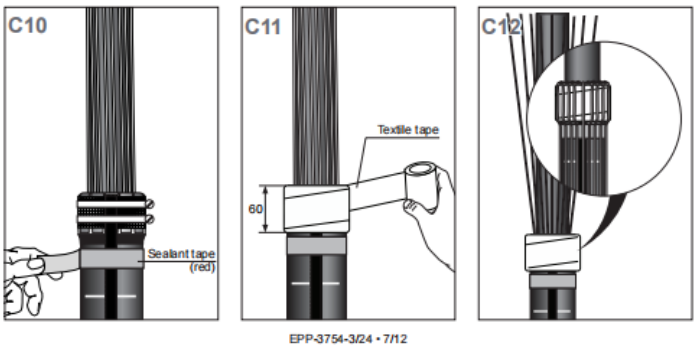
L1 Straightening	L2 Straightening	L3 Straightening
		

Marking Reference Lines

L1 Reference Line	L2 Reference Line	L3 Reference Line
		

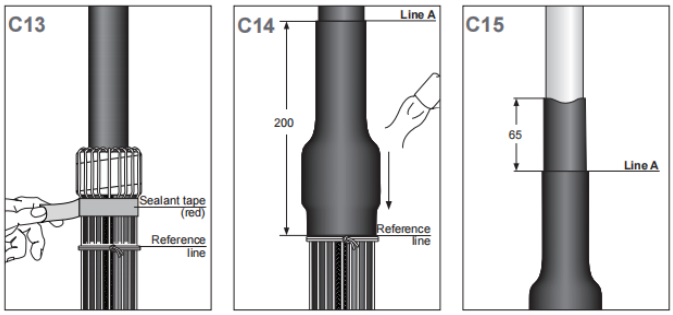
Preparation of Cable Screen/Sheath

Wrap 2 additional turns of red sealant tape around the cable on top of the copper braid and the other sealant tape layer. Press the layers together to avoid air gaps around the moisture block.
Apply 5 layers of textile tape to cover the support ring and all of the laminated foil over a length of 60 mm as shown. Make sure that all sharp edges are covered.
Bend the screen wires back over the textile tape and onto the oversheath. Push them into the sealant tape.

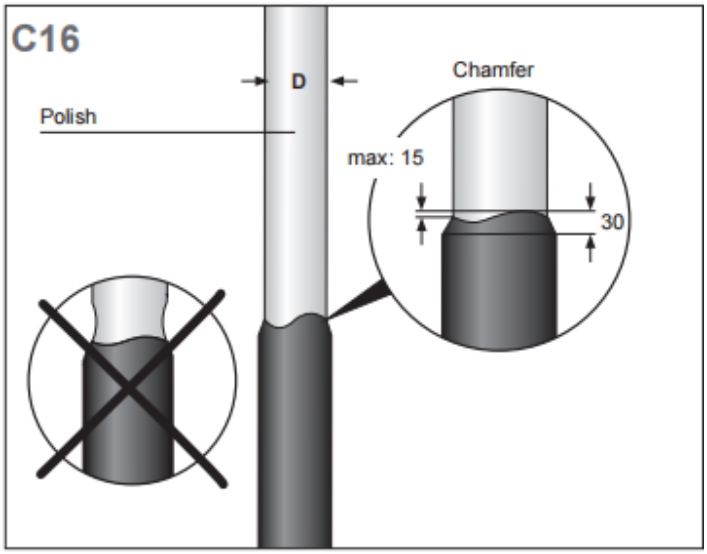


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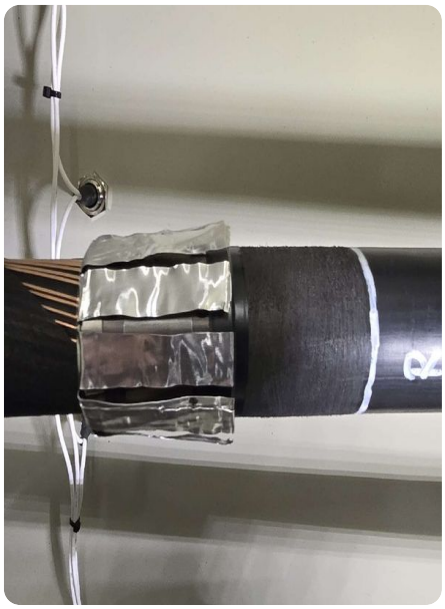
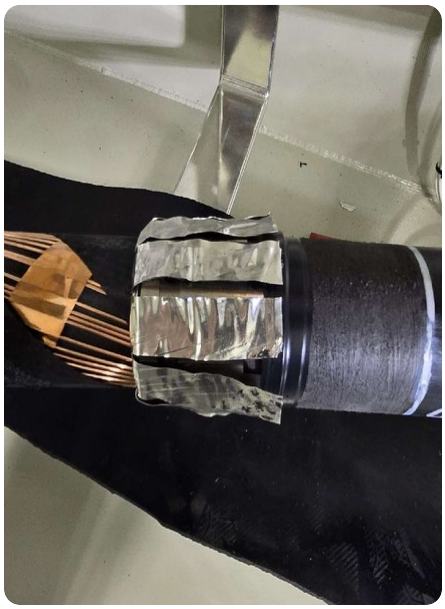
Wrap another 2 turns of red sealant tape around the cable on top of the copper wires and the other sealant tape layers.Fix the earth lead and copper wires onto the oversheath with a wire binder just below the 'Reference line'.
Mark Line A 200 mm up from Reference line and start shrinking the tube from the top (Line A) Start shrinking from the Line A as shown in the drawing.
Remove the core screen with appropriate screen removal tool according to the drawing.The surface of the insulation should be free from all traces of conductive material.

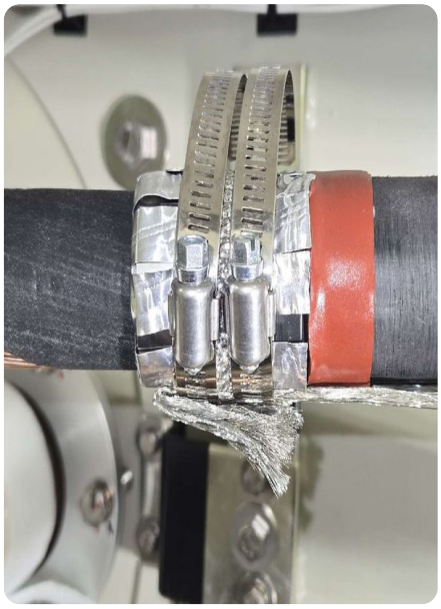
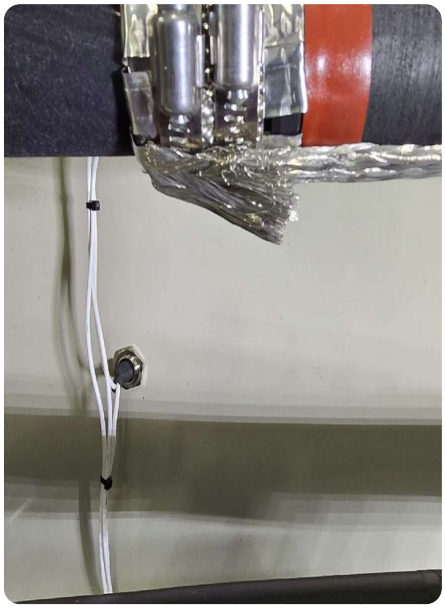
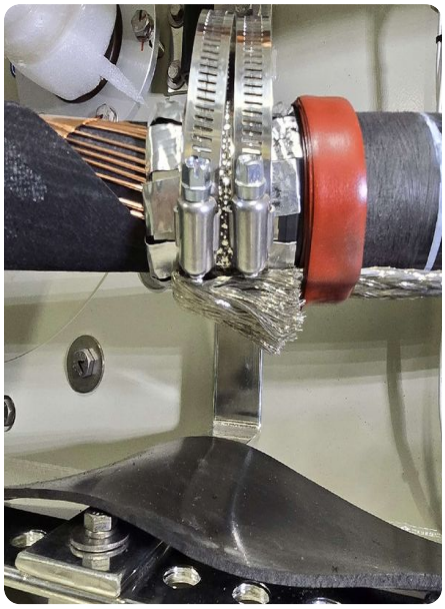


Make sure the semicon transition wave shape is in accordance with the values shown in the drawing.
Clean and degrease the insulation with the supplied cleanser in direction of the semicon to prevent contamination. Take care to
ensure that the diameter of the insulation is not reduced close to the transition to the semiconducting layer.
Check dimension D. The finally prepared diameter over insulation shall be within the application range of the stress cone,
marked at the rubber body.

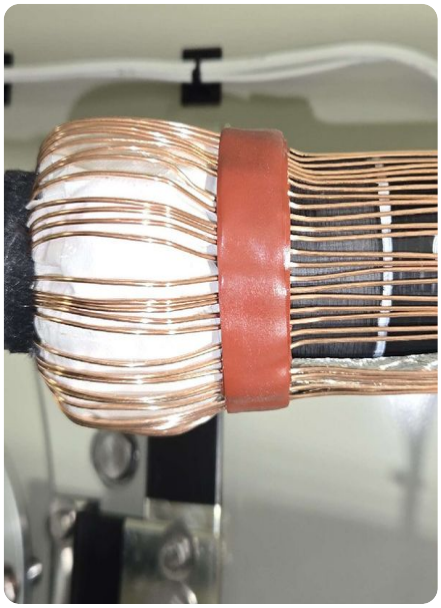


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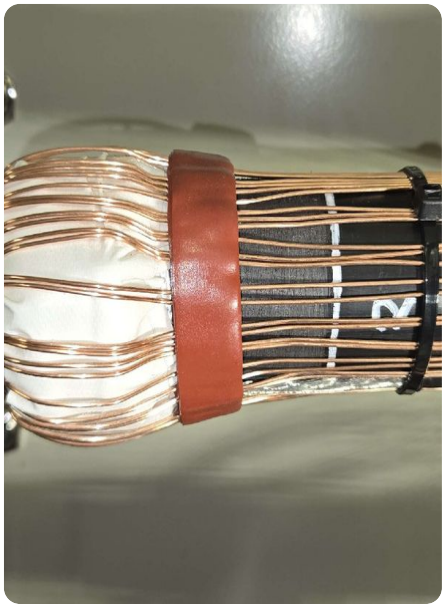
L1 Support Ring (C6)	L2 Support Ring (C6)	L3 Support Ring (C6)
		

L1 Contact Plate (C9)	L2 Contact Plate (C9)	L3 Contact Plate (C9)
		

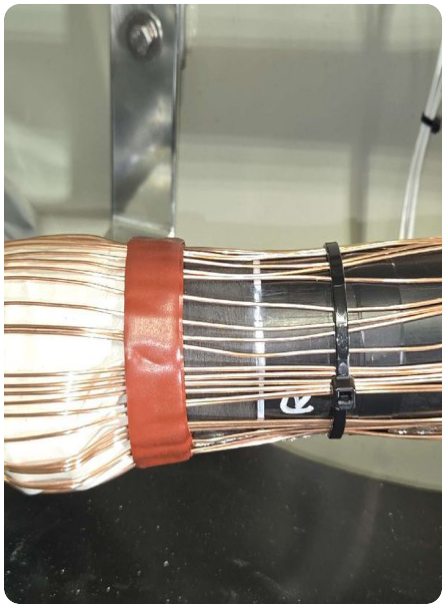
L1 Copper wires and Sealant Tape (C13)



L2 Copper wires and Sealant Tape (C13)



L3 Copper wires and Sealant Tape (C13)



L1 Heat Shrink Tube (C14)

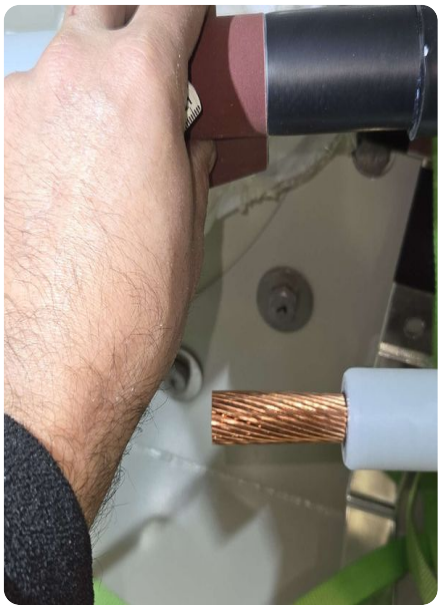
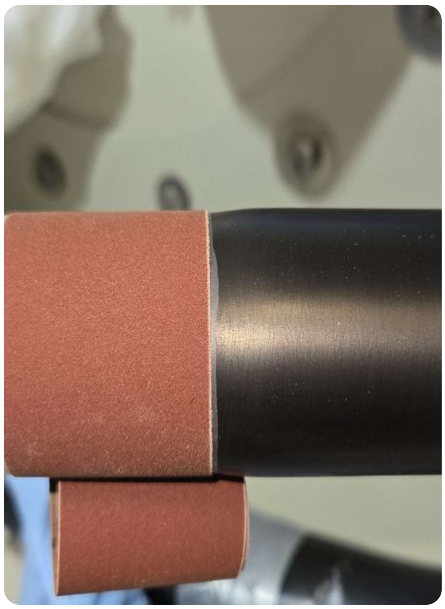


L2 Heat Shrink Tube (C14)



L3 Heat Shrink Tube (C14)



L1 Insulation Screen (C16)	L Insulation Screen (C16)	L1 Insulation Screen (C16)
		

Cut-Back Insulation and Conductor

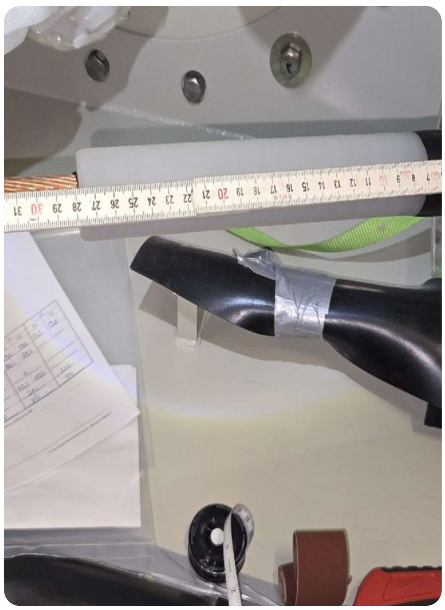
Cable Lug Type
BLMC-150/400

Dimension C (mm). Table 2	Dimension K (mm). Table 2	Dimension I (mm). Table 2
345	70	275

L1 Prepared Insulation and Conductor



L2 Prepared Insulation and Conductor



L3 Prepared Insulation and Conductor



Pre-Instalation and Cable Lug installation

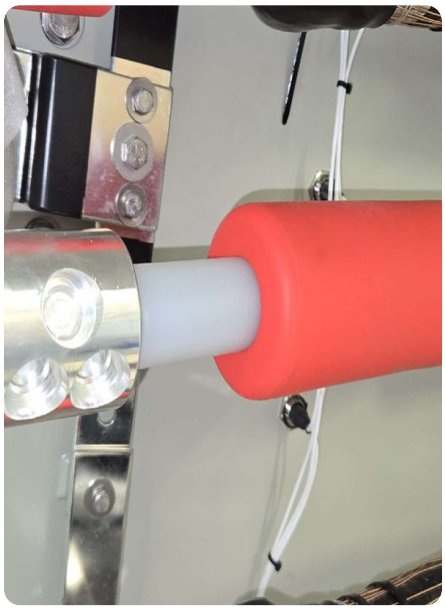
L1 Pre-Installation completed



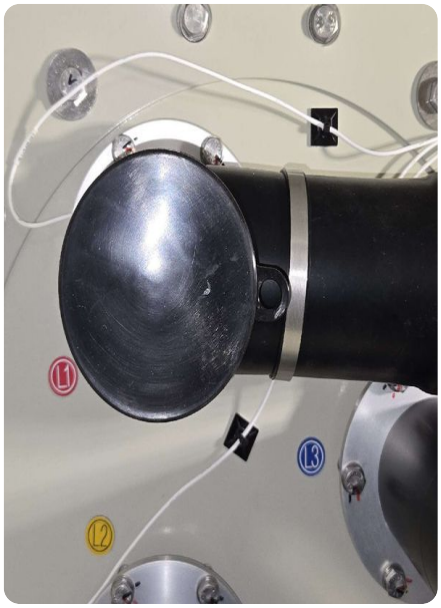
L1 Pre-Installation completed



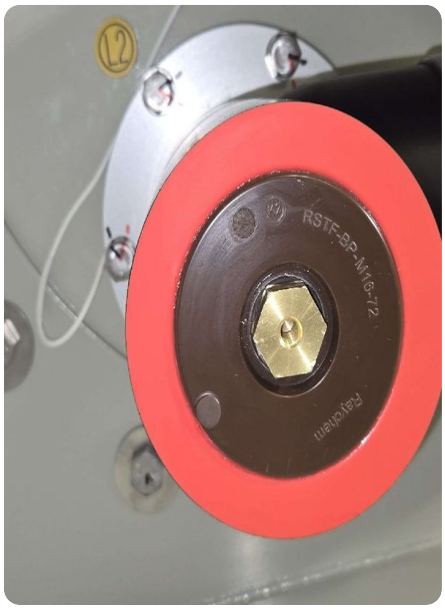
L1 Pre-Installation completed



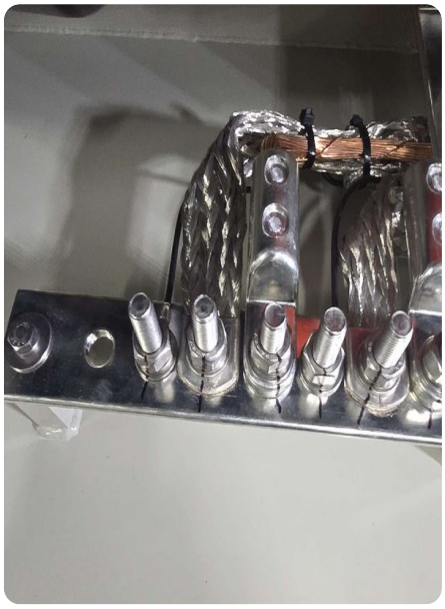
Installation of Base Connector

L1 Screen Connector Body Installed	L2 Screen Connector Body Installed	L3 Screen Connector Body Installed
		

L1 Nordlock Washer and Hex nut Installed	L2 Nordlock Washer and Hex nut Installed	L3 Nordlock Washer and Hex nut Installed
		

L1 Back Plug Installed	L2 Back Plug Installed	L3 Back Plug Installed
		

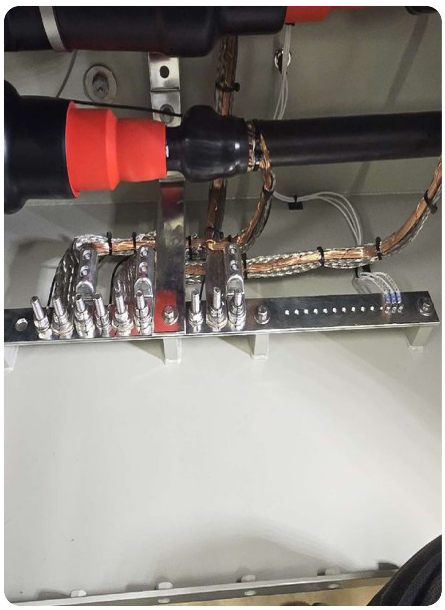
Grounding and Screening

L1 Gounding/Screening Installed	L2 Gounding/Screening Installed	L3 Gounding/Screening Installed
		

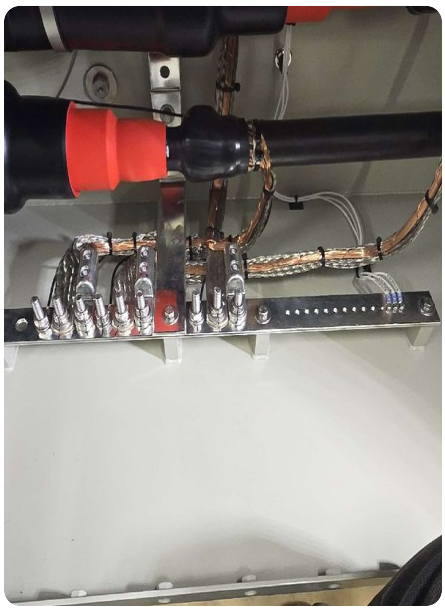
L1 Gounding/Screening Installed(Optional)



L2 Gounding/Screening Installed(Optional)

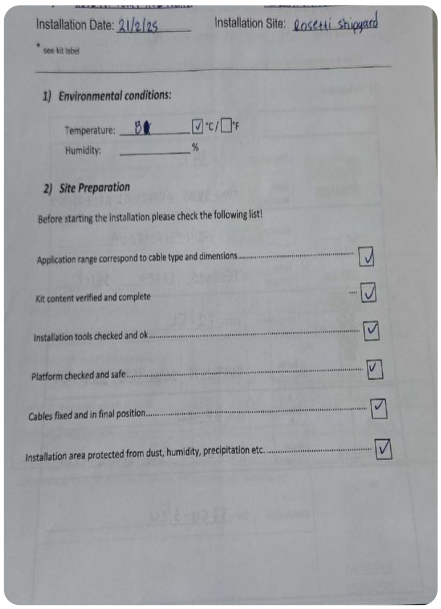


L3 Gounding/Screening Installed(Optional)



Installation Protocol

Installation Protocol Page 1



Installation Date: 21/2/25 Installation Site: Rosetti Shipyard

* see kit label

1) Environmental conditions:

Temperature: 8 ☑ °C/☐ °F

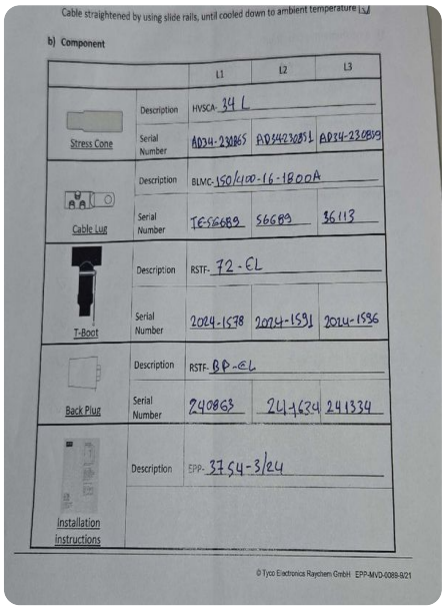
Humidity: _____ %

2) Site Preparation

Before starting the installation please check the following list!

- Application range correspond to cable type and dimensions ☑
- Kit content verified and complete ☑
- Installation tools checked and ok ☑
- Platform checked and safe ☑
- Cables fixed and in final position ☑
- Installation area protected from dust, humidity, precipitation etc. ☑

Installation Protocol Page 2



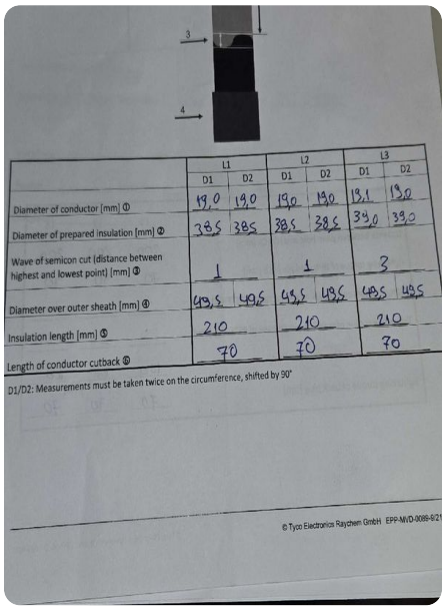
Cable straightened by using slide rails, until cooled down to ambient temperature ☑

b) Component

		L1	L2	L3
Stress Cone	Description	HVSCA- 34 L		
	Serial Number	AD24-23086	AD24230851	AD24-23089
Cable Lug	Description	BLMC-150/400-16-1800A		
	Serial Number	TE-56089	56089	36113
T-Boot	Description	RSTF- 72-EL		
	Serial Number	2024-1578	2024-1591	2024-1596
Back Plug	Description	RSTF- BP-EL		
	Serial Number	240863	241634	241334
Installation instructions	Description	EPP- 3754-3/24		

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Installation Protocol Page 3

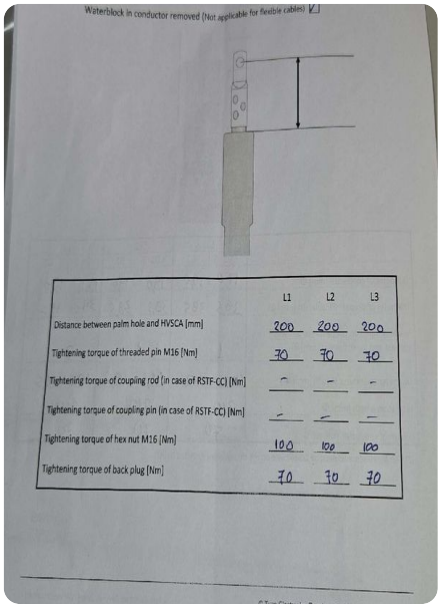


	L1		L2		L3	
	D1	D2	D1	D2	D1	D2
Diameter of conductor [mm] ①	19,0	19,0	19,0	19,0	19,1	19,0
Diameter of prepared insulation [mm] ②	38,5	38,5	38,5	38,5	39,0	39,0
Wave of semicon cut (distance between highest and lowest point) [mm] ③	1		1		3	
Diameter over outer sheath [mm] ④	49,5	49,5	49,5	49,5	49,5	49,5
Insulation length [mm] ⑤	210		210		210	
Length of conductor cutback ⑥	70		70		70	

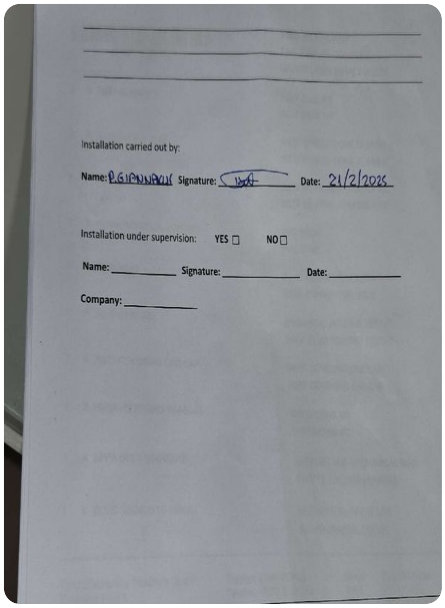
D1/D2: Measurements must be taken twice on the circumference, shifted by 90°

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Installation Protocol Page 4

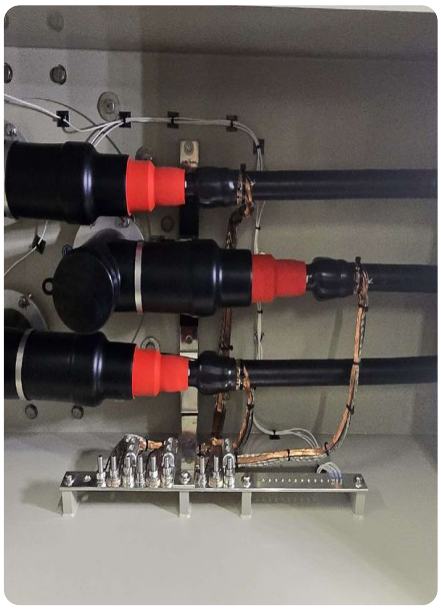


Installation Protocol Page 5



Final Overview

Cabinet Overview (Inside)



Cabinet Overview (Doors Closed)



[Optional] Client Rep Sign-off

Sign-Off

Panagiotis Giannaklis
24-02-2025





Certificate

te.com



Cert-Nr: 202490

Name **Panagiotis, Giannaklis**

Company **Reynard High Voltage Solutions (V&SH Offshore)**

Trained on **21.06 - 21.06.2023** **Valid until:** **6.2025**

Topic of training

RSTF on TKF cable 890113 and 890115 for HKN Project

Participated the theoretical and practical session successful.

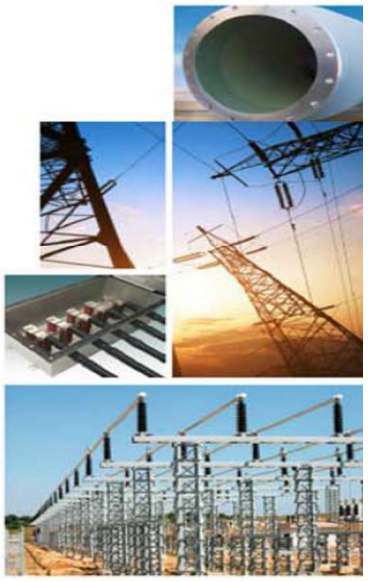
Content of training:

Installation of RSTF on TKF cable 890115 (800 mm²) with shifted Ligarex for HKN Project
RSTF-72B-M-P-E-45-NL06

The certificate can be extended by a minimum number of TE cable accessories were installed by the certificate holder since the date of issuance of this certificate.
This certificate qualifies for assembly and installation, but does not qualify to train third parties. The validity of this certificate is bounded to the above mentioned

21.06.2023

Benny Verley
Field Application Engineer Benelux
Energy Business Unit
TE Connectivity



Raychem
from TE Connectivity

te.com/trainingcenter

Report - Post-Term Test

Project	Report	Location
Rosetti Power Hub Platform Crosswind	Post-Term Test	GIS

Cable	Manufacturer	Type
GIS-Transformer	TKF	240mm2

Pre-testing Checks

Serial Number IR Tester

10211387

Expiry Date Calibration

2026-01-01

Area Safe and Secured?

true

L1 Insulation Resistance @5kV for 5min

L1 Test Voltage

5kV ☑

L1 Test Duration

5 Minutes ☑

L1 GΩ Recorded

1036

L1 Image of Screen IR tester



L1 Pass/Fail

Pass

L2 Insulation Resistance @5kV for 5min

L2 Test Voltage

5kV ☑

L2 Test Duration

5 minutes ☑

L2 GΩ Recorded

1134

L2 Image of Screen IR Tester



L2 Pass/Fail

Pass

L3 Insulation Resistance @5kV for 5min

L3 Test Voltage

5kV ☑

L3 Test Duration

5 Minutes ☑

L3 GΩ Recorded

1113

L3 Image of Screen IR Tester

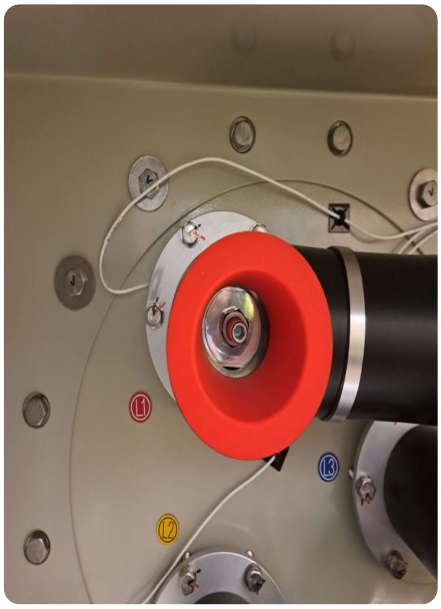


L3 Pass/Fail

Pass

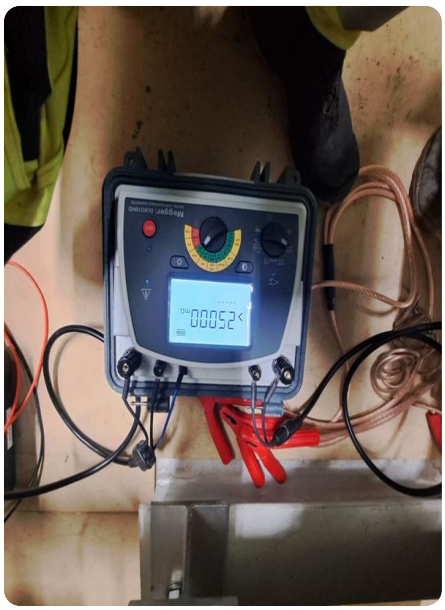
Phase ID

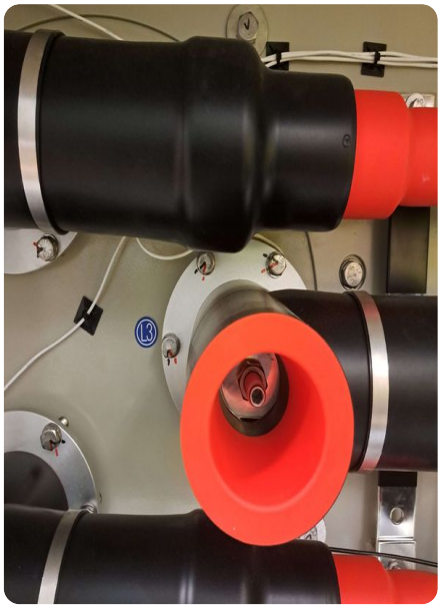
Phase ID L1 (Color Code etc.)



Phase ID L1 (Measurment)



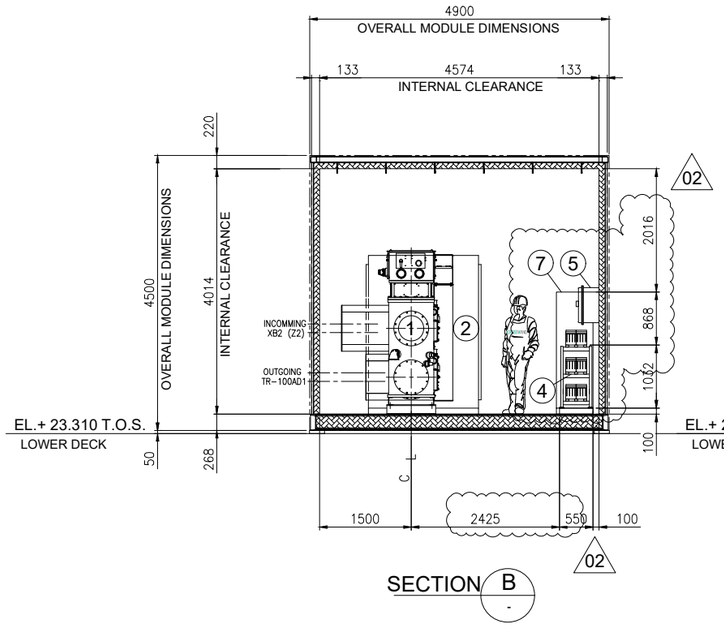
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Phase ID L3 (Color Code etc.)	Phase ID L3 (Measurment)
	

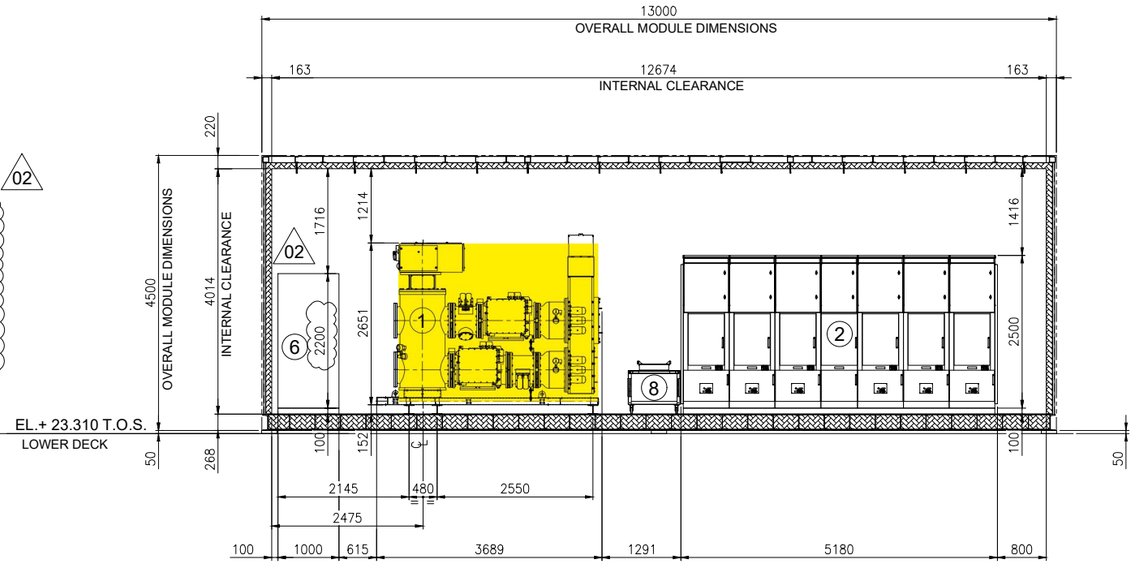
Sign-Off

Dimitrios Aravantinos
24-02-2025

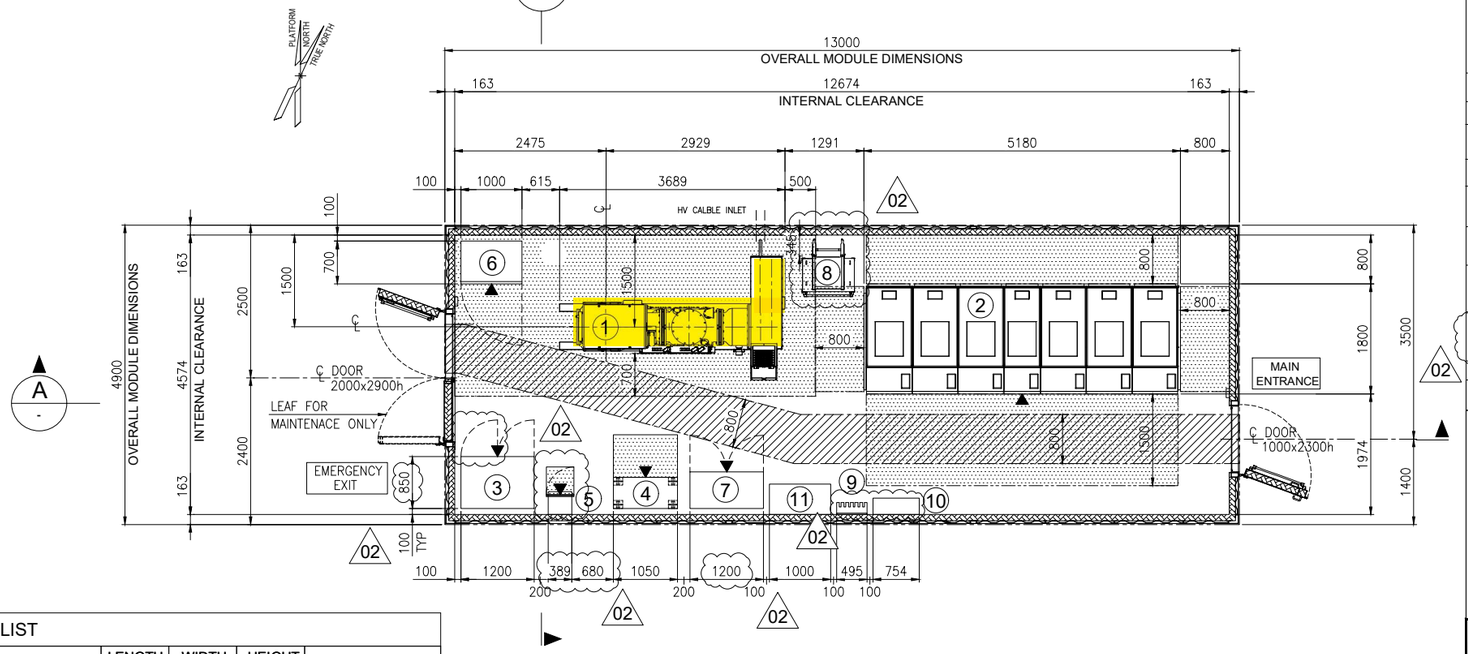
DRAWING NO. 123A90-DDL-EL-DL-20104 | REV. 02



SECTION B -



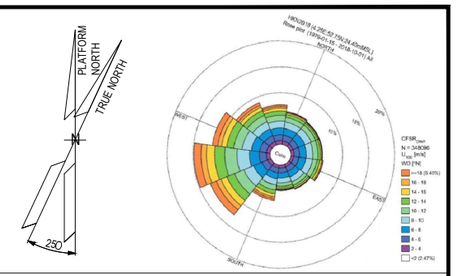
SECTION A -



A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

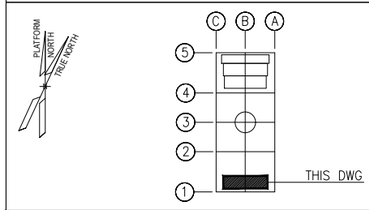
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

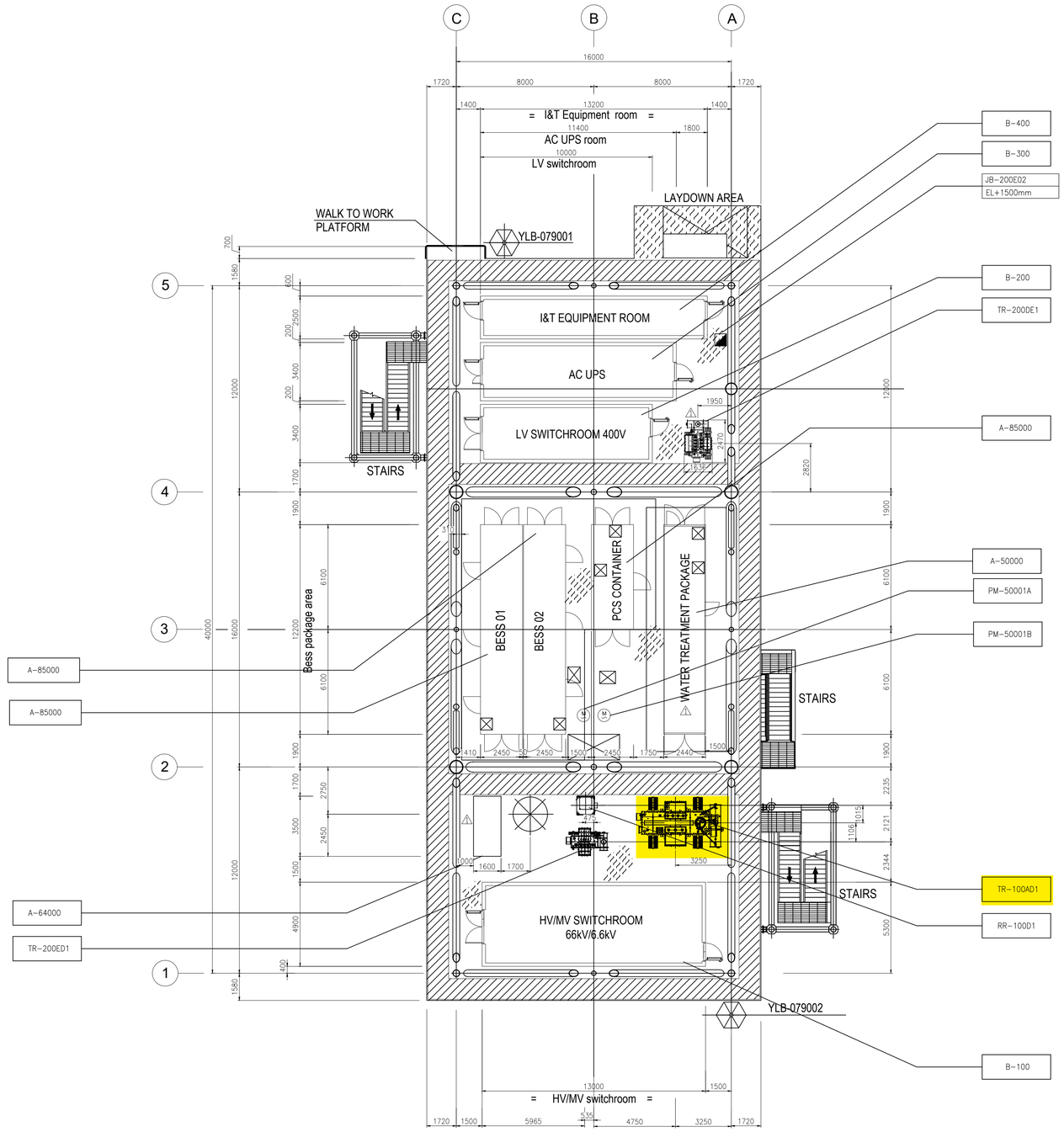
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

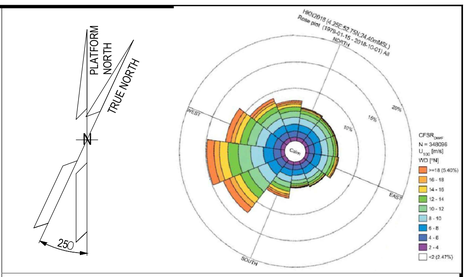
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

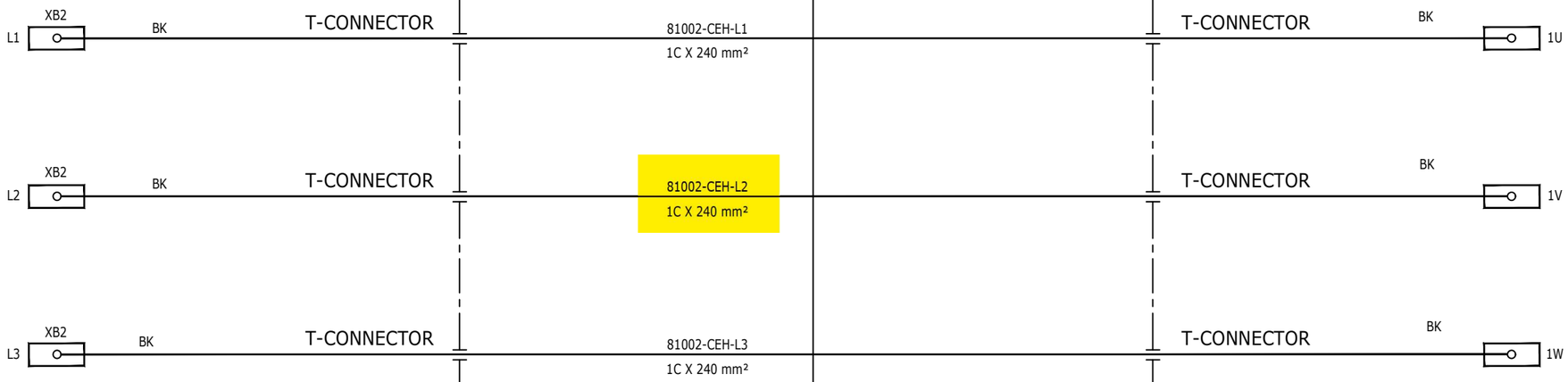
FROM	TO

DESCRIPTION: 66kV SWITCHGEAR (GIS)
TAG NUMBER: HNA6-AFA70

QZ91

DESCRIPTION: 66/6.9 KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1

HV TERMINAL BOX OF
TR-100AD1



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

REV.:	DATE:	SIGNATURE:
2_K	12/02/25	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
66kV GIS SWGR

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	011	02

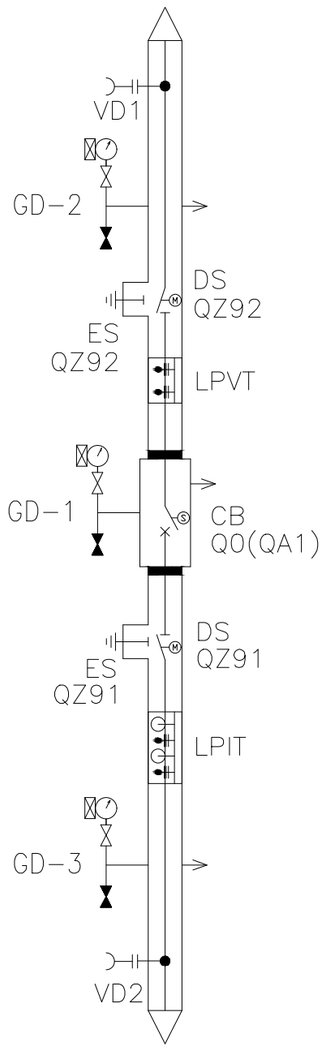
F.to UNI A3: 420mmx297mm

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

DRAWING NO. 1723001595-EL-DG-00014

REV. 00

XB2 (Z2)



TR-100AD1

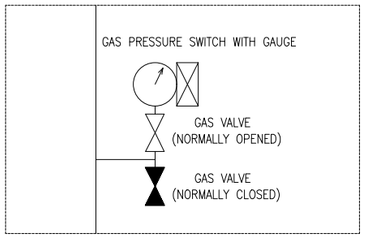
❑ RATED GAS (DRY AIR) PRESSURE

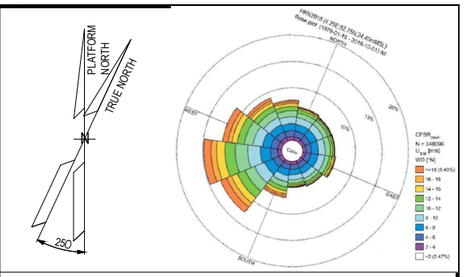
- CIRCUIT BREAKER COMPARTMENT : 5 bar.G
- OTHERS COMPARTMENT : 5 bar.G

❑ PRESSURE OF GAS AND ALARM SETTING

		PRESSURE SETTINGS : bar.G at 20°C			DESIGNATION
		RATED	ALARM ON	RESET	
CB	LOW 1'ST STAGE	5	4.7	4.9	GD-1
	LOW 2'ND STAGE		4.5	4.7	
OTHERS	LOW 1'ST STAGE	5	4.7	4.9	GD-2, GD-3
	LOW 2'ND STAGE		4.5	4.7	

❑ DETAIL-A(TYPICAL) FOR GAS VALVE & GAS PRESSURE SWITCH WITH GAUGE





NOTES

1. DESCRIPTION of ABBREVIATIONS.
   - CB : CIRCUIT BREAKER
   - DS : DISCONNECTING SWITCH
   - ES : EARTHING SWITCH
   - VD : VOLTAGE DETECTOR
   - LPIT : LOW POWER INSTRUMENT TRANSFORMER
   - ECVT : ELECTRONIC CT AND VT
   - EVT : ELECTRONIC VT

LEGEND

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER (SPRING OPERATION)
	COMBINED WITH DS(ISOLATOR) AND ES(EARTHING SWITCH) (MOTOR DRIVEN OPERATION)
	VOLTAGE & CURRENT TRANSFORMER (3ø X 2) (LPIT TYPE)
	VOLTAGE TRANSFORMER (3ø X 2) (LPVT TYPE)
	T-CONNECTOR
	GAS DENSITY MONITOR (PRESSURE SWITCH WITH GAUGE)
	GAS VALVE (NORMALLY CLOSED)-NON RETURN TYPE
	GAS VALVE (NORMALLY OPENED)-NON RETURN TYPE
	GAS TIGHT SPACER (BARRIER)
	RUPTURE DISK
	VOLTAGE DETECTING SENSOR

HOLDS

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	REVISED AS PER COMMENT
1	29/12/23	Y.D.LEE	Y.W.LEE	S.J.CHO	REVISED AS PER COMMENT
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

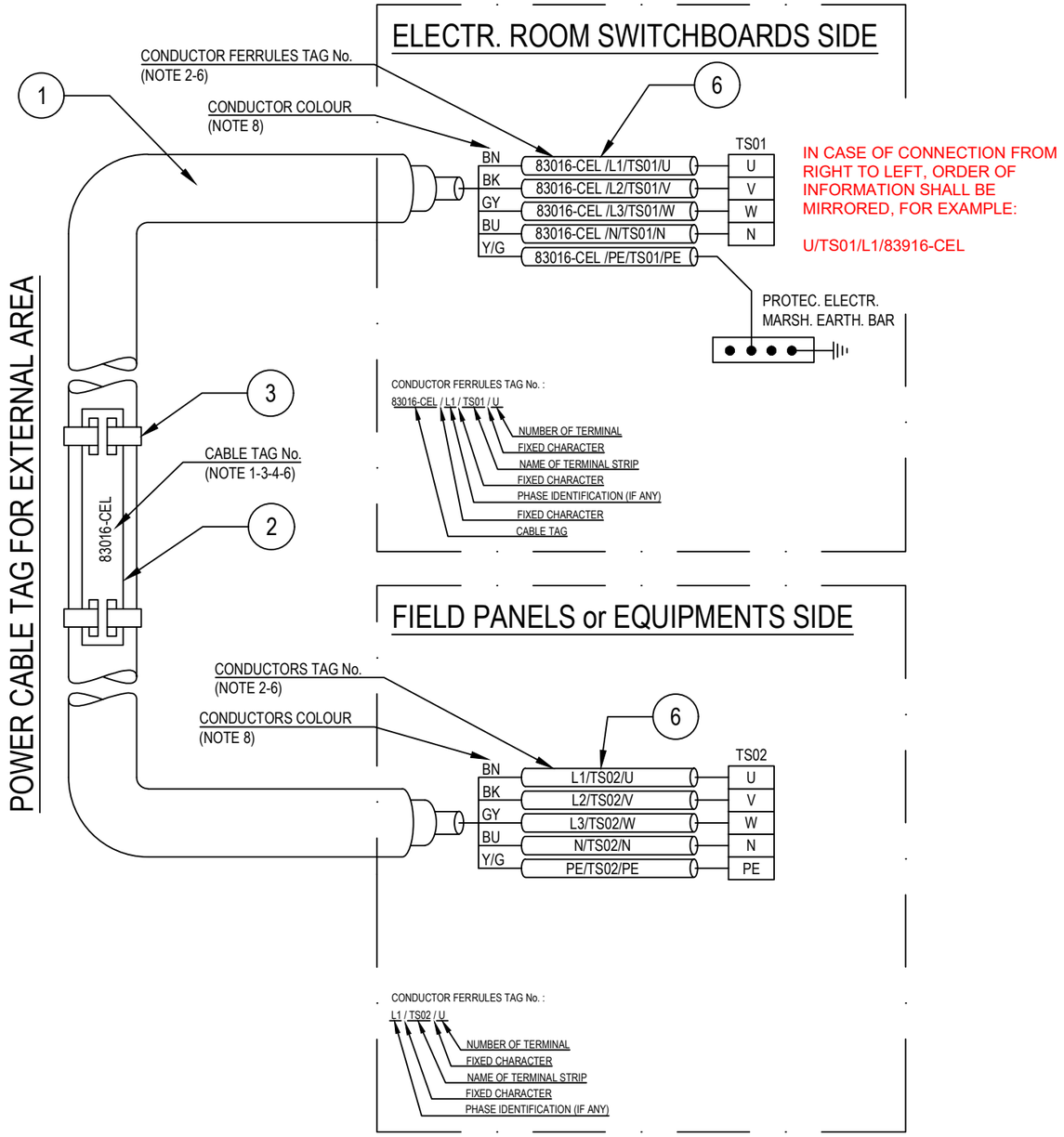
ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
GAS SINGLE LINE DIAGRAM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 10/11/23
A1	DRAWING NO. 1723001595-EL-DG-00014	SHEET 001	REV. 03

File Name : DRAWING_NO.

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

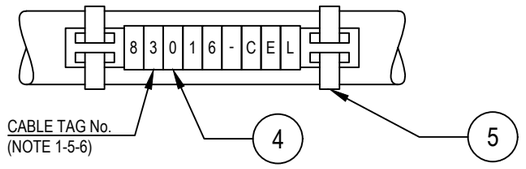
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

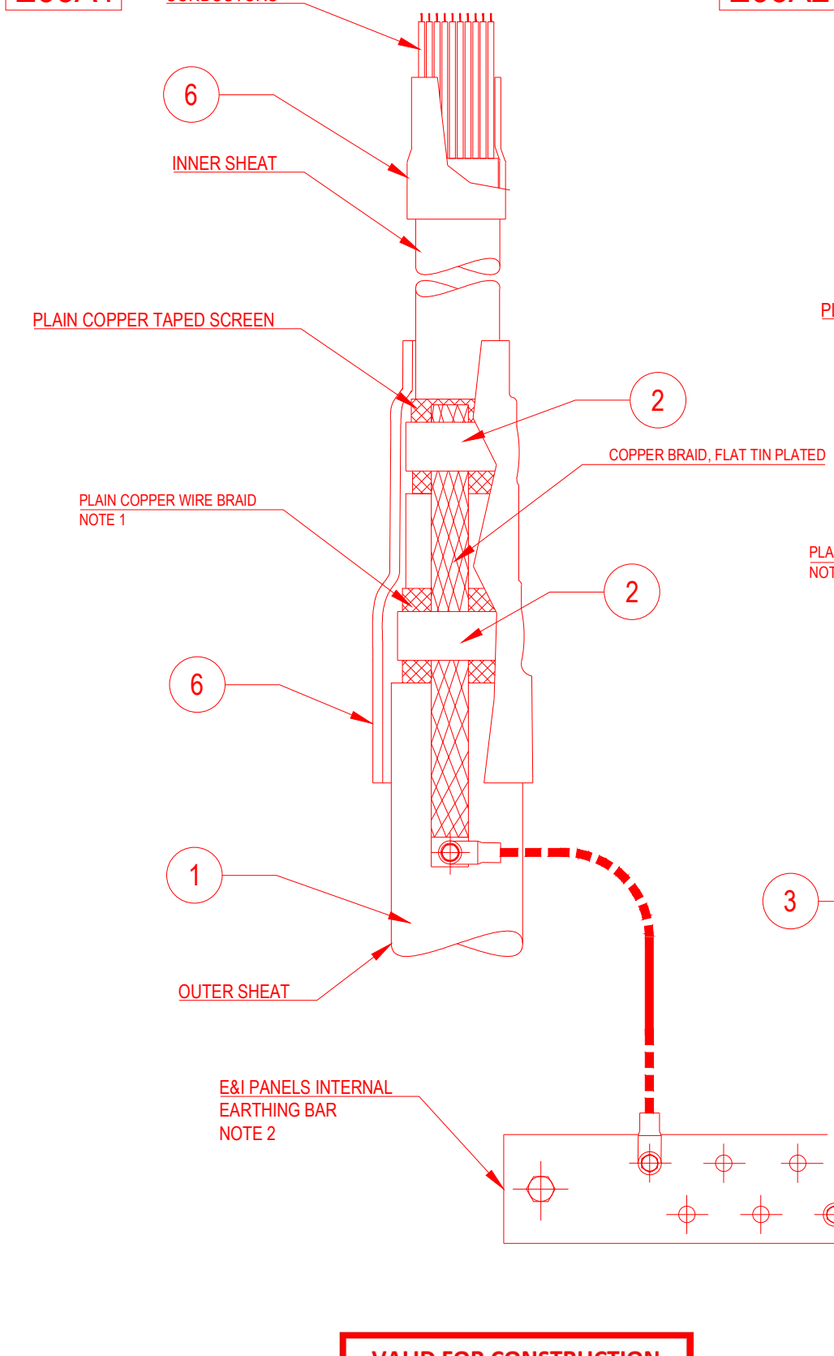
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

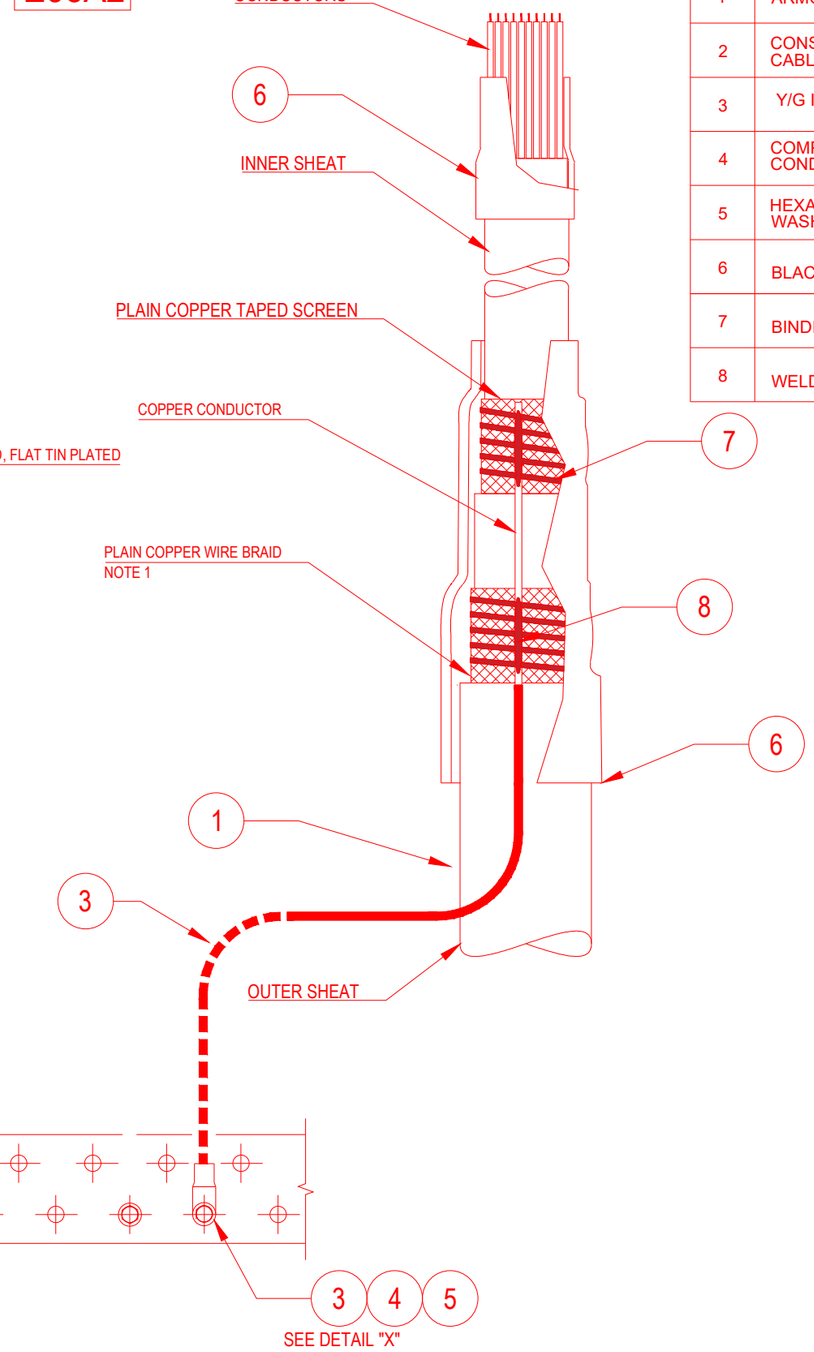
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

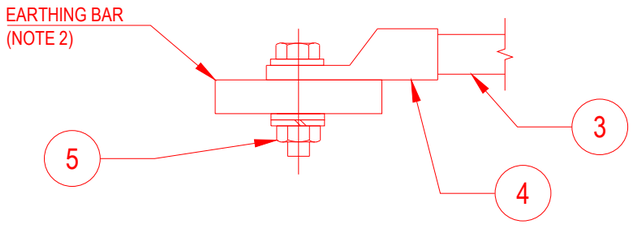


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Info	Category	Discipl	Eng Status	NativeDoc	Service	Entity Type	Main Function	Module	Area	From Tag	From Main Fund	From Tag Section	To Tag	To Main Funct	To Tag Sectio	Material ID	Material Desc.	Gland St	From Glan	From Entry	From Fittin	To Gland	To Entry	To Fitting	Routing	Routing Manual
81002-CEH-L2		Cable	EL	VFC	123A90-DDL-EL-LIS-20148						HNA6-AFA70	66 kV GIS	QZ91	TR-100AD1	66 / 6.9 kV 7 M	HV Cable Bo›	ELECV00-1X240	Cable Cu Cl.2/EPR/LSZH 36/66kV 1Cx240mm^2 - Red	M63	n.a.			T1_M63_Single				E-MCT-101 / L-300-101-HVT-003

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 | 03-07-2024

Description

1 x 240 / 50



* This image may differ from the actual product.

Trading information

Product group	Power cable >= 1 kV, for permanent installation
Type	Cu/XLPE/CWS/LAT/LSZH 36/66 kV
Net. Weight	4.11 kg/m
Sheath marking	{Length} TKF - Cu/XLPE/CWS/LAT/LSZH 36/66 kV 1 x 240/50 IEC 60840 - {Year} {Batch}

Trade lengths

	Minimal order
(58239 / 8713182481131)	1 MTR

Construction characteristics

Standardization	IEC 60840
Number of cores	1
Nominal cross section conductor	240 mm²
Conductor material	Copper
Conductor surface	Bare

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Construction characteristics

Standardization conductor material	IEC 60228
Shape of conductor	Round
Conductor category	Class 2c = stranded & compacted
Conductor shield	Semiconductive Compound
Material core insulation	XLPE++
Insulation shield	Semiconductive compound with semiconductive swellable tape
Earthscreen construction	Copper round wire + copper tape counter spiral
Nominal earthscreen cross section	50 mm²
Material outer sheath	LSZH
Colour outer sheath	Black
Diameter conductor	18.6 mm
Insulation thickness	9.5 mm
Diameter over insulation	39.2 mm
Aluminium sheath thickness	0.2 mm
Diameter shield wires	1.15 mm
Diameter over shield	41.7 mm
Outer sheath thickness	2.5 mm
Outer diameter approx.	48.1 mm

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Properties

Flame retardant	IEC 60332-3-24 Cat. C
Halogen free	IEC 60754-1 / IEC 60754-2
Low smoke	IEC 61034-1 & IEC 61034-2
Longitudinal water blocking	Yes
Radial water blocking	Yes
Radial watertight construction	Al/PE
UV resistant	Yes
UV protection	NEN EN 50289-4-17A

Technical characteristics

Min. bending radius during installation	870 mm
Min. bending radius after installation	755 mm
Tensile force with pullinghead	12,000 N
Tensile force with pullingsleeve	4,620 N
Max. conductor temperature	90 °C
Max. operating temperature	70 °C
Minimum installation temperature	-10 °C

Electrical characteristics

Nominal voltage U0	36 kV
Nominal voltage U	60 kV
Nominal voltage Umax	72.5 kV
Conductor DC resistance @ 20°C	0.0754 Ohm/km
Conductor AC resistance @ max. cont. Conductor temp.	0.0973 Ohm/km
Shield DC resistance	0.387 Ohm/km

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Electrical characteristics

Mutual capacitance (Nominal)	0.21 µF/km
Max. thermal short-circuit current conductor 0,5 sec	48.5 kA
Max. thermal short-circuit current conductor 1 sec	34.3 kA
Max. short-circuit temperature conductor	250 °C
Max. thermal short-circuit current shield 0,5 sec	10.51 kA
Max. thermal short-circuit current shield 1 sec	7.43 kA
Max. short-circuit temperature shield	250 °C
E-Max fieldstrength	5.38 kV/mm
E-Min fieldstrength	2.77 kV/mm
Charging current per core	2.373 A/km
Frequency	50 Hz
Operating reactance trefoil arrangement	0.12 Ohm/km
Operating reactance flat arrangement	0.18 Ohm/km
*) Theoretical calculated values	Depends on application
Maximum current buried trefoil arrangement	455 A
Maximum current buried flat arrangement	455 A
Maximum current in air trefoil arrangement	630 A
Maximum current in air flat arrangement	730 A
Homopolar resistance Ro (trefoil) *)	2.1899 Ohm/km
Homopolar resistance Ro (flat) *)	2.1894 Ohm/km
Homopolar reactance Xo (trefoil) *)	0.3877 Ohm/km
Homopolar reactance Xo (flat) *)	0.6233 Ohm/km
Homopolar impedance Zo (trefoil) *)	2.2239 Ohm/km
Homopolar impedance Zo (flat) *)	2.2764 Ohm/km

Subject to technical modifications | No rights can be derived from this information

Spinnerstraat 15 | P.O. Box 6 | 7481 KJ Haaksbergen | Nederland | Phone: +31 (0)53 573 22 55 | E-mail: info@tkf.nl

ITEM	Tag	81002-CEH-L3	: 66kV GIS / 66/6.6 kV, 7MVA Transformer			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100/LD
TASK	code	C10000467		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1Cx240mm² | Color: BLACK

From: HNA6-AFA70 | To: TR-100AD1

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	PL
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	PL
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	PL
11	Check cores marking are in accordance with termination diagram	NA
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	81002-CEH-L3	: 66kV GIS / 66/6.6 kV, 7MVA Transformer		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100/LD	
TASK	code	C10000467	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS		
1	CORE CONTINUITY	mΩ	Note
2	SCREEN CONTINUITY	mΩ	Note
3	ARMOUR CONTINUITY	mΩ	Note
	1st INSULATION TEST		
	Voltage applied:	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	MΩ	Note
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	MΩ	Note
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	MΩ	Note
	HV TEST 15 min		
	Voltage applied:	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	µA	Note
	2nd INSULATION TEST		
	Voltage applied:	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	MΩ	Note
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	MΩ	Note
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	MΩ	Note
	RE-CONNECT TERMINATIONS		
13	Tightening torque	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	See attached certificate	TYPE / SERIAL N°
Calibration certificate N° and date:	See attached certificate	Calibration certificate N° and date:
TYPE / SERIAL N°	See attached certificate	TYPE / SERIAL N°
Calibration certificate N° and date:	See attached certificate	Calibration certificate N° and date:

Comments:

Note: See attached report

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	REYNARD	RM (ROSETTI MARINO)	
Name	Dimitrios Aravantinos	Josip Krizanic	
Date	2025-02-25	2025-02-26	
Signature	PROVERLIS Digitaly signed by Dimitrios Aravantinos 2025-02-25T10:53:53.123Z	PROVERLIS Digitaly signed by Josip Krizanic 2025-02-26T08:42:10.347Z	

Report - TE RSTF-72B

Project	Report	Location
Rosetti Power Hub Platform Crosswind	TE RSTF-72B	GIS

Cable	Manufacturer	Type
GIS-Transformer	TKF	240mm2

Cable ID

L1 Cable ID	L2 Cable ID	L3 Cable ID
5126600005	5126600005	5126600005

TE RSTF-72B Serial Numbers

T-connector Type
TE RSTF-72B

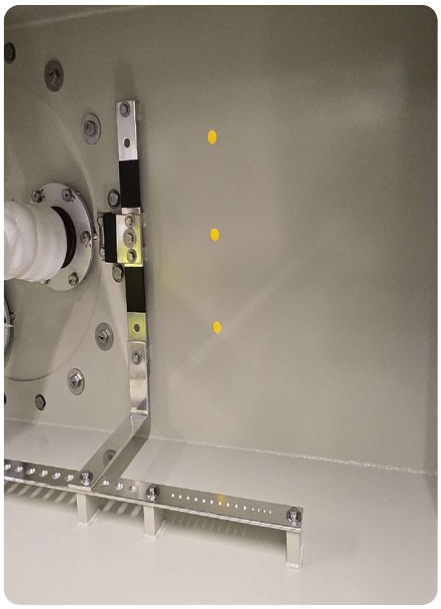
L1 Serial No. Connector Body	L2 Serial No. Connector Body	L3 Serial No. Connector Body
2024-1578	2024-1591	2024-1596

L1 Serial No. Stress Cone	L2 Serial No. Stress Cone	L3 Serial No. Stress Cone
ADE34-230865	ADE34-230851	ADE34-230859

L1 Serial No. Cable Lug	L2 Serial No. Cable Lug	L3 Serial No. Cable Lug
TE 56689	TE 56689	TE 36113

Electrical Cabinet Pre-installation Checks

Electrical Cabinet



L1 Bushing



L2 Bushing

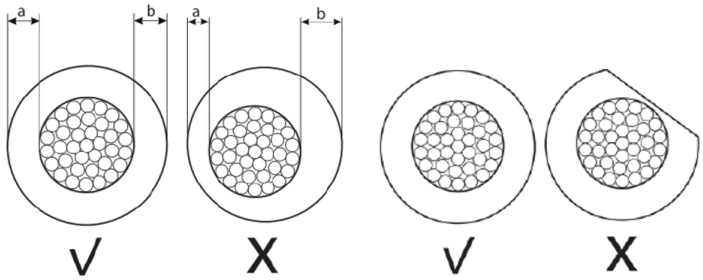


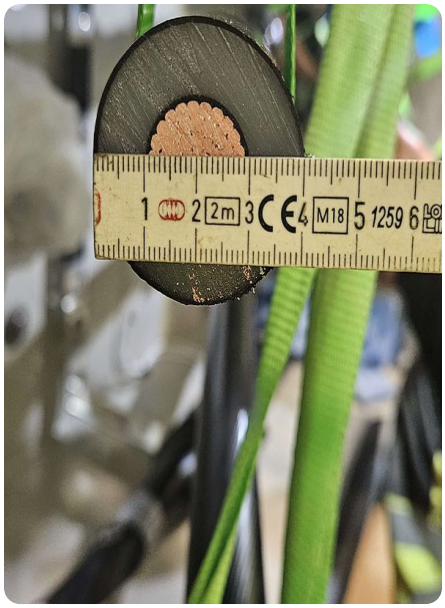
L3 Bushing



Eccentricity & Flattening Checks

Eccentricity & Flattening Diagram:



L1 Cross Section Cable	L2 Cross Section Cable	L3 Cross Section Cable
		

L1 measurement in mm (A)	L1 measurement in mm (B)
10	10

L2 measurement in mm (A)	L2 measurement in mm (B)
10	10

L3 measurement in mm (A)	L3 measurement in mm (B)
10	10

Heating & Straightening

L1 Cable Heating	L2 Cable Heating	L3 Cable Heating
		

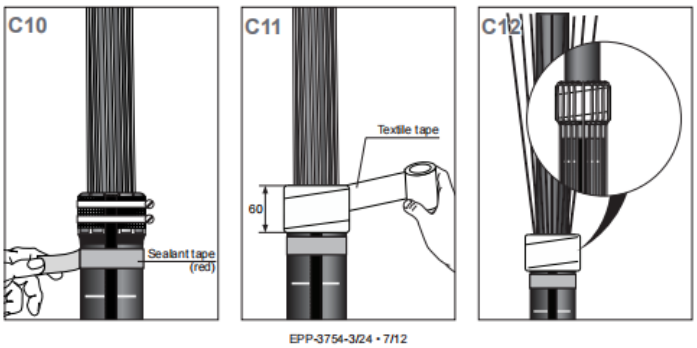
L1 Straightening	L2 Straightening	L3 Straightening
		

Marking Reference Lines

L1 Reference Line	L2 Reference Line	L3 Reference Line
		

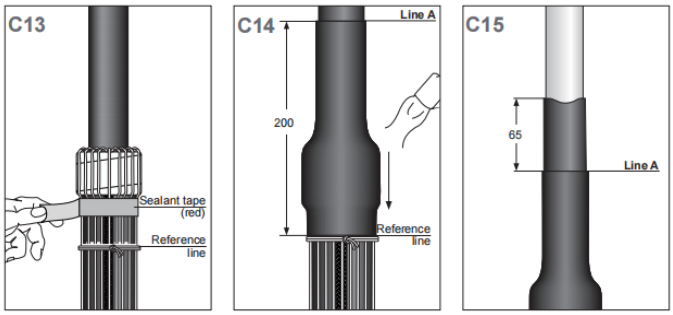
Preparation of Cable Screen/Sheath

Wrap 2 additional turns of red sealant tape around the cable on top of the copper braid and the other sealant tape layer. Press the layers together to avoid air gaps around the moisture block.
Apply 5 layers of textile tape to cover the support ring and all of the laminated foil over a length of 60 mm as shown. Make sure that all sharp edges are covered.
Bend the screen wires back over the textile tape and onto the oversheath. Push them into the sealant tape.

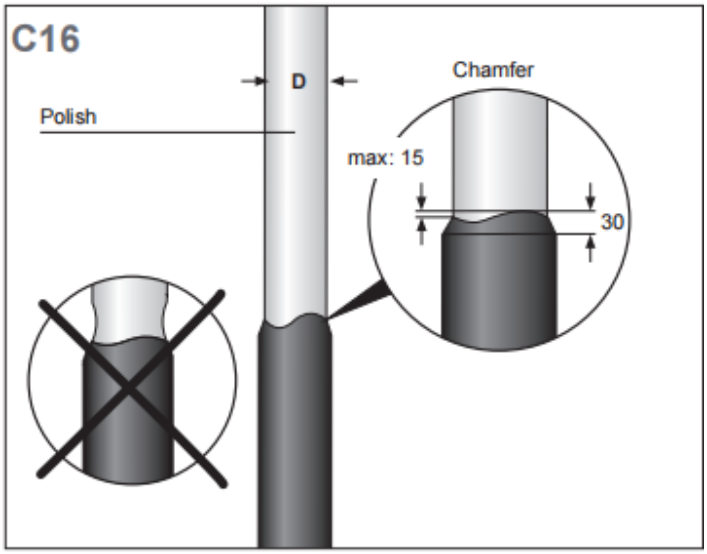


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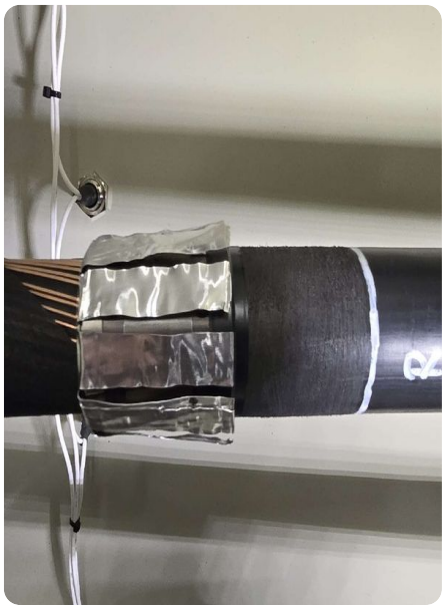
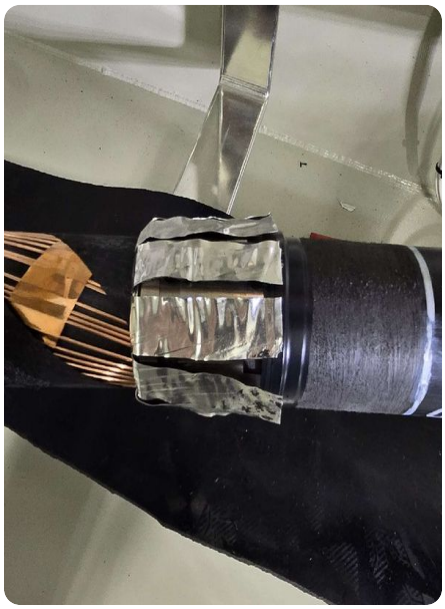
Wrap another 2 turns of red sealant tape around the cable on top of the copper wires and the other sealant tape layers.Fix the earth lead and copper wires onto the oversheath with a wire binder just below the 'Reference line'.
Mark Line A 200 mm up from Reference line and start shrinking the tube from the top (Line A) Start shrinking from the Line A as shown in the drawing.
Remove the core screen with appropriate screen removal tool according to the drawing.The surface of the insulation should be free from all traces of conductive material.

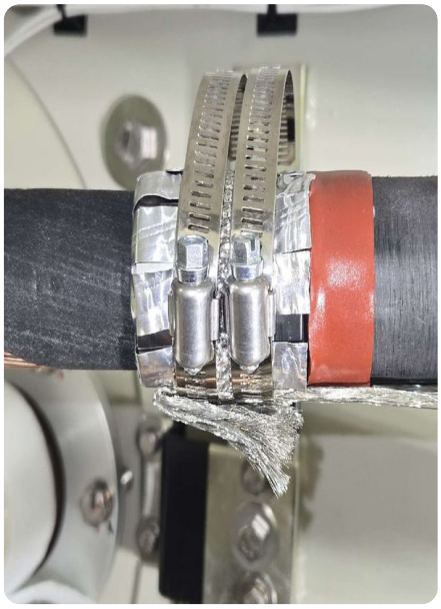
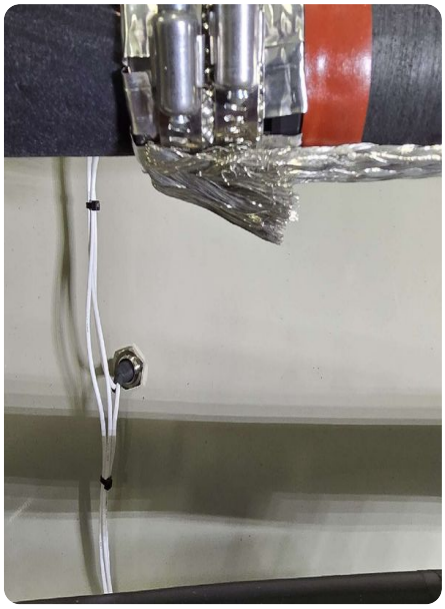
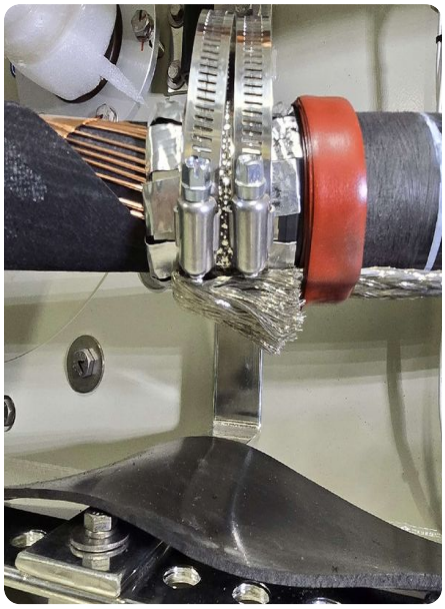


Make sure the semicon transition wave shape is in accordance with the values shown in the drawing.
Clean and degrease the insulation with the supplied cleanser in direction of the semicon to prevent contamination. Take care to
ensure that the diameter of the insulation is not reduced close to the transition to the semiconducting layer.
Check dimension D. The finally prepared diameter over insulation shall be within the application range of the stress cone,
marked at the rubber body.

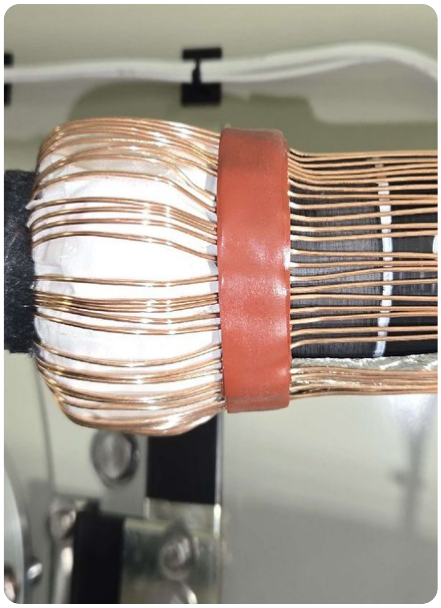


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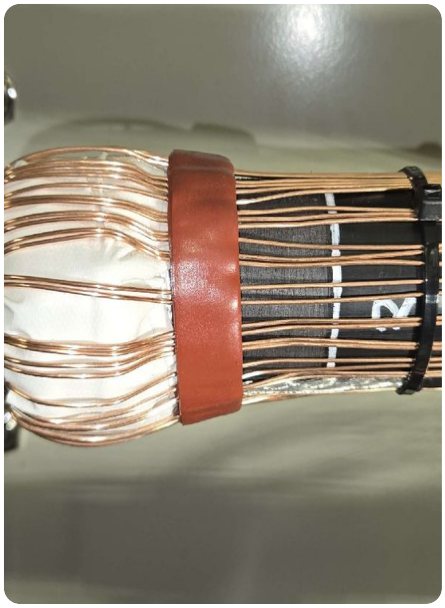
L1 Support Ring (C6)	L2 Support Ring (C6)	L3 Support Ring (C6)
		

L1 Contact Plate (C9)	L2 Contact Plate (C9)	L3 Contact Plate (C9)
		

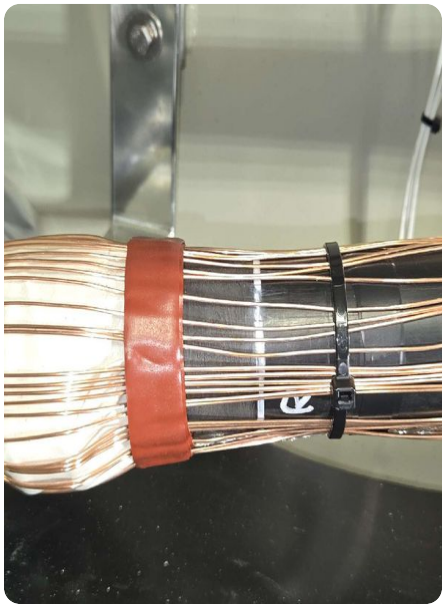
L1 Copper wires and Sealant Tape (C13)



L2 Copper wires and Sealant Tape (C13)



L3 Copper wires and Sealant Tape (C13)



L1 Heat Shrink Tube (C14)

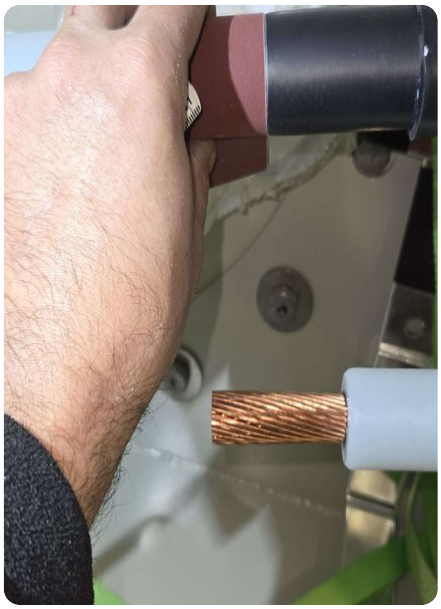
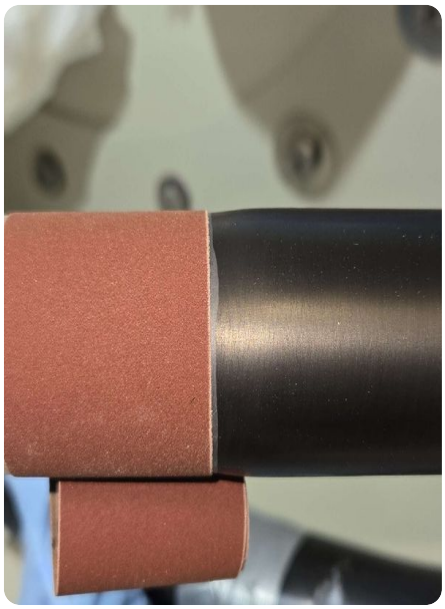


L2 Heat Shrink Tube (C14)



L3 Heat Shrink Tube (C14)



L1 Insulation Screen (C16)	L Insulation Screen (C16)	L1 Insulation Screen (C16)
		

Cut-Back Insulation and Conductor

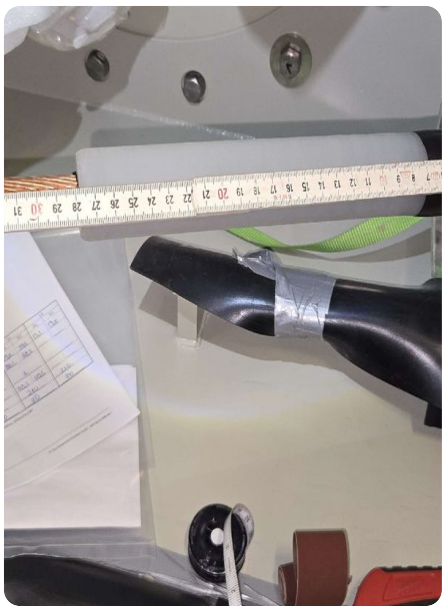
Cable Lug Type
BLMC-150/400

Dimension C (mm). Table 2	Dimension K (mm). Table 2	Dimension I (mm). Table 2
345	70	275

L1 Prepared Insulation and Conductor



L2 Prepared Insulation and Conductor



L3 Prepared Insulation and Conductor



Pre-Instalation and Cable Lug installation

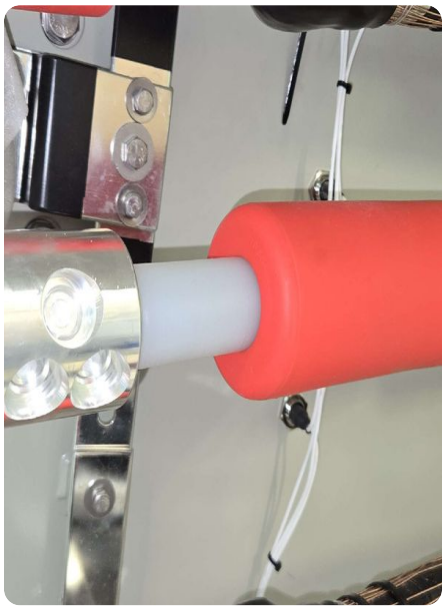
L1 Pre-Installation completed



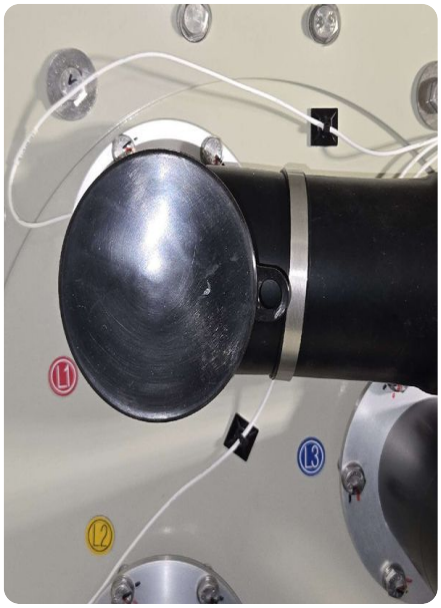
L1 Pre-Installation completed



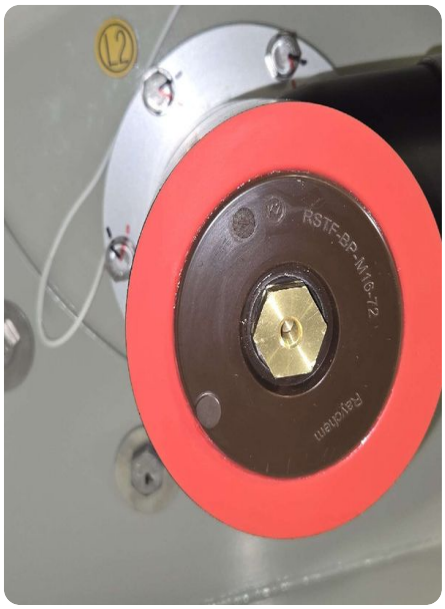
L1 Pre-Installation completed



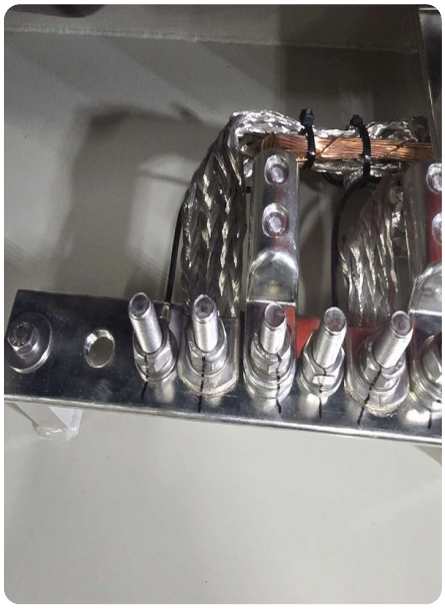
Installation of Base Connector

L1 Screen Connector Body Installed	L2 Screen Connector Body Installed	L3 Screen Connector Body Installed
		

L1 Nordlock Washer and Hex nut Installed	L2 Nordlock Washer and Hex nut Installed	L3 Nordlock Washer and Hex nut Installed
		

L1 Back Plug Installed	L2 Back Plug Installed	L3 Back Plug Installed
		

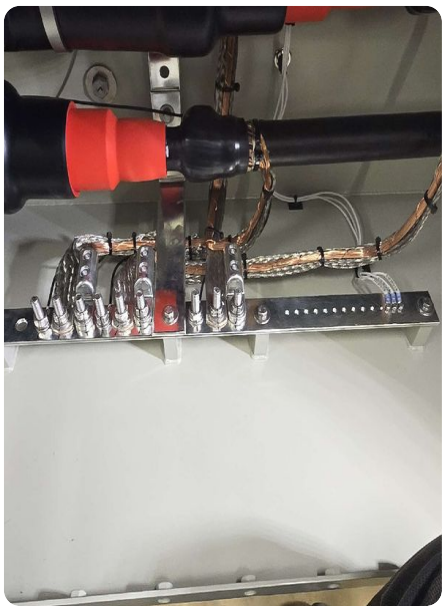
Grounding and Screening

L1 Gounding/Screening Installed	L2 Gounding/Screening Installed	L3 Gounding/Screening Installed
		

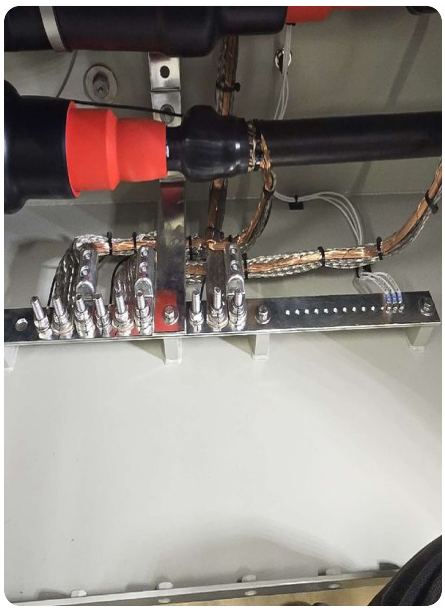
L1 Gounding/Screening Installed(Optional)



L2 Gounding/Screening Installed(Optional)

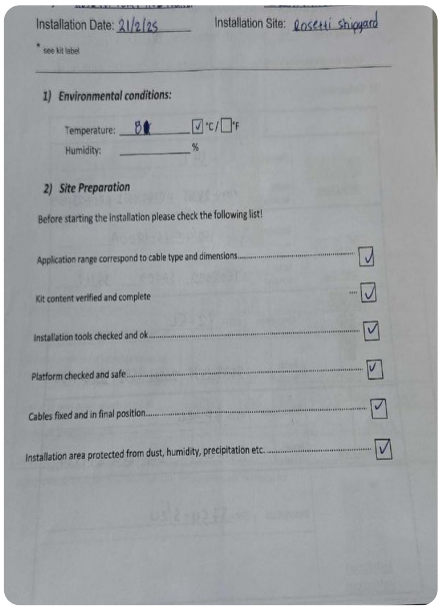


L3 Gounding/Screening Installed(Optional)



Installation Protocol

Installation Protocol Page 1



Installation Date: 21/2/25 Installation Site: Rosetti Shipyard

* see kit label

1) Environmental conditions:

Temperature: 8 ☑ °C/☐ °F

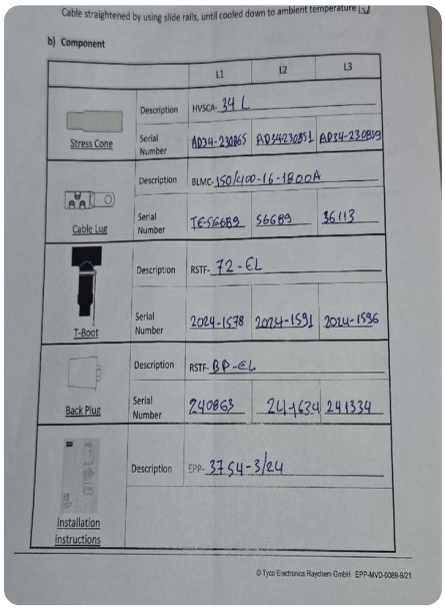
Humidity: _____ %

2) Site Preparation

Before starting the installation please check the following list!

- Application range correspond to cable type and dimensions ☑
- Kit content verified and complete ☑
- Installation tools checked and ok ☑
- Platform checked and safe ☑
- Cables fixed and in final position ☑
- Installation area protected from dust, humidity, precipitation etc. ☑

Installation Protocol Page 2



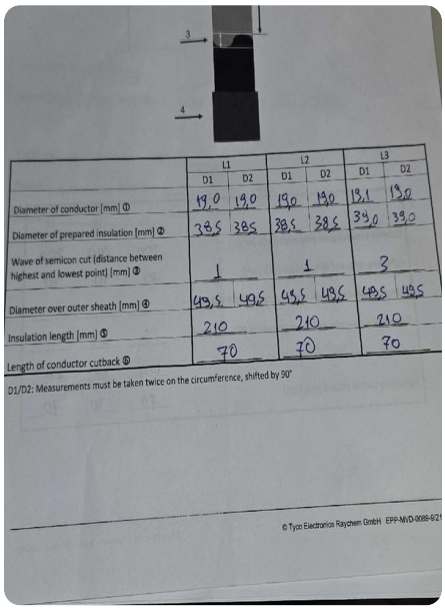
Cable straightened by using slide rails, until cooled down to ambient temperature ☑

b) Component

		L1	L2	L3
Stress Cone	Description	HVSCA- 34 L		
	Serial Number	AD24-23086	AD24230851	AD24-23089
Cable Lug	Description	BLMC-150/400-16-1800A		
	Serial Number	TE-56089	56089	36113
T-Boot	Description	RSTF- 72-EL		
	Serial Number	2024-1578	2024-1591	2024-1596
Back Plug	Description	RSTF- BP-EL		
	Serial Number	240863	241634	241334
Installation instructions	Description	EPP- 3754-3/24		

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Installation Protocol Page 3

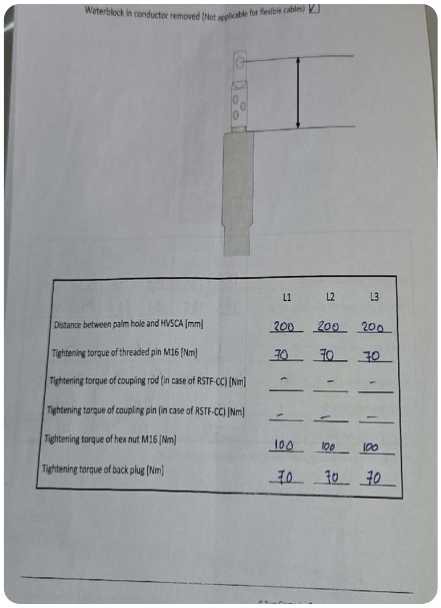


	L1		L2		L3	
	D1	D2	D1	D2	D1	D2
Diameter of conductor [mm] ①	19,0	19,0	19,0	19,0	19,1	19,0
Diameter of prepared insulation [mm] ②	38,5	38,5	38,5	38,5	39,0	39,0
Wave of semicon cut (distance between highest and lowest point) [mm] ③	1		1		3	
Diameter over outer sheath [mm] ④	49,5	49,5	49,5	49,5	49,5	49,5
Insulation length [mm] ⑤	210		210		210	
Length of conductor cutback ⑥	70		70		70	

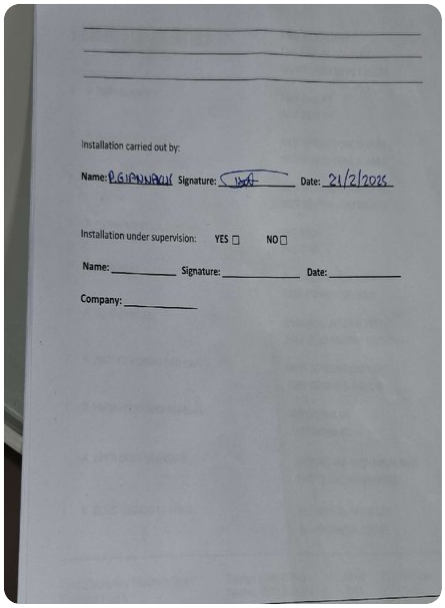
D1/D2: Measurements must be taken twice on the circumference, shifted by 90°

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Installation Protocol Page 4

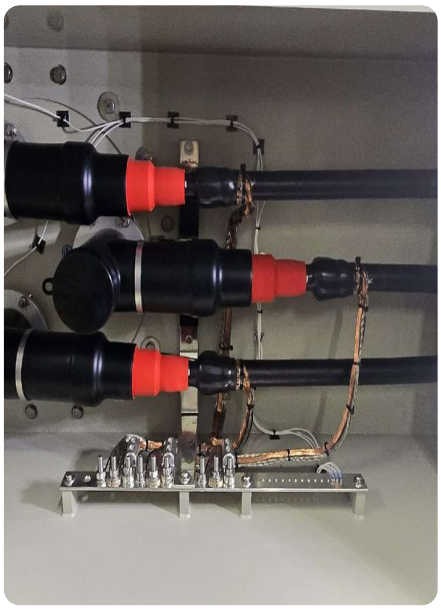


Installation Protocol Page 5



Final Overview

Cabinet Overview (Inside)



Cabinet Overview (Doors Closed)



[Optional] Client Rep Sign-off

Sign-Off

Panagiotis Giannaklis
24-02-2025





Certificate

te.com



Cert-Nr: 202490

Name **Panagiotis, Giannaklis**

Company **Reynard High Voltage Solutions (V&SH Offshore)**

Trained on **21.06 - 21.06.2023** **Valid until:** **6.2025**

Topic of training

RSTF on TKF cable 890113 and 890115 for HKN Project

Participated the theoretical and practical session successful.

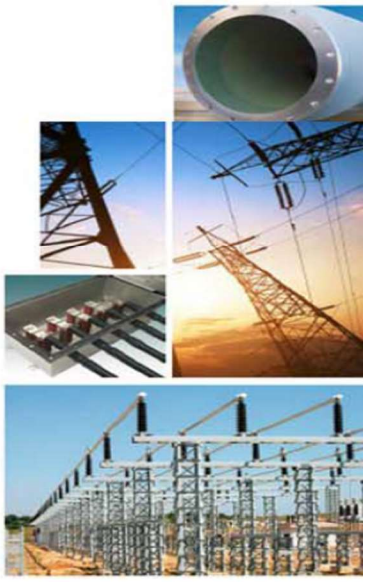
Content of training:

Installation of RSTF on TKF cable 890115 (800 mm²) with shifted Ligarex for HKN Project
RSTF-72B-M-P-E-45-NL06

The certificate can be extended by a minimum number of TE cable accessories were installed by the certificate holder since the date of issuance of this certificate.
This certificate qualifies for assembly and installation, but does not qualify to train third parties. The validity of this certificate is bounded to the above mentioned

21.06.2023

Benny Verley
Field Application Engineer Benelux
Energy Business Unit
TE Connectivity



Raychem
from TE Connectivity

te.com/trainingcenter

Report - Post-Term Test

Project	Report	Location
Rosetti Power Hub Platform Crosswind	Post-Term Test	GIS

Cable	Manufacturer	Type
GIS-Transformer	TKF	240mm2

Pre-testing Checks

Serial Number IR Tester

10211387

Expiry Date Calibration

2026-01-01

Area Safe and Secured?

true

L1 Insulation Resistance @5kV for 5min

L1 Test Voltage

5kV ☑

L1 Test Duration

5 Minutes ☑

L1 GΩ Recorded

1036

L1 Image of Screen IR tester



L1 Pass/Fail

Pass

L2 Insulation Resistance @5kV for 5min

L2 Test Voltage

5kV ☑

L2 Test Duration

5 minutes ☑

L2 GΩ Recorded

1134

L2 Image of Screen IR Tester



L2 Pass/Fail

Pass

L3 Insulation Resistance @5kV for 5min

L3 Test Voltage

5kV ☑

L3 Test Duration

5 Minutes ☑

L3 GΩ Recorded

1113

L3 Image of Screen IR Tester

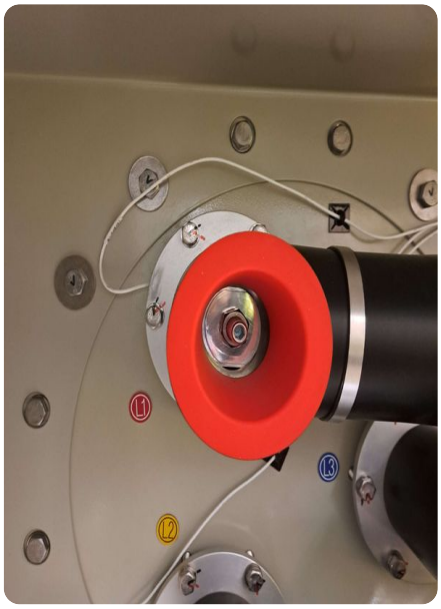


L3 Pass/Fail

Pass

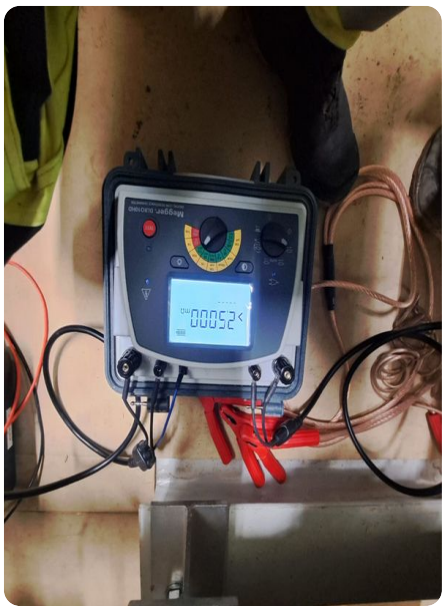
Phase ID

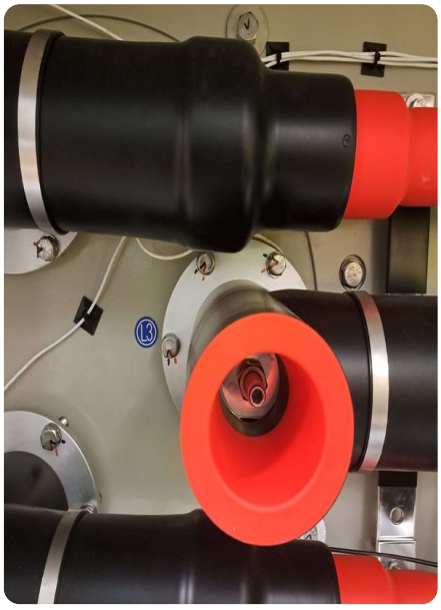
Phase ID L1 (Color Code etc.)



Phase ID L1 (Measurment)



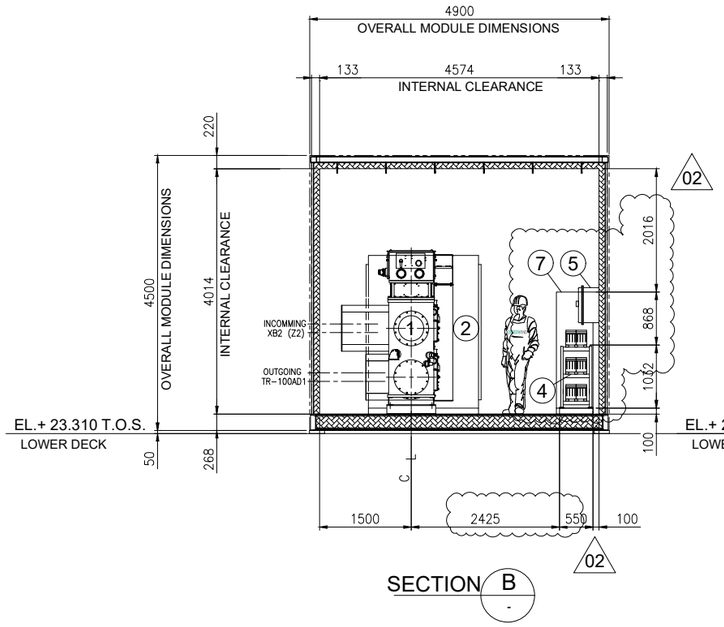
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Phase ID L3 (Color Code etc.)	Phase ID L3 (Measurment)
	

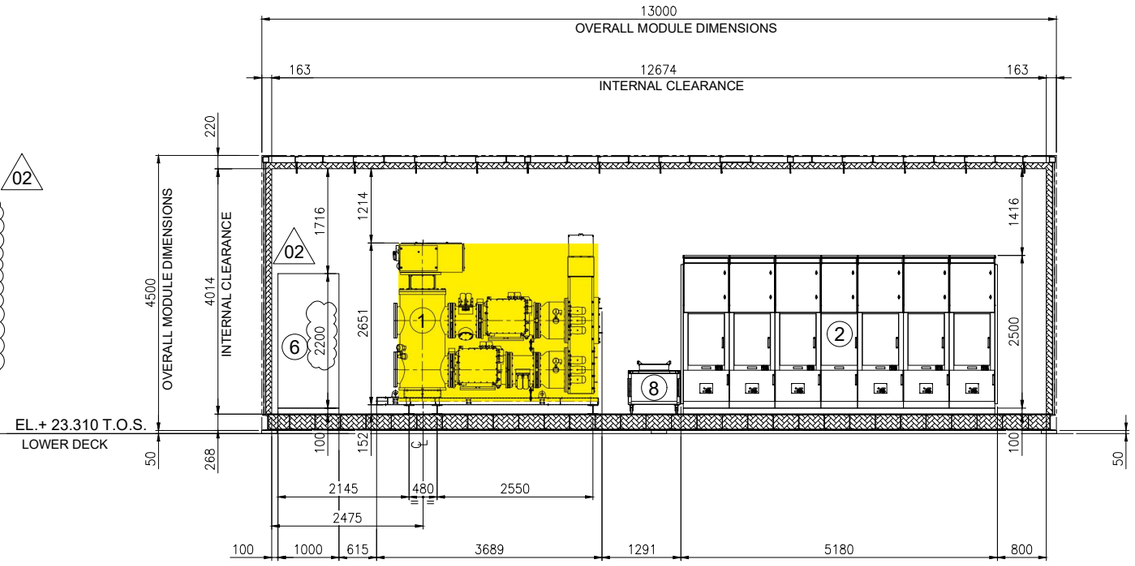
Sign-Off

Dimitrios Aravantinos
24-02-2025

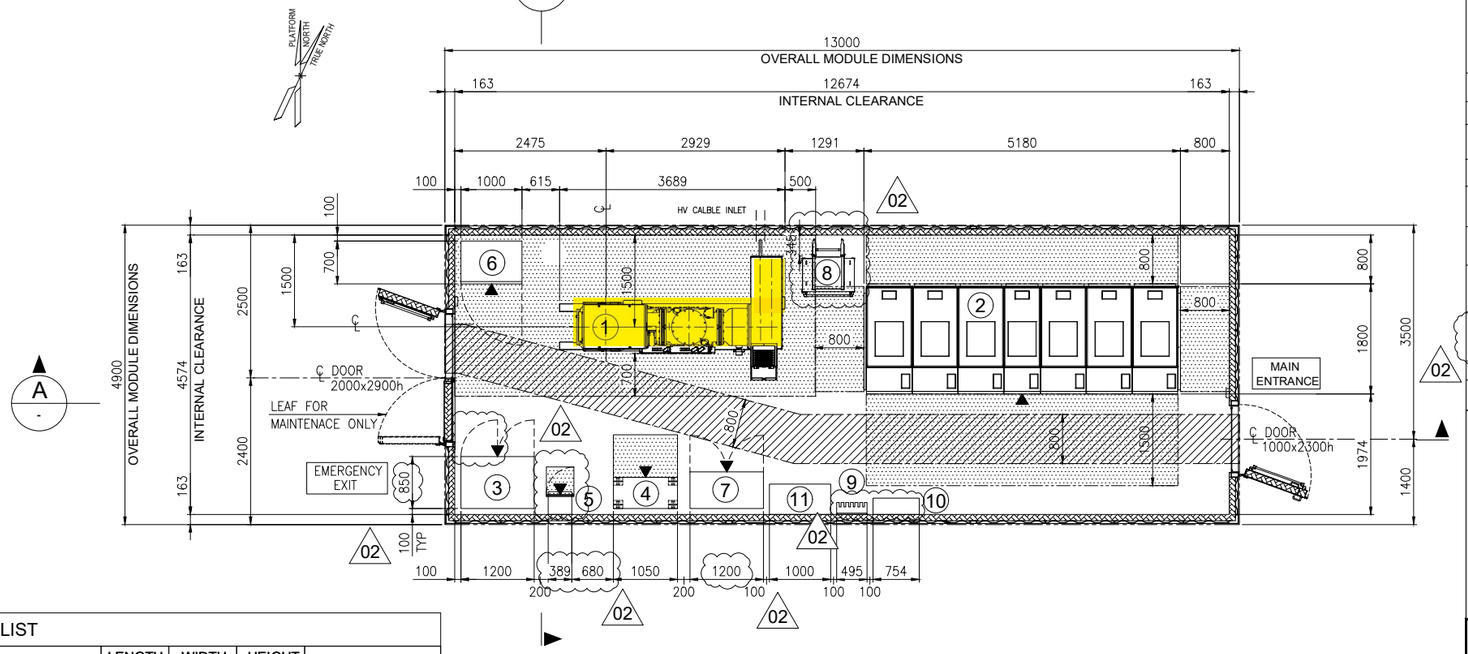
DRAWING NO. 123A90-DDL-EL-DL-20104 | REV. 02



SECTION B -



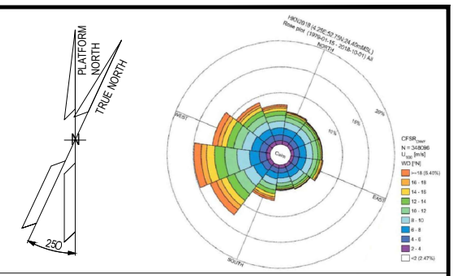
SECTION A -



A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

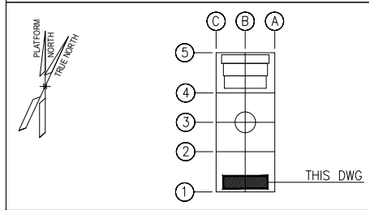
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

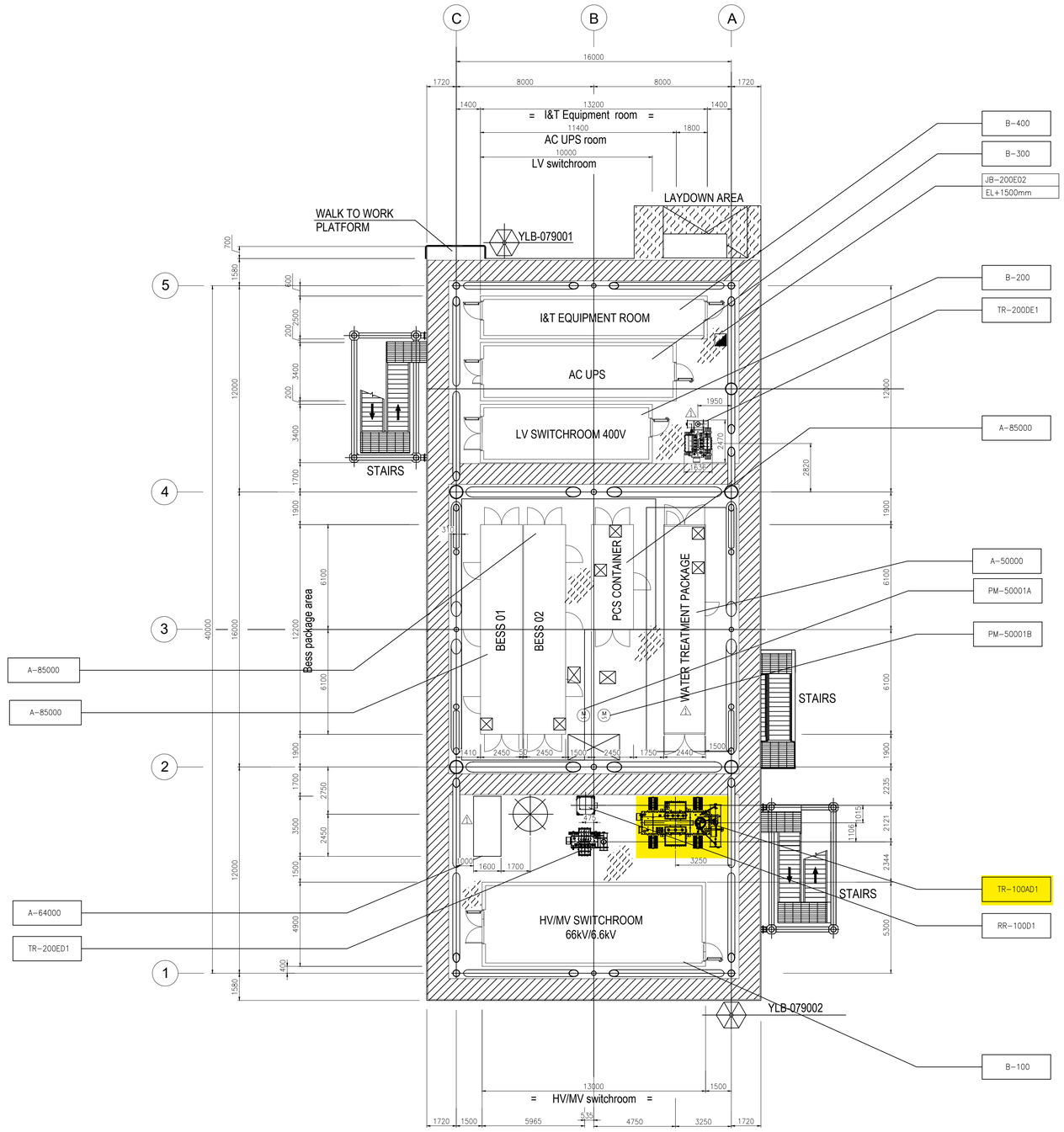
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

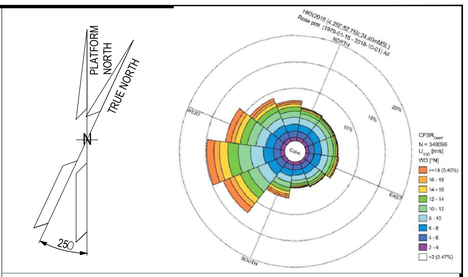
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM	TO

DESCRIPTION: 66kV SWITCHGEAR (GIS)
TAG NUMBER: HNA6-AFA70

QZ91

XB2 L1 — BK — T-CONNECTOR — 81002-CEH-L1, 1C X 240 mm² — T-CONNECTOR — BK — 1U

XB2 L2 — BK — T-CONNECTOR — 81002-CEH-L2, 1C X 240 mm² — T-CONNECTOR — BK — 1V

XB2 L3 — BK — T-CONNECTOR — 81002-CEH-L3, 1C X 240 mm² — T-CONNECTOR — BK — 1W

DESCRIPTION: 66/6.9 KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1

HV TERMINAL BOX OF
TR-100AD1

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

REV.:	DATE:	SIGNATURE:
2_K	12/02/25	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
66kV GIS SWGR

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 011 | REV. 02

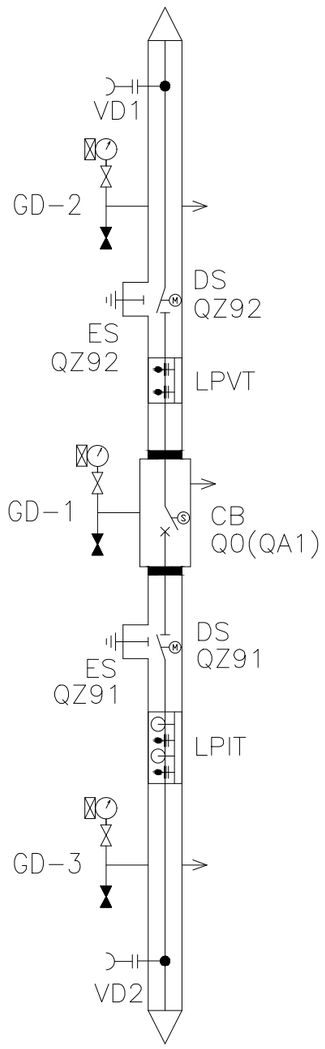
F.to UNI A3: 420mmx297mm

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

DRAWING NO. 1723001595-EL-DG-00014

REV. 00

XB2 (Z2)



TR-100AD1

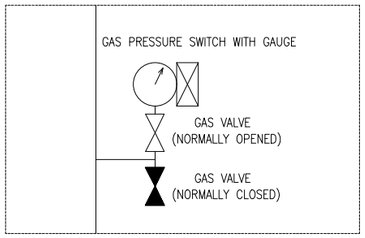
❑ RATED GAS (DRY AIR) PRESSURE

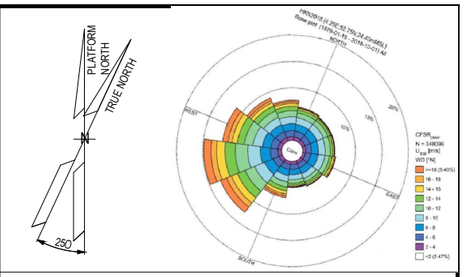
- CIRCUIT BREAKER COMPARTMENT : 5 bar.G
- OTHERS COMPARTMENT : 5 bar.G

❑ PRESSURE OF GAS AND ALARM SETTING

		PRESSURE SETTINGS : bar.G at 20°C			DESIGNATION
		RATED	ALARM ON	RESET	
CB	LOW 1'ST STAGE	5	4.7	4.9	GD-1
	LOW 2'ND STAGE		4.5	4.7	
OTHERS	LOW 1'ST STAGE	5	4.7	4.9	GD-2, GD-3
	LOW 2'ND STAGE		4.5	4.7	

❑ DETAIL-A(TYPICAL) FOR GAS VALVE & GAS PRESSURE SWITCH WITH GAUGE





NOTES

1. DESCRIPTION of ABBREVIATIONS.
   - CB : CIRCUIT BREAKER
   - DS : DISCONNECTING SWITCH
   - ES : EARTHING SWITCH
   - VD : VOLTAGE DETECTOR
   - LPIT : LOW POWER INSTRUMENT TRANSFORMER
   - ECVT : ELECTRONIC CT AND VT
   - EVT : ELECTRONIC VT

LEGEND

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER (SPRING OPERATION)
	COMBINED WITH DS(ISOLATOR) AND ES(EARTHING SWITCH) (MOTOR DRIVEN OPERATION)
	VOLTAGE & CURRENT TRANSFORMER (3ø X 2) (LPIT TYPE)
	VOLTAGE TRANSFORMER (3ø X 2) (LPVT TYPE)
	T-CONNECTOR
	GAS DENSITY MONITOR (PRESSURE SWITCH WITH GAUGE)
	GAS VALVE (NORMALLY CLOSED)-NON RETURN TYPE
	GAS VALVE (NORMALLY OPENED)-NON RETURN TYPE
	GAS TIGHT SPACER (BARRIER)
	RUPTURE DISK
	VOLTAGE DETECTING SENSOR

HOLDS

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
3	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	REVISED AS PER COMMENT
1	29/12/23	Y.D.LEE	Y.W.LEE	S.J.CHO	REVISED AS PER COMMENT
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR CLIENT REVIEW (ICR)

CROSSWIND

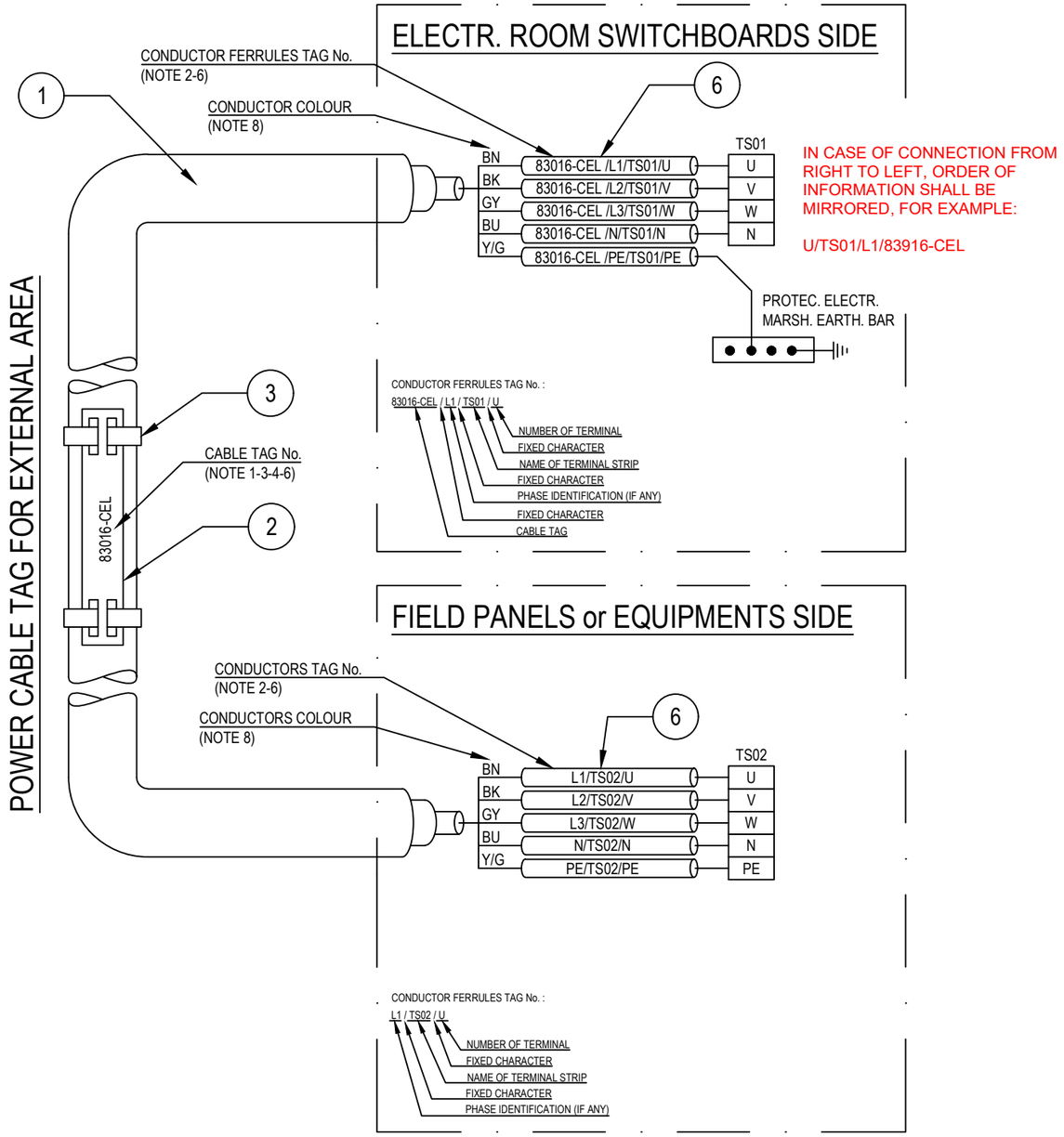
ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
GAS SINGLE LINE DIAGRAM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 10/11/23
A1	DRAWING NO. 1723001595-EL-DG-00014	SHEET 001	REV. 03

File Name : DRAWING_NO.

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

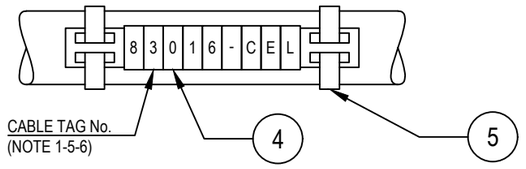
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

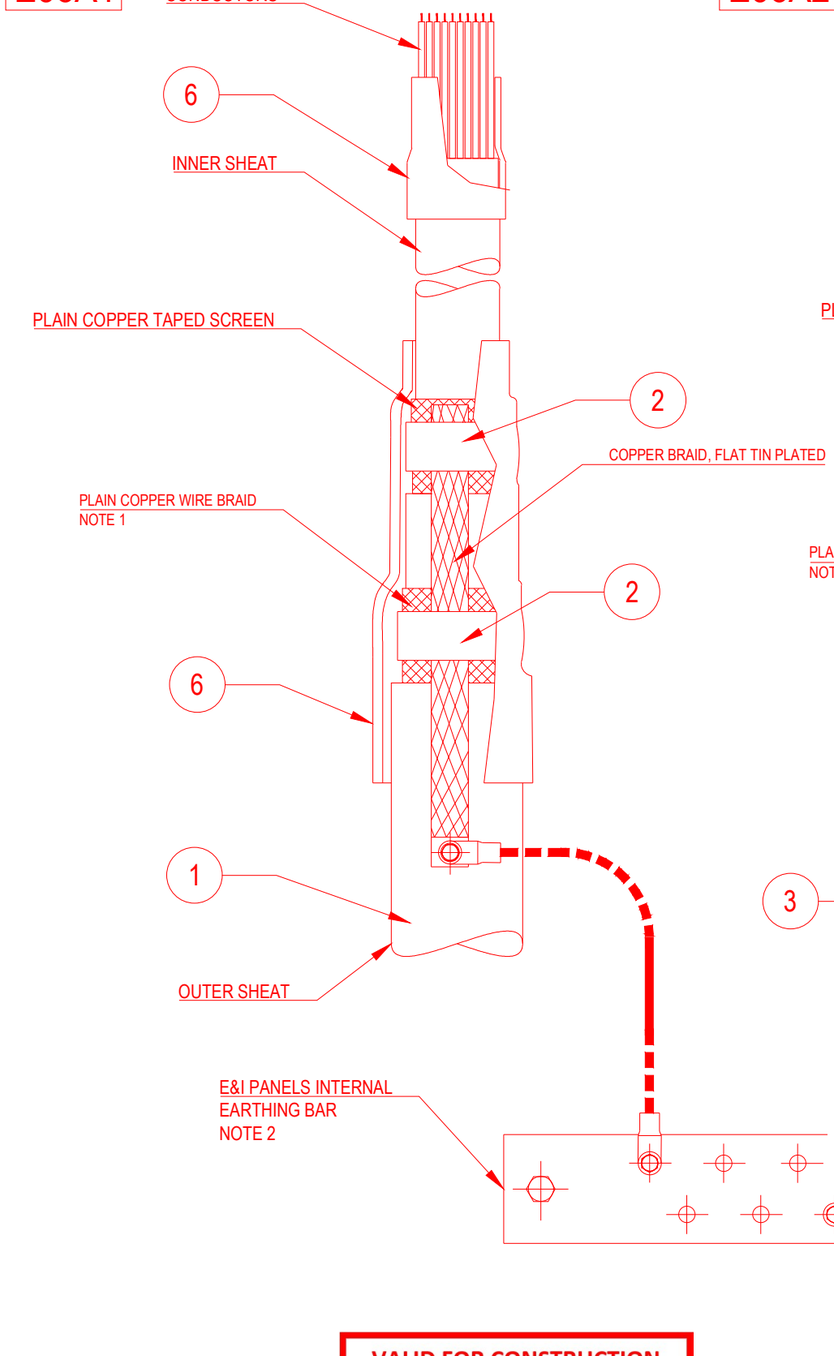
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

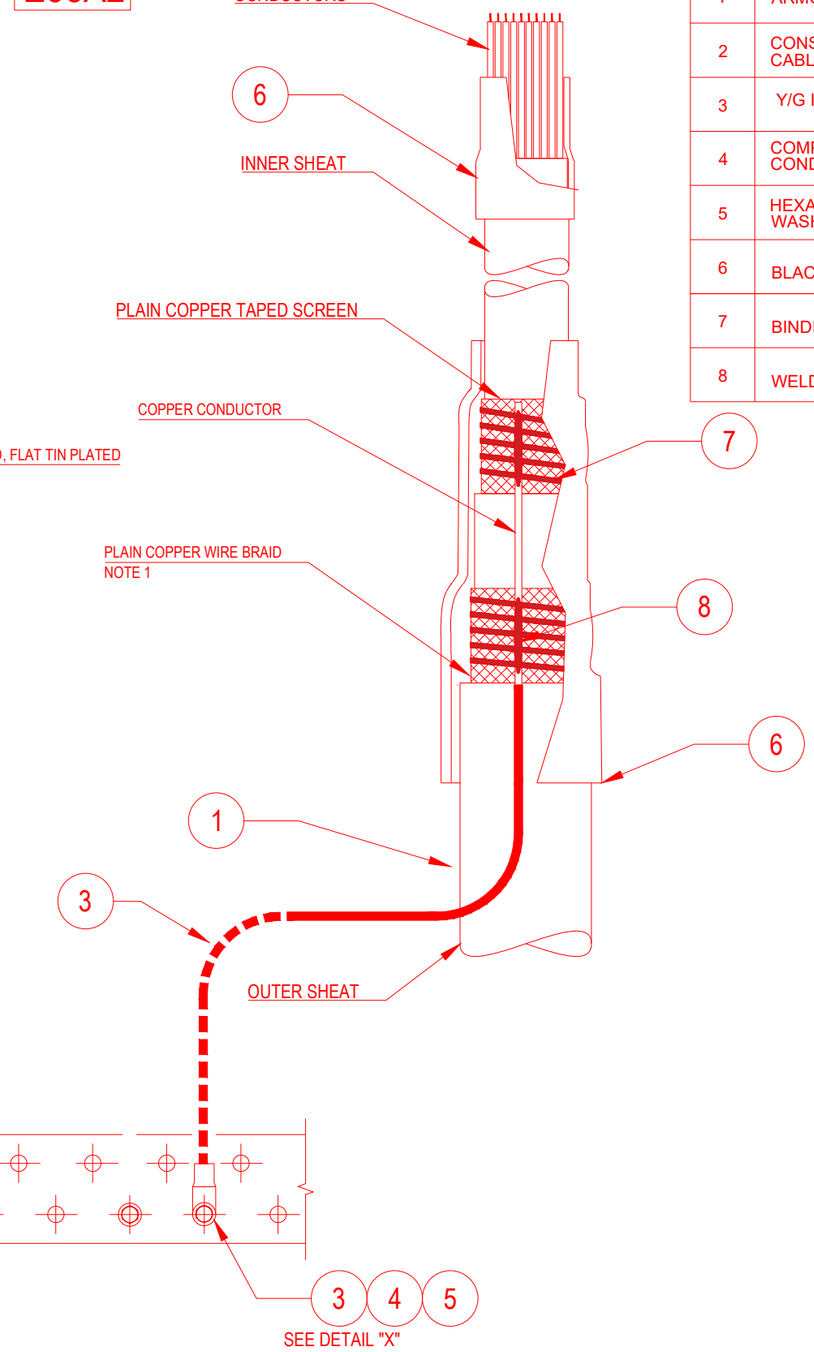
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

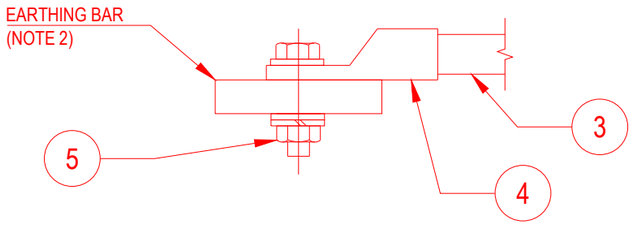


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Info	Category	Discipl	Eng Status	NativeDoc	Service	Entity Type	Main Function	Module	Area	From Tag	From Main Fun	From Tag Section	To Tag	To Main Funct	To Tag Sectio	Material ID	Material Desc.	Gland St	From Glan	From Entry	From Fittin	To Gland	To Entry	To Fitting	Routing	Routing Manual
81002-CEH-L3		Cable	EL	VFC	123A90-DDL-EL-LIS-20148						HNA6-AFA70	66 kV GIS	QZ91	TR-100AD1	66 / 6.9 kV 7 M	HV Cable Bo›	ELECV00-1X240	Cable Cu Cl.2/EPR/LSZH 36/66kV 1Cx240mm^2 - Red	M63	n.a.			T1_M63_Single				E-MCT-101 / L-300-101-HVT-003

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 | 03-07-2024

Description

1 x 240 / 50



* This image may differ from the actual product.

Trading information

Product group	Power cable >= 1 kV, for permanent installation
Type	Cu/XLPE/CWS/LAT/LSZH 36/66 kV
Net. Weight	4.11 kg/m
Sheath marking	{Length} TKF - Cu/XLPE/CWS/LAT/LSZH 36/66 kV 1 x 240/50 IEC 60840 - {Year} {Batch}

Trade lengths

	Minimal order
(58239 / 8713182481131)	1 MTR

Construction characteristics

Standardization	IEC 60840
Number of cores	1
Nominal cross section conductor	240 mm²
Conductor material	Copper
Conductor surface	Bare

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Construction characteristics

Standardization conductor material	IEC 60228
Shape of conductor	Round
Conductor category	Class 2c = stranded & compacted
Conductor shield	Semiconductive Compound
Material core insulation	XLPE++
Insulation shield	Semiconductive compound with semiconductive swellable tape
Earthscreen construction	Copper round wire + copper tape counter spiral
Nominal earthscreen cross section	50 mm²
Material outer sheath	LSZH
Colour outer sheath	Black
Diameter conductor	18.6 mm
Insulation thickness	9.5 mm
Diameter over insulation	39.2 mm
Aluminium sheath thickness	0.2 mm
Diameter shield wires	1.15 mm
Diameter over shield	41.7 mm
Outer sheath thickness	2.5 mm
Outer diameter approx.	48.1 mm

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Properties

Flame retardant	IEC 60332-3-24 Cat. C
Halogen free	IEC 60754-1 / IEC 60754-2
Low smoke	IEC 61034-1 & IEC 61034-2
Longitudinal water blocking	Yes
Radial water blocking	Yes
Radial watertight construction	Al/PE
UV resistant	Yes
UV protection	NEN EN 50289-4-17A

Technical characteristics

Min. bending radius during installation	870 mm
Min. bending radius after installation	755 mm
Tensile force with pullinghead	12,000 N
Tensile force with pullingsleeve	4,620 N
Max. conductor temperature	90 °C
Max. operating temperature	70 °C
Minimum installation temperature	-10 °C

Electrical characteristics

Nominal voltage U0	36 kV
Nominal voltage U	60 kV
Nominal voltage Umax	72.5 kV
Conductor DC resistance @ 20°C	0.0754 Ohm/km
Conductor AC resistance @ max. cont. Conductor temp.	0.0973 Ohm/km
Shield DC resistance	0.387 Ohm/km

Subject to technical modifications | No rights can be derived from this information

Power cable >= 1 kV, for permanent installation

Cu/XLPE/CWS/LAT/LSZH 36/66 kV

Article number: 58239 03-07-2024

Electrical characteristics

Mutual capacitance (Nominal)	0.21 µF/km
Max. thermal short-circuit current conductor 0,5 sec	48.5 kA
Max. thermal short-circuit current conductor 1 sec	34.3 kA
Max. short-circuit temperature conductor	250 °C
Max. thermal short-circuit current shield 0,5 sec	10.51 kA
Max. thermal short-circuit current shield 1 sec	7.43 kA
Max. short-circuit temperature shield	250 °C
E-Max fieldstrength	5.38 kV/mm
E-Min fieldstrength	2.77 kV/mm
Charging current per core	2.373 A/km
Frequency	50 Hz
Operating reactance trefoil arrangement	0.12 Ohm/km
Operating reactance flat arrangement	0.18 Ohm/km
*) Theoretical calculated values	Depends on application
Maximum current buried trefoil arrangement	455 A
Maximum current buried flat arrangement	455 A
Maximum current in air trefoil arrangement	630 A
Maximum current in air flat arrangement	730 A
Homopolar resistance Ro (trefoil) *)	2.1899 Ohm/km
Homopolar resistance Ro (flat) *)	2.1894 Ohm/km
Homopolar reactance Xo (trefoil) *)	0.3877 Ohm/km
Homopolar reactance Xo (flat) *)	0.6233 Ohm/km
Homopolar impedance Zo (trefoil) *)	2.2239 Ohm/km
Homopolar impedance Zo (flat) *)	2.2764 Ohm/km

Subject to technical modifications | No rights can be derived from this information

Spinnerstraat 15 | P.O. Box 6 | 7481 KJ Haaksbergen | Nederland | Phone: +31 (0)53 573 22 55 | E-mail: info@tkf.nl

ITEM	Tag	82001-CEM-1-L1	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000468	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	OK
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-1-L1	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000468	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:	11,5	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	122	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:		µA	
9	Ph3 / Ph2-Ph1-screen-armour-Earth:		µA	
	2nd INSULATION TEST			
	Voltage applied:	500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	Note	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	VOLCRAFT 1000V - ET-200 S/N:H240103023	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°LAT 042 00768/24 _ 12/10/2024	Calibration certificate N° and date:	

Comments: Note HV TEST: See attached certificate and Test Report.

Note : Tightening torque will be done by the commissioning activity.

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Giovanni Tangianu	
Date	2025-04-11	2025-04-11	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-11T09:38:20.556Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-11T11:53:00.607Z	

82001-CEM-1-L1

VLF Withstand Report
82001-CEM-1-L1 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	4/5/2025 7:45 AM
Company Name	ICS
Region	---
Station	---
Operator Name	RECHICHI
Work Order	---

Device Under Test (Cable XLPE)

Voltage Rating	11.5 kV
Insulation	XLPE
Line Length	25 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	11.5 kV•	Sine	0.1 Hz (A)	15 min

Measurements:

Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	11.5 kV•	122 µA•	16.9 nF	18 GΩ	0.1 Hz

- RMS value

TEST REPORT

Cable Tag/ID: 82001-CEM-1-L1

Cable Type: 1X150 mm²

Voltage Rating: 6/10 kV

5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF - 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA 45

Serial Number: GH.5219.16C0.10

Operator: FAUSTO RECHICHI

5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 10.4.25

Witnessed by: GIOVANNI TANGIANV Signature: _____ Date: 10/04/25

JOHN MACKOP 10.4.25

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ITEM	Tag	82001-CEM-1-L1	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000468	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	PL
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	Note
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-1-L1	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000468	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	2500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:		kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :		µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:		µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:		µA	Note
	2nd INSULATION TEST			
	Voltage applied:	2500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	Note	N.m	

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	Mod:FLUKE 175 S/N:(AW1/018-17140769	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°7715/24 _ 10/07/2024	Calibration certificate N° and date:	

Comments:

Note HV TEST: See attached certificate

Note 12,13: Cable will be connected during Commissioning activities

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-02	2024-12-19	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-02T16:18:58.813Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-19T15:40:03.703Z	

82001-CEM-1-L1

VLF Withstand Report
82001-CEM-1-L1 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	12/13/2024 2:49 PM
Company Name	ICS
Region	---
Station	---
Operator Name	STEFAN
Work Order	MT-MISURE

Device Under Test (Cable XLPE)

Voltage Rating	10.0 kV
Insulation	XLPE
Line Length	75 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	10.0 kV•	Sine	0.1 Hz (A)	5 min

Measurements:

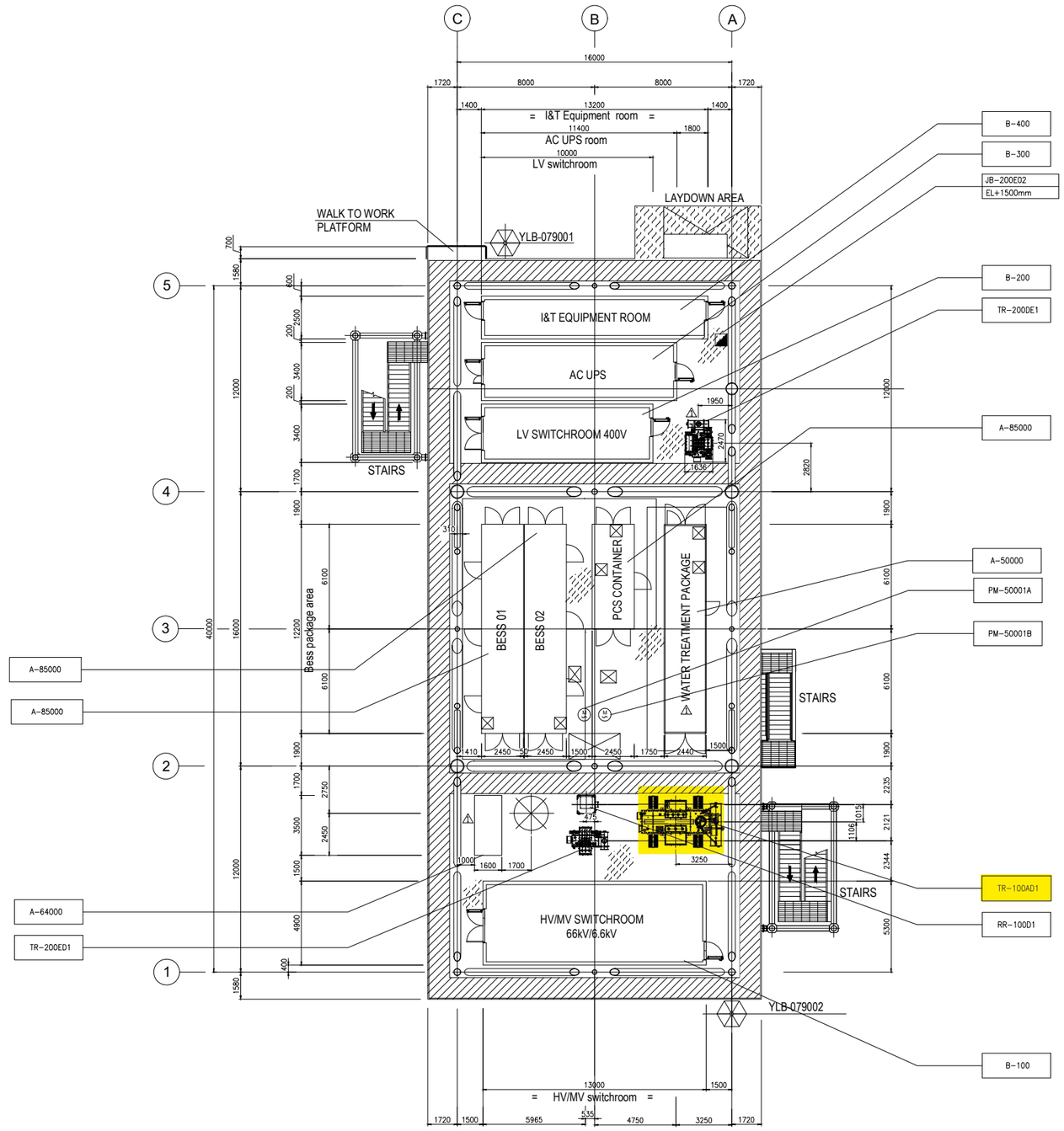
Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	10.0 kV•	36 µA•	5.7 nF	3.1 GΩ	0.1 Hz

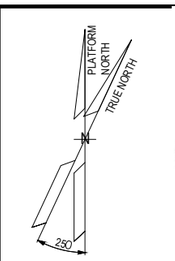
- RMS value

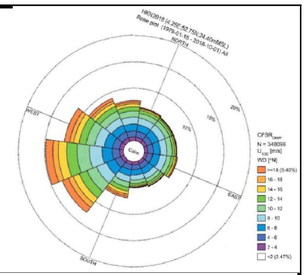
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.





NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

M	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

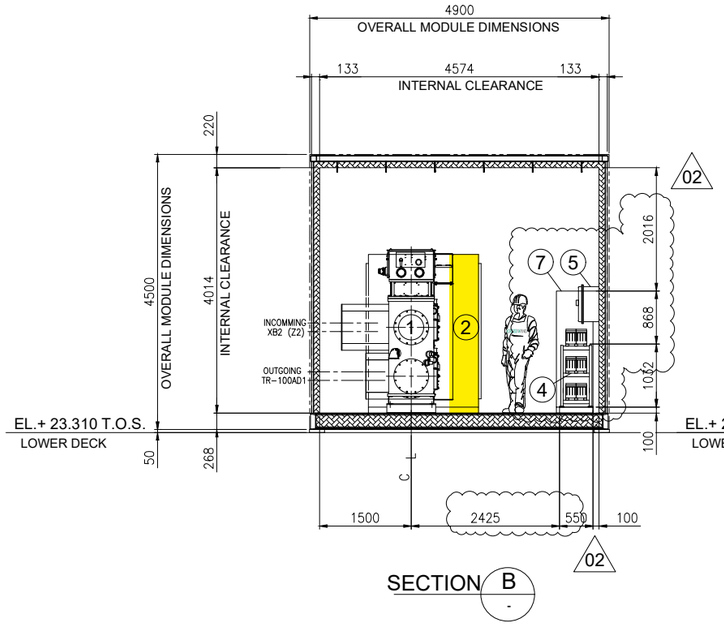
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

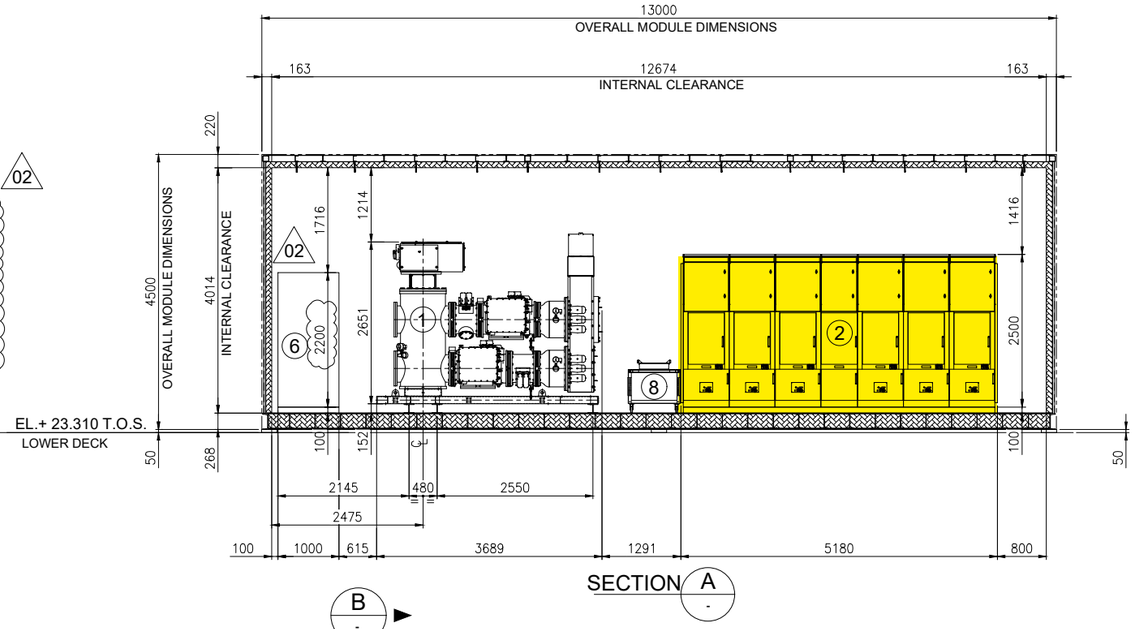
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DRAWING NO. 123A90-DDL-EL-DL-20104

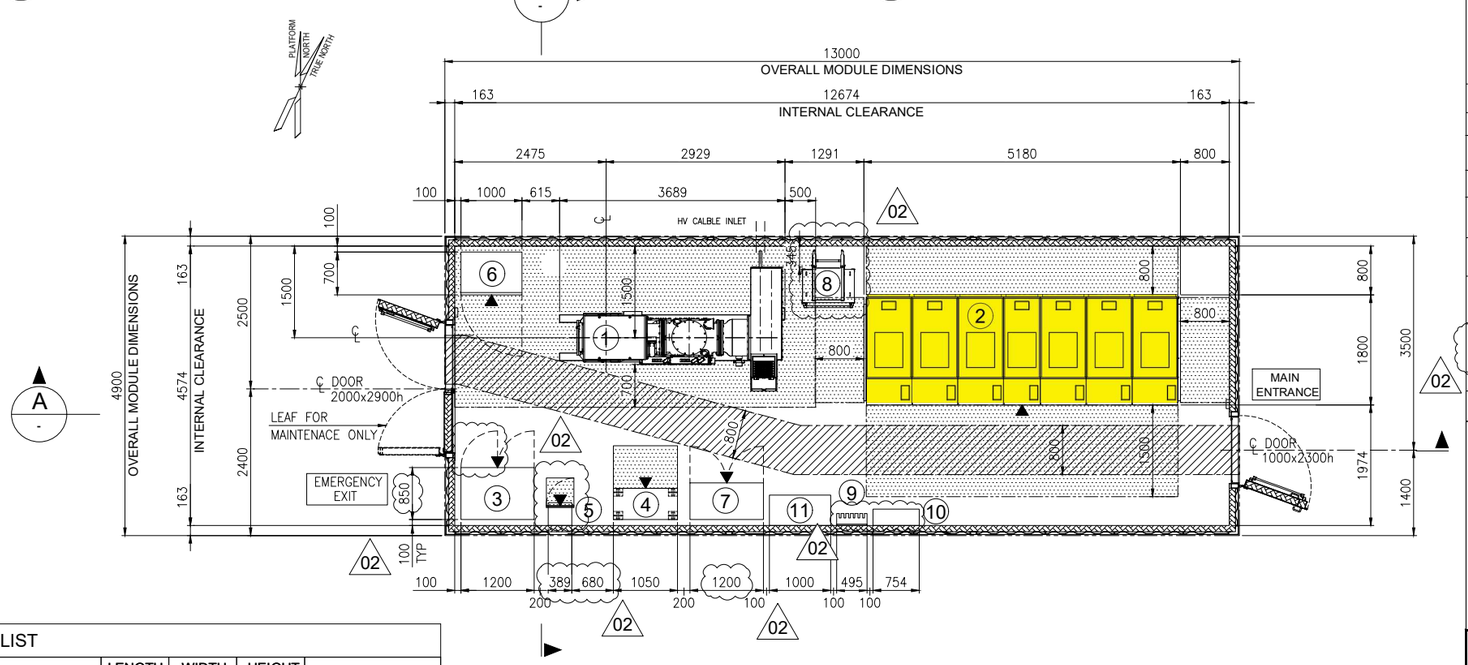
REV. 02



SECTION B -

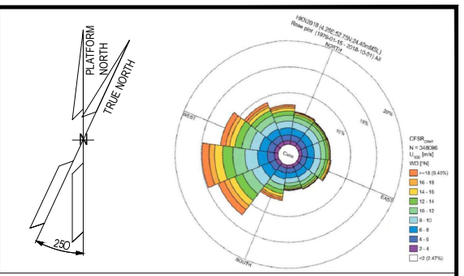


SECTION A -



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

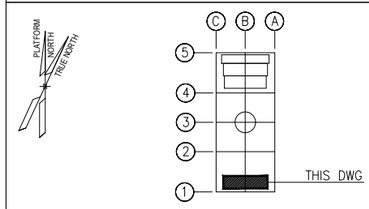
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

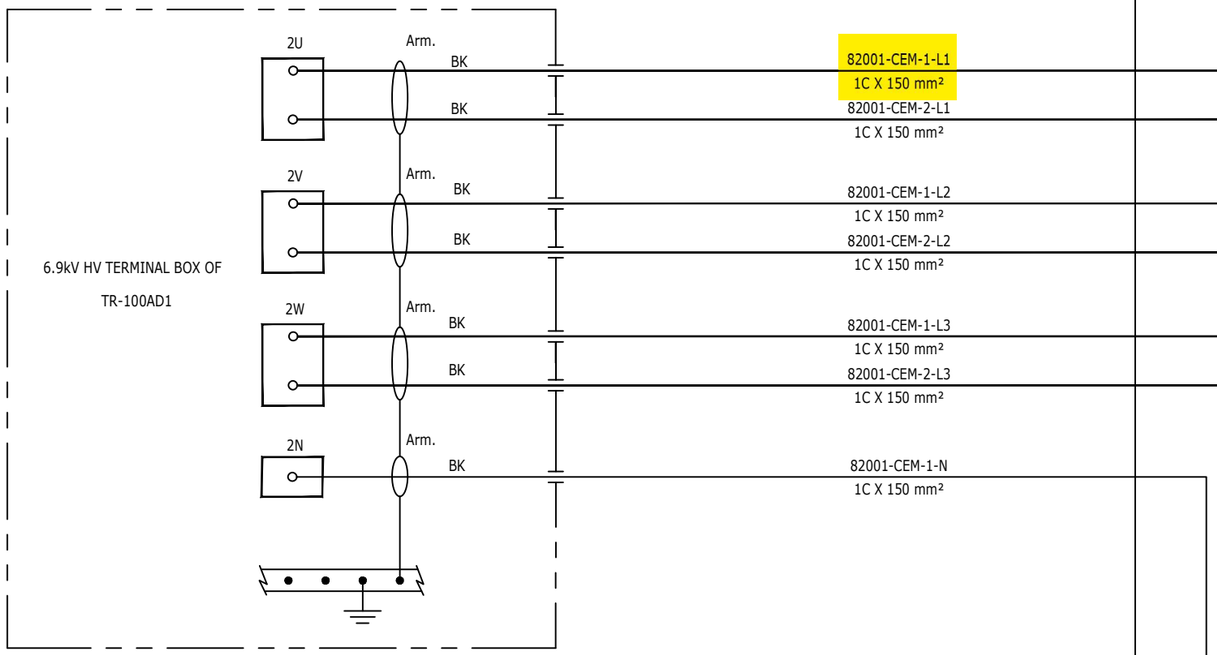
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

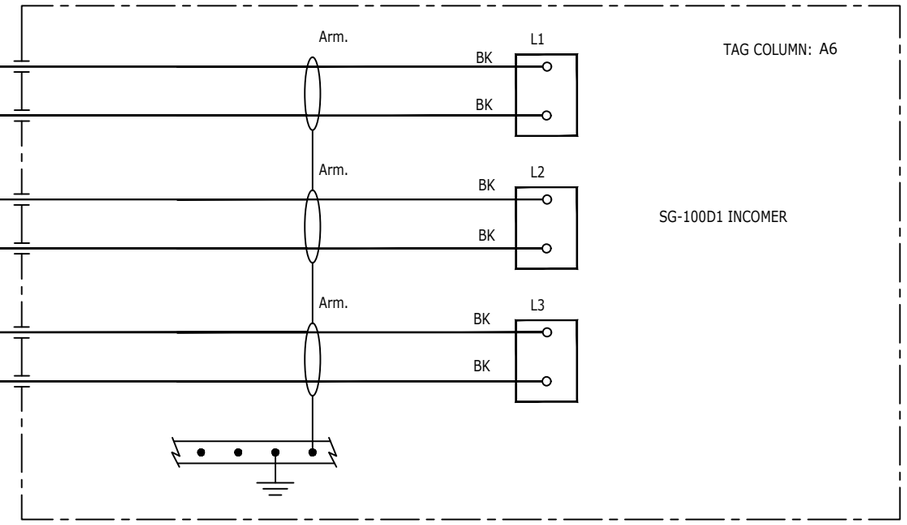
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

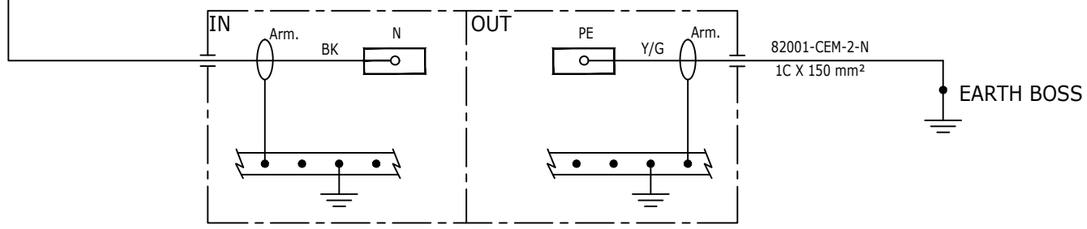
DESCRIPTION: 66/6.9KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1



DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



DESCRIPTION: NER
TAG NUMBER: RR-100D1



VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
2_D	12/12/24	C.Pilato

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
66KV, 7MVA TRANSFORMER

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

SCALE : 1:X

A3

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

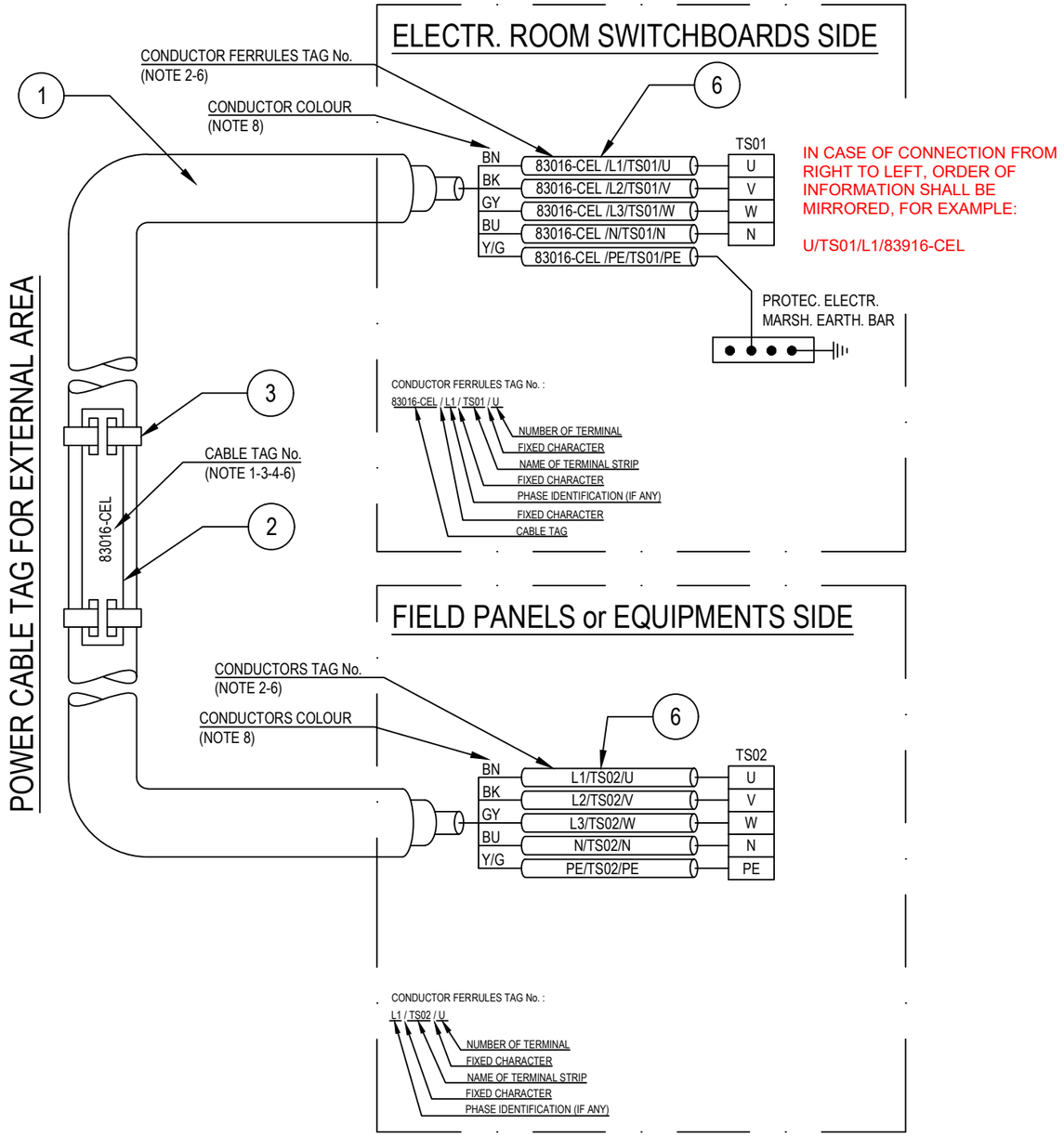
SHEET 012

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

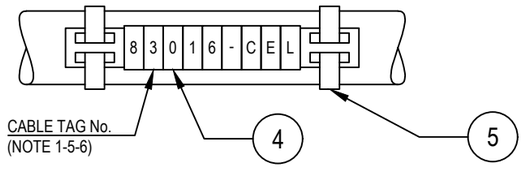
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

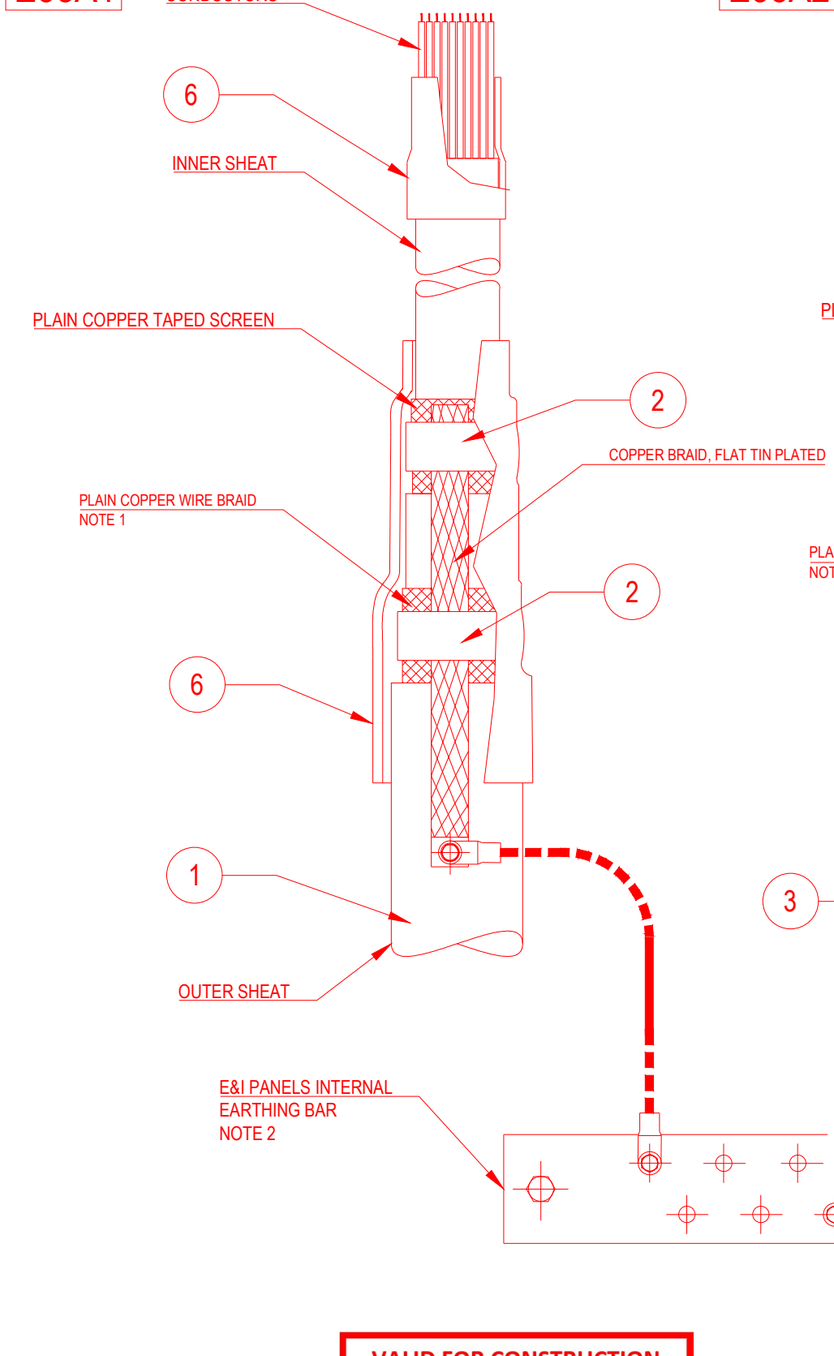
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

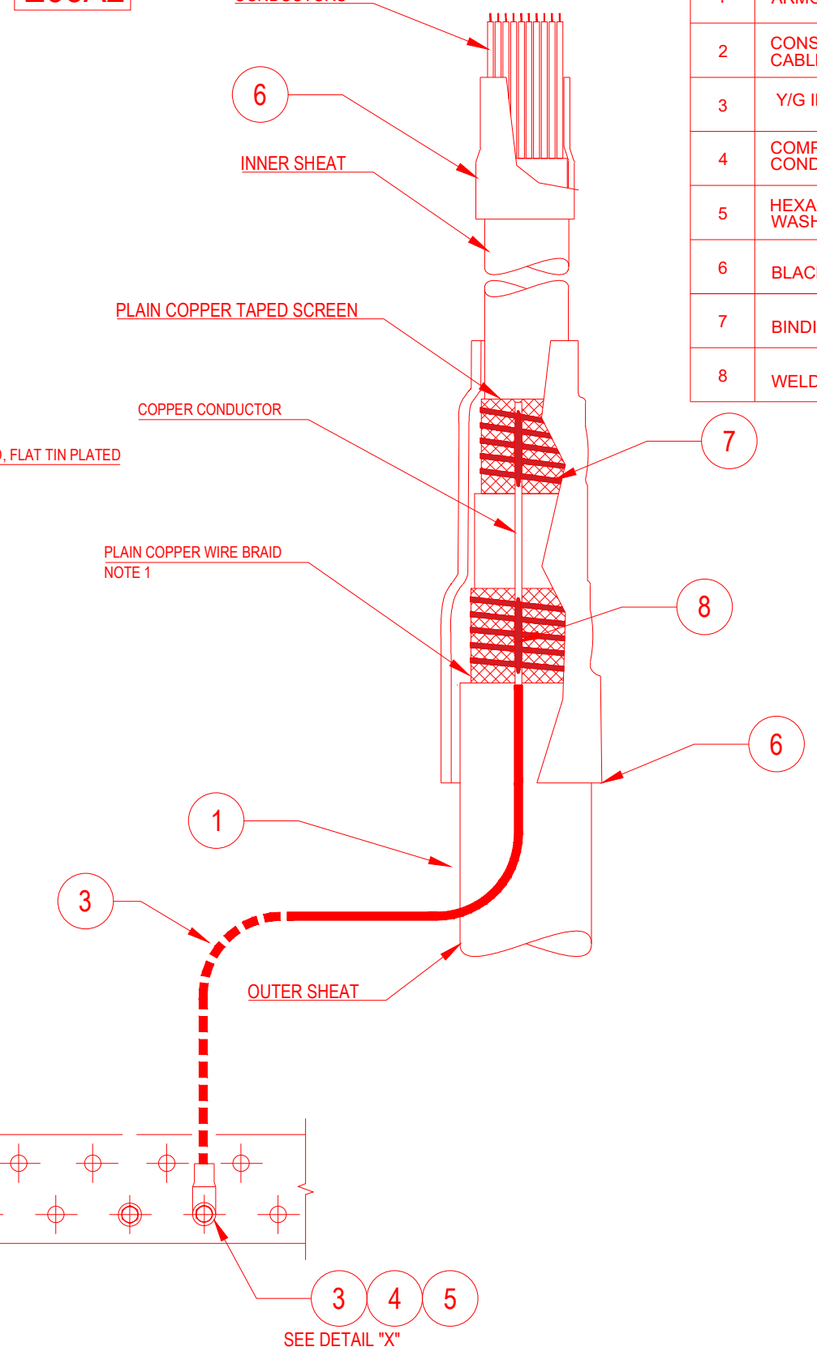
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

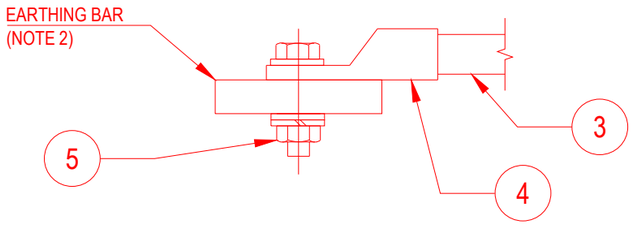


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEM-1-L1	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						TR-100AD1	66 / 6.9 kV 7 MVA Transformer	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV37-1X150	Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x150mm²- Red	M50S	T1_M50S_Single			n.a.				L-300-101-MVT-001 / E-MCT-103 / L-600-101-MVT-009 / L-150-101-MVT-012

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
		Sh: 9 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024
		Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

ELECTRICAL SYSTEM CHARACTERISTIC

OPERATING VOLTAGE	6,6	kVac	±	5	%		
FREQUENCE	50	Hz	±	2	%		
NEUTRAL SYSTEM	☐	EARTHED				☐	INSULATED
	☑	EARTHED BY RESISTANCE				☐	
EXPOSITION OF LIGHTNING OVER VOLTAGE						☐ NO	☑ YES

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

CABLE CHARACTERISTIC

GENERAL CHARACT	REFERENCE STD	FOR CONSTRUCTION AND TEST	IEC 60092-350
		FOR SPECIAL CHARACTERISTIC	**IEC-60754-1, IEC-60332-1-2**
			IEC-61034-2

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm^2

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm^2

SPECIAL CHARACT.	☐ HYDROCARBON RESISTANCE	☐ NON PROPAGATING FIRE	☐ FIRE RESISTANCE	
	☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL			kg/m
	☐ LOW CORROSIVE GAS EMISSION	☐ % HCl ≤ 0,3	☐ % HCl =	
	☐ LOW TOXIC GAS EMISSION (T INDEX)	☐ T ≤ 2	☐ T=	
	☑ LOW SMOKE EMISION (OPTICAL DENSITY)	☐ D ≤ 1,5	☐ D=	
	☐ U.V. RESISTANT	☑ HALOGEN FREE COMPOUND	☑ FLAME RETARDANT	

INSTALL. SPECIAL CONDITION	CABLE LADDER, TREFOIL FORMATION
ACCESS.	

NOTES:

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 10 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

MATERIALS

GENERAL DATA	REF.STD N.: IEC 60092-350
CONDUCTOR	MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H)
INSULATION	MATERIAL: EPR
SEMI-CONDUCTOR LAYER	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: HF EXTRUDED COMPOUND
SCREENS	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: Plain Copper Taped Screen
ARMOUR	☑ REQUIRED TYPE: MATERIAL: Plain Copper Wire Braid
OUTER SHEATING	MATERIAL: SHF1 to IEC 60093.360
COMPONENTS AND SPECIAL CONSTR.	

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 11 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

1	**CONSTRUCTIVE DATA**						
2							
3	MR TAG / PART NUMBER			Note-3	Note-3		
4	n° x NOMINAL AREA OF CONDUCTORS		N.xmm^2	1Cx70	1Cx150		
5	n° AND DIAMETER OF WIRES IN EACH CONDUCTOR		N.xmm	352x0,52	776X0,51		
6	CONDUCTOR CLASS (2)			2	2		
7	RATED CURRENT IN AIR AT 30°		A	285	460		
8	RATED CURRENT IN GROUND AT 20°		A	272	416		
9							
10	A.C. PHASES RESISTANCE AT THE MAX OP. TEMP.		Ω/km	0,345	0,163		
11	PHASE REACTANCE AT 50 Hz		Ω/km	0,110	0,097		
12	MINIMUM INSULATION RESISTANCE AT 20°		MΩ/km	745	567		
13	PHASE CAPACITY		µF/km	0,301	0,396		
14							
15	MINIMUM ORDER Q.TY		m	TBD	TBD		
16	MAX LENGHT OF DRUMS		m	TBD	TBD		
17	DIAMETERS	BARE CONDUCTOR	mm	10	14,3		
18		CORE (INSULATED CORE)	mm	19,6	24		
19		UNDER ARMOUR	mm	23,6	28,3		
20		ARMOUR OR CONCENTRIC CONDUCTOR	mm	24,8	29,5		
21							
22							
23		OVERALL	mm	29	34		
24	MASSES	CONDUCTORS	kg/km	640	1350		
25		INSULATION	kg/km	290	410		
26		INNER COVERING	kg/km	180	220		
27		ARMOUR OR CONCENTRIC CONDUCTOR	kg/km	220	250		
28		OUTER SHEATING	kg/km	280	350		
29							
30		TOTAL	kg/km	1610	2580		
31	EXTERNAL COLOUR			RED	RED		
32	CORE IDENTIFICATION (1)			NATURAL	NATURAL		
33							
34							
35							
36							
37							
38							

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

49

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51

ITEM	Tag	82001-CEM-2-L1	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000469	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	OK
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-2-L1	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000469	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:	11,5	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	47	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	.	µA	
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	.	µA	
	2nd INSULATION TEST			
	Voltage applied:	500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	NOTE	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	VOLCRAFT 1000V - ET-200 S/N:H240103023	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°LAT 042 00768/24 _ 12/10/2024	Calibration certificate N° and date:	

Comments: Note HV TEST: See attached certificate and Test Report.

Note : Tightening torque will be done by the commissioning activity.

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Giovanni Tangianu	
Date	2025-04-11	2025-04-11	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-11T09:38:40.302Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-11T11:52:44.976Z	

82001-CEM-2-L1

VLF Withstand Report
82001-CEM-2-L1 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	4/5/2025 10:52 AM
Company Name	ICS
Region	---
Station	---
Operator Name	RECHICHI
Work Order	---

Device Under Test (Cable XLPE)

Voltage Rating	11.5 kV
Insulation	XLPE
Line Length	25 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	11.5 kV•	Sine	0.1 Hz (A)	15 min

Measurements:

Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	11.5 kV•	47 µA•	6.6 nF	> 20 GΩ	0.1 Hz

- RMS value

TEST REPORT

Cable Tag/ID: 82001-CEM-2-L1

Cable Type: 1X150 mm²

Voltage Rating: 6/10 kV

5.12 PRE-TEST CHECKLIST

- ☑ Cable properly tagged and identified
- ☑ Visual inspection of terminations completed
- ☑ Insulation resistance test performed
- ☑ Clean and dry termination surfaces
- ☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF - 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA 45

Serial Number: GH 5219.165010

Operator: FAUSTO RECHICHI

5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 10.04.25

Witnessed by: GIOVANNI TANDIONO / JOHN MACKLOP Signature: _____ Date: 10/04/25 / 10.04.25

ITEM	Tag	82001-CEM-2-L1	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000469	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	Note
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	Note
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-2-L1	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000469	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	2500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:		kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :		µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:		µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:		µA	Note
	2nd INSULATION TEST			
	Voltage applied:	2500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	Note	N.m	

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	Mod:FLUKE 175 S/N:(AW1/018-17140769)	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°7715/24 _ 10/07/2024	Calibration certificate N° and date:	

Comments:

Nota 8: refer to PL C30001890

Note HV TEST: See attached certificate

Nota 12/13: Cable will be connected during Commissioning Activities

	Performed by	☉ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-02	2024-12-19	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-02T16:19:14.220Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-19T15:46:51.954Z	

82001-CEM-2-L1

VLF Withstand Report
82001-CEM-2-L1 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	12/13/2024 2:30 PM
Company Name	ICS
Region	---
Station	---
Operator Name	STEFAN
Work Order	MT-MISURE

Device Under Test (Cable XLPE)

Voltage Rating	10.0 kV
Insulation	XLPE
Line Length	75 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

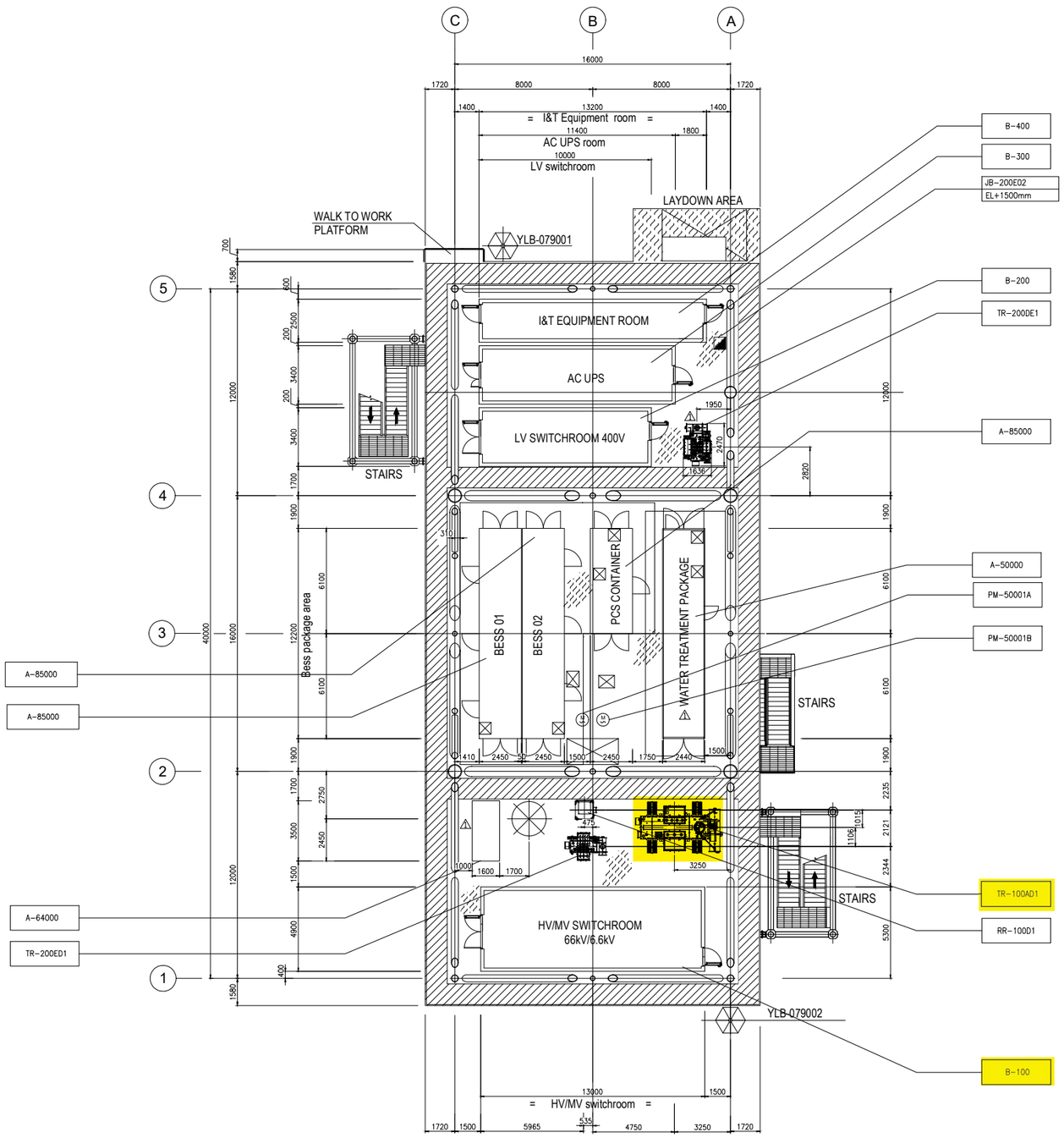
#	Test Voltage	Waveform	Frequency	Duration
1	10.0 kV•	Sine	0.1 Hz (A)	5 min

Measurements:

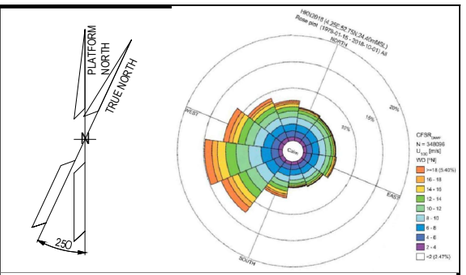
Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	10.0 kV•	36 µA•	5.6 nF	1.4 GΩ	0.1 Hz

- RMS value



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

M	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

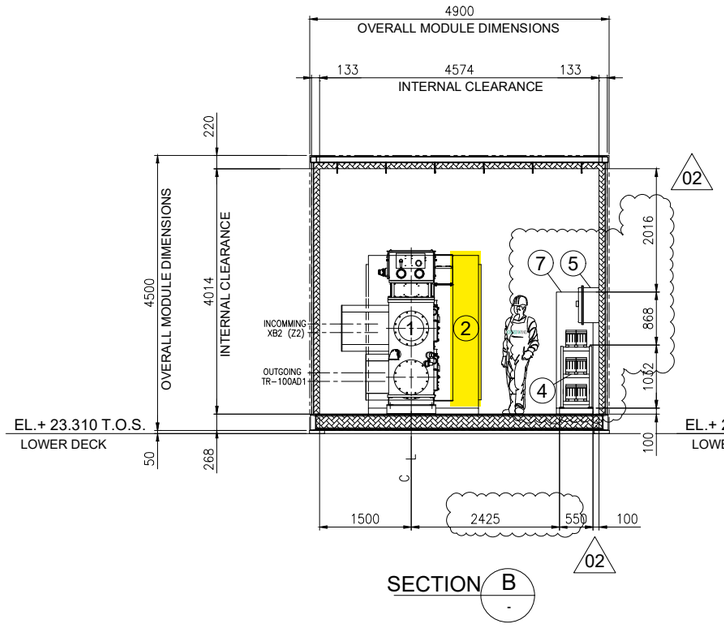
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

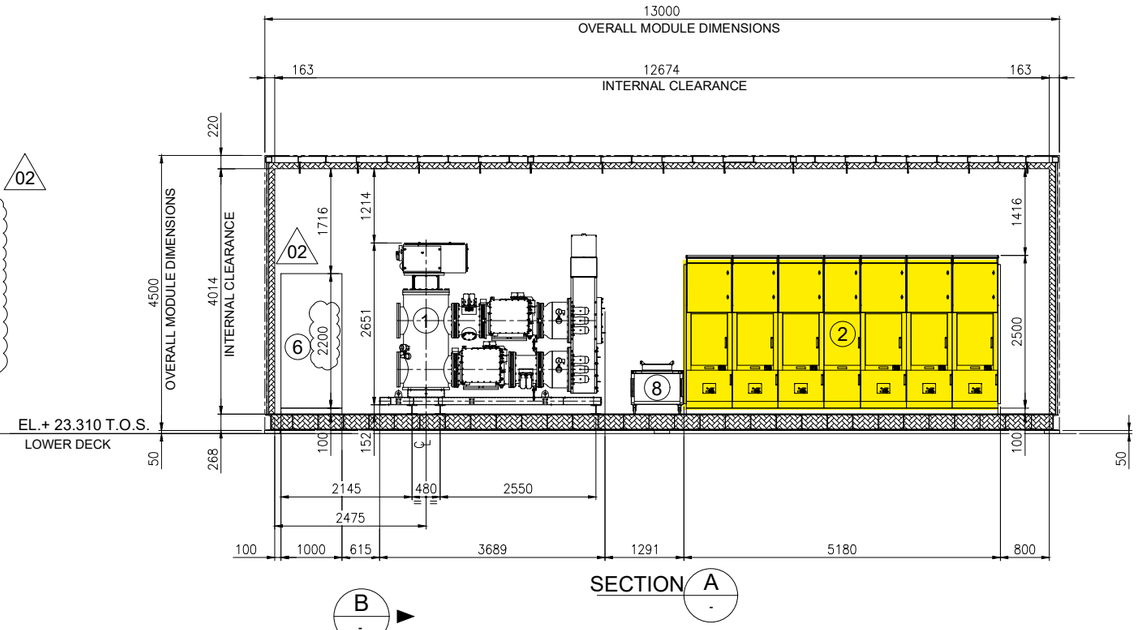
DRAWING NO. 123A90-DDL-EL-DL-20101 REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

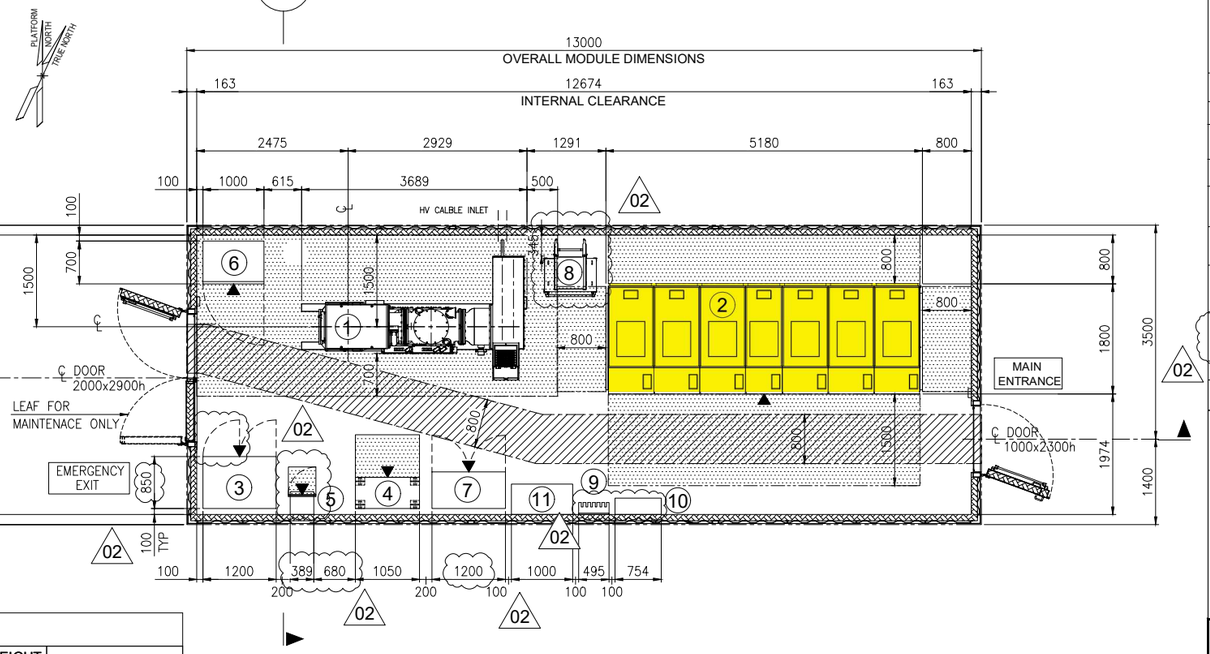
DRAWING NO. 123A90-DDL-EL-DL-20104 | REV. 02



SECTION B -

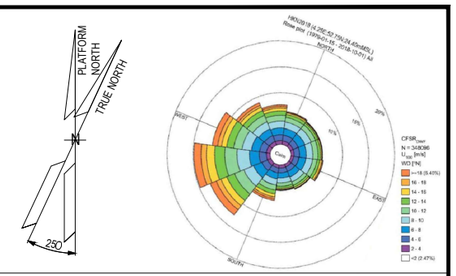


SECTION A -



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

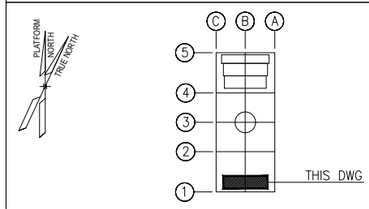
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

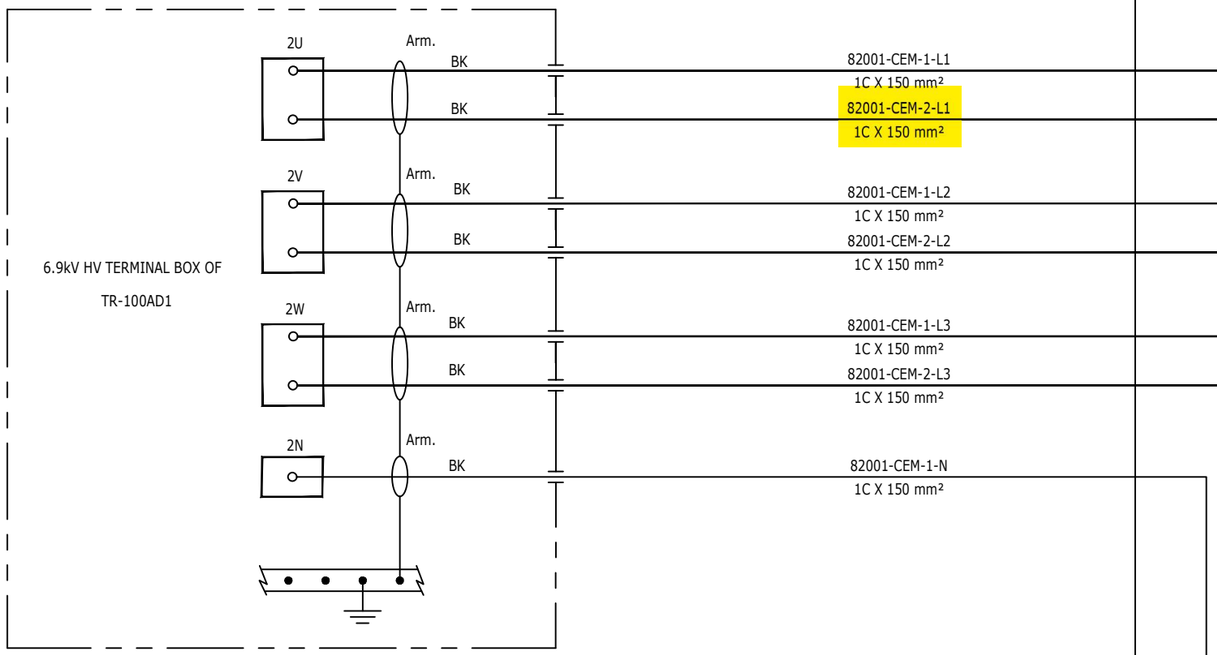
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

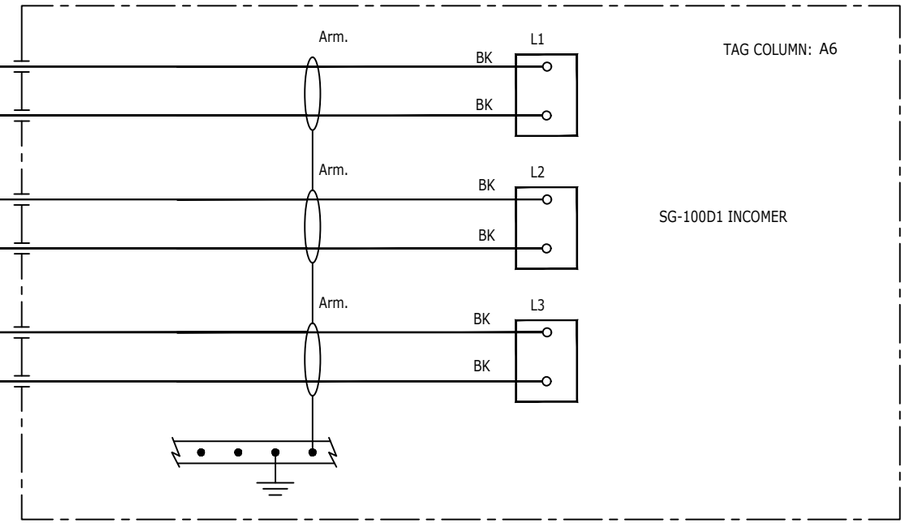
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

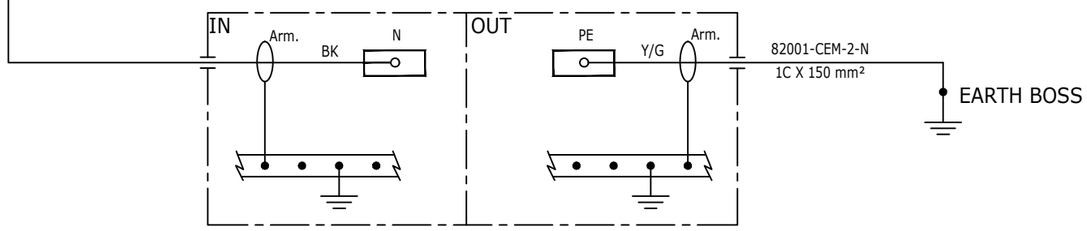
DESCRIPTION: 66/6.9KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1



DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



DESCRIPTION: NER
TAG NUMBER: RR-100D1



VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
2_D	12/12/24	C.Pilato

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
66KV, 7MVA TRANSFORMER

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

SCALE : 1:X

A3

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

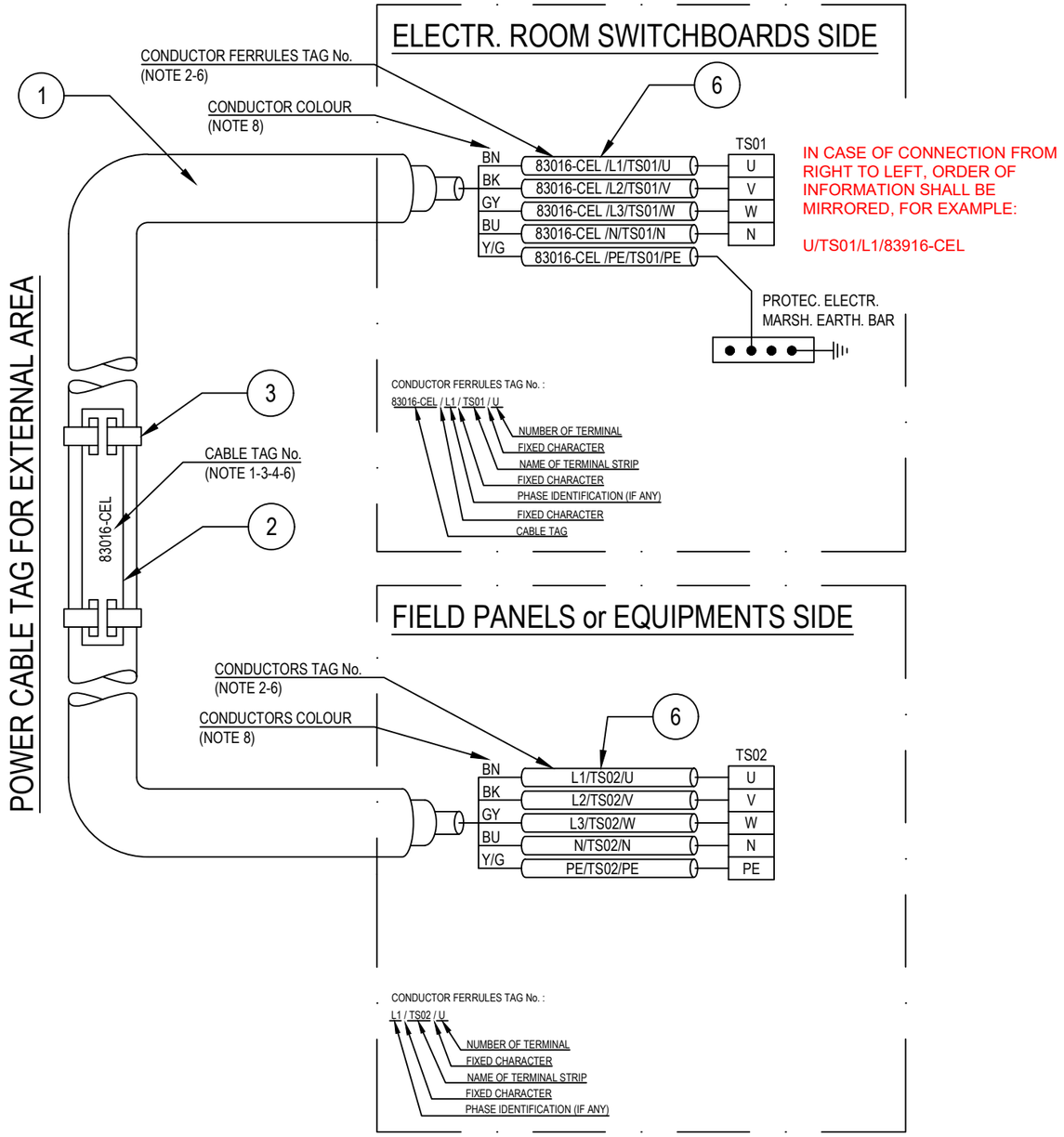
SHEET 012

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

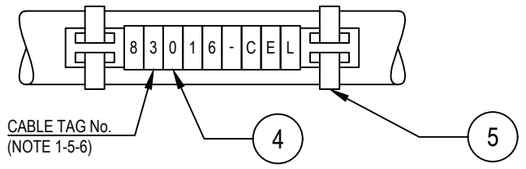
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

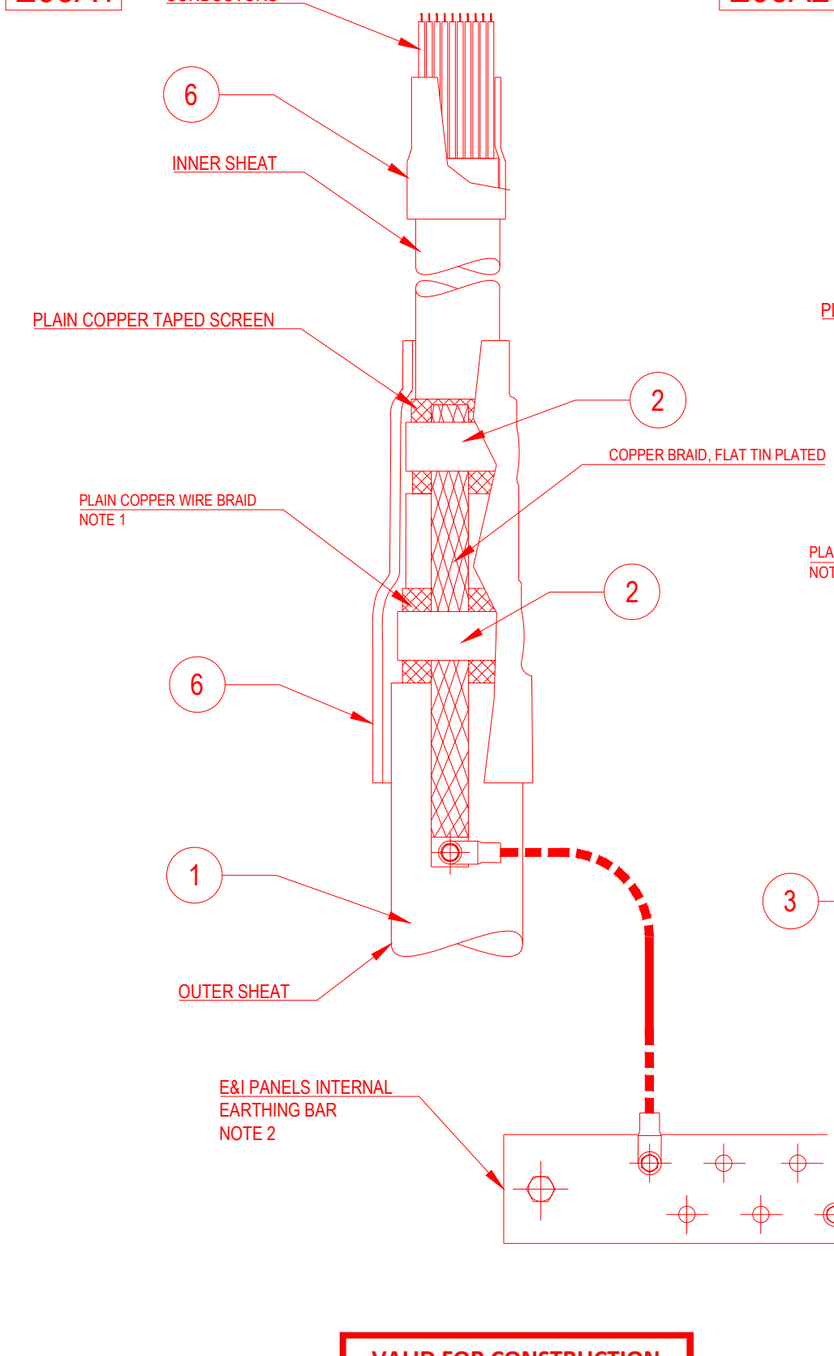
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

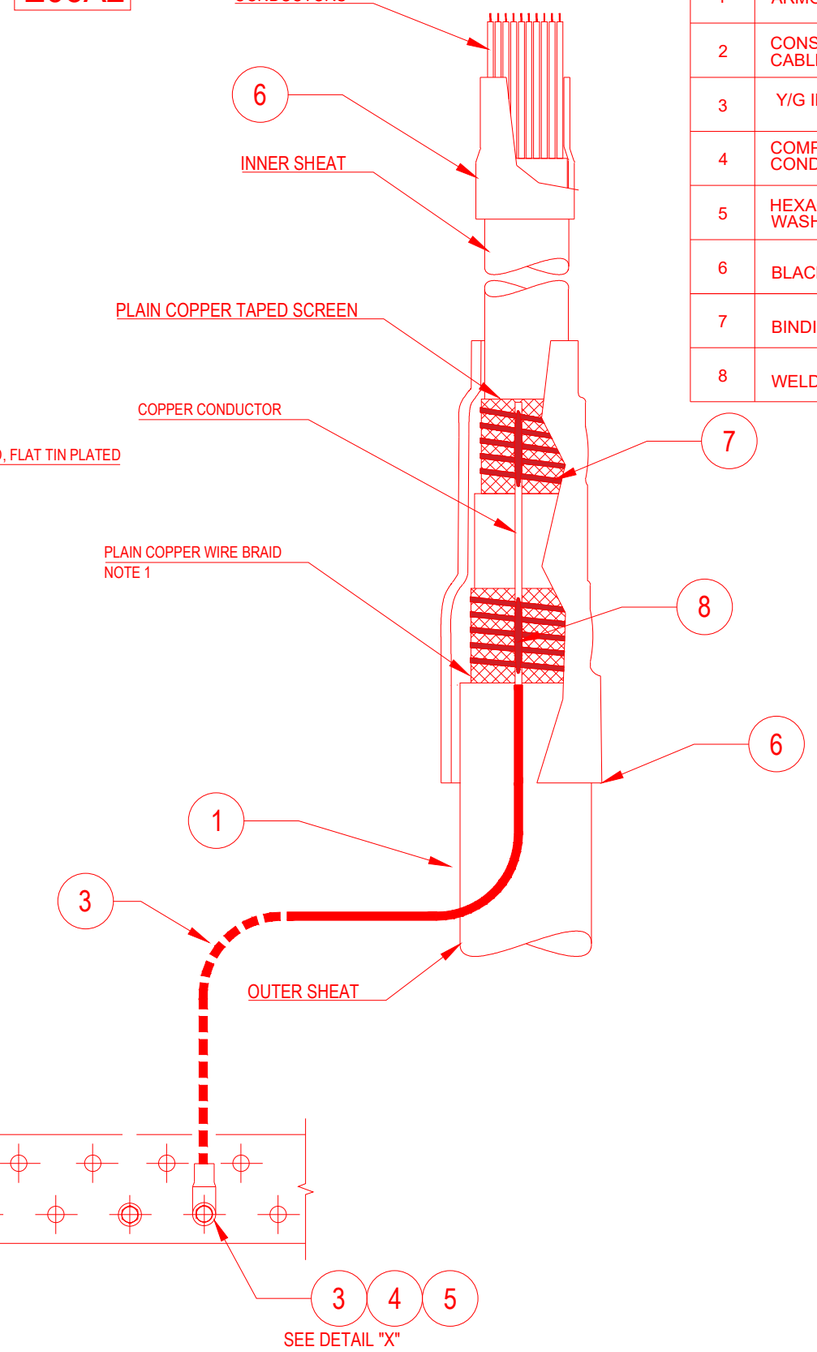
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

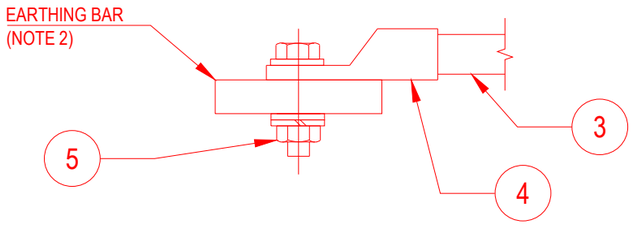


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEM-2-L1	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						TR-100AD1	66 / 6.9 kV 7 MVA Transformer	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV37-1X150	Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x150mm²- Red	M50S	T1_M50S_Single			n.a.				L-300-101-MVT-001 / E-MCT-103 / L-600-101-MVT-009 / L-150-101-MVT-012

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
		Sh: 9 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024
		Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

ELECTRICAL SYSTEM CHARACTERISTIC

OPERATING VOLTAGE	6,6	kVac	±	5	%		
FREQUENCE	50	Hz	±	2	%		
NEUTRAL SYSTEM	☐	EARTHED				☐	INSULATED
	☑	EARTHED BY RESISTANCE				☐	
EXPOSITION OF LIGHTNING OVER VOLTAGE						☐ NO	☑ YES

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

CABLE CHARACTERISTIC

GENERAL CHARACT	REFERENCE STD	FOR CONSTRUCTION AND TEST	IEC 60092-350
		FOR SPECIAL CHARACTERISTIC	**IEC-60754-1, IEC-60332-1-2**
			IEC-61034-2

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm^2

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm^2

SPECIAL CHARACT.	☐ HYDROCARBON RESISTANCE	☐ NON PROPAGATING FIRE	☐ FIRE RESISTANCE	
	☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL			kg/m
	☐ LOW CORROSIVE GAS EMISSION	☐ % HCl ≤ 0,3	☐ % HCl =	
	☐ LOW TOXIC GAS EMISSION (T INDEX)	☐ T ≤ 2	☐ T=	
	☑ LOW SMOKE EMISION (OPTICAL DENSITY)	☐ D ≤ 1,5	☐ D=	
	☐ U.V. RESISTANT	☑ HALOGEN FREE COMPOUND	☑ FLAME RETARDANT	

INSTALL. SPECIAL CONDITION	CABLE LADDER, TREFOIL FORMATION
ACCESS.	

NOTES:

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 10 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

MATERIALS

GENERAL DATA	REF.STD N.: IEC 60092-350
CONDUCTOR	MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H)
INSULATION	MATERIAL: EPR
SEMI-CONDUCTOR LAYER	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: HF EXTRUDED COMPOUND
SCREENS	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: Plain Copper Taped Screen
ARMOUR	☑ REQUIRED TYPE: MATERIAL: Plain Copper Wire Braid
OUTER SHEATING	MATERIAL: SHF1 to IEC 60093.360
COMPONENTS AND SPECIAL CONSTR.	

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 11 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

1	**CONSTRUCTIVE DATA**						
2							
3	MR TAG / PART NUMBER			Note-3	Note-3		
4	n° x NOMINAL AREA OF CONDUCTORS		N.xmm^2	1Cx70	1Cx150		
5	n° AND DIAMETER OF WIRES IN EACH CONDUCTOR		N.xmm	352x0,52	776X0,51		
6	CONDUCTOR CLASS (2)			2	2		
7	RATED CURRENT IN AIR AT 30°		A	285	460		
8	RATED CURRENT IN GROUND AT 20°		A	272	416		
9							
10	A.C. PHASES RESISTANCE AT THE MAX OP. TEMP.		Ω/km	0,345	0,163		
11	PHASE REACTANCE AT 50 Hz		Ω/km	0,110	0,097		
12	MINIMUM INSULATION RESISTANCE AT 20°		MΩ/km	745	567		
13	PHASE CAPACITY		µF/km	0,301	0,396		
14							
15	MINIMUM ORDER Q.TY		m	TBD	TBD		
16	MAX LENGHT OF DRUMS		m	TBD	TBD		
17	DIAMETERS	BARE CONDUCTOR	mm	10	14,3		
18		CORE (INSULATED CORE)	mm	19,6	24		
19		UNDER ARMOUR	mm	23,6	28,3		
20		ARMOUR OR CONCENTRIC CONDUCTOR	mm	24,8	29,5		
21							
22							
23		OVERALL	mm	29	34		
24	MASSES	CONDUCTORS	kg/km	640	1350		
25		INSULATION	kg/km	290	410		
26		INNER COVERING	kg/km	180	220		
27		ARMOUR OR CONCENTRIC CONDUCTOR	kg/km	220	250		
28		OUTER SHEATING	kg/km	280	350		
29							
30		TOTAL	kg/km	1610	2580		
31	EXTERNAL COLOUR			RED	RED		
32	CORE IDENTIFICATION (1)			NATURAL	NATURAL		
33							
34							
35							
36							
37							
38							

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

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ITEM	Tag	82001-CEM-1-L2	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000470	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	OK
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-1-L2	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000470	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:	11,5	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	121	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	.	µA	
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	.	µA	
	2nd INSULATION TEST			
	Voltage applied:	500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	NOTE	N.m	

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	VOLCRAFT 1000V - ET-200 S/N:H240103023	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°LAT 042 00768/24 _ 12/10/2024	Calibration certificate N° and date:	

Comments:

Note HV TEST: See attached certificate and Test Report.

Note : Tightening torque will be done by the commissioning activity.

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Giovanni Tangianu	
Date	2025-04-11	2025-04-11	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-11T09:38:57.269Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-11T11:52:30.417Z	

82001-CEM-1-L2

VLF Withstand Report
82001-CEM-1-L2 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	4/5/2025 7:28 AM
Company Name	ICS
Region	---
Station	---
Operator Name	RECHICHI
Work Order	---

Device Under Test (Cable XLPE)

Voltage Rating	11.5 kV
Insulation	XLPE
Line Length	25 Meter
Size	1X150
Phase	B
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	11.5 kV•	Sine	0.1 Hz (A)	15 min

Measurements:

Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	11.5 kV•	121 µA•	16.7 nF	18 GΩ	0.1 Hz

- RMS value

TEST REPORT

Cable Tag/ID: 82001-CEM-1-L2

Cable Type: 1X 150 mm²

Voltage Rating: 6/10 kV

5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF - 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA 45

Serial Number: GH.5219.16 C010

Operator: FAUSTO RECHICHI

5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 10.4.25

Witnessed by: GIOVANNI TONDIANI Signature: _____ Date: 10/04/25.
JOHN MACKLOP 10.4.25.

ITEM	Tag	82001-CEM-1-L2	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD/LD_B-100
TASK	code	C10000470		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	Note
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	Note
13	If required produce Red Line Mark Up for "AS BUILT"	

REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-1-L2	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000470	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CONTINUITY TESTS

1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK

1st INSULATION TEST

	Voltage applied:	2500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK

HV TEST 15 min

	Voltage applied:		kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :		µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:		µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:		µA	Note

2nd INSULATION TEST

	Voltage applied:	2500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK

RE-CONNECT TERMINATIONS

13	Tightening torque		N.m

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	Mod:FLUKE 175 S/N:(AW1/018-17140769)	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°7715/24 _ 10/07/2024	Calibration certificate N° and date:	

Comments:

Nota 4: refer to PL C30001889
Nota 8: refer to PL C30001890

Note HV TEST: See attached certificate

Nota 12/13: Cable will be connected during Commissioning Activities

	Performed by	☉ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-02	2024-12-19	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-02T16:19:29.989Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-19T15:47:29.790Z	

82001-CEM-1-L2

VLF Withstand Report
82001-CEM-1-L2 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	12/13/2024 2:40 PM
Company Name	ICS
Region	---
Station	---
Operator Name	STEFAN
Work Order	MT-MISURE

Device Under Test (Cable XLPE)

Voltage Rating	10.0 kV
Insulation	XLPE
Line Length	75 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	10.0 kV•	Sine	0.1 Hz (A)	5 min

Measurements:

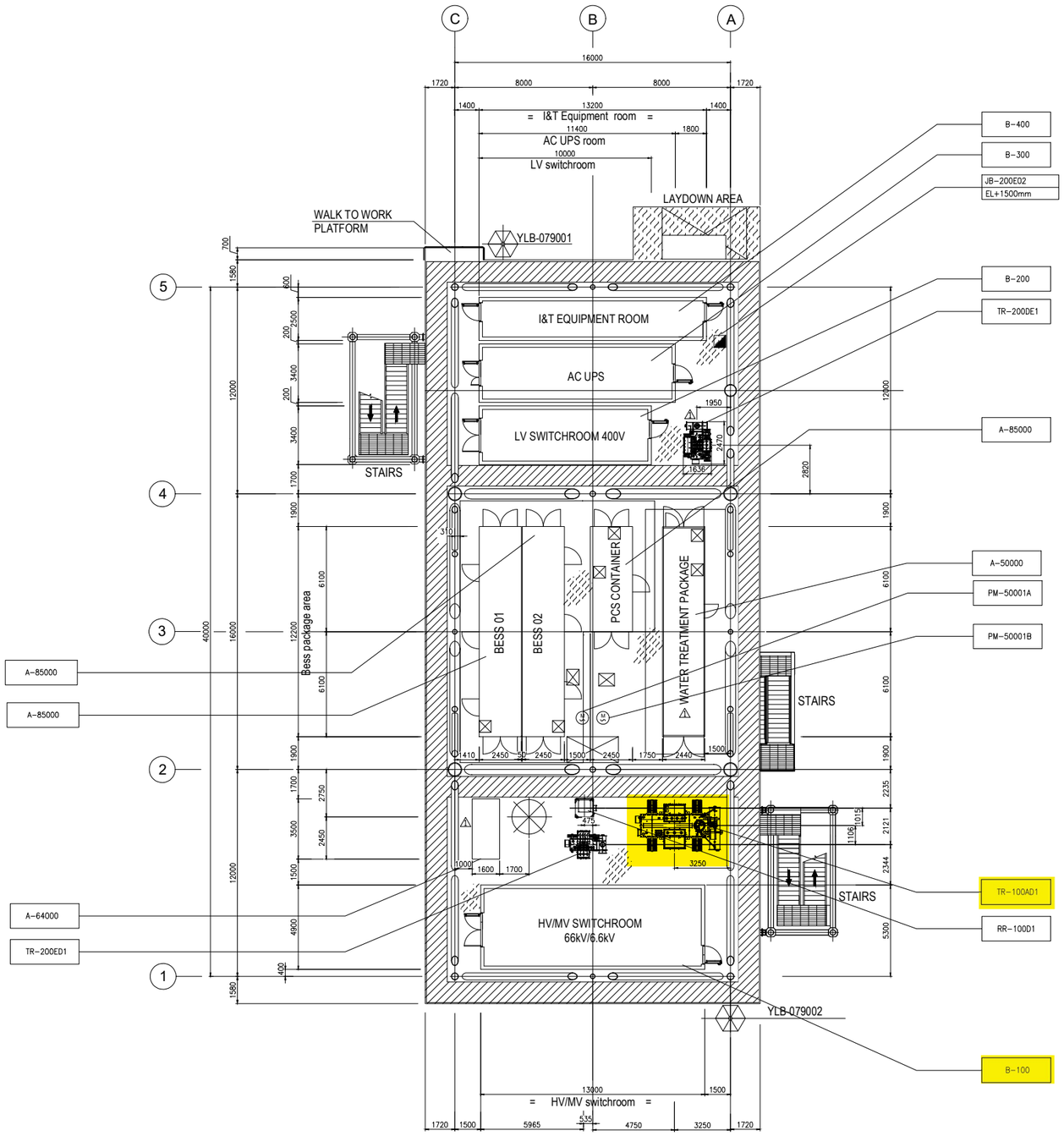
Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	10.0 kV•	36 µA•	5.6 nF	2.2 GΩ	0.1 Hz

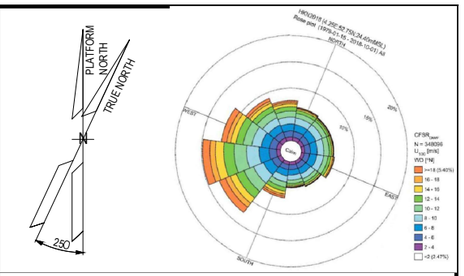
- RMS value

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

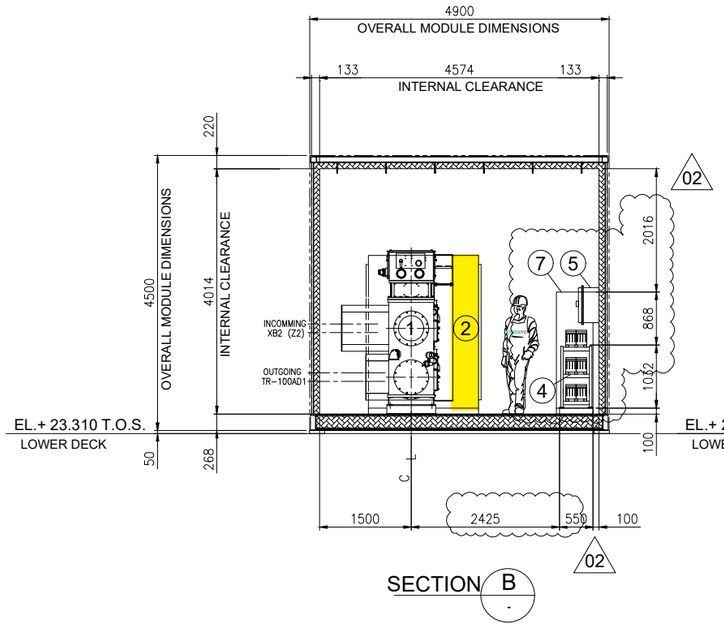
ROSETTI MARINO SpA

TITLE :
BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

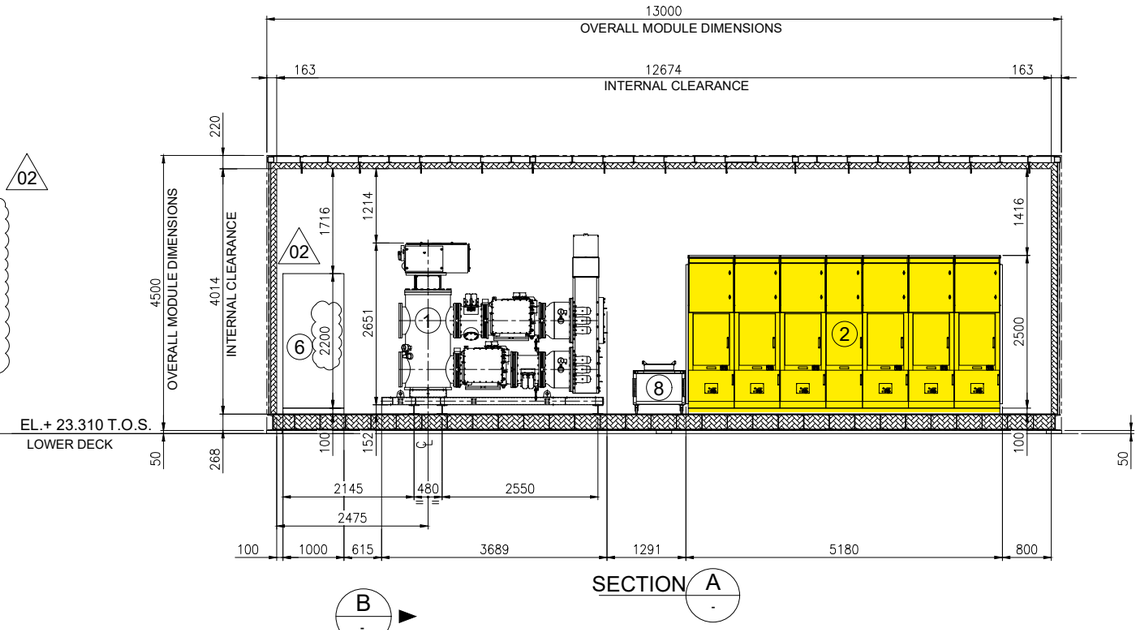
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101		SHEET 001 / REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

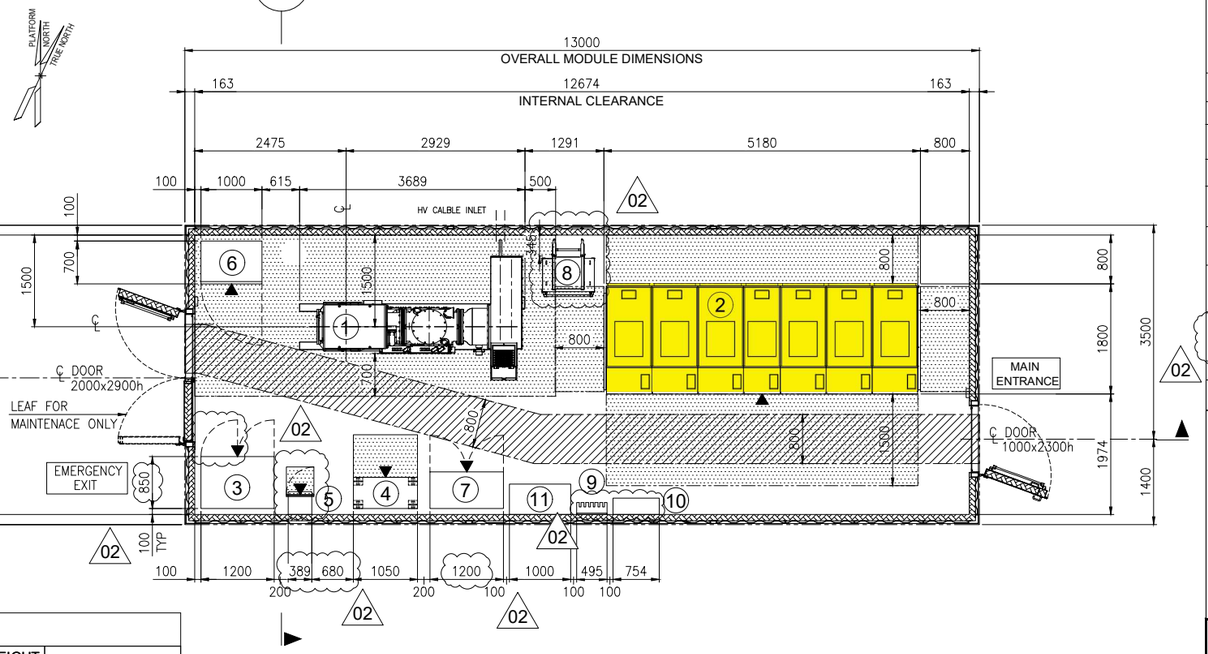
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SECTION B -

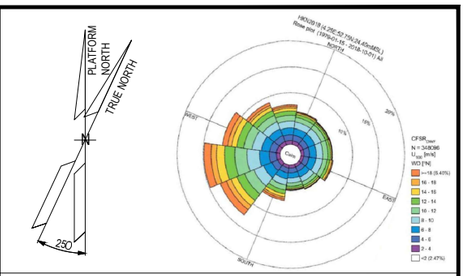


SECTION A -



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

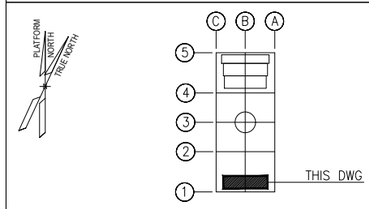
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

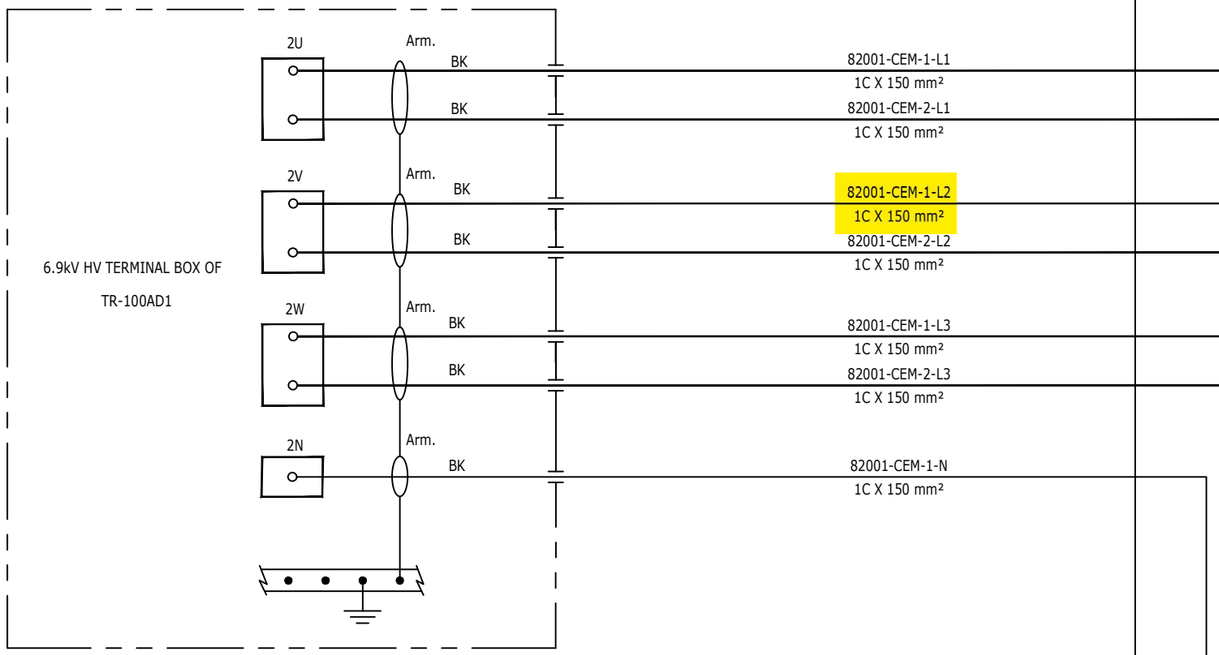
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

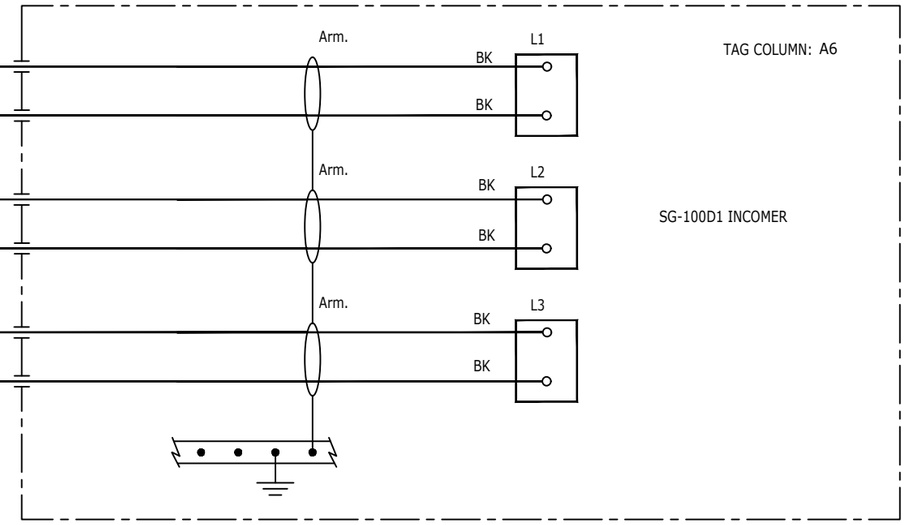
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FROM	TO

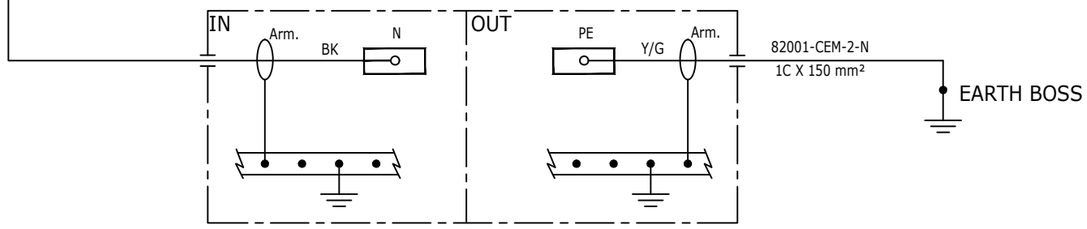
DESCRIPTION: 66/6.9KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1



DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



DESCRIPTION: NER
TAG NUMBER: RR-100D1



VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
2_D	12/12/24	C.Pilato

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
66KV, 7MVA TRANSFORMER

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

SCALE : 1:X

A3

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

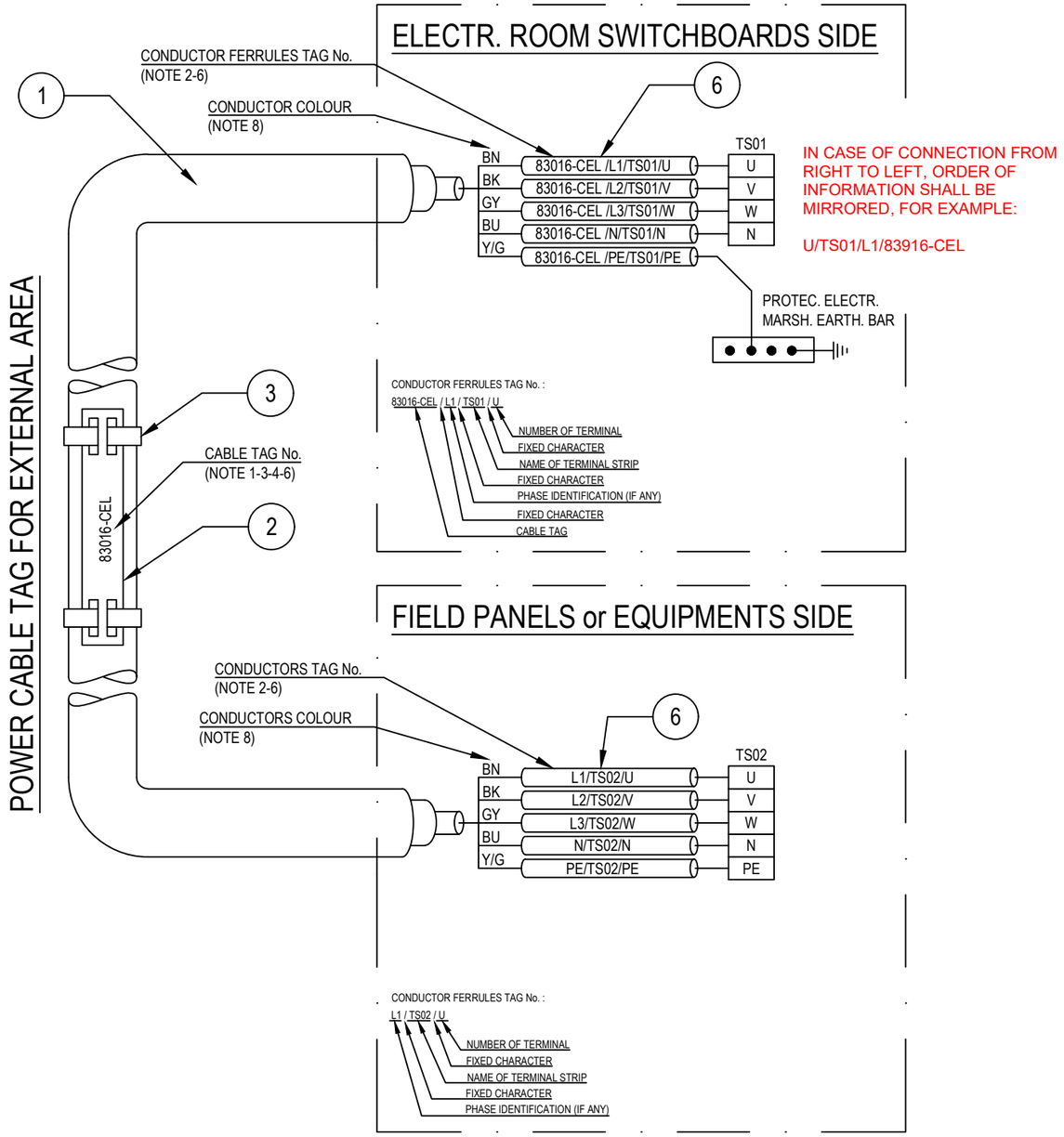
SHEET 012

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

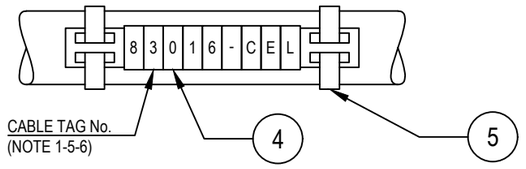
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

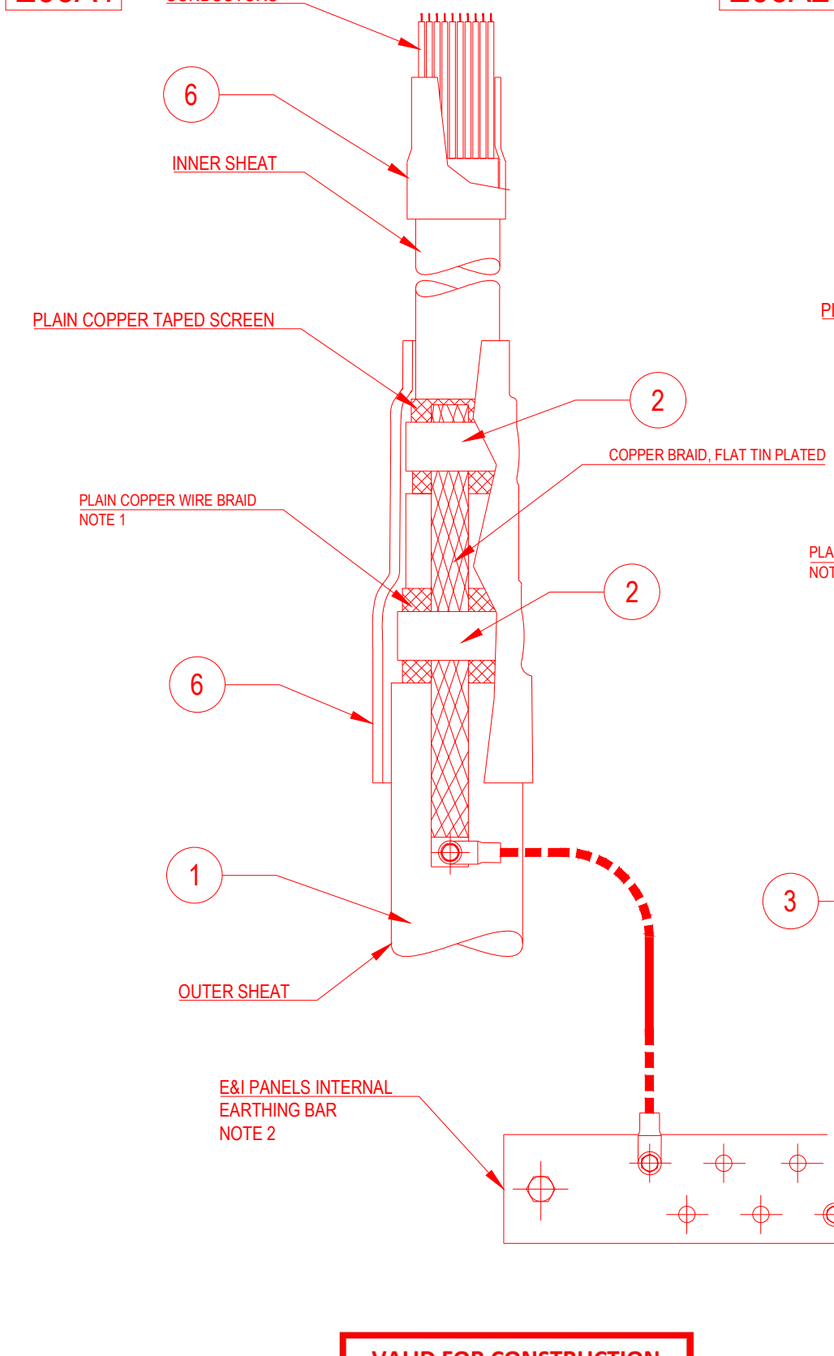
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

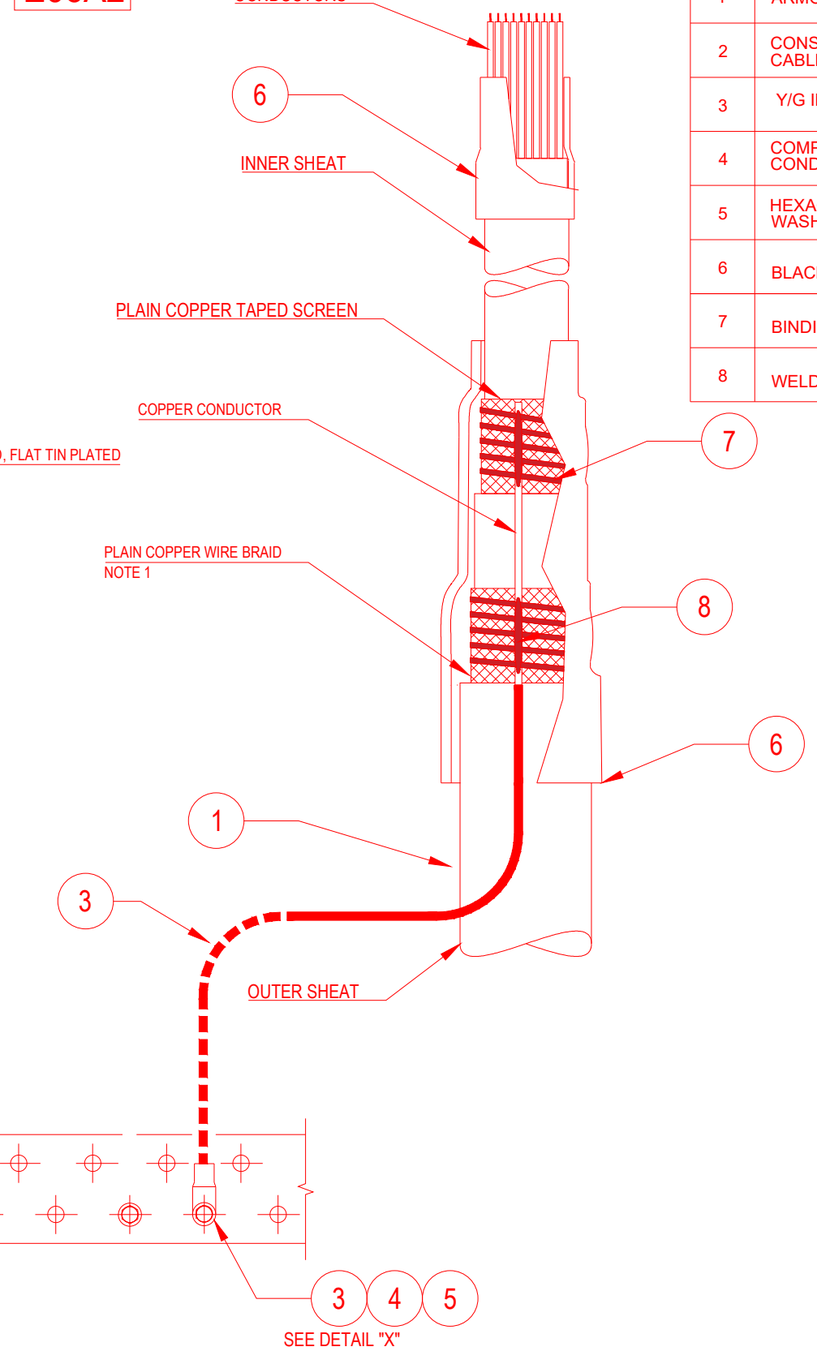
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

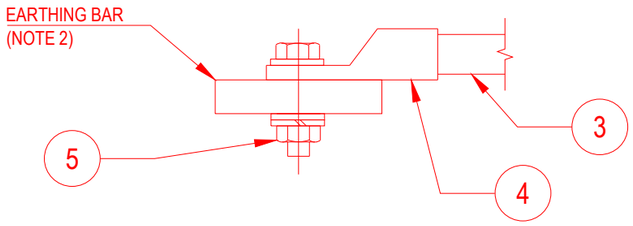


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEM-1-L2	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						TR-100AD1	66 / 6.9 kV 7 MVA Transformer	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV37-1X150	Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x150mm²- Red	M50S	T1_M50S_Single			n.a.				L-300-101-MVT-001 / E-MCT-103 / L-600-101-MVT-009 / L-150-101-MVT-012

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
		Sh: 9 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024
		Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

ELECTRICAL SYSTEM CHARACTERISTIC

OPERATING VOLTAGE	6,6	kVac	±	5	%		
FREQUENCE	50	Hz	±	2	%		
NEUTRAL SYSTEM	☐	EARTHED				☐	INSULATED
	☑	EARTHED BY RESISTANCE				☐	
EXPOSITION OF LIGHTNING OVER VOLTAGE						☐ NO	☑ YES

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

CABLE CHARACTERISTIC

GENERAL CHARACT	REFERENCE STD	FOR CONSTRUCTION AND TEST	IEC 60092-350
		FOR SPECIAL CHARACTERISTIC	**IEC-60754-1, IEC-60332-1-2**
			IEC-61034-2

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm^2

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm^2

SPECIAL CHARACT.	☐ HYDROCARBON RESISTANCE	☐ NON PROPAGATING FIRE	☐ FIRE RESISTANCE	
	☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL			kg/m
	☐ LOW CORROSIVE GAS EMISSION	☐ % HCl ≤ 0,3	☐ % HCl =	
	☐ LOW TOXIC GAS EMISSION (T INDEX)	☐ T ≤ 2	☐ T=	
	☑ LOW SMOKE EMISION (OPTICAL DENSITY)	☐ D ≤ 1,5	☐ D=	
	☐ U.V. RESISTANT	☑ HALOGEN FREE COMPOUND	☑ FLAME RETARDANT	

INSTALL. SPECIAL CONDITION	CABLE LADDER, TREFOIL FORMATION
ACCESS.	

NOTES:

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 10 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

MATERIALS

GENERAL DATA	REF.STD N.: IEC 60092-350
CONDUCTOR	MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H)
INSULATION	MATERIAL: EPR
SEMI-CONDUCTOR LAYER	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: HF EXTRUDED COMPOUND
SCREENS	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: Plain Copper Taped Screen
ARMOUR	☑ REQUIRED TYPE: MATERIAL: Plain Copper Wire Braid
OUTER SHEATING	MATERIAL: SHF1 to IEC 60093.360
COMPONENTS AND SPECIAL CONSTR.	

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 11 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

1	**CONSTRUCTIVE DATA**						
2							
3	MR TAG / PART NUMBER			Note-3	Note-3		
4	n° x NOMINAL AREA OF CONDUCTORS		N.xmm^2	1Cx70	1Cx150		
5	n° AND DIAMETER OF WIRES IN EACH CONDUCTOR		N.xmm	352x0,52	776X0,51		
6	CONDUCTOR CLASS (2)			2	2		
7	RATED CURRENT IN AIR AT 30°		A	285	460		
8	RATED CURRENT IN GROUND AT 20°		A	272	416		
9							
10	A.C. PHASES RESISTANCE AT THE MAX OP. TEMP.		Ω/km	0,345	0,163		
11	PHASE REACTANCE AT 50 Hz		Ω/km	0,110	0,097		
12	MINIMUM INSULATION RESISTANCE AT 20°		MΩ/km	745	567		
13	PHASE CAPACITY		µF/km	0,301	0,396		
14							
15	MINIMUM ORDER Q.TY		m	TBD	TBD		
16	MAX LENGHT OF DRUMS		m	TBD	TBD		
17	DIAMETERS	BARE CONDUCTOR	mm	10	14,3		
18		CORE (INSULATED CORE)	mm	19,6	24		
19		UNDER ARMOUR	mm	23,6	28,3		
20		ARMOUR OR CONCENTRIC CONDUCTOR	mm	24,8	29,5		
21							
22							
23		OVERALL	mm	29	34		
24	MASSES	CONDUCTORS	kg/km	640	1350		
25		INSULATION	kg/km	290	410		
26		INNER COVERING	kg/km	180	220		
27		ARMOUR OR CONCENTRIC CONDUCTOR	kg/km	220	250		
28		OUTER SHEATING	kg/km	280	350		
29							
30		TOTAL	kg/km	1610	2580		
31	EXTERNAL COLOUR			RED	RED		
32	CORE IDENTIFICATION (1)			NATURAL	NATURAL		
33							
34							
35							
36							
37							
38							

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

49

50

51

ITEM	Tag	82001-CEM-2-L2	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD/LD_B-100
TASK	code	C10000471		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	OK
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-2-L2	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000471	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:	11,5	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	73	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	µA	
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	µA	
	2nd INSULATION TEST			
	Voltage applied:	500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	NOTE	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	VOLCRAFT 1000V - ET-200 S/N:H240103023	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°LAT 042 00768/24 _ 12/10/2024	Calibration certificate N° and date:	

Comments:

Note HV TEST: See attached certificate and Test Report.

Note : Tightening torque will be done by the commissioning activity.

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Giovanni Tangianu	
Date	2025-04-11	2025-04-11	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-11T09:39:14.102Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-11T11:52:18.198Z	

82001-CEM-2-L2

VLF Withstand Report
82001-CEM-2-L2- Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	4/5/2025 9:02 AM
Company Name	ICS
Region	---
Station	---
Operator Name	RECHICHI
Work Order	---

Device Under Test (Cable XLPE)

Voltage Rating	11.5 kV
Insulation	XLPE
Line Length	25 Meter
Size	1X150
Phase	B
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	11.5 kV•	Sine	0.1 Hz (A)	15 min

Measurements:

Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	11.5 kV•	73 µA•	10.1 nF	> 20 GΩ	0.1 Hz

- RMS value

TEST REPORT

Cable Tag/ID: 82001-CEM-2-L2

Cable Type: 1X150 mm2

Voltage Rating: 6/10 kV

5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF - 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA45

Serial Number: QH5219.16C010

Operator: FAUSTO RECHICHI

5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 10.04.25

Witnessed by: GIOVANNI TANCIONI / JOHN MACKILLOP Signature: _____ Date: 10/04/25 / 0.4.25.

ITEM	Tag	82001-CEM-2-L2	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000471	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	Note
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	Note
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-2-L2	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000471	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CONTINUITY TESTS

1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK

1st INSULATION TEST

	Voltage applied:	2500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK

HV TEST 15 min

	Voltage applied:		kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :		µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:		µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:		µA	Note

2nd INSULATION TEST

	Voltage applied:	2500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK

RE-CONNECT TERMINATIONS

13	Tightening torque		N.m

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	Mod:FLUKE 175 S/N:(AW1/018-17140769)	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°7715/24 _ 10/07/2024	Calibration certificate N° and date:	

Comments:

Nota 4: refer to PL C30002020
Nota 8: refer to PL C30001890

Note HV TEST: See attached certificate

Nota 12/13: Cable will be connected during Commissioning Activities

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-02	2024-12-19	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-02T16:19:49.613Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-19T15:52:52.191Z	

82001-CEM-2-L2

VLF Withstand Report
82001-CEM-2-L2 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	12/13/2024 2:20 PM
Company Name	ICS
Region	---
Station	---
Operator Name	STEFAN
Work Order	MT-MISURE

Device Under Test (Cable XLPE)

Voltage Rating	10.0 kV
Insulation	XLPE
Line Length	75 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	10.0 kV•	Sine	0.1 Hz (A)	5 min

Measurements:

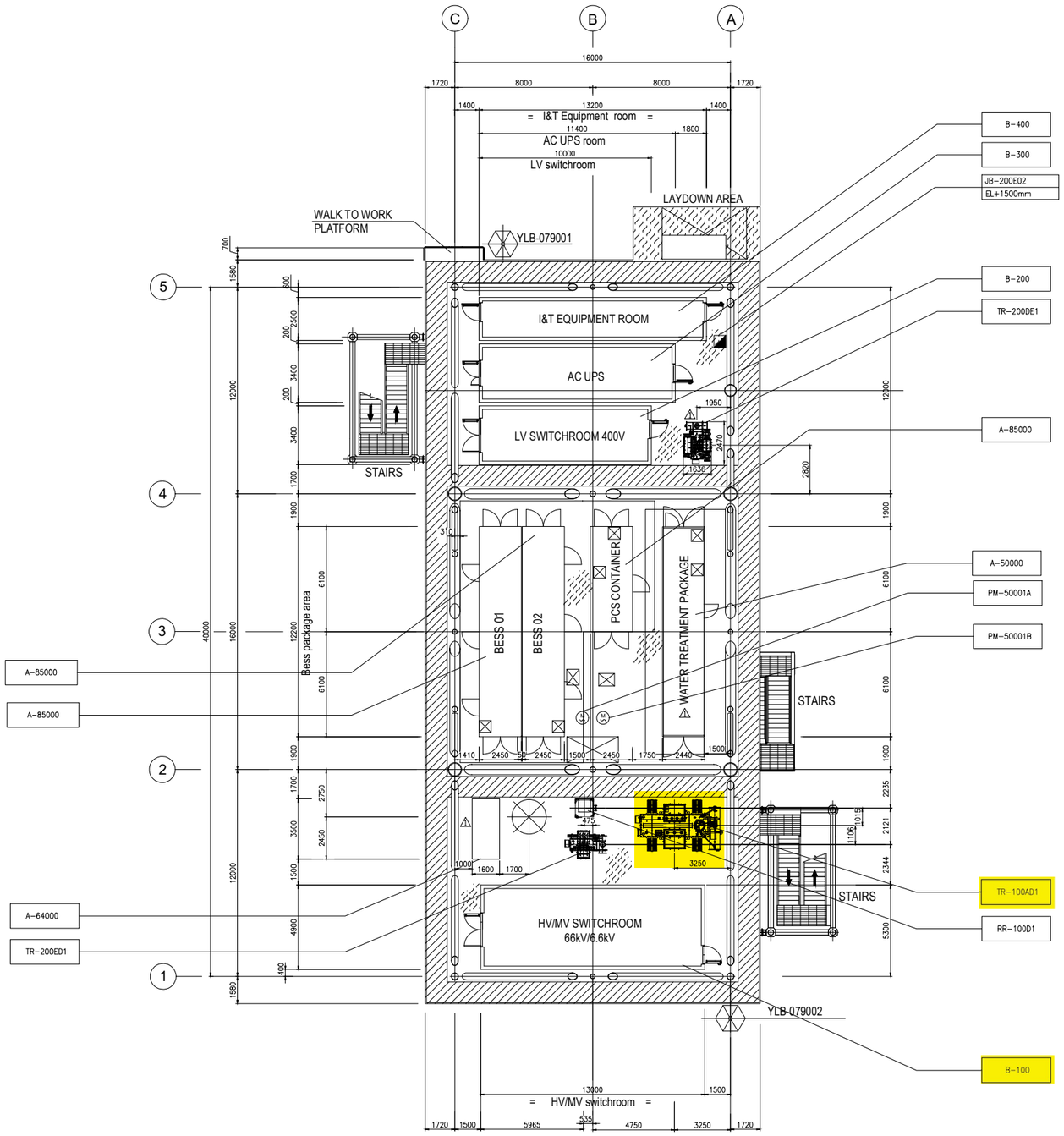
Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	10.0 kV•	35 µA•	5.5 nF	3.4 GΩ	0.1 Hz

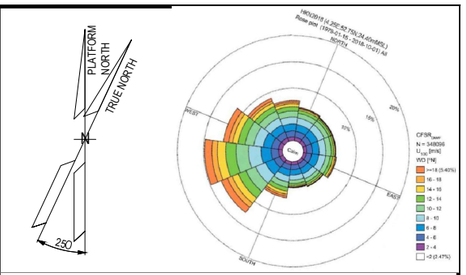
- RMS value

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

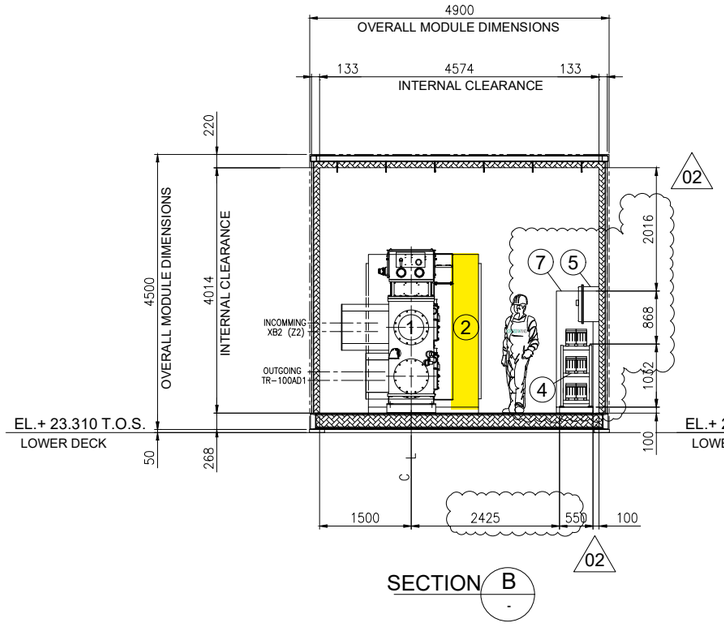
TITLE :
BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101		SHEET 001 / REV. 01

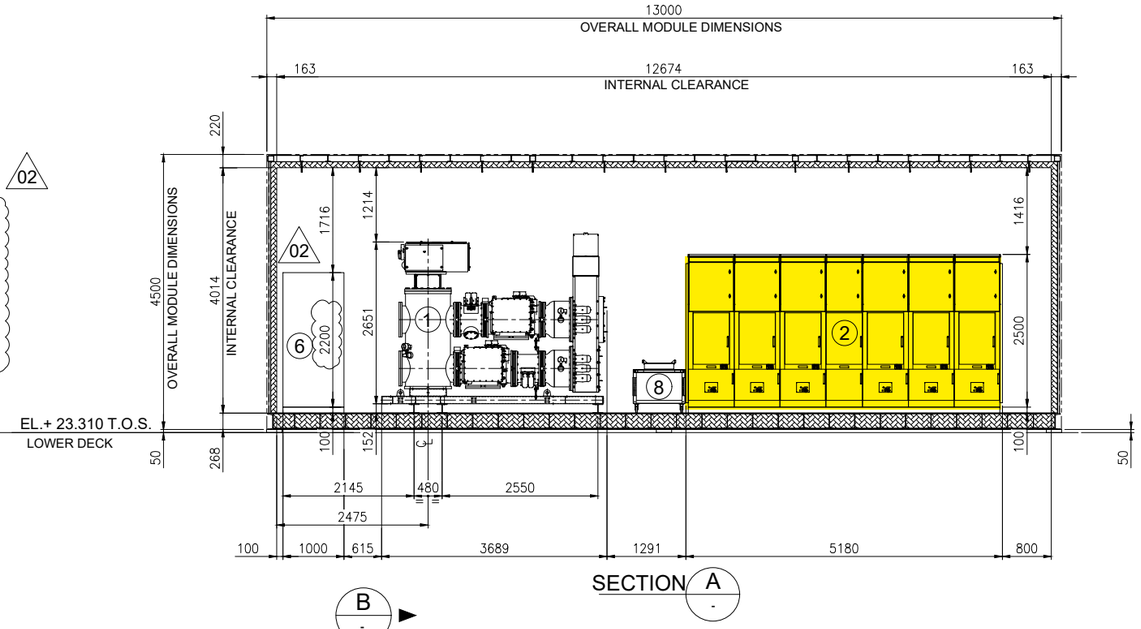
File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20104

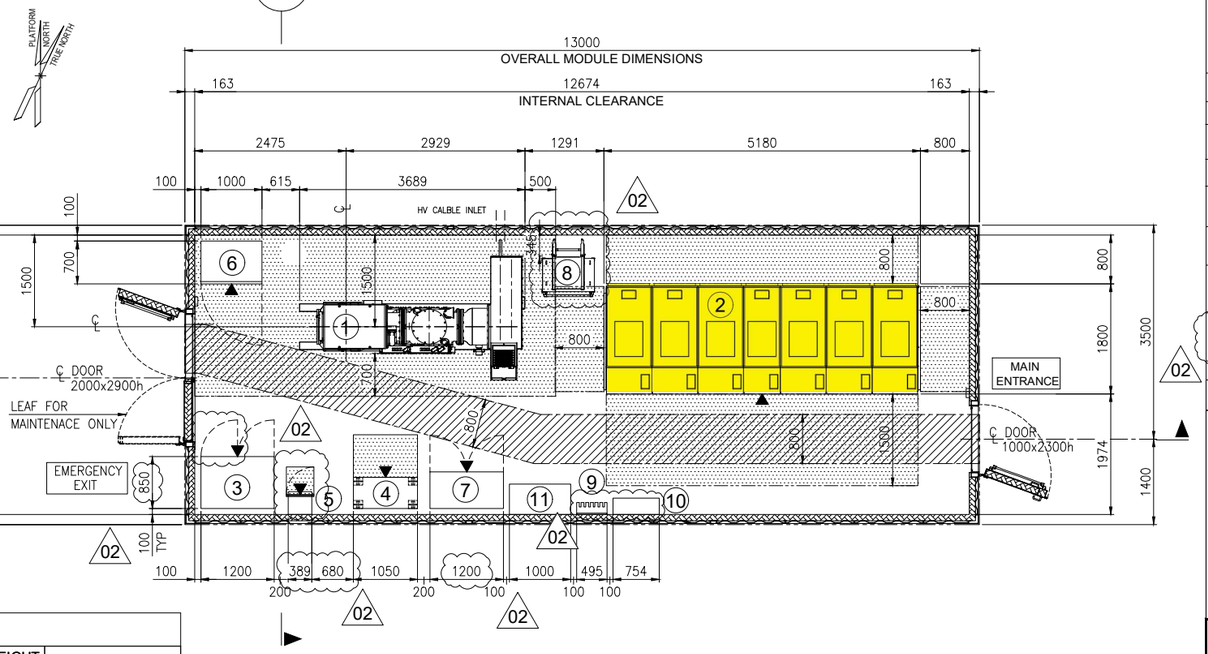
REV. 02



SECTION B -

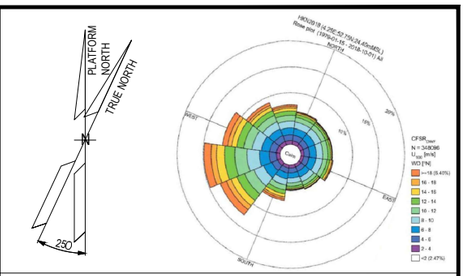


SECTION A -



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

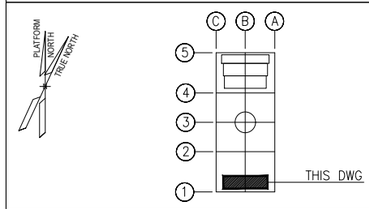
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 66/6.9KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1

6.9kV HV TERMINAL BOX OF
TR-100AD1

2U — Arm. — BK — 82001-CEM-1-L1 — 1C X 150 mm²
2U — Arm. — BK — 82001-CEM-2-L1 — 1C X 150 mm²
2V — Arm. — BK — 82001-CEM-1-L2 — 1C X 150 mm²
2V — Arm. — BK — 82001-CEM-2-L2 — 1C X 150 mm²
2W — Arm. — BK — 82001-CEM-1-L3 — 1C X 150 mm²
2W — Arm. — BK — 82001-CEM-2-L3 — 1C X 150 mm²
2N — Arm. — BK — 82001-CEM-1-N — 1C X 150 mm²

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

TAG COLUMN: A6

SG-100D1 INCOMER

Arm. — BK — L1
Arm. — BK — L2
Arm. — BK — L3

DESCRIPTION: NER
TAG NUMBER: RR-100D1

IN: Arm. — BK — N
OUT: PE — Y/G — Arm. — 82001-CEM-2-N — 1C X 150 mm² — EARTH BOSS

VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
2_D	12/12/24	C.Pilato

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
66KV, 7MVA TRANSFORMER

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

SCALE : 1:X

A3

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

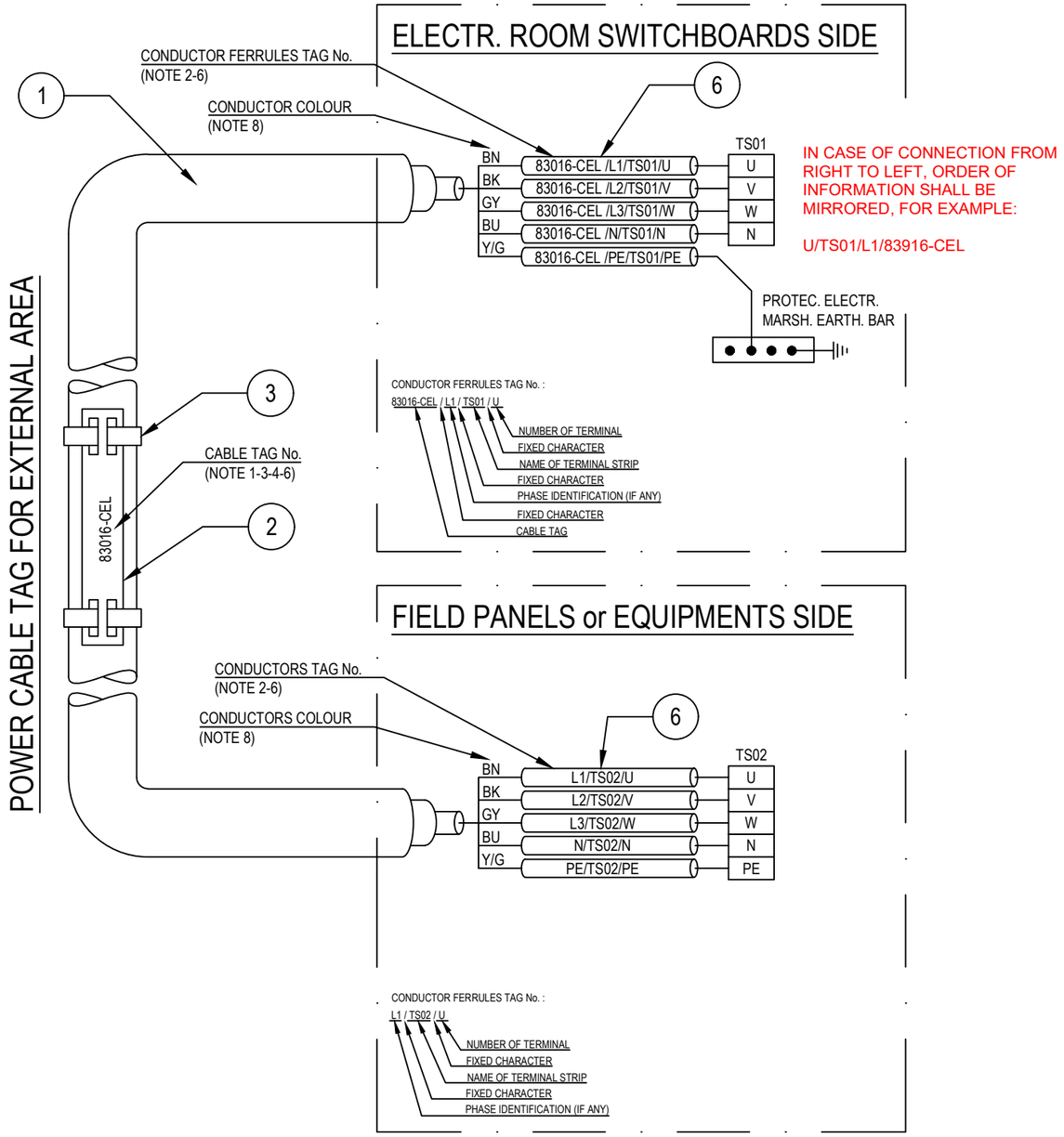
SHEET 012

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

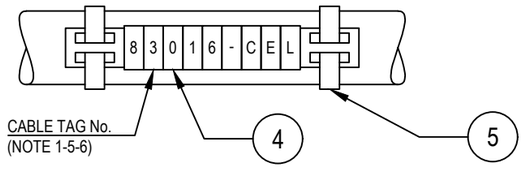
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

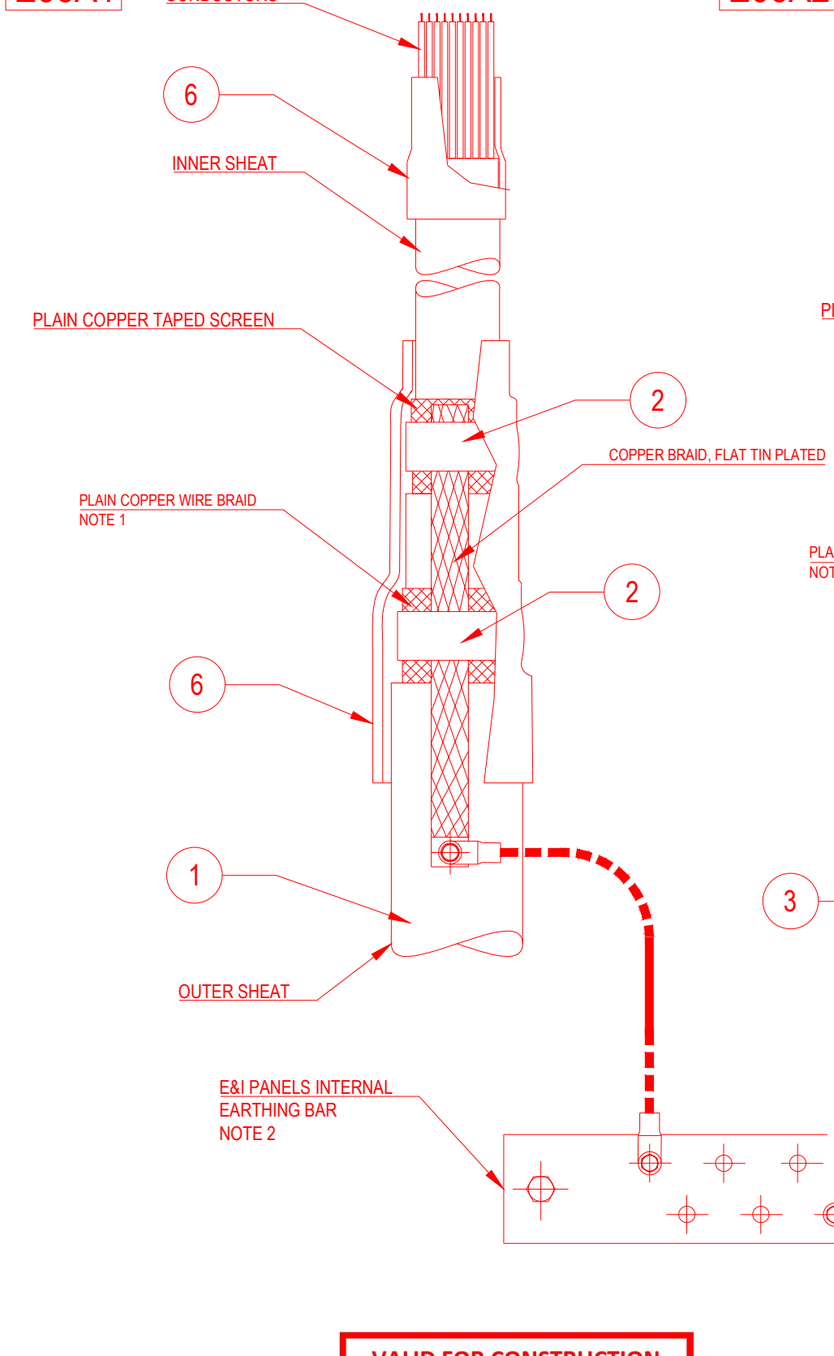
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

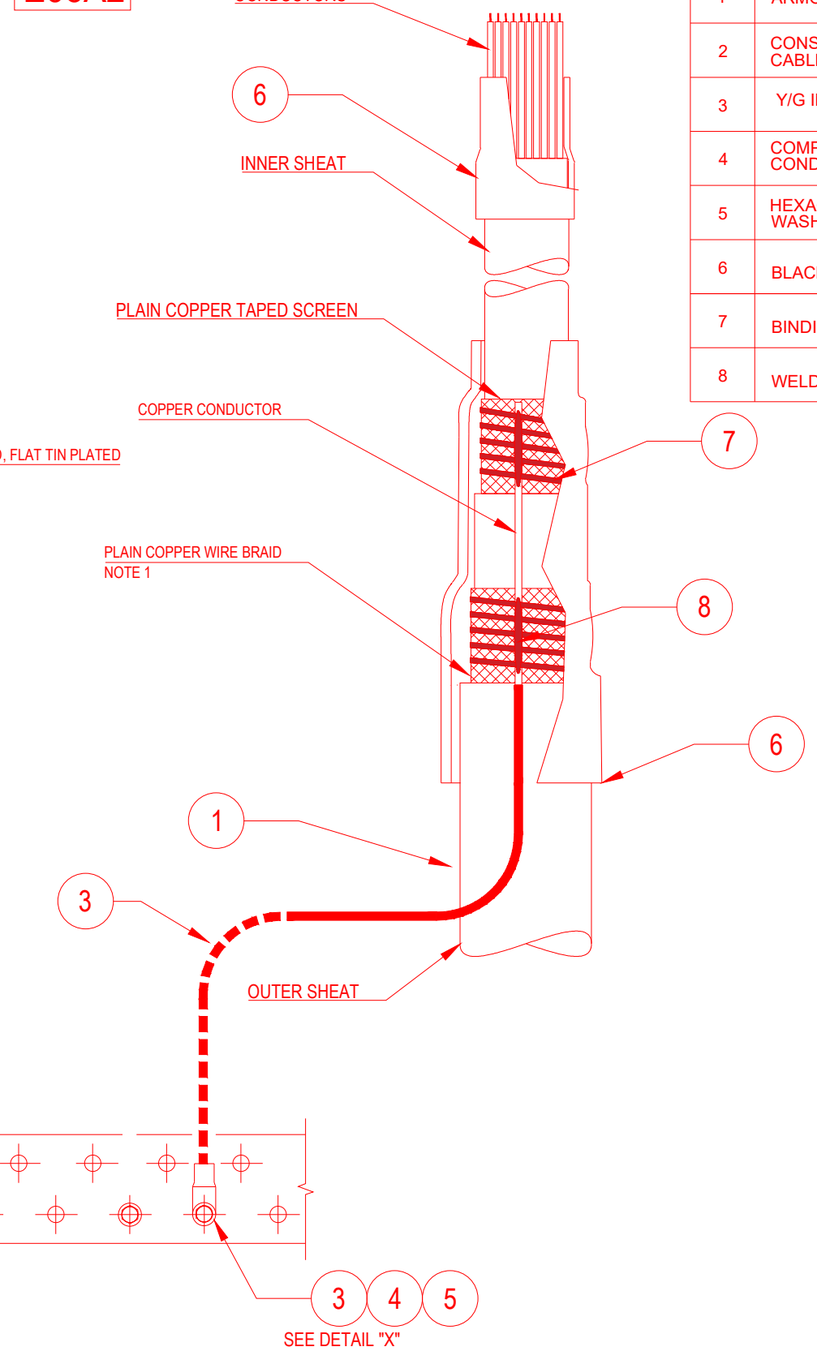
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

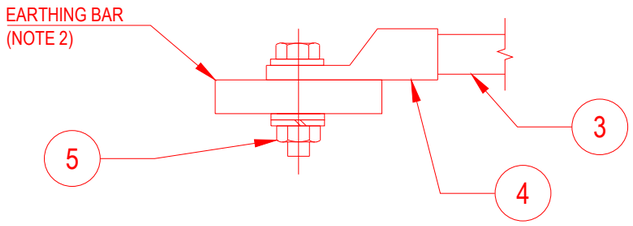


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEM-2-L2	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						TR-100AD1	66 / 6.9 kV 7 MVA Transformer	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV37-1X150	Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x150mm²- Red	M50S	T1_M50S_Single			n.a.				L-300-101-MVT-001 / E-MCT-103 / L-600-101-MVT-009 / L-150-101-MVT-012

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
		Sh: 9 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024
		Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

ELECTRICAL SYSTEM CHARACTERISTIC

OPERATING VOLTAGE	6,6	kVac	±	5	%		
FREQUENCE	50	Hz	±	2	%		
NEUTRAL SYSTEM	☐	EARTHED				☐	INSULATED
	☑	EARTHED BY RESISTANCE				☐	
EXPOSITION OF LIGHTNING OVER VOLTAGE						☐ NO	☑ YES

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

CABLE CHARACTERISTIC

GENERAL CHARACT	REFERENCE STD	FOR CONSTRUCTION AND TEST	IEC 60092-350
		FOR SPECIAL CHARACTERISTIC	**IEC-60754-1, IEC-60332-1-2**
			IEC-61034-2

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm^2

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm^2

SPECIAL CHARACT.	☐ HYDROCARBON RESISTANCE	☐ NON PROPAGATING FIRE	☐ FIRE RESISTANCE	
	☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL			kg/m
	☐ LOW CORROSIVE GAS EMISSION	☐ % HCl ≤ 0,3	☐ % HCl =	
	☐ LOW TOXIC GAS EMISSION (T INDEX)	☐ T ≤ 2	☐ T=	
	☑ LOW SMOKE EMISION (OPTICAL DENSITY)	☐ D ≤ 1,5	☐ D=	
	☐ U.V. RESISTANT	☑ HALOGEN FREE COMPOUND	☑ FLAME RETARDANT	

INSTALL. SPECIAL CONDITION	CABLE LADDER, TREFOIL FORMATION
ACCESS.	

NOTES:

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 10 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

MATERIALS

GENERAL DATA	REF.STD N.: IEC 60092-350
CONDUCTOR	MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H)
INSULATION	MATERIAL: EPR
SEMI-CONDUCTOR LAYER	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: HF EXTRUDED COMPOUND
SCREENS	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: Plain Copper Taped Screen
ARMOUR	☑ REQUIRED TYPE: MATERIAL: Plain Copper Wire Braid
OUTER SHEATING	MATERIAL: SHF1 to IEC 60093.360
COMPONENTS AND SPECIAL CONSTR.	

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 11 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

1	**CONSTRUCTIVE DATA**						
2							
3	MR TAG / PART NUMBER			Note-3	Note-3		
4	n° x NOMINAL AREA OF CONDUCTORS		N.xmm^2	1Cx70	1Cx150		
5	n° AND DIAMETER OF WIRES IN EACH CONDUCTOR		N.xmm	352x0,52	776X0,51		
6	CONDUCTOR CLASS (2)			2	2		
7	RATED CURRENT IN AIR AT 30°		A	285	460		
8	RATED CURRENT IN GROUND AT 20°		A	272	416		
9							
10	A.C. PHASES RESISTANCE AT THE MAX OP. TEMP.		Ω/km	0,345	0,163		
11	PHASE REACTANCE AT 50 Hz		Ω/km	0,110	0,097		
12	MINIMUM INSULATION RESISTANCE AT 20°		MΩ/km	745	567		
13	PHASE CAPACITY		µF/km	0,301	0,396		
14							
15	MINIMUM ORDER Q.TY		m	TBD	TBD		
16	MAX LENGHT OF DRUMS		m	TBD	TBD		
17	DIAMETERS	BARE CONDUCTOR	mm	10	14,3		
18		CORE (INSULATED CORE)	mm	19,6	24		
19		UNDER ARMOUR	mm	23,6	28,3		
20		ARMOUR OR CONCENTRIC CONDUCTOR	mm	24,8	29,5		
21							
22							
23		OVERALL	mm	29	34		
24	MASSES	CONDUCTORS	kg/km	640	1350		
25		INSULATION	kg/km	290	410		
26		INNER COVERING	kg/km	180	220		
27		ARMOUR OR CONCENTRIC CONDUCTOR	kg/km	220	250		
28		OUTER SHEATING	kg/km	280	350		
29							
30		TOTAL	kg/km	1610	2580		
31	EXTERNAL COLOUR			RED	RED		
32	CORE IDENTIFICATION (1)			NATURAL	NATURAL		
33							
34							
35							
36							
37							
38							

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

49

50

51

ITEM	Tag	82001-CEM-1-L3	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD/LD_B-100
TASK	code	C10000472		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	OK
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-1-L3	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000472	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:	11,5	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	48	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	µA	
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	µA	
	2nd INSULATION TEST			
	Voltage applied:	500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	NOTE	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	VOLCRAFT 1000V - ET-200 S/N:H240103023	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°LAT 042 00768/24 _ 12/10/2024	Calibration certificate N° and date:	

Comments: Note HV TEST: See attached certificate and Test Report.

Note : Tightening torque will be done by the commissioning activity.

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Giovanni Tangianu	
Date	2025-04-11	2025-04-11	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-11T09:39:31.936Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-11T11:52:04.439Z	

82001-CEM-1-L3

VLF Withstand Report
82001-CEM-1-L3 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	4/5/2025 10:36 AM
Company Name	ICS
Region	---
Station	---
Operator Name	RECHICHI
Work Order	---

Device Under Test (Cable XLPE)

Voltage Rating	11.5 kV
Insulation	XLPE
Line Length	25 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	11.5 kV•	Sine	0.1 Hz (A)	15 min

Measurements:

Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	11.5 kV•	48 µA•	6.7 nF	> 20 GΩ	0.1 Hz

- RMS value

TEST REPORT

Cable Tag/ID: 82001-CEM-1-L3

Cable Type: 1X150 mm²

Voltage Rating: 6/10 kV

5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF - 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA 45

Serial Number: GH 5219.16 C 010

Operator: FAUSTO RECHICHI

5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 10-4-25

Witnessed by: GIOVANNI TANGIANU Signature: _____ Date: 10/04/25

JOHN MACKILLOP 10-04-25.

ITEM	Tag	82001-CEM-1-L3	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000472	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	Note
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	Note
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-1-L3	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000472	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CONTINUITY TESTS

1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK

1st INSULATION TEST

	Voltage applied:	2500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK

HV TEST 15 min

	Voltage applied:		kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :		µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:		µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:		µA	Note

2nd INSULATION TEST

	Voltage applied:	2500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK

RE-CONNECT TERMINATIONS

13	Tightening torque	Note	N.m

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	Mod:FLUKE 175 S/N:(AW1/018-17140769)	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°7715/24 _ 10/07/2024	Calibration certificate N° and date:	

Comments:

Nota 4: refer to PL C30001889
Nota 8: refer to PL C30001890

Note HV TEST: See attached certificate

Nota 12/13: Cable will be connected during Commissioning Activities

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-02	2024-12-19	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-02T16:20:04.040Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-19T15:48:26.601Z	

82001-CEM-1-L3

VLF Withstand Report
82001-CEM-1-L3 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	12/13/2024 1:51 PM
Company Name	ICS
Region	---
Station	---
Operator Name	STEFAN
Work Order	MT-MISURE

Device Under Test (Cable XLPE)

Voltage Rating	10.0 kV
Insulation	XLPE
Line Length	75 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

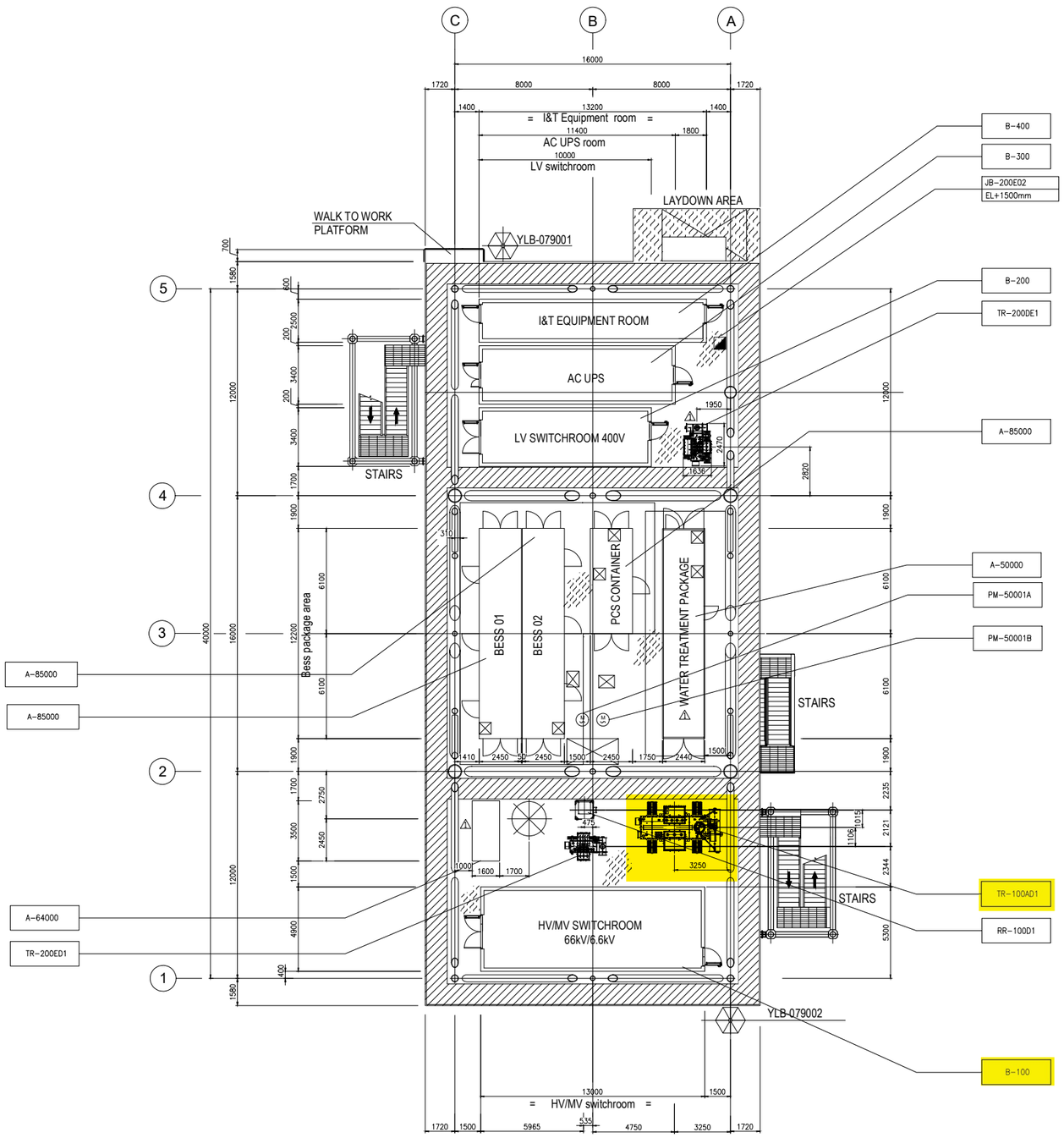
#	Test Voltage	Waveform	Frequency	Duration
1	10.0 kV•	Sine	0.1 Hz (A)	5 min

Measurements:

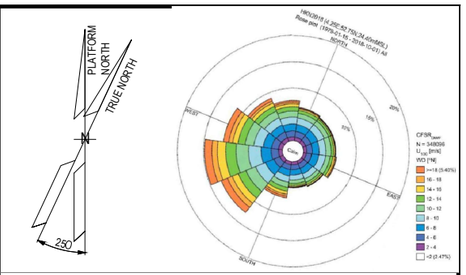
Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	10.0 kV•	36 µA•	5.7 nF	1.8 GΩ	0.1 Hz

- RMS value



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND — ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

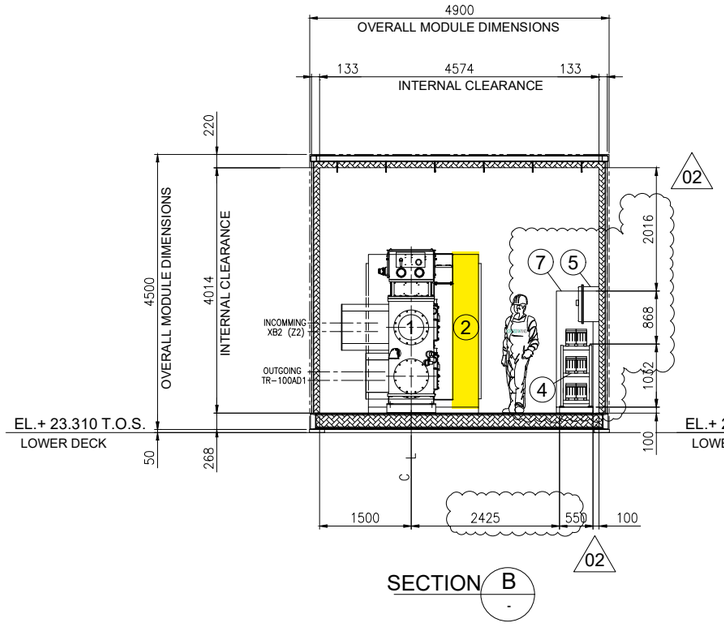
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

DRAWING NO. 123A90-DDL-EL-DL-20101 REV. 01

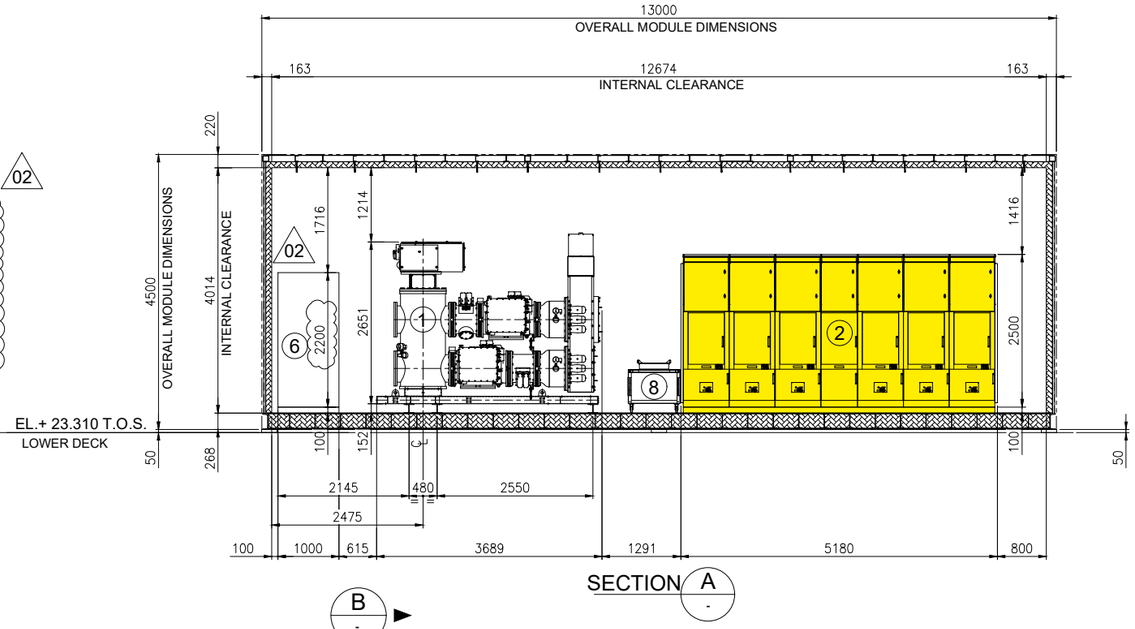
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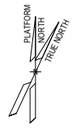
REV. 02

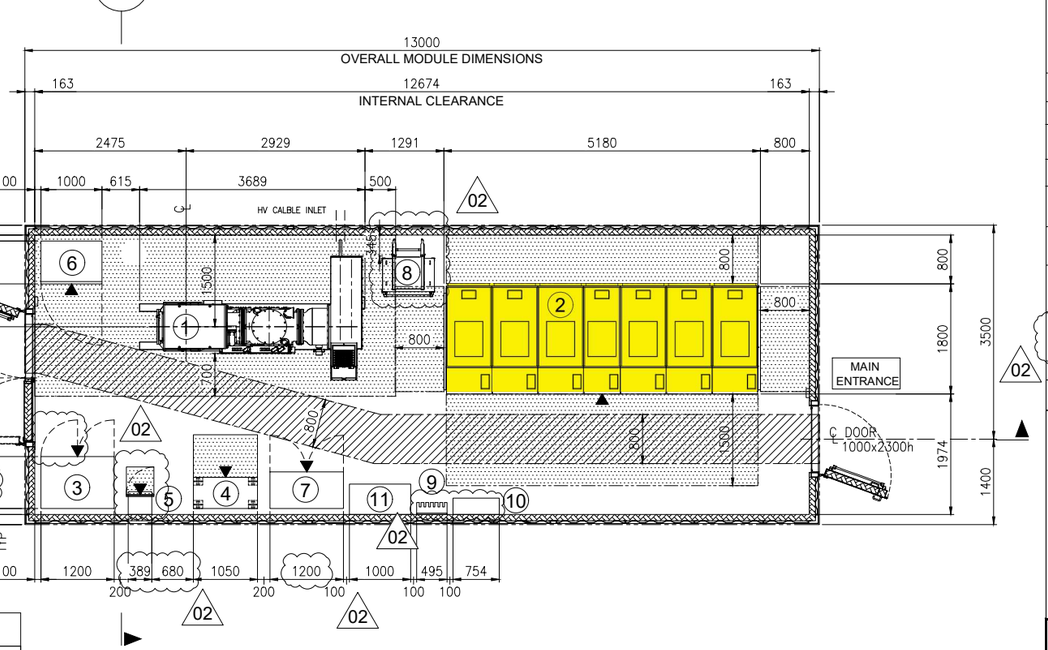


SECTION B -



SECTION A -



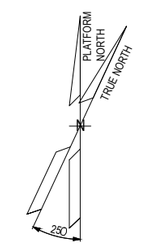


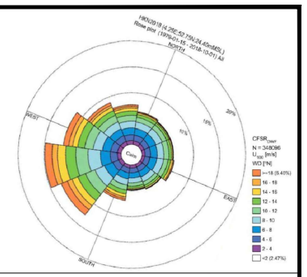
B -

A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	





NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

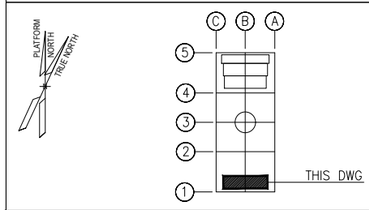
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

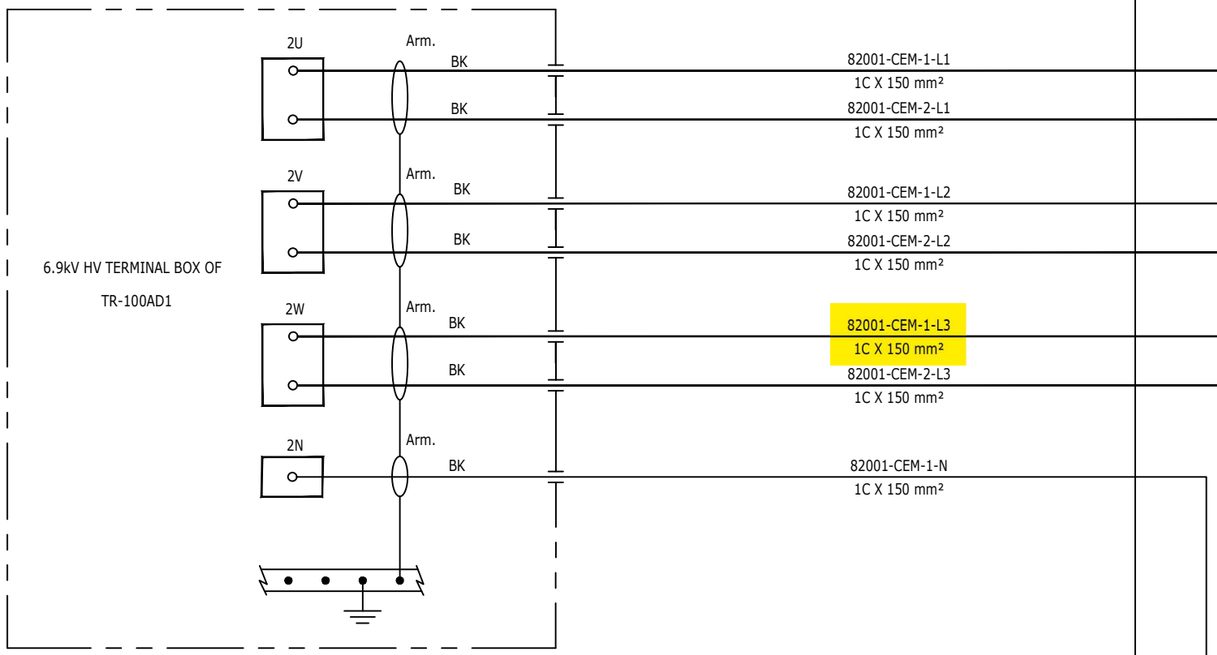
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

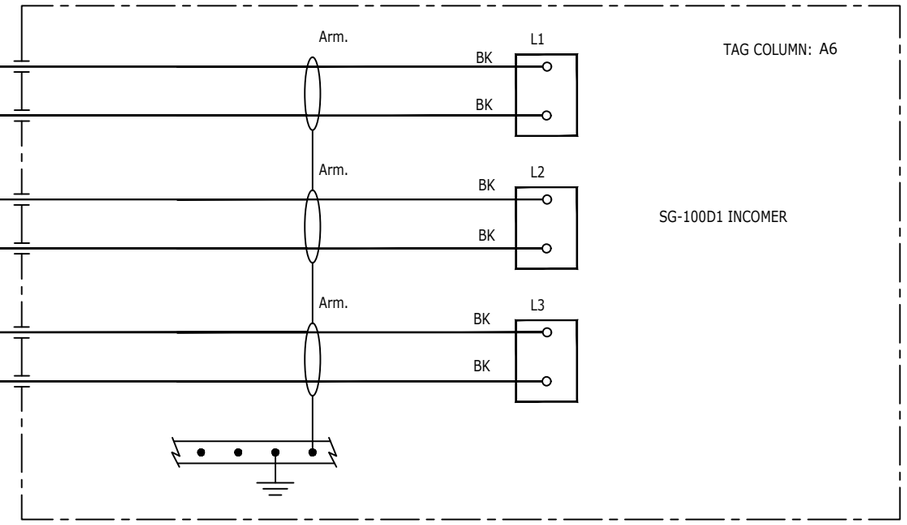
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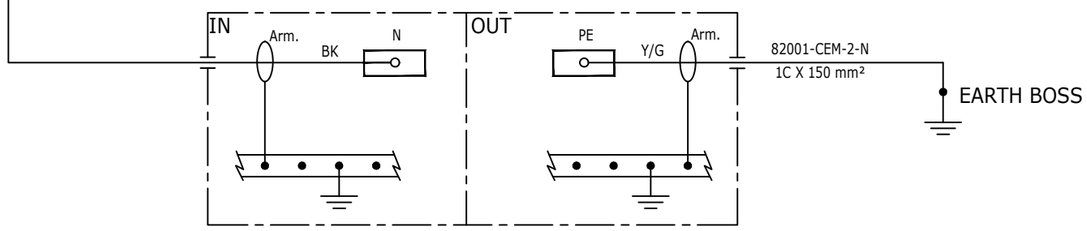
DESCRIPTION: 66/6.9KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1



DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



DESCRIPTION: NER
TAG NUMBER: RR-100D1



VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
2_D	12/12/24	C.Pilato

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
66KV, 7MVA TRANSFORMER

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

SCALE : 1:X

A3

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

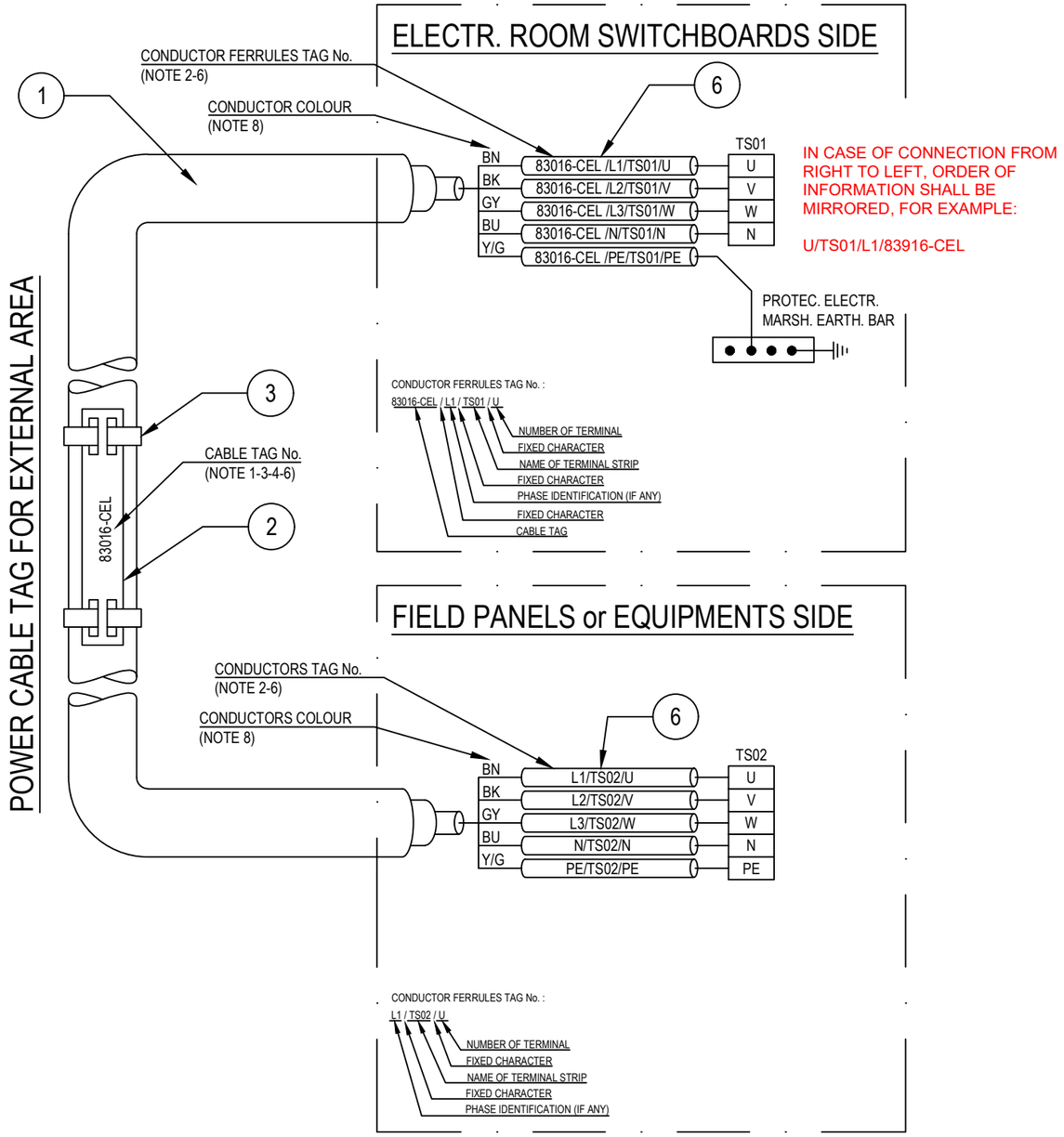
SHEET 012

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

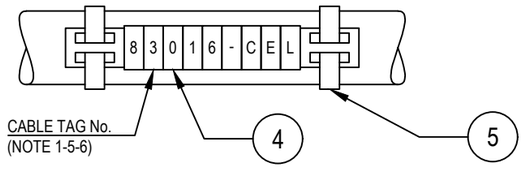
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

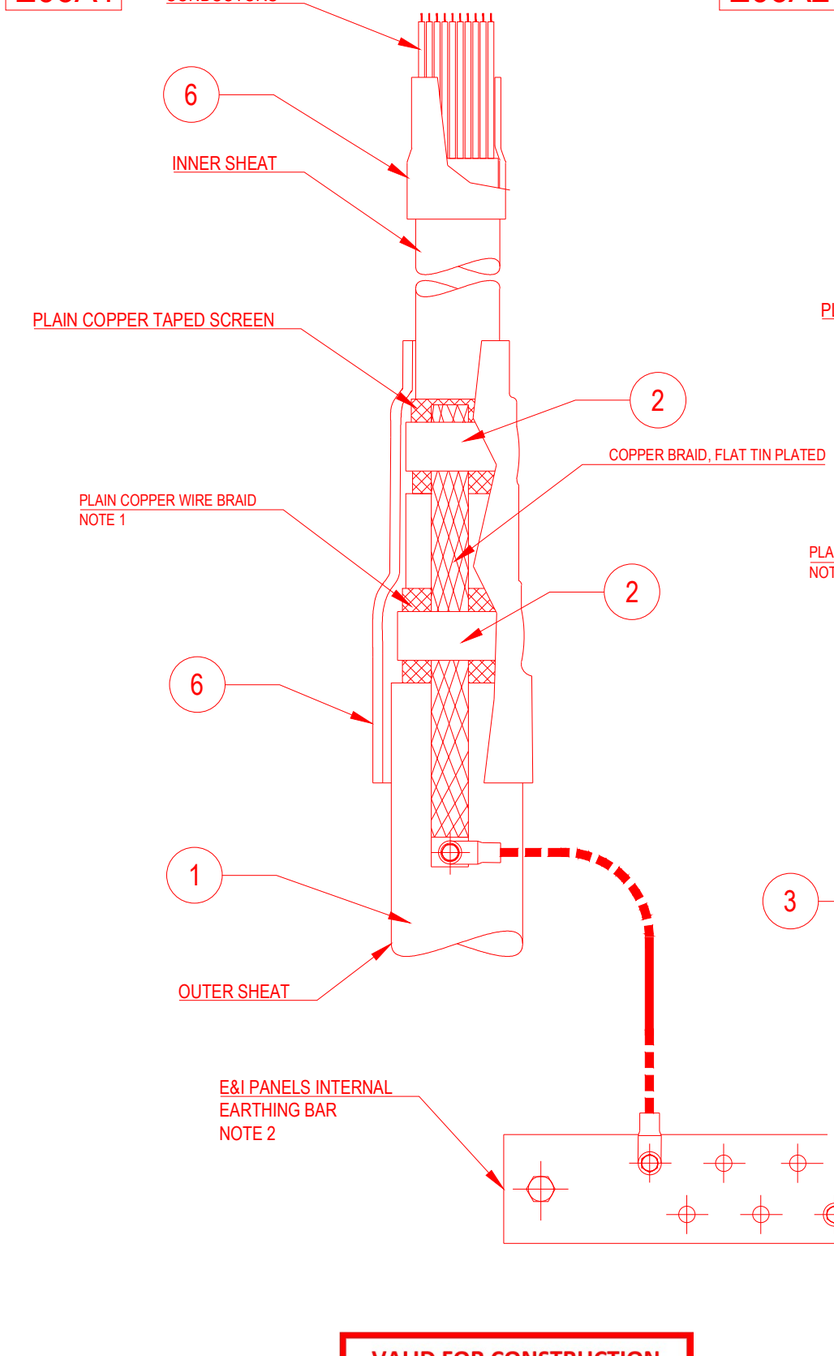
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

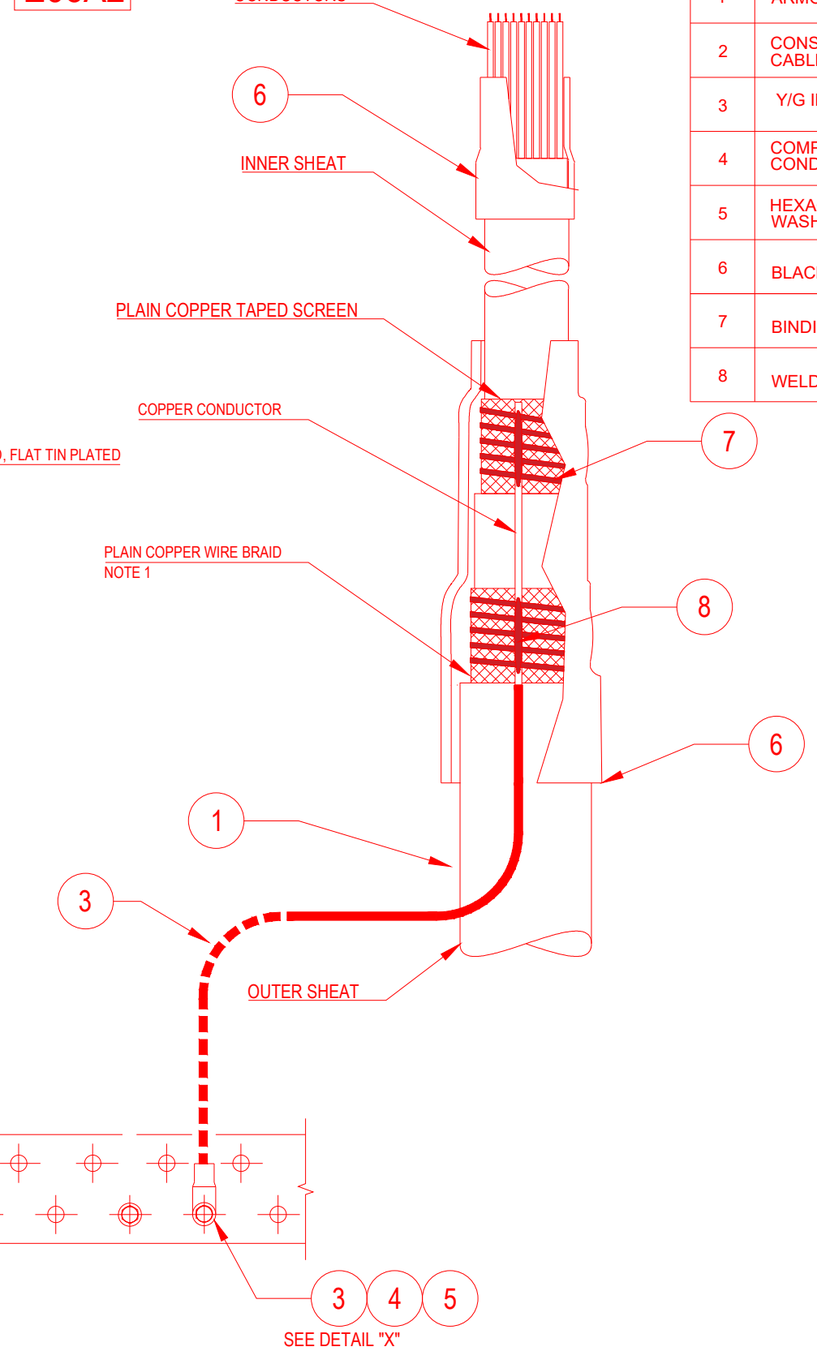
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

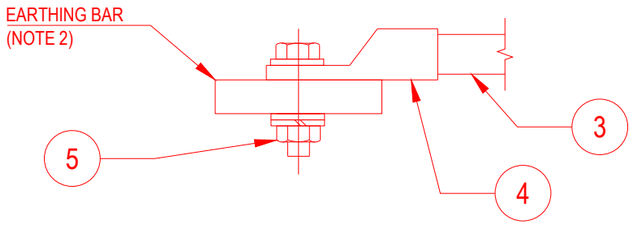


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEM-1-L3	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						TR-100AD1	66 / 6.9 kV 7 MVA Transformer	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV37-1X150	Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x150mm²- Red	M50S	T1_M50S_Single			n.a.				L-300-101-MVT-001 / E-MCT-103 / L-600-101-MVT-009 / L-150-101-MVT-012

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
		Sh: 9 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024
		Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

ELECTRICAL SYSTEM CHARACTERISTIC

OPERATING VOLTAGE	6,6	kVac	±	5	%		
FREQUENCE	50	Hz	±	2	%		
NEUTRAL SYSTEM	☐	EARTHED				☐	INSULATED
	☑	EARTHED BY RESISTANCE				☐	
EXPOSITION OF LIGHTNING OVER VOLTAGE						☐ NO	☑ YES

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

CABLE CHARACTERISTIC

GENERAL CHARACT	REFERENCE STD	FOR CONSTRUCTION AND TEST	IEC 60092-350
		FOR SPECIAL CHARACTERISTIC	**IEC-60754-1, IEC-60332-1-2**
			IEC-61034-2

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm^2

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm^2

SPECIAL CHARACT.	☐ HYDROCARBON RESISTANCE	☐ NON PROPAGATING FIRE	☐ FIRE RESISTANCE	
	☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL			kg/m
	☐ LOW CORROSIVE GAS EMISSION	☐ % HCl ≤ 0,3	☐ % HCl =	
	☐ LOW TOXIC GAS EMISSION (T INDEX)	☐ T ≤ 2	☐ T=	
	☑ LOW SMOKE EMISION (OPTICAL DENSITY)	☐ D ≤ 1,5	☐ D=	
	☐ U.V. RESISTANT	☑ HALOGEN FREE COMPOUND	☑ FLAME RETARDANT	

INSTALL. SPECIAL CONDITION	CABLE LADDER, TREFOIL FORMATION
ACCESS.	

NOTES:

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 10 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

MATERIALS

GENERAL DATA	REF.STD N.: IEC 60092-350
CONDUCTOR	MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H)
INSULATION	MATERIAL: EPR
SEMI-CONDUCTOR LAYER	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: HF EXTRUDED COMPOUND
SCREENS	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: Plain Copper Taped Screen
ARMOUR	☑ REQUIRED TYPE: MATERIAL: Plain Copper Wire Braid
OUTER SHEATING	MATERIAL: SHF1 to IEC 60093.360
COMPONENTS AND SPECIAL CONSTR.	

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 11 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

1	**CONSTRUCTIVE DATA**						
2							
3	MR TAG / PART NUMBER			Note-3	Note-3		
4	n° x NOMINAL AREA OF CONDUCTORS		N.xmm^2	1Cx70	1Cx150		
5	n° AND DIAMETER OF WIRES IN EACH CONDUCTOR		N.xmm	352x0,52	776X0,51		
6	CONDUCTOR CLASS (2)			2	2		
7	RATED CURRENT IN AIR AT 30°		A	285	460		
8	RATED CURRENT IN GROUND AT 20°		A	272	416		
9							
10	A.C. PHASES RESISTANCE AT THE MAX OP. TEMP.		Ω/km	0,345	0,163		
11	PHASE REACTANCE AT 50 Hz		Ω/km	0,110	0,097		
12	MINIMUM INSULATION RESISTANCE AT 20°		MΩ/km	745	567		
13	PHASE CAPACITY		µF/km	0,301	0,396		
14							
15	MINIMUM ORDER Q.TY		m	TBD	TBD		
16	MAX LENGHT OF DRUMS		m	TBD	TBD		
17	DIAMETERS	BARE CONDUCTOR	mm	10	14,3		
18		CORE (INSULATED CORE)	mm	19,6	24		
19		UNDER ARMOUR	mm	23,6	28,3		
20		ARMOUR OR CONCENTRIC CONDUCTOR	mm	24,8	29,5		
21							
22							
23		OVERALL	mm	29	34		
24	MASSES	CONDUCTORS	kg/km	640	1350		
25		INSULATION	kg/km	290	410		
26		INNER COVERING	kg/km	180	220		
27		ARMOUR OR CONCENTRIC CONDUCTOR	kg/km	220	250		
28		OUTER SHEATING	kg/km	280	350		
29							
30		TOTAL	kg/km	1610	2580		
31	EXTERNAL COLOUR			RED	RED		
32	CORE IDENTIFICATION (1)			NATURAL	NATURAL		
33							
34							
35							
36							
37							
38							

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

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51

ITEM	Tag	82001-CEM-2-L3	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD/LD_B-100
TASK	code	C10000473		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	OK
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-2-L3	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD/LD_B-100	
TASK	code	C10000473	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:	11,5	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	49	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	.	µA	
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	.	µA	
	2nd INSULATION TEST			
	Voltage applied:	500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	NOTE	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	VOLCRAFT 1000V - ET-200 S/N:H240103023	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°LAT 042 00768/24 _ 12/10/2024	Calibration certificate N° and date:	

Comments: Note HV TEST: See attached certificate and Test Report.

Note : Tightening torque will be done by the commissioning activity.

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Giovanni Tangianu	
Date	2025-04-11	2025-04-11	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-11T09:39:46.752Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-11T11:51:47.973Z	

82001-CEM-2-L3

VLF Withstand Report
82001-CEM-2-L3 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	4/5/2025 10:10 AM
Company Name	ICS
Region	---
Station	---
Operator Name	RECHICHI
Work Order	---

Device Under Test (Cable XLPE)

Voltage Rating	11.5 kV
Insulation	XLPE
Line Length	25Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	11.5 kV•	Sine	0.1 Hz (A)	15 min

Measurements:

Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	11.5 kV•	49 µA•	6.8 nF	> 20 GΩ	0.1 Hz

- RMS value

TEST REPORT

Cable Tag/ID: 82001-CEM-2-L3

Cable Type: 1x150 mm²

Voltage Rating: 6/10 kV

5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF - 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA 45

Serial Number: QH.5219.16C010

Operator: FAUSTO RECHICHI

5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 10-04-25

Witnessed by: GIOVANNI TANGIONU Signature: _____ Date: 10/04/25

John Mackillop 10-04-25

ITEM	Tag	82001-CEM-2-L3	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD/LD_B-100
TASK	code	C10000473		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

CABLE DATA

Type	CU/EPR/CTS/LSZH/CWB/LSZH	Cores/Size mm²	1X150 mm2	Color	RED
From	TR-100AD1	To	SG-100D1		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	Note
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	Note
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-2-L3	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear	Dwg	123A90-DDL-EL-LIS-20148		
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)	Module	LD/LD_B-100		
TASK	code	C10000473	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form CPX08	HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	2500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:		kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :		µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:		µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:		µA	Note
	2nd INSULATION TEST			
	Voltage applied:	2500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	Note	N.m	OK

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	Mod:FLUKE 175 S/N:(AW1/018-17140769)	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°7715/24 _ 10/07/2024	Calibration certificate N° and date:	

Comments:

Nota 4: refer to PL C30002020
Nota 8: refer to PL C30001890

Note HV TEST: See attached certificate

Nota 12/13: Cable will be connected during Commissioning Activities

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-02	2024-12-19	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-02T16:20:17.973Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-19T15:52:35.011Z	

82001-CEM-2-L3

VLF Withstand Report
82001-CEM-2-L3 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	12/13/2024 2:04 PM
Company Name	ICS
Region	---
Station	---
Operator Name	STEFAN
Work Order	MT-MISURE

Device Under Test (Cable XLPE)

Voltage Rating	10.0 kV
Insulation	XLPE
Line Length	75 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	10.0 kV•	Sine	0.1 Hz (A)	5 min

Measurements:

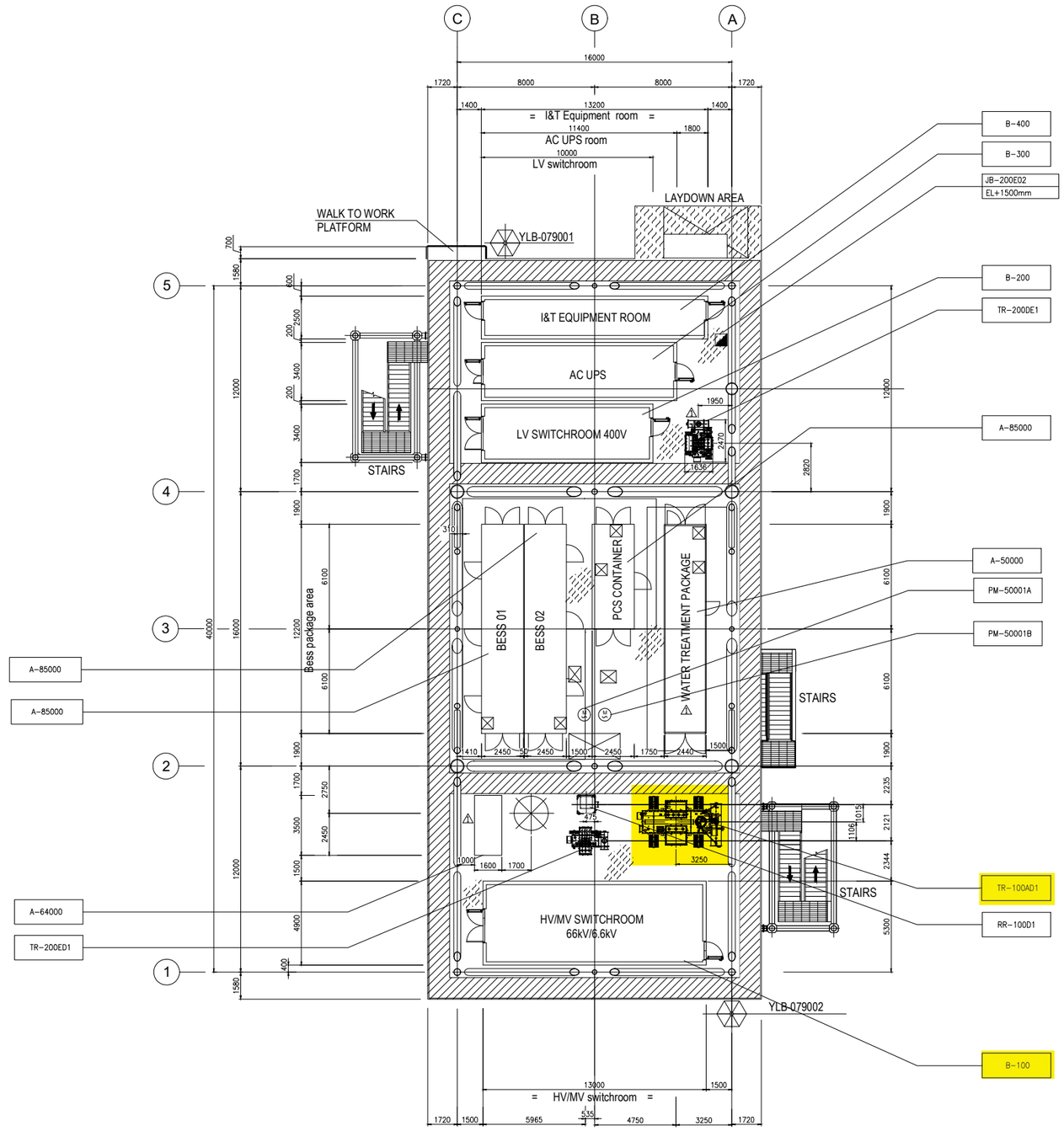
Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	10.0 kV•	36 µA•	5.7 nF	2.6 GΩ	0.1 Hz

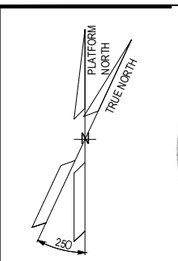
- RMS value

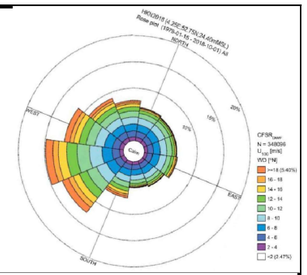
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.





NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

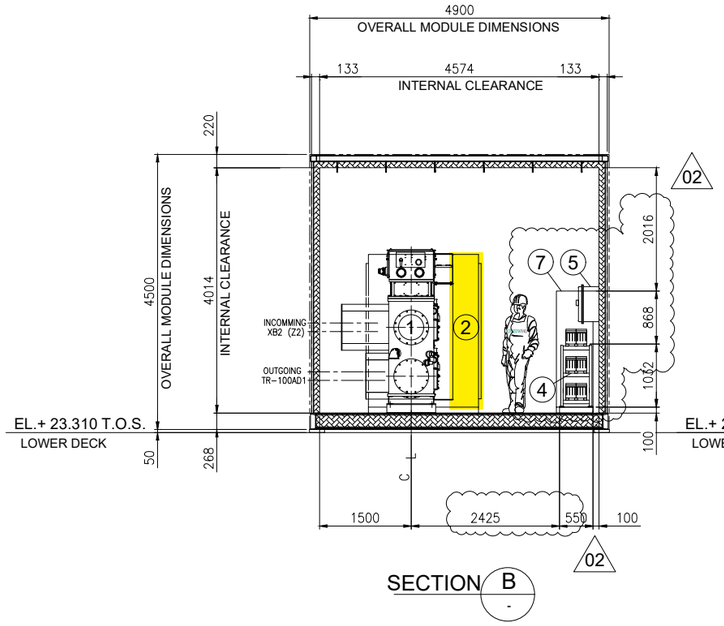
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

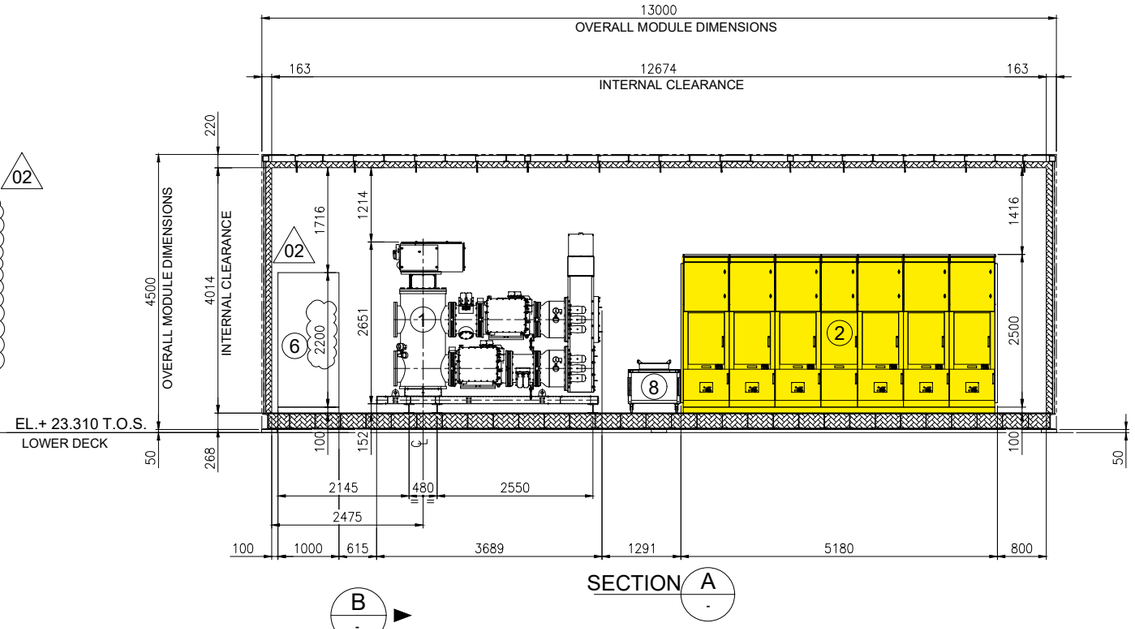
File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20104

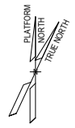
REV. 02

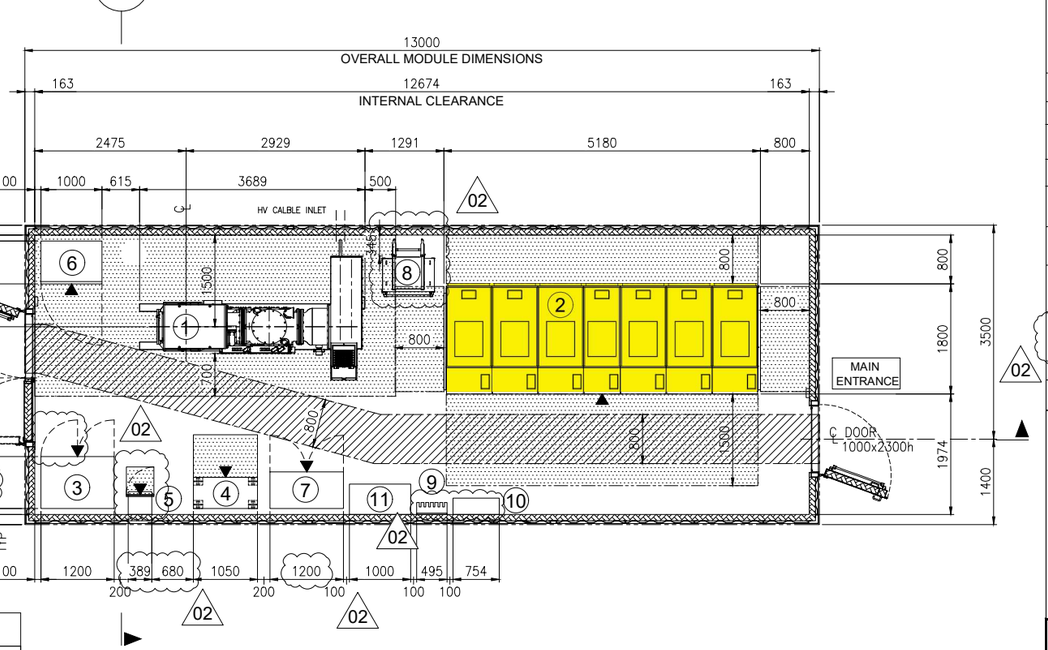


SECTION B -



SECTION A -



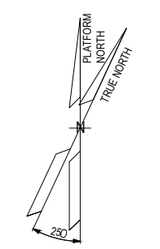


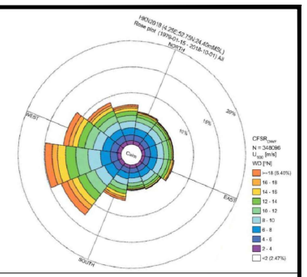
A -

B -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	





NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

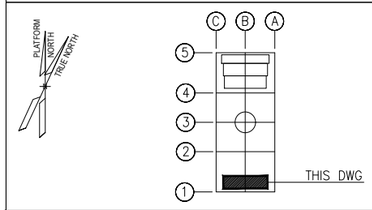
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

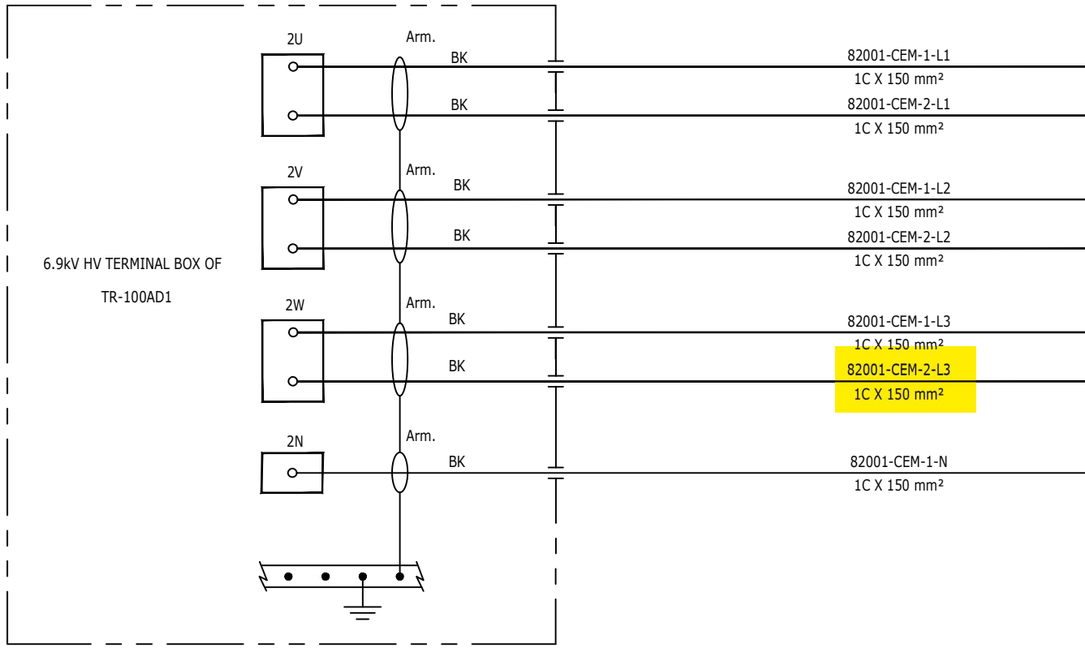
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

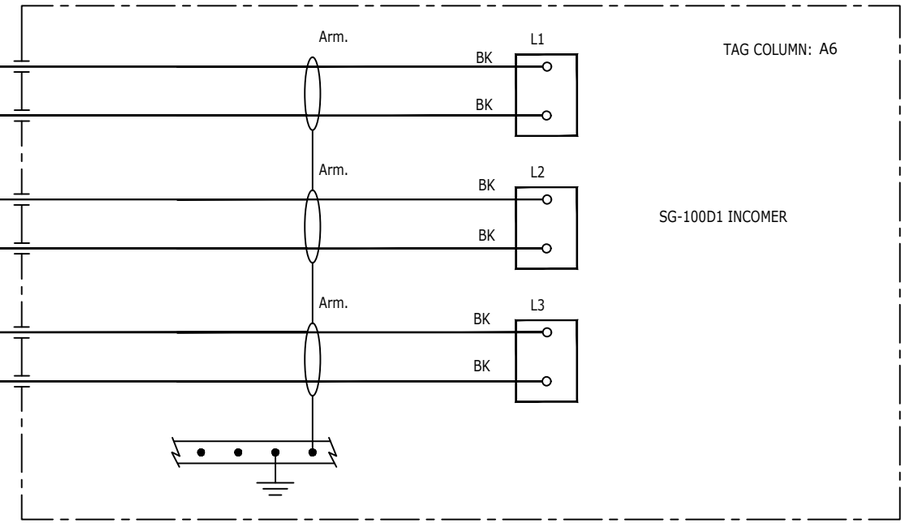
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

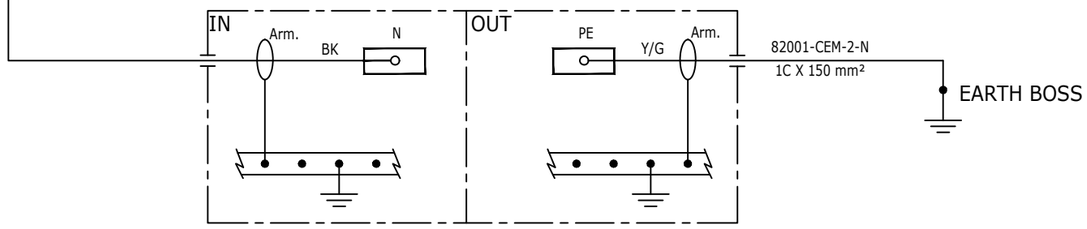
DESCRIPTION: 66/6.9KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1



DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



DESCRIPTION: NER
TAG NUMBER: RR-100D1



VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
2_D	12/12/24	C.Pilato

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
66KV, 7MVA TRANSFORMER

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

SCALE : 1:X

A3

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

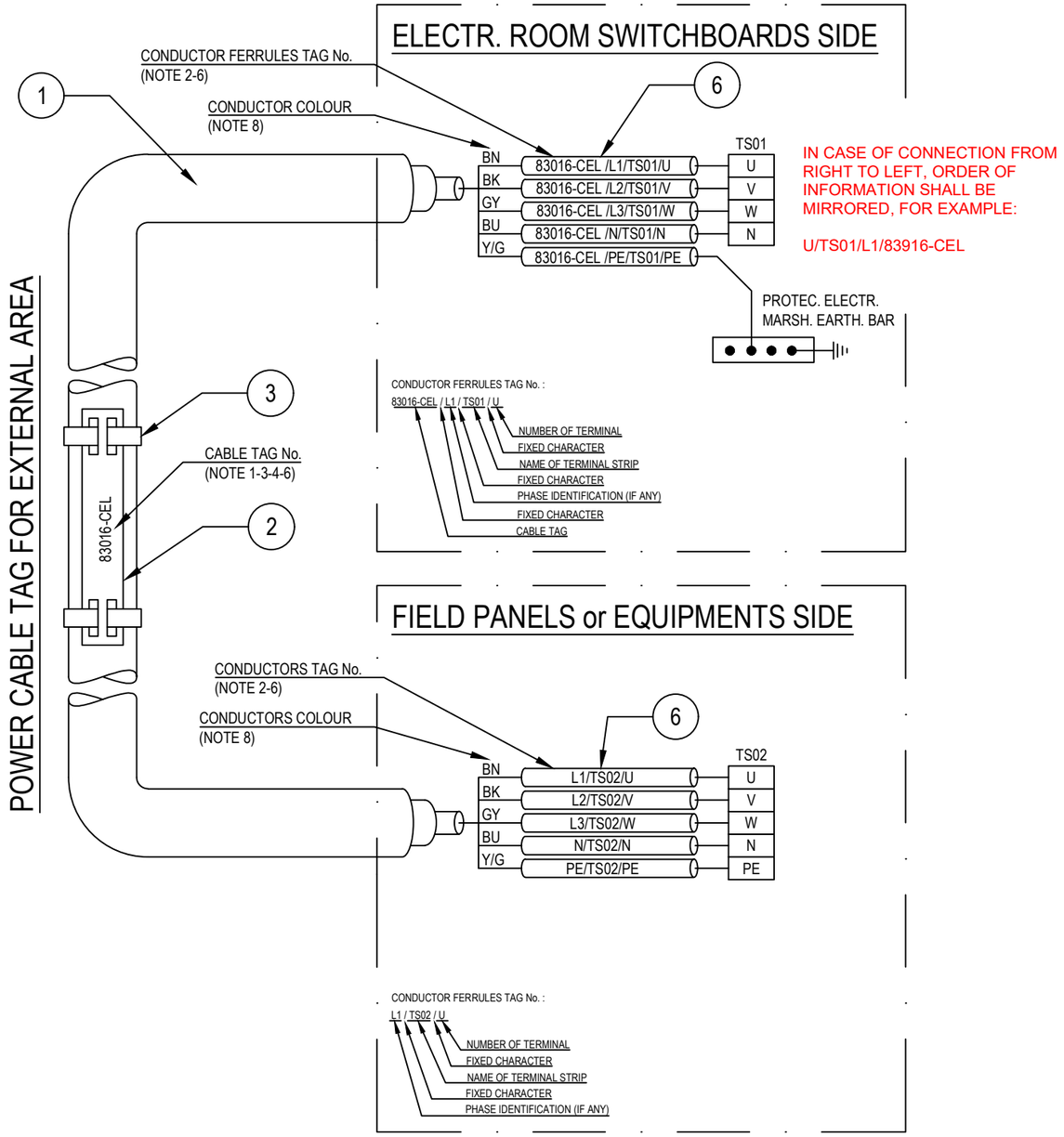
SHEET 012

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

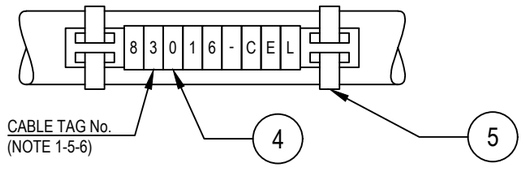
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

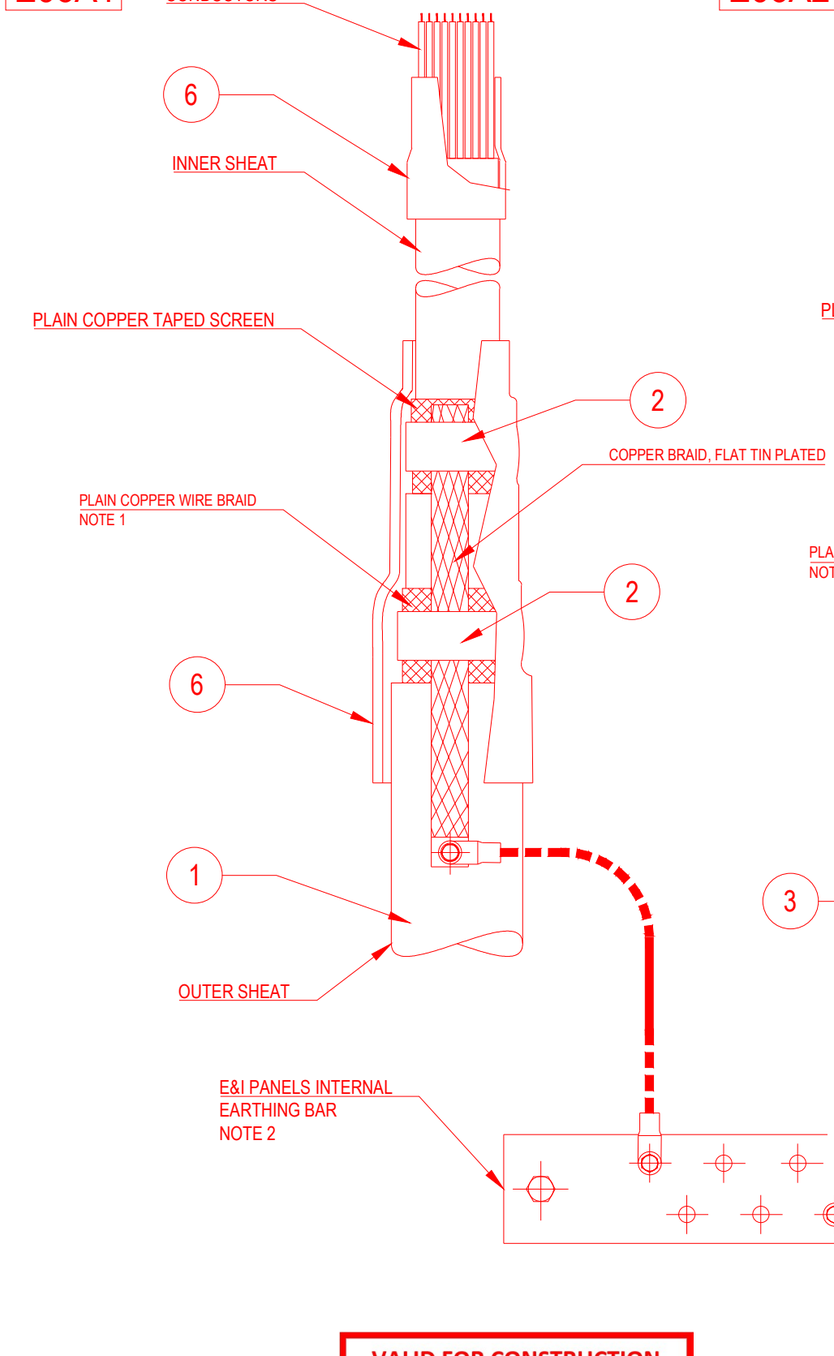
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

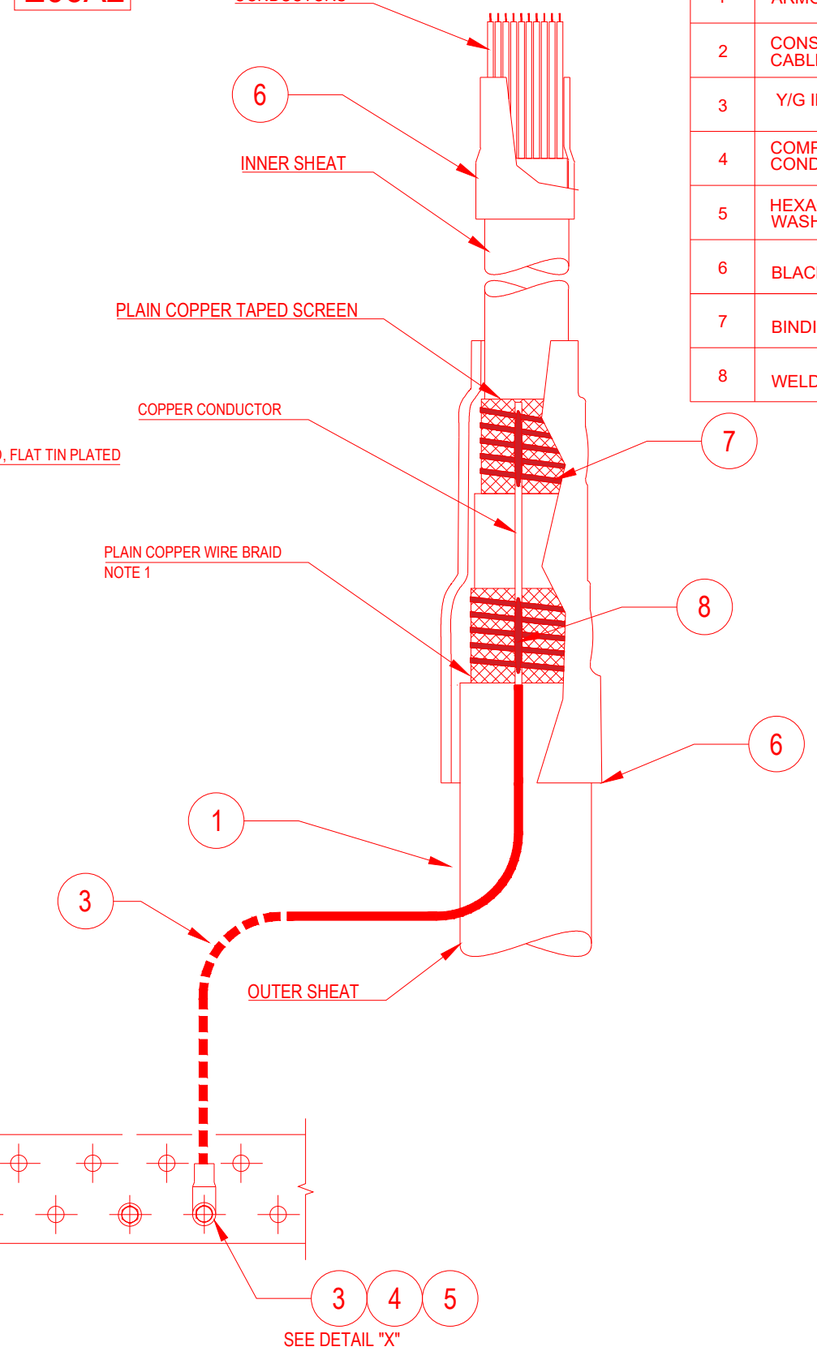
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

E06A1

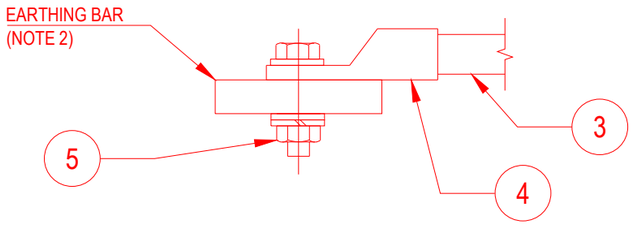


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEM-2-L3	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						TR-100AD1	66 / 6.9 kV 7 MVA Transformer	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV37-1X150	Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x150mm²- Red	M50S	T1_M50S_Single			n.a.				L-300-101-MVT-001 / E-MCT-103 / L-600-101-MVT-009 / L-150-101-MVT-012

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
		Sh: 9 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024
		Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

ELECTRICAL SYSTEM CHARACTERISTIC

OPERATING VOLTAGE	6,6	kVac	±	5	%		
FREQUENCE	50	Hz	±	2	%		
NEUTRAL SYSTEM	☐	EARTHED				☐	INSULATED
	☑	EARTHED BY RESISTANCE				☐	
EXPOSITION OF LIGHTNING OVER VOLTAGE						☐ NO	☑ YES

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

CABLE CHARACTERISTIC

GENERAL CHARACT	REFERENCE STD	FOR CONSTRUCTION AND TEST	IEC 60092-350
		FOR SPECIAL CHARACTERISTIC	**IEC-60754-1, IEC-60332-1-2**
			IEC-61034-2

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm^2

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm^2

SPECIAL CHARACT.	☐ HYDROCARBON RESISTANCE	☐ NON PROPAGATING FIRE	☐ FIRE RESISTANCE	
	☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL			kg/m
	☐ LOW CORROSIVE GAS EMISSION	☐ % HCl ≤ 0,3	☐ % HCl =	
	☐ LOW TOXIC GAS EMISSION (T INDEX)	☐ T ≤ 2	☐ T=	
	☑ LOW SMOKE EMISION (OPTICAL DENSITY)	☐ D ≤ 1,5	☐ D=	
	☐ U.V. RESISTANT	☑ HALOGEN FREE COMPOUND	☑ FLAME RETARDANT	

INSTALL. SPECIAL CONDITION	CABLE LADDER, TREFOIL FORMATION
ACCESS.	

NOTES:

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 10 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

MATERIALS

GENERAL DATA	REF.STD N.: IEC 60092-350
CONDUCTOR	MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H)
INSULATION	MATERIAL: EPR
SEMI-CONDUCTOR LAYER	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: HF EXTRUDED COMPOUND
SCREENS	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: Plain Copper Taped Screen
ARMOUR	☑ REQUIRED TYPE: MATERIAL: Plain Copper Wire Braid
OUTER SHEATING	MATERIAL: SHF1 to IEC 60093.360
COMPONENTS AND SPECIAL CONSTR.	

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 11 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

1	**CONSTRUCTIVE DATA**						
2							
3	MR TAG / PART NUMBER			Note-3	Note-3		
4	n° x NOMINAL AREA OF CONDUCTORS		N.xmm^2	1Cx70	1Cx150		
5	n° AND DIAMETER OF WIRES IN EACH CONDUCTOR		N.xmm	352x0,52	776X0,51		
6	CONDUCTOR CLASS (2)			2	2		
7	RATED CURRENT IN AIR AT 30°		A	285	460		
8	RATED CURRENT IN GROUND AT 20°		A	272	416		
9							
10	A.C. PHASES RESISTANCE AT THE MAX OP. TEMP.		Ω/km	0,345	0,163		
11	PHASE REACTANCE AT 50 Hz		Ω/km	0,110	0,097		
12	MINIMUM INSULATION RESISTANCE AT 20°		MΩ/km	745	567		
13	PHASE CAPACITY		µF/km	0,301	0,396		
14							
15	MINIMUM ORDER Q.TY		m	TBD	TBD		
16	MAX LENGHT OF DRUMS		m	TBD	TBD		
17	DIAMETERS	BARE CONDUCTOR	mm	10	14,3		
18		CORE (INSULATED CORE)	mm	19,6	24		
19		UNDER ARMOUR	mm	23,6	28,3		
20		ARMOUR OR CONCENTRIC CONDUCTOR	mm	24,8	29,5		
21							
22							
23		OVERALL	mm	29	34		
24	MASSES	CONDUCTORS	kg/km	640	1350		
25		INSULATION	kg/km	290	410		
26		INNER COVERING	kg/km	180	220		
27		ARMOUR OR CONCENTRIC CONDUCTOR	kg/km	220	250		
28		OUTER SHEATING	kg/km	280	350		
29							
30		TOTAL	kg/km	1610	2580		
31	EXTERNAL COLOUR			RED	RED		
32	CORE IDENTIFICATION (1)			NATURAL	NATURAL		
33							
34							
35							
36							
37							
38							

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

49

50

51

ITEM	Tag	82001-CEM-1-N	: 66kV, 7MVA Transformer / NER			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD
TASK	code	C10000474		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

CABLE DATA

Type CU/EPR/CTS/LSZH/CWB/LSZH Cores/Size mm² 1X150 mm2 Color RED

From TR-100AD1 To RR-100D1

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	OK
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ITEM	Tag	82001-CEM-1-N	: 66kV, 7MVA Transformer / NER			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD
TASK	code	C10000474		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:	11,5	kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :	121	µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:	.	µA	
9	Ph3 / Ph2-Ph1-screen-armour-Earth:	.	µA	
	2nd INSULATION TEST			
	Voltage applied:	500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	NOTE	N.m	Note

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	VOLCRAFT 1000V - ET-200 S/N:H240103023	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°LAT 042 00768/24 _ 12/10/2024	Calibration certificate N° and date:	

Comments: Note HV TEST: See attached certificate and Test Report.

Note : Tightening torque will be done by the commissioning activity.

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Giovanni Tangianu	
Date	2025-04-11	2025-04-11	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-11T09:40:02.737Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-11T11:51:30.569Z	

82001-CEM-1-N

VLF Withstand Report
82001-CEM-1-N - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	4/5/2025 7:28 AM
Company Name	ICS
Region	---
Station	---
Operator Name	RECHICHI
Work Order	---

Device Under Test (Cable XLPE)

Voltage Rating	11.5 kV
Insulation	XLPE
Line Length	25 Meter
Size	1X150
Phase	N
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

#	Test Voltage	Waveform	Frequency	Duration
1	11.5 kV•	Sine	0.1 Hz (A)	15 min

Measurements:

Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	11.5 kV•	121 µA•	16.7 nF	18 GΩ	0.1 Hz

- RMS value

TEST REPORT

Cable Tag/ID: 82001-CEM-1-N

Cable Type: 1 X 150 mm²

Voltage Rating: 6/10 kV

5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF - 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA 45

Serial Number: GH 5219.16 C 010

Operator: FAUSTO RECHICHI

5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 10.4.25

Witnessed by: GIOVANNI TANGIANU Signature: _____ Date: 10/04/25

S. MACKILLOP 10.4.25

ITEM	Tag	82001-CEM-1-N	: 66kV, 7MVA Transformer / NER		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD	
TASK	code	C10000474	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX08	HV Power Cable

CABLE DATA

Type CU/EPR/CTS/LSZH/CWB/LSZH Cores/Size mm² 1X150 mm2 Color RED

From TR-100AD1 To RR-100D1

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	Note
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	Note
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-1-N	: 66kV, 7MVA Transformer / NER			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD
TASK	code	C10000474		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX08 HV Power Cable

	CONTINUITY TESTS			
1	CORE CONTINUITY	10200	mΩ	OK
2	SCREEN CONTINUITY	10200	mΩ	OK
3	ARMOUR CONTINUITY	10200	mΩ	OK
	1st INSULATION TEST			
	Voltage applied:	2500	kV	
4	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
5	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
6	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	HV TEST 15 min			
	Voltage applied:		kV	
7	Ph1 / Ph2-Ph3-screen-armour-Earth :		µA	Note
8	Ph2 / Ph1-Ph3-screen-armour-Earth:		µA	Note
9	Ph3 / Ph2-Ph1-screen-armour-Earth:		µA	Note
	2nd INSULATION TEST			
	Voltage applied:	2500	kV	
10	Ph1 / Ph2-Ph3-screen-armour-Earth :	>999	MΩ	OK
11	Ph2 / Ph1-Ph3-screen-armour-Earth:	>999	MΩ	OK
12	Ph3 / Ph2-Ph1-screen-armour-Earth:	>999	MΩ	OK
	RE-CONNECT TERMINATIONS			
13	Tightening torque	Note	N.m	

TESTING INSTRUMENTS USED

TYPE / SERIAL N°	Mod:KEW3125A S/N: W8330207	TYPE / SERIAL N°	Mod:HVA45 S/N:GH5219.16C010
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	LAT04200772/24 _ 02.2024
TYPE / SERIAL N°	Mod:FLUKE 175 S/N:(AW1/018-17140769)	TYPE / SERIAL N°	
Calibration certificate N° and date:	N°7715/24 _ 10/07/2024	Calibration certificate N° and date:	

Comments:

Nota 4: refer to PL C30002020
Nota 8: refer to PL C30001890

Note HV TEST: See attached certificate

Nota 12/13: Cable will be connected during Commissioning Activities

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-09	2024-12-19	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-09T10:28:22.097Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-19T15:53:27.777Z	

82001-CEM-1-N
VLF Withstand Report
82001-CEM-1-L1 - Maintenance Test
Auto Test
Test finished successfully

Report Information

Date	12/14/2024 10:32 AM
Company Name	ICS
Region	---
Station	---
Operator Name	RIELA
Work Order	MT-MISURE

Device Under Test (Cable XLPE)

Voltage Rating	10.0 kV
Insulation	XLPE
Line Length	15 Meter
Size	1X150
Phase	A
Manufacturer Name	---

Equipment:

HVA45	GH5219.16C010

Test Setup

Test Purpose	Maintenance
Arc Management Mode	Trip out on Arc

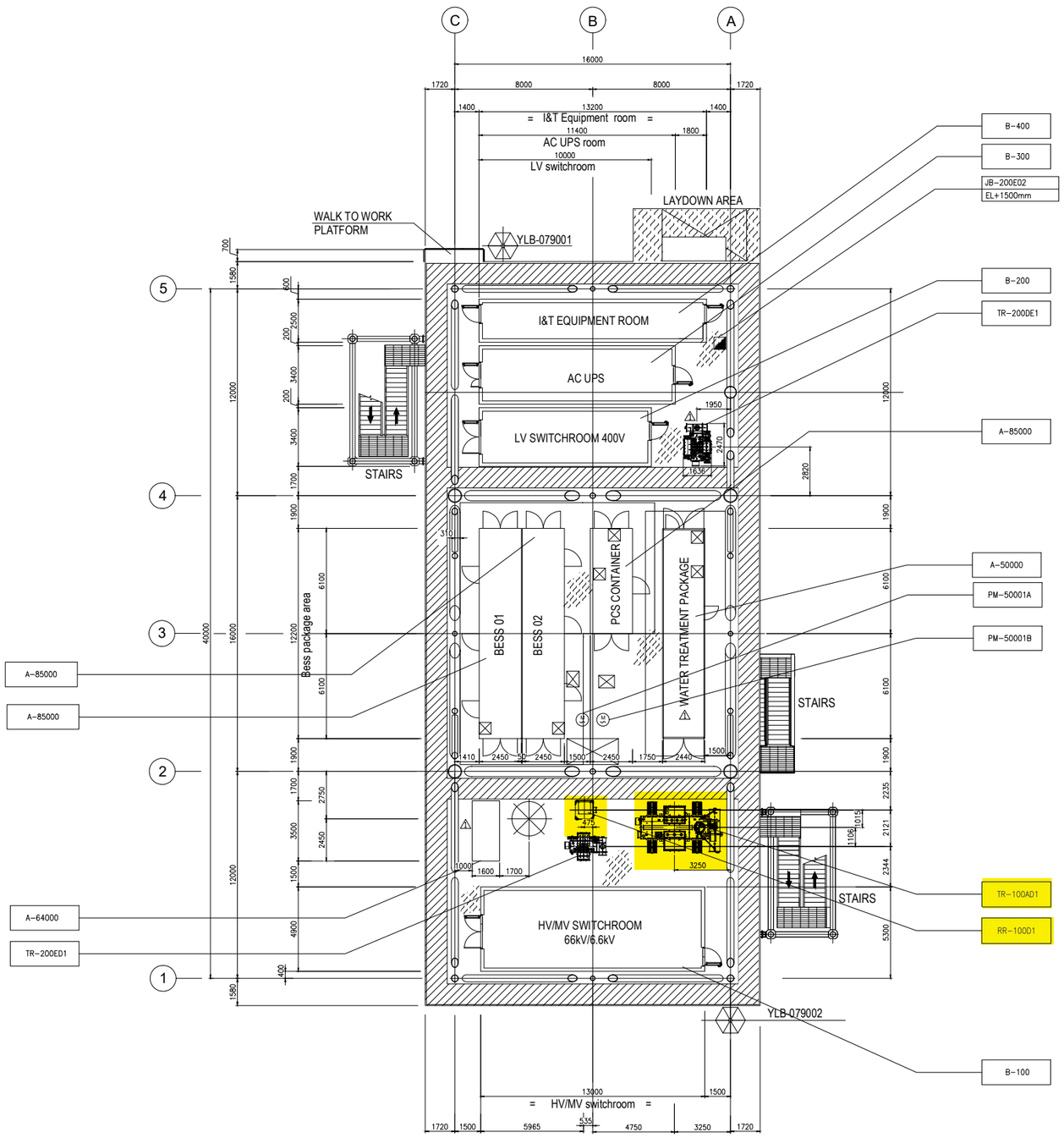
#	Test Voltage	Waveform	Frequency	Duration
1	10.0 kV•	Sine	0.1 Hz (A)	5 min

Measurements:

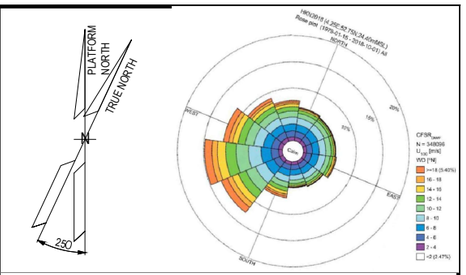
Test finished successfully

#	Voltage	Current	Cap.	Res.	Frequency
1	10.0 kV•	61 µA•	6.5 nF	231 MΩ	0.1 Hz

•RMS value



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

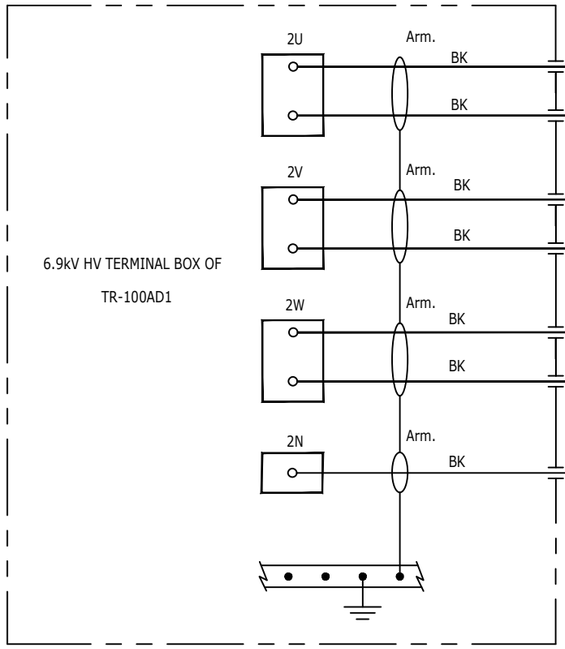
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

DRAWING NO. 123A90-DDL-EL-DL-20101 REV. 01

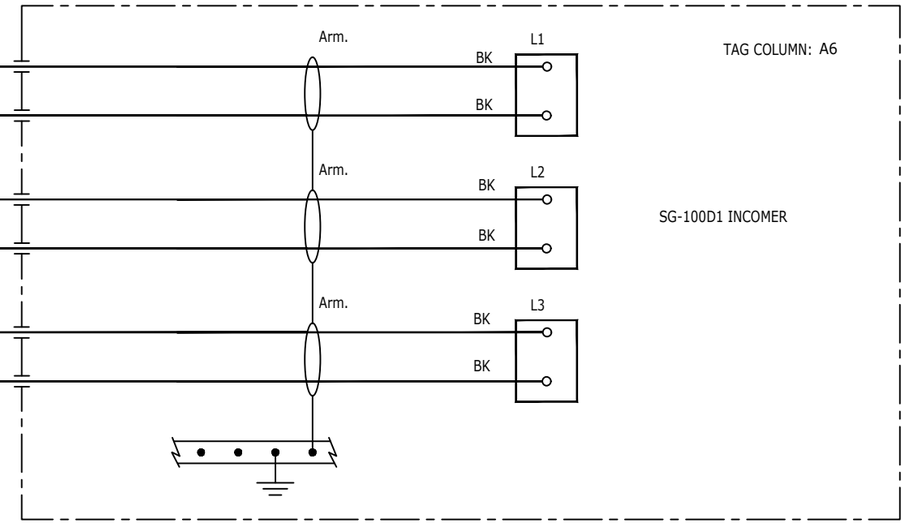
File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM	TO

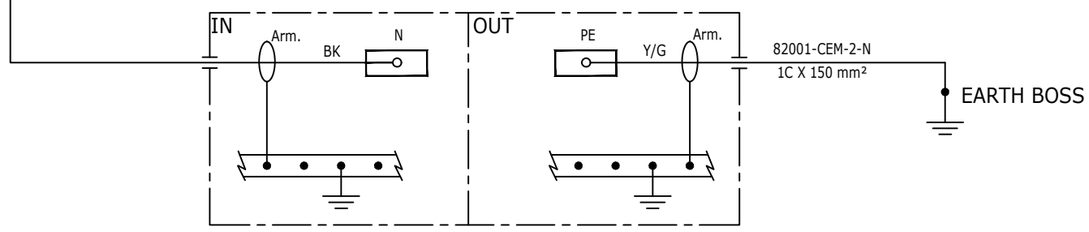
DESCRIPTION: 66/6.9KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1



DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



DESCRIPTION: NER
TAG NUMBER: RR-100D1



VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
2_D	12/12/24	C.Pilato

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
66KV, 7MVA TRANSFORMER

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

SCALE : 1:X

A3

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

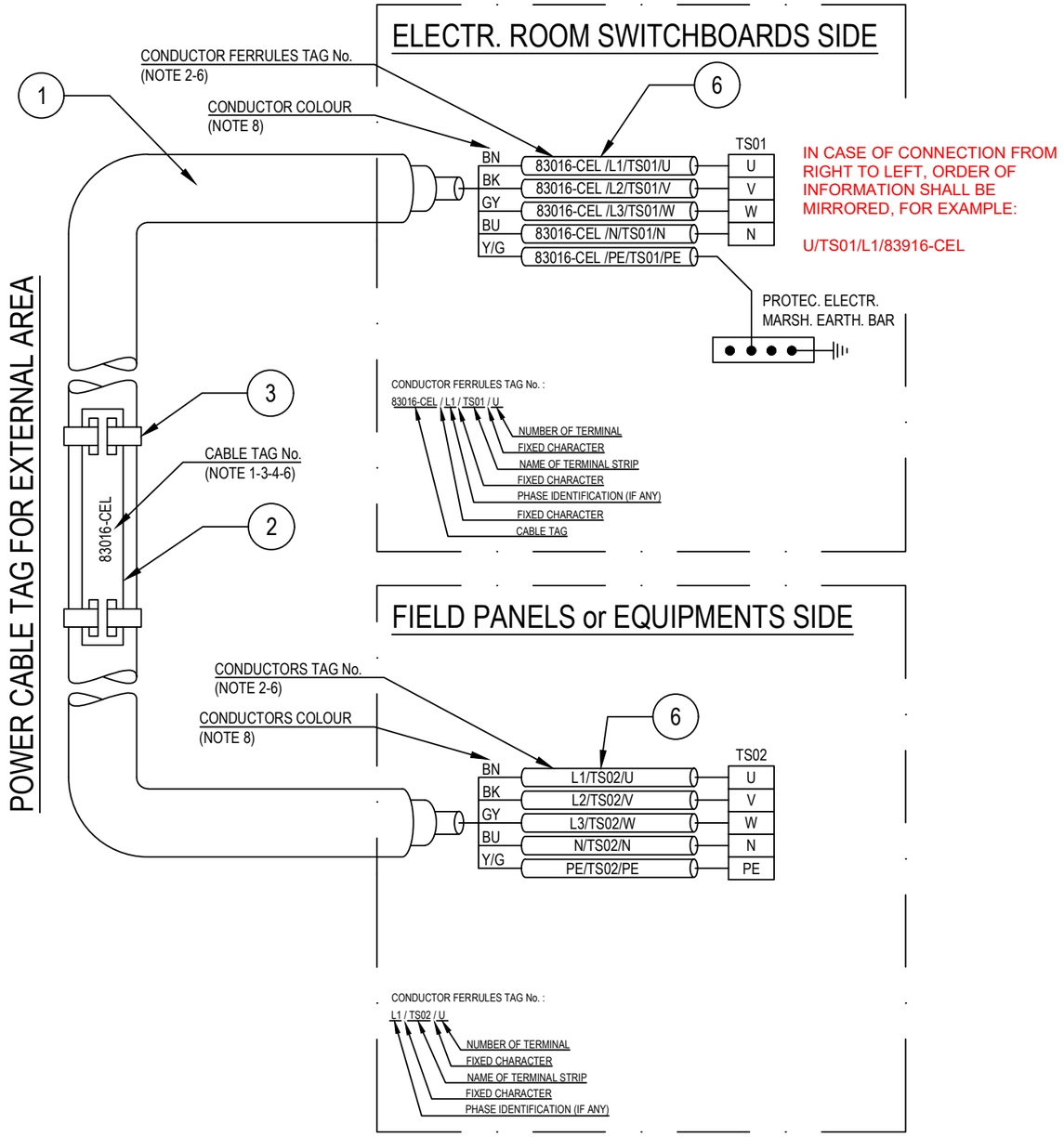
SHEET 012

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

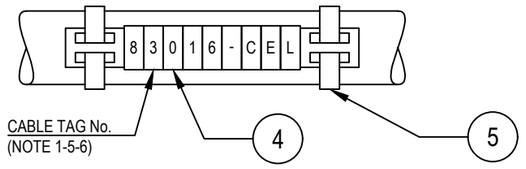
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

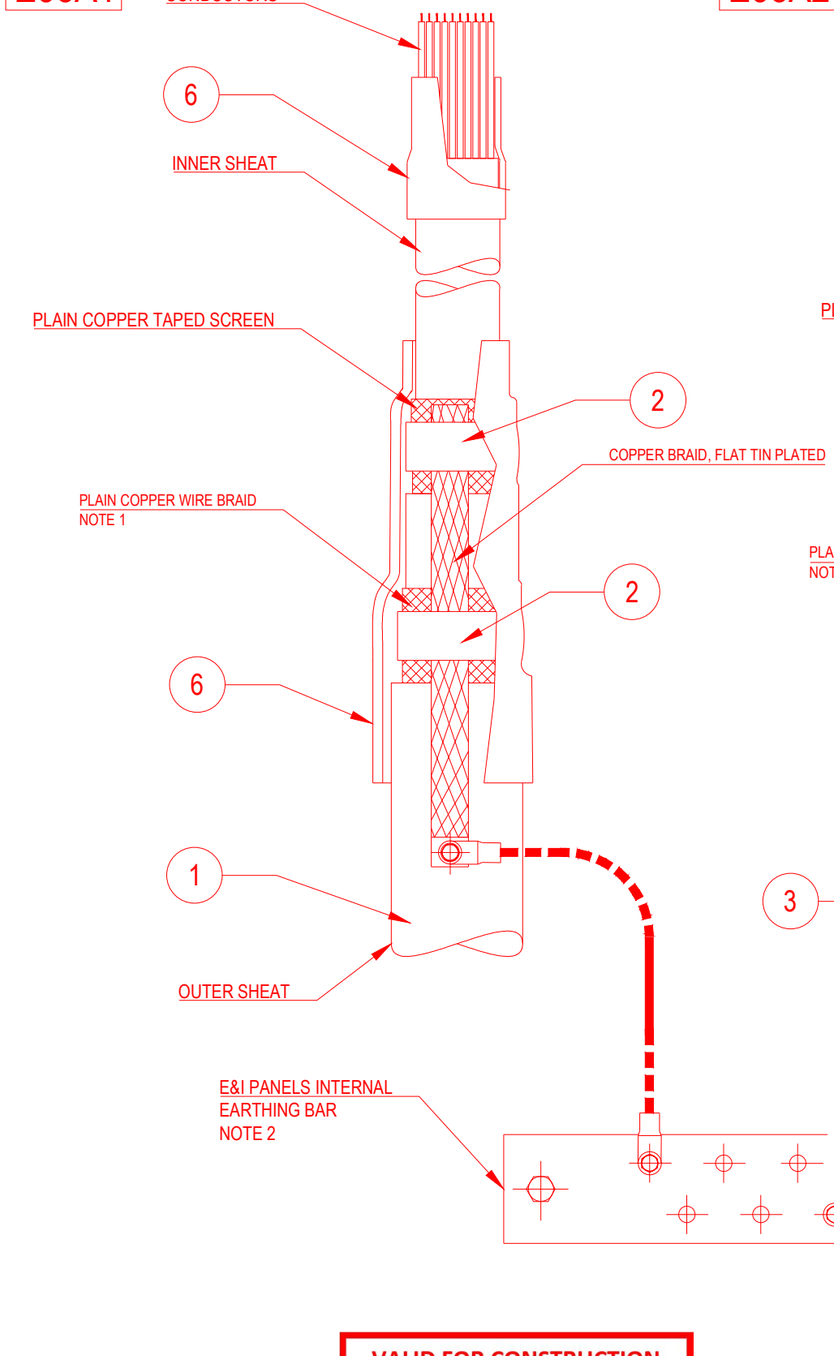
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

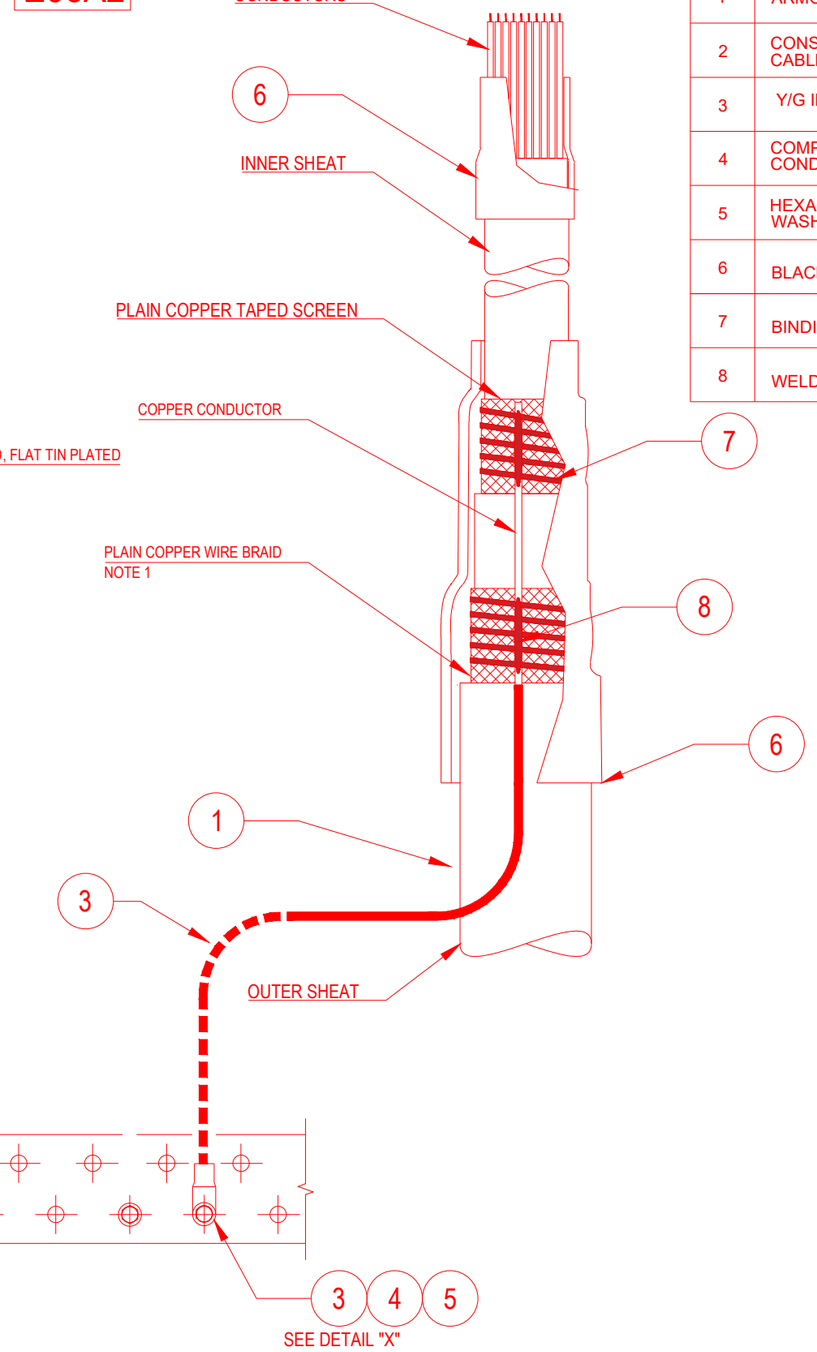
F.to UNI A3: 420mmx297mm

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E06A1

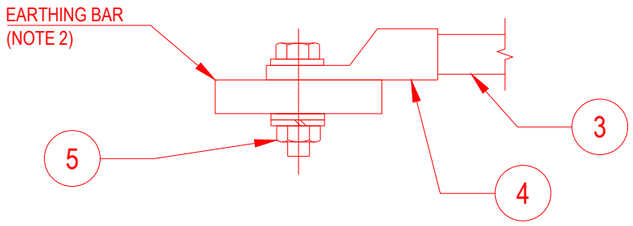


E06A2



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	ARMOURED CABLE				
2	CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE	AISI 316L			
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$16mm^2$		
4	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$16mm^2$		
5	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M8X30		
6	BLACK HEAT SHRINKABLE SLEEVE				
7	BINDING WITH COPPER WIRE	COPPER			
8	WELDING	Sn 50%			

DETAIL "X"



NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_I	07/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : FOGLIO 28.DWG

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEM-1-N	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						TR-100AD1	66 / 6.9 kV 7 MVA Transformer	Lower Deck	RR-100D1	NER	Lower Deck	ELECV37-1X150	Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x150mm²- Red	M50S	T1_M50S_Single			T1_M50S_Single				L-300-101-MVT-001 / L-150-101-MVT-017

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
		Sh: 9 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024
		Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

ELECTRICAL SYSTEM CHARACTERISTIC

OPERATING VOLTAGE	6,6	kVac	±	5	%		
FREQUENCE	50	Hz	±	2	%		
NEUTRAL SYSTEM	☐	EARTHED				☐	INSULATED
	☑	EARTHED BY RESISTANCE				☐	
EXPOSITION OF LIGHTNING OVER VOLTAGE						☐ NO	☑ YES

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

CABLE CHARACTERISTIC

GENERAL CHARACT	REFERENCE STD	FOR CONSTRUCTION AND TEST	IEC 60092-350
		FOR SPECIAL CHARACTERISTIC	**IEC-60754-1, IEC-60332-1-2**
			IEC-61034-2

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm^2

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm^2

SPECIAL CHARACT.	☐ HYDROCARBON RESISTANCE	☐ NON PROPAGATING FIRE	☐ FIRE RESISTANCE	
	☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL			kg/m
	☐ LOW CORROSIVE GAS EMISSION	☐ % HCl ≤ 0,3	☐ % HCl =	
	☐ LOW TOXIC GAS EMISSION (T INDEX)	☐ T ≤ 2	☐ T=	
	☑ LOW SMOKE EMISION (OPTICAL DENSITY)	☐ D ≤ 1,5	☐ D=	
	☐ U.V. RESISTANT	☑ HALOGEN FREE COMPOUND	☑ FLAME RETARDANT	

INSTALL. SPECIAL CONDITION	CABLE LADDER, TREFOIL FORMATION
ACCESS.	

NOTES:

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 10 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

MATERIALS

GENERAL DATA	REF.STD N.: IEC 60092-350
CONDUCTOR	MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H)
INSULATION	MATERIAL: EPR
SEMI-CONDUCTOR LAYER	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: HF EXTRUDED COMPOUND
SCREENS	☑ FORESEEN AS PER IEC 60092-350 MATERIAL: Plain Copper Taped Screen
ARMOUR	☑ REQUIRED TYPE: MATERIAL: Plain Copper Wire Braid
OUTER SHEATING	MATERIAL: SHF1 to IEC 60093.360
COMPONENTS AND SPECIAL CONSTR.	

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO Sh: 11 of 35
Document Title:	Technical Data Sheet (TDS) for Electrical Power and Control Cables	Date: 31/07/2024 Rev.: 01

TITLE

DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)

1	**CONSTRUCTIVE DATA**						
2							
3	MR TAG / PART NUMBER			Note-3	Note-3		
4	n° x NOMINAL AREA OF CONDUCTORS		N.xmm^2	1Cx70	1Cx150		
5	n° AND DIAMETER OF WIRES IN EACH CONDUCTOR		N.xmm	352x0,52	776X0,51		
6	CONDUCTOR CLASS (2)			2	2		
7	RATED CURRENT IN AIR AT 30°		A	285	460		
8	RATED CURRENT IN GROUND AT 20°		A	272	416		
9							
10	A.C. PHASES RESISTANCE AT THE MAX OP. TEMP.		Ω/km	0,345	0,163		
11	PHASE REACTANCE AT 50 Hz		Ω/km	0,110	0,097		
12	MINIMUM INSULATION RESISTANCE AT 20°		MΩ/km	745	567		
13	PHASE CAPACITY		µF/km	0,301	0,396		
14							
15	MINIMUM ORDER Q.TY		m	TBD	TBD		
16	MAX LENGHT OF DRUMS		m	TBD	TBD		
17	DIAMETERS	BARE CONDUCTOR	mm	10	14,3		
18		CORE (INSULATED CORE)	mm	19,6	24		
19		UNDER ARMOUR	mm	23,6	28,3		
20		ARMOUR OR CONCENTRIC CONDUCTOR	mm	24,8	29,5		
21							
22							
23		OVERALL	mm	29	34		
24	MASSES	CONDUCTORS	kg/km	640	1350		
25		INSULATION	kg/km	290	410		
26		INNER COVERING	kg/km	180	220		
27		ARMOUR OR CONCENTRIC CONDUCTOR	kg/km	220	250		
28		OUTER SHEATING	kg/km	280	350		
29							
30		TOTAL	kg/km	1610	2580		
31	EXTERNAL COLOUR			RED	RED		
32	CORE IDENTIFICATION (1)			NATURAL	NATURAL		
33							
34							
35							
36							
37							
38							

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

49

50

51

ITEM	Tag	82001-CEM-2-N	: NER / NER Earth Point		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD	
TASK	code	C10000475	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX09	LV Power Cable

CABLE DATA

Type	Cu Cl.2/LSZH TI7 450/750V	Cores/Size mm²	1G150 mm2	Color	Y/G
From	RR-100D1	To	EB01		

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	OK
8	Confirm cable labelling is in accordance with specifications.	OK
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	OK
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	82001-CEM-2-N	: NER / NER Earth Point			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD
TASK	code	C10000475		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX09 LV Power Cable

CONTINUITY				
5	CORE CONTINUITY Ω	PH 1	0,2	
6		PH 2	NA	
7		PH 3	NA	
8	ARMOUR CONTINUITY Ω		NA	
9	PROTECTIVE CONDUCTOR CONTINUITY Ω		NA	
INSULATION				
10	CORES / ARMOUR+EARTH MΩ	PH1 / PH2-PH3-A-E	>999	
11		PH2 / PH1-PH3-A-E	NA	
12		PH3 / PH1-PH2-A-E	NA	
13	CABLE IS CORRECTLY RE-CONNECTED.		Yes	

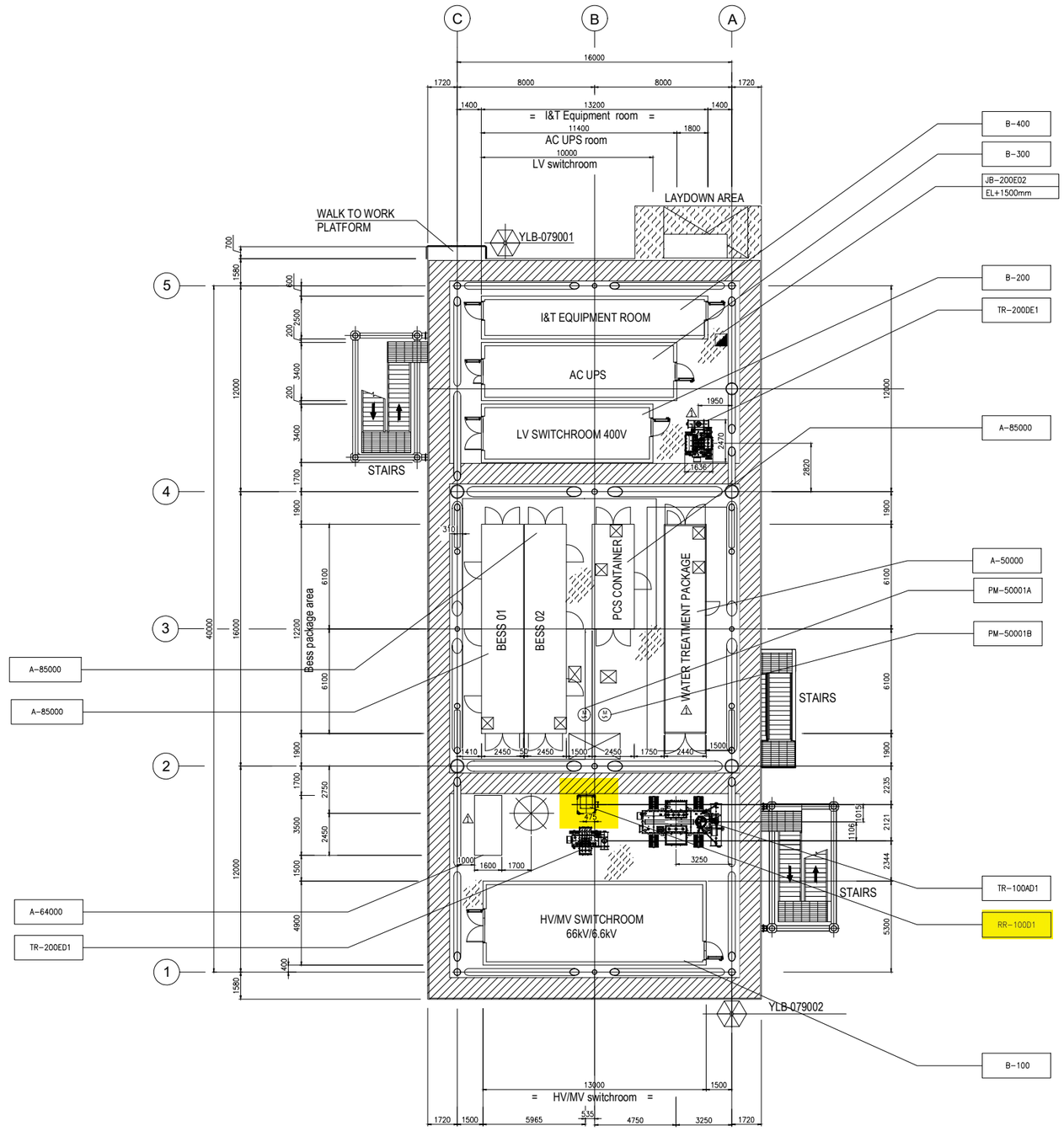
TESTING INSTRUMENTS USED			
TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207	TYPE / SERIAL N° :	Fluke/Serial:AW1/08(17140769)
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	7715/24 date:10/07/24

Comments: Nota 4: refer to PL C30000679

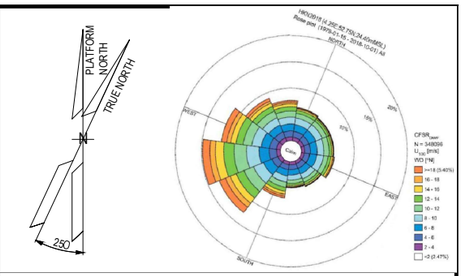
	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-14	2024-12-19	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-14T09:33:14.255Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-19T15:54:01.534Z	

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

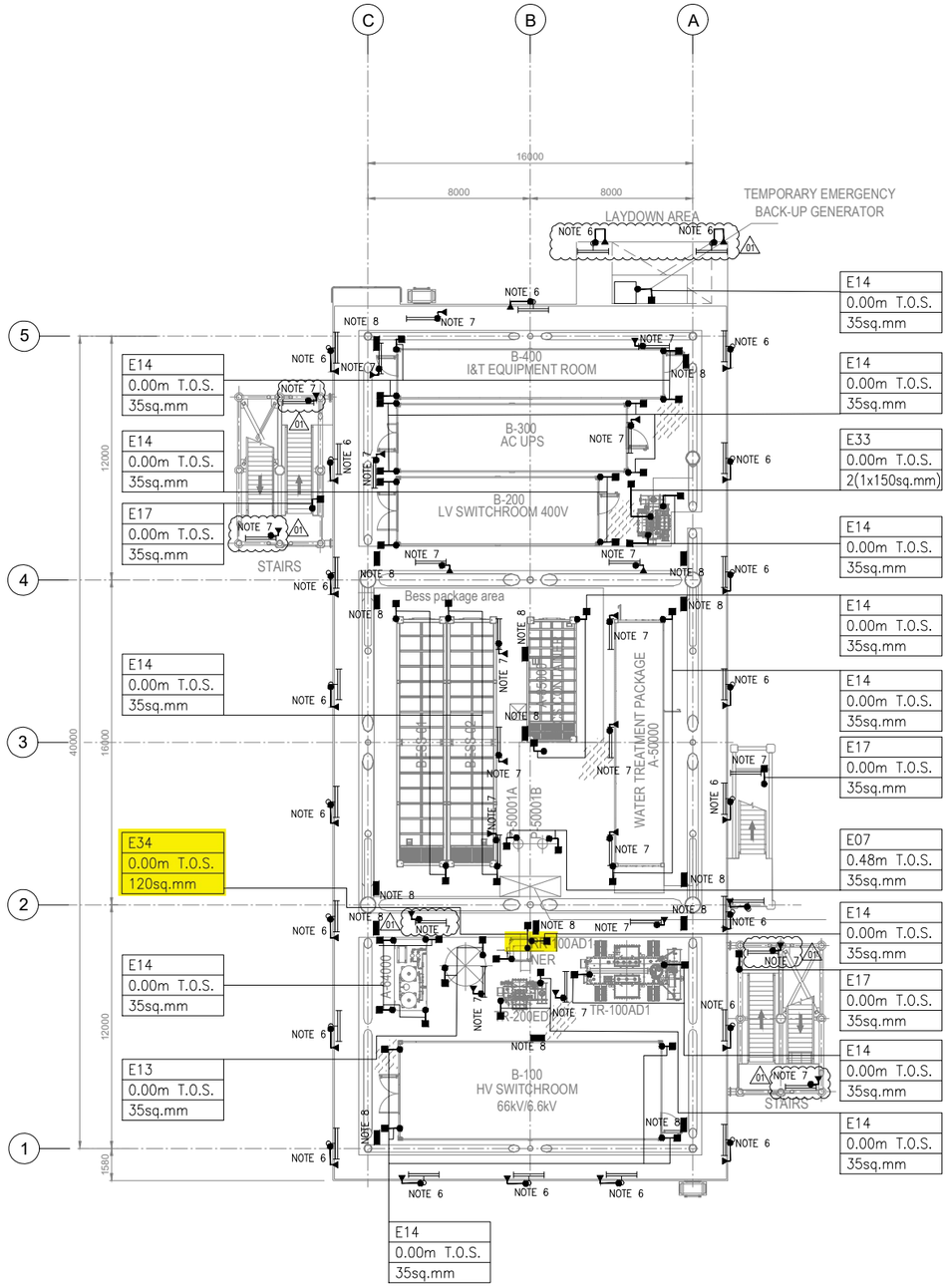
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

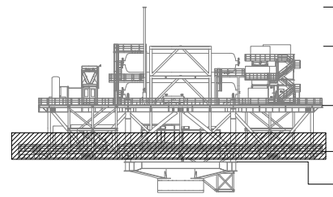
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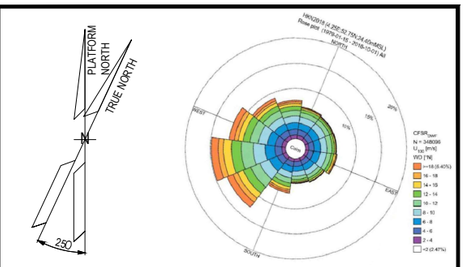
REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.

KEY PLAN





NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE GIVEN IN mm UNLESS OTHERWISE NOTED.
2. ELEVATIONS REFER TO T.O.S.
3. THIS DOCUMENT IS ONLY VALID FOR EARTHING LAYOUT.
4. ALL ELECTRICAL EQUIPMENT NOT DIRECTLY WELDED TO SKID FRAME SHALL BE BONDED TO STEEL TO THE STRUCTURE OF SKID BASEFRAME.
5. FOR LIGHTNING PROTECTION SYSTEM SURGE PROTECTIVE DEVICES (SPD), REFER TO THE DOCUMENT 123A90-DDL-EL-RE-20154.
6. ALL NON-WELDED POLES WILL BE EARTHED AS PER TYPICAL E05 AND E24. 01
7. ALL LINEAR LIGHTING FIXTURE WILL BE EARTHED AS PER TYPICAL E32.
8. EARTH BAR WILL BE FIXED TO THE PRIMARY BEAMS OF THE UPPER DECK. COMPLETE EARTHING INCLUDING WITH 2 THREADED STUDS. ALL EARTH BAR WILL BE EARTHED AS PER TYPICAL E03D / 6.00M T.O.S. / 35 SQ MM.
9. EQUIPOTENTIAL BONDING GROUPING FOR BOLTED HANDRAILS ARE PROVIDED EVERY 3M FOR THE ENTIRE PERIMETER AS TYPICAL E16 AND WILL BE DEFINED DURING ASSEMBLY PHASE

LEGEND

- LIGHTING FIXTURE POLE MOUNTED
- LINEAR LIGHTING FIXTURE
- EARTHING BOSS AISI316L
- COMPRESSION TYPE LUG TINNED COPPER
- THREADED STUD FOR EARTHING CONNECTION
- Exx EARTHING TYPICAL CODE
- EARTHING BAR

TYP.	TYPICAL
ELE	ELEVATION
SIZE	

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DD-20090	ELECTRICAL TYPICAL INSTALLATION DETAILS - EARTHING SYSTEM
123A90-DDL-EL-RE-20154	LIGHTNING PROTECTION SYSTEM CALCULATION REPORT
123A90-DDL-EL-DL-20119	LIGHTING & SOCKET LAYOUT - LOWER DECK
123A90-DDL-EL-DL-20101	ELECTRICAL EQUIPMENT LAYOUT - LOWER DECK

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	25/07/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	29/05/24	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
EARTHING & LIGHTNING LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150

DRAWN SPS | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 25/07/24

A1 | DRAWING NO. 123A90-DDL-EL-DL-20133 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20133

SHEET 001 OF 002

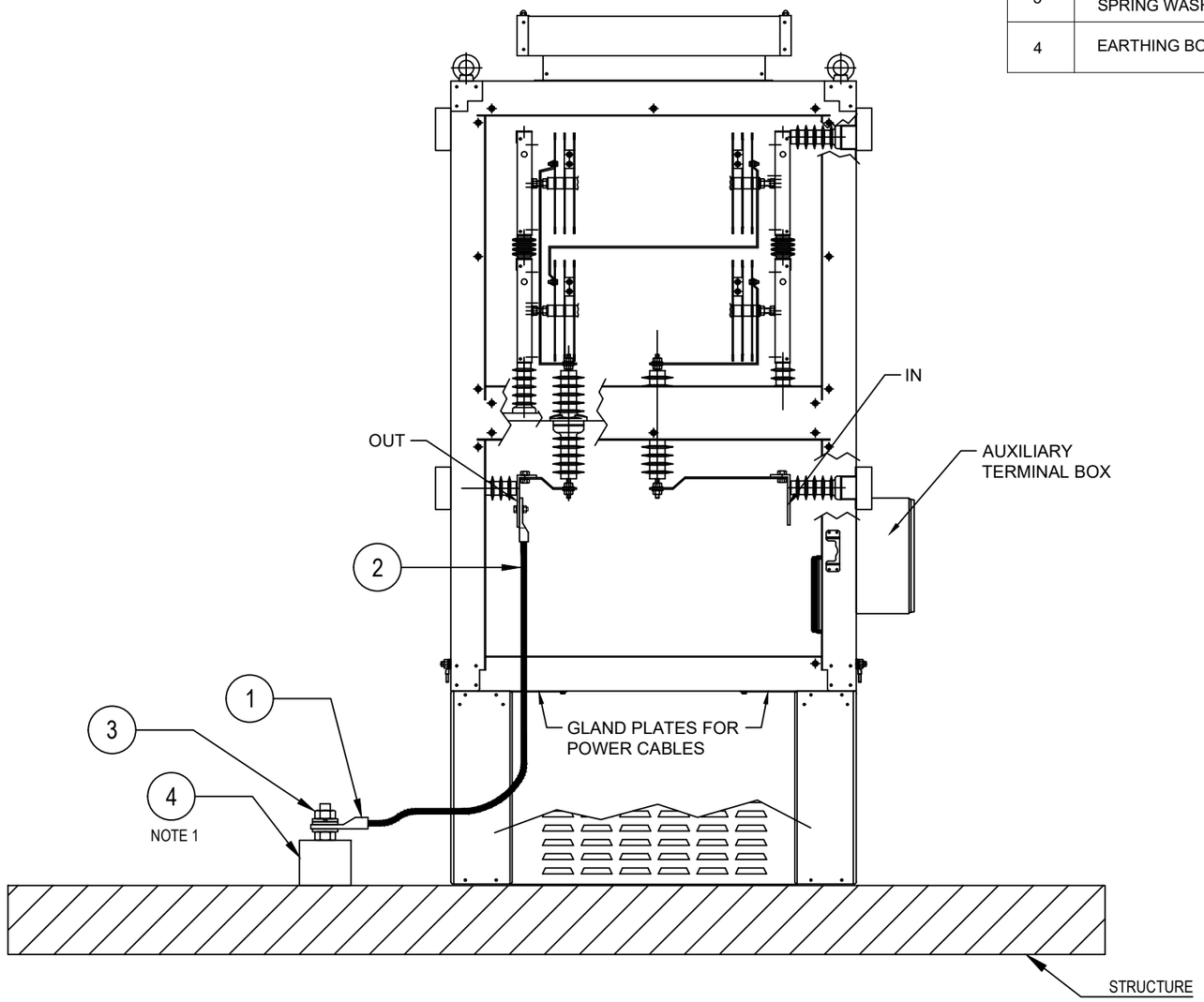
VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20133**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

E34

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER		1	
2	Y/G INSULATING COPPER CONDUCTOR	COPPER	150mm² ~~120mm²~~	AS R	
3	HEXAG. BOLT COMPLETE WITH PLANE WASHERS, SPRING WASHER AND NUT	AISI 316L	M10X30	1	
4	EARTHING BOSS WITH THREADED HOLE M10	AISI 316L	50X50		NOTE 2



NOTES:
1) FOR EARTHING BOSS TYPICAL DETAIL E11A
2) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE)

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20090
REV.: 2_G | DATE: 25/10/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
NER EARTHING

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 025 | REV. 02

CROSSWIND

ROSETTI MARINO

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

FROM	TO

DESCRIPTION: 66/6.9KV, 7MVA TRANSFORMER
TAG NUMBER: TR-100AD1

6.9kV HV TERMINAL BOX OF TR-100AD1

2U — Arm. — BK — 82001-CEM-1-L1, 1C X 150 mm²
BK — 82001-CEM-2-L1, 1C X 150 mm²

2V — Arm. — BK — 82001-CEM-1-L2, 1C X 150 mm²
BK — 82001-CEM-2-L2, 1C X 150 mm²

2W — Arm. — BK — 82001-CEM-1-L3, 1C X 150 mm²
BK — 82001-CEM-2-L3, 1C X 150 mm²

2N — Arm. — BK — 82001-CEM-1-N, 1C X 150 mm²

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

TAG COLUMN: A6

SG-100D1 INCOMER

L1 — Arm. — BK
BK

L2 — Arm. — BK
BK

L3 — Arm. — BK
BK

DESCRIPTION: NER
TAG NUMBER: RR-100D1

IN — Arm. — BK — N
OUT — PE — Y/G — Arm. — 82001-CEM-2-N, 1C X 150 mm² — EARTH BOSS

VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
2_D	12/12/24	C.Pilato

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
66KV, 7MVA TRANSFORMER

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

SCALE : 1:X

A3

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

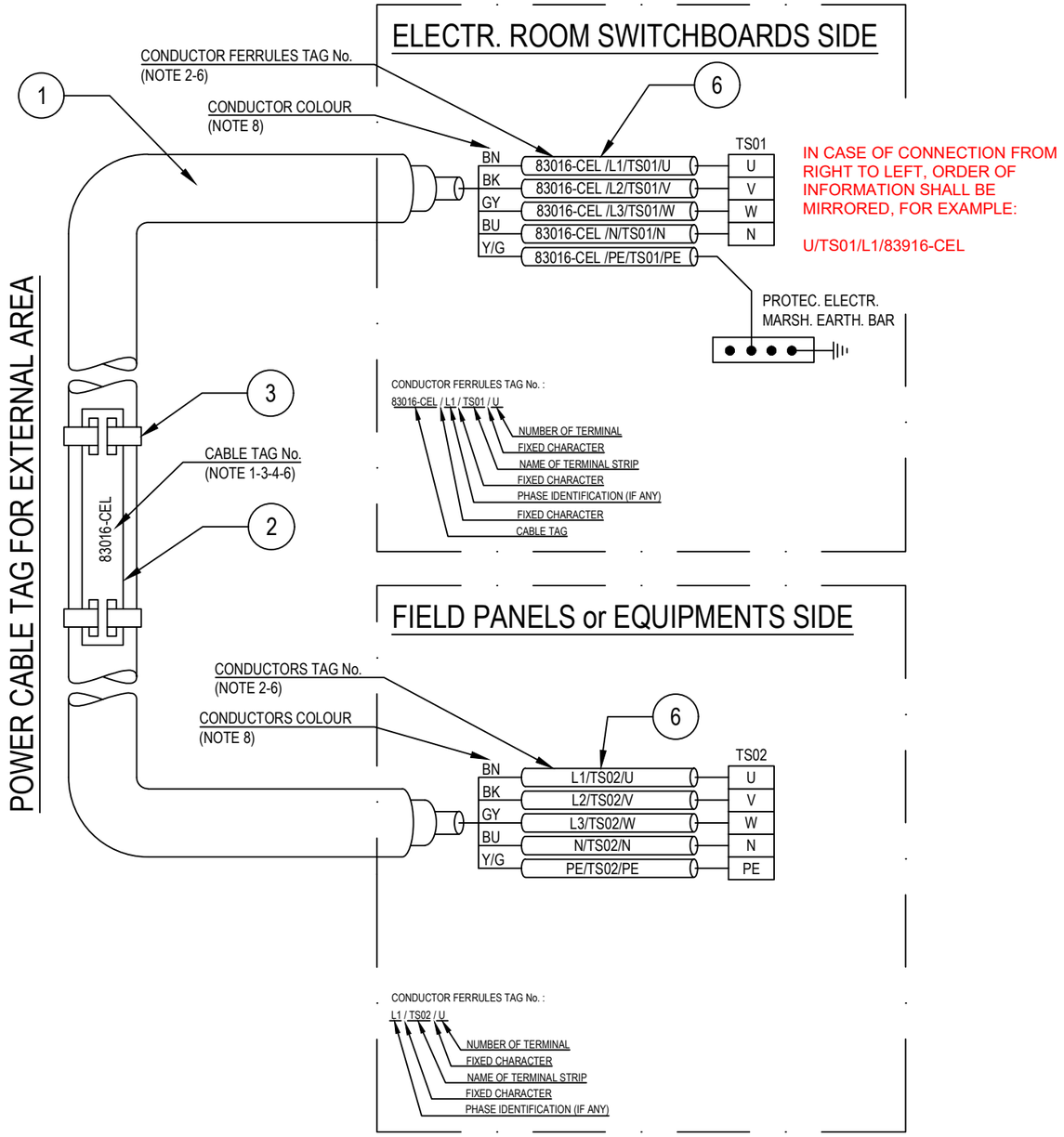
SHEET 012

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

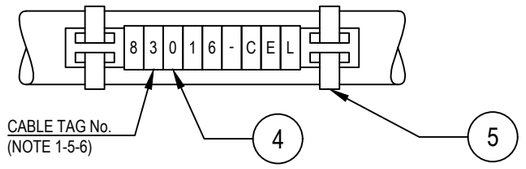
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

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

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

F.to UNI A3: 420mmx297mm

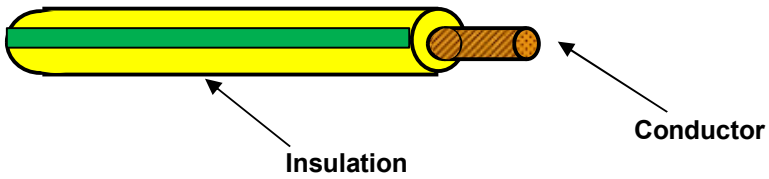
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEM-2-N	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						RR-100D1	NER	Lower Deck	EB01	Structure Earth Point	Lower Deck	ELECV28-1G150	Cable Cu Cl.2/LSZH TI7 450/750V 1G150mm² - Yellow with 2 Green Stripes	M25	T1_M25_Single			n.a.				NA

FLEI s.r.l.

Cu Cl.2/LSZH 450/750 V

1G150 - PE CABLE - Flame Retardant



TECHNICAL FEATURES

Conductor :	**STRANDED COMPACTED** plain/bare annealed copper wires	EN/IEC 60228 Class 2
Insulation :	LSZH compound, TI7 quality, Nominal Thickness 1,8 mm	
Core colour code :	**Yellow with 2 Green stripes**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Not Required	
Overall Wrapping:	Not required	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Not required	
Inner covering color code:	Not required	
Armour :	Not required	
Outer sheath :	Not required	
Outer sheath color code:	Not required	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 450/750 V - 1G150 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(17,7 ± 10%) mm	
Bending radius :	cable outer diameter x 8	(in fixed installation)
Spark test :	13 kV a.c.	(on insulation)
Conductors DC Resistance :		EN/IEC 60228 Class 2
Insulation Resistance :	≥ 10 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**EN 50525.3.31**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
During Operation :	(-20°C up to +70°C)	(in fixed installation)
	(max +160°C)	(max conductors temperature during short-circuit for 5 seconds)
During Installation :	(-10°C up to +50°C)	
Note :	**The cable is suitable for installation and use in Zone 1 & Zone 2 (IEC 60079-14) using only correct ATEX approved equipment or accessories**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ITEM	Tag	83112-CEL	: Lighting & Small Power DB BoP / Auxiliary Trafo OLTC		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-200/LD_B-100	
TASK	code	C10000631	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX09	LV Power Cable

CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 5G4 mm2 | Color: GREY

From: DP-200N1 | To: CP-100E2

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	NA
8	Confirm cable labelling is in accordance with specifications.	PL
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	PL
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	83112-CEL	: Lighting & Small Power DB BoP / Auxiliary Trafo OLTC			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-200/LD_B-100
TASK	code	C10000631	Location	Onshore Activities		User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX09 LV Power Cable

CONTINUITY				
5	CORE CONTINUITY Ω	PH 1	0,5	
6		PH 2	0,5	
7		PH 3	0.6	
8	ARMOUR CONTINUITY Ω		NA	
9	PROTECTIVE CONDUCTOR CONTINUITY Ω		0,5	
INSULATION				
10	CORES / ARMOUR+EARTH MΩ	PH1 / PH2-PH3-A-E	>999	
11		PH2 / PH1-PH3-A-E	>999	
12		PH3 / PH1-PH2-A-E	>999	
13	CABLE IS CORRECTLY RE-CONNECTED.		Yes	

TESTING INSTRUMENTS USED			
TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207	TYPE / SERIAL N° :	MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769)
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	N°7715/24 _ 10/07/2024

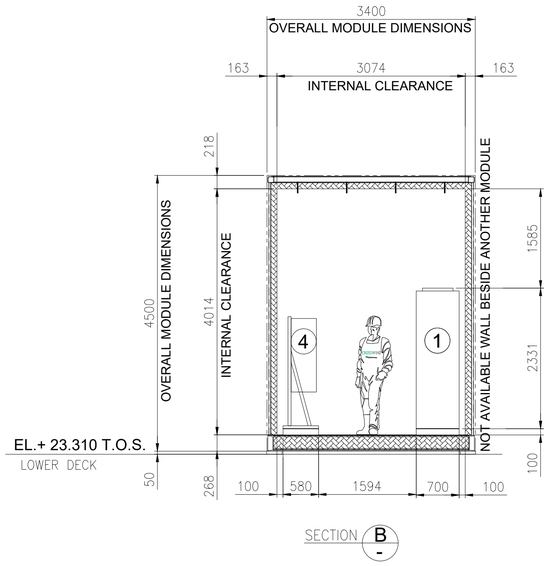
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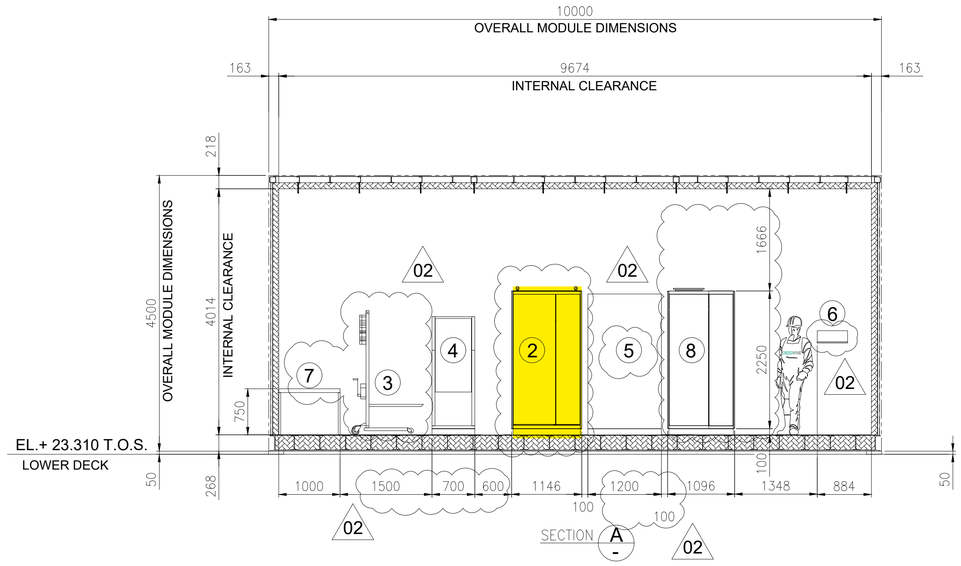
CORE CONTINUITY PH 4= 0.5
CORES / ARMOUR+EARTH INS. PH 4 = >999 M

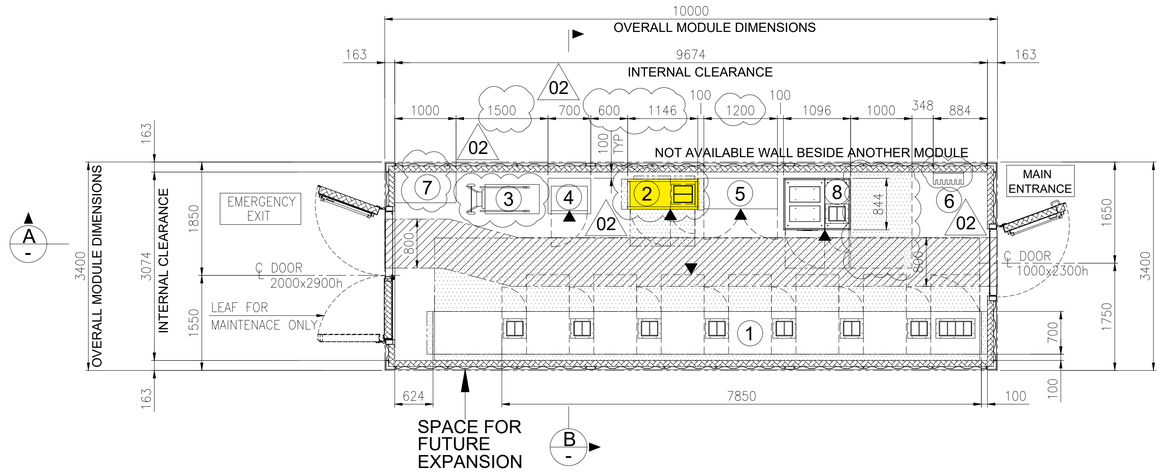
Nota 4: refer to PL C30000679

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-11-29	2024-12-03	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-11-29T10:31:43.002Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-03T13:51:25.745Z	

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02





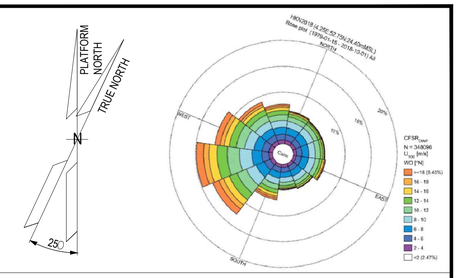


EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	
3	-	SERVICE TROLLEY FOR 400V SWITCHGEAR	1034	490	2030	
4	CN-200N1	ICCP PANEL	700	580	1830	
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	02
6	-	TOOL BOX	495	200	200	
7	-	TABLE	1000	500	750	
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

LEGEND

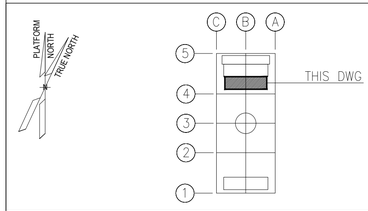
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
SG-200N1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00007
SG-200D2 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00008
DP-200N1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00009
AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00004
AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM	1724000372-EL-DG-00011
B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00015
ICCC PANEL GENERAL ARRANGEMENT DRAWING	144671-CORR-TF-FAB-DWG-0003

02

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	08/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

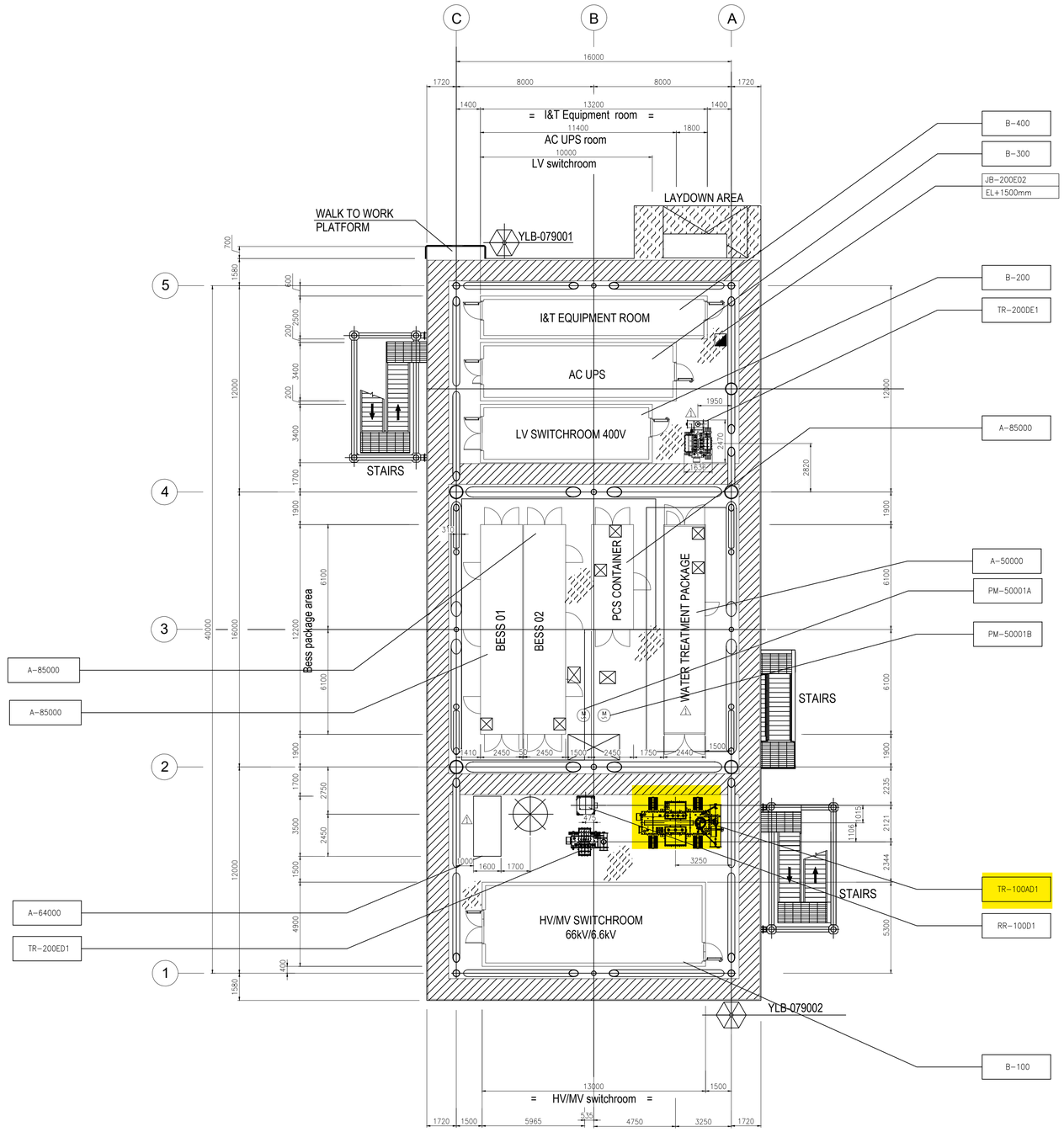
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN FMO	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20105	SHEET 001	REV. 02

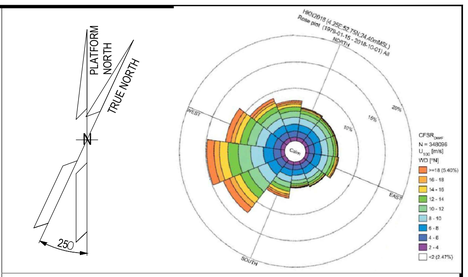
File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

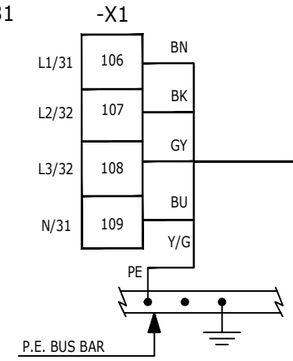
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150	
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24	
A1	DRAWING NO. 123A90-DDL-EL-DL-20101		SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM	TO

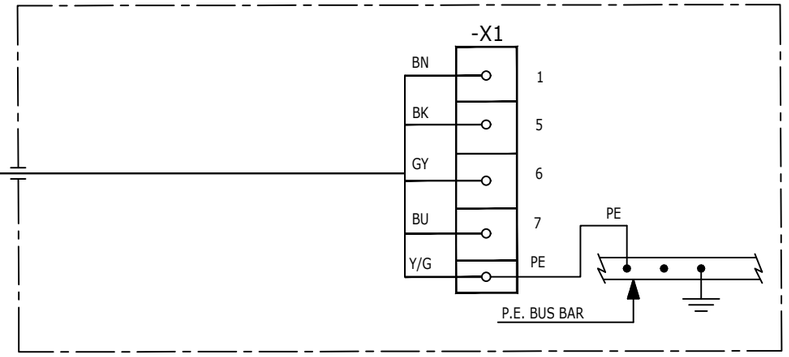
DESCRIPTION: LIGHTING & SMALL POWER DB BOP
TAG NUMBER: DP-200N1

CUBICLE/CB: +03/Q31

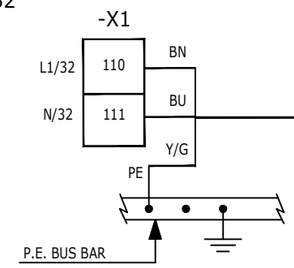


83112-CEL
5G4 mm²

DESCRIPTION: AUXILIARY TRAFO OLTC
TAG NUMBER: CP-100E2

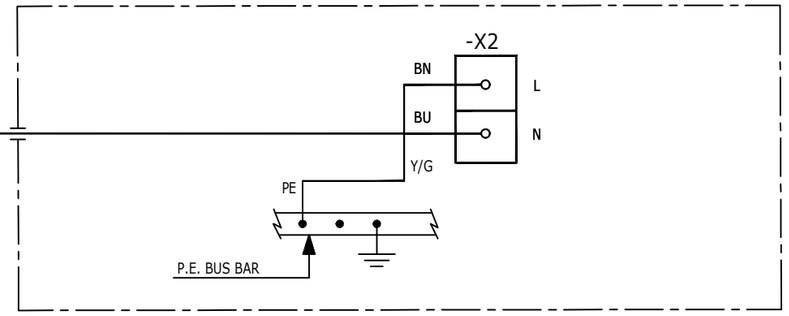


CUBICLE/CB: +03/Q32

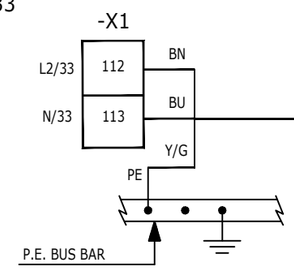


83113-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO AVR
TAG NUMBER: CP-100E3

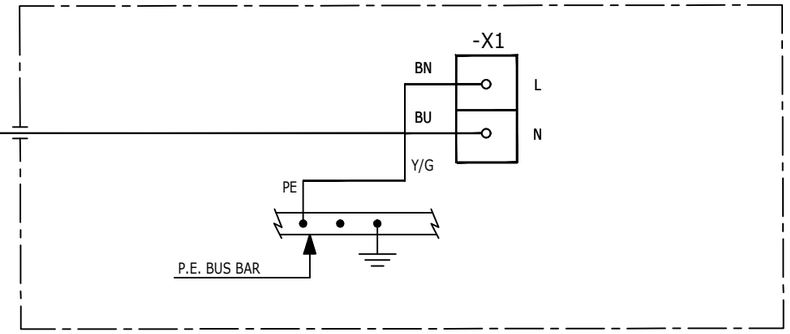


CUBICLE/CB: +03/Q33



83114-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO 7MVA
TAG NUMBER: CP-100E4



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

REV.:	DATE:	SIGNATURE:
2_B	26/11/24	G.Randi

ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
LIGHTING & SMALL POWER DB BOP

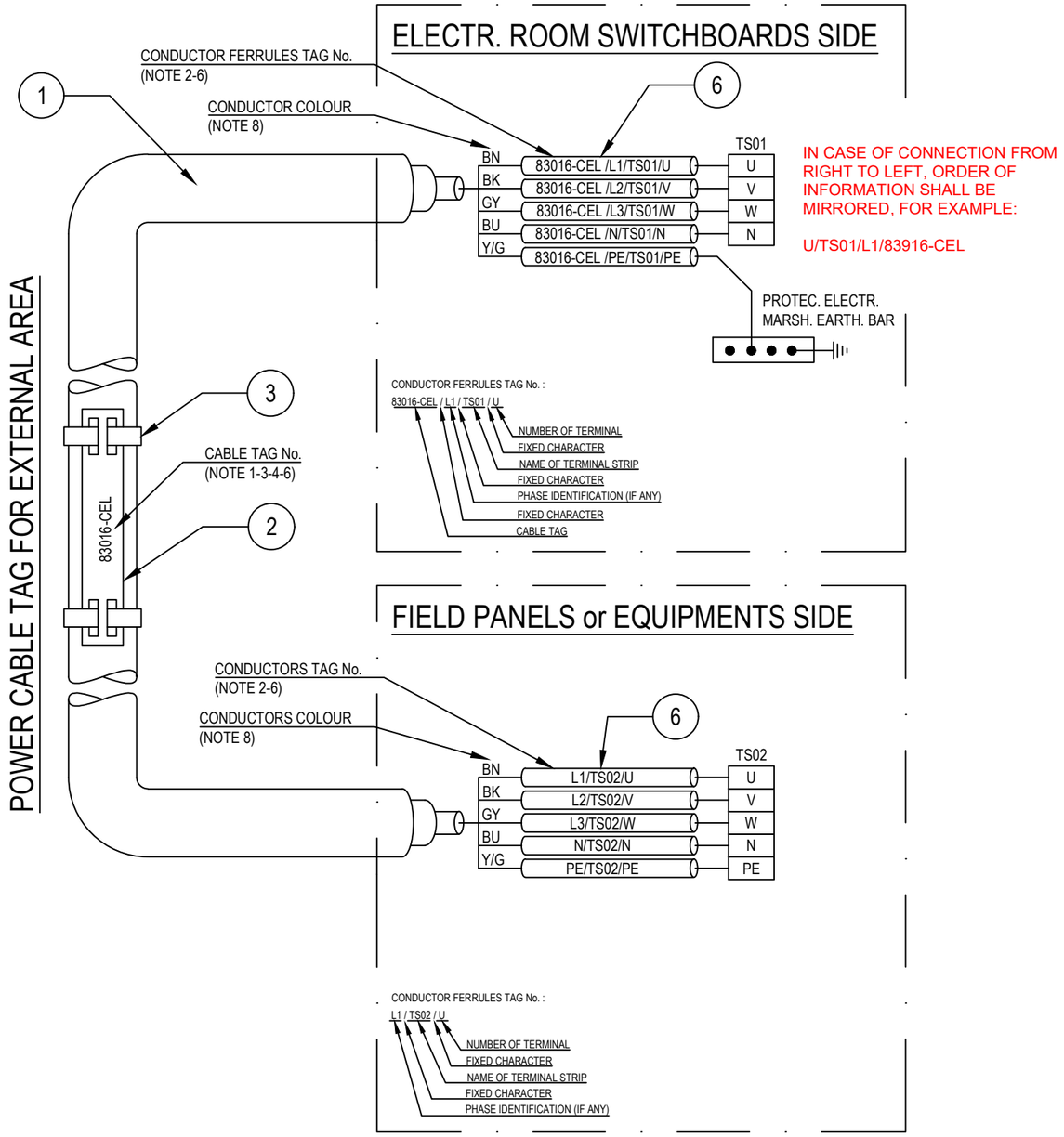
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 054 | REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

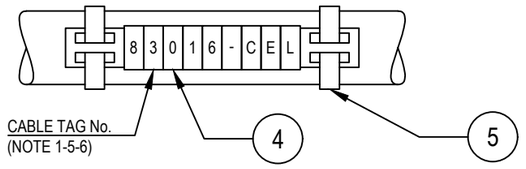
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

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

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

F.to UNI A3: 420mmx297mm

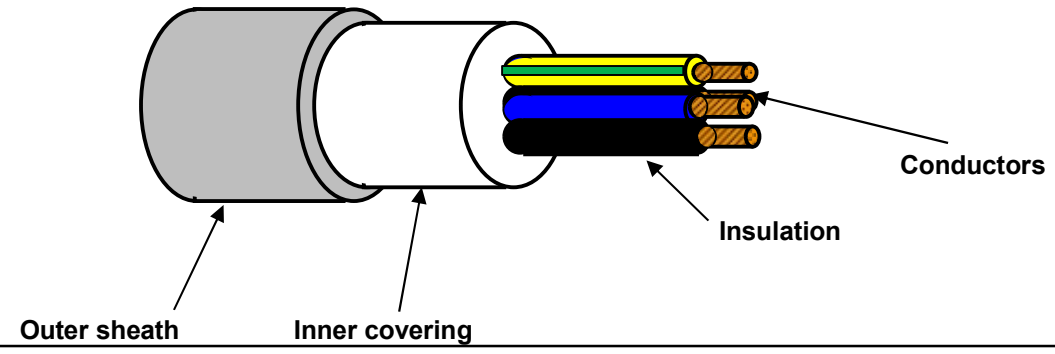
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Disciplin	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
83112-CEL	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						DP-200N1	LV 0,4 / 0,23 kV Distribution Switchgear	Lower Deck (B-200)	CP-100E2	Auxiliary Trafo OLTC Local Control Panel	Lower Deck	ELECV16-5G4	Cable Cu Cl.2/EPR/LSZH 0,6/1kV 5G4mm² - Grey	M25	n.a.			T1_M25_Single				L-450-101-LVT-030 / L-600-101-LVT-020 / L-600-101-LVT-019 / L-600-101-LVT-017 / E-MCT-203 / L-750-101-LVT-013 / L-750-101-LVT-014 / L-600-101-LVT-094 / L-450-101-LVT-072 / L-150-101-LVT-090

FLEI s.r.l.

Cu Cl.2/EPR/LSZH 0,6/1 KV

5G4 - L.V. POWER CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	EPR compound, quality to IEC 60092.360, Nominal Thickness 1,0 mm	
Cores colour code :	**Black - Brown - Grey - Blue - Yellow/Green**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	Not required	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,3 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 5G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(17,0 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 910 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ITEM	Tag	83113-CEL	: Lighting & Small Power DB BoP / Auxiliary Trafo AVR		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-200/LD_B-100	
TASK	code	C10000632	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX09	LV Power Cable

CABLE DATA

Type Cu Cl.2/EPR/LSZH | Cores/Size mm² 3G2,5 mm2 | Color GREY

From DP-200N1 | To CP-100E3

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	NA
8	Confirm cable labelling is in accordance with specifications.	PL
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	PL
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	83113-CEL	: Lighting & Small Power DB BoP / Auxiliary Trafo AVR			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-200/LD_B-100
TASK	code	C10000632		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX09 LV Power Cable

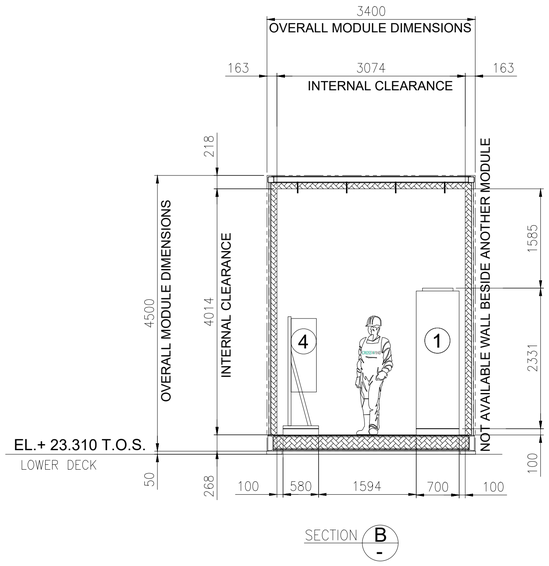
CONTINUITY				
5	CORE CONTINUITY Ω	PH 1	0,6	
6		PH 2	0,6	
7		PH 3	NA	
8	ARMOUR CONTINUITY Ω		NA	
9	PROTECTIVE CONDUCTOR CONTINUITY Ω		0,6	
INSULATION				
10	CORES / ARMOUR+EARTH MΩ	PH1 / PH2-PH3-A-E	>999	
11		PH2 / PH1-PH3-A-E	>999	
12		PH3 / PH1-PH2-A-E	NA	
13	CABLE IS CORRECTLY RE-CONNECTED.		Yes	

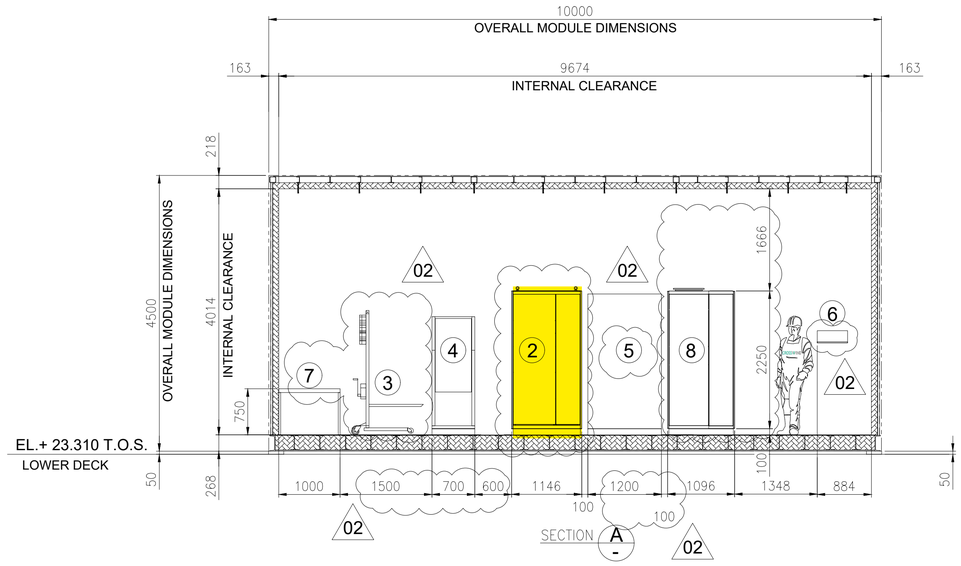
TESTING INSTRUMENTS USED			
TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207	TYPE / SERIAL N° :	MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769)
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	N°7715/24 _ 10/07/2024

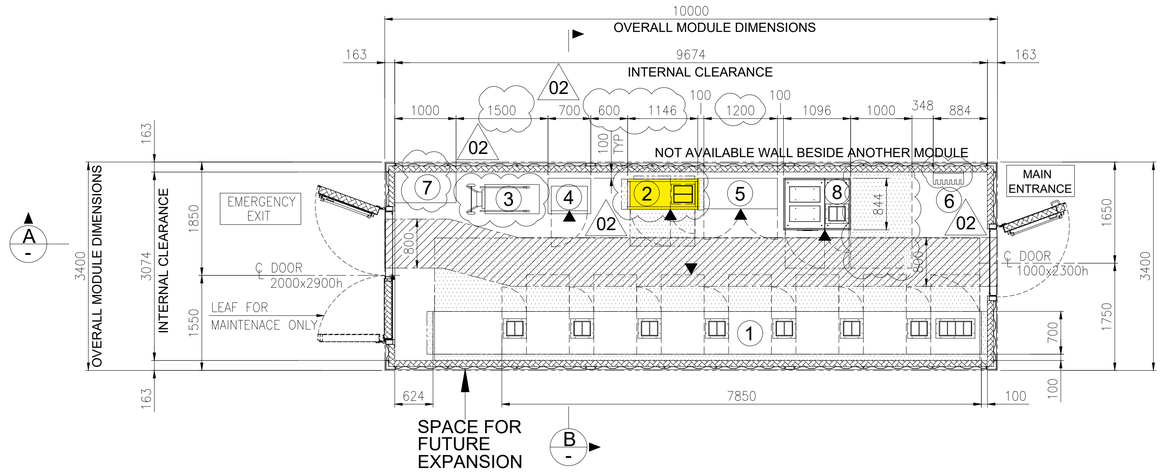
Comments: Nota 4: refer to PL C30000679

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-11-29	2024-12-03	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-11-29T10:32:06.985Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-03T13:54:43.638Z	

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02





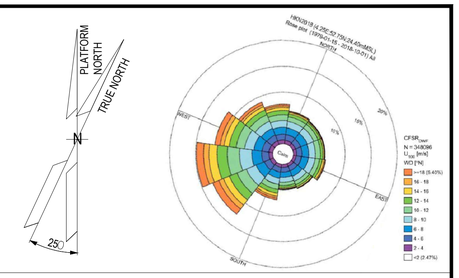


EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	
3	-	SERVICE TROLLEY FOR 400V SWITCHGEAR	1034	490	2030	
4	CN-200N1	ICCP PANEL	700	580	1830	
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	02
6	-	TOOL BOX	495	200	200	
7	-	TABLE	1000	500	750	
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

LEGEND

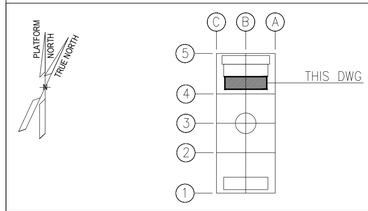
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
SG-200N1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00007
SG-200D2 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00008
DP-200N1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00009
AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00004
AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM	1724000372-EL-DG-00011
B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00015
ICCC PANEL GENERAL ARRANGEMENT DRAWING	144671-CORR-TF-FAB-DWG-0003

02

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	08/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

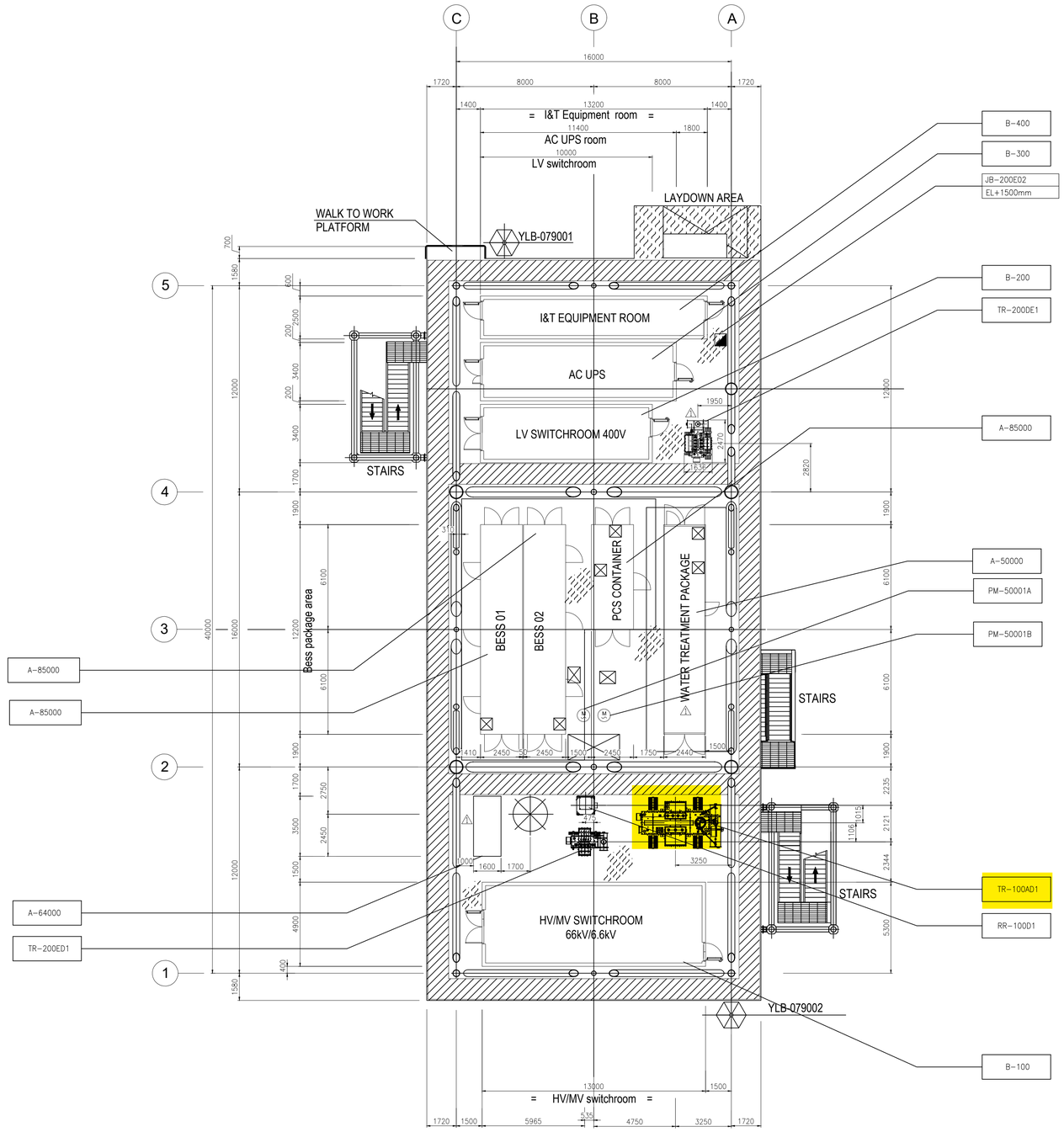
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN FMO	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20105	SHEET 001	REV. 02

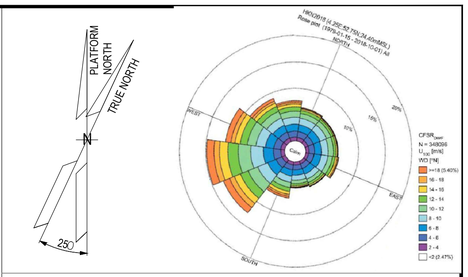
File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

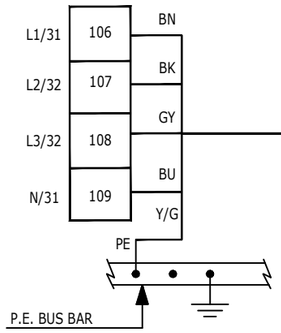
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150	
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24	
A1	DRAWING NO. 123A90-DDL-EL-DL-20101		SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM	TO

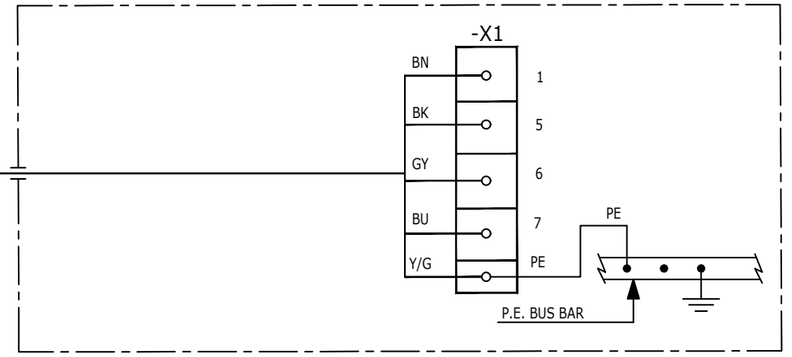
DESCRIPTION: LIGHTING & SMALL POWER DB BOP
TAG NUMBER: DP-200N1

CUBICLE/CB: +03/Q31

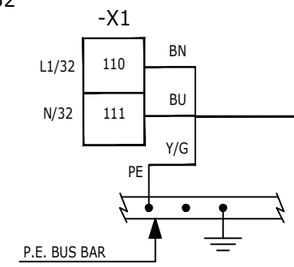


83112-CEL
5G4 mm²

DESCRIPTION: AUXILIARY TRAFO OLTC
TAG NUMBER: CP-100E2

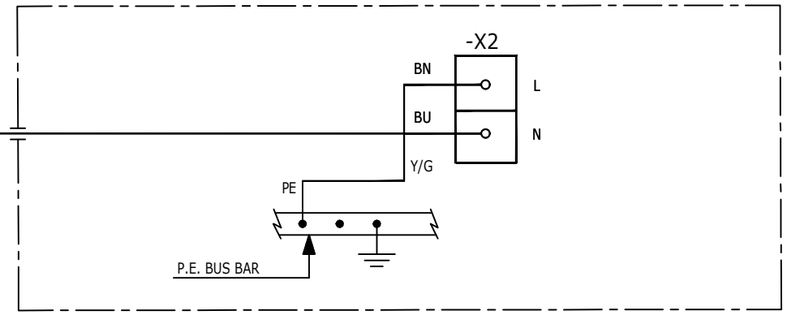


CUBICLE/CB: +03/Q32



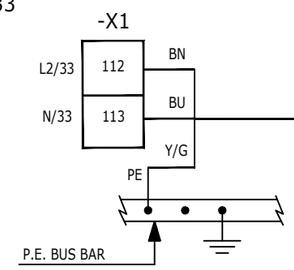
83113-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO AVR
TAG NUMBER: CP-100E3

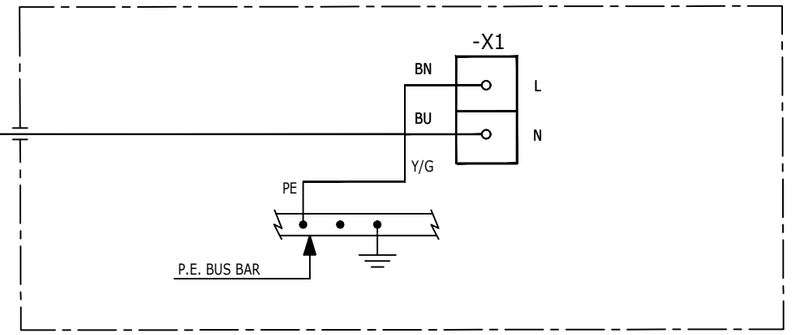


DESCRIPTION: AUXILIARY TRAFO 7MVA
TAG NUMBER: CP-100E4

CUBICLE/CB: +03/Q33



83114-CEL
3G2.5 mm²



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

REV.:	DATE:	SIGNATURE:
2_B	26/11/24	G.Randi

ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
LIGHTING & SMALL POWER DB BOP

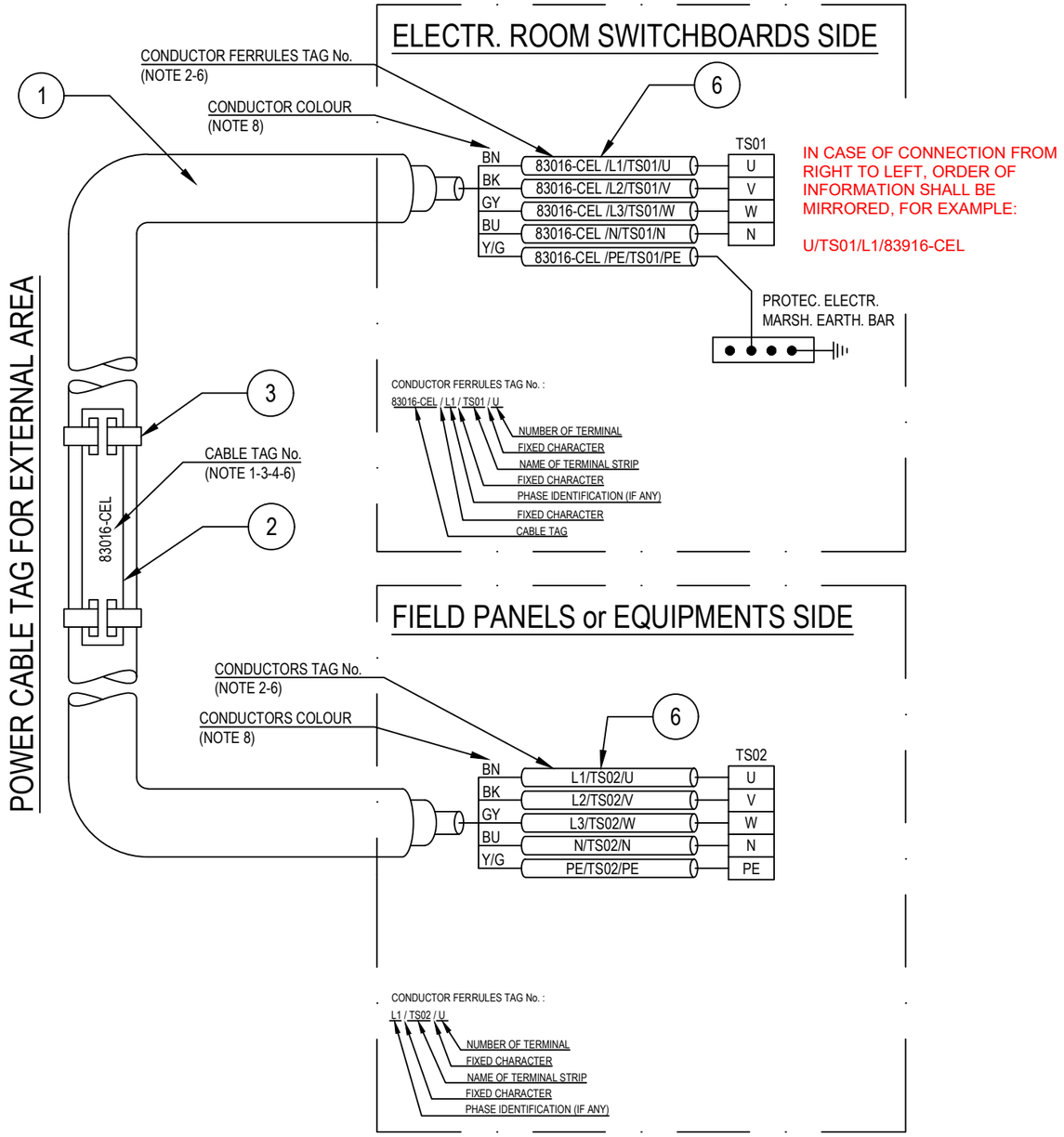
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 054 | REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

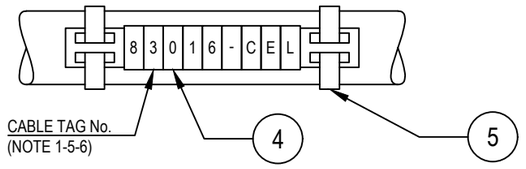
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

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

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

F.to UNI A3: 420mmx297mm

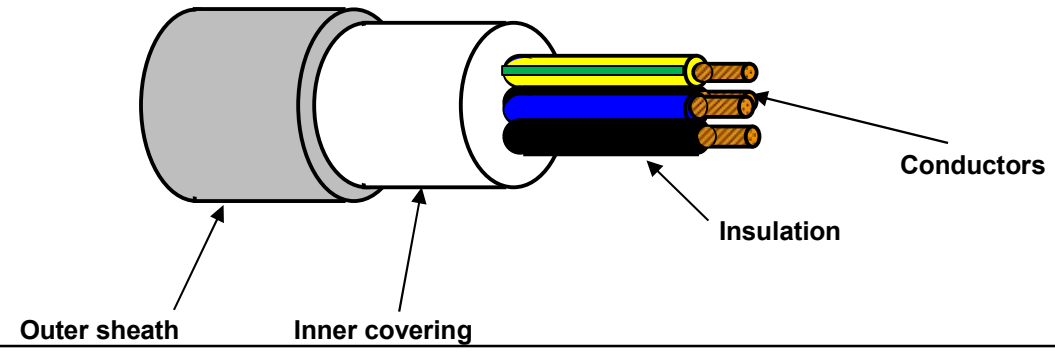
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Disciplin	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
83113-CEL	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						DP-200N1	LV 0,4 / 0,23 kV Distribution Switchgear	Lower Deck (B-200)	CP-100E3	Auxiliary Trafo AVR Local Control Panel	Lower Deck	ELECV06-3G2,5	Cable Cu Cl.2/EPR/LSZH 0,6/1kV 3G2,5mm² - Grey	M20	n.a.			T1_M20_Single				L-450-101-LVT-030 / L-600-101-LVT-020 / L-600-101-LVT-019 / L-600-101-LVT-017 / E-MCT-203 / L-750-101-LVT-013 / L-750-101-LVT-014 / L-600-101-LVT-094 / L-450-101-LVT-072 / L-150-101-LVT-090

FLEI s.r.l.

Cu Cl.2/EPR/LSZH 0,6/1 KV

3G2,5 - L.V. POWER CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	EPR compound, quality to IEC 60092.360, Nominal Thickness 1,0 mm	
Cores colour code :	**Brown - Blue - Yellow/Green**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	Not required	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 3G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,0 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1100 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ITEM	Tag	83114-CEL	: Lighting & Small Power DB BoP / Auxiliary Trafo 7MVA			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-200/LD_B-100
TASK	code	C10000633		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX09 LV Power Cable

CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 3G2,5 mm2 | Color: GREY

From: DP-200N1 | To: CP-100E4

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	NA
8	Confirm cable labelling is in accordance with specifications.	PL
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	PL
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	83114-CEL	: Lighting & Small Power DB BoP / Auxiliary Trafo 7MVA			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-200/LD_B-100
TASK	code	C10000633		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX09 LV Power Cable

	CONTINUITY			
5	CORE CONTINUITY Ω	PH 1	0,5	
6		PH 2	0,5	
7		PH 3	NA	
8	ARMOUR CONTINUITY Ω		NA	
9	PROTECTIVE CONDUCTOR CONTINUITY Ω		0,5	
	INSULATION			
10	CORES / ARMOUR+EARTH MΩ	PH1 / PH2-PH3-A-E	>999	
11		PH2 / PH1-PH3-A-E	>999	
12		PH3 / PH1-PH2-A-E	NA	
13	CABLE IS CORRECTLY RE-CONNECTED.		Yes	

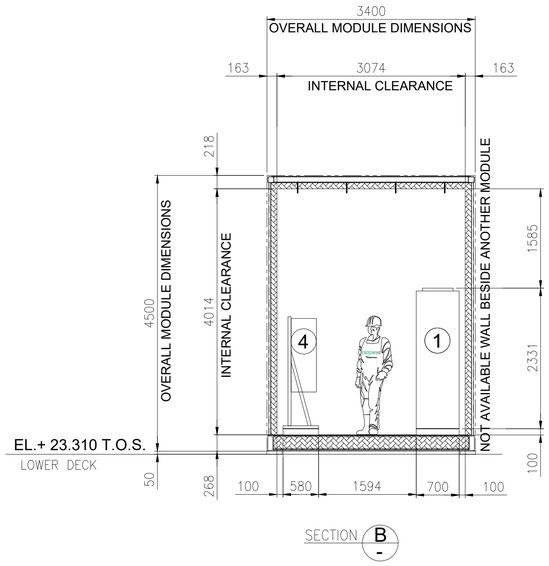
TESTING INSTRUMENTS USED

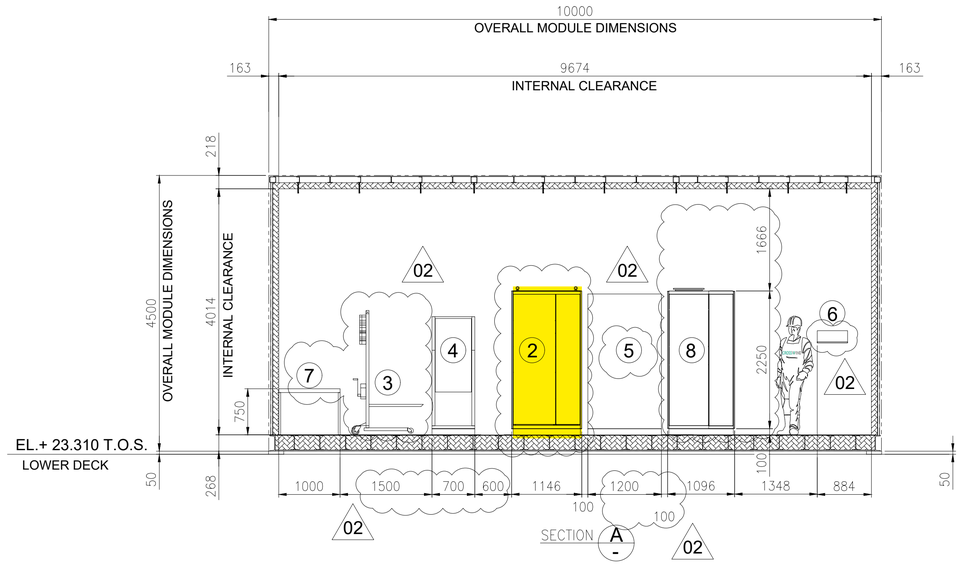
TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207	TYPE / SERIAL N° :	MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769)
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	N°7715/24 _ 10/07/2024

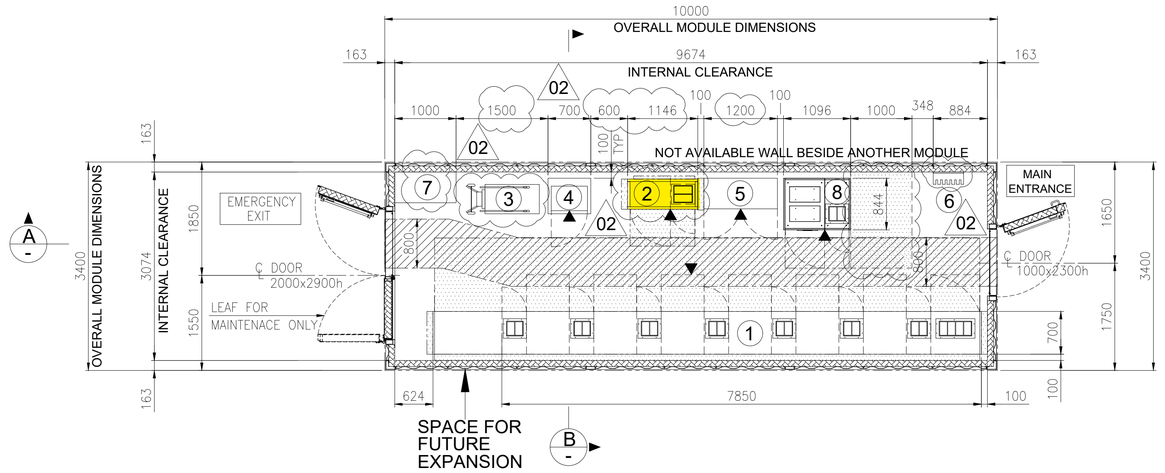
Comments: Nota 4: refer to PL C30000679

	Performed by	☉ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-11-27	2024-12-03	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-11-27T15:29:56.923Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-03T13:58:20.348Z	

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02





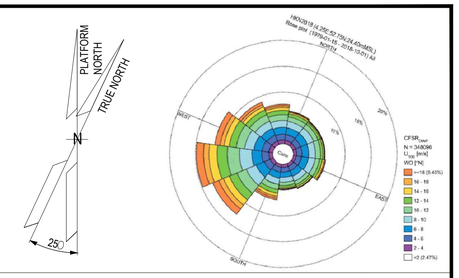


EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	
3	-	SERVICE TROLLEY FOR 400V SWITCHGEAR	1034	490	2030	
4	CN-200N1	ICCP PANEL	700	580	1830	
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	02
6	-	TOOL BOX	495	200	200	
7	-	TABLE	1000	500	750	
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

LEGEND

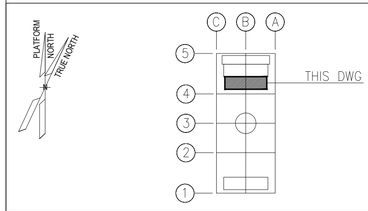
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
SG-200N1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00007
SG-200D2 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00008
DP-200N1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00009
AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00004
AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM	1724000372-EL-DG-00011
B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00015
ICCC PANEL GENERAL ARRANGEMENT DRAWING	144671-CORR-TF-FAB-DWG-0003

02

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	08/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

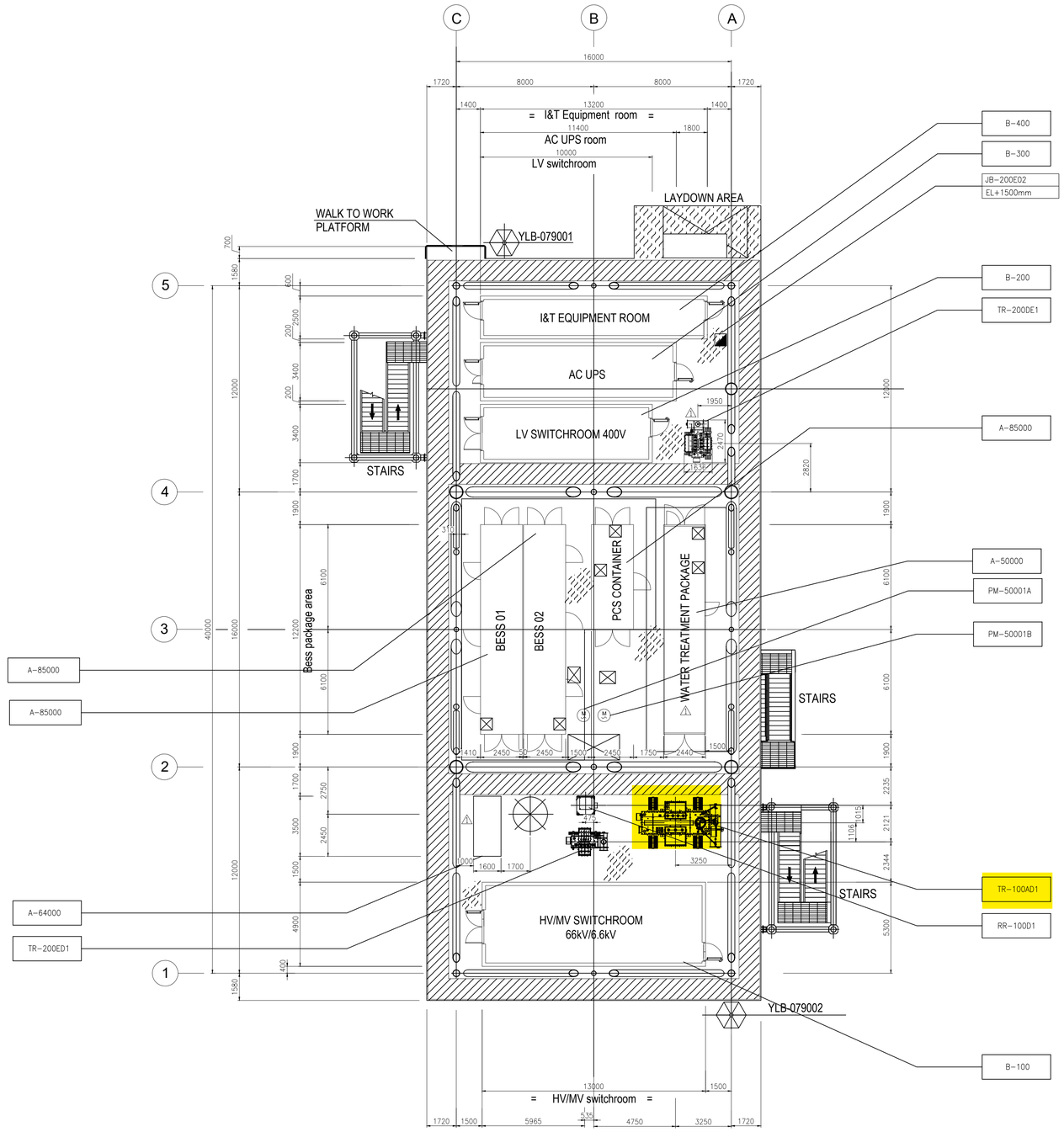
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN FMO	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20105	SHEET 001	REV. 02

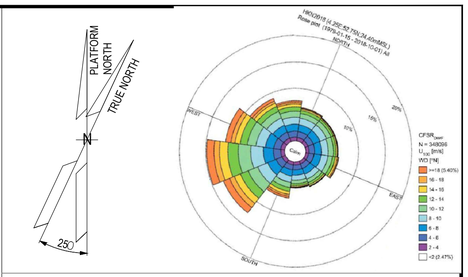
File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

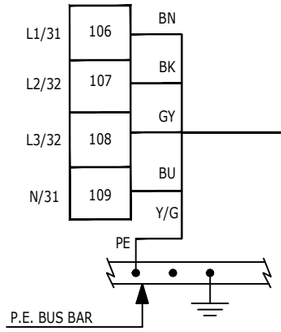
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150	
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24	
A1	DRAWING NO. 123A90-DDL-EL-DL-20101		SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM	TO

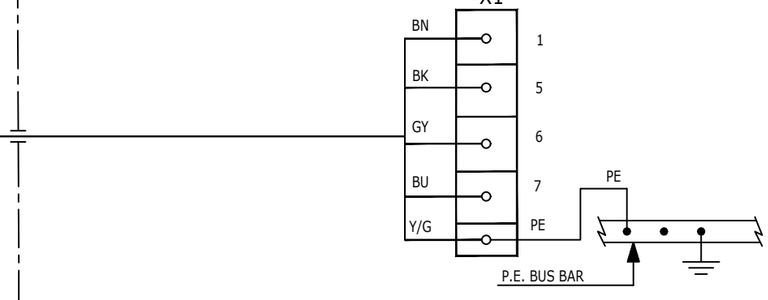
DESCRIPTION: LIGHTING & SMALL POWER DB BOP
TAG NUMBER: DP-200N1

CUBICLE/CB: +03/Q31

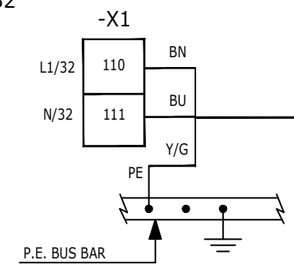


83112-CEL
5G4 mm²

DESCRIPTION: AUXILIARY TRAFO OLTC
TAG NUMBER: CP-100E2

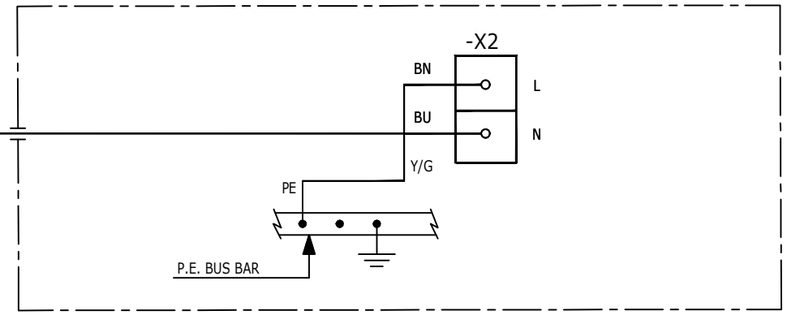


CUBICLE/CB: +03/Q32

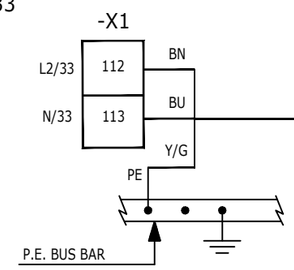


83113-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO AVR
TAG NUMBER: CP-100E3

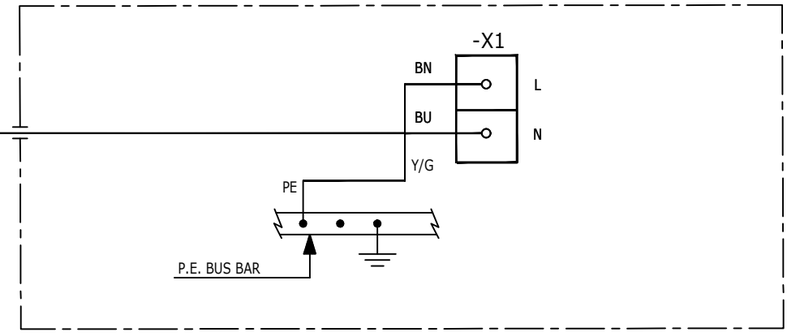


CUBICLE/CB: +03/Q33



83114-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO 7MVA
TAG NUMBER: CP-100E4



VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DG-20149
REV.: 2_B | DATE: 26/11/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
LIGHTING & SMALL POWER DB BOP

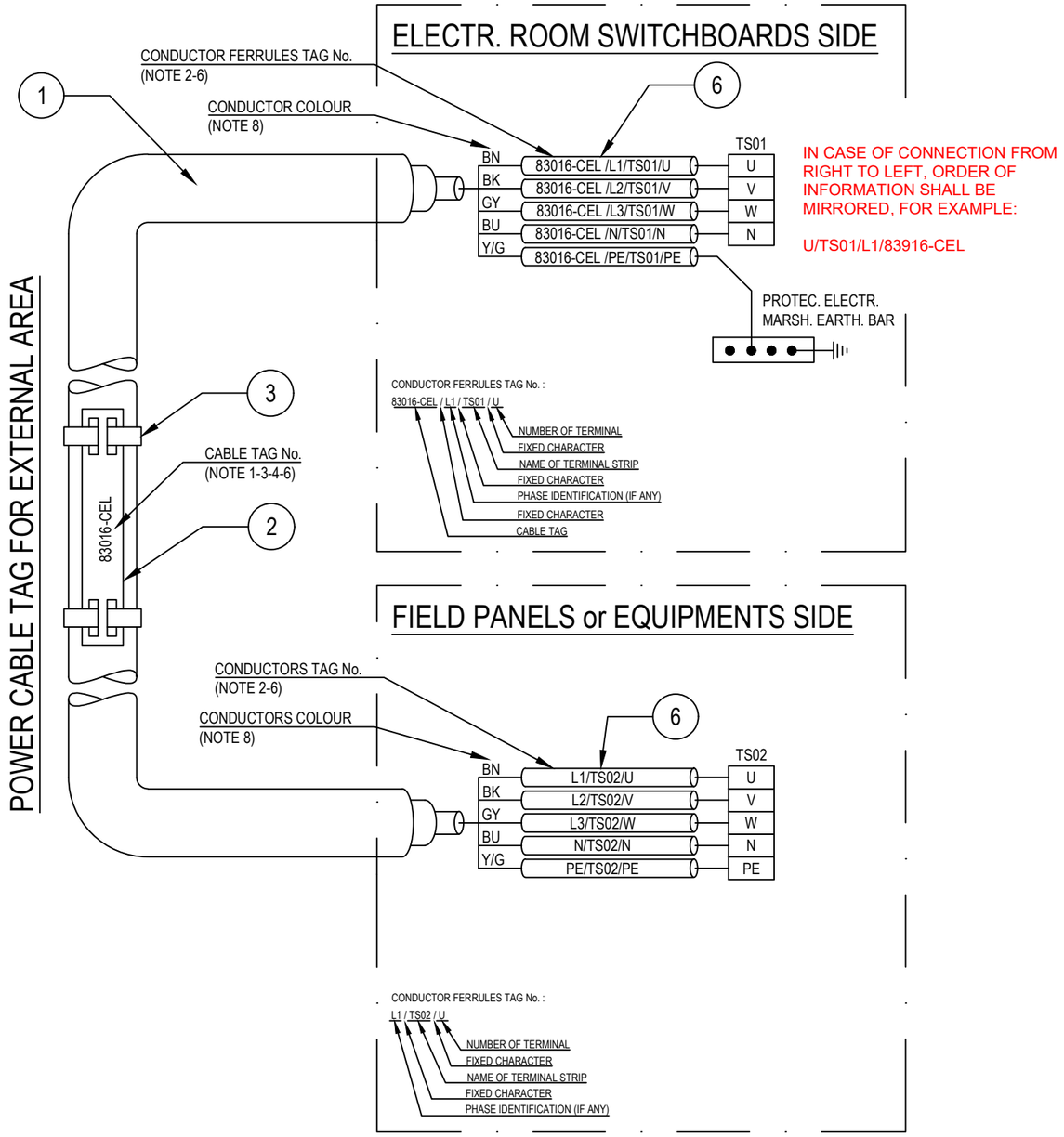
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 054 | REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

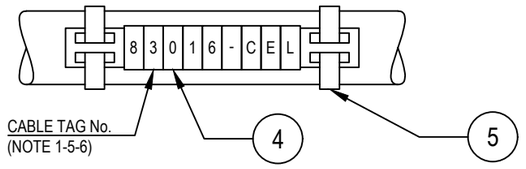
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

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

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

F.to UNI A3: 420mmx297mm

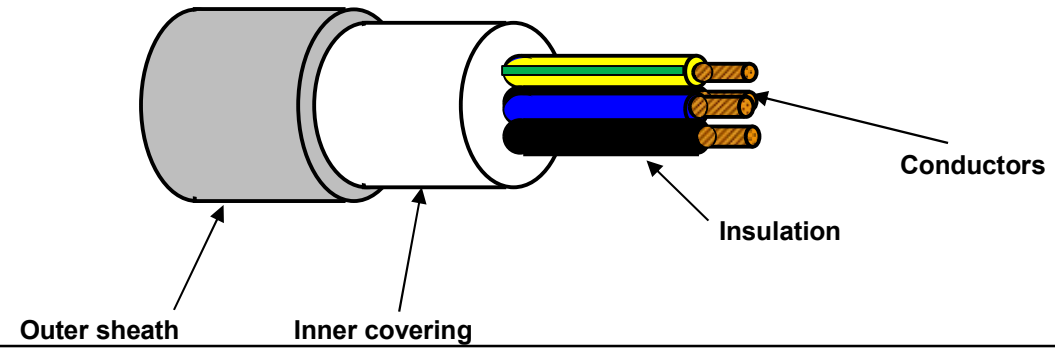
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Disciplin	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
83114-CEL	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						DP-200N1	LV 0,4 / 0,23 kV Distribution Switchgear	Lower Deck (B-200)	CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	ELECV06-3G2,5	Cable Cu Cl.2/EPR/LSZH 0,6/1kV 3G2,5mm² - Grey	M20	n.a.			T1_M20_Single				L-450-101-LVT-030 / L-600-101-LVT-020 / L-600-101-LVT-019 / L-600-101-LVT-017 / E-MCT-203 / L-750-101-LVT-013 / L-750-101-LVT-014 / L-600-101-LVT-094 / L-450-101-LVT-072 / L-150-101-LVT-090

FLEI s.r.l.

Cu Cl.2/EPR/LSZH 0,6/1 KV

3G2,5 - L.V. POWER CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	EPR compound, quality to IEC 60092.360, Nominal Thickness 1,0 mm	
Cores colour code :	**Brown - Blue - Yellow/Green**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	Not required	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 3G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,0 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1100 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ITEM	Tag	83115-CEL	: Lighting & Small Power DB BoP / Auxiliary NER		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-200/LD	
TASK	code	C10000634	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX09	LV Power Cable

CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 3G2,5 mm2 | Color: GREY

From: DP-200N1 | To: RR-100D1

1	Confirm cable is as specified in project cable schedule	OK
2	Visual Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	OK
7	Check gland plate for single core cables is non ferrous (non -magnetic).	NA
8	Confirm cable labelling is in accordance with specifications.	PL
9	Check cable is correctly loomed and segregated in accordance with specification.	OK
10	Check cable earthing against lastest drawings.	OK
11	Check cores marking are in accordance with termination diagram	PL
12	Check terminations are in accordance with latest termination diagram	OK
13	If required produce Red Line Mark Up for "AS BUILT"	

ROSETTI MARINO PROVERLIS CROSSWIND

ITEM	Tag	83115-CEL	: Lighting & Small Power DB BoP / Auxiliary NER			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-200/LD
TASK	code	C10000634		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX09 LV Power Cable

	CONTINUITY			
5	CORE CONTINUITY Ω	PH 1	0,5	
6		PH 2	0,5	
7		PH 3	NA	
8	ARMOUR CONTINUITY Ω		NA	
9	PROTECTIVE CONDUCTOR CONTINUITY Ω		0,5	
	INSULATION			
10	CORES / ARMOUR+EARTH MΩ	PH1 / PH2-PH3-A-E	>999	
11		PH2 / PH1-PH3-A-E	>999	
12		PH3 / PH1-PH2-A-E	NA	
13	CABLE IS CORRECTLY RE-CONNECTED.		Yes	

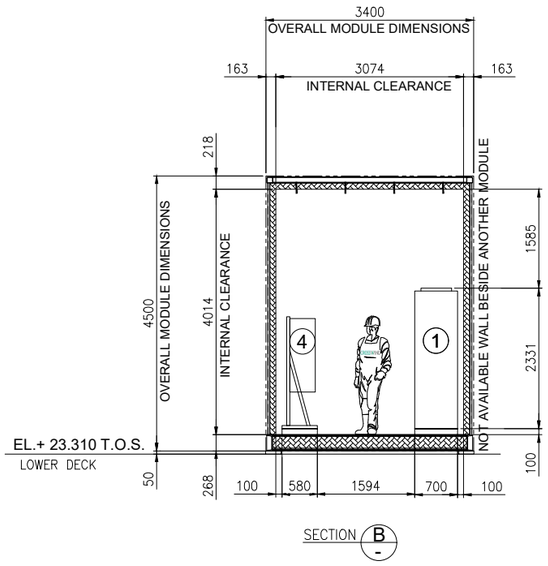
TESTING INSTRUMENTS USED

TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207	TYPE / SERIAL N° :	MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769)
Calibration certificate N° and date:	N°7722/24 _ 10/07/2024	Calibration certificate N° and date:	N°7715/24 _ 10/07/2024

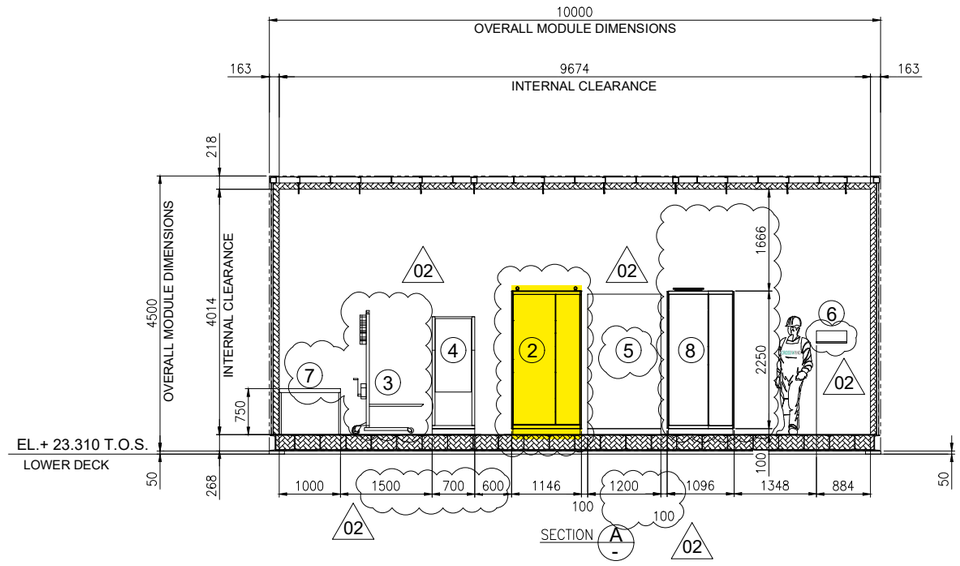
Comments: Nota 4: refer to PL C30000679

	Performed by	☉ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-11-27	2024-12-03	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-11-27T15:30:14.452Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-03T13:40:34.114Z	

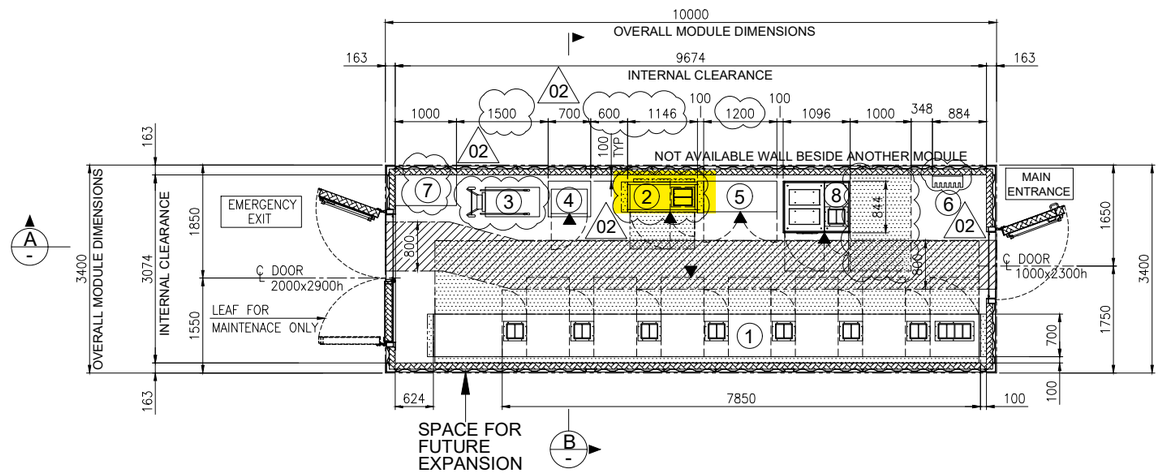
DRAWING NO. 123A90-DDL-EL-DL-20105 | REV. 02



SECTION B



SECTION A



A

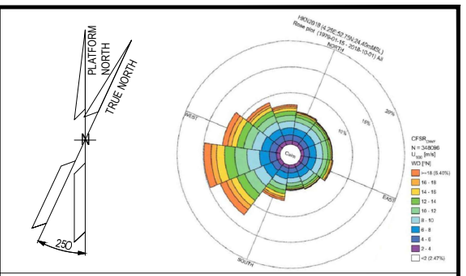
B

EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	SG-200N1	400V SWITCHGEAR	7850	700	2331	
2	DP-200N1	DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P.	1146	520	2250	
3	-	SERVICE TROLLEY FOR 400V SWITCHGEAR	1034	490	2030	
4	CN-200N1	ICCP PANEL	700	580	1830	
5	B200-HSB-001	DISTRIBUTION & HVAC PANEL - LV ROOM	1200	600	1900	02
6	-	TOOL BOX	495	200	200	
7	-	TABLE	1000	500	750	
8	SG-200D2	ACB PANEL FOR SOLAR PACKAGE	1096	844	2294	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

LEGEND

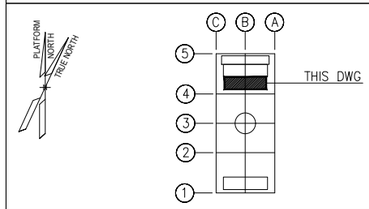
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
SG-200N1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00007
SG-200D2 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00008
DP-200N1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00009
AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00004
AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM	1724000372-EL-DG-00011
B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00015
ICCC PANEL GENERAL ARRANGEMENT DRAWING	144671-CORR-TF-FAB-DWG-0003

02

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	08/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

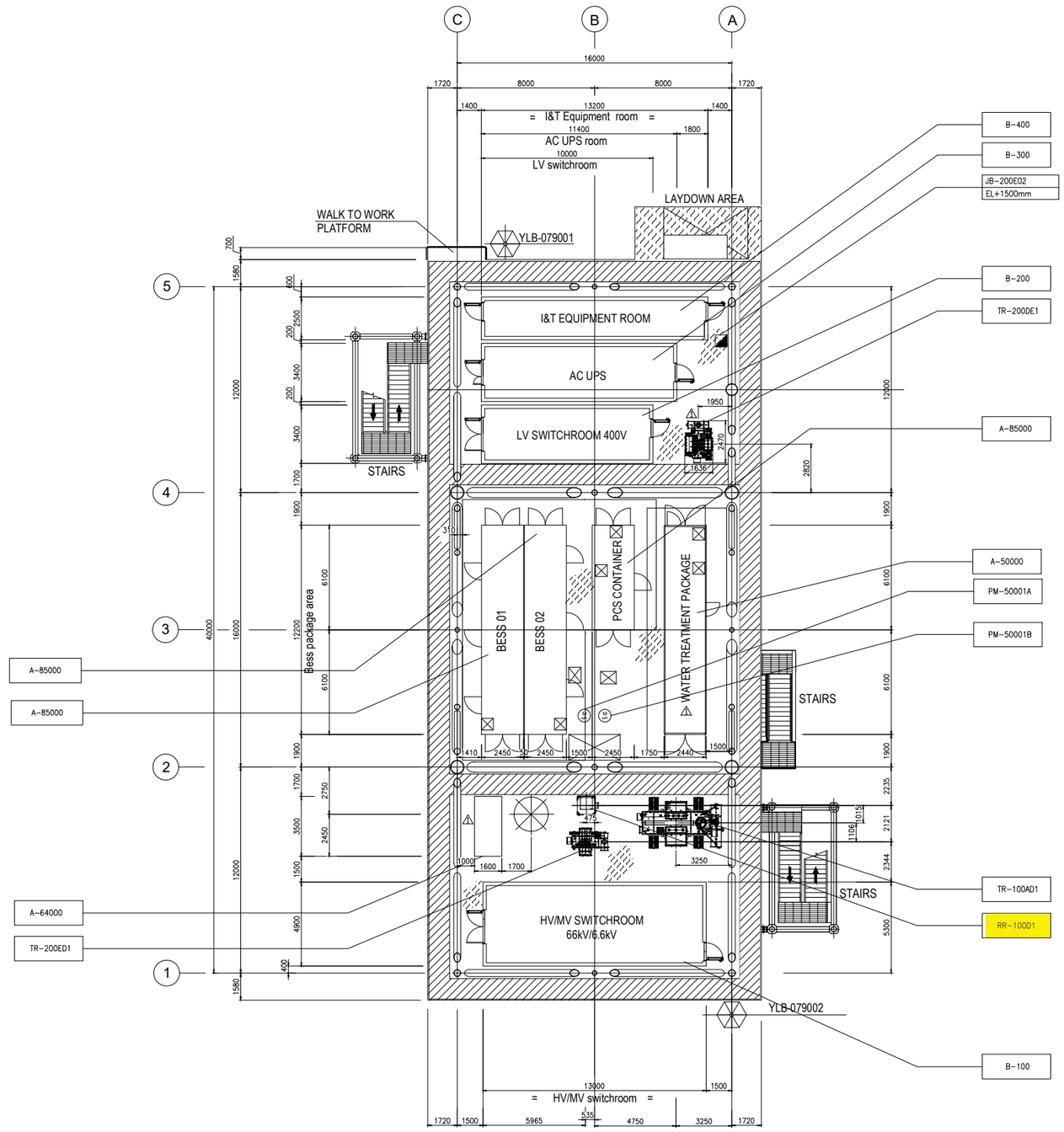
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN FMO	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20105	SHEET 001	REV. 02

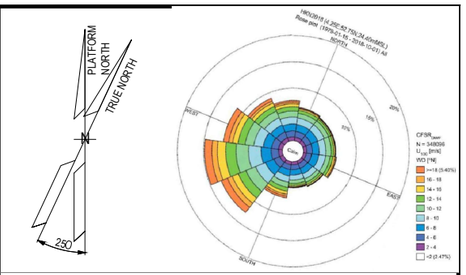
File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

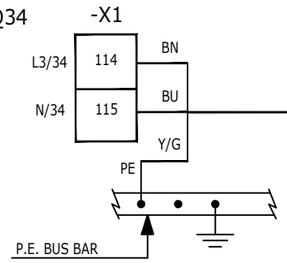
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM	TO

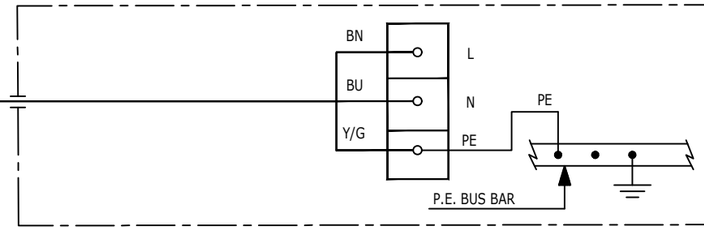
DESCRIPTION: LIGHTING & SMALL POWER DB BOP
TAG NUMBER: DP-200N1

CUBICLE/CB: +03/Q34

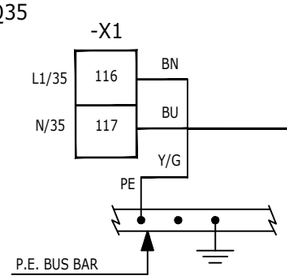


83115-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY NER
TAG NUMBER: RR-100D1

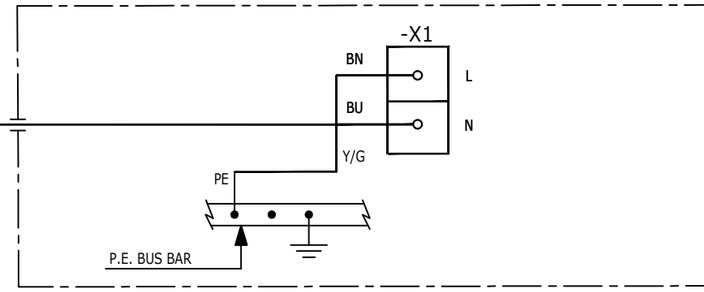


CUBICLE/CB: +03/Q35

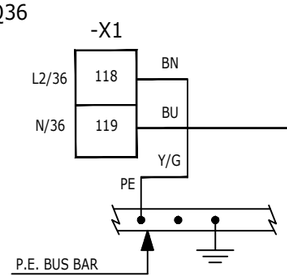


83116-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO 1,6MVA
TAG NUMBER: CP-200E1

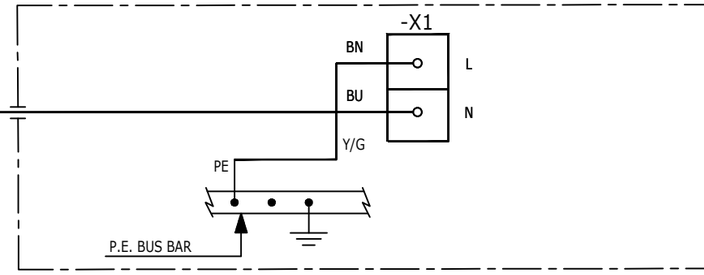


CUBICLE/CB: +03/Q36

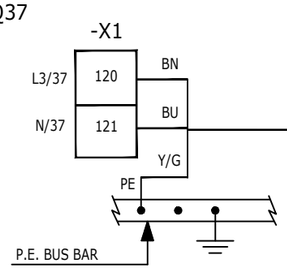


83117-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO SOLAR 0,5MVA
TAG NUMBER: CP-200E2

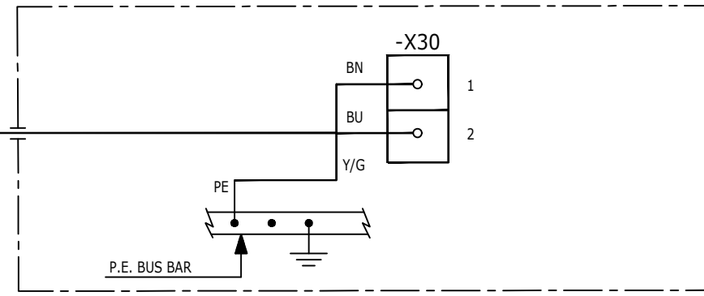


CUBICLE/CB: +03/Q37



83118-CEL
3G6 mm²

DESCRIPTION: AUXILIARY GIS
TAG NUMBER: CP-100E1



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

REV.:	DATE:	SIGNATURE:
2_B	26/11/24	G.Randi

ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

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. 123A90-DDL-EL-DG-20149

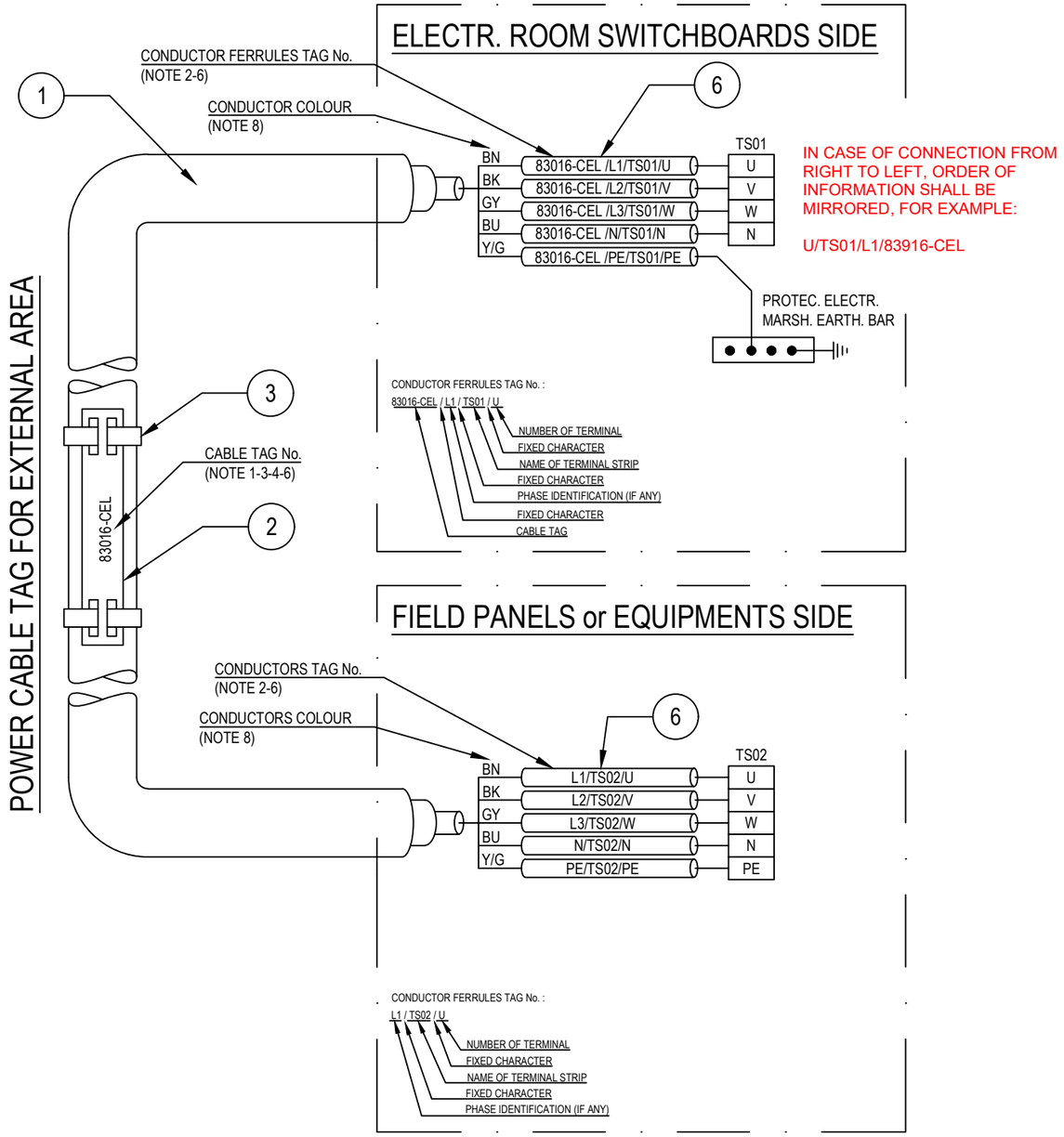
SHEET 055

REV. 02

F.to UNI A3: 420mmx297mm

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

C02



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

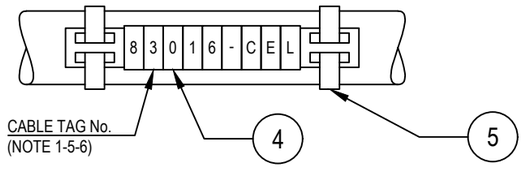
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

POWER CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

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

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20092	007	02

F.to UNI A3: 420mmx297mm

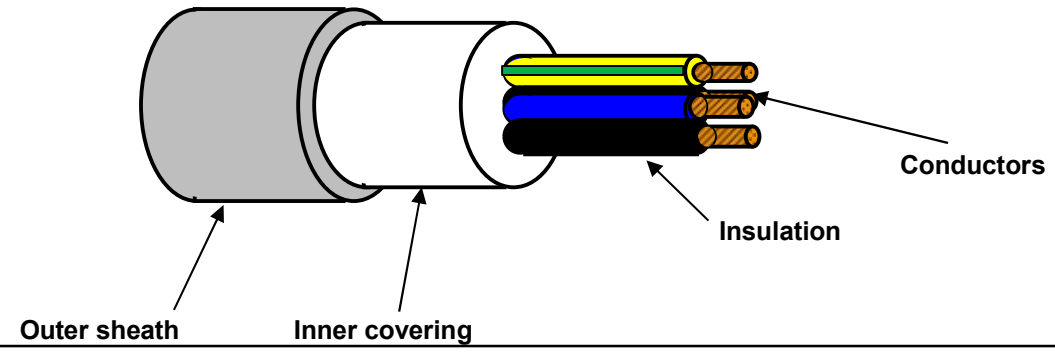
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
83115-CEL	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						DP-200N1	LV 0,4 / 0,23 kV Distribution Switchgear	Lower Deck (B-200)	RR-100D1	NER	Lower Deck	ELECV06-3G2,5	Cable Cu Cl.2/EPR/LSZH 0,6/1kV 3G2,5mm² - Grey	M20	n.a.			T1_M20_Single				L-450-101-LVT-030 / L-600-101-LVT-020 / L-600-101-LVT-019 / L-600-101-LVT-017 / E-MCT-203 / L-750-101-LVT-013 / L-750-101-LVT-014 / L-600-101-LVT-094 / L-150-101-LVT-089

FLEI s.r.l.

Cu Cl.2/EPR/LSZH 0,6/1 KV

3G2,5 - L.V. POWER CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	EPR compound, quality to IEC 60092.360, Nominal Thickness 1,0 mm	
Cores colour code :	**Brown - Blue - Yellow/Green**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	Not required	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 3G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,0 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1100 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	RR-100D1	: Neutral Earthing Resistor			Dwg	123A90-DDL-EL-DS-20011
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD
TASK	code	C10000863		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX21 Neutral Earthing Resistor

1	Check equipment is de-energized and safe.	OK
2	Check equipment is installed according layout.	OK
3	Check conformity to data sheet / project specification.	OK
4	Check earthing and bonding against drawings.	Note
5	Check coating integrity.	OK
6	Check connection: N/m	Note
7	Check equipment tagging against drawings (if tags are required).	OK
8	Check Supplier's documentation and drawings.	OK
9	If required produce Red Line Mark Up for "AS BUILT"	

NAME PLATE DATA

Manufacturer :	FM Trasformatori	Serial N° :	R240214-1A	Type	RESISTOR
Voltage	6900 V	Frequency	50 Hz	Data Sheet :	123A90-DDL-EL-DS-20011
Rating Ohm/Amp/sec :	9,96/400A/10s	Permanent :	199 V	Supplied from :	TELEMA

TESTING AND MEASUREMENT INSTRUMENT USED

Type	Serial n°	Calibration certificate	Validity

See Attached

TEST RESULTS

NER RESISTANCE	Ohm(measured)	Ohm(design)
Insulation resistance test (MOhm)	Test voltage (V)	MOhm

Comments: Note: (4;6) Check on cable connection,will be done during cable ispection.Please refer to the relevant ITR.

Page 1/1	Performed by	☑ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS Impianti Srl	RM (Rosetti Marino)	
Name	Carmelo Bongiovanni	Giovanni Tangianu	
Date	2024-09-11	2024-09-13	
Signature	PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-09-11T15:30:13.055Z	Firma Digitale Sicura Giovanni Tangianu 2024-09-13T10:10:37+0200	

Subject : NEUTRAL GROUNDING (EARTHING) RESISTOR

FACTORY ACCEPTANCE TEST REPORT

Ref. : TC230214-1 Rev. : 0

Date: Piacenza, 26/07/2024

CUSTOMER **MF TRASFORMATORI s.r.l.**

CUSTOMER PURCHASE ORDER **77/24 dated 25/01/24**

TELEMA JOB NUMBER CO 240214

RESISTOR MODEL	R 230214-1
SYSTEM	CONSTANT VOLTAGE
OHMIC VALUE AT 20 °C	9,96 Ω +/- 5 %
INITIAL EARTH FAULT CURRENT / INSERTION TIME	400 A for 10 seconds
RATED VOLTAGE	6,91 /√3 kV
RATED VOLTAGE (CONSTANT) DURING UNLIMITED PERIOD	199,2 V
INITIAL EARTH FAULT CURRENT DURING UNLIMITED PERIOD	20 A
INSULATION CLASS	12 / 28 / 75 kV
RATED FREQUENCY	50 Hz
OVER TEMPERATURE OF RESISTOR ELEMENTS	760 °C
RESISTOR ELEMENSTS MATERIAL / TEMPERATURE COEFFICIENT	AISI 316L / 0,00082 /K
PROTECTION DEGREE RESISTOR COMPARTMEN / EQUIPMENTS COMPARTMENT	IP 54 / 55

Nr.	DESCRIPTION OF TESTS AND CONTROLS	PROCEDURE	ACCORDING TO	RESULT
1	Verification of conformity to the Purchase Order	Visual	77/24	POSITIVE
2	Verification of conformity to the Purchase Order documents attached	Visual	//	POSITIVE
3	Verification of gauging and calibration of check / test instrumentation	Visual	Telema Procedure "BT"	POSITIVE
4	Visual check of the equipment	Visual	DS 240214 -1 R. 0	POSITIVE
5	Check of binding dimensions	Steel tape line	DS 240214 -1 R. 0	POSITIVE
6	Check of satisfactory fit of all covers (bent, twisted, close, latch)	Visual	DS 240214 -1 R. 0	POSITIVE
7	Visual check of protection degree	Visual	DS 240214 -1 R. 0	POSITIVE
8	Arrangement of components, devices and accessories	Visual	DS 240214 -1 R. 0	POSITIVE
9	Check of integrity of all components, devices and accessories	Visual	DS 240214 -1 R. 0	POSITIVE
10	Functional check of components, devices and accessories	(where possible)	DS 240214 -1 R. 0	POSITIVE
11	Check of integrity of wiring terminal connection	Visual	DS 240214 -1 R. 0	POSITIVE
12	Check of cables and terminal-boards marking	Visual	DS 240214 -1 R. 0	POSITIVE
13	Check of nameplate	Visual	DS 240214 -3 R. 0	POSITIVE
14	Measurement of ohm value at cold condition (ambient temperature) of the completely assembled resistor	Digital Double Bridge	C57.32a-2020 / IEC 60076-25-2023	See Tab. 1
15	Measurement of insulation resistance (> 400 MΩ a 1000 Vcc)	Megger test	IEC Std. 62271	POSITIVE
16	Dielectric test - High voltage withstand test at 28 kV - 50 Hz for 60"	Primary circuit	IEC Std. 62271 / 60060-1	POSITIVE
17	Dielectric test - High voltage withstand test at 2 kV - 50 Hz for 60"	Auxiliary circuit	IEC Std. 62271 / 60060-1	POSITIVE
18	Check of Sub-suppliers Test Reports	Visual		POSITIVE

TAB. 1 - MEASURED OHMIC VALUE

CUSTOMER TAG NUMBER	TELEMA SERIAL NUMBER	SECTION	NOMINALE OHMIC VALUE	MEASURED OHMIC VALUE	AMBIENT TEMPERATURE	NOTE
	R 230214 -1 A		9,96 Ω	10,27 Ω	31 °C	

TELEMA S.p.A.
Piera Cordani
Quality Assurance department

Cordani Piera

Sheet 1 of 1

Subject : NEUTRAL GROUNDING (EARTHING) RESISTOR

DECLARATION OF CONFORMITY

Ref. : DC 240214 Rev. : 0

Date: Piacenza, 10/09/2024

CUSTOMER	**MF TRASFORMATORI s.r.l.**
CUSTOMER PURCHASE ORDER	**77/24 dated 25/01/24**
TELEMA JOB NUMBER	CO 240214
RESISTOR MODEL	R 230214-1
SYSTEM	CONSTANT VOLTAGE
OHMIC VALUE AT 20 °C	9,96 Ω +/- 5 %
INITIAL EARTH FAULT CURRENT / INSERTION TIME	400 A for 10 seconds
RATED VOLTAGE	6,91 /√3 kV
RATED VOLTAGE (CONSTANT) DURING UNLIMITED PERIOD	199,2 V
INITIAL EARTH FAULT CURRENT DURING UNLIMITED PERIOD	20 A
INSULATION CLASS	12 / 28 / 75 kV
RATED FREQUENCY	50 Hz
OVER TEMPERATURE OF RESISTOR ELEMENTS	760 °C
RESISTOR ELEMENSTS MATERIAL / TEMPERATURE COEFFICIENT	AISI 316L / 0,00082 /K
PROTECTION DEGREE RESISTOR COMPARTMEN / EQUIPMENTS COMPARTMENT	IP 54 / 55

DECLARATION OF CONFORMITY (rif.: EN ISO/IEC 17050-1 & EN ISO/IEC 17050-2)

TELEMA S.p.A, Via Salvoni, 60 - Frazione Quarto - 29122 Piacenza - Italia, certify that the following equipment:

TELEMA SERIAL NUMBER

R 230214 -1 A

is in conformity (where applicable) with the following standards:

C57.32a-2020	IEEE Standard for requirements, terminology, and test procedures for neutral grounding devices
IEC 60076-25-2023	Power transformers – Part 25: Neutral grounding resistors

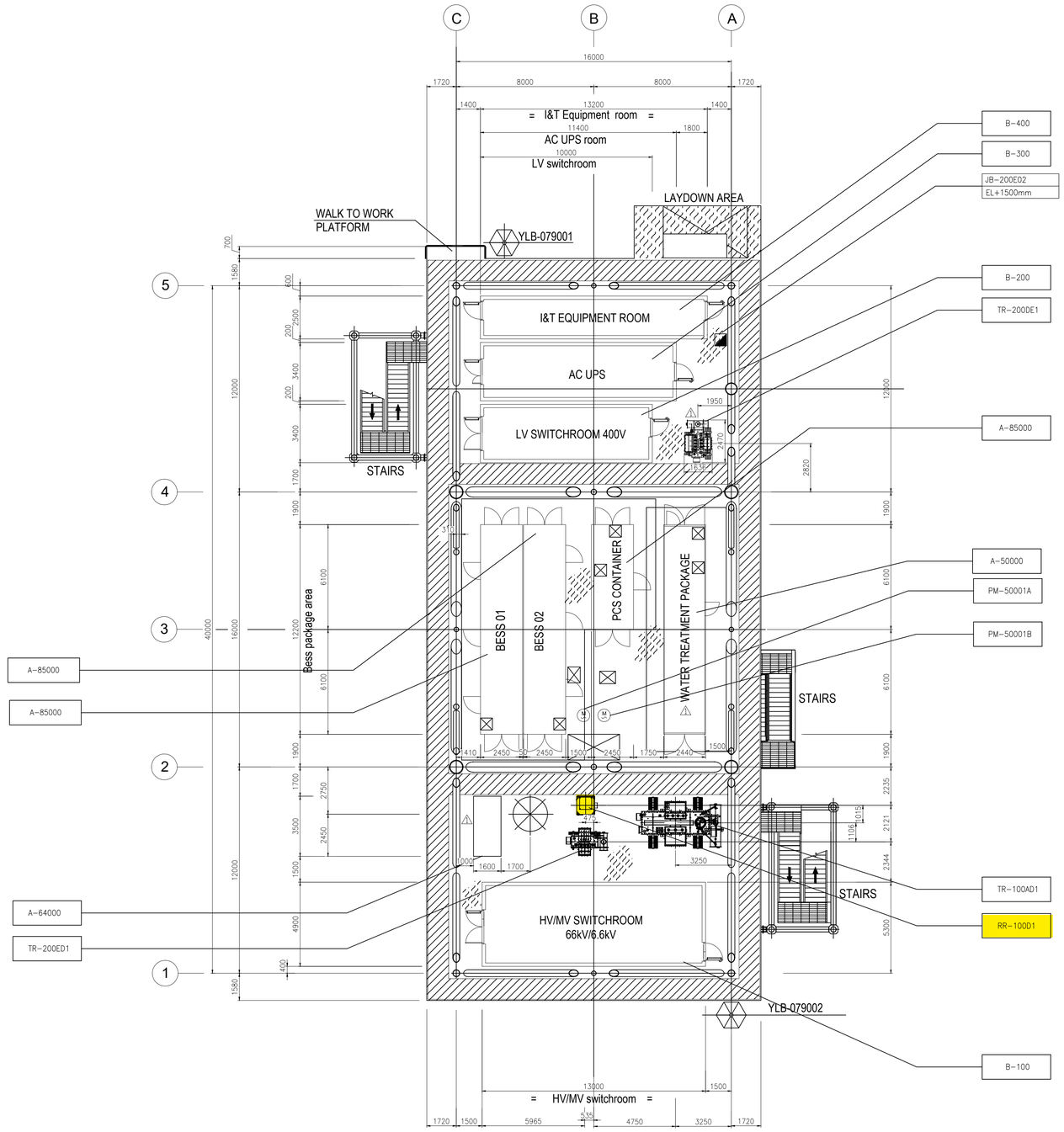
Note: this standard apply only with regard to thermal design and test. Complete equipment(s) will be tested, as described in the following chapters, in accordance with International Electro technical Commission (IEC) latest Standards and Codes of Practice of the National Standards Institution of the Country of Suppliers:

IEC 60038	IEC Standard Voltages
IEC 60060-1	High voltage test techniques – Part 1: General definitions and test requirements
IEC 60071	Insulation co-ordination
IEC 62271 -1	High-voltage switchgear and control gear – Part 1: Common specifications for alternating current switchgear and controlgear
IEC 62271 -102	High-voltage switchgear and control gear – Part 2, Alternating current disconnectors and earthing switches
IEC 60529	Classification of degrees of protection provided by enclosures
IEC 60137	Insulated bushings for alternating voltages above1000 V
IEC 60664-1	Insulation for equipment with low voltage systems – Part. 1_ Principles, requirements and tests
IEC 61364	Low Voltage Electrical Installations
IEC 60439	Low Voltage Switchgear and Control Gear Assemblies
IEC 61439	Low Voltage Switchgear and Control Gear Assemblies
IEC 60947	Low voltage switchgear and control-gear
IEC 61000	Electro Magnetic Compatibility
EMC 2014/30/EU	Electro Magnetic Compatibility
2006/42/CE	Machine Standard
LVD 2014/35/EU	Low Voltage Standard

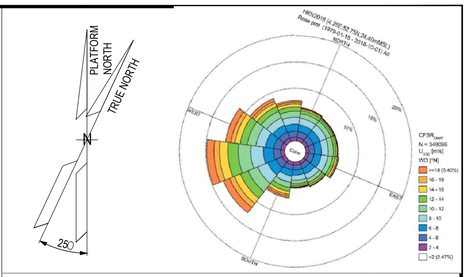
TELEMA S.p.A. **Piera Cordani** Quality Assurance department	Cordani Piera	Sheet 1 of 1

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

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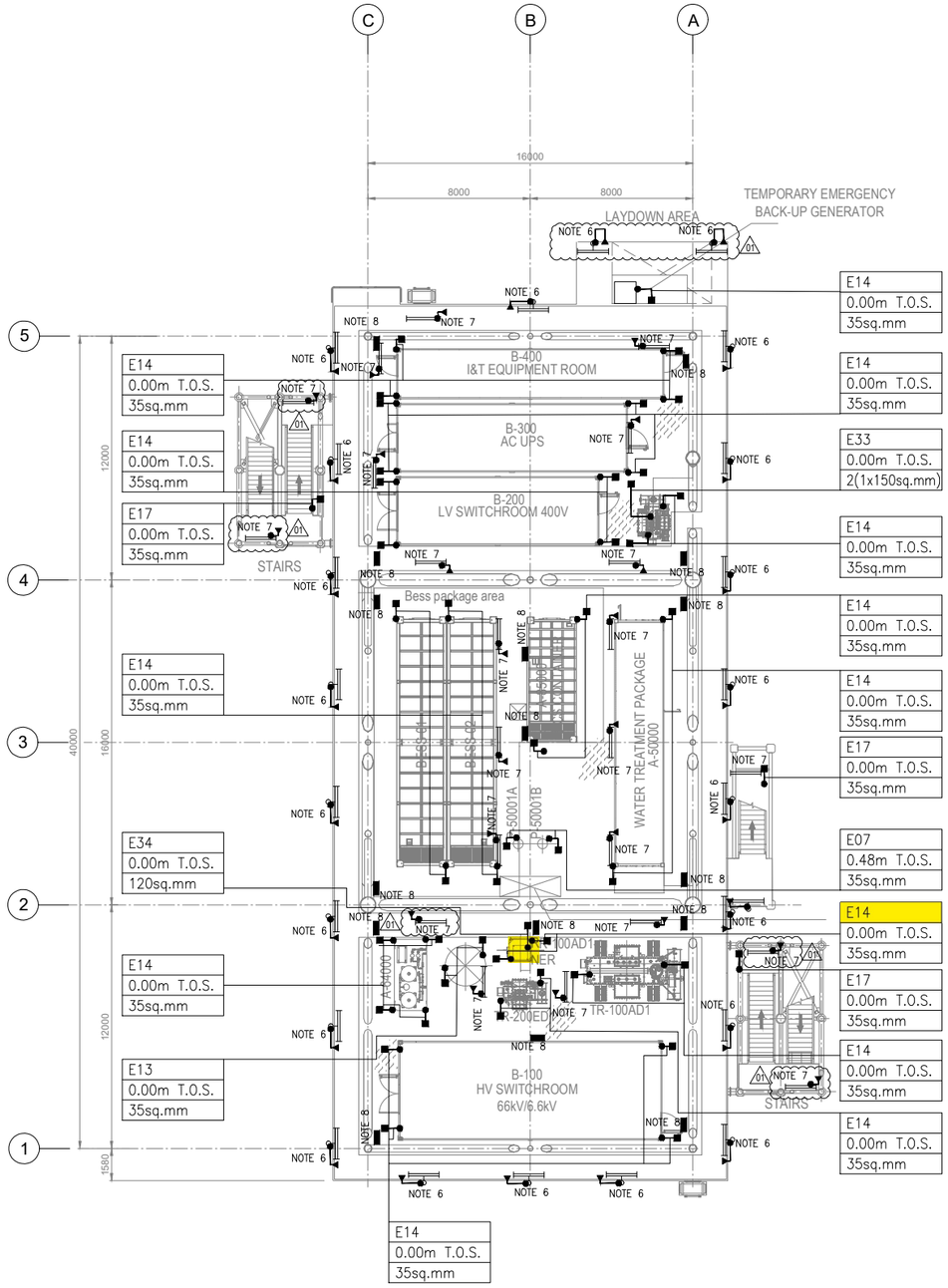
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

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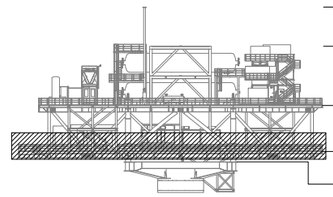
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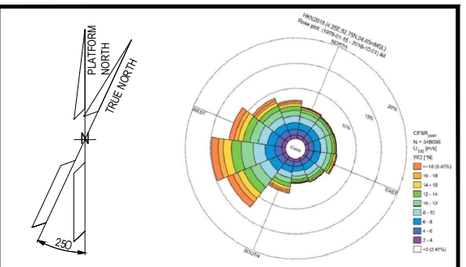
REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.

KEY PLAN





NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE GIVEN IN mm UNLESS OTHERWISE NOTED.
2. ELEVATIONS REFER TO T.O.S.
3. THIS DOCUMENT IS ONLY VALID FOR EARTHING LAYOUT.
4. ALL ELECTRICAL EQUIPMENT NOT DIRECTLY WELDED TO SKID FRAME SHALL BE BONDED TO STEEL TO THE STRUCTURE OF SKID BASEFRAME.
5. FOR LIGHTNING PROTECTION SYSTEM SURGE PROTECTIVE DEVICES (SPD), REFER TO THE DOCUMENT 123A90-DDL-EL-RE-20154.
6. ALL NON-WELDED POLES WILL BE EARTHED AS PER TYPICAL E05 AND E24. 01
7. ALL LINEAR LIGHTING FIXTURE WILL BE EARTHED AS PER TYPICAL E32.
8. EARTH BAR WILL BE FIXED TO THE PRIMARY BEAMS OF THE UPPER DECK. COMPLETE EARTHING INCLUDING WITH 2 THREADED STUDS. ALL EARTH BAR WILL BE EARTHED AS PER TYPICAL E03D / 6.00M T.O.S. / 35 SQ MM.
9. EQUIPOTENTIAL BONDING GROUPING FOR BOLTED HANDRAILS ARE PROVIDED EVERY 3M FOR THE ENTIRE PERIMETER AS TYPICAL E16 AND WILL BE DEFINED DURING ASSEMBLY PHASE

LEGEND

- LIGHTING FIXTURE POLE MOUNTED
- LINEAR LIGHTING FIXTURE
- ■ EARTHING BOSS AISI316L
- ● COMPRESSION TYPE LUG TINNED COPPER
- ▲ THREADED STUD FOR EARTHING CONNECTION
- Exx EARTHING TYPICAL CODE
- ▬ EARTHING BAR

TYP.	TYPICAL
ELE	ELEVATION
SIZE	

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DD-20090	ELECTRICAL TYPICAL INSTALLATION DETAILS - EARTHING SYSTEM
123A90-DDL-EL-RE-20154	LIGHTNING PROTECTION SYSTEM CALCULATION REPORT
123A90-DDL-EL-DL-20119	LIGHTING & SOCKET LAYOUT - LOWER DECK
123A90-DDL-EL-DL-20101	ELECTRICAL EQUIPMENT LAYOUT - LOWER DECK

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	25/07/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	29/05/24	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

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TITLE : BASE LOAD POWER HUB (BLPH)
EARTHING & LIGHTNING LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SPS	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 25/07/24
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SHEET 001 OF 002

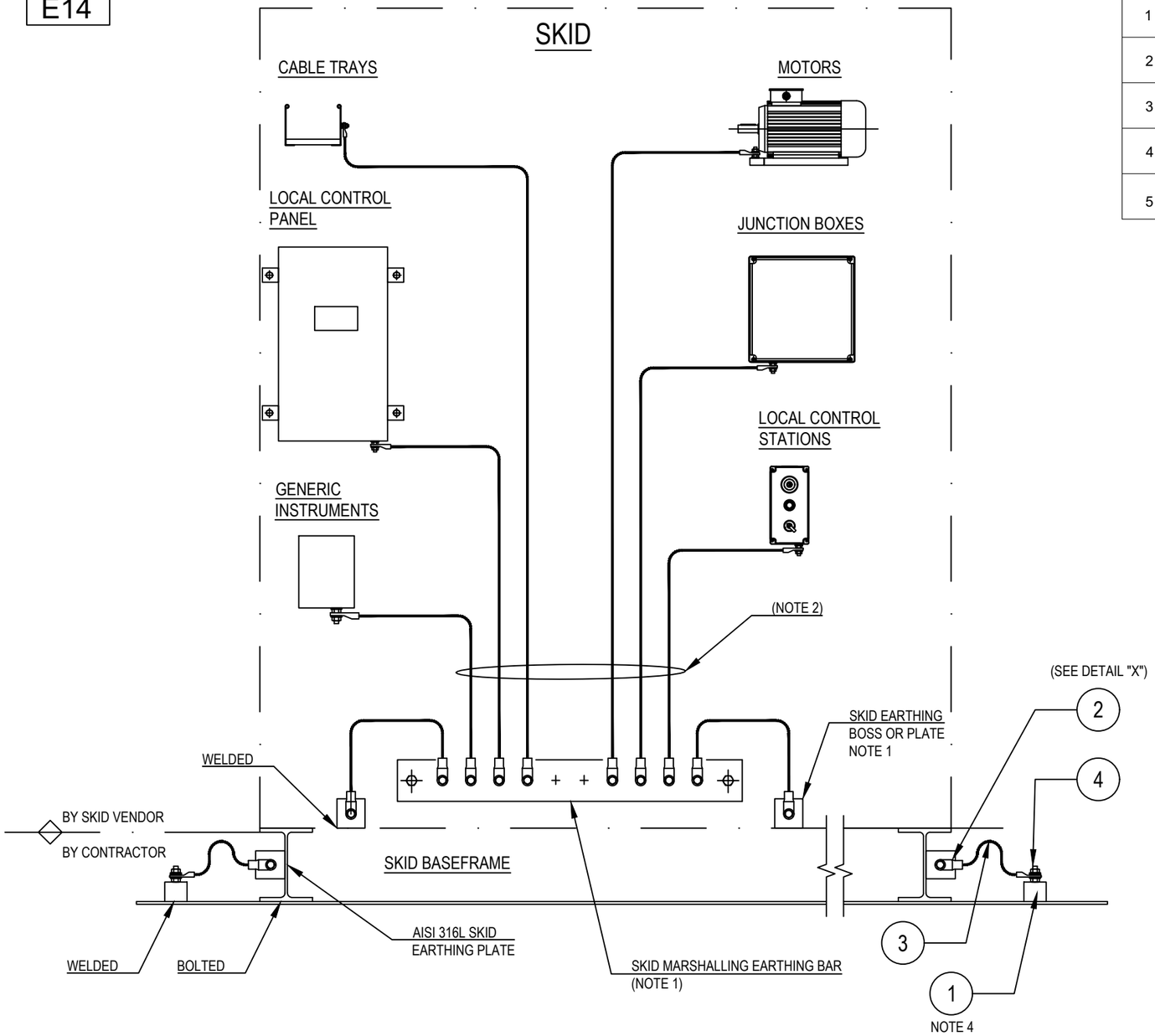
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REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

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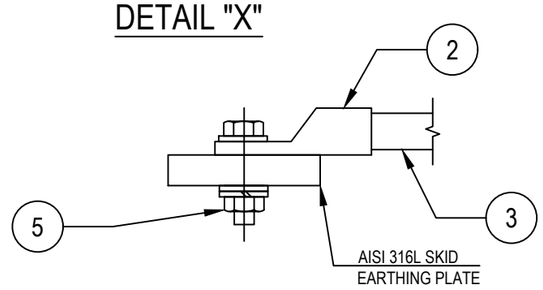
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E14



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	EARTHING BOSS WITH THREADED HOLE M10	AISI 316L	50X50		NOTE 5
2	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	$35mm^2$		NOTE 3
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	$35mm^2$		NOTE 3
4	STUD BOLT WITH PLANE WASHER, SPRING WASHER AND NUT	AISI 316L	M10X50		
5	HEXAG. BOLT COMPLETE WITH PLANE WASHERS, SPRING WASHER AND NUT	AISI 316L	M10X30		

DETAIL "X"



NOTES:
1) EARTHING BAR/BOSS/PLATE SUPPLIED BY SKID MANUFACTURER
2) ALL EQUIPMENTS AND CABLE TRAYS WILL BE EARTHING ON SKID EARTHING BAR BY SKID MANUFACTURER
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY
4) FOR EARTHING BOSS TYPICAL DETAIL E11
5) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20090**

REV.:	DATE:	SIGNATURE:
2_B	02/09/24	G.Randi

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REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
EARTHING FOR SKID BASEFRAME

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

A3 | DRAWING NO. 123A90–DDL–EL–DD–20090 | SHEET 014 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

BASE LOAD POWER HUB (BLPH)

RR-100D1 - General arrangement drawings

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	29/05/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/04/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	16/02/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

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TITLE : BASE LOAD POWER HUB (BLPH)
RR-100D1 – General arrangement drawings
FRONT PAGE

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

SCALE : NTS

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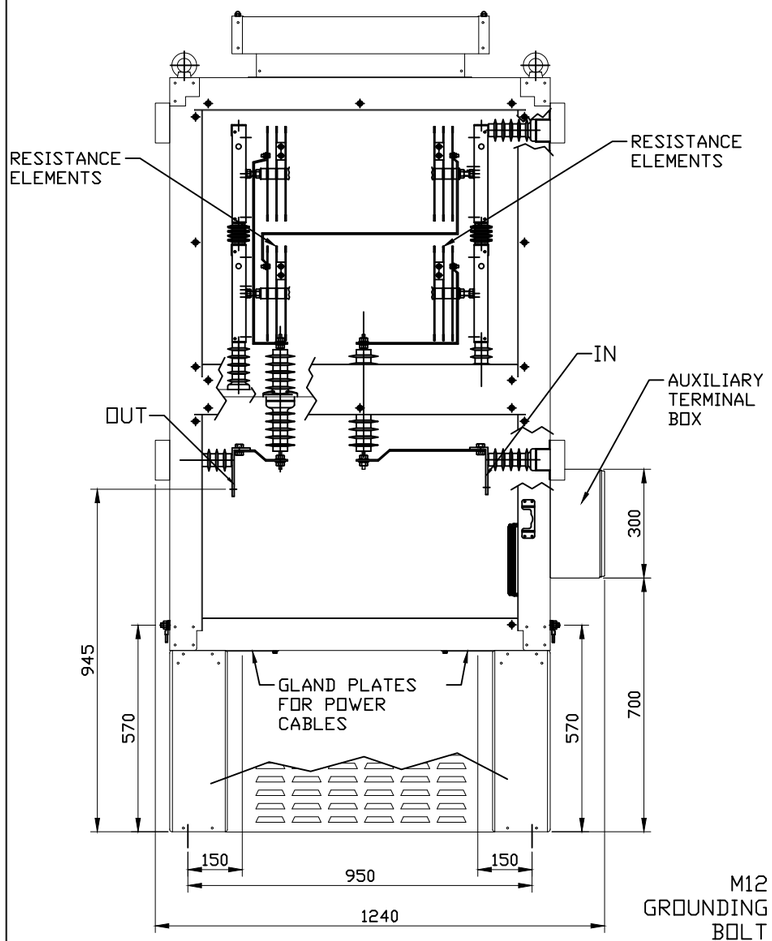
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REV. 02

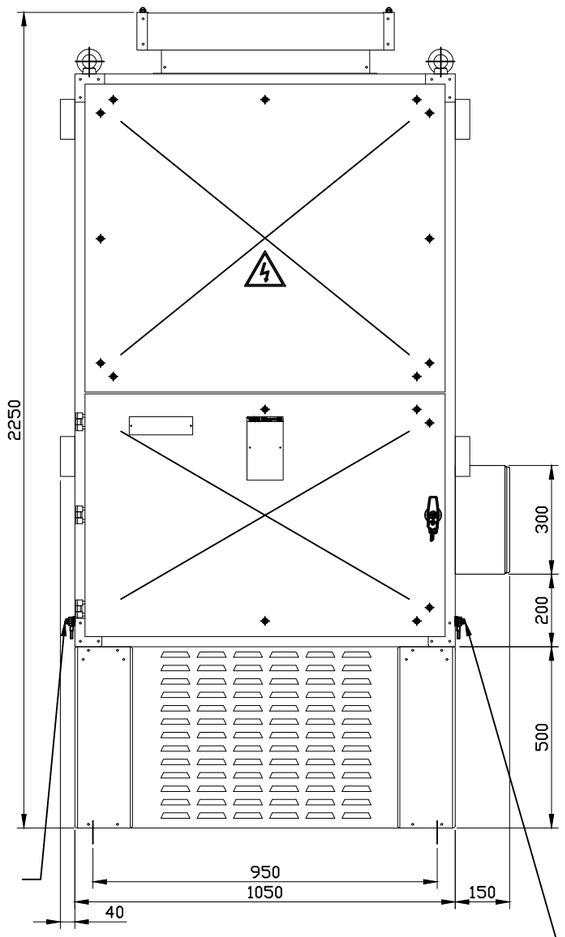
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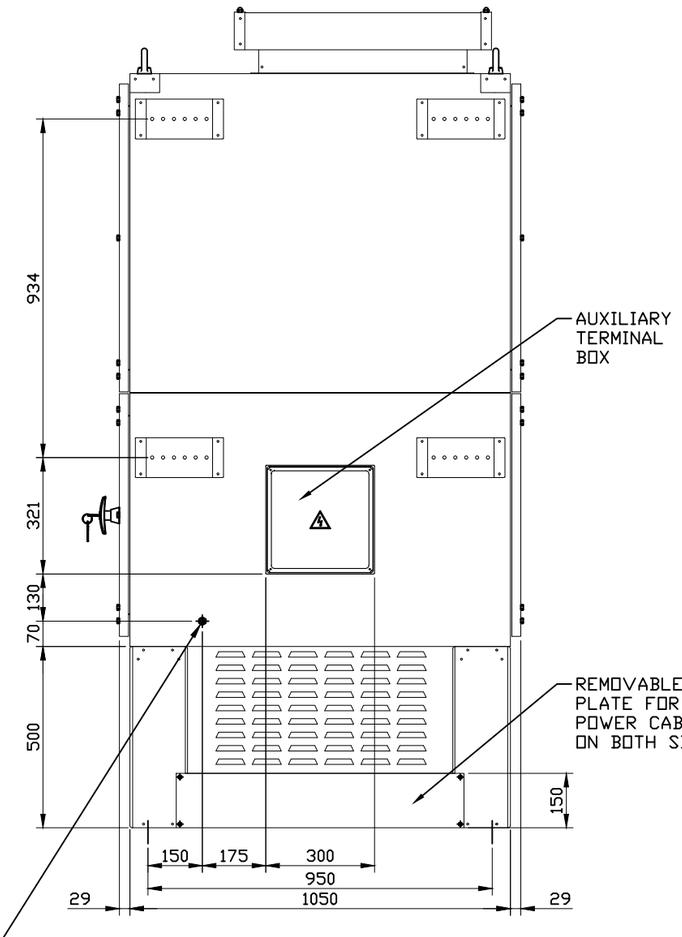
FRONT WIEW WITHOUT DOOR



FRONT VIEW WITH PANEL



RIGHT VIEW



ENCLOSURE MATERIAL: UNPAINTED STAILESS STEEL AISI 316L
PROTECTION DEGREE: IP55

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	29/05/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/04/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	16/02/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

MF Trasformatori srl

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TITLE : BASE LOAD POWER HUB (BLPH)
RR-100D1 – General arrangement drawings
GENERAL ARRANGEMENT

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

SCALE : NTS

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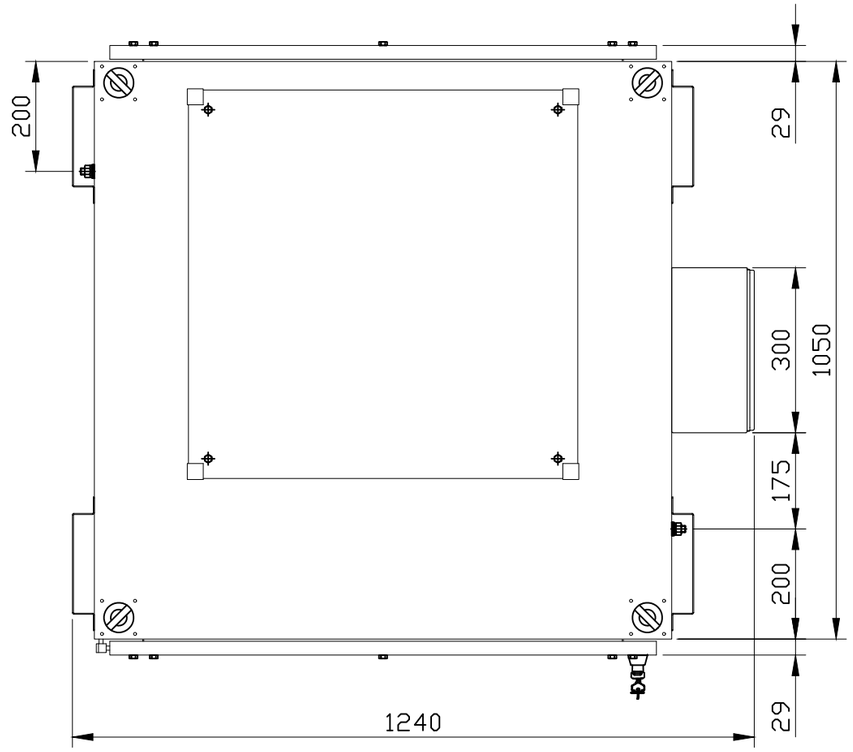
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REV. 02

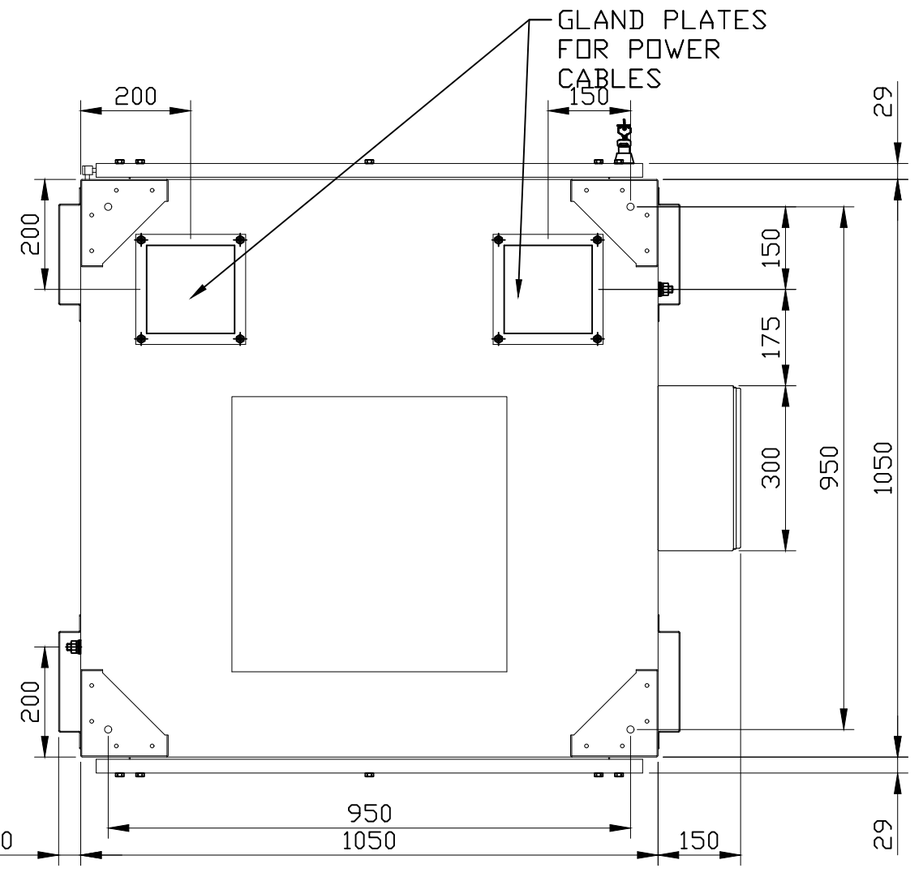
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File Name : 1723001697-EL-DA-00009 Rev. 02

TOP VIEW



BOTTOM VIEW



NORTH

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	29/05/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/04/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	16/02/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

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ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
RR–100D1 – General arrangement drawings
GENERAL ARRANGEMET

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

SCALE : NTS

A3

DRAWING NO. 1723001697–EL–DA–00009

SHEET 004

REV. 02

File Name : 1723001697–EL–DA–00009 Rev. 02

F.to UNI A3: 420mmx297mm

TELEMA S.P.A.
Via Salvoni, 60 - 29122 PIACENZA - ITALY
Tel +39 02 83382.1 - Fax +39 02 83382.206
e-mail: info@telemait.com

CE

NEUTRAL GROUNDING RESISTOR	R240214-1
YEAR OF MANUFACTURING	2024
SERIAL NUMBER	R240214-1A
NUMBER OF PHASES	1
RATED RESISTANCE AT 25 °C	9,96 OHM +/- 5%
RATED SHORT TIME CURRENT	400 A INITIAL
	285 A AFTER 10 SECONDS
RATED CONTINUOUS CURRENT	20 A
RATED TIME	10 SEC
TEMP. COEFFICIENT AT 30 °C	0,00074 /K
TEMP. RISE OVER 30 °C	760 °C AFTER 10 SEC
	385 °C CONTINUOUS DUTY
MAXIMUM CHANGE IN RESISTANCE	67 %
RATED FREQUENCY	50 Hz
RATED VOLTAGE	6,9 /√3 kV
INSULATION CLASS	12/28/75 kV
PROTECTION DEGREE	ENCLOSURE IP 55
	IN/OUT CABLE-BOX IP 55
	AUXILIARY TERMINAL-BOX IP66
INSTALLATION	OUTDOOR
AMBIENT TEMPERATURE	-10 / +40 °C
ALTITUDE	< 1000 m a.s.l.
COOLING	NATURAL VENTILATION
MASS	420 kg
STANDARD	IEEE C57.32a™-2020 - IEC 60076-25-2023
MADE IN	ITALY

RR-100D1

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	10/04/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	16/02/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
RR-100D1 – General arrangement drawings
RATING PLATE

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

A3 | DRAWING NO. 1723001697-EL-DA-00009 | SHEET 005 | REV. 02

File Name : 1723001697-EL-DA-00009 Rev. 02

F.to UNI A3: 420mmx297mm

Row		Data Sheet for Neutral Earthing Resistor (NER)				Rev.
1	Tag No. :	*RR-100D1*				01
2	Service :	*Neutral Earthing Resistor*				01
3	Ref. Clause	Description			Additional notes	
4		**1. General**				
5		Manufacturer :	MF Trasformatori srl			01
6		Vendor :	MF Trasformatori srl			01
7		Equipment identifier :	RR-100D1			01
8		Quantity :	1			
9		Type :	dry type natural air-cooled resistors			
10		Service :	for distribution transformer			
12		Conformity assessment system :	D			
11		**2. Environmental conditions**				
12		Altitude (if more than 1000m or 3280ft) :	not more than 1000 m	m		
13		Minimum ambient temperature :	-8,4	°C		
14		Maximum ambient temperature :	25	°C		
15		Yearly average ambient temperature :	10,5	°C		
16		Design ambient temperature (if more than 40 °C or 104 °F) :	not more than 40°C	°C	Offshore (Netherlands)	
17		Relative humidity at maximum operating temperature (if more	95	%		
18		Corrosion class :	CX			
19		Seismic zone as per IEC 60721-2-6, figure 5 :	zone 2			
20		Location :	offshore fixed			
21		Installation :	Outdoor			
22		Unusual service conditions :	No			
23		**3. Hazardous area classification**				
24		Hazardous area classification zone :	non hazardous			
25		Hazardous area classification temperature class :	N/A			
26		**4. Technical data**				
27		**4.1 Electrical system data**				
28		Rated voltage :	6,6	kV		
29		Rated frequency :	50	Hz		
30		**4.2 NER data**				
31		**4.2.1 General**				
32		**Resistor specific requirements**				
33		Application :	Permanent connection between star-point and earth			
34		Rated short time current :	400	A		
35		Time to withstand rated short circuit current :	10	s		
36		Initial current during continuous rating :	20	A		
37		Ohm value at 20°C :	9,96	Ohms		01
38		Maximum permanent voltage :	199	V		01
39		Reated Voltage :	6,9	kV		
40		Rated insulation level :	12	kV		01
41		Power frequency withstand voltage :	28	kV		01
42		Impulse withstand voltage :	75	kV		01
43		**4.2.2 Resistor**				
44		Type of resistive elements :	metal punch grid			01
45		Insulation of resistor elements :	completely insulated from earth			01
46		Maximun resistance variation :	67	%		01
47		Maximum temperature rise above 30 °C of resistor elements	760	°C		01
48		Maximum temperature rise above 30 °C of resistor elements for	385	°C		01
49		Maximum over temperature of enclosure for continuous current	<70	°C		01
50		Design temperature :	25	°C		
51		**4.2.3 Termination**				
52		Type of terminals :	Tinnes copper			01
53		Main external termination details :	cable box			
54		Cable box type :	air insulated			
55		Main cable box design :	supplier standard			
56		Cable type :	insulated			
57		Number of cables :	1			01
58		Cable conductor size :	120	mm²		01
59		Number of cores per cable :	1			01
60		**4.2.4 Cooling**				
61		Type of cooling :	Natural ventilation			
62		Provision for mounting of cooling fans :	N/A			
63		**4.2.5 Mechanical characteristics**				
64		**a. Construction**				
65		Enclosure thickness :	2	mm		01
66		Protection degree of resistor compartment (IP) :	55			
67		Protection degree of auxiliary termknal box compartment (IP) :	55			
68		Access required for installation /connection / maintenance :	Front			
69		Incoming / outgoing cables :	From bottom			
70		Cables ingress :	Removable Plate			
71		Surface finish :	stainless steel			01
72		Painting class required :	stainless steel			01
73		**b. Interface**				
74		Auxiliary supply voltage details for heater :	230	V ac		

75		**4.3. Accessories**				
76		Lifting lugs :	Yes			
77		Earthing cable lug size :	Suitable for 35mm² earthing cable	mm		01
78		Current transformer :	N/A			
79		Auxiliary terminal-box :	Yes			
80		Heater :	Yes			
81		Nameplate :	Yes			
82		Warning labels :	Yes			
83		**4.4. Dimensions & weight**				
84		Length :	1200	mm		01
85		Depth :	1050	mm		01
86		Height :	2250	mm	500mm enclosure feet	01
87		Net weight :	390	kg		01
88		**5. Transport (packaged)**				
89		Limiting transportation dimensions (height) :	1350	mm		01
90		Limiting transportation dimensions (width) :	1200	mm		01
91		Limiting transportation dimensions (depth) :	2650	mm		01
92		Limiting transportation weight :	680	kg		01

ITEM	Tag	TR-100AD1	: 66 / 6.9 kV 7 MVA Transformer			Dwg	123A90-DDL-EL-DS-20002
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD
TASK	code	C10000867		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX02 Power Transformer LV/HV

1	Check transformer is de-energized and safe.	OK
2	Check transformer rating plate is correct.	OK
3	Check conformity to latest data sheet /project specification.	OK
4	Check transformer installation against latest drawings.	Note
5	Check dielectric levels are correct with no leak (visual check).	OK
6	Check transformer access is properly protected and warning labels and safety instructions are adequately posted.	OK
7	Check primary terminations are clean, undamaged and correctly identified (phase).	OK
8	Check secondary terminations are clean, undamaged and correctly identified (phase).	OK
9	Check all termination enclosures have correct gaskets and fixing bolts.	OK
10	Check accessories according to data sheet are correctly installed and undamaged (themometers, relay, fans etc...).	OK
11	Check tap changer selector is correclty fitted and locked in the mid position (where applicable).	OK
12	Check On load tap changer control panel to wiring diagram (where applicable).	OK
13	Check mechanichal interlock of terminals.	OK
14	Check cable connections against drawings (visual check only of power and control cables).	Note
15	Check coating integrity.	OK
16	Check earthing and bonding against drawings.	OK
17	Check transformer is properly clean.	OK
18	If required produce Red Line Mark Up for "AS BUILT"	

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ITEM	Tag	TR-100AD1	: 66 / 6.9 kV 7 MVA Transformer		Dwg	123A90-DDL-EL-DS-20002	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD	
TASK	code	C10000867	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX02	Power Transformer LV/HV

TRANSFORMER DATA

Manufacturer :	MF	Serial N° :	181023/1	Rating :	70000 kWA
Primary Voltage	66000 V	Secondary Voltg.	6900 V	Vector group	DYn11
UpStream Eqp.	HNA6-AFA70	DownStream Eqp.	SG-100D1	Data Sheet :	123A90-DDL-EL-DS-20002_01

Testing & measurement instruments used

Type	Serial n°	Calibration certificate	Validity
,			

TEST RESULTS

INSULATION RESISTANCE / H.V. TESTS

Temperature record:

	Voltage	Mini Req	Readings MΩ	IR FAT VALUE
Primary winding /Secondary windings - Earth				
Secondary windings/primary windings- Earth				
TANK INSULATION RESISTANCE (if applicable)				
AUXILIARY WIRING INSULATION RESISTANCE				

See Attached

OIL BREAKDOWN TESTS

OIL WATER CONTENT TEST	< 50	ppm
DIELECTRIC STRENGTH		KV/cm

CONTINUITY CHECK PHASES / TAPPING POSITION (Winding Resistance in mOhms)

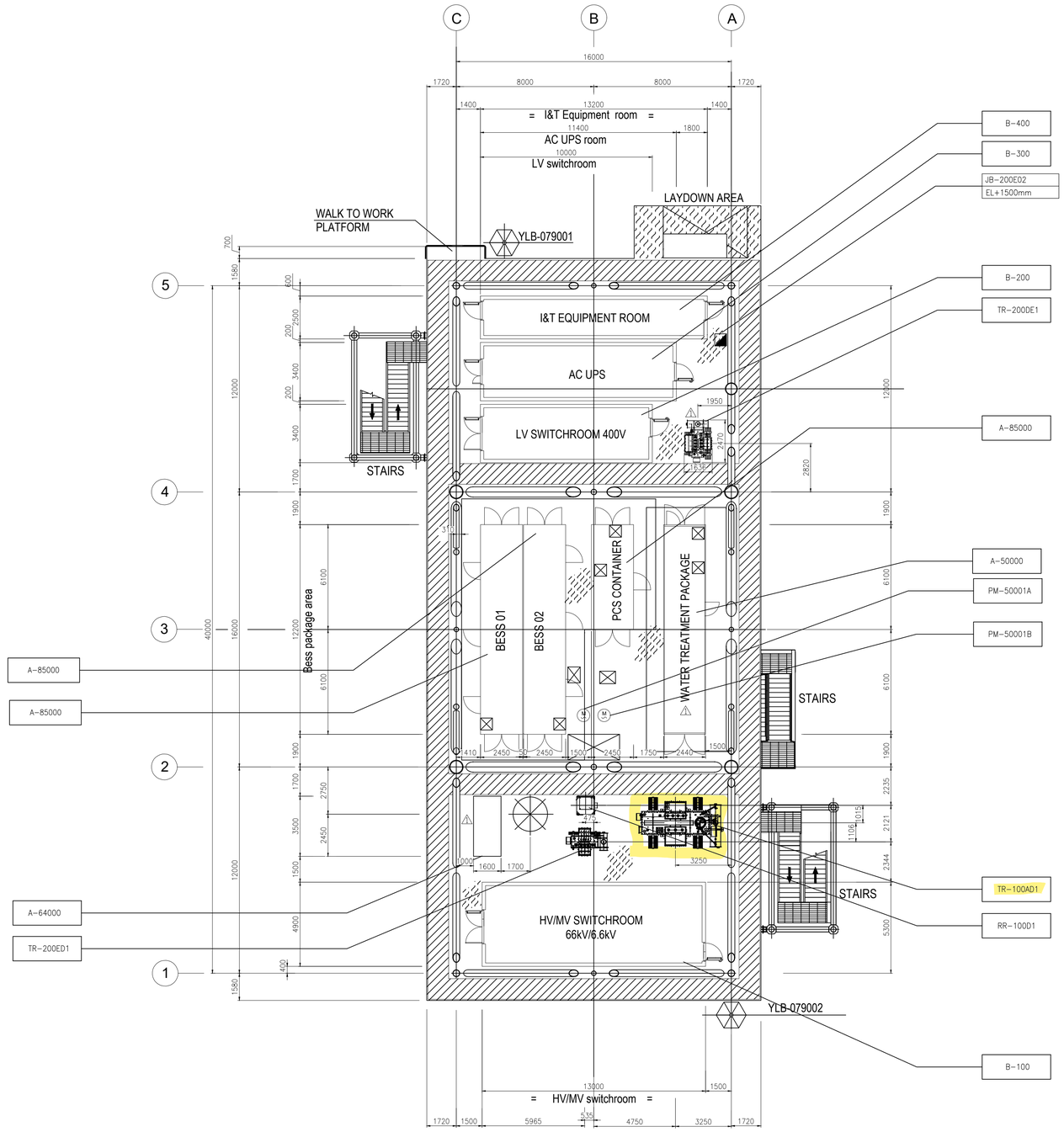
Ph1 / Ph2	Ph1 / Ph3	Ph3 / Ph2	TAPPING POSITION
			+5 %
			+2.5 %
			0%
			-2.5 %
			-5 %

Comments: NOTE (4) : SEE ATTACHED RLMU RAISED DURING FAT
NOTE (14) : CHECK ON CONNECTION WILL BE DONE DURING CABLES INSTECTION. PLEASE REFER TO THE RELEVANT ITR

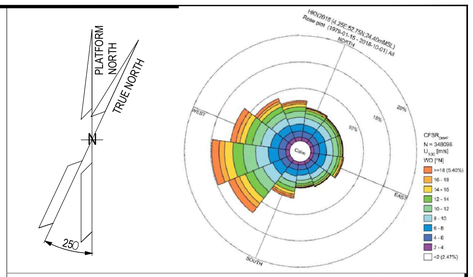
	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	CPY (Company)	RM (Rosetti Marino)	
Name	Carmelo Bongiovanni	Giovanni Tangianu	
Date	2024-09-11	2024-09-13	
Signature	Firma Digitale Sicura Carmelo Bongiovanni 2024-09-11T17:44:05+0200	Firma Digitale Sicura Giovanni Tangianu 2024-09-13T07:56:19+0200	

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

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CROSSWIND | ROSETTI MARINO

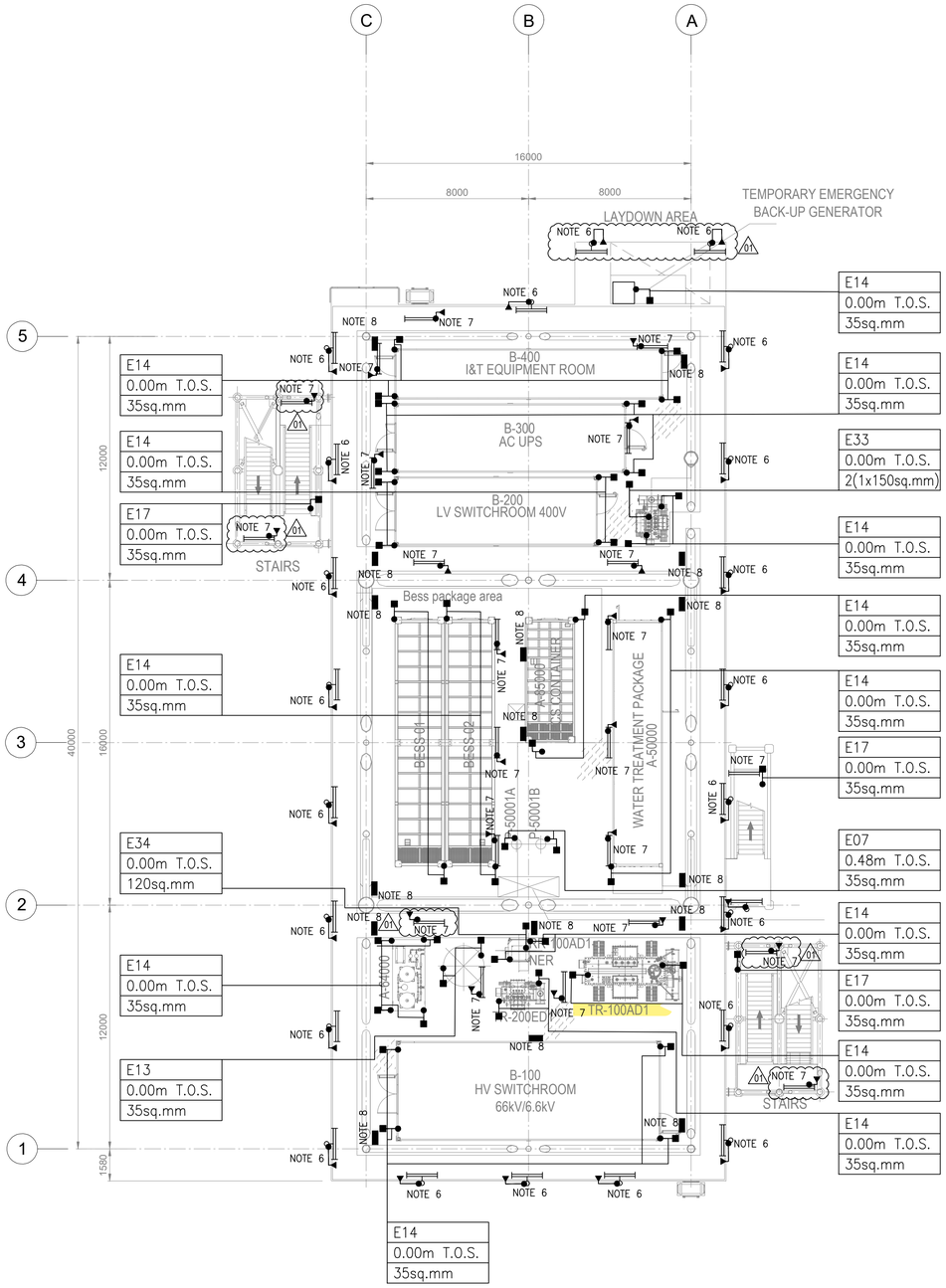
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

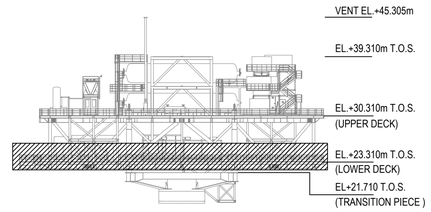
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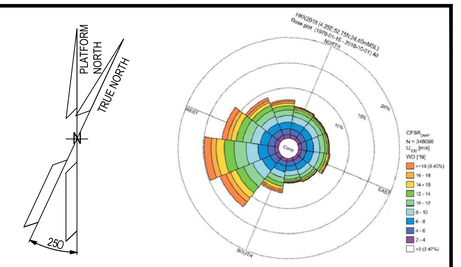
REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.

KEY PLAN





NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE GIVEN IN mm UNLESS OTHERWISE NOTED.
2. ELEVATIONS REFER TO T.O.S.
3. THIS DOCUMENT IS ONLY VALID FOR EARTHING LAYOUT.
4. ALL ELECTRICAL EQUIPMENT NOT DIRECTLY WELDED TO SKID FRAME SHALL BE BONDED TO STEEL TO THE STRUCTURE OF SKID BASEFRAME.
5. FOR LIGHTNING PROTECTION SYSTEM SURGE PROTECTIVE DEVICES (SPD), REFER TO THE DOCUMENT 123A90-DDL-EL-RE-20154.
6. ALL NON-WELDED POLES WILL BE EARTHED AS PER TYPICAL E05 AND E24. 01
7. ALL LINEAR LIGHTING FIXTURE WILL BE EARTHED AS PER TYPICAL E32.
8. EARTH BAR WILL BE FIXED TO THE PRIMARY BEAMS OF THE UPPER DECK. COMPLETE EARTHING INCLUDING WITH 2 THREADED STUDS. ALL EARTH BAR WILL BE EARTHED AS PER TYPICAL E03D / 6.00M T.O.S. / 35 SQ MM.
9. EQUIPOTENTIAL BONDING GROUPING FOR BOLTED HANDRAILS ARE PROVIDED EVERY 3M FOR THE ENTIRE PERIMETER AS TYPICAL E16 AND WILL BE DEFINED DURING ASSEMBLY PHASE

LEGEND

- LIGHTING FIXTURE POLE MOUNTED
- LINEAR LIGHTING FIXTURE
- EARTHING BOSS AISI316L
- COMPRESSION TYPE LUG TINNED COPPER
- THREADED STUD FOR EARTHING CONNECTION
- Exx EARTHING TYPICAL CODE
- EARTHING BAR

TYP.	TYPICAL
ELE	ELEVATION
SIZE	

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DD-20090	ELECTRICAL TYPICAL INSTALLATION DETAILS - EARTHING SYSTEM
123A90-DDL-EL-RE-20154	LIGHTNING PROTECTION SYSTEM CALCULATION REPORT
123A90-DDL-EL-DL-20119	LIGHTING & SOCKET LAYOUT - LOWER DECK
123A90-DDL-EL-DL-20101	ELECTRICAL EQUIPMENT LAYOUT - LOWER DECK

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	25/07/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	29/05/24	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
EARTHING & LIGHTNING LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SPS	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 25/07/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20133	SHEET 001	REV. 01

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20133**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

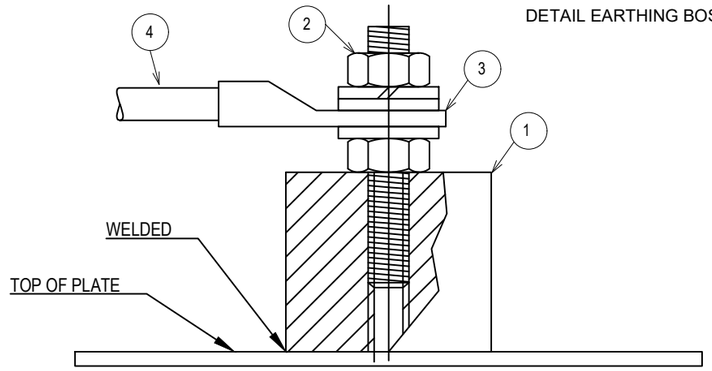
SHEET 001 OF 002

File Name : 123A90-DDL-EL-DL-20133

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	EARTHING BOSS WITH THREADED HOLE M10	AISI 316L	50X50 50X150	1	NOTE 2
2	STUD BOLT WITH PLANE WASHER, GROWER AND NUT	AISI 316L	M10X50		
3	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER			~~NOTE 3~~
4	Y/G INSULATING COPPER CONDUCTOR				NOTE 1 NOTE 5
5	EARTHING PLATE	AISI 316L (NOT PAINTED)	50X50X5		NOTE 4
6	HEXAGONAL BOLT WITH PLANE WASHERS, GROWER AND NUT.	AISI 316L	M10X30		
7	THREADED STUD COMPLETE WITH GROWER AND NUTS	AISI 316L	M10X28		NOTE 6 NOTE 7

E11A

DETAIL EARTHING BOSS 50x50

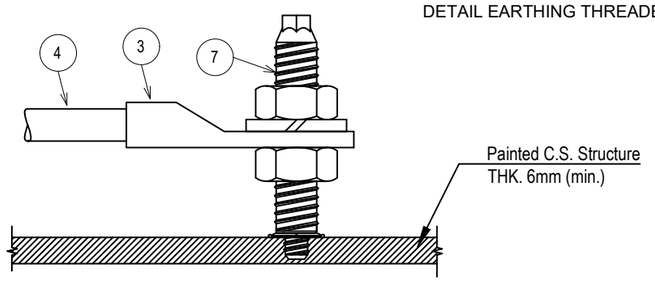


E11D

SEE NOTE 6

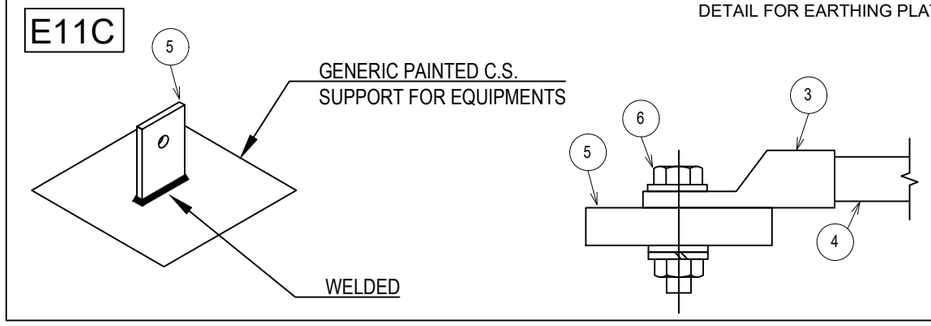
FOR CABLE
MAX 10mm²

DETAIL EARTHING THREADED STUD



E11C

DETAIL FOR EARTHING PLATE

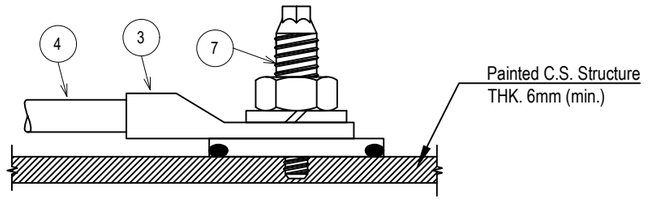


E11E

SEE NOTE 7

FOR CABLE
MAX 35mm²

DETAIL EARTHING THREADED STUD



NOTES:

1) ONLY ONE PROTECTIVE CONDUCTOR TERMINATION LUG SHALL BE CONNECTED TO A DEDICATED EARTHING BOSS, EARTH PLATE OR EARTH STUD.
2) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE).
3) ~~CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.~~
4) EARTHING PLATE SHALL BE DEDICATED TO CABLE TRAY AND PIPE SUPPORTS, JUNCTION BOX, LOCAL CONTROL STATION AND SMALL EQUIPMENT SUPPORTS, LIGHTING POLES, RECEPTACLE SUPPORTS AND REMOVABLE HANDRAILS, ONLY.
5) FOR SIZE OF THE EARTHING CABLE SEE EARTHING LAYOUT DRAWINGS OF RESPECTIVE AREAS
6) HILTI S-BT-ER M10/15 SN6 CERTIFIED FOR EARTHING SYSTEM. RECOMMENDED MAX CONDUCTOR SIZE 10mm².
7) HILTI S-BT-ER M10 HC 120 CERTIFIED FOR EARTHING SYSTEM. RECOMMENDED MAX CONDUCTOR SIZE 35mm².

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_C	09/09/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
SINGLE EARTHING CONNECTION

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

SCALE : NTS

A3

DRAWING NO. 123A90–DDL–EL–DD–20090

SHEET 003

REV. 02

F.to UNI A3: 420mmx297mm

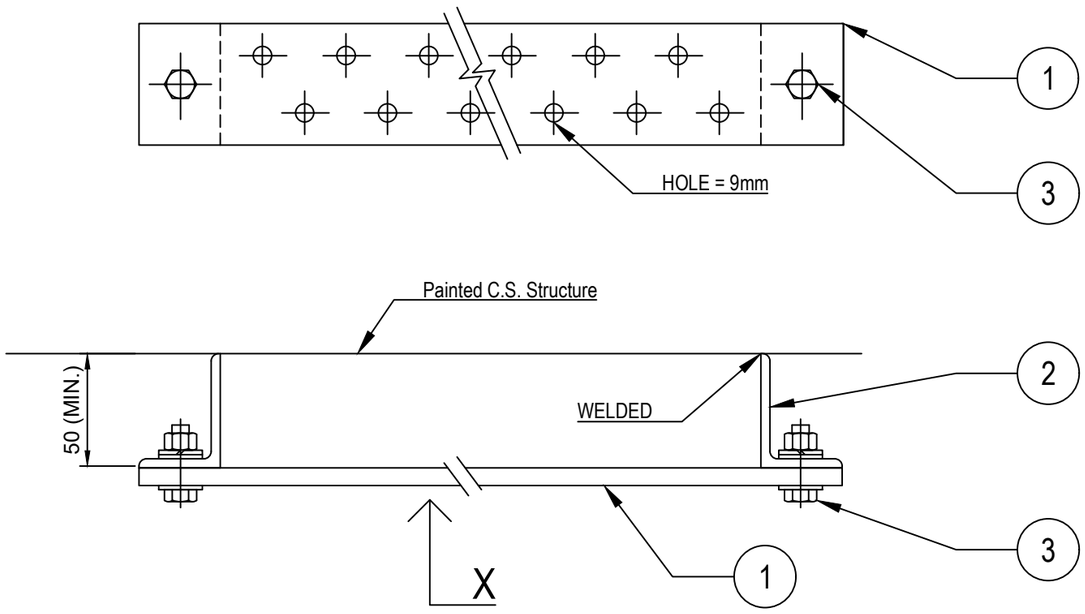
File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	EARTHING BAR	TINNED COPPER	285X50X5	1	
2	PROFILE SUPPORT	AISI 316L		2	
3	HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT	AISI 316L	M10X30	2	
4	THREADED STUD	AISI 316L	M10X28	2	NOTE 1
5	FEMALE / MALE COUPLING	AISI 316L	M10X50	2	NOTE 2
6	PLANE WASHER, GROWER AND NUT	AISI 316L	M10	2	

TYPICAL DETAIL VALID FOR EXTERNAL USE ONLY

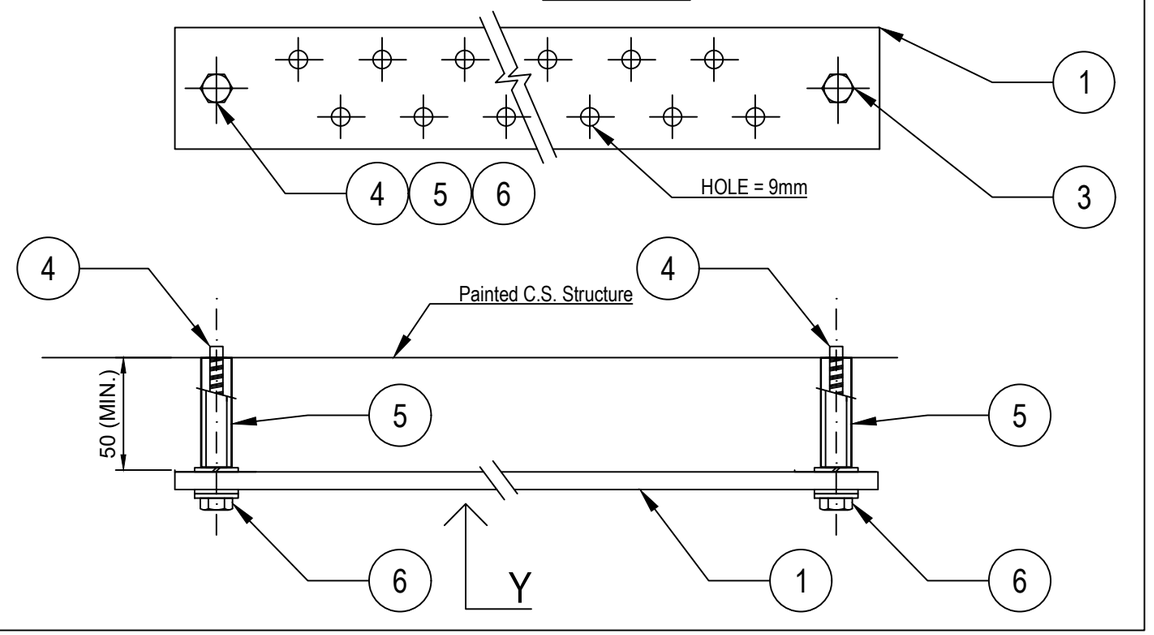
E03A

VIEW "X"



E03D

VIEW "Y"



NOTES:

1) THREADED STUD mod. HILTI S-BT-ER M10/15 SN6 CERTIFIED FOR EARTHING SYSTEM.

2) STANDOFF ADAPTER mod. HILTI M10-HC120 50

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_C	09/09/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
EARTHING BAR INSTALLED ON WELDED PROFILE OR THREADED STUD

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

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DD-20090	004	02

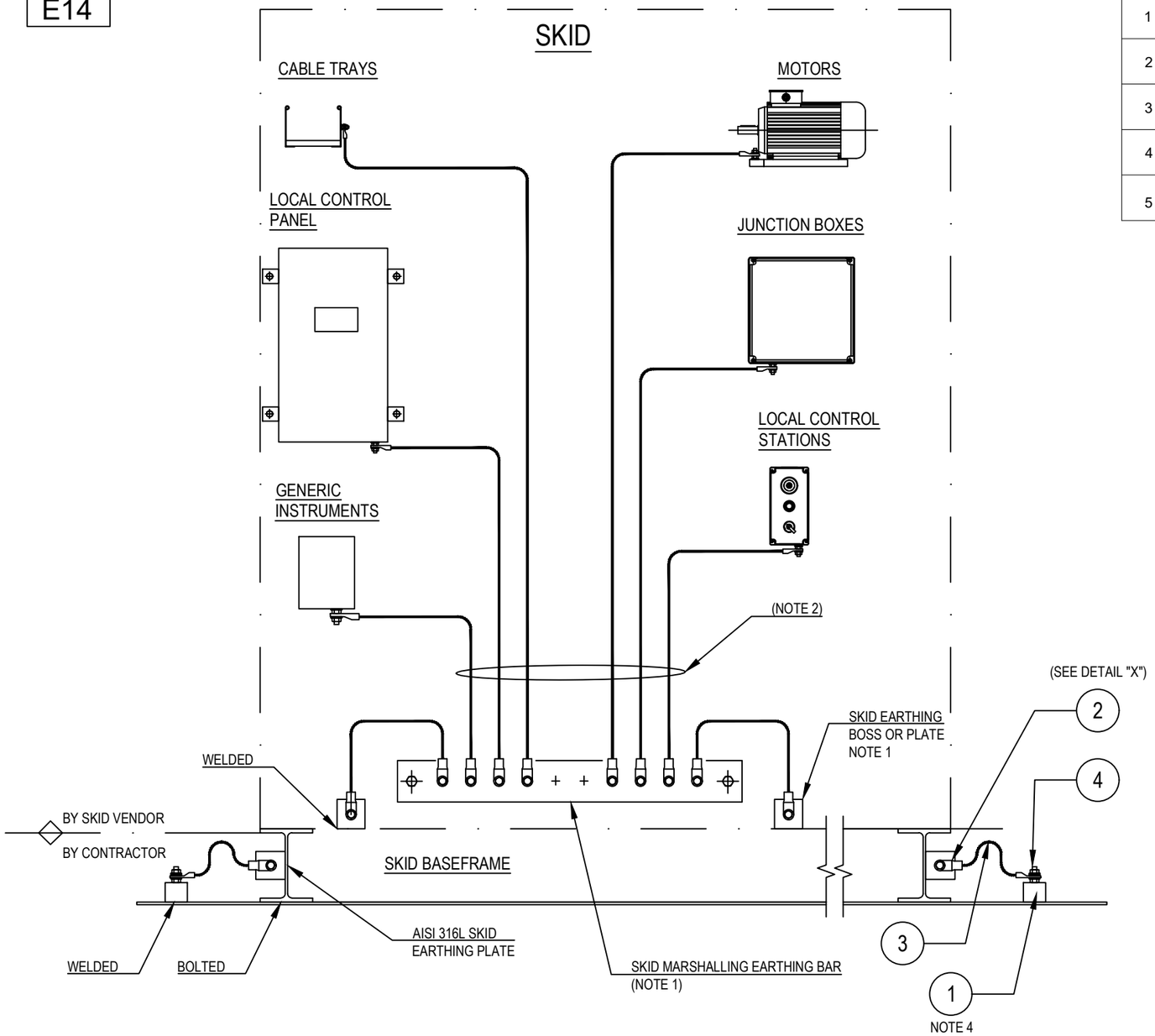
CROSSWIND

ROSETTI MARINO

F.to UNI A3: 420mmx297mm

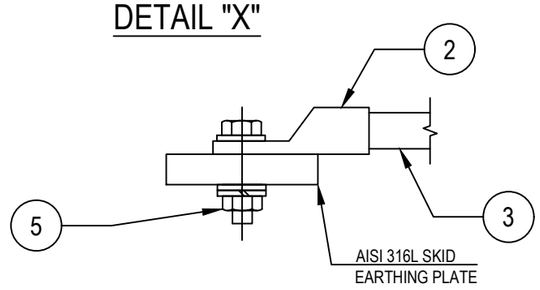
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E14



POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	EARTHING BOSS WITH THREADED HOLE M10	AISI 316L	50X50		NOTE 5
2	COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR	TINNED COPPER	35mm^2		NOTE 3
3	Y/G INSULATING COPPER CONDUCTOR	COPPER	35mm^2		NOTE 3
4	STUD BOLT WITH PLANE WASHER, SPRING WASHER AND NUT	AISI 316L	M10X50		
5	HEXAG. BOLT COMPLETE WITH PLANE WASHERS, SPRING WASHER AND NUT	AISI 316L	M10X30		

DETAIL "X"



NOTES:
1) EARTHING BAR/BOSS/PLATE SUPPLIED BY SKID MANUFACTURER
2) ALL EQUIPMENTS AND CABLE TRAYS WILL BE EARTHING ON SKID EARTHING BAR BY SKID MANUFACTURER
3) ~~CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY~~
4) FOR EARTHING BOSS TYPICAL DETAIL E11A
5) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20090**

REV.:	DATE:	SIGNATURE:
2_C	09/09/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/06/24	SPS	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
EARTHING FOR SKID BASEFRAME

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 014 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

Row		S-720D Data Sheet for Transformers				Issue
2	Tag No. :	*TR-100AD1*				01
3	Service :	*66/6.9 kV, 7MVA Power Transformer*				01
4	Ref. Clause	Description			Additional notes	
5		**1. General**				
6		Manufacturer :	MF Trasformatori srl			01
7		Vendor :	MF Trasformatori srl			01
8		Equipment identifier :	TR-100AD1			
9		Quantity :	1			
10	9,3	Type of liquid preservation system :	conservator with bladder or diaphragm type			01
11	4.1, 5.7.1, A.1.1 a) to x)	Service :	Distribution transformer			
12		Conformity assessment system :	D			
13		**2. Environmental conditions**				
14	5.5, A.1.1a) to x)	Altitude (if more than 1000m or 3280ft) :	not more than 1000 m	m		
15	4.2 a) to e), 4.2 f, A.1.1 a) to x)	Minimum ambient temperature :	-8,4	°C		
16	4.2 a) to e), 4.2 f , A.1.1 a) to x)	Maximum ambient temperature :	25	°C		
17	4.2 a) to e), A.1.1 a) to x)	Yearly average ambient temperature :	10,5	°C		
18	5.5, A.1.1 a) to x)	Design ambient temperature (if more than 40 °C or 104 °F) :	not more than 40°C	°C	Offshore (Netherlands)	
19	4.2 a) to e), 4.2 f, A.1.1 a) to x)	Relative humidity at maximum operating temperature (if more than 90 %) :	95	%		
20	4.2 f	Climatic conditions (K) for liquid immersed transformer :	4K26			
21	4.2 f	Special climatic conditions (Z) for liquid immersed transformer :	4Z1,4Z5,4Z14, 4Z15, 4Z17, 4Z10			
22	4.2 f	Biological conditions (B) for liquid immersed transformer :	4B2			
23	4.2 f	Chemically active substances (C) for liquid immersed transformer :	4CX			
24	4.2 f	Mechanically active substances (S) for liquid immersed transformer :	4S11			
25	4.2 f	Mechanical conditions (M) for liquid immersed transformer :	4M11			
26	9.6.18.1, 9.6.18.3	Corrosion class :	CX			
27	A.1.1 a) to x)	Seismic zone as per IEC 60721-2-6, figure 5 :	zone 2			
28	4.2 f , 4.2 i, 5.7.4.2, A.1.1 a) to x)	Location :	offshore fixed			
29	A.1.1 a) to x)	Unusual service conditions :	No			
30	5.7.3, 5.7.3	Sound power level :	68	dB(A)		01
31		**3. Hazardous area classification**				
32	4.2 g, A.1.1 a) to x)	Hazardous area classification zone :	non hazardous			
33	4.2 g, A.1.1 a) to x)	Hazardous area classification gas group :	N/A			
34	4.2 g, A.1.1 a) to x)	Hazardous area classification temperature class :	N/A			
35		**4. Technical data**				
36		**4.1 Electrical system data**				
37	5.4.1, A.1.1 a) to x)	Rated voltage (HV) :	66	kV		
38	5.4.1	Rated voltage (HV) :	6,9	kV		
39	5.4.1	Rated voltage (tertiary) :	N/A	kV		
40	5.4.2, A.1.1 a) to x)	Rated frequency :	50	Hz		
41	A.1.1 a) to x), A.1.2 a) to t)	System short circuit apparent power :	87,5	MVA		
42	6.4.3.e	Minimum full load power factor :	0,8			
43	A.1.1 a) to x), A.1.2 a) to t)	Supply voltage harmonic content :	5	%		
44		**4.2 Transformer/reactor data**				
45		**4.2.1 General**				
46		**Power frequency withstand voltage**				
47	A.1.1 a) to x)	Power frequency withstand voltage - HV (66kV) winding :	140	kV		
48	A.1.1 a) to x)	Power frequency withstand voltage - HV (6.9kV) winding :	20	kV		
49	A.1.1 a) to x)	Power frequency withstand voltage - tertiary winding :	N/A	kV		
50	A.1.1 a) to x)	Power frequency withstand voltage - neutral terminal :	20	kV		01
51		**Lightning impulse withstand voltage**				
52	A.1.1 a) to x)	Lightning impulse withstand voltage - HV (66kV) winding :	325	kV		
53	A.1.1 a) to x)	Lightning impulse withstand voltage - HV (6.9kV) winding :	60	kV		
54	A.1.1 a) to x)	Lightning impulse withstand voltage - tertiary winding :	N/A	kV		
55	A.1.1 a) to x)	Lightning impulse withstand voltage - neutral terminal :	60	kV		01
56	5.7.2, 7.1.1 , A.1.1 a) to x)	Number of phases :	3			
57	6.4.3.a, A.1.1 a) to x)	Direction of power flow :	bi-directional			
58	7.1.5, 5.7.2, 7.1.1, A.1.1 a) to x)	Connection and phase displacement symbol (vector group) :	Dyn11			
59	A.1.1 a) to x), A.1.2 a) to t), B.4	Percentage impedance on air natural rating at principal tap :	8	%		
60	5.7.2	High limit for zero sequence impedance :	N/A	ohms/ph		01
61	5.7.2	Low limit for zero sequence impedance :	N/A	Ohms/ph		01
62	5.1.1, A.1.1 a) to x)	Rated power in air natural mode (HV - 66kV) :	7000	kVA		
63	5.1.1, A.1.1 a) to x)	Rated power in air natural mode (HV - 6.9kV) :	7000	kVA		
64	5.1.1, A.1.1 a) to x)	Rated power in air natural mode (tertiary) :	N/A	kVA		
65	5.1.1, 5.1.3, A.1.1 a) to x)	Rated power in forced cooling mode (HV - 66kV) :	N/A	kVA		
66	5.1.1, 5.1.3, A.1.1 a) to x)	Rated power in forced cooling mode (HV - 6.9kV) :	N/A	kVA		
67	5.1.1, 5.1.3, A.1.1 a) to x)	Rated power in forced cooling mode (tertiary) :	N/A	kVA		

Row						Issue
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68	5.4.3	Variation in V/Hz ratio from no load to rated load when exceeding 105 % :	Not more than 105	%		
69	A.1.1 a) to x), A.1.2 a) to t), A.2 a) to f)	Parallel operation :	No			
70	5.1.1	Requirement of 1.8 times overloading for transformer feeding a group of motors :	No			
71	5.8, A.1.1 a) to x)	Insulating liquid :	synthetic organic liquid		MIDEL 7131	01
72	A.1.1 a) to x), A.1.2 a) to t), Table 1	Tolerance on total losses when not in accordance with IEC 60076-1 :	N/A	%		
73	6.5, A.1.1 a) to x), A.1.2 a) to t), Table 1	Tolerance on impedance value when not in accordance with IEC 60076-1 :	N/A	%		
74		**4.2.2 Neutral terminal**				
75	9,4	Level of DC current in neutral :	<5	%		
76	A.1.1 a) to x)	Transformer neutral earthing for HV (66kV) winding :	N/A			
77	A.1.1 a) to x)	Transformer neutral earthing for HV (6.9kV) winding :	resistance grounded			
78	A.1.1 a) to x)	Transformer neutral earthing for tertiary winding :	N/A			
79	9,2	Sizing of the low voltage neutral terminal :	N/A	%		
80		**4.2.3 Winding**				
81	A.1.1 a) to x)	Winding conductor material :	copper			
82	5.7.2	Requirement of delta connected stabilizing winding :	No			
83	5.7.2	Method of earthing of delta connected stabilizing winding :	N/A			
84	A.1.1 a) to x)	Winding class of insulation :	A			01
85	A.1.1 a) to x)	Non-uniform (graded) insulation :	No			01
86	A.1.1 a) to x)	High temperature insulation :	No			01
87	A.1.2 a) to t)	Thermally upgraded paper :	No			01
88		**4.2.4 Termination**				
89	A.1.1 a) to x), A.1.2 a) to t)	Main external termination details (HV - 66kV) :	plug-in connection			01
90	A.1.1 a) to x), A.1.2 a) to t)	Main external termination details (HV - 6.9kV) :	cable box			
91	A.1.1 a) to x), A.1.2 a) to t)	Main external termination details (tertiary) :	N/A			
92	A.1.1 a) to x), A.1.2 a) to t)	Main external termination details (neutral) :	N/A			
93	A.1.1 a) to x), A.1.2 a) to t)	Cable box type :	air insulated			
94	A.1.1 a) to x)	Main cable box design :	supplier standard			
95	A.1.1 a) to x)	Cable type :	insulated			
96	A.1.1 a) to x)	Number of cables (HV - 66kV) :	3			01
97	A.1.1 a) to x)	Number of cables (HV - 6.9kV) :	6			01
98	A.1.1 a) to x)	Number of cables (tertiary) :	N/A			
99	9.6.11.1.4, A.1.1 a) to x)	Cable conductor size (HV - 66kV) :	300	mm²		01
100	9.6.11.1.4	Cable conductor size (HV - 6.9kV) :	120	mm²		01
101	9.6.11.1.4	Cable conductor size (tertiary) :	N/A	Select		
102	9.6.11.1.4, A.1.1 a) to x)	Number of cores per cable (HV - 66kV) :	1			01
103	9.6.11.1.4	Number of cores per cable (HV - 6.9kV) :	1			01
104	9.6.11.1.4	Number of cores per cable (tertiary) :	N/A			
105	9.6.11.1.4, A.1.1 a) to x)	Number of cables per phase (HV - 66kV) :	1			01
106	9.6.11.1.4	Number of cables per phase (HV - 6.9kV) :	2			01
107	9.6.11.1.4	Number of cables per phase (tertiary) :	N/A			
108	5.6, A.1.1 a) to x)	Separate neutral terminal box :	No			
109	9.6.9.5, A.1.1 a) to x)	Canopy required for cable box :	No			
110	9.6.9.9.7	Breather with dessicant or drain for main cable boxes :	No			01
111	A.1.1 a) to x)	Busduct type :	N/A			
112	A.1.1(a to x)	**Bushings**				
113	A.1.1 a) to x)	Type of bushings (HV - 66kV) :	Epoxy resin			01
114	A.1.1 a) to x)	Type of bushings (HV - 6.9kV) :	Porcelain			01
115	A.1.1 a) to x)	Type of bushings (tertiary) :	N/A			
116	A.1.1 a) to x)	Type of bushings (neutral) :	Porcelain			01
117		**4.2.5 Tap changer**				
118	6.1, A.1.1 a) to x)	Tap changer required and type :	OLTC			
119	6.4.2.a, 6.4.3.c	Voltage variation required on: :	HV			
120	A.1.1 a) to x)	Type of de-energized tap changer (DETC) :	N/A			
121	9.6.17.2.2	Tap changer switching medium :	liquid			
122	6.2.a, 6.2.b, 6.2.c	Category of voltage variation :	CFVV			
123	6.4.1, 6.4.2.b, 6.4.3.b, 6.4.3.c, A.1.1 a) to x), B.4	Tapping range :	±8x1,25	%		01
124	6.4.1, 6.4.2.b, 6.4.3.b, 6.4.3.c, A.1.1 a) to x)	Number of tapping positions :	17 steps			01
125	6.4.3.b	Principal tapping position :	symmetrical			
126	6,3	Maximum current tapping position :	68	A		01
127	9.6.17.3.4	Remote tap-changer cabinet for OLTC :	Yes			
128		**4.2.6 Cooling**				
129	5.2, 5.1.3, A.1.1 a) to x)	Type of cooling :	KNAN			
130	5.1.3, 9.3, A.1.2 a) to t)	Temperature rise of insulating liquid when not in accordance with IEC 60076-2 :	N/A			
131	5.1.3, A.1.2 a) to t)	Temperature rise of winding when not in accordance with IEC 60076-2 or IEC 60076-11 :	N/A			
132	4.2 a) to e)	Cooling water inlet temperature when not in accordance with IEC 60076-2 and IEC 60076-11 :	N/A			
133	5,2	Provision for mounting of cooling fans :	N/A			

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134	A.1.1 a) to x)	AF fan motor cabinet :	N/A			
135		**4.2.7 Miscellaneous requirements**				
136		**a. Construction**				
137	A.1.1 a) to x)	Type of cover for liquid immersed transformer and reactor :	bolted			
138	A.1.1 a) to x)	Surface finish of tank and radiators :	zinc coated			01
139	9.6.18.1	Painting class required :	VH			
140	A.1.1 a) to x)	Paint shade :	Suplier Standard			
141		**b. Interface**				
142	A.1.1 a) to x)	Auxiliary supply voltage details for cooling fans :	N/A	V		
143	A.1.1 a) to x)	Auxiliary supply voltage details for RTCC :	400	V		
144	8.3 d) to k)	Requirement of current transformer in neutral terminal box :	Yes			
145	A.1.1 a) to x)	Current transformer ratio :	250/1	A		01
146	A.1.1 a) to x)	Current transformer accuracy class :	5P20			01
147	A.1.1 a) to x)	Current transformer burden :	5	VA		01
148		**c. Transport**				
149	5.7.4.1, A.1.2 a) to t)	Limiting transportation dimensions (height) :	5075 ±20	mm		01
150	5.7.4.1, A.1.2 a) to t)	Limiting transportation dimensions (width) :	3000 ±20	mm		01
151	5.7.4.1, A.1.2 a) to t)	Limiting transportation dimensions (depth) :	3490 ±20	mm		01
152	5.7.4.1, A.1.2 a) to t)	Limiting transportation weight :	22750	kg		01
153	A.1.1(a to x)	Impact recorder requirement during transportation :	Yes			
154	5.7.4.2	Acceleration in excess of 1 g during transportation :	Yes			
155		**4.3 Reactor specific requirements**				
156	A.1.1 a) to x)	Application :	N/A			
157	A.1.1 a) to x)	Rated current :	N/A	A		
158	A.1.1 a) to x)	Rated short circuit current :	N/A	A		
159	A.1.1 a) to x)	Time to withstand rated short circuit current :	N/A	s		
160	6.5, A.1.1 a) to x)	Impedance at rated voltage and current :	N/A	Ohms		
161		**5. Accessories**				
162	9.1.2, A.1.1 a) to x)	Lifting lugs :	Yes			
163	9.3, A.1.1 a) to x)	Silica gel breather for main tank :	Yes			
164	A.1.1 a) to x)	Type of silica gel breather :	self regenerating			
165	A.1.1 a) to x), Annex F, Table F.1	Liquid level indicator :	Yes			
166	A.1.1 a) to x), Annex F, Table F.1	Magnetic liquid level gauge with alarm and trip contacts :	Yes			
167	9.6.3.4, 9.6.3.5, A.1.1 a) to x), Annex F, Table F.1	Buchholz relay with alarm and trip contacts :	Yes			
168	9.6.1.1, A.1.1 a) to x), Annex F	Pressure Relief Device (PRD) for transformer/reactor tank :	No			01
169	9.6.1.1	Pressure relief device for OLTC :	No			01
170	9.6.10.3.2	Pressure relief device for liquid filled cable box :	N/A			
171	9.6.1.3	Facility for directing emissions of liquid from the relief device in the direction specified :	No			01
172	A.1.1 a) to x)	Sudden pressure relay :	Yes			
173	A.1.1 a) to x), Annex F, Table F.1	Liquid temperature Indicator with alarm and trip contacts :	Yes			
174	A.1.1 a) to x), Annex F, Table F.2	Winding temperature indicator with alarm and trip contacts :	Yes			
175	A.1.1 a) to x), Annex F, Table F.3	Winding temperature measurement type :	Thermal Image			01
176	A.1.1 a) to x)	Cooling fans :	N/A			
177	A.1.1 a) to x)	Redundancy of cooling fans :	N/A			
178	A.1.1 a) to x), Annex F, Table F.1	Control panel for fan starters (for AF type transformer) :	N/A			
179	A.1.1 a) to x), Annex F, Table F.2	Marshalling box :	Yes			
180	A.1.1 a) to x)	HV (66kV) cable box :	Yes			
181	A.1.1 a) to x)	HV (6.9kV) cable box :	Yes			
182	A.1.1 a) to x)	Tertiary cable box :	N/A			
184	9.6.13, A.1.1 a) to x)	Surge arrester requirement :	No			01
185	9.6.13	Surge arrester class :	Select		No surge arrester	01
186	Annex F	Requirement of online dissolved gas analysis (DGA) :	No			
187	Annex F	Requirement of fiber optic temperature sensing :	No			
188	Annex F	Number of channels of fiber optic temperature sensor :	No			
189	9.6.6.2	Core earthing terminals at accessible location. :	Yes			
190	9.6.6.3, A.1.1 a) to x)	Earthing cable lug size :	Suitable for 35mm² earthing cable	mm		01
193	9,3	Alarm contact for diaphragm failure for transformer with diaphragm in conservator :	Yes			
194	A.1.1 a) to x)	Bi-directional rollers :	Yes			
195	4.2 f	Anti-condensation heater for cable box :	Yes			
196	9.6.17.3.5	Anti-condensation heater for remote tap-changer cabinet :	Yes			
197	9.1.2. Note	Requirement of ladder :	Yes			
198		**6. Design data from vendor**				
199		**6.1 Electrical parameters**				
200	A.1.1 a) to x), A.1.2 a) to t)	No-load loss at rated voltage and principal tap :	6,2	kW		01
201	A.1.1 a) to x), A.1.2 a) to t)	Load loss at rated voltage and principal tap :	34,8	kW		01

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202	A.1.1 a) to x)	Percentage regulation at unity power factor :	0,82	%		01
203	A.1.1 a) to x)	Percentage regulation at 0.8 lagging power factor :	5,374	%		01
204	5.1.1, A.1.1 a) to x)	Efficiency at unity power factor, 50 % load :	99,58	%		01
205	5.1.1, A.1.1 a) to x)	Efficiency at unity power factor, 100 % load :	99,42	%		01
206	5.1.1, 6.4.3.e, A.1.1 a) to x)	Efficiency at 0.8 lagging power factor, 50 % load :	99,47	%		01
207	5.1.1, 6.4.3.e, A.1.1 a) to x)	Efficiency at 0.8 lagging power factor, 100 % load :	99,27	%		01
208	6.5, 6.5, 6.5 , A.1.1 a) to x), B.4	Percentage impedance on AN rating at principal tap :	8	%		01
209	5.7.2 , A.1.1 a) to x)	Zero sequence impedance :	0,53	Ohms/ph		01
210		**6.2 Construction**				
211	A.1.1 a) to x)	Winding conductor material :	copper			01
212		**Winding type**				
213	A.1.1 a) to x)	HV (66kV) :	Non-foil			01
214	A.1.1 a) to x)	HV (6.9kV) :	Non-foil			01
215	A.1.1 a) to x)	Tertiary :	Select			
216	A.1.1 a) to x)	Weight of core and windings :	9300	kg		01
217	A.1.1 a) to x), A.1.2 a) to t)	Total weight with insulating liquid :	22750	kg		01
218	A.1.1 a) to x)	Weight of insulating liquid :	7000	kg		01
219	5.8, A.1.1 a) to x)	Insulating liquid :	synthetic organic liquid			01
220	A.1.1 a) to x)	On-load tap changer make :	MR			01
221	A.1.1 a) to x)	On-load tap changer power required :	1	kW		01
222	A.1.1 a) to x), A.1.2 a) to t)	Transformer overall assembled length :	5075 ±20	mm		01
223	A.1.1 a) to x), A.1.2 a) to t)	Transformer overall assembled width :	3000 ±20	mm		01
224	A.1.1 a) to x), A.1.2 a) to t)	Transformer overall assembled height :	3490 ±20	mm		01
225	A.1.1 a) to x)	Dimension details for remote tap changer cabinet length :	N/A	mm		01
226	A.1.1 a) to x)	Dimension details for remote tap changer cabinet width :	N/A	mm		01
227	A.1.1 a) to x)	Dimension details for remote tap changer cabinet height :	N/A	mm		01
228	A.1.1 a) to x), A.1.2 a) to t)	Transportation weight :	22750	kg		01
229	5.7.3, A.1.1 a) to x), A.1.2 a) to t)	Sound power level :	68	dB(A)		01
230	5.8, A.1.1 a) to x), A.1.2 a) to t)	Use of environmentally harmful materials :	No			01
231	4.2.f	Seismic zone certification :	No			01
232		**7. Testing requirements**				
233	11.1.3.a	Temperature rise test :	Yes			
234	6.6.b	Temperature rise test at tapping other than the maximum current tapping :	No			
235	11.1.3.d	Power consumption of fans and liquid pump motors :	N/A			
236	11.1.3.b, A.1.2 a) to t)	Dielectric type tests :	Yes			
237	11.1.3.c	Sound level test :	Yes			
238	11.1.3.e	Measurement of no-load loss and current at 90 % and 110 % of rated voltage :	Yes			
239	11.1.4.a, A.1.2 a) to t)	Dielectric special tests :	No			
240	11.1.4.b, A.1.2 a) to t)	Winding hot-spot temperature-rise measurements :	No			
241	11.1.4.c, A.1.2 a) to t)	Determination of capacitances windings-to-earth and between windings :	Yes			
242	11.1.4.e, A.1.2 a) to t)	Determination of transient voltage transfer characteristics :	Yes			
243	11.1.4.f, A.1.2 a) to t)	Measurement of zero-sequence impedance :	Yes			
244	11.1.4.g, A.1.2 a) to t)	Short-circuit withstand test :	Yes			
245	11.1.4.i, A.1.2 a) to t)	Vacuum deflection test :	No			
246	11.1.4.j, A.1.2 a) to t)	Pressure deflection test :	No			
247	11.1.4	Pressure deflection test for OLTC tank :	No			
248	11.1.4.k, A.1.2 a) to t)	Vacuum tightness test :	No			
249	11.1.4	Vacuum tightness test for OLTC tank :	No			
250	11.1.4.l, A.1.2 a) to t)	Measurement of frequency response :	No			
251	11.1.4.m, A.1.2 a) to t)	Check of external coating :	Yes			
252	A.1.2 a) to t)	Measurement of dissolved gasses before and after dielectric tests :	Yes			
253	11.1.4.o, A.1.2 a) to t)	Mechanical test :	Yes			
254	11.1.4	Simulated transformer/motor on load start test for unit transformer :	N/A			
255	11.1.4	Routine test for Ex 'P' type transformer in accordance with IEC 60079-13 :	N/A			
256	11.1.4	Routine tests for Ex 'O' type transformer in accordance with IEC 60079-6 :	N/A			

MF Trasformatori srl

CERTIFICATE N° 0724108

DATE 02/08/2024

CHECK CONTROL TRANSFORMER

Integred diagnostic method for the control of electric devices

KIT N° 1 SERIAL NUMBER 181023/1 CUSTOMER N° 522/23 SITE ---

DESCRIPTION	TYPE INSTRUMENT	MANUFACTURER	POWER (KVA)	VOLTAGE V1/V2	COMMUTATOR	HEAT SINKING FLUID	INSTALLATION	MANUF. YEAR	SILICA GEL
STANDARD FEATURES OF THE EQUIPMENT	TRANSFORMER	MF	7000	66000 / 6900	X NO-LOAD ☐ UNDER CHARGE — MAIN TANK	KNAN	---	2024	YES ☐ NO ☐

SPECIFICATIONS OF THE ANALYSED FLUID	OIL TYPE	OIL WEIGHT (kg)	NOME OF PRODUCER	COMMERCIAL CODE OR NAME
	SYNTHETIC OIL	7000		MIDEL 7131

DRAWING DATA	SAMPLER'S NAME	DATA SAMPLING	DATA OF RICEIPT	OIL T deg C	AMB. T deg C	DRAWING POSITION	OIL LEVEL	LEAKS OIL	COLOUR OF SILICAGEL
	MF TRASFORMATORI	23/07/2024	23/07/2024	--	---	BUCHHOLZ		☐ YES X NO	☐ BLUE ☐ ROSE

PARTICULAR MAINTENANCE DONE ON THE TRANSFORMER	DATE	DESCRIPTION

PURCHASER ROSETTI MARINO SPA

Witnessed X Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 02-08-2024

IT IS FORBIDDEN TO REPRODUCE EVEN IN PARTIALLY THIS CERTIFICATE WITHOUT AUTHORIZATION OF MF TRASFORMATORI SRL

MF TRASFORMATORI: Sede Amm.:Via S.Anna 25011 Calcinato(BS) PIVA 03550350171 Capitale Sociale € 3'000'000 Tel. 030/9980253 030/9636020 Fax. 030/9980218

L. PIGNATELLI ON BEHALF OF CROSS WIND

☒ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS

DATE 02/08/2024

MF Trasformatori srl

CERTIFICATE N° 0724108

DATE 02/08/2024

Results of analysed parameters

KIT N° 1 MANUFACTURING N° 181023/1 CUSTOMER N° 522/23 SITE --- POWER (KVA) 7000

ANALYSIS DATE / ANALYTIC PARAMETERS	MEASURE UNIT	01/08/2024 ANALYST BEDUSCHI S. VALUE	ANALYST VALUE	ANALYST VALUE	ANALYST VALUE	VALORE DI SOGLIA EN 61203	VALORE OLIO EN 61099	NORMA DI RIFERMENTO
CARBON MONOXIDE CO	µl/l	54				300	80	NORME ANSI CEI 10 - 10 EN 60599 CEI 10 - 28
HYDROGEN H2	µl/l	<2				100	15	
METHANE CH4	µl/l	<2				120	5	
ETHYLENE C2H4	µl/l	<2				50	2	
ETHANE C2H6	µl/l	<2				65	5	
ACETHYLENE C2H2	µl/l	<2				35	1	
BURNING GAS	µl/l	54				720	108	
C2H2/C2H4	-----	/				/	/	
CH4/H2	-----	/				/	/	
C2H4/C2H6	-----	/				/	/	
I.E.C. CODES	-----	0 0 0				/	/	
OXYGEN O2	µl/l	2341				17500	3000	CEI 10 - 10 EN 60599 CEI 10 - 28 MF
NYTROGEN N2	µl/l	5904				72500	10000	
CARBON DIOXIDE CO2	µl/l	219				2500	250	
CO2/CO	µl/l	4,06				/	/	
TOTAL GASES	µl/l	8518				93000	/	
BREAKDOWN-VOLTAGE	KV	74				> 30	> 50	CEI 61203 / CEI 61099
ASPECT	-----	CLEAR				LIMPIDO	LIMPIDO	
COLOUR	-----	100				< 200	< 200	

NOTE: the sampling will be stocked for one month in our laboratory

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Witnessed X Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 02-08-2024

L. PIGNATELLI ON BEHALF OF CROSS WIND
☒ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS
DATE 02/08/2024

MF Trasformatori srl

CERTIFICATE N° 0724108

DATE 02/08/2024

KIT N° 1 SERIAL N° 181023/1 CUSTOMER N° 522/23 SITE --- POWER (KVA) 7000

Main trend parameters



Witnessed ☒ Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 02-08-2024

Diagnosis and degradation of the transformer

General insulation conditions	NORMAL
Fluid conditions	NORMAL
Active part conditions	NORMAL
Solid insulation condition	NORMAL
Important increments of the analysed parameters	///////

Advised operation

Next diagnostic control	AFTER 12 MONTHS
Other diagnostic proves	///
Fuid operations	///
General operation	///
Note	////

STAMP AND SI

ORDINE DEGLI INGEGNERI DELLA PROVINCIA DI BRESCIA
A 6659
Ingegnere
MARCO FESTA
Industriale

CERTIFICATION RELEASED BY MFS LABORATORY.

L. PIGNATELLI ON BEHALF OF CROSS WIND

☒ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS

DATE 02/08/2024

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THE GLOBAL COMPACT WE SUPPORT

ROSETTI MARINO SPA

TEST REPORT No. 181023/1

Customer : ROSETTI MARINO SPA **Serial No.:** 181023/1

MF Job No. 522/23 **Project No. :** 7000ToECO66/6,9 - TR100AD1

CE REFERENCE STANDARDS : EU/548/2014 ECO - TRANSFORMER

Reference Standards: UE/548/2014 & CEI EN 60076 - 1

DATE: 10/11 REVISION: 1 SCHEDULE: S-36OITA

RATING PLATE DATA

Power (kVA) :	7000			Type :	OIL
Primary Voltage (kV) :	66 ±2×2,5%			Connection Group :	Dyn11
Primary Current (A):	61,2			Short-circuit Voltage (%) :	8
Primary Insul. Class (kV) :	AC 140	BIL	325	Thermal Insulation Class :	A / A
Secondary Voltage (V) :	6900			Temperature Rise (K) :	60/65
Secondary Current (A) :	586			Transformer Weight (Kg)	22750
Secondary Insul. Class : (kV) :	AC 20	BIL	60	Oil Weight (Kg) :	7000
Frequency (Hz) :	50				

TRANSFORMER RATIO MEASUREMENT AND CHECK OF POLARITY AND CONNECTIONS

Tap-Changer Pos.	Primary Voltage	Secondary Voltage	U-Phase	V-Phase	W-Phase	Nominal Ratio
1	72600	6900	18,271	18,274	18,276	18,22
2	71775	6900	18,062	18,063	18,065	18,02
3	70950	6900	17,850	18,851	17,853	17,81
4	70125	6900	17,638	17,639	17,641	17,60
5	69300	6900	17,426	17,426	17,428	17,40
6	68475	6900	17,214	17,214	17,216	17,19
7	67650	6900	17,001	17,002	17,004	16,98
8	66825	6900	16,789	16,790	16,791	16,77
9	66000	6900	16,577	16,579	16,581	16,57
10	65175	6900	16,364	16,365	16,366	16,36
11	64350	6900	16,152	16,153	16,154	16,15
12	63525	6900	15,940	15,941	15,942	15,95
13	62700	6900	15,728	15,728	15,729	15,74
14	61875	6900	15,516	15,516	15,517	15,53
15	61050	6900	15,303	15,304	15,304	15,32
16	60225	6900	15,091	15,091	15,092	15,12
17	59400	6900	14,879	14,879	14,880	14,91

The polarity and connection check have been carried out during the transformer ratio measurement.
Measured Connection: Dyn11

WINDING RESISTANCE MEASUREMENT

66kV	POS. 1	POS 9	POS. 17	
R-1U1V	2,630	2,245	2,630	Ohm
R-1V1W	2,624	2,240	2,624	Ohm
R-1W1U	2,626	2,243	2,626	Ohm

Measured at ambient temperature : 33,6 °C

6900 V	R-2U2V	24,79	mOhm
	R-2V2W	24,73	mOhm
	R-2W2U	24,83	mOhm

CHECK OF AUXILIARIES

Testing	Grounded Winding
auxiliary	Grounded

Test Voltage (V)	Test Frequency	Test Duration
2500	50 Hz	60 Seconds

During the test no voltage failure occurred.

Result : POSITIVE

Name and signature of authorized person:	Date	Witnessed by :
SANDRINI MATTIA	01/08/24	

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L. PIGNATELLI ON BEHALF OF CROSS WOODS
☒ WITNESS ☐ INFORMATION ☐ REVIEW ☐ SPOT WITNESS
DATE 02/08/2024

Witnessed ☒ Reviewed ☐
Lastene Bevoni on behalf of RMG
Date 01-08-2024

MF Trasformatori srl

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THE GLOBAL COMPACT WE SUPPORT

Reference Standards: UE/548/2014 & CEI EN 60076 - 1

DATE: 10/11 REVISION: 1

TEST REPORT No. 181023/1

INSULATION TEST WITH APPLIED VOLTAGE

Testing Winding	Grounded Winding	Tap-Changer Position	Test Voltage (V)	Test Frequency	Test Duration
66kV	6900 V	9	140000	50 Hz	60 Seconds

During the test no voltage failure occurred.

Result : POSITIVE

Testing Winding	Grounded Winding	Tap-Changer Position	Test Voltage (V)	Test Frequency	Test Duration
6900 V	66kV	9	20000	50 Hz	60 Seconds

During the test no voltage failure occurred.

Result : POSITIVE

INSULATION TEST WITH INDUCED VOLTAGE

Fed Winding	Tap-Changer Position	Test Voltage (V)	Test Frequency	Test Duration
6900 V	9	13800	100 Hz	60 Seconds

During the test no voltage failure occurred.

Result : POSITIVE

MEASUREMENT OF NO-LOAD LOSSES AND NO-LOAD CURRENT

Vm Phase Volt	Vm Line Volt	I U-Phase Ampere	I V-Phase Ampere	I W-Phase Ampere	Im Ampere	Losses Watt	Test Frequency	Io %
3983,7	6900	0,9859	0,8531	0,7918	0,877	5793	50 Hz	0,15

Fed Winding
6900 V

Test Temperature	
33,6	°C

Measured No-Load Losses (W) : 5793

Contract No-Load Losses (W) : 6200 Tolerance : + 0%

PEI EU/548/2014

PEI : 99,5964 %

CONTRACT PEI : > 99,580 %

TIGHTNESS TEST / OIL LEAKAGE TEST

An adequate pressure of 30kPa was applied and maintained for 8 hours. This pressure was applied using a column of liquid (oil).

Result of check : POSITIVE

Name and signature of authorized person:	Date	Witnessed by :
SANDRINI MATTIA	01/08/24	----------

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Cod. Univoco EH1R83N

L. PIGNATELLI ON BEHALF OF
CROSS WORDS
☒ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS
DATE 02/08/2024

Witnessed X Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 01-08-2024

MF Trasformatori srl
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Reference Standards: UE/548/2014 & CEI EN 60076 - 1

DATE: 10/11 REVISION: 1

TEST REPORT No. 181023/1

MEASUREMENT OF SHORT-CIRCUIT VOLTAGE, SHORT-CIRCUIT IMPEDANCE AND LOAD-LOSSES 66000 V TAP CHANGER POS. 9

AmbT : 33,6 °C

Vm Phase Volt	Vm Line Volt	I U-Phase Ampere	I V-Phase Ampere	I W-Phase Ampere	Im Ampere	Losses Watt	Test Frequency	Fed Winding	Winding in S/C	TAP CHANGER POS. 9 Reference Power
2119,7	3671	42,891	42,733	42,619	42,75	15273	50 Hz	66kV	6900 V	7000 kVA

Detected Load-Losses at 75 °C (W) :	34451	Contract Load-Losses (W) :	34800	Tolerance :	+ 0%
Detected Short-circuit Voltage at 75 °C (%) :	7,97	Contract Short-circuit Voltage (%) :	8	Tolerance :	± 10 %

Measured Total Losses (W) :	40244	Contract Total Losses (W) :	41000	Tolerance :	+ 0%

MEASUREMENT OF SHORT-CIRCUIT VOLTAGE, SHORT-CIRCUIT IMPEDANCE AND LOAD-LOSSES 59400 V TAP CHANGER POS. 17

AmbT : 33,6 °C

Vm Phase Volt	Vm Line Volt	I U-Phase Ampere	I V-Phase Ampere	I W-Phase Ampere	Im Ampere	Losses Watt	Test Frequency	Fed Winding	Winding in S/C	TAP CHANGER POS. 17 Reference Power
1581,9	2740	40,669	40,549	40,442	40,55	12936	50 Hz	59,4kV	6900 V	7000 kVA

Detected Load-Losses at 75 °C (W) :	40465	Contract Load-Losses (W) :	-	Tolerance :	+ 0%
Detected Short-circuit Voltage at 75 °C (%) :	7,74	Contract Short-circuit Voltage (%) :	8	Tolerance :	± 10 %

Measured Total Losses (W) :	46258	Contract Total Losses (W) :	-	Tolerance :	-

MEASUREMENT OF SHORT-CIRCUIT VOLTAGE, SHORT-CIRCUIT IMPEDANCE AND LOAD-LOSSES 72600 V TAP CHANGER POS. 1

AmbT : 33,6 °C

Vm Phase Volt	Vm Line Volt	I U-Phase Ampere	I V-Phase Ampere	I W-Phase Ampere	Im Ampere	Losses Watt	Test Frequency	Fed Winding	Winding in S/C	TAP CHANGER POS. 1 Reference Power
2039,3	3532	32,367	32,213	32,051	32,21	10736	50 Hz	72,6kV	6900 V	7000 kVA

Detected Load-Losses at 75 °C (W) :	34966	Contract Load-Losses (W) :	-	Tolerance :	+ 0%
Detected Short-circuit Voltage at 75 °C (%) :	8,41	Contract Short-circuit Voltage (%) :	8	Tolerance :	± 10 %

Measured Total Losses (W) :	40759	Contract Total Losses (W) :	-	Tolerance :	-

Name and signature of authorized person:	Date	Witnessed by :
SANDRINI MATTIA	01/08/24	----------

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Cod. Univoco EH1R83N

L. PIGNATELLI ON BEHALF OF CROSS WORLD
☒ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS
DATE 01/08/2024

Witnessed X Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 01-08-2024

MF Trasformatori srl

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THE GLOBAL COMPACT WE SUPPORT

Reference Standards: UE/548/2014 & CEI EN 60076 - 1

DATE: 10/11 REVISION: 1

TEST REPORT No. 181023/1

MEASUREMENT OF INSULATION RESISTANCE ----- MV - (LV + G) ------

5 kV - 1 minute : 1,71 GΩ

MEASUREMENT OF INSULATION RESISTANCE ----- LV - (MV + G) ------

5 kV - 1 minute : 1,34 GΩ

TIGHTNESS TEST

Result of check : POSITIVE

MEASUREMENT OF CAPACITANCE AND DISSIPATION FACTOR ----- MV - (LV+ G) ------

C : 7,807 nF @ 12 kV Dissipation Factor : 0,449% @ 12 kV

MEASUREMENT OF CAPACITANCE AND DISSIPATION FACTOR ----- LV - (MV+ G) ------

C : 9,845 nF @ 1 kV Dissipation Factor : 0,396% @ 1 kV

MEASUREMENT OF ZERO-SEQUENCE IMPEDANCE

V :8,8571 I1 : 46,913 I2 : 46,838 Im : 46,8755 Z (V/Im) . 0,1889 Z (ZX3) : 0,56682 Ω/PHASE
566,82 mΩ/PHASE

ENCLOSURE PAINTING CHECK

Enclosure painting : RAL 7031 CHECK POSITIVE

FUNCTIONAL TEST ON ALL ACCESSORIES

THE FUNCTIONALITY OF THE AUXILIARY ACCESSORIES WAS CHECKED DURING THE FAT CHECK POSITIVE

MEASUREMENT OF INSULATION RESISTANCE & APPLIED MAGNETIC CORE - (TANK - CORE-FRAME)

2,5 kV - 1 min. 50 Hz During the test no voltage failure occurred. Result : POSITIVE

MEASUREMENT OF INSULATION RESISTANCE & APPLIED MAGNETIC CORE-FRAME - (TANK - CORE)

2,5 kV - 1 min. 50 Hz During the test no voltage failure occurred. Result : POSITIVE

Name and signature of authorized person:	Date	Witnessed by :
SANDRINI MATTIA	01/08/24	----------

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
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Cod. Univoco EH1R83N

Witnessed X Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 01-08-2024

L. PIGNATELLI ON BEHALF OF CROSS WIND
☒ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS
DATE 01/08/2024

Directive 2009/125/EU

DECLARATION OF CONFORMITY

No. 374/23

WE

MF Trasformatori srl

DECLARE THAT

the transformer 7000ToECO66/6,9 - TR100AD1 no. 181023/1

L. PIGNATELLI ON BEHALF OF CAPOSWIND
☐ WITNESS ☐ INFORMATION
☒ REVIEW ☐ SPOT WITNESS
DATE 01/08/2024

Type

OIL

Respects requirements of the Directive 2009/125/EU

with reference to Regulation

EU/548/2014

Other Specifications

.....

.....

Name and signature of authorized person

Ing. Festa M.

Date

01/08/24

MF Trasformatori srl
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Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

Witnessed ☐ Reviewed ☒
Lastene Bevoni
on behalf of RMG
Date 01-08-2024

Directive 2014/30/EU

DECLARATION OF CONFORMITY

No. 300/24

WE

MF Trasformatori srl

DECLARE THAT

the transformer 7000ToECO66/6,9 - TR100AD1 no. 181023/1

Type

OIL

L. PIGNATELLI ON BEHALF OF CROSSWIND
☐ WITNESS ☐ INFORMATION
☒ REVIEW ☐ SPOT WITNESS
DATE 01/08/2024

Respects the electromagnetic compatibility requirements Directive 2014/30/EU

with reference to the harmonized standards
EN61000-6-1 Electromagnetic compatibilty emissions
EN61000-6-3 Electromagnetic compatibility immunity

Name and signature of authorized person
Ing. Festa M.

Date

01/08/24

MF Trasformatori srl
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Witnessed ☐ Reviewed ☒
Lastene Bevoni
on behalf of RMG
Date 01-08-2024

MF Trasformatori srl

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Codice Fiscale 01547220176

Oil Certificate

Calcinato, 01/08/24

WE

MF Trasformatori s.r.l.

L. PIGNATELLI ON BEHALF OF
QAP SSW IND
☐ WITNESS ☐ INFORMATION
☒ REVIEW ☐ SPOT WITNESS
DATE 01/08/2024

DECLARE THAT

the oil contained inside the MF transformer no. 181023/1

TYPE

MIDEL 7131

is in conformity with the Standards CEI EN 60296

" Fluids for electrotechnical applications - new mineral insultating oils for transformers"

Signature and stamp
Ing. Festa M.

Witnessed ☐ Reviewed ☒
Lastene Bevoni
on behalf of RMG
Date 01-08-2024

MF Trasformatori srl
Località S. Anna N. 22/24
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MF Trasformatori srl

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25011 Calcinato (BS) - Italy Partita Iva 03550350171
info@mftrasformatori.it Codice Fiscale 01547220176

WARRANTY

Calcinato, 01/08/24

Starting from this date the transformer is guaranteed for 36 MAX 48 against any manufacturing defect (accessories not included).
The incorrect use and/or modifications, which have not been expressly approved by the manufacturer - the removal of trade marks included - imply automatically the expiration of this guarantee.

L. PIGNATELLI ON BEHALF OF
OMS SWIND
☐ WITNESS ☐ INFORMATION
☒ REVIEW ☐ SPOT WITNESS
DATE 01/08/2024

Transformer No.: *181023/1*

Signature and stamp
Ing. Festa M.

Mauro Festa

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

Witnessed ☐ Reviewed ☒
Lastene Bevoni
on behalf of RMG
Date 01-08-2024

BASE LOAD POWER HUB (BLPH)

TR-100AD1 General arrangment drawings

Witnessed ☐ Reviewed ☒
Lastene Bevoni
on behalf of RMG
Date 01-08-2024

WHERE

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

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

Sign	Date
Luca Macula	03/06/2024

L. PIGNATELLI ON BEHALF OF CROSSWIND

☐ WITNESS ☐ INFORMATION
☒ REVIEW ☐ SPOT WITNESS

DATE 22/08/2024

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	16/05/24	ML	MF	MF	ACCEPTED FOR COSTRUCTION (AFC)
02	10/04/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
01	22/02/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
00	18/01/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

MF Trasformatori srl

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TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 General arrangment drawings
FRONT PAGE

drawgement

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK		SCALE : NTS	
A3	DRAWING NO. 1723001697-EL-DA-00006	SHEET 001	REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DA-00006 Rev. 03

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
03	001	FRONT PAGE	
03	002	SUMMARY and GENERAL NOTES	
03	003	GENERAL ARRANGEMENT	
03	004	GENERAL ARRANGEMENT	
03	005	EQUIPMENT LIST	
03	006	H.V. 66kV - PROTECTION BOX DETAIL	
03	007	H.V. 6.9kV - PROTECTION BOX DETAIL	
03	008	DETAIL BASE FRAME	
03	009	RATING PLATE	

MF Trasformatori srl

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REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	16/05/24	ML	MF	MF	ACCEPTED FOR COSTRUCTION (AFC)
02	10/04/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
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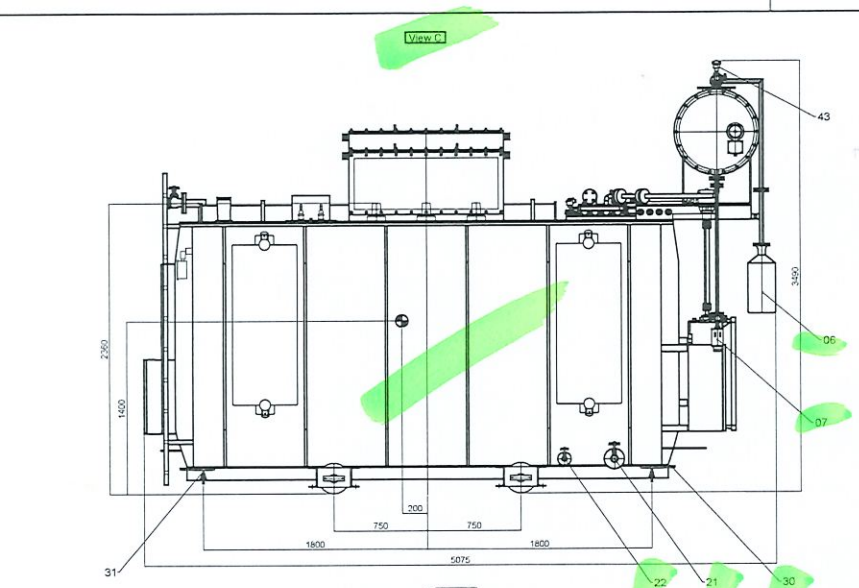
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TR-100AD1 General arrangment drawings
SUMMARY and GENERAL NOTES

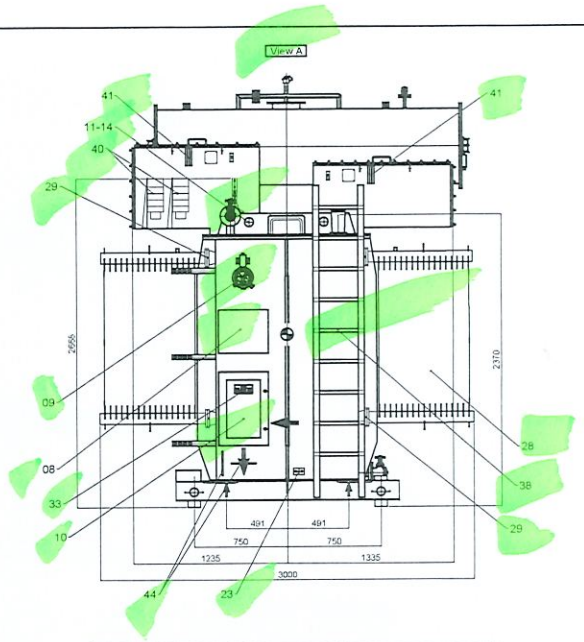
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

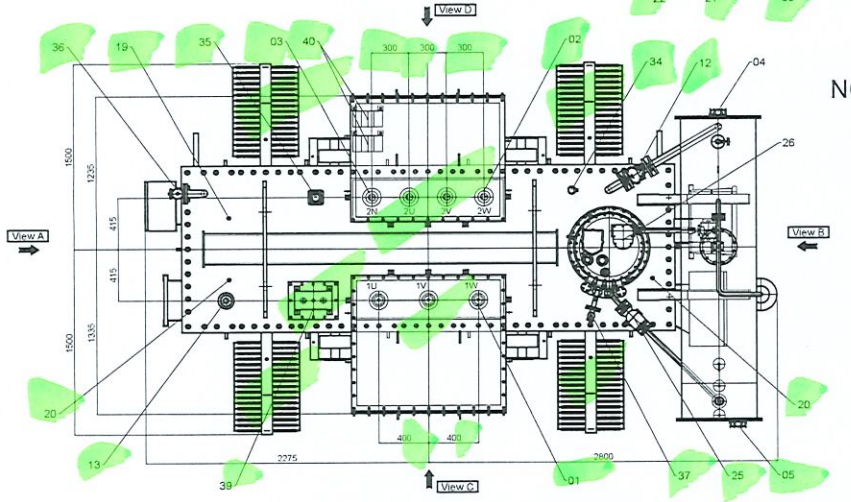
A3 | DRAWING NO. 1723001697-EL-DA-00006 | SHEET 002 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DA-00006 Rev. 03







NORTH

Note:

- Minimum height of the crane hook for lifting the transformer	5m
- Rated power:	7MVA (KNAN)
- Rated voltage:	66±8x1.25% / 6.9kV
- Vector group:	Dyn11
- Oil weight:	7000kg
- Total weight:	22750kg
- Painting:	RAL7031 (CX)
- Short circuit impedance:	8%
- Tag transformers:	TR-100AD1
Tolerance:	±20mm

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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02	10/04/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
01	22/02/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
00	18/01/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

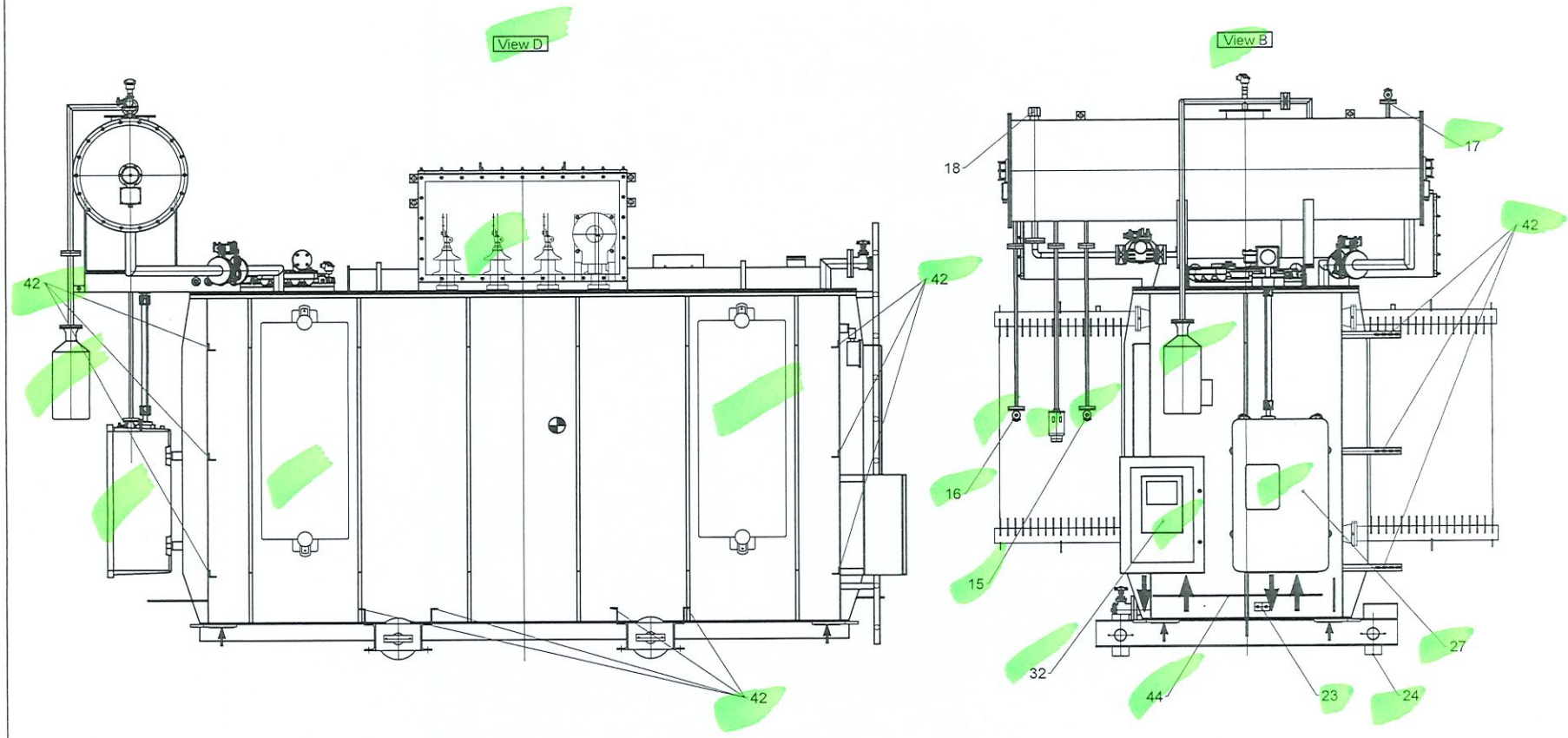
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TR-100AD1 General arrangment drawings
GENERAL ARRANGEMENT

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

A3 | DRAWING NO. 1723001697-EL-DA-00006 | SHEET 003 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DA-00006 Rev. 03



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	16/05/24	ML	MF	MF	ACCEPTED FOR COSTRUCTION (AFC)
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MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 General arrangment drawings
GENERAL ARRANGEMENT

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DA-00006

SHEET 004

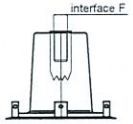
REV. 03

F.to UNI A3: 420mmx297mm

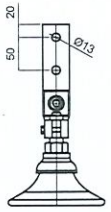
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EQUIPMENTS LIST

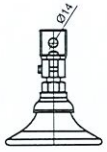
ITEM	DESCRIPTION	N°	SUPPLIER	TYPE	ITEM	DESCRIPTION	N°	SUPPLIER	TYPE
01	66kV H.V. Terminals	03	NEXANS	R900AR-8-L	23	Earthing terminal	02	MF	Stainless steel plate 90x50 with n.2 holes MA16 - distance 50
02	6.9kV H.V. Terminals with extention copper bars	03	EMC	UNEL 12kV/630A	24	Bi-directional wheels	04	MF	Ø250x100
03	6.9kV H.V. Neutral Terminal	01	EMC	UNEL 12kV/630A	25	Protection relay with 1contact - OLTC	01	MR	RS2001
04	Oil level indicator with 2 contacts - TRANSFO	01	COMEM	LB14XON	26	On Load Tap Changer	01	MR	VACUTAP VV III 250D-76-10 19 3W
05	Oil level indicator with 2 contacts - OLTC	01	COMEM	LA14XON	27	Motor Drive Unit (MDU) - OLTC Panel - CP-100E2	01	MR	ED100
06	Dehydrating breather - TRANSFO	01	COMEM	ESDB 14C	28	Cooling elements	04	WARM	17 El. - Int. 1300
07	Dehydrating breather - OLTC	01	COMEM	EM1DB	29	Cooling element valves	08	ETI	WU080
08	Rating plate	01	MF		30	Haulage lugs	04	MF	Ø50
09	Oil thermometer with 2 contacts	01	TERMAF	Type A - DS150	31	Jacking pads	04	MF	Ø150x10
10	Auxiliary panel - Protection devices - CP-100E4	01	MF	Stainless steel - IP65	32	AVR control panel - CP-100E3	01	MF	Stainless steel - IP65
11	Lifting eyebolts for removable part	04	MF	Ø70	33	Winding Temperature Indicator	01	TECSYSTEM	NT133/3
12	Buchholz relay with 2 contacts	01	COMEM	BR50	34	Thermal sensor for WTI	01	TECSYSTEM	PTO
13	Pressure relay with 1 contact	01	QUALITROL	900-FLA-T-NO-STD	35	Current transformer signal for WTI	01	ETI	SM2-X
14	Lifting eyebolts transformer	04	MF	Ø70	36	Oil treatment valve - TRANSFO	01	MF	DN50-PN10
15	Conservator oil drain valve - TRANSFO	01	BARBERI	DN15-PN10	37	Oil treatment valve - OLTC	01	MR	DN25-PN10
16	Conservator oil drain valve - OLTC	01	BARBERI	DN15-PN10	38	Ladder	01	MF	
17	Conservator air release valve - TRANSFO	01	BARBERI	DN15-PN10	39	Core earthing terminals	02	MF	
18	Conservator air release cap - OLTC	01	MF	2"	40	Current transformer	02	STE	250/1A - 5P20 - 5VA
19	Thermal pocket for pos. 09	01	MF	3/4"	41	Heating element with thermostat	02	MF	100W
20	Thermal pocket (spare)	02	MF	3/4"	42	Support cable duct	06	MF	
21	Oil drain valve - TRANSFO	01	BARBERI	DN50-PN10	43	Diaphragm failure device with alarm contact	01	PRONAL	STP-BBR
22	Oil sampling valve - TRANSFO	01	BARBERI	DN15-PN10	44	Support auxiliary cables	02	MF	



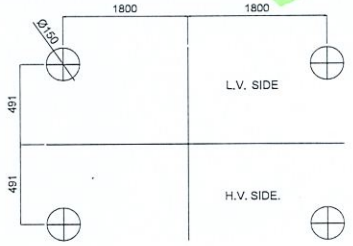
Pos. 1
Detail H.V. Terminal



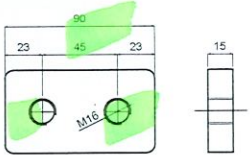
Pos. 2
Detail L.V. Terminal



Pos. 3
Detail Neutral Terminal



Pos. 31
Detail jacking pads



Pos. 23
Detail earthing terminal

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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MF Trasformatori srl

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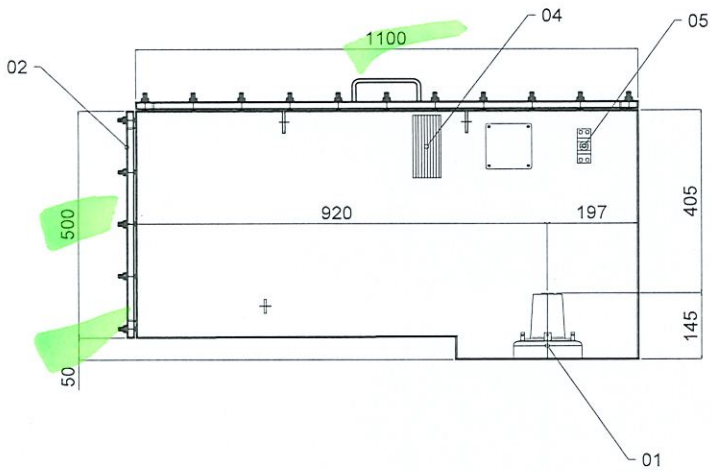
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TR-100AD1 General arrangment drawings
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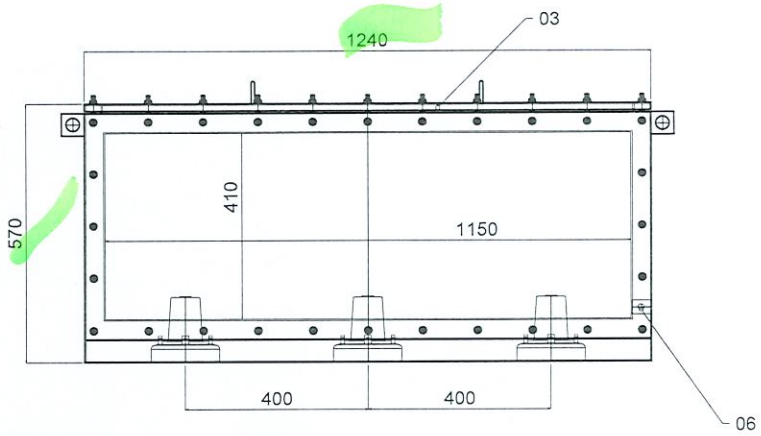
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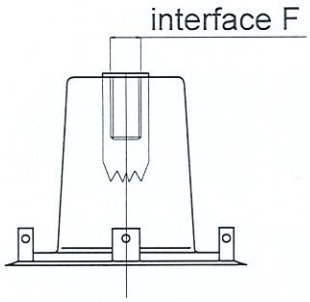
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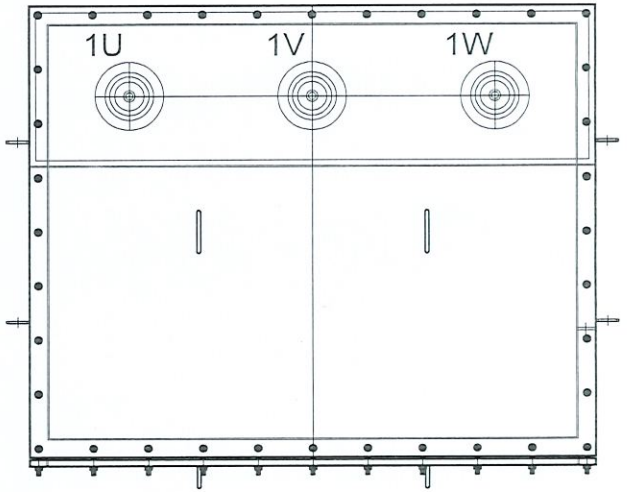
F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DA-00006 Rev. 03









Item	Description	Q.ty	Type
01	66kV H.V. Terminal	3	R900AR-8
02	Cable inlet plate	1	Aluminium - th. 5mm
03	Removable plate	1	Painted steel - th. 3mm
04	Heating element	1	100W
05	Thermostat	1	
06	Earthing terminal	1	Stainless steel 40x30x5 - Ø13

MF Trasformatori srl

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REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	16/05/24	ML	MF	MF	ACCEPTED FOR COSTRUCTION (AFC)
02	10/04/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
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00	18/01/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

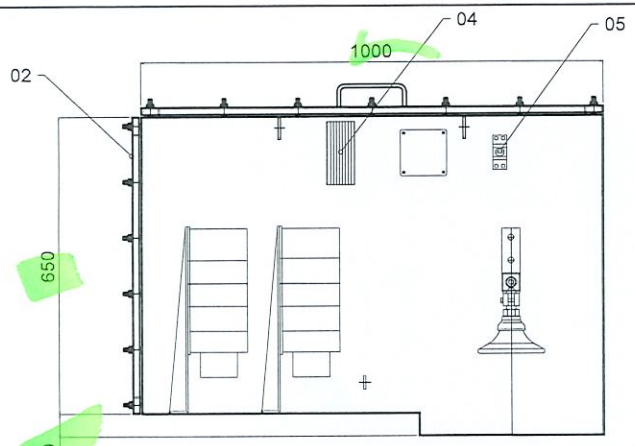
TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 General arrangment drawings
H.V. 66kV - PROTECTION BOX DETAIL

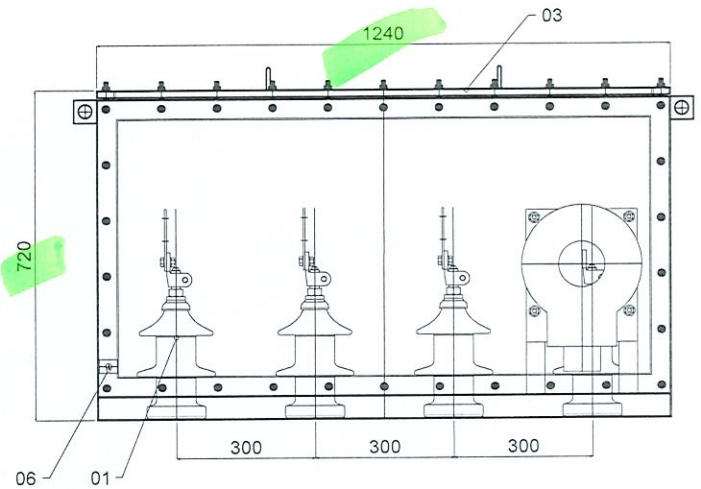
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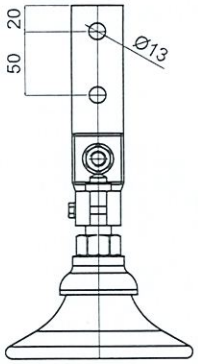
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F.to UNI A3: 420mmx297mm

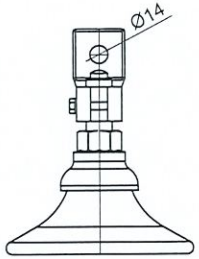
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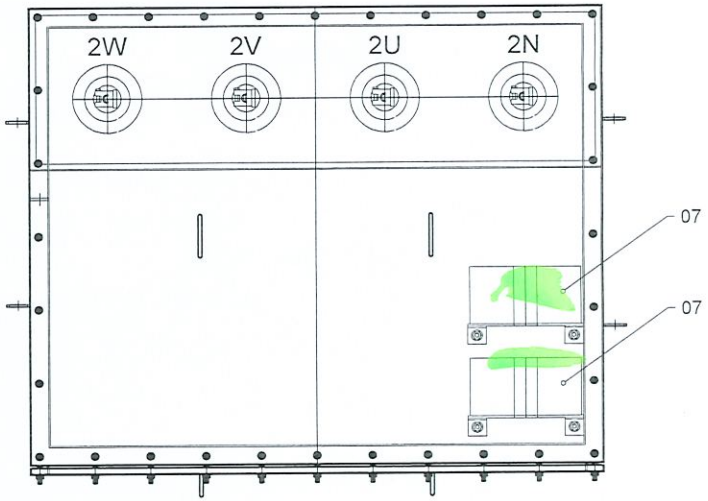




Detail
6.9kV H.V. Terminal



Detail
6.9kV H.V. Neutral Terminal



Item	Description	Q.ty	Type
01	6.9kV H.V. Terminal	4	UNEL 12kV/630A
02	Cable inlet plate	1	Aluminium - th. 5mm
03	Removable plate	1	Painted steel - th. 3mm
04	Heating element	1	100W
05	Thermostat	1	
06	Earthing terminal	1	Stainless steel 40x30x5 - Ø13
07	Current transformer	2	250/1A - 5P20 - 5VA

MF Trasformatori srl

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REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	16/05/24	ML	MF	MF	ACCEPTED FOR COSTRUCTION (AFC)
02	10/04/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
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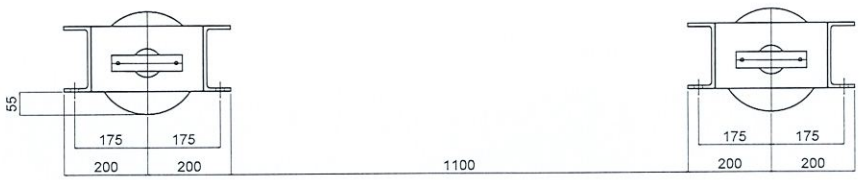
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TR-100AD1 General arrangment drawings
H.V. 6.9kV – PROTECTION BOX DETAIL

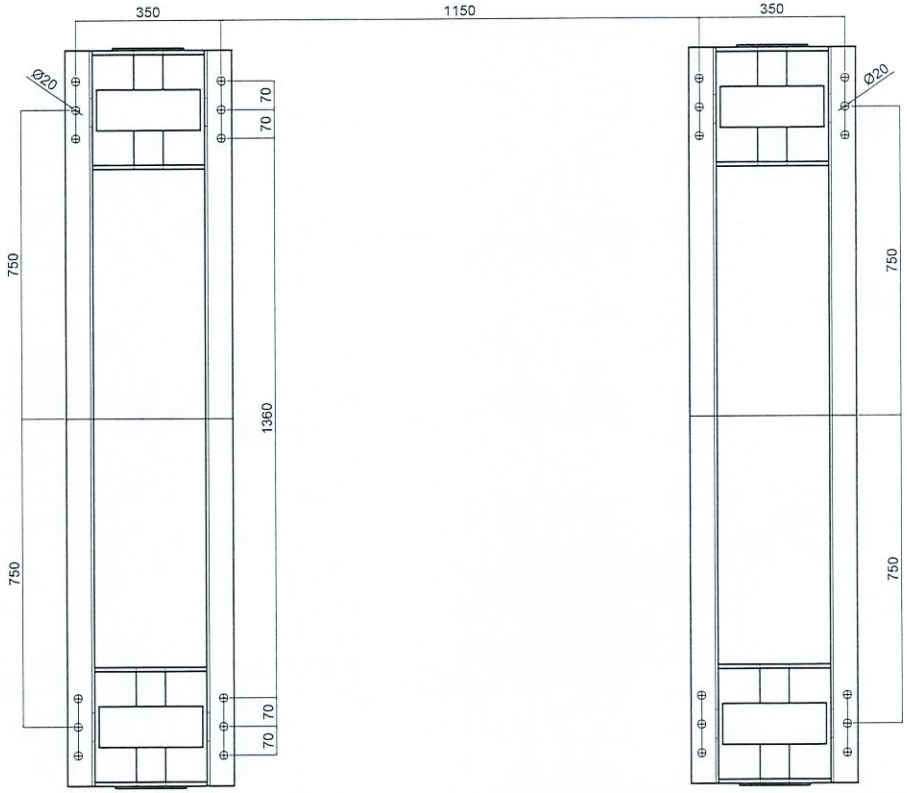
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A3 | DRAWING NO. 1723001697-EL-DA-00006 | SHEET 007 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DA-00006 Rev. 03





REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	16/05/24	ML	MF	MF	ACCEPTED FOR COSTRUCTION (AFC)
02	10/04/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
01	22/02/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
00	18/01/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

MF Trasformatori srl

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ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 General arrangment drawings
DETAIL BASE FRAME

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

SCALE : NTS

A3

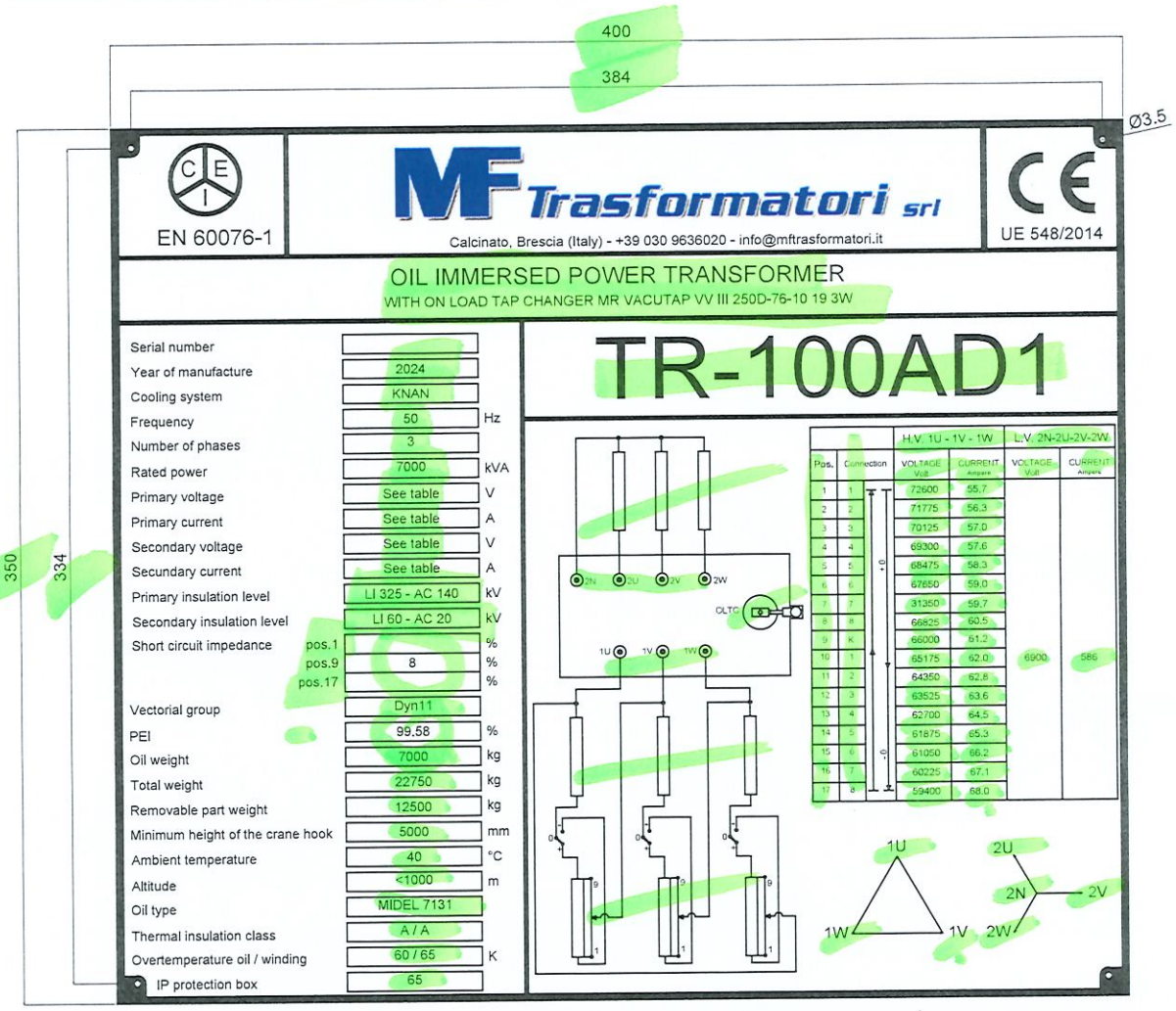
DRAWING NO. 1723001697-EL-DA-00006

SHEET 008

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DA-00006 Rev. 03



Note:
- Material: stainless steel
- Black write on neutral background

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	16/05/24	ML	MF	MF	ACCEPTED FOR COSTRUCTION (AFC)
02	10/04/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)
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00	18/01/24	ML	MF	MF	ISSUE FOR REVIEW (IFR)

MF Trasformatori srl

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TITLE : BASE LOAD POWER HUB (BLPH)
TR–100AD1 General arrangment drawings
RATING PLATE

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

A3 | DRAWING NO. 1723001697–EL–DA–00006 | SHEET 009 | REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DA-00006 Rev. 03

BASE LOAD POWER HUB (BLPH)

TR-100AD1 Termination and Wiring Diagram

MARK UP on Sh. 003, 005, 010, 014, 008

To be issued AFC prior the FAT

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

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

Sign	Date
Luca Macula	23/07/2024

L. PIGNATELLI ON BEHALF OF CROSSWIND

☐ WITNESS ☐ INFORMATION

☒ REVIEW ☐ SPOT WITNESS

DATE 02/08/2024

Witnessed ☐ Reviewed ☒

Lastene Bevoni on behalf of RMG

Date 01-08-2024

WHERE

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED ISSUE FOR INFORMATION (IFI)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
FRONT PAGE

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

SCALE : NTS

A3	DRAWING NO. 1723001697-EL-DG-00010	SHEET 001	REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01

REV.	SHEET NUMBER	DESCRIPTION	REF. CODE
00	001	FRONT PAGE	
00	002	SUMMARY and GENERAL NOTES	
00	003	LAYOUT - AUXILIARY CONTROL PANEL	
00	004	INTERNAL POWER CIRCUIT DIAGRAM	
00	005	PROTECTION DEVICES ON TRANSFORMER	
00	006	THERMAL CONTROL UNIT	
00	007	BLADDER RUPTURE RELAY	
00	008	TERMINAL STRIP	
00	009	EQUIPMENT LIST	
00	010	LAYOUT - AVR PANEL	
00	011	INTERNAL POWER CIRCUIT DIAGRAM - AVR PANEL	
00	012	WIRINGS BETWEEN AVR AND MDU	
00	013	TERMINAL STRIP - AVR PANEL	
00	014	EQUIPMENT LIST - AVR PANEL	
00	015	AVR - TAPCON 230 EXPERT	
00	016	AVR - TAPCON 230 EXPERT	
00	017	AVR - TAPCON 230 EXPERT	
00	018	MDU - WIRINGS	
00	019	MDU - WIRINGS	
00	020	MDU - WIRINGS	
00	021	MDU - WIRINGS	
00	022	MDU - WIRINGS	
00	023	MDU - WIRINGS	

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
SUMMARY and GENERAL NOTES

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

SHEET 002

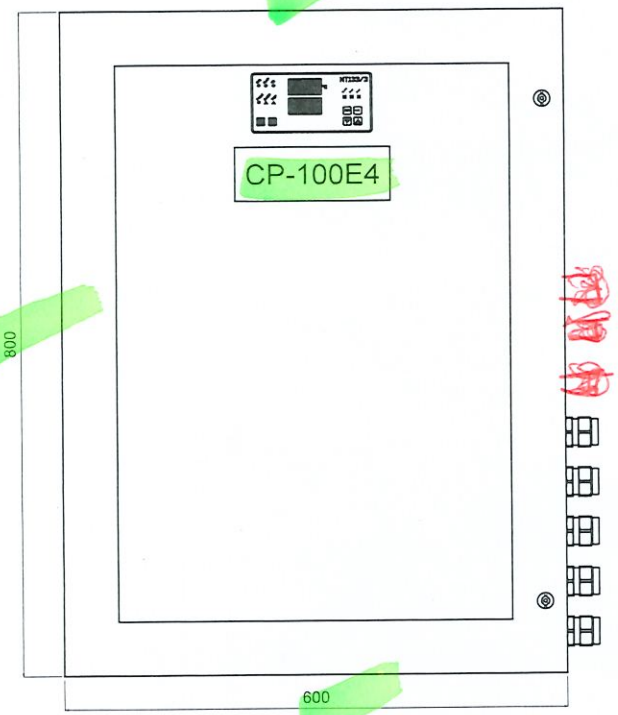
REV. 01

File Name : 1723001697-EL-DG-00010 Rev. 01

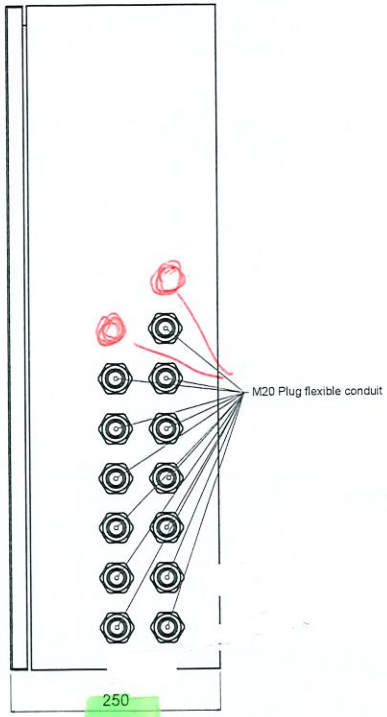
F.to UNI A3: 420mmx297mm

LAYOUT - AUXILIARY CONTROL PANEL

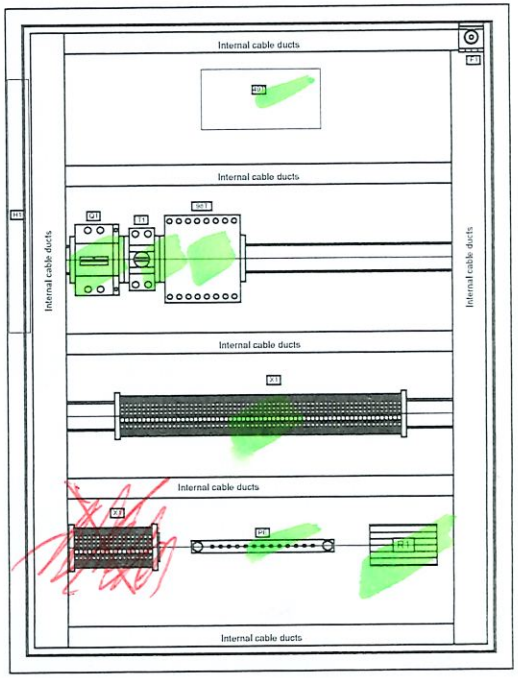
Frontal view



Left side view

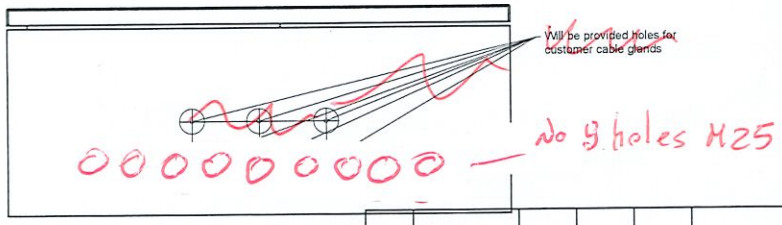


Internal view



PE BAR IS GROUNDED ON INTERNAL PLATE OF THE PANEL BOX

Bottom view



AUXILIARY CONTROL PANEL	
PROTECTION DEGREE :	IP65
VENTILATION :	NATURAL
BOX MATERIAL :	STAINLESS STEEL 15/10
INTERNAL REMOVABLE PLATE :	STELL 15/10

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

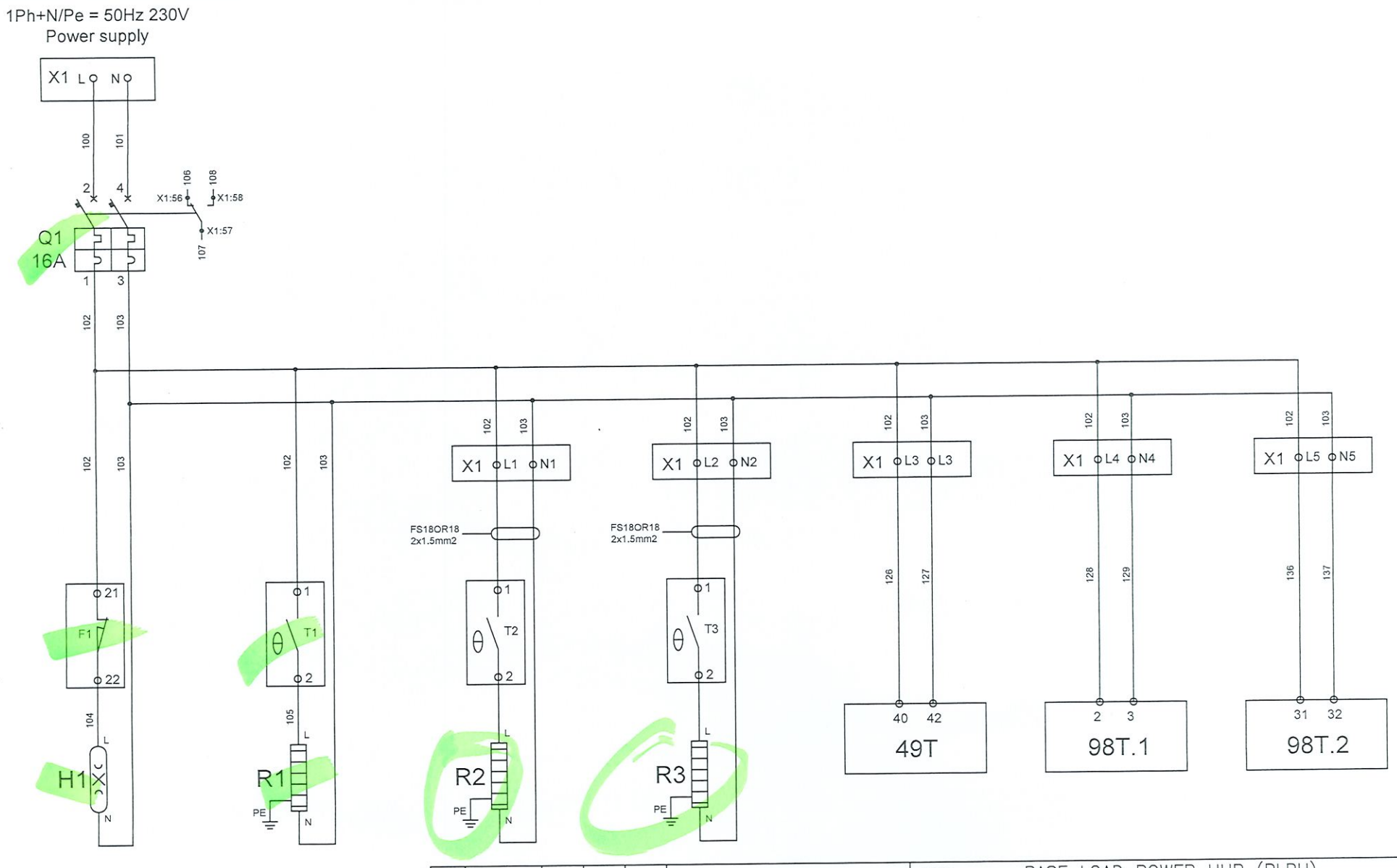
TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
LAYOUT - AUXILIARY CONTROL PANEL

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

A3 | DRAWING NO. 1723001697-EL-DG-00010 | SHEET 003 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
INTERNAL POWER CIRCUIT DIAGRAM

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

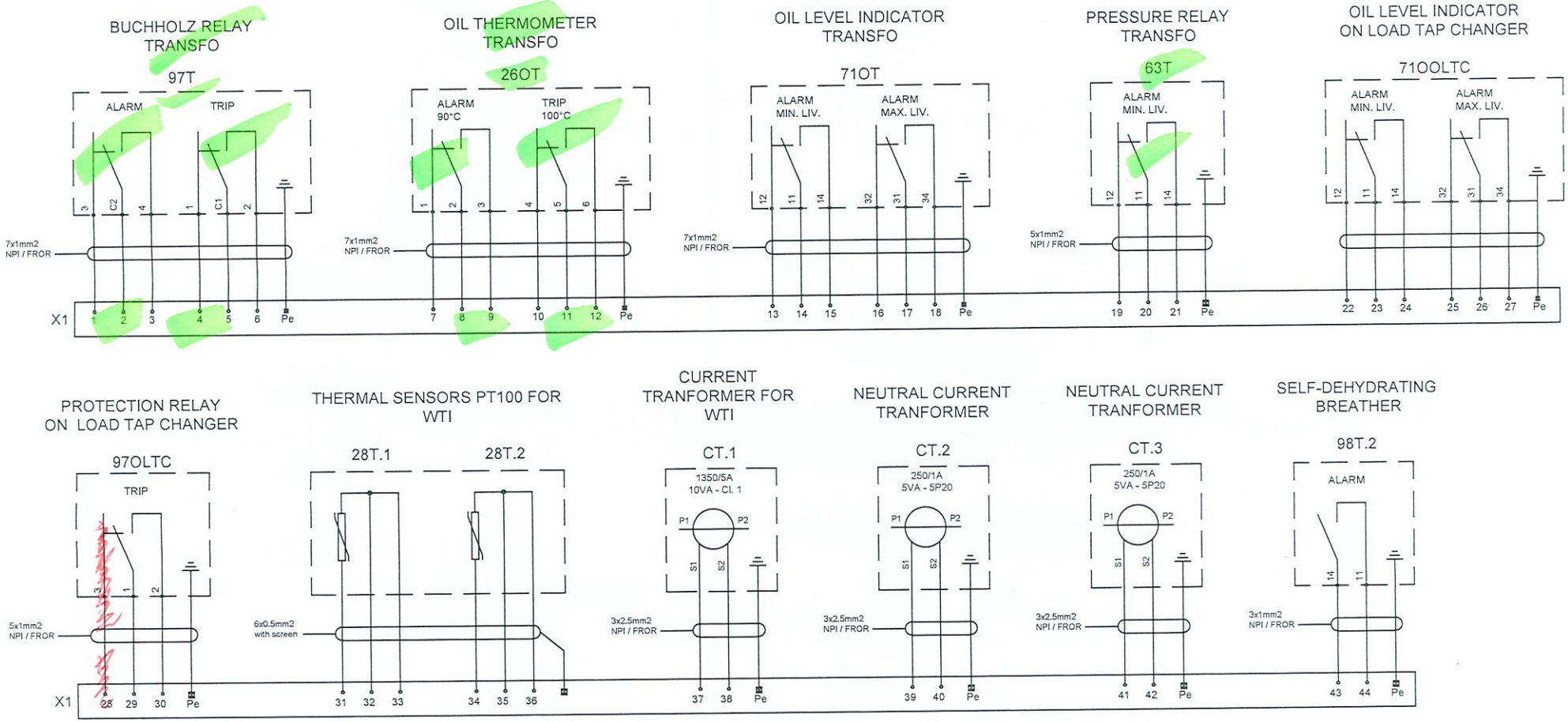
SHEET 004

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01

TRANSFORMER PROTECTIONS



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
PROTECTION DEVICES ON TRANSFORMER

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

SHEET 005

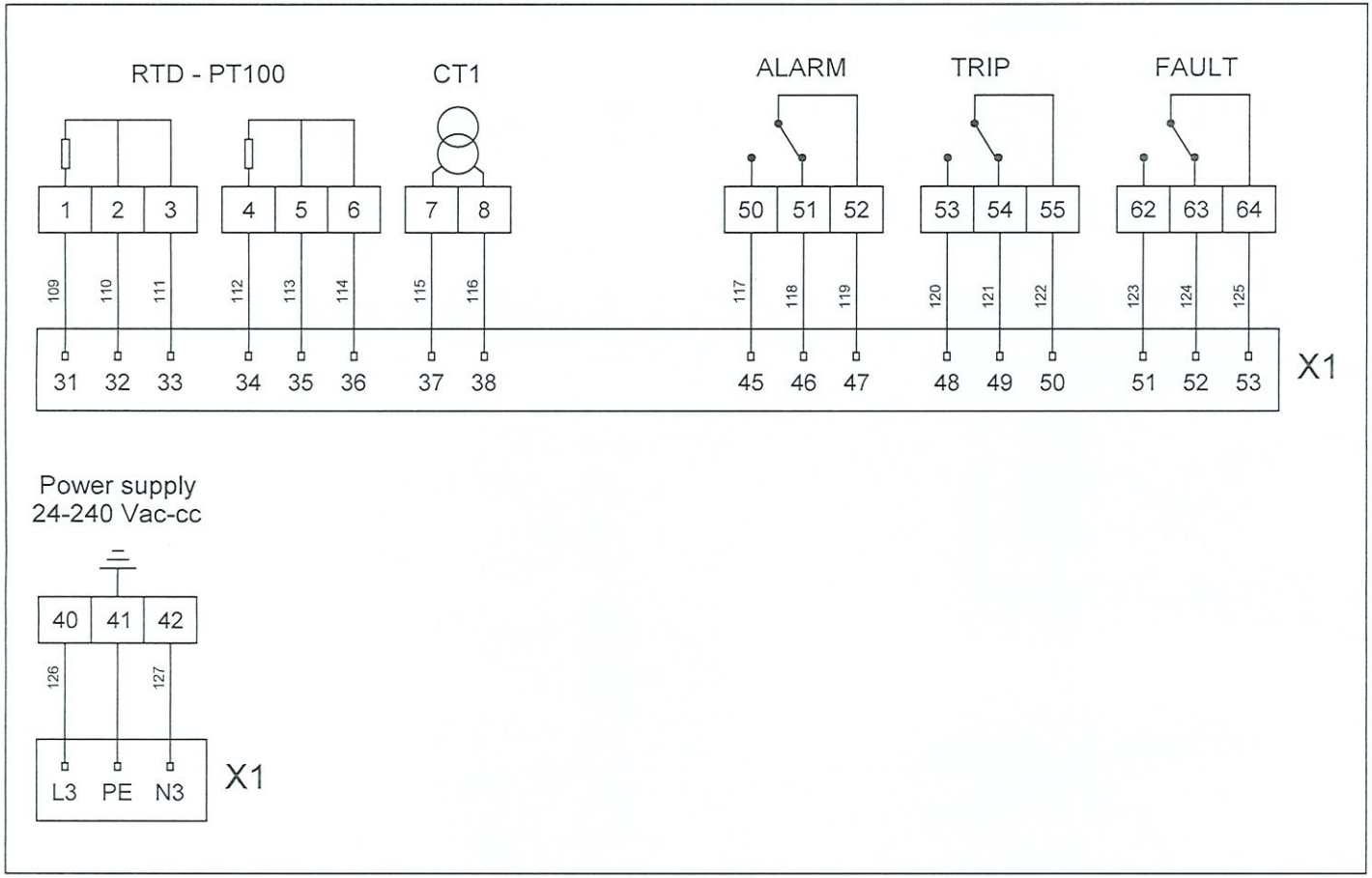
REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01

THERMAL IMAGE - WINDING TEMPERATURE INDICATOR (WTI)

49T (NT133/3)



SETTING:

-	NPT:	2
-	NCT:	1
-	DT:	5
-	CT1:	4.6A
-	TC:	6min
-	OIL ALARM:	90°C
-	WINDING ALARM:	95°C
-	TRIP OIL:	100°C
-	TRIP WINDING:	105°C

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
THERMAL CONTROL UNIT

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

SHEET 006

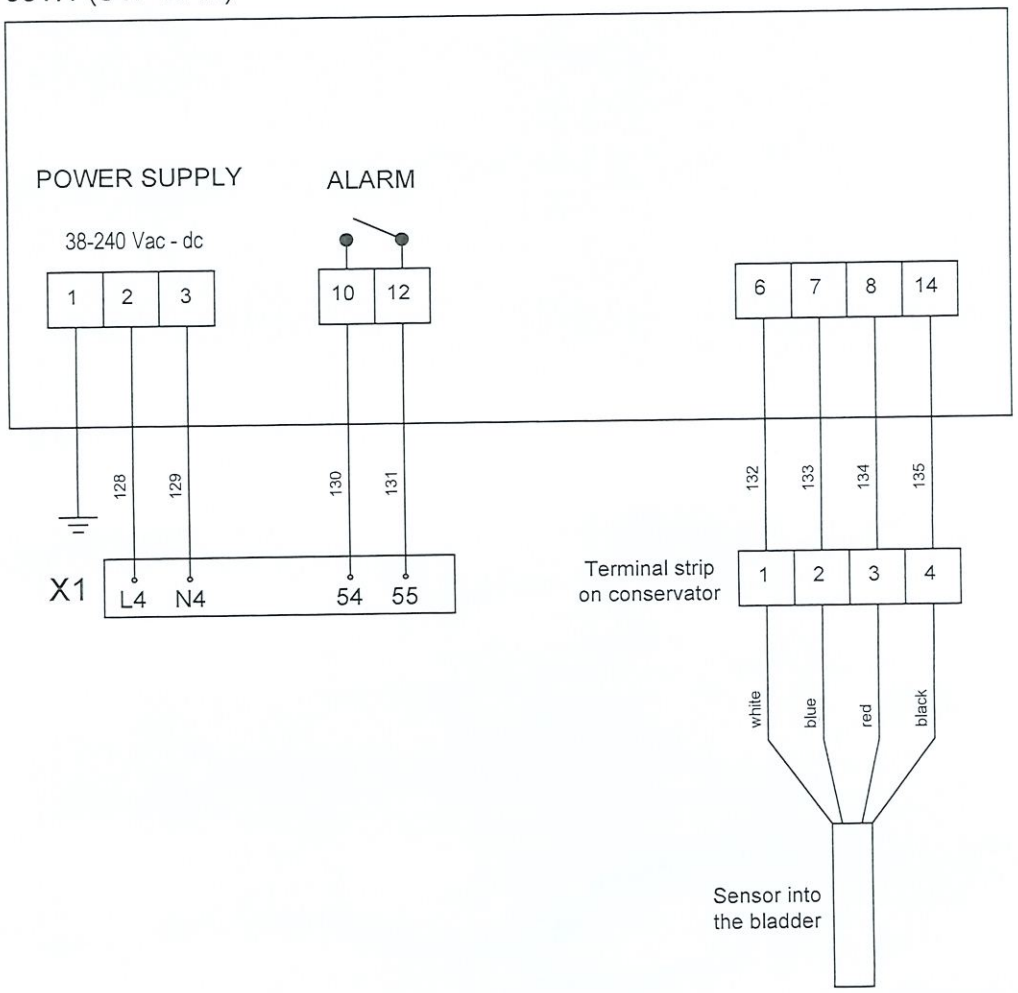
REV. 01

File Name : 1723001697-EL-DG-00010 Rev. 01

F.to UNI A3: 420mmx297mm

BLADDER RUPTURE RELAY

98T.1 (STP-BRR)



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
FRONT PAGE

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

SCALE : NTS

A3

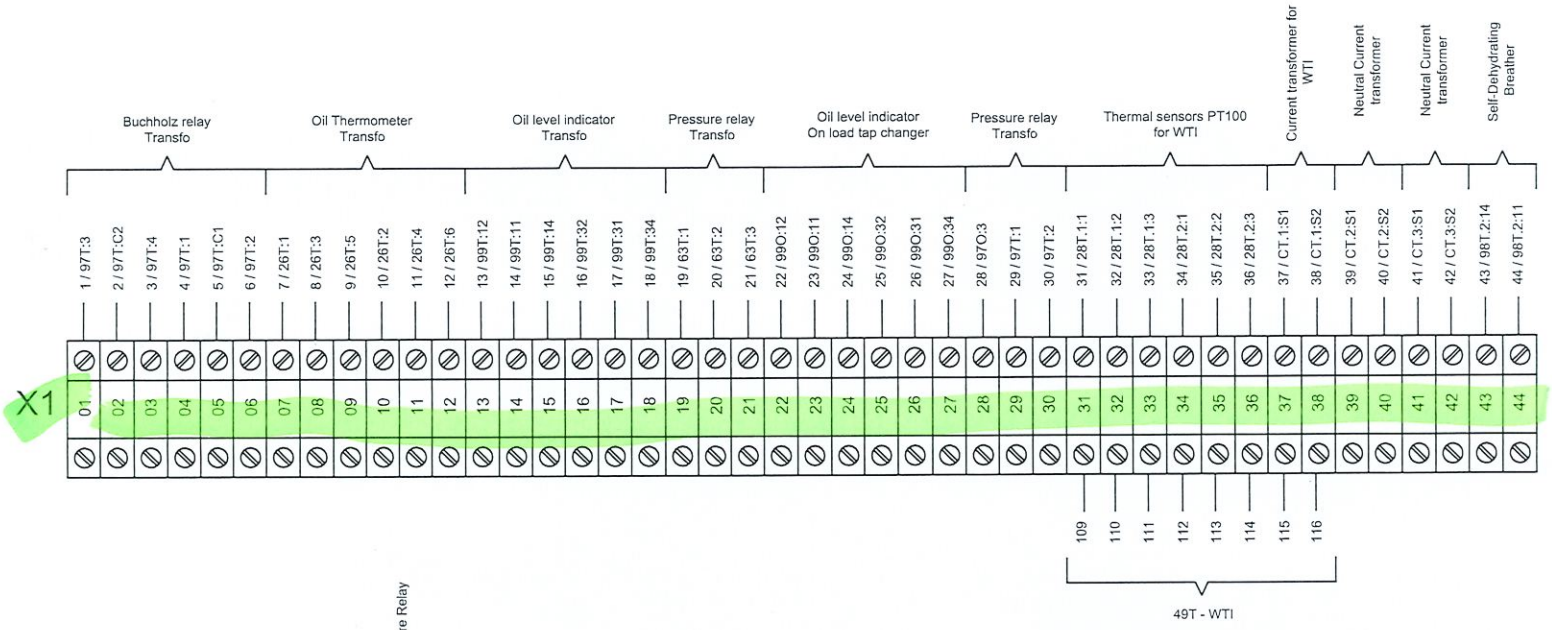
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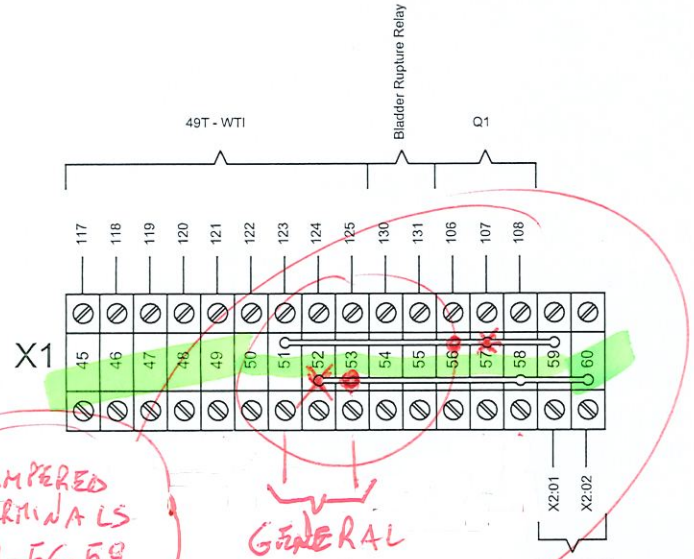
SHEET 007

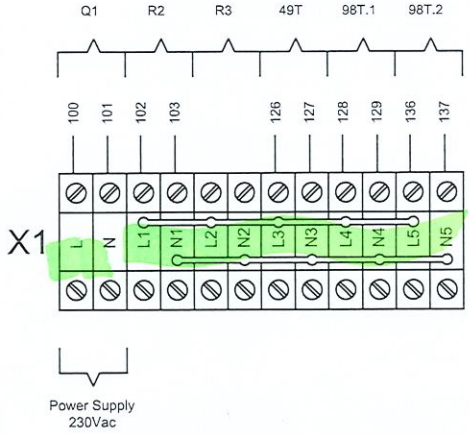
REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01







JUMPERED TERMINALS 51-56-59 53-58-60

GENERAL ALARM

ALL PE CONDUCTORS WILL BE CONNECTED AT PE BAR

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

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CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
TERMINAL STRIP

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

SHEET 008

REV. 01

File Name : 1723001697-EL-DG-00010 Rev. 01

F.to UNI A3: 420mmx297mm

Label	Description	Supplier	Model No.	Quantity	
Q1	MCB	ABB	S202 - C16 + S2C - H6R	1	
H1	CONTROL PANEL LAMP	ARTELETA	230V - 8W	1	
F1	MICROSWITCH	PIZZATO	FM 1815-S1	1	
R1	CONTROL PANEL HEATER - 15W	FANDIS	HWM015	1	
T1	CONTROL PANEL THERMOSTAT	FANDIS	TRT-10A230V-NCF	1	
R2	H.V. 66kV - CABLE BOX HEATER - 100W	FANDIS	HWM0100	1	
T2	H.V. 66kV - CABLE BOX HEATER THERMOSTAT	FANDIS	TRT-10A230V-NCF	1	
R3	L.V. 6.9kV - CABLE BOX HEATER - 100W	FANDIS	HWM0100	1	
T3	L.V. 6.9kV - CABLE BOX HEATER THERMOSTAT	FANDIS	TRT-10A230V-NCF	1	
49T	WINDING TEMPERATURE INDICATOR	TECSYSTEM	NT133	1	
98T.1	BLADDER RUPTURE RELAY	PRONAL	STP-BRR	1	
98T.2	SELF DEHYDRATING BREATHER	COMEM	ESDB 14C	1	
X1	TERMINAL STRIP	PHOENIX	ST2.5	70	

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
EQUIPMENT LIST

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

SHEET 009

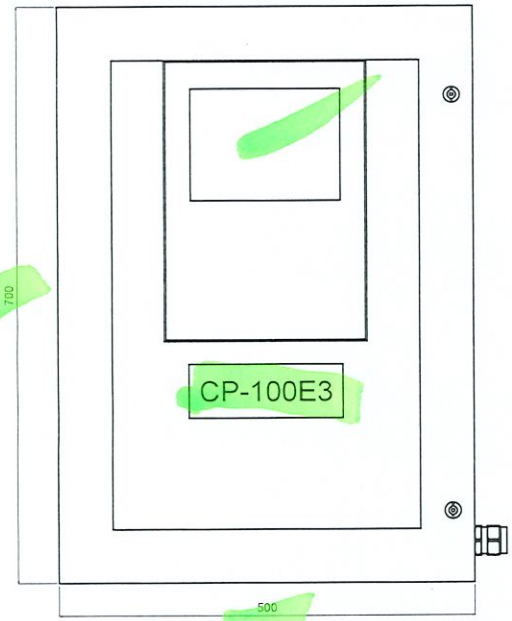
REV. 01

F.to UNI A3: 420mmx297mm

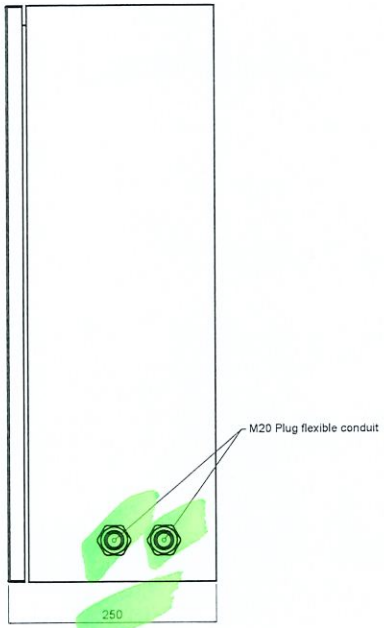
File Name : 1723001697-EL-DG-00010 Rev. 01

LAYOUT - AVR PANEL

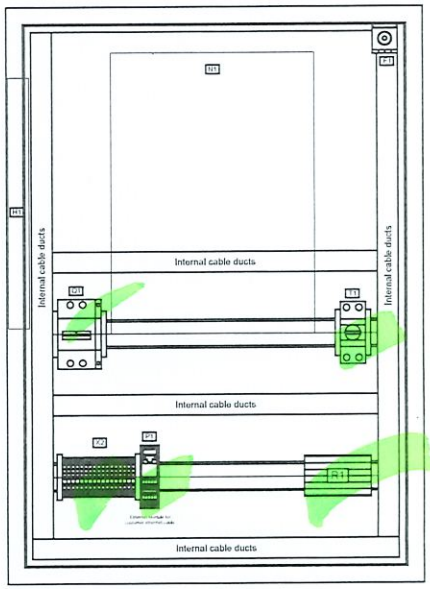
Frontal view



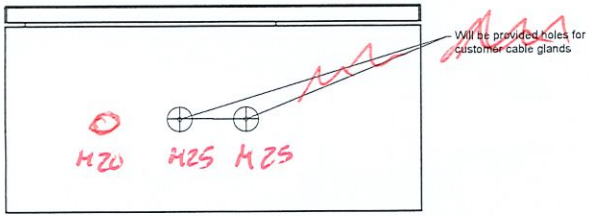
Left side view



Internal view



Bottom view



AUXILIARY CONTROL PANEL	
PROTECTION DEGREE :	IP65
VENTILATION :	NATURAL
BOX MATERIAL :	STAINLESS STEEL 15/10
INTERNAL REMOVABLE PLATE :	STELL 15/10

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

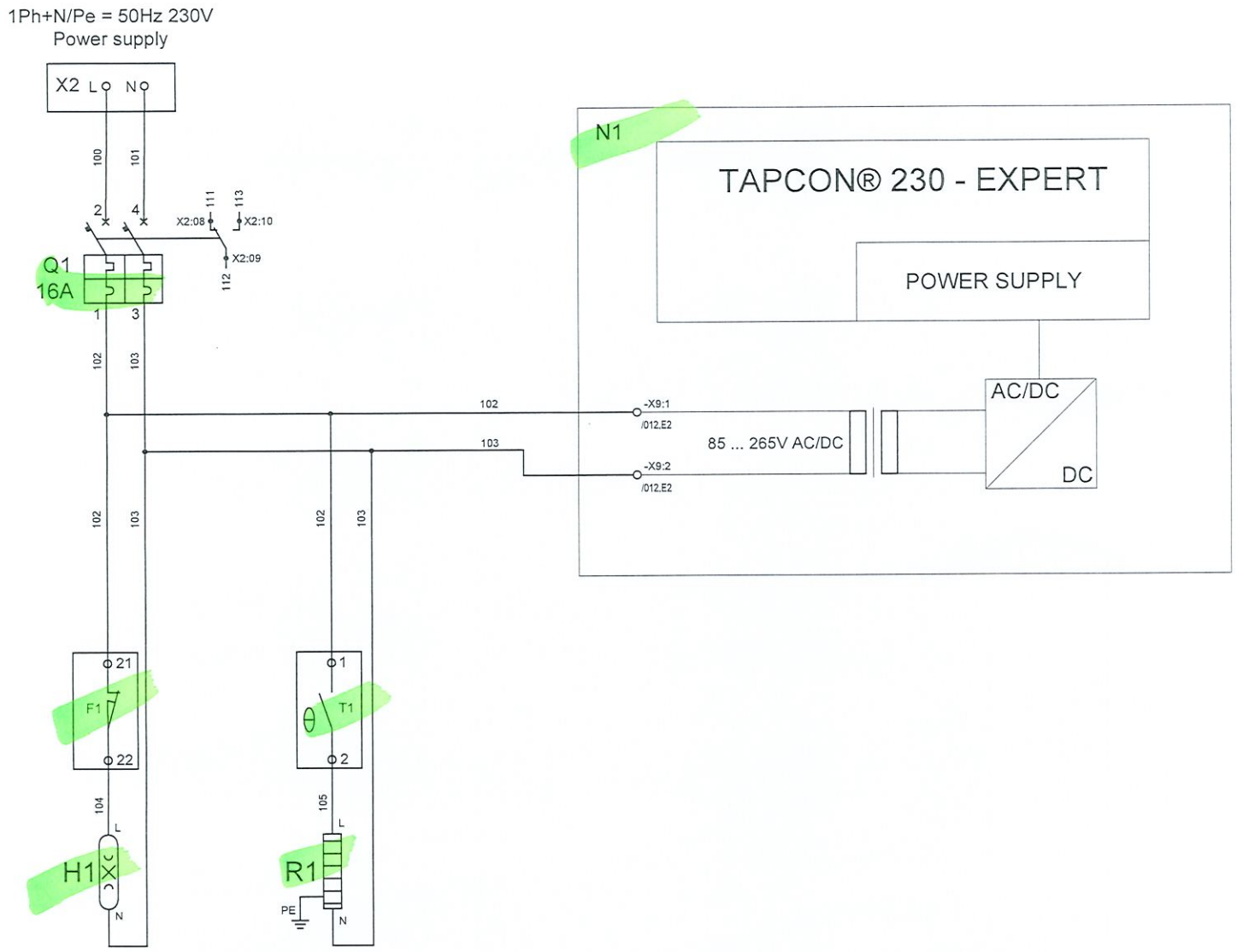
TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
LAYOUT – AVR PANEL

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

A3 | DRAWING NO. 1723001697-EL-DG-00010 | SHEET 010 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
LAYOUT – AVR PANEL

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

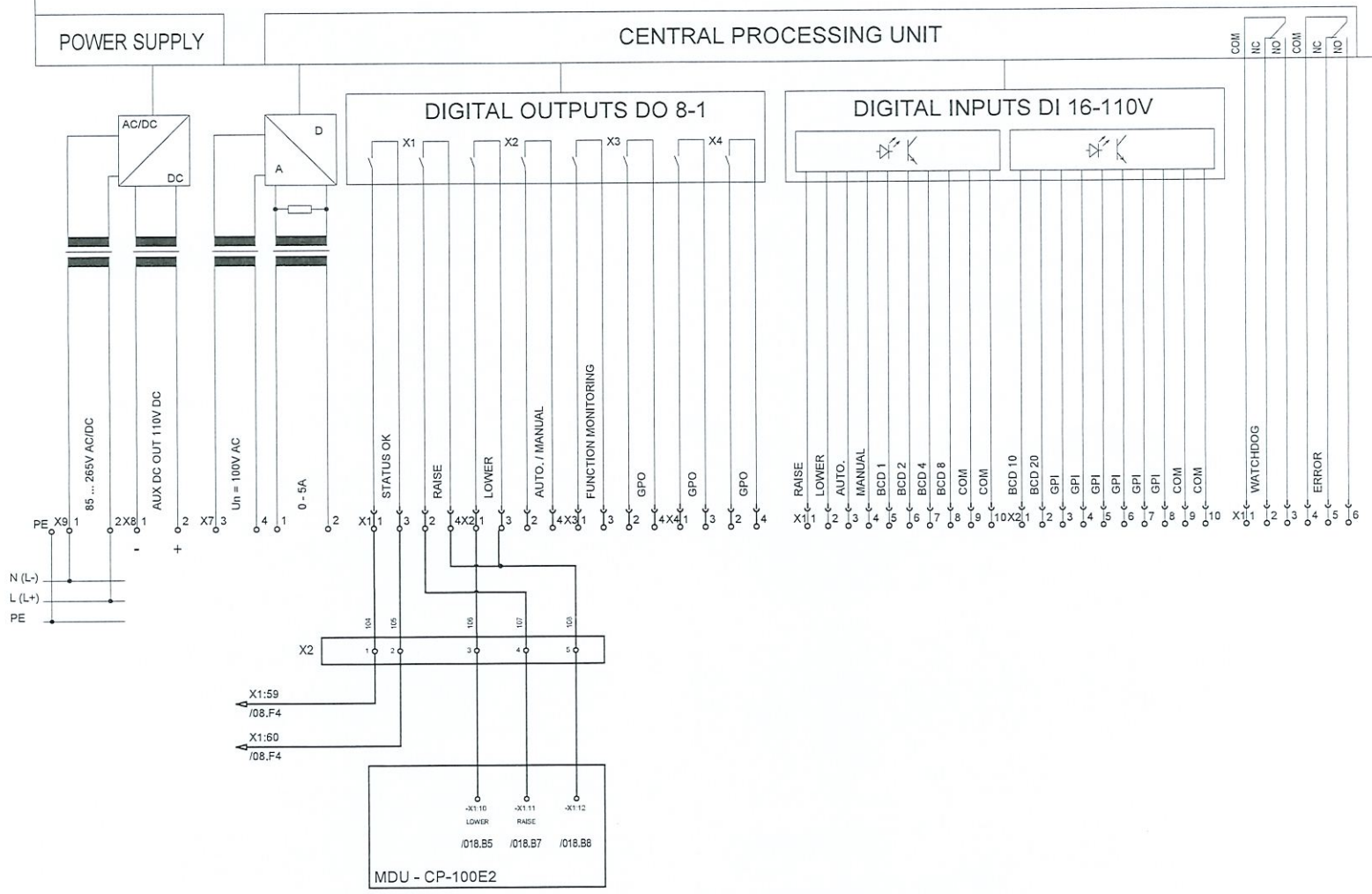
SHEET 011

REV. 01

File Name : 1723001697-EL-DG-00010 Rev. 01

F.to UNI A3: 420mmx297mm

TAPCON® 230 - EXPERT



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
INTERNAL POWER CIRCUIT DIAGRAM – AVR PANEL

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

A3 | DRAWING NO. 1723001697-EL-DG-00010 | SHEET 012 | REV. 01

F.to UNI A3: 420mmx297mm

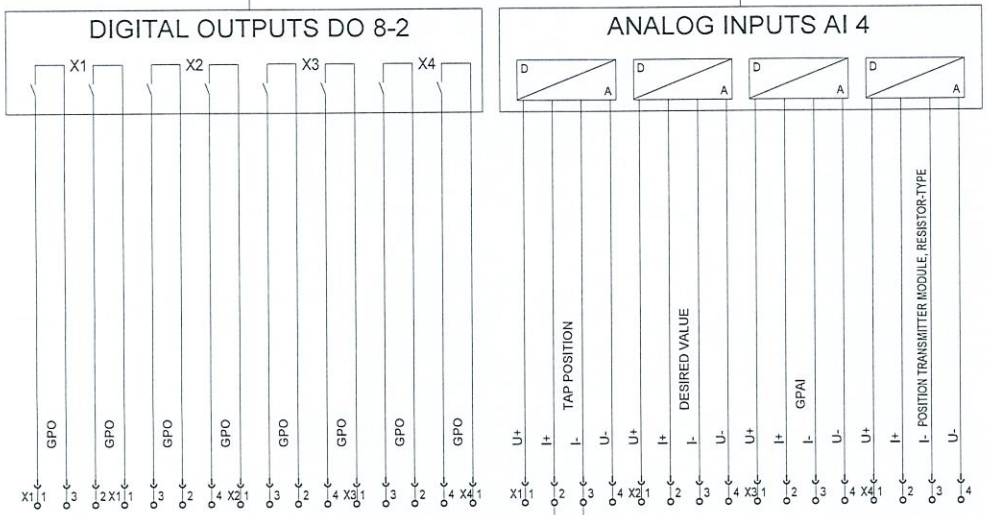
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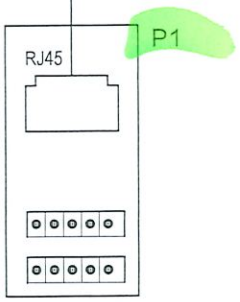
TAPCON® 230 - EXPERT

CENTRAL PROCESSING UNIT

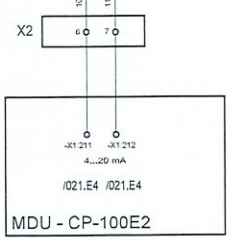
COM

SCADA ETHERNET
RJ45





Ethernet Module for
customer ethernet cable



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

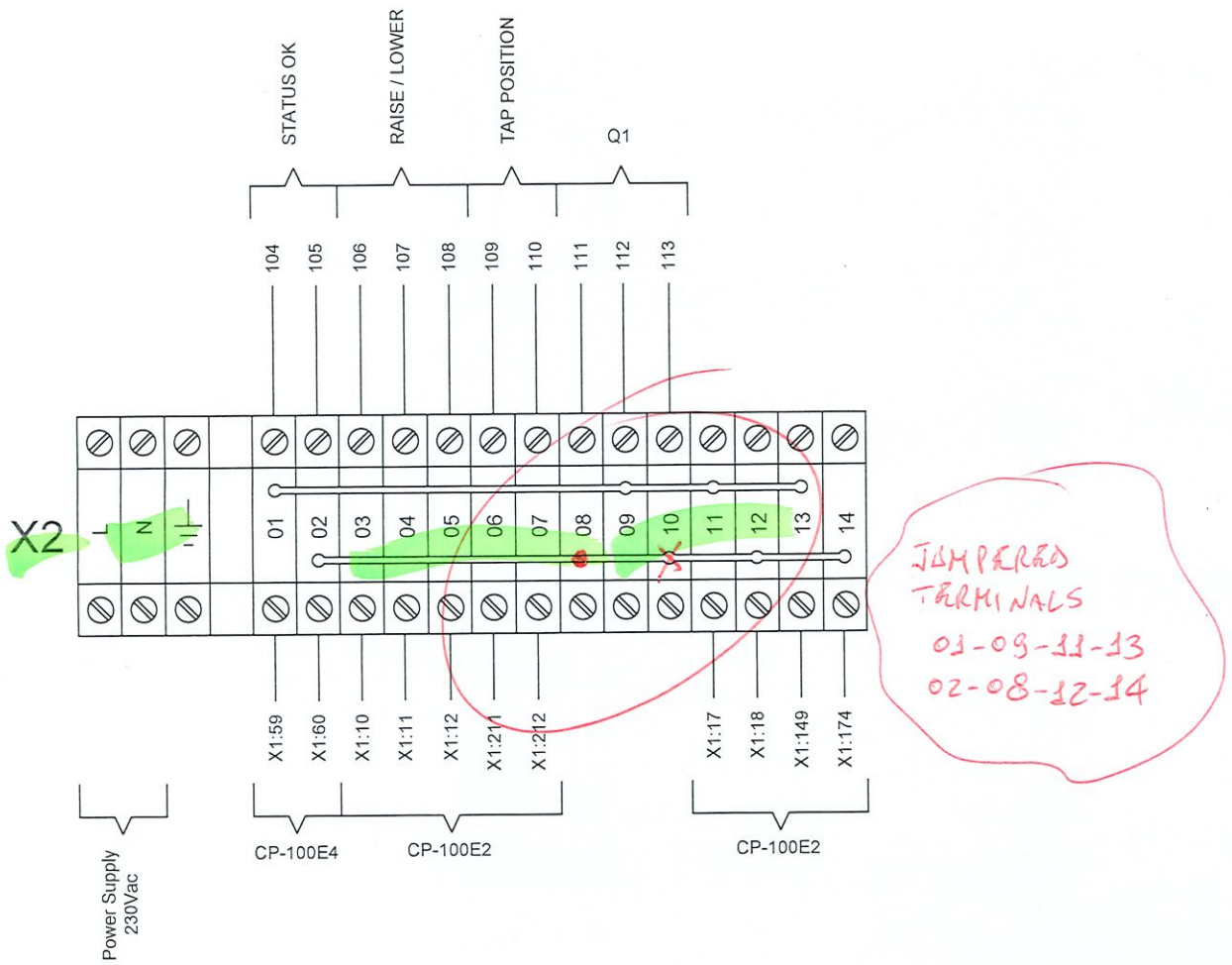
TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
INTERNAL POWER CIRCUIT DIAGRAM – AVR PANEL

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

A3 | DRAWING NO. 1723001697-EL-DG-00010 | SHEET 013 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
TERMINAL STRIP – AVR PANEL

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

SHEET 014

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01

Label	Description	Supplier	Model No.	Quantity	
Q1	MCB	ABB	S202 - C16 + S2C - H6R	1	
H1	CONTROL PANEL LAMP	ARTELETA	230V - 8W	1	
F1	MICROSWITCH	PIZZATO	FM 1815-S1	1	
R1	CONTROL PANEL HEATER - 15W	FANDIS	HWM015	1	
T1	CONTROL PANEL THERMOSTAT	FANDIS	TRT-10A230V-NCF	1	
N1	AUTOMATIC VOLTAGE REGULATOR	MR	TAPCON EXPERT	1	
P1	PASSIVE MODULE ETHERNET CABLE CONNECTOR	PHOENIX	UMK-RJ45/S/8PTDA	1	
X2	TERMINAL STRIP	PHOENIX	ST2.5	11	

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
EQUIPMENT LIST – AVR PANEL

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

A3 | DRAWING NO. 1723001697-EL-DG-00010 | SHEET 015 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01

CP-100E2
MDU - MOTOR DRIVE UNIT
WIRING DIAGRAM

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
MDU - WIRINGS

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

SCALE : NTS

A3

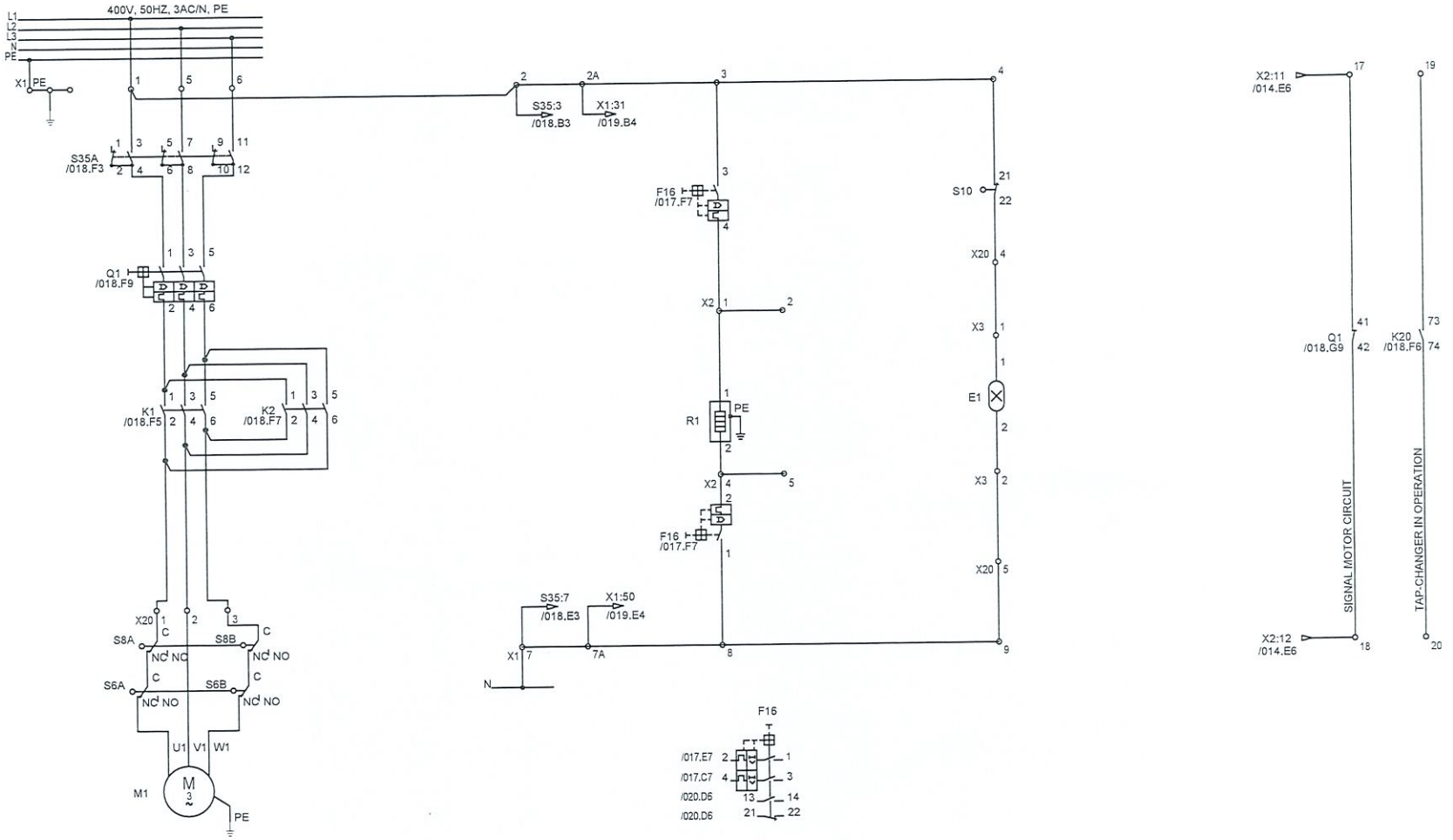
DRAWING NO. 1723001697-EL-DG-00010

SHEET 016

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01



DRIVE

HEATER

LIGHTING

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
MDU – WIRINGS

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

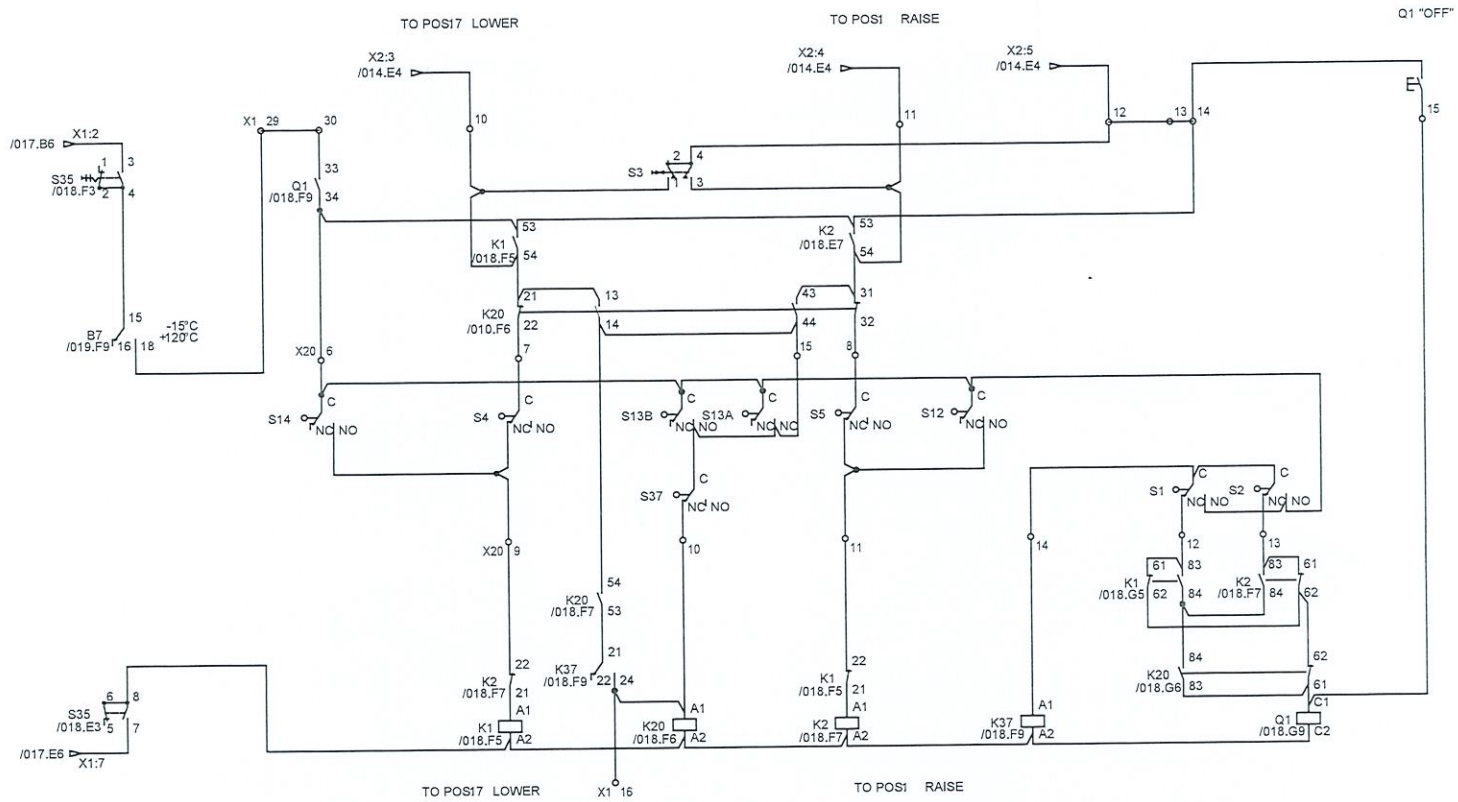
SHEET 017

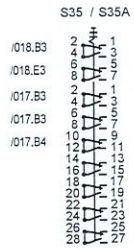
REV. 01

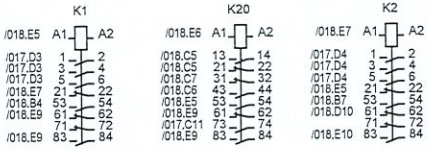
F.to UNI A3: 420mmx297mm

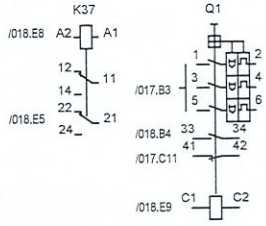
File Name : 1723001697-EL-DG-00010 Rev. 01

WITH STEP-BY-STEP OPERATION









REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR–100AD1 Termination and Wiring Diagram
MDU – WIRINGS

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

SCALE : NTS

A3

DRAWING NO. 1723001697–EL–DG–00010

SHEET 018

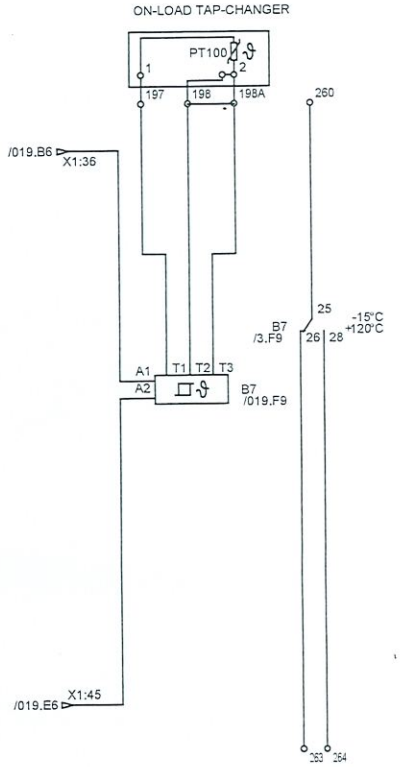
REV. 01

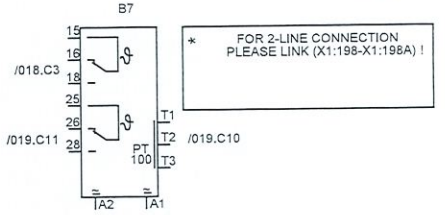
F.to UNI A3: 420mmx297mm

File Name : 1723001697–EL–DG–00010 Rev. 01









TAP CHANGER TEMPERATURE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
MDU - WIRINGS

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

SCALE : NTS

A3

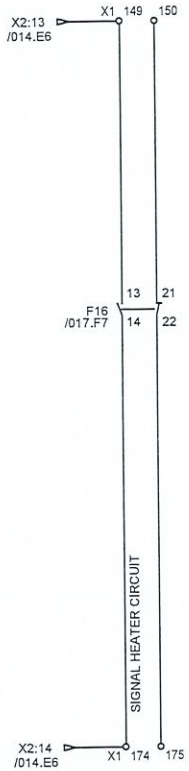
DRAWING NO. 1723001697-EL-DG-00010

SHEET 019

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

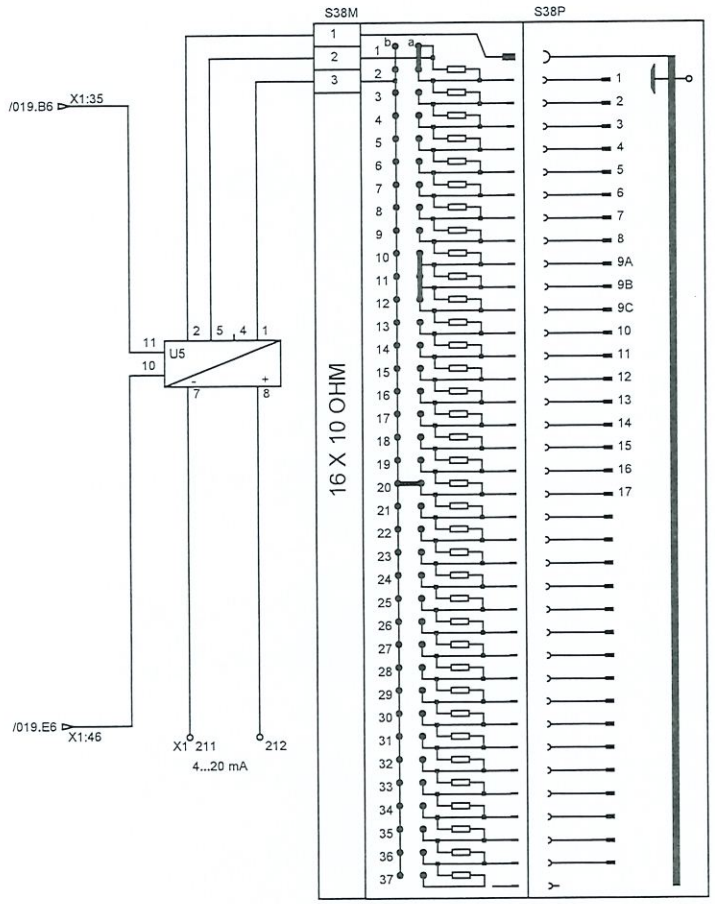
TITLE : BASE LOAD POWER HUB (BLPH)
TR–100AD1 Termination and Wiring Diagram
MDU – WIRINGS

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

A3 | DRAWING NO. 1723001697–EL–DG–00010 | SHEET 020 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697–EL–DG–00010 Rev. 01



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
MDU – WIRINGS

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

SCALE : NTS

A3

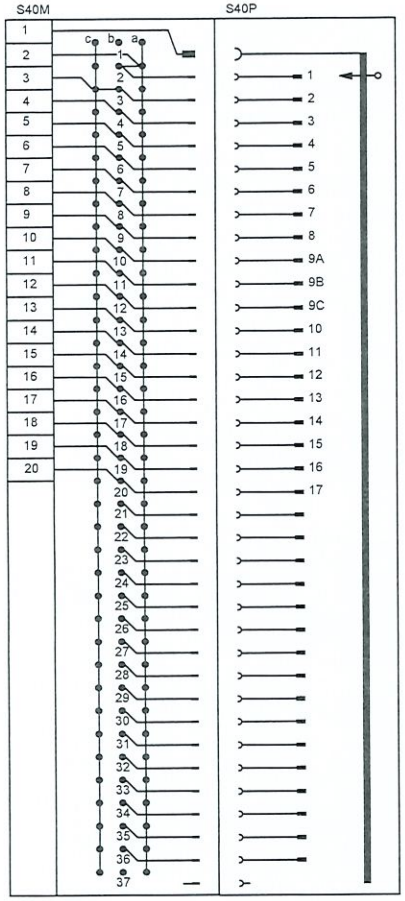
DRAWING NO. 1723001697-EL-DG-00010

SHEET 021

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
MDU – WIRINGS

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

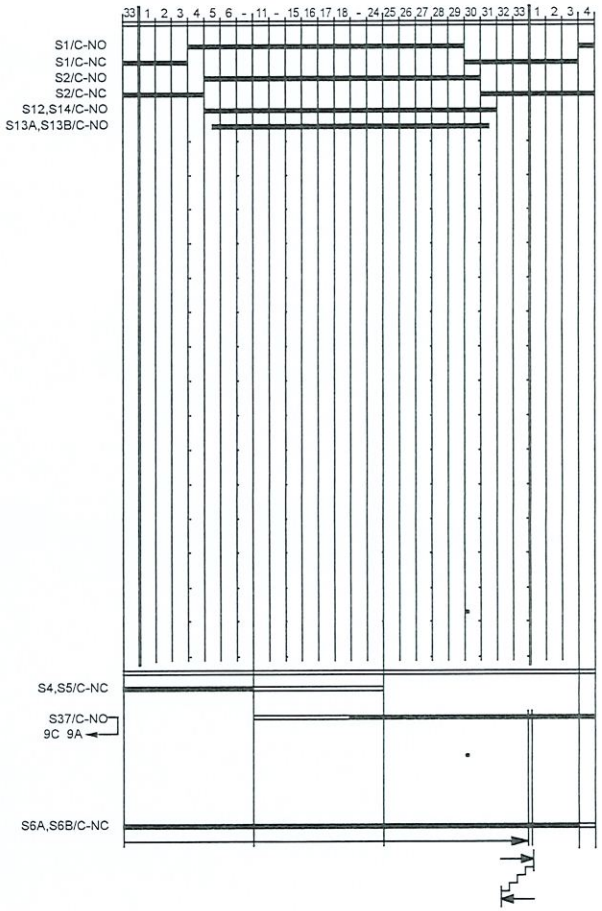
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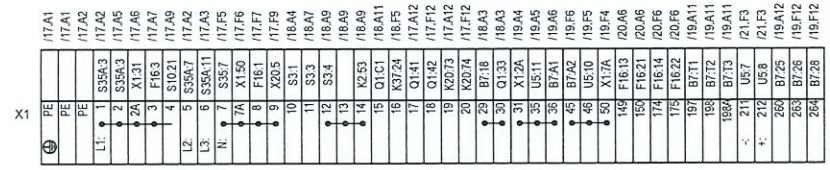
REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01

B7	MEASURING AMPLIFIER
E1	HAND LAMP
F16	AUTOMATIC CUT-OUT
K1	MOTOR CONTACTOR
K2	MOTOR CONTACTOR
K20	AUXILIARY CONTACTOR
K37	COUPLING RELAY FOR AUTOMATIC PASSAGE OF POSITIONS
M1	MOTOR
Q1	MOTOR PROTECTIVE SWITCH
R1	HEATER
S1	CAM-OPERATED SWITCH
S2	CAM-OPERATED SWITCH
S3	RAISE/LOWER CONTROL SWITCH
S4	END POSITION SWITCH
S5	END POSITION SWITCH
S6A	END POSITION SWITCH
S6B	END POSITION SWITCH
S8A	HAND CRANK SAFETY SWITCH
S8B	HAND CRANK SAFETY SWITCH
S10	DOOR CONTACT
S12	CAM-OPERATED DIRECTIONAL SWITCH
S13A	CAM-OPERATED DIRECTIONAL SWITCH
S13B	CAM-OPERATED DIRECTIONAL SWITCH
S14	CAM-OPERATED DIRECTIONAL SWITCH
S35	MAIN SWITCH
S35A	MAIN SWITCH
S37	SWITCH FOR AUTOMATIC PASSAGE OF POSITIONS
S38M	POSITION TRANSMITTER MODULE, RESISTOR-TYPE
S38P	POSITION TRANSMITTER BOARD
S40M	POSITION TRANSMITTER MODULE WITH N/O CONTACT RANGE
S40P	POSITION TRANSMITTER BOARD
U5	MEASURING TRANSDUCER
X1	TERMINAL
X2	TERMINAL
X3	TERMINAL
X20	TERMINAL





REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	16/07/24	ML	MF	MF	ACCEPTED FOR CONSTRUCTION (AFC)
00	11/04/24	ML	MF	MF	ISSUE FOR INFORMATION (IFI)

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-100AD1 Termination and Wiring Diagram
EQUIPMENT LIST - AVR PANEL

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

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DG-00010

SHEET 023

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00010 Rev. 01

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81001-CEC	: 66kV, 7MVA Transformer / LCP GIS			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10002120		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH/CWB/LSZH | Cores/Size mm²: 4X4 mm2 | Color: GREY

From: CP-100E4 | To: CP-100E1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	NA
9	Check terminations are in accordance with latest termination diagram.	OK
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,8
	CORE 2 / All cores+screen+armour+earth	0,8
	CORE 3 / All cores+screen+armour+earth	0,8
	CORE 4 / All cores+screen+armour+earth	0,8
	CORE 5 / All cores+screen+armour+earth	\
	CORE 6 / All cores+screen+armour+earth	\
	CORE 7 / All cores+screen+armour+earth	\
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\
INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	\
	CORE 6	\
	CORE 7	\
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

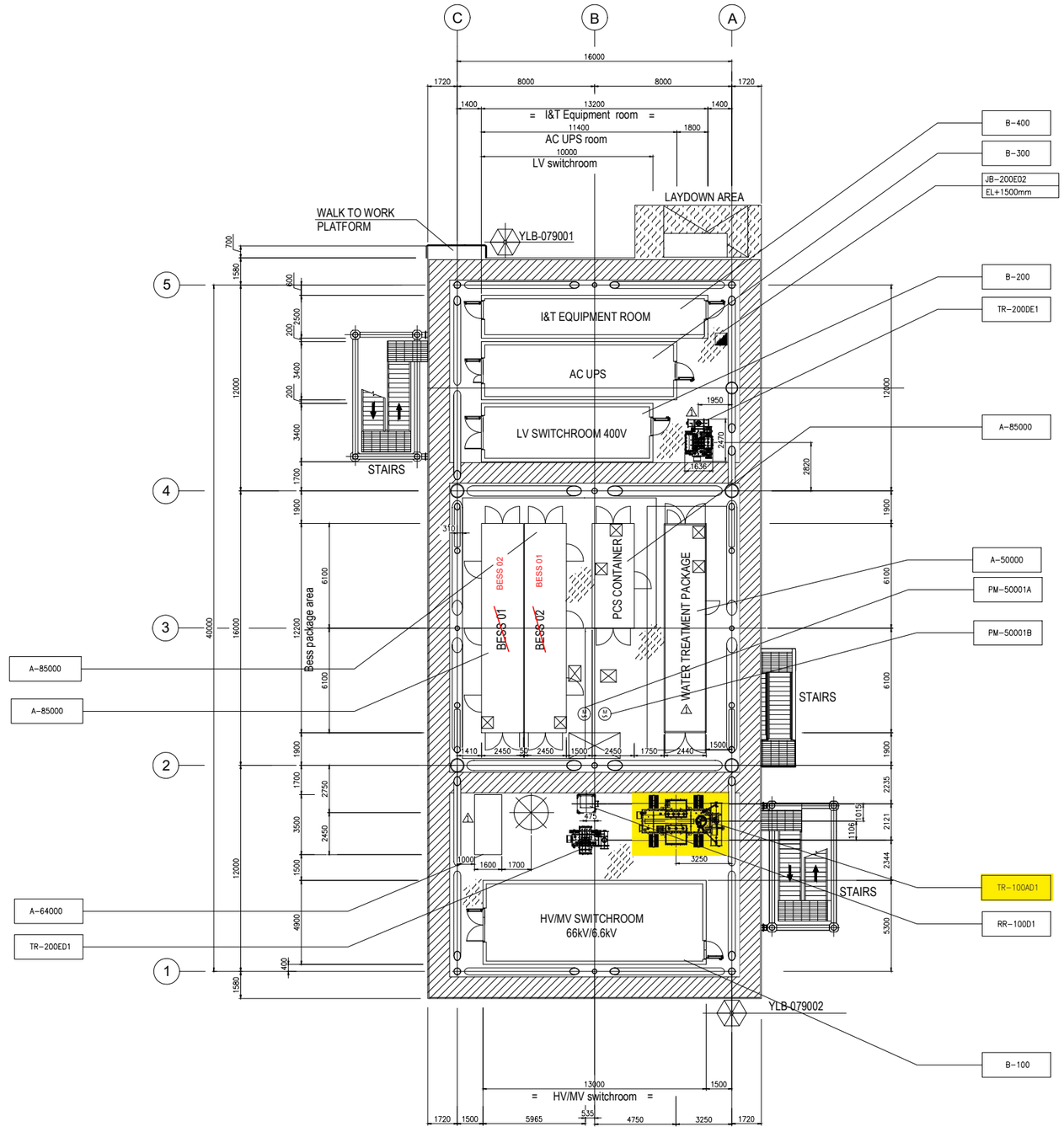
TYPE / SERIAL N° : VOLCRAFT 1000V - ET-200 S/N:H240103023 Calibration certificate N° and date: 12/10/2024	TYPE / SERIAL N° : MEGGER: KEW3125ASERIAL:W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

Comments: Nota 4: refer to PL C30000679

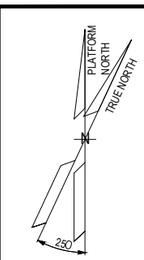
Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-15	2025-01-18	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-15T10:32:54.079Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-18T14:42:59.680Z	

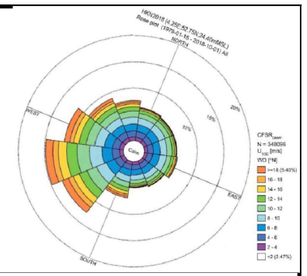
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.





NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

M	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
1_B	12/12/24	C.Pilato

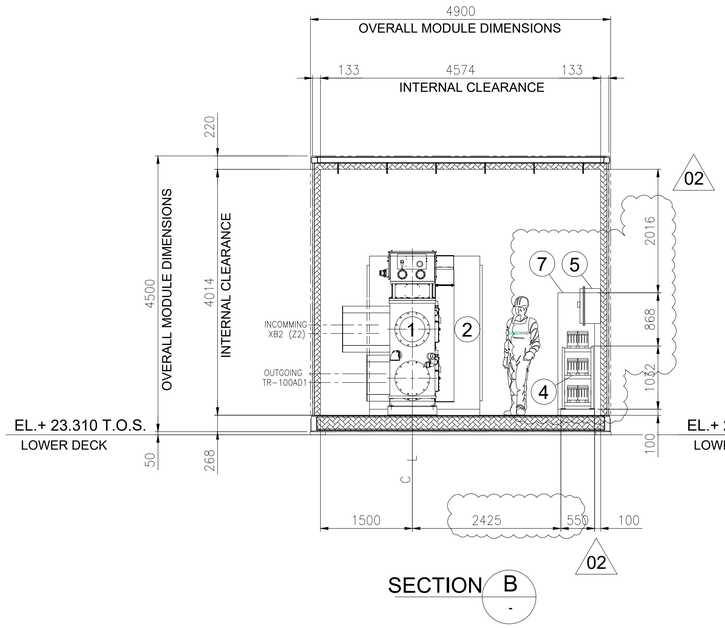
ROSETTI MARINO SpA

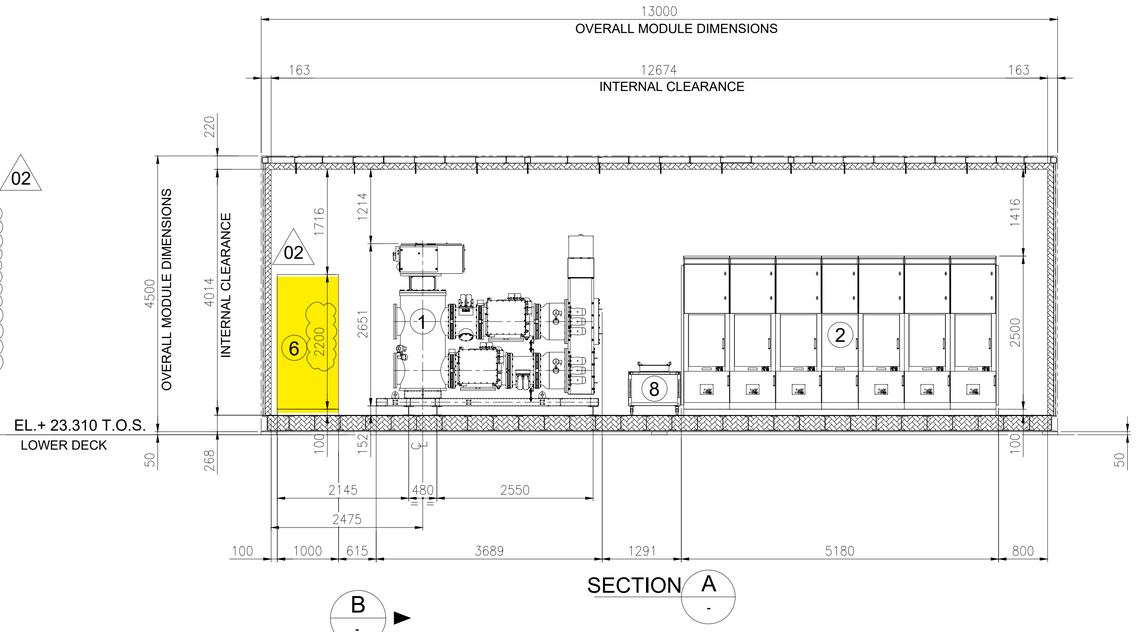
TITLE :
BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

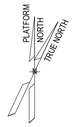
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout - Lower Deck

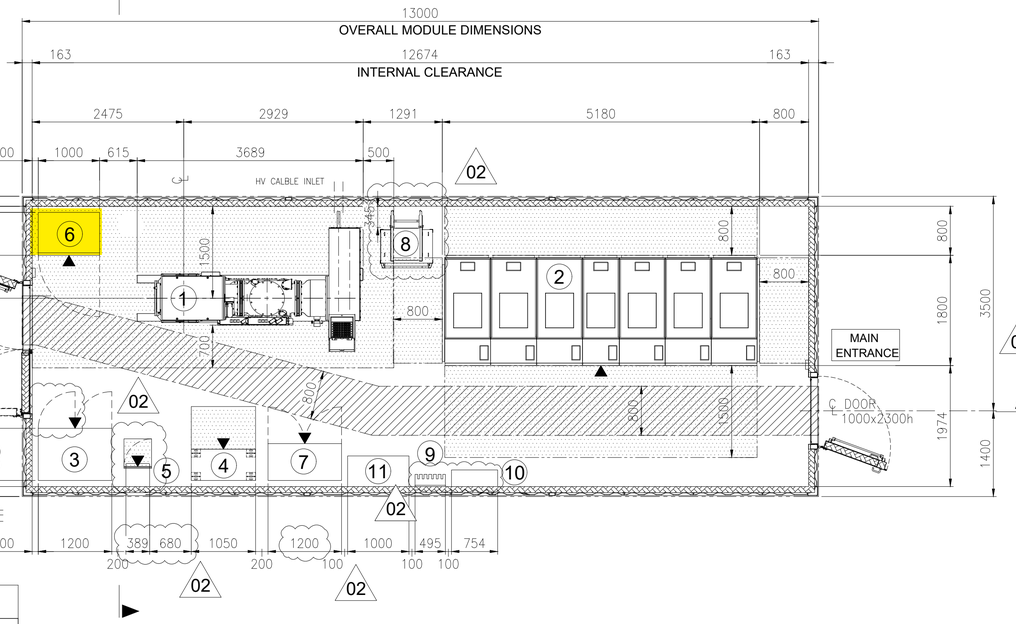
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



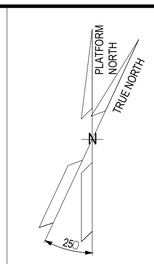


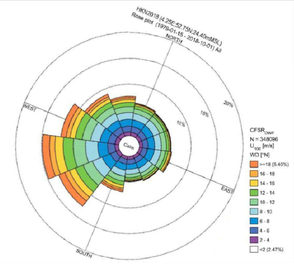


B -



A -





NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

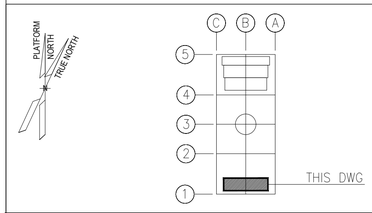
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 66KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E4

COLUMN/CUBIC.: -

NEUTRAL CURRENT TRANSFORMER

-X1

X1 / 39
FROM CT
X1 / 40

1
2
3
4

BK

81001-CEC
4C X 4 mm²

BK

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.: -

-X41

1
2
3
4

X41 / 1
X41 / 2

CT FOR
51G PROTECTION
(7SJ85)

-X1

X1 / 41
FROM CT
X1 / 42

1
2
3
4

BK

81002-CEC
4C X 4 mm²

BK

COLUMN/CUBIC.:-

-X43

1
2
3
4

X43 / 1
X43 / 2

CT FOR 87NT
PROTECTION
(7UT85)

-X1

X1 / 02
BUCHHOLZ RELAY ALARM
X1 / 03

X1 / 08
OIL THERMOMETER ALARM
X1 / 09

X1 / 14
OIL LEVEL (MIN.) ALARM
X1 / 15

1
2
3
4
5
6
7

BK

81003-CEC
7C X 1.5 mm²

BK

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

-XM

1
2
3
4
5
6
7

XM / 61
XM / 62
ALARM 97T

XM / 47
XM / 48
ALARM 26OT

XM / 49
XM / 50
ALARM 71OT

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

REV.:	DATE:	SIGNATURE:
2_H	16/01/25	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
66KV, 7MVA TRANSFORMER ALARMS PROTECTION

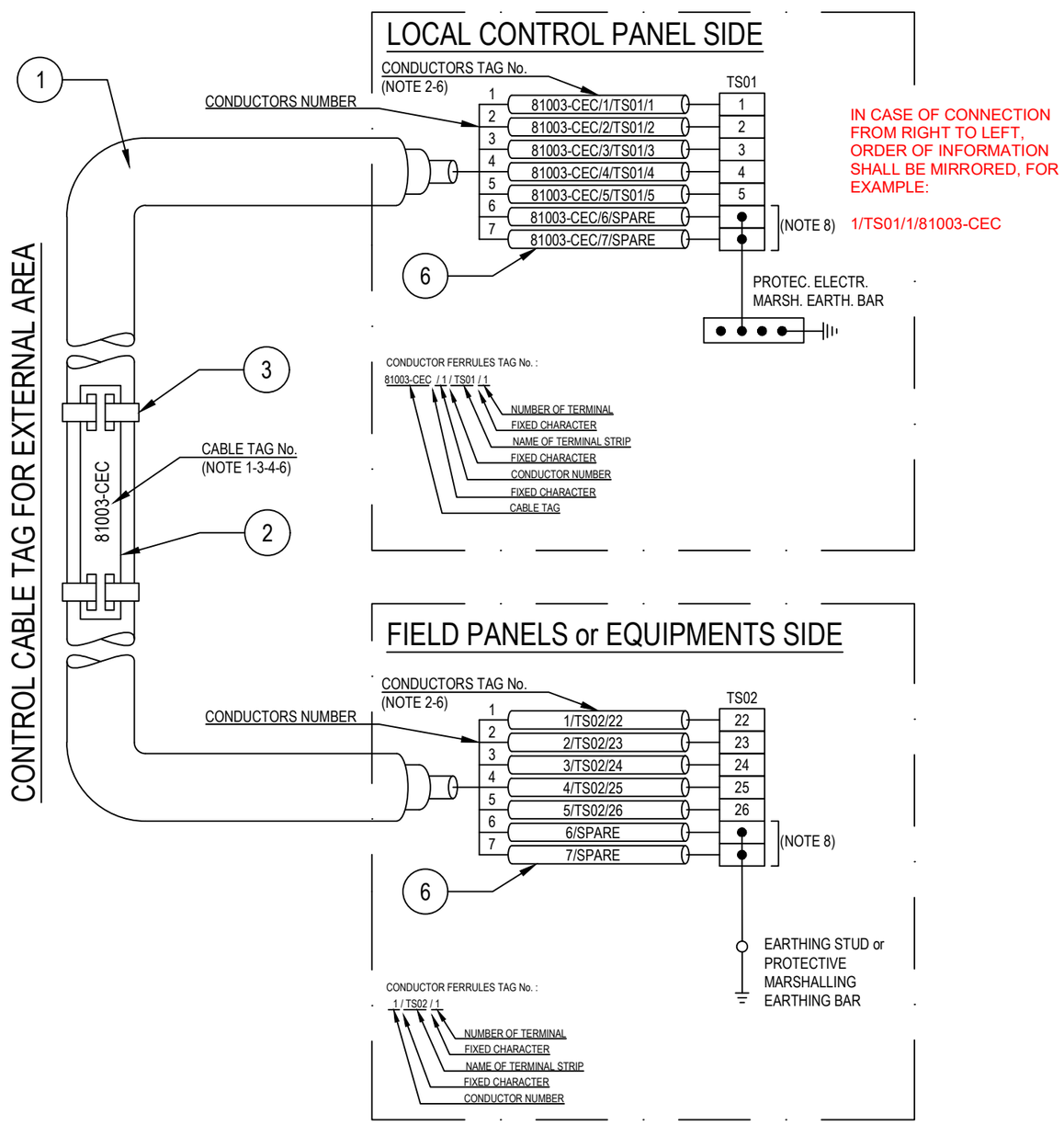
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DG-20149	067	02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

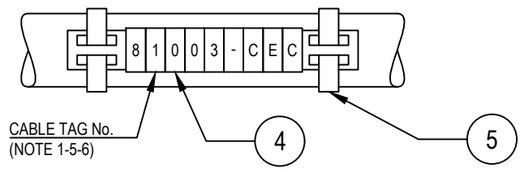
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

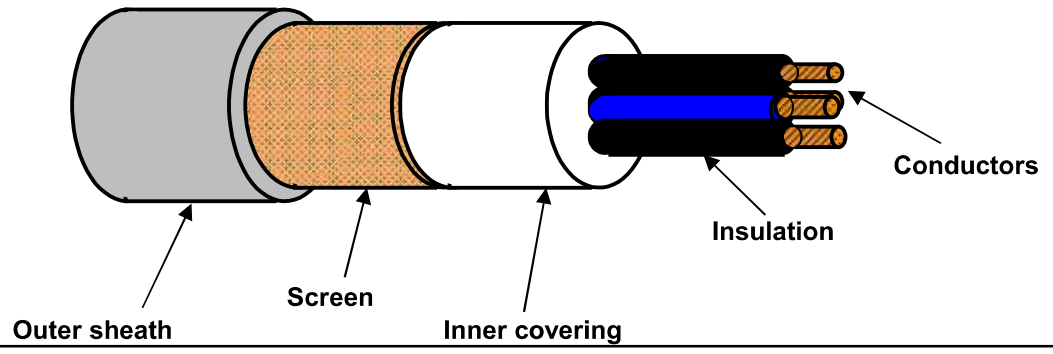
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81001-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	CP-100E1	66 kV GIS Local Control Panel	Lower Deck (B-100)	ELECV35-4X4	Cable Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1kV 4Cx4mm² - Grey	M20	T2_M20_Double	M25	RED_M25MxM20F	T2_M20_Double				L-150-101-LVT-091 / L-150-101-LVT-090 / L-450-101-LVT-072 / L-600-101-LVT-094 / L-750-101-LVT-014 / L-450-101-LVT-075 / E-MCT-106 / L-600-101-LVT-058 / L-300-101-LVT-059 / L-300-101-LVT-063

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV

4CX4 - CONTROL CABLE - SCREENED - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 4)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Screen :	**Copper Wire Braid (coverage ≥ 90%)**	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60092.360, Average Thickness 1,3 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking**	
Outer diameter :	(15,4 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores - Screen)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 690 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance	IEC 61034.2 (LT ≥ 60%)	
Hazardous Areas :	IEC 60079.14:2013 par.9.3.2a	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81003-CEC	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100	
TASK	code	C10002122	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX10	Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH | Cores/Size mm²: 7X1,5 mm2 | Color: GREY

From: CP-100E4 | To: SG-100D1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	PL
4	Check cable is supported and fixed to rack according to latest project Specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	PL
7	Check cable labelling is in accordance with latest specification.	PL
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0.8
	CORE 2 / All cores+screen+armour+earth	0.8
	CORE 3 / All cores+screen+armour+earth	0.8
	CORE 4 / All cores+screen+armour+earth	0.8
	CORE 5 / All cores+screen+armour+earth	0.8
	CORE 6 / All cores+screen+armour+earth	0.8
	CORE 7 / All cores+screen+armour+earth	0.8
	CORE 8 / All cores+screen+armour+earth	NA
	CORE 9 / All cores+screen+armour+earth	NA
	CORE 10 / All cores+screen+armour+earth	NA
INSULATION	CORE 1	>999
	CORE 2	>999
	CORE 3	>999
	CORE 4	>999
	CORE 5	>999
	CORE 6	>999
	CORE 7	>999
	CORE 8	NA
	CORE 9	NA
	CORE 10	NA
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

TYPE / SERIAL N° : KEW3125A S/N: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024	TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769) Calibration certificate N° and date: N°7715/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

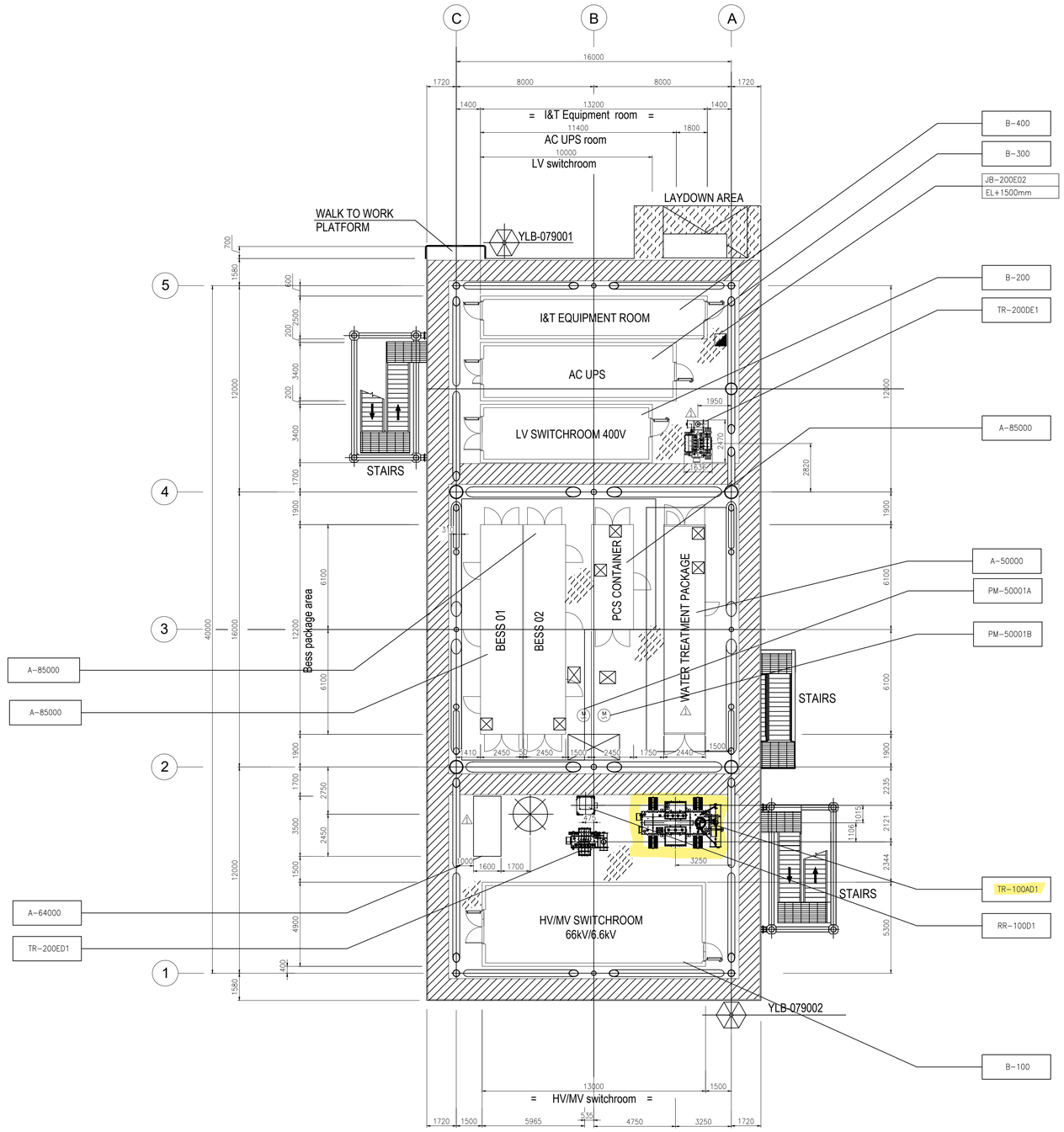
Comments: Note 4 : refer to PL C30000679

Note 9 :cable terminations must be reconnected during the commissioning phase.

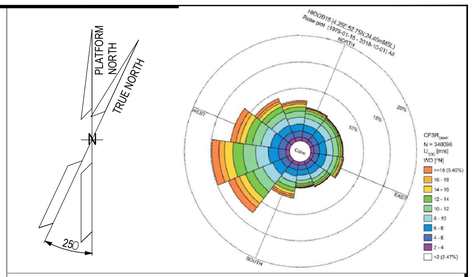
Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Giovanni Tangianu	
Date	2024-11-29	2024-12-09	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-11-29T10:40:07.389Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2024-12-09T09:38:56.082Z	

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

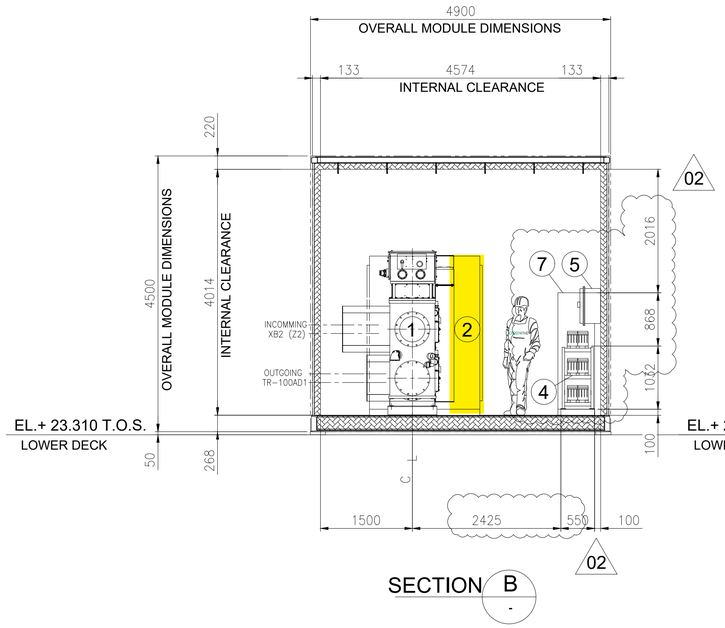
CROSSWIND | ROSETTI MARINO

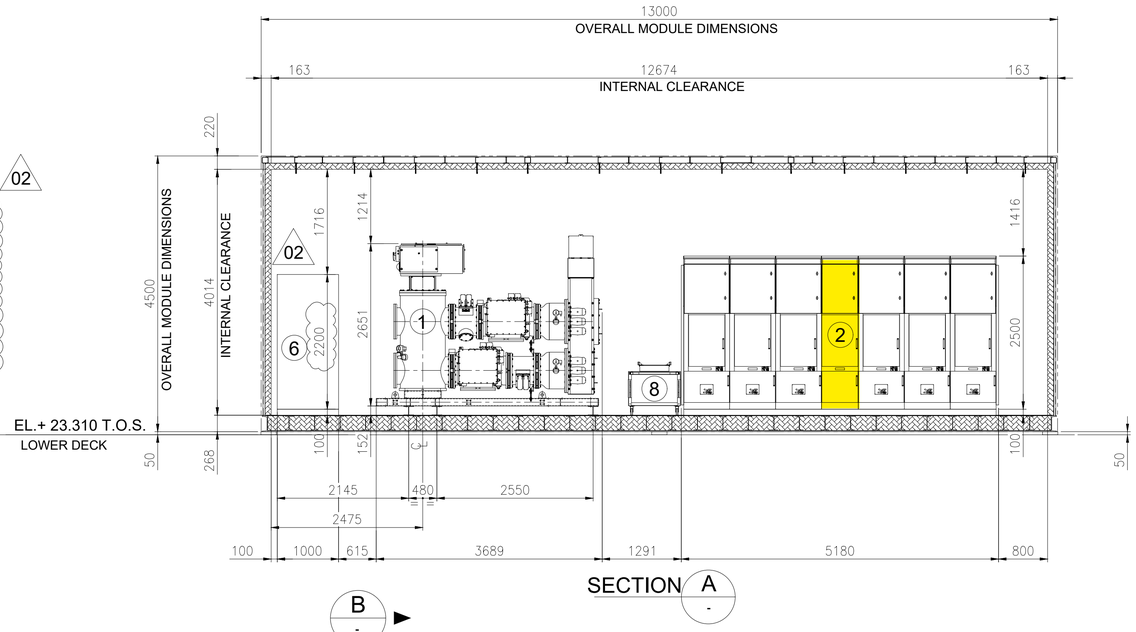
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

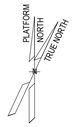
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

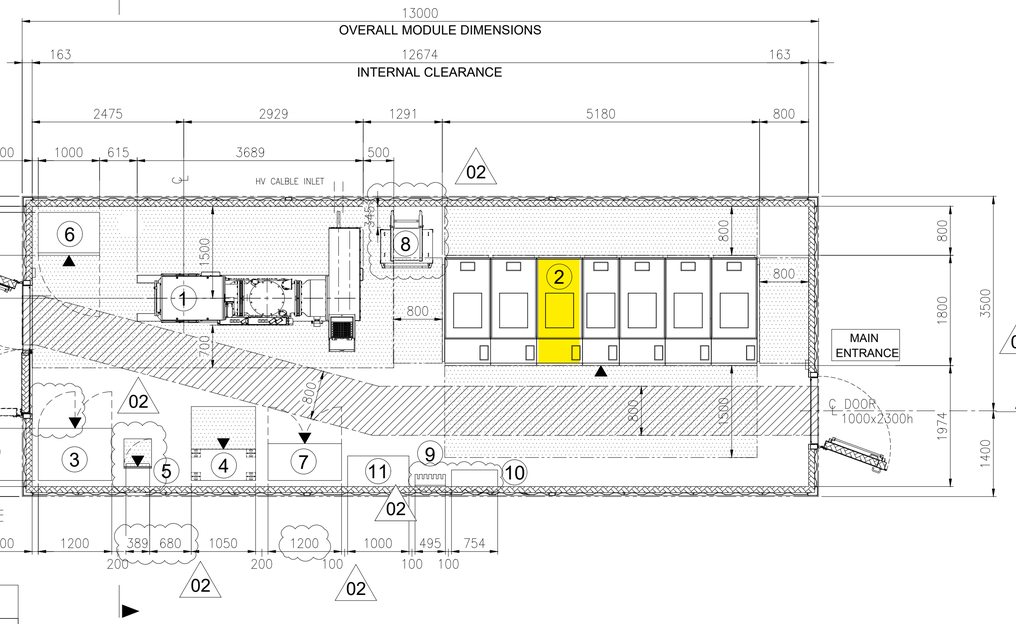
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



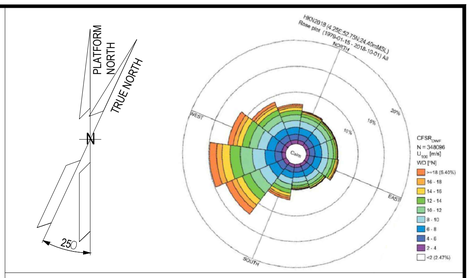




B -



A -



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

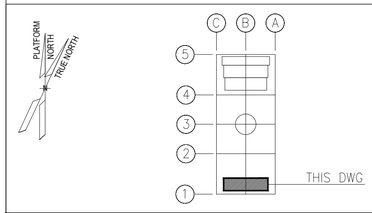
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 66KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E4

COLUMN/CUBIC.: -

NEUTRAL CURRENT TRANSFORMER

-X1

X1 / 39 — FROM CT — X1 / 40 → 1, 2, 3, 4

BK — 81001-CEC 4C X 4 mm² — BK

-X1

X1 / 41 — FROM CT — X1 / 42 → 1, 2, 3, 4

BK — 81002-CEC 4C X 4 mm² — BK

-X1

X1 / 02	BUCHHOLZ RELAY ALARM	1
X1 / 03		2
X1 / 08	OIL THERMOMETER ALARM	3
X1 / 09		4
X1 / 14	OIL LEVEL (MIN.) ALARM	5
X1 / 15		6
		7

BK — 81003-CEC 7C X 1.5 mm² — BK

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.: -

-X41

1	X41 / 1	CT FOR 51G PROTECTION (7SJ85)
2	X41 / 2	
3		
4		

COLUMN/CUBIC.:-

-X43

1	X43 / 1	CT FOR 87NT PROTECTION (7UT85)
2	X43 / 2	
3		
4		

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

-XM

1	XM / 61	ALARM 97T
2	XM / 62	
3	XM / 47	ALARM 26OT
4	XM / 48	
5	XM / 49	ALARM 71OT
6	XM / 50	
7		

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

REV.:	DATE:	SIGNATURE:
2_C	02/12/24	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
66KV, 7MVA TRANSFORMER ALARMS PROTECTION

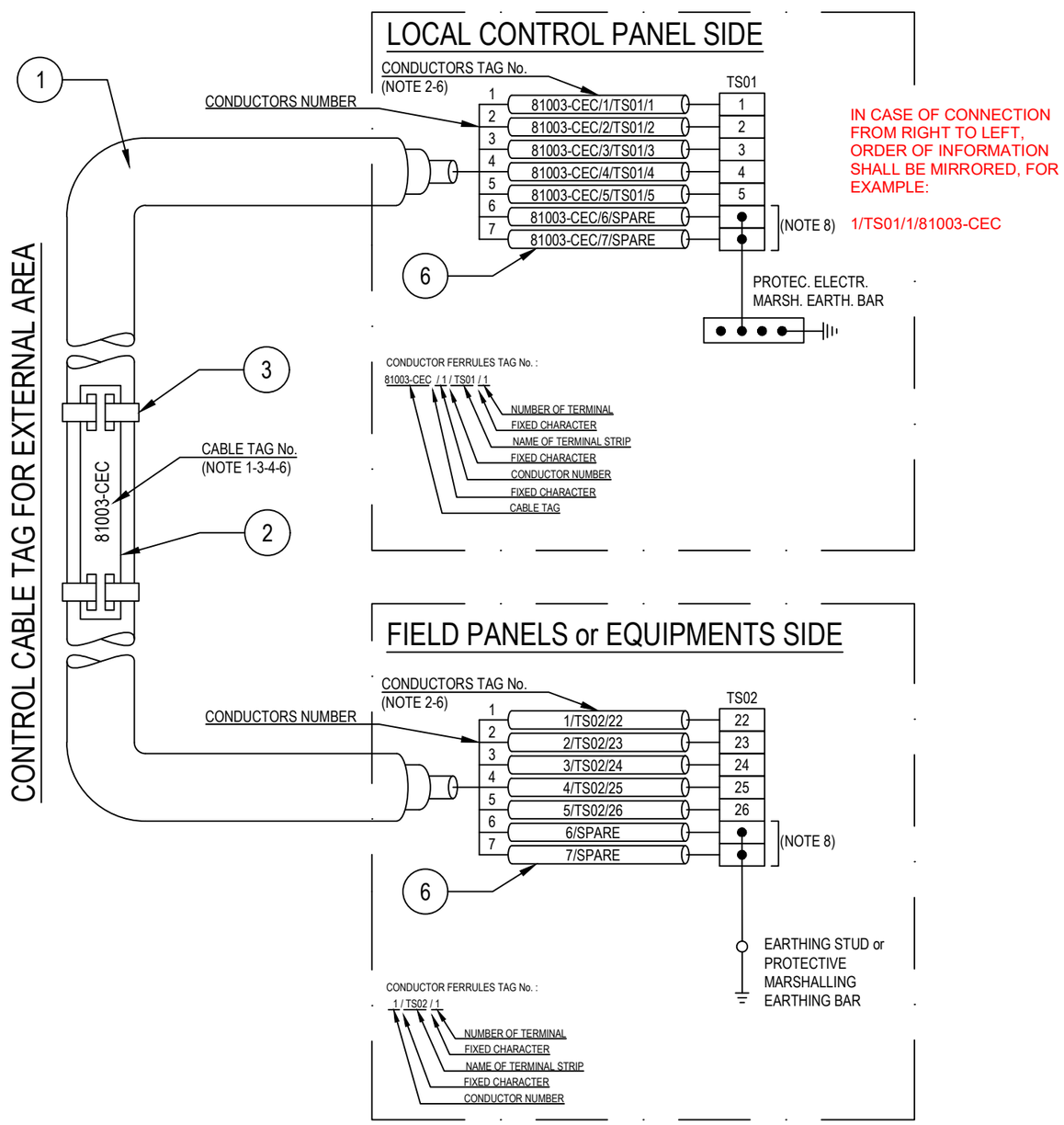
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 067 | REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

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1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
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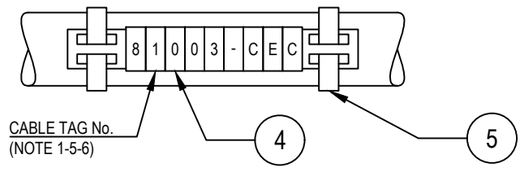
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6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

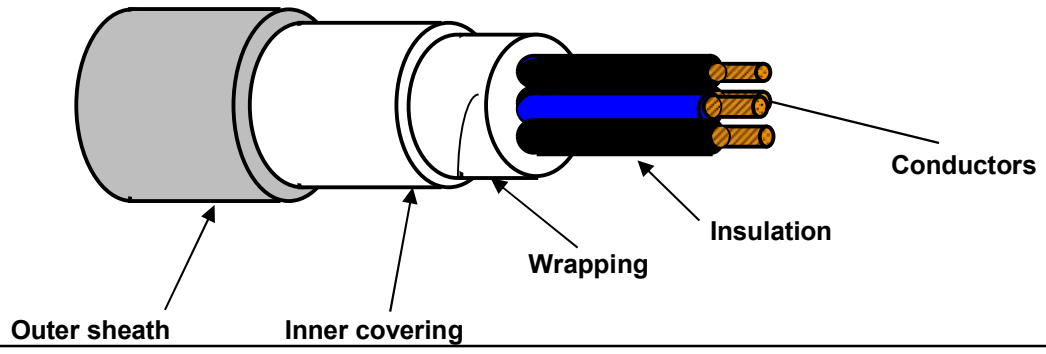
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Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81003-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-150-101-LVT-091 / L-150-101-LVT-090 / L-450-101-LVT-072 / L-600-101-LVT-094 / L-750-101-LVT-014 / L-450-101-LVT-075 / E-MCT-106 / L-600-101-LVT-058 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81004-CEC	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100	
TASK	code	C10002123	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX10	Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH | Cores/Size mm²: 7X1,5 mm2 | Color: GREY

From: CP-100E4 | To: SG-100D1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	PL
4	Check cable is supported and fixed to rack according to latest project Specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	PL
7	Check cable labelling is in accordance with latest specification.	PL
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0.8
	CORE 2 / All cores+screen+armour+earth	0.8
	CORE 3 / All cores+screen+armour+earth	0.8
	CORE 4 / All cores+screen+armour+earth	0.8
	CORE 5 / All cores+screen+armour+earth	0.8
	CORE 6 / All cores+screen+armour+earth	0.8
	CORE 7 / All cores+screen+armour+earth	0.8
	CORE 8 / All cores+screen+armour+earth	NA
	CORE 9 / All cores+screen+armour+earth	NA
	CORE 10 / All cores+screen+armour+earth	NA
INSULATION	CORE 1	>999
	CORE 2	>999
	CORE 3	>999
	CORE 4	>999
	CORE 5	>999
	CORE 6	>999
	CORE 7	>999
	CORE 8	NA
	CORE 9	NA
	CORE 10	NA
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

TYPE / SERIAL N° : KEW3125A S/N: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024	TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769 Calibration certificate N° and date: N°7715/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

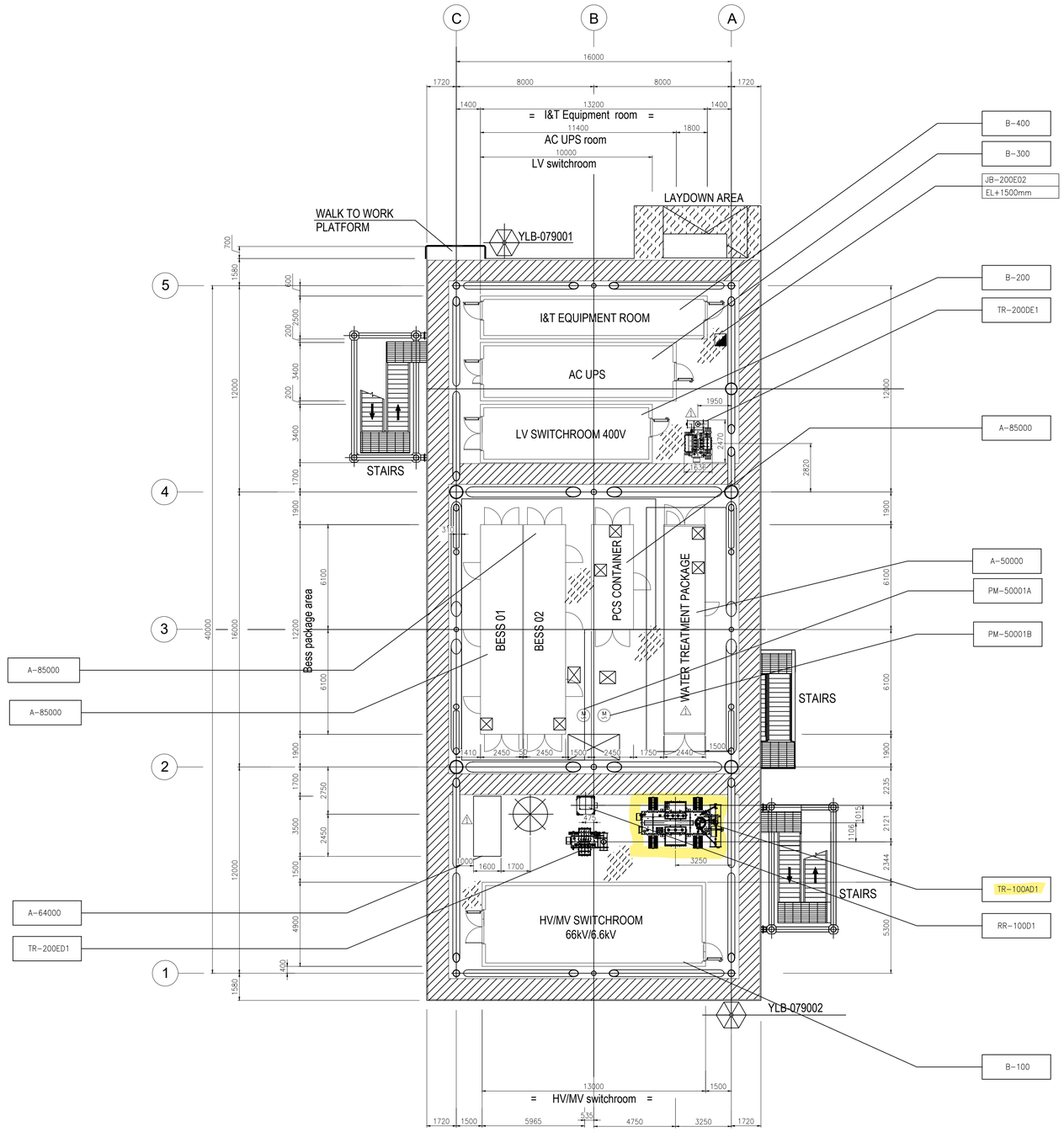
Comments: Note 4 : refer to PL C30000679
Note 9 :Note 9 :cable terminations must be reconnected during the commissioning phase.

Page 1/1

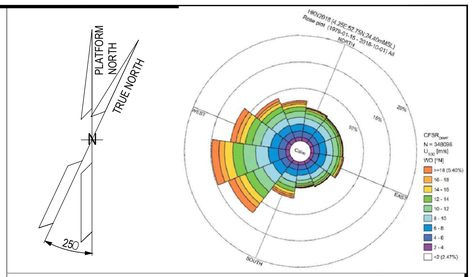
	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Carmelo Bongiovanni	Giovanni Tangianu	
Date	2024-11-22	2024-12-09	
Signature	PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-22T17:33:52.287Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2024-12-09T09:32:16.335Z	

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

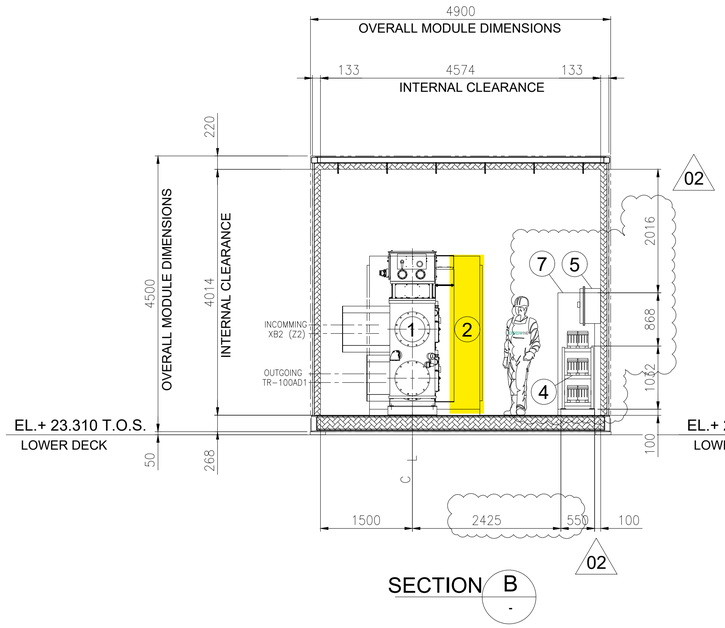
CROSSWIND | ROSETTI MARINO

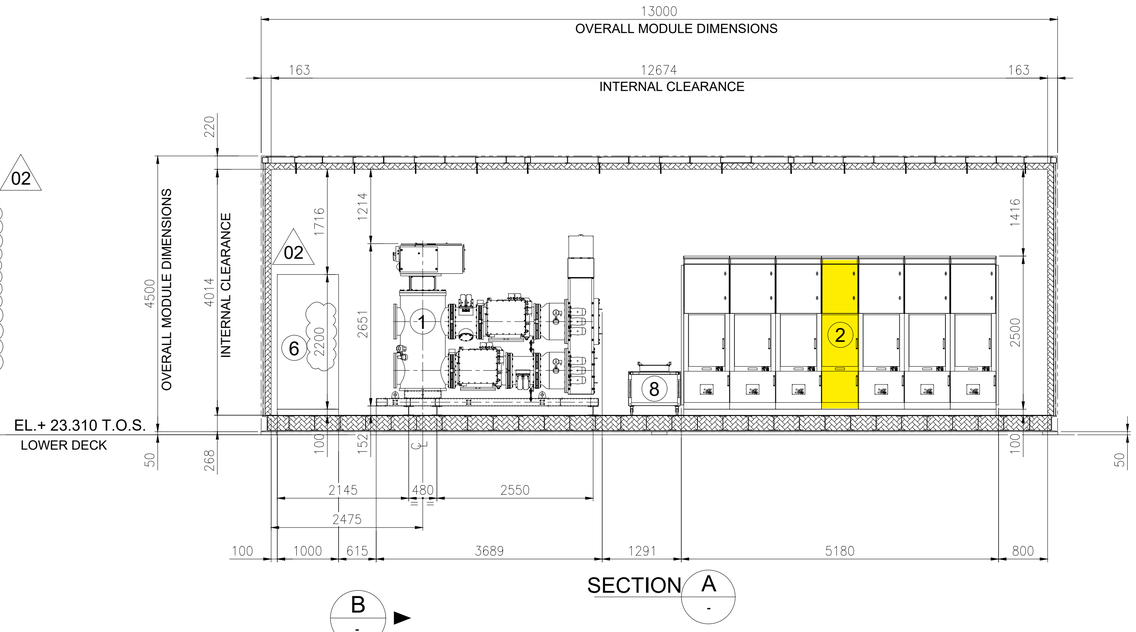
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

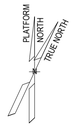
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

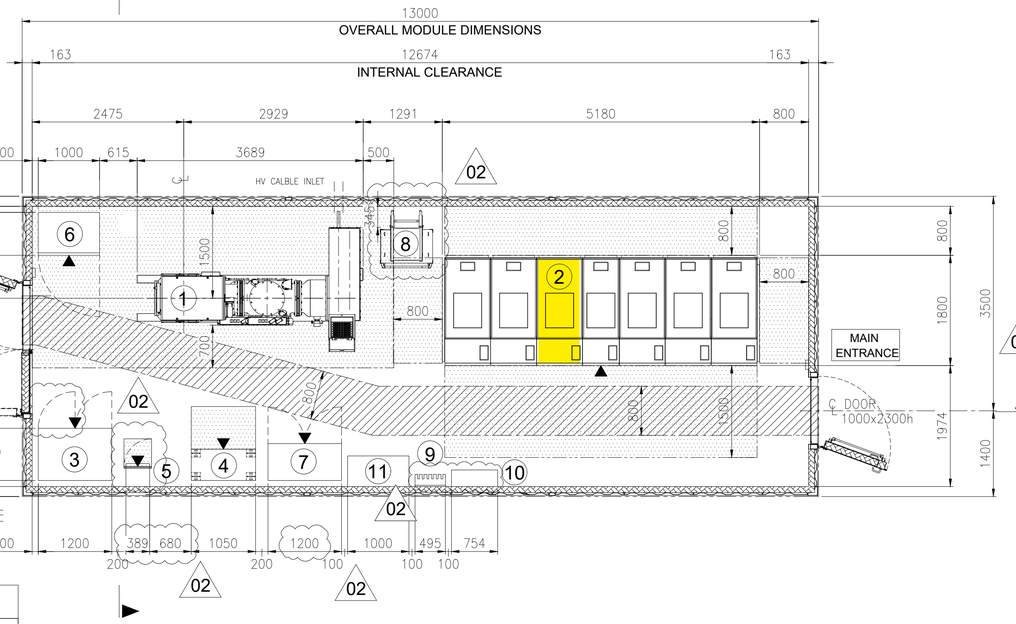
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



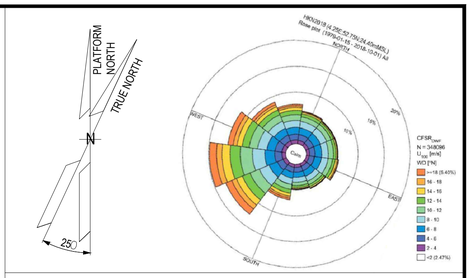




B -



A -



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

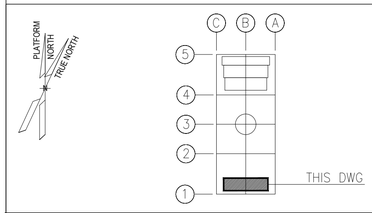
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

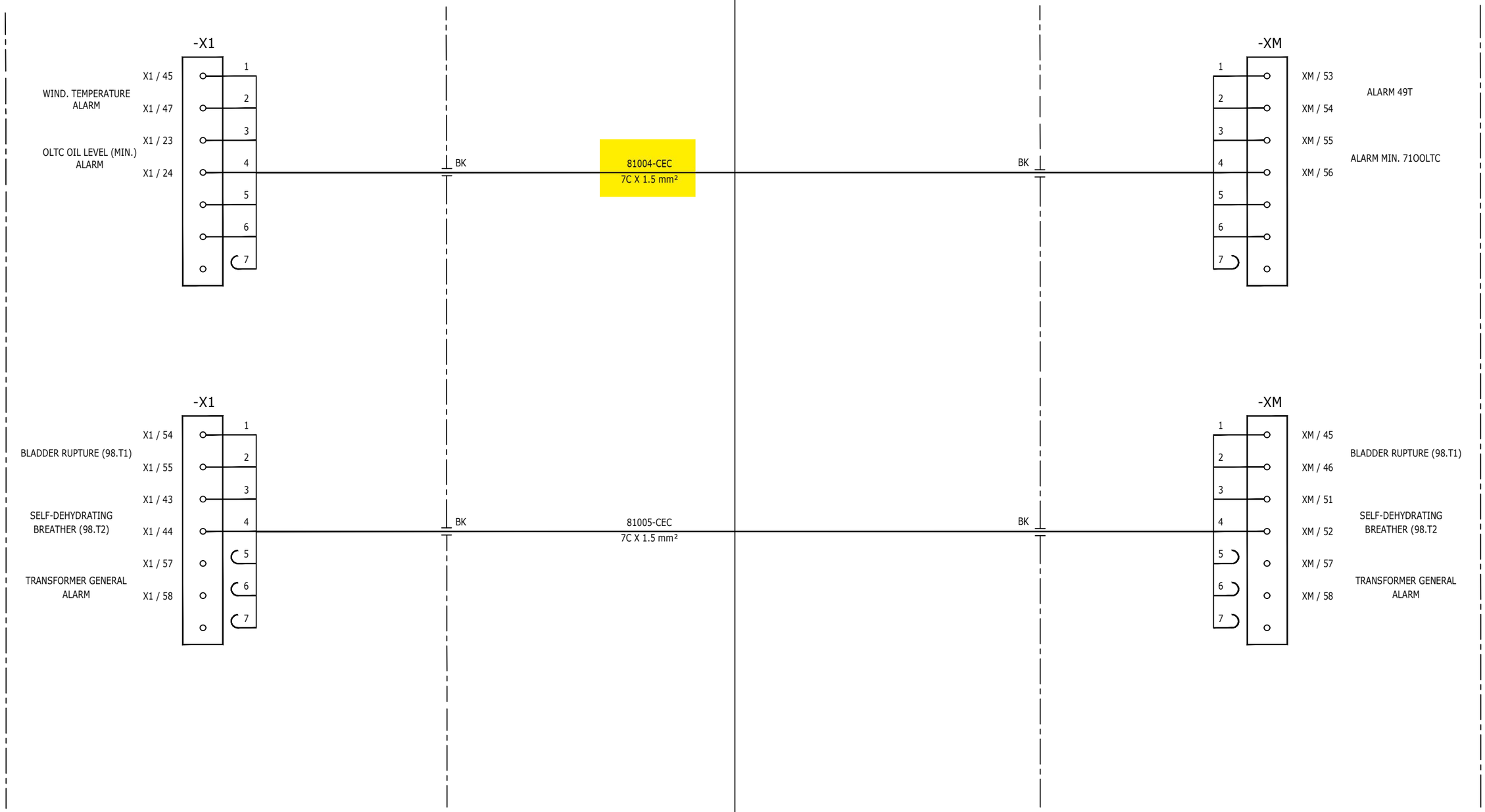
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File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 66KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E4

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



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

REV.:	DATE:	SIGNATURE:
2_C	02/12/24	G.Randi

ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
66KV, 7MVA TRANSFORMER ALARMS PROTECTION

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

SCALE : 1:X

A3

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

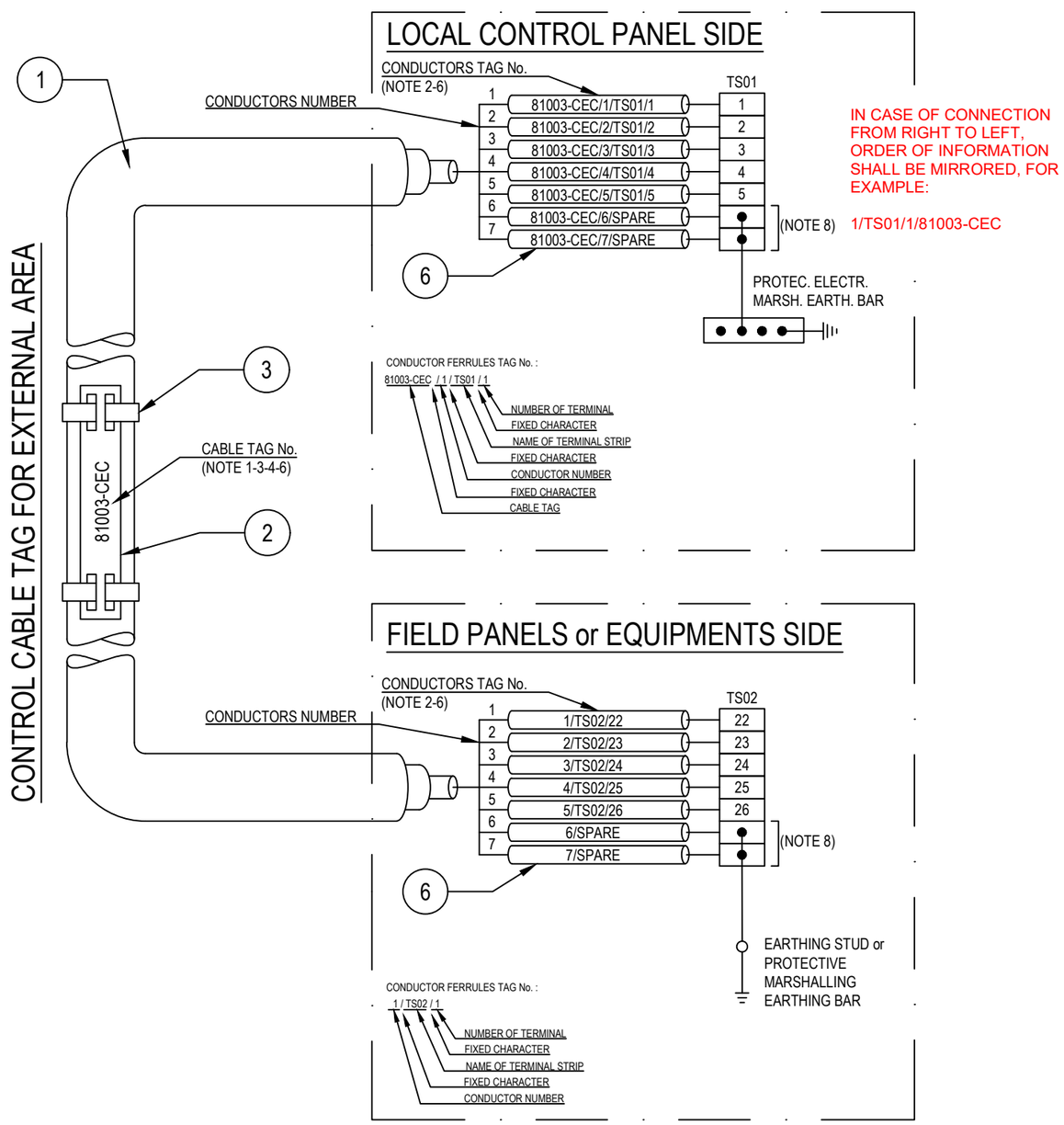
SHEET 068

REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

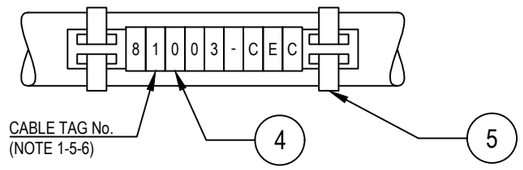
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

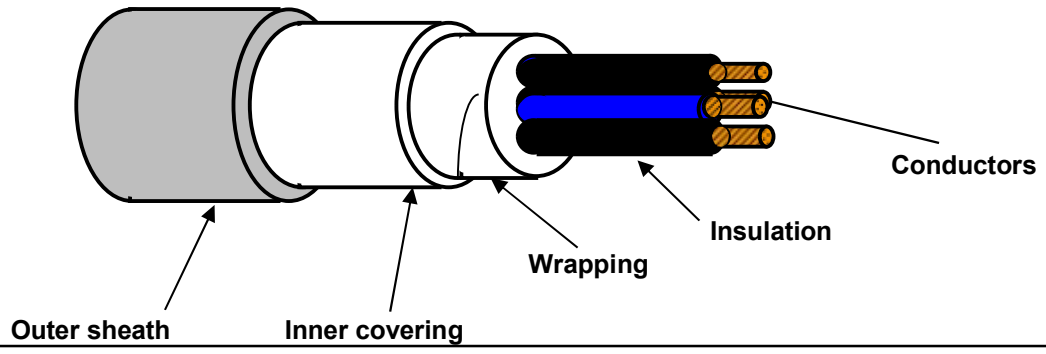
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81004-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-150-101-LVT-091 / L-150-101-LVT-090 / L-450-101-LVT-072 / L-600-101-LVT-094 / L-750-101-LVT-014 / L-450-101-LVT-075 / E-MCT-106 / L-600-101-LVT-058 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81005-CEC	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100	
TASK	code	C10002124	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX10	Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH | Cores/Size mm²: 7X1,5 mm2 | Color: GREY

From: CP-100E4 | To: SG-100D1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	PL
4	Check cable is supported and fixed to rack according to latest project Specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	PL
7	Check cable labelling is in accordance with latest specification.	PL
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0.8
	CORE 2 / All cores+screen+armour+earth	0.8
	CORE 3 / All cores+screen+armour+earth	0.8
	CORE 4 / All cores+screen+armour+earth	0.8
	CORE 5 / All cores+screen+armour+earth	0.8
	CORE 6 / All cores+screen+armour+earth	0.8
	CORE 7 / All cores+screen+armour+earth	0.8
	CORE 8 / All cores+screen+armour+earth	NA
	CORE 9 / All cores+screen+armour+earth	NA
	CORE 10 / All cores+screen+armour+earth	NA
INSULATION	CORE 1	>999
	CORE 2	>999
	CORE 3	>999
	CORE 4	>999
	CORE 5	>999
	CORE 6	>999
	CORE 7	>999
	CORE 8	NA
	CORE 9	NA
	CORE 10	NA
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

TYPE / SERIAL N° : KEW3125A S/N: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024	TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769) Calibration certificate N° and date: N°7715/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

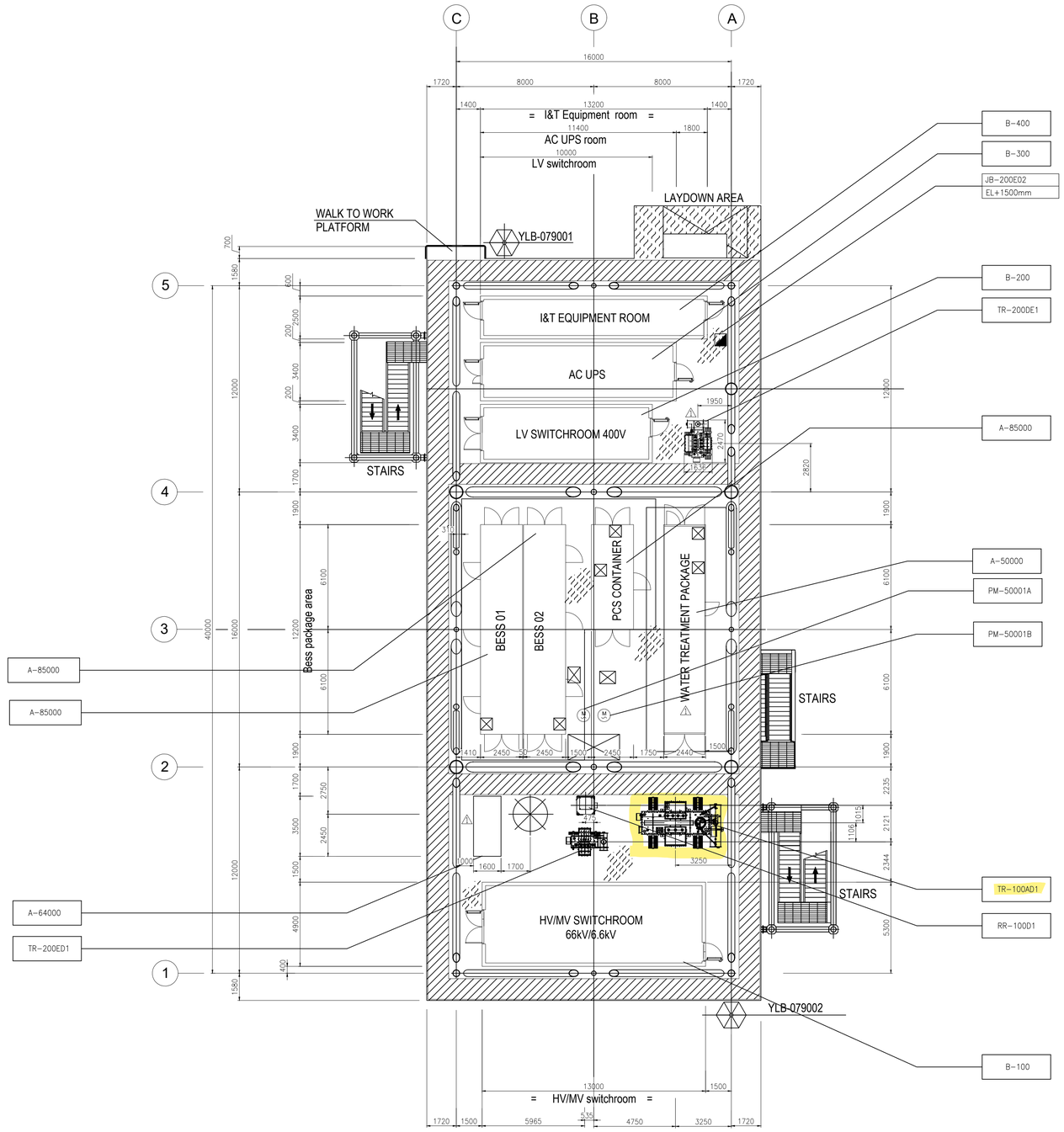
Comments: Note 4 : refer to PL C30000679
Note 9 :cable terminations must be reconnected during the commissioning phase.

Page 1/1

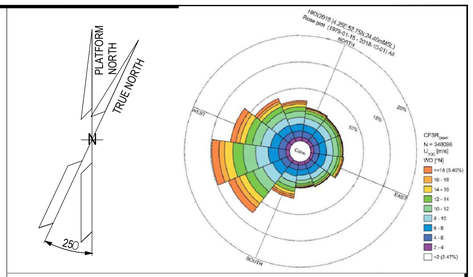
	Performed by	☑ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Carmelo Bongiovanni	Giovanni Tangianu	
Date	2024-11-22	2024-12-09	
Signature	PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-22T17:34:05.045Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2024-12-09T09:26:32.593Z	

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

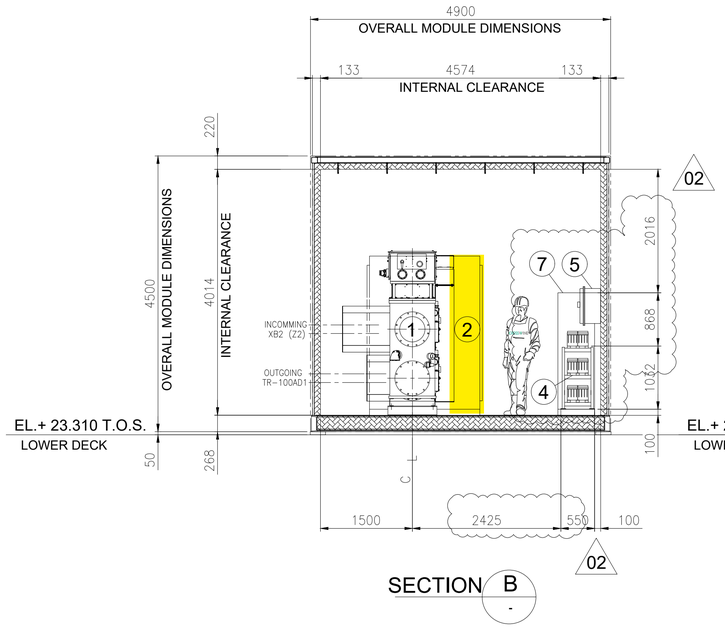
CROSSWIND | ROSETTI MARINO

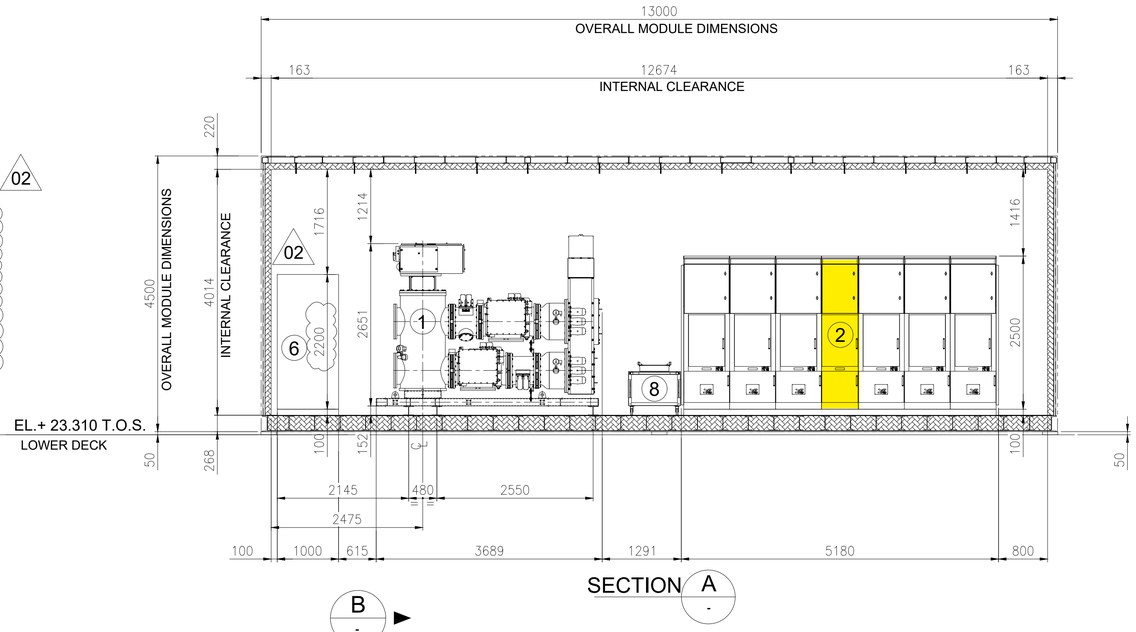
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

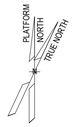
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

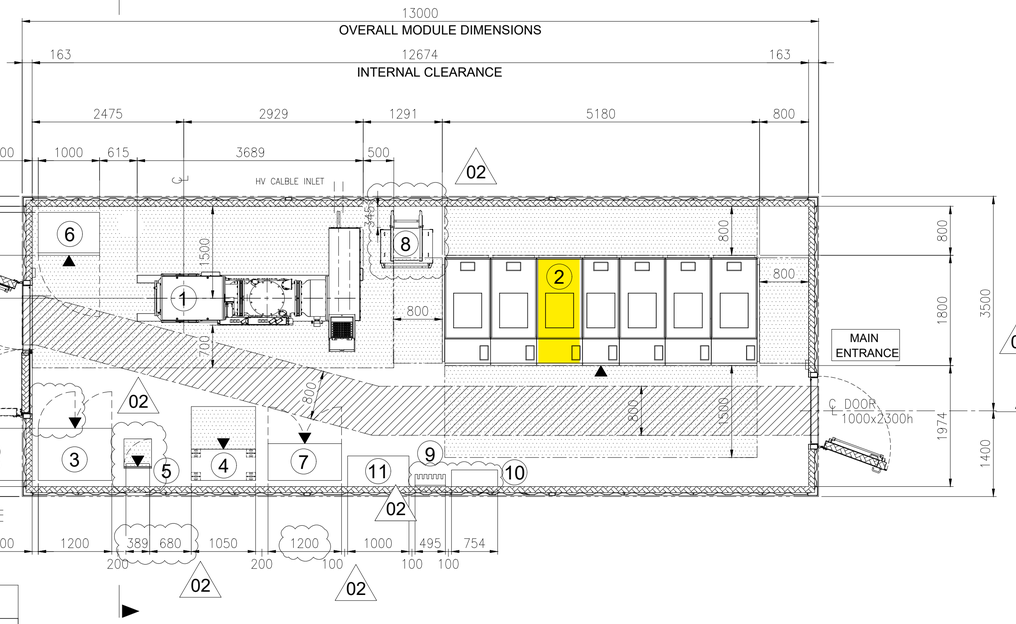
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



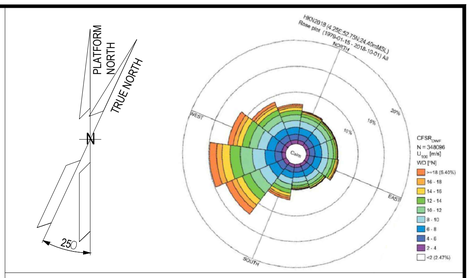




B -



A -



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

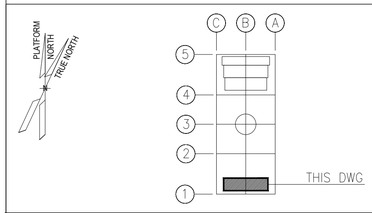
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

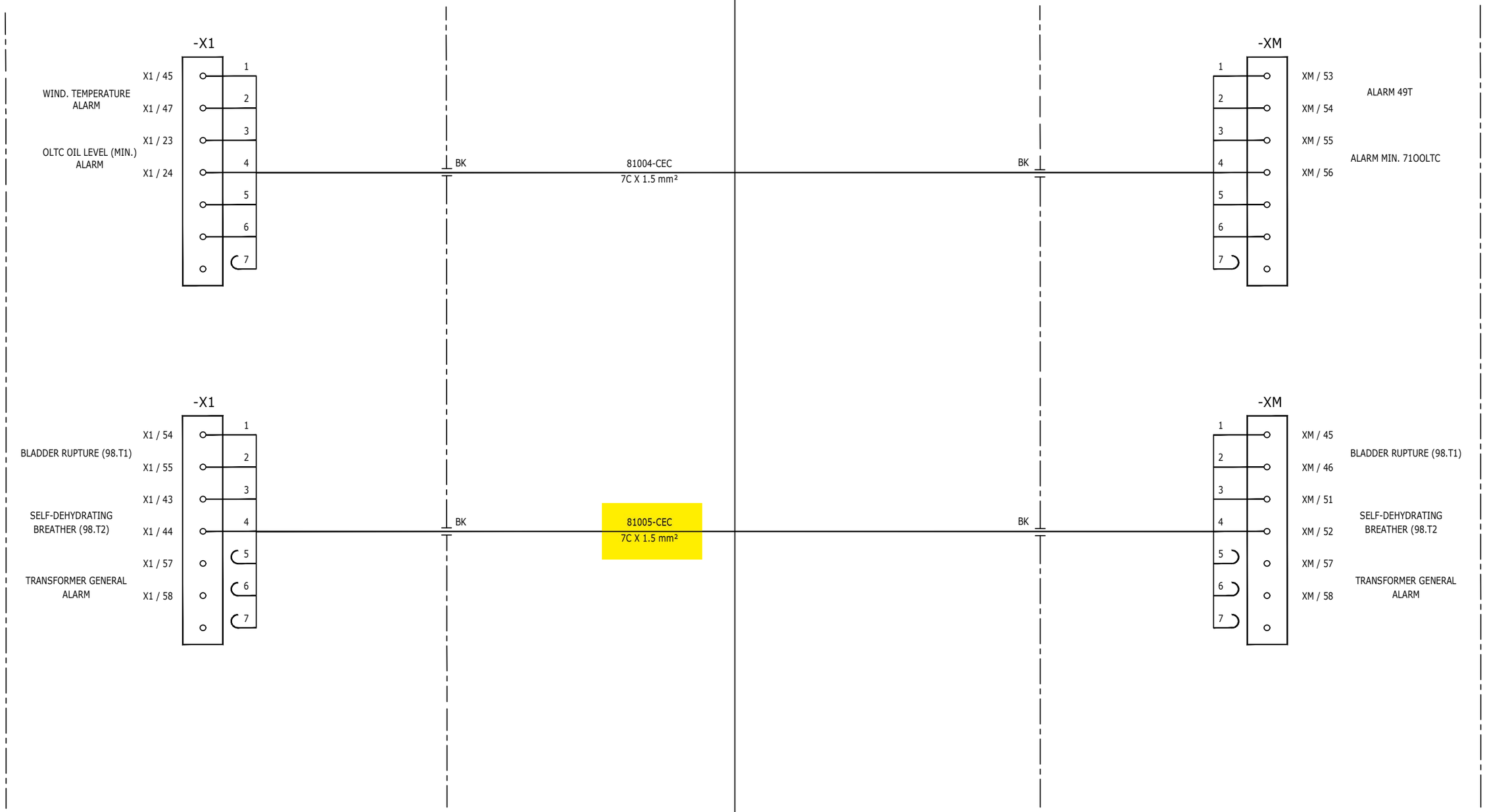
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 66KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E4

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



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

REV.:	DATE:	SIGNATURE:
2_C	02/12/24	G.Randi

ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
66KV, 7MVA TRANSFORMER ALARMS PROTECTION

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

SCALE : 1:X

A3

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

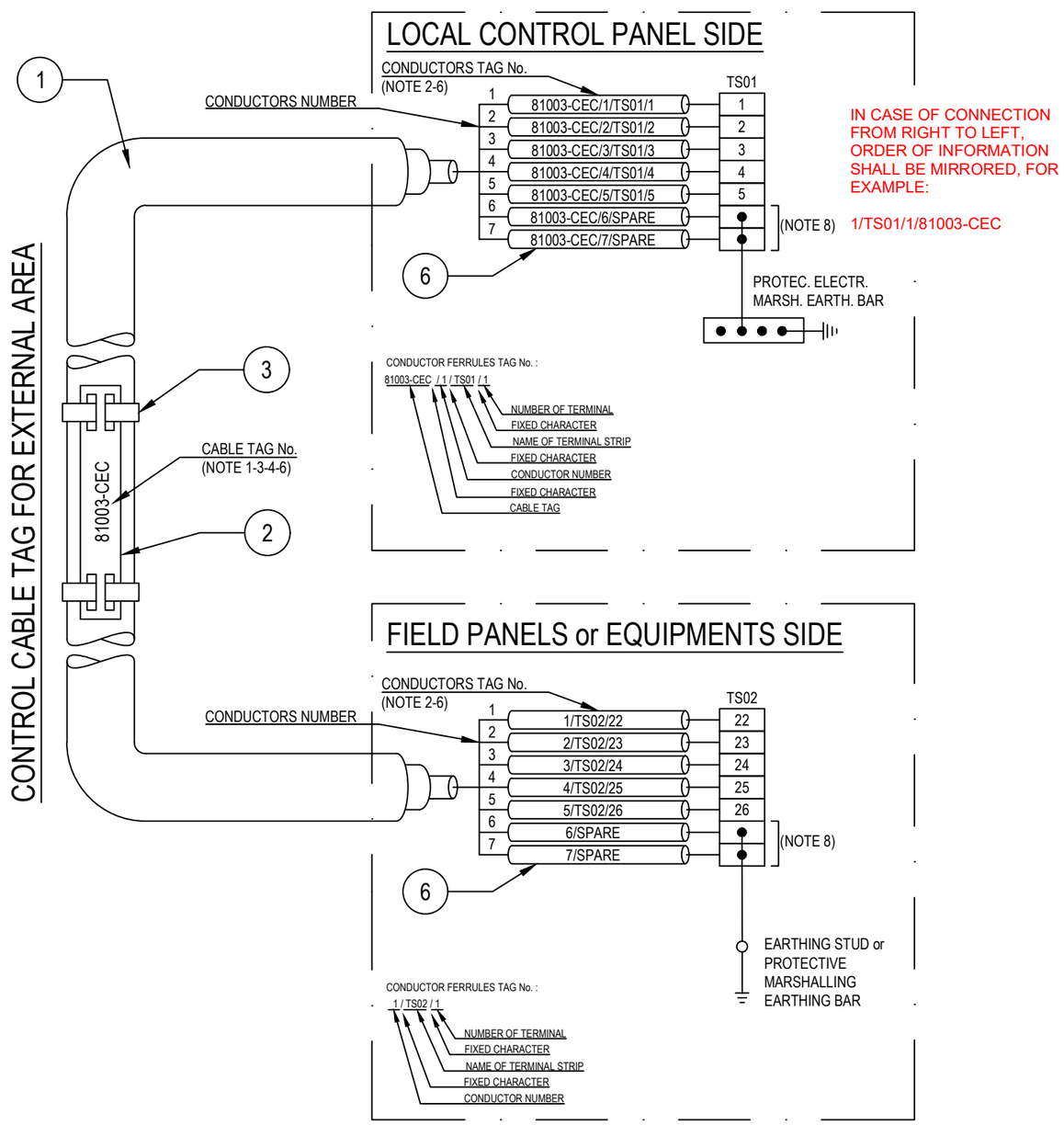
SHEET 068

REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

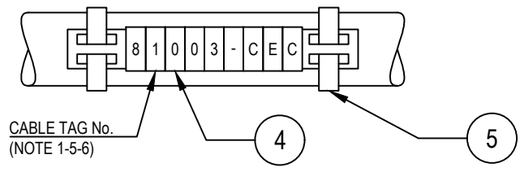
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

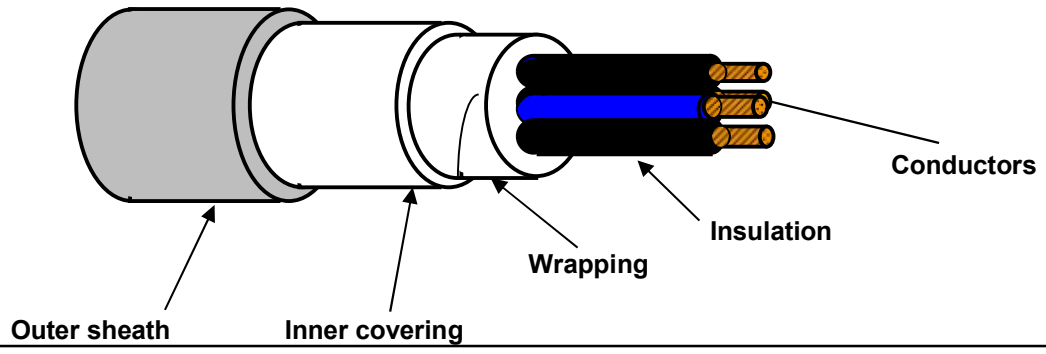
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81005-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-150-101-LVT-091 / L-150-101-LVT-090 / L-450-101-LVT-072 / L-600-101-LVT-094 / L-750-101-LVT-014 / L-450-101-LVT-075 / E-MCT-106 / L-600-101-LVT-058 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81006-CEC	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100	
TASK	code	C10002125	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX10	Multicore Electrical Control Cable

CABLE DATA

Type	Cu Cl.2/XLPE/LSZH	Cores/Size mm²	7X1,5 mm2	Color	GREY
From	CP-100E4	To	SG-100D1		

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	PL
4	Check cable is supported and fixed to rack according to latest project Specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	PL
7	Check cable labelling is in accordance with latest specification.	PL
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0.8
	CORE 2 / All cores+screen+armour+earth	0.8
	CORE 3 / All cores+screen+armour+earth	0.8
	CORE 4 / All cores+screen+armour+earth	0.8
	CORE 5 / All cores+screen+armour+earth	0.8
	CORE 6 / All cores+screen+armour+earth	0.8
	CORE 7 / All cores+screen+armour+earth	0.8
	CORE 8 / All cores+screen+armour+earth	NA
	CORE 9 / All cores+screen+armour+earth	NA
	CORE 10 / All cores+screen+armour+earth	NA
INSULATION	CORE 1	>999
	CORE 2	>999
	CORE 3	>999
	CORE 4	>999
	CORE 5	>999
	CORE 6	>999
	CORE 7	>999
	CORE 8	NA
	CORE 9	NA
	CORE 10	NA
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

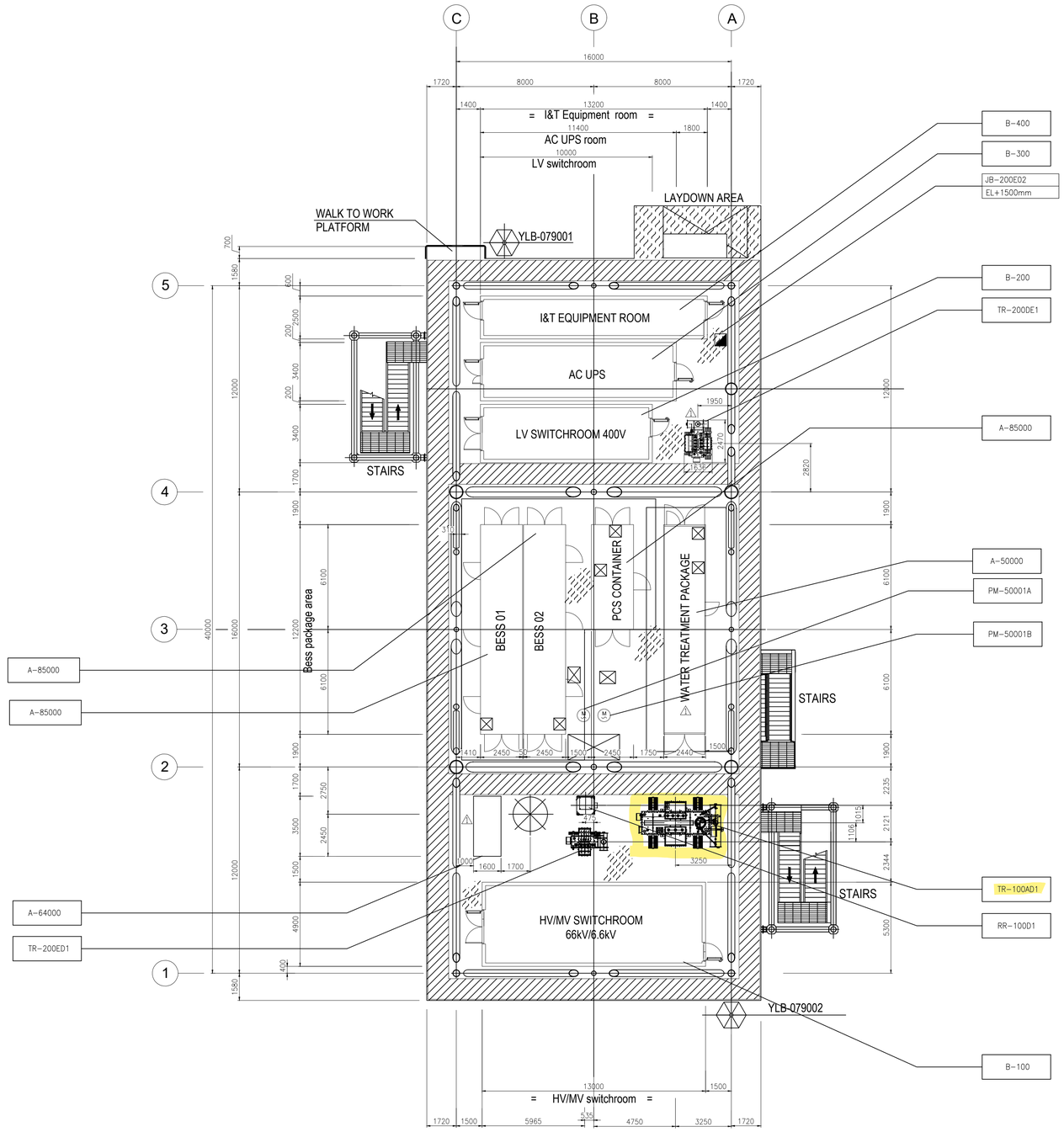
TYPE / SERIAL N° : KEW3125A S/N: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024	TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769) Calibration certificate N° and date: N°7715/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

Comments: Note 4 : refer to PL C30000679
Note 9 :cable terminations must be reconnected during the commissioning phase.

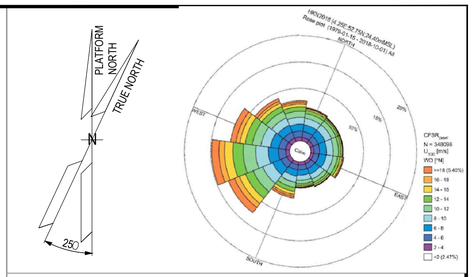
Page 1/1	Performed by	☑ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Giovanni Tangianu	
Date	2024-11-29	2024-12-09	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-11-29T10:40:40.728Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2024-12-09T09:15:03.957Z	

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

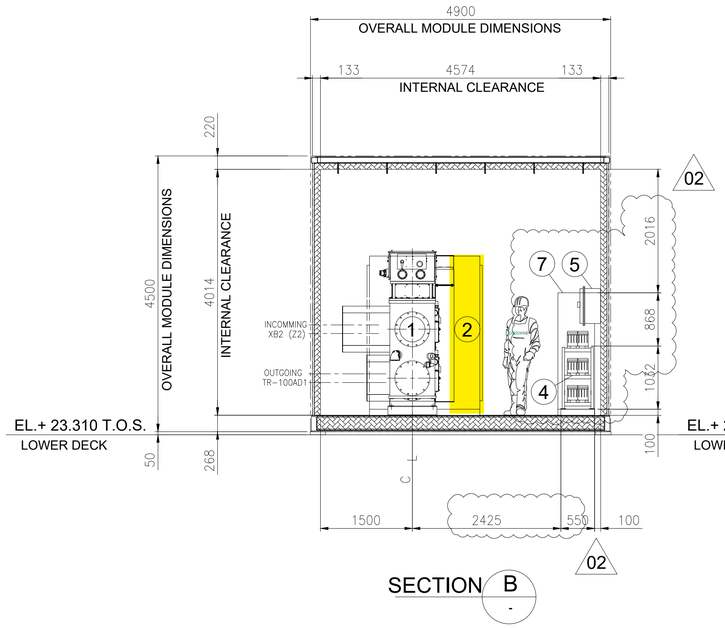
CROSSWIND | ROSETTI MARINO

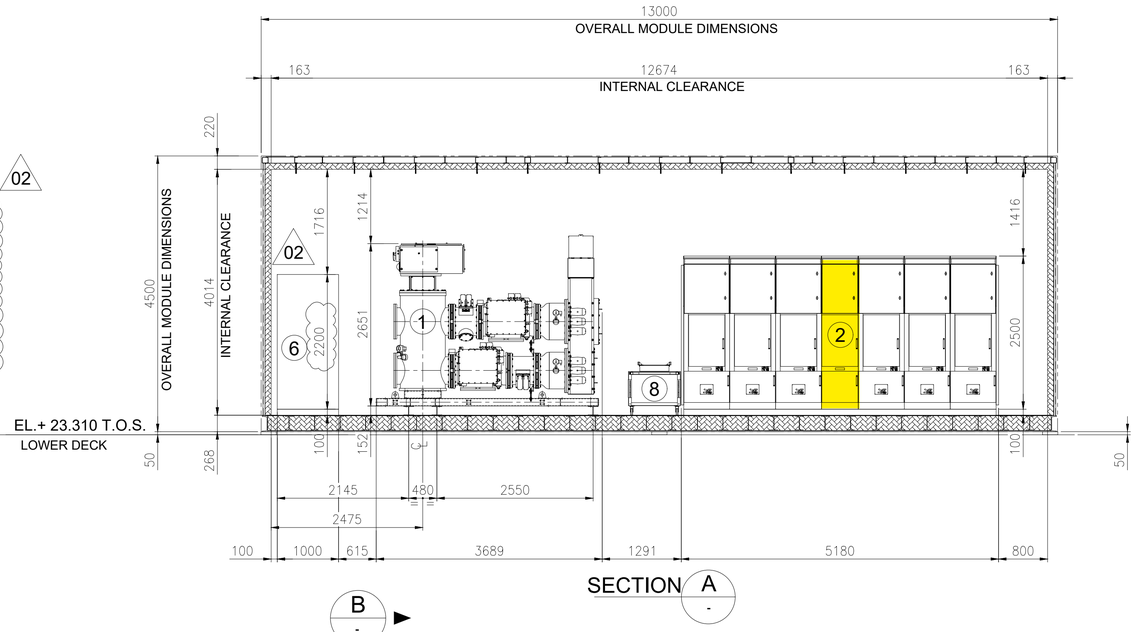
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

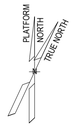
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

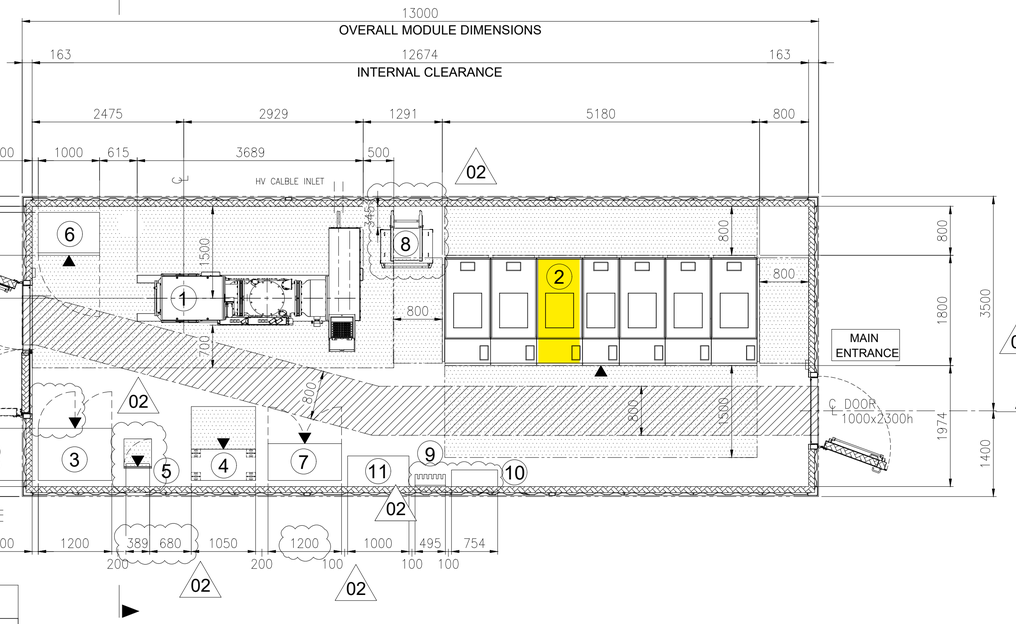
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



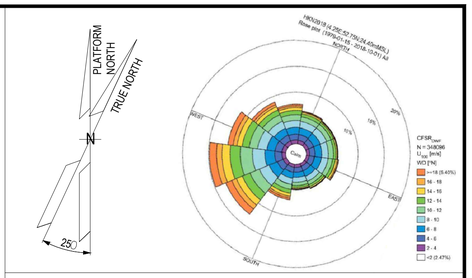




B -



A -



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

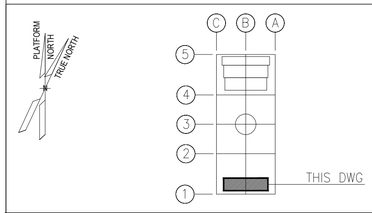
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

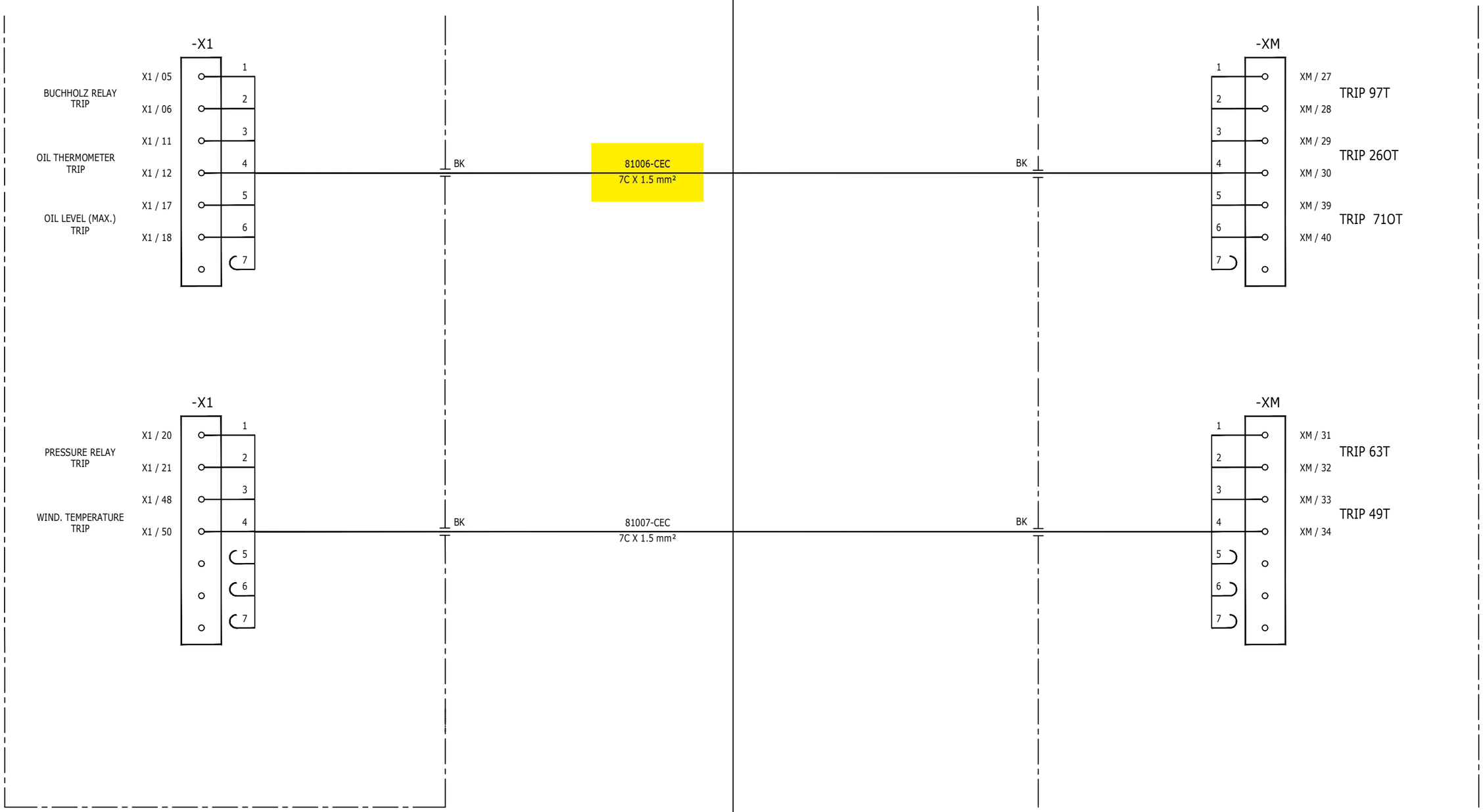
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 66KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E4

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



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

REV.:	DATE:	SIGNATURE:
2_C	02/12/24	G.Randi

ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
66KV, 7MVA TRANSFORMER TRIP PROTECTION

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

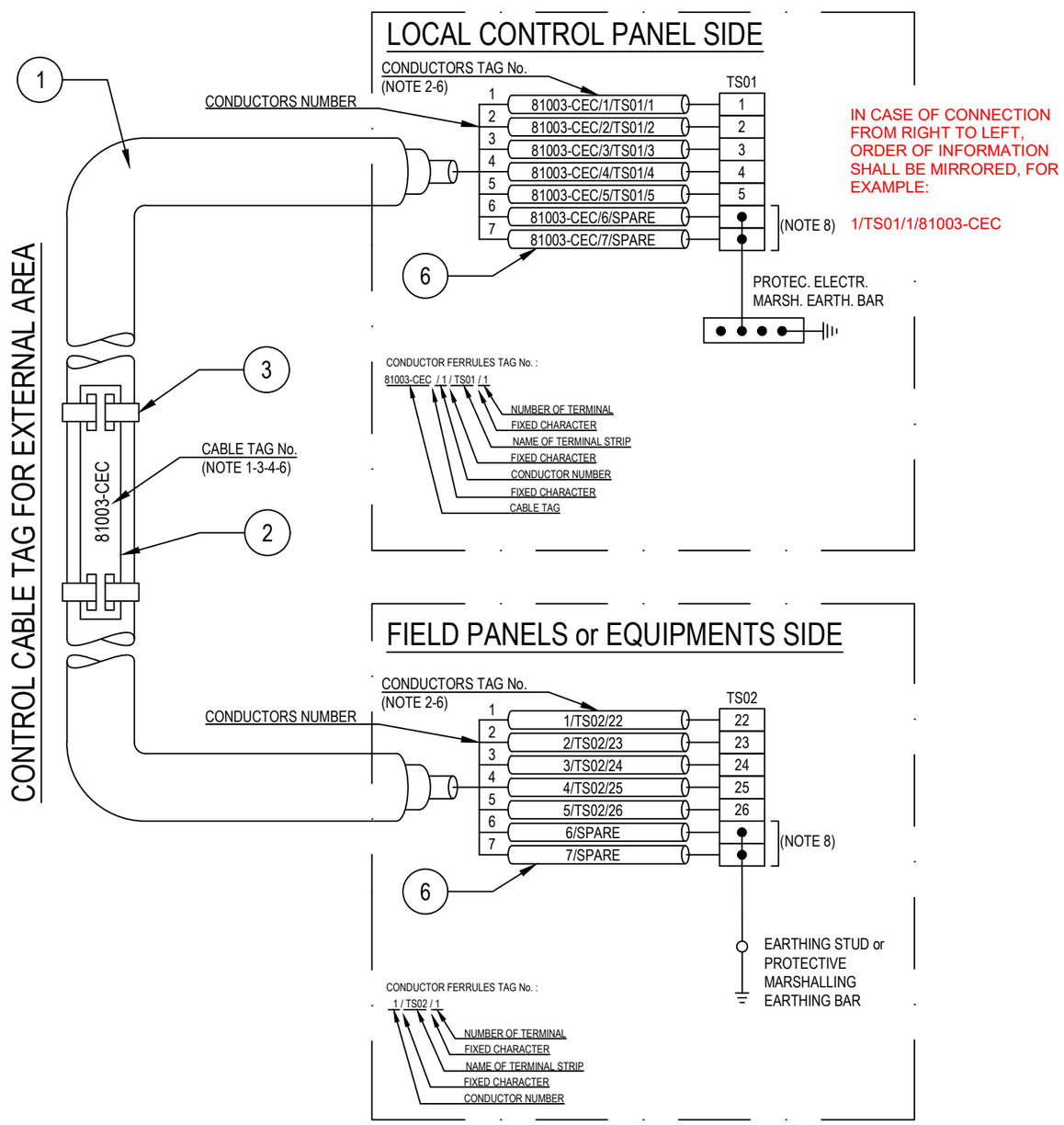
SCALE : 1:X

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DG-20149	069	02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

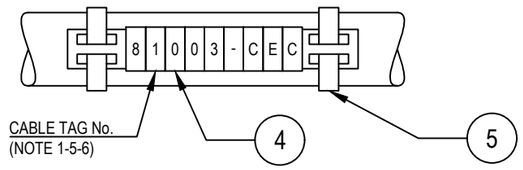
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

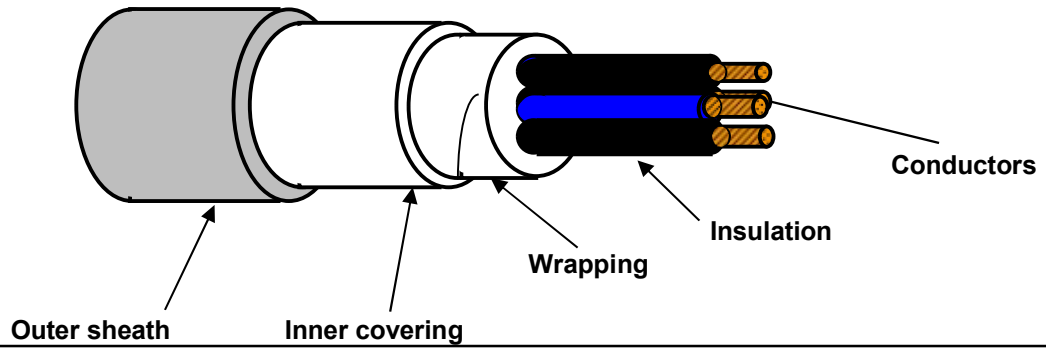
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81006-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-150-101-LVT-091 / L-150-101-LVT-090 / L-450-101-LVT-072 / L-600-101-LVT-094 / L-750-101-LVT-014 / L-450-101-LVT-075 / E-MCT-106 / L-600-101-LVT-058 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81007-CEC	: 66kV, 7MVA Transformer / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100	
TASK	code	C10002126	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX10	Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH | Cores/Size mm²: 7X1,5 mm2 | Color: GREY

From: CP-100E4 | To: SG-100D1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	PL
4	Check cable is supported and fixed to rack according to latest project Specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	PL
7	Check cable labelling is in accordance with latest specification.	PL
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0.8
	CORE 2 / All cores+screen+armour+earth	0.8
	CORE 3 / All cores+screen+armour+earth	0.8
	CORE 4 / All cores+screen+armour+earth	0.8
	CORE 5 / All cores+screen+armour+earth	0.8
	CORE 6 / All cores+screen+armour+earth	0.8
	CORE 7 / All cores+screen+armour+earth	0.8
	CORE 8 / All cores+screen+armour+earth	NA
	CORE 9 / All cores+screen+armour+earth	NA
	CORE 10 / All cores+screen+armour+earth	NA
INSULATION	CORE 1	>999
	CORE 2	>999
	CORE 3	>999
	CORE 4	>999
	CORE 5	>999
	CORE 6	>999
	CORE 7	>999
	CORE 8	NA
	CORE 9	NA
	CORE 10	NA
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

TYPE / SERIAL N° : KEW3125A S/N: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024	TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769) Calibration certificate N° and date: N°7715/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

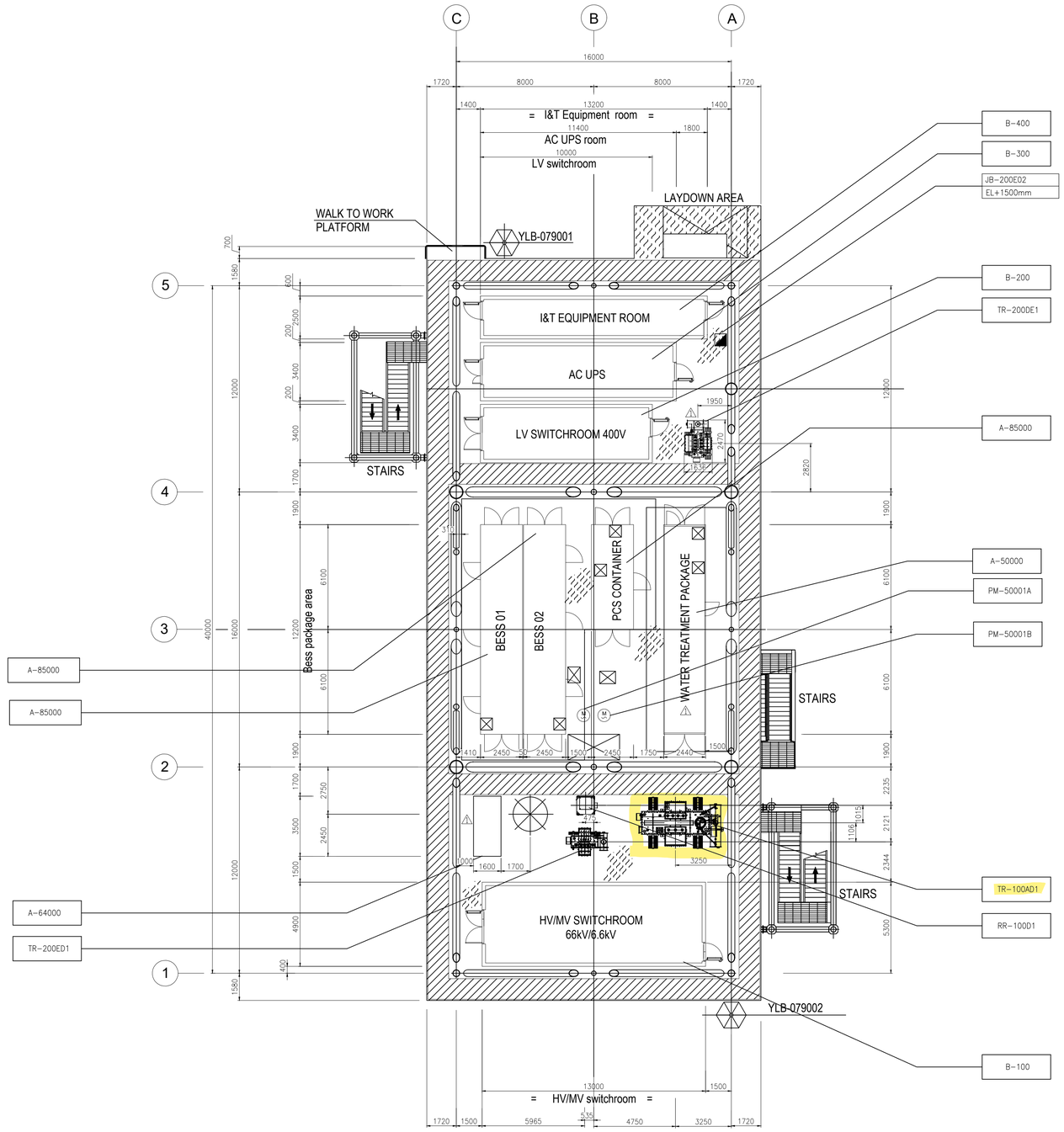
Comments: Note 4 : refer to PL C30000679
Note 9 :cable terminations must be reconnected during the commissioning phase.

Page 1/1

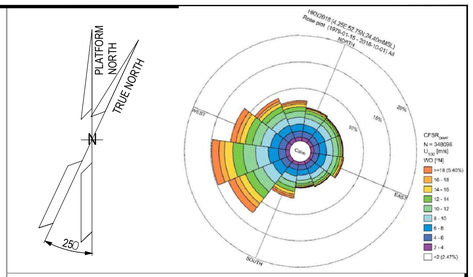
	Performed by	☑ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Carmelo Bongiovanni	Giovanni Tangianu	
Date	2024-11-22	2024-12-09	
Signature	PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-22T17:34:16.047Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2024-12-09T09:08:49.532Z	

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

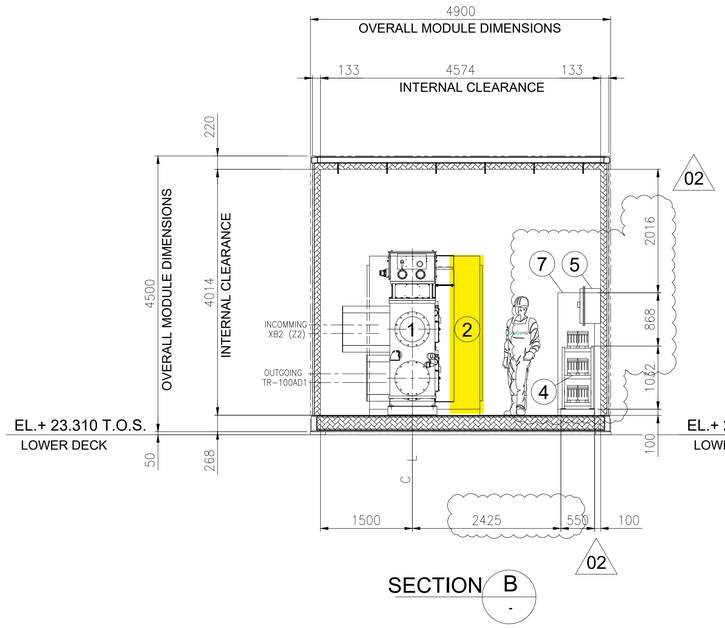
CROSSWIND | ROSETTI MARINO

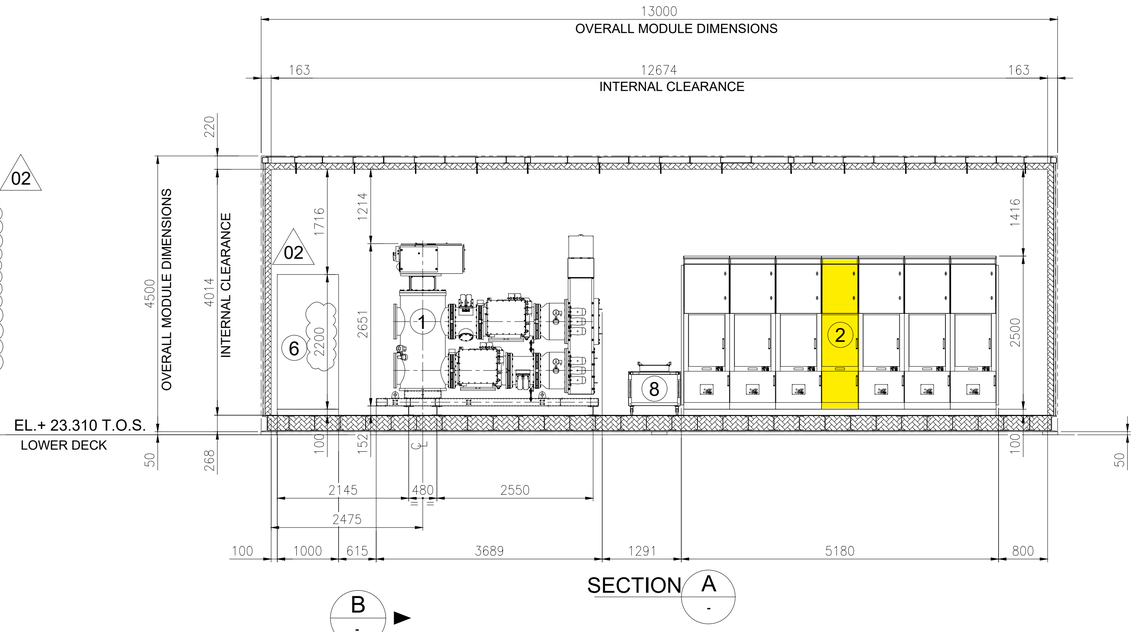
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

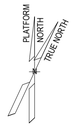
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

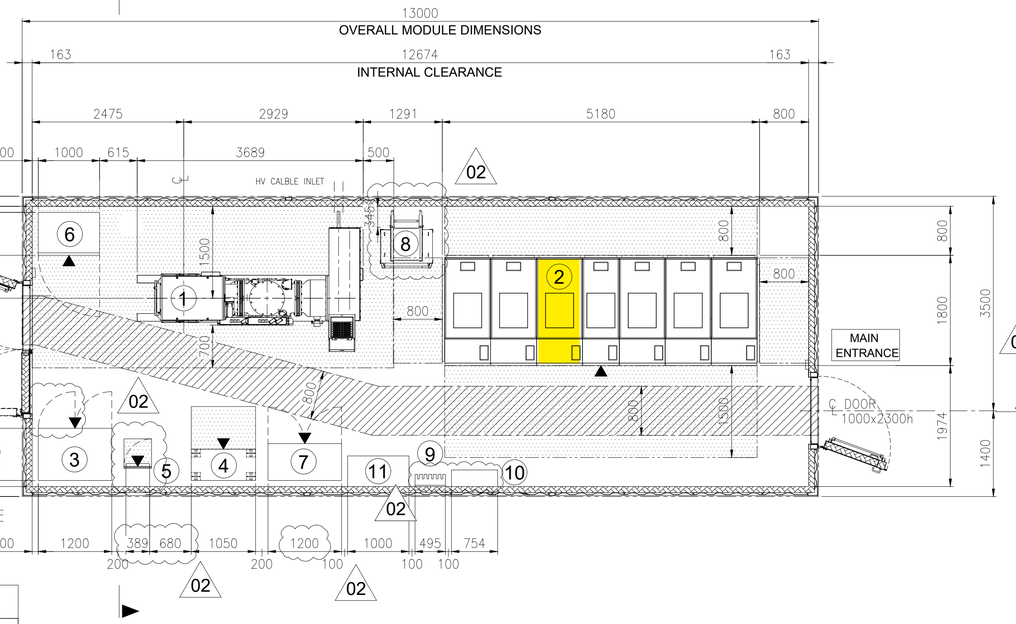
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



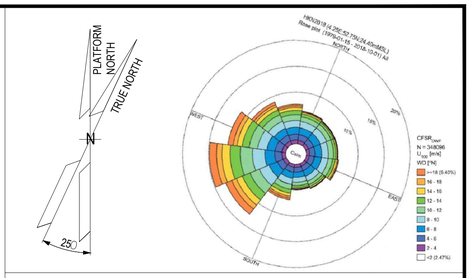




B -



A -



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

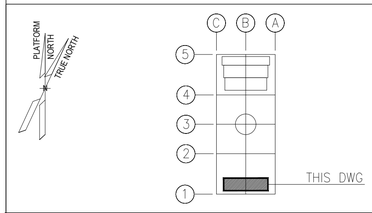
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

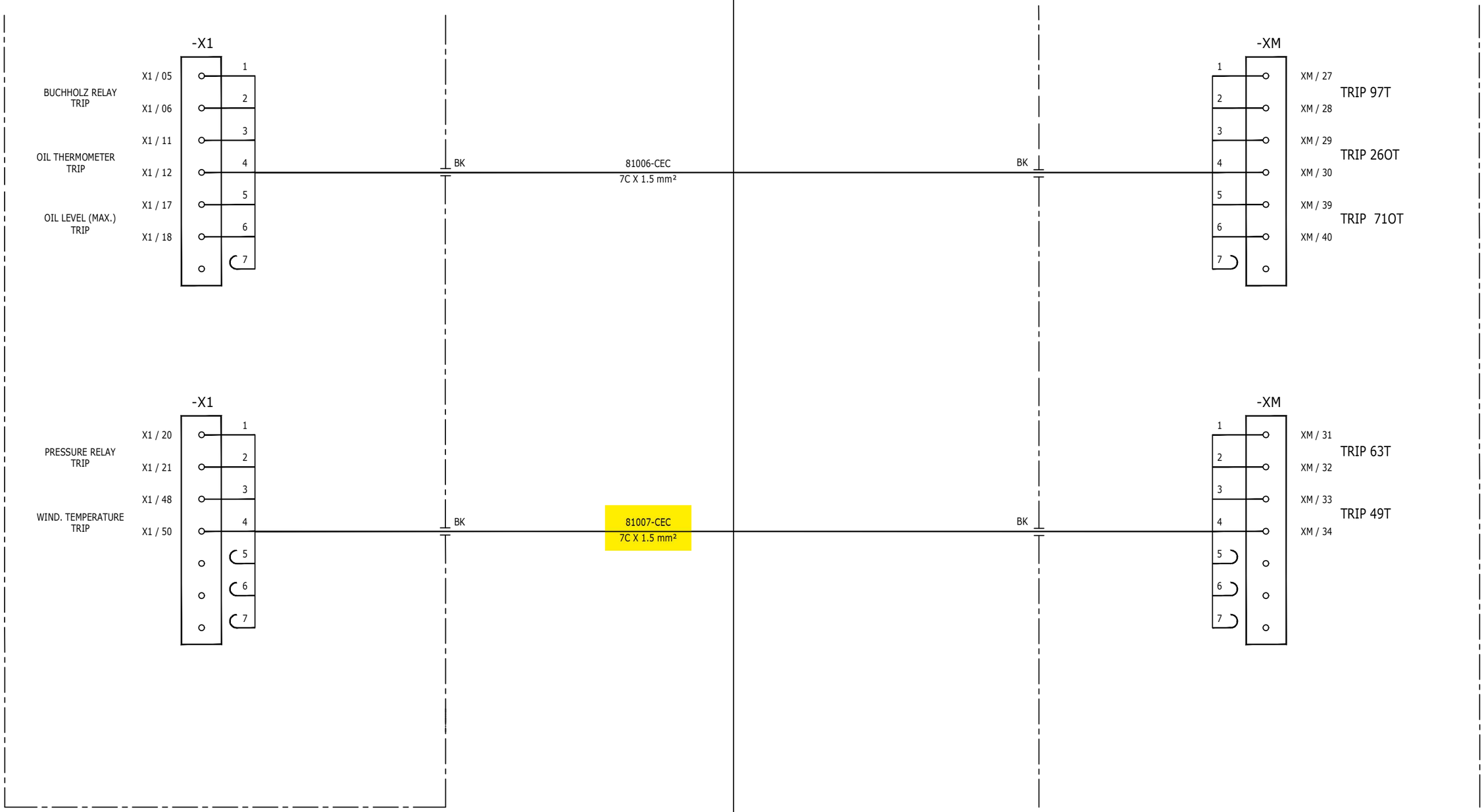
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 66KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E4

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



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

REV.:	DATE:	SIGNATURE:
2_C	02/12/24	G.Randi

ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
66KV, 7MVA TRANSFORMER TRIP PROTECTION

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

SCALE : 1:X

A3

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

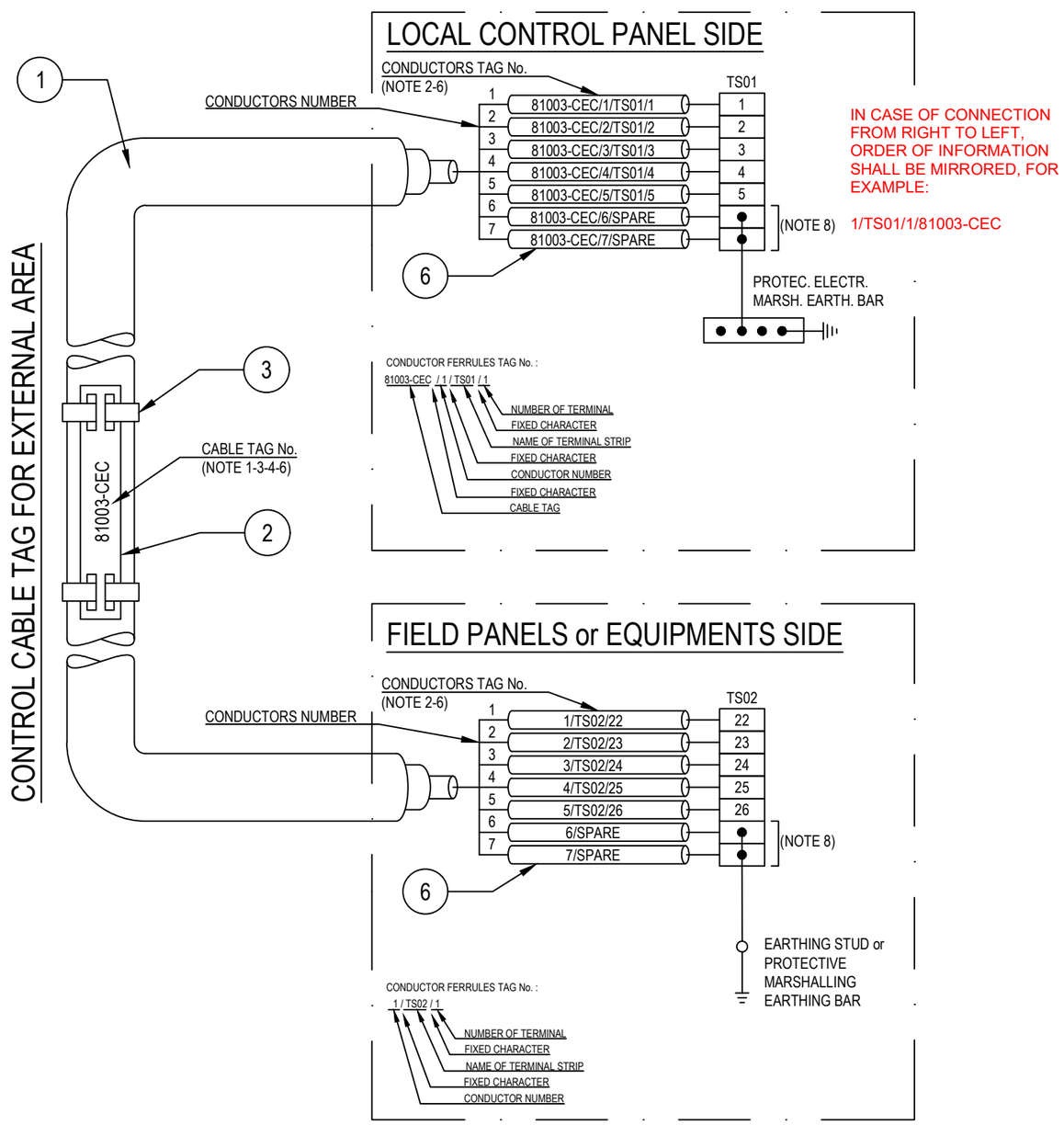
SHEET 069

REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

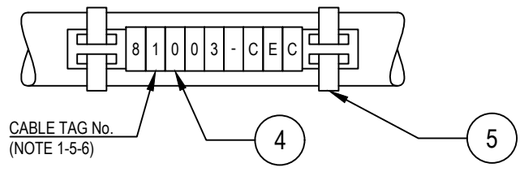
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

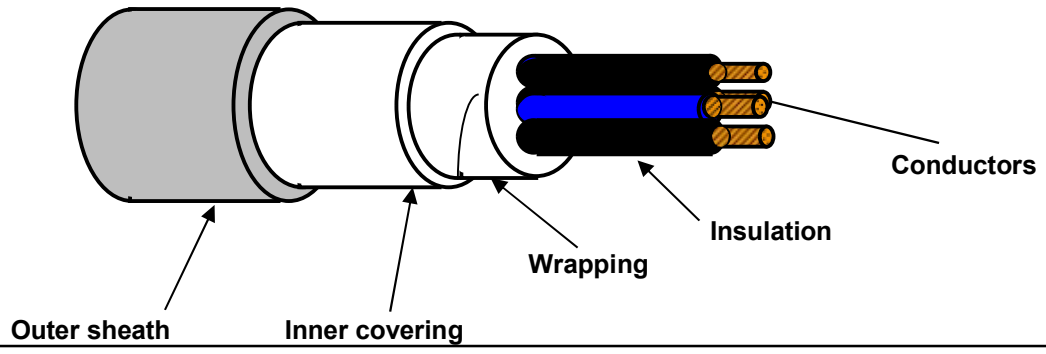
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81007-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-150-101-LVT-091 / L-150-101-LVT-090 / L-450-101-LVT-072 / L-600-101-LVT-094 / L-750-101-LVT-014 / L-450-101-LVT-075 / E-MCT-106 / L-600-101-LVT-058 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81008-CEC	: 66kV, 7MVA Transformer Step-up AVR / 6.6KV HV Switchgear			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10002127		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH — Cores/Size mm²: 7X1,5 mm2 — Color: GREY

From: CP-100E4 — To: SG-100D1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	NA
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,7
	CORE 2 / All cores+screen+armour+earth	0,7
	CORE 3 / All cores+screen+armour+earth	0,7
	CORE 4 / All cores+screen+armour+earth	0,7
	CORE 5 / All cores+screen+armour+earth	0,7
	CORE 6 / All cores+screen+armour+earth	0,7
	CORE 7 / All cores+screen+armour+earth	0,7
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\

INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	>1999
	CORE 6	>1999
	CORE 7	>1999
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

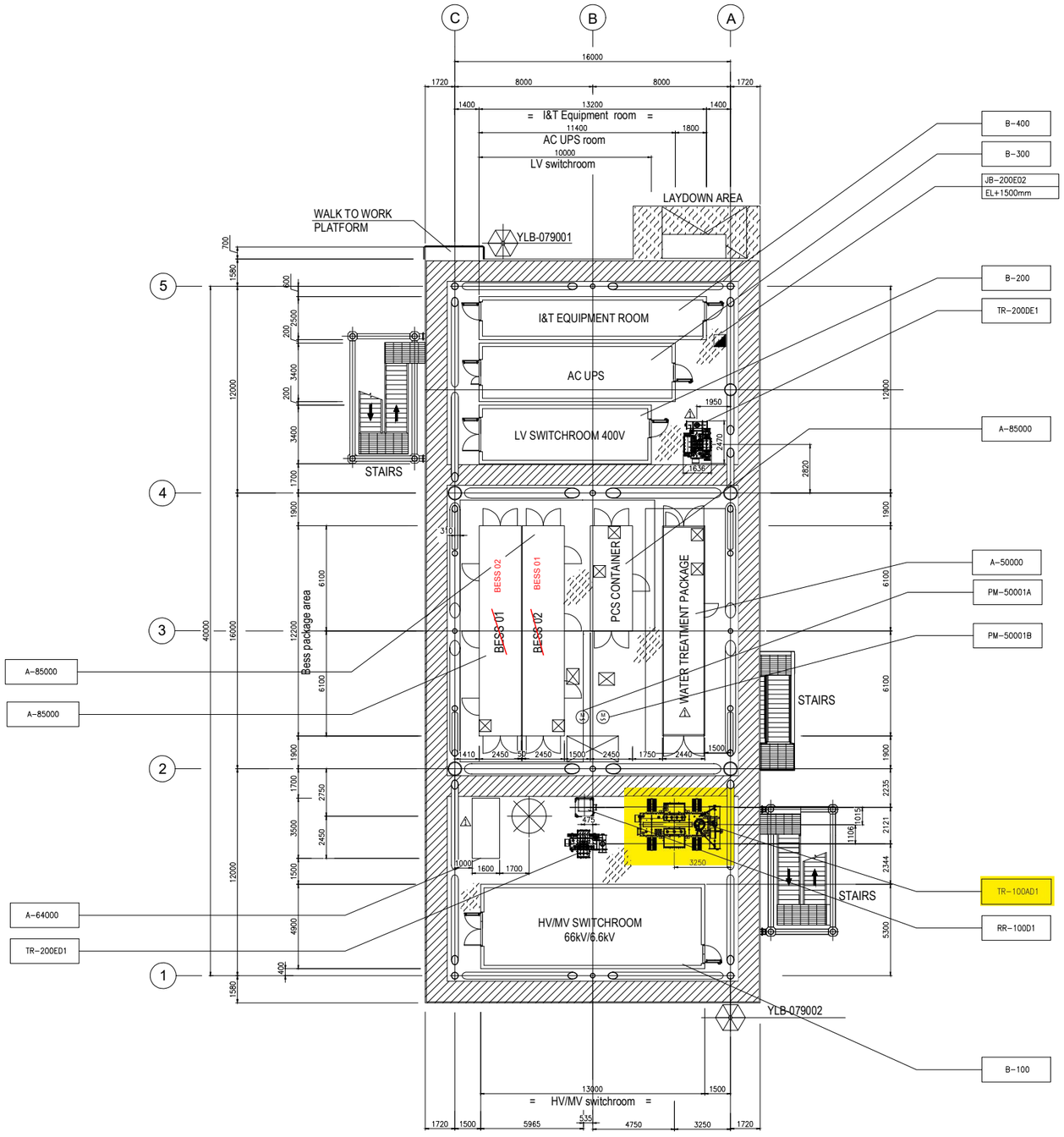
TYPE / SERIAL N° : VOLCRAFT 1000V ET-200 S/N:H240103023 Calibration certificate N° and date: 12/10/2024	TYPE / SERIAL N° : MEGGER : KEW3125A SERIAL: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

Comments: Nota 4: refer to PL C30000679
Note 9: Cable will be connected by SG-100D1 panel during Vendor/COMM activities

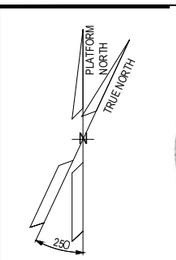
Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-17	2025-01-20	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-17T15:09:33.089Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-20T17:28:28.922Z	

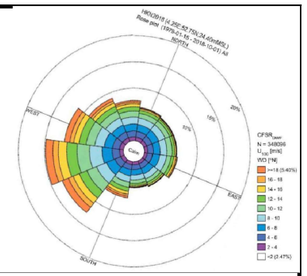
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.





NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
1_B	12/12/24	C.Pilato

ROSETTI MARINO SpA

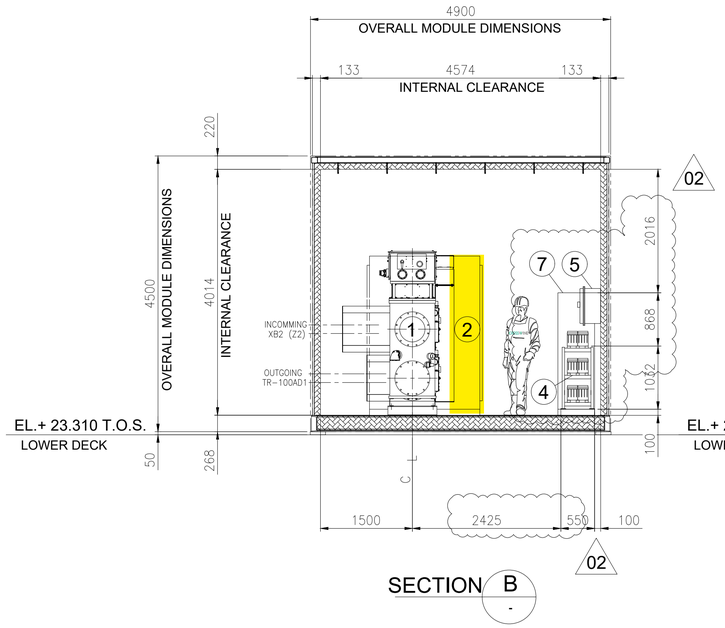
TITLE :
BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

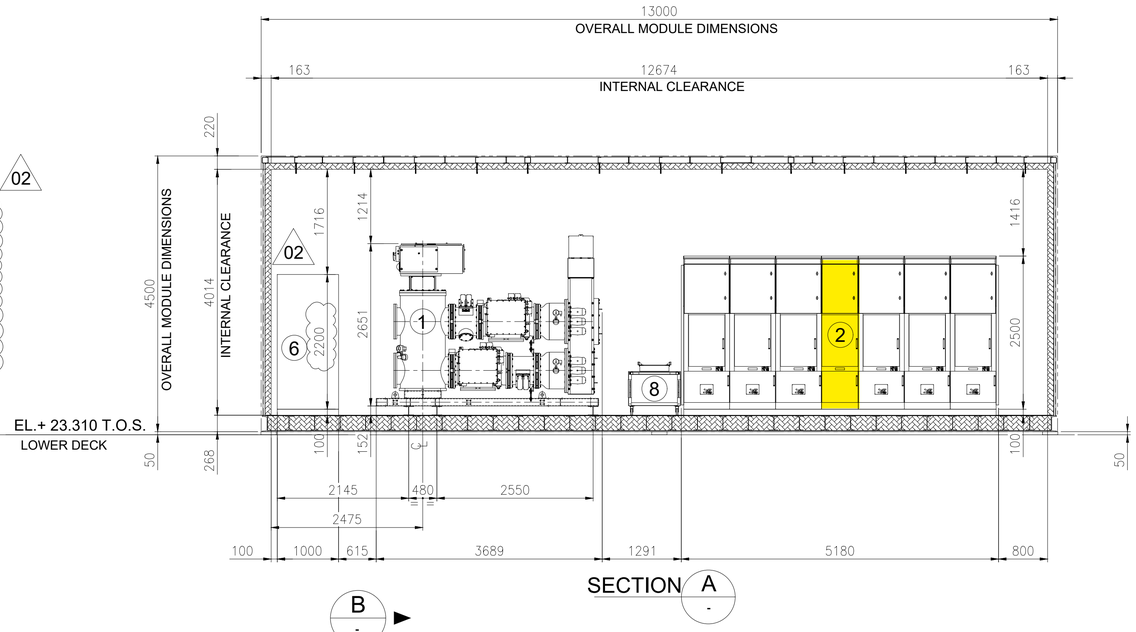
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24

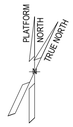
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File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout - Lower Deck

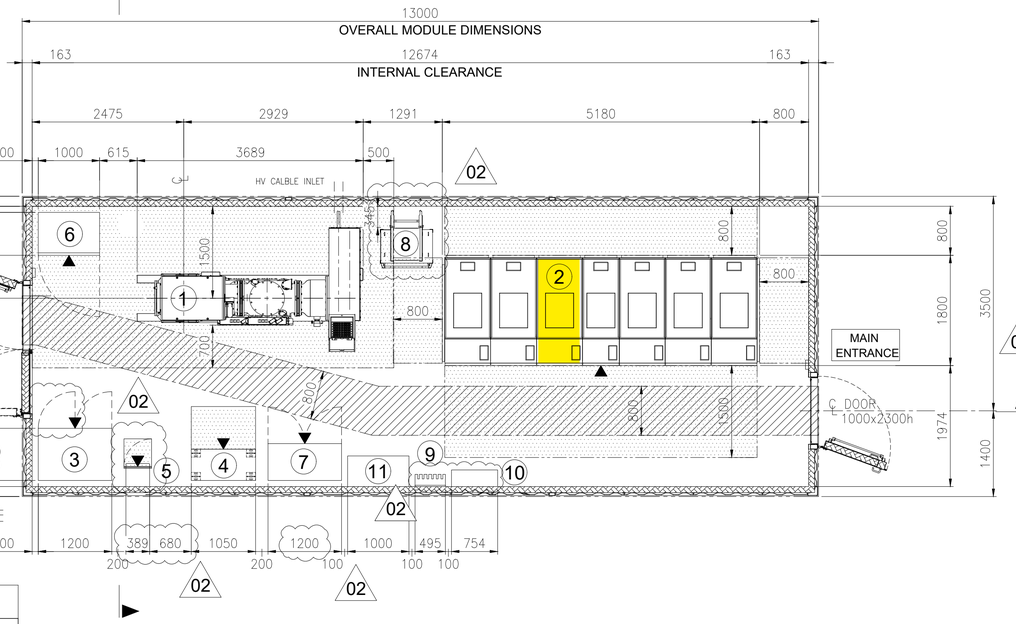
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



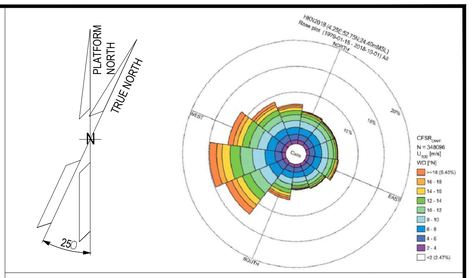




B -



A -



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

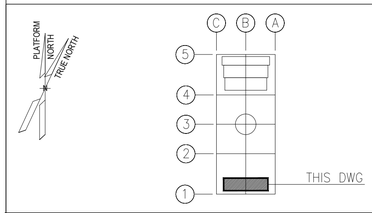
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

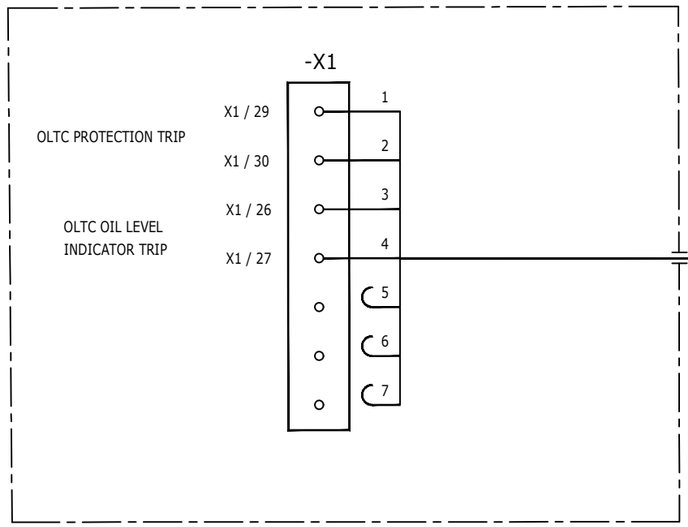
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

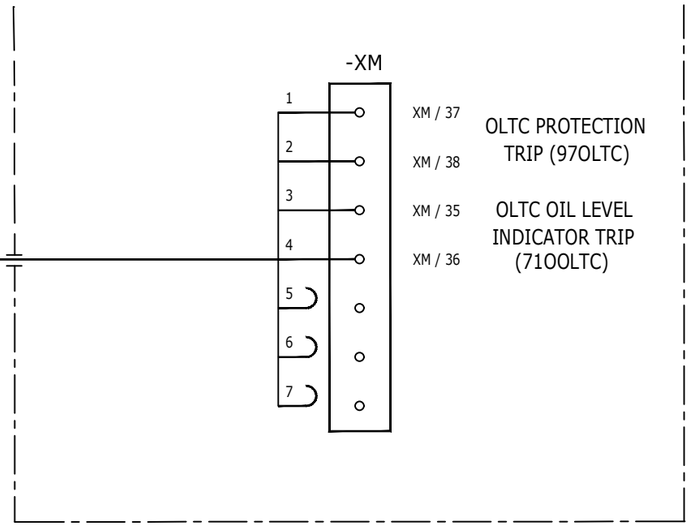
FROM	TO

DESCRIPTION: 66KV, 7MVA TRANSFORMER STEP-UP AVR
TAG NUMBER: CP-100E4



81008-CEC
7C X 1.5 mm²

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



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

REV.:	DATE:	SIGNATURE:
2_H	16/01/25	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
66KV, 7MVA TRANSFORMER OLTC TRIP PROTECTION

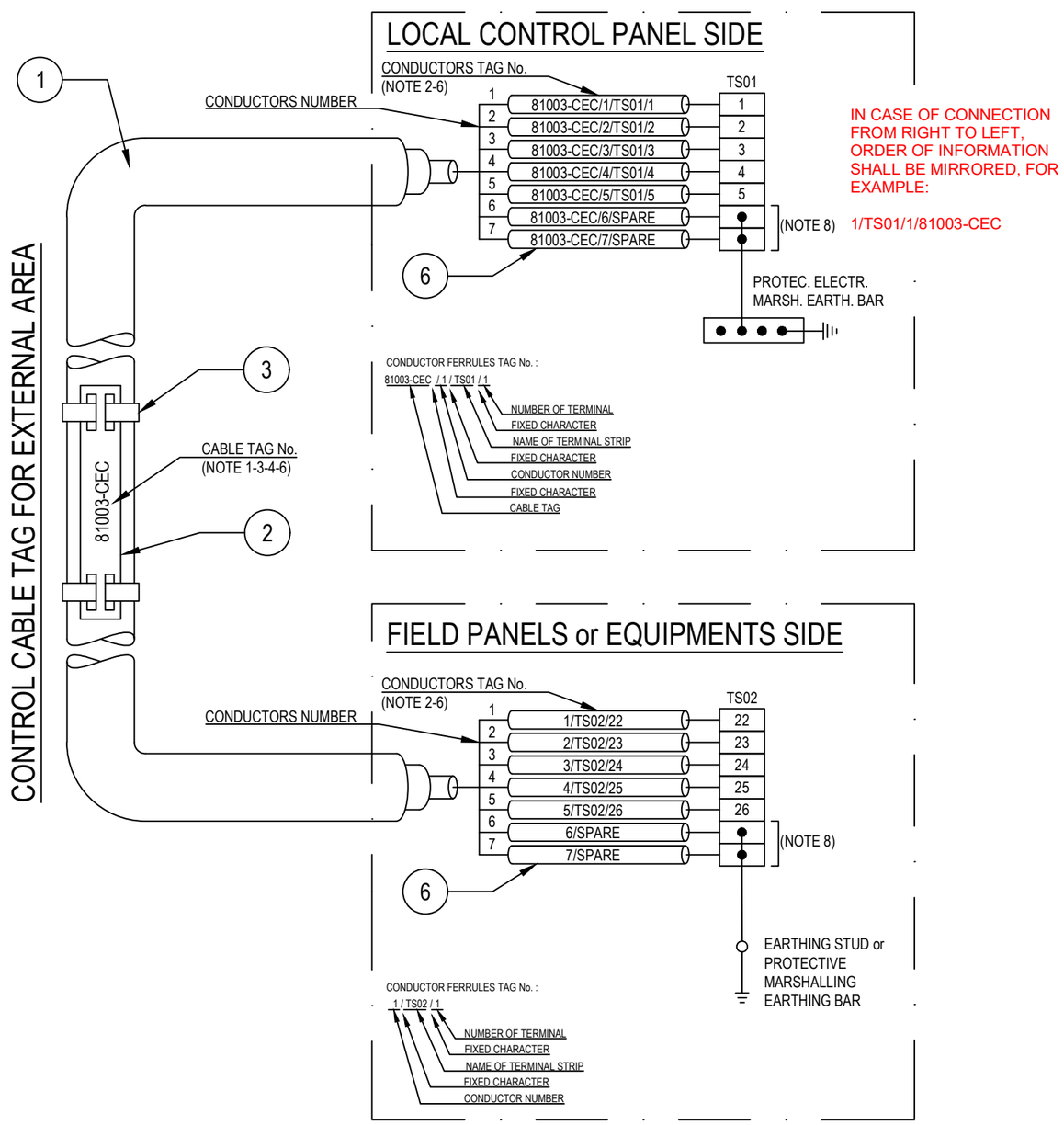
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 070 | REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

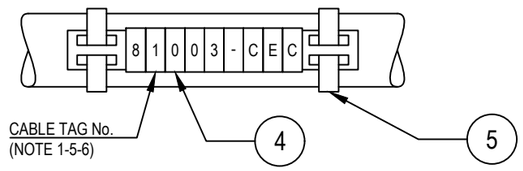
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

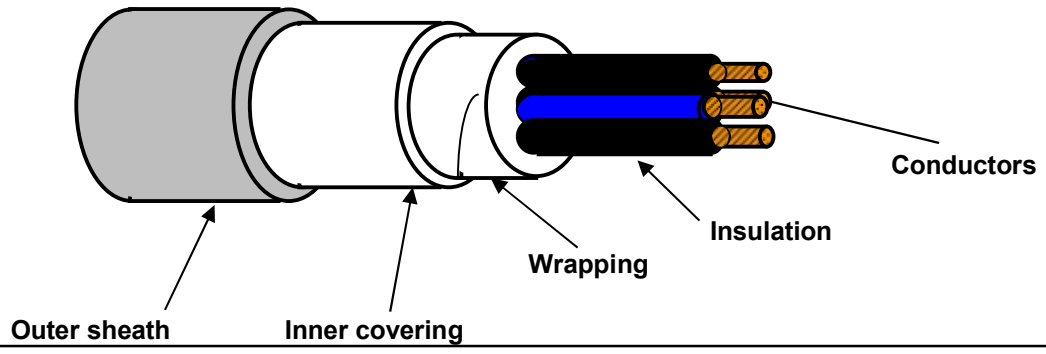
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Disciplin	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81008-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-150-101-LVT-091 / L-150-101-LVT-090 / L-450-101-LVT-072 / L-600-101-LVT-094 / L-750-101-LVT-014 / L-450-101-LVT-075 / E-MCT-106 / L-600-101-LVT-058 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ITEM	Tag	81012-CEC	: LCP GIS / 6.6KV HV Switchgear		Dwg	123A90-DDL-EL-LIS-20148	
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)		Module	LD_B-100	
TASK	code	C10002128	Location	Onshore Activities	User	Rosetti Marino Quality Control	
FORM	Process	MC	Activity CCK	Discipline Electrical	Form	CPX10	Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH — Cores/Size mm²: 7X1,5 mm2 — Color: GREY

From: CP-100E1 — To: SG-100D1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	NA
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,7
	CORE 2 / All cores+screen+armour+earth	0,7
	CORE 3 / All cores+screen+armour+earth	0,7
	CORE 4 / All cores+screen+armour+earth	0,7
	CORE 5 / All cores+screen+armour+earth	0,7
	CORE 6 / All cores+screen+armour+earth	0,7
	CORE 7 / All cores+screen+armour+earth	0,7
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\

INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	>1999
	CORE 6	>1999
	CORE 7	>1999
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

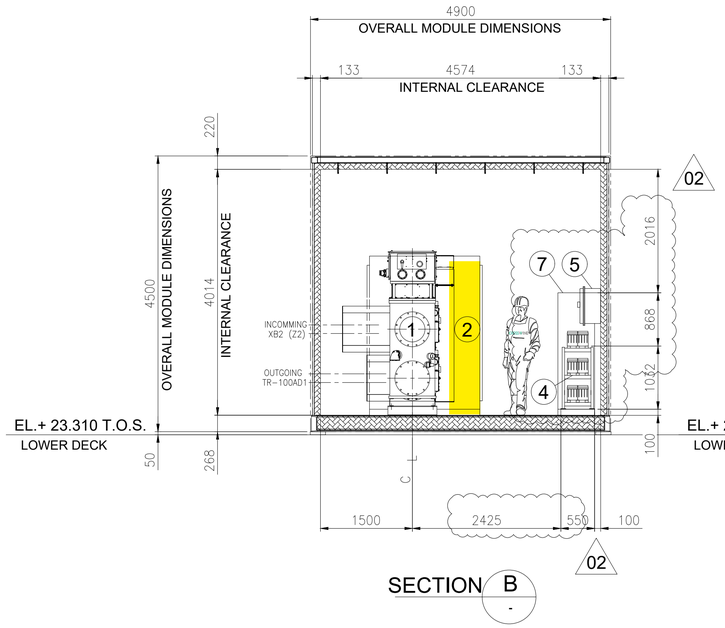
TYPE / SERIAL N° :	VOLCRAFT 1000V ET-200 S/N:H240103023	TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207
Calibration certificate N° and date:	12/10/2024	Calibration certificate N° and date:	N°7722/24 _ 10/07/2024
TYPE / SERIAL N° :		TYPE / SERIAL N° :	
Calibration certificate N° and date:		Calibration certificate N° and date:	

Comments: Note 4: refer to PL C30000679

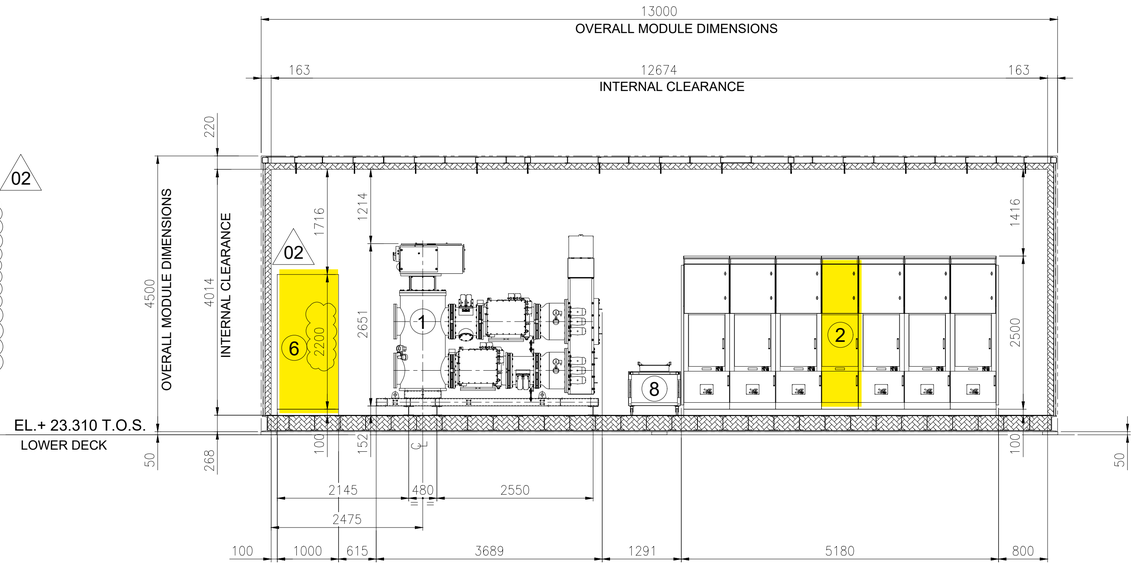
Note 9:Cable will be connected by SG-100D1 panel during Vendor/COMM activities

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-15	2025-01-20	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-15T10:33:21.825Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-20T14:48:59.403Z	

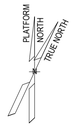
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

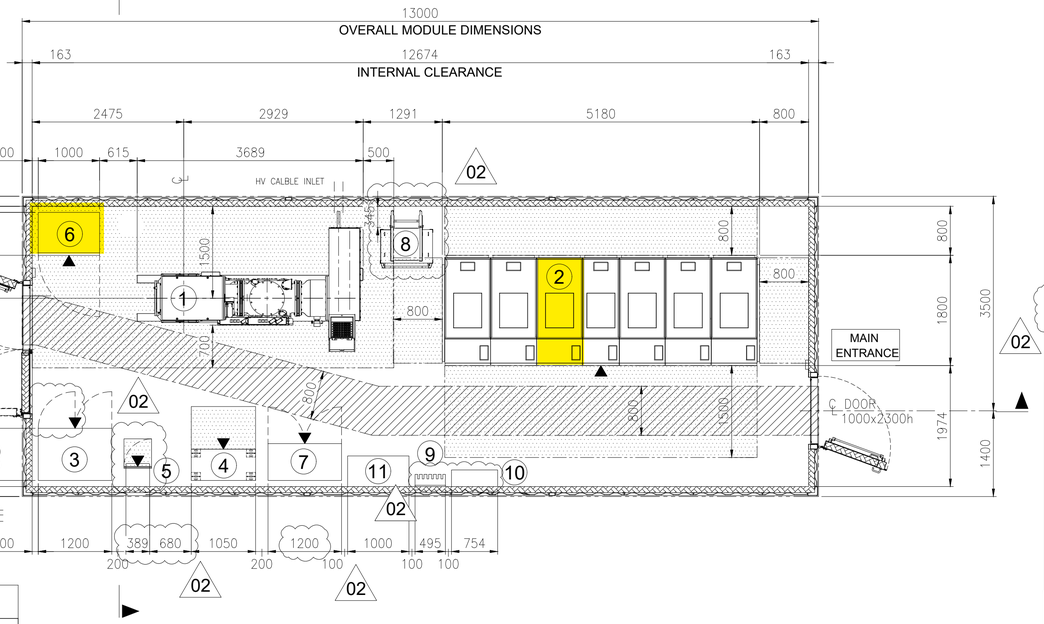


SECTION B -



SECTION A -

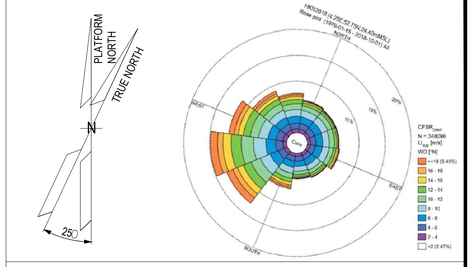




A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

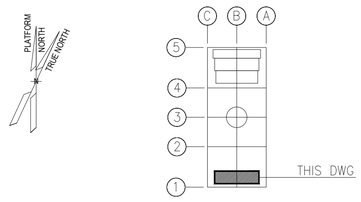
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.:-

-X21B
~~X12B~~

X21B/11 ~~X12B~~ / 11	1	
X21B/12 ~~X12B~~ / 12	2	
X21B/15 ~~X12B~~ / 15	3	
X21B/16 ~~X12B~~ / 16	4	BK
	5	
	6	
	7	

81012-CEC
7C X 1.5 mm²

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

COLUMN/CUBIC.:A6

-XM

	1	XM / 11 — 66KV SWBD. 86 TRIP
	2	XM / 12
	3	XM / 25 — 66KV SWBD. 86 TRIP
BK	4	XM / 26
	5	
	6	
	7	

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

COLUMN/CUBIC.:A6

-X1

X1 / 09	1	
X1 / 10	2	BK
CT FOR 87T PROTECTION	3	
X1 / 11	4	
X1 / 12		

82001-CEC
4C X 4 mm²

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.:-

-X42

	1	X42 / 1
	2	X42 / 3
BK	3	X42 / 5
	4	X42 / 6

DESCRIPTION: 6.6/0.415 KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E3

COLUMN/CUBIC.:A5

-XM

XM / 15	1	
XM / 16	2	BK
	3	
	4	

02

82002-CEC
4C X 4 mm²

COLUMN/CUBIC.:-

-X7

	1	X7 / 3
BK	2	X7 / 4
02	3	
	4	

02

N1
TAPCON
230
EXPERT

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

REV.:	DATE:	SIGNATURE:
2_H	16/01/25	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
LCP GIS & 6.6KV HV SWITCHGEAR INTER TRIP

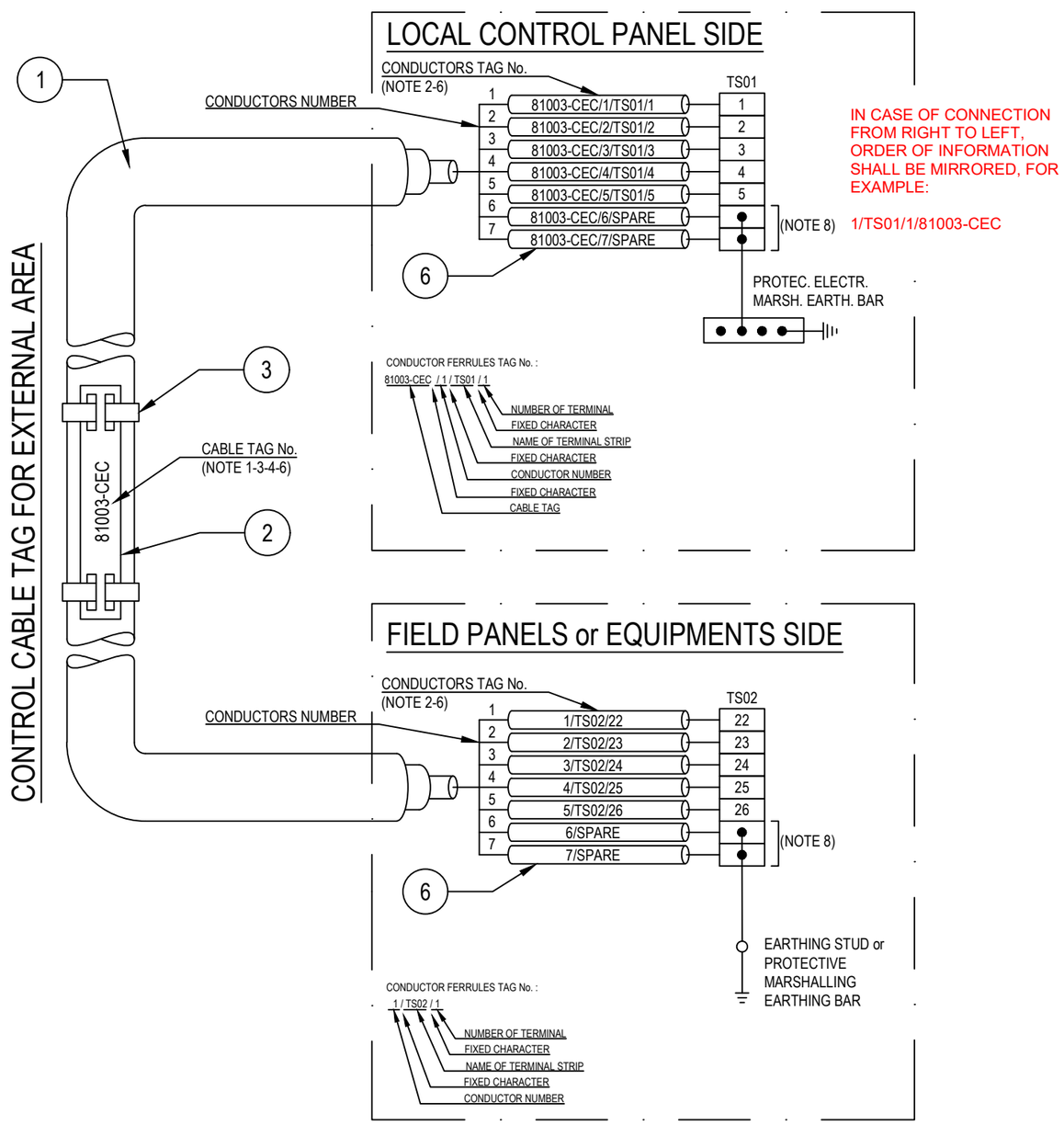
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 072 | REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

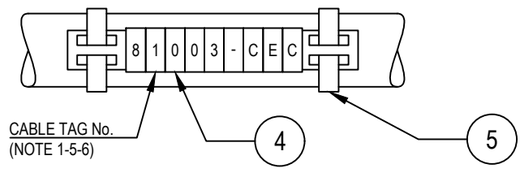
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

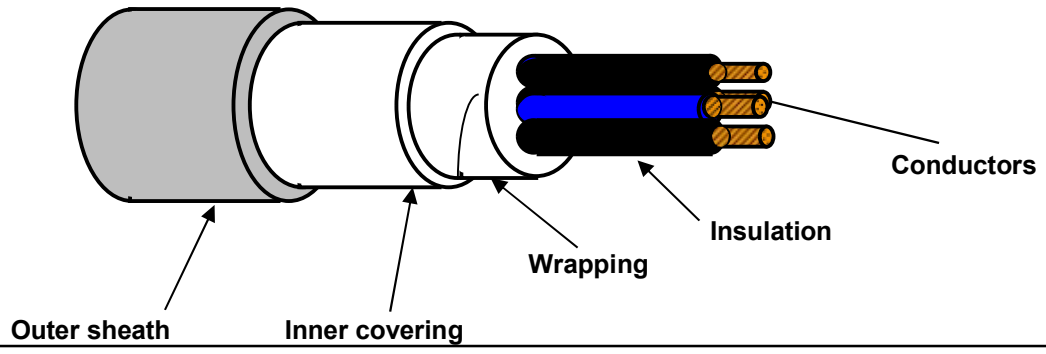
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81012-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E1	66 kV GIS Local Control Panel	Lower Deck (B-100)	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-300-101-LVT-063 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ITEM	Tag	82001-CEC	: 6.6KV HV Switchgear / LCP GIS			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10002129		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH/CWB/LSZH | Cores/Size mm²: 4X4 mm2 | Color: GREY

From: SG-100D1 | To: CP-100E1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	OK
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,7
	CORE 2 / All cores+screen+armour+earth	0,7
	CORE 3 / All cores+screen+armour+earth	0,7
	CORE 4 / All cores+screen+armour+earth	0,7
	CORE 5 / All cores+screen+armour+earth	\
	CORE 6 / All cores+screen+armour+earth	\
	CORE 7 / All cores+screen+armour+earth	\
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\
INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	\
	CORE 6	\
	CORE 7	\
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

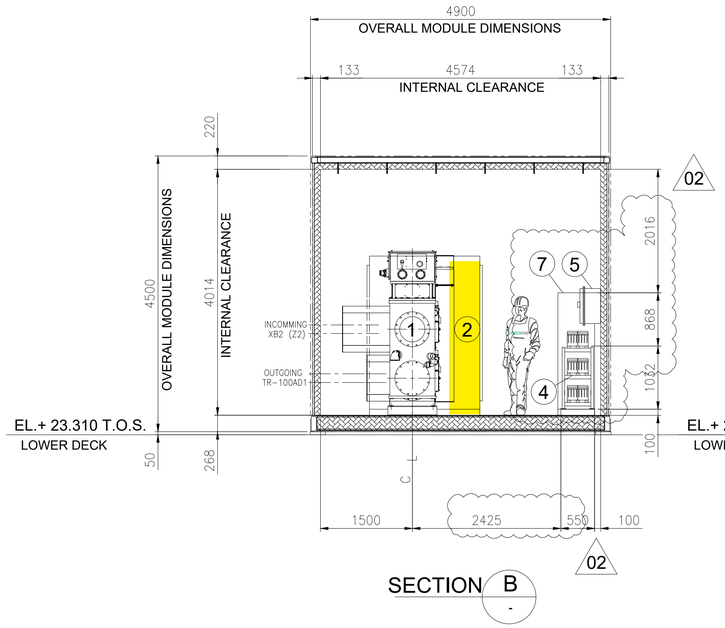
TESTING INSTRUMENTS USED

TYPE / SERIAL N° : VOLCRAFT 1000V ET-200 S/N:H240103023 Calibration certificate N° and date: 12/10/2024	TYPE / SERIAL N° : MEGGER : KEW3125A SERIAL: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

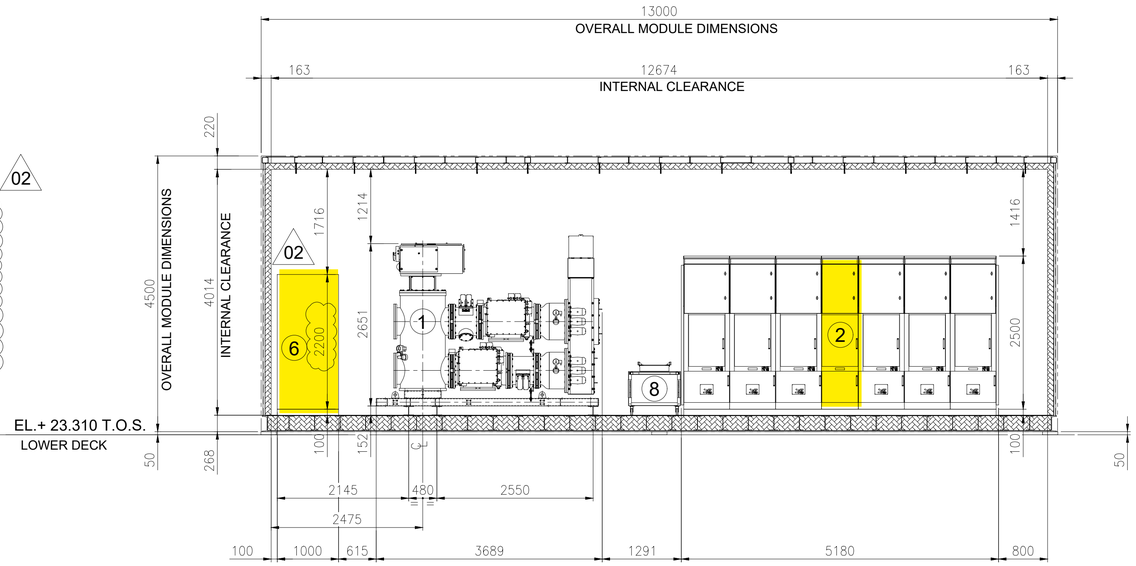
Comments: Nota 4: refer to PL C30000679

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-17	2025-01-20	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-17T15:09:53.452Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-20T14:50:07.210Z	

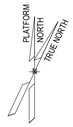
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

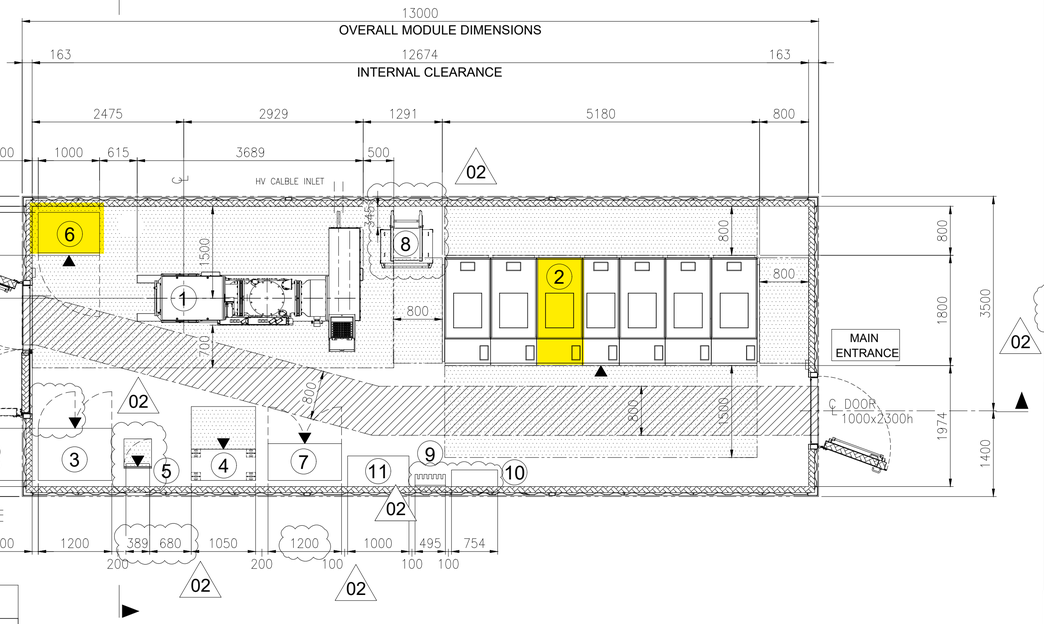


SECTION B -



SECTION A -

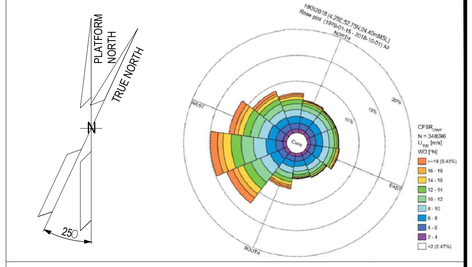




A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

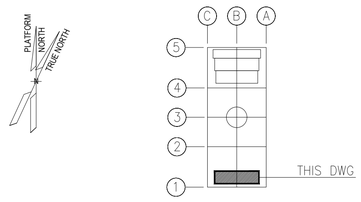
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.:-

-X21B
~~X12B~~

X21B/11 ~~X12B~~ / 11	1	
X21B/12 ~~X12B~~ / 12	2	
X21B/15 ~~X12B~~ / 15	3	
X21B/16 ~~X12B~~ / 16	4	BK
	5	
	6	
	7	

81012-CEC
7C X 1.5 mm²

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

COLUMN/CUBIC.:A6

-XM

BK	1	XM / 11 — 66KV SWBD. 86 TRIP
	2	XM / 12
	3	XM / 25 — 66KV SWBD. 86 TRIP
	4	XM / 26
	5	
	6	
	7	

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

COLUMN/CUBIC.:A6

-X1

X1 / 09	1	
X1 / 10	2	BK
CT FOR 87T PROTECTION		
X1 / 11	3	
X1 / 12	4	

82001-CEC
4C X 4 mm²

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.:-

-X42

	1	X42 / 1
BK	2	X42 / 3
	3	X42 / 5
	4	X42 / 6

DESCRIPTION: 6.6/0.415 KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E3

COLUMN/CUBIC.:A5

-XM

XM / 15	1	
XM / 16	2	BK
	3	
	4	

02

82002-CEC
4C X 4 mm²

COLUMN/CUBIC.:-

-X7

	1	X7 / 3
BK	2	X7 / 4
02	3	
	4	

02

N1
TAPCON
230
EXPERT

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

REV.:	DATE:	SIGNATURE:
2_H	16/01/25	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
LCP GIS & 6.6KV HV SWITCHGEAR INTER TRIP

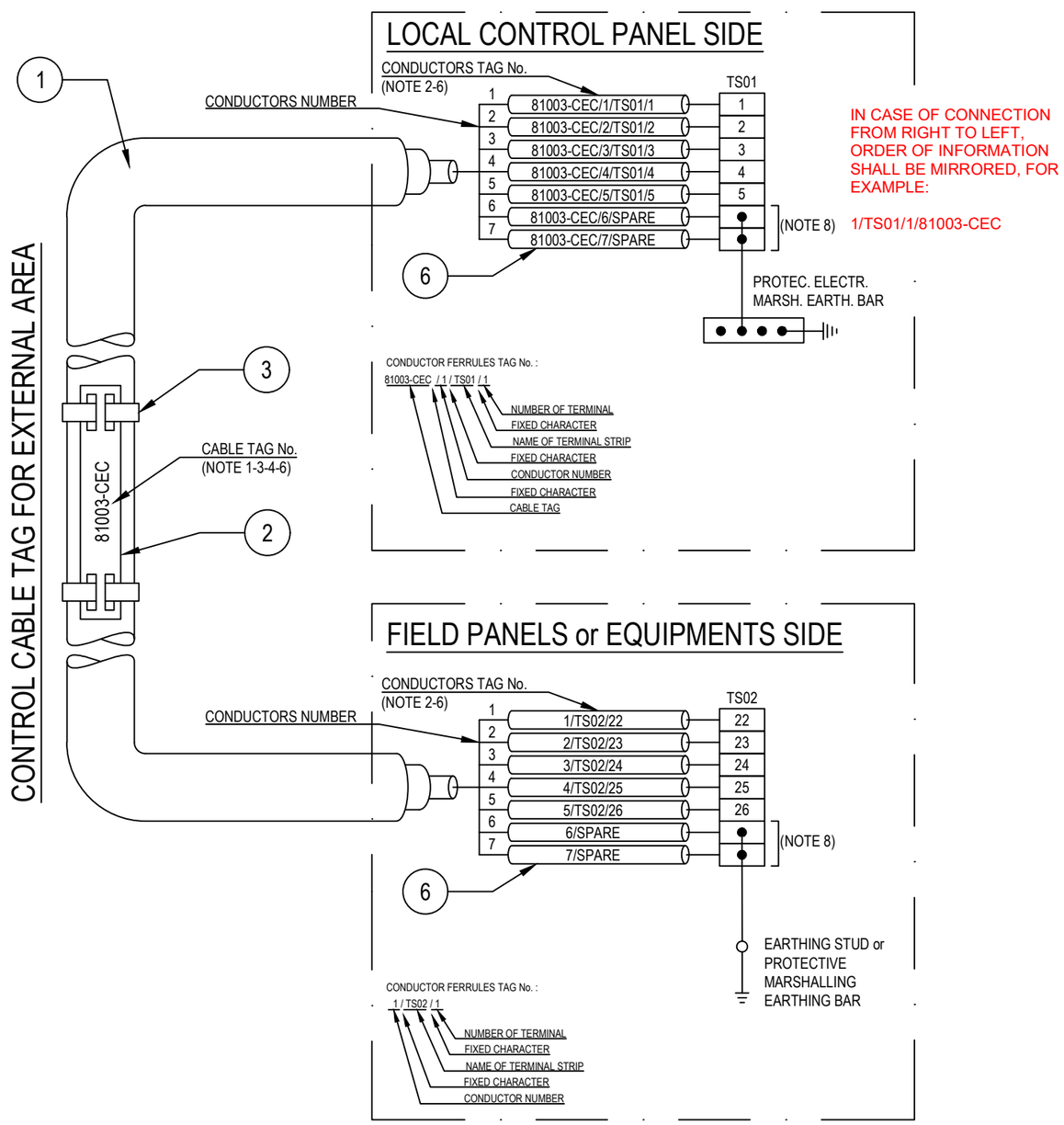
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 072 | REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

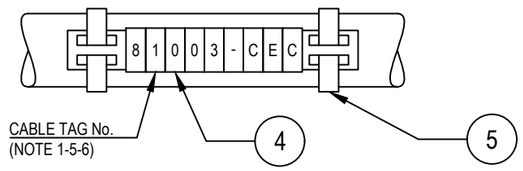
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

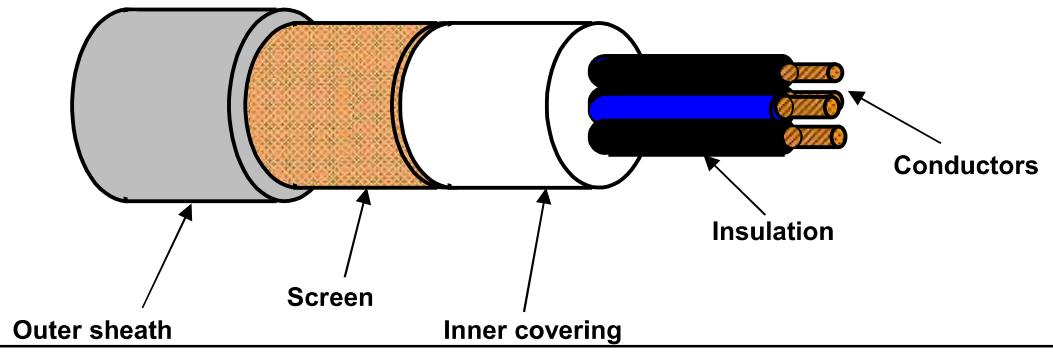
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82001-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	CP-100E1	66 kV GIS Local Control Panel	Lower Deck (B-100)	ELECV35-4X4	Cable Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1kV 4Cx4mm² - Grey	M20	n.a.			T2_M20_Double				L-300-101-LVT-059 / L-300-101-LVT-063

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV

4CX4 - CONTROL CABLE - SCREENED - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 4)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Screen :	**Copper Wire Braid (coverage ≥ 90%)**	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60092.360, Average Thickness 1,3 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking**	
Outer diameter :	(15,4 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores - Screen)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 690 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance	IEC 61034.2 (LT ≥ 60%)	
Hazardous Areas :	IEC 60079.14:2013 par.9.3.2a	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO

CROSSWIND

ITEM	Tag	82002-CEC	: 6.6KV HV Switchgear / 66/6.6 kV, 7MVA Transformer			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10002130		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH/CWB/LSZH | Cores/Size mm²: 4X4 mm2 | Color: GREY

From: SG-100D1 | To: CP-100E3

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	PL
7	Check cable labelling is in accordance with latest specification.	PL
8	Check cable glands suit for cable type and are in accordance with latest specification.	NA
9	Check terminations are in accordance with latest termination diagram.	OK
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,7
	CORE 2 / All cores+screen+armour+earth	0,7
	CORE 3 / All cores+screen+armour+earth	0,7
	CORE 4 / All cores+screen+armour+earth	0,7
	CORE 5 / All cores+screen+armour+earth	\
	CORE 6 / All cores+screen+armour+earth	\
	CORE 7 / All cores+screen+armour+earth	\
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\
INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	\
	CORE 6	\
	CORE 7	\
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

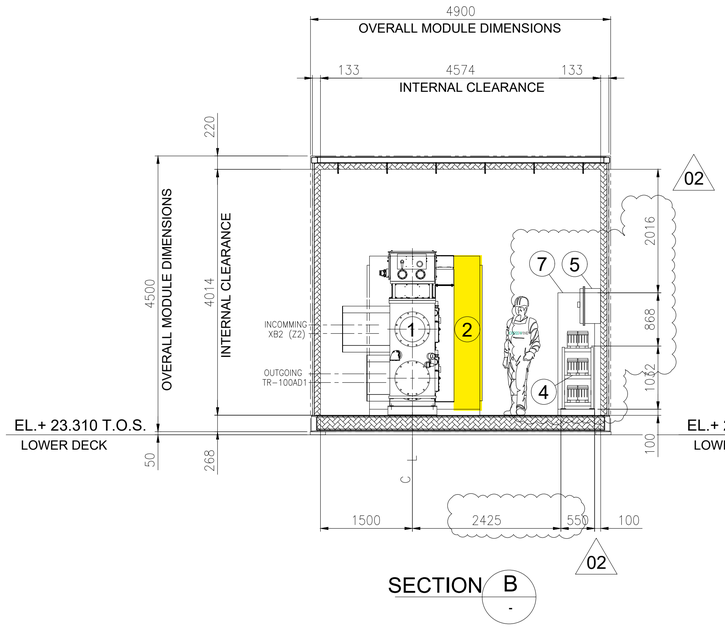
TYPE / SERIAL N° : MEGGER: KEW3125ASERIAL:W833020 Calibration certificate N° and date: N° 7722/24 10/07/2024	TYPE / SERIAL N° : Calibration certificate N° and date:
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

Comments: Nota 4: refer to PL C30000679

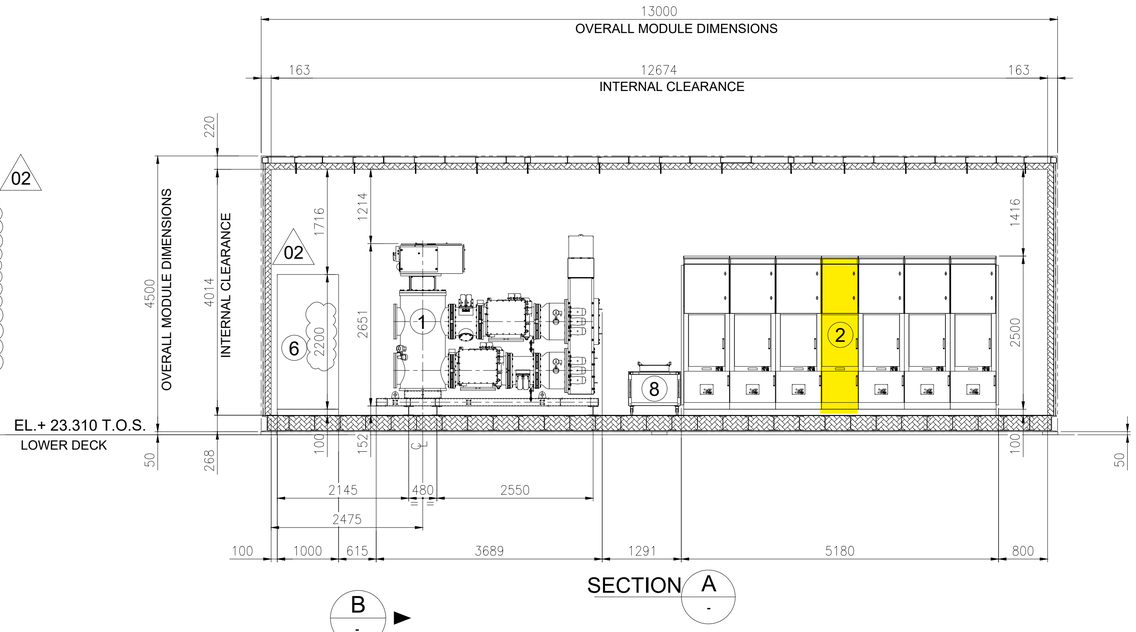
Page 1/1

	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Paolo Schintu	
Date	2024-12-03	2024-12-17	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-12-03T06:32:53.776Z	PROVERLIS Digitaly signed by Paolo Schintu 2024-12-17T07:55:47.299Z	

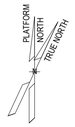
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



SECTION B -



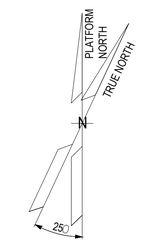
SECTION A -

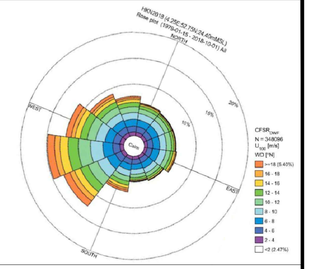


A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	





NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

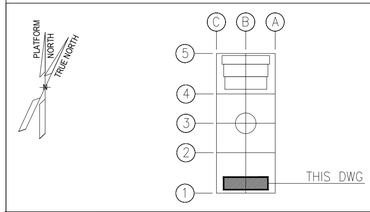
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

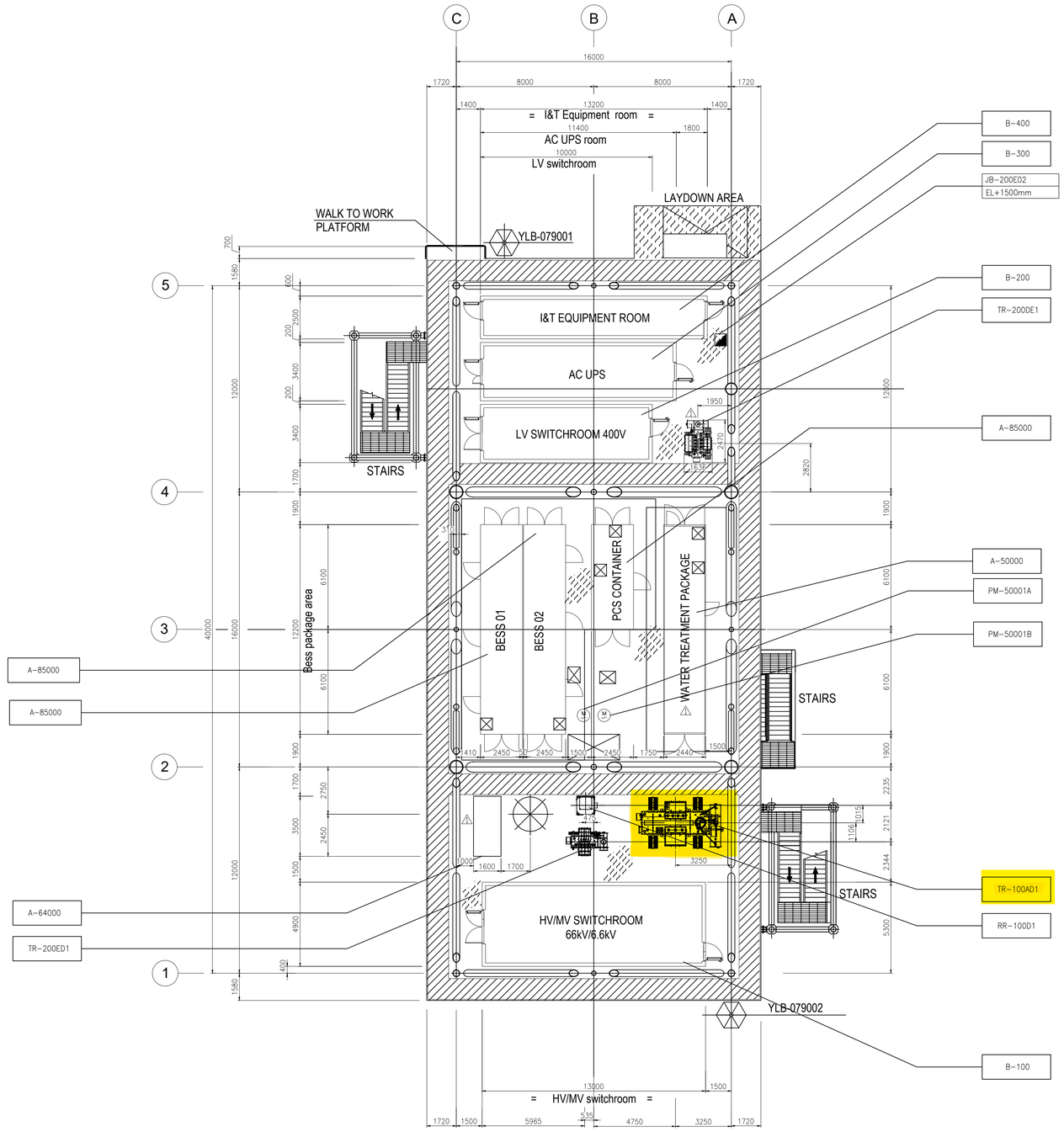
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

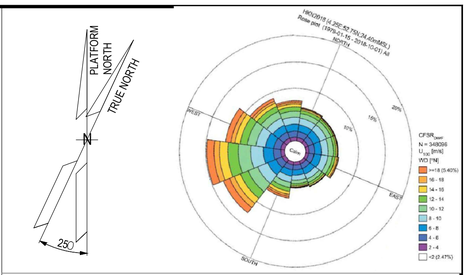
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20101**

REV.:	DATE:	SIGNATURE:
1_A	08/08/24	G.Randi

ROSETTI MARINO SpA

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM	TO

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.:-

-X12B

X12B / 11 — 1
X12B / 12 — 2
X12B / 15 — 3
X12B / 16 — 4
5
6
7

BK — 81012-CEC — 7C X 1.5 mm²

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

COLUMN/CUBIC.:A6

-XM

1 — XM / 11 — 66KV SWBD. 86 TRIP
2 — XM / 12
3 — XM / 25 — 66KV SWBD. 86 TRIP
4 — XM / 26
5
6
7

BK

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

COLUMN/CUBIC.:A6

-X1

X1 / 09 — 1
X1 / 10 — 2
CT FOR 87T PROTECTION
X1 / 11 — 3
X1 / 12 — 4

BK — 82001-CEC — 4C X 4 mm²

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.:-

-X42

1 — X42 / 1
2 — X42 / 3
3 — X42 / 5
4 — X42 / 6

BK

COLUMN/CUBIC.:A5

-XM

XM / 15 — 1
XM / 16 — 2
3
4
02

BK — 82002-CEC — 4C X 4 mm²

DESCRIPTION: 6.6/0.415 KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E3

COLUMN/CUBIC.:-

-X7

1 — X7 / 3
2 — X7 / 4
3
4
02
02

N1
TAPCON
230
EXPERT

BK

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

REV.:	DATE:	SIGNATURE:
2_C	02/12/24	G.Randi

ROSETTI MARINO SpA

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)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
LCP GIS & 6.6KV HV SWITCHGEAR INTER TRIP

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

SCALE : 1:X

A3

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

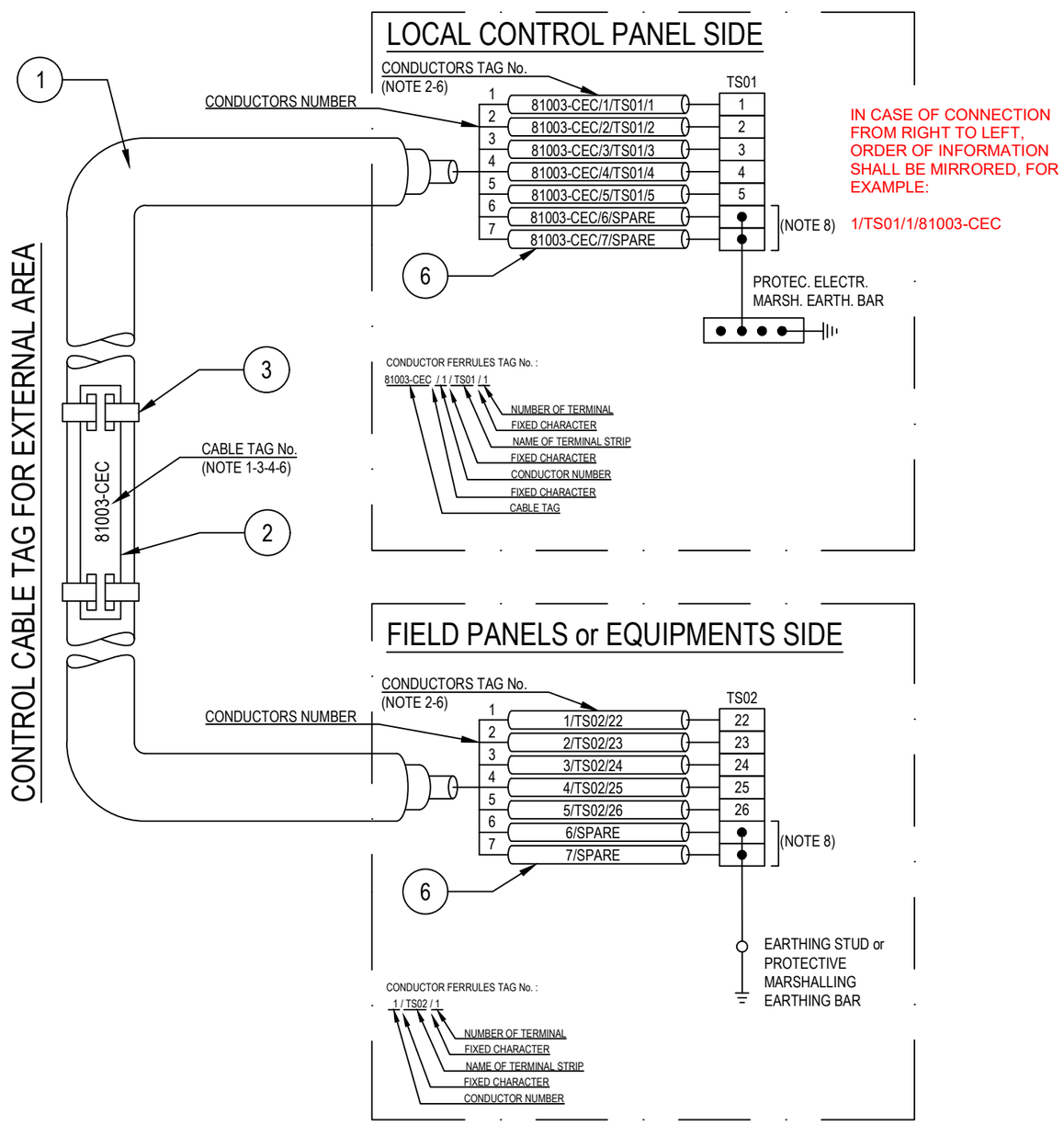
SHEET 072

REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

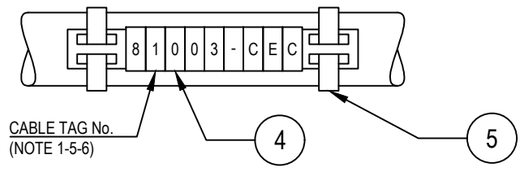
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

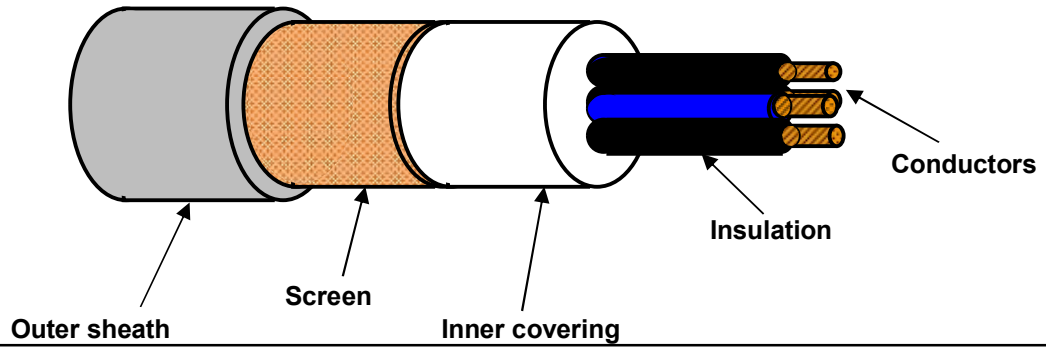
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82002-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	CP-100E3	Auxiliary Trafo AVR Local Control Panel	Lower Deck	ELECV35-4X4	Cable Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1kV 4Cx4mm² - Grey	M20	n.a.			T2_M20_Double				L-300-101-LVT-059 / L-600-101-LVT-058 / E-MCT-106 / L-450-101-LVT-075 / L-750-101-LVT-014 / L-600-101-LVT-094 / L-150-101-LVT-090 / L-150-101-LVT-091

Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV

4CX4 - CONTROL CABLE - SCREENED - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 4)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Screen :	**Copper Wire Braid (coverage ≥ 90%)**	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60092.360, Average Thickness 1,3 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking**	
Outer diameter :	(15,4 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores - Screen)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 690 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Hazardous Areas :	IEC 60079.14:2013 par.9.3.2a	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	82010-CEC	: 6.6KV HV Switchgear / LCP GIS			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10002131		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type	Cu Cl.2/XLPE/LSZH	Cores/Size mm²	7X1,5 mm2	Color	GREY
From	SG-100D1	To	CP-100E1		

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	NA
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,7
	CORE 2 / All cores+screen+armour+earth	0,7
	CORE 3 / All cores+screen+armour+earth	0,7
	CORE 4 / All cores+screen+armour+earth	0,7
	CORE 5 / All cores+screen+armour+earth	0,7
	CORE 6 / All cores+screen+armour+earth	0,7
	CORE 7 / All cores+screen+armour+earth	0,7
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\

INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	>1999
	CORE 6	>1999
	CORE 7	>1999
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	\
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

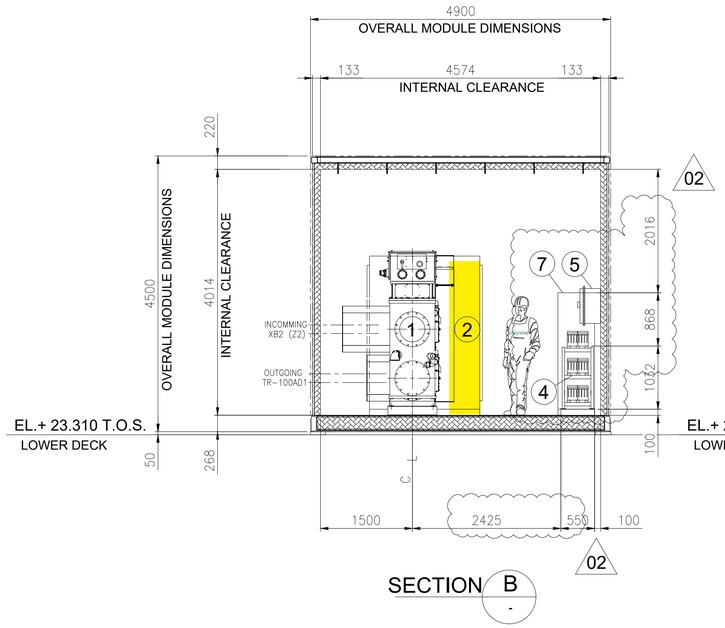
TESTING INSTRUMENTS USED

TYPE / SERIAL N° :	VOLCRAFT 1000V ET-200 S/N:H240103023	TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207
Calibration certificate N° and date:	12/10/2024	Calibration certificate N° and date:	N°7722/24 _ 10/07/2024
TYPE / SERIAL N° :		TYPE / SERIAL N° :	
Calibration certificate N° and date:		Calibration certificate N° and date:	

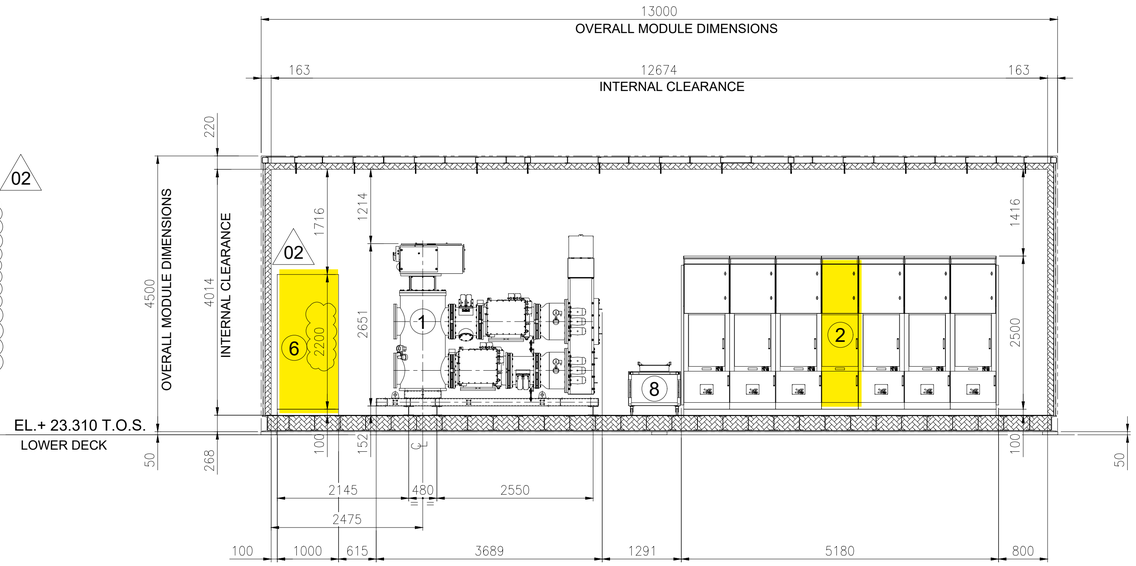
Comments: Note 9: Cable will be connected by SG-100D1 panel during Vendor/COMM activities

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-17	2025-01-20	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-17T15:10:06.992Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-20T17:26:25.156Z	

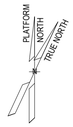
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

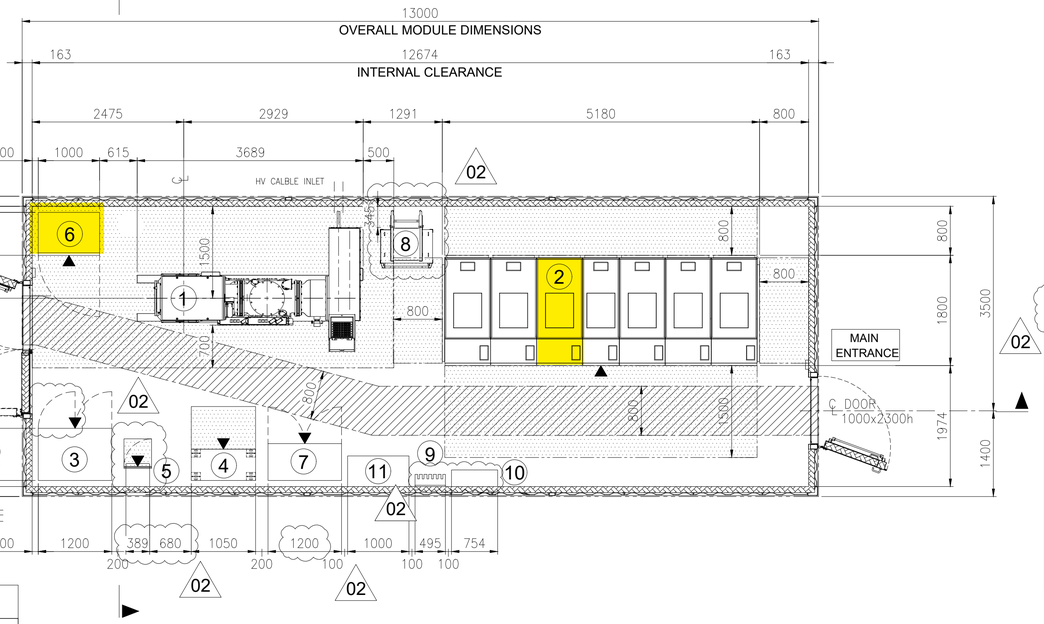


SECTION B -



SECTION A -

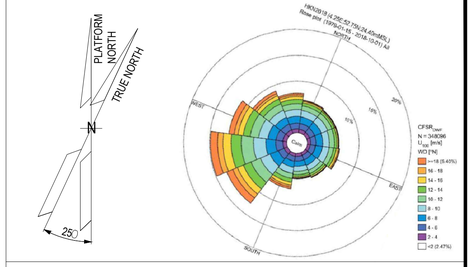




A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

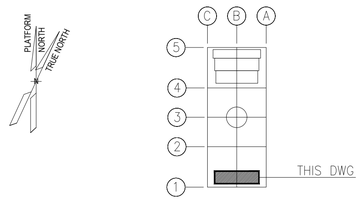
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

COLUMN/CUBIC.:A6

PERMISSIVES FROM 6.6KV TO GIS CB & EARTHING SWITCH

-XM

CB STATUS OPENED	XM / 65	1
CB CONNECTED SERVICE POSITION	XM / 66	2
	XM / 67	3
EARTHING SWITCH OPENED	XM / 68	4
	XM / 91	5
CB OPEN	XM / 92	6
		7

BK

82010-CEC
7C X 1.5 mm²

BK

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.:-

-X13

1	X13 / 15
2	X13 / 16
3	X13 / 29
4	X13 / 30
5	X13 / 33
6	X13 / 34
7	

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

REV.:	DATE:	SIGNATURE:
2_H	16/01/25	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
6.6KV HV SWITCHGEAR & LCP GIS INTERLOCK

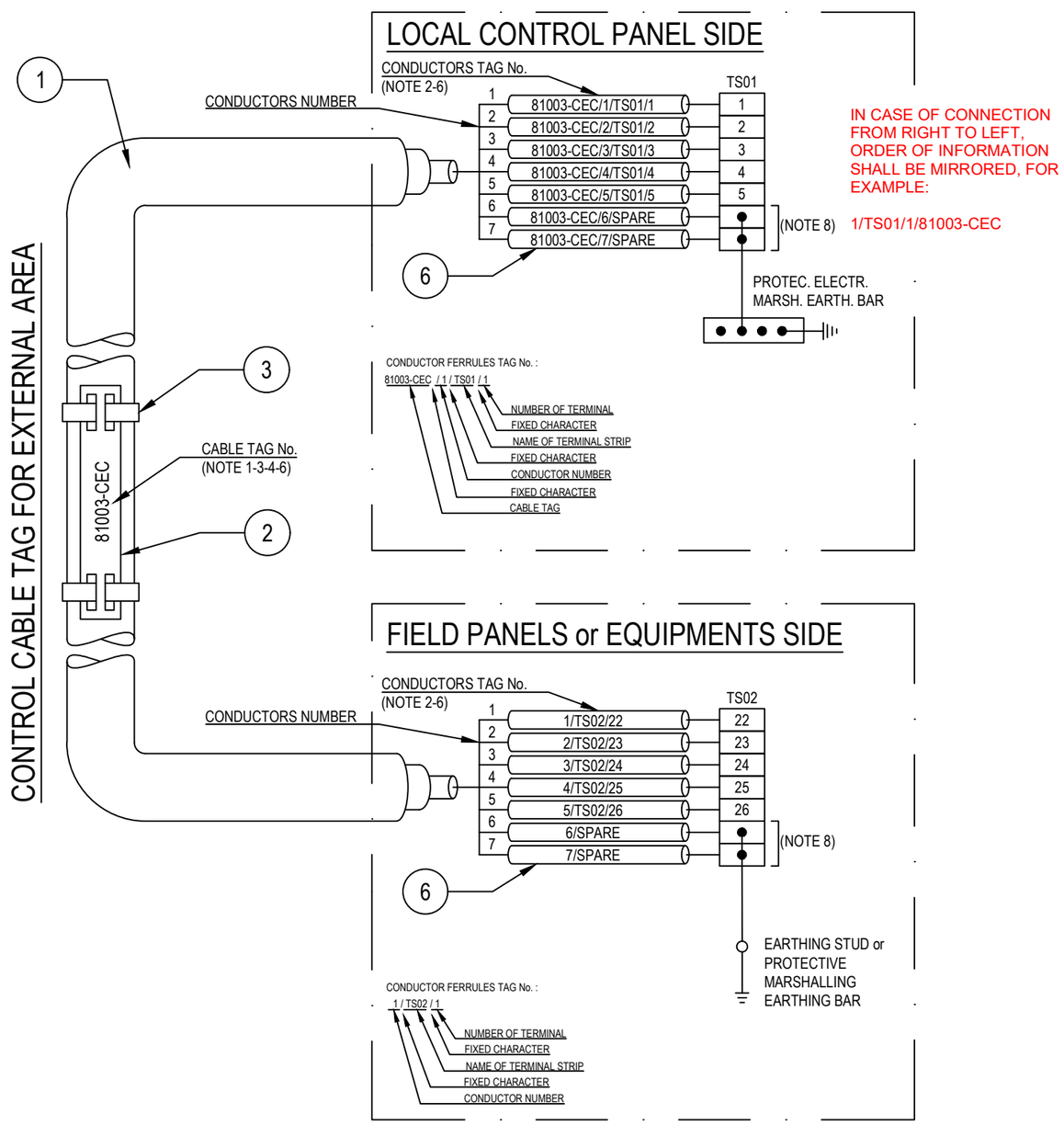
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 076 | REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

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3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
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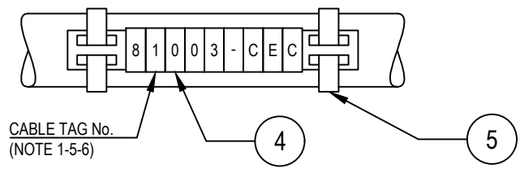
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

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- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

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CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

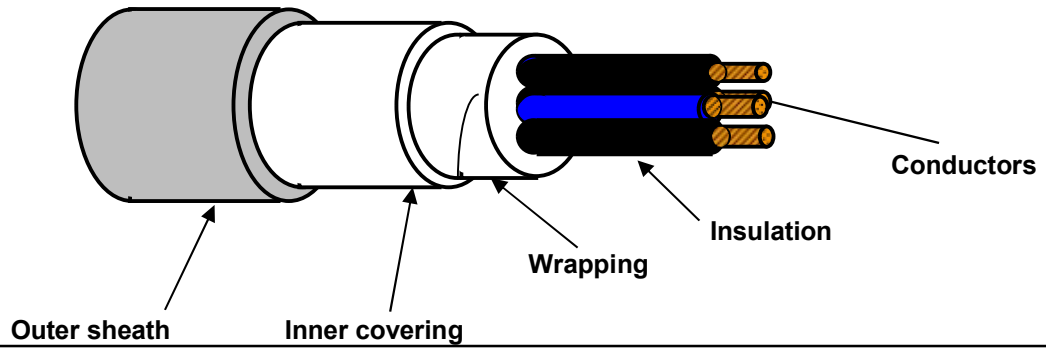
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82010-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	CP-100E1	66 kV GIS Local Control Panel	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	n.a.			T1_M25_Single				L-300-101-LVT-059 / L-300-101-LVT-063

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	82011-CEC	: 6.6KV HV Switchgear / LCP GIS			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10002132		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type	Cu Cl.2/XLPE/LSZH	Cores/Size mm²	7X1,5 mm2	Color	GREY
From	SG-100D1	To	CP-100E1		

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,7
	CORE 2 / All cores+screen+armour+earth	0,7
	CORE 3 / All cores+screen+armour+earth	0,7
	CORE 4 / All cores+screen+armour+earth	0,7
	CORE 5 / All cores+screen+armour+earth	0,7
	CORE 6 / All cores+screen+armour+earth	0,7
	CORE 7 / All cores+screen+armour+earth	0,7
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\

INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	>1999
	CORE 6	>1999
	CORE 7	>1999
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

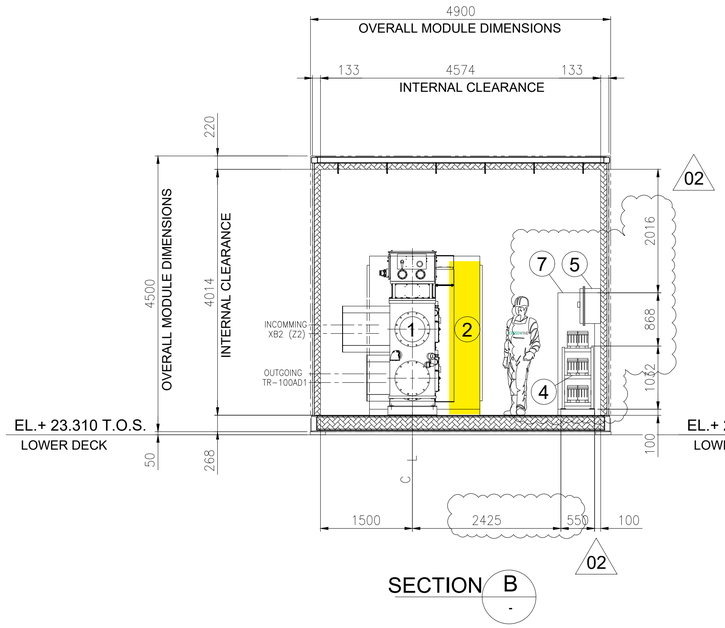
TESTING INSTRUMENTS USED

TYPE / SERIAL N° :	VOLCRAFT 1000V ET-200 S/N:H240103023	TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207
Calibration certificate N° and date:	12/10/2024	Calibration certificate N° and date:	N°7722/24 _ 10/07/2024
TYPE / SERIAL N° :		TYPE / SERIAL N° :	
Calibration certificate N° and date:		Calibration certificate N° and date:	

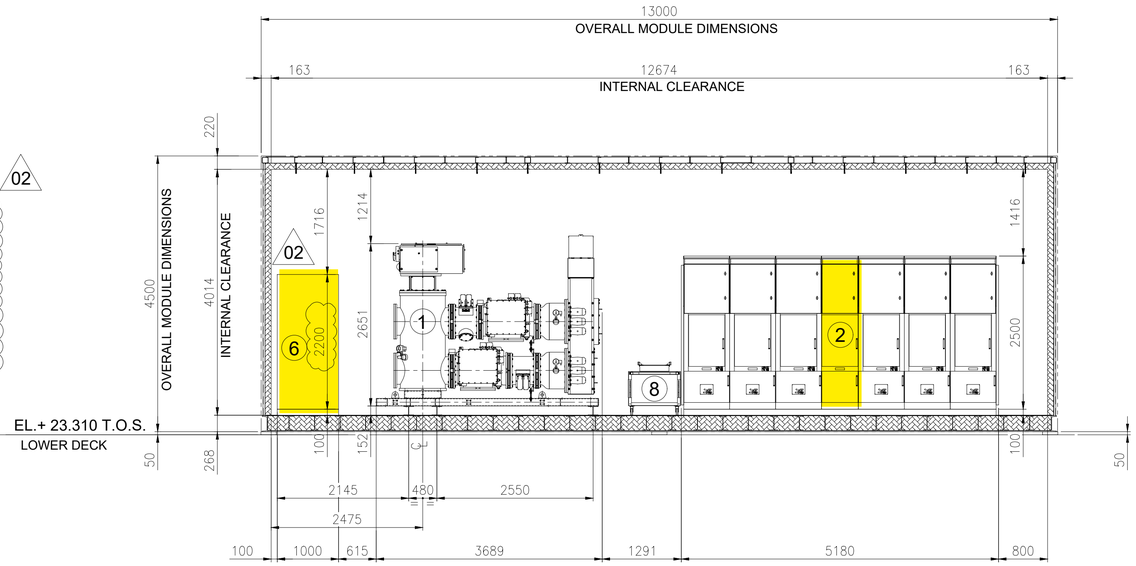
Comments: Note 9: Cable will be connected by SG-100D1 panel during Vendor/COMM activities

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-17	2025-01-20	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-17T15:10:17.284Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-20T14:52:45.269Z	

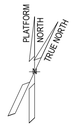
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

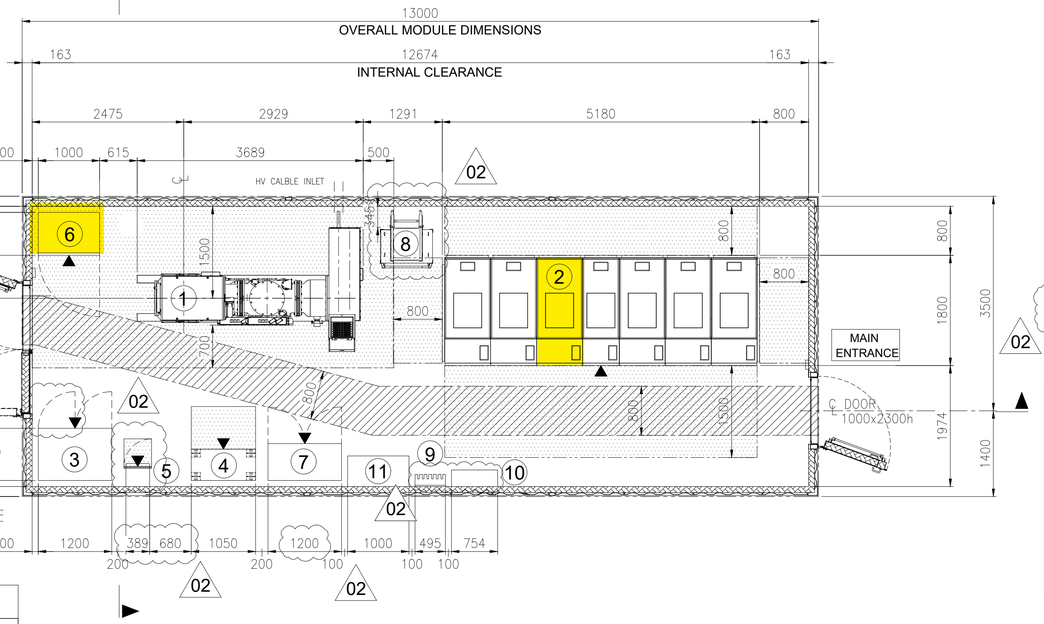


SECTION B -



SECTION A -

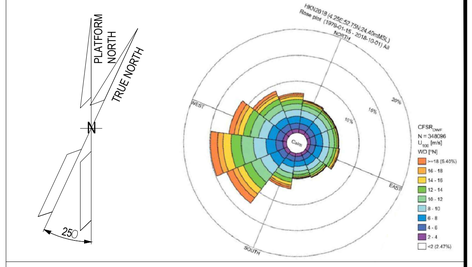




A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

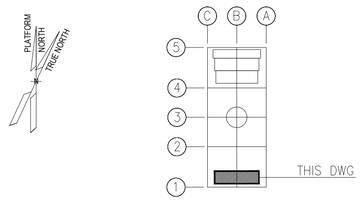
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

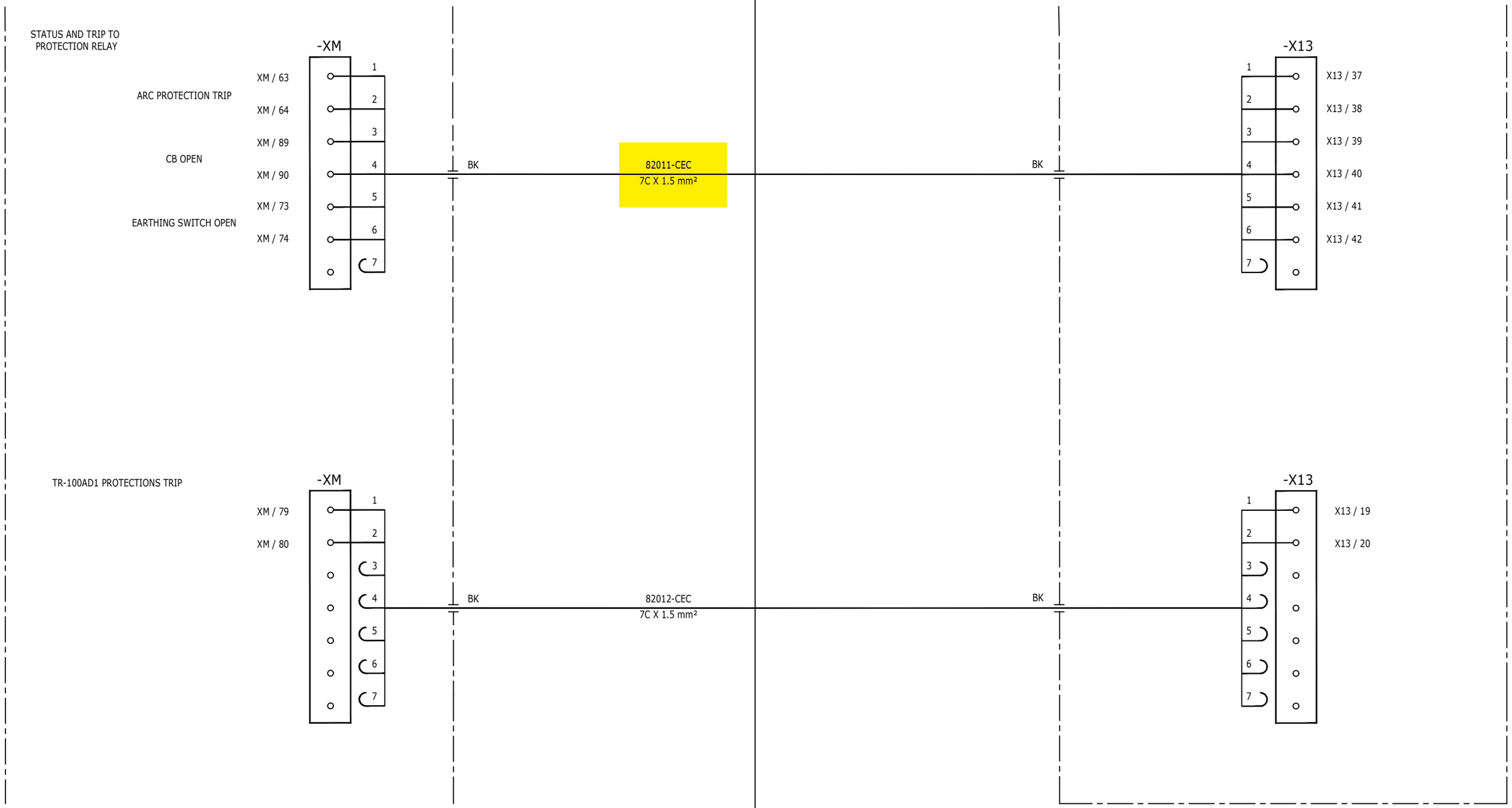
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1



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

REV.:	DATE:	SIGNATURE:
2_H	16/01/25	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
6.6KV HV SWITCHGEAR & LCP GIS INTERLOCK

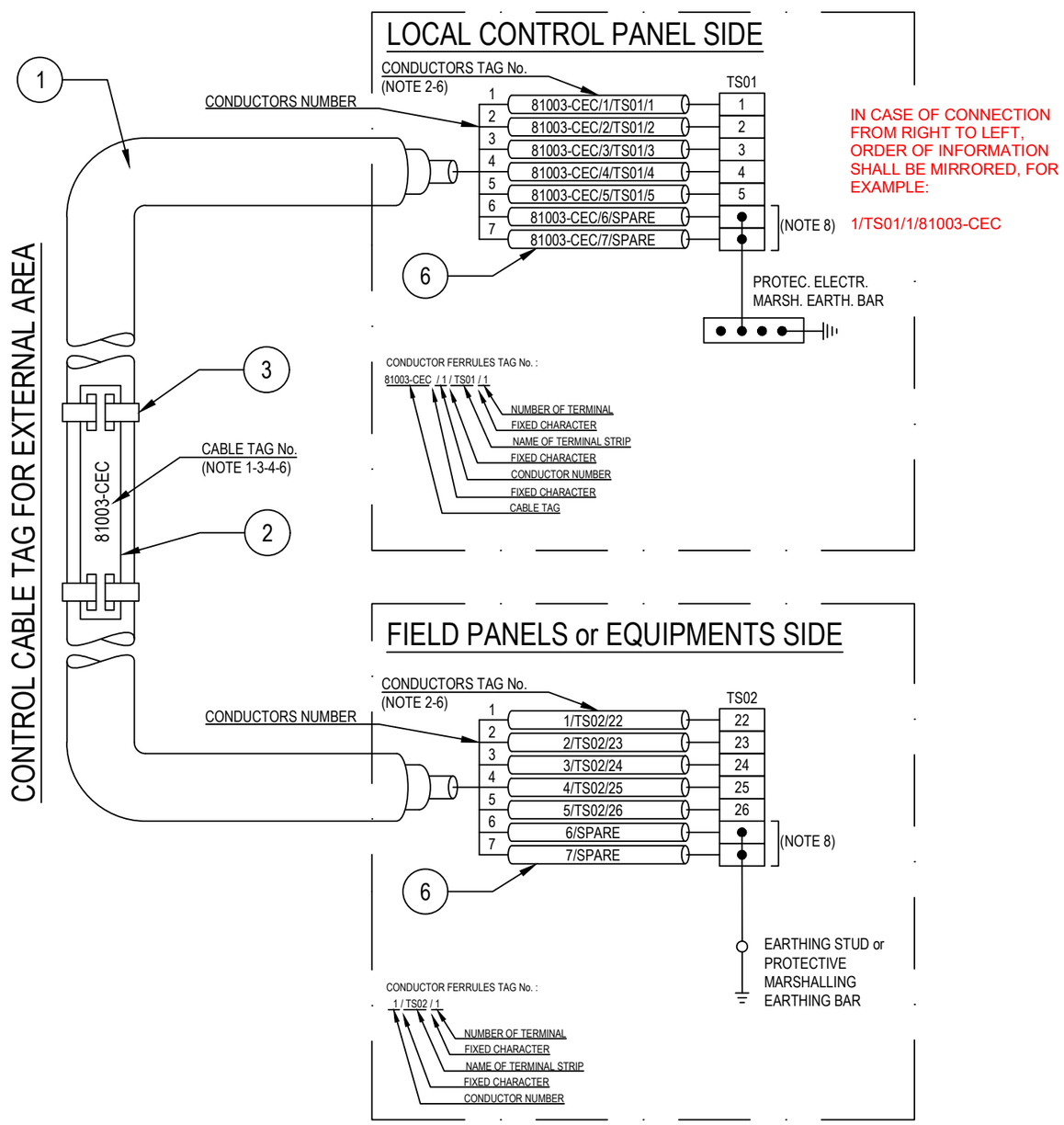
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3	DRAWING NO.	SHEET	REV.
	123A90-DDL-EL-DG-20149	077	02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

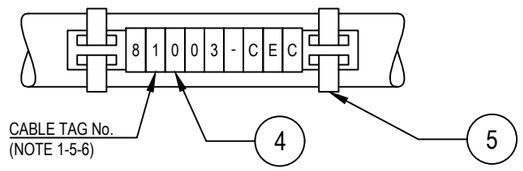
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

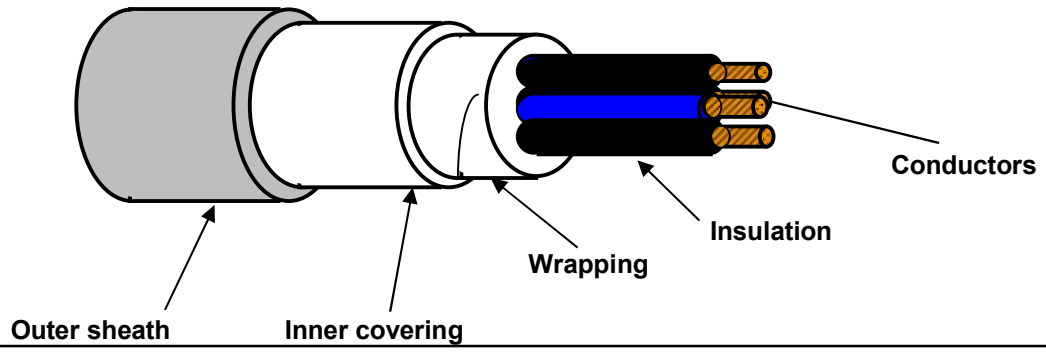
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82011-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	CP-100E1	66 kV GIS Local Control Panel	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	n.a.			T1_M25_Single				L-300-101-LVT-059 / L-300-101-LVT-063

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	82012-CEC	: 6.6KV HV Switchgear / LCP GIS			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10002133		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type	Cu Cl.2/XLPE/LSZH	Cores/Size mm²	7X1,5 mm2	Color	GREY
From	SG-100D1	To	CP-100E1		

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	OK
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,7
	CORE 2 / All cores+screen+armour+earth	0,6
	CORE 3 / All cores+screen+armour+earth	0,6
	CORE 4 / All cores+screen+armour+earth	0,7
	CORE 5 / All cores+screen+armour+earth	0,7
	CORE 6 / All cores+screen+armour+earth	0,7
	CORE 7 / All cores+screen+armour+earth	0,7 0.6
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\

INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	>1999
	CORE 6	>1999
	CORE 7	>1999
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

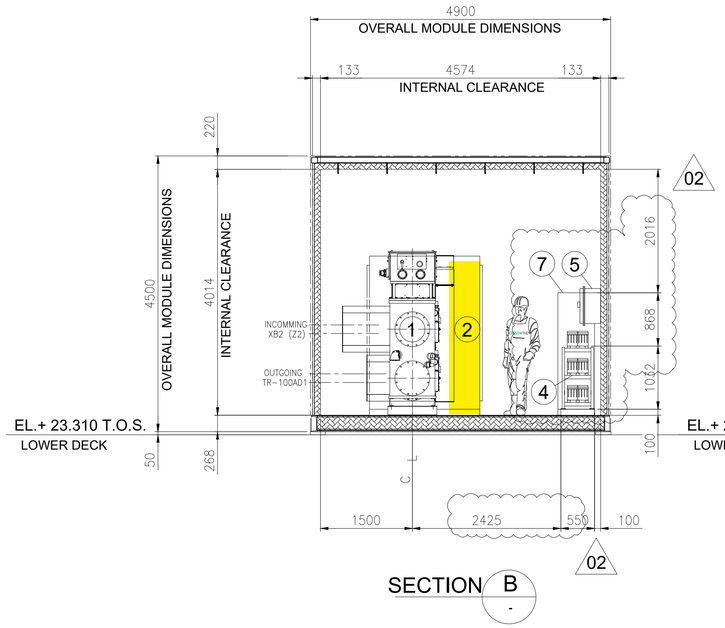
TESTING INSTRUMENTS USED

TYPE / SERIAL N° :	VOLCRAFT 1000V ET-200 S/N:H240103023	TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207
Calibration certificate N° and date:	12/10/2024	Calibration certificate N° and date:	N°7722/24 _ 10/07/2024
TYPE / SERIAL N° :		TYPE / SERIAL N° :	
Calibration certificate N° and date:		Calibration certificate N° and date:	

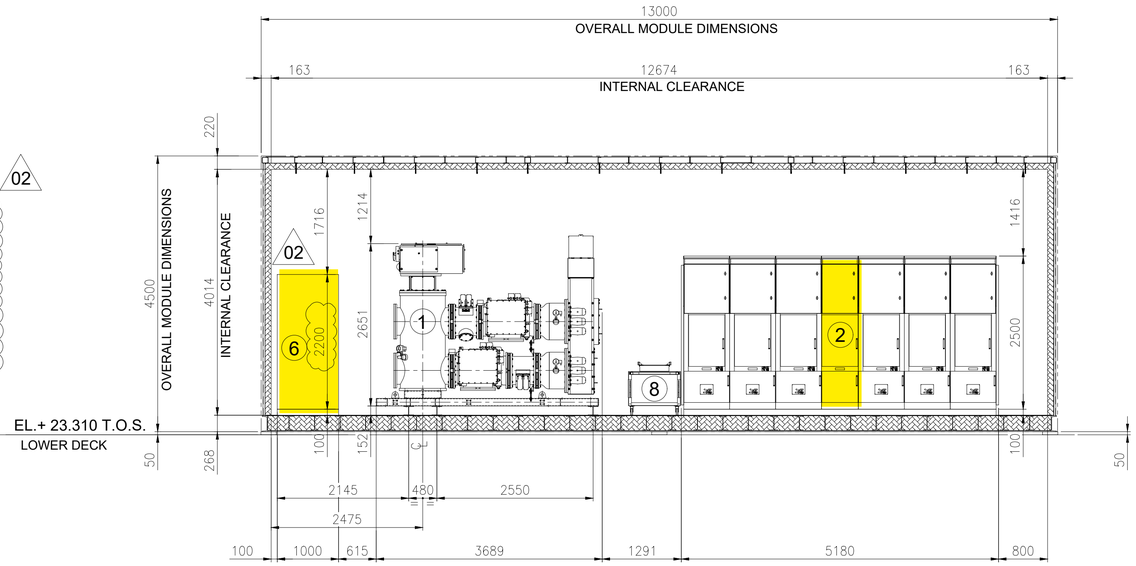
Comments: Note 9: Cable will be connected by SG-100D1 panel during Vendor/COMM activities

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-17	2025-01-20	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-17T15:10:32.990Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-20T14:54:23.752Z	

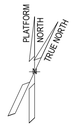
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

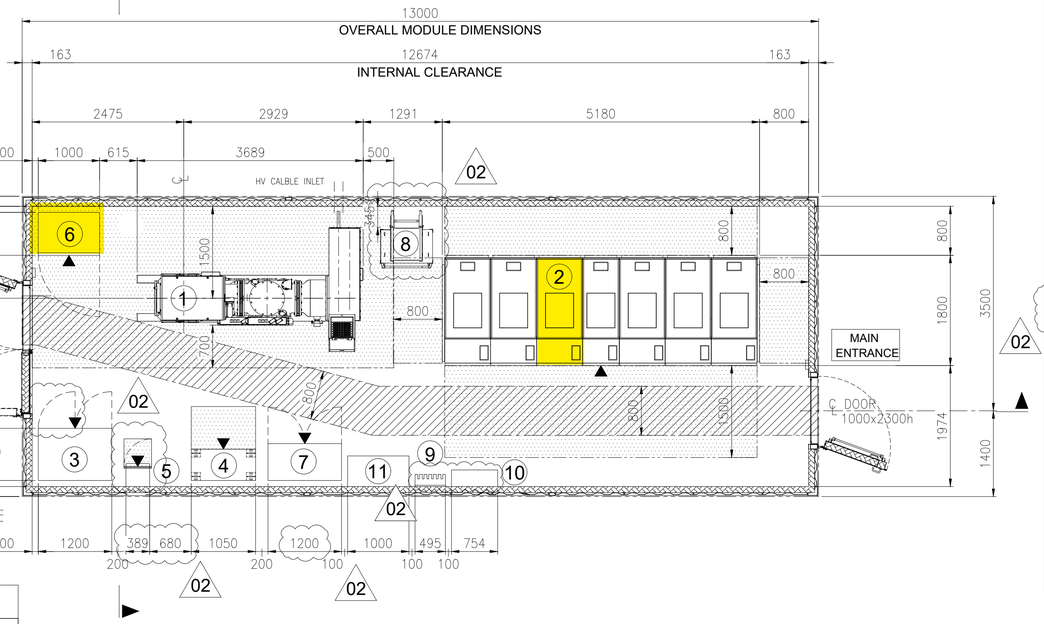


SECTION B -



SECTION A -

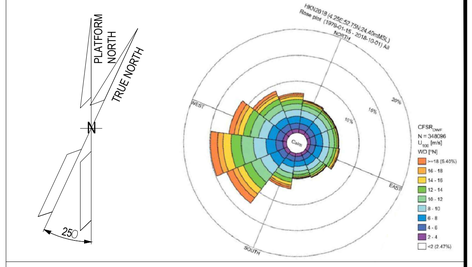




A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

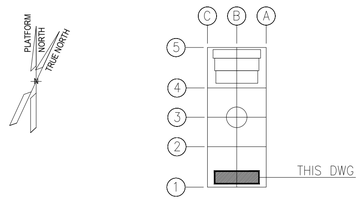
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

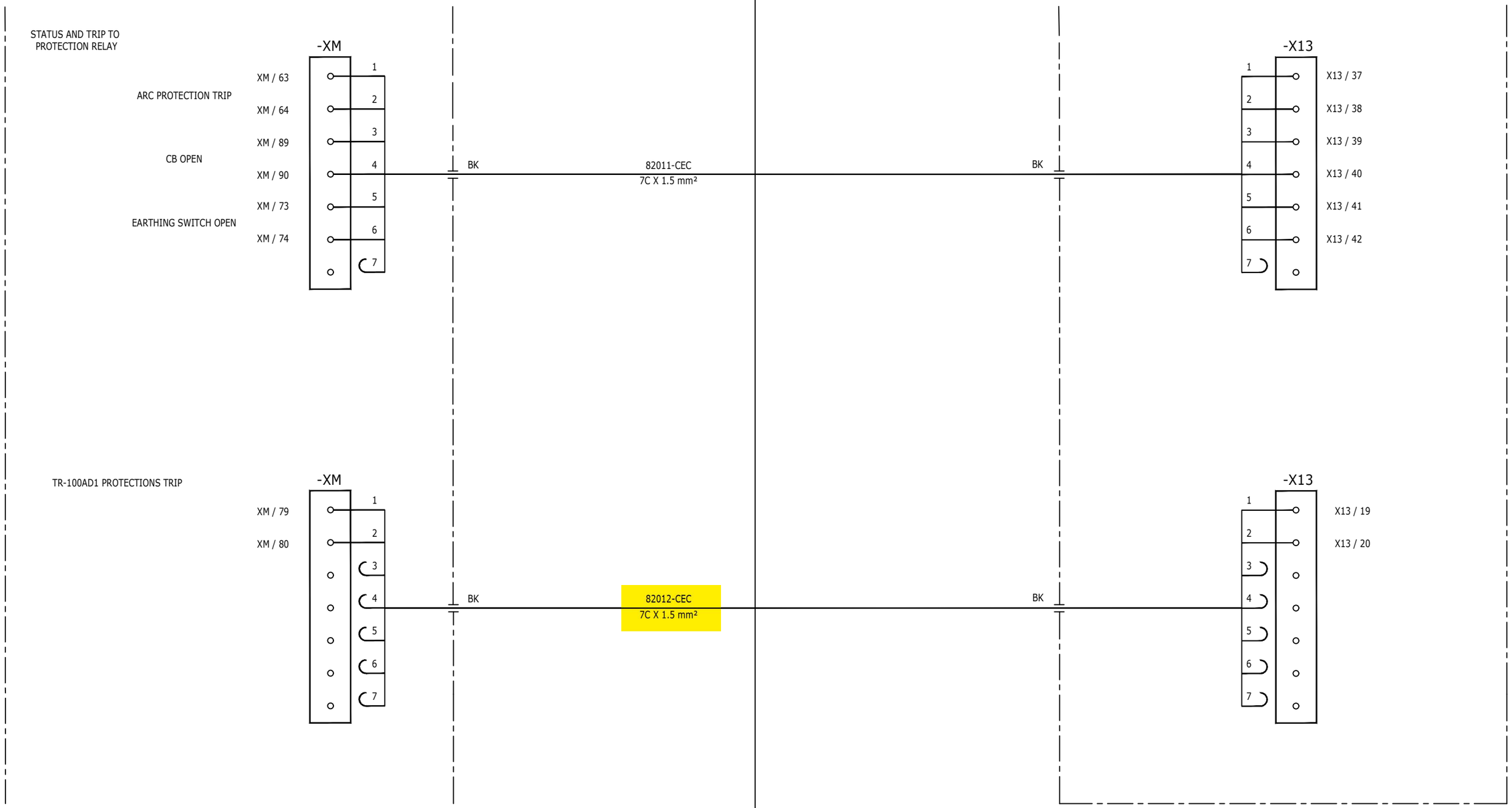
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File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1



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

REV.:	DATE:	SIGNATURE:
2_H	16/01/25	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
6.6KV HV SWITCHGEAR & LCP GIS INTERLOCK

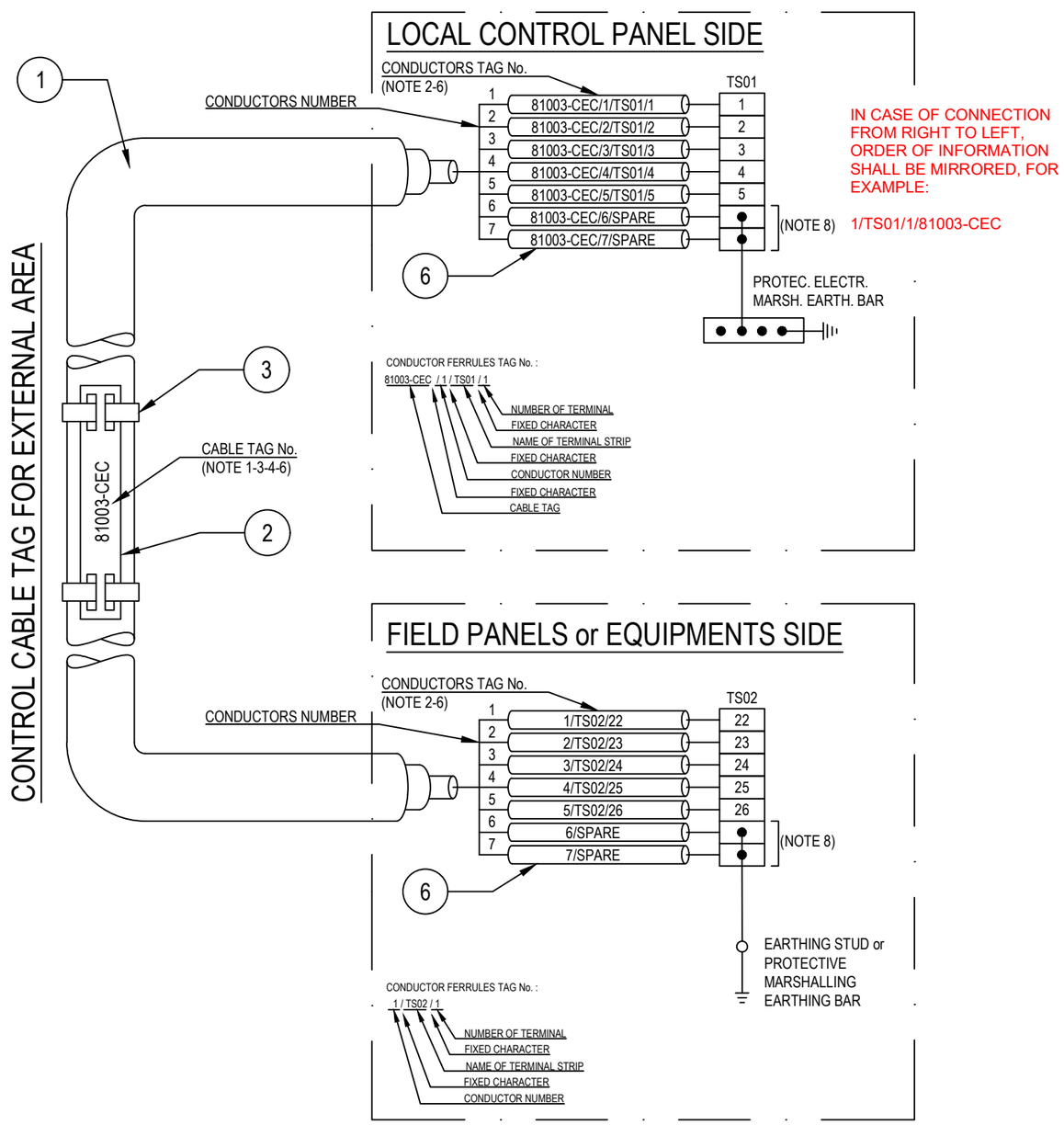
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 077 | REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

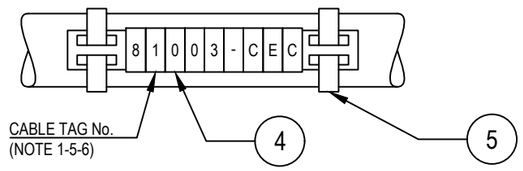
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

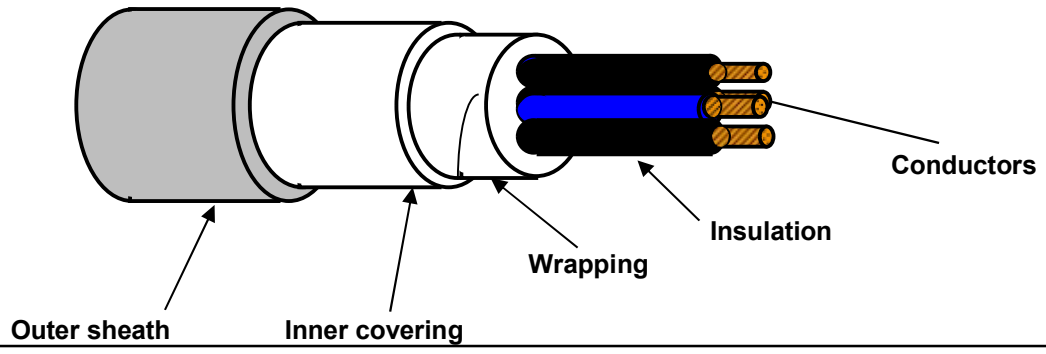
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82012-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	CP-100E1	66 kV GIS Local Control Panel	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	n.a.			T1_M25_Single				L-300-101-LVT-059 / L-300-101-LVT-063

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81013-CEC	: LCP GIS / 6.6KV HV Switchgear			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10002142		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH | Cores/Size mm²: 7X1,5 mm2 | Color: GREY

From: CP-100E1 | To: SG-100D1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	NA
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,6
	CORE 2 / All cores+screen+armour+earth	0,6
	CORE 3 / All cores+screen+armour+earth	0,6
	CORE 4 / All cores+screen+armour+earth	0,6
	CORE 5 / All cores+screen+armour+earth	0,6
	CORE 6 / All cores+screen+armour+earth	0,6
	CORE 7 / All cores+screen+armour+earth	0,6
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\
INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	>1999
	CORE 6	>1999
	CORE 7	>1999
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	\
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

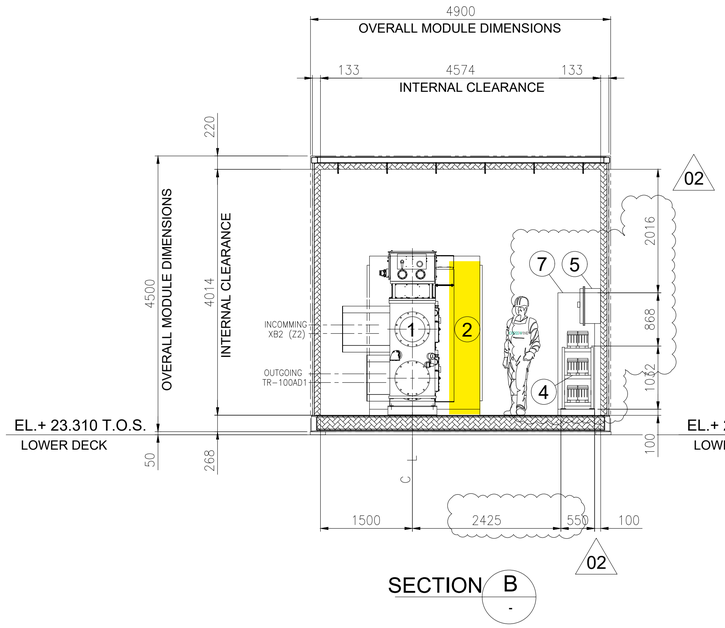
TYPE / SERIAL N° :	VOLCRAFT 1000V ET-200 S/N:H240103023	TYPE / SERIAL N° :	MEGGER : KEW3125A SERIAL: W8330207
Calibration certificate N° and date:	12/10/2024	Calibration certificate N° and date:	N°7722/24 _ 10/07/2024
TYPE / SERIAL N° :		TYPE / SERIAL N° :	
Calibration certificate N° and date:		Calibration certificate N° and date:	

Comments: Note 4: refer to PL C30000679

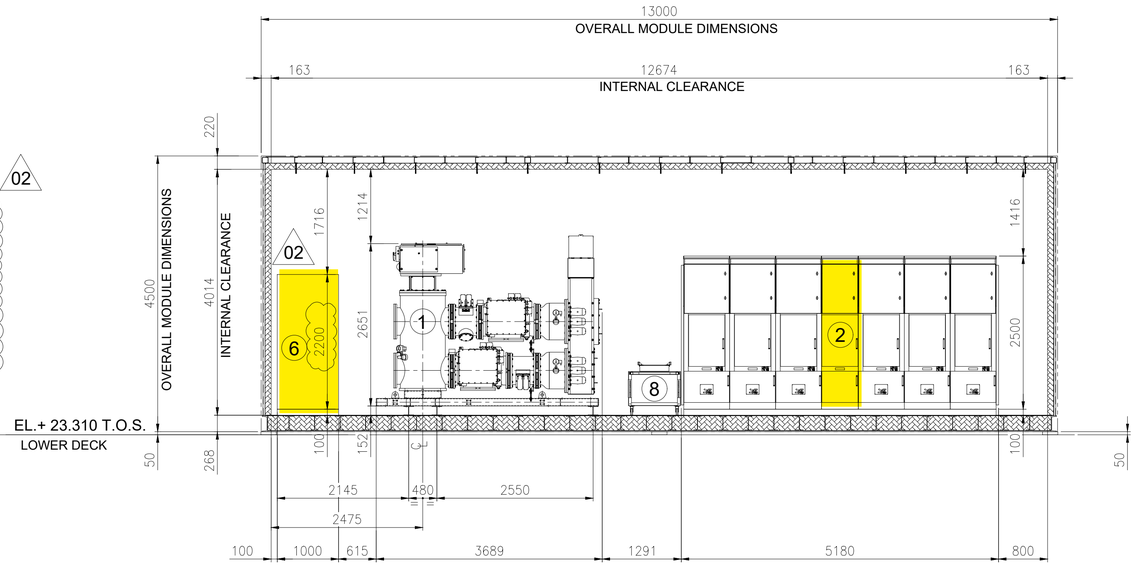
Note 9: Cable will be connected by SG-100D1 panel during Vendor/COMM activities

Page 1/1	Performed by	☐ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-17	2025-01-20	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-17T15:10:55.020Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-20T14:02:01.896Z	

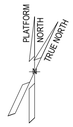
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

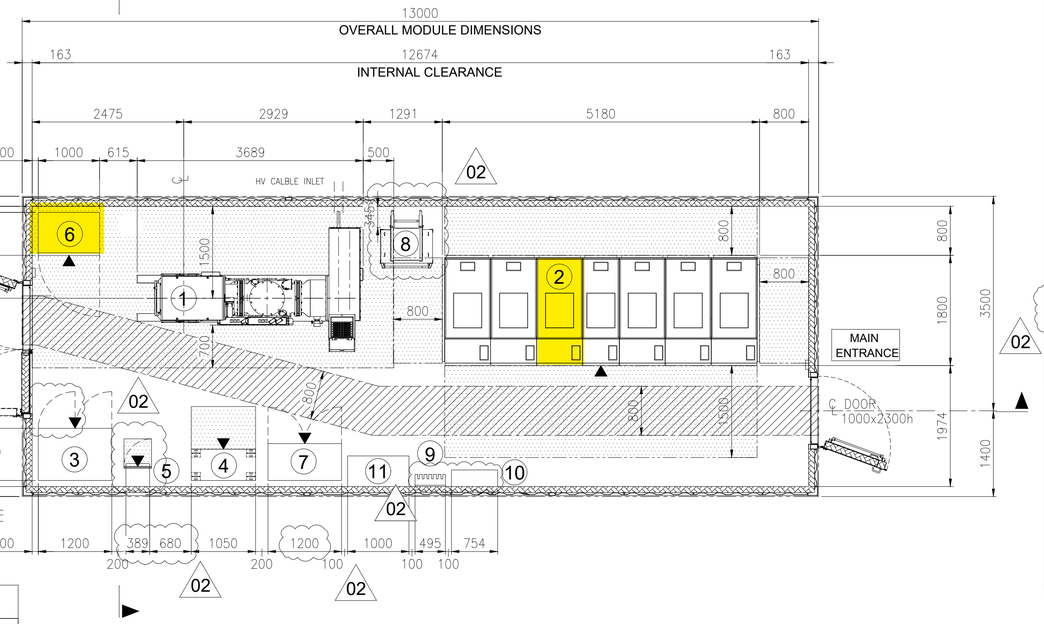


SECTION B -



SECTION A -

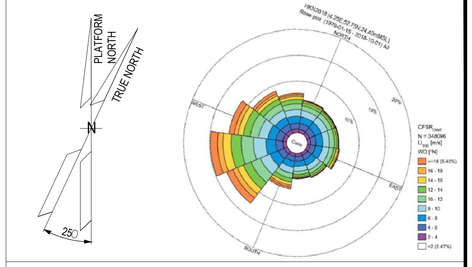




A -

EQUIPMENT LIST

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5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	



NOTES

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2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
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02

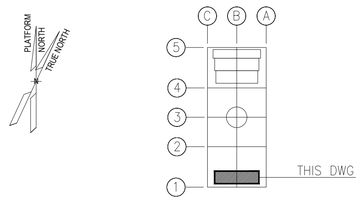
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

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CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	OYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: EMCS
TAG NUMBER: B400-EMCS-001

COLUMN: -

-TB-DI

TB-DI / 25 — 1
TB-DI / 26 — 2
3
4
5
6
7

BK — 85002-CEC — 7C X 1.5 mm²

DESCRIPTION: BESS
TAG NUMBER: A-85000

COLUMN: -

-XT1

1 — XT1 / 19 — PERMISSIVE - BESS TO SWITCH TO GRID FORMING MODE
2 — XT1 / 20
3
4
5
6
7

BK

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN: -

-X1

ISLAND SIGNAL

X1 / 39 — 1
X1 / 40 — 2
X1 / 41 — 3
X1 / 42 — 4
X1 / 43 — 5
X1 / 44 — 6
7

BK — 81013-CEC — 7C X 1.5 mm²

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

COLUMN: A6

-XM

1 — XM / 43 — 66 KV CB OPEN STATUS
2 — XM / 44
3 — XM / 81 — 66 KV CB OPEN STATUS FOR ELECTROLYZER FEEDER
4 — XM / 82
5 — XM / 83 — 66 KV CB OPEN STATUS FOR BESS
6 — XM / 84
7

BK

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

REV.:	DATE:	SIGNATURE:
2_H	16/01/25	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
INTERLOCKS BETWEEN LCP GIS&6.6KV HV SWITCHGEAR

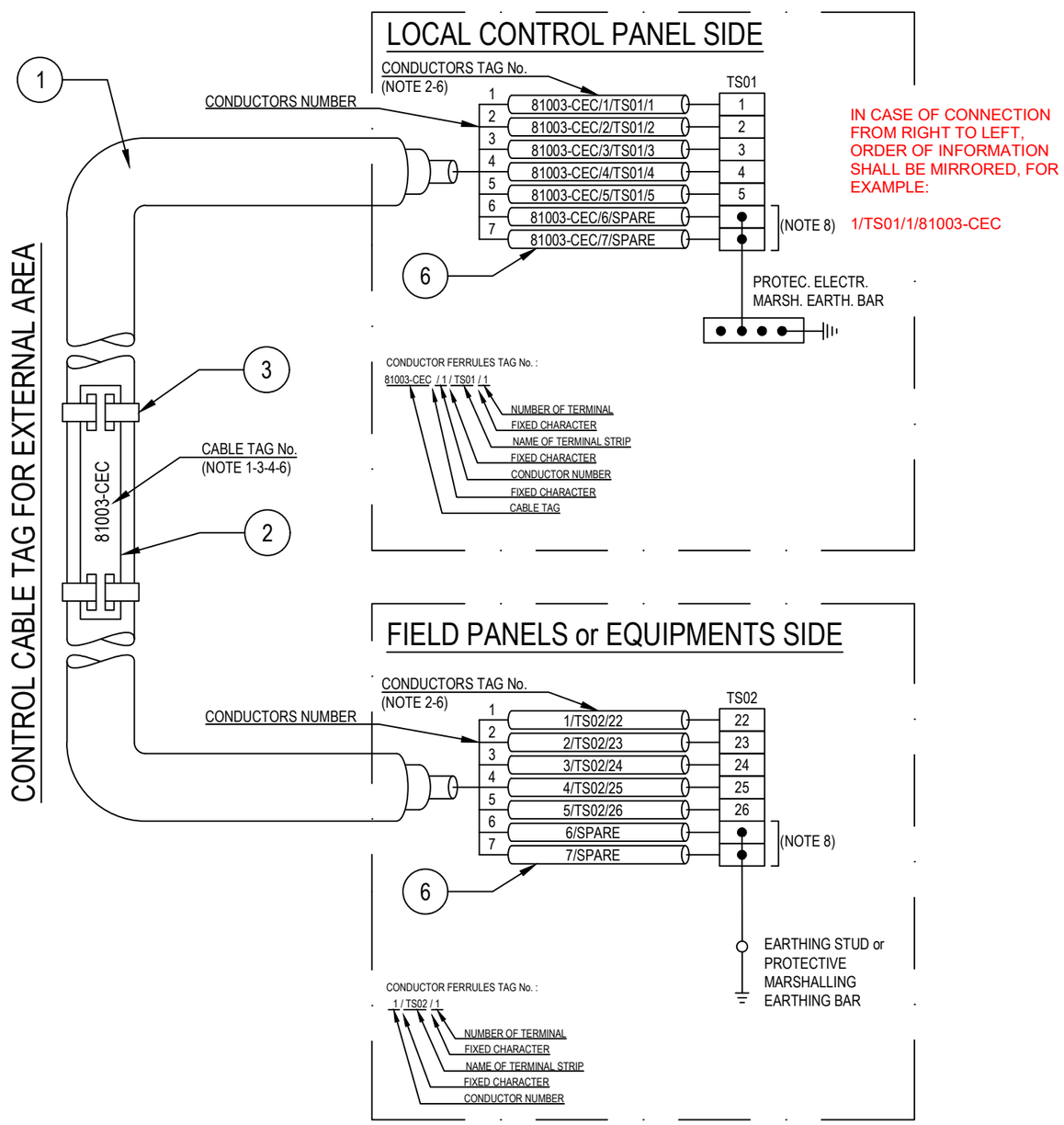
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 085 | REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

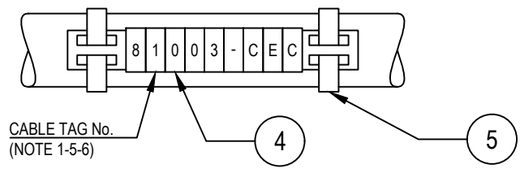
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

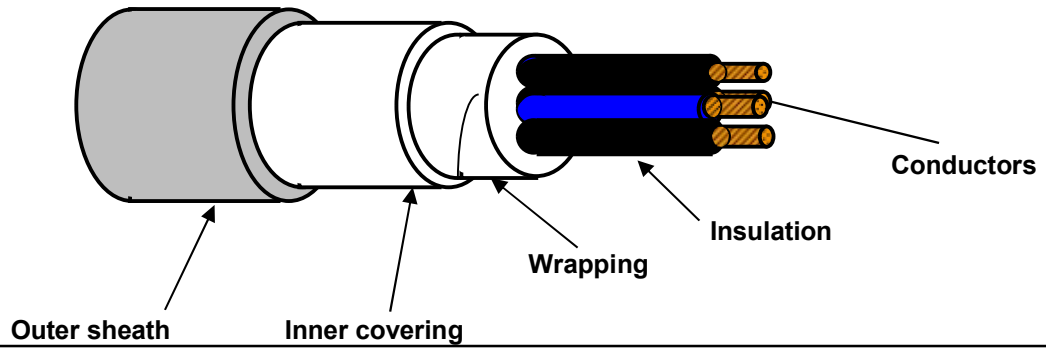
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81013-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148			Interlock GIS /6,6kV			CP-100E1	66 kV GIS Local Control Panel	Lower Deck (B-100)	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-300-101-LVT-063 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO — PROVERLIS — CROSSWIND

ITEM	Tag	82014-CEC	: NER / 6.6KV HV Switchgear			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD/LD_B-100
TASK	code	C10002320		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 — Multicore Electrical Control Cable

CABLE DATA

Type	Cu Cl.2/XLPE/LSZH	Cores/Size mm²	7X1,5 mm2	Color	GREY
From	RR-100D1	To	SG-100D1		

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	PL
4	Check cable is supported and fixed to rack according to latest project Specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	PL
7	Check cable labelling is in accordance with latest specification.	PL
8	Check cable glands suit for cable type and are in accordance with latest specification.	OK
9	Check terminations are in accordance with latest termination diagram.	Note
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	1,1
	CORE 2 / All cores+screen+armour+earth	1,1
	CORE 3 / All cores+screen+armour+earth	1,1
	CORE 4 / All cores+screen+armour+earth	1,1
	CORE 5 / All cores+screen+armour+earth	1,1
	CORE 6 / All cores+screen+armour+earth	1,1
	CORE 7 / All cores+screen+armour+earth	1,1
	CORE 8 / All cores+screen+armour+earth	NA
	CORE 9 / All cores+screen+armour+earth	NA
	CORE 10 / All cores+screen+armour+earth	NA
INSULATION	CORE 1	>999
	CORE 2	>999
	CORE 3	>999
	CORE 4	>999
	CORE 5	>999
	CORE 6	>999
	CORE 7	>999
	CORE 8	NA
	CORE 9	NA
	CORE 10	NA
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

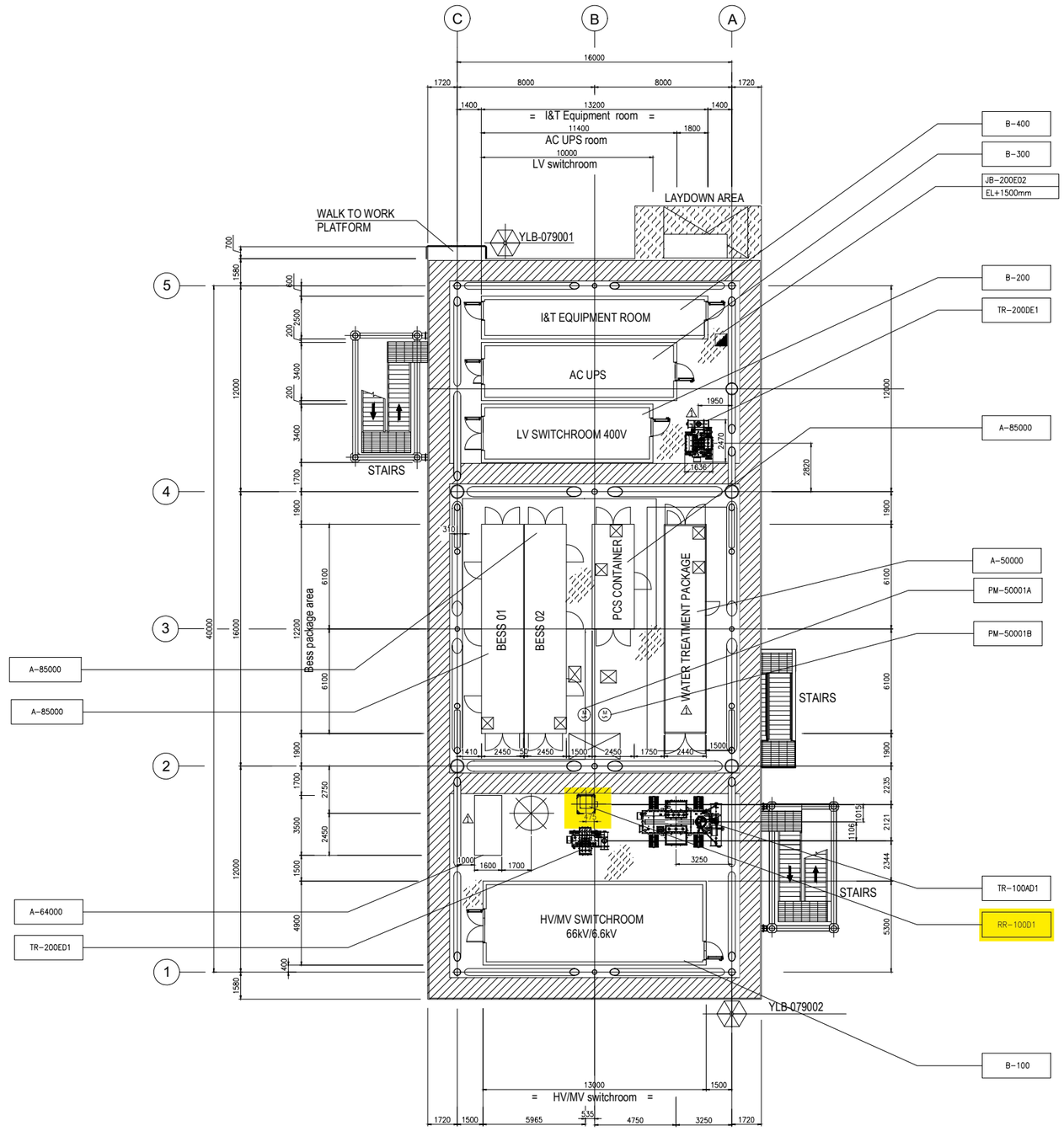
TYPE / SERIAL N° : KEW3125A S/N: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024	TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769) Calibration certificate N° and date: N°7715/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

Comments: Note 4 : refer to PL C30000679
Note 9: Cable terminations must be reconnected during the commissioning phase.

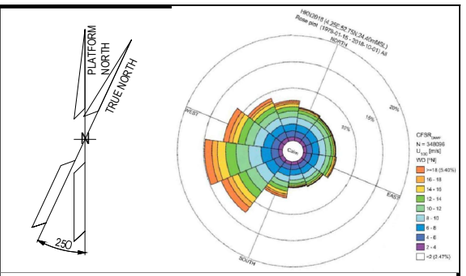
Page 1/1	Performed by	☑ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Giovanni Tangianu	
Date	2024-11-27	2024-12-09	
Signature	PROVERLIS Digitaly signed by Francesco Zucca 2024-11-27T15:30:54.922Z	PROVERLIS Digitaly signed by Giovanni Tangianu 2024-12-09T08:05:22.969Z	

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

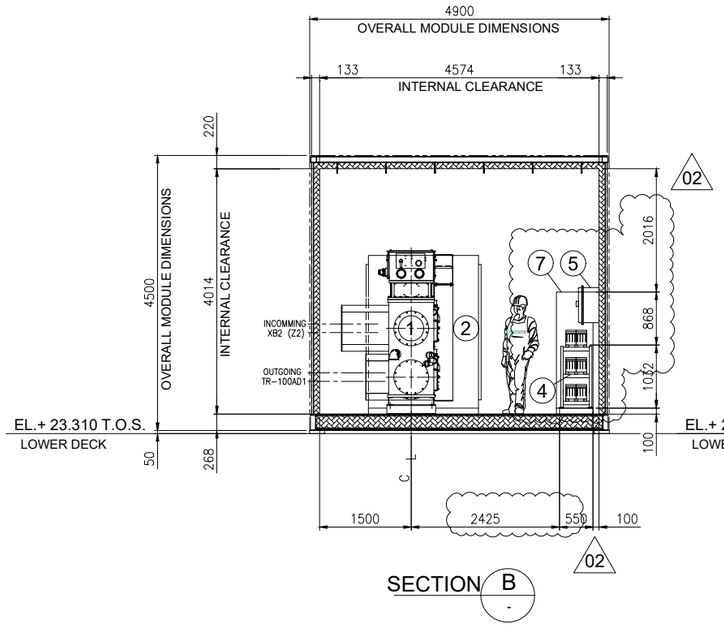
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

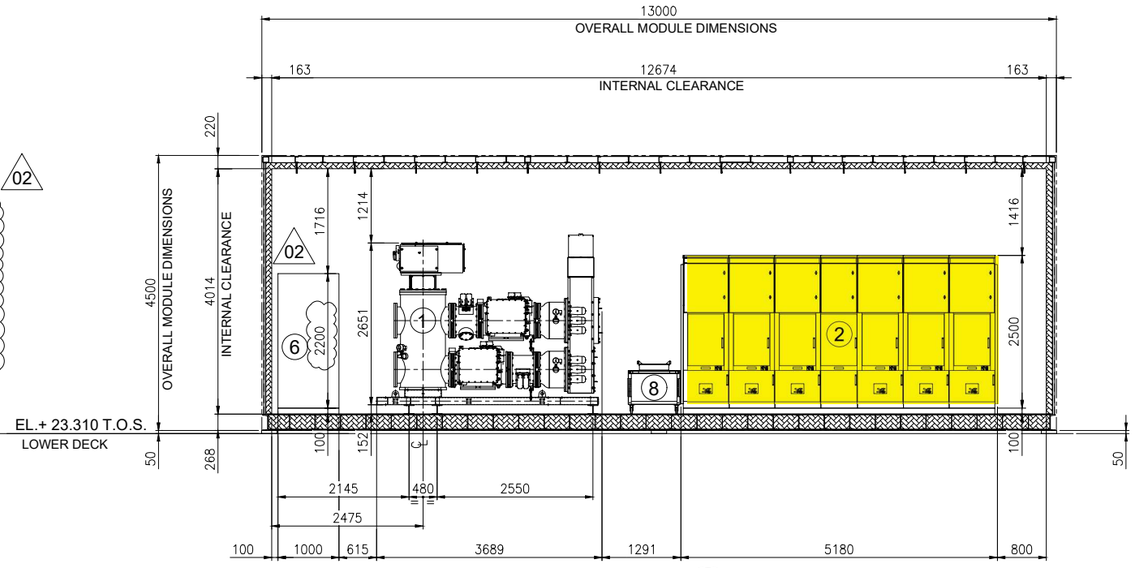
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

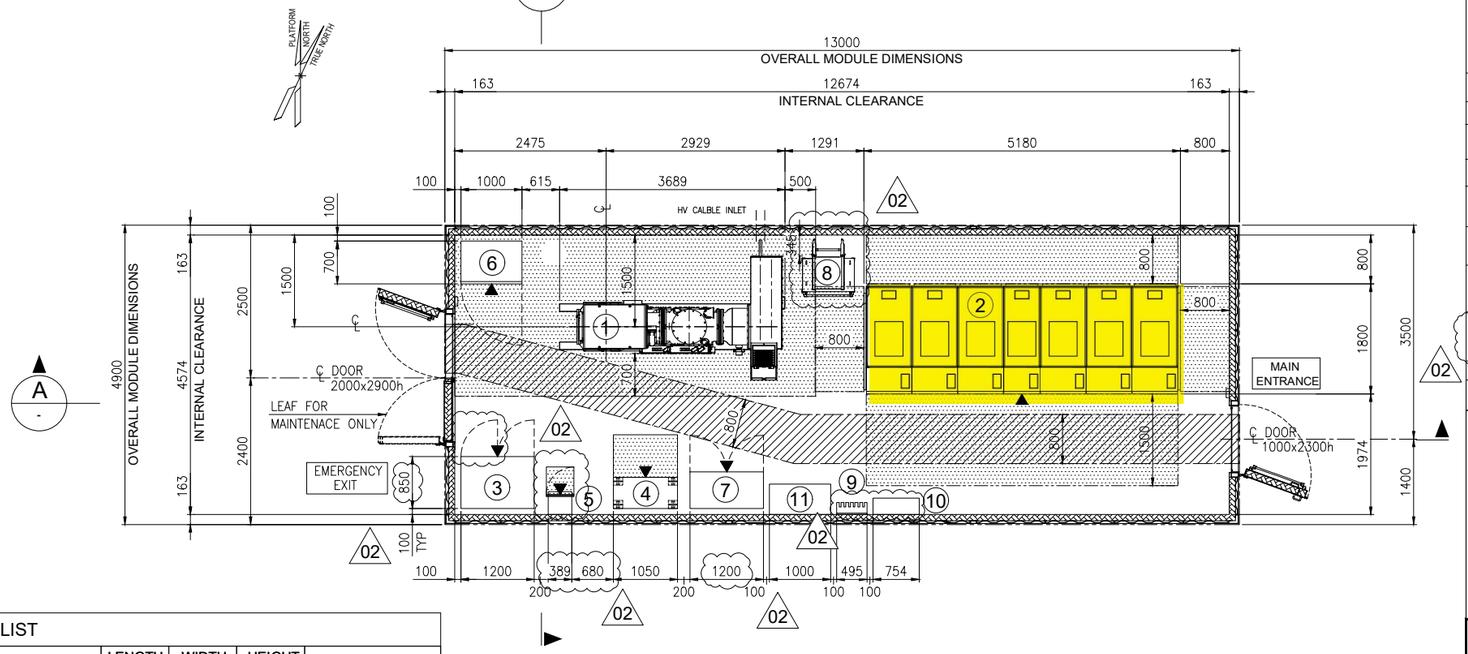
DRAWING NO. 123A90-DDL-EL-DL-20104 | REV. 02



SECTION B -



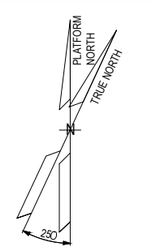
SECTION A -

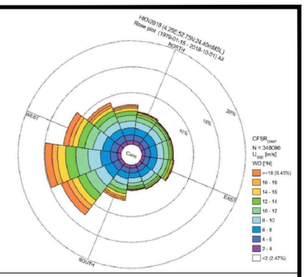


A -

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	





NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

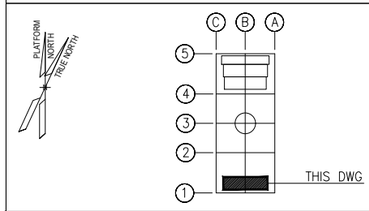
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

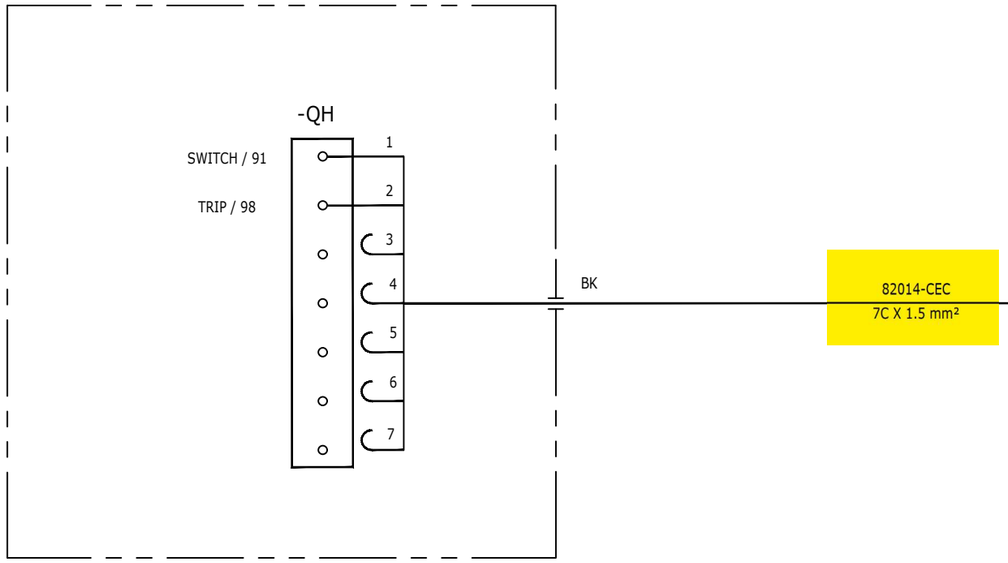
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024
A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

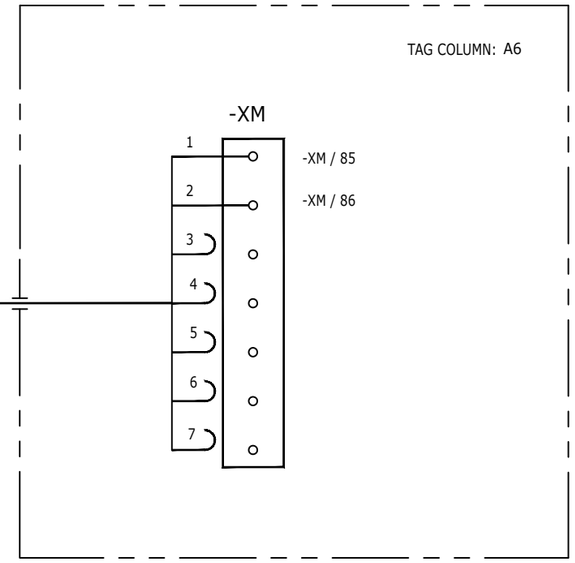
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: NER (NEUTRAL EARTHING RESISTOR)
TAG NUMBER: RR-100D1



DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1



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

REV.:	DATE:	SIGNATURE:
2_C	02/12/24	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
NEUTRAL–EARTHING RESISTORS

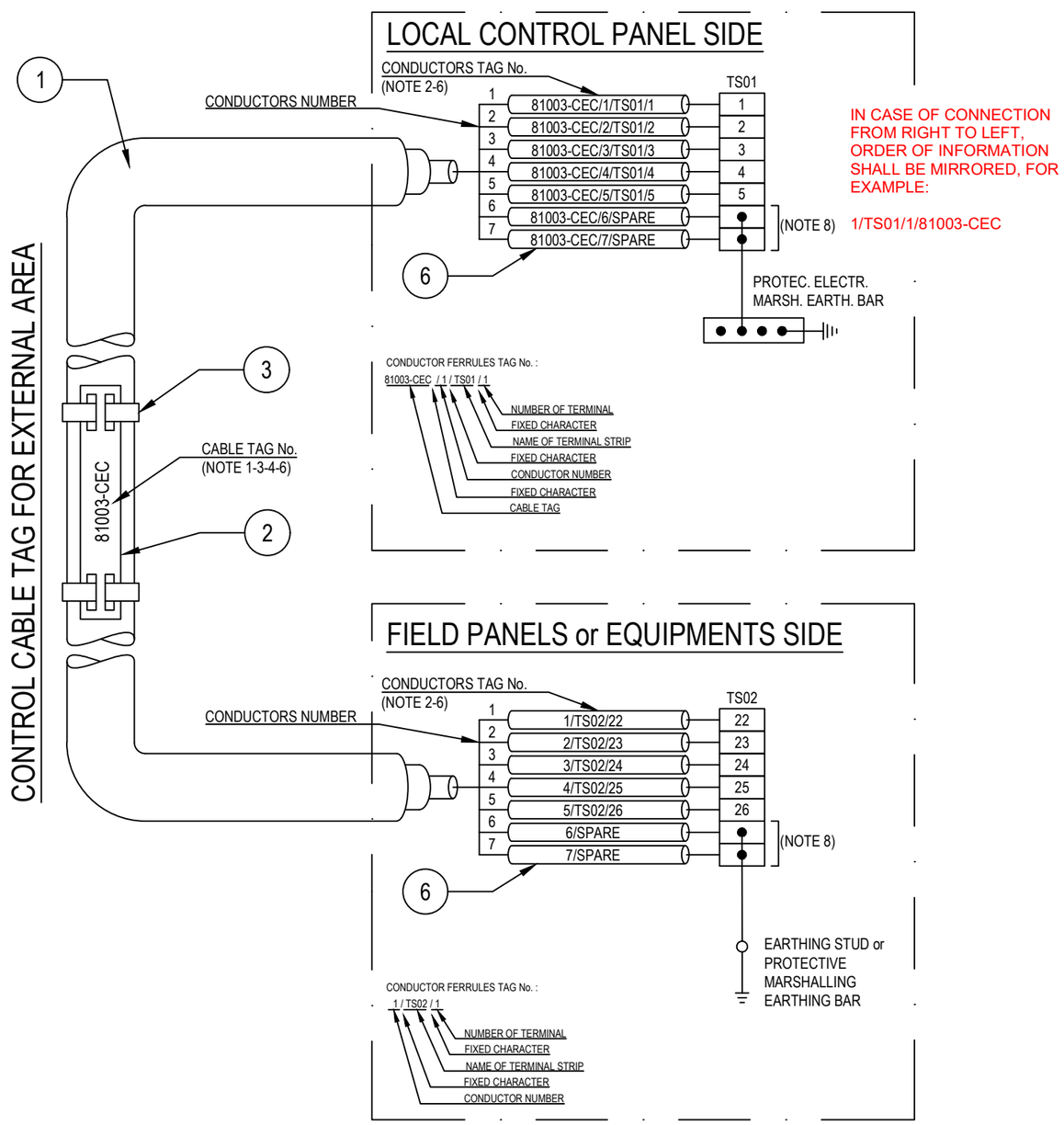
CONTRACT NO./TITLE CW–I–WP4–2023–05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3	DRAWING NO.	SHEET	REV.
	123A90–DDL–EL–DG–20149	015	02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

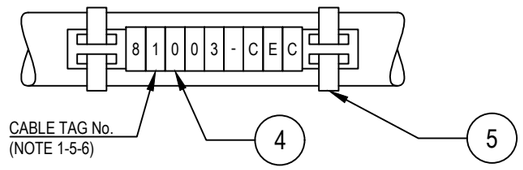
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092

REV.:	DATE:	SIGNATURE:
2_B	28/11/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

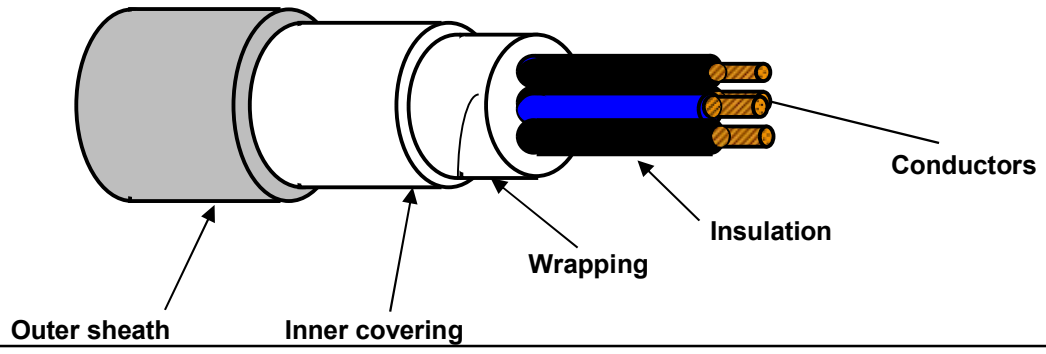
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
82014-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						RR-100D1	NER	Lower Deck	SG-100D1	MV 6,6kV Switchgear	Lower Deck (B-100)	ELECV34-7X1,5	Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey	M25	T1_M25_Single			n.a.				L-150-101-LVT-089 / L-600-101-LVT-094 / L-600-101-LVT-012 / L-300-101-LVT-074 / E-MCT-105 / L-600-101-LVT-058 / L-300-101-LVT-059

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH 0,6/1 KV

7CX1,5 - CONTROL CABLE - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 7)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	by plastic tape helically wound	
Drain wire :	Not required	
Overall Shield:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Armour :	Not required	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -**	
	Year of Manufacture - CE + Meter Marking	
Outer diameter :	(13,5 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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ROSETTI MARINO | PROVERLIS | CROSSWIND

ITEM	Tag	81002-CEC	: Auxiliary Trafo 7 MVA Local Control Panel / 66 kV GIS Local Control Panel			Dwg	123A90-DDL-EL-LIS-20148
	S/Sys	81-20	: Power Transformer 7 MVA (TR-100AD1)			Module	LD_B-100
TASK	code	C10003046		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Electrical	Form	CPX10 Multicore Electrical Control Cable

CABLE DATA

Type: Cu Cl.2/XLPE/LSZH/CWB/LSZH | Cores/Size mm²: 4X4 mm2 | Color: GREY

From: CP-100E4 | To: CP-100E1

1	Check cable physical integrity	OK
2	Check cable data against latest cable schedule.	OK
3	Check cable routing against latest drawings (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to latest project Specification.	Note
5	Check bending radius is within the specified limits.	OK
6	Check cable and core marking against latest drawings	OK
7	Check cable labelling is in accordance with latest specification.	OK
8	Check cable glands suit for cable type and are in accordance with latest specification.	NA
9	Check terminations are in accordance with latest termination diagram.	OK
10	Check cable earthing against lastest drawings.	NA
11	Check gland plate for single core cables is non magnetic.	NA
12	If required produce Red Line Mark Up for "AS BUILT"	

CONTINUITY	CORE 1 / All cores+screen+armour+earth	0,7
	CORE 2 / All cores+screen+armour+earth	0,7
	CORE 3 / All cores+screen+armour+earth	0,7
	CORE 4 / All cores+screen+armour+earth	0,7
	CORE 5 / All cores+screen+armour+earth	\
	CORE 6 / All cores+screen+armour+earth	\
	CORE 7 / All cores+screen+armour+earth	\
	CORE 8 / All cores+screen+armour+earth	\
	CORE 9 / All cores+screen+armour+earth	\
	CORE 10 / All cores+screen+armour+earth	\
INSULATION	CORE 1	>1999
	CORE 2	>1999
	CORE 3	>1999
	CORE 4	>1999
	CORE 5	\
	CORE 6	\
	CORE 7	\
	CORE 8	\
	CORE 9	\
	CORE 10	\
	SCREEN	NA
	EARTH	NA
	ARMr	NA
	TEST VOLTS	1000

TESTING INSTRUMENTS USED

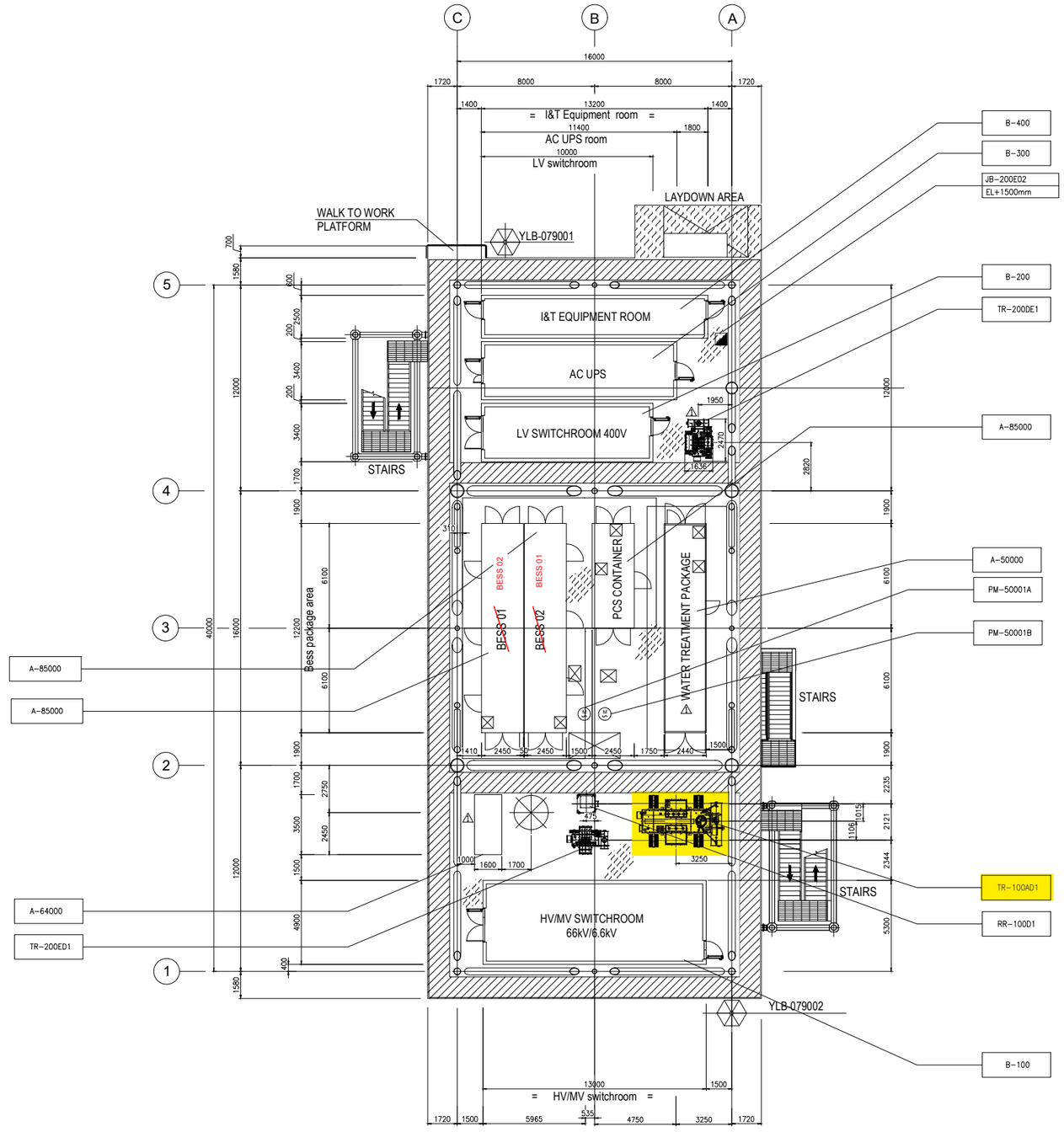
TYPE / SERIAL N° : VOLCRAFT 1000V - ET-200 S/N:H240103023 Calibration certificate N° and date: 12/10/2024	TYPE / SERIAL N° : MEGGER : KEW3125A SERIAL: W8330207 Calibration certificate N° and date: N°7722/24 _ 10/07/2024
TYPE / SERIAL N° : Calibration certificate N° and date:	TYPE / SERIAL N° : Calibration certificate N° and date:

Comments: Nota 4: refer to PL C30000679

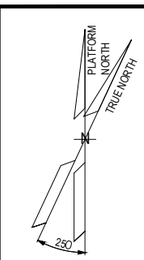
Page 1/1	Performed by	☑ WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Michele Tartaglia	Paolo Schintu	
Date	2025-01-15	2025-01-18	
Signature	PROVERLIS Digitaly signed by Michele Tartaglia 2025-01-15T10:33:59.668Z	PROVERLIS Digitaly signed by Paolo Schintu 2025-01-18T14:39:08.693Z	

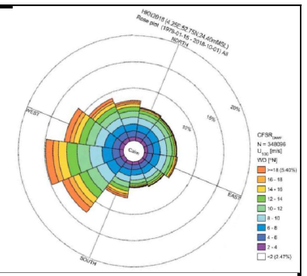
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.





NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

M	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
⚠ 123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION

REV.:	DATE:	SIGNATURE:
1_B	12/12/24	C.Pilato

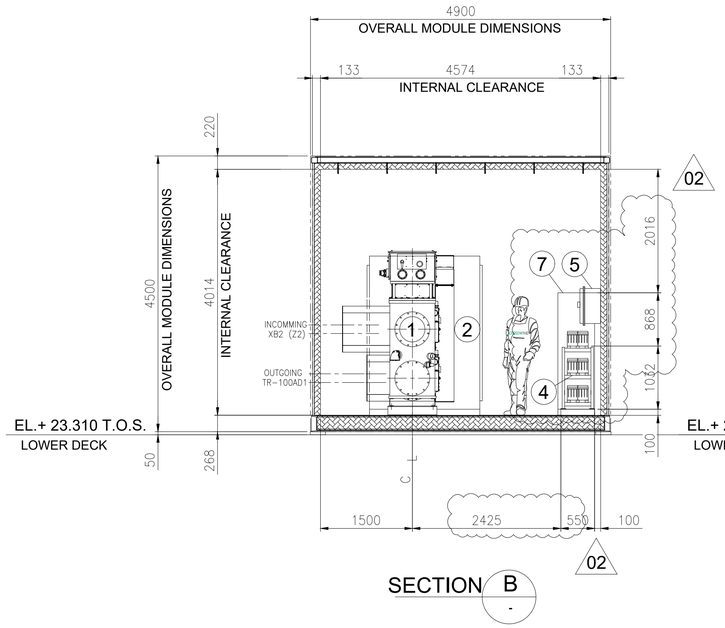
ROSETTI MARINO SpA

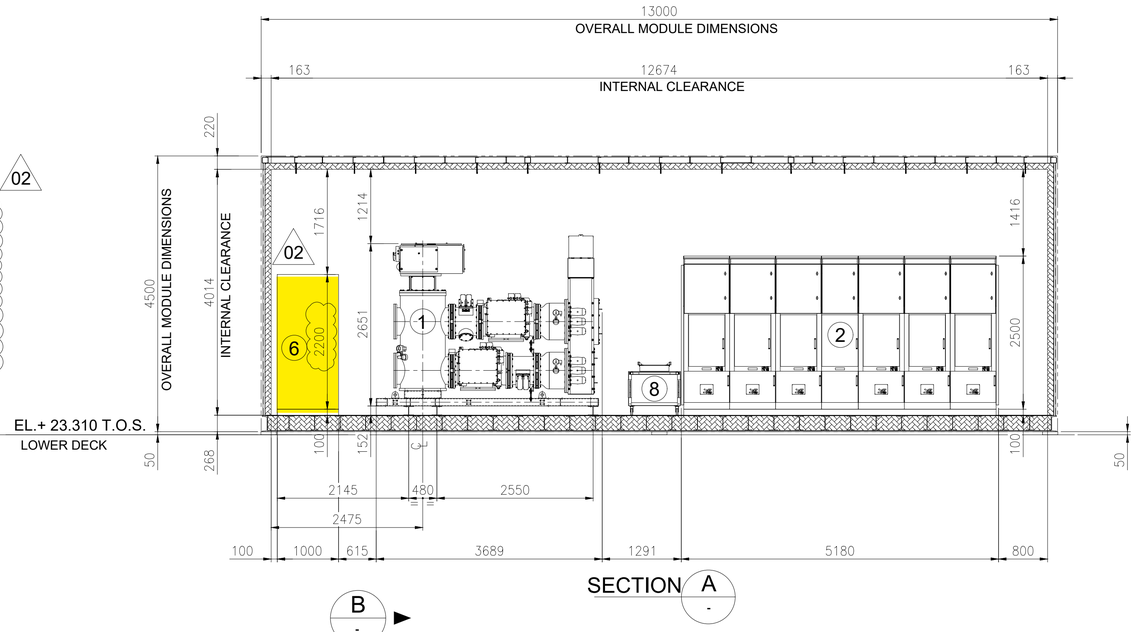
TITLE :
BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

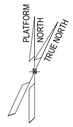
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN SAM	CHECKED FMA/AMA	APPROVED FPA/DLO	DATE 04/03/24
A1	DRAWING NO. 123A90-DDL-EL-DL-20101	SHEET 001	REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout - Lower Deck

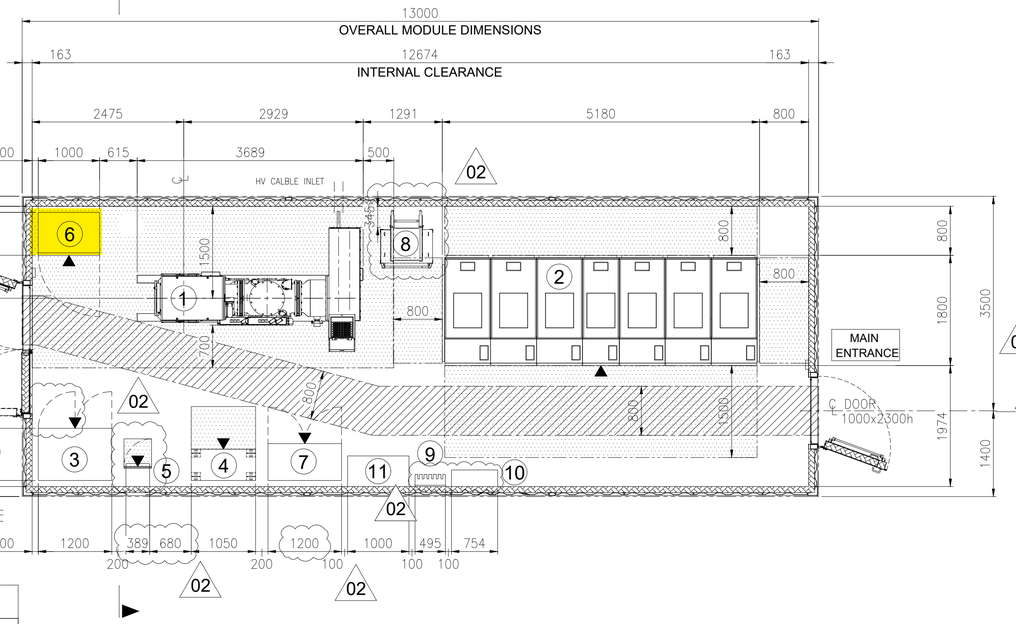
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02



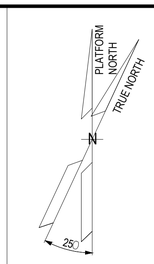


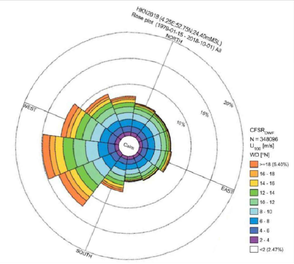


B -



A -





NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

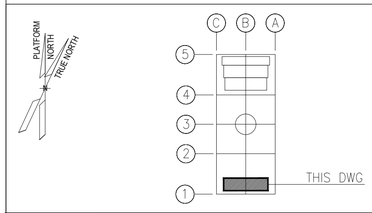
LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

REFERENCES

DOCUMENT TITLE	DOCUMENT NUMBER
66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING	1723001595-EL-DA-00006
CIRCUIT AND WIRING DIAGRAM	1723001595-EL-DG-00015
SG-100D1 GENERAL ARRANGEMENT DRAWING	1723002197-EL-DA-00006
DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS	1724000372-EL-DA-00003
DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM	1724000372-EL-DG-00010
B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER	1724000049-AR-DA-00014

KEY PLAN



EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	HNA6-AFA70	66kV SWITCHGEAR (GIS)	3689	2025	2651	
2	SG-100D1	6.6kV SWITCHGEAR	5180	1800	2500	
3	UP-200F1	DC UPS PANEL	1200	850	2105	
4	BA-200F1	DC UPS BATTERY RACK	1050	510	1272	
5	CB-200F1 02	ISOLATOR FOR DC UPS	452	377	634	
6	CP-100E1	66 kV SWITCHGEAR LOCAL CONTROL PANEL	1000	700	2200	02
7	B100-HSB-001	DISTRIBUTION & HVAC PANEL - HV MV ROOM	1200	600	1900	
8	-	SERVICE TROLLEY FOR 6.6kV SWITCHGEAR	943	862	874	
9	-	TOOL BOX	495	200	200	
10	-	SUBSTATION LIFE SAVING & INTERVENTION KIT	754	270	840	
11	-	TABLE	1000	500	750	

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20104**

REV.:	DATE:	SIGNATURE:
2_A	08/08/24	G.Randi

ROSETTI MARINO SpA

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	27/05/2024	FMO	LMA/AMA	LMA/MDO	ACCEPTED FOR CONSTRUCTION (AFC)
01	26/03/2024	GPA	LMA/AMA	LMA/MDO	ISSUE FOR REVIEW (IFR)
00	10/11/2023	DSF	CB/AMA	DYFO/MDO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:50
DRAWN GPA	CHECKED LMA/AMA	APPROVED LMA/MDO	DATE 27/05/2024

A1	DRAWING NO. 123A90-DDL-EL-DL-20104	SHEET 001	REV. 02

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

FROM	TO

DESCRIPTION: 66KV, 7MVA TRANSFORMER
TAG NUMBER: CP-100E4

COLUMN/CUBIC.: -

NEUTRAL CURRENT TRANSFORMER

-X1

X1 / 39 — FROM CT — X1 / 40 — terminals 1, 2, 3, 4

BK — 81001-CEC 4C X 4 mm² — BK

-X1

X1 / 41 — FROM CT — X1 / 42 — terminals 1, 2, 3, 4

BK — 81002-CEC 4C X 4 mm² — BK

-X1

BUCHHOLZ RELAY ALARM: X1 / 02, X1 / 03
OIL THERMOMETER ALARM: X1 / 08, X1 / 09
OIL LEVEL (MIN.) ALARM: X1 / 14, X1 / 15
terminals 1, 2, 3, 4, 5, 6, 7

BK — 81003-CEC 7C X 1.5 mm² — BK

DESCRIPTION: LCP GIS
TAG NUMBER: CP-100E1

COLUMN/CUBIC.: -

-X41

1 — X41 / 1 — CT FOR 51G PROTECTION (7SJ85)
2 — X41 / 2
3
4

COLUMN/CUBIC.:-

-X43

1 — X43 / 1 — CT FOR 87NT PROTECTION (7UT85)
2 — X43 / 2
3
4

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

-XM

1 — XM / 61, XM / 62 — ALARM 97T
2
3 — XM / 47, XM / 48 — ALARM 26OT
4
5 — XM / 49, XM / 50 — ALARM 71OT
6
7

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

REV.:	DATE:	SIGNATURE:
2_G	14/01/25	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
66KV, 7MVA TRANSFORMER ALARMS PROTECTION

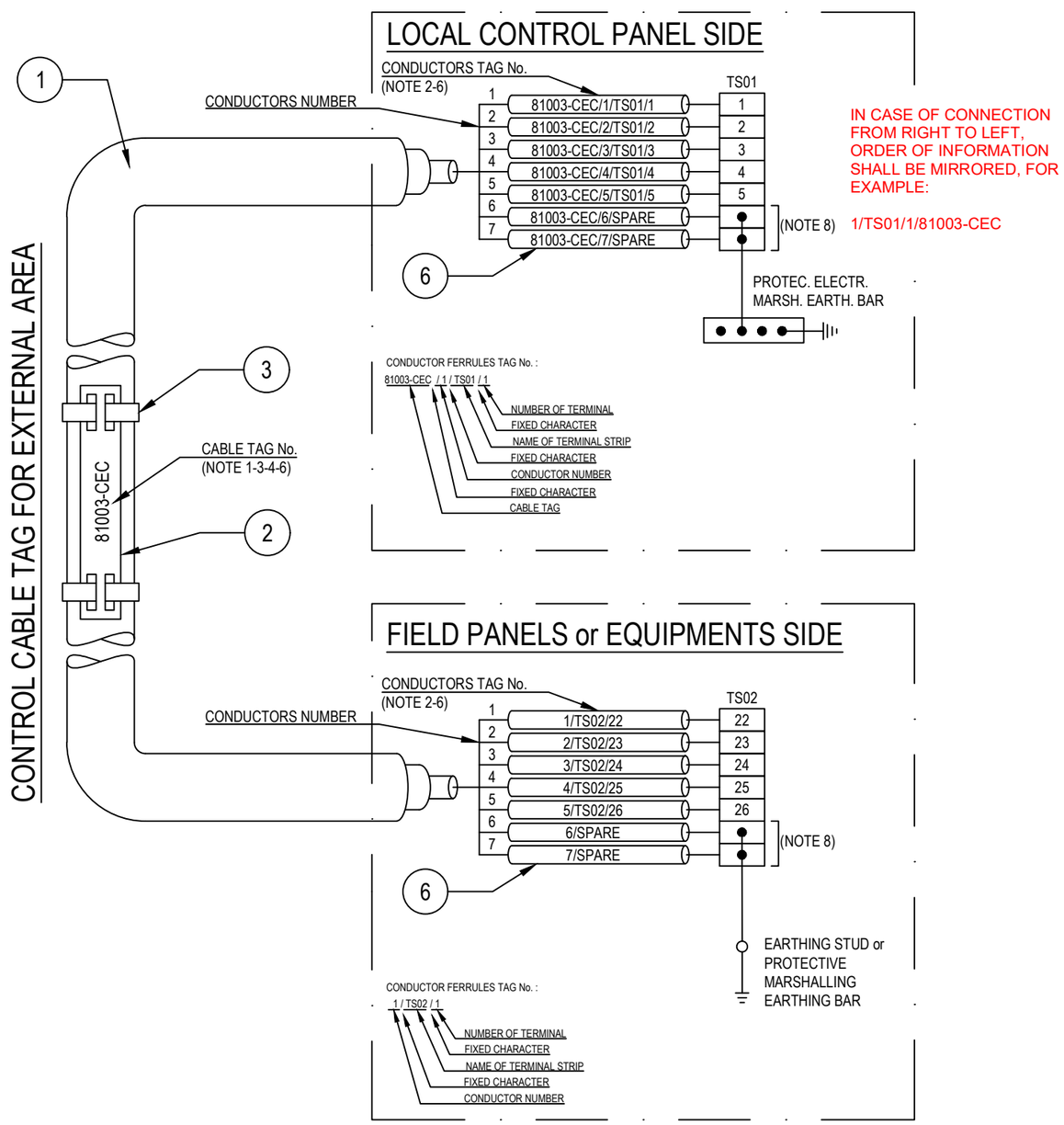
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 067 | REV. 02

F.to UNI A3: 420mmx297mm

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

C04



IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED, FOR EXAMPLE:

1/TS01/1/81003-CEC

POS.	DESCRIPTION	MATERIAL	SIZE	Q.TY	NOTE
1	UNARMOURED CABLE				
2	CABLE TAG FOR EXTERNAL AREA	HDG/SS			NOTE 1 NOTE 4
3	TIE FOR CABLE TAG IN EXTERNAL AREA	HDG/SS			
4	CABLE TAG FOR INTERNAL AREA	PVC			NOTE 1 NOTE 5
5	TIE FOR CABLE TAG IN INTERNAL AREA	NYLON 6.6			
6	CORE FERRULES	PVC			

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

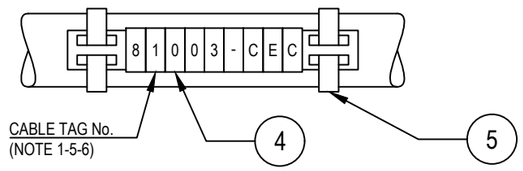
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
- EARTHING BOSS AND EARTH RING
- EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

CONTROL CABLE TAG FOR INTERNAL AREA



VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DD-20092**

REV.:	DATE:	SIGNATURE:
2_D	20/12/24	V.Ramponi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	28/08/24	GRA	AMA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	04/07/24	NLK	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	21/11/23	SPS	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

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

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

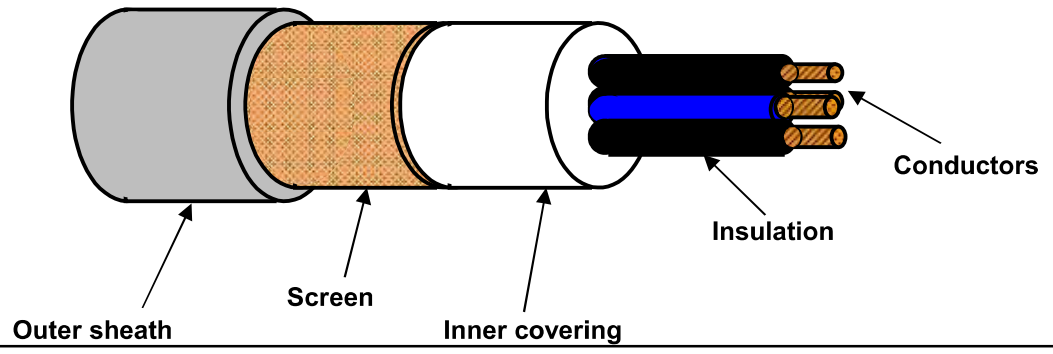
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

Tag Number	Category	Discipline	Eng Statu	NativeDoc	Layout	Parent Tag	Main Function	Secondary Functio	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland Standard	From Gland	From Entry	From Fitting	To Gland	To Entry	To Fitting	Routing	Routing Manual
81002-CEC	Cable	EL	VFC	123A90-DDL-EL-LIS-20148						CP-100E4	Auxiliary Trafo 7 MVA Local Control Panel	Lower Deck	CP-100E1	66 kV GIS Local Control Panel	Lower Deck (B-100)	ELECV3S-4X4	Cable Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1kV 4Cx4mm² - Grey	M20	T2_M20_Double	M25	RED_M25MxM20F	T2_M20_Double				L-150-101-LVT-091 / L-150-101-LVT-090 / L-450-101-LVT-072 / L-600-101-LVT-094 / L-750-101-LVT-014 / L-450-101-LVT-075 / E-MCT-106 / L-600-101-LVT-058 / L-300-101-LVT-059 / L-300-101-LVT-063

FLEI s.r.l.

Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV

4CX4 - CONTROL CABLE - SCREENED - Flame Retardant



TECHNICAL FEATURES

Conductors :	**STRANDED** plain/bare annealed copper wires	IEC 60228 Class 2
Insulation :	**XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm	
Cores colour code :	**Black NUMBERED (from 1 to 4)**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not Required	
Total Assembling :	Cores layed up with optimal lay length	
Overall Wrapping:	Not required	
Inner covering :	Extruded LSZH compound, Average Thickness 1,0 mm	
Inner covering color code:	**Black or Natural**	
Screen :	**Copper Wire Braid (coverage ≥ 90%)**	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60092.360, Average Thickness 1,3 mm	
Outer sheath color code:	**Grey**	
Outer printing (INKJET) :	**FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking**	
Outer diameter :	(15,4 ± 10%) mm	
Bending radius :	cable outer diameter x 10	(in fixed installation)
Voltage test :	3,5 kV a.c. for 5' (Between Cores - Screen)	
Conductors DC Resistance :		IEC 60228 Class 2
Insulation Resistance :	≥ 690 MΩ x Km (@ 20°C)	
Applicable Standards		
Design Guidelines :	**IEC 60092.353**	
ON COMPLETE CABLE		
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance	IEC 61034.2 (LT ≥ 60%)	
Hazardous Areas :	IEC 60079.14:2013 par.9.3.2a	
Temperature Range :		
ON INSULATION	(max +90°C)	(max continuous operation temperature of conductors)
	(max +250°C)	(max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C)	(in fixed installation)
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/03/2024	Messa			
Checked :	29/03/2024	Spaccasassi			
Approved :	29/03/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

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Section 6 MECHANICAL COMPLETION STATUS INDEX - INSTRUMENTAL DISCIPLINE

NOT APPLICABLE

Section 7 MECHANICAL COMPLETION STATUS INDEX - MECHANICAL DISCIPLINE

NOT APPLICABLE

Section 8 MECHANICAL COMPLETION STATUS INDEX - TELECOMMUNICATION DISCIPLINE

CROSSWIND

ROSETTI MARINO

Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 81-20 & process: MC & discipline : T

Telecom	81-20 Power Transformer 7 MVA (TR-100AD1)						
ITEM		TASK					
Code	Description	Location	Code	Form	Progress	Date	Certificate
TR-100AD1AVR/B400-NET-001	66 / 6.9 kV 7 MVA Transformer / Network Cabinet / EMCS System	ONSHORE	C10004374	CIX09	100	2024-11-27	RFC 3

ROSETTI MARINO

CROSSWIND

ITEM	Tag	TR-100AD1AVR/B400-NET-001 : 66 / 6.9 kV 7 MVA Transformer / Network Cabinet / EMCS System				Dwg	123A90-DDL-IN-LIS-40091
	S/Sys	81-20 : Power Transformer 7 MVA (TR-100AD1)				Module	LD/LD_B-400
TASK	code	C10004374		Location	Onshore Activities	User	Rosetti Marino Quality Control
FORM	Process	MC	Activity CCK	Discipline	Telecom	Form	CIX09 Telecom Cable RJ45

CABLE DATA

Type	FTP-LSZH-IS-OS-SWB-LSZH	Cores/Size mm²	4X2X23AWG mm2	Color	GREY
From	TR-100AD1AVR	To	B400-NET-001		

1	Confirm cable is as specified in project cable schedule	OK
2	Check cable physical integrity.	OK
3	Check is installed in accordance with layout drawing (segregation, distance…).	OK
4	Check cable is supported and fixed to rack according to project specification.	PL
5	Check bending radius is within the specified limits.	OK
6	Confirm cable glands suit for cable type, correctly mounted and tightened.	PL
7	Confirm cable labelling is in accordance with specifications.	PL
8	Check cable is correctly loomed and segregated in accordance with specification.	OK
9	Check proper fitting of heat shrink sleeves and cable glands (if applicable).	OK
10	Check cores marking are in accordance with termination diagram.	OK
11	Check terminations are in accordance with latest termination diagram.	PL
12	To roll up that measured lenght complies with pulled lenght.	OK
13	To roll up the cable complies with Cat. 5E performance requirements (250 Mhz).	OK
14	Attach LAN tester print out to this test sheet.	OK
15	if required produce Red Line Mark Up for "AS BUILT"	

Comments: Nota 4: refer to PL C30000680

	Performed by	● WITNESS ☐ REVIEW	☐ WITNESS ☐ REVIEW
Company	ICS IMPIANTI	RM(ROSETTI MARINO)	
Name	Francesco Zucca	Alessio Polo	
Date	2024-11-25	2024-11-27	
Signature	Digitaly signed by Francesco Zucca 2024-11-25T11:05:12.250Z	Digitaly signed by Alessio Polo 2024-11-27T12:21:11.754Z	

ROSETTI MARINO

Cable ID: TR-100AD1AVR/B400-NET-001

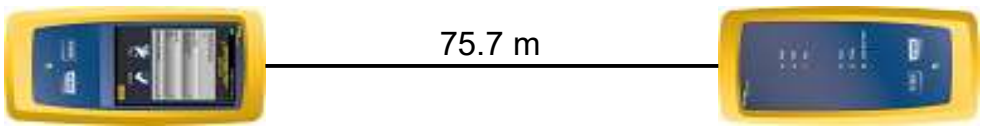
Test Summary: PASS

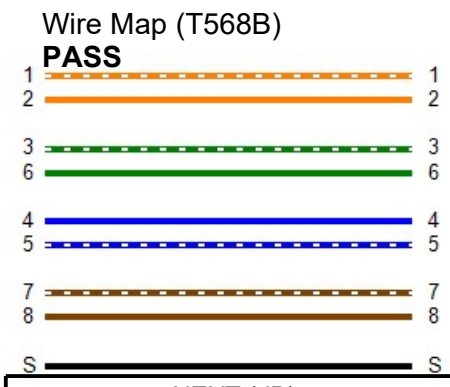
Test Limit: ISO11801 PL2 Class Ea
Limits Version: V7.6
Date / Time: 22-11-2024 16:16:49
Headroom 4.1 dB (NEXT 1,2-3,6)
Cable Type: Cat 6A S/FTP
NVP: 77.0%

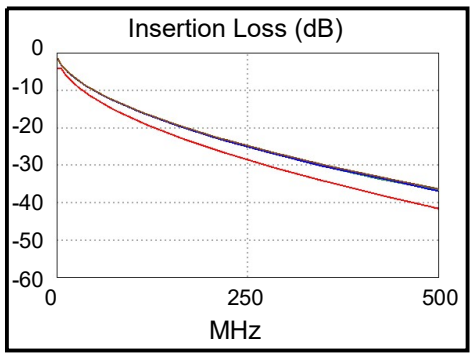
Main: Versiv
S/N: 2226344
Software Version: V6.7 Build 1
Calibration Date: 12-12-2022
Adapter: DSX-8000 (DSX-PLA804)
S/N: 22340270

Remote: Versiv
S/N: 2226336
Software Version: V6.7 Build 1
Calibration Date: 12-12-2022
Adapter: DSX-8000R (DSX-PLA804)
S/N: 22340257

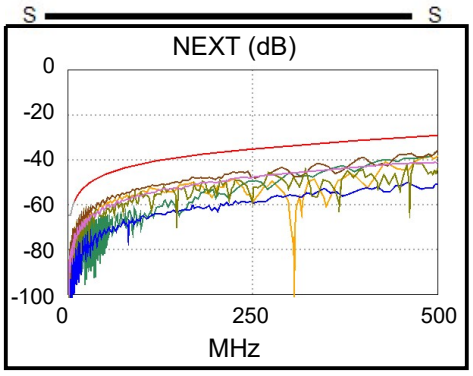
Length (m), Limit 90.0	[Pair 4,5]	75.7
Prop. Delay (ns), Limit 496	[Pair 1,2]	334
Delay Skew (ns), Limit 43	[Pair 1,2]	6
Resistance (ohms), Limit 20.60	[Pair 3,6]	10.54
Insertion Loss Margin (dB)	[Pair 1,2]	4.8
Frequency (MHz)	[Pair 1,2]	500.0
Limit (dB)	[Pair 1,2]	41.6

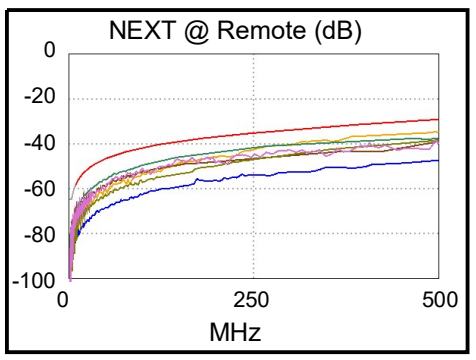




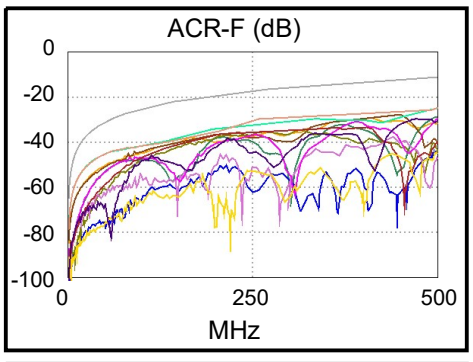


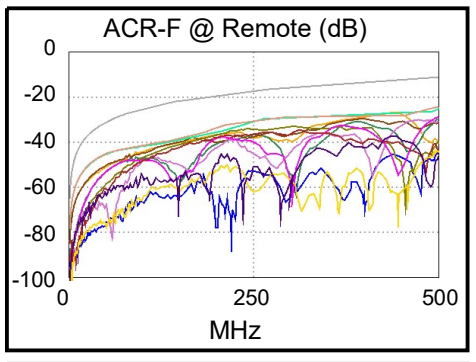
	Worst Case Margin		Worst Case Value	
PASS	MAIN	SR	MAIN	SR
Worst Pair	3,6-4,5	1,2-3,6	3,6-4,5	1,2-3,6
NEXT (dB)	6.6	4.1	6.6	4.1
Freq. (MHz)	500.0	447.0	500.0	447.0
Limit (dB)	29.2	30.3	29.2	30.3
Worst Pair	4,5	3,6	4,5	3,6
PS NEXT (dB)	6.1	5.2	6.1	5.8
Freq. (MHz)	500.0	448.0	500.0	499.0
Limit (dB)	26.4	27.5	26.4	26.4



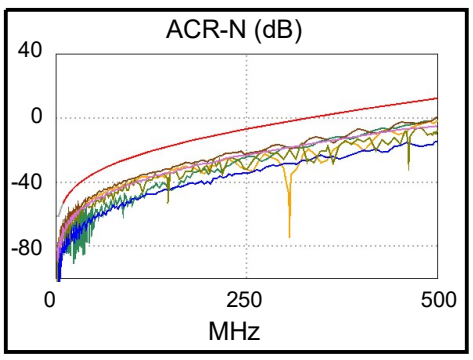


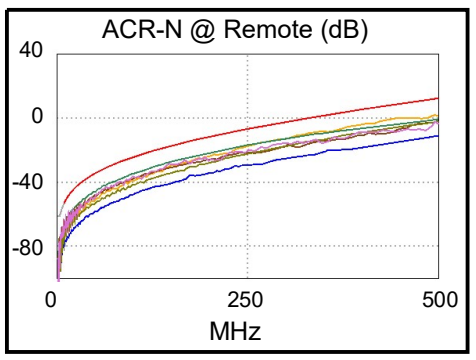
PASS	MAIN	SR	MAIN	SR
Worst Pair	7,8-4,5	4,5-7,8	7,8-4,5	7,8-4,5
ACR-F (dB)	12.4	12.7	13.4	13.2
Freq. (MHz)	291.0	292.0	500.0	500.0
Limit (dB)	16.0	15.9	11.3	11.3
Worst Pair	4,5	4,5	4,5	4,5
PS ACR-F (dB)	14.4	14.1	15.0	14.9
Freq. (MHz)	267.0	241.5	500.0	500.0
Limit (dB)	13.7	14.6	8.3	8.3



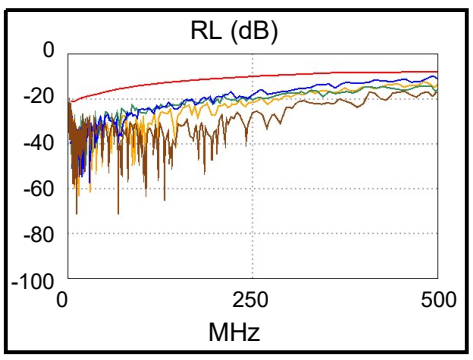


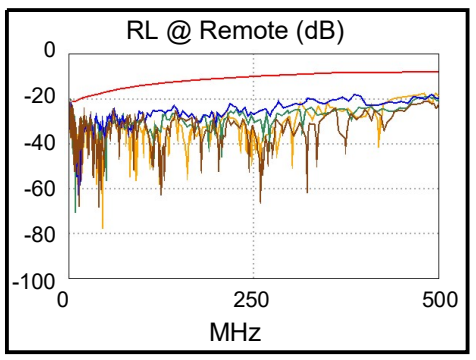
PASS	MAIN	SR	MAIN	SR
Worst Pair	3,6-4,5	1,2-3,6	3,6-4,5	1,2-3,6
ACR-N (dB)	11.4	8.5	11.4	10.2
Freq. (MHz)	500.0	447.0	500.0	495.0
Limit (dB)	-12.4	-8.9	-12.4	-12.1
Worst Pair	4,5	4,5	4,5	3,6
PS ACR-N (dB)	11.0	8.9	11.0	10.9
Freq. (MHz)	500.0	147.5	500.0	500.0
Limit (dB)	-15.3	14.9	-15.3	-15.3





PASS	MAIN	SR	MAIN	SR
Worst Pair	4,5	1,2	4,5	1,2
RL (dB)	1.9	4.7	1.9	8.3
Freq. (MHz)	494.0	4.9	494.0	476.0
Limit (dB)	8.0	21.0	8.0	8.0





Compliant Network Standards:

10BASE-T	100BASE-TX	100BASE-T4
1000BASE-T	2.5GBASE-T	5GBASE-T
10GBASE-T	ATM-25	ATM-51
ATM-155	100VG-AnyLan	TR-4
TR-16 Active	TR-16 Passive	

LinkWare™ PC Version 11.4

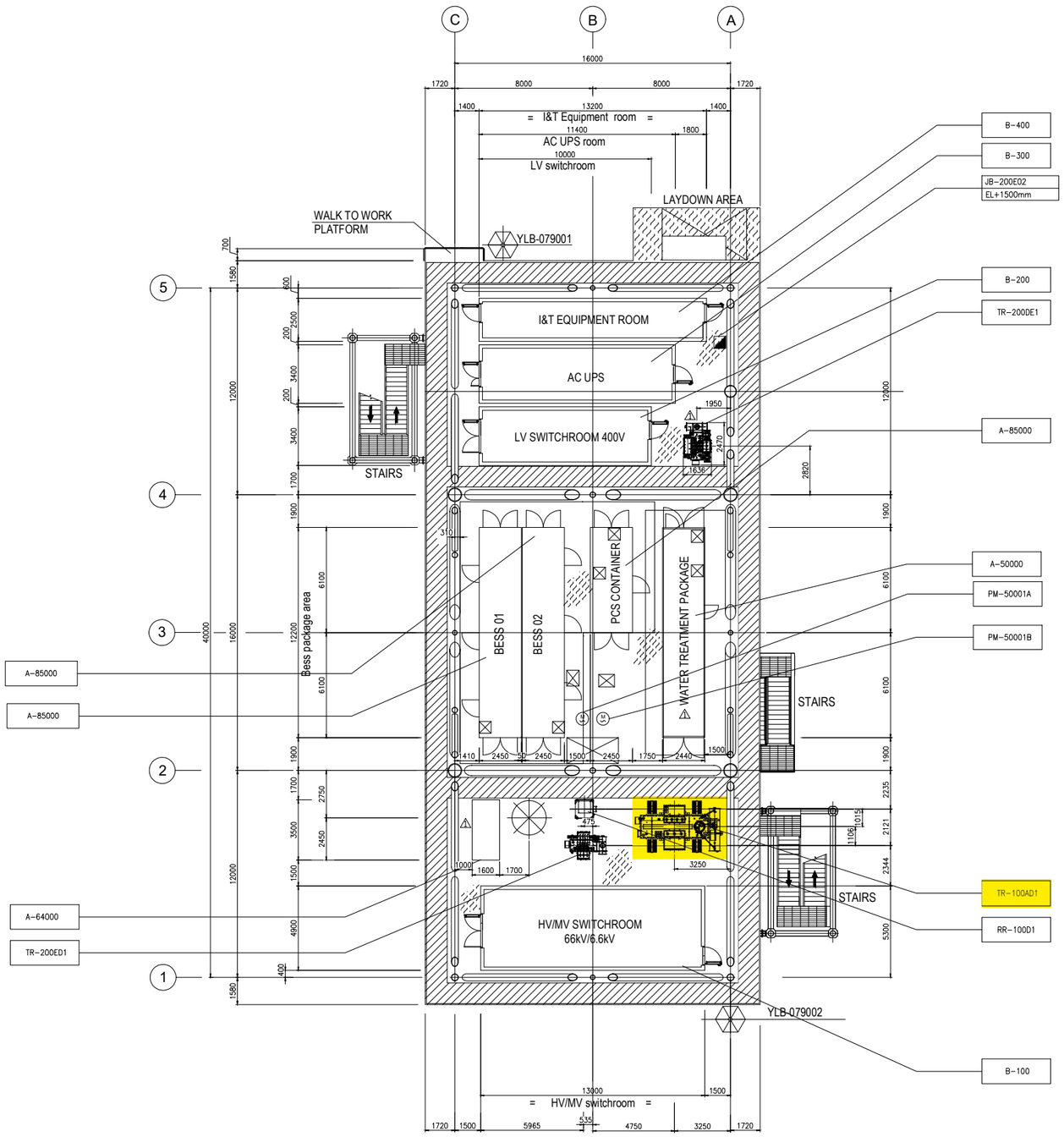
Project: CROSSWIND
Site: Not Set
Floor: Not Set
Rack: Not Set
ROSETTI - CROSSWIND RAME 22.11.2024.flw

Building: Not Set
Room: Not Set
Patch: Not Set

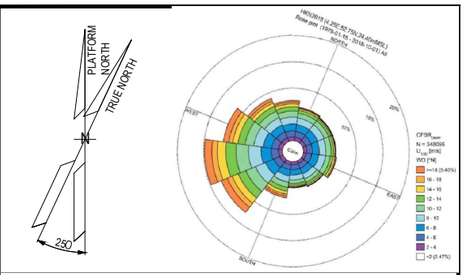
FLUKE networks

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01



PLAN ON LOWER DECK
EL+23.310 T.O.S.



NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

LEGEND

(M)	ELECTRIC MOTOR – LOW VOLTAGE
⊠	INTERFACE PANEL
◪	JUNCTION BOX
JB-200E2 / EL+500mm	TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL)

HOLDS

REFERENCE DOCUMENTS

123A90-DDL-PP-DL-70070	PLOT PLAN - LOWER & UPPER DECK
123A90-DDL-EL-DL-20106	ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM
123A90-DDL-IN-DL-40012	ITER EQUIPMENT LAYOUT
123A90-DDL-EL-DL-20104	ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM
123A90-DDL-EL-DL-20105	LV SWITCHGEAR ROOM EQUIPMENT LAYOUT

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	06/05/24	SAM	FMA/AMA	FPA/DLO	ACCEPTED FOR CONSTRUCTION (AFC)
00	04/03/24	SAM	FMA/AMA	FPA/DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

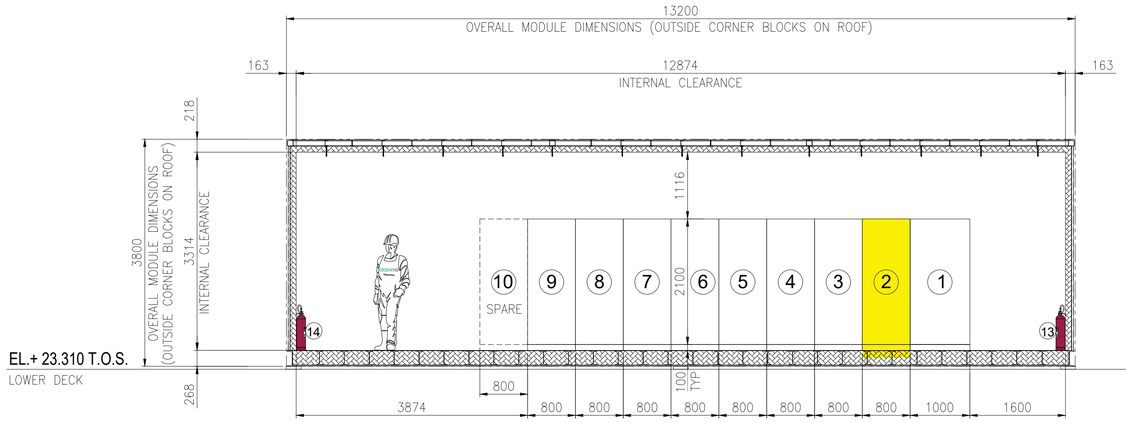
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

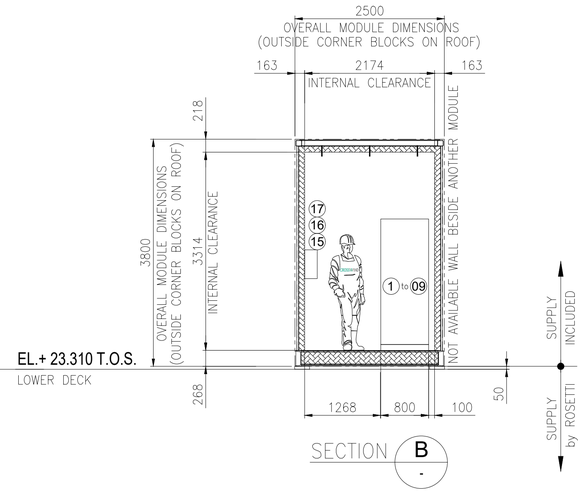
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

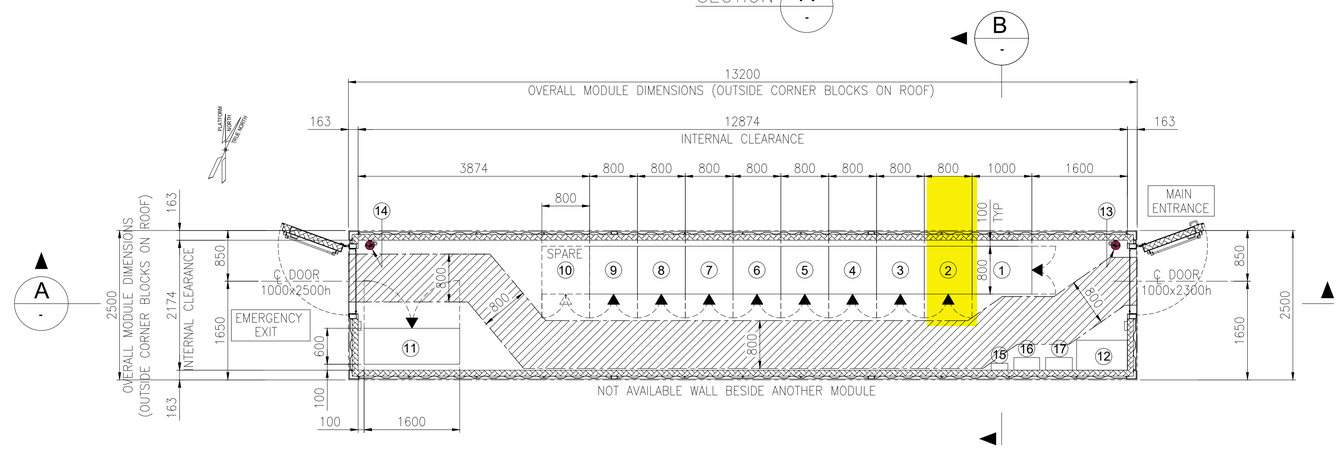
DRAWING NO. 123A90-DDL-IN-DL-40012 REV. 03



SECTION A -



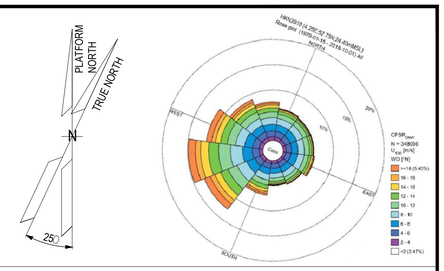
SECTION B -



EQUIPMENT LAYOUT
"B-400" I&T EQUIPMENT ROOM
BOTTOM PLAN

EQUIPMENT LIST

REF.	TAG No.	DESCRIPTION	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NOTE
1	B400-SRV-001	SERVER CABINET	1000	800	2100	
2	B400-NET-001	NETWORK CABINET	800	800	2100	
3	B400-EMCS-001	EMCS SYSTEM CABINET	800	800	2100	
4	B400-PCS-002	PCS MARSHALLING CABINET	800	800	2100	
5	B400-PCS-001	PCS SYSTEM CABINET (03)	800	800	2100	
6	B400-FGS-003	FGS MARSHALLING CABINET 2	800	800	2100	
7	B400-FGS-002	FGS MARSHALLING CABINET 1	800	800	2100	
8	B400-FGS-001	FGS SYSTEM CABINET	800	800	2100	
9	B400-SIS-001	SIS SYSTEM/MARSHALLING CABINET	800	800	2100	
10	-	SPARE				
11	B400-HSB-001	DISTRIBUTION & HVAC PANEL - I&T ROOM	1600	600	2300	
12	-	TABLE	850	500	750	
13	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	
14	-	PORTABLE EXTINGUISHER (CO2) 5 Kg.	150	150	750	
15	-	FIRST AID KIT	280	115	200	
16	-	RESUSCITATION UNIT	430	210	480	
17	-	CABINET INCLUDED N.10 ESCAPE MASK	448	213	422	



NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DOCUMENT VALID ONLY FOR INSTRUMENT COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.

LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR – WIDTH 800mm.
_____ EQUIPMENT ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

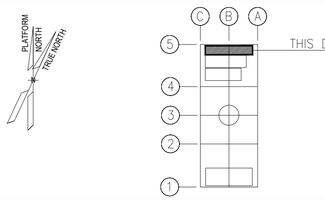
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REFERENCE

DOCUMENT TITLE	DOCUMENT NUMBER
Control System Architecture Detailed Drawings	123A90-DDL-IN-DD-40096
Data Network Architecture Drawings	123A90-DDL-IN-DD-40019
Earthing layouts drawings (CCR, ITER)	123A90-DDL-IN-DL-40013
Instrument and Telecom MCT Layout – Lower Deck	123A90-DDL-IN-DL-40086
"B-400" I&T Equipment Room – Architectural Layout	123A90-DDL-AR-DL-10015
"B-400" ARCHITECTURAL GENERAL LAYOUT PLAN, WIEW, SECTIONS & TYP. DETAILS	123A90-DDL-AR-DL-10015
"B-400" GENERAL ARRANGEMENT DRAWING	1724000049-AR-DA-00017
"B-400" GENERAL ARRANGEMENT DRAWING	1724000049-AR-DD-00021
"B-400" HVAC SYSTEM G.A. and DETAILS	1724000049-HV-DA-00067

KEY PLAN



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
03	04/10/24	VBA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
02	27/05/24	MGA	LCA	DLO	ACCEPTED FOR CONSTRUCTION (AFC)
01	22/01/24	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)
00	07/11/23	VBA	LCA	DLO	ISSUE FOR REVIEW (IFR)

CROSSWIND — ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH) OFF-SHORE ITER EQUIPMENT LAYOUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:33,3
DRAWN MGA | CHECKED LCA | APPROVED DLO | DATE 27/05/24
A1 | DRAWING NO. 123A90-DDL-IN-DL-40012 | SHEET 001 | REV. 03

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-IN-DL-40012**

REV.:	DATE:	SIGNATURE:
3_A	07/10/24	G.Randi

ROSETTI MARINO SpA

File Name : 123A90-DDL-IN-DL-40012 Rev.03.dwg

DRAWING NO. 123A90-DDL-IN-DG-40015

REV. 01

FIELD					I&T EQUIPMENT ROOM (ITER B400)		
					NETWORK CABINET - B400-NET-001		
							<01>
CP-500E1 UCP PANEL	SEA WATER TREAT. (A-50003) 50-LP-001	ITEM: PORT: P3	RJ45	50-LP-001 / B400-NET-001 CAT.6A4x2xAWG23,Sh+ShT+ARM,F.Ret,GREEN,NIS	RJ45	SWITCH: COOP-01 PORT: P16	
	Doc. 1723000448-EL-DG-00015 sh.13						
	I. A. PACKAGE (A-63000) 63-LP-001	ITEM: NOTE 5 PORT: NOTE 5	RJ45	63-LP-001 / B400-NET-001 CAT.6A4x2xAWG23,Sh+ShT+ARM,F.Ret,GREEN,NIS	RJ45	SWITCH: COOP-01 PORT: P17	
	Doc. 1723000428-MAC-DG-00009 sh.13						
	NITROGEN SYSTEM (U-64000) 64-LP-001	ITEM: NOTE 5 PORT: NOTE 5	RJ45	64-LP-001 / B400-NET-001 CAT.6A4x2xAWG23,Sh+ShT+ARM,F.Ret,GR	RJ45	SWITCH: COOP-01 PORT: P18	
	Doc. 1723000437-MAC-DG-00009 sh.13						
CP-100E3	TRANSFORMER TR-100AD1 AVR	ITEM: TAPCON 230 - EXPERT PORT: SCADA ETHERNET	RJ45	TR-100AD1AVR/B400-NET-001 ~~TR-100AD1-AVR/-B400-EMCS-001~~ CAT.6A4x2xAWG23,Sh+ShT+ARM,F.Ret,GREEN,NIS	RJ45	SWITCH: COOP-01 PORT: P19	
	Doc. 1723001697-EL-DG-00010 sh.13						

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-IN-DG-40015**

REV.:	DATE:	SIGNATURE:
1_E	19/11/24	G.Randi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
INSTRUMENT – PCS WIRING DIAGRAMS
COMMUNICATION – CAT-6

CONTRACT NO./TITLE			SCALE 1:1
DRAWN VBA	CHECKED LCA	APPROVED DLO	DATE 23/02/2024

A3	DRAWING NO. 123A90-DDL-IN-DG-40015	SHEET 038	REV. 01

File Name : 123A90-DDL-IN-DG-40015_Rev.01

DRAWING NO. 123A90-DDL-IN-DG-40015

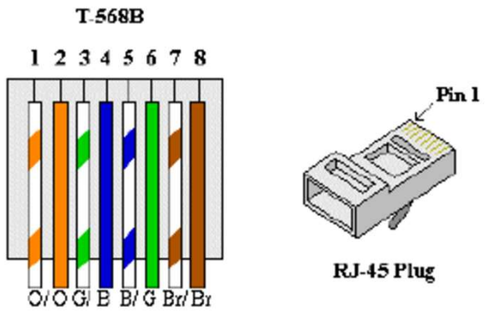
REV. 01

NOTES:

1. ALL SPARE ENTRIES SHALL BE PROVIDED WITH CERTIFIED EX PROOF PLUGS.
2. CABLE SCREENS / DRAIN WIRE SHALL BE SECURELY INSULATED AND TIED BACK IN THE INSTRUMENT SIDE AND SHAL BE TERMINATED IN THE MARSHALLING SIDE OF THE PANEL.
3. SPARE PAIRS / TRIADS SHALL BE CONNECTED TO TERMINALS IN JUNCTION BOX AND PANEL / MARSHALLING CABINETS.
4. ALL CABLE SCREENS TO BE TERMINATED AT THE INSTRUMENT EARTH BAR IN THE RESPECTIVE EARTH BARS (IS OR NIS) AS APPLICABLE IN THE MARSHALLING CABINET.
5. SWITCH TAG NAME AND PORT WILL BE DEFINED DURING THE CONSTRUCTION PHASE
6. FIBER OPTIC TAG NAME WILL BE DEFINED DURING THE CONSTRUCTION PHASE.

<01>

7. CAT. 6A CABLE SHALL BE TERMINATED MEETING REQUIREMENTS OF STANDARD EIA/TIA 568B:



RJ-45 Plug

8. FOR OPTICAL FIBERS, USE THE FOLLOWING COLOR CODING:
   01) RED
   02) GREEN
   03) BLUE
   04) YELLOW
   05) GREY
   06) PURPLE
   07) BROWN
   08) ORANGE
   09) WHITE
   10) PINK
   11) BLACK
   12) TURQUOISE

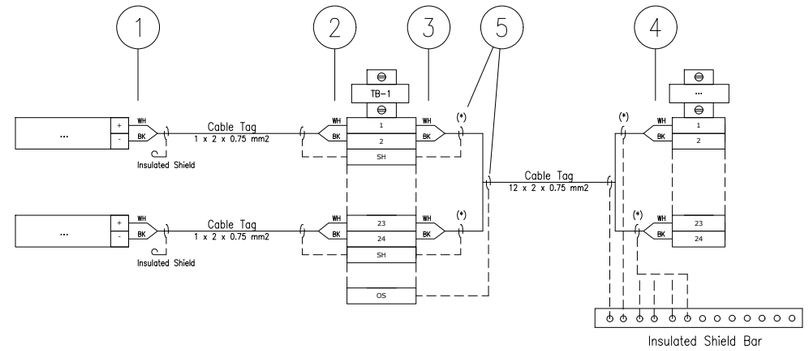
LEGENDS & SYMBOLS:

LEGEND:

I.E.	- GREEN ——— INSTRUMENT SIGNAL EARTH
P.E.	- GREEN / YELLOW —— P.E. EARTH / BONDING
	- TERMINAL BLOCK (TB)
WH	- WHITE
BK	- BLACK
RD	- RED
S	- SHIELD TERMINAL
OS	- OVERALL SHIELD TERMINAL
O/A Shld	- OVERALL SHIELD
I&O/A Shld	- INDIVIDUAL & OVERALL SHIELD
NIS	- NON INTRINSICALLY SAFE
IS	- INTRINSICALLY SAFE
P.E.	- PLANT EARTH
PCS	- PROCESS CONTROL SYSTEM
ESD	- EMERGENCY SHUTDOWN SYSTEM
SIS	- SAFETY INSTRUMENT SYSTEM
MC	- MARSHALLING CABINET
AI	- ANALOGUE INPUT
AO	- ANALOGUE OUTPUT
DI	- DIGITAL INPUT
DO	- DIGITAL OUTPUT

TYPICAL WIRE CROSS-FERRULING:

PHILOSOPHY OF CROSS-FERRULING: <01>



(*) Single shield is foreseen only for AI/AO signals.

1 - INSTRUMENT TERMINAL NO. OR POLARITY/JB NO./JB TERMINAL NO.
(SAME TAGGING PHILOSOPHY SHALL APPLIED ALSO TO THE SHIELD)

2 - INSTRUMENT TERMINAL NO. OR POLARITY/INSTRUMENT TAG NO./JB TERMINAL NO.
(SAME TAGGING PHILOSOPHY SHALL APPLIED ALSO TO THE SHIELD)

3 - PAIR OR CORE NO./MARSHALLING CABINET NO./TB NO./TERMINAL NO.
(SAME TAGGING PHILOSOPHY SHALL APPLIED ALSO TO THE SHIELD)

4 - PAIR OR CORE NO./JB NO./JB TERMINAL NO./TB NO./TERMINAL NO.
(SAME TAGGING PHILOSOPHY SHALL APPLIED ALSO TO THE SHIELD)

5 - HEAT SHRINKABLE BLACK FOR SHIELD OF NIS INSTRUMENT CABLE.
(HEAT SHRINKABLE BLUE FOR SHIELD OF NIS INSTRUMENT CABLE)

6 - IN CASE OF CONNECTION FROM RIGHT TO LEFT, ORDER OF INFORMATION SHALL BE MIRRORED

REFERENCE DRAWINGS

PIPING AND INSTRUMENT DIAGRAM	123A90-DDL-PR-PID-80009
INSTRUMENT INDEX	123A90-DDL-IN-LIS-40088 Rev.01

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-IN-DG-40015**

REV.:	DATE:	SIGNATURE:
1_E	19/11/24	G.Randi

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
INSTRUMENT – PCS WIRING DIAGRAMS
GENERAL NOTES/LEGENDS

CONTRACT NO./TITLE			SCALE 1:1
DRAWN VBA	CHECKED LCA	APPROVED DLO	DATE 23/02/2024

A3	DRAWING NO. 123A90-DDL-IN-DG-40015	SHEET 003	REV. 01

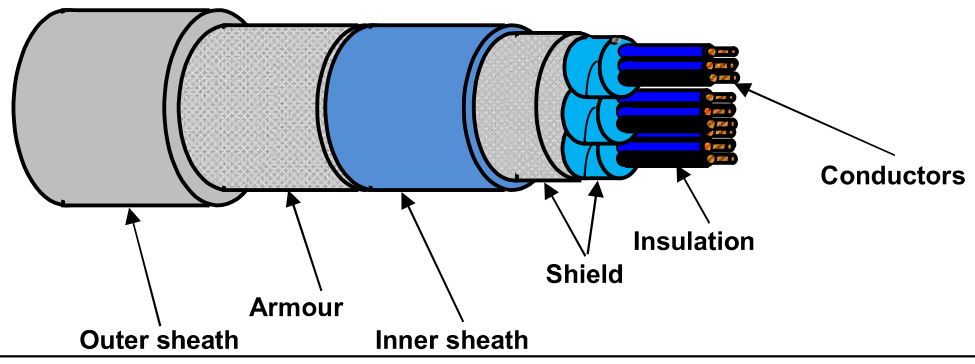
File Name : 123A90-DDL-IN-DG-40015_Rev.01

Tag Number	Category	Discipline	Eng Status	NativeDoc	Layout	Parent Tag	Main Function	Secondary Function	Area	From Tag	From Main Function	From Area	To Tag	To Main Function	To Area	Material ID	Material Desc.	Gland St	From Gland	From Entry	From Fittin	To Gland	To Entry	To Fitting	Routing	Routing Manual
TR-100AD1AVR/B400-NET-001	Cable	IN	VFC	123A90-DDL-IN-LIS-40091						TR-100AD1AVR	66 / 6.9 kV 7 MVA Transformer	Lower Deck	B400-NET-001	Network Cabinet / EMCS System	Lower Deck (B-400)	TELCV03-4X2X23AWG	Cable CAT 6A S/FTP 4x2x23AWG Armoured LSZH - Grey	M20S	T2_M20S_Double			n.a.				L-SEC-15 / L-SEC-1L / L-SEC-1J / L-SEC-1I / L-SEC-1H / L-SEC-1G / L-SEC-1F / L-SEC-1E / L-SEC-1D / L-SEC-1C / L-SEC-1B / L-SEC-1A / B-400-SEC-3A / B-400-SEC-2I / B-400-SEC-2G / B-400-SEC-2E / B-400-SEC-2C / B-400-SEC-3B / I-MCT-402

FLEI s.r.l.

CAT. 6A S/FTP ARMOURED LSZH

4X2X23AWG - Based on Draka UC500 HS23



TECHNICAL FEATURES

Conductors :	**SOLID** plain annealed copper wires (AWG23) **ø 0,56 mm**
Insulation :	Foamskin PE - **ø 1,38 mm**
Cores colour code :	**blue/white; orange/white; green/white; brown/white**
Pair Assembling :	Cores twisted in pairs
Pair Shield :	Al-laminated plastic foil
Overall Shield:	Tinned copper braid
Inner sheath :	Extruded LSZH Thermoplastic Compound
Inner sheath color code:	**Blue**
Armour :	**Galvanized Steel Wire Braid Armour (coverage ≥ 90%)**
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, moisture/abrasion/UV Resistant, Average Thickness 1,2 mm
Outer sheath color code:	**Grey**
Outer printing (INKJET) :	**FLEI - 4X2X23AWG - CAT.6A S/FTP ARMOURED LSZH - IEC 60332.1.2 - IEC 60332.3.22 -**
(every 1000 mm)	**Year of Manufacture - CE + Meter Marking**
Under armour diameter :	(7,5 ± 10%) mm
Over armour diameter :	(8,3 ± 10%) mm
Outer diameter :	(10,7 ± 10%) mm
Bending radius :	cable outer diameter x 8 (in fixed installation)
Test Voltage :	1000 V DC for 1' (Between Cores) / 1000 V DC for 1' (Between Cores - Shield)
Loop Resistance :	≤ 154 Ω/Km (@ 20°C)
Insulation Resistance :	≥ 2000 MΩ x km (@ 20°C)
Mutual Capacitance :	Nom. 43 nF/km
Characteristic Impedance :	(100 ± 5) Ω
Applicable Standards	
Design Guidelines :	**Generally to ISO/IEC 11801 / IEC 61156-5 / EN 50173-1 / EN 50288-10 / IEEE 802.3at / af / bt**
ON COMPLETE CABLE	
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22
Acid Gas generation :	IEC 60754.1/2
Smoke density/Light Transm	IEC 61034.2 (LT ≥ 60%)
Hazardous Areas :	IEC 60079.14 par.9.3.2a
Temperature Range :	
ON COMPLETE CABLE	
During Operation :	(-20°C up to +60°C) (in fixed installation)
During installation :	(0°C up to +50°C)
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner Sheath together with correct ATEX approved equipment or accessories.**

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	29/05/2024	Messa			
Checked :	29/05/2024	Spaccasassi			
Approved :	29/05/2024	Cucinotta			

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

Cable ID: TR-100AD1AVR/B400-NET-001

Test Summary: PASS

Test Limit: ISO11801 PL2 Class Ea
Limits Version: V7.6
Date / Time: 27-01-2025 14:24:20
Headroom 2.7 dB (NEXT 4,5-7,8)
Cable Type: Cat 6A U/UTP
NVP: 68.2%

Main: Versiv
S/N: 2226344
Software Version: V6.7 Build 1
Calibration Date: 12-12-2022
Adapter: DSX-8000 (DSX-PLA804)
S/N: 22340257

Remote: Versiv
S/N: 2226336
Software Version: V6.7 Build 1
Calibration Date: 12-12-2022
Adapter: DSX-8000R (DSX-PLA804)
S/N: 22340270

Length (m), Limit 90.0	[Pair 4,5]	66.9
Prop. Delay (ns), Limit 496	[Pair 1,2]	334
Delay Skew (ns), Limit 43	[Pair 1,2]	7
Resistance (ohms), Limit 20.60	[Pair 1,2]	11.52
Insertion Loss Margin (dB)	[Pair 1,2]	5.1
Frequency (MHz)	[Pair 1,2]	500.0
Limit (dB)	[Pair 1,2]	41.6

	Worst Case Margin		Worst Case Value	
PASS	MAIN	SR	MAIN	SR
Worst Pair	4,5-7,8	3,6-4,5	4,5-7,8	3,6-4,5
NEXT (dB)	2.7	6.8	5.6	7.5
Freq. (MHz)	338.0	399.0	484.0	500.0
Limit (dB)	32.9	31.4	29.5	29.2
Worst Pair	4,5	4,5	4,5	4,5
PS NEXT (dB)	4.0	6.6	5.9	6.6
Freq. (MHz)	338.0	500.0	484.0	500.0
Limit (dB)	30.2	26.4	26.7	26.4

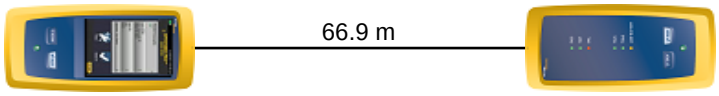
PASS	MAIN	SR	MAIN	SR
Worst Pair	4,5-7,8	7,8-4,5	7,8-4,5	7,8-4,5
ACR-F (dB)	13.2	12.9	13.9	13.9
Freq. (MHz)	294.0	286.0	500.0	500.0
Limit (dB)	15.9	16.1	11.3	11.3
Worst Pair	4,5	4,5	4,5	4,5
PS ACR-F (dB)	14.5	14.7	15.7	15.7
Freq. (MHz)	290.0	265.0	500.0	500.0
Limit (dB)	13.0	13.8	8.3	8.3

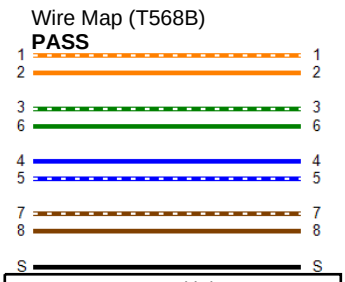
PASS	MAIN	SR	MAIN	SR
Worst Pair	4,5-7,8	3,6-4,5	4,5-7,8	3,6-4,5
ACR-N (dB)	6.4	11.0	11.0	12.6
Freq. (MHz)	168.5	169.5	484.0	500.0
Limit (dB)	15.0	14.9	-11.3	-12.4
Worst Pair	4,5	3,6	4,5	4,5
PS ACR-N (dB)	7.5	11.0	11.6	11.8
Freq. (MHz)	168.5	171.0	499.0	500.0
Limit (dB)	12.4	12.1	-15.2	-15.3

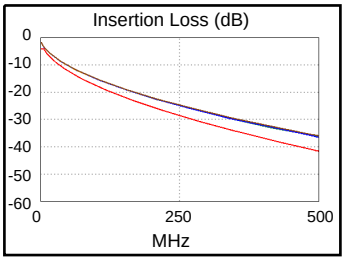
PASS	MAIN	SR	MAIN	SR
Worst Pair	1,2	4,5	1,2	4,5
RL (dB)	5.1	2.1	8.4	2.1
Freq. (MHz)	4.8	496.0	500.0	496.0
Limit (dB)	21.0	8.0	8.0	8.0

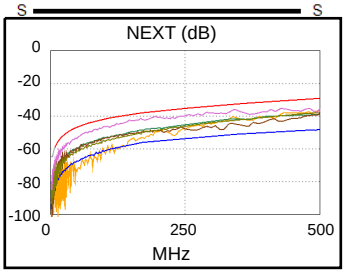
Compliant Network Standards:

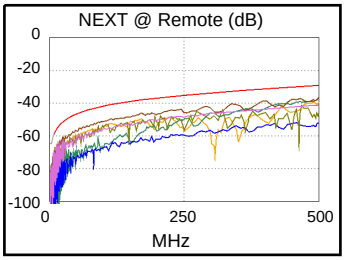
10BASE-T	100BASE-TX	100BASE-T4
1000BASE-T	2.5GBASE-T	5GBASE-T
10GBASE-T	ATM-25	ATM-51
ATM-155	100VG-AnyLan	TR-4
TR-16 Active	TR-16 Passive	

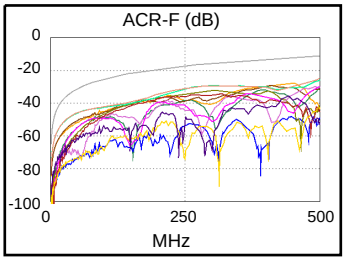


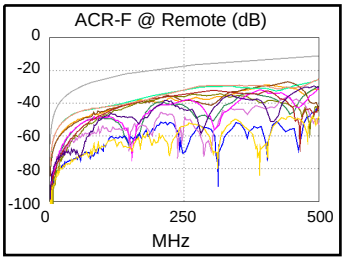


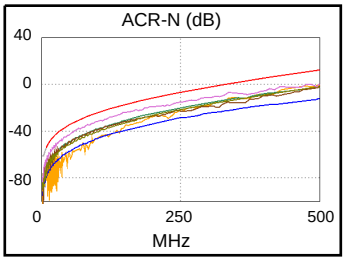


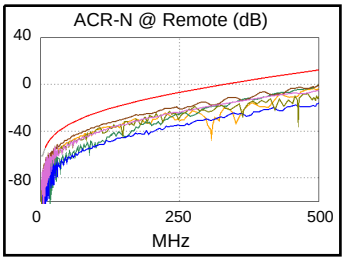


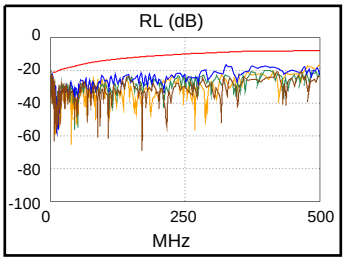


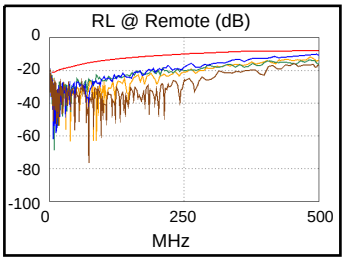












LinkWare™ PC Version 11.4

Project: CROSSWIND
Site: Not Set
Floor: Not Set
Rack: Not Set
CrossWind.flw

Building: Not Set
Room: Not Set
Patch: Not Set

Section 9 MECHANICAL COMPLETION STATUS INDEX - HVAC DISCIPLINE

NOT APPLICABLE

Section 10 MECHANICAL COMPLETION STATUS INDEX - PIPING DISCIPLINE

NOT APPLICABLE

Section 11 MECHANICAL COMPLETION INDEX - SAFETY DISCIPLINE

NOT APPLICABLE

Section 12 FAT / VENDOR REPORTS

ROSETTI MARINO	**INSPECTION REPORT**	**Report No.** IR-1697-MFT-02	SHEET 1 di 13
		Data *Date* 31/072024 and 1-2/08/2024	Rev. *Rev.* 00

PROGETTO	**CLIENTE**	**COMMESSA** / *Job*	**COMMESSA FORNITORE** / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	**123A90**	***522.23 (7 MVA)***

FORNITORE/*Supplier*	**No. Ordine**/*P.O. No.*	**OGGETTO**/ *Object:*
MF Trasformatori	**1723001697 rev.01**	**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR**

DESCRIZIONE DEL MATERIALE / *Material Description*

POS. *Item*	**QUANTITA'** *Quantity*	**DESCRIZIONE** *Description*	**Nr. TAG S/N** *TAG No. S/N*	**TIPO DI ISPEZIONE** / *Kind of Inspection*	**ESITO** / *Result*
10	**1**	**HV TRANSFORMER WITH OIL**	**TR-100AD1**	**FAT (QCP Step 3 & 4)**	**SATISFACTORY**

DOCUMENTI APPLICABILI / *Applicable Documents*

TITOLO DOCUMENTO / *Document Title*	**NUMERO DOCUMENTO** / *Document Number*	**REVISIONE** / *Revision*	**STATO DOCUMENTO** / *Document Status*
Inspection and test Plan (ITP)	1723001697-QC-ITP-00002	03 (04-06-2024)	1 – (No Comments …)
Factory Acceptance test (FAT) Procedure	1723001697-QC-PRO-00014	02 (04-06-2024)	2 – (Minor Comments …)
TR-100AD1 General Arrangement	1723001697-EL-DA-00006	03 (16-05-2024)	1 – (No Comments …)
TR-100AD1 Termination and Wiring Diagram	1723001697-EL-DG-00010	01 (16-07-2024)	2 – (Minor Comments …)

DISTRIBUZIONE A: / *Distribution to:*

☐ **GESTIONE FORNITURE** / *Supply Management Department*	☐ **CAPO COMMESSA** / *Project Manager*
☐ **PRODUZIONE** / *Production*	☒ **FORNITORE** / *Supplier*
☐ **PPLM** / *Project Procurement & Logistic Manager*	☐ **P.Q.M.**
☐ **MAGAZZINO** / *Warehouse*	☐ **P.E.M.**

ATTIVITA' ESEGUITE / *Activities Carried Out*

A – INTRODUZIONE / *Preliminary Introduction*

According to Inspection Notification Nr. 02 issued on 22/07/2024, Inspection held at MF Trasformatori premises in Loc. S. Anna 22-24, 25011 Calcinato (BS) - Italy from July 31st to August 2nd, 2024 in order to attend Factory Acceptance Test of one HV Transformer with Oil, with following main characteristics:
Voltage 66 / 6.6 kV, Power 7 MVA, Frequency 50 Hz, Cooling KNAN (Non-Mineral) Oil Natural Air Natural (Letter K stands for "Liquid with a flash point greater than or equal to 300°C"), Outdoor-Offshore Type.
The following IR describes the tests activities.
The result of the individual tests is SATISFACTORY as per detail in Pos. B, below.

L' INCARICATO / *The person in charge*	**IL RAPP. DEL CLIENTE** / *Client's Representative*	**IL FORNITORE** / *Supplier*
Lastene Bevoni Obo Rosetti Marino	Luigi Pignatelli Inspector On behalf of Crosswind	Mattia Sandrini Test Room Manager MF Trasformatori

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising durin g the utilization.

ROSETTI MARINO	INSPECTION REPORT	Report No. IR-1697-MFT-02	SHEET 2 di 13
		Data *Date* 31/072024 and 1-2/08/2024	Rev. *Rev.* 00

PROGETTO	CLIENTE	COMMESSA / *Job*	COMMESSA FORNITORE / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	123A90	*522.23 (7 MVA)*

FORNITORE/*Supplier*	No. Ordine/*P.O. No.*	OGGETTO/ *Object:*
MF Trasformatori	1723001697 rev.01	POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR

B – SCOPO DELL'ISPEZIONE / *Scope of Inspection*

DESCRIZIONE DEI TEST PRESENZIATI / Description of witnessed tests	ESITO / Result
3 - FACTORY ACCEPTANCE TEST	
3.1 Visual, labeling, dimensional check and correspondence at technical specification	Satisfactory
3-2 Measurement of voltage ratio and vectorial group check	Satisfactory
3-3 Measurement of winding resistance	Satisfactory
3-4 Separate source AC voltage withstand test	Satisfactory
3-5 Induced AC voltage test	Satisfactory
3-6 Measurement of no-load losses and current	Satisfactory
3-7 Measurement of short circuit impedance and load losses	Satisfactory
3-8 Leak testing with pressure test (tightness test)	Satisfactory
3-9 Functional test on all accessories	Satisfactory
3-10 Breakdown voltage on insulation oil	Satisfactory
3-11 Check of the ratio and polarity of built-in current transformers (if applicable)	Satisfactory
3-12 Measurement of zero sequence impedance	Satisfactory
3-13 Painting check (DFT and color)	Satisfactory
3.14 Measurement for the dissipation factor (tan δ) of the insulation system capacitances	Satisfactory
3.15 Measurement for the d.c. insulation resistance each winding to earth and between windings	Satisfactory
3.16 Measurement for the dissolved gasses in dielectric liquid	Satisfactory
3.17 Determination of capacitances winding to earth and between windings	Satisfactory
4 - TYPE TEST	Satisfactory
4.1 Full wave lightning impulse test	Satisfactory
4.2 Temperature rise test	Satisfactory
4.3 Noise test	Satisfactory
4.4 Short circuit withstand test	Satisfactory

C –DETTAGLIO DEGLI STRUMENTI UTILIZZATI PER TEST E ISPEZIONE / *Details of Inspection and Test Instruments used*

NOME DELLO STRUMENTO *Equipment name*	PRODUTTORE *Manufacturer*	MODELLO *Model*	PROSSIMA TARATURA *Next calibration*
See Attachment 12			
Please note: the document is a simple list of the instruments used during the FAT with the serial numbers and calibration expiration dates reported. The instrument calibration certificates are kept by the supplier who can provide them upon request.			

L' INCARICATO / *The person in charge*	IL RAPP. DEL CLIENTE / *Client's Representative*	IL FORNITORE / *Supplier*
Lastene Bevoni Obo Rosetti Marino	Luigi Pignatelli Inspector On behalf of Crosswind	Mattia Sandrini Test Room Manager MF Trasformatori

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
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PROGETTO	CLIENTE	COMMESSA / *Job*	COMMESSA FORNITORE / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	123A90	*522.23 (7 MVA)*
FORNITORE/*Supplier* MF Trasformatori	**No. Ordine**/*P.O. No.* 1723001697 rev.01	**OGGETTO**/ *Object:* POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR	

D –ALLEGATI / *Attachments (***CERTIFICATI E TEST REPORT** */ Certificates and Test Reports)*

NUMERO DOC. / *Document Number*	DESCRIZIONE / *Description*	TIPO / *Type*	NR. PAGINE /*No. Pages*
01	PO Item 10 TR-100AD1 7 MVA Ability to withstand short circuit	Calculation Report	9
02	PO Item 10 TR-100AD1 7 MVA Impulse test	Test Report	28
03	PO Item 10 TR-100AD1 7 MVA Noise Test	Test Report	1
04	PO Item 10 TR-100AD1 7 MVA Oil Test	Test Report	3
05	PO Item 10 TR-100AD1 7 MVA Routine & Special Test	Test Report	8
06	PO Item 10 TR-100AD1 7 MVA Temperature Rise Test	Test Report	9
07	PO Item 10 TR-100AD1 7 MVA Current Transformer Test Report	Test Report	4
08	PO Item 10 TR-100AD1 7 MVA General Arrangement with Mark-Up	Drawing	9
09	PO Item 10 TR-100AD1 7 MVA Wiring Diagram with Mark-Up	Drawing	23
10	PO Item 10 TR-100AD1 7 MVA Inspection and Test Plan (ITP)	ITP	21
11	PO Item 10 TR-100AD1 7 MVA FAT Procedure	Procedure	24
12	PO Item 10 TR-100AD1 7 MVA Test Instrument List	List	1
13	Items and ITP points tested with dates	List	1

E – DETTAGLI ED ESITO DELL'ISPEZIONE */ Details and Results of Inspection*

POS. *Item*	BREVE DESCRIZIONE MATERIALE *Material brief description*	Q.TA' ODA *Order Q.ty*	Q.TA' TESTATA *Tested Q.ty*	ACCETTATO *Accepted*	DATA ACCETTAZIONE *Acceptance date*
10	1EQP059 HV Transformer with Oil Transformer 66 / 6.6 kV, 7 MVA, 50 Hz, KNAN, Outdoor-Offshore Type	1	1	**1**	**02-08-2024**

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PROGETTO	CLIENTE	COMMESSA / *Job*	COMMESSA FORNITORE / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	123A90	*522.23 (7 MVA)*
FORNITORE/*Supplier* MF Trasformatori	**No. Ordine**/*P.O. No.* 1723001697 rev.01	**OGGETTO**/ *Object:* POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR	

F – CONCLUSIONI / *Conclusions*

According to Inspection Notification Nr. 02 issued on 22/07/2024, Inspection held at MF Trasformatori premises in Loc. S. Anna 22-24, 25011 Calcinato (BS) - Italy on July 31st to August 02nd, 2024 in order to attend Factory Acceptance Test of one HV Transformer with Oil
In the below section, all the activities carried out are listed:

Activities on Wednesday 31 July 2024
Inspector checked documentation with particular attention to the approval status. (See Applicable Documents section).
All documents are approved with approval status “1 - No Comments – Approved – Work May Proceed” except the FAT Procedure document and Dwg "TR-100AD1 Termination and wiring diagram" which have approval status “2 - Minor Comments - Revise and Resubmit - Work May Be Proceed".
With reference to the positions of the ITP, the following tests were performed as per sequence, on transformer:

- 4.1 Full wave lightning impulse test
- 3.4 Separate source AC voltage withstand test
- 3.14 Measurement for the dissipation factor (tan δ) of the insulation system capacitances
- 3.17 Determination of capacitances winding to earth and between windings
- 3.15 Measurement for the d.c. insulation resistance each winding to earth and between windings
- 3.3 Measurement of winding resistance
- 3.2 Measurement of voltage ratio and vectorial group check
- 3.5 Induced AC voltage test
- 3.6 Measurement of no-load losses and current

Activities on Thursday 01 August 2024
With reference to the positions of the ITP, the following tests were performed as per sequence,

- 4.3 Noise Test
- 4.4 Short circuit withstand test
- 3.16 Measurement for the dissolved gasses in dielectric liquid
- 3.10 Breakdown voltage on insulation oil
- 3.12 Measurement of zero sequence impedance
- 3.8 Leak testing with pressure test (Tightness test) (Begin)
- 3.1 Visual, labeling, dimensional check, and correspondence
- 3.13 Painting check
- 3.9 Functional test on all accessories
- 3.8 Leak testing with pressure test (Tightness test) (End)
- 3.7 Measurement of short circuit impedance and load losses
- 4.2 Temperature rise test (Begin)

L’ INCARICATO / *The person in charge*	**IL RAPP. DEL CLIENTE** / *Client’s Representative*	**IL FORNITORE** / *Supplier*
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QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
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PROGETTO	CLIENTE	COMMESSA / *Job*	COMMESSA FORNITORE / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	123A90	*522.23 (7 MVA)*
FORNITORE/*Supplier* MF Trasformatori	**No. Ordine**/*P.O. No.* 1723001697 rev.01	**OGGETTO**/ *Object:* POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR	

Activities on Friday 02 August 2024

With reference to the positions of the ITP, the following tests were performed as per sequence,

4.2 Temperature rise test (End)

3.11 Check of the ratio and polarity of built-in current transformers

The result of the individual tests is SATISFACTORY as per detail in Pos. B.

In particular, have been checked for the presence of the protective boxes of the HV and MV terminals, complete with thermostat and anti-condensation resistance and the four wheels, currently in the assembly phase at the end of all electrical tests.

Also checked for the presence of the service ladder that will be mounted before shipping.

Note:
The verification of the contacts reported on the terminal board has been done and in particular the General Alarm contacts are in parallel and when closed the General Alarm is activated. Unfortunately, the auxiliary contact of the CP-100E3 panel (AVR Panel) which gives the Ok status of the TAPCON 230 - Expert (Sh. 12 Dwg TR-100AD1 termination and Wiring Diagram) has simply been simulated, since the contact is normally closed and in the opinion of the technician Mr. Landi / MF it is a question of adjustment to be implemented in the field.

During the checks, some minor problems were found on the technical documentation and consequently some Mark-ups were inserted.

All the documents issued during the test were checked and signed by the attendees, the same were scanned and the pdf files are attached to the Report.
The Vendor has undertaken to update them during the As Built phase.

The various testing phases can also be verified on the attached photos

G – PUNTI IRRISOLTI / *Outstanding points*

No technical issue to report. Just documentation to be revised to reflect the “As built” conditions,

H – STATO PACKING LIST / *Packing List Status*	☐ **EMESSO** / *Issued*	☐ **NON EMESSO** / *Not Issued*	DD/MM/YYYY **ULTIMA DATA UTILE** / *Last Date*

PUNCH LIST REPORT: VEDI ALLEGATO N° / *Refer to Attachment n° N/A*

L’ INCARICATO / *The person in charge*	**IL RAPP. DEL CLIENTE** / *Client’s Representative*	**IL FORNITORE** / *Supplier*
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PROGETTO	CLIENTE	COMMESSA / *Job*	COMMESSA FORNITORE / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	123A90	*522.23 (7 MVA)*
FORNITORE/*Supplier* MF Trasformatori	**No. Ordine**/*P.O. No.* 1723001697 rev.01	**OGGETTO**/ *Object:* POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR	

REPORT FOTOGRAFICO (SE PRESENTE) / *Digital Pictures (if any)*

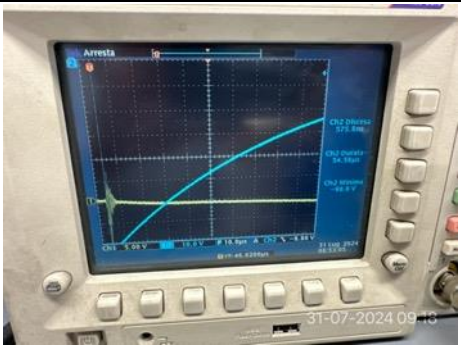
Activities on Wednesday 31 July 2024



01-TR-100AD1- 7 MVA - View from test room during Full wave lightning impulse test



02-TR-100AD1- 7 MVA - Control desk in the Test Room



03-TR-100AD1- 7 MVA - Full wave lightning impulse test



04-TR-100AD1- 7 MVA



05-TR-100AD1- 7 MVA



06-TR-100AD1- 7 MVA - Control box detail

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Activities on Wednesday 31 July 2024



07-TR-100AD1- 7 MVA - Prepared for Separate source AC voltage withstand test



08-TR-100AD1- 7 MVA - Separate source AC voltage withstand test



09-TR-100AD1- 7 MVA - Prepared for Measurement for the dissipation factor (Tan δ) of the insulation system capacitances



10-TR-100AD1- 7 MVA - Measurement for the dissipation factor (Tan δ) of the insulation system capacitances



11-TR-100AD1- 7 MVA - Measurement for the dissipation factor (Tan δ) of the insulation system capacitances



12-TR-100AD1- 7 MVA - Prepared for Measurement for the d.c. insulation resistance each winding to earth and between windings

L' INCARICATO / *The person in charge*	IL RAPP. DEL CLIENTE / *Client's Representative*	IL FORNITORE / *Supplier*
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Activities on Wednesday 31 July 2024



13-TR-100AD1- 7 MVA - Measurement for the d.c. insulation resistance each winding to earth and between windings



14-TR-100AD1- 7 MVA - Measurement for the d.c. insulation resistance each winding to earth and between windings



15-TR-100AD1- 7 MVA - Top view



16-TR-100AD1- 7 MVA - Top view



17-TR-100AD1- 7 MVA - Prepared for Measurement of winding resistance



18-TR-100AD1- 7 MVA - Measurement of winding resistance



19-TR-100AD1- 7 MVA - Measurement of winding resistance



20-TR-100AD1- 7 MVA - Prepared for Voltage ratio and vectorial group check



21-TR-100AD1- 7 MVA - Voltage ratio and vectorial group check

L' INCARICATO / *The person in charge*	IL RAPP. DEL CLIENTE / *Client's Representative*	IL FORNITORE / *Supplier*
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Activities on Wednesday 31 July 2024



22-TR-100AD1- 7 MVA - Voltage ratio and vectorial group check



23-TR-100AD1- 7 MVA - Voltage ratio and vectorial group check



24-TR-100AD1- 7 MVA - Prepared for Induced AC voltage test



25-TR-100AD1- 7 MVA - Induced AC voltage test for 60 seconds



26-TR-100AD1- 7 MVA - Measurement of no-load losses and current

Intentionally void

Activities on Thursday 01 August 2024



01-TR-100AD1- 7 MVA - Prepared for Measurement of zero sequence impedance



02-TR-100AD1- 7 MVA - Measurement of zero sequence impedance



03-TR-100AD1- 7 MVA - Manufacturer and Data Nameplates

L' INCARICATO / *The person in charge*	IL RAPP. DEL CLIENTE / *Client's Representative*	IL FORNITORE / *Supplier*
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PROGETTO	CLIENTE	COMMESSA / *Job*	COMMESSA FORNITORE / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	123A90	*522.23 (7 MVA)*
FORNITORE/*Supplier* MF Trasformatori	**No. Ordine**/*P.O. No.* 1723001697 rev.01	**OGGETTO**/ *Object:* POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR	

Activities on Thursday 01 August 2024



04-TR-100AD1- 7 MVA - Oil and Control Boxes Nameplates



05-TR-100AD1- 7 MVA - Oil sample collection for Measurement for the dissolved gasses in dielectric liquid



06-TR-100AD1- 7 MVA - Oil sample collection for Breakdown voltage on insulation oil



07-TR-100AD1 - 7 MVA - Leak testing with pressure - Begin at 0 bar (0,2 bar)



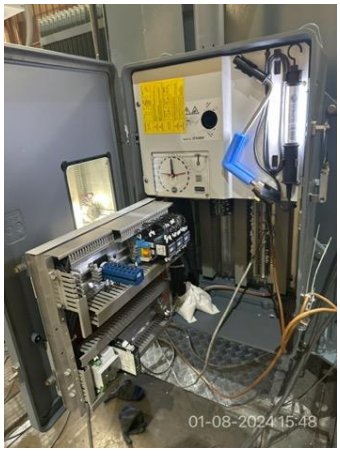
08-TR-100AD1 - 7 MVA - Leak testing with pressure - Begin at + 0,3 bar (0,5 bar)



09-TR-100AD1 - 7 MVA - Auxiliary panel - Protection device - CP-100E4, internal view



10-TR-100AD1 - 7 MVA - AVR control panel - CP-100E3 internal view



11-TR-100AD1 - 7 MVA - Motor Drive Unit (MDU) - OLTC Panel - CP-100E2



12-TR-100AD1 - 7 MVA - Buchholz Relay

L' INCARICATO / *The person in charge*	IL RAPP. DEL CLIENTE / *Client's Representative*	IL FORNITORE / *Supplier*
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Activities on Thursday 01 August 2024



13-TR-100AD1 - 7 MVA - Painting Color Check



14-TR-100AD1 - 7 MVA - Painting Check, Calibration of Instrument for thickness check



15-TR-100AD1 - 7 MVA - Painting Color Check



16-TR-100AD1 - 7 MVA - Painting Color Check



17-TR-100AD1 - 7 MVA - Painting Color Check



18-TR-100AD1 - 7 MVA - Painting Color Check



19-TR-100AD1 - 7 MVA - Painting Color Check



20-TR-100AD1 - 7 MVA - Painting Color Check



21-TR-100AD1 - 7 MVA - Painting Color Check

L' INCARICATO / *The person in charge*	IL RAPP. DEL CLIENTE / *Client's Representative*	IL FORNITORE / *Supplier*
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PROGETTO	CLIENTE	COMMESSA / *Job*	COMMESSA FORNITORE / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	123A90	*522.23 (7 MVA)*
FORNITORE/*Supplier* MF Trasformatori	**No. Ordine**/*P.O. No.* 1723001697 rev.01	**OGGETTO**/ *Object:* POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR	

Activities on Thursday 01 August 2024

		
22-TR-100AD1 - 7 MVA - Painting Color Check	23-TR-100AD1 - 7 MVA - Leak testing with pressure - End at + 0,3 bar (0,5 bar)	24-TR-100AD1 - 7 MVA - Measurement of short circuit impedance and load losses
		Intentionally void
25-TR-100AD1 - 7 MVA - Prepared for Temperature Rise Test	26-TR-100AD1 - 7 MVA - Temperature Rise Test (Begin)	

Activities on Friday 02 August 2024

		
01-TR -100AD1 - 7 MVA - In preparation for shipping	02-TR -100AD1 - 7 MVA - In preparation for shipping with ladder	03-TR -100AD1 - 7 MVA - No. 4 Wheels

L' INCARICATO / *The person in charge*	**IL RAPP. DEL CLIENTE** / *Client's Representative*	**IL FORNITORE** / *Supplier*
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PROGETTO	CLIENTE	COMMESSA / *Job*	COMMESSA FORNITORE / *Job Vendor*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	123A90	*522.23 (7 MVA)*
FORNITORE/*Supplier* MF Trasformatori	**No. Ordine**/*P.O. No.* 1723001697 rev.01	**OGGETTO**/ *Object:* POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR	

Activities on Friday 02 August 2024



04-TR -100AD1 7 MVA - Protection boxes



05-TR -100AD1 7 MVA - HV 6.6 kV Protection boxes wit current transformer, thermostat and heating element



06-TR -100AD1 7 MVA - HV 66 kV Protection boxes wit thermostat and heating element



07-TR -100AD1 7 MVA - Thermostat and heating element, detail



08-TR -100AD1 7 MVA - Current Transformers in HV 6.6 kV protection box, detail



09-TR -100AD1 7 MVA - Current Transformers - Data nameplates

L' INCARICATO / *The person in charge*	IL RAPP. DEL CLIENTE / *Client's Representative*	IL FORNITORE / *Supplier*
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Section 13 MECHANICAL COMPLETION CHANGES / MARK-UPS

NOT APPLICABLE