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Customer:	Statron	
Project:	Shell Crosswind BESS FQ 1MW 5MWh Offshore	
Type:	BESS MSC-1000-620-8	
Product	CONVERTER CONTAINER	
Circuit diagram No:	10354_23A2007	20241105_V1.2

Producer (company):	Freqcon GmbH	53396
Project:	Shell Crosswind BESS FQ 1MW 5MWh Offshore	CT_Ausbau_1 53457 CT_Ausbau_2 53765
Type:	BESS MSC-1000-620-8	CONV 53399
Project manager:	Freqcon_CP	

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&EMZ ++CONV +CIR		Terminals Converter Circuit Breaker cabinet		
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&EMZ ++CT +CTRL_1.3		Terminals Control cabinets Control cabinet 1 Main mounting plate		
	2005	Klemmenplan =UNIT_01++CT+CTRL_1.3-X3.11	05.11.2024	Freqcon_DG
	2006	Klemmenplan =UNIT_01++CT+CTRL_1.3-X3.12	05.11.2024	Freqcon_DG
	2007	Klemmenplan =UNIT_01++CT+CTRL_1.3-X3.13	05.11.2024	Freqcon_DG
	2008	Klemmenplan =UNIT_01++CT+CTRL_1.3-X5	05.11.2024	Freqcon_DG
	2009	Klemmenplan =UNIT_01++CT+CTRL_1.3-X5	05.11.2024	Freqcon_DG
	2010	Klemmenplan =UNIT_01++CT+CTRL_1.3-X5.1	05.11.2024	Freqcon_DG
	2011	Klemmenplan =UNIT_01++CT+CTRL_1.3-150X1	05.11.2024	Freqcon_DG
	2012	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC1	05.11.2024	Freqcon_DG
	2013	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC1	05.11.2024	Freqcon_DG
	2014	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC2	05.11.2024	Freqcon_DG
	2015	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC2	05.11.2024	Freqcon_DG
	2016	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC2	05.11.2024	Freqcon_DG
	2017	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC3	05.11.2024	Freqcon_DG
	2018	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC4	05.11.2024	Freqcon_DG
	2019	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC5.1	05.11.2024	Freqcon_DG
	2020	Klemmenplan =UNIT_01++CT+CTRL_1.3-XDC5.2	05.11.2024	Freqcon_DG
	2021	Klemmenplan =UNIT_01++CT+CTRL_1.3-XE	05.11.2024	Freqcon_DG
	2022	Klemmenplan =UNIT_01++CT+CTRL_1.3-XT	05.11.2024	Freqcon_DG
	2023	Klemmenplan =UNIT_01++CT+CTRL_1.3-XT	05.11.2024	Freqcon_DG
	2024	Klemmenplan =UNIT_01++CT+CTRL_1.3-190XT1	05.11.2024	Freqcon_DG
	2025	Klemmenplan =UNIT_01++CT+CTRL_1.3-191XT1	05.11.2024	Freqcon_DG
	2026	Klemmenplan =UNIT_01++CT+CTRL_1.3-XV	05.11.2024	Freqcon_DG
	2027	Klemmenplan =UNIT_01++CT+CTRL_1.3-XV	05.11.2024	Freqcon_DG
&EMZ ++CT +CTRL_1.4		Terminals Control cabinets Control cabinet 1 Right side		
	1000	Klemmenleistenübersicht : =UNIT_01++CT+CTRL_1.4-350X1.21 - =UNIT_01++CT+CTRL_1.4-XV.20	05.11.2024	Freqcon_DG
	2000	Klemmenplan =UNIT_01++CT+CTRL_1.4-350X1.21	05.11.2024	Freqcon_DG

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next page: 14

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FREQCON_INHALT_04_de_en

Assignment	Page	Page description	Date	Edited by
&EMZ ++CT +CTRL_1.4		Terminals Control cabinets Control cabinet 1 Right side		
	2001	Klemmenplan =UNIT_01++CT+CTRL_1.4-350X1.21	05.11.2024	Freqcon_DG
	2002	Klemmenplan =UNIT_01++CT+CTRL_1.4-XE2	05.11.2024	Freqcon_DG
	2003	Klemmenplan =UNIT_01++CT+CTRL_1.4-XV.20	05.11.2024	Freqcon_DG
	2004	Klemmenplan =UNIT_01++CT+CTRL_1.4-XV.20	05.11.2024	Freqcon_DG
&EMZ ++CT +CTRL_2.1		Terminals Control cabinets Control cabinet 2 Cabinet door		
	1000	Klemmenleistenübersicht : =UNIT_01++CT+CTRL_2.1-149X1 - =UNIT_01++CT+CTRL_2.1-149X1	05.11.2024	Freqcon_DG
	2000	Klemmenplan =UNIT_01++CT+CTRL_2.1-149X1	05.11.2024	Freqcon_DG
&EMZ ++FAN		Terminals FAN		
	1000	Klemmenleistenübersicht : =UNIT_01++FAN+-52G1-181X1 - =UNIT_01++FAN+-52G1-181X3	05.11.2024	Freqcon_DG
	2000	Klemmenplan =UNIT_01++FAN+-52G1-181X1	05.11.2024	Freqcon_DG
	2001	Klemmenplan =UNIT_01++FAN+-52G1-181X3	05.11.2024	Freqcon_DG

SPECIFICATION

TERMINAL STRIP

-XE1	MAIN POWER SUPPLY 600V AC
-XE2	DC POWER SUPPLY 1000V DC
-XE	MAIN POWER SUPPLY 400V AC
-X1	MAIN POWER 400V/230V AC
-X2	LIGHT CABINET 230V AC
-X3	CONTROL VOLTAGE 24V DC
-14X1	CONTROL VOLTAGE 24V DC (TO DC CONTACTORS)
-X5	LOW-VOLTAGE SIGNALS
-XDC0	24V DC POWER SUPPLY
-XDC1-4	CONTROL VOLTAGE 24V DC (UPS)
-XT	TRANSFER TERMINAL BLOCK 24V DC / 230V AC

WIRING COLOR

L1 / L2 / L3	=	BLACK
N	=	LIGHT BLUE (IEC) / GREY (UL)
PE	=	YELLOW-GREEN
EXTERNAL VOLTAGE	=	ORANGE
CONTROL VOLTAGE 24 V DC	=	DARK BLUE
ANALOG SIGNALS	=	WHITE

PLACE

+CTRL	=	Control cabinet
+CON	=	Converter cabinet
+IND	=	Inductor cabinet
+CIR	=	Circuit breaker cabinet
+COSY	=	Cooling System
+FAN	=	External fan

previous page: &EAB/14

next page: 6a

SPECIFICATION of grounding

	from frame to			
1	**roof & side walls & doors**	**EVD_1**	**Flachband**	**2x25 mm²**
2	**frame**	**EVD_2**	**Flachband**	**2x25 mm²**
3	**base**	**EVD_3**	**Flachband**	**2x25 mm²**
4	**Mounting plate & partitions**	**EVD_4**	**H07-V-K**	**2x25 mm²**
5	**inductors**	**EVD_5**	**H07-V-k**	**2x25 mm²**
6	**Powerstack**	**EVD_6**	**H07-V-K**	**2x25 mm²**
7	**DC Switch & Fuse**	**EVD_7**	**H07-V-K**	**2x25 mm²**
8	**AC Filter**	**EVD_8**	**H07-V-K**	**2x25 mm²**
9	**circuit-breaker**	**EVD_9**	**H07-V-K**	**2x25 mm²**
10	**Freqcon_Fast_Disconektor**	**EVD_10**	**H07-V-K**	**2x25 mm²**
11	**Freqcon_Rectifier_Modul**	**EVD_11**	**H07-V-K**	**2x25 mm²**
12	**capacitor banks**	**EVD_12**	**H07-V-K**	**2x25 mm²**
13	**water distributor**	**EVD_13**	**H07-V-K**	**2x25 mm²**
14	**SPARE**	**EVD_14**	**H07-V-K**	**2x25 mm²**
15	**SPARE**	**EVD_15**	**H07-V-K**	**2x25 mm²**
16	**SPARE**	**EVD_16**	**H07-V-K**	**2x25 mm²**
17	**SPARE**	**EVD_17**	**H07-V-K**	**2x25 mm²**
18	**SPARE**	**EVD_18**	**H07-V-K**	**2x25 mm²**
	from door to			
19	**PROFINET IRT IGBT Interface**	**EVD_19**	**H07-V-K**	**1,5 mm²**
20	**HMI**	**EVD_20**	**H07-V-K**	**1,5 mm²**
21	**SPARE**	**EVD_21**	**H07-V-K**	**??? mm²**
22	**SPARE**	**EVD_22**	**H07-V-K**	**??? mm²**

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next page: &EFA/1a

Editor	Freqcon_JD			Statron	FREQCON	Specification Earthing	20241105_V1.2	= UNIT_01	Converter Container 1
Date	14.06.2024	Norm						& EAC	Explanatory documents
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++	page: 6a
Date								+	total: 498

Single line diagram

=UNIT_01++TRA

=UNIT_01++CONV

+AC_DC

+CIR

+IND

+CON

+IND

+CIR

+AC_DC

medium voltage transformer
-18T1
&EFS++TRA/18.2
1,25MVA
6,6kV/0,62 kV AC

Gehäuse Erdung

V1_L1 V1_L2 V1_L3

-78W1 - 78W3
GRID L1 -L3
&EFS++CONV/78.1

NSGAFöu 3x4x50mm²

3WL1112-2BB36-1BJ2-Z
A08+H07+M06+M21+R10

-80Q1
max.
1250 A
&EFS++CONV/80.0

-83U1
Filter Caps 3*600µF
Overvoltage protect
&EFS++CONV/83.2

PT100
201L1 - 203L1
Inductor
1*1000A
0,2mH
&EFS++CONV/201.1

PIII 1_1
-
PIII_1_3
201Q1 - 203Q1
1000A Stack x 3
AC
DC

V1_DC+ V1_DC-
UDC +
UDC N
UDC -

PIII 2_1
-
PIII_2_3
-211Q1
3X250A Stack
DC DC DC DC DC

PT100
-211L1
&EFS++CONV/211.1
0,6mH
3*250A

V3_L2 V3_L3 -231U1 VA_182
&EFS++CONV/231.0
DC Switch & Fuse 3*250A
Filter Caps 3*340µF
-K1 -F1 1500V 300A 1250V 400A
-K7 -F2
-K2 -F5
-K8 -F6
-K3 -F9
-K9 -F10
-C1 -C7 -C13 340µF
V3_L1 VA_186 VA_184

NSGAFöu 6x1x50mm²

-224W10 DC 1.4 + Pos.
-224W11 DC 1.4 - Pos.
-224W12 DC 1.5 + Pos.
-224W13 DC 1.5 - Pos.
-224W14 DC 1.6 + Pos.
-224W15 DC 1.6 - Pos.

HELUTHERM 2x1x70mm²

=UNIT_02++
BAT 1-3
BAT 4-5
BAT 6-8
LFP Battery Modul

V3_DC- V3_Ub -227U1 VA_188
&EFS++CONV/227.0
DC Switch & Fuse 3*250A
Filter Caps 3*340µF
-K1 -F1 1500V 300A 1250V 400A
-K7 -F2
-K2 -F5
-K8 -F6
-K3 -F9
-K9 -F10
-C1 -C7 -C13 340µF
V3_DC+ VA_192 VA_190

-231W10 DC 2.1 + Pos.
-231W11 DC 2.1 - Pos.
-231W12 DC 2.2 + Pos.
-231W13 DC 2.2 - Pos.
-231W14 DC 2.3 + Pos.
-231W15 DC 2.3 - Pos.

BAT 9-11
BAT 1-3
=UNIT_03++

PIII 3_1
-
PIII_3_3
-207Q1
3X250A Stack

PT100
-207L1
&EFS++CONV/207.1
0,6mH
3*250A

V4_L1 V4_L3 -237U1 V4_L2
&EFS++CONV/237.0
DC Switch & Fuse 3*250A
Filter Caps 3*340µF
-K1 -F1 1500V 300A 1250V 400A
-K7 -F2
-K2 -F5
-K8 -F6
-K3 -F9
-K9 -F10
-C1 -C7 -C13 340µF
V4_DC+ V4_DC- V4_Ub

-237W10 DC 2.4 + Pos.
-237W11 DC 2.4 - Pos.
-237W12 DC 2.5 + Pos.
-237W13 DC 2.5 - Pos.
-237W14 DC 2.6 + Pos.
-237W15 DC 2.6 - Pos.

BAT 4-6
BAT 7-8
BAT 9-11

PIII 4_1
-
PIII_4_3
-217Q1
3X250A Stack

PT100
-217L1
&EFS++CONV/217.1
0,6mH
3*250A

N
78W4:N
&EFS++CONV/78.3
PEN
78W5:PE
&EFS++CONV/78.2

UDC_LINK_+ 2a.2 /
UDC_LINK_N 2a.5 /
UDC_LINK_- 2a.2 /

previous page: &EAC/6a
next page: 2a

Editor	Freqcon_JD			Statron	FREQCON	SYSTEMS OVERVIEW	20241105_V1.2
Date	18.06.2024	Norm		Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007
Proved by							
Date							

=	UNIT_01	Converter Container 1
&	EFA	Single line diagram
++		page: 1a
+		total: 498

Single line diagram

Control circuit

++CONV

++CT
+CTRL_1

CTRL

UDC_LINK_+ / 1a.4

UDC_LINK_- / 1a.4

UDC_LINK_N / 1a.4

+4

-173F2 &EFS++CT/173.2 10A

-173F3 &EFS++CT/173.4 1A

-173K2 1500V 30A DC

-173R3 500 Ohm 150 W

-173R4 500 Ohm 150 W

-173K1 1500V 30A DC

-173R1 500 Ohm 150 W

-173R2 500 Ohm 150 W

V1_DC-

V1_DC+

+4

V1_L1 V1_L2 V1_L3

-85U1 &EFS++CT/85.6 L1 L2 L3 DC+ DC-

-171F1 &EFS++CT/171.2 10A

-171K1 &EFS++CT/171.7 1500V 50A DC

-171K2 &EFS++CT/171.8 1500V 50A DC

-171R1 &EFS++CT/171.1 15 Ohm 300W

-171R2 &EFS++CT/171.2 15 Ohm 300W

Grid 400V
inc. overvotage fuse
& Fuse ??A(20A)

+3
Main mounting plate

1-6
-XE
1

-84F2

>+
CTRL_1.1
-84Q1

AC L1,L2,L3

101T1 &EFS++CT/101.2

24V DC supply unit

102G1 &EFS++CT/102.2
24V DC UPS

+24VDC GND

+ 24V DC
24V GND

-102G2 &EFS++CT/102.6 Battery

-103F1 - 103F4 &EFS++CT/103.2 F2, 10A 60VDC

-103F5 &EFS++CT/103.9 F2, 10A 60VDC

-186K1 &EFS++CT/186.6

-186B1 &EFS++CT/186.6

24V Supply
Main PLC
ET200SP

+24V DC
for Control Cabinet

24V GND

Precharge
Resistors

400V AC
Control Cabinet

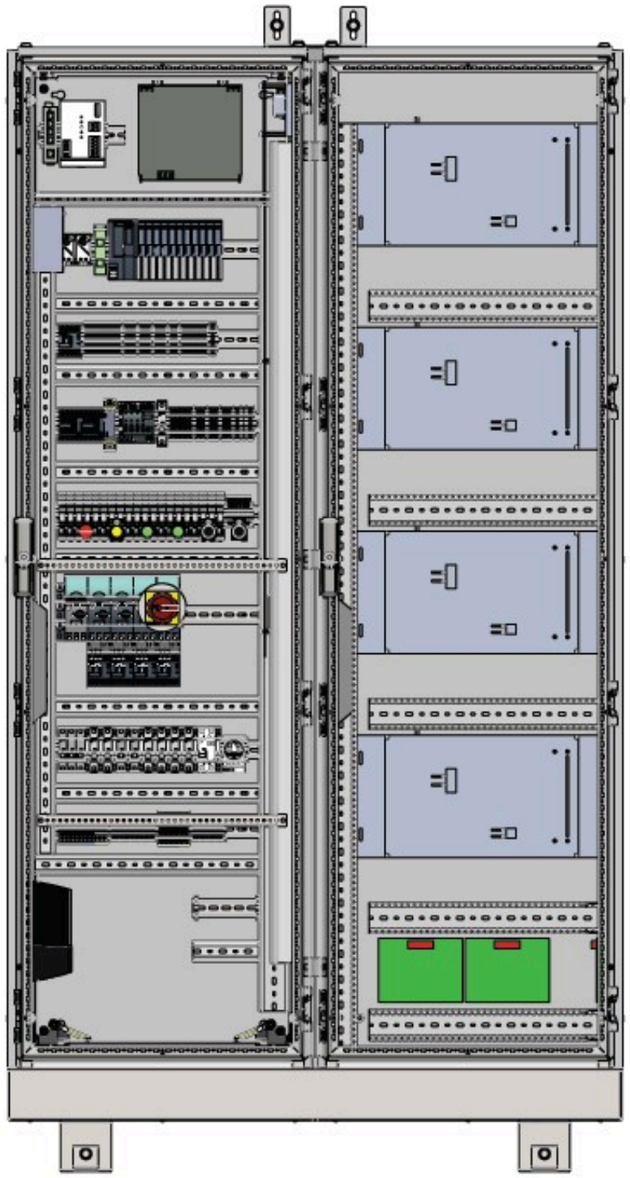
Thermostat
for start PLC

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next page: &ELU/5a

Editor	Freqcon_JD			Statron	FREQCON	SYSTEMS OVERVIEW	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024	Norm						& EFA Single line diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++	page: 2a
Date								+	total: 498

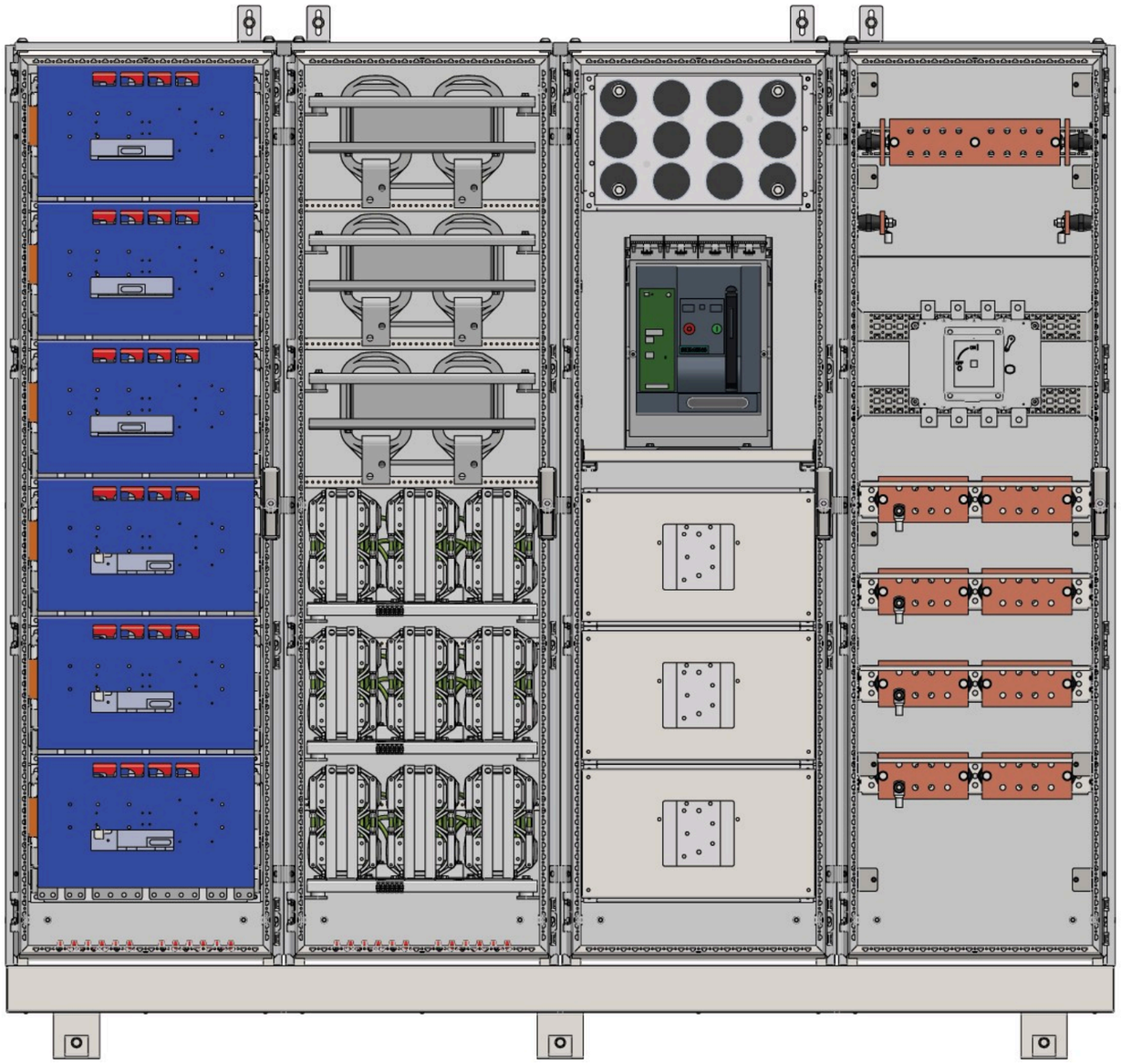
0	1	2	3	4	5	6	7	8	9



+CTRL_1
Control cabinet 1

+CTRL_2
Control cabinet 2

++CT Control cabinets



+CON
Converter cabinet

+IND
Inductor cabinet

+CIR
Circuit Breaker cabinet

+AC_DC
AC and DC connection cabinet

++CONV Converter



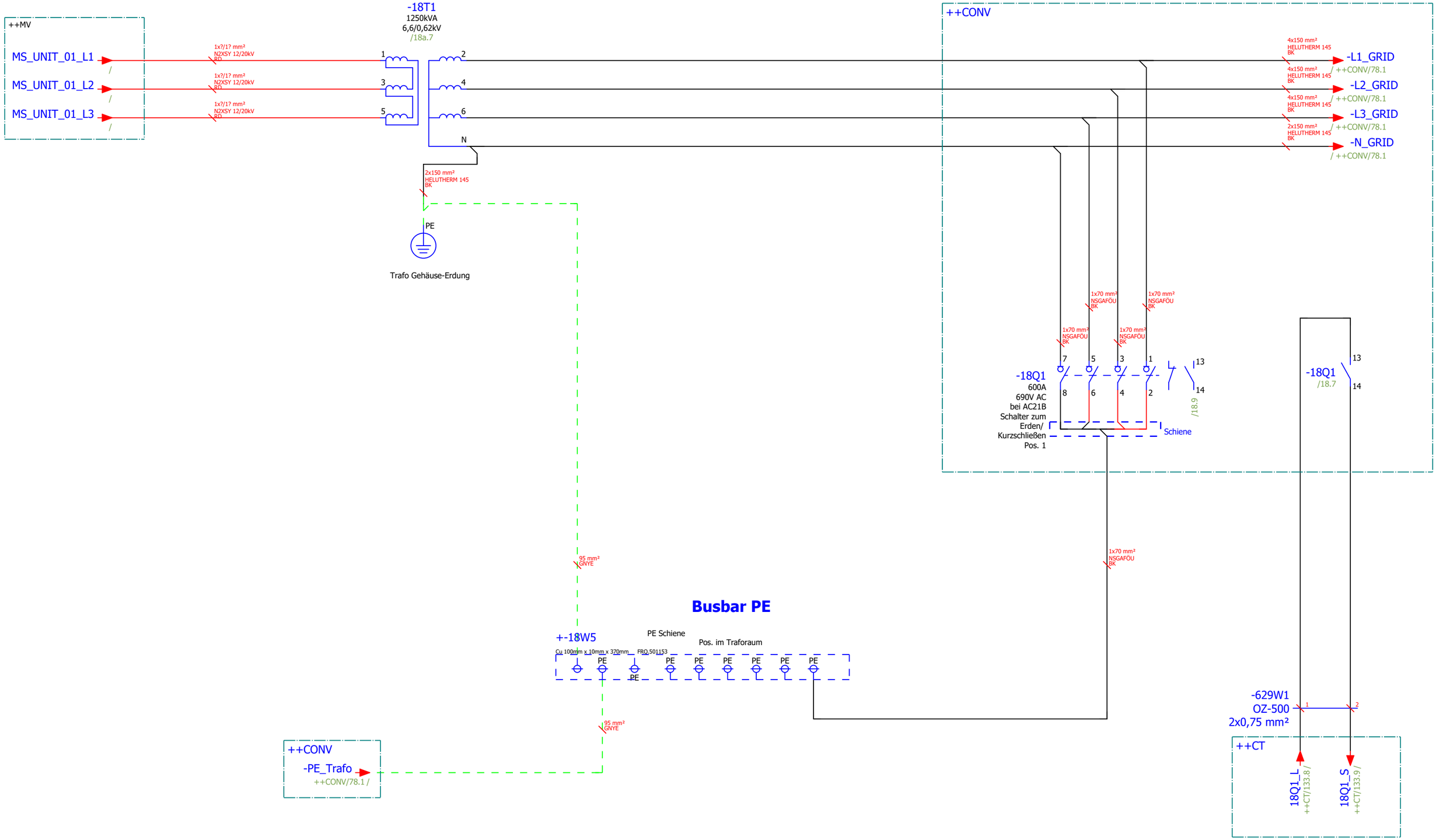


++FAN
FAN

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&EFA/2a

next page:
&EFS++TRA/18

Editor	Freqcon_DG			Statron	FREQCON	CABINETS OVERVIEW	20241105_V1.2	= UNIT_01	Converter Container 1
Date	05.11.2024	Norm						& ELU	Cabinet Overview
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++	page: 5a
Date								+	total: 498



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&ELU++/5a

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18a

Editor	Freqcon_DG			Statron	FREQCON	MV-TRANSFORMER UNIT_01+02	20241105_V1.2	= UNIT_01 Converter Container 1
Date	05.11.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ TRA medium voltage transformer page: 18
Date								+ total: 498

++CT
+CTRL_1.2
-18B1
PWR07
Trafo-
Temperaturüberwachung
Pos: in Tür +ASC

SUPPLY
24-240V AC DC

ALARM

FAULT

FAN

PT100 SENSORS

CH 1

CH 2

CH 3

CH 4

40 41 42 4 5 6 7 8 9 1 2 3 4 5 6 13 14 15 16 17 18 19 20 21 22 23 24

0,75 mm² RT

-18W2
JZ-500
8G1,5 mm²

1 GNYE 2 3 4 5 6

-18W1
F-CY-OZ (LiY-CY)
10x1,5 mm²
500V
geschirmt

1 2 3 4 5 6 7 8 9

-18T1
/18.2

3x PT100 Fühler in NS-Wicklung Trafo

CH 3 CH 2 CH 1

3 2 1 3 2 1 3 2 1

++CT

-1L+3 ++CT/103.2/
-1PE5 ++CT/103.4/
-1M6 ++CT/103.3/
-PreAlarm ++CT/133.0/
-Trip ++CT/133.0/
-Fault ++CT/133.0/
-Fan ++CT/133.0/

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next page:
++CONV/78

Editor	Freqcon_DG			Statron	FREQCON	TEMPERATURE TRANSFORMER UNIT_01+02	20241105_V1.2	= UNIT_01	Converter Container 1
Date	05.11.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ TRA	medium voltage transformer
Date								+	

page: 18a
total: 498

Grid Busbars L1, L2, L3

++TRA

-L1_GRID ++TRA/18.9 /
-L2_GRID ++TRA/18.9 /
-L3_GRID ++TRA/18.9 /

+AC_DC-78W1 GRID L1 Pos. 1/ Links
Cu 100mm x 10mm x 370mm FRQ.52163 &EFA++/1a.0
+AC_DC-78W2 GRID L2 Pos. 1/ Mitte
Cu 100mm x 10mm x 370mm FRQ.52163
+AC_DC-78W3 GRID L3 Pos. 1/ Rechts
Cu 100mm x 10mm x 370mm FRQ.52163

4x50 mm² NSGAFöu BK → -L1CON1 / 80.0
4x50 mm² NSGAFöu BK → -L2CON1 / 80.0
4x50 mm² NSGAFöu BK → -L3CON1 / 80.0

25 mm² NSGAFöu BK

+AC_DC -78F1 690Vac 100A gL/gG NH00 /78.8
1 3 5 13 21 / 2 4 6 14 22

-1F2 / ++CT/127.4
F3 / 238b.9

-238W7 OZ-500 2x0,75 mm² /238a.2
0,75 mm² BU
+AC_DC -X3.43 20 19
-78W7 OZ-500 2x0,75 mm²
+AC_DC -78F1 /78.6 13 14

+AC_DC -78F2 Typ 1 + Typ 2 400/690 V~ L1 L2 L3 PE PE
+AC_DC -78F3 20A, aR 1 3 5 / 2 4 6
-78W6 OZ-600 3x2,5 mm² 0,6kV/1kV 1 2 3

-CHA_L1 ++CT/85.1 /
-CHA_L2 ++CT/85.1 /
-CHA_L3 ++CT/85.1 /

35 mm² GNYE

Busbars N

-N_GRID ++TRA/18.9 /

+AC_DC-78W4 GRID N &EFA++/1a.1 Pos. unten Links
Cu 50mm x 10mm x 370mm FRQ.50622
2x50 mm² NSGAFöu BK → GRID_N / 99.5

16 mm² NSGA Föu BK
-AC_F_N.1 83.3 /
-AC_F_N.2 83.3 /
-AC_F_N.3 83.3 /

Busbars PE

Einspeisung_IEC_Seite 78
Einbauort_Sicherung in Connection cabinet

+AC_DC-78W5 GRID PE &EFA++/1a.1 Pos. unten rechts
Cu 100mm x 10mm x 370mm FRQ.50070

-PE_Trafo ++TRA/18.2 /

PE PE PE PE PE PE PE PE PE PE PE PE PE PE

95 mm² GNYE
35 mm² GNYE

PE_2_1 238a.1 /
PE_2_2 238a.4 /
PE_2_3 238a.8 /
PE_3_1 228.1 /
PE_3_2 228.4 /
PE_3_3 228.8 /
PE_4_1 238b.1 /
PE_4_2 238b.4 /
PE_4_3 238b.8 /

=UNIT_02 PE_BAT_CONV_1 =UNIT_02++Container/278.5 /
=UNIT_03 PE_BAT_CONV_2 =UNIT_03++Container/278.5 /

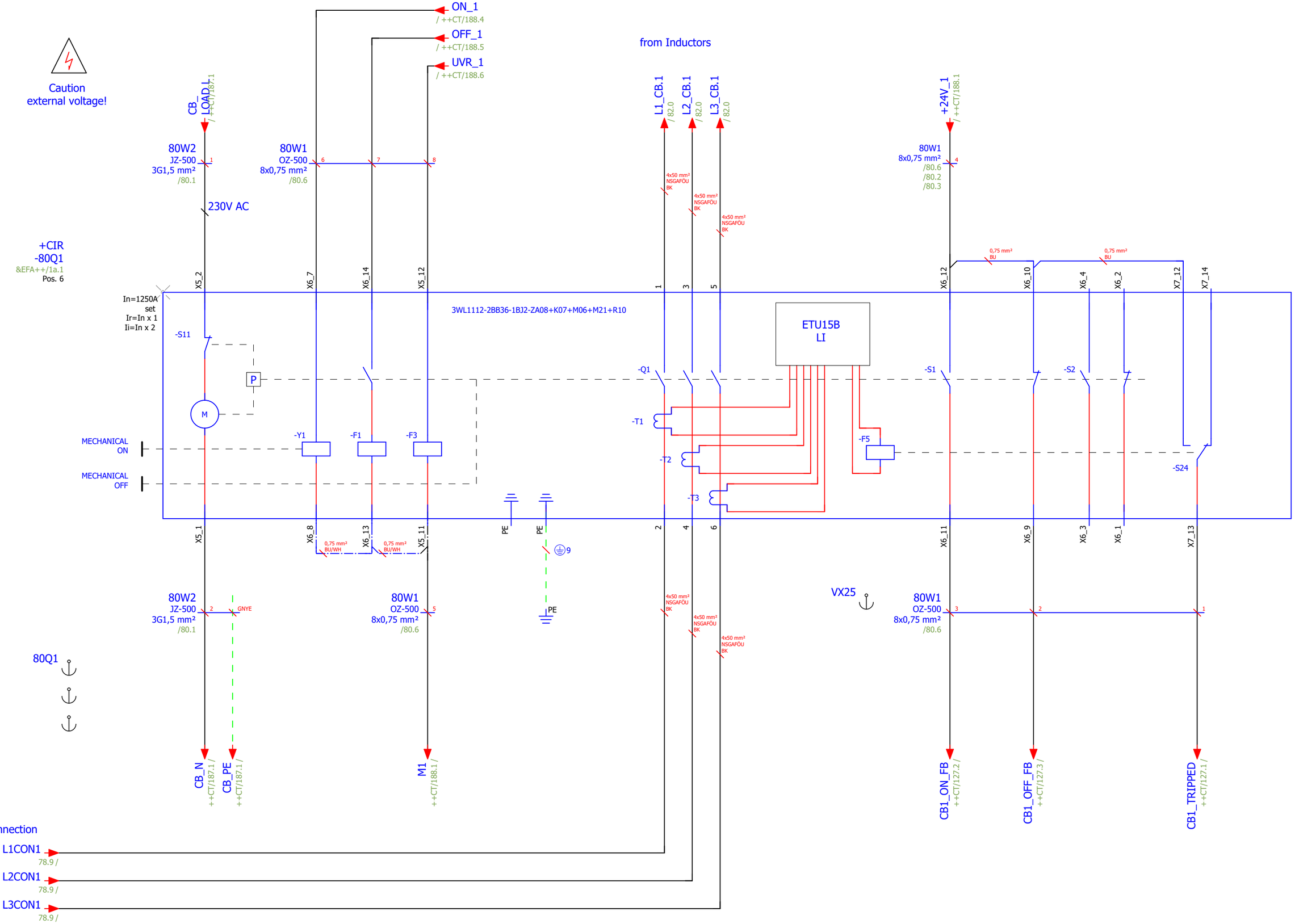
PE Container
PE Cabinet base frame front side
PE Cabinet base frame back side

400V TYP 1

previous page: ++TRA/18a
next page: 80

Editor	Freqcon_JD			Statron	FREQCON	GRID CONNECTION	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV	Converter
Date								+	

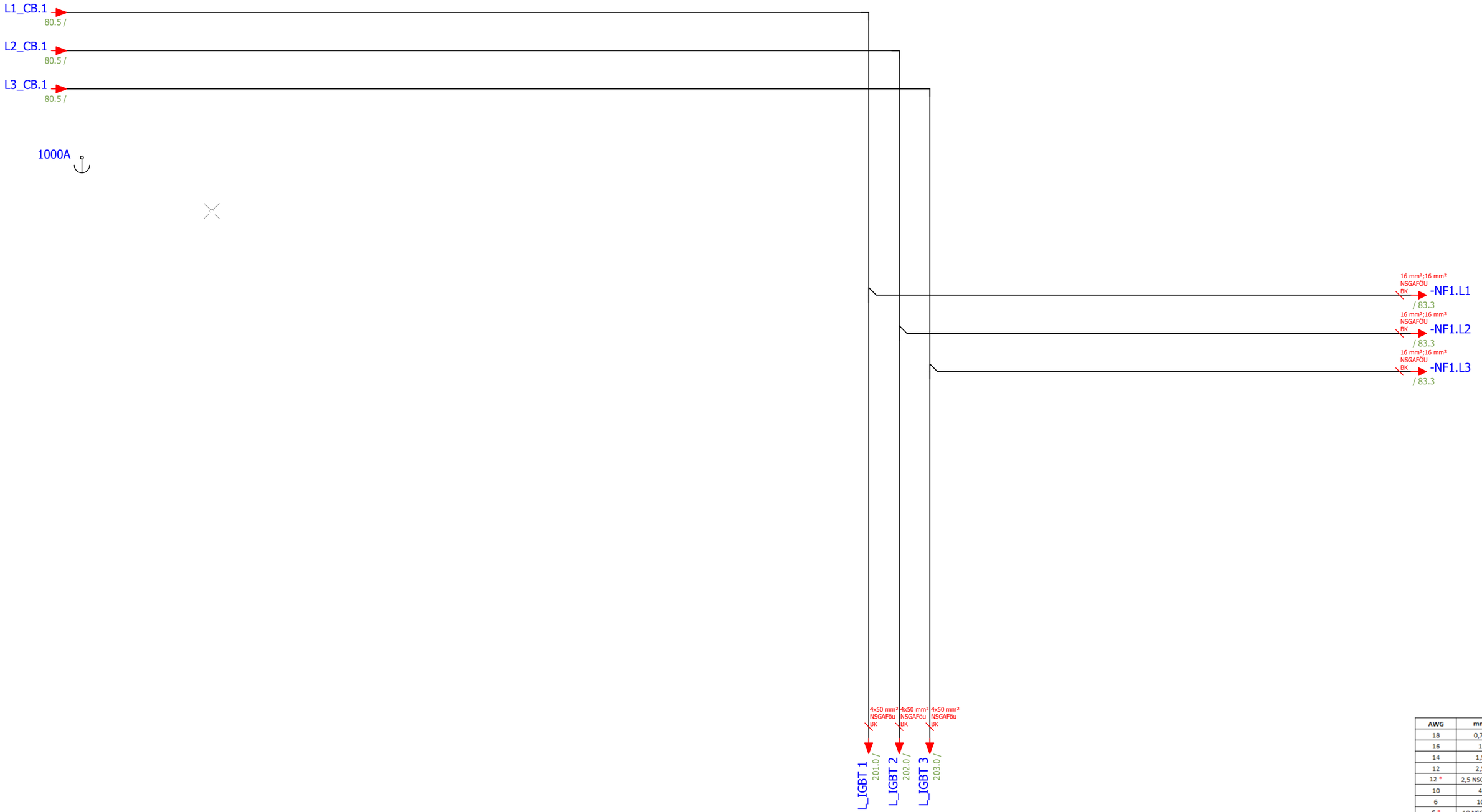
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total: 498



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Editor	Freqcon_JD			Statron		BG CIRCUIT BREAKER 1000A AC GRID	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter	page: 80
Date								+	total: 498



AWG	mm²
18	0,75
16	1
14	1,5
12	2,5
12 *	2,5 NSGAFÖu
10	4
6	10
6 *	10 NSGAFÖu
4	16
2	25
2 *	16 NSGAFÖu
1	35
250 kcmil	95 ALU
2x2	1x70 NSGAFÖu
2x4	2x70 NSGAFÖu
4x250 kcmil	4x70 NSGAFÖu
6x250 kcmil	6x70 NSGAFÖu

*cable into seperate UL protective tube

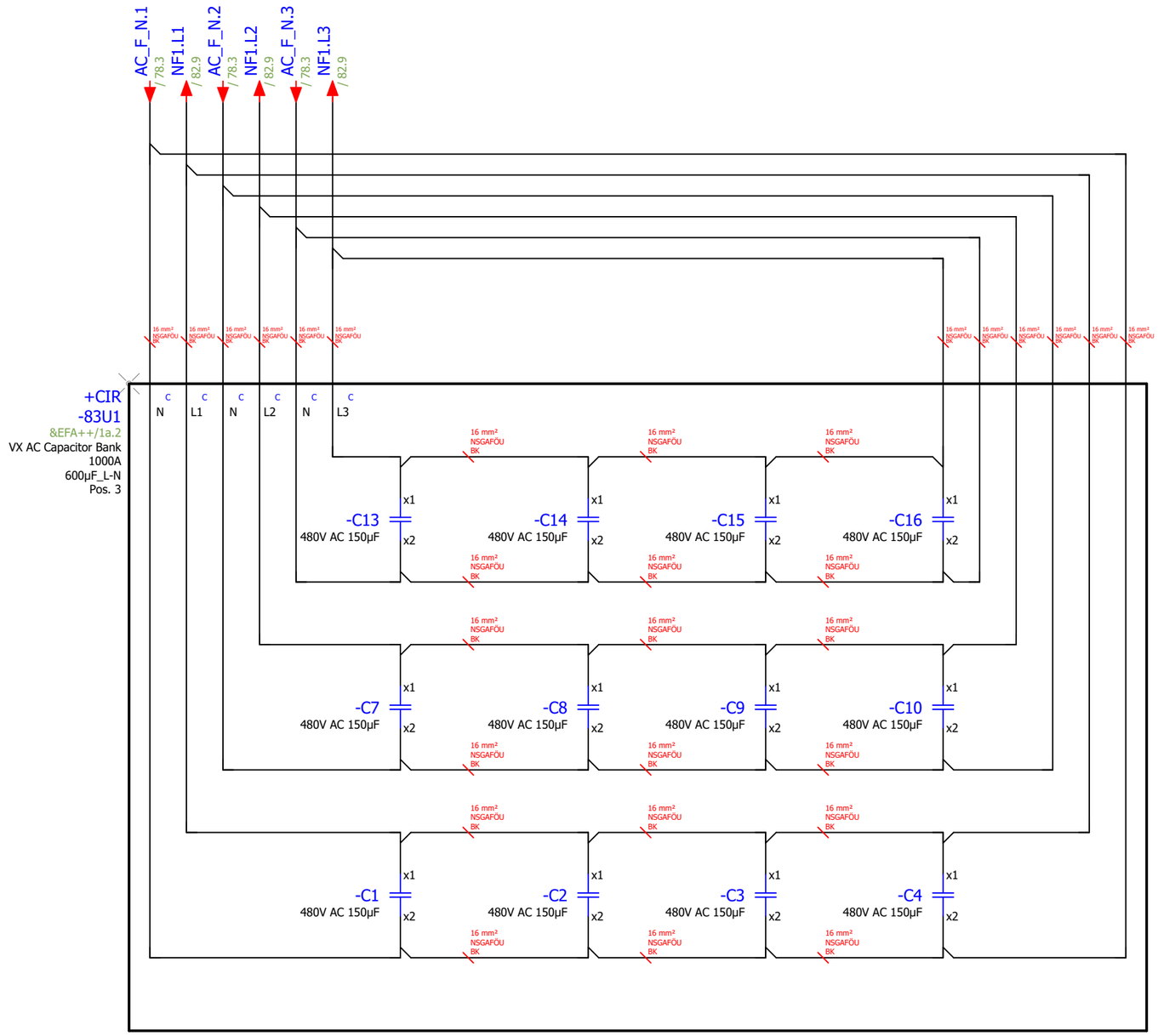
previous page:
80

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83

Editor	Freqcon_JD			Statron	FREQCON	PI INDUCTORS GRID SIDE	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV	Converter	page: 82
Date								+		total: 498

to polarity bar

behind main breaker



AWG	mm²
18	0,75
16	1
14	1,5
12	2,5
12 *	2,5 NSGAFöu
10	4
6	10
6 *	10 NSGAFöu
4	16
2	25
2 *	16 NSGAFöu
1	35
250 kcmil	95 ALU
2x2	1x70 NSGAFöu
2x4	2x70 NSGAFöu
4x250 kcmil	4x70 NSGAFöu
6x250 kcmil	6x70 NSGAFöu

*cable into seperate UL protective tube

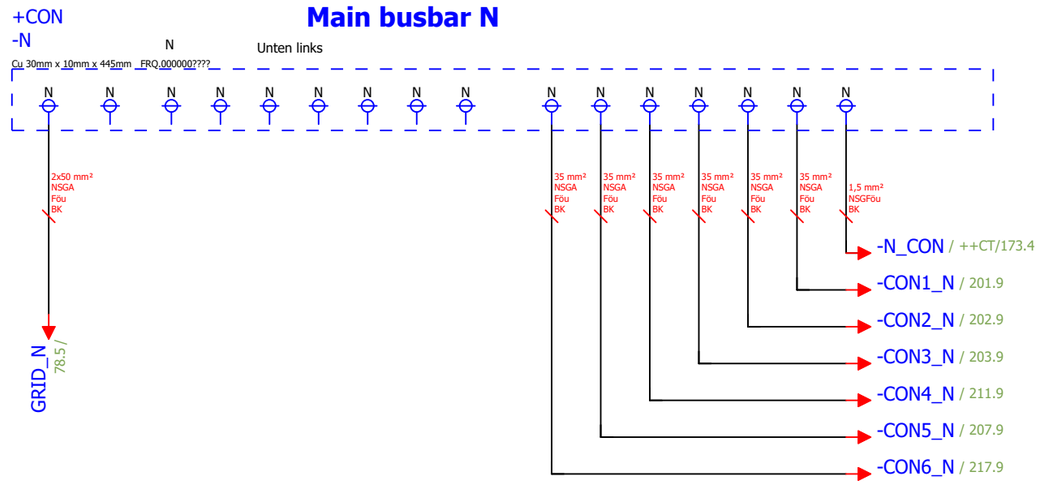
83U1

previous page: 82

next page: 99

Editor	Freqcon_JD			Statron	FREQCON	GRID AC FILTER 3* 600 µF + OVERVOLTAGE PROTECTOR	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter page: 83
Date								+ total: 498

in converter cabinet



1000A

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next page: 200

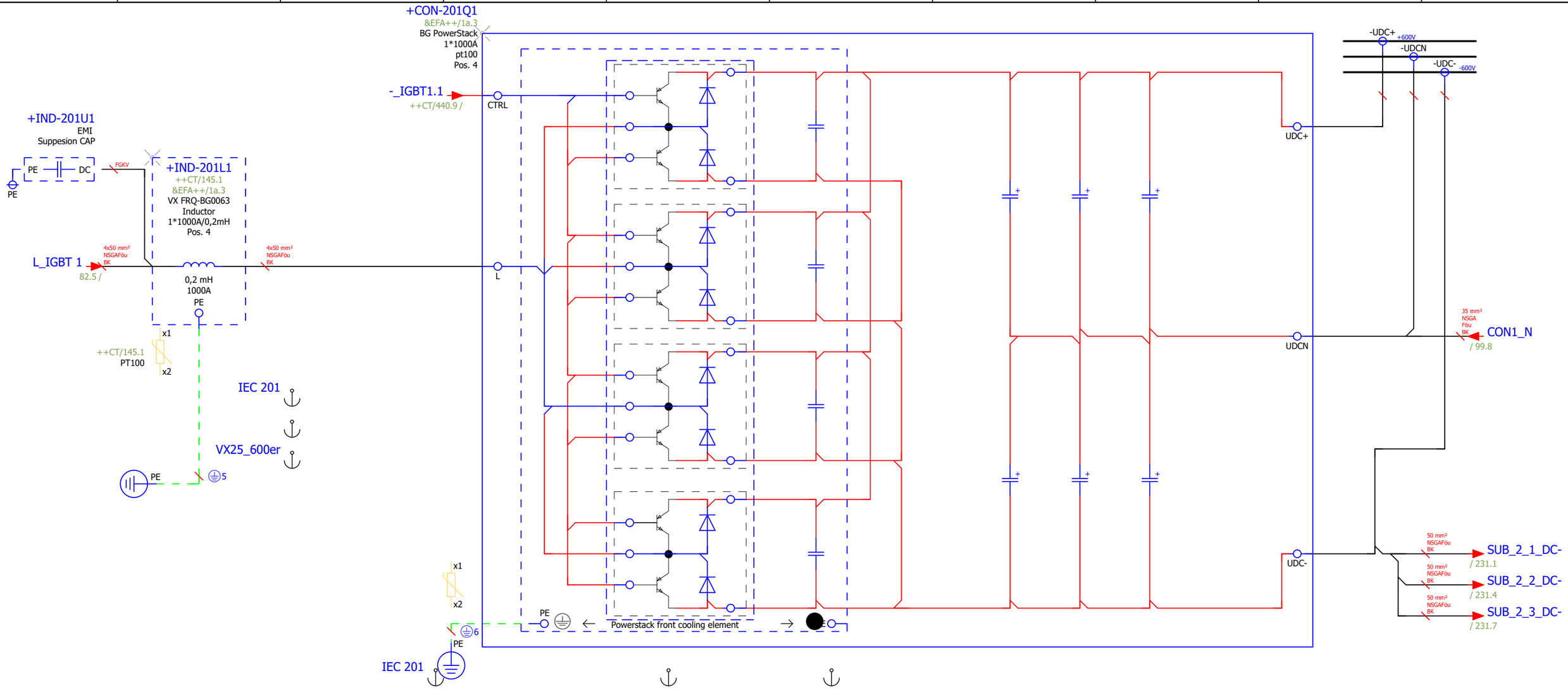
Editor	Freqcon_JD			Statron	FREQCON	BUSBARS N, PE	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter	page: 99
Date								+	total: 498

Power Circuits

Pages 200 - 299

- Converter cabinet
- Inductor cabinet
- Circuit Breaker cabinet

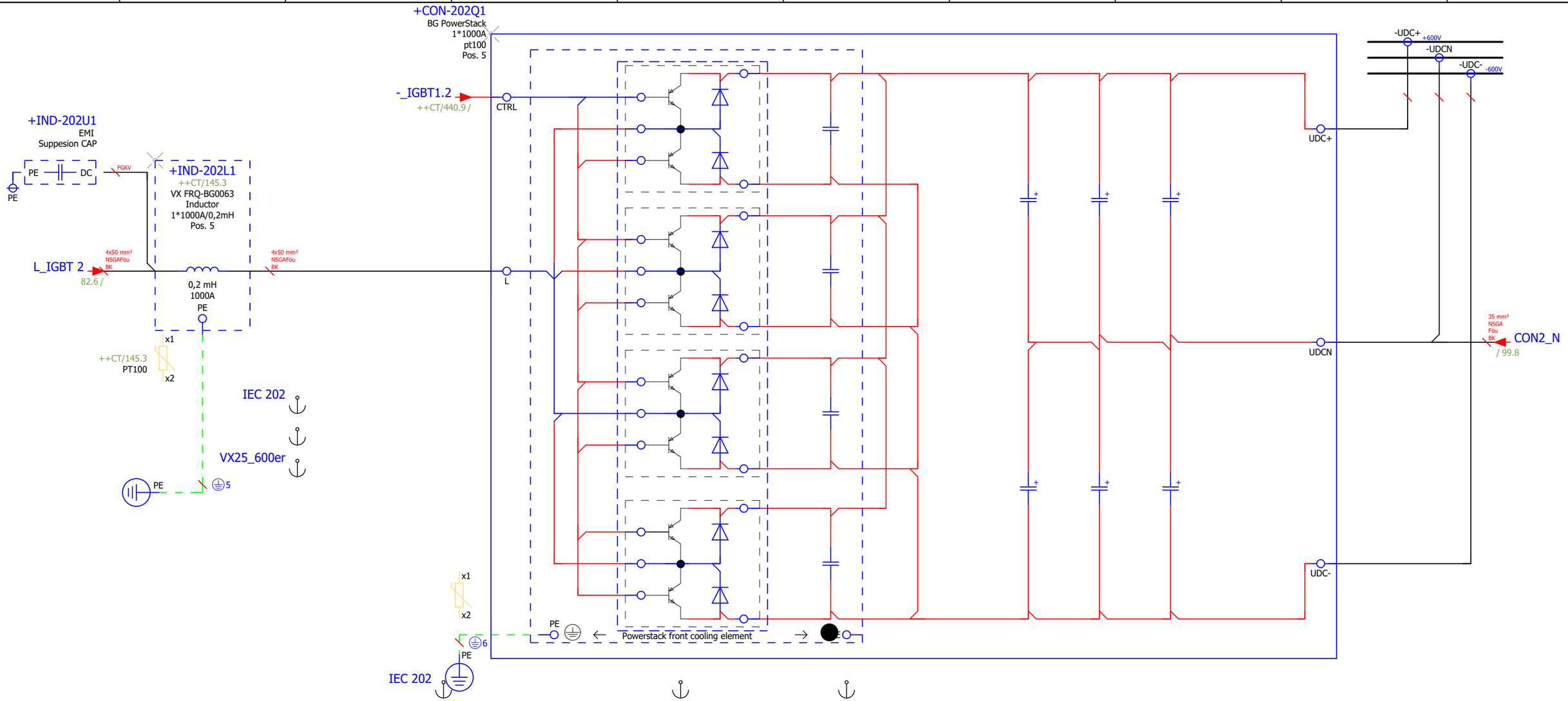
Editor	Freqcon_JD			Statron	FREQCON	POWER CIRCUITS COVER PAGE	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	14.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter	page: 200
Date								+	total: 498



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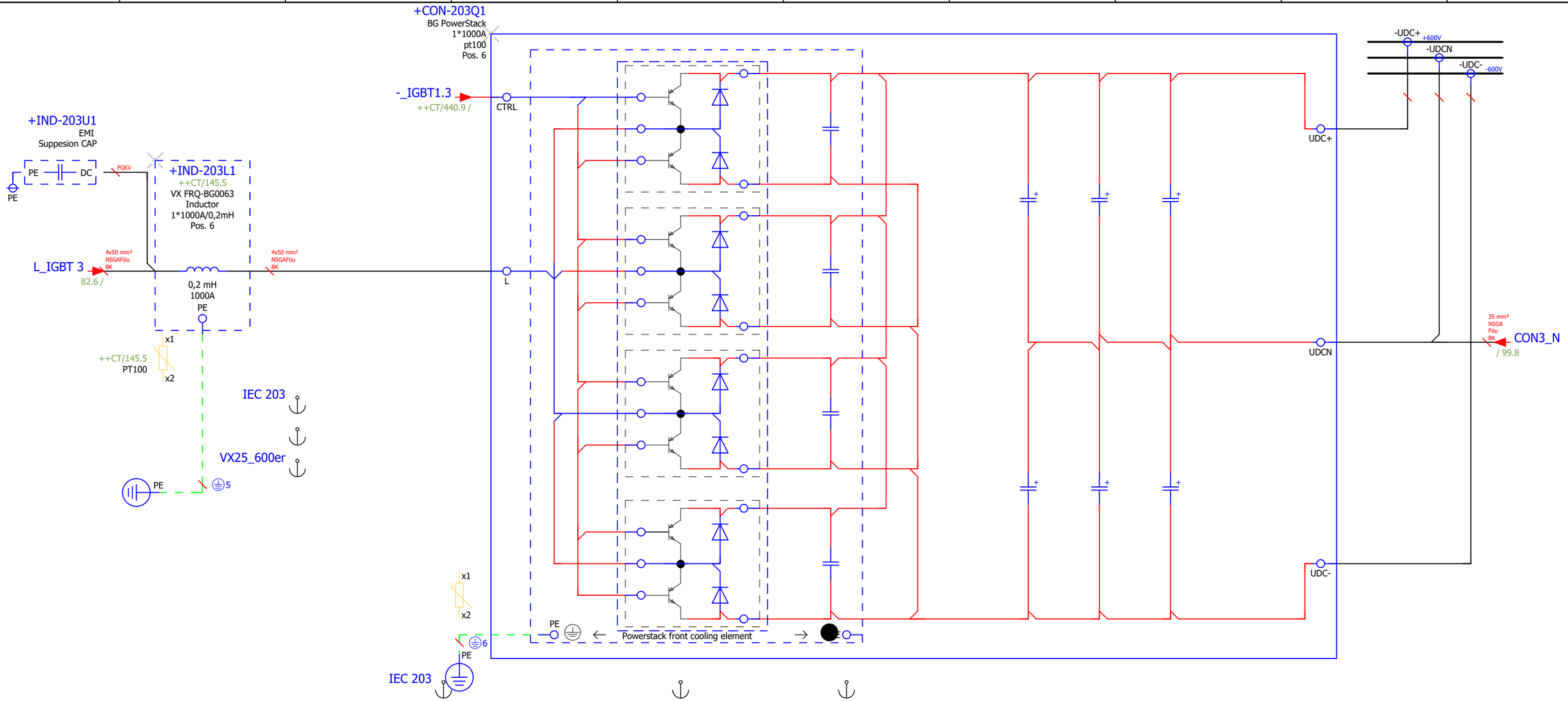
Editor	Freqcon_JD			Statron	FREQCON	IGBT & INDUCTOR FOR GRID PHASE 1	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV	Converter page: 201
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	IGBT & INDUCTOR FOR GRID PHASE 2	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter	page: 202
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	IGBT & INDUCTOR FOR GRID PHASE 3	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV	Converter
Date								+	

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total: 498

+CON-207Q1
&EFA++/1a.4
VX BG PowerStack
3*250A
Pos. 1

-_IGBT3.1_2
207.9 /
CTRL

+IND-207L1
&EFA++/1a.5
VX FRQ-BG0060
Inductor
3*250A/0,6mH
Pos. 1

L_IGBT 3_1
227.0 /
50 mm² NSGAFöu BK
0,6mH
L:1

L_IGBT 3_2
227.3 /
50 mm² NSGAFöu BK
0,6mH
L:2

L_IGBT 3_3
227.6 /
50 mm² NSGAFöu BK
0,6mH
L:3

PE.1 PE.2 PE.3

IEC 204 DC

++CT/146.5
PT100
++CT/146.7
++CT/147.1
x1 x2

VX25

PE
5
6

IEC 204

-UDC+ +600V
-UDCN
-UDC- -600V

UDC+
UDCN
UDC-

35 mm² NSGA Föu BK
CON5_N
/ 99.8

+CON-207Q1-U1
FRQ-M00080-1
Pos. 1

-_IGBT3.1
++CT/442.9 /
X1
25-POL SUB-D SOCKET

-_IGBT3.2
++CT/442.9 /
X2
25-POL SUB-D SOCKET

-_IGBT3.3
++CT/442.9 /
X3
25-POL SUB-D SOCKET

SKiiP 3 Adapter

FRQ-M00080
FREQCON

Shield connect by a ring cable lug
SH

X4
26-POL Stiftleiste (für Flachband) SOCKET

-_IGBT3.1_2
/ 207.3

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Editor	Freqcon_JD			Statron	FREQCON	IGBT & INDUCTOR SUB 3_1 - 3_3	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter page: 207
Date								+ total: 498

+CON-211Q1
&EFA++/1a.4
VX BG PowerStack
3*250A
Pos. 2

-_IGBT2.1_2
211.9 /
CTRL

+IND-211L1
&EFA++/1a.5
VX FRQ-BG0060
Inductor
3*250A/0,6mH
Pos. 2

L_IGBT 2_1
231.0 /
50 mm² NSGAFöu BK
0,6mH
L:1

L_IGBT 2_2
231.3 /
50 mm² NSGAFöu BK
0,6mH
L:2

L_IGBT 2_3
231.6 /
50 mm² NSGAFöu BK
0,6mH
L:3

PE.1 PE.2 PE.3

IEC 211 DC

++CT/145.7
PT100
x1 x2

++CT/146.1
x1 x2

++CT/146.3
x1 x2

VX25

PE
5

PE
5

PE
5

x1
x2

6
PE

IEC 211

-UDC+ +600V
-UDCN
-UDC- -600V

UDC+
UDCN
UDC-

35 mm² NSGA Föu BK
CON4_N
/ 99.8

+CON-211Q1-U1
FRQ-M00080-1
Pos. 1

-_IGBT2.1
++CT/441.9 /
X1
25-POL SUB-D SOCKET

-_IGBT2.2
++CT/441.9 /
X2
25-POL SUB-D SOCKET

-_IGBT2.3
++CT/441.9 /
X3
25-POL SUB-D SOCKET

Shield connect by a ring cable lug
SH

SKiiP 3 Adapter

FRQ-M00080
FREQCON

X4
26-POL Stiftleiste (für Flachband) SOCKET

-_IGBT2.1_2
/ 211.3

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Editor	Freqcon_JD			Statron	FREQCON	IGBT & INDUCTOR SUB 2_1 -2_3	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter page: 211
Date								+ total: 498

+CON-217Q1
&EFA++/1a.4
VX BG PowerStack
3*250A
Pos. 2

-_IGBT4.1_2
217.9 /
CTRL

+IND-217L1
&EFA++/1a.5
VX FRQ-BG0060
Inductor
3*250A/0,6mH
Pos. 2

L_IGBT 4_1
237.0 /
50 mm² NSGAFöu BK
0,6mH
L:1

L_IGBT 4_2
237.3 /
0,6mH
L:2

L_IGBT 4_3
237.6 /
0,6mH
L:3

PE.1 PE.2 PE.3

IEC 211 DC

++CT/147.3
PT100
++CT/148.3
++CT/148.7
x1 x2

VX25

PE
5

x1 x2
6
PE

IEC 211

-UDC+ +600V
-UDCN
-UDC- -600V

UDC+
UDCN
UDC-

35 mm² NSGA Föu BK
CON6_N
/ 99.8

50 mm² NSGAFöu BK
SUB_3_1_DC-
/ 227.1
SUB_3_2_DC-
/ 227.4
SUB_3_3_DC-
/ 227.7
SUB_4_1_DC-
/ 237.1
SUB_4_2_DC-
/ 237.4
SUB_4_3_DC-
/ 237.7

+CON-217Q1-U1
FRQ-M00080-1
Pos. 1

-_IGBT4.1
++CT/443.9 /
X1
25-POL SUB-D SOCKET

-_IGBT4.2
++CT/443.9 /
X2
25-POL SUB-D SOCKET

-_IGBT4.3
++CT/443.9 /
X3
25-POL SUB-D SOCKET

Shield connect by a ring cable lug
SH

SKiiP 3 Adapter

FRQ-M00080
FREQCON

X4
26-POL Stiftleiste (für Flachband) SOCKET
-_IGBT4.1_2
/ 217.3

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Editor	Freqcon_JD			Statron	FREQCON	IGBT & INDUCTOR SUB 4_1 -4_3	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV	Converter
Date								+	

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total: 498

VX25

224

Spare connections, if the BSU will be from here 20A supplied.

* cable intro seperate UL protrctive tube

+CIR
-227U1
/227.a.0
&EFA++/1a.6
VX DC switch and Fuse
3*250A
1000V
Pos. 1

L_IGBT 3_1 / 207.0
SUB_3_1_V / ++CT/163.9
SUB_3_1_DC- / 217.9
SUB_3_1_V.1 / ++CT/162.9
L_IGBT 3_2 / 207.0
SUB_3_2_V / ++CT/163.9
SUB_3_2_DC- / 217.9
SUB_3_2_V.1 / ++CT/162.9
L_IGBT 3_3 / 207.0
SUB_3_3_V / ++CT/163.9
SUB_3_3_DC- / 217.9
SUB_3_3_V.1 / ++CT/162.9

227W1 OZ-600 2x0,75 mm²
227W2 OZ-600 2x0,75 mm²
227W3 OZ-600 2x0,75 mm²

50 mm² NSGAFöu BK

PE
PE
Rear mounting plate
7

IGBT1 1+ | V_IGBT1 1+ | UDC [1]- | V_DC1 1+ | V_DC 1-
IGBT2 2+ | V_IGBT2 2+ | UDC [2]- | V_DC2 2+
IGBT3 3+ | V_IGBT3 3+ | UDC [3]- | V_DC3 3+

F3 1A
F4 1A [20A, aR (BSU)]
F0 [20A, aR (BSU)]
F7 1A
F8 1A
F11 1A
F12 1A

2,5 mm² NSGAFöu BK

-C1 -C7 -C13
x1 x2
340µF, 1320V DC Epcos

16 mm² NSGAFöu BK

Front mounting plate
PE
-U1
EMI
Suppesion CAP
16 mm² FGKV
16 mm² in Shrin-kable Tube FGKV
1 2 3 4 5 6

-K1 /227.a.1 1500V 300A
-K7 /227.a.3 1500V 300A
-K2 /227.a.2 1500V 300A
-K8 /227.a.4 1500V 300A
-K3 /227.a.2 1500V 300A
-K9 /227.a.5 1500V 300A
A1 A2

70 mm² NSGAFöu BK

-F1 /227.a.7 1250V 400A 1KN/110 HLS Datenblatt
-F2 /227.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS
-F5 /227.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS
-F6 /227.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS
-F9 /227.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS
-F10 /227.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS

IEC

DC1 + / DC1 -
DC2 + / DC2 -
DC3 + / DC3 -

AWG	mm²	*cable into seperate UL protective tube	AWG	mm²
18	0,75		2	25
16	1		2 *	16 NSGAFöu
14	1,5		1	35
12	2,5		250 kcmil	95 ALU
12 *	2,5 NSGAFöu		2x2	1x70 NSGAFöu
10	4		2x4	2x70 NSGAFöu
6	10		4x250 kcmil	4x70 NSGAFöu
6 *	10 NSGAFöu		6x250 kcmil	6x70 NSGAFöu
4	16			

*2
The single conductor must be placed in the protective tube

+AC_DC-227W10 Cu 100mm x 10mm x 195mm FRQ.50604 SUB 3_1 + Pos. =UNIT_02 DC+3_1_BAT / =UNIT_02++ASC/678.7
+AC_DC-227W11 Cu 100mm x 10mm x 195mm FRQ.50604 SUB 3_1 - Pos. DC-3_1_BAT / =UNIT_02++ASC/678.7
DC-3_1 / 228.1
DC+3_1 / 228.1

+AC_DC-227W12 Cu 100mm x 10mm x 195mm FRQ.50604 SUB 3_2 + Pos.
+AC_DC-227W13 Cu 100mm x 10mm x 195mm FRQ.50604 SUB 3_2 - Pos.
DC-3_2 / 228.4
DC+3_2 / 228.4

+AC_DC-227W14 Cu 100mm x 10mm x 195mm FRQ.50604 SUB 3_3 + Pos. =UNIT_03 DC+3_3_BAT / =UNIT_03++ASC/678.0
+AC_DC-227W15 Cu 100mm x 10mm x 195mm FRQ.50604 SUB 3_3 - Pos. DC-3_3_BAT / =UNIT_03++ASC/678.0
DC-3_3 / 228.8
DC+3_3 / 228.7

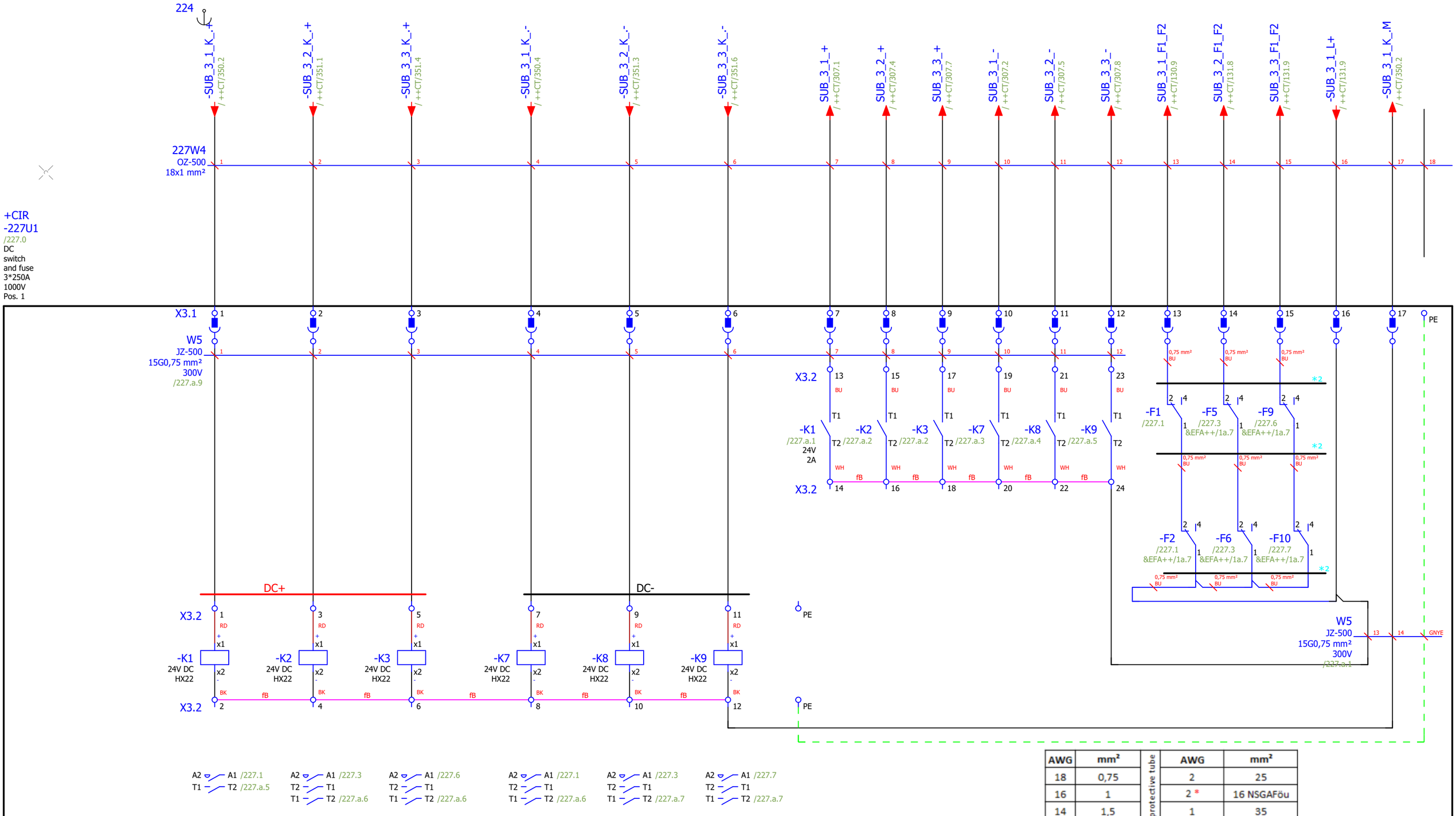
EEC

DC+ and DC- Busbars in Connection cabinet

previous page: 217
next page: 227.a

Editor	Freqcon_JD			Statron	FREQCON	SUBSYSTEM 3_1 - 3_1 DC 3 x 250A	20241105_V1.2
Date	18.06.2024						
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007
Date							

=	UNIT_01	Converter Container 1	
&	EFS	Circuit diagram	
++	CONV	Converter	page: 227
+			total: 498



AWG	mm²	* cable into seperate UL protective tube	AWG	mm²
18	0,75		2	25
16	1		2 *	16 NSGAFöu
14	1,5		1	35
12	2,5		250 kcmil	95 ALU
12 *	2,5 NSGAFöu		2x2	1x70 NSGAFöu
10	4		2x4	2x70 NSGAFöu
6	10		4x250 kcmil	4x70 NSGAFöu
6 *	10 NSGAFöu		6x250 kcmil	6x70 NSGAFöu
4	16			

*2 The single conductor must be placed in the protective tube

IEC

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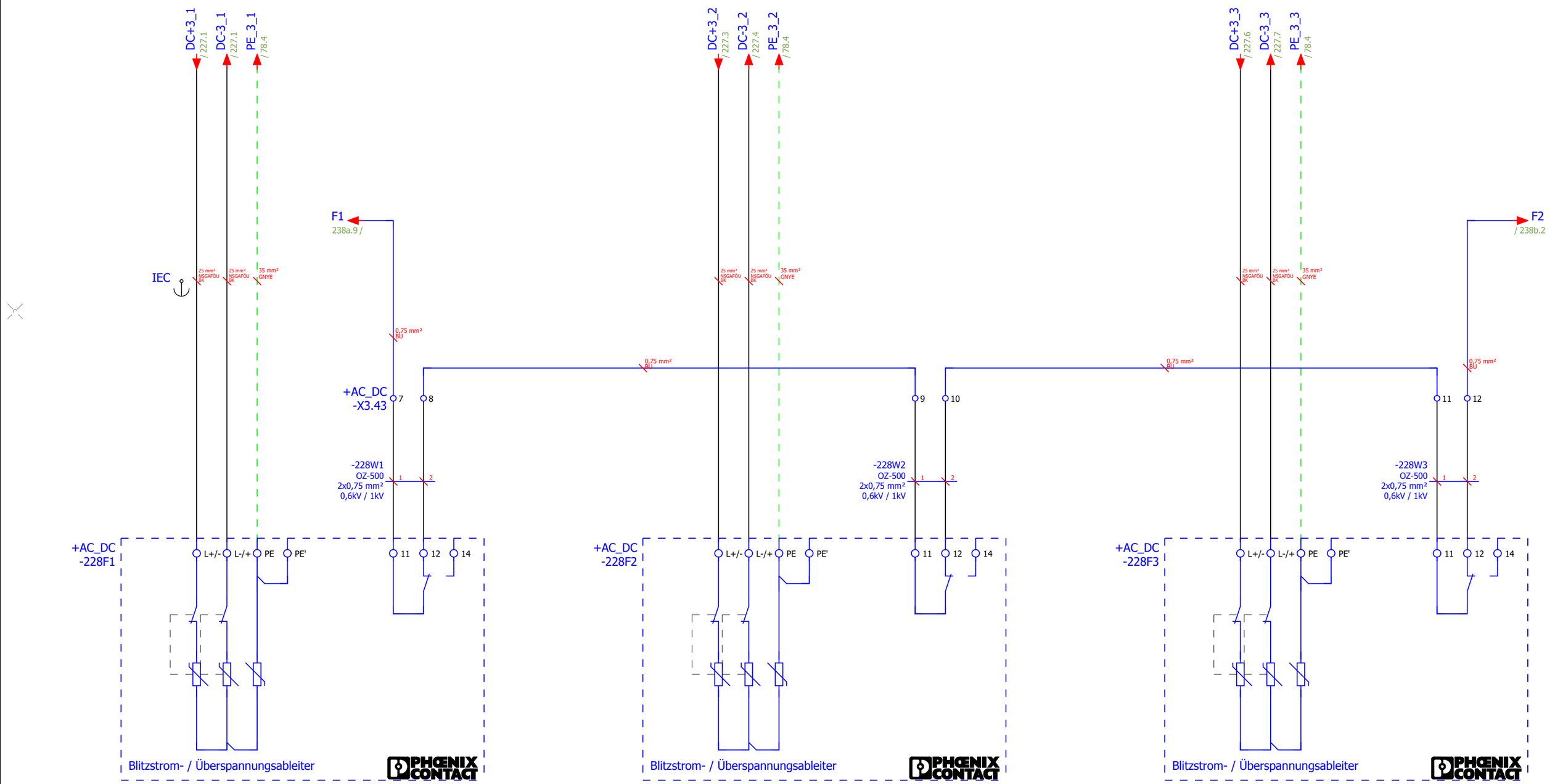
next page: 228

Editor	Freqcon_JD			Statron	FREQCON	SUBSYSTEM 3_1 - 3_1 DC 3 x 250A	20241105_V1.2
Date	18.06.2024						= UNIT_01 Converter Container 1
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			& EFS Circuit diagram
Date						10354_23A2007	++ CONV Converter page: 227.a
							+ total: 498

DC+ and DC- Busbars

DC+ and DC- Busbars

DC+ and DC- Busbars



SURGE ARRESTER
DC SUBSYSTEM 3_1

SURGE ARRESTER
DC SUBSYSTEM 3_2

SURGE ARRESTER
DC SUBSYSTEM 3_3

in Connection cabinet

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227.a

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Editor	Freqcon_JD			Statron	FREQCON	DC SURGE ARRESTER 3_1 - 3_3	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter page: 228
Date								+ total: 498

0	1	2	3	4	5	6	7	8	9

VX25

221

Spare connections,
if the BSU
will be from here
20A supplied.

* cable intro seperate UL protrctive tube

L_IGBT 2_1 / 211.0 | SUB_2_1_V / ++CT/163.9 | SUB_2_1_DC- / 201.9 | SUB_2_1_V.1 / ++CT/162.9

L_IGBT 2_2 / 211.0 | SUB_2_2_V / ++CT/163.9 | SUB_2_2_DC- / 201.9 | SUB_2_2_V.1 / ++CT/162.9

L_IGBT 2_3 / 211.0 | SUB_2_3_V / ++CT/163.9 | SUB_2_3_DC- / 201.9 | SUB_2_3_V.1 / ++CT/162.9

231W1 OZ-600 2x0,75 mm²

231W2 OZ-600 2x0,75 mm²

231W3 OZ-600 2x0,75 mm²

+CIR
-231U1
/231.a.0
&EFA++/1a.6
VX DC
switch
and Fuse
3*250A
1000V
Pos. 2

50 mm² NSGAFöu BK

PE

7

PE

Rear mounting plate

IGBT1 1+ | V_IGBT1 1+ | V_DC1 1+ | V_DC 1-

UDC [1]-

IGBT2 2+ | V_IGBT2 2+ | V_DC2 2+

UDC [2]-

IGBT3 3+ | V_IGBT3 3+ | V_DC3 3+

UDC [3]-

F3 1A

F4 1A [20A, aR (BSU)]

F0 [20A, aR (BSU)]

F7 1A

F8 1A

F11 1A

F12 1A

2,5 mm² NSGAFöu BK

-C1 | -C7 | -C13

x1 x2

340µF, 1320V DC
Epcos

16 mm² NSGAFöu BK

AWG	mm²	*cable into seperate UL protective tube	AWG	mm²
18	0,75		2	25
16	1		2 *	16 NSGAFöu
14	1,5		1	35
12	2,5		250 kcmil	95 ALU
12 *	2,5 NSGAFöu		2x2	1x70 NSGAFöu
10	4		2x4	2x70 NSGAFöu
6	10		4x250 kcmil	4x70 NSGAFöu
6 *	10 NSGAFöu		6x250 kcmil	6x70 NSGAFöu
4	16			

Front mounting plate

PE

-U1
EMI
Suppesion CAP

16 mm² FGKV

16 mm² in Shrin-kable Tube FGKV

-K1 /231.a.1 1500V 300A | -K7 /231.a.3 1500V 300A

-K2 /231.a.2 1500V 300A | -K8 /231.a.4 1500V 300A

-K3 /231.a.2 1500V 300A | -K9 /231.a.5 1500V 300A

A1 A2

70 mm² NSGAFöu BK

-F1 /231.a.7 1250V 400A 1KN/110 HLS Datenblatt

-F2 /231.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS

-F5 /231.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS

-F6 /231.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS

-F9 /231.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS

-F10 /231.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS

IEC

*2

The single conductor
must be placed
in the protective tube

DC1 + | DC1 -

DC2 + | DC2 -

DC3 + | DC3 -

2,5 mm² NSGAFöu BK

+AC_DC-231W10 Cu 100mm x 10mm x 195mm FRQ 50604 =UNIT_02&EFA++/1a.5

+AC_DC-231W11 Cu 100mm x 10mm x 195mm FRQ 50604 =UNIT_02&EFA++/1a.5

+AC_DC-231W12 Cu 100mm x 10mm x 195mm FRQ 50604 &EFA++/1a.7

+AC_DC-231W13 Cu 100mm x 10mm x 195mm FRQ 50604 &EFA++/1a.7

+AC_DC-231W14 Cu 100mm x 10mm x 195mm FRQ 50604 &EFA++/1a.7 =UNIT_03&EFA++/1a.0

+AC_DC-231W15 Cu 100mm x 10mm x 195mm FRQ 50604 &EFA++/1a.7 =UNIT_03&EFA++/1a.0

SUB 2_1 + =UNIT_02 DC+2_1_BAT / =UNIT_02++ASC/678.0

SUB 2_1 - DC-2_1_BAT / =UNIT_02++ASC/678.0

SUB 2_2 + =UNIT_02 DC+2_2_BAT / =UNIT_02++ASC/678.2

SUB 2_2 - DC-2_2_BAT / =UNIT_02++ASC/678.2

SUB 2_3 + =UNIT_02 DC+2_3_BAT / =UNIT_02++ASC/678.5

SUB 2_3 - DC-2_3_BAT / =UNIT_02++ASC/678.5

DC-2_1 / 238a.1

DC+2_1 / 238a.1

DC-2_2 / 238a.4

DC+2_2 / 238a.4

DC-2_3 / 238a.8

DC+2_3 / 238a.7

EEC

DC+ and DC- Busbars
in Connection cabinet

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next page:
231.a

Editor	Freqcon_JD			Statron	FREQCON	SUBSYSTEM 2_1 - 2_3 DC 3 x 250A	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter page: 231
Date								+ total: 498

231

-SUB_2_1_K_.+ /++CT/150.2
-SUB_2_2_K_.+ /++CT/151.1
-SUB_2_3_K_.+ /++CT/151.4
-SUB_2_1_K_.- /++CT/150.4
-SUB_2_2_K_.- /++CT/151.3
-SUB_2_3_K_.- /++CT/151.6
SUB_2_1_+ /++CT/306.1
SUB_2_2_+ /++CT/306.4
SUB_2_3_+ /++CT/306.7
SUB_2_1_- /++CT/306.2
SUB_2_2_- /++CT/306.5
SUB_2_3_- /++CT/306.8
SUB_2_1_F1_F2 /++CT/129.8
SUB_2_2_F1_F2 /++CT/129.9
SUB_2_3_F1_F2 /++CT/130.8
-SUB_2_1_L+ /++CT/129.9
-SUB_2_1_K_.M /++CT/150.2

231W4
OZ-500
18x1 mm²

+CIR
-231U1
/231.0
DC
switch
and fuse
3*250A
1000V
Pos. 2

X3.1
W5
JZ-500
15G0,75 mm²
300V
/231.a.9

X3.2
-K1 /231.a.1 24V 2A
-K2 /231.a.2
-K3 /231.a.2
-K7 /231.a.3
-K8 /231.a.4
-K9 /231.a.5
BU T1 T2 WH fB

-F1 /231.1
-F5 /231.3 &EFA++/1a.7
-F9 /231.6 &EFA++/1a.7
-F2 /231.1 &EFA++/1a.7
-F6 /231.3 &EFA++/1a.7
-F10 /231.7 &EFA++/1a.7
0,75 mm² BU
*2

W5
JZ-500
15G0,75 mm²
300V
/231.a.1
13 14 GNYE

PE

DC+
DC-
X3.2
-K1 -K2 -K3 -K7 -K8 -K9
24V DC HX22
RD x1 x2 BK fB

A2 A1 /231.1 T1 T2 /231.a.5
A2 A1 /231.3 T2 T1 T1 T2 /231.a.6
A2 A1 /231.6 T2 T1 T1 T2 /231.a.6
A2 A1 /231.1 T2 T1 T1 T2 /231.a.6
A2 A1 /231.3 T2 T1 T1 T2 /231.a.7
A2 A1 /231.7 T2 T1 T1 T2 /231.a.7

AWG	mm²	* cable into seperate UL protective tube	AWG	mm²
18	0,75		2	25
16	1		2 *	16 NSGAFöu
14	1,5		1	35
12	2,5		250 kcmil	95 ALU
12 *	2,5 NSGAFöu		2x2	1x70 NSGAFöu
10	4		2x4	2x70 NSGAFöu
6	10		4x250 kcmil	4x70 NSGAFöu
6 *	10 NSGAFöu		6x250 kcmil	6x70 NSGAFöu
4	16			

*2 The single conductor must be placed in the protective tube

IEC

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Editor	Freqcon_JD			Statron	FREQCON	SUBSYSTEM 2_1 - 2_3 DC 3 x 250A	20241105_V1.2
Date	18.06.2024						= UNIT_01 Converter Container 1
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			& EFS Circuit diagram
Date						10354_23A2007	++ CONV Converter page: 231.a
							+ total: 498

VX25
224

Spare connections,
if the BSU
will be from here
20A supplied.

* cable intro seperate UL protrctive tube

+CIR
-237U1
/237.a.0
&EFA++/1a.6
VX DC
switch
and Fuse
3*250A
1000V
Pos. 3

L_IGBT 4_1 / 217.0
SUB_4_1_V / ++CT/164.9
SUB_4_1_DC- / 217.9
SUB_4_1_V.1 / ++CT/164.9
L_IGBT 4_2 / 217.0
SUB_4_2_V / ++CT/164.9
SUB_4_2_DC- / 217.9
SUB_4_2_V.1 / ++CT/164.9
L_IGBT 4_3 / 217.0
SUB_4_3_V / ++CT/164.9
SUB_4_3_DC- / 217.9
SUB_4_3_V.1 / ++CT/164.9

237W1 OZ-600 2x0,75 mm²
237W1 OZ-600 2x0,75 mm²
237W2 OZ-600 2x0,75 mm²
237W2 OZ-600 2x0,75 mm²
237W3 OZ-600 2x0,75 mm²
237W3 OZ-600 2x0,75 mm²

50 mm² NSGAFöu BK

PE
PE
Rear mounting plate
7

IGBT1 1+ | V_IGBT1 1+ | V_DC1 1+ | V_DC 1-
UDC [1]-
IGBT2 2+ | V_IGBT2 2+ | V_DC2 2+
UDC [2]-
IGBT3 3+ | V_IGBT3 3+ | V_DC3 3+
UDC [3]-

F3 1A
F4 1A [20A, aR (BSU)]
F0 [20A, aR (BSU)]
F7 1A
F8 1A
F11 1A
F12 1A

2,5 mm² NSGAFöu BK
-C1
-C7
-C13
x1 x2
340µF, 1320V DC Epcos
16 mm² NSGAFöu BK

Front mounting plate
-U1
EMI
Suppesion CAP
16 mm² FGKV
1 2 3 4 5 6
16 mm² in Shrin-kable Tube FGKV

-K1 /237.a.1 1500V 300A
-K7 /237.a.3 1500V 300A
-K2 /237.a.2 1500V 300A
-K8 /237.a.4 1500V 300A
-K3 /237.a.2 1500V 300A
-K9 /237.a.5 1500V 300A
70 mm² NSGAFöu BK

-F1 /237.a.7 1250V 400A 1KN/110 HLS Datenblatt
-F2 /237.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS
-F5 /237.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS
-F6 /237.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS
-F9 /237.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS
-F10 /237.a.8 &EFA++/1a.7 1250V 400A 1KN/110 HLS

IEC

DC1 + / DC1 -
DC2 + / DC2 -
DC3 + / DC3 -

*2
The single conductor
must be placed
in the protective tube

AWG	mm²	*cable into seperate UL protective tube	AWG	mm²
18	0,75		2	25
16	1		2 *	16 NSGAFöu
14	1,5		1	35
12	2,5		250 kcmil	95 ALU
12 *	2,5 NSGAFöu		2x2	1x70 NSGAFöu
10	4		2x4	2x70 NSGAFöu
6	10		4x250 kcmil	4x70 NSGAFöu
6 *	10 NSGAFöu		6x250 kcmil	6x70 NSGAFöu
4	16			

EEC

+AC_DC-237W10 SUB 4_1 + Pos. =UNIT_03 → DC+4_1_BAT / =UNIT_03++ASC/678.2
+AC_DC-237W11 SUB 4_1 - Pos. → DC-4_1_BAT / =UNIT_03++ASC/678.2
+AC_DC-237W12 SUB 4_2 + Pos. =UNIT_03 → DC+4_2_BAT / =UNIT_03++ASC/678.5
+AC_DC-237W13 SUB 4_2 - Pos. → DC-4_2_BAT / =UNIT_03++ASC/678.5
+AC_DC-237W14 SUB 4_3 + Pos. =UNIT_03 → DC+4_3_BAT / =UNIT_03++ASC/678.7
+AC_DC-237W15 SUB 4_3 - Pos. → DC-4_3_BAT / =UNIT_03++ASC/678.7

Cu 100mm x 10mm x 195mm FRQ.50604 &EFA++/1a.7 =UNIT_03&EFA++/1a.0
Cu 100mm x 10mm x 195mm FRQ.50604 &EFA++/1a.7 =UNIT_03&EFA++/1a.5

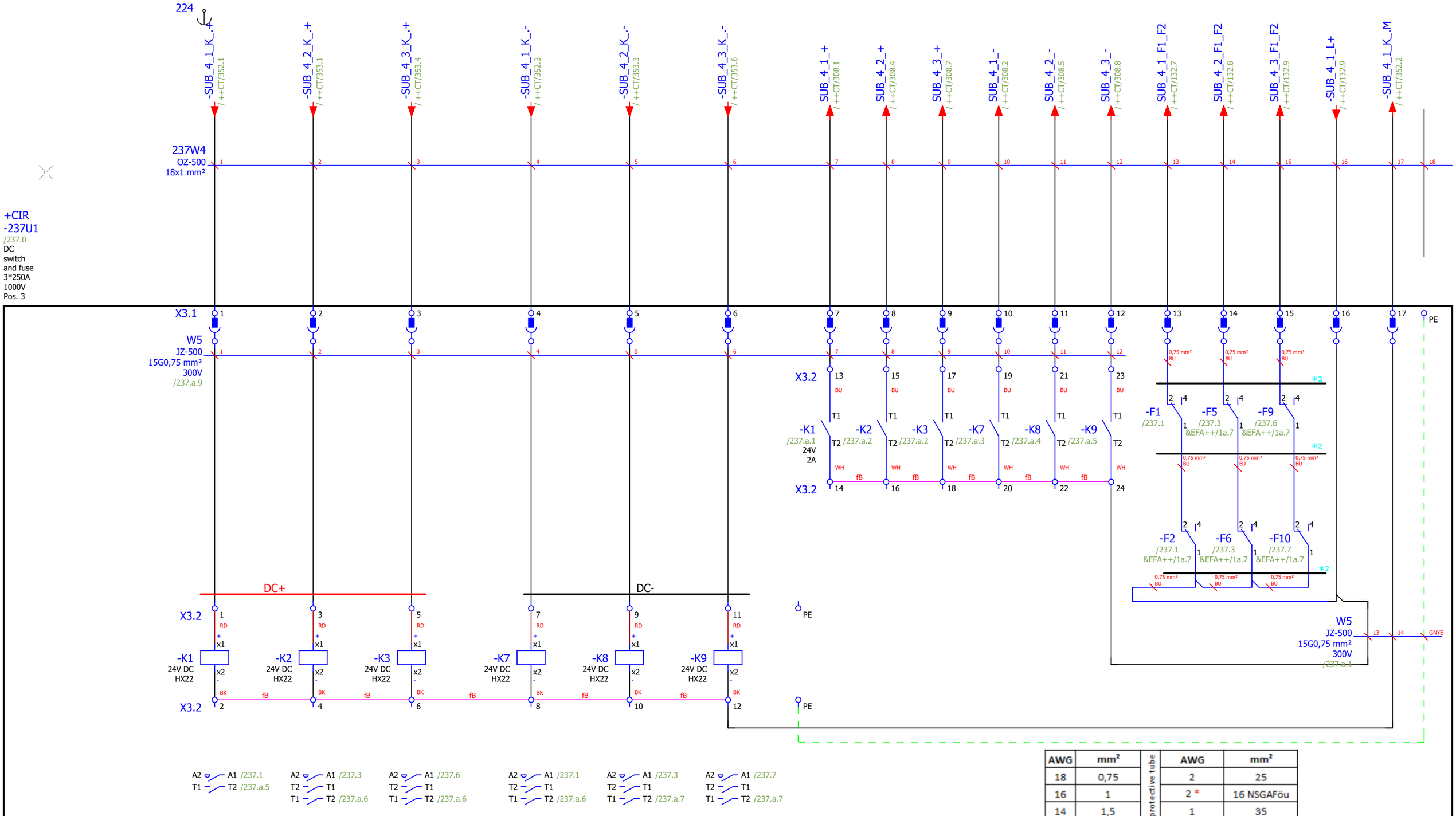
DC+4_1 / 238b.1
DC-4_1 / 238b.1
DC+4_2 / 238b.4
DC-4_2 / 238b.4
DC+4_3 / 238b.7
DC-4_3 / 238b.8

DC+ and DC- Busbars
in Connection cabinet

previous page: 231.a
next page: 237.a

Editor	Freqcon_JD			Statron	FREQCON	SUBSYSTEM 4_1 - 4_3 DC 3 x 250A	20241105_V1.2
Date	18.06.2024						10354_23A2007
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			
Date							

=	UNIT_01	Converter Container 1	
&	EFS	Circuit diagram	
++	CONV	Converter	page: 237
+			total: 498



AWG	mm²	* cable into seperate UL protective tube	AWG	mm²
18	0,75		2	25
16	1		2 *	16 NSGAFöu
14	1,5		1	35
12	2,5		250 kcmil	95 ALU
12 *	2,5 NSGAFöu		2x2	1x70 NSGAFöu
10	4		2x4	2x70 NSGAFöu
6	10		4x250 kcmil	4x70 NSGAFöu
6 *	10 NSGAFöu		6x250 kcmil	6x70 NSGAFöu
4	16			

*2 The single conductor must be placed in the protective tube

IEC

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next page: 238a

Editor	Freqcon_DG			Statron	FREQCON	SUBSYSTEM 4_1 - 4_3 DC 3 x 250A	20241105_V1.2
Date	29.07.2024						
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007
Date							

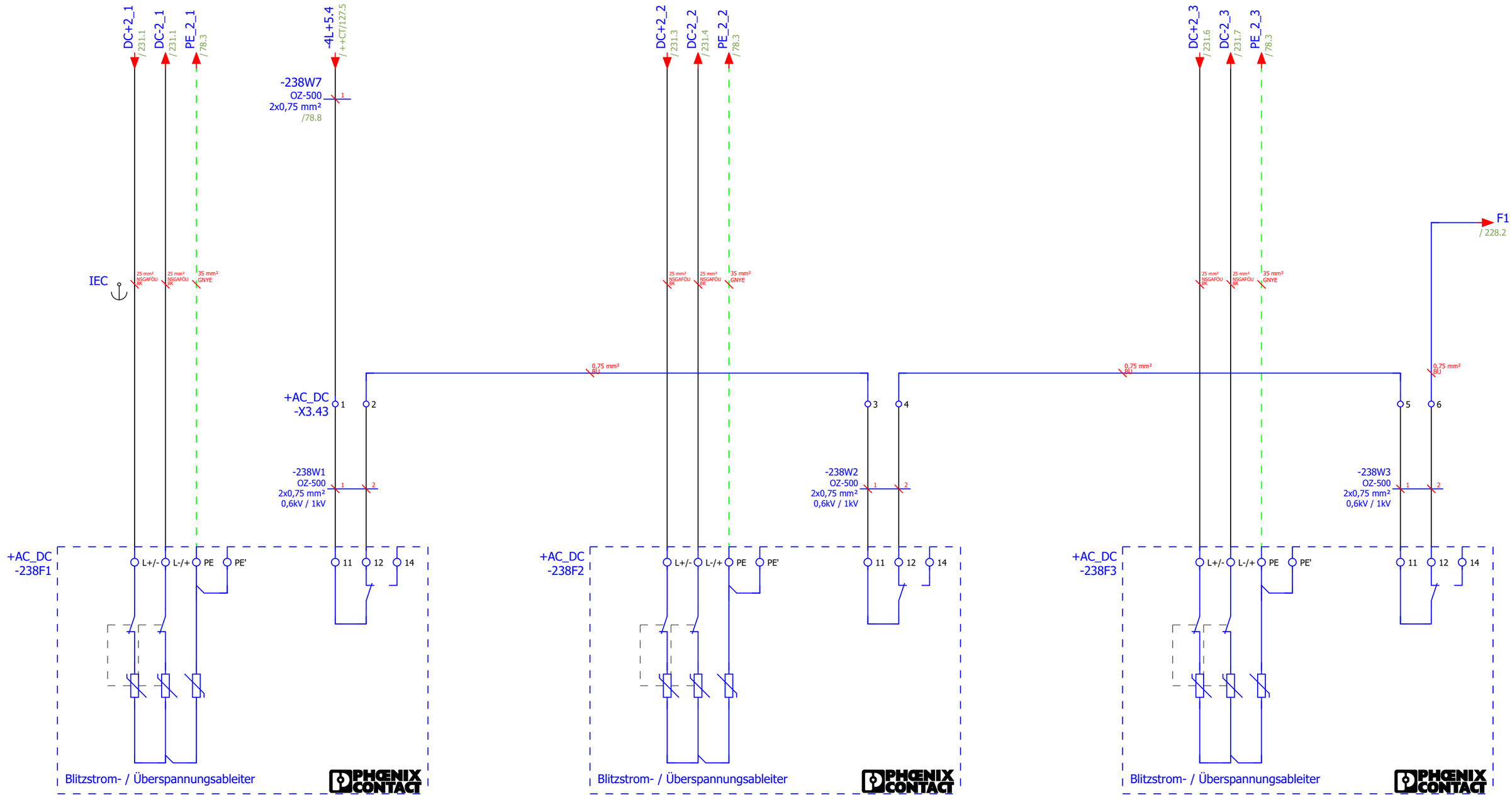
=	UNIT_01	Converter Container 1
&	EFS	Circuit diagram
++	CONV	Converter
+		

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total: 498

DC+ and DC- Busbars

DC+ and DC- Busbars

DC+ and DC- Busbars



SURGE ARRESTER
DC SUBSYSTEM 2_1

SURGE ARRESTER
DC SUBSYSTEM 2_2

SURGE ARRESTER
DC SUBSYSTEM 2_3

in Connection cabinet

previous page:
237.a

next page:
238b

Editor	Freqcon_JD			Statron	FREQCON	DC SURGE ARRESTER 2_1 - 2_3	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter	page: 238a
Date								+	total: 498

DC+ and DC- Busbars

DC+4_1 / 237.1
DC-4_1 / 237.1
PE_4_1 / 78.4

IEC

25 mm² NSGAFÖU BK
25 mm² NSGAFÖU BK
35 mm² GNYE

F2
228.9 /

0,75 mm² BU

+AC_DC
-X3.43
13 14

-238W4
OZ-500
2x0,75 mm²
0,6kV / 1kV
1 2

+AC_DC
-238F4
L+/- L-/+ PE PE'
11 12 14

Blitzstrom- / Überspannungsableiter
PHOENIX CONTACT

SURGE ARRESTER
DC SUBSYSTEM 4_1

DC+ and DC- Busbars

DC+4_2 / 237.3
DC-4_2 / 237.4
PE_4_2 / 78.4

25 mm² NSGAFÖU BK
25 mm² NSGAFÖU BK
35 mm² GNYE

0,75 mm² BU

15 16

-238W5
OZ-500
2x0,75 mm²
0,6kV / 1kV
1 2

+AC_DC
-238F5
L+/- L-/+ PE PE'
11 12 14

Blitzstrom- / Überspannungsableiter
PHOENIX CONTACT

SURGE ARRESTER
DC SUBSYSTEM 4_2

DC+ and DC- Busbars

DC+4_3 / 237.6
DC-4_3 / 237.7
PE_4_3 / 78.5

25 mm² NSGAFÖU BK
25 mm² NSGAFÖU BK
35 mm² GNYE

0,75 mm² BU

F3
/ 78.9

17 18

-238W6
OZ-500
2x0,75 mm²
0,6kV / 1kV
1 2

+AC_DC
-238F6
L+/- L-/+ PE PE'
11 12 14

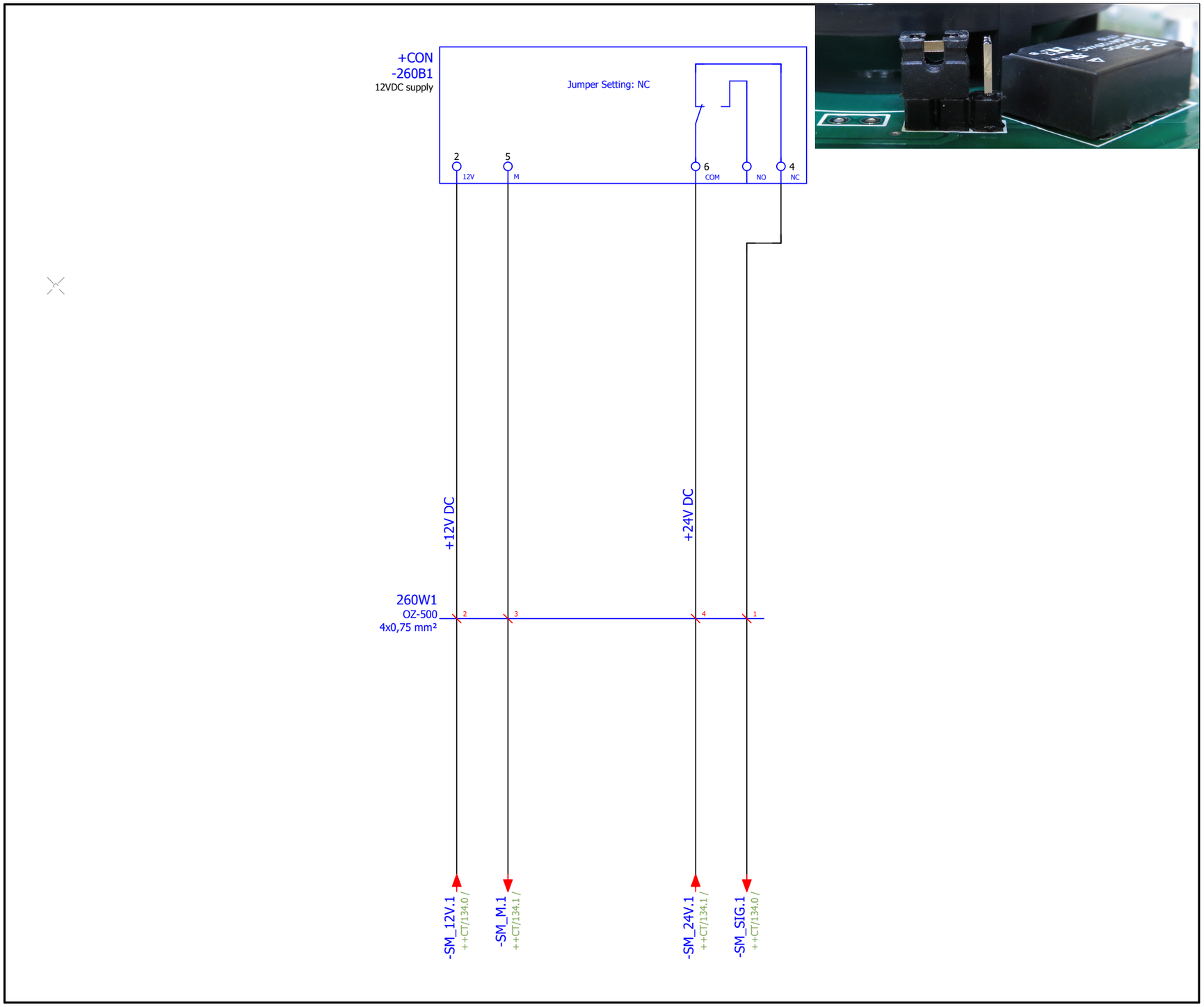
Blitzstrom- / Überspannungsableiter
PHOENIX CONTACT

SURGE ARRESTER
DC SUBSYSTEM 4_3

in Connection cabinet

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Editor	Freqcon_JD			Statron	FREQCON	DC SURGE ARRESTER 4_1 - 4_3	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter	page: 238b
Date								+	total: 498

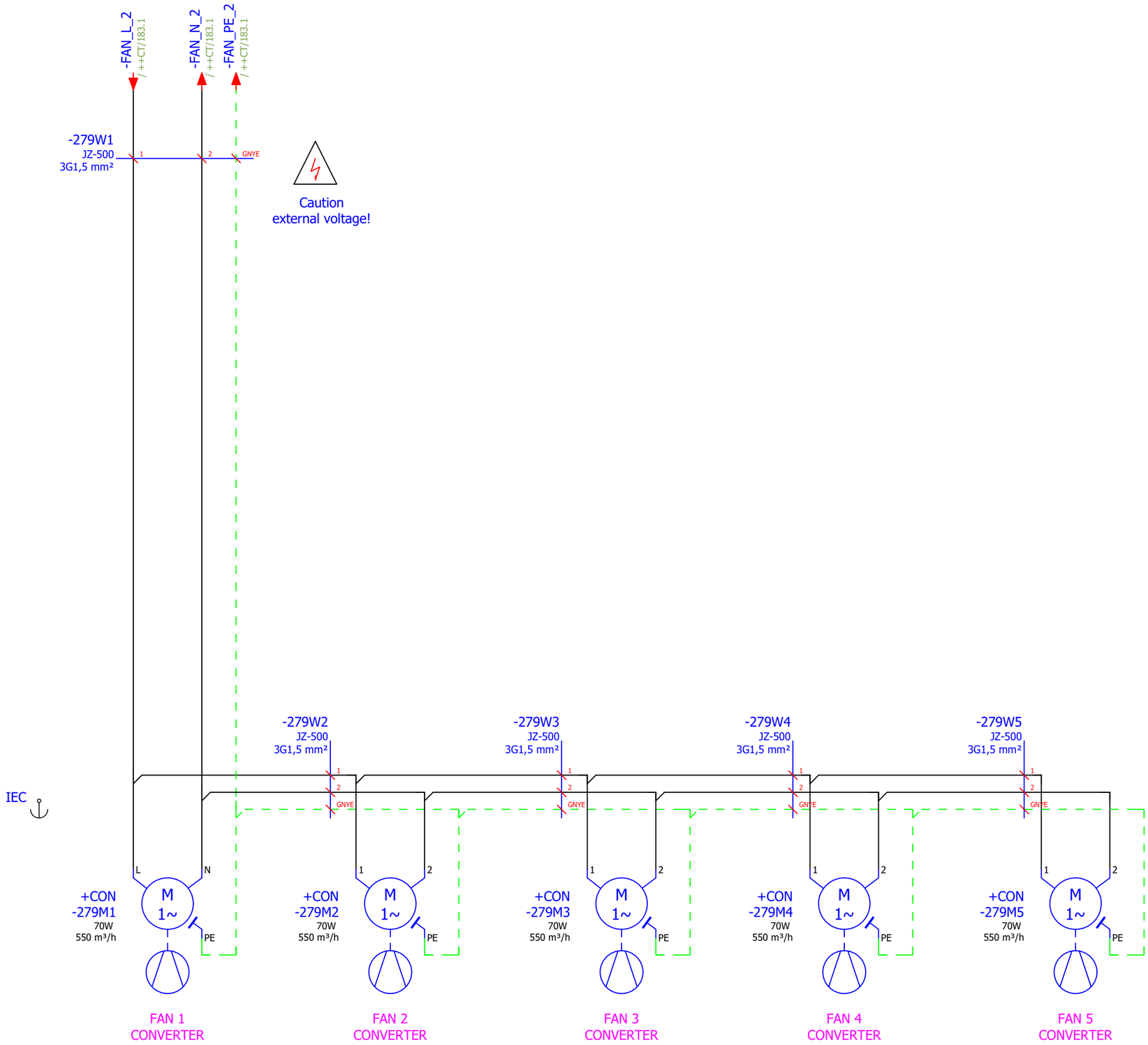


SMOKE DETECTOR
+CON CABINET

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238b

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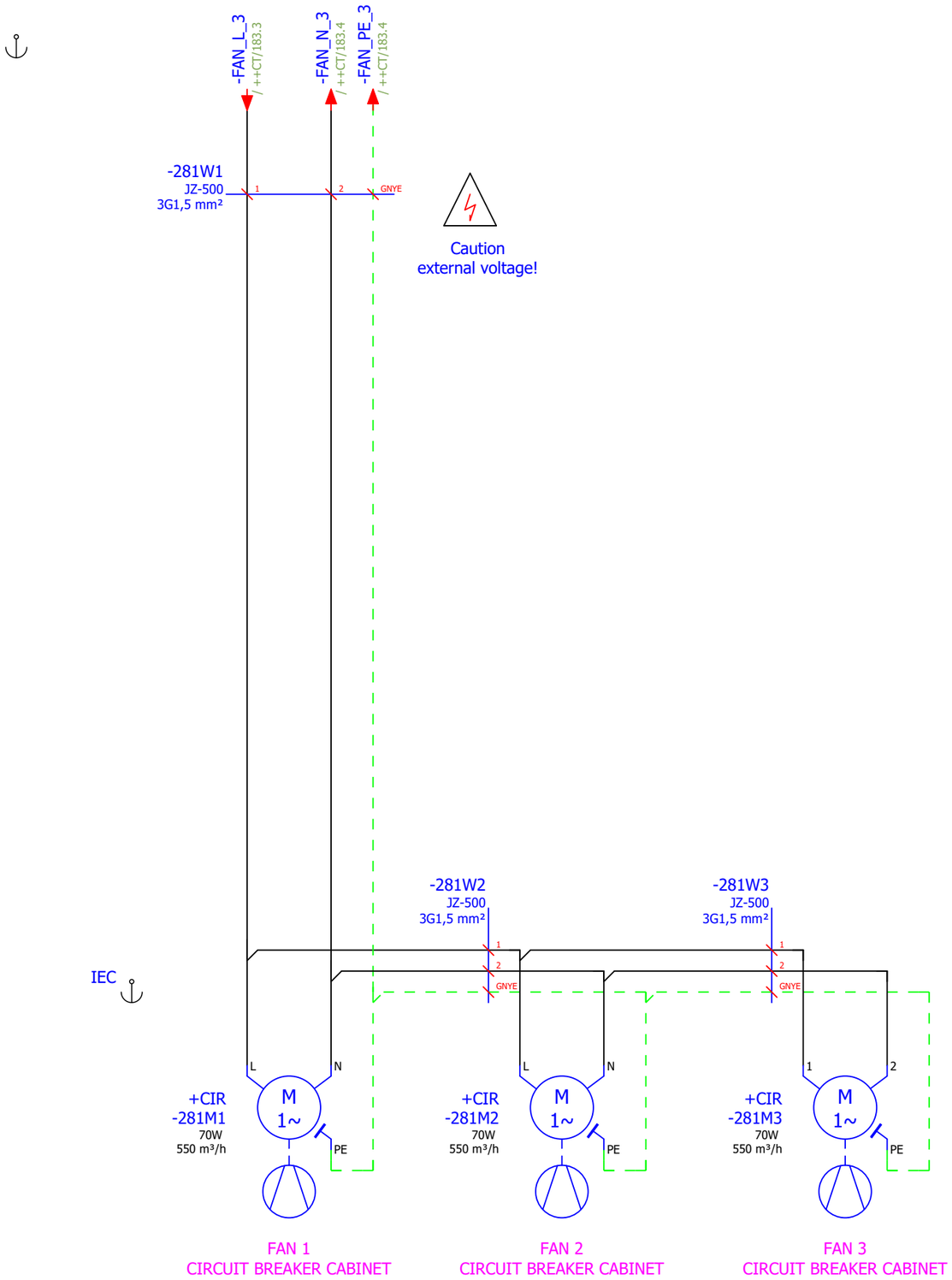
Editor	Freqcon_JD			Statron	FREQCON	SMOKE DETECTOR	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV	Converter	page: 260
Date								+		total: 498



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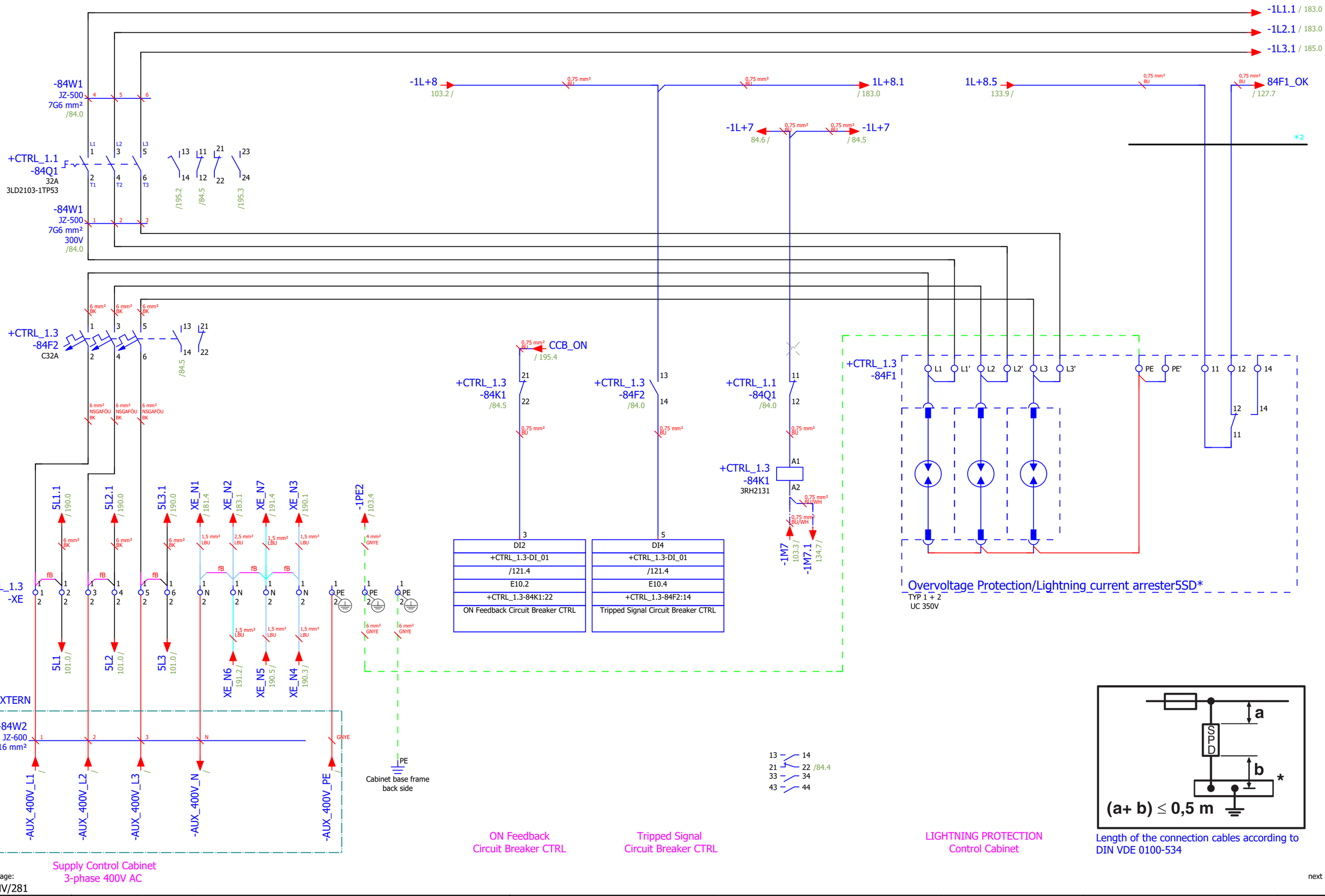
Editor	Freqcon_JD			Statron	FREQCON	CONVERTER CABINET CLIMATE	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV Converter	page: 279
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++CT/84

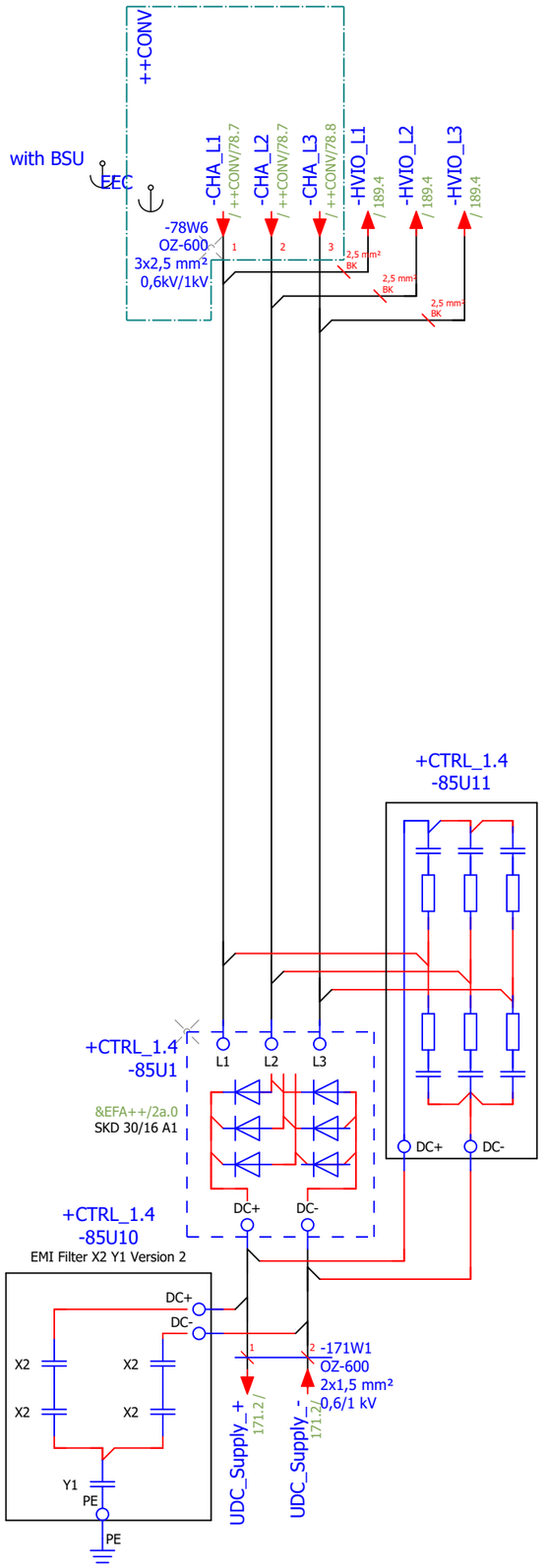
Editor	Freqcon_JD			Statron	FREQCON	CIRCUIT BREAKER CABINET CLIMATE	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CONV	Converter	page: 281
Date								+		total: 498



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++CONV/281

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Editor	Freqcon_DG			Statron	FREQCON	FEEDING CONTROL CABINET (CTRL)	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	29.07.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 84
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earthing via cooling element

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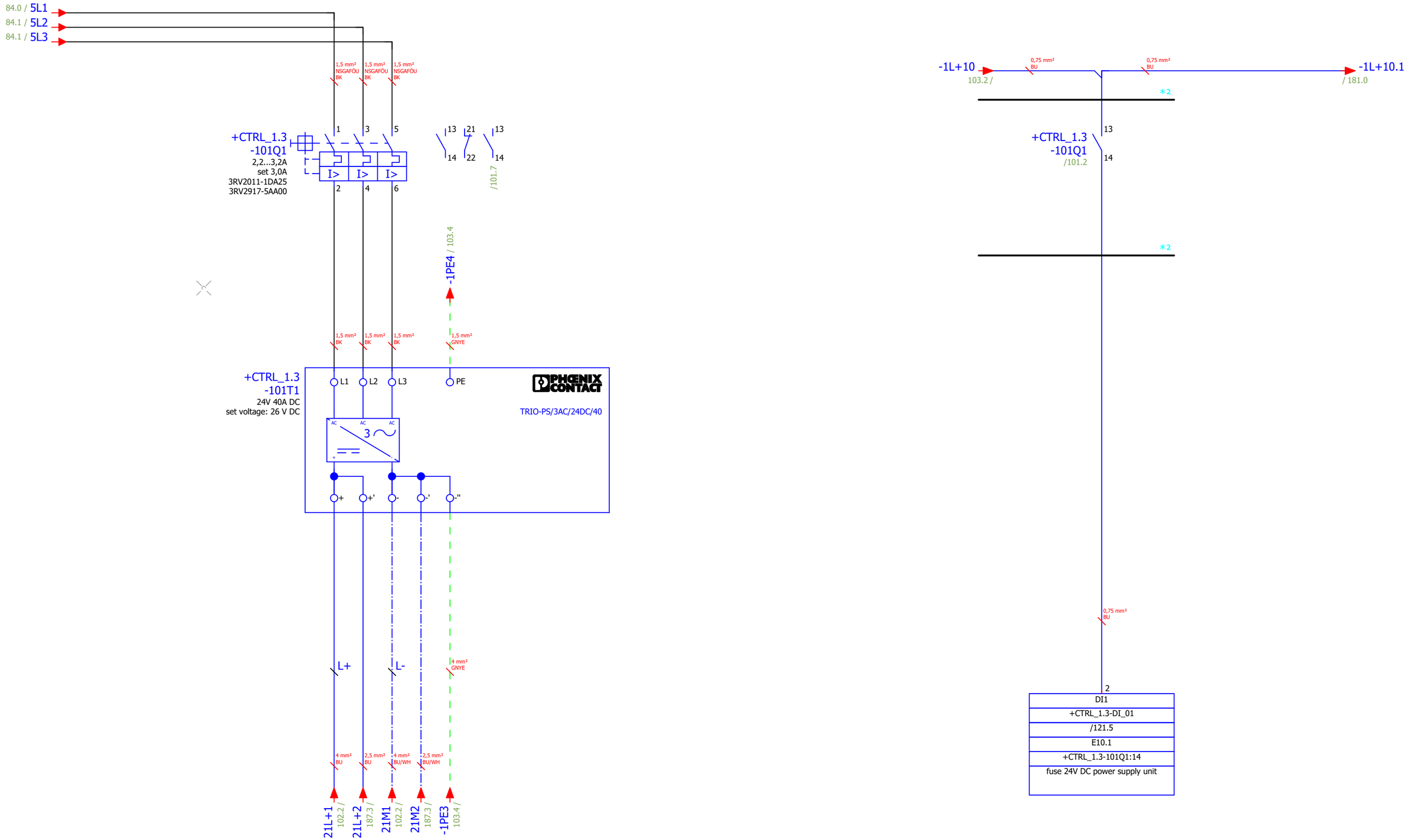
Editor	Freqcon_DG			Statron	FREQCON	SUPPLY UDC	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	29.07.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 85
Date								+		total: 498

Control Cabinet

Pages 100 - 199

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*2

The single conductor must be placed in the protective tube

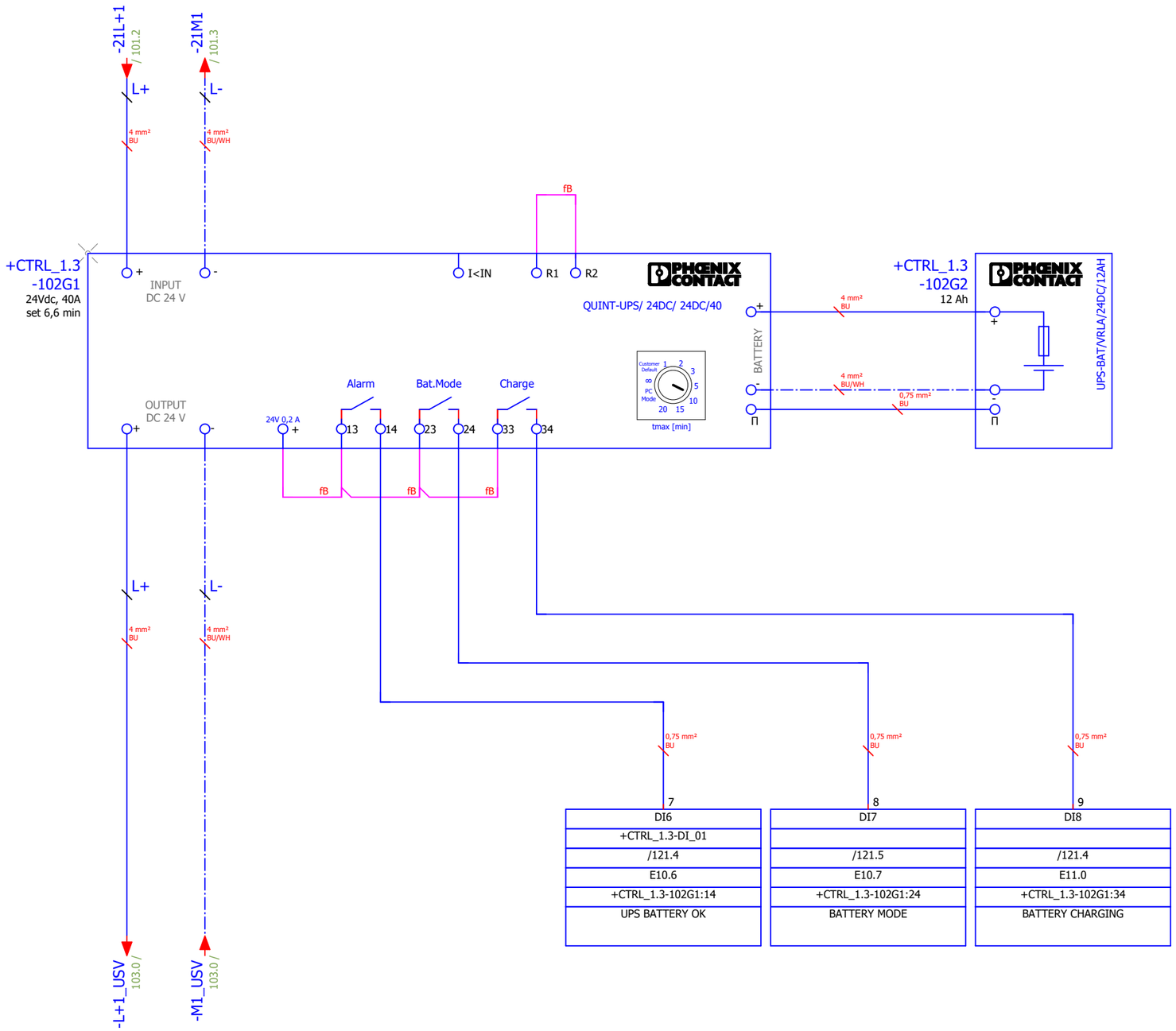
fuse
24V DC power supply unit

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Power supply unit from 400V AC

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Editor	Freqcon_DG			Statron	FREQCON	CONTROL VOLTAGE POWER SUPPLY UNIT	20241105_V1.2	= UNIT_01	Converter Container 1
Date	05.11.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 101
Date								+	total: 498

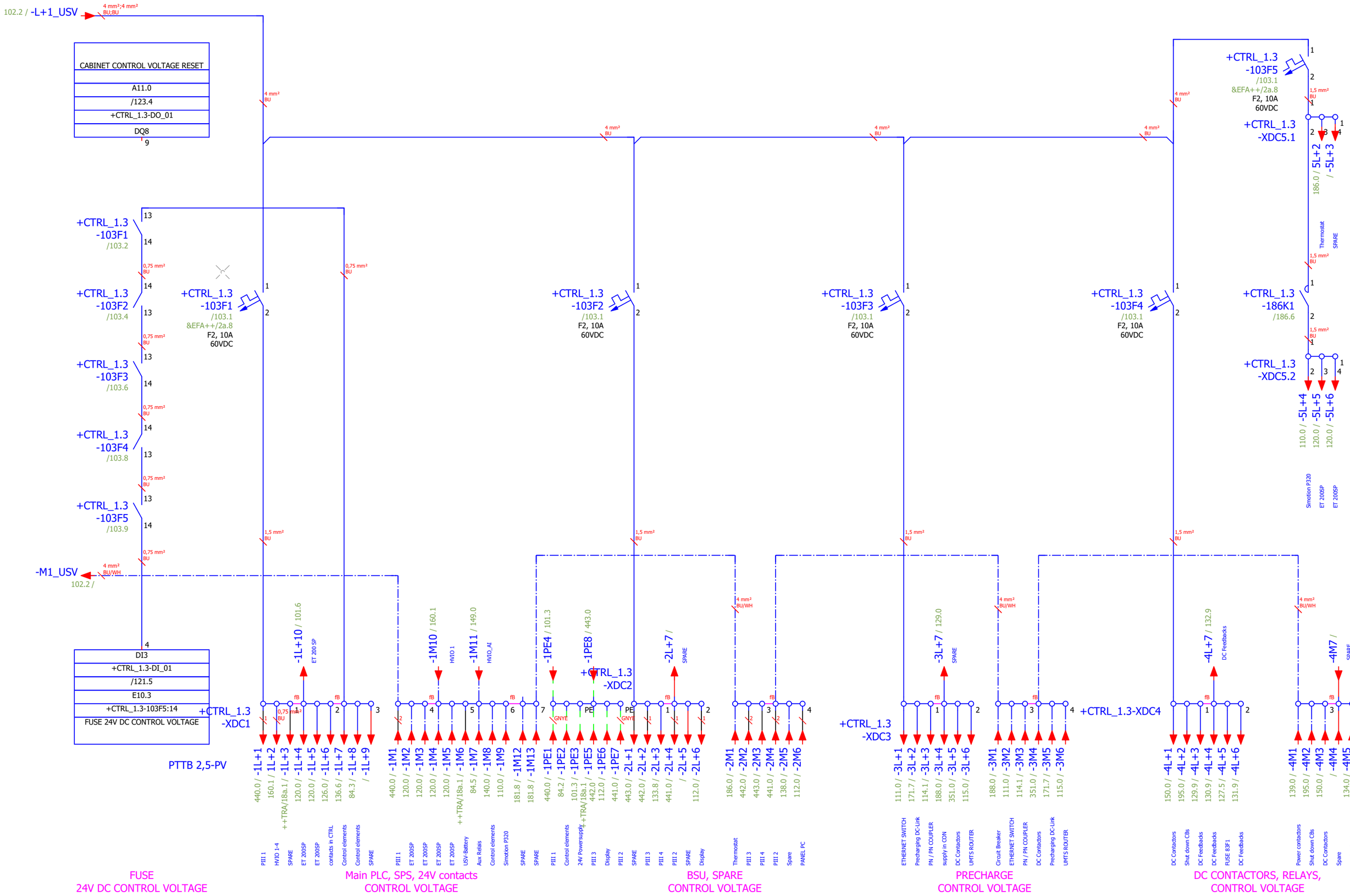


UPS BATTERY OK | BATTERY MODE | BATTERY CHARGING

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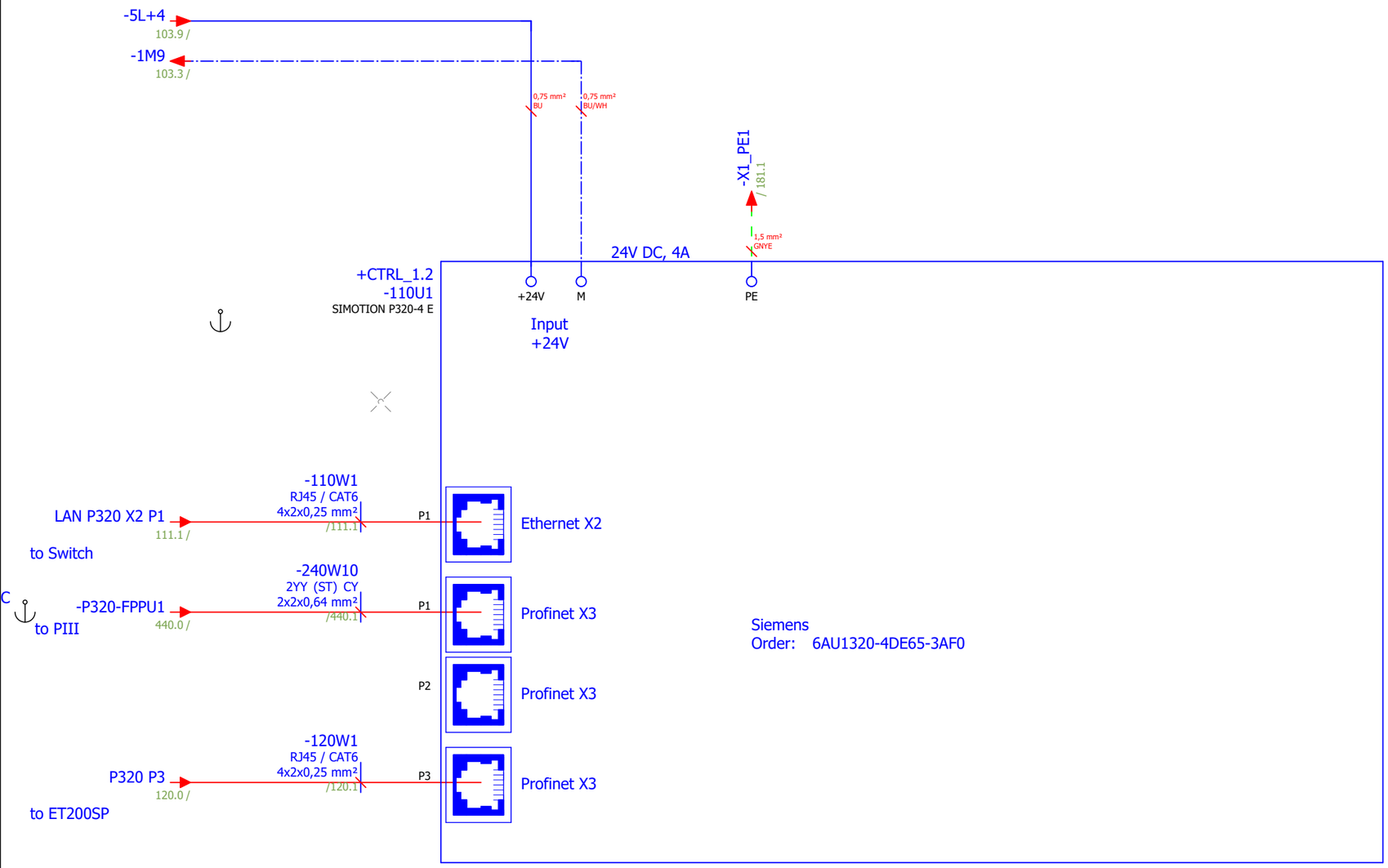
Editor	Freqcon_JD			Statron		CONTROL VOLTAGE UPS	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 102
Date								+ total: 498



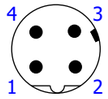
previous page: 102

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Editor	Freqcon_DG			Statron	FREQCON	CONTROL VOLTAGE FUSE	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	29.07.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 103
Date								+	total: 498



Plug with D-coded



Top view of the pinheader

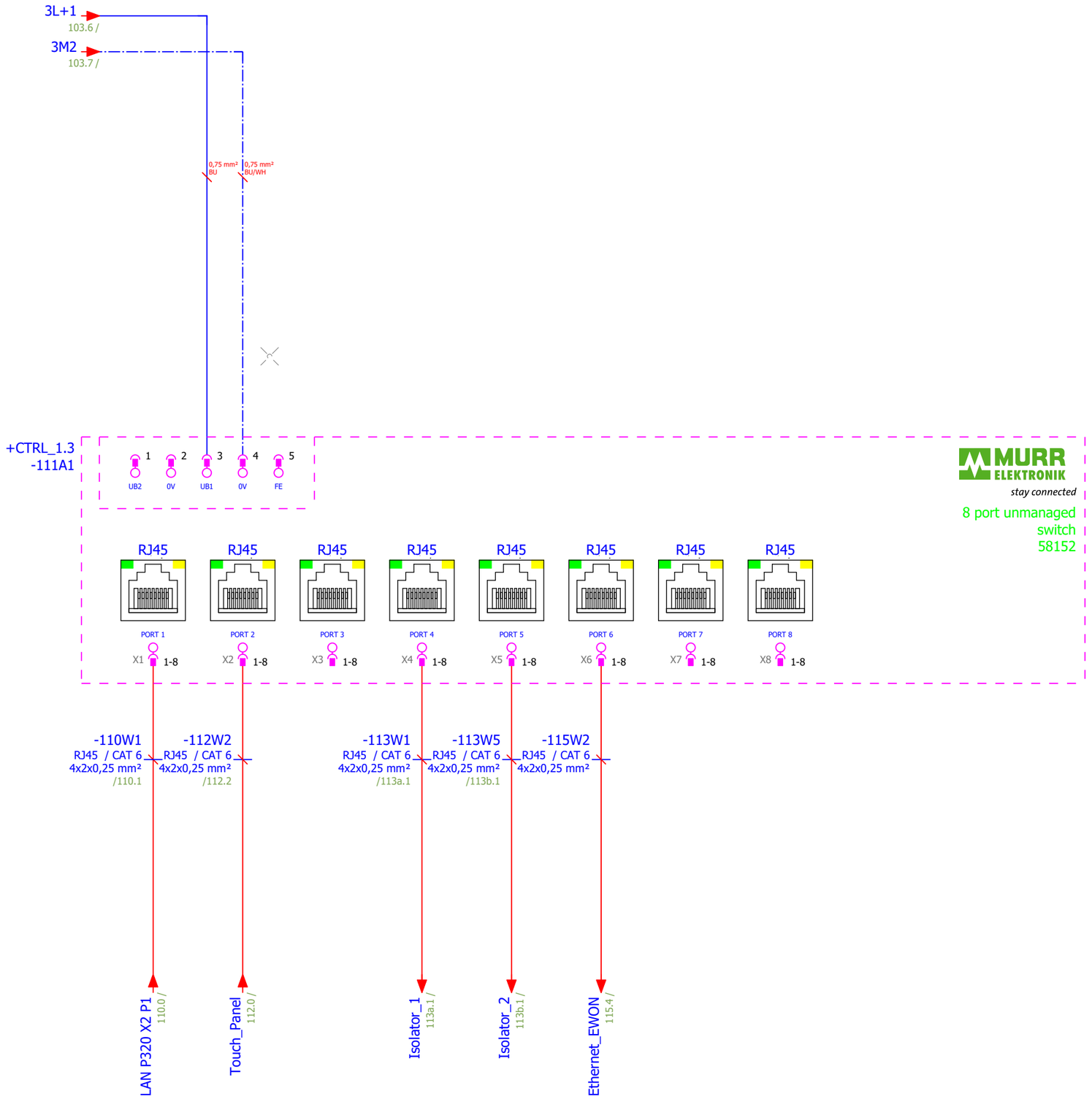
Signal	Colour	RJ45	M12 plug
TD+	yellow	1	1
TD-	orange	2	3
RD+	white	3	2
RD-	blue	6	4

Connection P320 -- PIII

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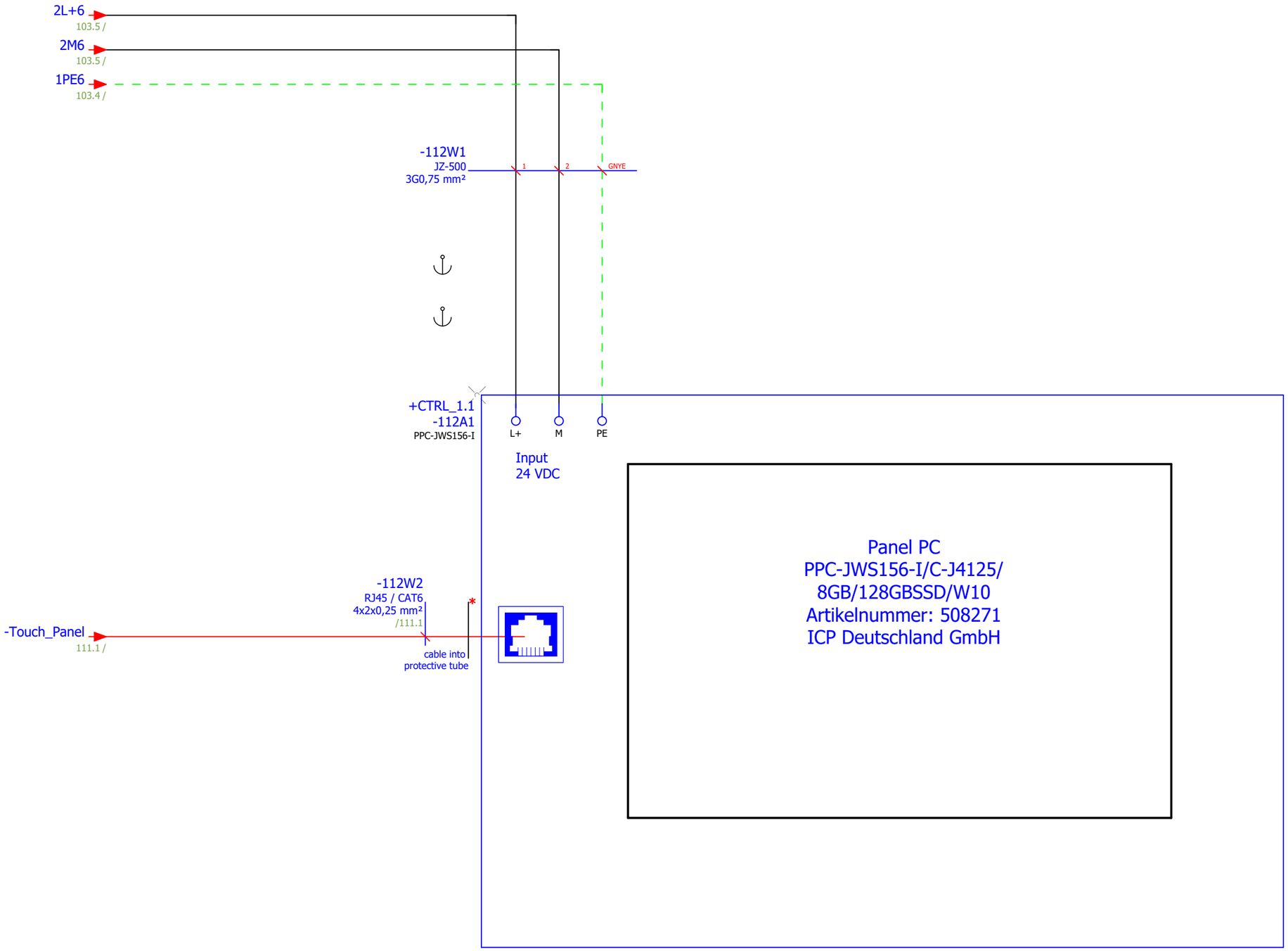
Editor	Freqcon_JD			Statron	FREQCON	MAIN PLC	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	20.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 110
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	ETHERNET SWITCH	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 111
Date								+	total: 498

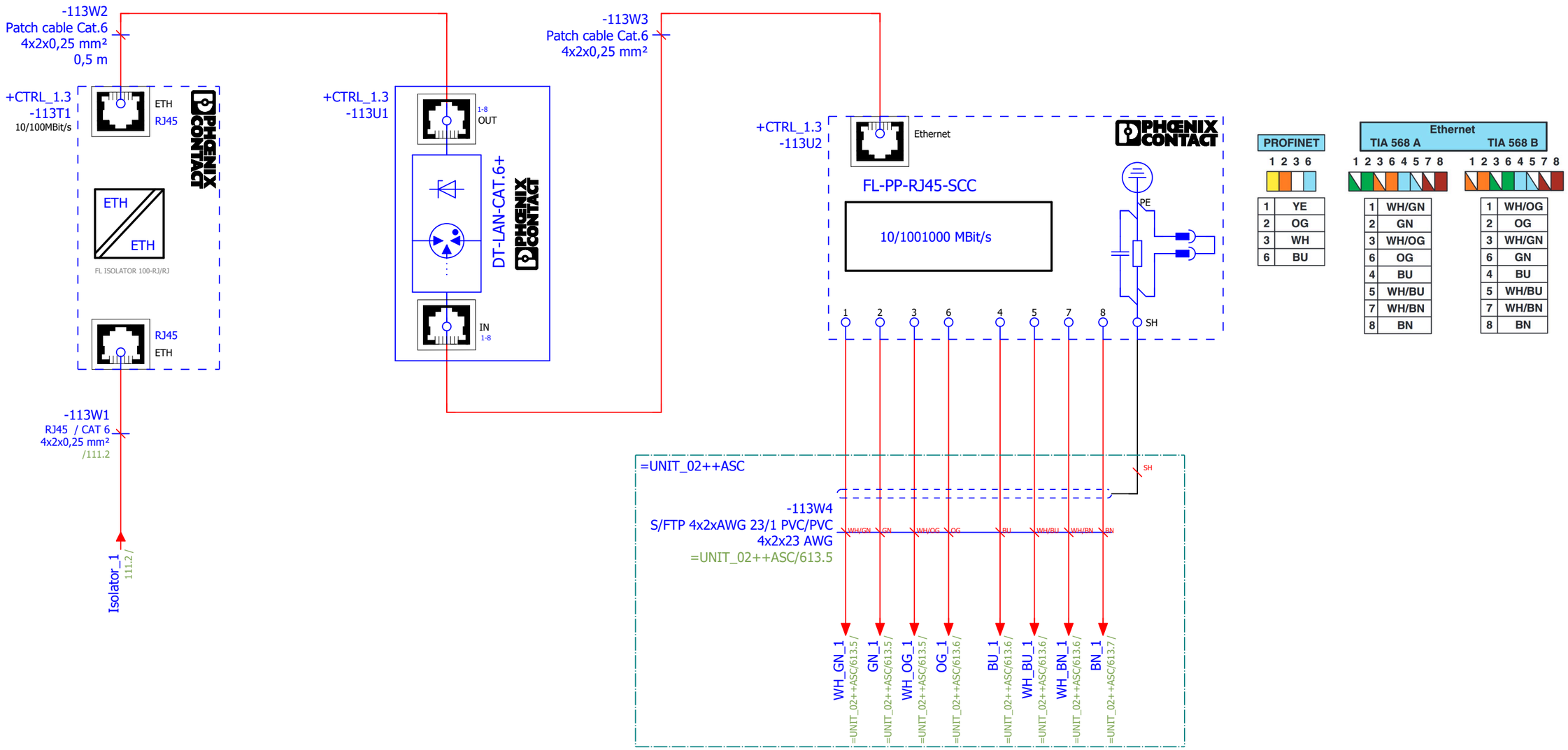


PANEL PC

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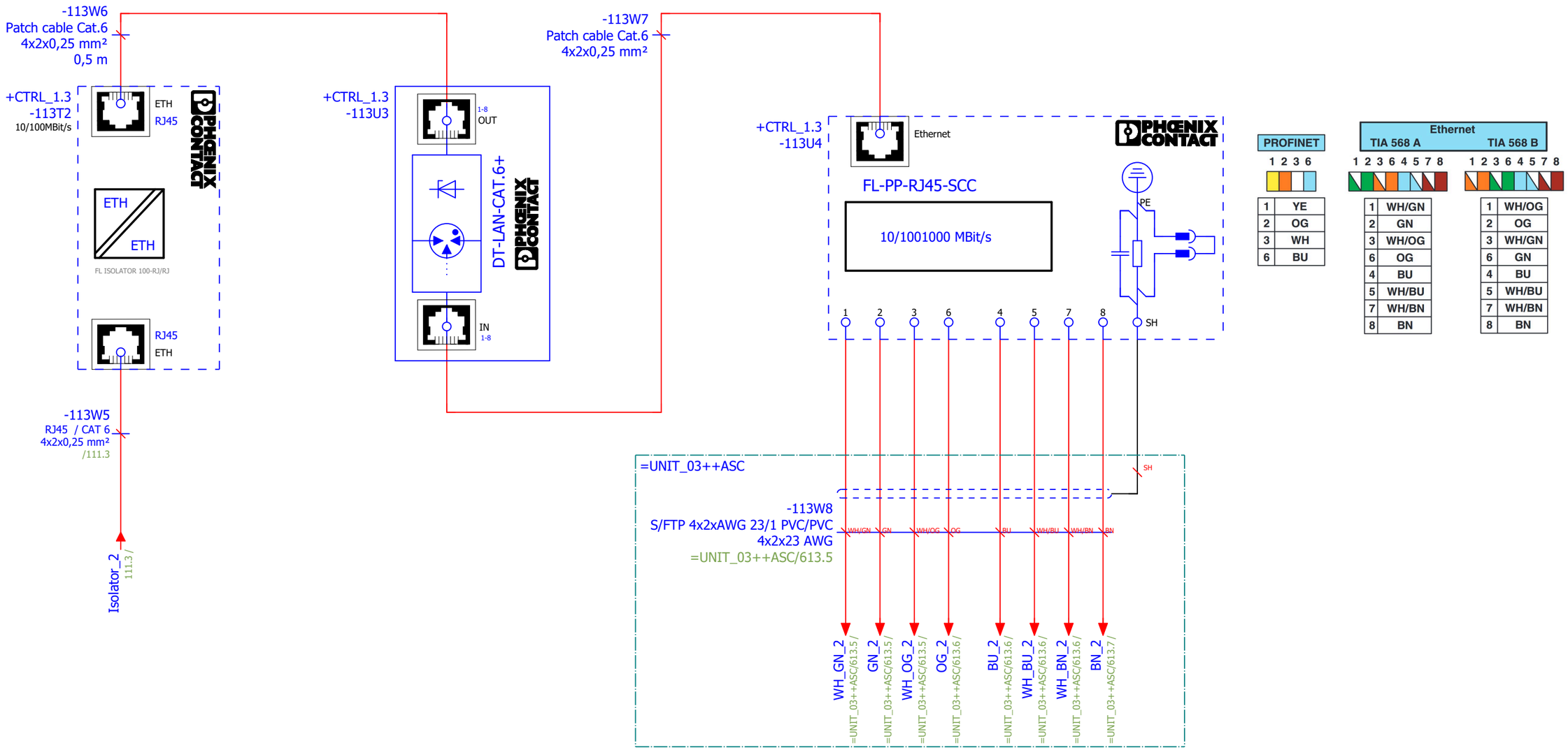
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Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 112
Date								+		total: 498



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113b

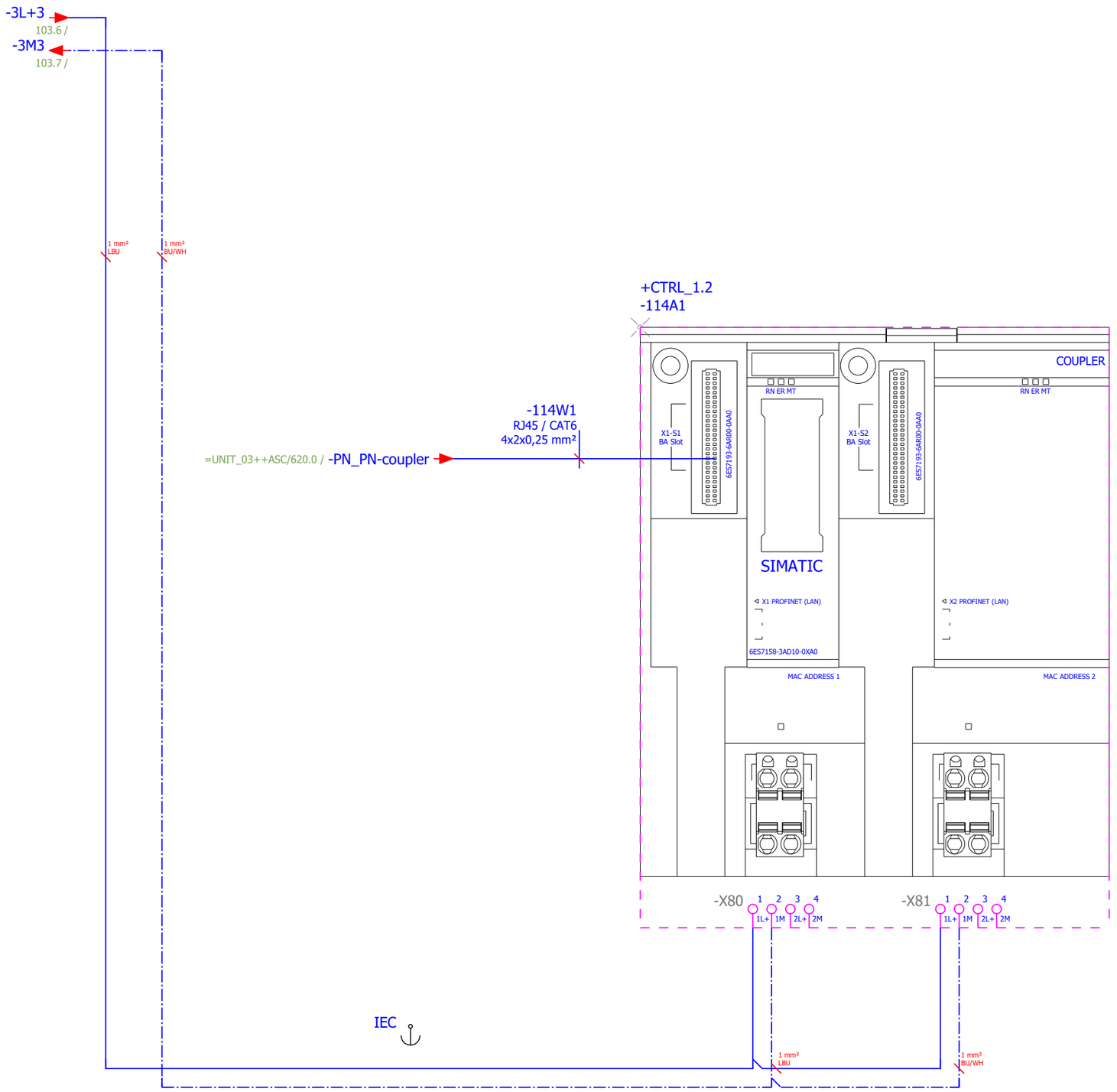
Editor	Freqcon_JD			Statron	FREQCON	ETHERNET / PROFINET ISOLATOR	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 113a
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	ETHERNET / PROFINET ISOLATOR	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 113b
Date								+	total: 498

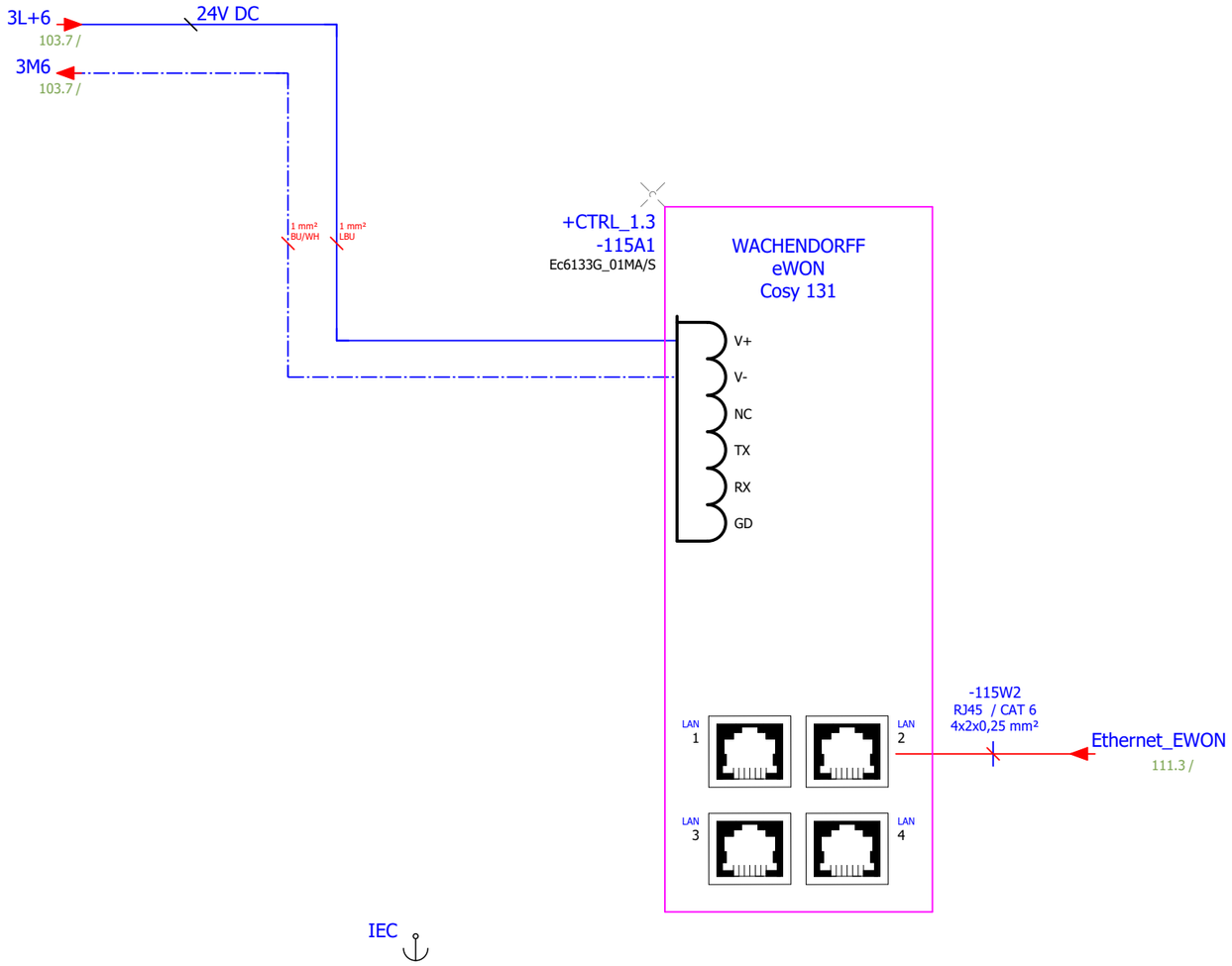


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Editor	Freqcon_JD			Statron	FREQCON	HELMHOLZ	20241105_V1.2	= UNIT_01	Converter Container 1
Date	02.07.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets
Date								+	

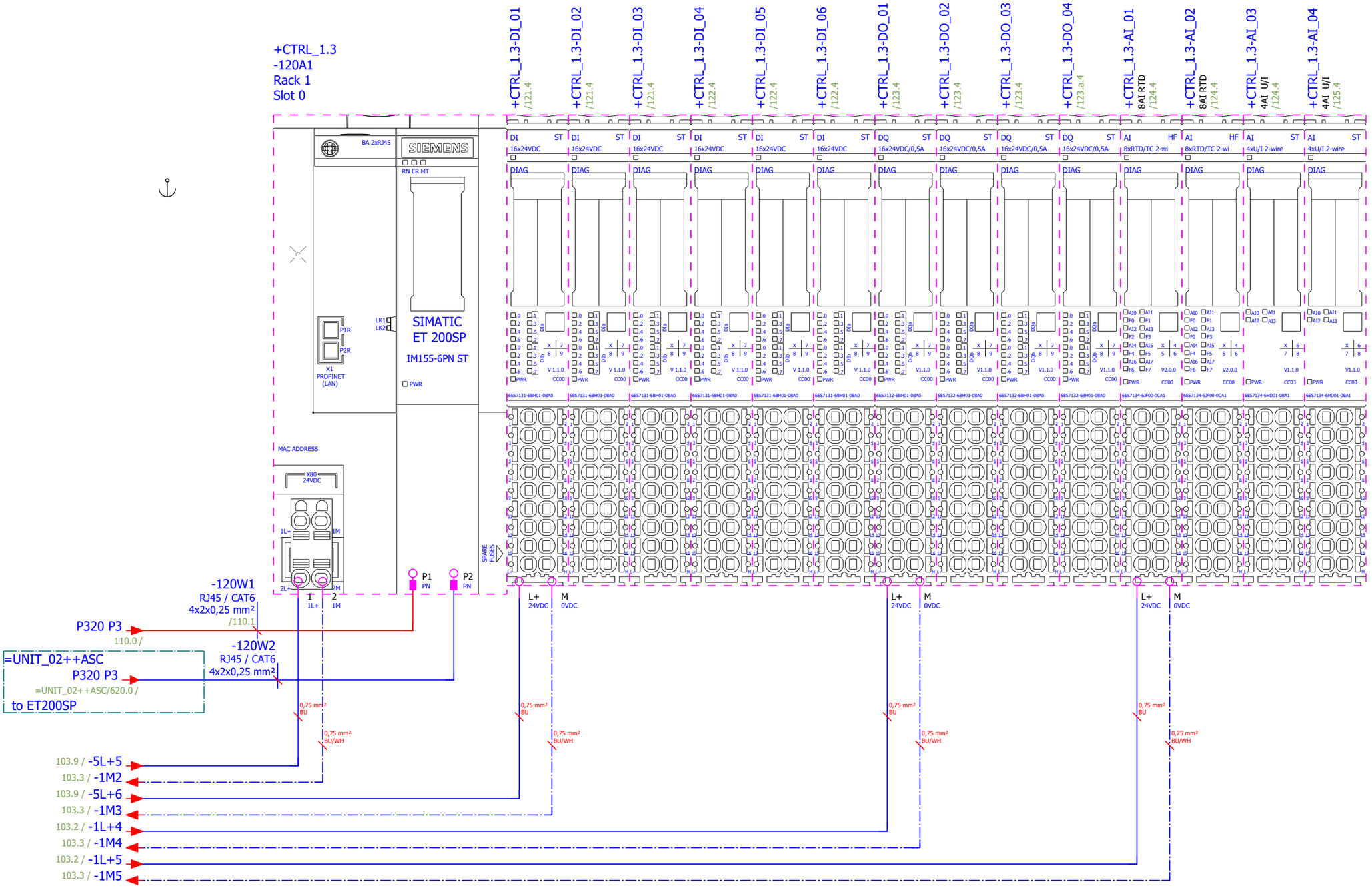
page: 114
total: 498



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Editor	Freqcon_JD			Statron	FREQCON	UMTS ROUTER	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 115
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	ET200 24V DC	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	20.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 120
Date								+		total: 498

+CTRL_1.3-DI_01

/120.3

		DI0 1	E10.0	E10.1 2 DI1	/101.7	fuse 24V DC power supply unit
ON Feedback Circuit Breaker CTRL	/84.4	DI2 3	E10.2	E10.3 4 DI3	/103.1	FUSE 24V DC CONTROL VOLTAGE
Tripped Signal Circuit Breaker CTRL	/84.5	DI4 5	E10.4	E10.5 6 DI5	/127.7	LIGHTNING PROTECTION in Control Cabinet OPTIONAL
UPS BATTERY OK	/102.5	DI6 7	E10.6	E10.7 8 DI7	/102.6	BATTERY MODE
BATTERY CHARGING	/102.7	DI8 9	E11.0	E11.1 10 DI9	/126.1	RESET -126S1
FUSE FOR PUMP	/181.2	DI10 11	E11.2	E11.3 12 DI11	/182.2	FAN 1 HEAT EXCHANGER
FUSE FOR HEATER	/181.5	DI12 13	E11.4	E11.5 14 DI13		
Fuse Fans CON, IND Cabinets	/183.6	DI14 15	E11.6	E11.7 16 DI15	/185.9	supply light, fan, heater, power unit in cabinet
	/120.3	24VDC L+		M 0VDC	/120.3	

+CTRL_1.3-DI_02

/120.3

FAULT SIGNAL SAFETY RELAY	/195.4	DI0 1	E12.0	E12.1 2 DI1	/187.6	FUSES SUPPLY FOR CIRCUIT BREAKER 1+2
CB 1 ON GRID	/127.2	DI2 3	E12.2	E12.3 4 DI3	/127.3	CB 1 OFF GRID
CB 1 Tripped GRID	/127.1	DI4 5	E12.4	E12.5 6 DI5	/127.4	FUSE AND LIGHTNING PROTECTION
Smoke detector CON	/134.0	DI6 7	E12.6	E12.7 8 DI7	/129.0	SUBSYSTEM 2_1_DC + Contactor K1 is on
SUBSYSTEM 2_1_DC -Contactor K7 is on	/129.1	DI8 9	E13.0	E13.1 10 DI9	/129.2	SUBSYSTEM 2_2_DC + Contactor K2 is on
SUBSYSTEM 2_2_DC -Contactor K8 is on	/129.3	DI10 11	E13.2	E13.3 12 DI11	/129.4	SUBSYSTEM 2_3_DC + Contactor K3 is on
SUBSYSTEM 2_3_DC -Contactor K9 is on	/129.5	DI12 13	E13.4	E13.5 14 DI13	/129.6	SUBSYSTEM 2_3_DC + SPARE
SUBSYSTEM 2_DC -SPARE	/129.7	DI14 15	E13.6	E13.7 16 DI15	/129.8	SUBSYSTEM 2_1_DC FUSE OK
		24VDC L+		M 0VDC		

+CTRL_1.3-DI_03

/120.3

SUBSYSTEM 2_2_DC FUSE OK	/129.9	DI0 1	E14.0	E14.1 2 DI1	/130.0	SUBSYSTEM 3_1_DC + Contactor K1 is on
SUBSYSTEM 3_1_DC -Contactor K7 is on	/130.1	DI2 3	E14.2	E14.3 4 DI3	/130.2	SUBSYSTEM 3_2_DC + Contactor K2 is on
SUBSYSTEM 3_2_DC -Contactor K8 is on	/130.3	DI4 5	E14.4	E14.5 6 DI5	/130.4	SUBSYSTEM 3_3_DC + Contactor K3 is on
SUBSYSTEM 3_3_DC -Contactor K9 is on	/130.5	DI6 7	E14.6	E14.7 8 DI7	/130.6	SUBSYSTEM 3_DC + SPARE
SUBSYSTEM 3_DC -SPARE	/130.7	DI8 9	E15.0	E15.1 10 DI9	/130.8	SUBSYSTEM 2_DC FUSE OK
SUBSYSTEM 3_1_DC FUSE OK	/130.9	DI10 11	E15.2	E15.3 12 DI11	/131.0	SUBSYSTEM 4_1_DC + Contactor K1 is on
SUBSYSTEM 4_1_DC -Contactor K7 is on	/131.1	DI12 13	E15.4	E15.5 14 DI13	/131.2	SUBSYSTEM 4_2_DC + Contactor K2 is on
SUBSYSTEM 4_2_DC -Contactor K8 is on	/131.3	DI14 15	E15.6	E15.7 16 DI15	/131.4	SUBSYSTEM 4_3_DC + Contactor K3 is on
		24VDC L+		M 0VDC		

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+CTRL_1.3-DI_04

/120.4

		DI			DI		
SPARE	/133.1	DI0 1	E16.0	E16.1 2 DI1	/133.2	SPARE	
SPARE	/133.3	DI2 3	E16.2	E16.3 4 DI3	/133.4	TRIP	
Earthing switch in On Transformer 620V side	/133.9	DI4 5	E16.4	E16.5 6 DI5			
		DI6 7	E16.6	E16.7 8 DI7			
		DI8 9	E17.0	E17.1 10 DI9			
Fuse 230V AC for Container Air Conditioning	/133.6	DI10 11	E17.2	E17.3 12 DI11	/128.1	CB 2 Tripped ISLAND GRID	
CB 2 ON ISLAND GRID	/128.2	DI12 13	E17.4	E17.5 14 DI13	/128.3	CB 2 OFF ISLAND GRID	
FUSE AND LIGHTNING PROTECTION 2	/128.4	DI14 15	E17.6	E17.7 16 DI15	/182.5	FAN 2 HEAT EXCHANGER (OPTIONAL)	
		24VDC L+		M 0VDC			

+CTRL_1.3-DI_05

/120.4

		DI			DI		
SUBSYSTEM 4_3_DC -Contactor K9 is on	/131.5	DI0 1	E18.0	E18.1 2 DI1	/131.6	SUBSYSTEM 4_DC + SPARE	
SUBSYSTEM 4_DC -SPARE	/131.7	DI2 3	E18.2	E18.3 4 DI3	/131.8	SUBSYSTEM 3_2_DC FUSE OK	
SUBSYSTEM 3_3_DC FUSE OK	/131.9	DI4 5	E18.4	E18.5 6 DI5	/132.0		
	/132.1	DI6 7	E18.6	E18.7 8 DI7	/132.2		
	/132.3	DI8 9	E19.0	E19.1 10 DI9	/132.4		
	/132.5	DI10 11	E19.2	E19.3 12 DI11	/132.6		
SUBSYSTEM 4_1_DC FUSE OK	/132.7	DI12 13	E19.4	E19.5 14 DI13	/132.8	SUBSYSTEM 4_2_DC FUSE OK	
SUBSYSTEM 4_3_DC FUSE OK	/132.9	DI14 15	E19.6	E19.7 16 DI15			
		24VDC L+		M 0VDC			

+CTRL_1.3-DI_06

/120.4

		DI			DI		
Shut-down to BESS	/136.6	DI0 1	E20.0	E20.1 2 DI1			
		DI2 3	E20.2	E20.3 4 DI3			
		DI4 5	E20.4	E20.5 6 DI5			
		DI6 7	E20.6	E20.7 8 DI7			
incoming CB is open	/136.8	DI8 9	E21.0	E21.1 10 DI9	/136.9	cmd island mode	
		DI10 11	E21.2	E21.3 12 DI11			
		DI12 13	E21.4	E21.5 14 DI13			
		DI14 15	E21.6	E21.7 16 DI15			
		24VDC L+		M 0VDC			

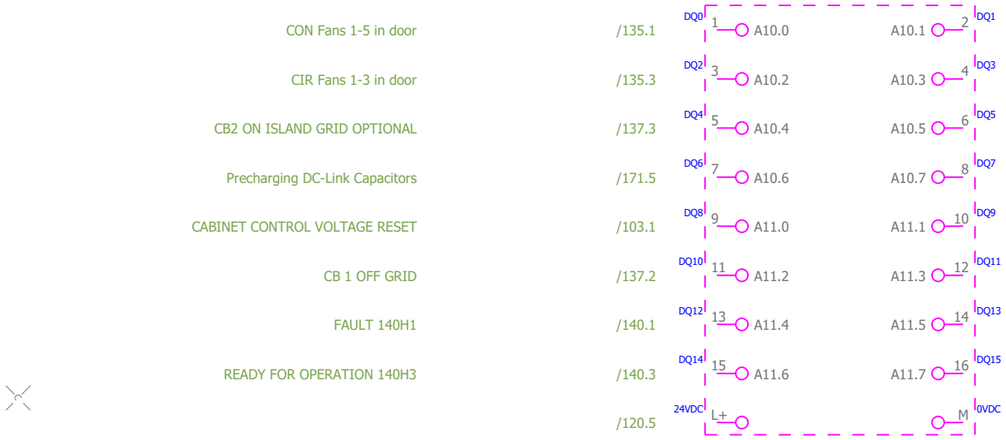
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Editor	Freqcon_JD			Statron		ET200SP DIGITAL INPUTS DI_04 + DI_05	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	14.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 122
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+CTRL_1.3-DO_01

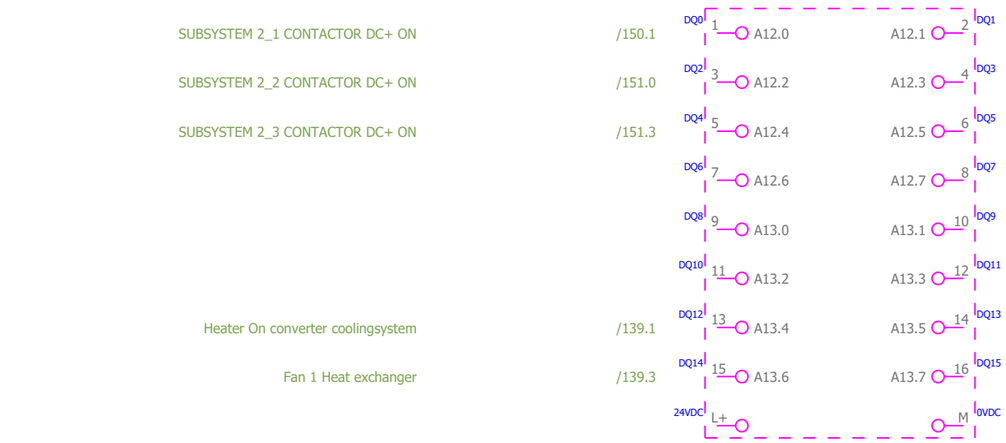
/120.5



CON Fans 1-5 in door	/135.1			/135.2	FAN 1 Control cabinet
CIR Fans 1-3 in door	/135.3			/135.4	SPARE 230V
CB2 ON ISLAND GRID OPTIONAL	/137.3			/137.4	CB 2 OFF ISLAND GRID OPTIONAL
Precharging DC-Link Capacitors	/171.5			/173.6	Discharge CON
CABINET CONTROL VOLTAGE RESET	/103.1			/137.1	CB1 ON GRID
CB 1 OFF GRID	/137.2			/189.1	GRID FAULT
FAULT 140H1	/140.1			/140.2	PREHEATING 140H2
READY FOR OPERATION 140H3	/140.3			/140.4	OPERATING 140H4
	/120.5			/120.5	

+CTRL_1.3-DO_02

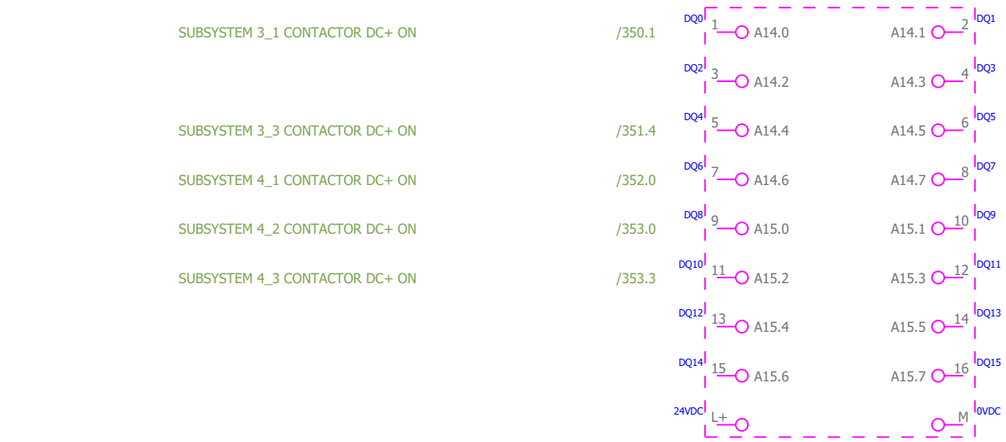
/120.5



SUBSYSTEM 2_1 CONTACTOR DC+ ON	/150.1			/150.3	SUBSYSTEM 2_1 CONTACTOR DC-ON
SUBSYSTEM 2_2 CONTACTOR DC+ ON	/151.0			/151.2	SUBSYSTEM 2_2 CONTACTOR DC-ON
SUBSYSTEM 2_3 CONTACTOR DC+ ON	/151.3			/151.5	SUBSYSTEM 2_3 CONTACTOR DC-ON
				/135.5	SPARE
				/139.4	Fan 2 Heat exchanger optional
Heater On converter coolingsystem	/139.1			/139.2	Pump converter coolingsystem
Fan 1 Heat exchanger	/139.3			/134.8	Reset the smoke detectors

+CTRL_1.3-DO_03

/120.5



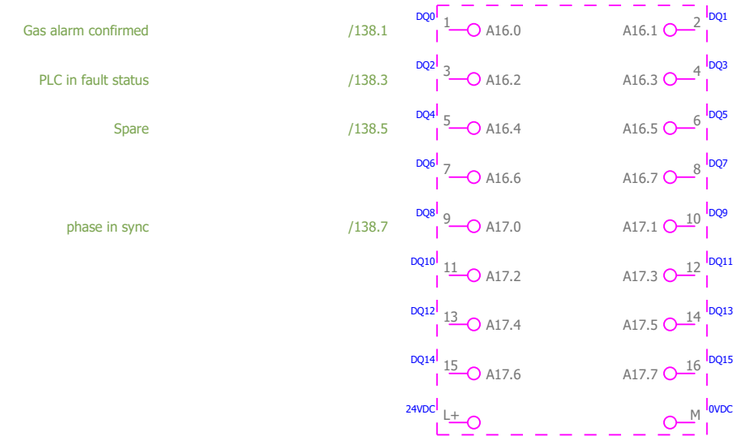
SUBSYSTEM 3_1 CONTACTOR DC+ ON	/350.1			/350.3	SUBSYSTEM 3_1 CONTACTOR DC-ON
SUBSYSTEM 3_3 CONTACTOR DC+ ON	/351.4			/351.5	SUBSYSTEM 3_3 CONTACTOR DC-ON
SUBSYSTEM 4_1 CONTACTOR DC+ ON	/352.0			/352.2	SUBSYSTEM 4_1 CONTACTOR DC-ON
SUBSYSTEM 4_2 CONTACTOR DC+ ON	/353.0			/353.2	SUBSYSTEM 4_2 CONTACTOR DC-ON
SUBSYSTEM 4_3 CONTACTOR DC+ ON	/353.3			/353.5	SUBSYSTEM 4_3 CONTACTOR DC-ON

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+CTRL_1.3-DO_04

/120.6



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Editor	Freqcon_JD			Statron	FREQCON	ET200SP DIGITAL OUTPUTS DO_01 - DO_03	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 123.a
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+CTRL_1.3-AI_01

/120.6

INDUCTOR GRID PHASE L1 TEMPERATURE 1_1	/145.1	M0+	1	PIW150	PIW152	2	M1+	/145.3	INDUCTOR GRID PHASE L2 TEMPERATURE 1_2
INDUCTOR GRID PHASE L3 TEMPERATURE 1_3	/145.5	M2+	3	PIW154	PIW156	4	M3+	/145.7	INDUCTOR DC SUB 2_1 TEMPERATURE 2_1
INDUCTOR DC SUB 2_2 TEMPERATURE 2_2	/146.1	M4+	5	PIW158	PIW160	6	M5+	/146.3	INDUCTOR DC SUB 2_3 TEMPERATURE 2_3
INDUCTOR DC SUB 3_1 TEMPERATURE 3_1	/146.5	M6+	7	PIW162	PIW164	8	M7+	/146.7	INDUCTOR DC SUB 3_2 TEMPERATURE 3_2
INDUCTOR GRID PHASE L1 TEMPERATURE 1_1	/145.1	M0-	9	PIW150	PIW152	10	M1-	/145.3	INDUCTOR GRID PHASE L2 TEMPERATURE 1_2
INDUCTOR GRID PHASE L3 TEMPERATURE 1_3	/145.5	M2-	11	PIW154	PIW156	12	M3-	/145.7	INDUCTOR DC SUB 2_1 TEMPERATURE 2_1
INDUCTOR DC SUB 2_2 TEMPERATURE 2_2	/146.1	M4-	13	PIW158	PIW160	14	M5-	/146.3	INDUCTOR DC SUB 2_3 TEMPERATURE 2_3
INDUCTOR DC SUB 3_1 TEMPERATURE 3_1	/146.5	M6-	15	PIW162	PIW164	16	M7-	/146.7	INDUCTOR DC SUB 3_2 TEMPERATURE 3_2
	/120.6	24VDC	L+		M	0VDC		/120.6	

+CTRL_1.3-AI_02

/120.6

INDUCTOR DC SUB 3_3 TEMPERATURE 3_3	/147.1	M0+	1	PIW166	PIW168	2	M1+	/147.3	INDUCTOR DC SUB 4_1 TEMPERATURE 4_1
CONTROL CABINET TEMPERATURE	/147.5	M2+	3	PIW170	PIW172	4	M3+	/147.7	CONVERTER CABINET TEMPERATURE
COOLING WATER TEMPERATURE	/148.1	M4+	5	PIW174	PIW176	6	M5+	/148.3	INDUCTOR DC SUB 4_2 TEMPERATURE 4_2
CIR CABINET TEMPERATURE	/148.5	M6+	7	PIW178	PIW180	8	M7+	/148.7	INDUCTOR DC SUB 4_3 TEMPERATURE 4_3
INDUCTOR DC SUB 3_3 TEMPERATURE 3_3	/147.1	M0-	9	PIW166	PIW168	10	M1-	/147.3	INDUCTOR DC SUB 4_1 TEMPERATURE 4_1
CONTROL CABINET TEMPERATURE	/147.5	M2-	11	PIW170	PIW172	12	M3-	/147.7	CONVERTER CABINET TEMPERATURE
COOLING WATER TEMPERATURE	/148.1	M4-	13	PIW174	PIW176	14	M5-	/148.3	INDUCTOR DC SUB 4_2 TEMPERATURE 4_2
CIR CABINET TEMPERATURE	/148.5	M6-	15	PIW178	PIW180	16	M7-	/148.7	INDUCTOR DC SUB 4_3 TEMPERATURE 4_3
		24VDC	L+		M	0VDC			

+CTRL_1.3-AI_03

/120.7

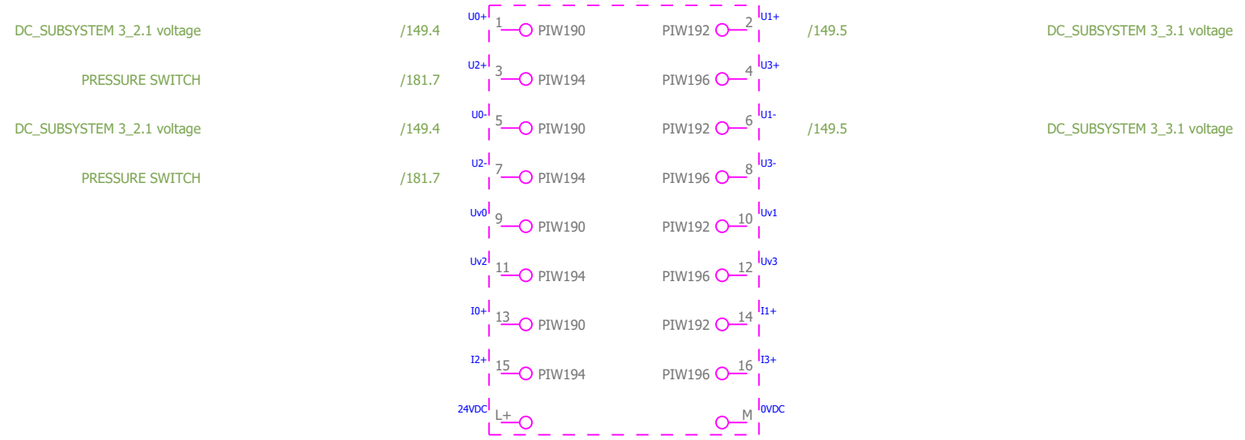
DC_SUBSYSTEM 2_1.1 voltage	/149.0	U0+	1	PIW182	PIW184	2	U1+	/149.1	DC_SUBSYSTEM 2_2.1 voltage
DC_SUBSYSTEM 2_3.1 voltage	/149.2	U2+	3	PIW186	PIW188	4	U3+	/149.3	DC_SUBSYSTEM 3_1.1 voltage
DC_SUBSYSTEM 2_1.1 voltage	/149.0	U0-	5	PIW182	PIW184	6	U1-	/149.1	DC_SUBSYSTEM 2_2.1 voltage
DC_SUBSYSTEM 2_3.1 voltage	/149.2	U2-	7	PIW186	PIW188	8	U3-	/149.3	DC_SUBSYSTEM 3_1.1 voltage
		Uv0	9	PIW182	PIW184	10	Uv1		
		Uv2	11	PIW186	PIW188	12	Uv3		
		I0+	13	PIW182	PIW184	14	I1+		
		I2+	15	PIW186	PIW188	16	I3+		
		24VDC	L+		M	0VDC			

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+CTRL_1.3-AI_04

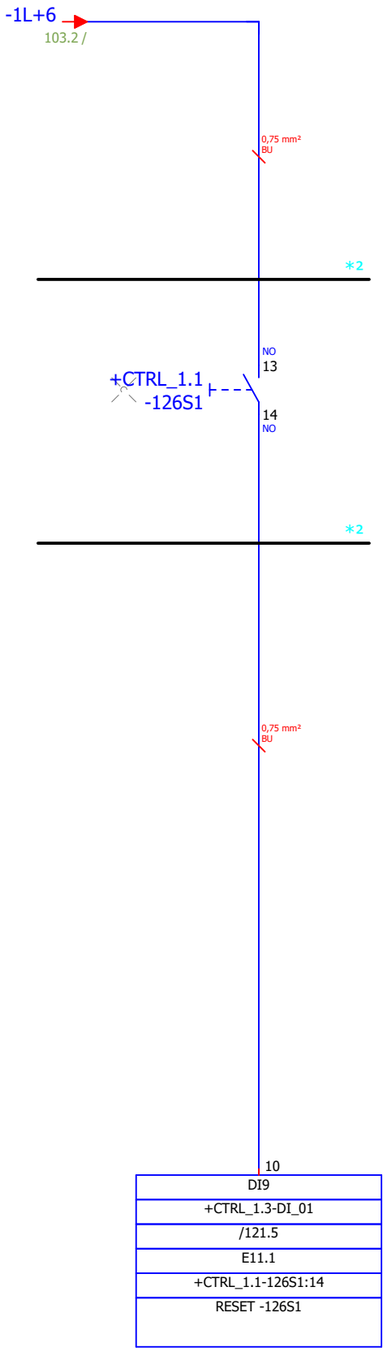
/120.7



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Editor	Freqcon_JD			Statron	FREQCON	ET200SP ANALOG INPUTS AI_04	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	14.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 125
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RESET
-126S1

*2
The single conductor
must be placed
in the protective tube

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Editor	Freqcon_JD			Statron	FREQCON	INPUTS CONTROL ELEMENTS	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	02.07.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 126
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EC

3WL

++CONV

-CB1_TRIPPED / ++CONV/80.8

-CB1_ON_FB / ++CONV/80.7

-CB1_OFF_FB / ++CONV/80.7

-1F2 / ++CONV/78.9

-4L+5.4 / ++CONV/238a.2

-80W1
OZ-500
8x0,75 mm²

-238W7
OZ-500
2x0,75 mm²

-24V_Signal / 189.5

-4L+5.3 / 134.0

84F1_OK / 84.9

+CTRL_1.3
-X3

0,75 mm² BU

fB

bridge

-4L+5 / 103.8

-4L+5.1 / 128.5

DI14	DI2	DI3	DI5
+CTRL_1.3-DI_02	+CTRL_1.3-DI_02		
/121.4	/121.4	/121.5	/121.5
E12.4	E12.2	E12.3	E12.5
++CONV+CIR-80Q1:X7_13	++CONV+CIR-80Q1:X6_11	++CONV+CIR-80Q1:X6_9	++CONV+AC_DC-78F1:13
CB 1 Tripped GRID	CB 1 ON GRID	CB 1 OFF GRID	FUSE AND LIGHTNING PROTECTION

DI5
+CTRL_1.3-DI_01
/121.5
E10.5
+CTRL_1.3-84F1:12
LIGHTNING PROTECTION in Control Cabinet OPTIONAL

Info:
true = not fail,
false = cb tripped
CB = Circuit Breaker

CB 1 Tripped GRID

CB 1 ON GRID

CB 1 OFF GRID

FUSE AND LIGHTNING PROTECTION

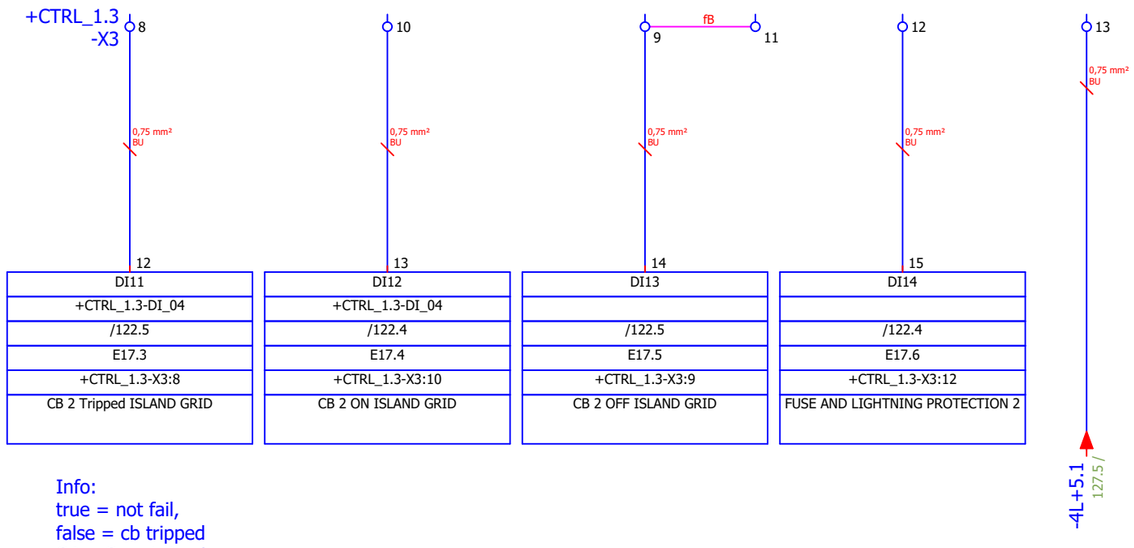
LIGHTNING PROTECTION in Control Cabinet OPTIONAL

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Editor	Freqcon_JD			Statron		DIGITAL INPUTS CB 1	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets
Date								+	

0	1	2	3	4	5	6	7	8	9



Info:
true = not fail,
false = cb tripped
CB = Circuit Breaker

CB 2 Tripped ISLAND GRID

CB 2 ON ISLAND GRID

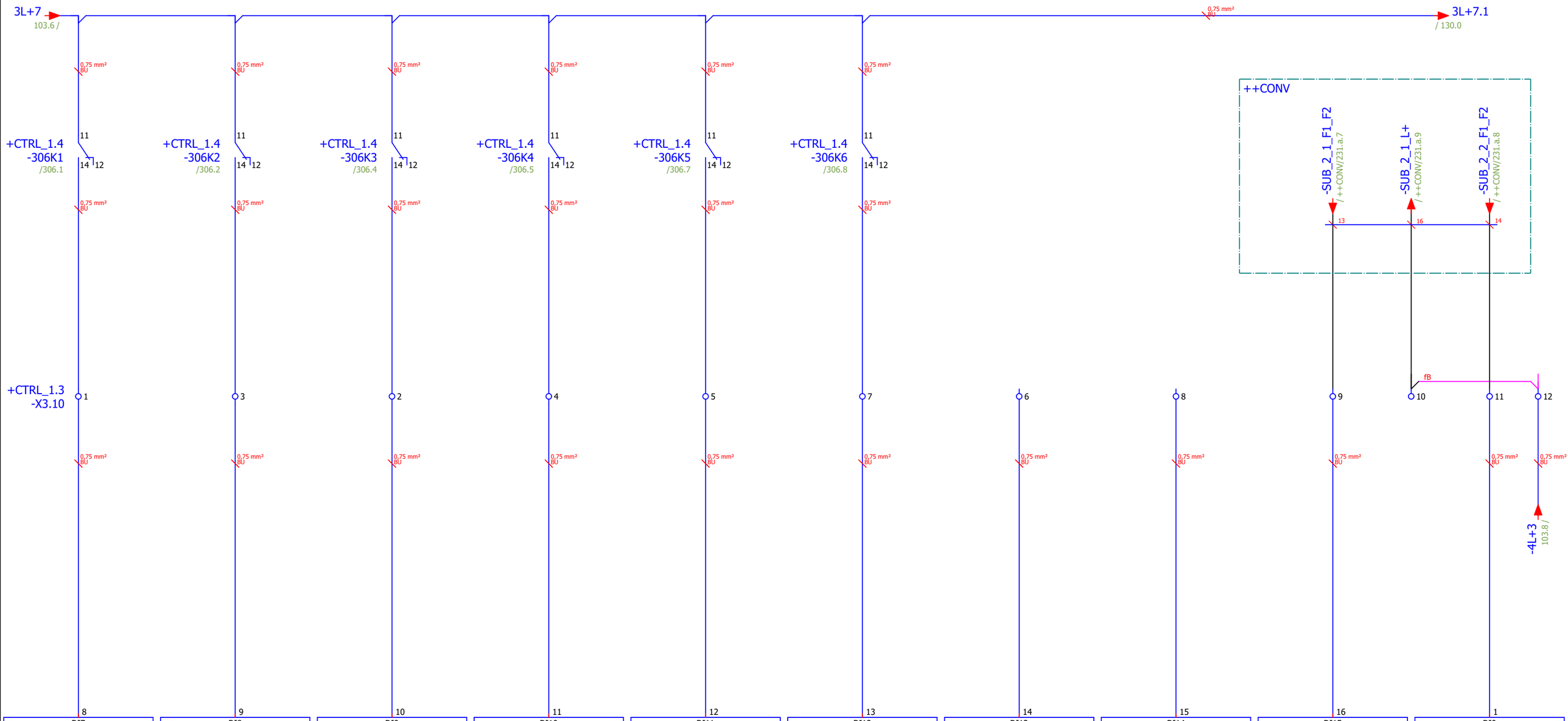
CB 2 OFF ISLAND GRID

FUSE AND LIGHTNING PROTECTION 2

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Editor	Freqcon_JD			Statron		DIGITAL INPUTS CB 2	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 128
Date								+		total: 498



Feedback of DC Contactors

SUBSYSTEM 2_1_DC + Contactor K1 is on

SUBSYSTEM 2_1_DC - Contactor K7 is on

SUBSYSTEM 2_2_DC + Contactor K2 is on

SUBSYSTEM 2_2_DC - Contactor K8 is on

SUBSYSTEM 2_3_DC + Contactor K3 is on

SUBSYSTEM 2_3_DC - Contactor K9 is on

SUBSYSTEM 2_3_DC + SPARE

SUBSYSTEM 2_DC - SPARE

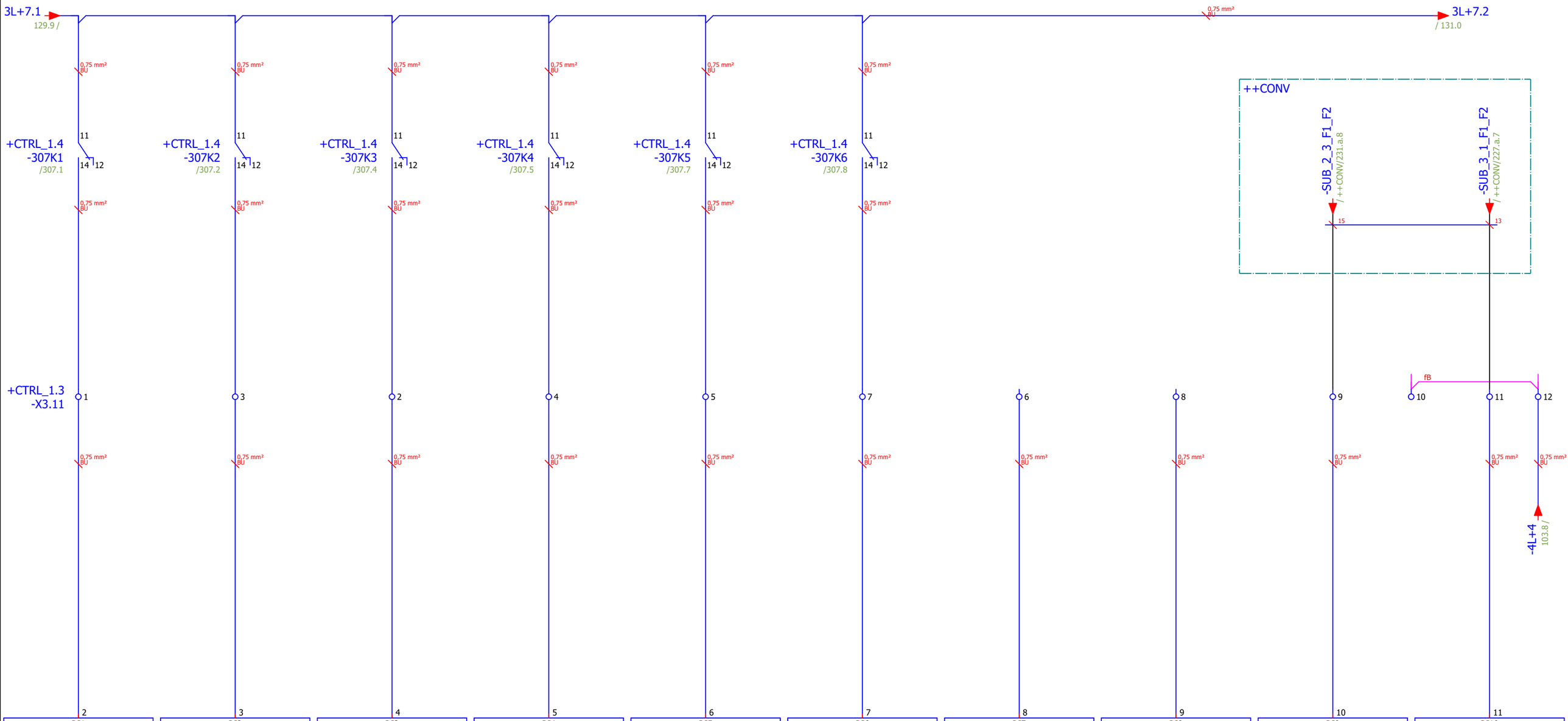
SUBSYSTEM 2_1_DC FUSE OK

SUBSYSTEM 2_2_DC FUSE OK

previous page: 128

next page: 130

Editor	Freqcon_JD			Statron	FREQCON	DIGITAL INPUTS SUBSYSTEM 2_1 / 2_2	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 129
Date								+	total: 498



2	3	4	5	6	7	8	9	10	11
DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	DI9	DI10
+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03
/121.5	/121.4	/121.5	/121.4	/121.5	/121.4	/121.5	/121.4	/121.5	/121.4
E14.1	E14.2	E14.3	E14.4	E14.5	E14.6	E14.7	E15.0	E15.1	E15.2
+CTRL_1.4-307K1:14	+CTRL_1.4-307K2:14	+CTRL_1.4-307K3:14	+CTRL_1.4-307K4:14	+CTRL_1.4-307K5:14	+CTRL_1.4-307K6:14	+CTRL_1.3-X3.11:6	+CTRL_1.3-X3.11:8	++CONV+CIR-231U1-F9:2	++CONV+CIR-227U1-F1:2
SUBSYSTEM 3_1_DC + Contactor K1 is on	SUBSYSTEM 3_1_DC -Contactor K7 is on	SUBSYSTEM 3_2_DC + Contactor K2 is on	SUBSYSTEM 3_2_DC -Contactor K8 is on	SUBSYSTEM 3_3_DC + Contactor K3 is on	SUBSYSTEM 3_3_DC -Contactor K9 is on	SUBSYSTEM 3_DC + SPARE	SUBSYSTEM 3_DC -SPARE	SUBSYSTEM 2_DC FUSE OK	SUBSYSTEM 3_1_DC FUSE OK

Feedback of DC Contactors

SUBSYSTEM 3_1_DC + Contactor K1 is on

SUBSYSTEM 3_1_DC - Contactor K7 is on

SUBSYSTEM 3_2_DC + Contactor K2 is on

SUBSYSTEM 3_2_DC - Contactor K8 is on

SUBSYSTEM 3_3_DC + Contactor K3 is on

SUBSYSTEM 3_3_DC - Contactor K9 is on

SUBSYSTEM 3_DC + SPARE

SUBSYSTEM 3_DC - SPARE

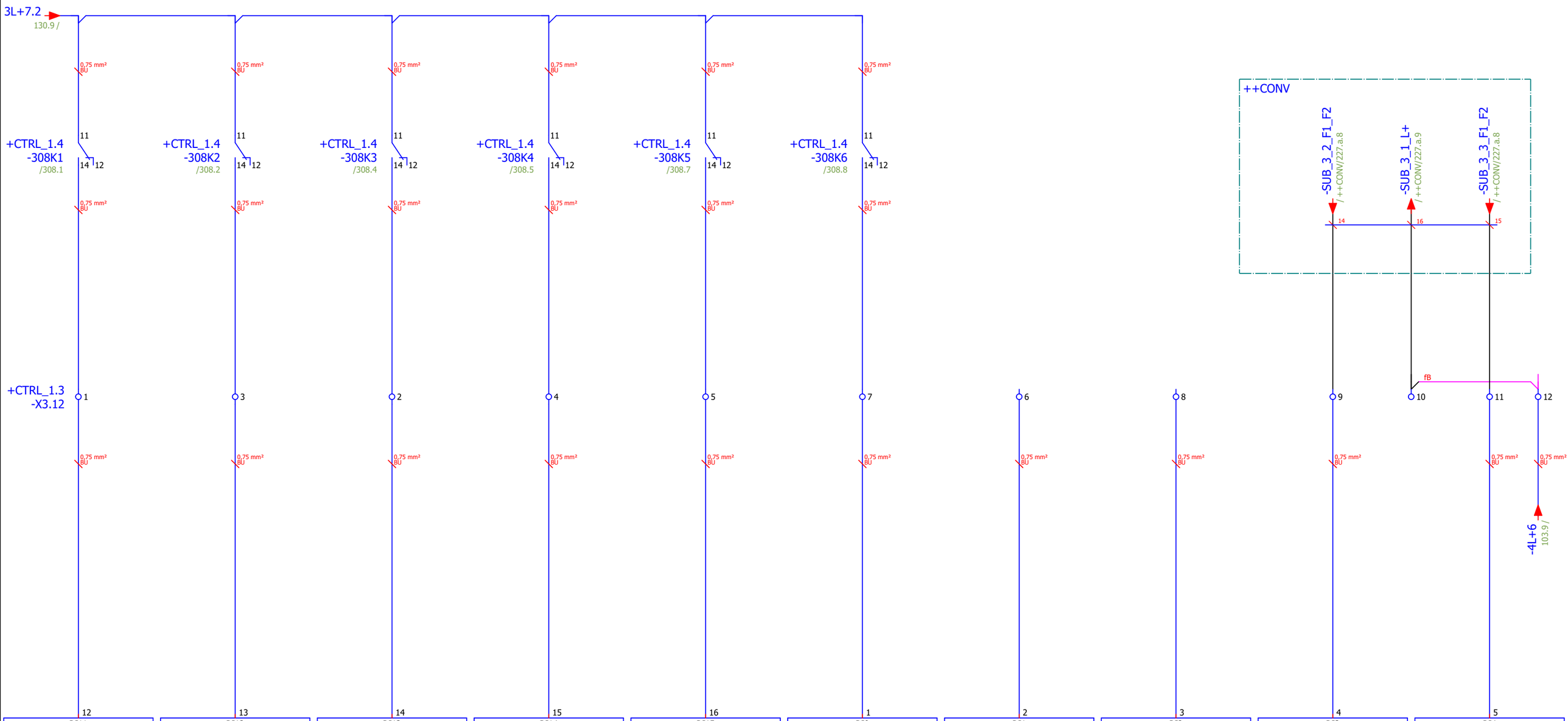
SUBSYSTEM 2_DC FUSE OK

SUBSYSTEM 3_1_DC FUSE OK

previous page: 129

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Editor	Freqcon_JD			Statron	FREQCON	DIGITAL INPUTS SUBSYSTEM 2_3 / 3_1	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 130
Date								+ total: 498



DI11	DI12	DI13	DI14	DI15	DI0	DI1	DI2	DI3	DI4
+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_03	+CTRL_1.3-DI_05	+CTRL_1.3-DI_05	+CTRL_1.3-DI_05	+CTRL_1.3-DI_05	+CTRL_1.3-DI_05
/121.5	/121.4	/121.5	/121.4	/121.5	/122.4	/122.5	/122.4	/122.5	/122.4
E15.3	E15.4	E15.5	E15.6	E15.7	E18.0	E18.1	E18.2	E18.3	E18.4
+CTRL_1.4-308K1:14	+CTRL_1.4-308K2:14	+CTRL_1.4-308K3:14	+CTRL_1.4-308K4:14	+CTRL_1.4-308K5:14	+CTRL_1.4-308K6:14	+CTRL_1.3-X3.12:6	+CTRL_1.3-X3.12:8	++CONV+CIR-227U1-F5:2	++CONV+CIR-227U1-F9:2
SUBSYSTEM 4_1_DC + Contactor K1 is on	SUBSYSTEM 4_1_DC -Contactor K7 is on	SUBSYSTEM 4_2_DC + Contactor K2 is on	SUBSYSTEM 4_2_DC -Contactor K8 is on	SUBSYSTEM 4_3_DC + Contactor K3 is on	SUBSYSTEM 4_3_DC -Contactor K9 is on	SUBSYSTEM 4_DC + SPARE	SUBSYSTEM 4_DC -SPARE	SUBSYSTEM 3_2_DC FUSE OK	SUBSYSTEM 3_3_DC FUSE OK

Feedback of DC Contactors

SUBSYSTEM 4_1_DC + Contactor K1 is on

SUBSYSTEM 4_1_DC - Contactor K7 is on

SUBSYSTEM 4_2_DC + Contactor K2 is on

SUBSYSTEM 4_2_DC - Contactor K8 is on

SUBSYSTEM 4_3_DC + Contactor K3 is on

SUBSYSTEM 4_3_DC - Contactor K9 is on

SUBSYSTEM 4_DC + SPARE

SUBSYSTEM 4_DC - SPARE

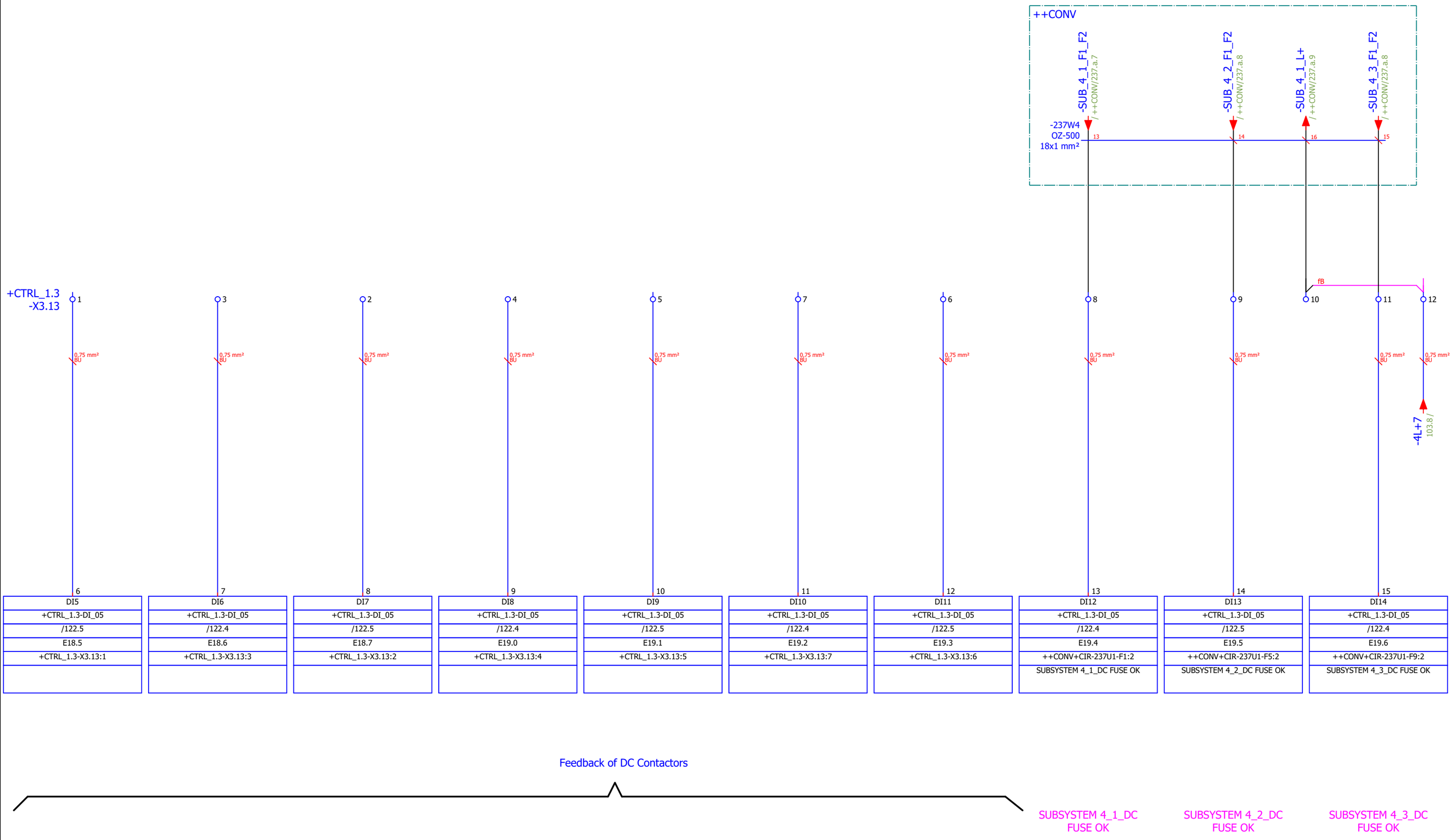
SUBSYSTEM 3_2_DC FUSE OK

SUBSYSTEM 3_3_DC FUSE OK

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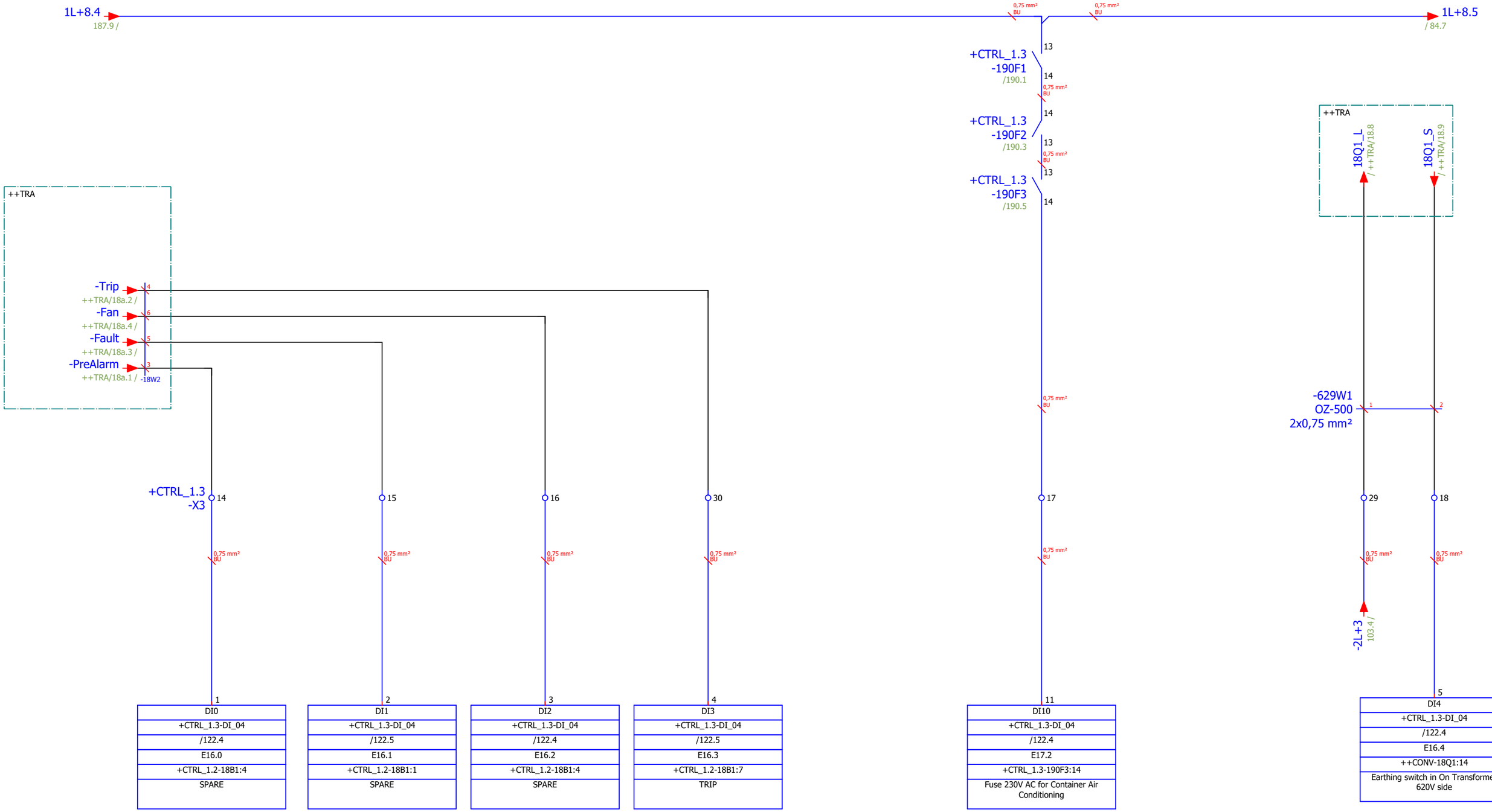
Editor	Freqcon_DG			Statron	FREQCON	DIGITAL INPUTS SUBSYSTEM 3_3 / 4_1	20241105_V1.2	= UNIT_01 Converter Container 1
Date	29.07.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 131
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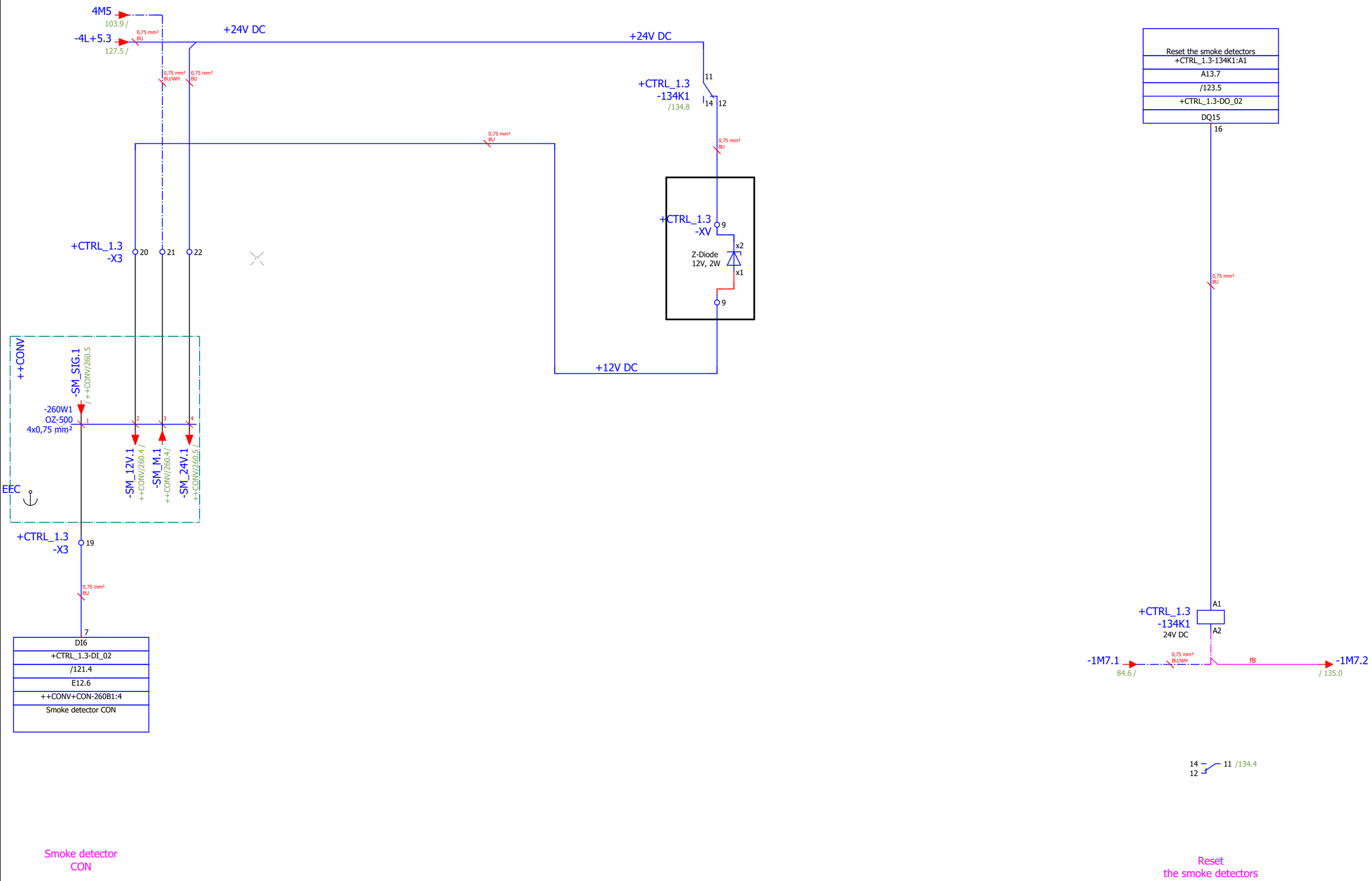
Editor	Freqcon_DG			Statron	FREQCON	DIGITAL INPUTS SUBSYSTEM 4_2 / 4_3	20241105_V1.2	= UNIT_01	Converter Container 1
Date	29.07.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 132
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Editor	Freqcon_DG			Statron	FREQCON	DIGITAL INPUTS SPARE	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	05.11.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 133
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Smoke detector
CON

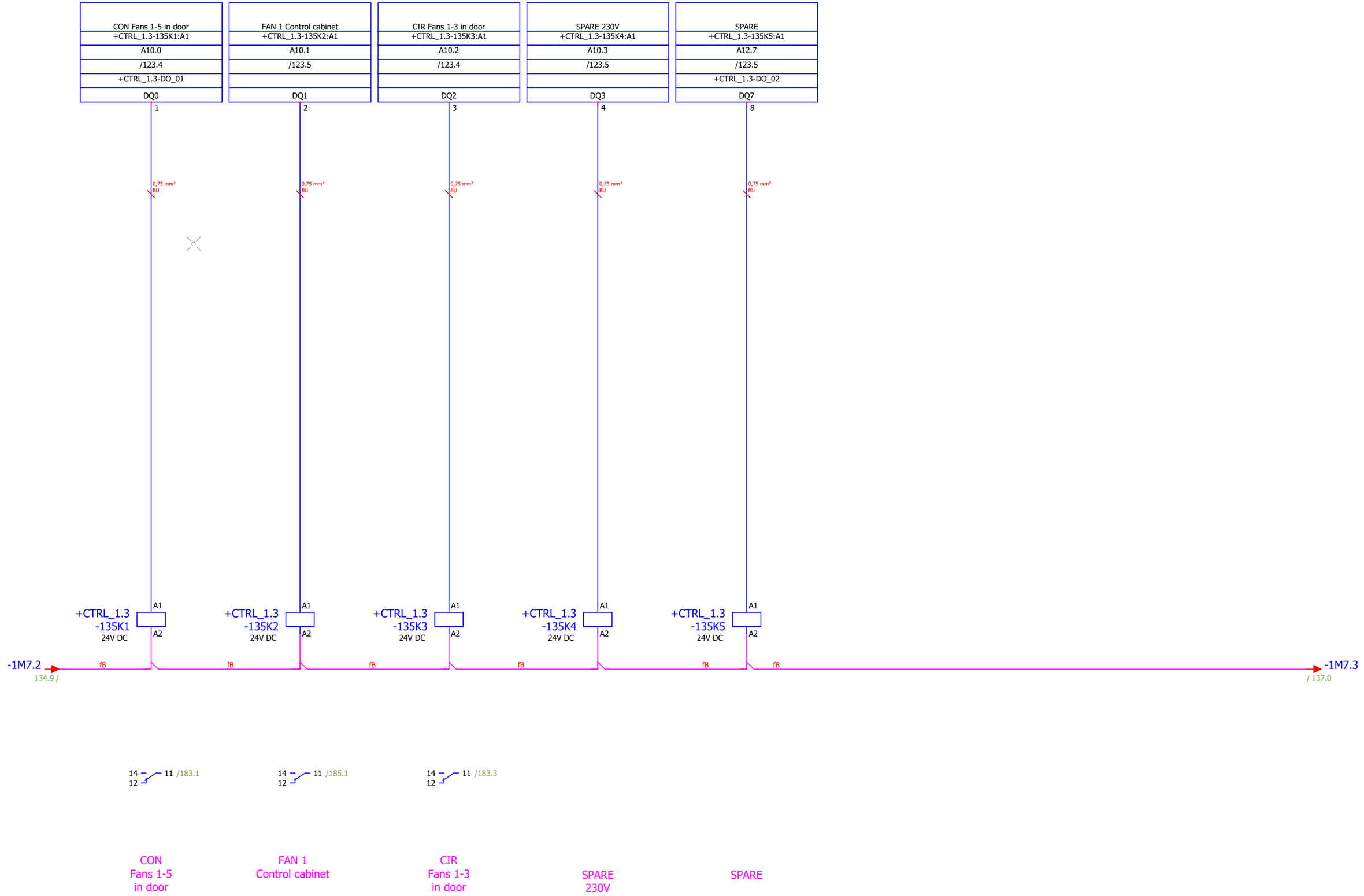
Reset
the smoke detectors

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Editor	Freqcon_JD			Statron	FREQCON	DIGITAL INPUTS SMOKE DETECTORS	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets
Date								+	

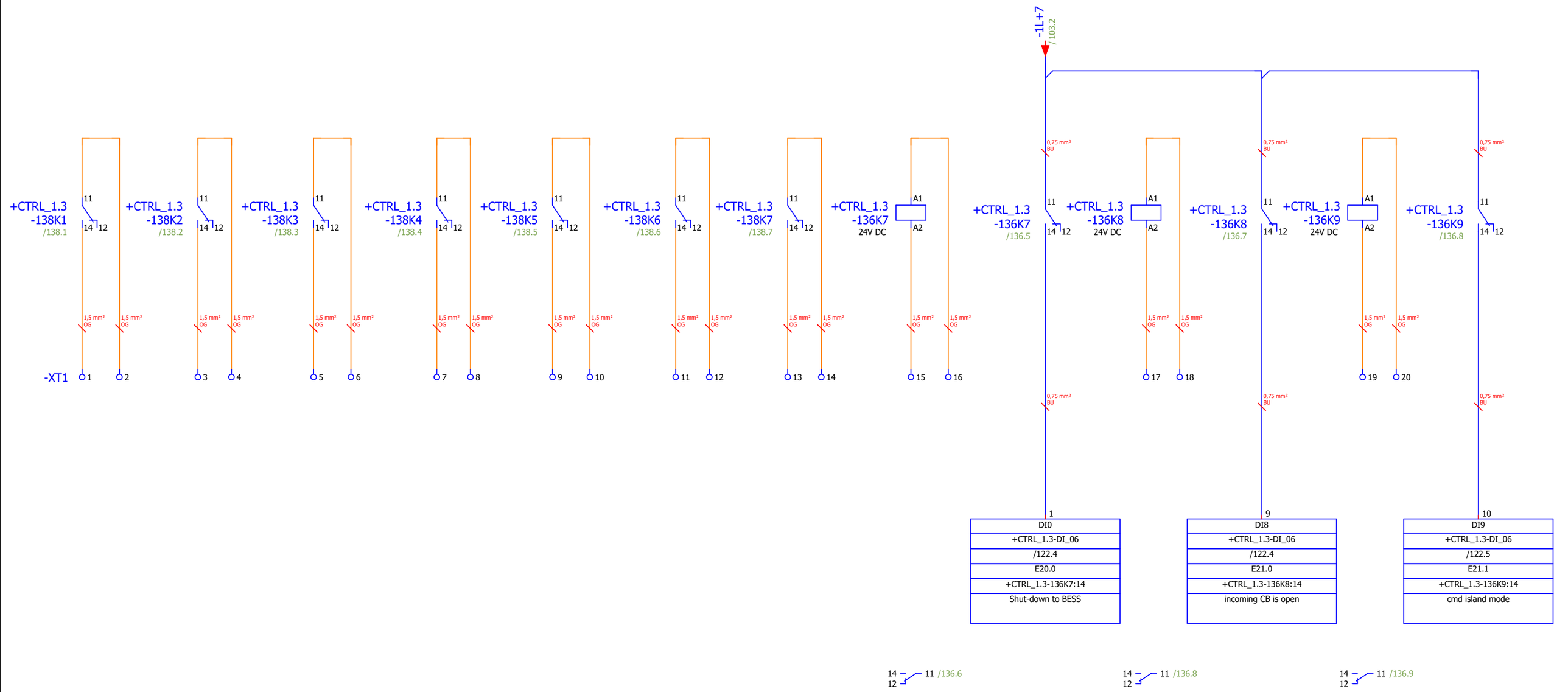
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total: 498



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Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS FAN	20241105_V1.2	= UNIT_01	Converter Container 1
Date	19.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 135
Date								+	total: 498

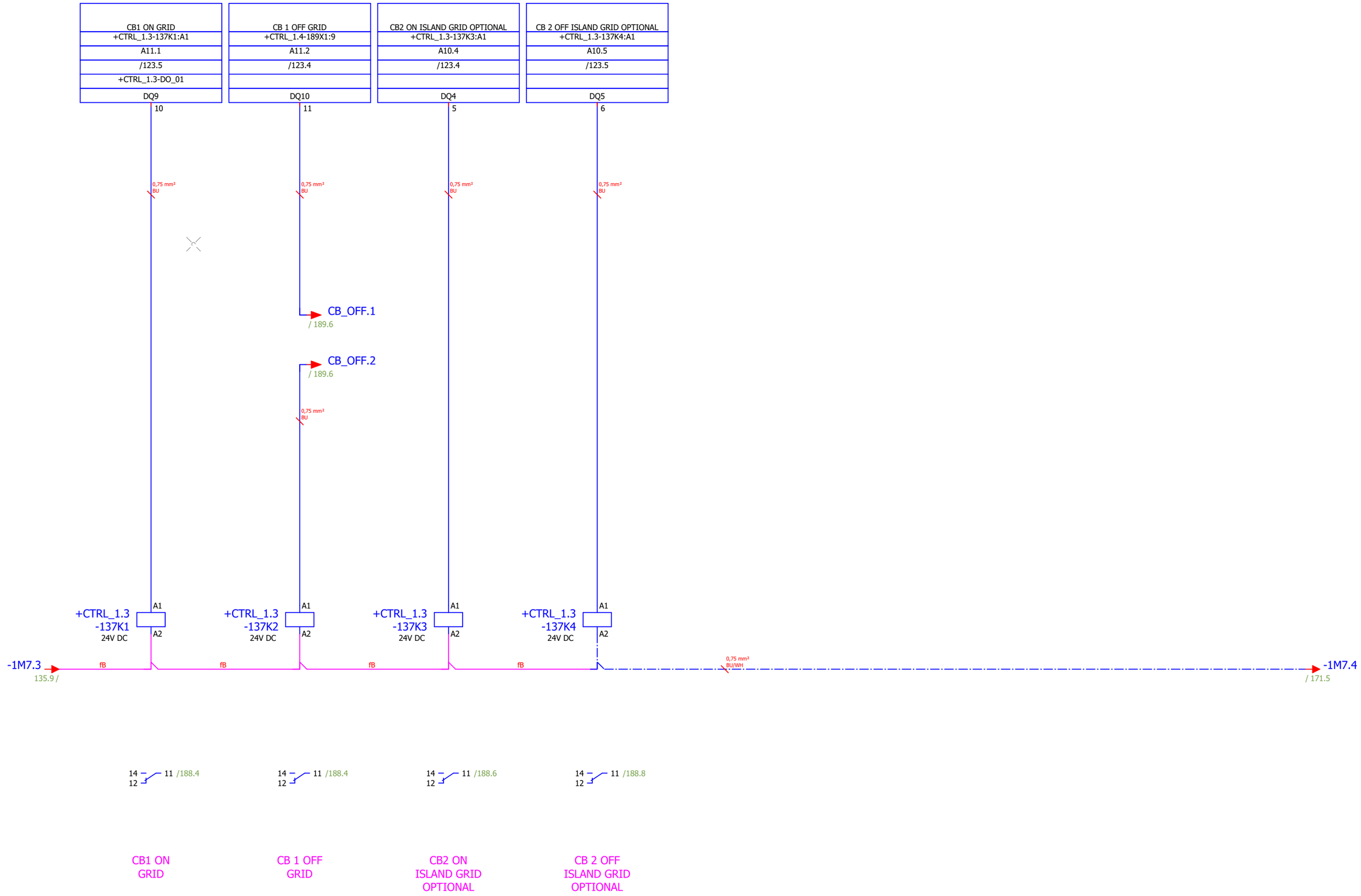


Gas confirmed FGS | Smoke confirmed FGS | PLC fault status SIS | Thermal runaway SIS | Spare | Spare | phase in sync | Shut-down to BESS | Shut-down to BESS | incoming CB is openincoming CB is open | cmd island mode | cmd island mode

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Editor	Freqcon_DG			Statron	FREQCON	OUTPUTS COMMUNICATION	20241105_V1.2	= UNIT_01 Converter Container 1
Date	12.09.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 136
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0	1	2	3	4	5	6	7	8	9



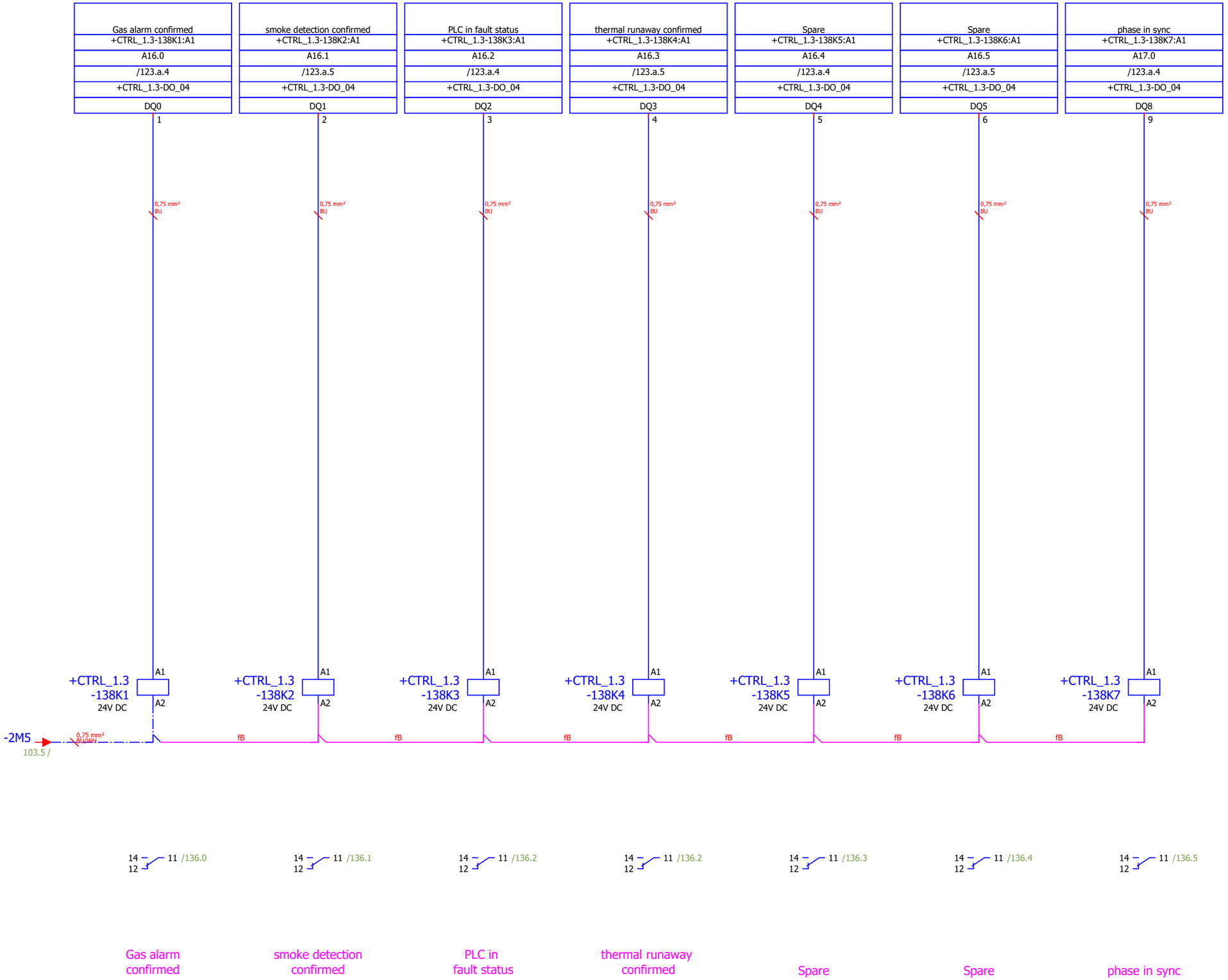
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Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS CIRCUIT BREAKER	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets
Date								+	

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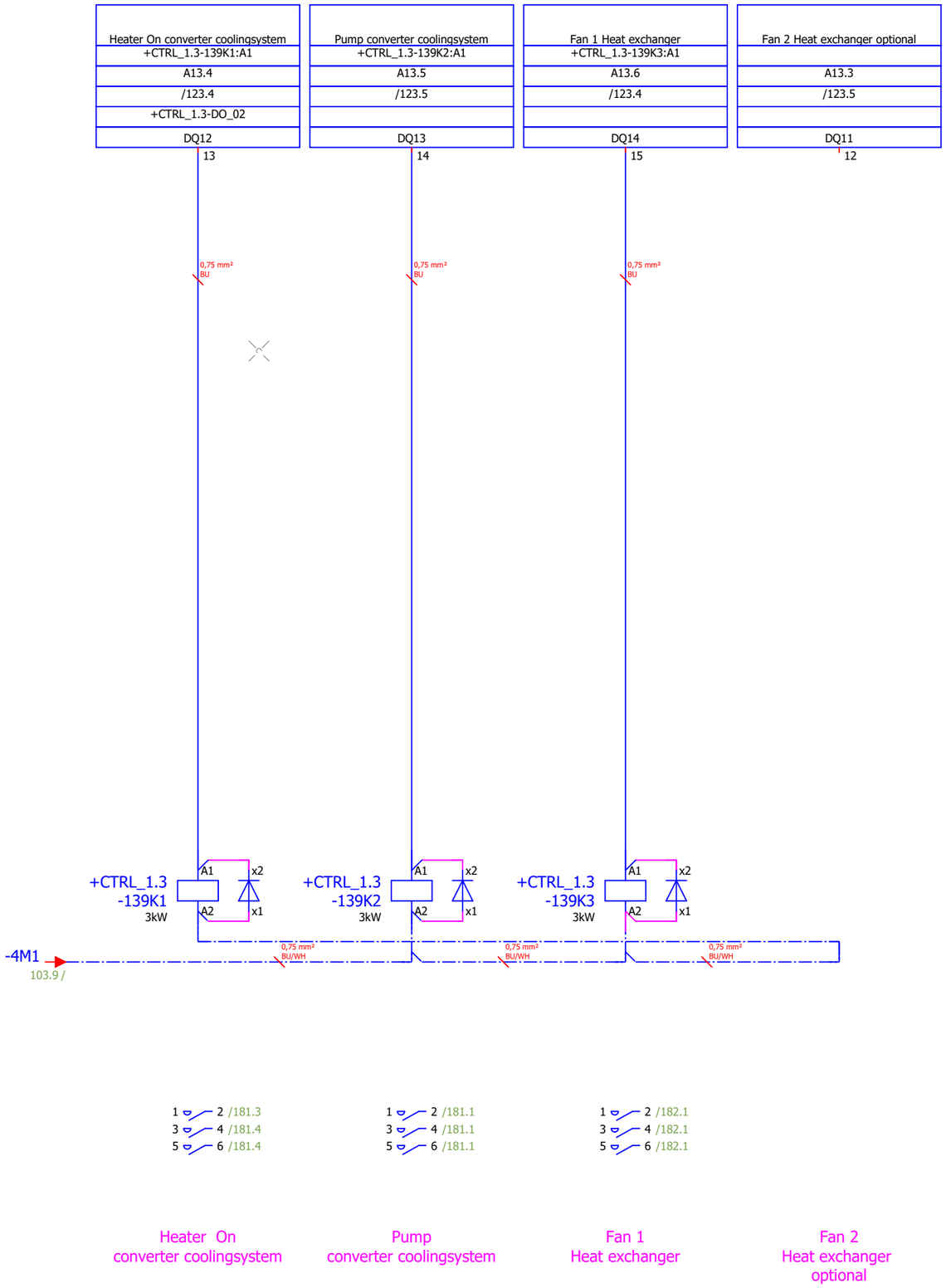
total: 498



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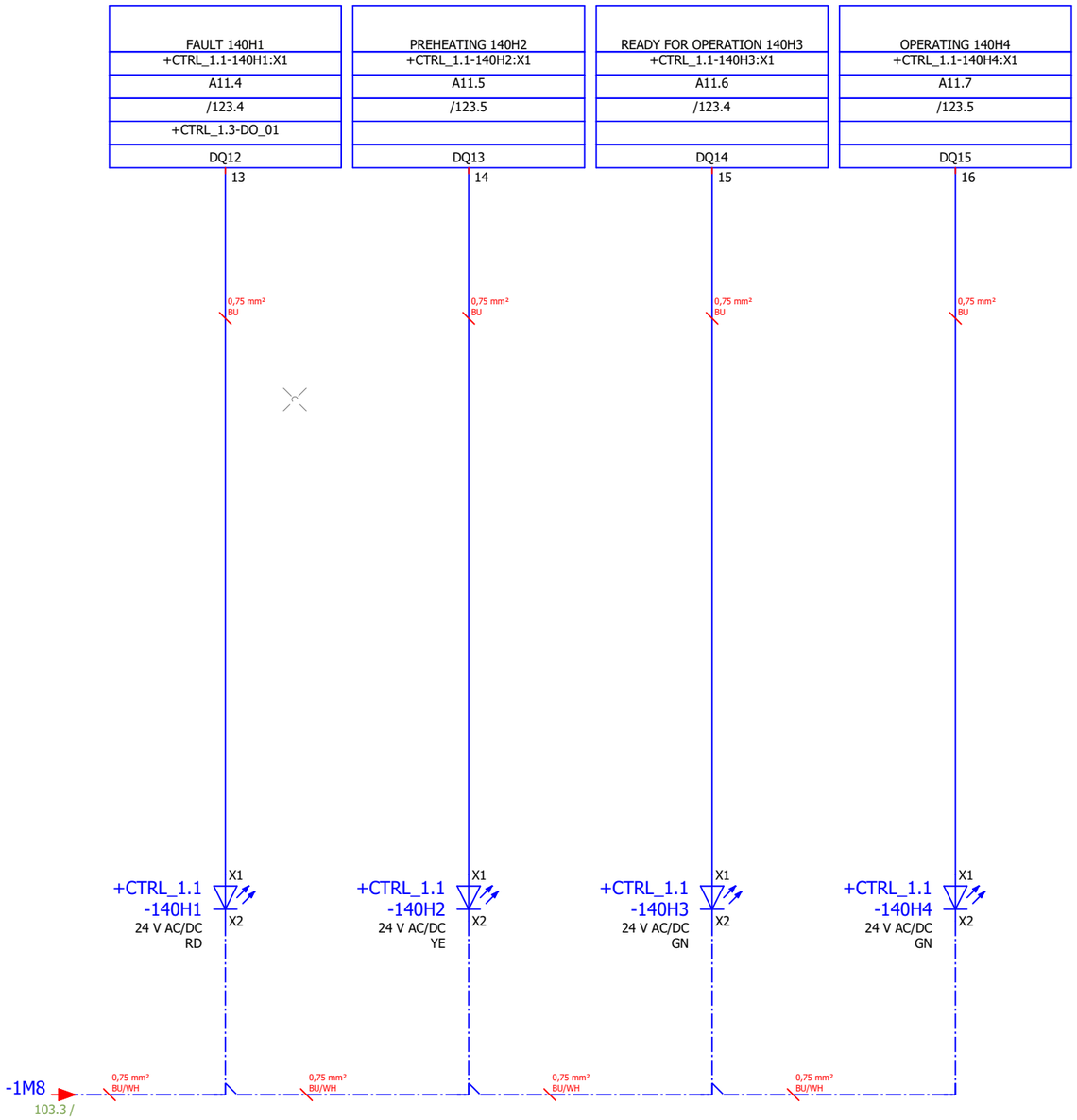
Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS CONTROL ELEMENTS	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	03.07.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 138
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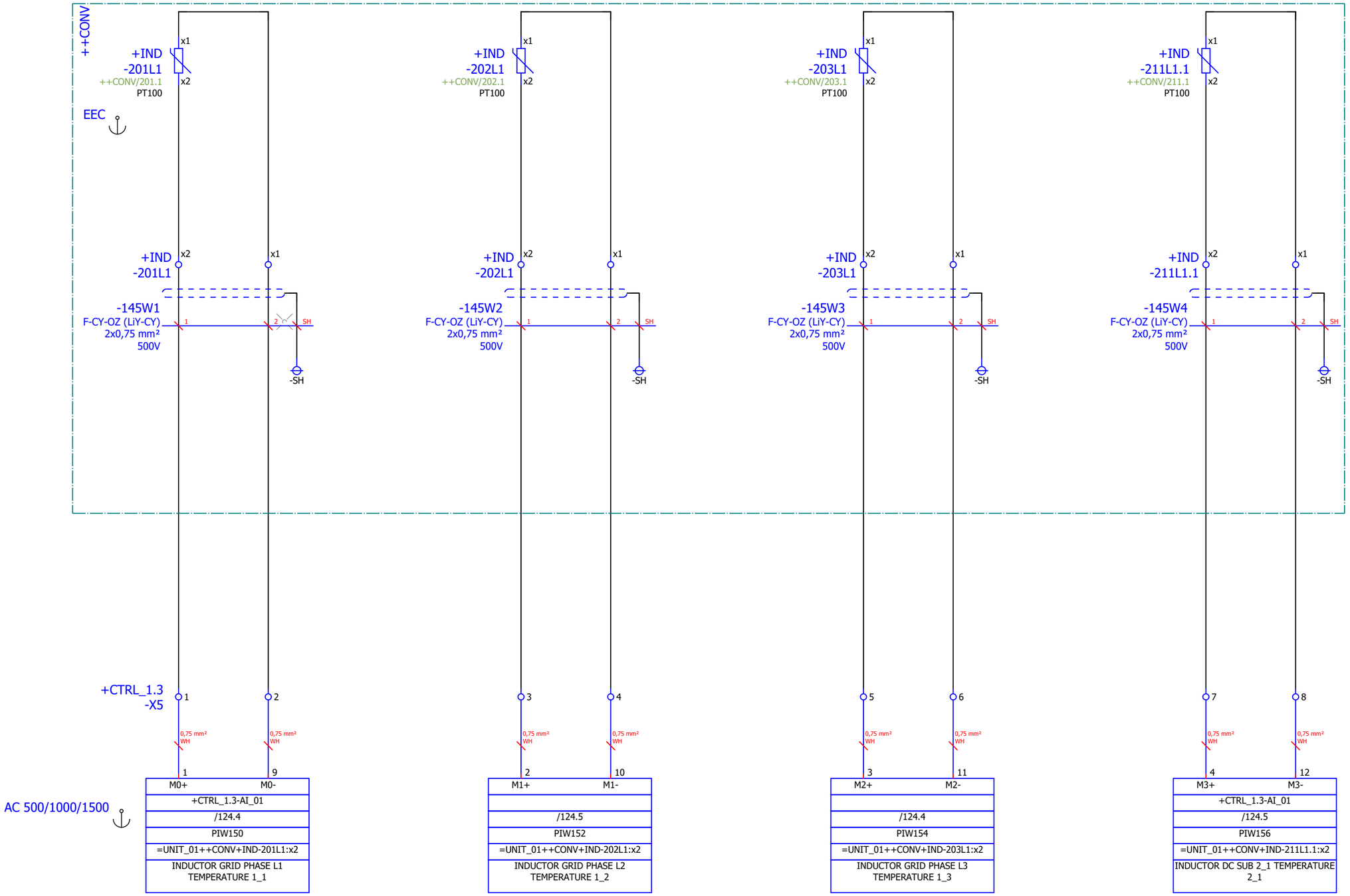
Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS COOLING	20241105_V1.2	= UNIT_01	Converter Container 1
Date	14.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 139
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Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS CONTROL ELEMENTS	20241105_V1.2	= UNIT_01 Converter Container 1
Date	14.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 140
Date								+ total: 498



INDUCTOR GRID PHASE L1 TEMPERATURE 1_1

INDUCTOR GRID PHASE L2 TEMPERATURE 1_2

INDUCTOR GRID PHASE L3 TEMPERATURE 1_3

INDUCTOR DC SUB 2_1 TEMPERATURE 2_1

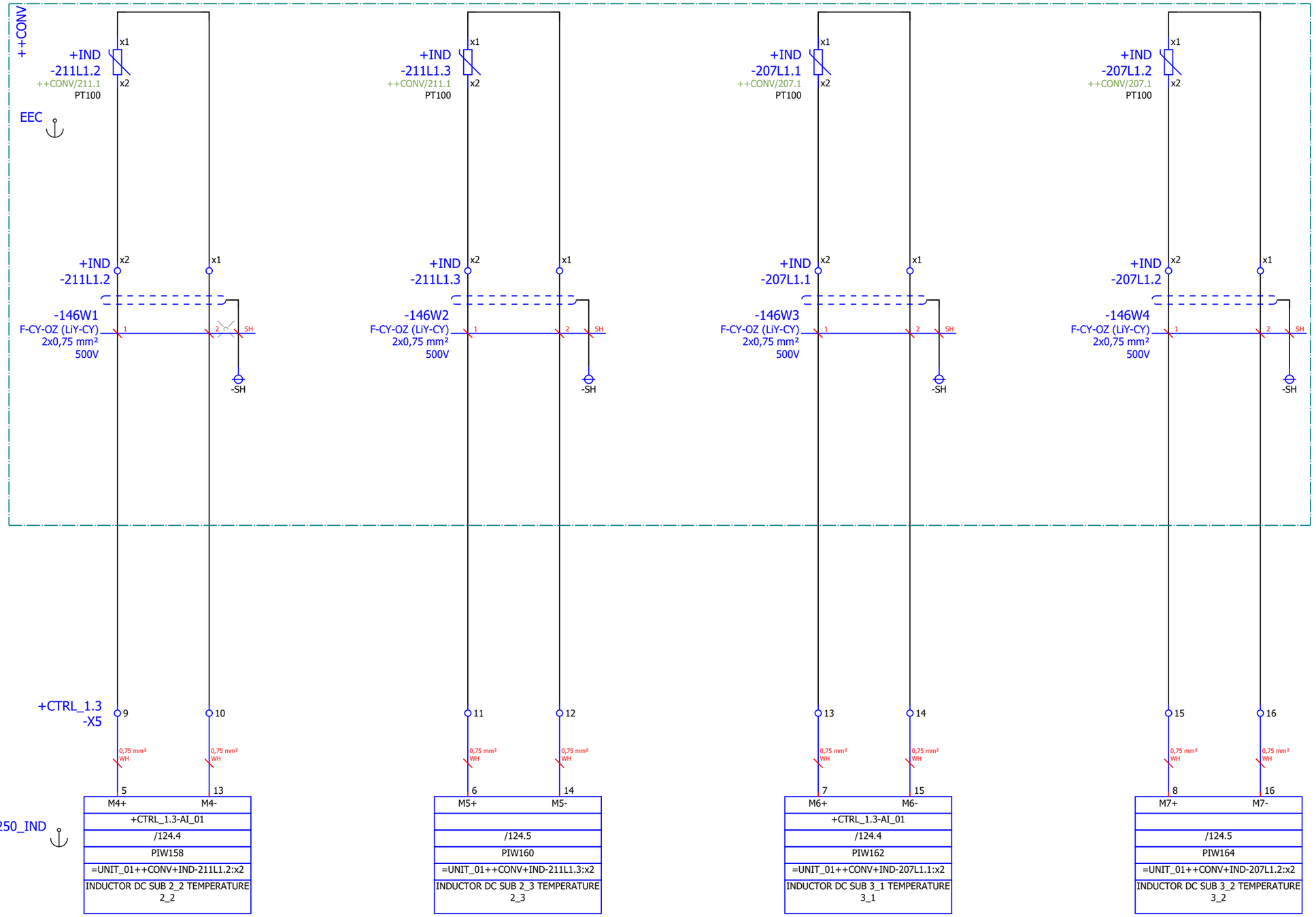
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Editor	Freqcon_JD			Statron	FREQCON	ANALOG INPUTS (TEMPERATURE SUBSYSTEM 1_1 -1_3)	20241105_V1.2	= UNIT_01	Converter Container 1
Date	14.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets
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INDUCTOR
DC SUB 2_2
TEMPERATURE 2_2

INDUCTOR
DC SUB 2_3
TEMPERATURE 2_3

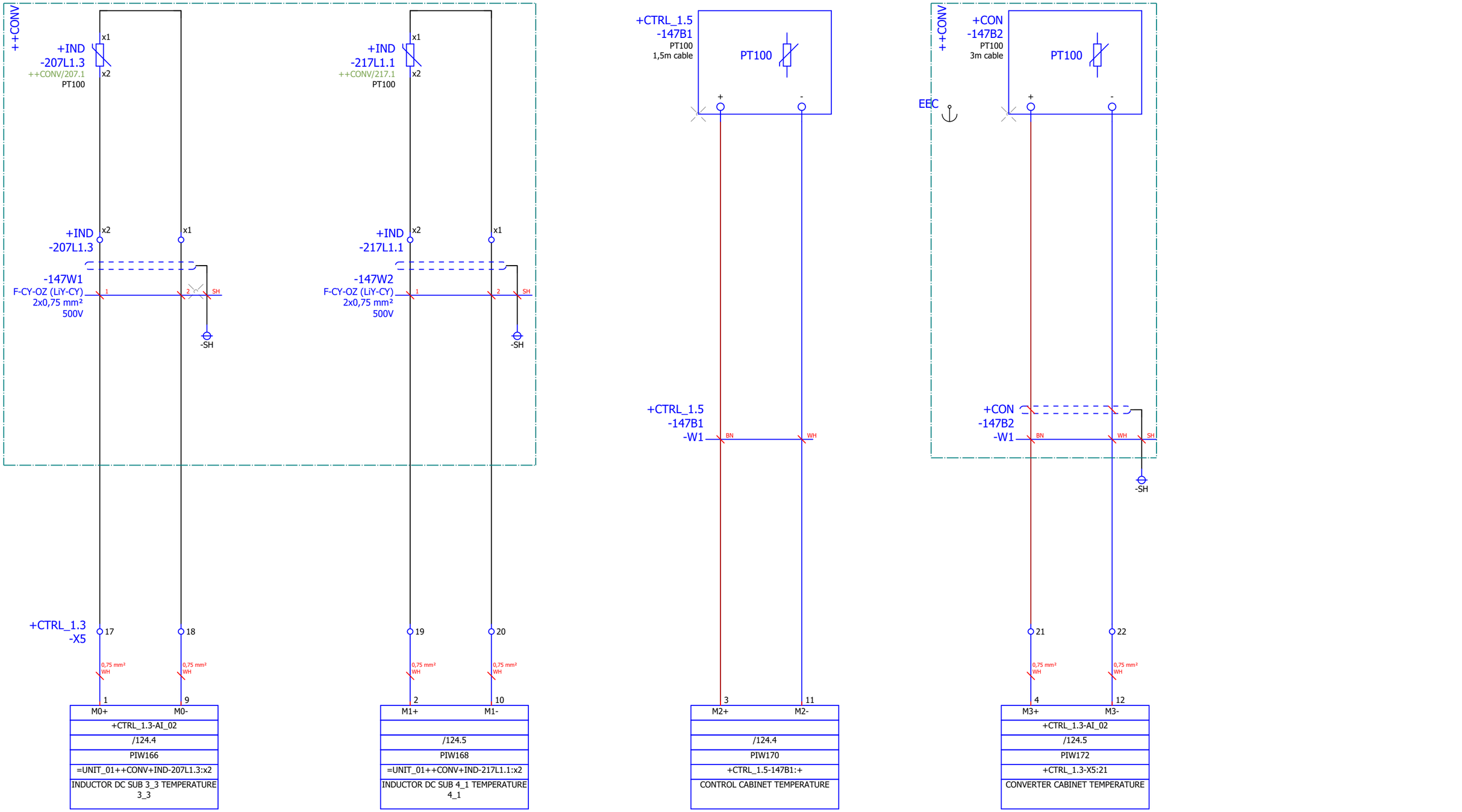
INDUCTOR
DC SUB 3_1
TEMPERATURE 3_1

INDUCTOR
DC SUB 3_2
TEMPERATURE 3_2

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Editor	Freqcon_JD			Statron	FREQCON	ANALOG INPUTS (TEMPERATURE SUBSYSTEM 1_4 -1_6)	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 146
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INDUCTOR DC SUB 3_3 TEMPERATURE 3_3

INDUCTOR DC SUB 4_1 TEMPERATURE 4_1

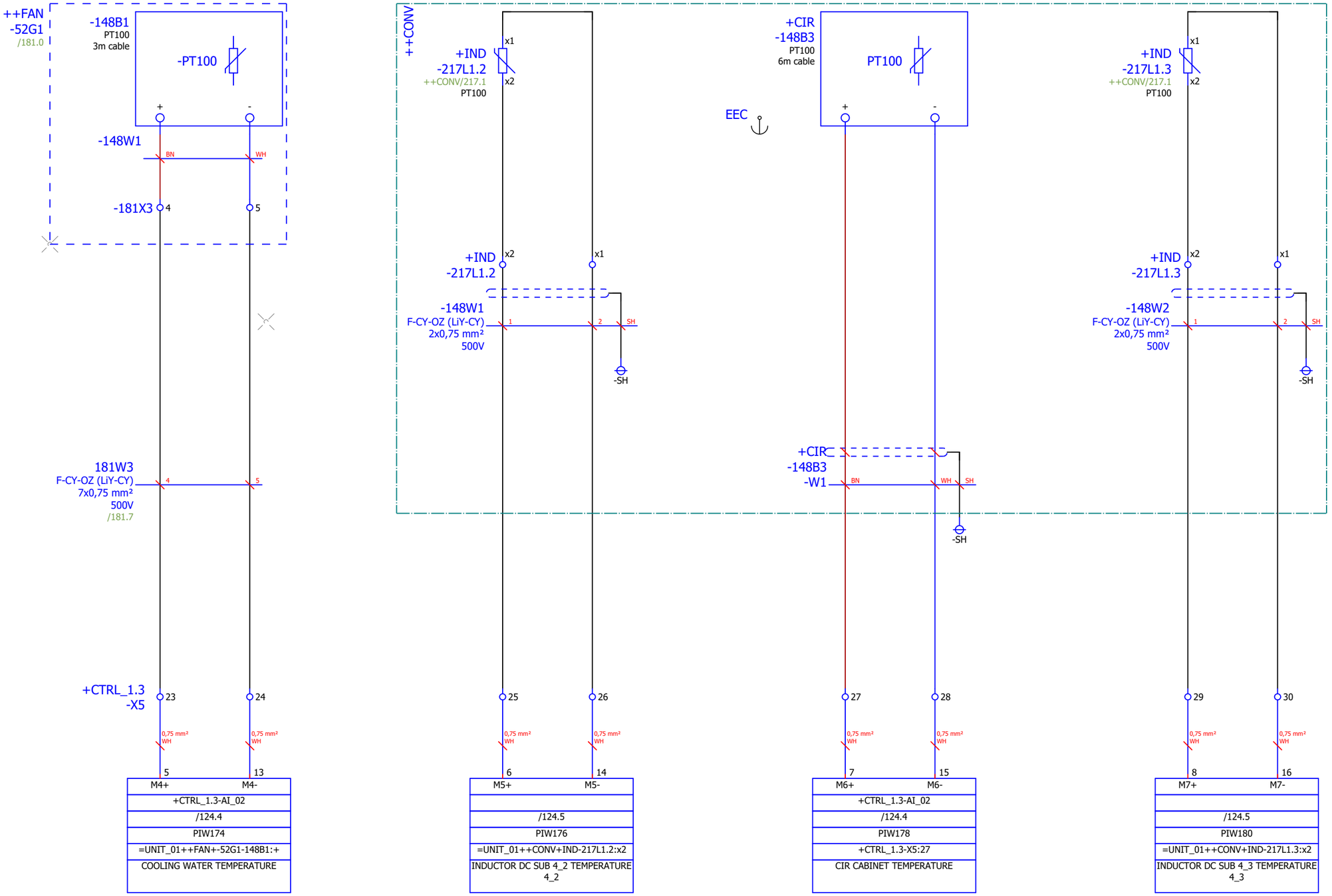
CONTROL CABINET TEMPERATURE

CONVERTER CABINET TEMPERATURE

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Editor	Freqcon_JD			Statron	FREQCON	ANALOG INPUTS CABINET TEMPERATURE	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 147
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COOLING WATER TEMPERATURE

INDUCTOR DC SUB 4_2 TEMPERATURE 4_2

CIR CABINET TEMPERATURE

INDUCTOR DC SUB 4_3 TEMPERATURE 4_3

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-1M11
103.3 /

+CTRL_1.3
-X5.1

fB

1 2

0,75 mm² BU/WH

0,75 mm² WH

1	5	2	6	3	7	4	8	1	5	2	6
U0+	U0-	U1+	U1-	U2+	U2-	U3+	U3-	U0+	U0-	U1+	U1-
+CTRL_1.3-AI_03				+CTRL_1.3-AI_03				+CTRL_1.3-AI_04		+CTRL_1.3-AI_04	
/124.4		/124.5		/124.4		/124.5		/125.4		/125.5	
PIW182		PIW184		PIW186		PIW188		PIW190		PIW192	
+CTRL_1.4-149U1:15		+CTRL_1.4-149U1:16		+CTRL_1.4-149U1:17		+CTRL_1.4-149U1:20		+CTRL_1.4-149U1:19		+CTRL_1.4-149U1:18	
DC_SUBSYSTEM 2_1.1 voltage		DC_SUBSYSTEM 2_2.1 voltage		DC_SUBSYSTEM 2_3.1 voltage		DC_SUBSYSTEM 3_1.1 voltage		DC_SUBSYSTEM 3_2.1 voltage		DC_SUBSYSTEM 3_3.1 voltage	

+CTRL_1.4
-149U1
PXC.2959609

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

Adapter Sub-D 25 Pin Buchse
Terminalblock 27 Pin

25-POL SUB-D SOCKET

11X3

-149W1
pre-assembled D-Sub cable 1:1
/162.7

HVIO_AN
/ 162.9

DC_SUBSYSTEM 2_1.1 voltage

DC_SUBSYSTEM 2_2.1 voltage

DC_SUBSYSTEM 2_3.1 voltage

DC_SUBSYSTEM 3_1.1 voltage

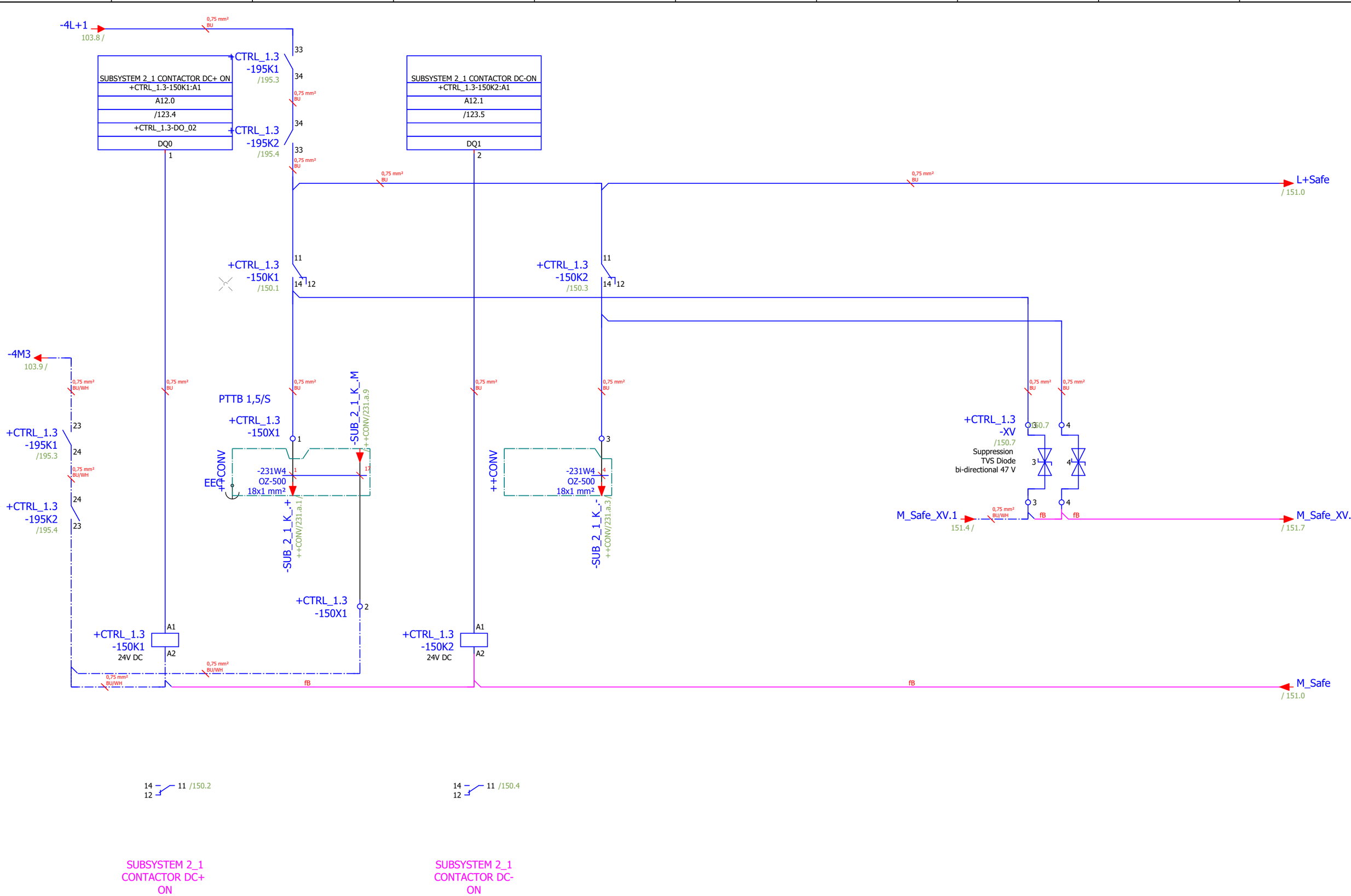
DC_SUBSYSTEM 3_2.1 voltage

DC_SUBSYSTEM 3_3.1 voltage

Voltage measurement

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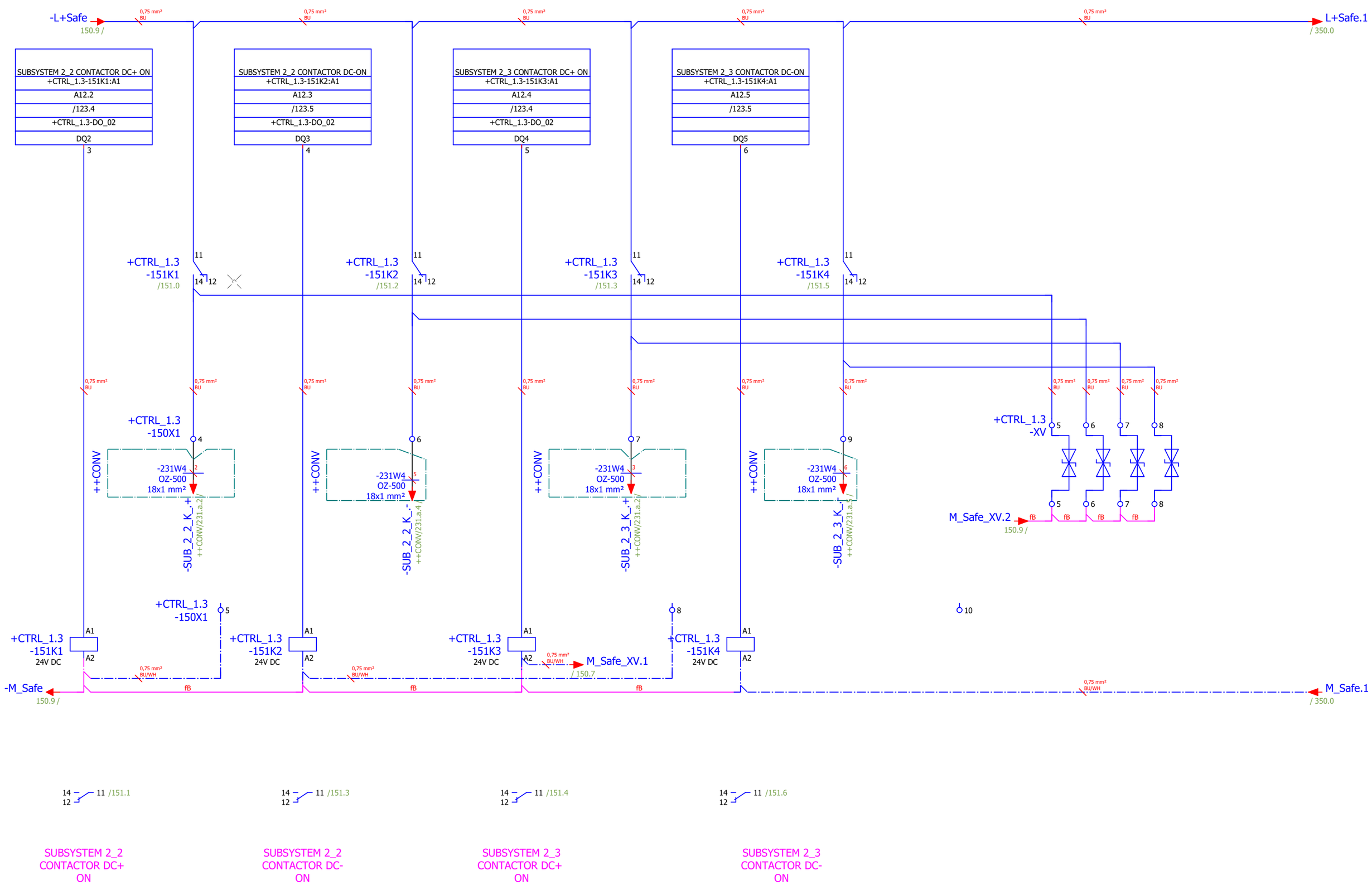
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Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS DC CONTACTORS 2_1	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 150
Date								+	total: 498



14 12 11 /151.1

14 12 11 /151.3

14 12 11 /151.4

14 12 11 /151.6

SUBSYSTEM 2_2 CONTACTOR DC+ ON

SUBSYSTEM 2_2 CONTACTOR DC- ON

SUBSYSTEM 2_3 CONTACTOR DC+ ON

SUBSYSTEM 2_3 CONTACTOR DC- ON

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Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS DC CONTACTORS 2_2, 2_3	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 151
Date								+	total: 498

0 1 2 3 4 5 6 7 8 9

* cable intro seperate UL protrctive tube

-UDC+_PreCharg
1,5 mm² BK
/ 173.3
-UDC-_PreCharg
1,5 mm² BK
/ 173.3

-UL3.HVIO / 189.4
-UL2.HVIO / 189.4
-UL1.HVIO / 189.4

-HVIO_1_N
173.3 /

-HVIO_2_N
/ 173.3

2,5 mm² LBU
2,5 mm² BK
2,5 mm² BK
2,5 mm² BK

+CTRL_2.1
-160U1
FRQ-M00029-1
HVIO 5.0
ISO
N-DC N-AC

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 (AC) UN 16 17 18 19 L3 20 21 22 23 L2 24 25 26 27 L1 28 29 30 31 32 UB 33 34 35 36 DC- 37 38 39 40 DC+ 41 42 44 (DC) UN

HIGH VOLTAGE I/O MODULE V5.0
FREQCON GmbH

25-POL SUB-D
SOCKET
11X3

+ -

-HVIO_1_L+
/ 161.1
-HVIO_1_L-
/ 161.1

-240W7
pre-assembled D-Sub cable 1:1
/440.8

-HVIO_1
/ 440.9

0,75 mm² BU
0,75 mm² BU/WH

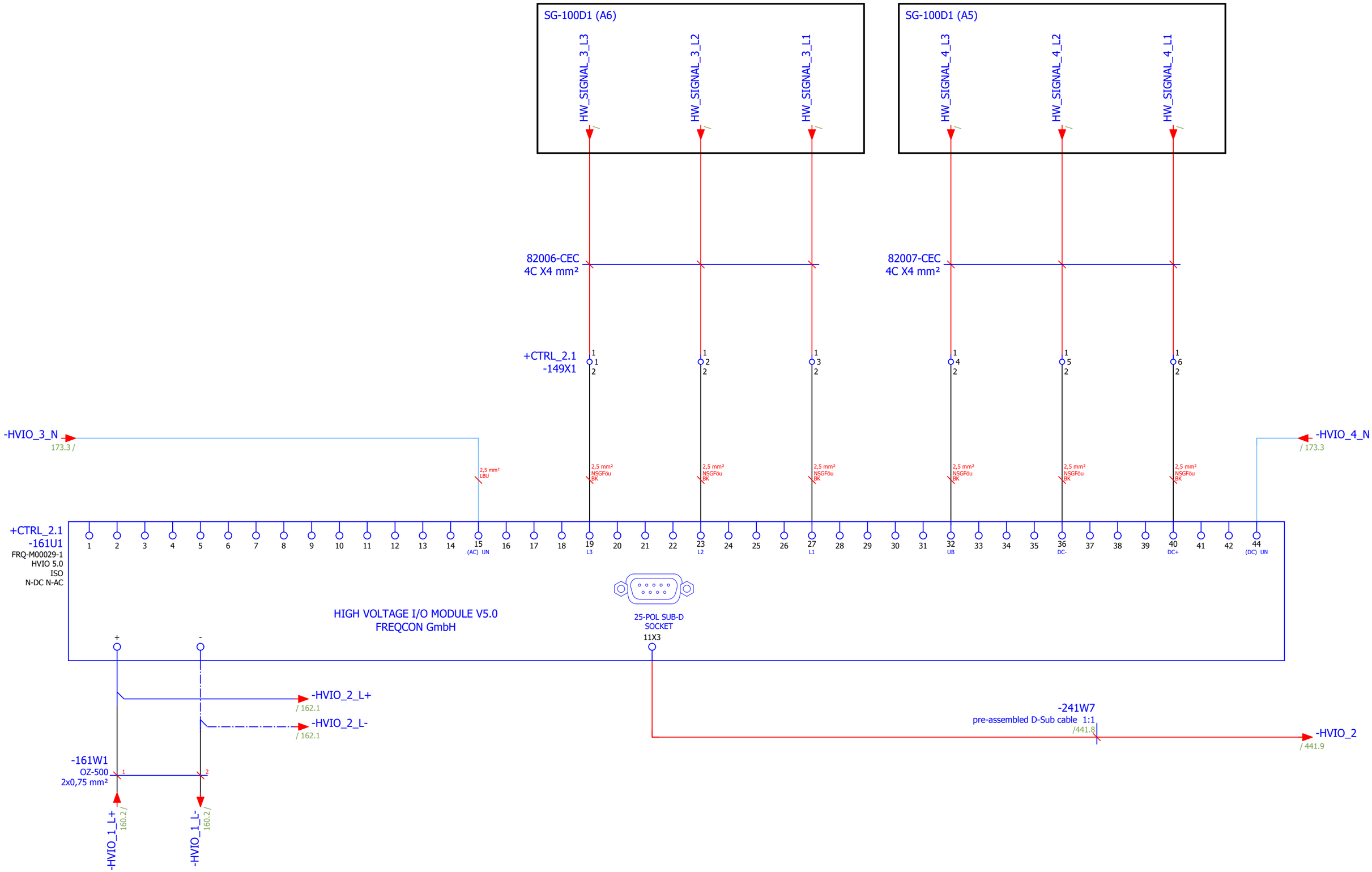
IEC
1L+2 103.2 /
1M10 103.3 /

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Measuring: Grid side voltage / DC-Link

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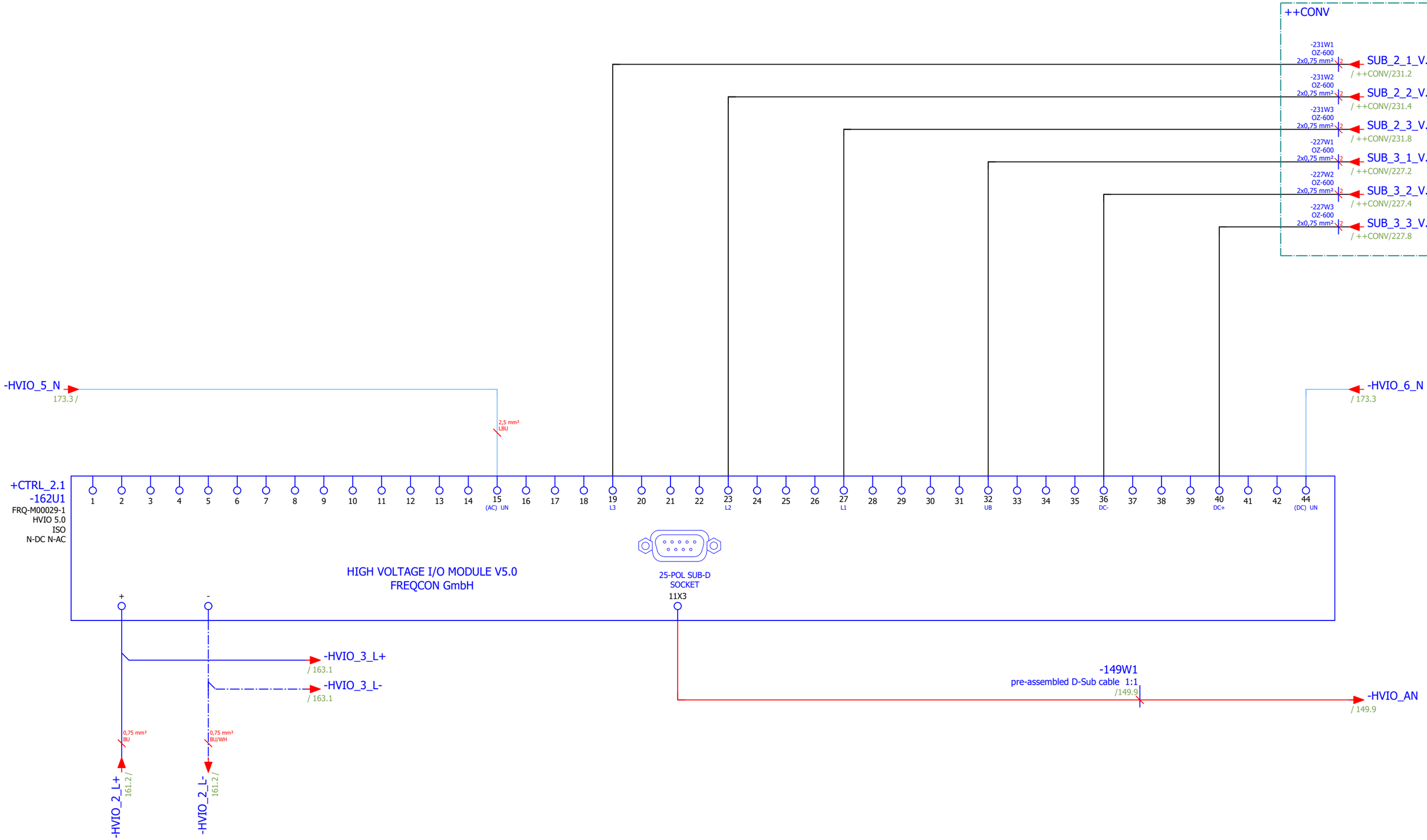
Editor	Freqcon_DG			Statron	FREQCON	INTERFACE HVIO 1	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	29.07.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 160
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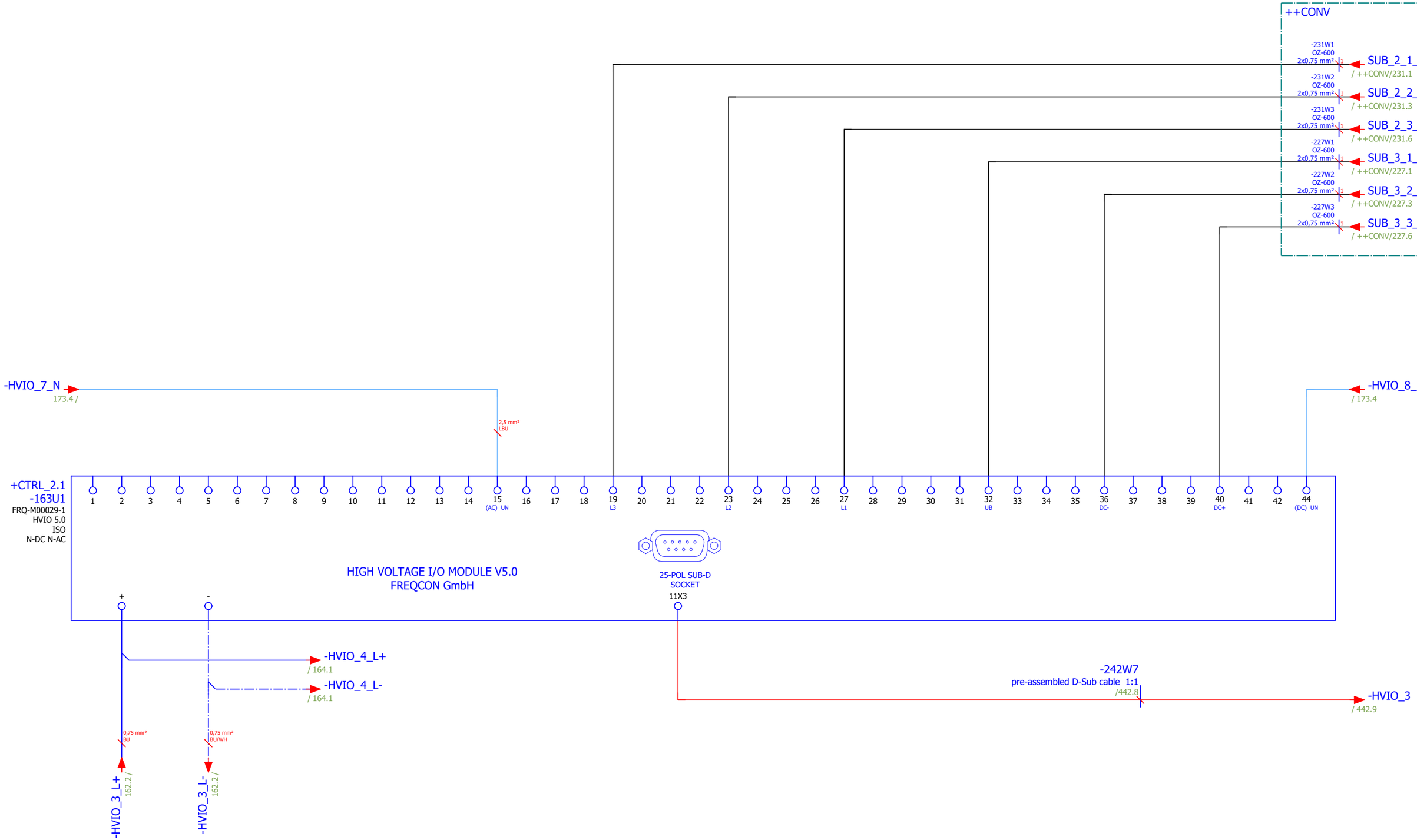
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Date	05.11.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 161
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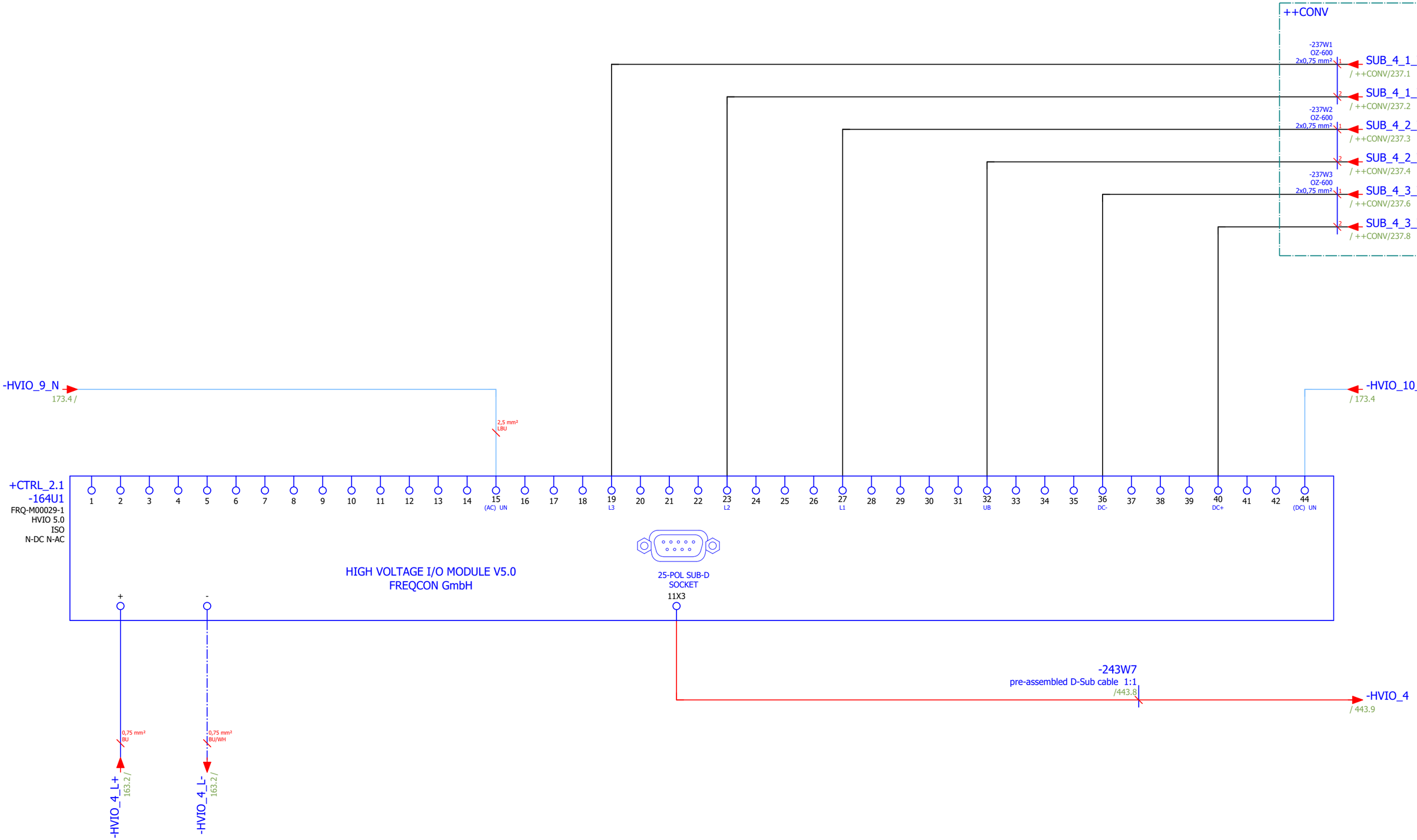
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Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 162
Date								+	total: 498



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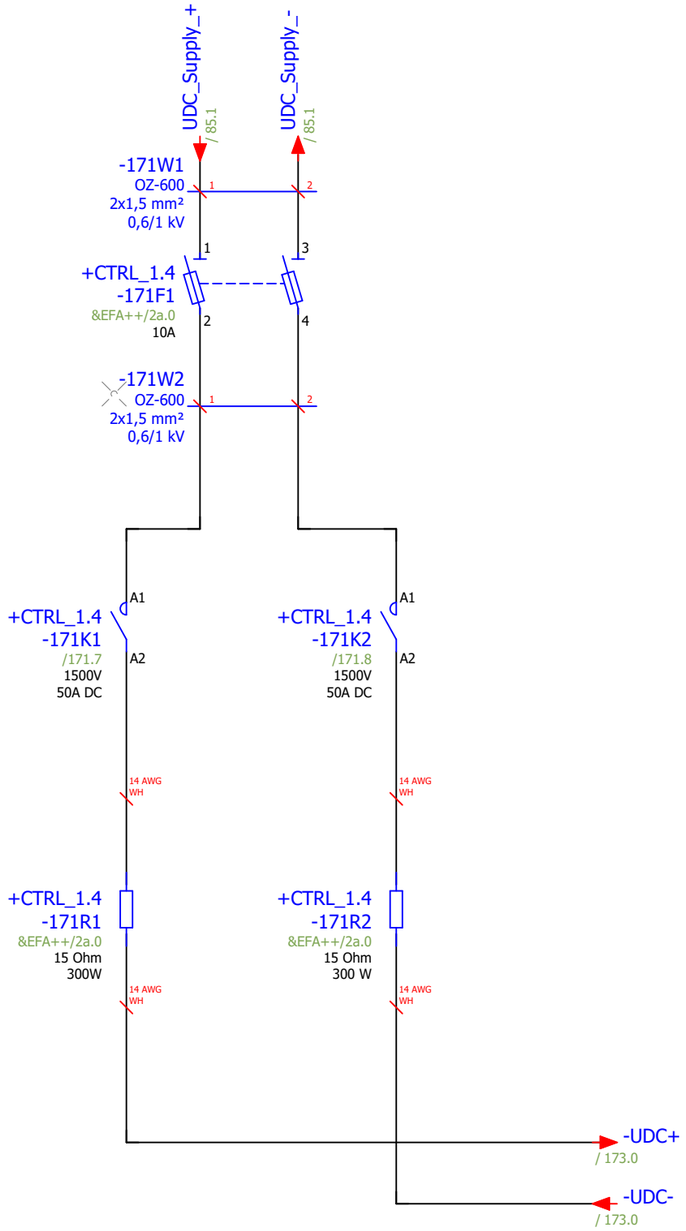
Editor	Freqcon_JD			Statron	FREQCON	INTERFACE HVIO 3	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 163
Date								+	total: 498



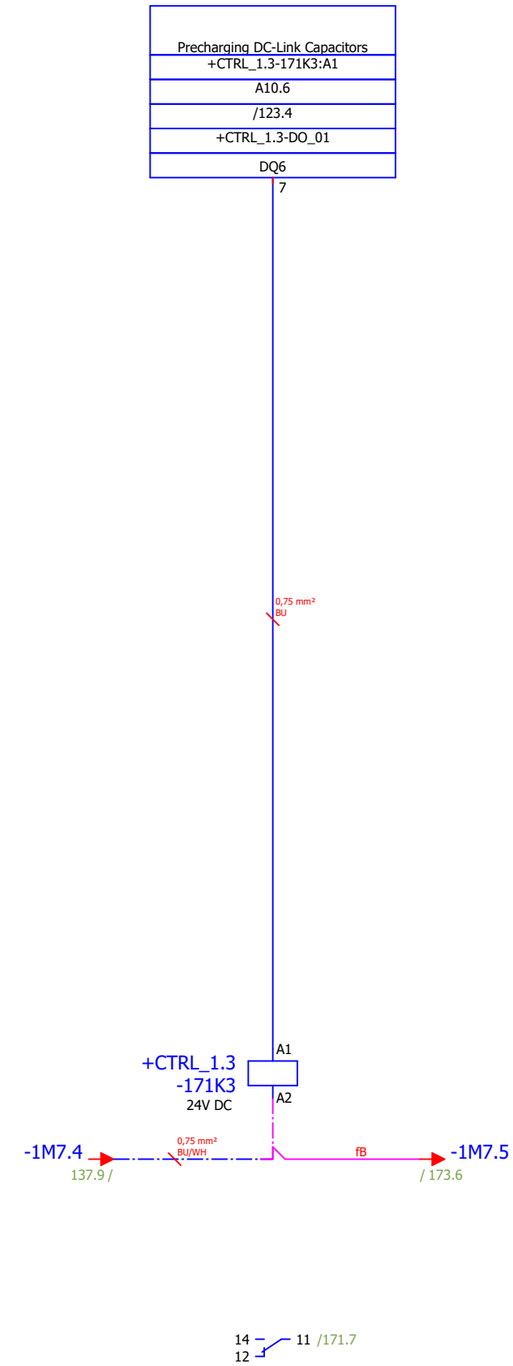
previous page:
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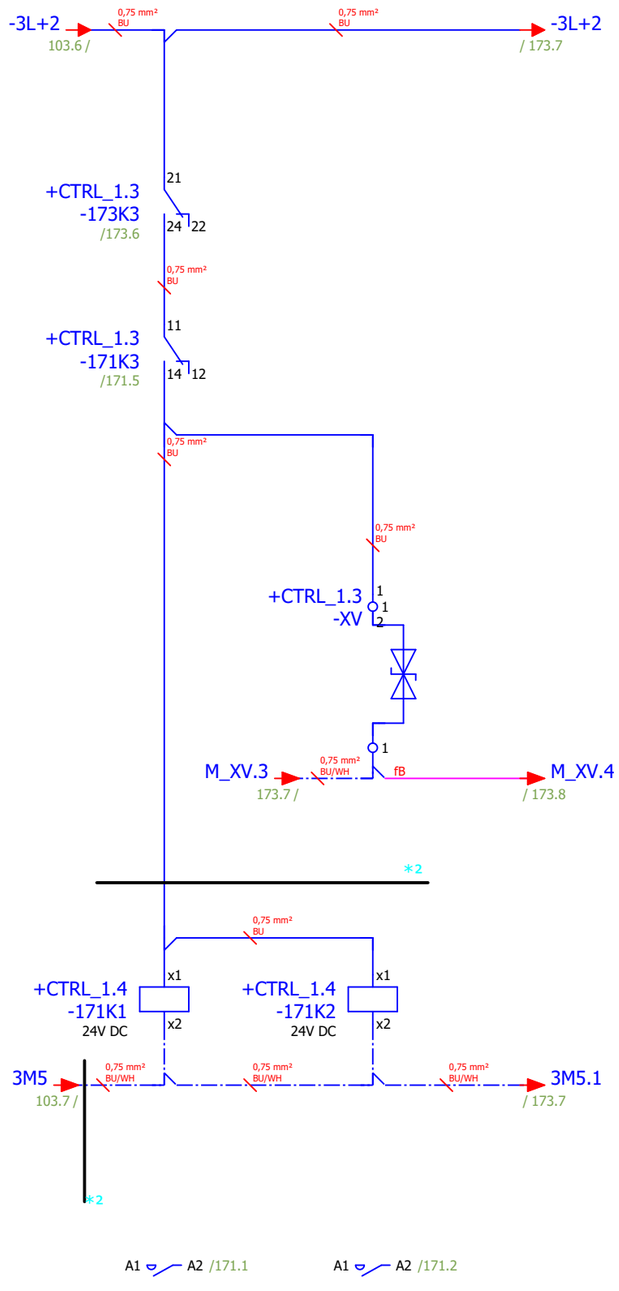
Editor	Freqcon_JD			Statron	FREQCON	INTERFACE HVIO 4	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 164
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RESISTORS
FOR PRECHARGING
from Grid or Battery or DC-Link



Precharging
DC-Link Capacitors

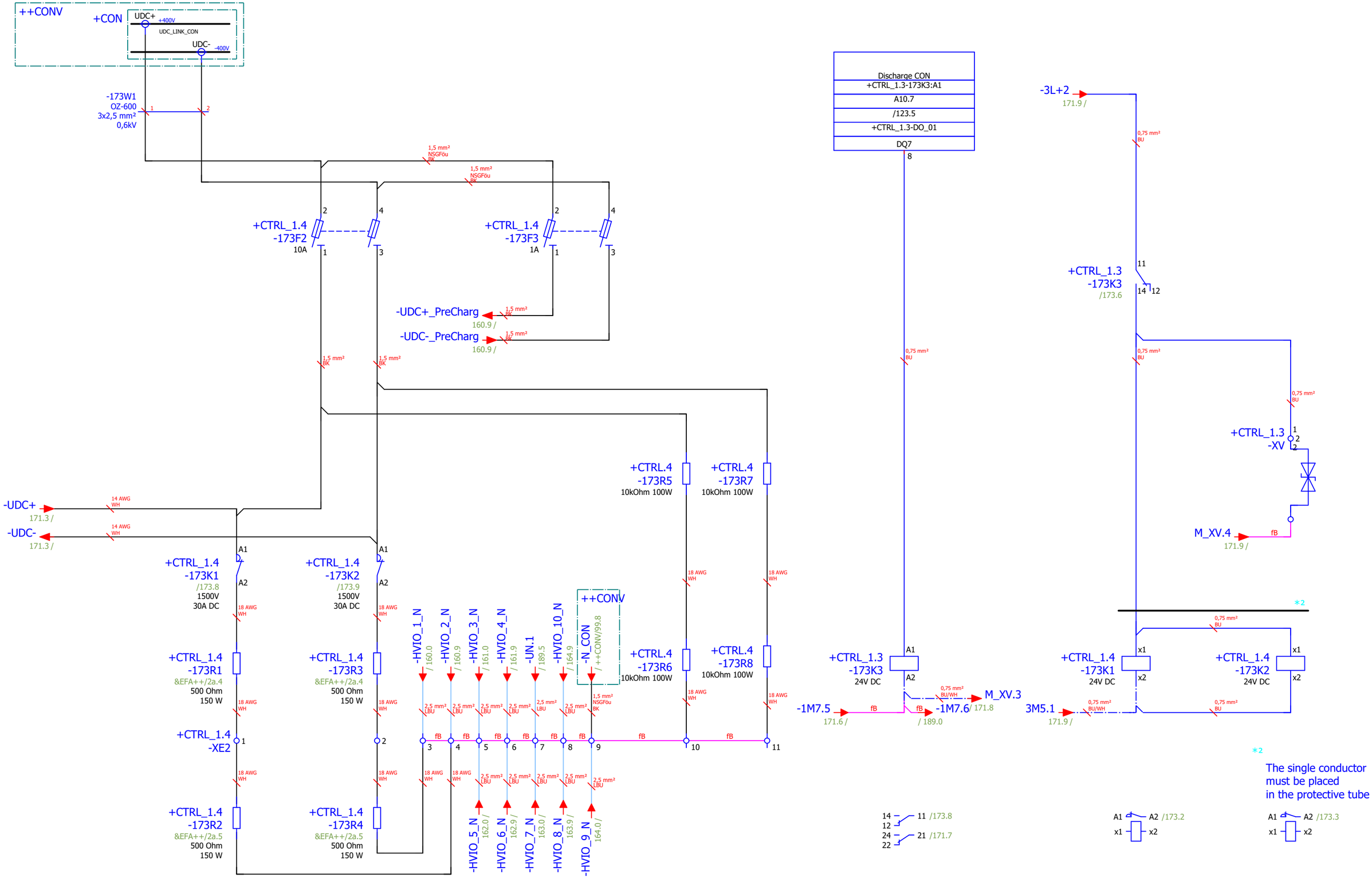


*2 The single conductor must be placed in the protective tube

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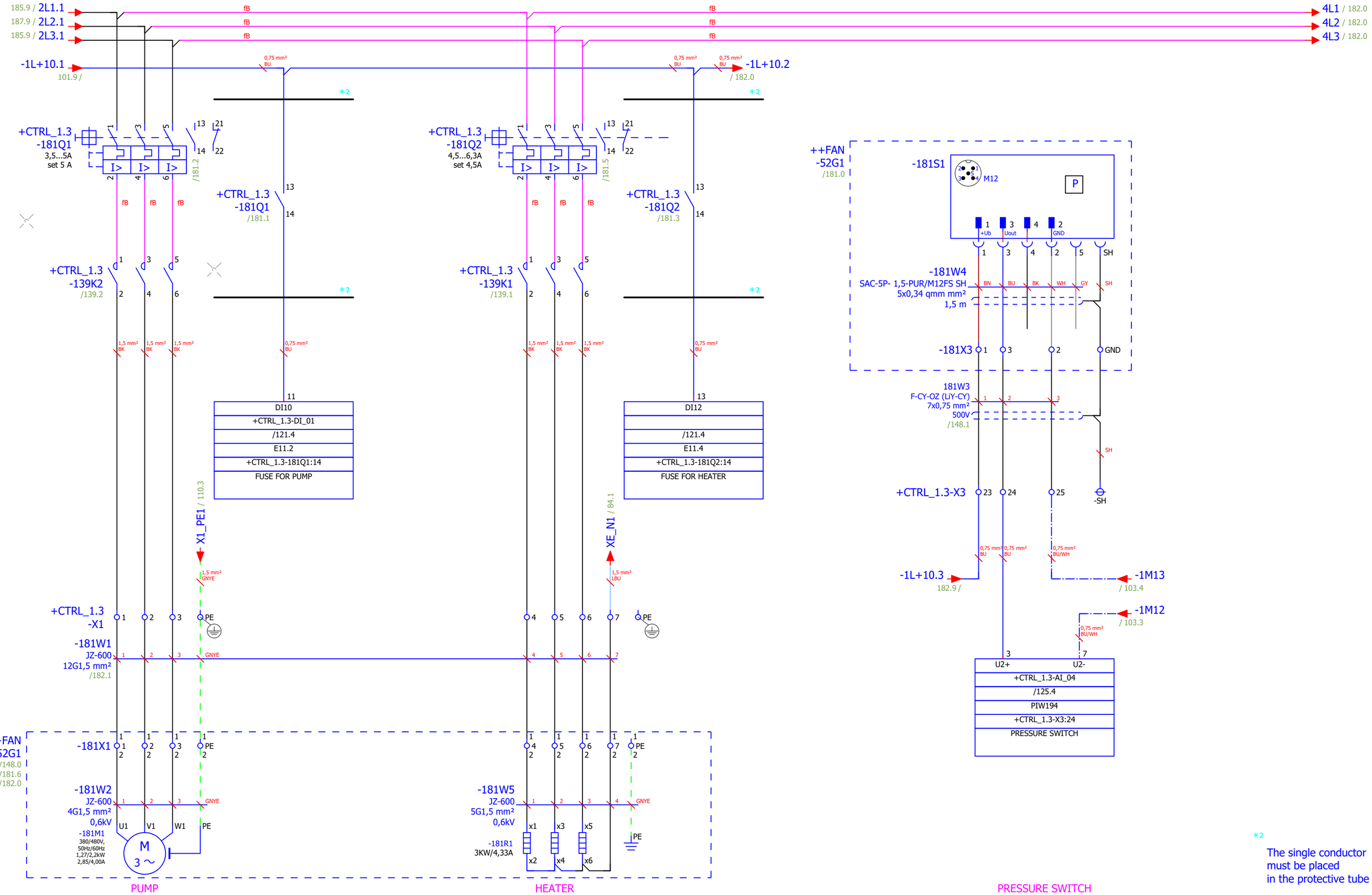
Editor	Freqcon_JD			Statron	FREQCON	PRE-CHARGING UDC	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 171
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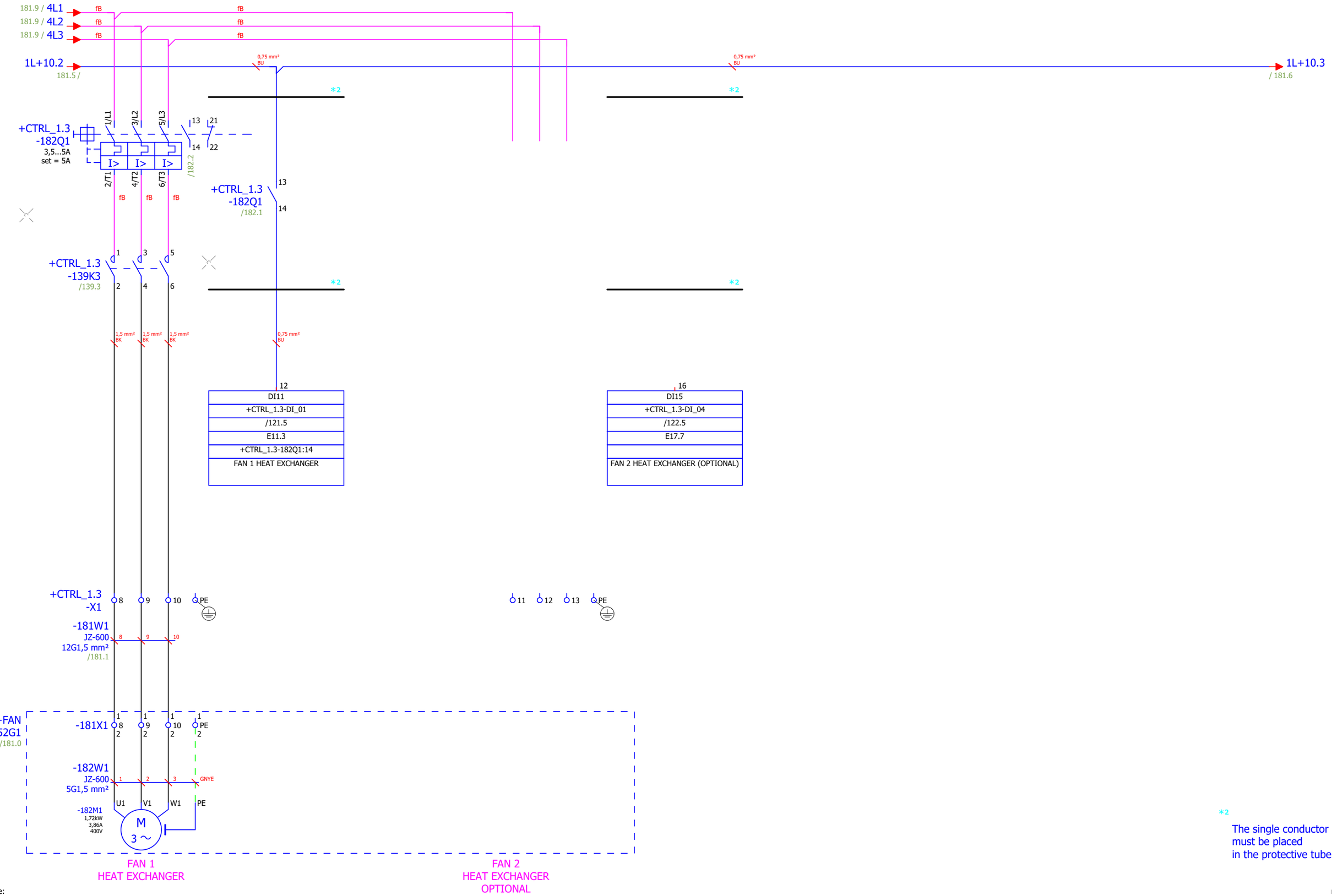
Editor	Freqcon_JD			Statron	FREQCON	DISCHARGE UDC	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 173
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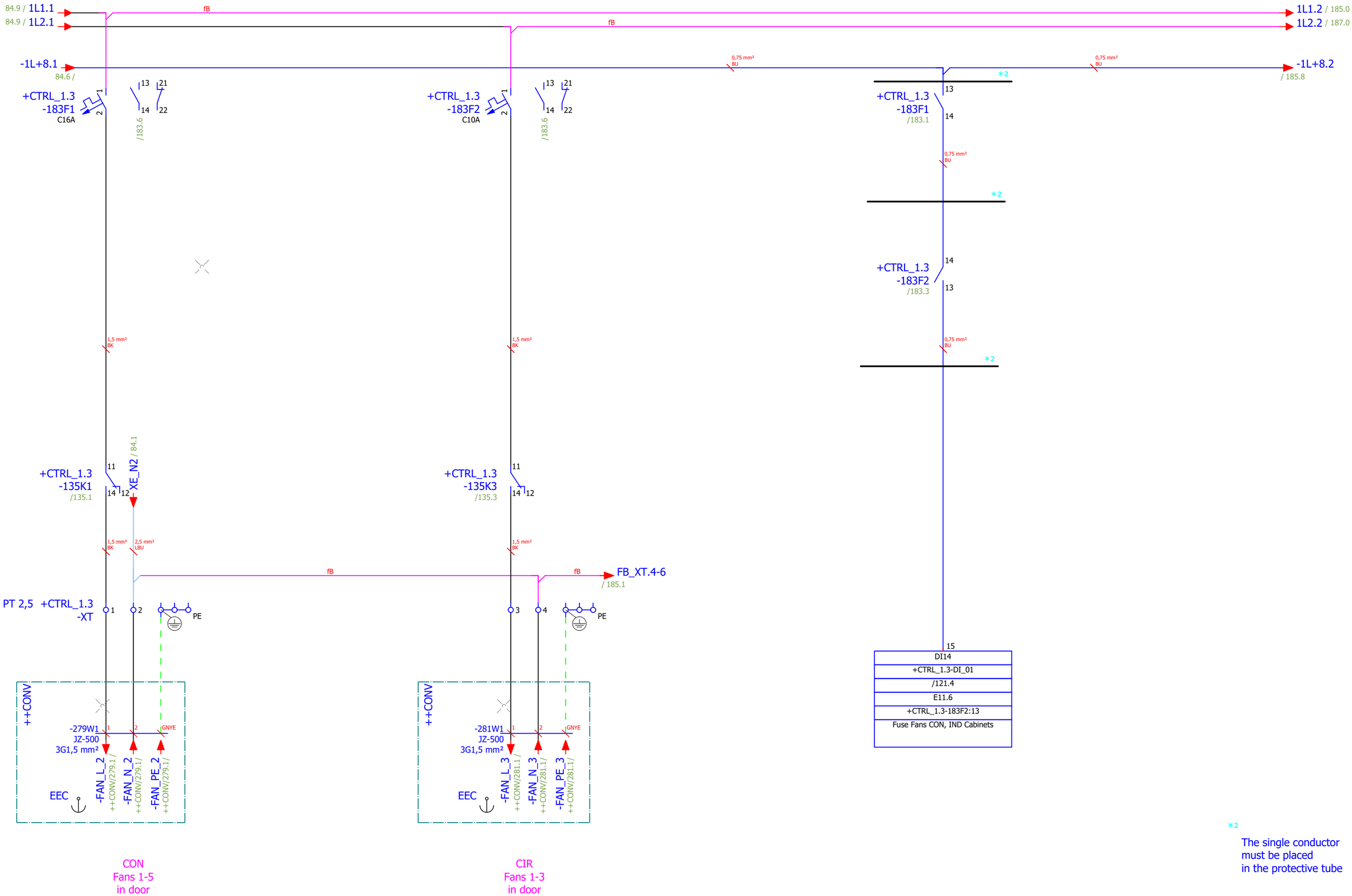
Editor	Freqcon_DG			Statron	FREQCON	WATER SYSTEM	20241105_V1.2	= UNIT_01	Converter Container 1
Date	29.07.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 181
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Editor	Freqcon_JD			Statron	FREQCON	HEAT EXCHANGER	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 182
Date								+	total: 498

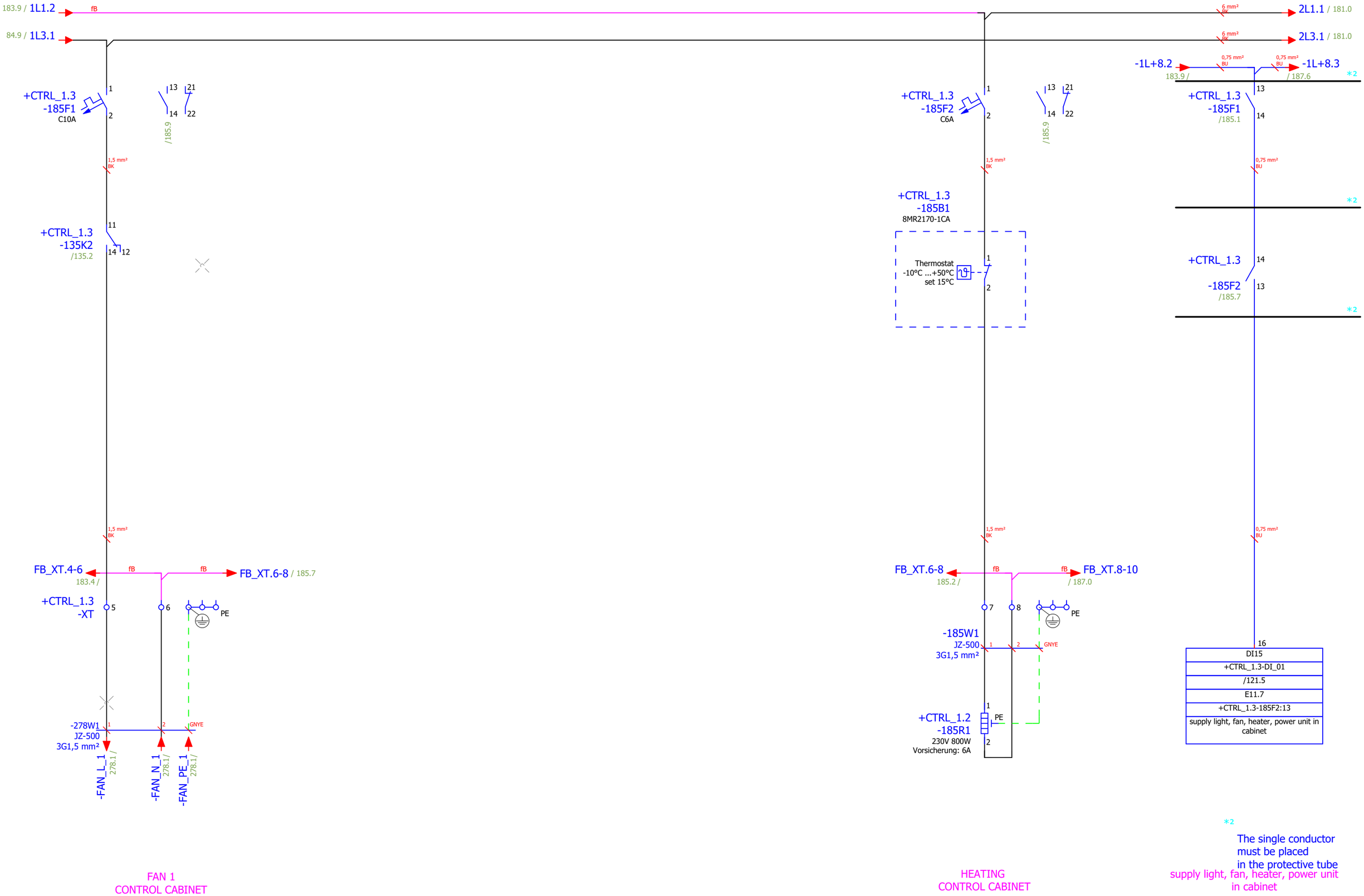


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Editor	Freqcon_DG			Statron	FREQCON	Supply for cabinet fan	20241105_V1.2	= UNIT_01	Converter Container 1
Date	29.07.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets
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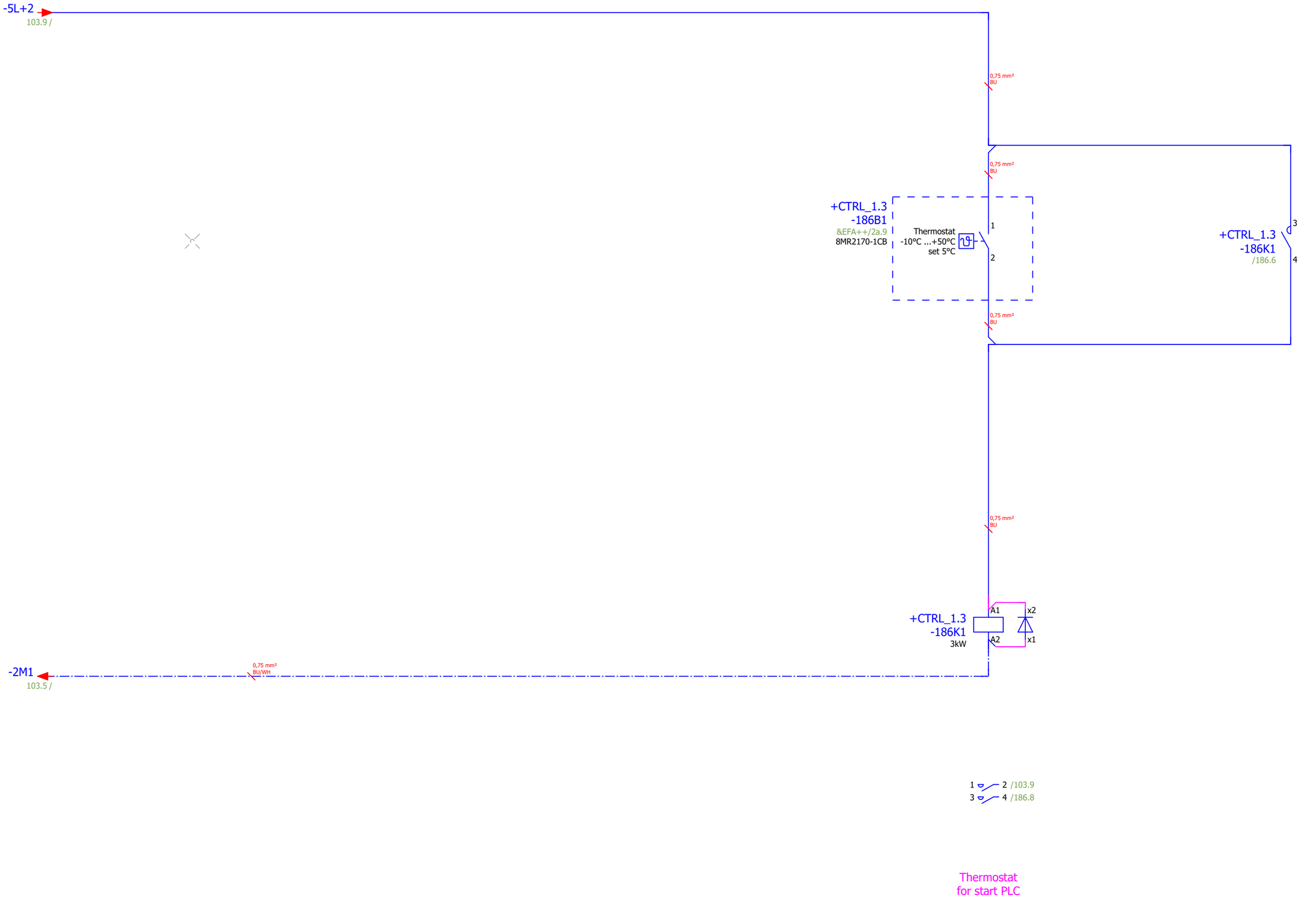
FAN 1
CONTROL CABINET

HEATING
CONTROL CABINET

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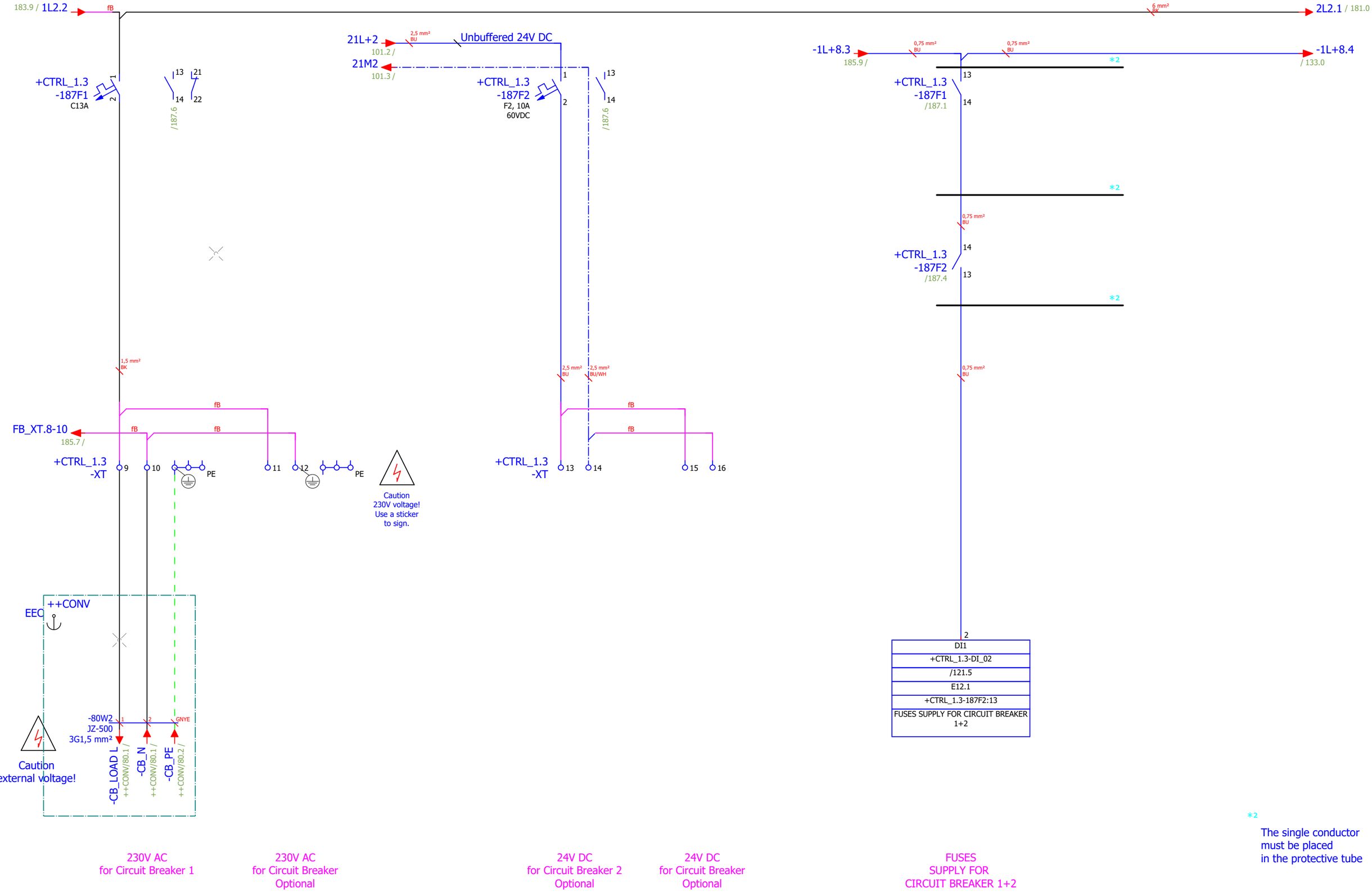
Editor	Freqcon_JD			Statron	FREQCON	FAN / HEATING CONTROL CABINET	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 185
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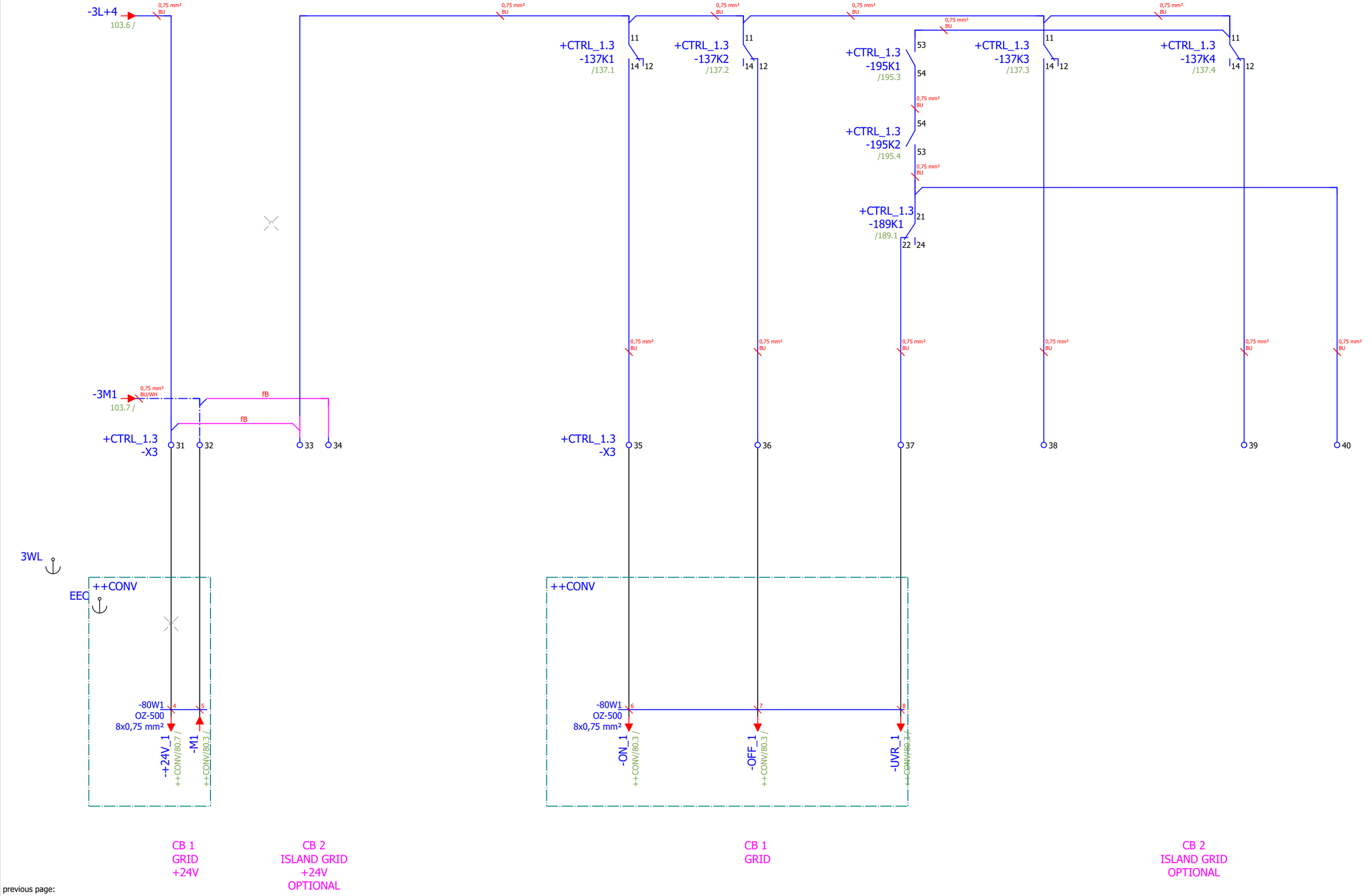
Editor	Freqcon_JD			Statron	FREQCON	THERMOSTAT	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 186
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Editor	Freqcon_JD			Statron	FREQCON	24V DC SUPPLY CB	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore				++ CT Control cabinets	page: 187
Date							10354_23A2007	+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	24V DC SUPPLY CON / CB GRID	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 188
Date								+	total: 498

GRID FAULT
+CTRL_1.3-189K1:A1
A11.3
/123.5
+CTRL_1.3-DO_01
DQ11
12

0,75 mm² BU

+CTRL_1.3
-189K1
24V DC
A1
A2

-1M7.6 fB 0,75 mm² BU/WH -M_(GND)
173.6 / / 189.5

14 11 /189.6
12
24 21 /188.6
22

Voltage inputs
3 phases 620V AC

Grid Circuit Breaker:
if OFF then 24V;
if ON then 0V

Grid OK

-UL1.HVIO / 160.5 — 2,5 mm² BK
-UL2.HVIO / 160.5 — 2,5 mm² BK
-UL3.HVIO / 160.4 — 2,5 mm² BK
-UN.1 / 173.4 — 2,5 mm² LBU
-24V_Signal / 127.4 — 0,75 mm² BU
-M_(GND) / 189.1 — 0,75 mm² BU/WH
+CTRL_1.3 -189K1 /189.1 — 0,75 mm² BU (11 / 12 / 14)
CB_OFF.1 / 137.2 — 0,75 mm² BU

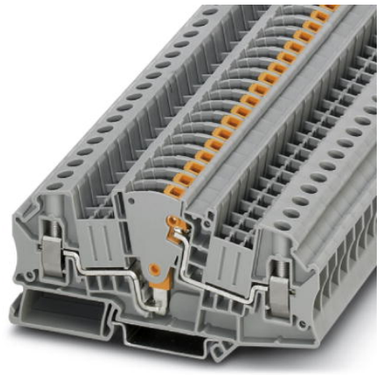
+CTRL_1.4
-189X1
Test disconnect
terminal block
Phoenix Contact
PTME 6

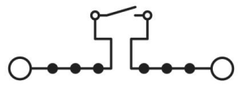
1 2 3 4 5 6 7 8 9

2,5 mm² BK
2,5 mm² BK
2,5 mm² BK
0,75 mm² BU

-HVIO_L1 / 85.1 /
-HVIO_L2 / 85.1 /
-HVIO_L3 / 85.2 /
CB_OFF.2 / 137.2 /

Relais
Circuit Breaker
OFF



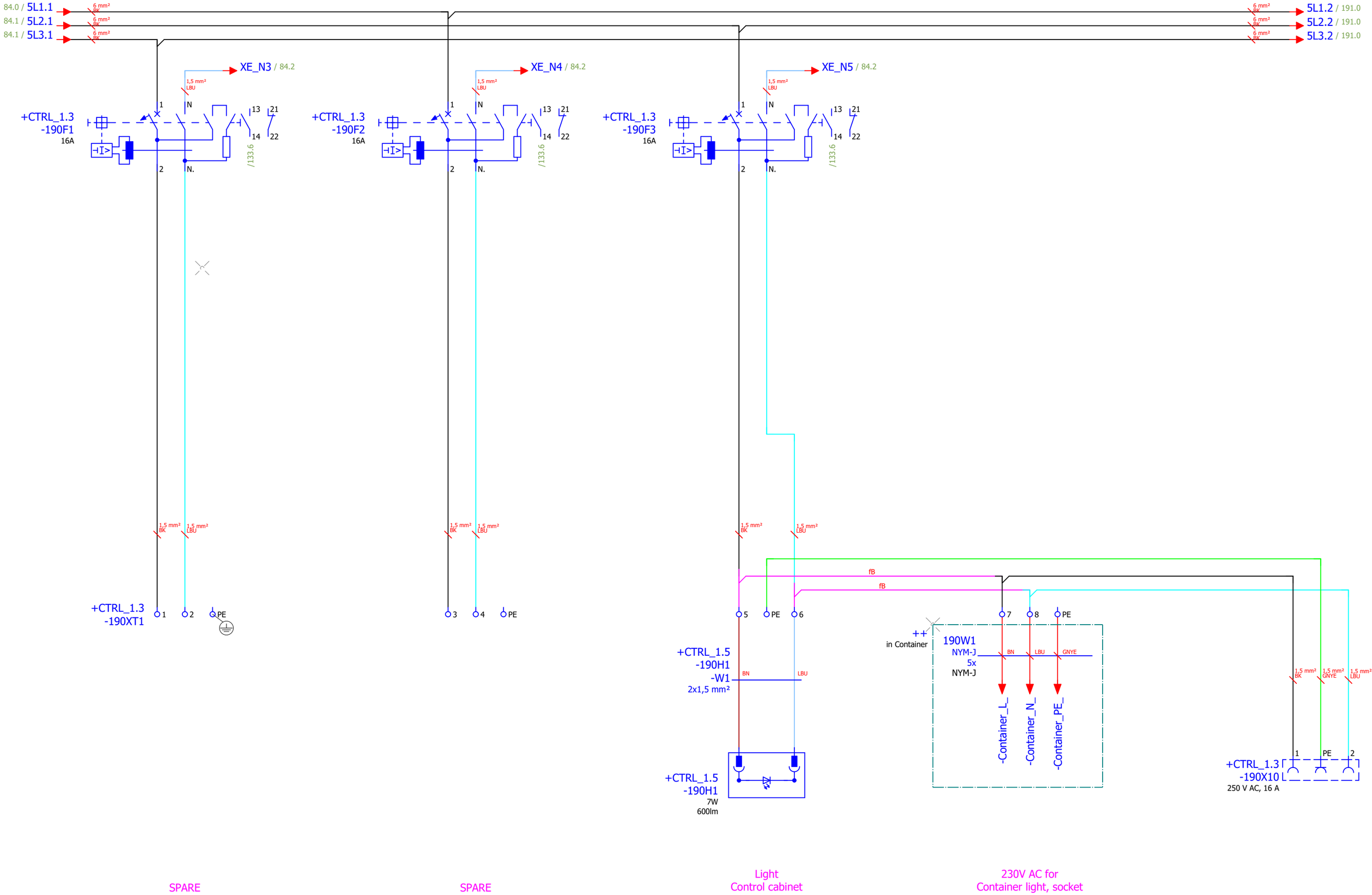


GRID FAULT

Test terminal block for protection tests

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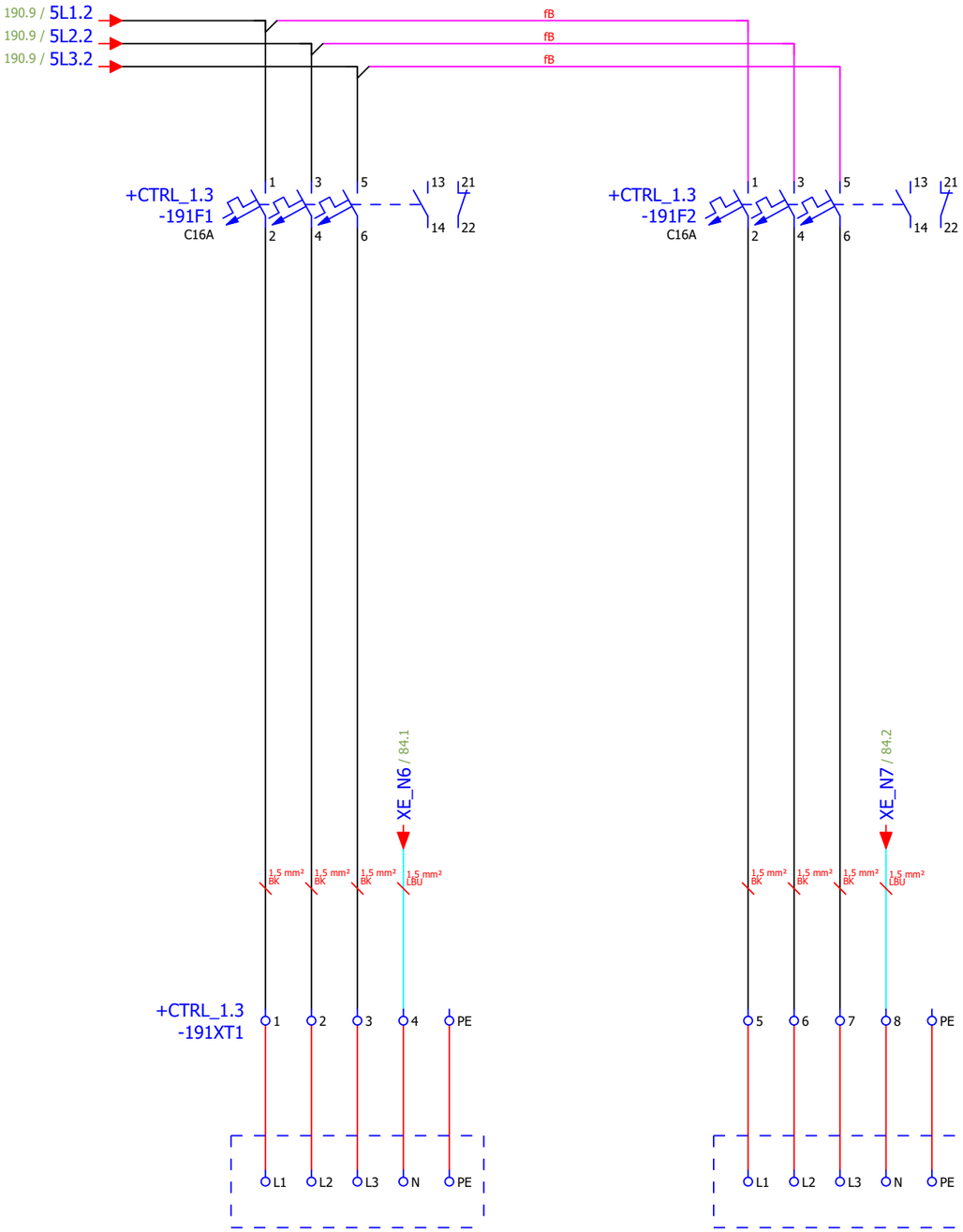
Editor	Freqcon_JD			Statron	FREQCON	TEST TERMINAL BLOCK	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 189
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Editor	Freqcon_DG			Statron	FREQCON	CONTAINER COOLING, LIGHT 230V SUPPLY	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	29.07.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 190
Date								+	total: 498



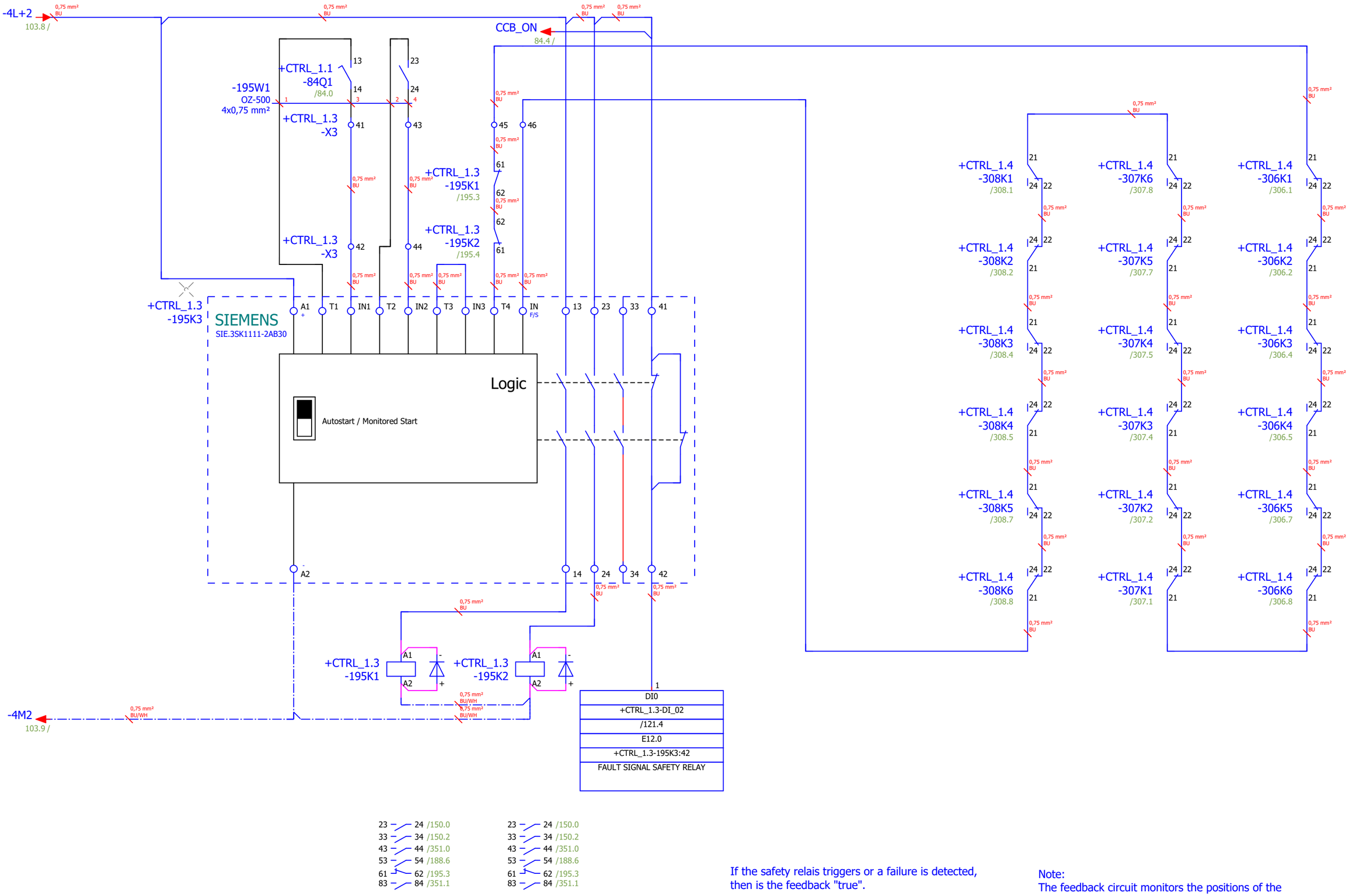
400V AC for
Container Air Conditioning 1

400V AC for
Container Air Conditioning 2

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Editor	Freqcon_DG			Statron	FREQCON	CONTAINER COOLING	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	29.07.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 191
Date								+	total: 498



23 — 24 /150.0
33 — 34 /150.2
43 — 44 /351.0
53 — 54 /188.6
61 — 62 /195.3
83 — 84 /351.1

23 — 24 /150.0
33 — 34 /150.2
43 — 44 /351.0
53 — 54 /188.6
61 — 62 /195.3
83 — 84 /351.1

SHUTDOWN CIRCUIT BREAKERS / DC CONTACTORS

FAULT SIGNAL SAFETY RELAY

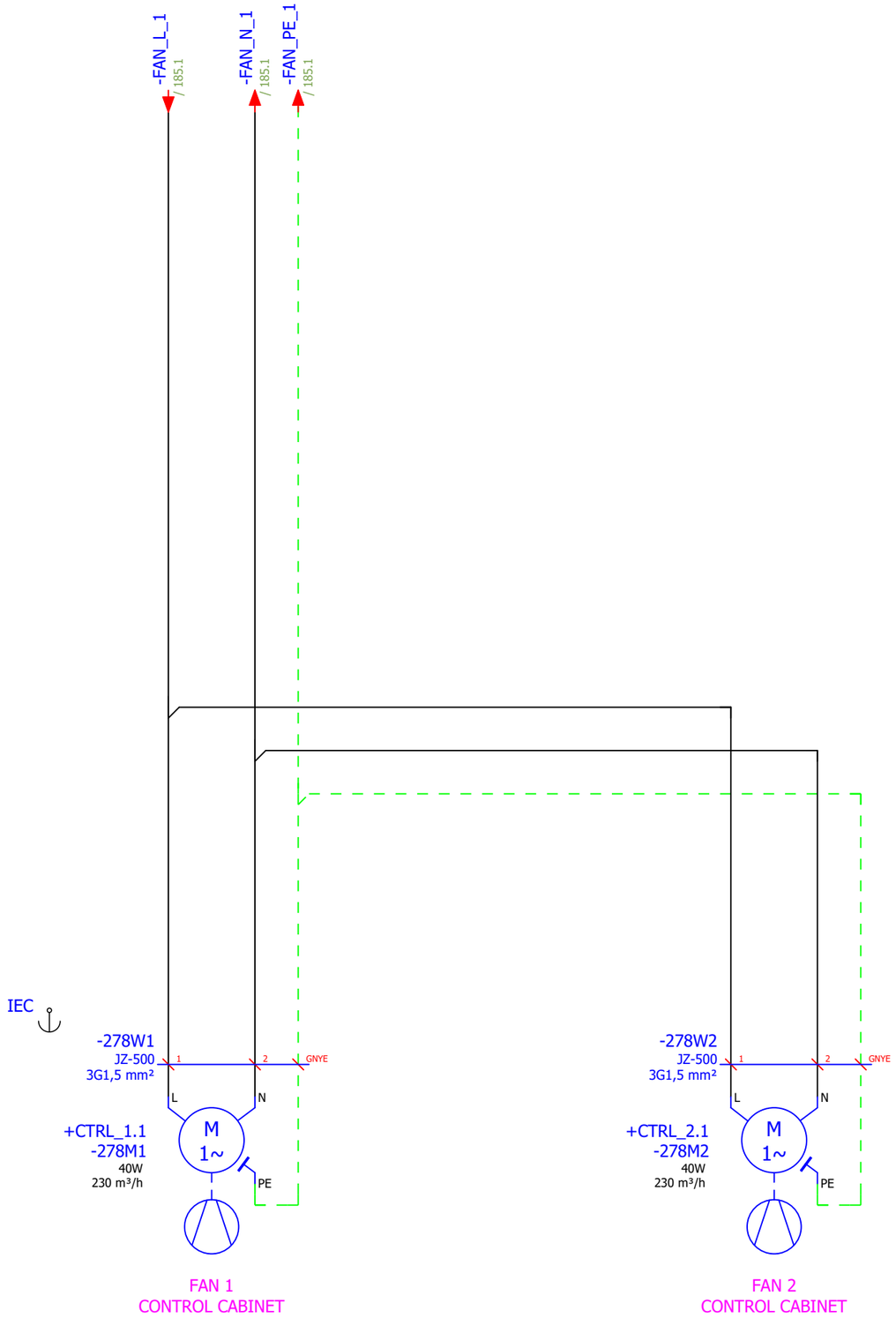
If the safety relais triggers or a failure is detected, then is the feedback "true".

Note:
The feedback circuit monitors the positions of the positive-guided NC contacts on the contactors 195K1 and 195K2. If one of their contacts latsches, then it is not possible to switch the contactors back on.

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Editor	Freqcon_DG			Statron	FREQCON	SHUTDOWN CIRCUIT BREAKERS, DC CONTACTORS	20241105_V1.2	= UNIT_01 Converter Container 1
Date	29.07.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 195
Date								+ total: 498



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Editor	Freqcon_DG			Statron	FREQCON	CONTROL CABINET CLIMATE	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	29.07.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 278
Date								+		total: 498

EEC

++CONV

306_PIII
DC_PIII_2-1
-231W4
-D2-500
18x1 mm²

SUB_2_1_+ /++CONV/231.a.5
SUB_2_1_- /++CONV/231.a.6
SUB_2_2_+ /++CONV/231.a.6
SUB_2_2_- /++CONV/231.a.7
SUB_2_3_+ /++CONV/231.a.6
SUB_2_3_- /++CONV/231.a.7

7 10 8 11 9 12

+CTRL_1.4 -306K1 24V DC
+CTRL_1.4 -306K2 24V DC
+CTRL_1.4 -306K3 24V DC
+CTRL_1.4 -306K4 24V DC
+CTRL_1.4 -306K5 24V DC
+CTRL_1.4 -306K6 24V DC

A1 A2

-4M6 103.9 /
0,75 mm² BU/WH
fB
-4M6 / 307.0

14 12 11 /129.0 24 22 21 /195.9
14 12 11 /129.1 24 22 21 /195.9
14 12 11 /129.2 24 22 21 /195.9
14 12 11 /129.3 24 22 21 /195.9
14 12 11 /129.4 24 22 21 /195.9
14 12 11 /129.5 24 22 21 /195.9

SUBSYSTEM 2_1_DC +
Contactor K1 is off

SUBSYSTEM 2_1_DC -
Contactor K7 is off

SUBSYSTEM 2_2_DC +
Contactor K2 is off

SUBSYSTEM 2_2_DC -
Contactor K8 is off

SUBSYSTEM 2_3_DC +
Contactor K3 is off

SUBSYSTEM 2_3_DC -
Contactor K9 is off

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Editor	Freqcon_JD			Statron	FREQCON	Feedback DC contactors 1_4 - 1_6	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 306
Date								+	total: 498

EEC ++CONV

SUB_3_1_+ /++CONV/227.a.5
SUB_3_1_- /++CONV/227.a.6
SUB_3_2_+ /++CONV/227.a.6
SUB_3_2_- /++CONV/227.a.7
SUB_3_3_+ /++CONV/227.a.6
SUB_3_3_- /++CONV/227.a.7

306_PIII
DC_PIII_3-1
-227W4
D2-500
18x1 mm²

7 10 8 11 9 12

+CTRL_1.4 -307K1 24V DC A1 A2
+CTRL_1.4 -307K2 24V DC A1 A2
+CTRL_1.4 -307K3 24V DC A1 A2
+CTRL_1.4 -307K4 24V DC A1 A2
+CTRL_1.4 -307K5 24V DC A1 A2
+CTRL_1.4 -307K6 24V DC A1 A2

-4M6 306.9 / fB fB fB fB fB fB -4M6 / 308.0

14 12 11 /130.0 24 22 21 /195.8
14 12 11 /130.1 24 22 21 /195.8
14 12 11 /130.2 24 22 21 /195.8
14 12 11 /130.3 24 22 21 /195.8
14 12 11 /130.4 24 22 21 /195.8
14 12 11 /130.5 24 22 21 /195.8

SUBSYSTEM 3_1_DC +
Contactor K1 is off

SUBSYSTEM 3_1_DC -
Contactor K7 is off

SUBSYSTEM 3_2_DC +
Contactor K2 is off

SUBSYSTEM 3_2_DC -
Contactor K8 is off

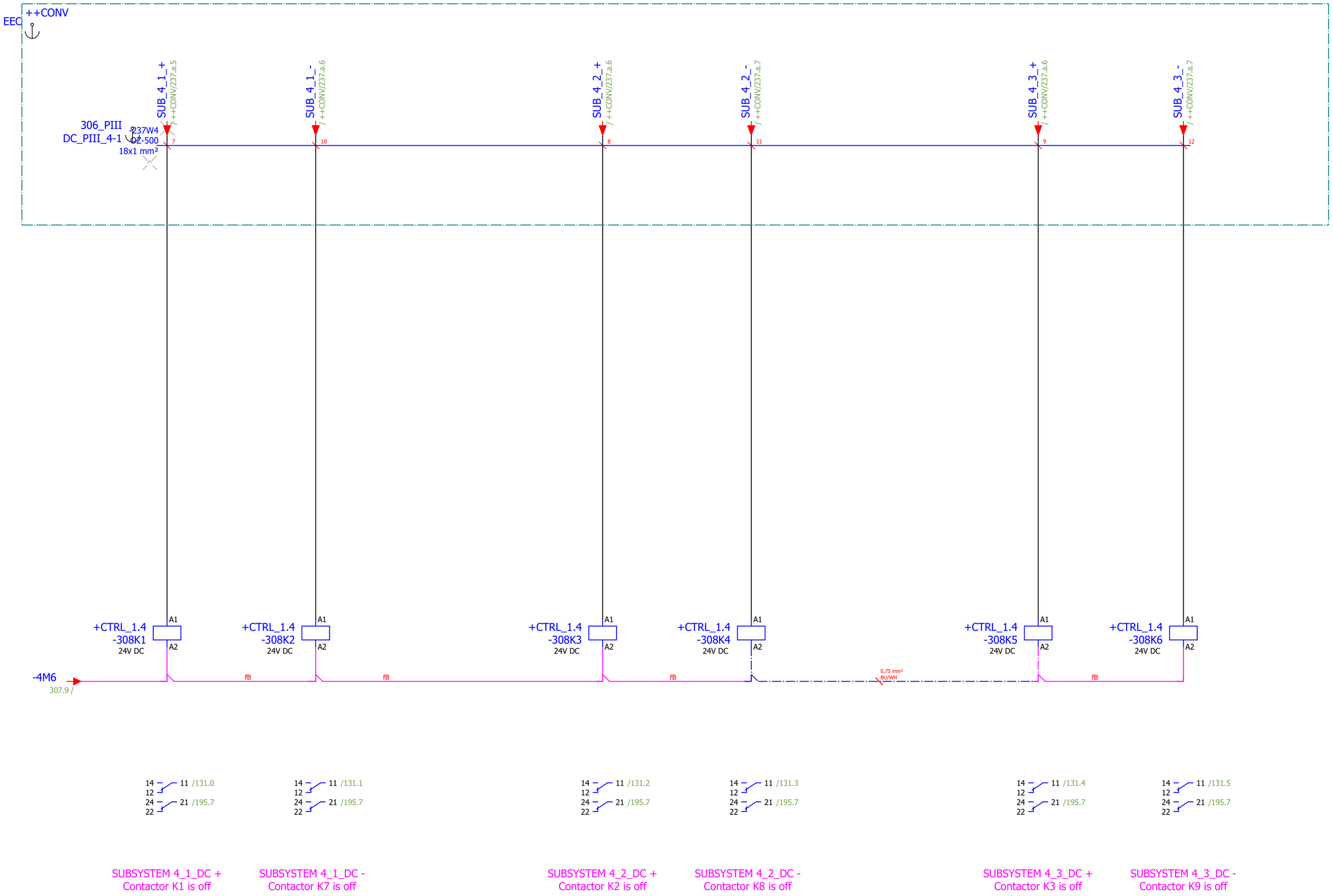
SUBSYSTEM 3_3_DC +
Contactor K3 is off

SUBSYSTEM 3_3_DC -
Contactor K9 is off

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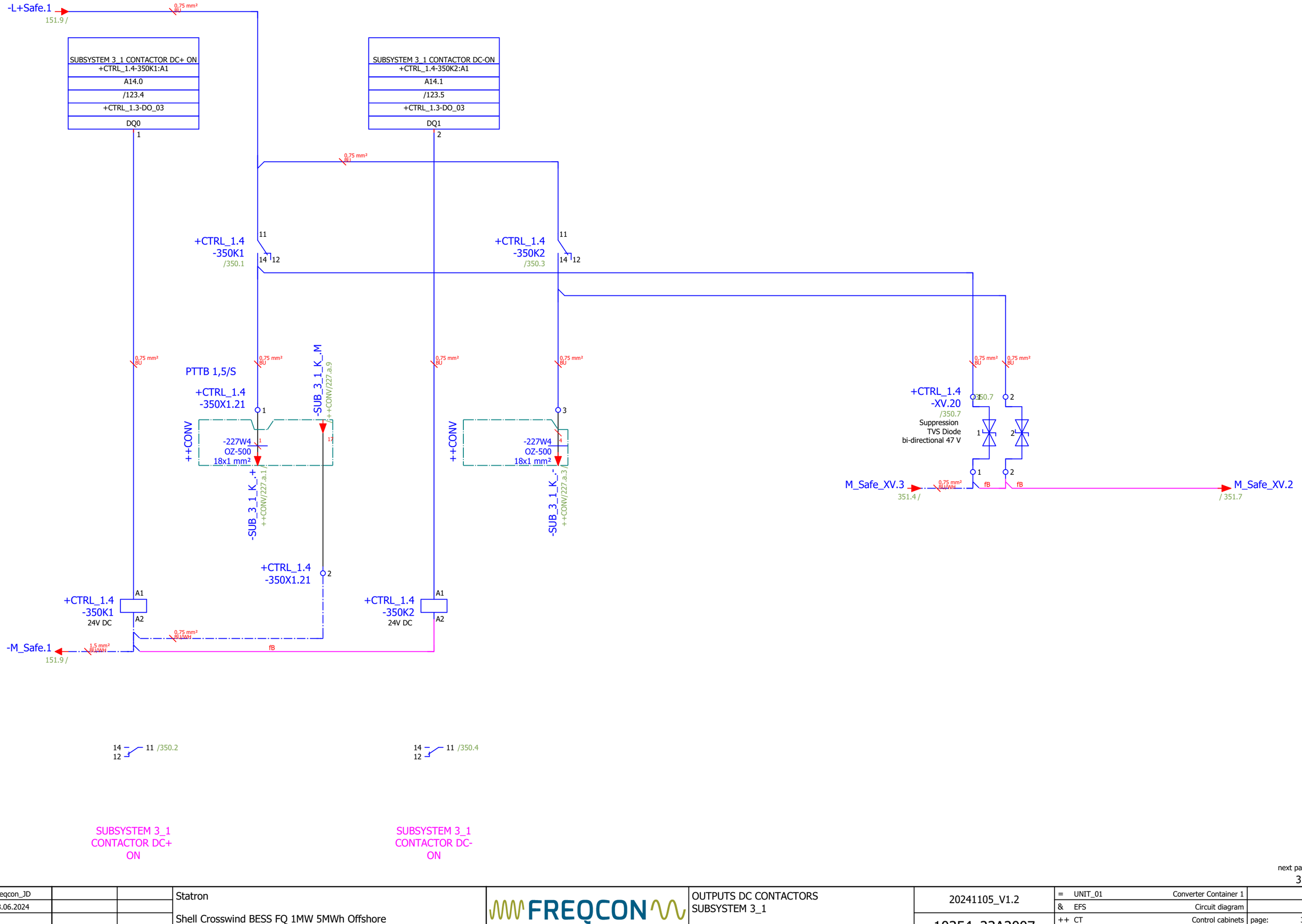
Editor	Freqcon_JD			Statron	FREQCON	Feedback DC contactors 2_1 - 2_3	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 307
Date								+	total: 498



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Editor	Freqcon_DG			Statron	FREQCON	Feedback DC contactors 2_4 - 2_6	20241105_V1.2	= UNIT_01	Converter Container 1
Date	29.07.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets page: 308
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS DC CONTACTORS SUBSYSTEM 3_1	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 350
Date								+	total: 498

-3L+5
103.7 /

0,75 mm² BU

+CTRL_1.3
-195K1
/195.3

83
84

+CTRL_1.3
-195K2
/195.4

84
83

SUBSYSTEM 3_3 CONTACTOR DC+ ON
+CTRL_1.4-351K3:A1
A14.4
/123.4
+CTRL_1.3-DO_03
DQ4
5

SUBSYSTEM 3_3 CONTACTOR DC-ON
+CTRL_1.4-351K4:A1
A14.5
/123.5
DQ5
6

L+Safe.2
/ 352.0

+CTRL_1.4
-351K1
/351.1

+CTRL_1.4
-351K2
/351.2

+CTRL_1.4
-351K3
/351.4

+CTRL_1.4
-351K4
/351.5

11
14
12

-3M4
103.7 /

0,75 mm² BU/WH

+CTRL_1.3
-195K1
/195.3

43
44

+CTRL_1.3
-195K2
/195.4

44
43

+CTRL_1.4
-350X1.21

4
6
7
9

++CONV

-227W4
OZ-500
18x1 mm²

-SUB_3_2_K_+
++CONV/227.a.2/

-SUB_3_2_K_-
++CONV/227.a.4/

-SUB_3_3_K_+
++CONV/227.a.2/

-SUB_3_3_K_-
++CONV/227.a.5/

+CTRL_1.4
-XV.20
/351.7
Suppression
TVS Diode
bi-directional 47 V

3
4
5
6

M_Safe_XV.2
350.9 /

fB

M_Safe_XV.4
/ 352.7

+CTRL_1.4
-350X1.21

5
8
10

+CTRL_1.4
-351K1
24V DC

+CTRL_1.4
-351K2
24V DC

+CTRL_1.4
-351K3
24V DC

+CTRL_1.4
-351K4
24V DC

A1
A2

M_Safe_XV.3
/ 350.7

M_Safe.2
/ 352.0

14 — 11 /351.1
12

14 — 11 /351.3
12

14 — 11 /351.4
12

14 — 11 /351.6
12

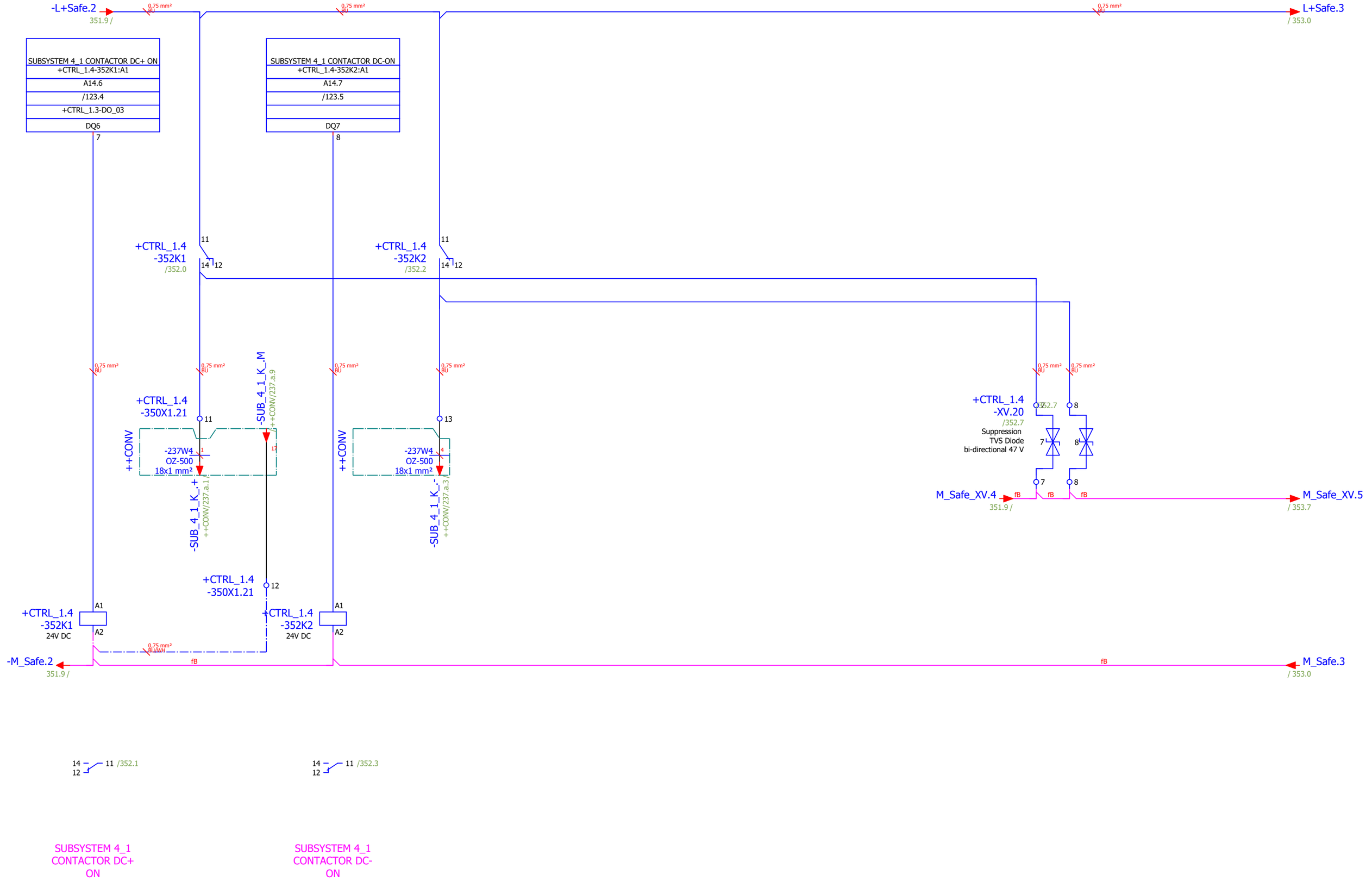
SUBSYSTEM 3_3
CONTACTOR DC+
ON

SUBSYSTEM 3_3
CONTACTOR DC-
ON

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Editor	Freqcon_DG			Statron	FREQCON	OUTPUTS DC CONTACTORS SUBSYSTEM 3_2 - 3_3	20241105_V1.2	= UNIT_01 Converter Container 1	
Date	29.07.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets	page: 351
Date								+	total: 498



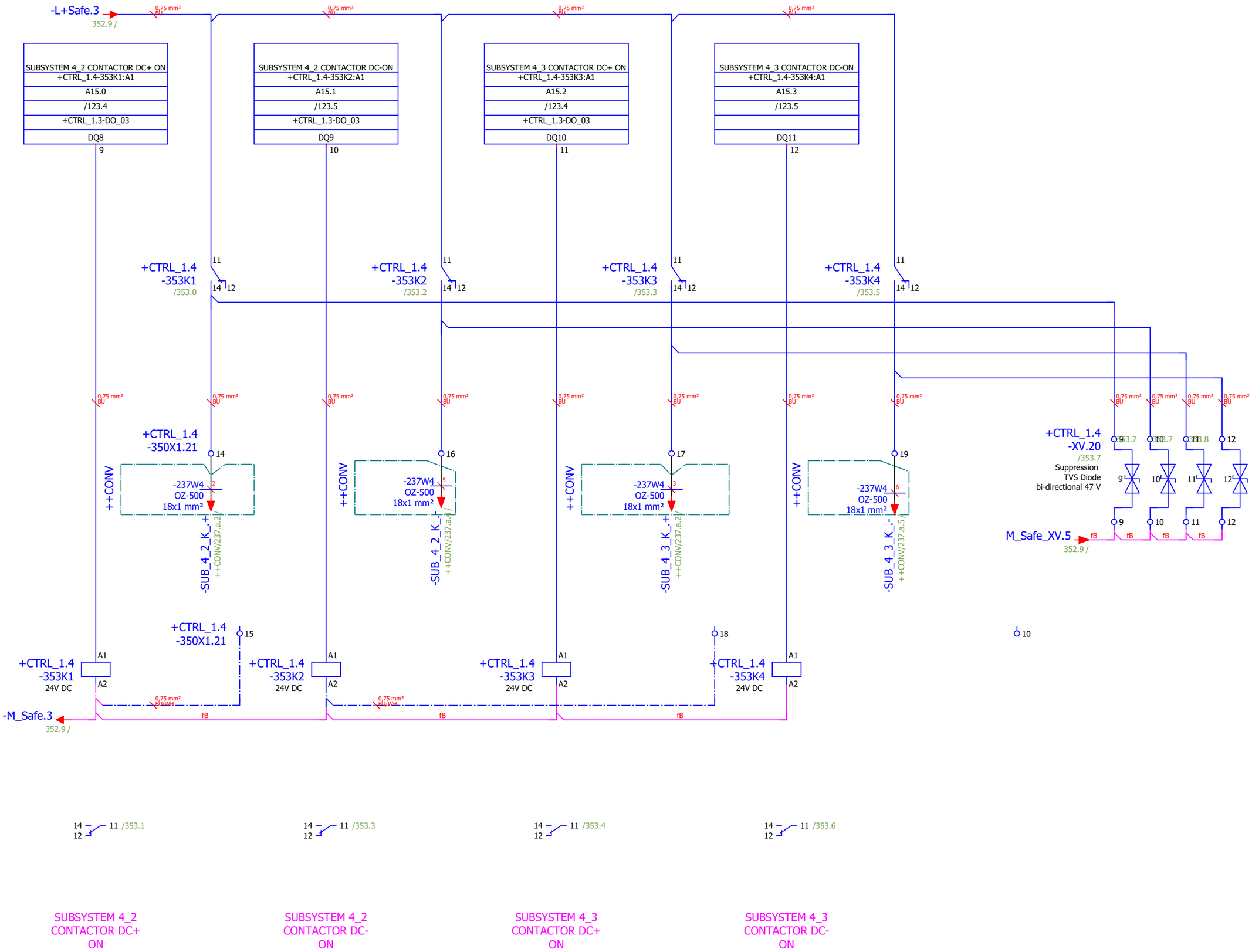
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Editor	Freqcon_DG			Statron	FREQCON	OUTPUTS DC CONTACTORS SUBSYSTEM 4_1	20241105_V1.2	= UNIT_01	Converter Container 1
Date	29.07.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets
Date								+	

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total: 498



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Editor	Freqcon_DG			Statron	FREQCON	OUTPUTS DC CONTACTORS SUBSYSTEM 4_2 - 4_3	20241105_V1.2	= UNIT_01 Converter Container 1
Date	29.07.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 353
Date								+ total: 498

-1L+1
103.2 /
-1M1
103.3 /
-1PE1
103.4 /
240W9
JZ-500
3G0,75 mm²
1 2 GNYE

+CTRL_2.1
-240U1
PIII
IGBT IRT Interface
2.6 V4 cabinet
1 3 4 2
4 3 1 2
Ansicht
Stiftleiste
24 VDC

M12 System-
steckverbinder

Ansicht
Buchsenleiste

240W10
2YY (ST) CY
2x2x0,64 mm²
/110.1
-P320-FPPU1
110.0 /
P1
3 4 (IN) 2 1

240W11
2YY (ST) CY
2x2x0,64 mm²
/441.1
-FPPU1-FPPU2
441.0 /
P2
3 4 (OUT) 2 1

M12 System-
steckverbinder

Arc Detect
3 4 2 1

M6 Bolzen
-PE

PE
19

4 3 1 2
Stecker A-Codiert

PIII_1

Converter Control Interface
Type: PIII IGBT IRT Interface 2.6 V4
FRQ 504890

CHOPPER
HVIO
IGBT6
IGBT5
25-POL SUB-D SOCKET
X8 X7 X6 X5

PIII_1

IGBT1 X1
IGBT2 X2
IGBT3 X3
IGBT4 X4
25-POL SUB-D SOCKET

++CONV

240W1
pre-assembled D-Sub cable 1:1
-_IGBT1.1
/ ++CONV/201.3

240W2
pre-assembled D-Sub cable 1:1
-_IGBT1.2
/ ++CONV/202.3

240W3
pre-assembled D-Sub cable 1:1
-_IGBT1.3
/ ++CONV/203.3

IEC

PIII_1

PIII_Version
2_6_V_4

-240W7
pre-assembled D-Sub cable 1:1
/160.7
-HVIO_1
/ 160.9

Signal	Colour	M12 Plug	M12 Plug
TD+	yellow	1	1
TD-	orange	3	3
RD+	white	2	2
RD-	blue	4	4

Connection PIII -- P320

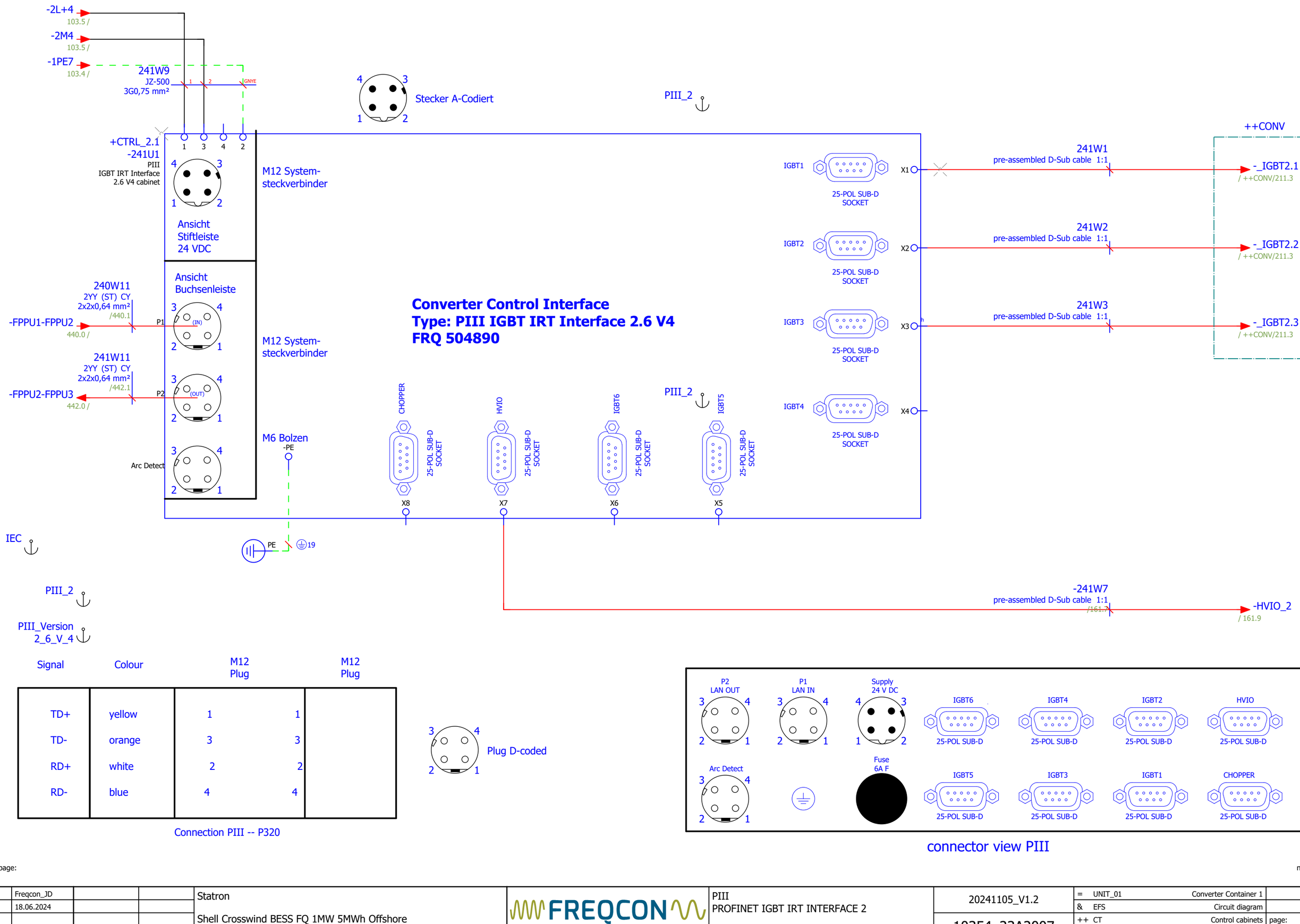
3 4 2 1
Plug D-coded

P2 LAN OUT
P1 LAN IN
Supply 24 V DC
Arc Detect
Fuse 6A F
IGBT6 IGBT4 IGBT2 HVIO
IGBT5 IGBT3 IGBT1 CHOPPER
25-POL SUB-D

connector view PIII

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Editor	Freqcon_JD			Statron	FREQCON	PIII PROFINET IGBT IRT INTERFACE 1	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 440
Date								+		total: 498



Signal	Colour	M12 Plug	M12 Plug
TD+	yellow	1	1
TD-	orange	3	3
RD+	white	2	2
RD-	blue	4	4

Connection PIII -- P320

Plug D-coded

connector view PIII

previous page: 440
next page: 442

Editor	Freqcon_JD			Statron	FREQCON	PIII PROFINET IGBT IRT INTERFACE 2	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 441
Date								+ total: 498

-2L+2
103.4 /
-2M2
103.5 /
-1PE5
103.4 /
242W9
JZ-500
3G0,75 mm²
1 2 GNYE

+CTRL_2.1
-242U1
PIII
IGBT IRT Interface
2.6 V4 cabinet
1 3 4 2
Ansicht
Stiftleiste
24 VDC

Stecker A-Codiert

PIII_3

M12 System-
steckverbinder

Ansicht
Buchsenleiste

241W11
2YY (ST) CY
2x2x0,64 mm²
/441.1
-FPPU2-FPPU3
441.0 /
P1 (IN)

242W11
2YY (ST) CY
2x2x0,64 mm²
/443.1
-FPPU3-FPPU4
443.0 /
P2 (OUT)

M12 System-
steckverbinder

Arc Detect

M6 Bolzen
-PE

PE
19

IEC

PIII_3

PIII_Version
2_6_V_4

Converter Control Interface
Type: PIII IGBT IRT Interface 2.6 V4
FRQ 504890

PIII_2

CHOPPER
HVIO
IGBT6
IGBT5
25-POL SUB-D SOCKET
X8 X7 X6 X5

IGBT1 X1
IGBT2 X2
IGBT3 X3
IGBT4 X4
25-POL SUB-D SOCKET

++CONV

242W1
pre-assembled D-Sub cable 1:1
-_IGBT3.1
/ ++CONV/207.3

242W2
pre-assembled D-Sub cable 1:1
-_IGBT3.2
/ ++CONV/207.3

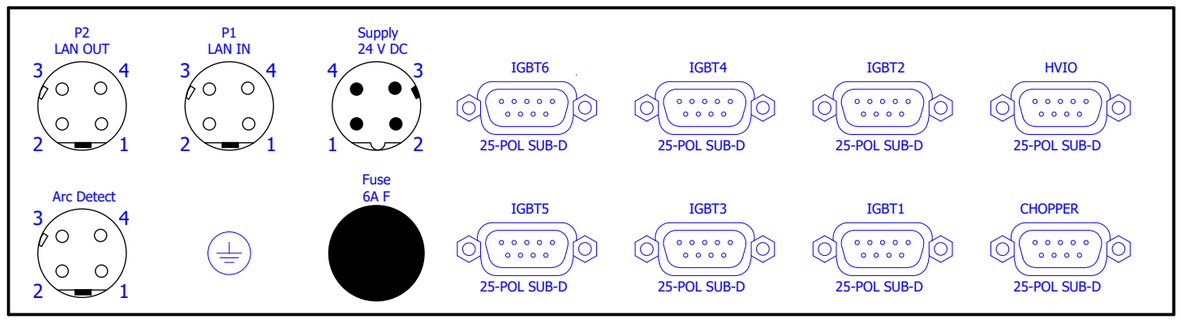
242W3
pre-assembled D-Sub cable 1:1
-_IGBT3.3
/ ++CONV/207.3

-242W7
pre-assembled D-Sub cable 1:1
/163.7
-HVIO_3
/ 163.9

Signal	Colour	M12 Plug	M12 Plug
TD+	yellow	1	1
TD-	orange	3	3
RD+	white	2	2
RD-	blue	4	4

Connection PIII -- P320

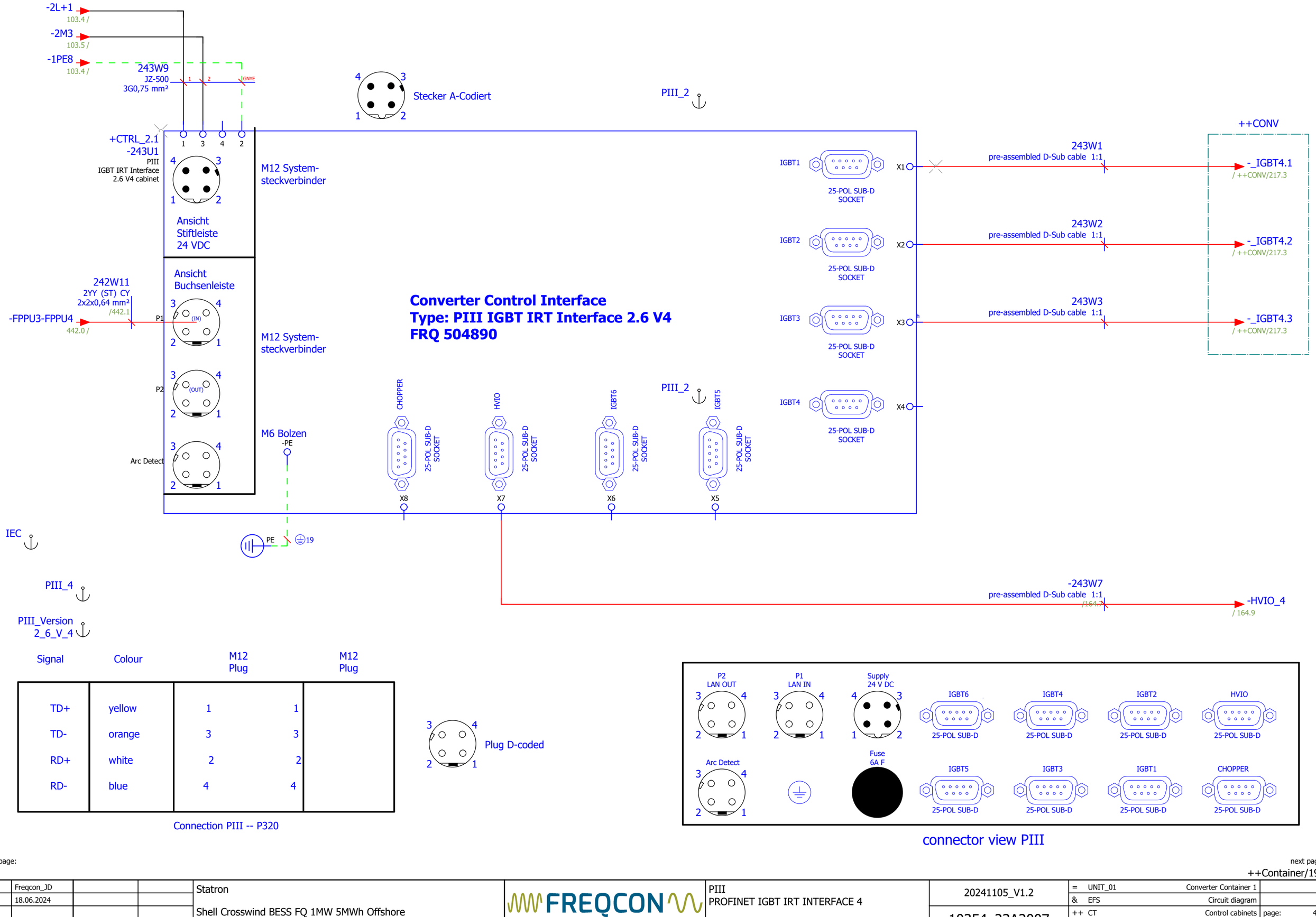
Plug D-coded



connector view PIII

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Editor	Freqcon_JD			Statron	FREQCON	PIII PROFINET IGBT IRT INTERFACE 3	20241105_V1.2	= UNIT_01	Converter Container 1	
Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT	Control cabinets	page: 442
Date								+		total: 498



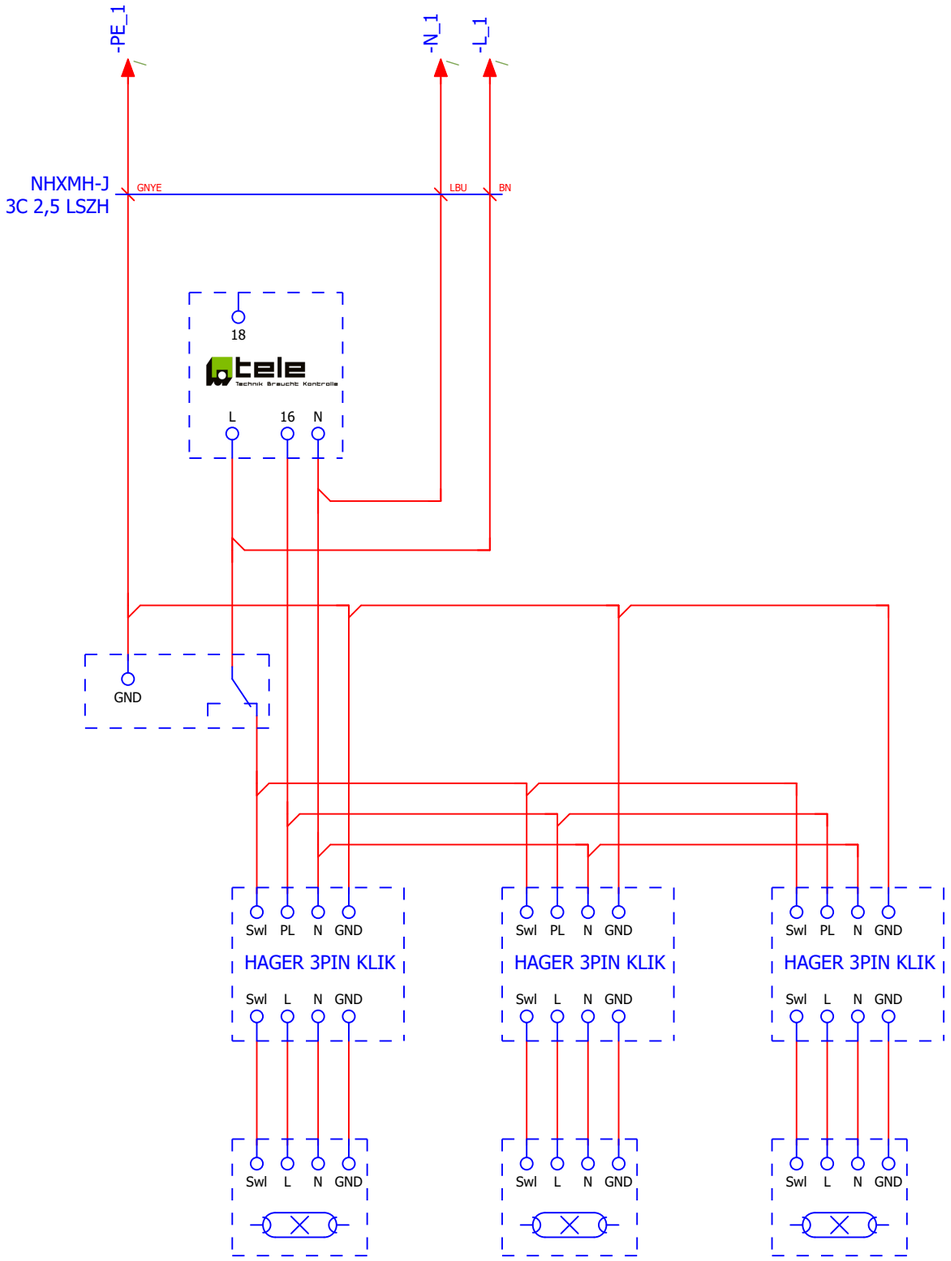
Signal	Colour	M12 Plug	M12 Plug
TD+	yellow	1	1
TD-	orange	3	3
RD+	white	2	2
RD-	blue	4	4

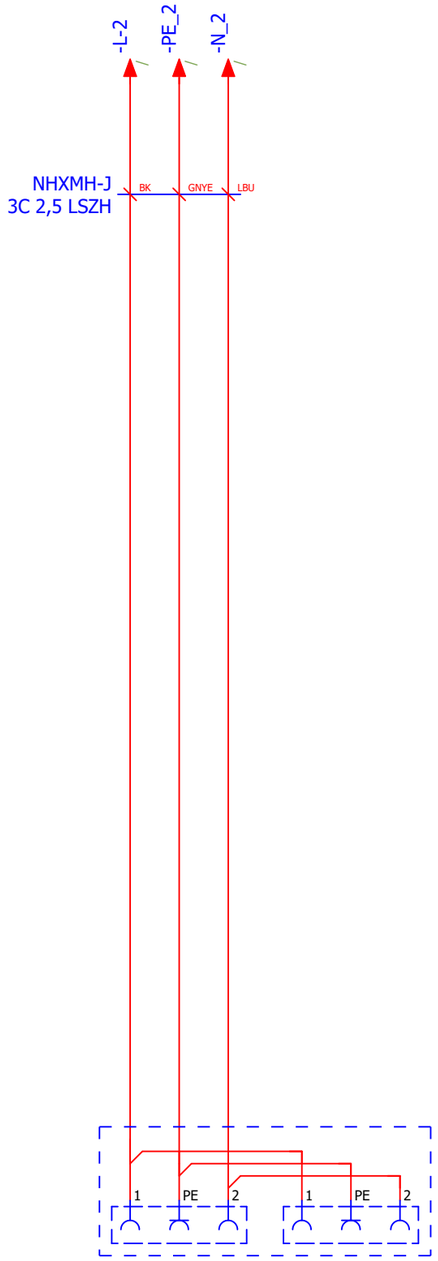
Connection PIII -- P320

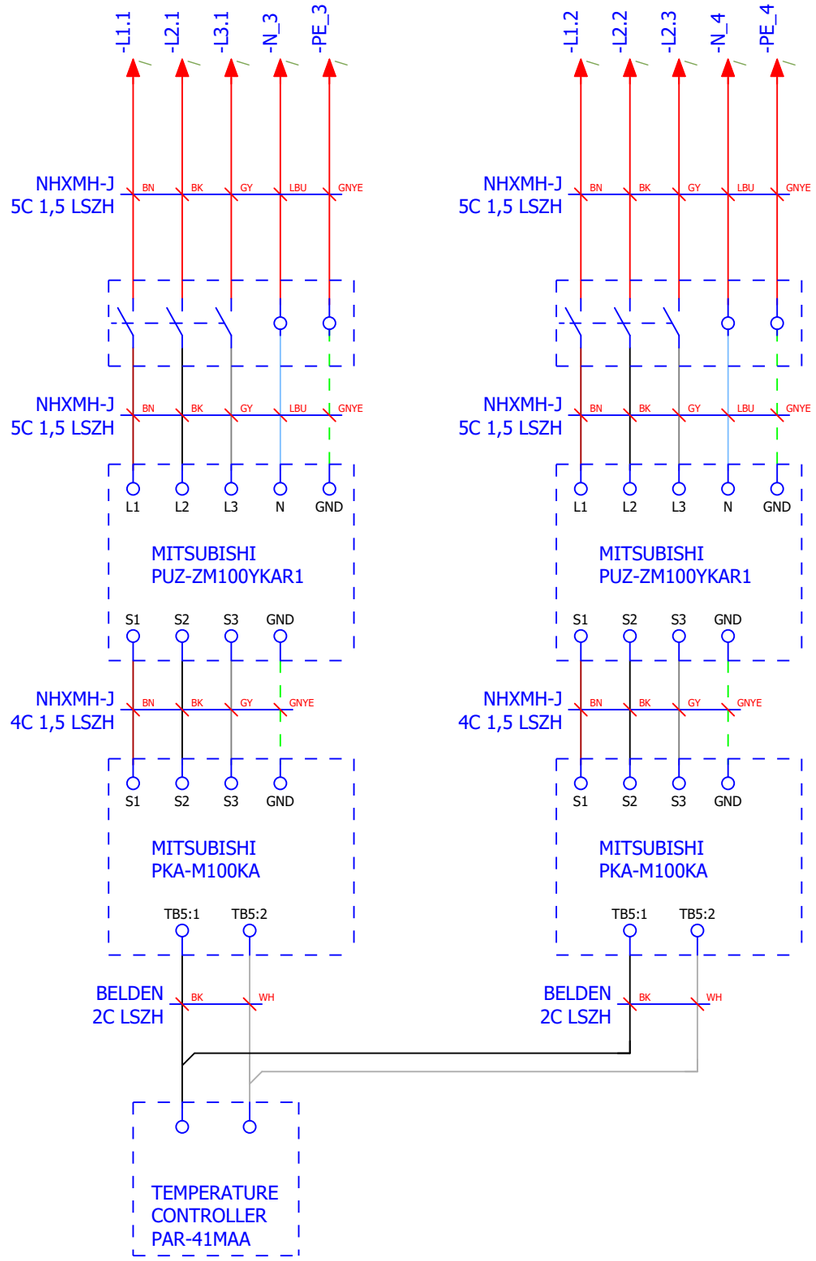
connector view PIII

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Editor	Freqcon_JD			Statron	FREQCON	PIII PROFINET IGBT IRT INTERFACE 4	20241105_V1.2	= UNIT_01 Converter Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ CT Control cabinets page: 443
Date								+ total: 498







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++CT/443

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&EPC++TRA/1

Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_01	Converter Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 190
Date								+	total: 498

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FREQCON

Customer:	Statron
Project:	Shell Crosswind BESS FQ 1MW 5MWh Offshore
Type:	BESS MSC-1000-620-8
Product	BATTERY CONTAINER 1
Circuit diagram No:	10354_23A2007 20241105_V1.2
Producer (company):	Freqcon GmbH 53406 ASC 53409
Project:	Shell Crosswind BESS FQ 1MW 5MWh Offshore
Type:	BESS MSC-1000-620-8
Project manager:	Freqcon_CP

created on: 17.09.2019
edited on: 05.11.2024 edited by: Freqcon_DG total pages: 498

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	7	PARTS LIST	05.11.2024	Freqcon_DG
&EPA ++Container		Summarized part list		
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&EPA ++ASC		Summarized part list auxillary cabinet		
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&EMB ++ASC		Cable list auxillary cabinet		
	1	CABEL LIST	05.11.2024	Freqcon_DG
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	8	CABEL LIST	05.11.2024	Freqcon_DG
	9	CABEL LIST	05.11.2024	Freqcon_DG
	10	CABEL LIST	05.11.2024	Freqcon_DG
&EMZ ++ASC		Terminals auxillary cabinet		
	1000	Klemmenleistenübersicht : =UNIT_02++ASC+-X5.1 - =UNIT_02++ASC+-690XT1	05.11.2024	Freqcon_DG
	2000	Klemmenplan =UNIT_02++ASC+-X5.1	05.11.2024	Freqcon_DG
	2001	Klemmenplan =UNIT_02++ASC+-X5.2	05.11.2024	Freqcon_DG

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	2009	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2010	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2011	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2012	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2013	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2014	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2015	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2016	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2017	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2018	Klemmenplan =UNIT_02++ASC+-369XT	05.11.2024	Freqcon_DG
	2019	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2020	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2021	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2022	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2023	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2024	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2025	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2026	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2027	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2028	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG

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&EMZ ++ASC		Terminals auxillary cabinet		
	2029	Klemmenplan =UNIT_02++ASC+-687XT1	05.11.2024	Freqcon_DG
	2030	Klemmenplan =UNIT_02++ASC+-690XT1	05.11.2024	Freqcon_DG
	2031	Klemmenplan =UNIT_02++ASC+-690XT1	05.11.2024	Freqcon_DG
	2032	Klemmenplan =UNIT_02++ASC+-690XT1	05.11.2024	Freqcon_DG
	2033	Klemmenplan =UNIT_02++ASC+-690XT1	05.11.2024	Freqcon_DG
	2034	Klemmenplan =UNIT_02++ASC+-690XT1	05.11.2024	Freqcon_DG

SPECIFICATION

TERMINAL STRIP

-XE1	MAIN POWER SUPPLY 600V AC
-XE2	DC POWER SUPPLY 1000V DC
-XE	MAIN POWER SUPPLY 400V AC
-X1	MAIN POWER 400V/230V AC
-X2	LIGHT CABINET 230V AC
-X3	CONTROL VOLTAGE 24V DC
-14X1	CONTROL VOLTAGE 24V DC (TO DC CONTACTORS)
-X5	LOW-VOLTAGE SIGNALS
-XDC0	24V DC POWER SUPPLY
-XDC1-4	CONTROL VOLTAGE 24V DC (UPS)
-XT	TRANSFER TERMINAL BLOCK 24V DC / 230V AC

WIRING COLOR

L1 / L2 / L3	=	BLACK
N	=	LIGHT BLUE (IEC) / GREY (UL)
PE	=	YELLOW-GREEN
EXTERNAL VOLTAGE	=	ORANGE
CONTROL VOLTAGE 24 V DC	=	DARK BLUE
ANALOG SIGNALS	=	WHITE

PLACE

+CTRL	=	Control cabinet
+CON	=	Converter cabinet
+IND	=	Inductor cabinet
+CIR	=	Circuit breaker cabinet
+COSY	=	Cooling System
+FAN	=	External fan

previous page: &EAB/6

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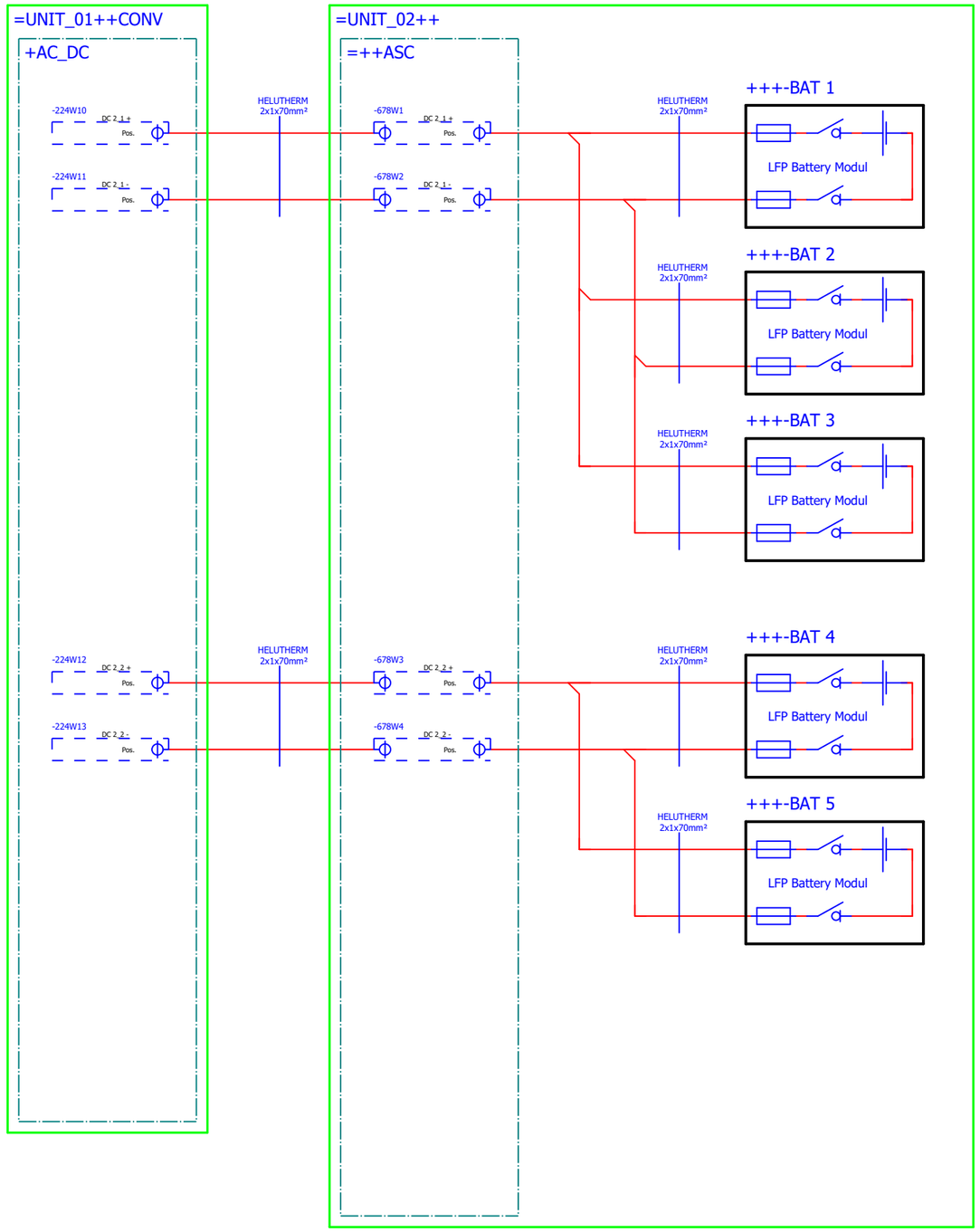
SPECIFICATION of grounding

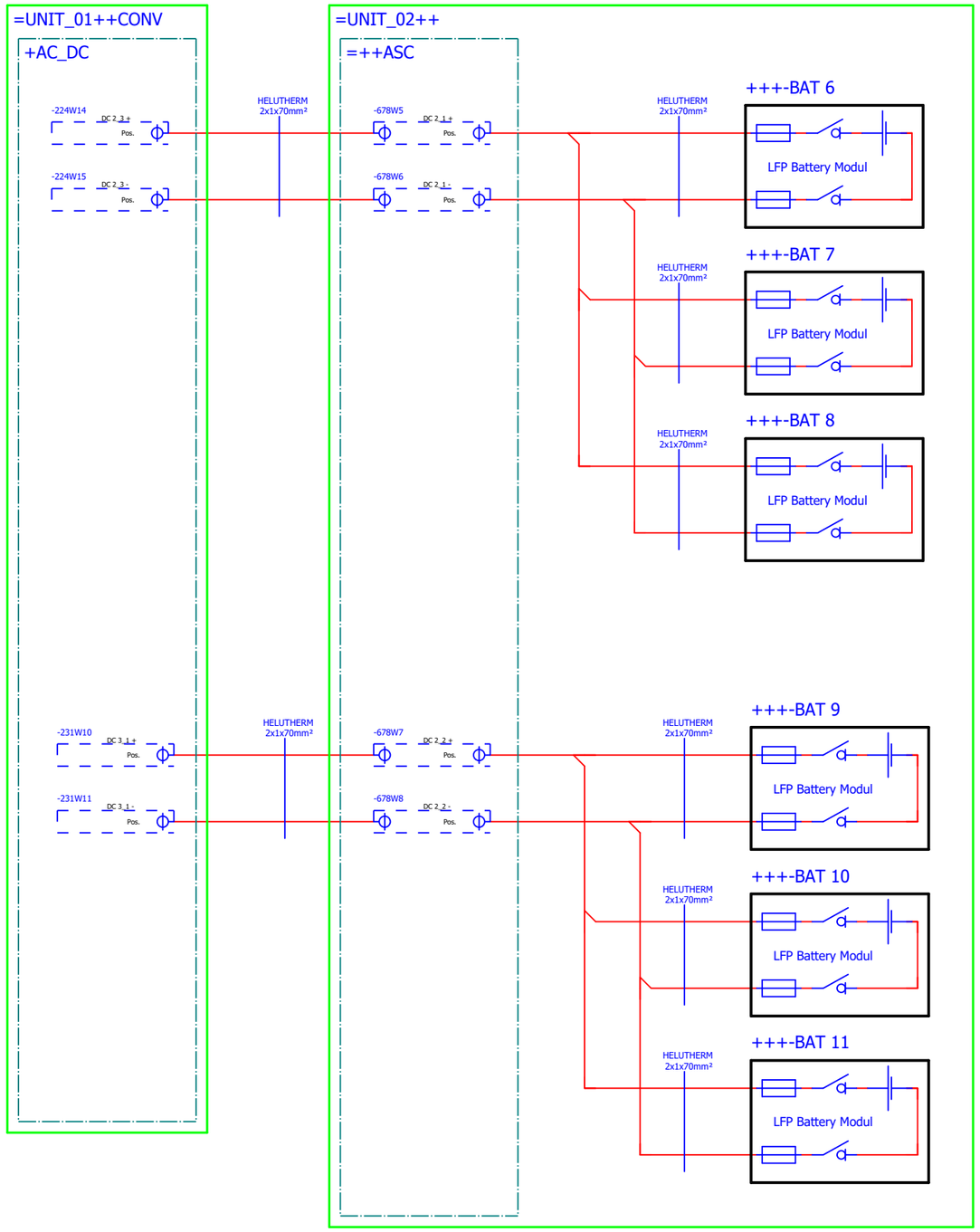
	from frame to			
1	**roof & side walls & doors**	**EVD_1**	**Flachband**	**2x25 mm²**
2	**frame**	**EVD_2**	**Flachband**	**2x25 mm²**
3	**base**	**EVD_3**	**Flachband**	**2x25 mm²**
4	**Mounting plate & partitions**	**EVD_4**	**H07-V-K**	**2x25 mm²**
5	**inductors**	**EVD_5**	**H07-V-k**	**2x25 mm²**
6	**Powerstack**	**EVD_6**	**H07-V-K**	**2x25 mm²**
7	**DC Switch & Fuse**	**EVD_7**	**H07-V-K**	**2x25 mm²**
8	**AC Filter**	**EVD_8**	**H07-V-K**	**2x25 mm²**
9	**circuit-breaker**	**EVD_9**	**H07-V-K**	**2x25 mm²**
10	**Freqcon_Fast_Disconektor**	**EVD_10**	**H07-V-K**	**2x25 mm²**
11	**Freqcon_Rectifier_Modul**	**EVD_11**	**H07-V-K**	**2x25 mm²**
12	**capacitor banks**	**EVD_12**	**H07-V-K**	**2x25 mm²**
13	**water distributor**	**EVD_13**	**H07-V-K**	**2x25 mm²**
14	**SPARE**	**EVD_14**	**H07-V-K**	**2x25 mm²**
15	**SPARE**	**EVD_15**	**H07-V-K**	**2x25 mm²**
16	**SPARE**	**EVD_16**	**H07-V-K**	**2x25 mm²**
17	**SPARE**	**EVD_17**	**H07-V-K**	**2x25 mm²**
18	**SPARE**	**EVD_18**	**H07-V-K**	**2x25 mm²**
	from door to			
19	**PROFINET IRT IGBT Interface**	**EVD_19**	**H07-V-K**	**1,5 mm²**
20	**HMI**	**EVD_20**	**H07-V-K**	**1,5 mm²**
21	**SPARE**	**EVD_21**	**H07-V-K**	**??? mm²**
22	**SPARE**	**EVD_22**	**H07-V-K**	**??? mm²**

previous page: 1a

next page: &EFA/1a

Single line diagram





previous page:
&EAC/6a

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2a

Editor	Freqcon_JD			Statron	FREQCON	SYSTEMS OVERVIEW	20241105_V1.2	= UNIT_02 Battery Container 1
Date	18.06.2024	Norm						& EFA Single line diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ page: 1a
Date								+ total: 498

0	1	2	3	4	5	6	7	8	9

Single line diagram

Control circuit

++ASC

400V

-XES

-684F3 &EFS++ASC/684.2 C32A

-684F1 &EFS++ASC/684.0 C32A

-684F2 &EFS++ASC/684.5 TYP 1 + 2 SPD

-601F1 &EFS++ASC/601.1 TYP 1 + 2 SPD

-684F4 &EFS++ASC/685.0 C32A

-684F5 &EFS++ASC/685.5 TYP 1 + 2 SPD

-691F1 &EFS++ASC/691.1 C6A

-691F2 &EFS++ASC/691.3 C6A

-691F3 &EFS++ASC/691.4 C6A

-690F1 &EFS++ASC/690.1 16A

-690F3 &EFS++ASC/690.5 C6A

-690F4 &EFS++ASC/690.7 C6A

-690F5 &EFS++ASC/690.8 C6A

-691F4 &EFS++ASC/691.5 C16A

-690F2 &EFS++ASC/690.3 16A

-101Q1

-687F1 &EFS++ASC/687.1 C16A

-687F2 &EFS++ASC/687.3 C16A

-687F3 &EFS++ASC/687.4 C16A

-687F4 &EFS++ASC/687.5 C16A

-687F5 &EFS++ASC/687.7 C16A

-636K1 &EFS++ASC/636.1

-636K2 &EFS++ASC/636.2

-636K3 &EFS++ASC/636.4

M 1~

1/N/PE

1/N/PE

1/N/PE

1/N/PE 1/N/PE

20 A

Battery cabinet 1

Battery cabinet 2

Battery cabinet 3

Battery cabinet 4

Battery cabinet 5

-687F6 &EFS++ASC/687.8 C16A

-688F1 &EFS++ASC/688.1 C16A

-688F2 &EFS++ASC/688.2 C16A

-688F3 &EFS++ASC/688.4 C16A

-688F4 &EFS++ASC/688.5 C16A

-688F5 &EFS++ASC/688.7 C16A

Battery cabinet 6

Battery cabinet 7

Battery cabinet 8

Battery cabinet 9

Battery cabinet 10

Battery cabinet 11

Exhaust Unit / shut-off flap Bat 1-4

Exhaust Unit / shut-off flap Bat 5-8

Exhaust Unit / shut-off flap Bat 9-11

Container Internal Lighting

crane 1

crane 2

crane 3

Cooling Units

Container Sockets

Power Supply

previous page: 1a

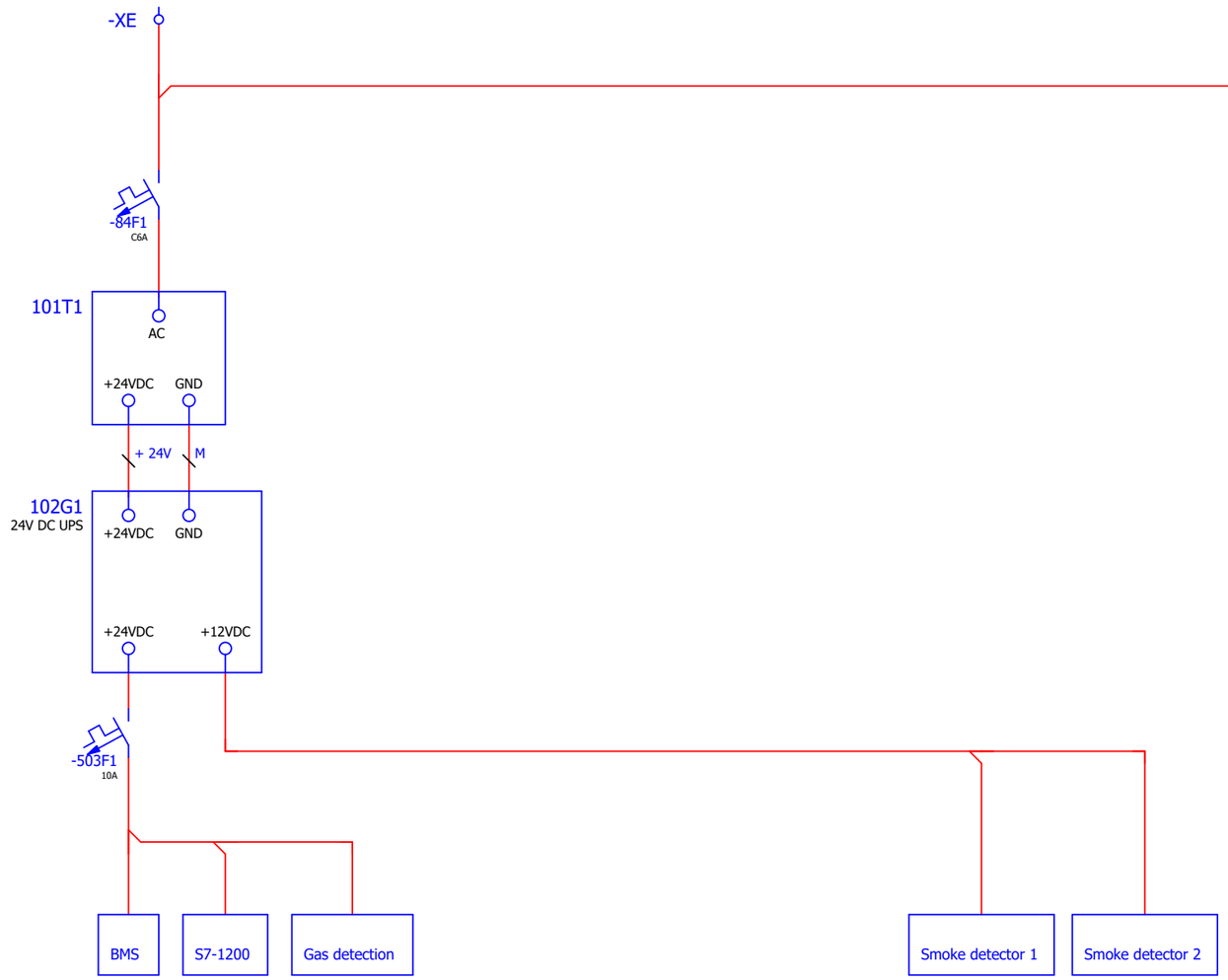
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Date	05.11.2024	Norm						& EFA Single line diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++	page: 2a
Date								+	total: 498

Single line diagram

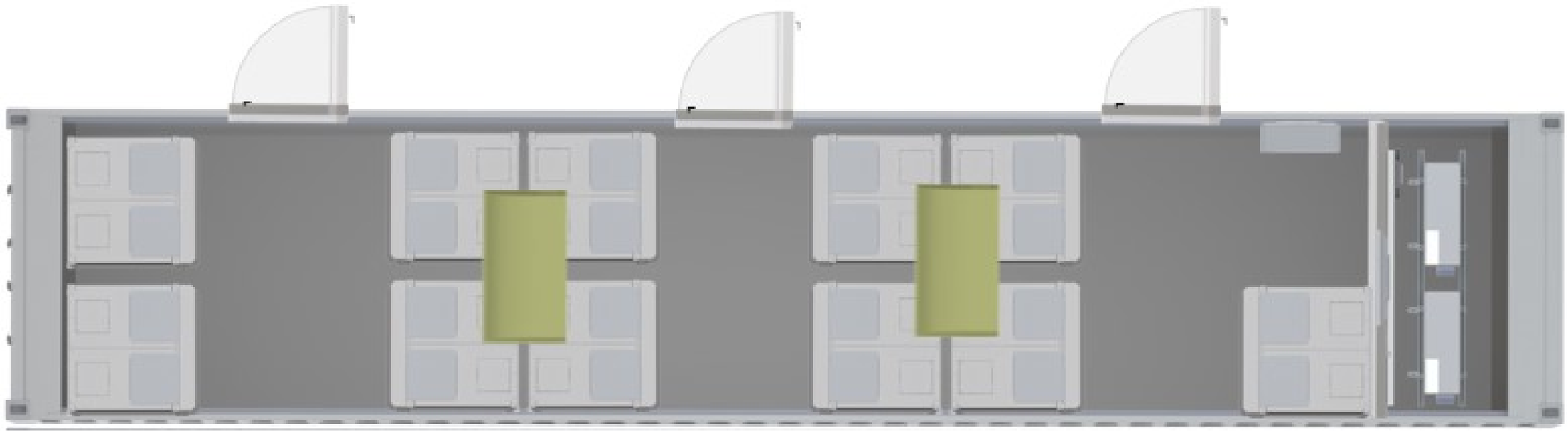
Control circuit

Battery Cabinet



Editor	Freqcon_JD			Statron	FREQCON	SYSTEMS OVERVIEW	20241105_V1.2	= UNIT_02	Battery Container 1
Date	18.06.2024	Norm						& EFA	Single line diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++	page: 3a
Date								+	total: 498

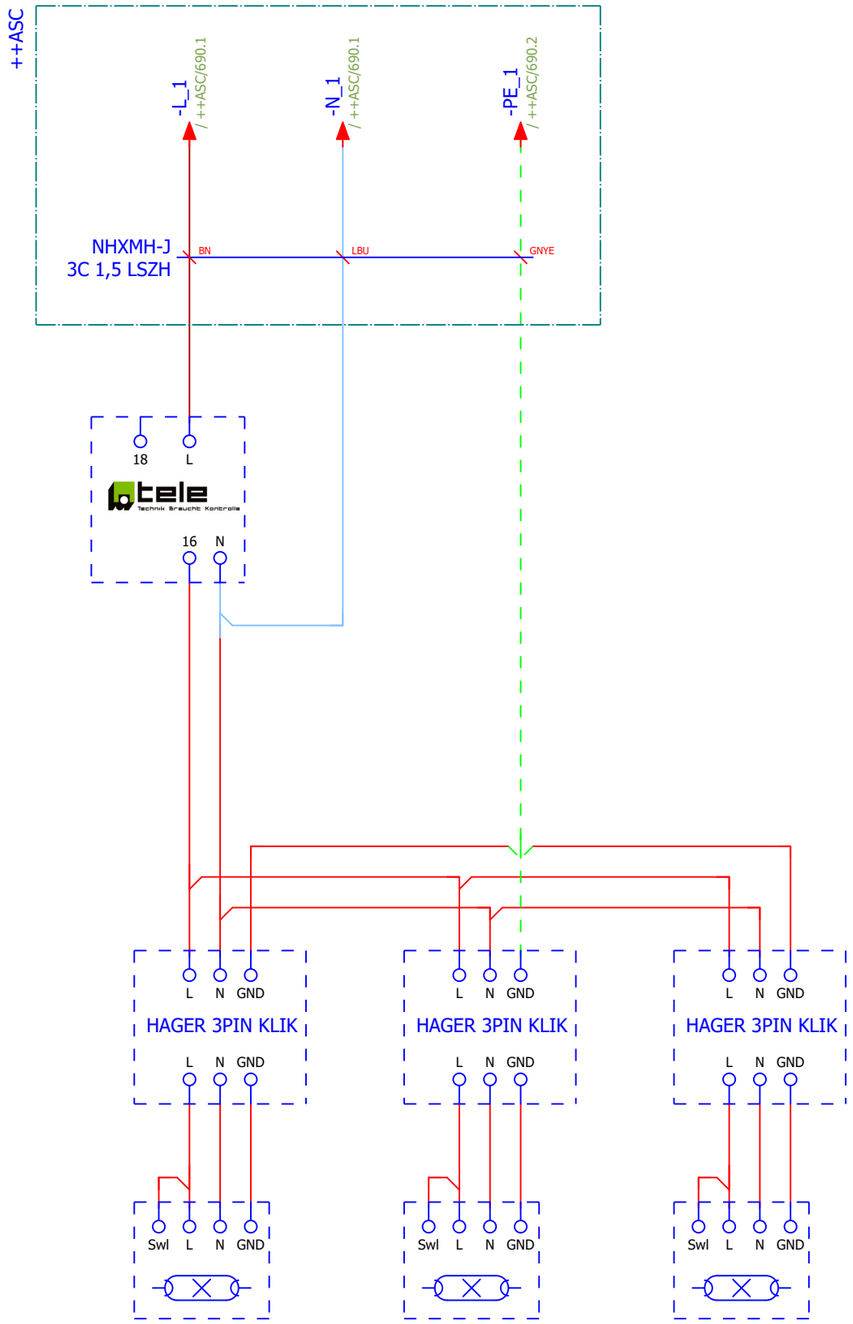
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previous page:
&EFA/3a

next page:
&EFS++Container/190

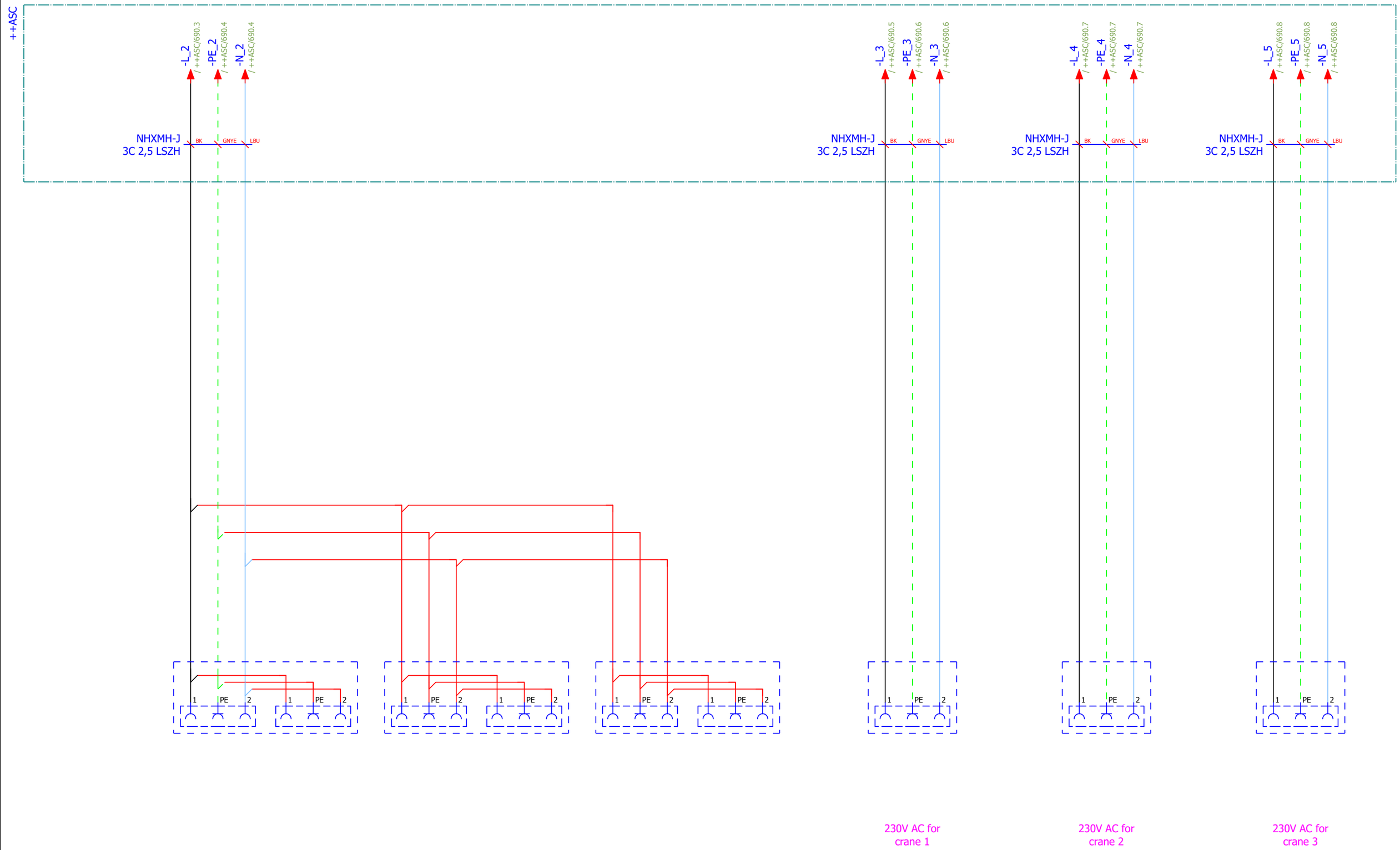
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Date	14.06.2024	Norm						& ELU Cabinet Overview	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++	page: 5a
Date								+	total: 498



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&ELU++/5a

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Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 190
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 191
Date								+	total: 498

++ASC

-L_6 / ++ASC/691.1
-N_6 / ++ASC/691.1
-PE_6 / ++ASC/691.2

NHXMH-J
3C 1,5 LSZH
BK LBU GNYE

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

BELDEN 9842
LSZH
WH BU WH BU

Junction Box
next to fan motor

230V AC for
Exhaust Unit
Battery cabinets 1-4

-L_6 / ++ASC/691.1
-N_6 / ++ASC/691.1
-PE_6 / ++ASC/691.2

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

230V AC for
shut-off flap
Battery cabinets 1-4

-L_7 / ++ASC/691.3
-N_7 / ++ASC/691.3
-PE_7 / ++ASC/691.3

NHXMH-J
3C 1,5 LSZH
BK LBU GNYE

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

BELDEN 9842
LSZH
WH BU WH BU

Junction Box
next to fan motor

230V AC for
Exhaust Unit
Battery cabinets 5-8

-L_7 / ++ASC/691.3
-N_7 / ++ASC/691.3
-PE_7 / ++ASC/691.3

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

230V AC for
shut-off flap
Battery cabinets 5-8

-L_8 / ++ASC/691.4
-N_8 / ++ASC/691.4
-PE_8 / ++ASC/691.4

NHXMH-J
3C 1,5 LSZH
BK LBU GNYE

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

BELDEN 9842
LSZH
WH BU WH BU

Junction Box
next to fan motor

230V AC for
Exhaust Unit
Battery cabinets 9-11

-L_8 / ++ASC/691.4
-N_8 / ++ASC/691.4
-PE_8 / ++ASC/691.4

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

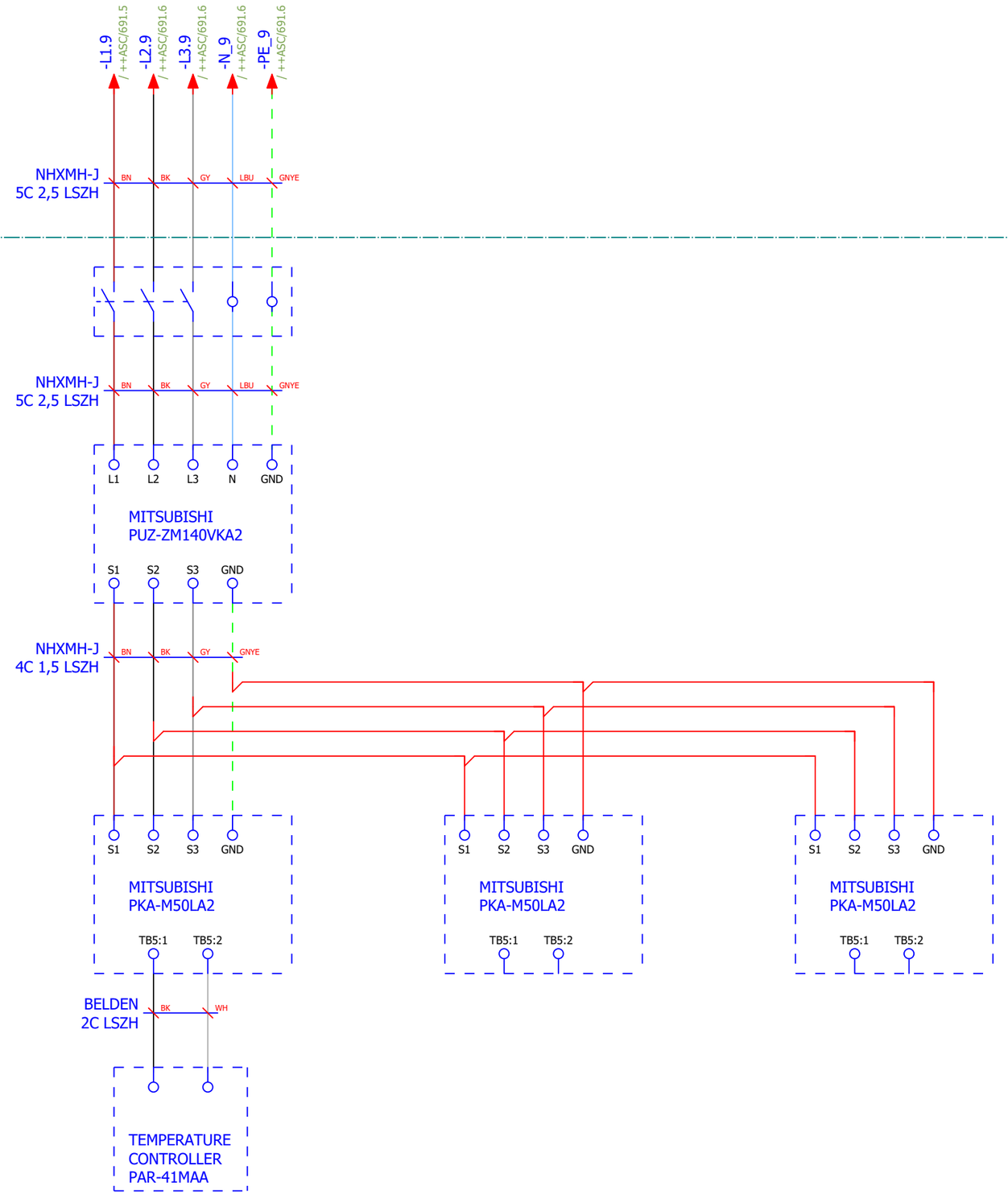
230V AC for
shut-off flap
Battery cabinets 9-11

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Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_02	Battery Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 192
Date								+	total: 498

++ASC

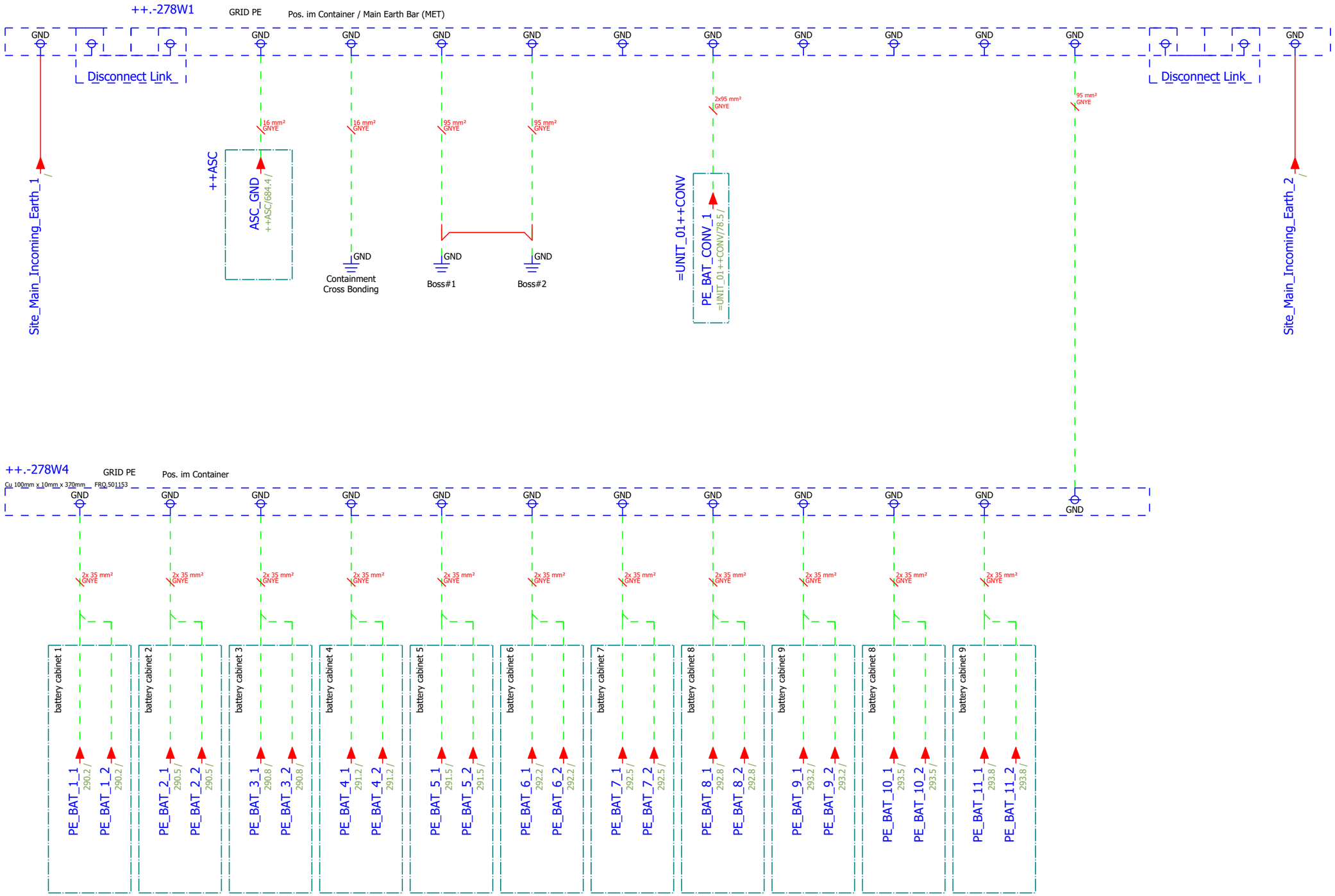


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Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 193
Date								+	total: 498

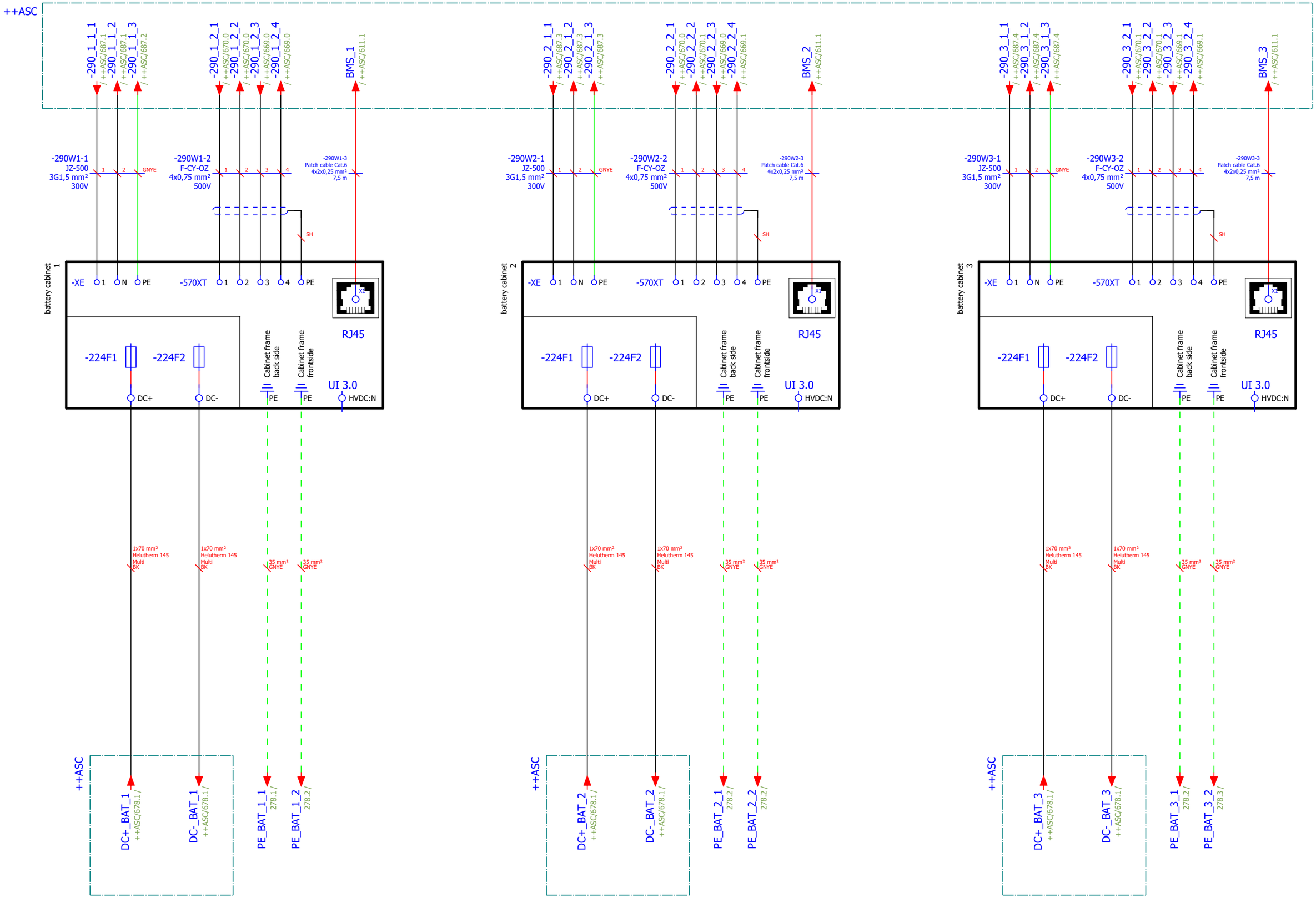
Busbars PE



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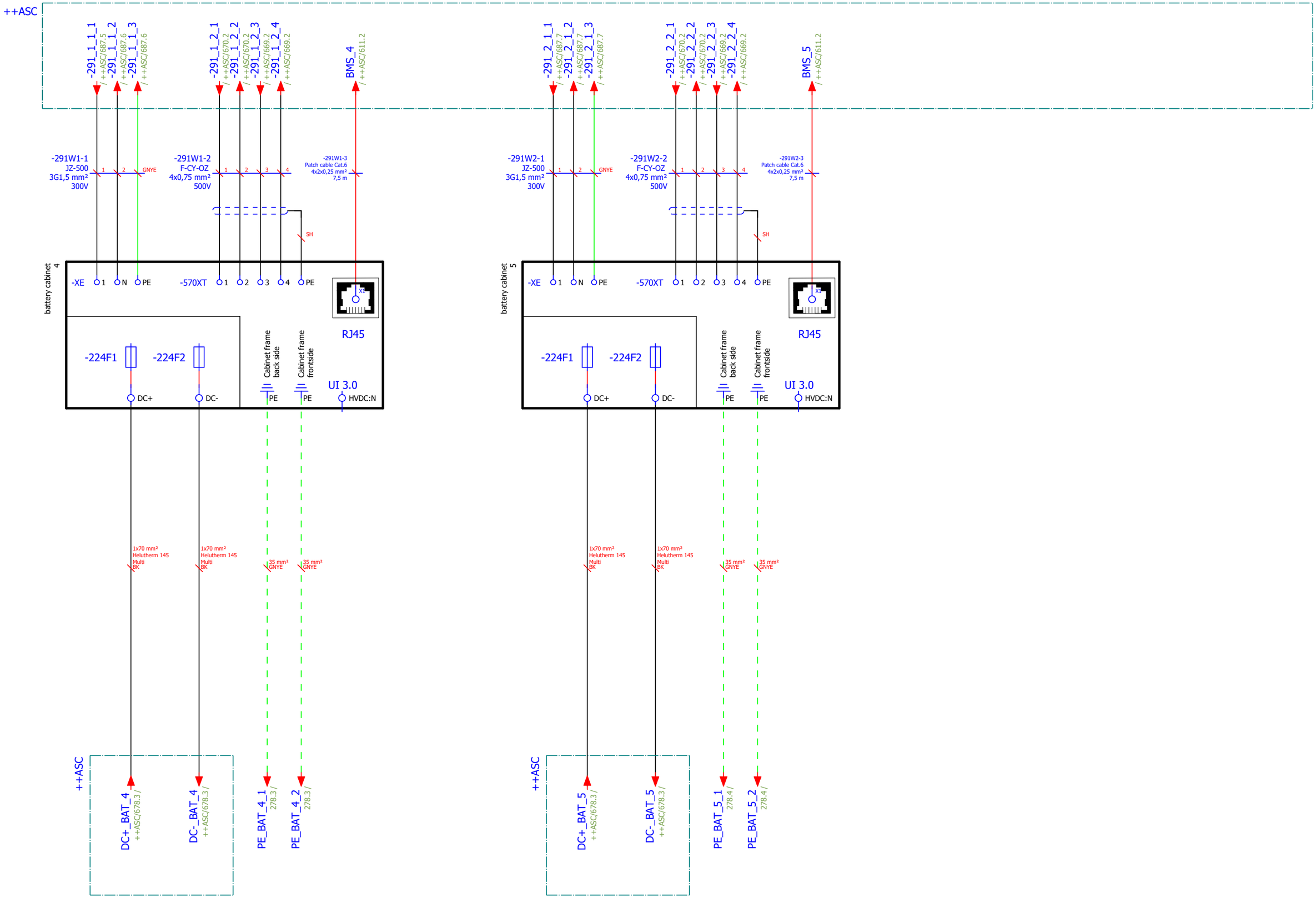
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Date	08.10.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 278
Date								+	total: 498



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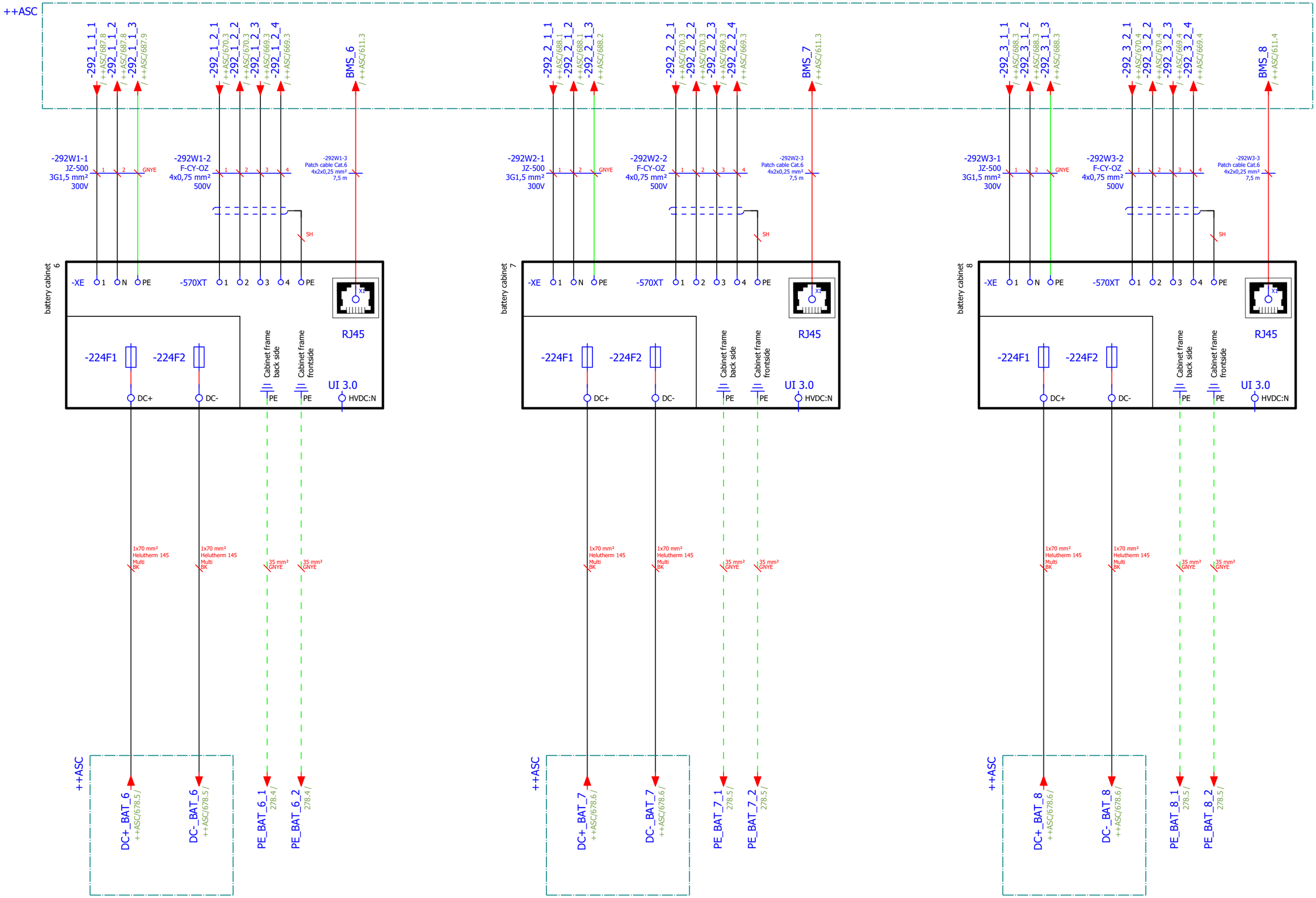
Editor	Freqcon_JD			Statron	FREQCON	BATTERY CABINETS 1-3	20241105_V1.2	= UNIT_02	Battery Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 290
Date								+	total: 498



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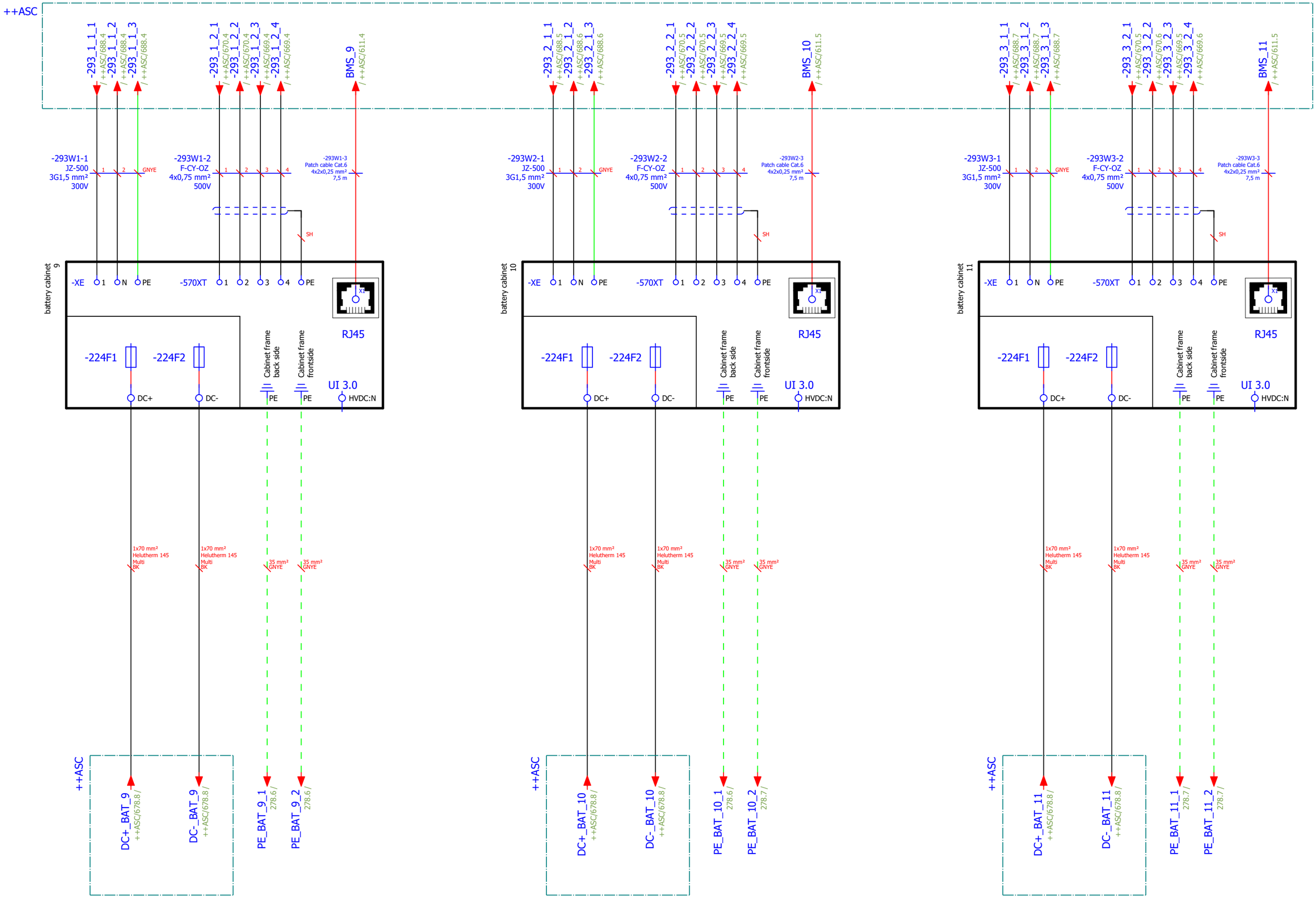
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Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 291
Date								+	total: 498



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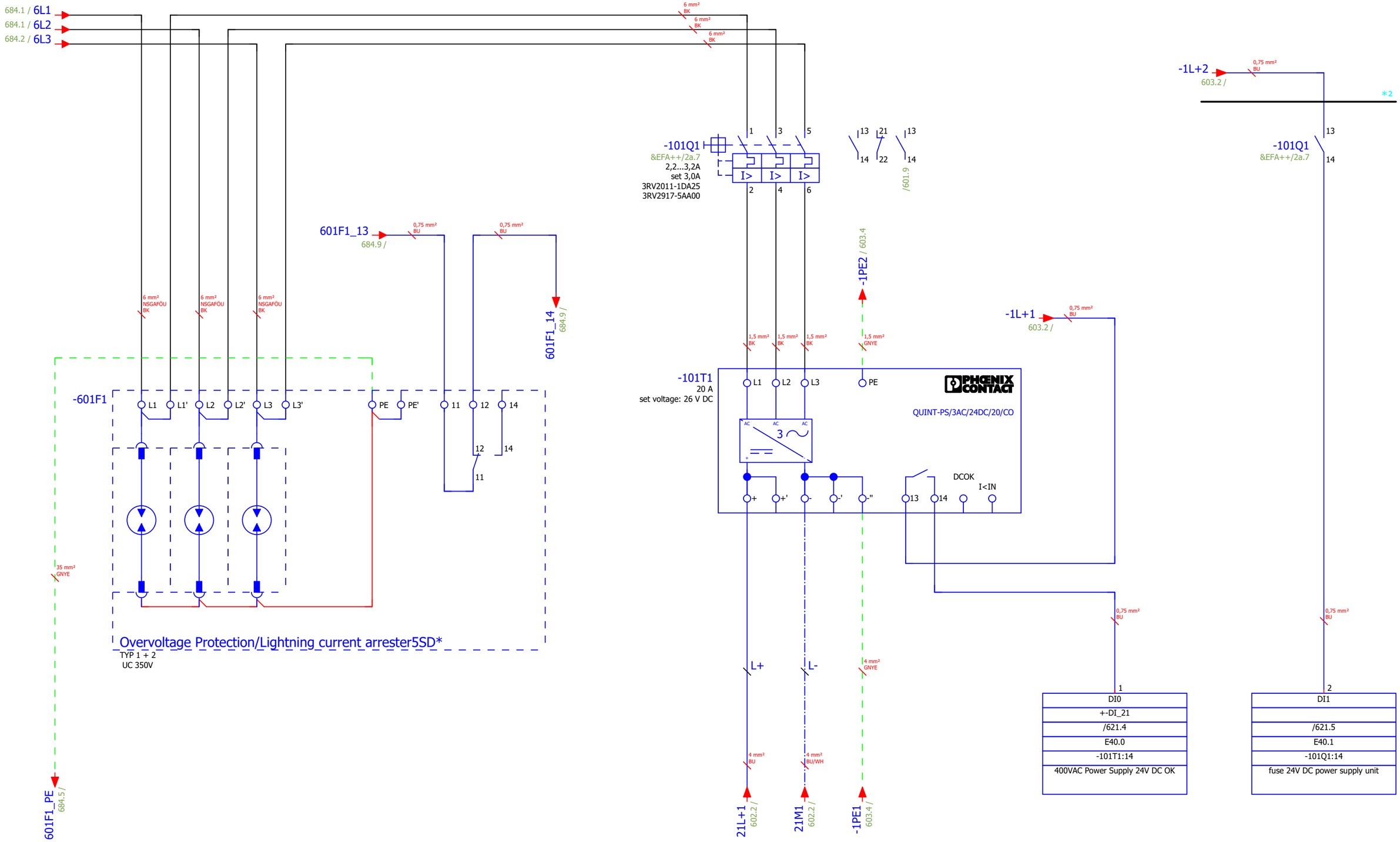
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Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container page: 292
Date								+ total: 498



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++ASC/601

Editor	Freqcon_JD			Statron	FREQCON	BATTERY CABINETS 9-11	20241105_V1.2	= UNIT_02 Battery Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container page: 293
Date								+ total: 498



400VAC Power Supply 24V DC OK

fuse 24V DC power supply unit

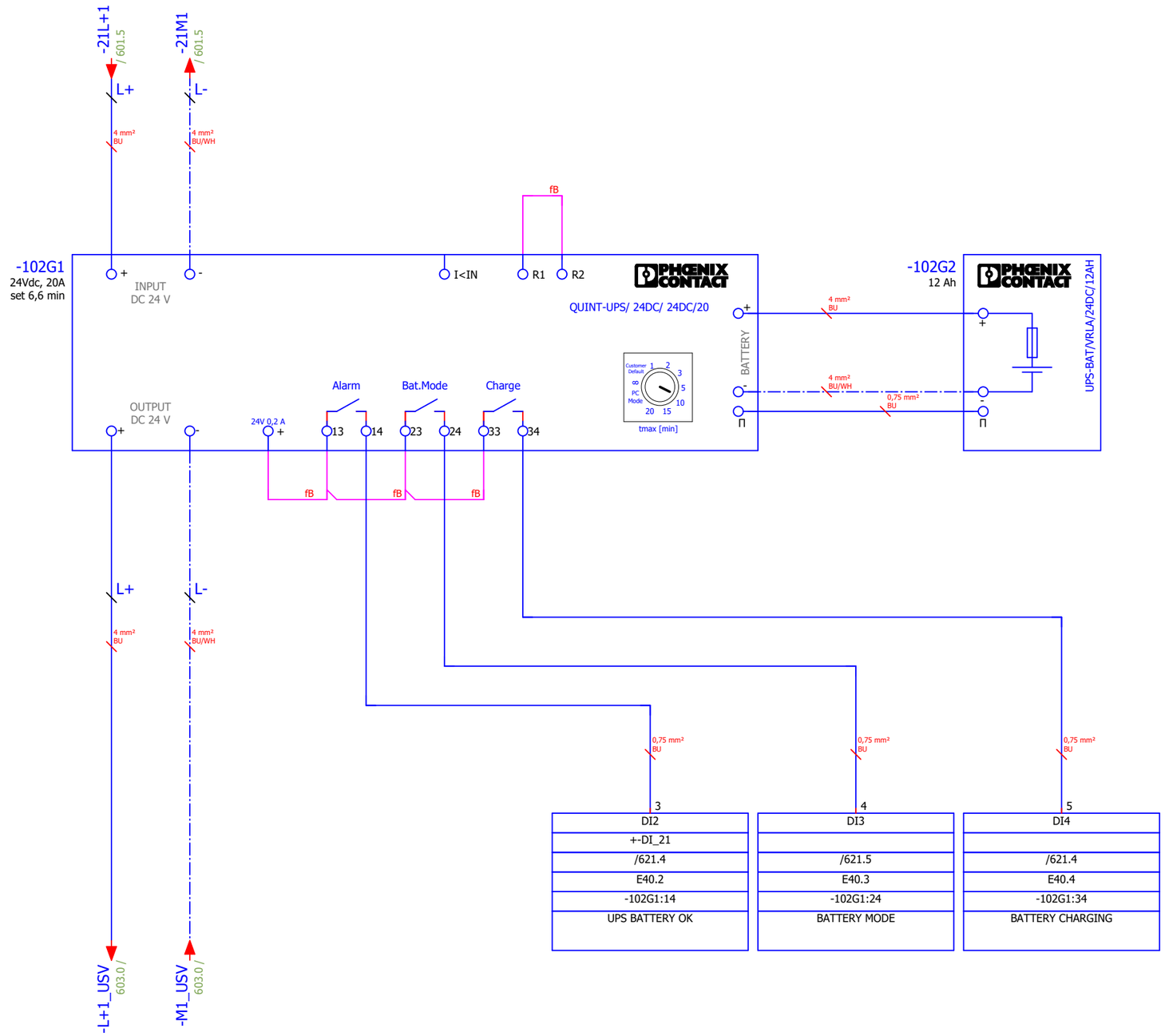
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++Container/293

Power supply unit from 400V AC

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602

Editor	Freqcon_DG			Statron	FREQCON	CONTROL VOLTAGE POWER SUPPLY UNIT	20241105_V1.2	= UNIT_02	Battery Container 1
Date	05.11.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

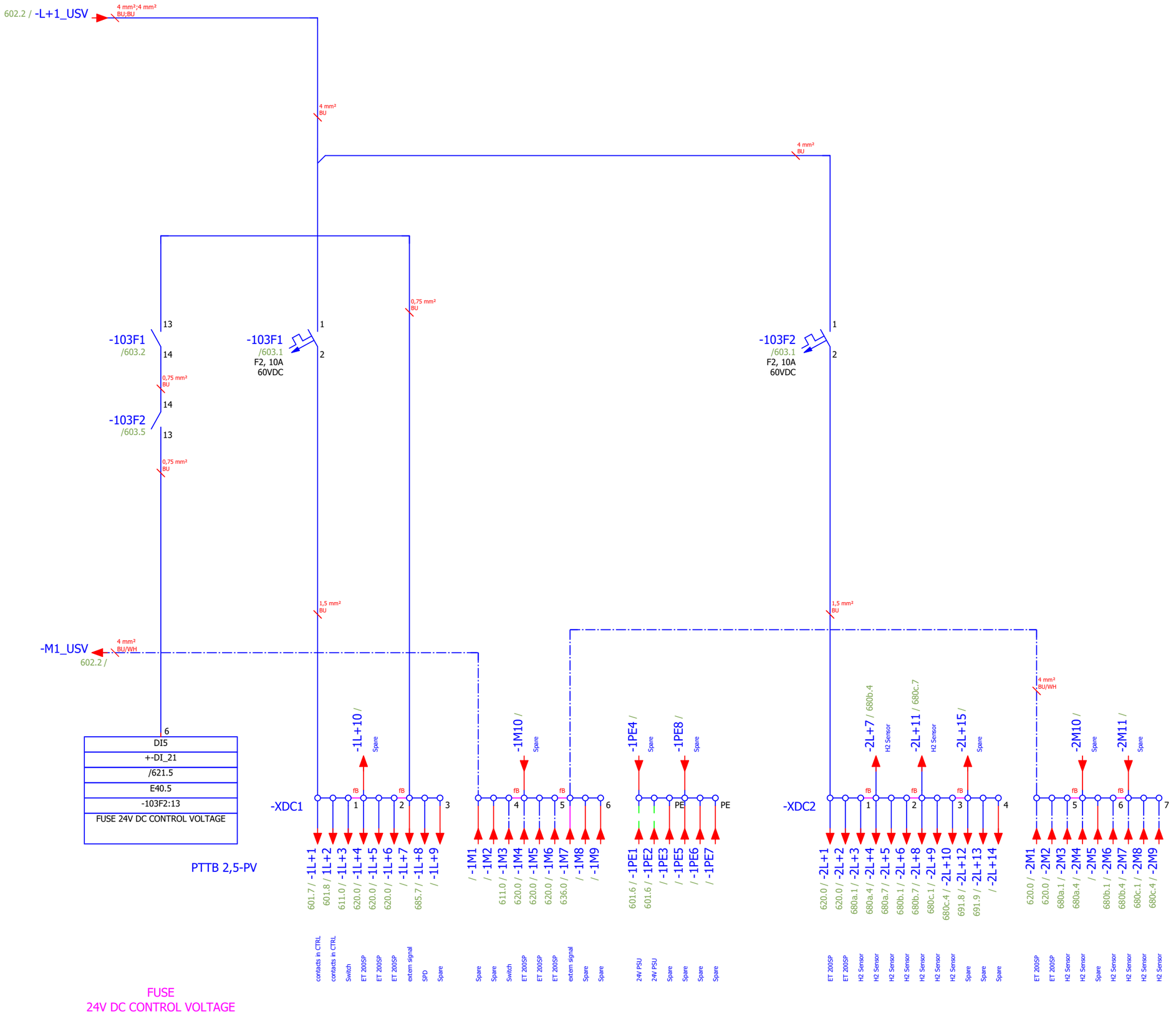
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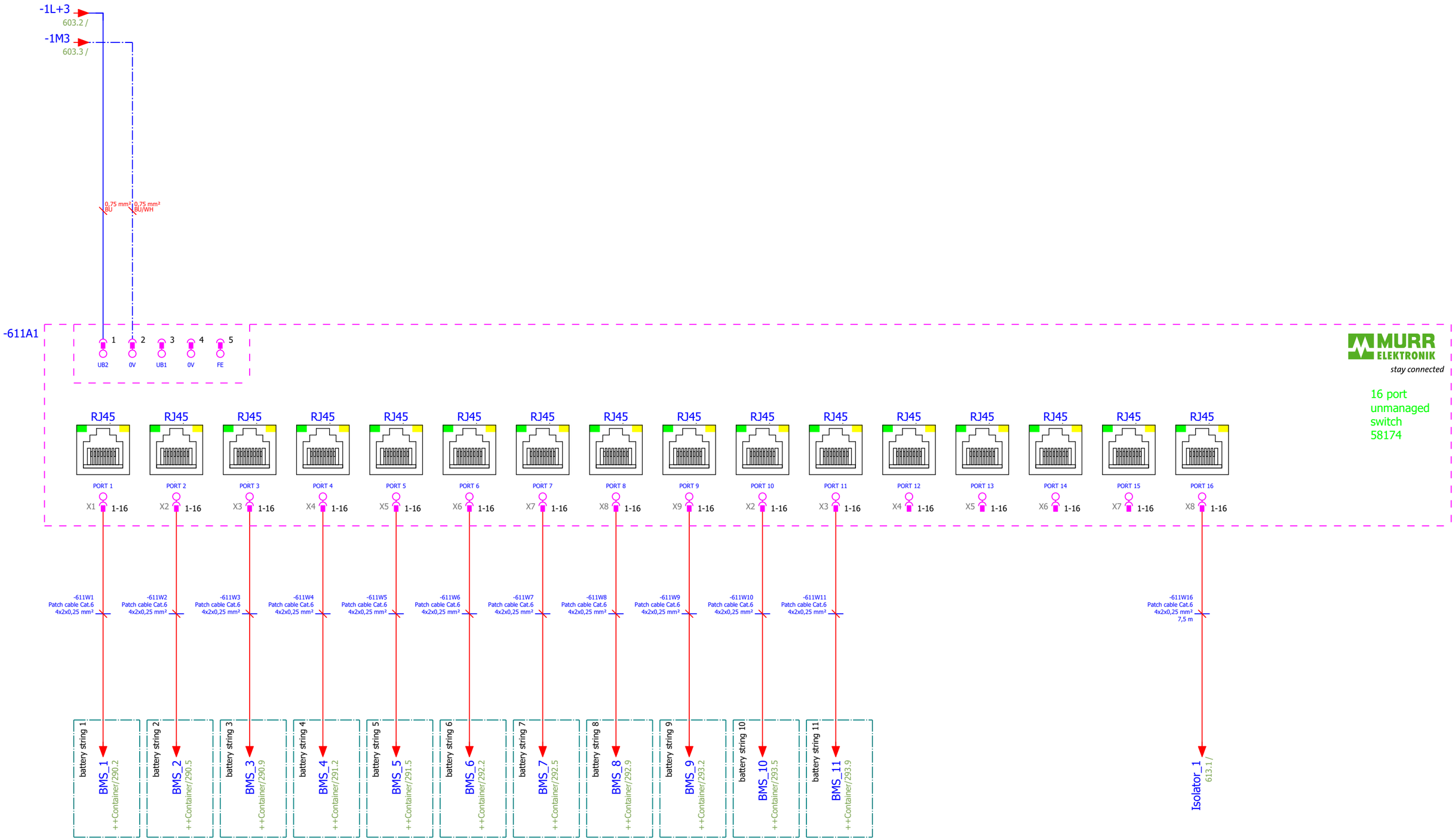
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Date	05.11.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet — page: 602
Date								+ — total: 498



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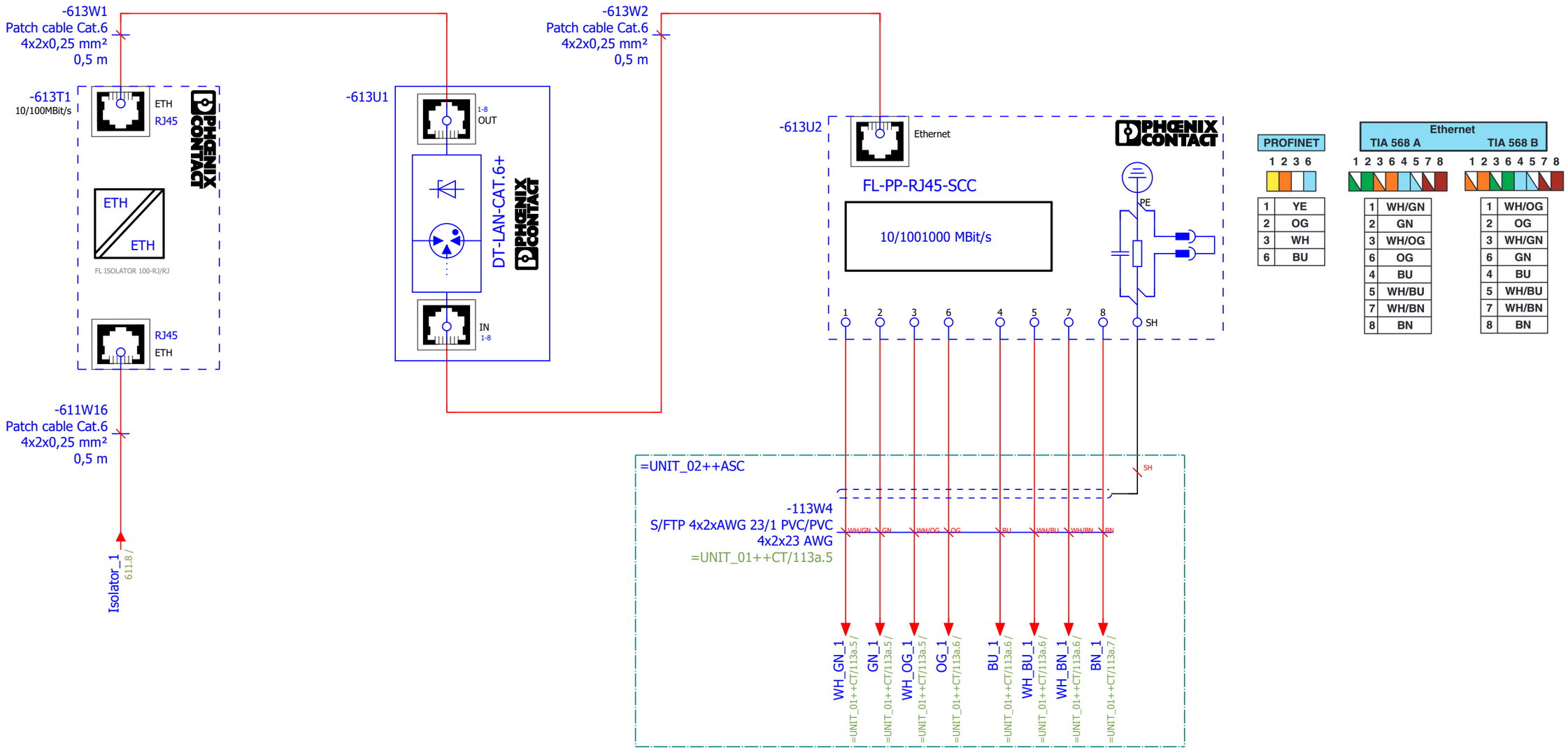
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Date	05.11.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxiliary cabinet	page: 603
Date								+	total: 498



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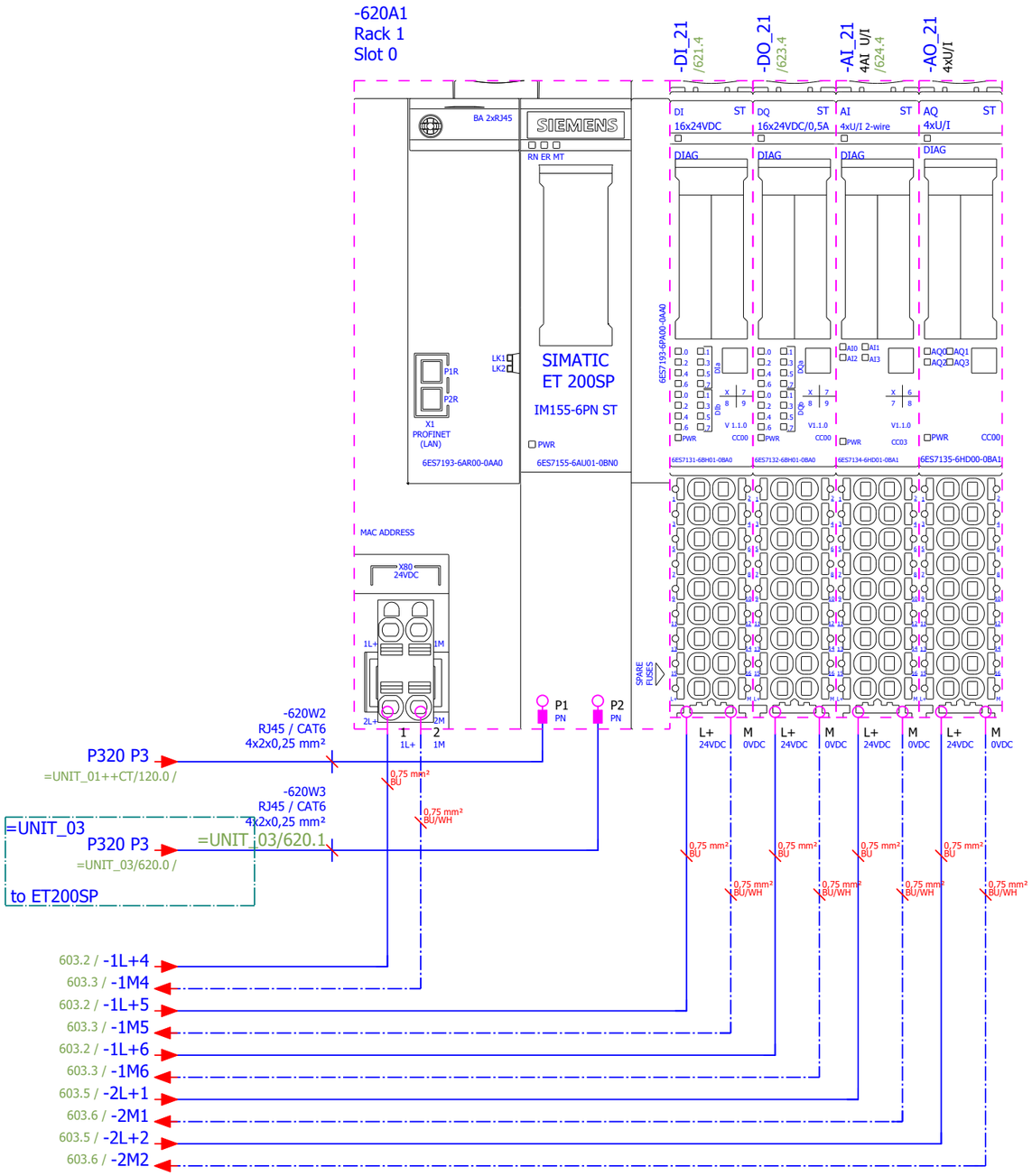
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Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 611
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	ETHERNET / PROFINET ISOLATOR	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 613
Date								+	total: 498



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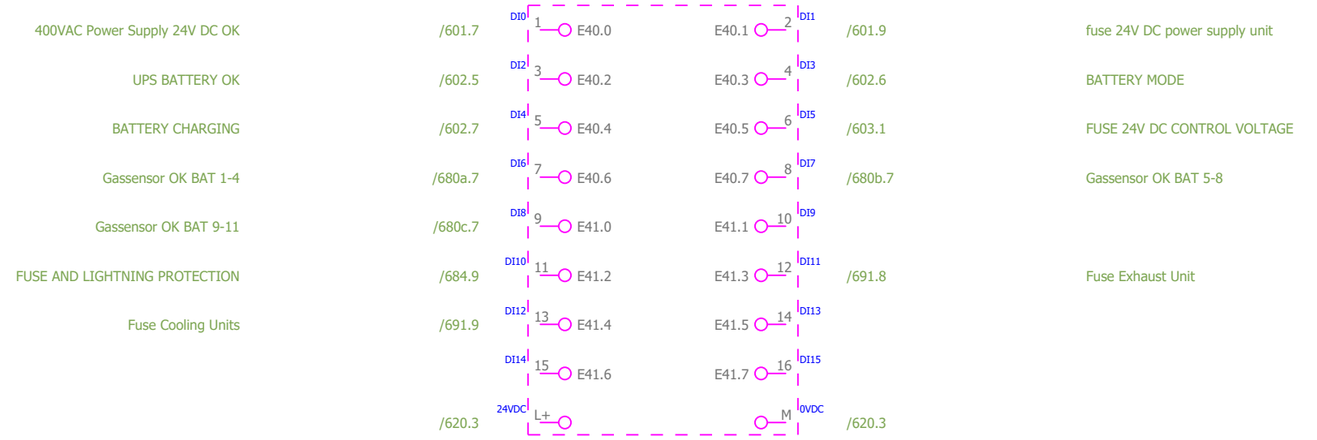
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Date	20.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

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0	1	2	3	4	5	6	7	8	9

-DI_21

/620.3



400VAC Power Supply 24V DC OK	/601.7				/601.9	fuse 24V DC power supply unit
UPS BATTERY OK	/602.5				/602.6	BATTERY MODE
BATTERY CHARGING	/602.7				/603.1	FUSE 24V DC CONTROL VOLTAGE
Gassensor OK BAT 1-4	/680a.7				/680b.7	Gassensor OK BAT 5-8
Gassensor OK BAT 9-11	/680c.7					
FUSE AND LIGHTNING PROTECTION	/684.9				/691.8	Fuse Exhaust Unit
Fuse Cooling Units	/691.9					
	/620.3				/620.3	

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Editor	Freqcon_JD			Statron	FREQCON	ET200SP DIGITAL INPUTS DI_21 + DI_22	20241105_V1.2	= UNIT_02	Battery Container 1
Date	14.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

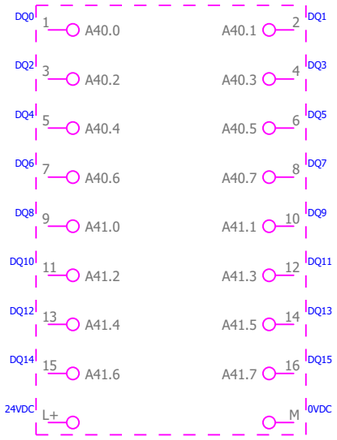
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total: 498

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-DO_21

/620.3



230V AC for Exhaust Unit / shut-off flap Battery cabinets 1-4 /636.1

230V AC for Exhaust Unit / shut-off flap Battery cabinets 9-11 /636.4

/620.3

/636.2 230V AC for Exhaust Unit / shut-off flap Battery cabinets 5-8

/620.3

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Editor	Freqcon_JD			Statron	FREQCON	ET200SP DIGITAL OUTPUTS DO_21	20241105_V1.2	= UNIT_02	Battery Container 1
Date	14.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

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-AI_21

/620.3



gas concentration BAT 1-4 /680a.2

gas concentration BAT 9-11 /680c.2

gas concentration BAT 1-4 /680a.2

gas concentration BAT 9-11 /680c.2

/620.3

gas concentration BAT 5-8 /680b.2

gas concentration BAT 5-8 /680b.2

/620.4

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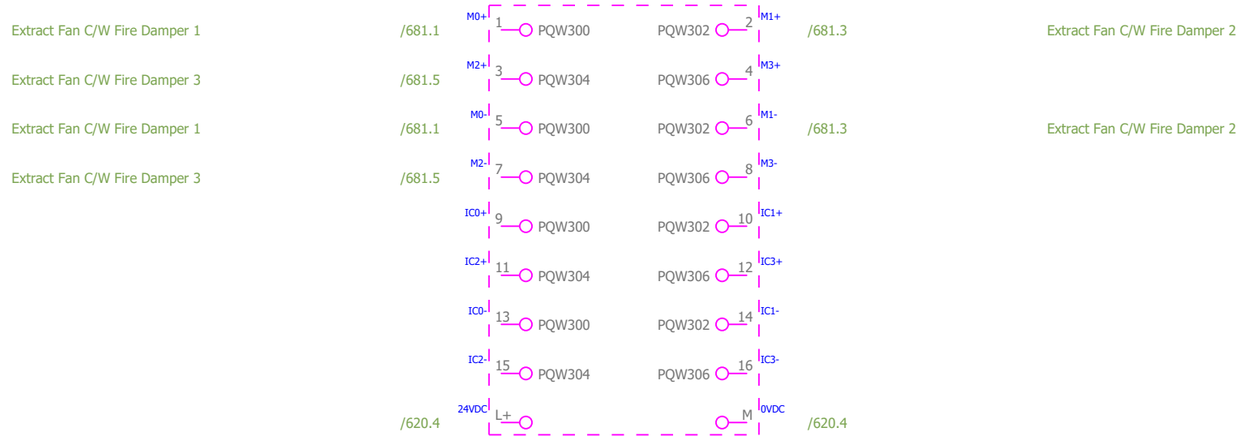
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Date	14.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet page: 624
Date								+ total: 498

0	1	2	3	4	5	6	7	8	9

-AO_21

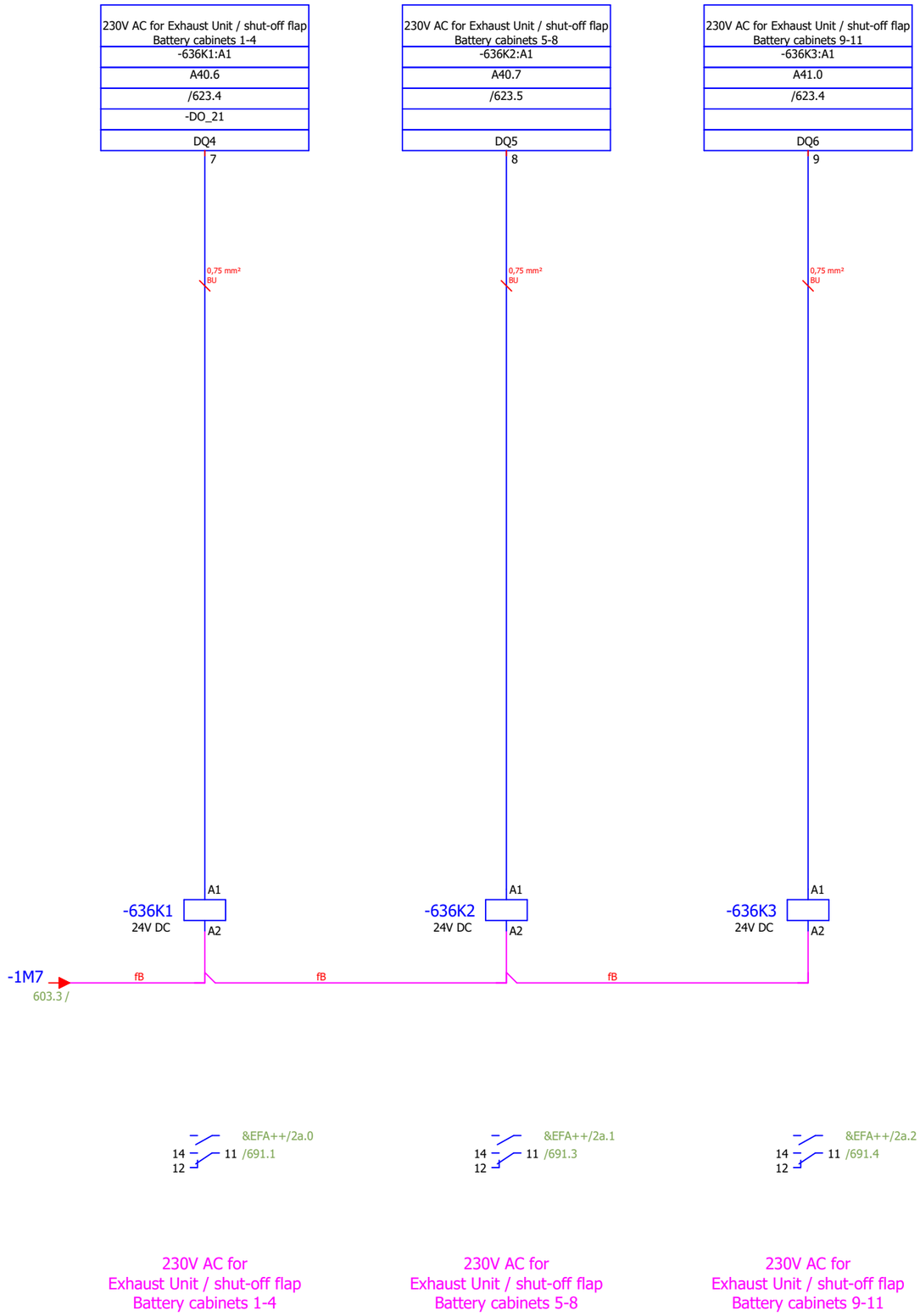
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Date	14.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 625
Date								+	total: 498

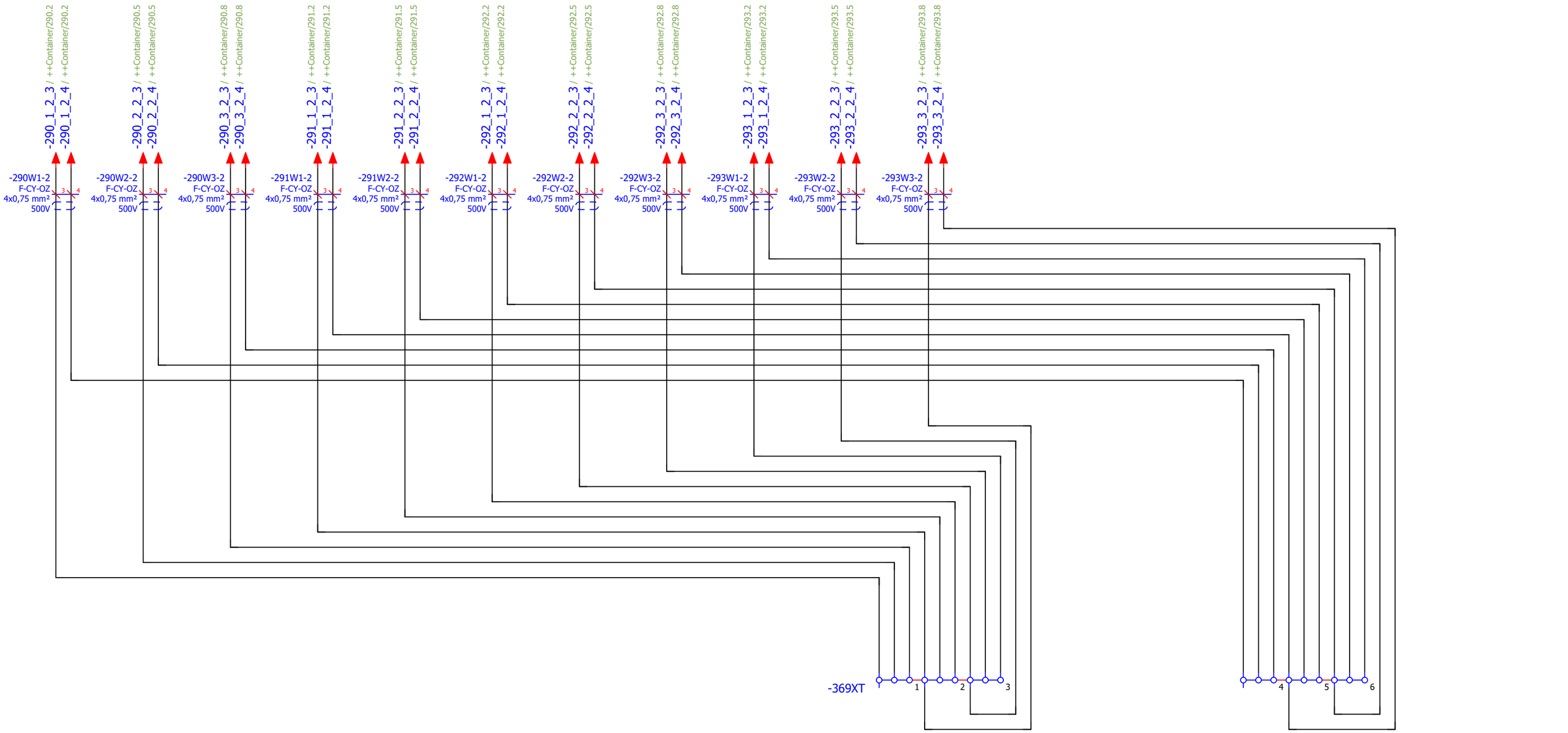


previous page: 625

next page: 669

Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS FIRE DAMPER	20241105_V1.2	= UNIT_02	Battery Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

page: 636
total: 498



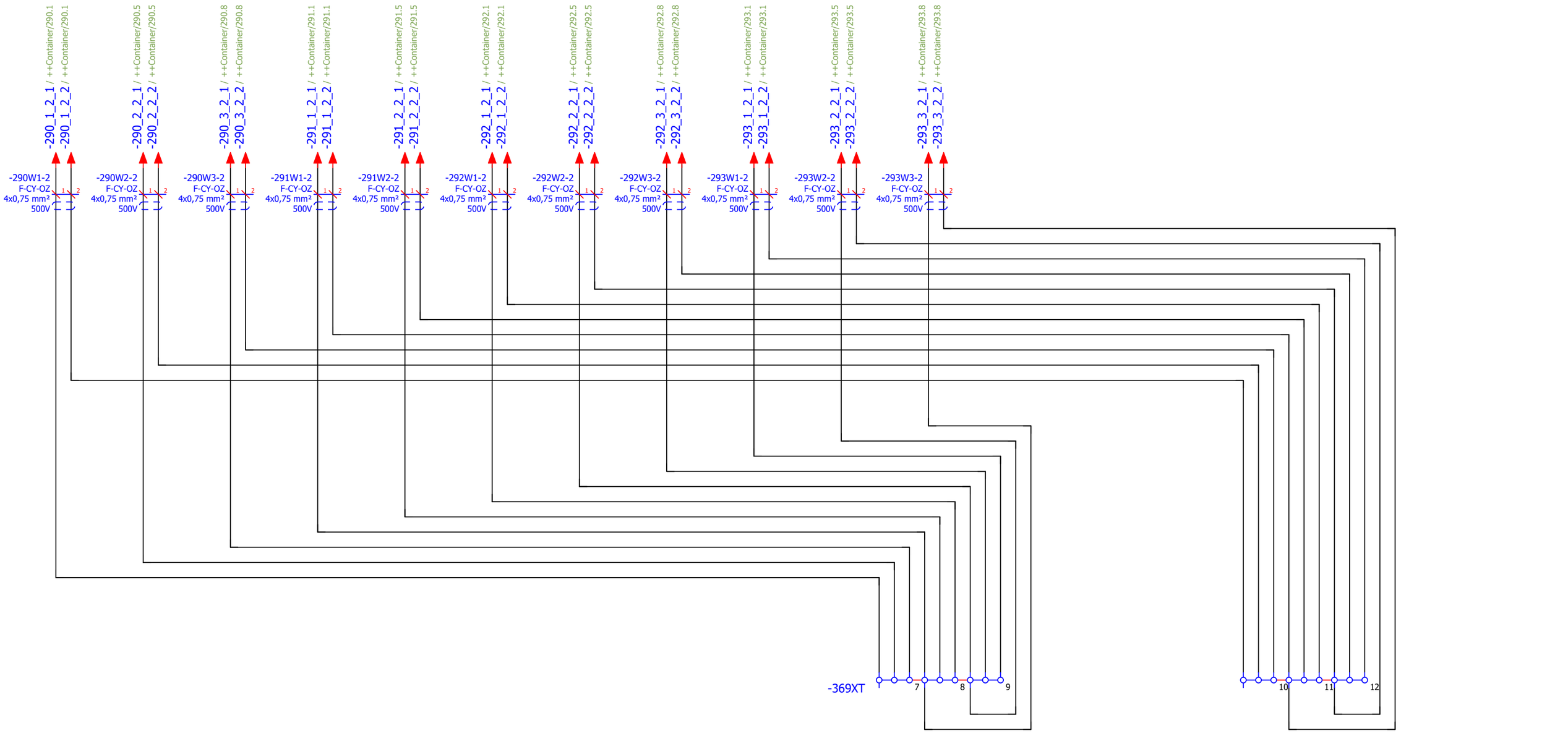
battery cabinet smoke detector
potential-free contacts
customer

battery cabinet smoke detector
potential-free contacts
customer

previous page: 636

next page: 670

Editor	Freqcon_JD			Statron	FREQCON	SMOKE POTENTIAL-FREE CONTACTS	20241105_V1.2	= UNIT_02	Battery Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	



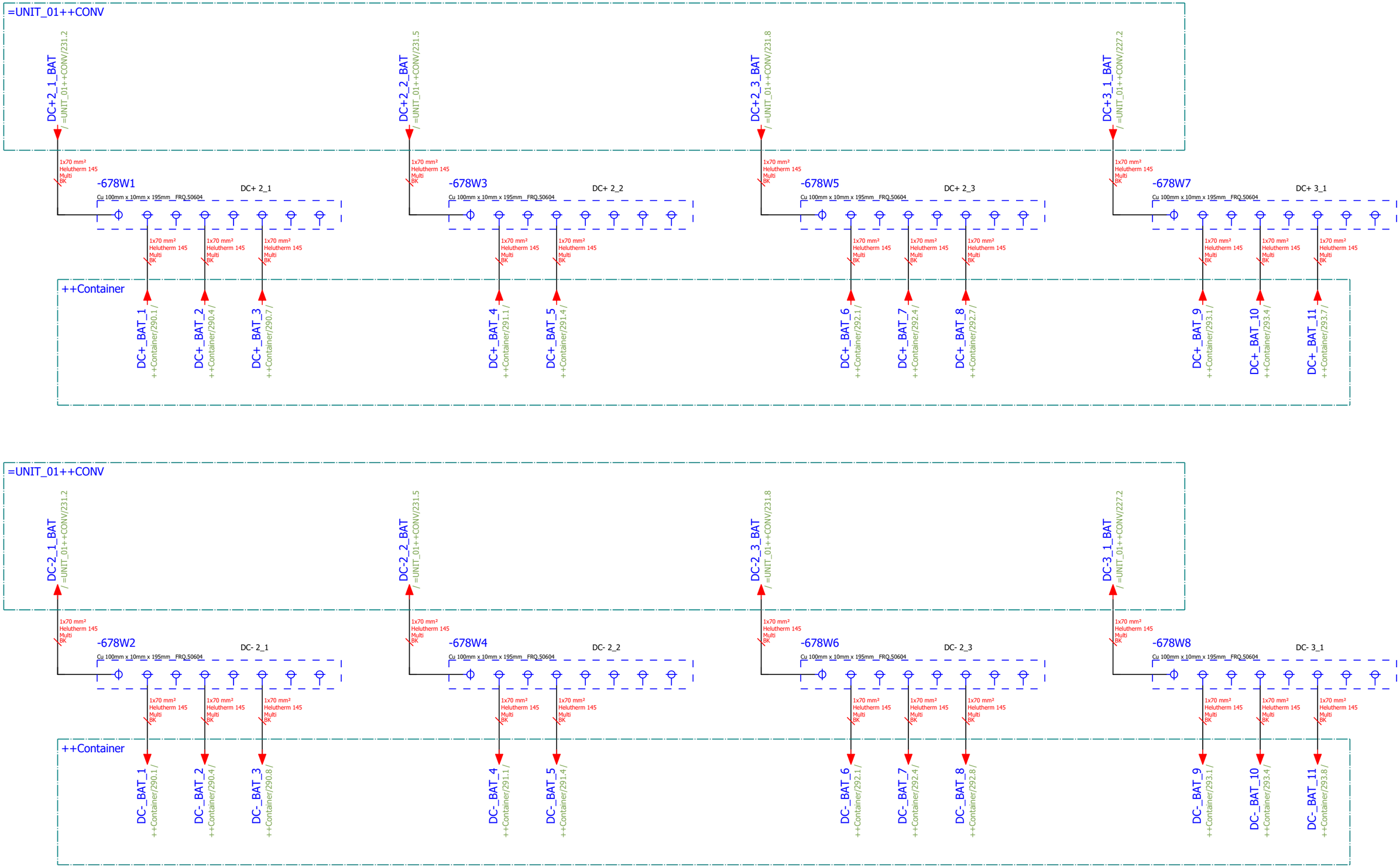
battery cabinet gas
potential-free contacts
customer

battery cabinet gas
potential-free contacts
customer

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669

next page:
678

Editor	Freqcon_JD			Statron	FREQCON	GAS POTENTIAL-FREE CONTACTS	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 670
Date								+	total: 498



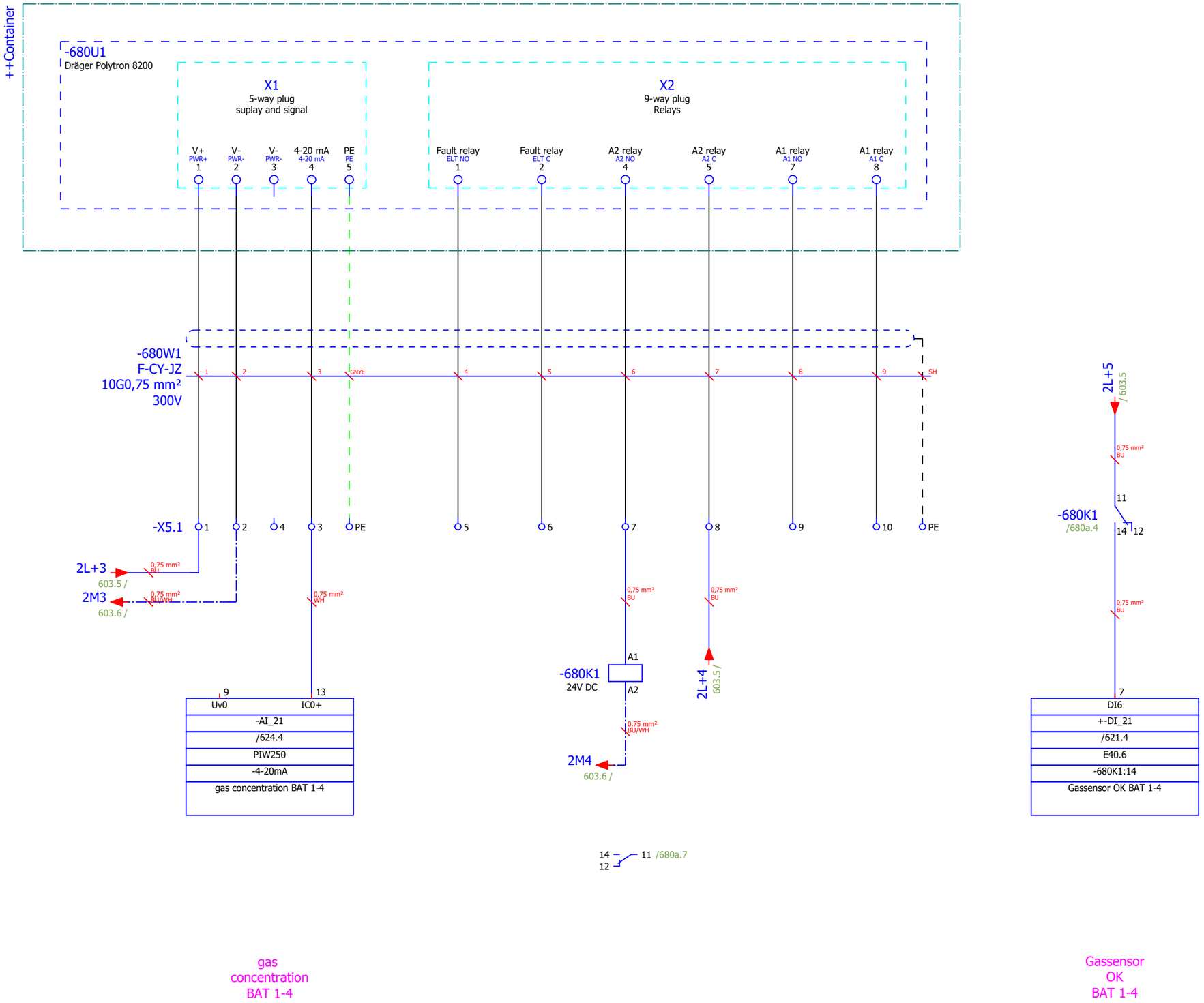
previous page: 670

next page: 680a

Editor	Freqcon_JD			Statron	FREQCON	DC BATTERY CABINETS	20241105_V1.2	= UNIT_02	Battery Container 1
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

page: 678

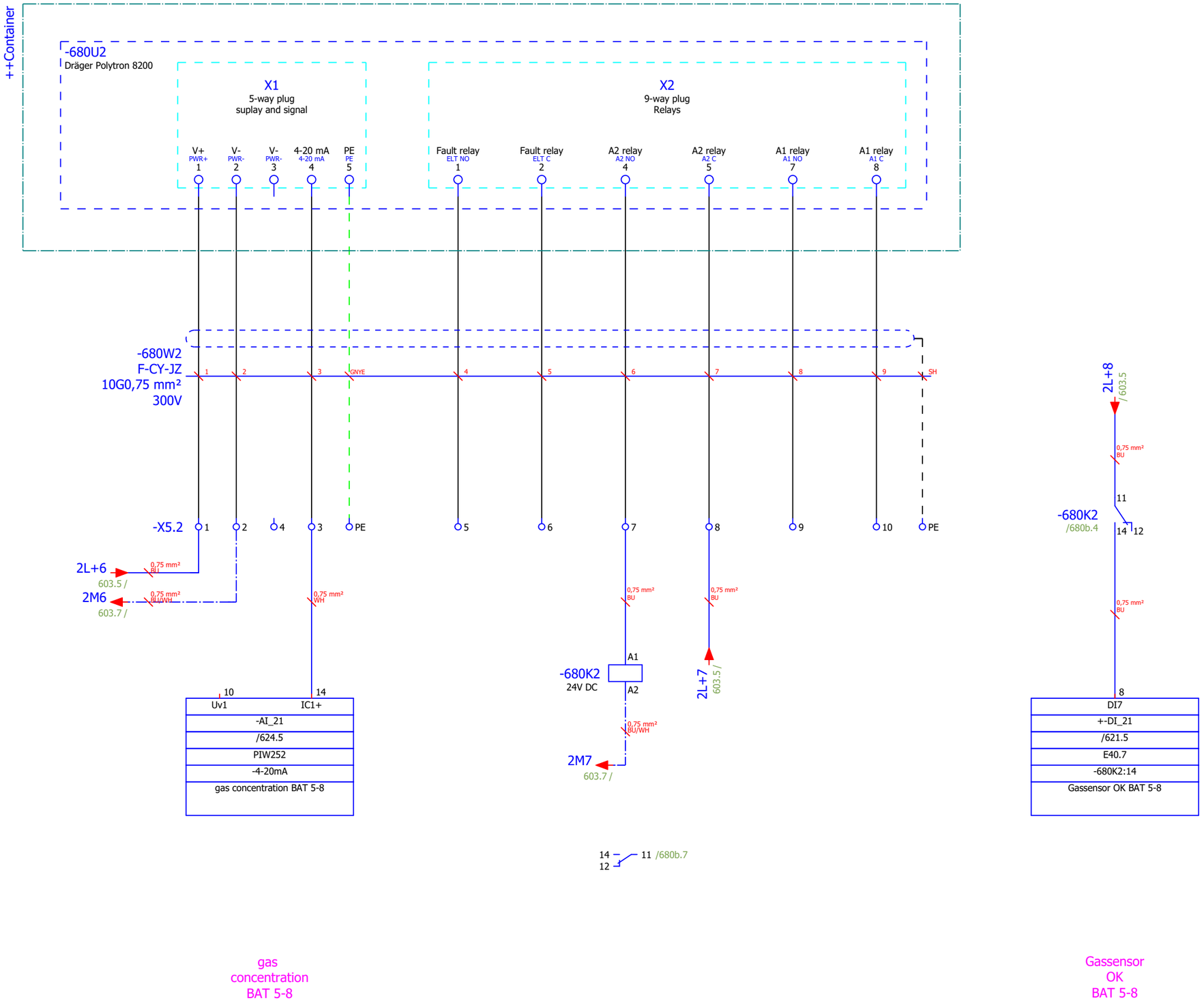
total: 498



previous page: 678

next page: 680b

Editor	Freqcon_JD			Statron	FREQCON	STATIONARY GAS DETECTOR BAT 1-4	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	14.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 680a
Date								+	total: 498



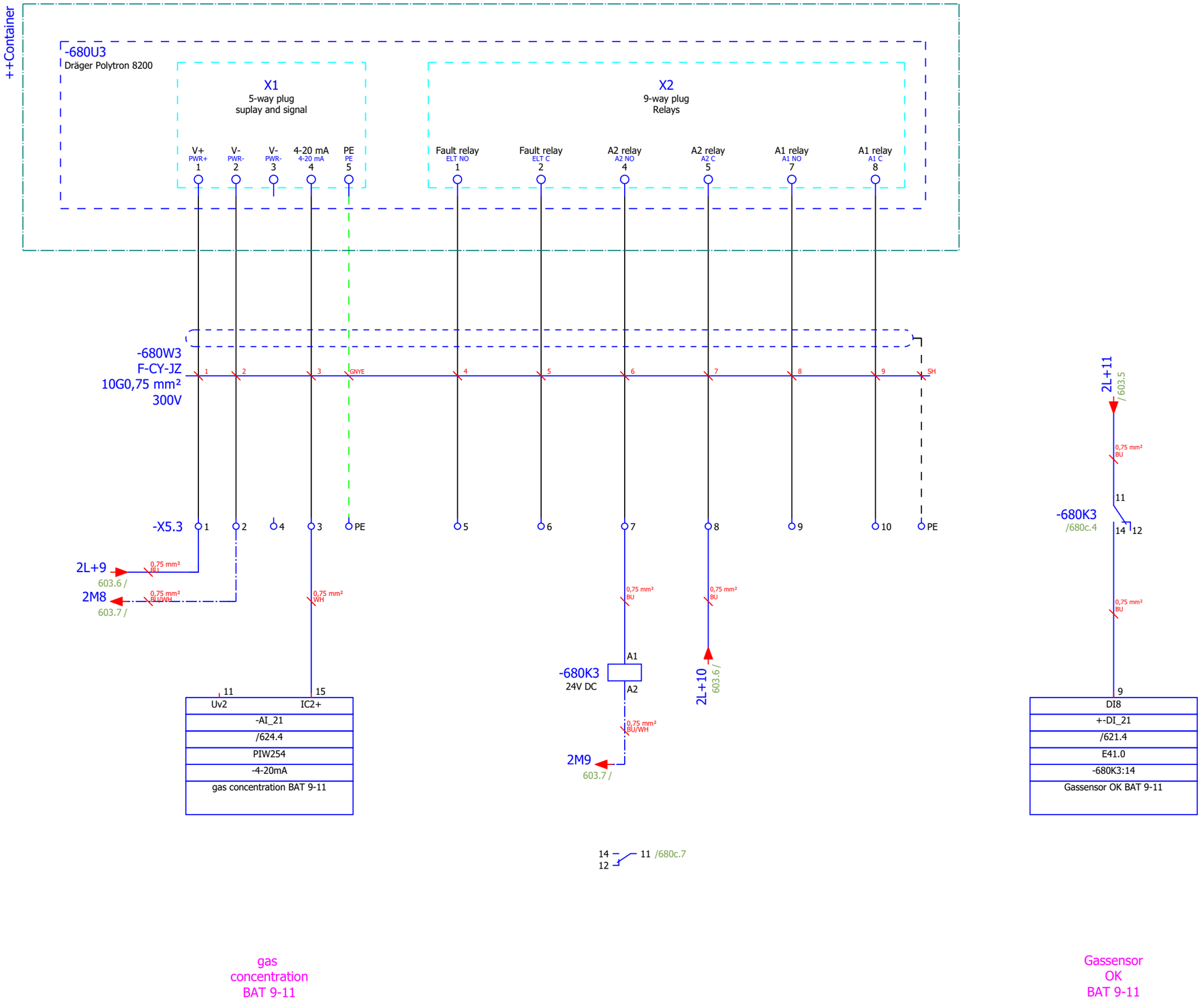
gas concentration BAT 5-8

Gassensor OK BAT 5-8

previous page: 680a

next page: 680c

Editor	Freqcon_JD			Statron	FREQCON	STATIONARY GAS DETECTOR BAT 5-8	20241105_V1.2	= UNIT_02 Battery Container 1
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet — page: 680b
Date								+ — total: 498



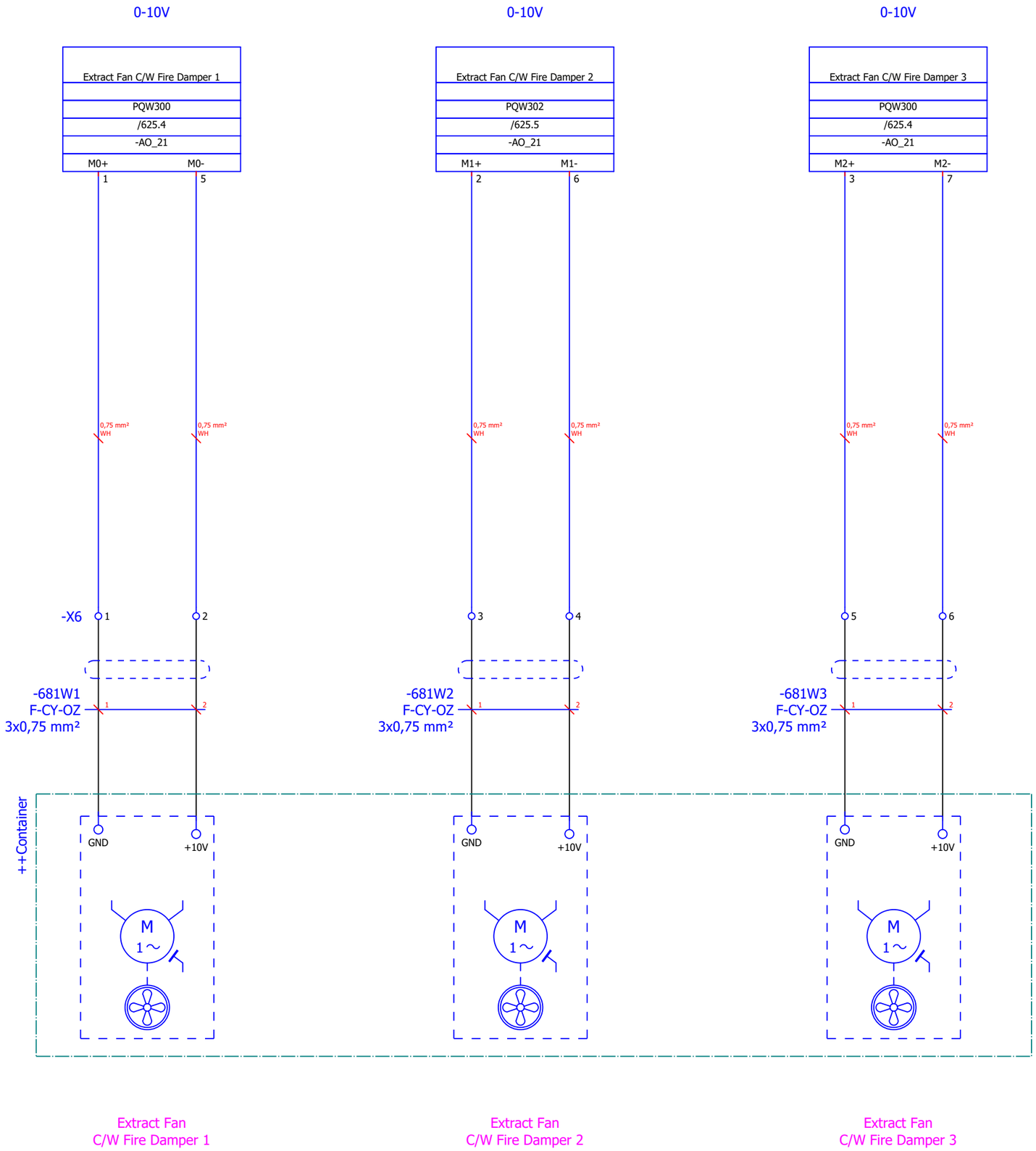
gas concentration BAT 9-11

Gassensor OK BAT 9-11

previous page: 680b

next page: 681

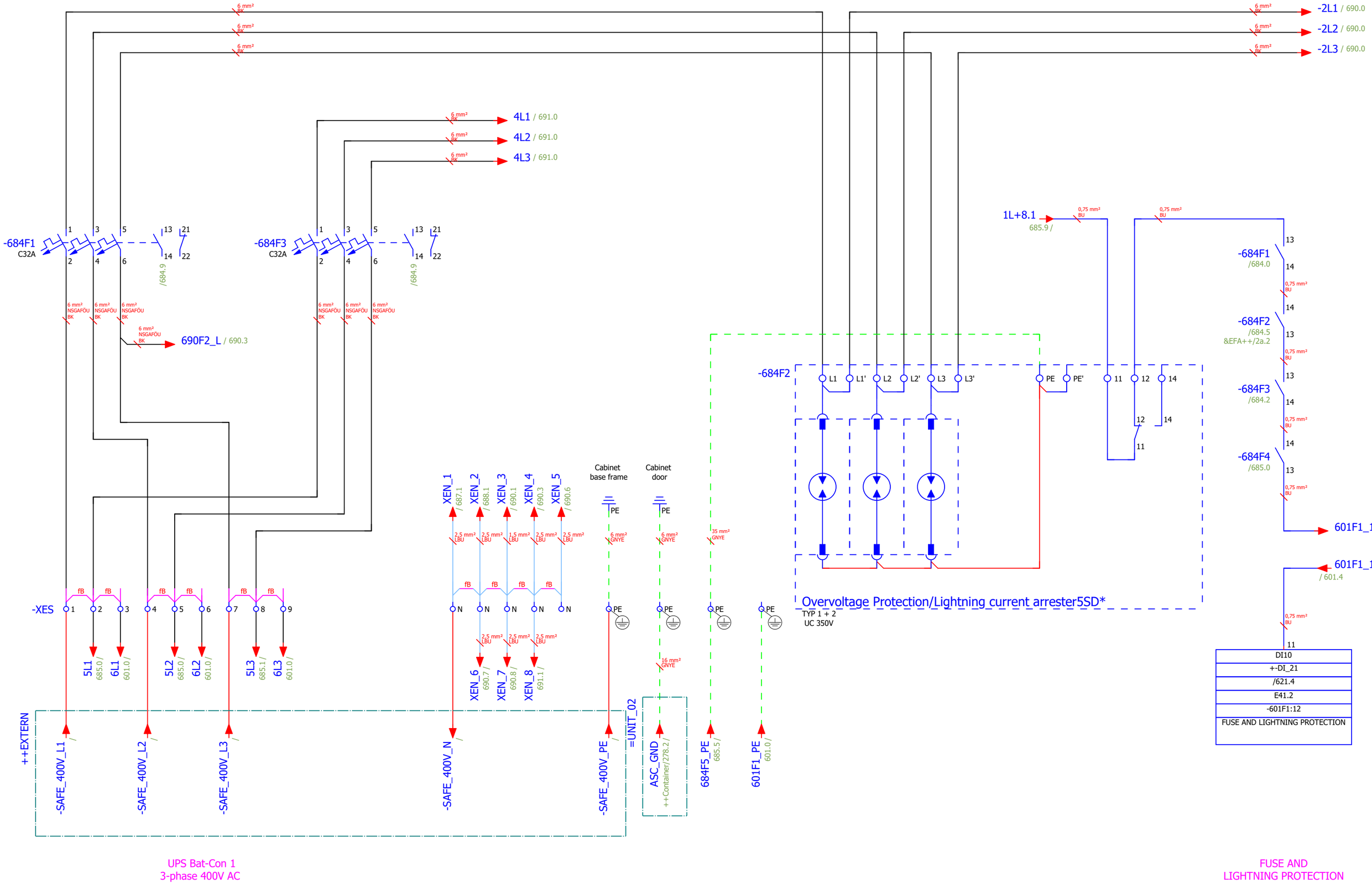
Editor	Freqcon_JD			Statron	FREQCON	STATIONARY GAS DETECTOR BAT 9-11	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 680c
Date								+	total: 498



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680c

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684

Editor	Freqcon_JD			Statron	FREQCON	EXTRACT FAN FIRE DAMPER	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	14.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 681
Date								+	total: 498



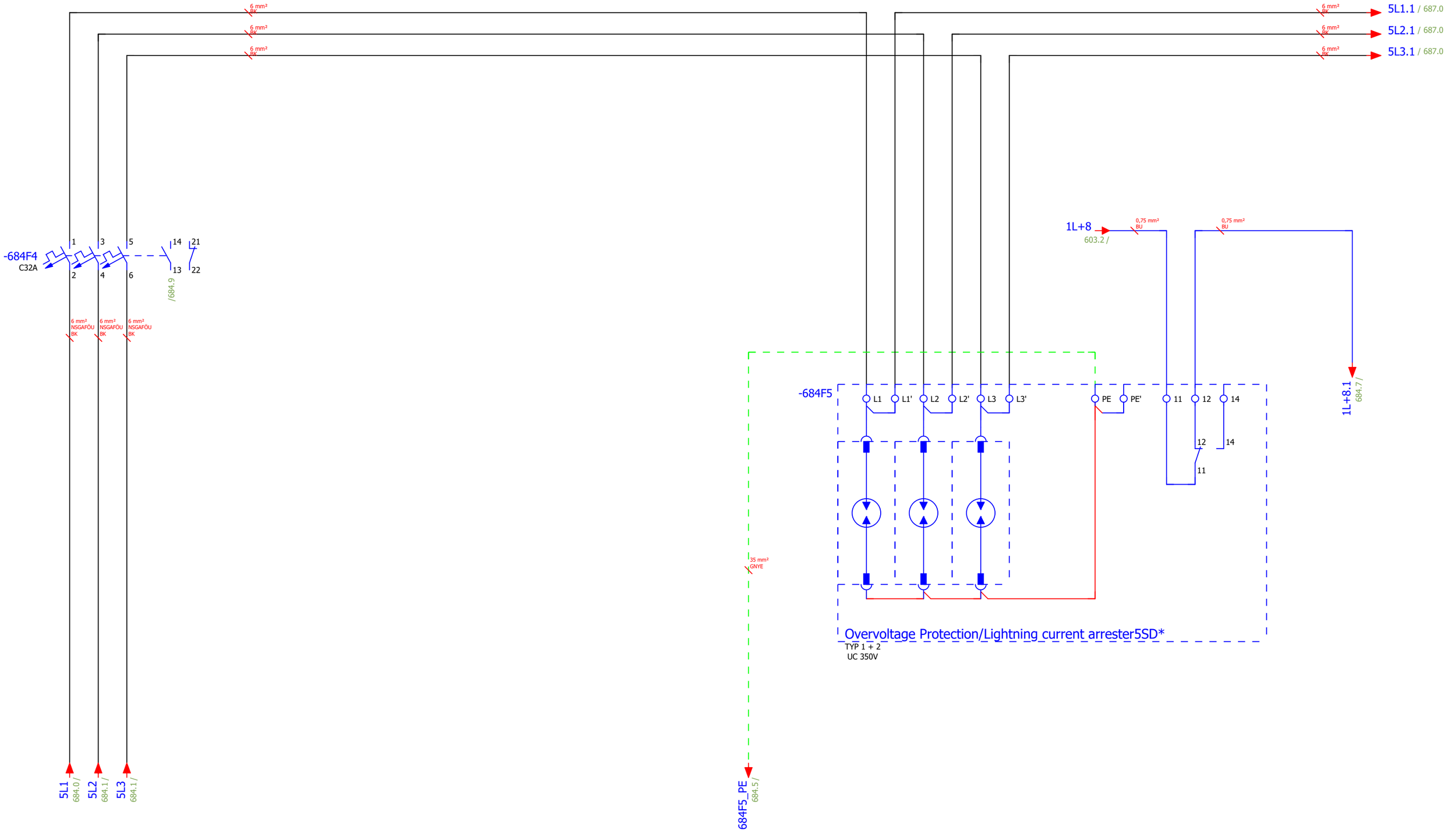
previous page: 681

next page: 685

Editor	Freqcon_DG			Statron	FREQCON	AUXILIARY SUPPLY 400V AC	20241105_V1.2	= UNIT_02	Battery Container 1
Date	05.11.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

page: 684

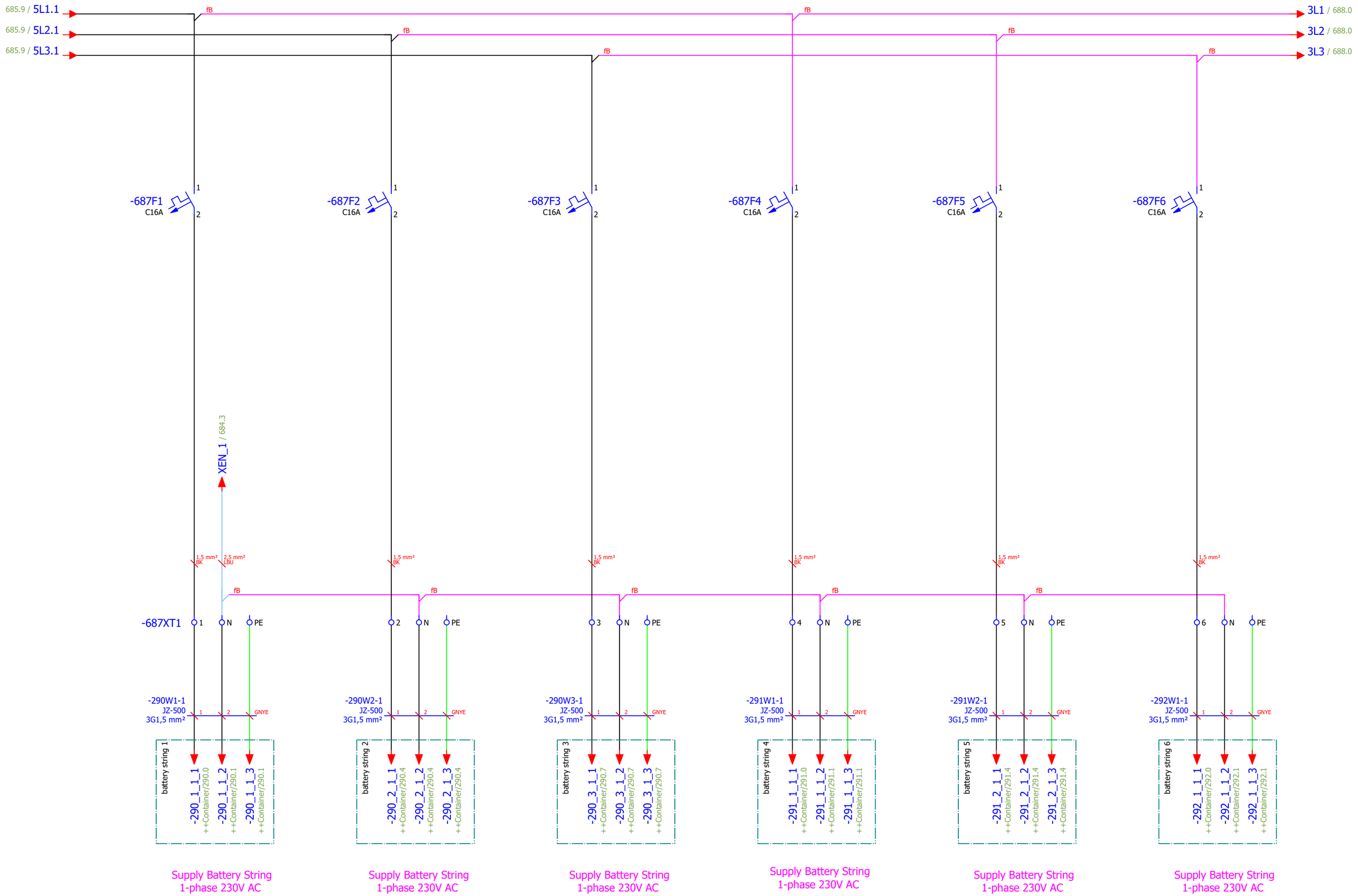
total: 498



FUSE AND
LIGHTNING PROTECTION

previous page: 684
next page: 687

Editor	Freqcon_DG			Statron	FREQCON	AUXILIARY SUPPLY 400V AC	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	05.11.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 685
Date								+	total: 498



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next page: 688

Editor	Freqcon_DG			Statron		AUXILIARY SUPPLY 400V / 230V AC DISTRIBUTION	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	08.10.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 687
Date								+	total: 498

687.9 / 3L1
687.9 / 3L2
687.9 / 3L3

-688F1 C16A
-688F2 C16A
-688F3 C16A
-688F4 C16A
-688F5 C16A

XEN_2 / 684.3

-687XT1 7 N PE
-687XT1 8 N PE
-687XT1 9 N PE
-687XT1 10 N PE
-687XT1 11 N PE

-292W2-1 JZ-500 3G1,5 mm²
-292W3-1 JZ-500 3G1,5 mm²
-293W1-1 JZ-500 3G1,5 mm²
-293W2-1 JZ-500 3G1,5 mm²
-293W3-1 JZ-500 3G1,5 mm²

battery string 7
-292_2_1_1 ++Container/292.4
-292_2_1_2 ++Container/292.4
-292_2_1_3 ++Container/292.4

battery string 8
-292_3_1_1 ++Container/292.7
-292_3_1_2 ++Container/292.7
-292_3_1_3 ++Container/292.7

battery string 9
-293_1_1_1 ++Container/293.0
-293_1_1_2 ++Container/293.1
-293_1_1_3 ++Container/293.1

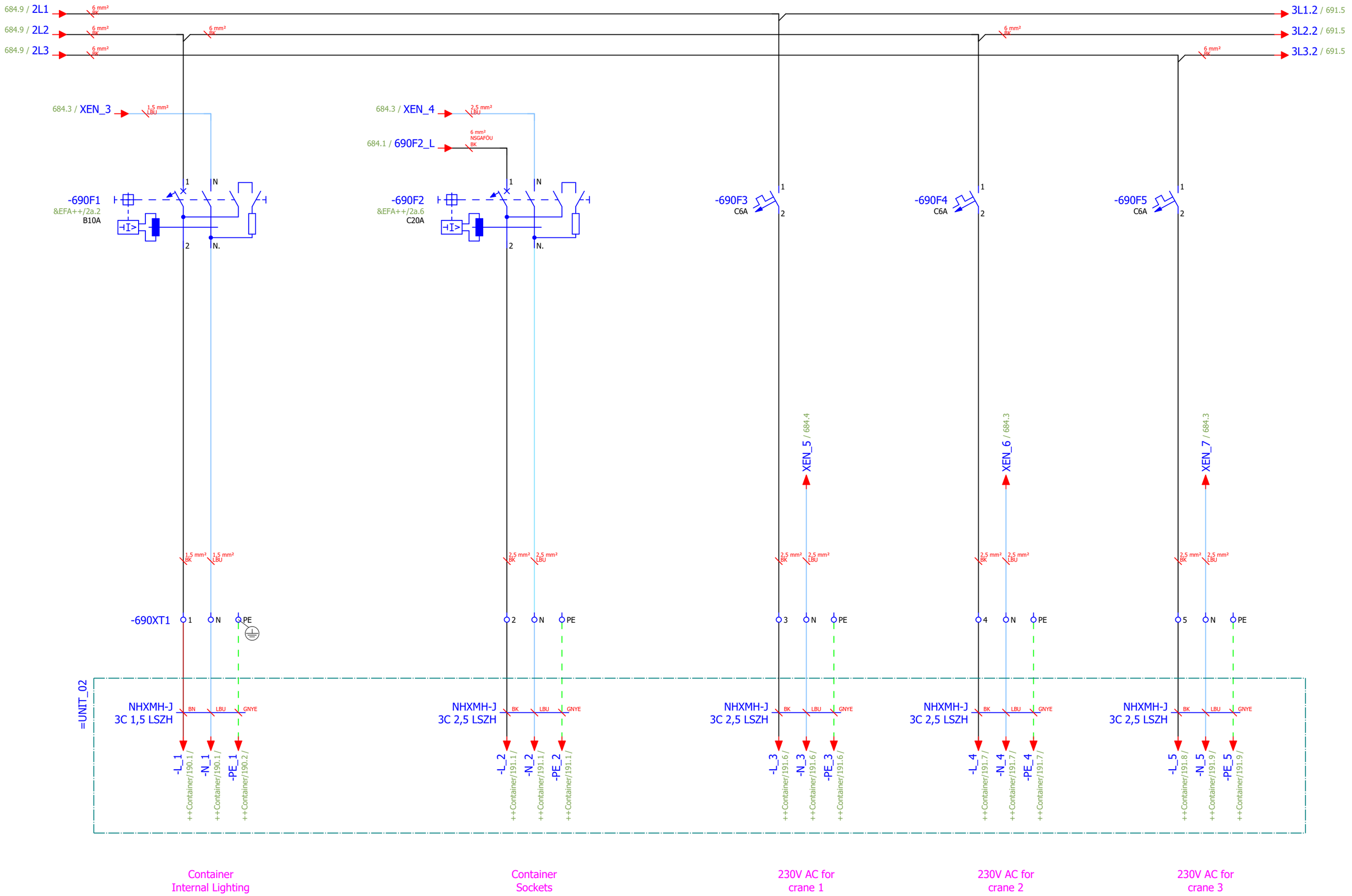
battery string 10
-293_2_1_1 ++Container/293.4
-293_2_1_2 ++Container/293.4
-293_2_1_3 ++Container/293.4

battery string 11
-293_3_1_1 ++Container/293.7
-293_3_1_2 ++Container/293.7
-293_3_1_3 ++Container/293.7

Supply Battery String 1-phase 230V AC
Supply Battery String 1-phase 230V AC
Supply Battery String 1-phase 230V AC
Supply Battery String 1-phase 230V AC
Supply Battery String 1-phase 230V AC

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next page: 690

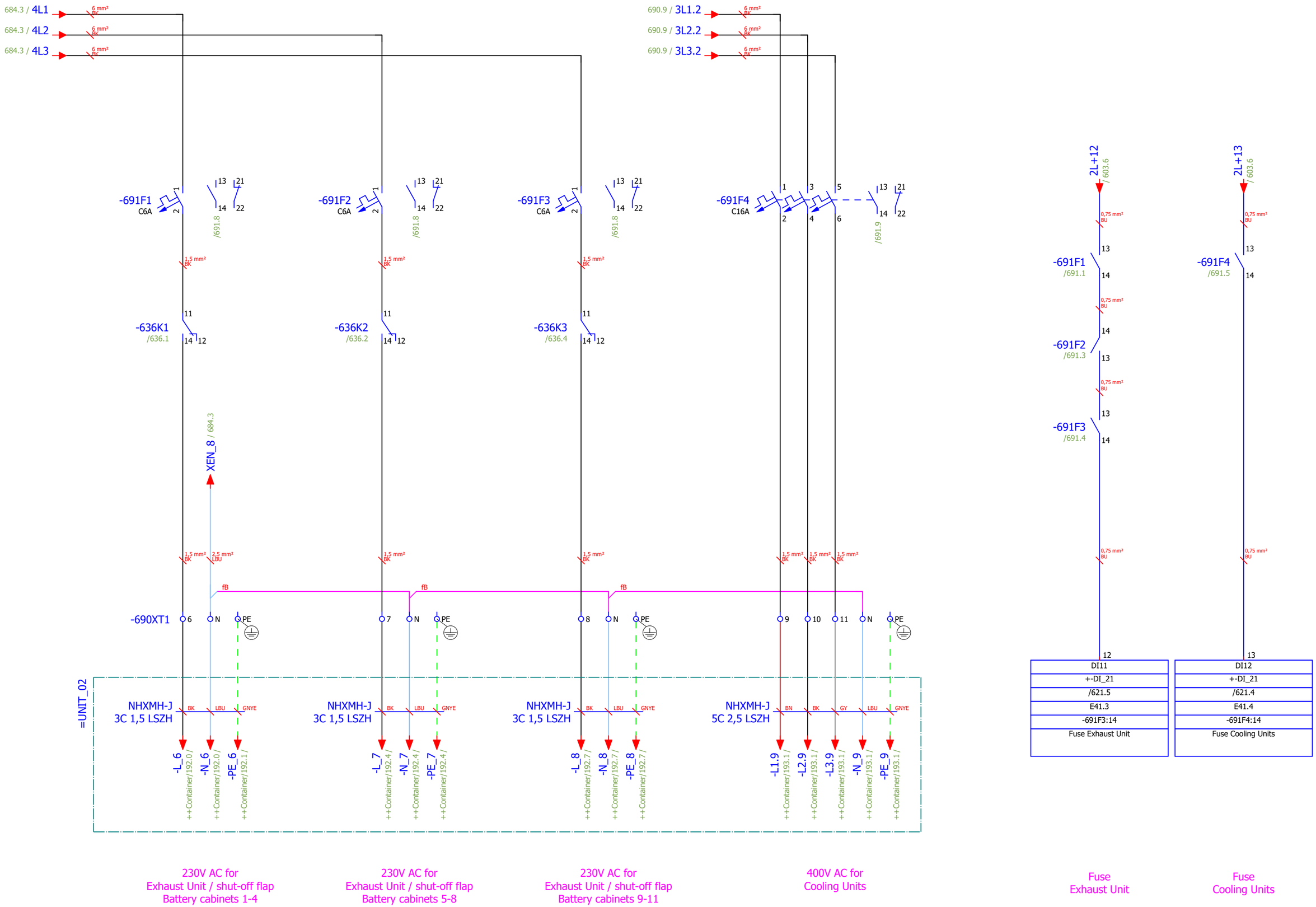
Editor	Freqcon_DG			Statron	FREQCON	AUXILIARY SUPPLY 400V / 230V AC DISTRIBUTION	20241105_V1.2	= UNIT_02 Battery Container 1	
Date	08.10.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 688
Date								+	total: 498



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next page: 691

Editor	Freqcon_DG			Statron	FREQCON	CONTAINER COOLING / LIGHTNING	20241105_V1.2	= UNIT_02	Battery Container 1	
Date	29.10.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet	page: 690
Date								+		total: 498



230V AC for
Exhaust Unit / shut-off flap
Battery cabinets 1-4

230V AC for
Exhaust Unit / shut-off flap
Battery cabinets 5-8

230V AC for
Exhaust Unit / shut-off flap
Battery cabinets 9-11

400V AC for
Cooling Units

Fuse
Exhaust Unit

Fuse
Cooling Units

previous page: 690

next page: &EPC++Container/1

Editor	Freqcon_DG			Statron	FREQCON	CONTAINER COOLING / LIGHTNING	20241105_V1.2	= UNIT_02	Battery Container 1	
Date	05.11.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet	page: 691
Date								+		total: 498

SPECIFICATION

TERMINAL STRIP

-XE1	MAIN POWER SUPPLY 600V AC
-XE2	DC POWER SUPPLY 1000V DC
-XE	MAIN POWER SUPPLY 400V AC
-X1	MAIN POWER 400V/230V AC
-X2	LIGHT CABINET 230V AC
-X3	CONTROL VOLTAGE 24V DC
-14X1	CONTROL VOLTAGE 24V DC (TO DC CONTACTORS)
-X5	LOW-VOLTAGE SIGNALS
-XDC0	24V DC POWER SUPPLY
-XDC1-4	CONTROL VOLTAGE 24V DC (UPS)
-XT	TRANSFER TERMINAL BLOCK 24V DC / 230V AC

WIRING COLOR

L1 / L2 / L3	=	BLACK
N	=	LIGHT BLUE (IEC) / GREY (UL)
PE	=	YELLOW-GREEN
EXTERNAL VOLTAGE	=	ORANGE
CONTROL VOLTAGE 24 V DC	=	DARK BLUE
ANALOG SIGNALS	=	WHITE

PLACE

+CTRL	=	Control cabinet
+CON	=	Converter cabinet
+IND	=	Inductor cabinet
+CIR	=	Circuit breaker cabinet
+COSY	=	Cooling System
+FAN	=	External fan

previous page: &EAB/6

next page: 6a

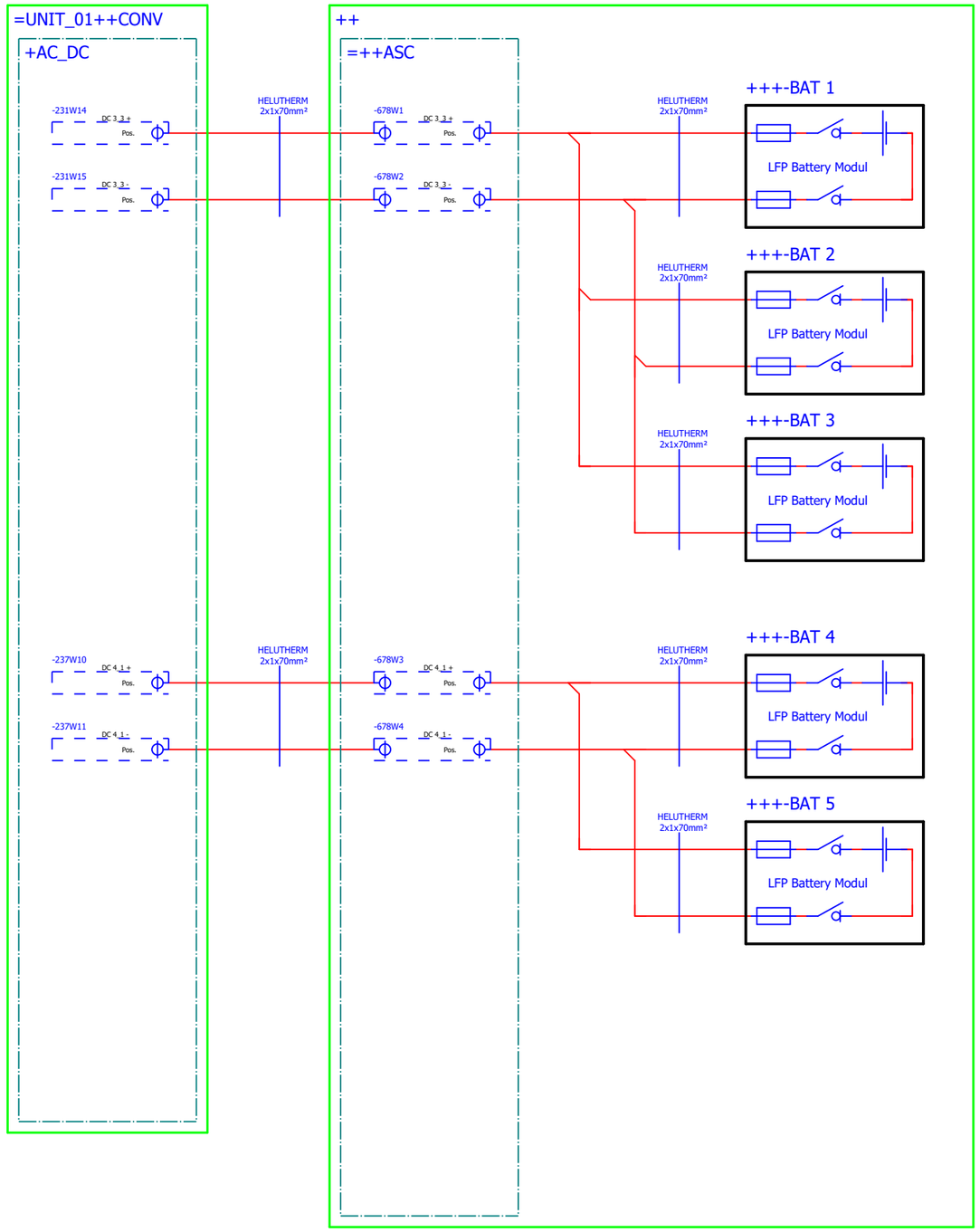
SPECIFICATION of grounding

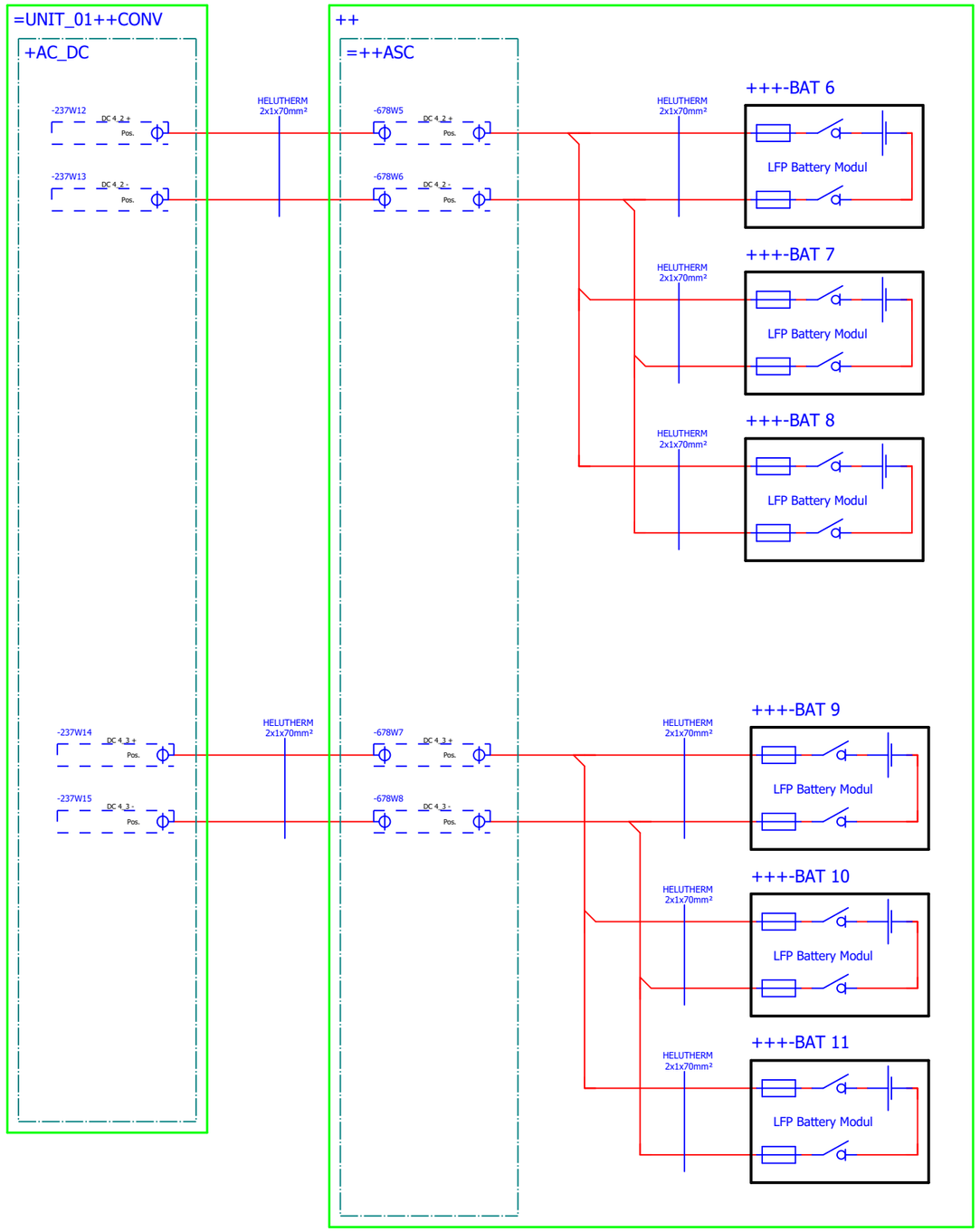
	from frame to			
1	**roof & side walls & doors**	**EVD_1**	**Flachband**	**2x25 mm²**
2	**frame**	**EVD_2**	**Flachband**	**2x25 mm²**
3	**base**	**EVD_3**	**Flachband**	**2x25 mm²**
4	**Mounting plate & partitions**	**EVD_4**	**H07-V-K**	**2x25 mm²**
5	**inductors**	**EVD_5**	**H07-V-k**	**2x25 mm²**
6	**Powerstack**	**EVD_6**	**H07-V-K**	**2x25 mm²**
7	**DC Switch & Fuse**	**EVD_7**	**H07-V-K**	**2x25 mm²**
8	**AC Filter**	**EVD_8**	**H07-V-K**	**2x25 mm²**
9	**circuit-breaker**	**EVD_9**	**H07-V-K**	**2x25 mm²**
10	**Freqcon_Fast_Disconektor**	**EVD_10**	**H07-V-K**	**2x25 mm²**
11	**Freqcon_Rectifier_Modul**	**EVD_11**	**H07-V-K**	**2x25 mm²**
12	**capacitor banks**	**EVD_12**	**H07-V-K**	**2x25 mm²**
13	**water distributor**	**EVD_13**	**H07-V-K**	**2x25 mm²**
14	**SPARE**	**EVD_14**	**H07-V-K**	**2x25 mm²**
15	**SPARE**	**EVD_15**	**H07-V-K**	**2x25 mm²**
16	**SPARE**	**EVD_16**	**H07-V-K**	**2x25 mm²**
17	**SPARE**	**EVD_17**	**H07-V-K**	**2x25 mm²**
18	**SPARE**	**EVD_18**	**H07-V-K**	**2x25 mm²**
	from door to			
19	**PROFINET IRT IGBT Interface**	**EVD_19**	**H07-V-K**	**1,5 mm²**
20	**HMI**	**EVD_20**	**H07-V-K**	**1,5 mm²**
21	**SPARE**	**EVD_21**	**H07-V-K**	**??? mm²**
22	**SPARE**	**EVD_22**	**H07-V-K**	**??? mm²**

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next page: &EFA/1a

Single line diagram





previous page:
&EAC/6a

next page:
2a

Editor	Freqcon_JD			Statron	FREQCON	SYSTEMS OVERVIEW	20241105_V1.2	= UNIT_03 Battery Container 2
Date	18.06.2024	Norm						& EFA Single line diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ page: 1a
Date								+ total: 498

Single line diagram

Control circuit

++ASC

400V

-XES

-684F3 &EFS++ASC/684.2 C32A

-684F1 &EFS++ASC/684.0 C32A

-684F2 &EFS++ASC/684.5 TYP 1 + 2 SPD

-601F1 &EFS++ASC/601.1 TYP 1 + 2 SPD

-684F4 &EFS++ASC/685.0 C32A

-684F5 &EFS++ASC/685.5 TYP 1 + 2 SPD

-691F1 &EFS++ASC/691.1 C6A

-691F2 &EFS++ASC/691.3 C6A

-691F3 &EFS++ASC/691.4 C6A

-690F1 &EFS++ASC/690.1 16A

-690F3 &EFS++ASC/690.5 C6A

-690F4 &EFS++ASC/690.7 C6A

-690F5 &EFS++ASC/690.8 C6A

-691F4 &EFS++ASC/691.5 C16A

-690F2 &EFS++ASC/690.3 16A

-101Q1

-687F1 &EFS++ASC/687.1 C16A

-687F2 &EFS++ASC/687.3 C16A

-687F3 &EFS++ASC/687.4 C16A

-687F4 &EFS++ASC/687.5 C16A

-687F5 &EFS++ASC/687.7 C16A

-636K1 &EFS++ASC/636.1

-636K2 &EFS++ASC/636.2

-636K3 &EFS++ASC/636.4

M 1~

1/N/PE

1/N/PE

1/N/PE

1/N/PE 1/N/PE

20 A

Battery cabinet 1

Battery cabinet 2

Battery cabinet 3

Battery cabinet 4

Battery cabinet 5

-687F6 &EFS++ASC/687.8 C16A

-688F1 &EFS++ASC/688.1 C16A

-688F2 &EFS++ASC/688.2 C16A

-688F3 &EFS++ASC/688.4 C16A

-688F4 &EFS++ASC/688.5 C16A

-688F5 &EFS++ASC/688.7 C16A

Battery cabinet 6

Battery cabinet 7

Battery cabinet 8

Battery cabinet 9

Battery cabinet 10

Battery cabinet 11

Exhaust Unit / shut-off flap Bat 1-4

Exhaust Unit / shut-off flap Bat 5-8

Exhaust Unit / shut-off flap Bat 9-11

Container Internal Lighting

crane 1

crane 2

crane 3

Cooling Units

Container Sockets

Power Supply

previous page: 1a

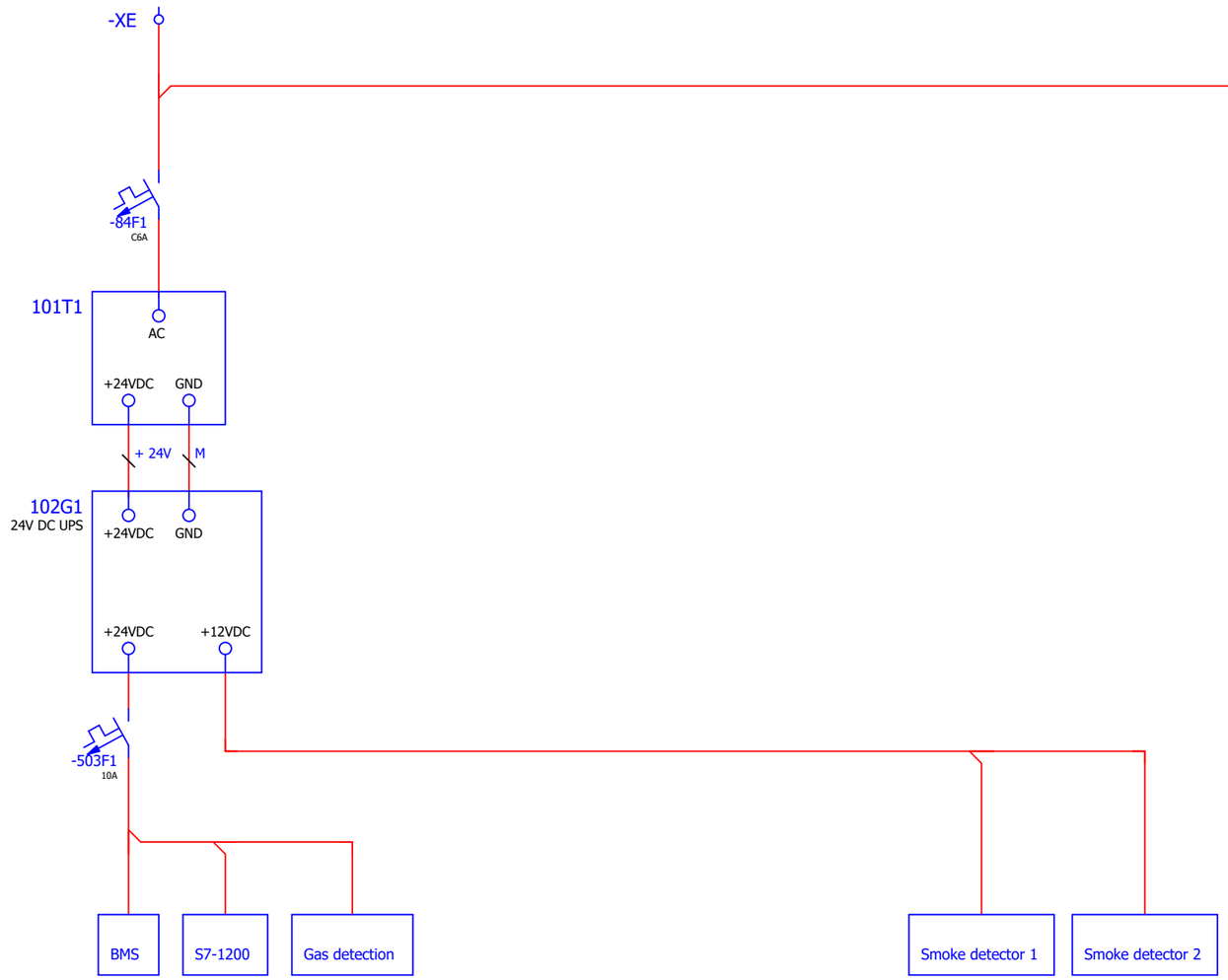
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Editor	Freqcon_DG			Statron	FREQCON	SYSTEMS OVERVIEW	20241105_V1.2	= UNIT_03 Battery Container 2
Date	05.11.2024	Norm						& EFA Single line diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ page: 2a
Date								+ total: 498

Single line diagram

Control circuit

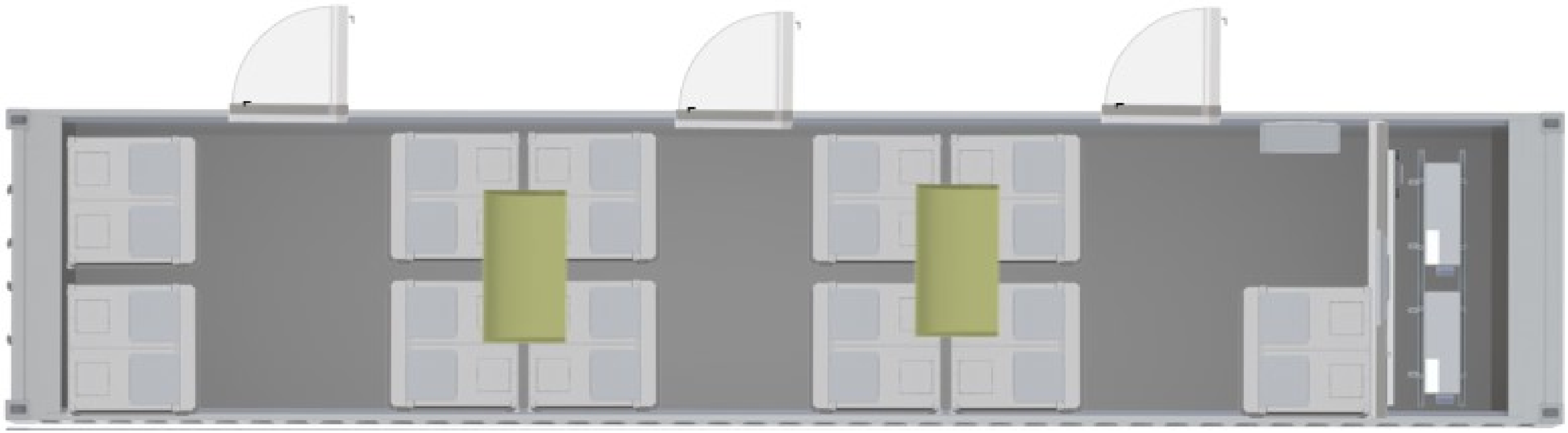
Battery Cabinet



previous page:
2a

next page:
&ELU/5a

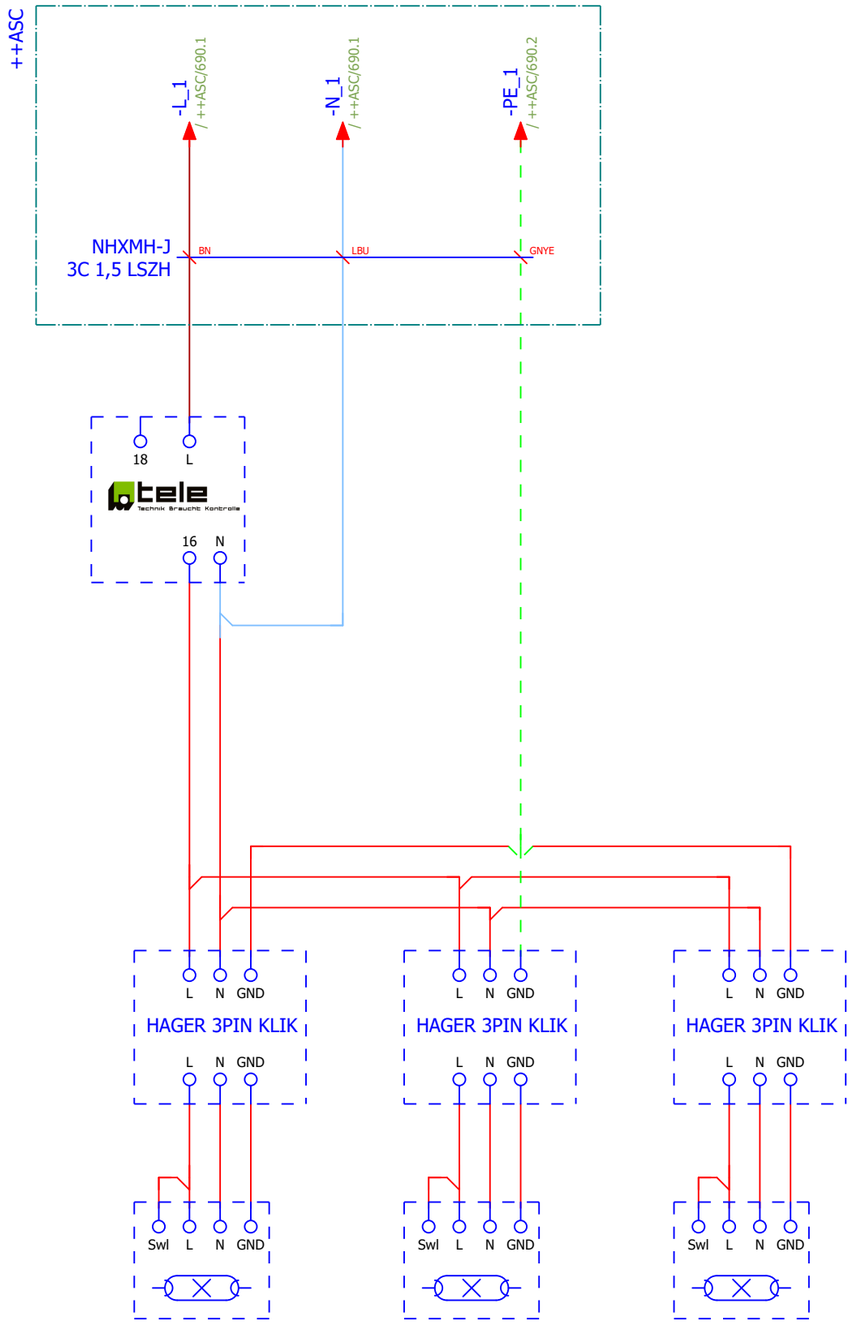
0	1	2	3	4	5	6	7	8	9



previous page:
&EFA/3a

next page:
&EFS++Container/190

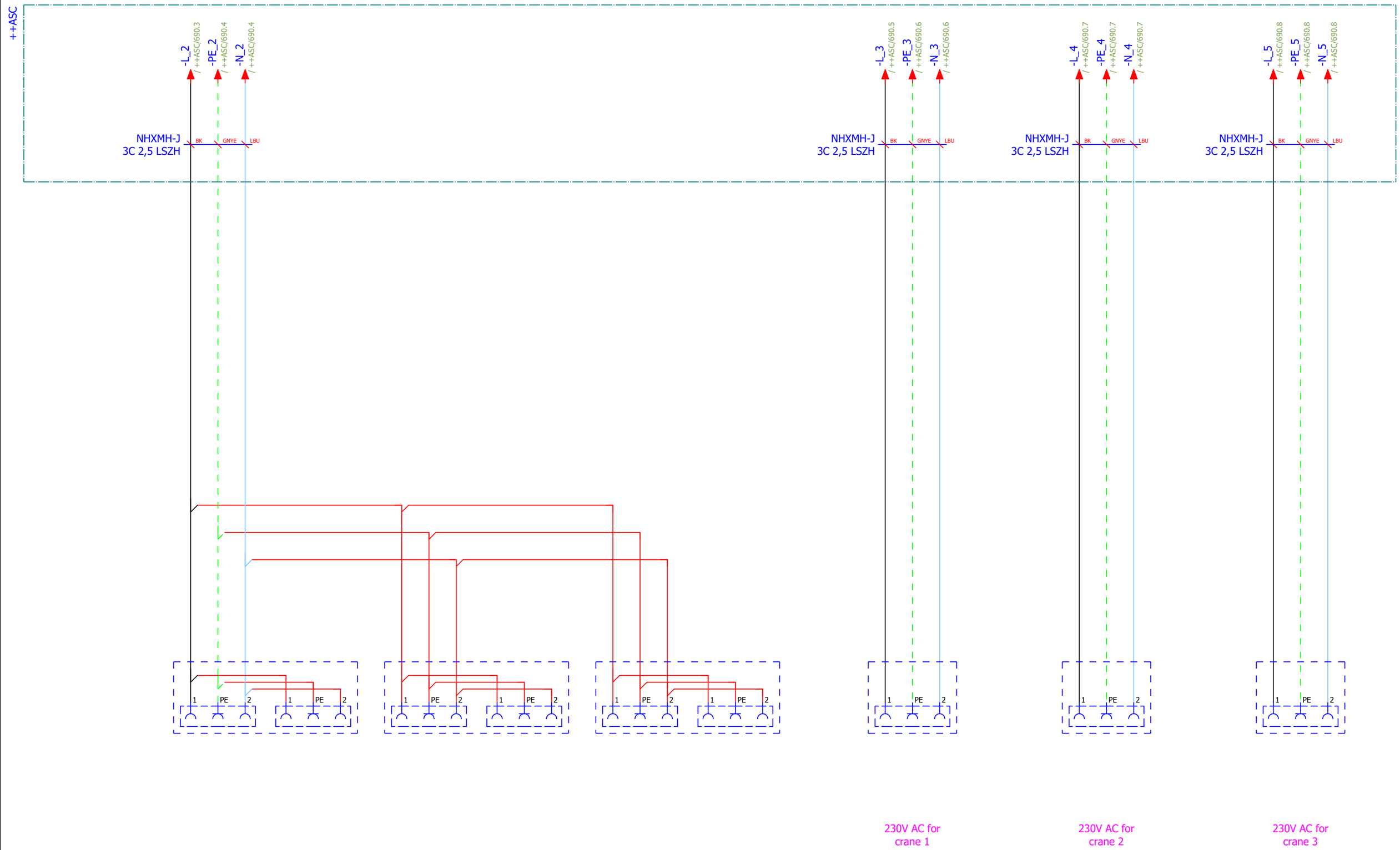
Editor	Freqcon_JD			Statron	FREQCON	Container overview	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	14.06.2024	Norm						& ELU Cabinet Overview	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++	page: 5a
Date								+	total: 498



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&ELU++/5a

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Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 190
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 191
Date								+	total: 498

++ASC

-L_6 / ++ASC/691.1
-N_6 / ++ASC/691.1
-PE_6 / ++ASC/691.2

NHXMH-J
3C 1,5 LSZH
BK LBU GNYE

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

BELDEN 9842
LSZH
WH BU WH BU

Junction Box
next to fan motor

230V AC for
Exhaust Unit
Battery cabinets 1-4

-L_6 / ++ASC/691.1
-N_6 / ++ASC/691.1
-PE_6 / ++ASC/691.2

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

230V AC for
shut-off flap
Battery cabinets 1-4

-L_7 / ++ASC/691.3
-N_7 / ++ASC/691.3
-PE_7 / ++ASC/691.3

NHXMH-J
3C 1,5 LSZH
BK LBU GNYE

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

BELDEN 9842
LSZH
WH BU WH BU

Junction Box
next to fan motor

230V AC for
Exhaust Unit
Battery cabinets 5-8

-L_7 / ++ASC/691.3
-N_7 / ++ASC/691.3
-PE_7 / ++ASC/691.3

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

230V AC for
shut-off flap
Battery cabinets 5-8

-L_8 / ++ASC/691.4
-N_8 / ++ASC/691.4
-PE_8 / ++ASC/691.4

NHXMH-J
3C 1,5 LSZH
BK LBU GNYE

L N GND
13A fused
Spur K983ALM
L N GND

1 2
M
1~
PE

BELDEN 9842
LSZH
WH BU WH BU

Junction Box
next to fan motor

230V AC for
Exhaust Unit
Battery cabinets 9-11

-L_8 / ++ASC/691.4
-N_8 / ++ASC/691.4
-PE_8 / ++ASC/691.4

L N GND
13A fused
Spur K983ALM
L N GND

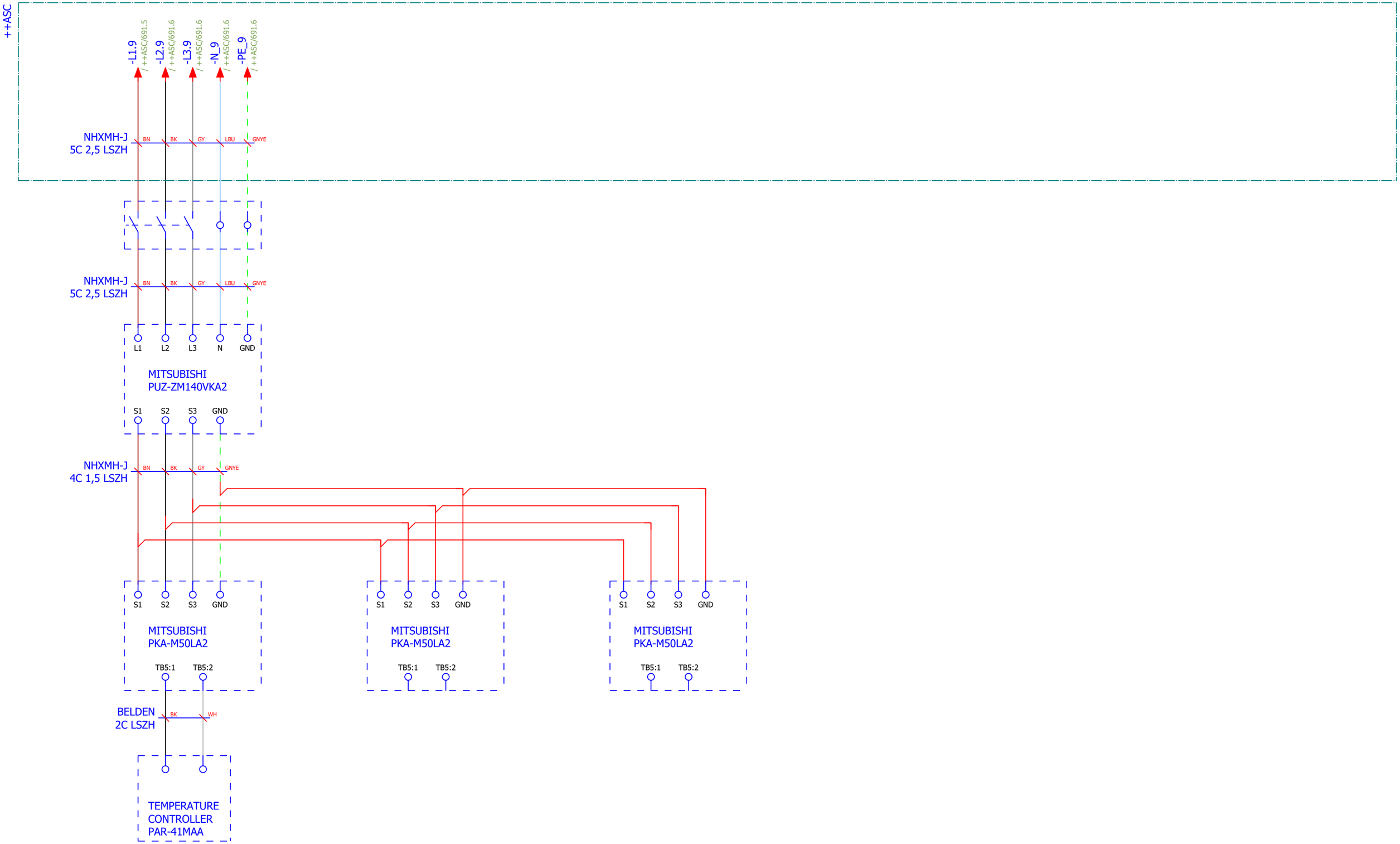
1 2
M
1~
PE

230V AC for
shut-off flap
Battery cabinets 9-11

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Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_03	Battery Container 2
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 192
Date								+	total: 498

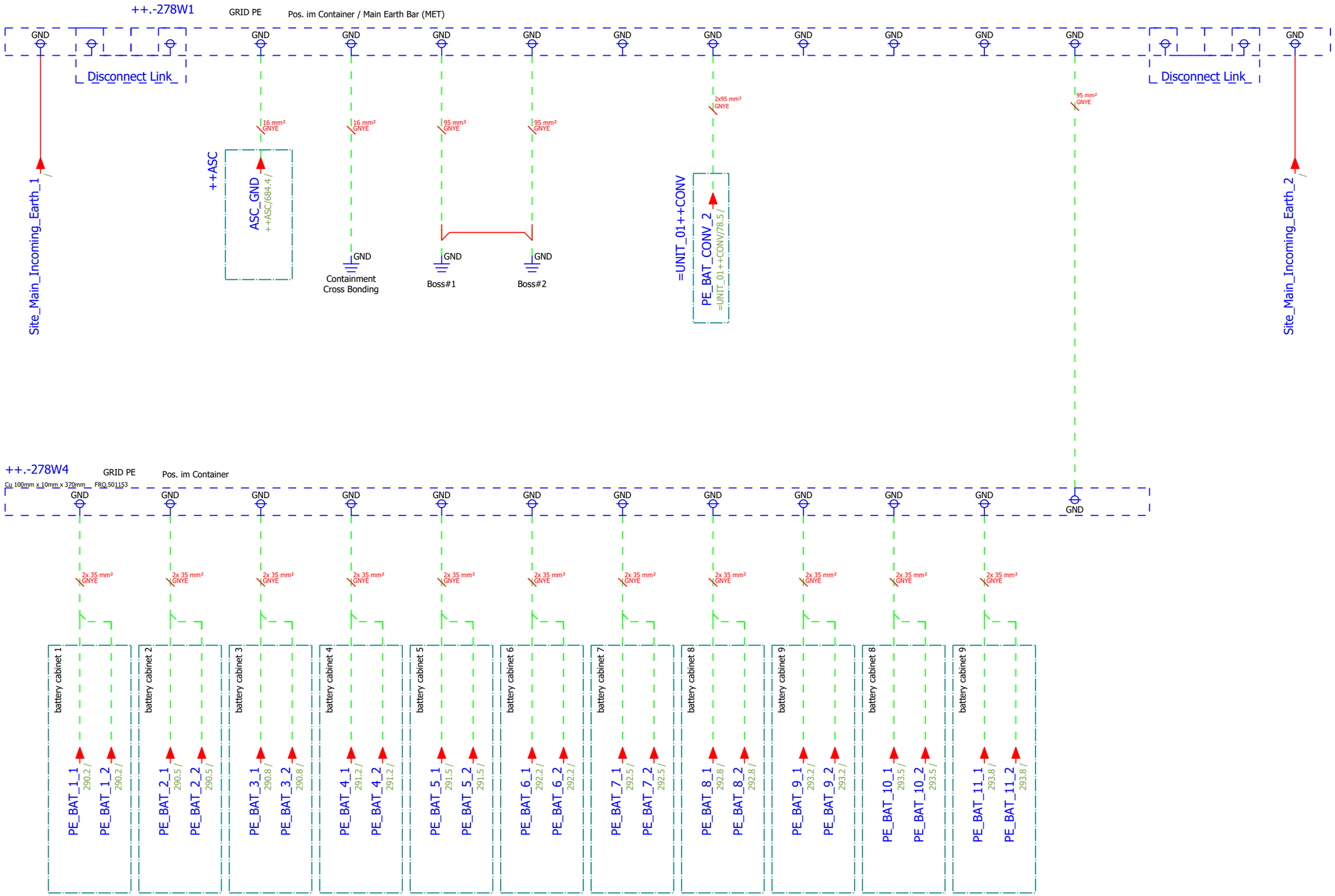


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Editor	Freqcon_JD			Statron	FREQCON	CONTAINER INSTALLATION	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 193
Date								+	total: 498

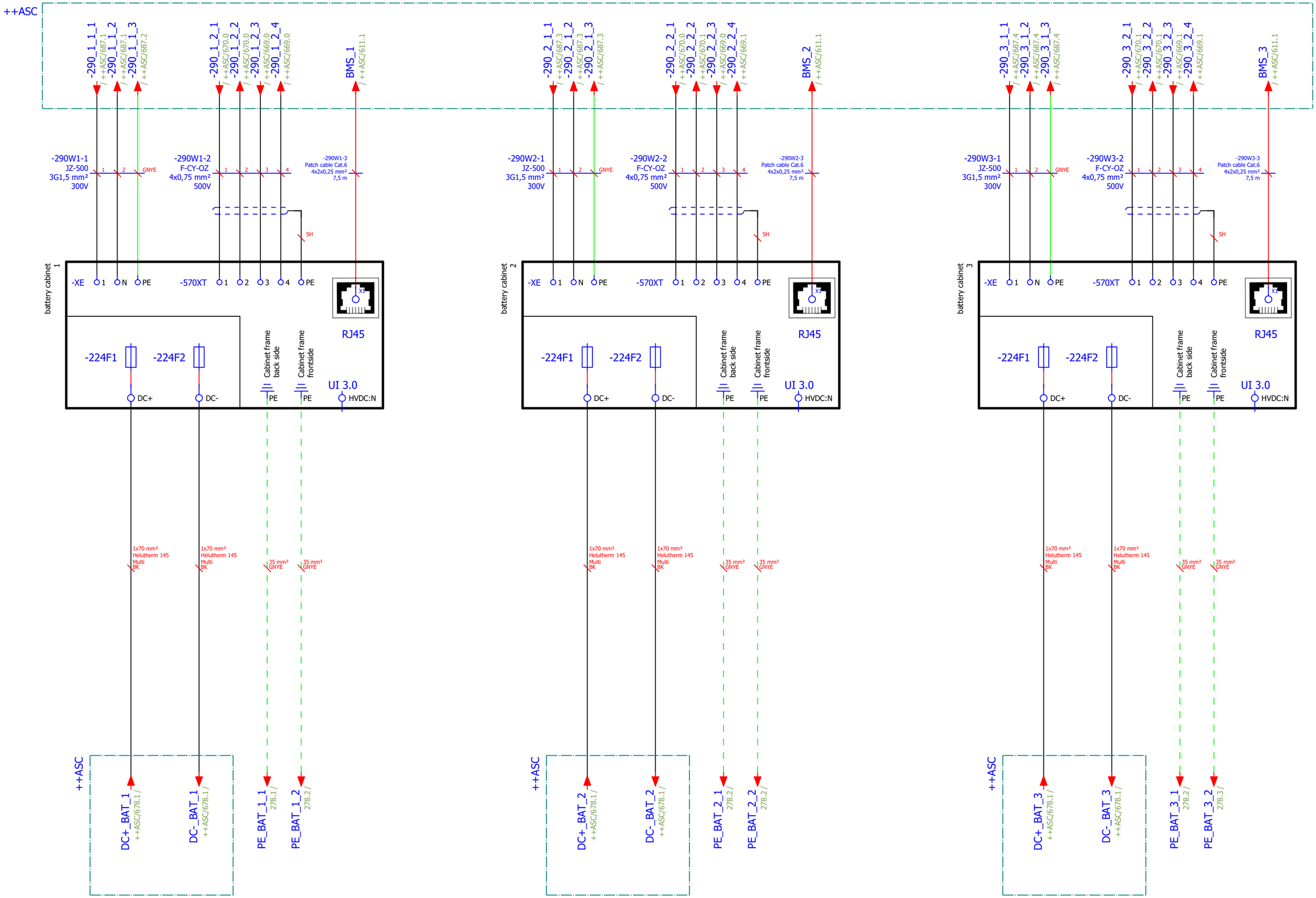
Busbars PE



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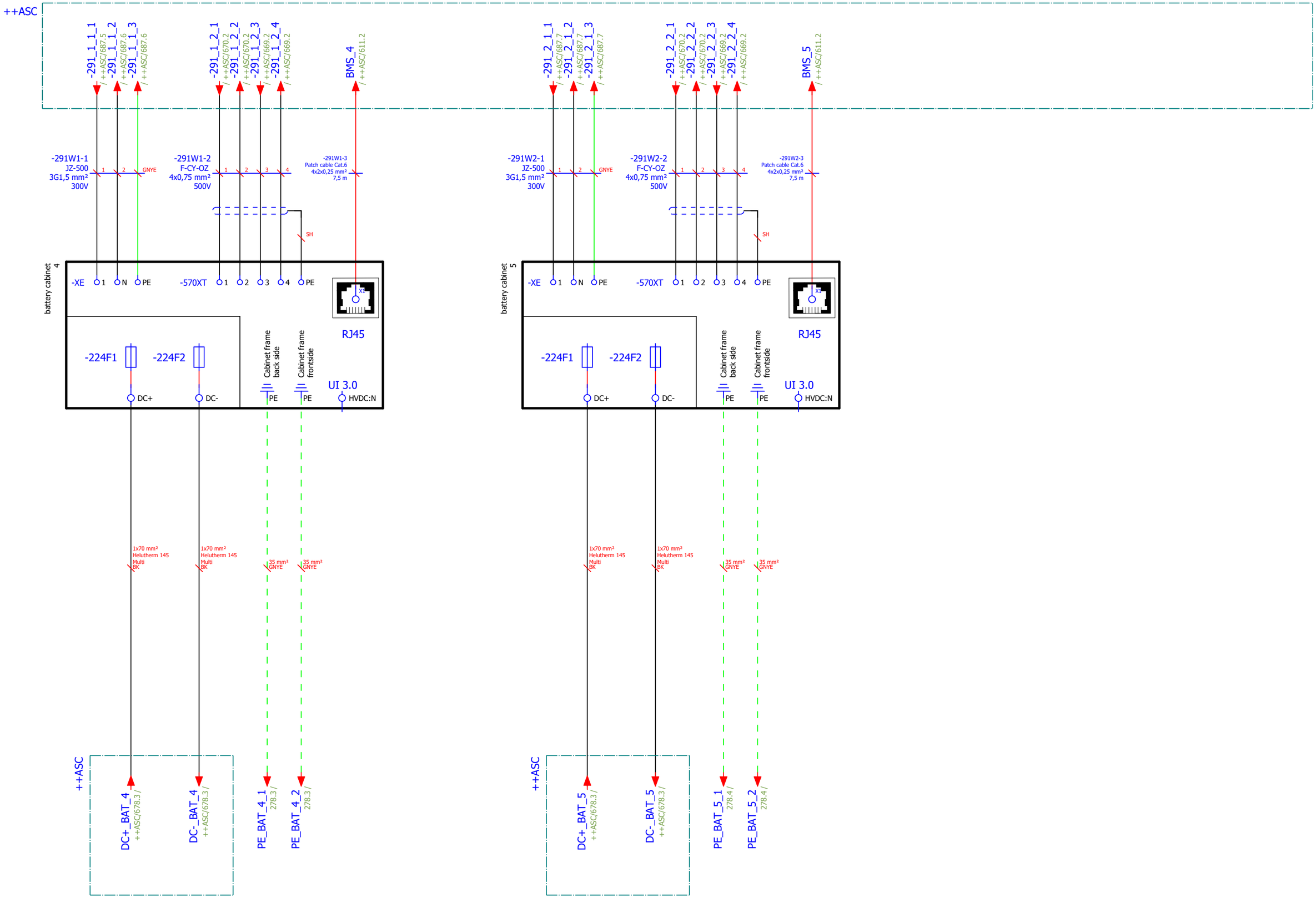
Editor	Freqcon_JD			Statron	FREQCON	EARTHING CONTAINER	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 278
Date								+	total: 498



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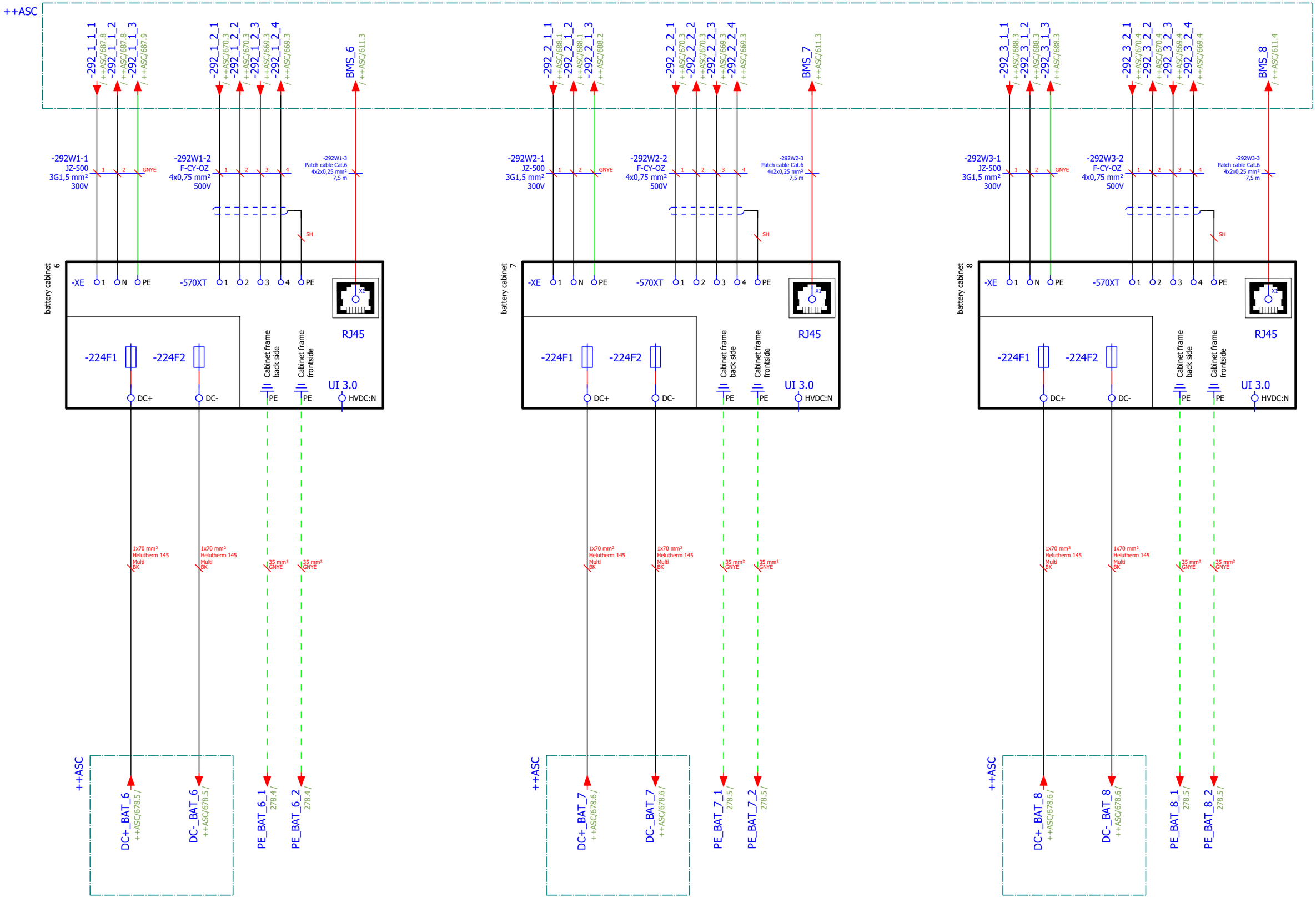
Editor	Freqcon_JD			Statron	FREQCON	BATTERY CABINETS 1-3	20241105_V1.2	= UNIT_03	Battery Container 2
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 290
Date								+	total: 498



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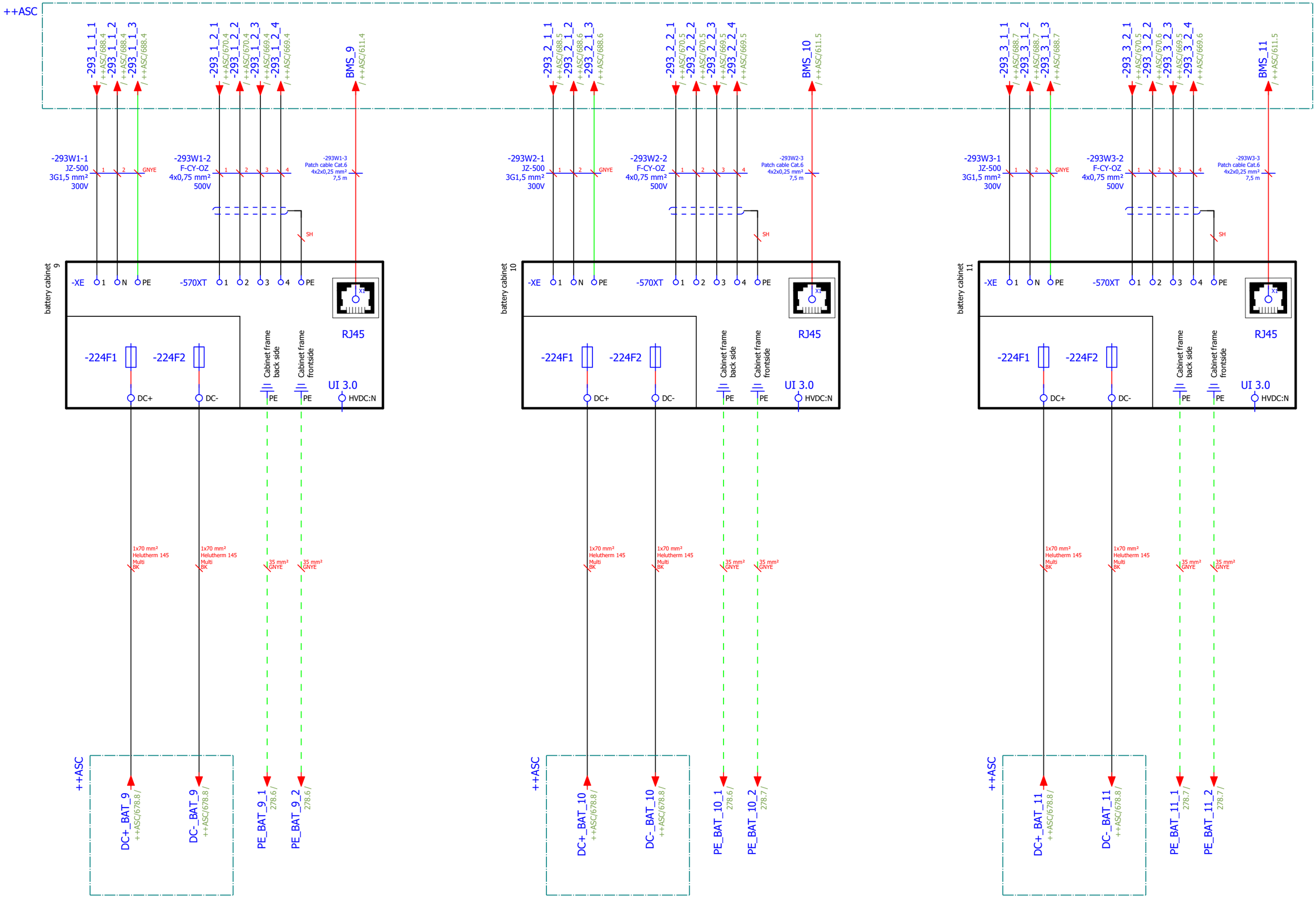
Editor	Freqcon_JD			Statron	FREQCON	BATTERY CABINETS 4+5	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 291
Date								+	total: 498



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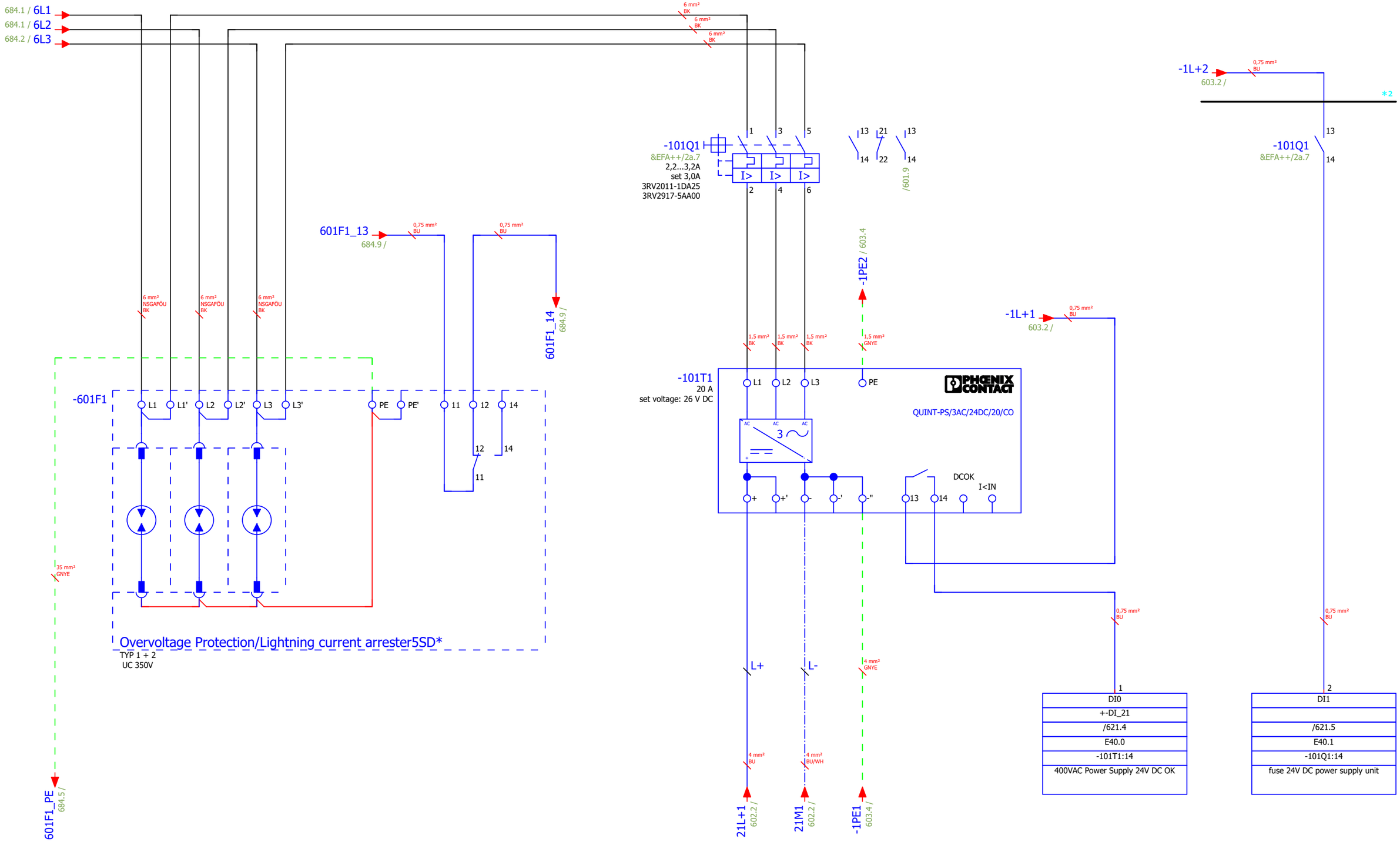
Editor	Freqcon_JD			Statron	FREQCON	BATTERY CABINETS 6-8	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container	page: 292
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	BATTERY CABINETS 9-11	20241105_V1.2	= UNIT_03 Battery Container 2
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ Container page: 293
Date								+ total: 498



400VAC
Power Supply
24V DC OK

fuse
24V DC power supply unit

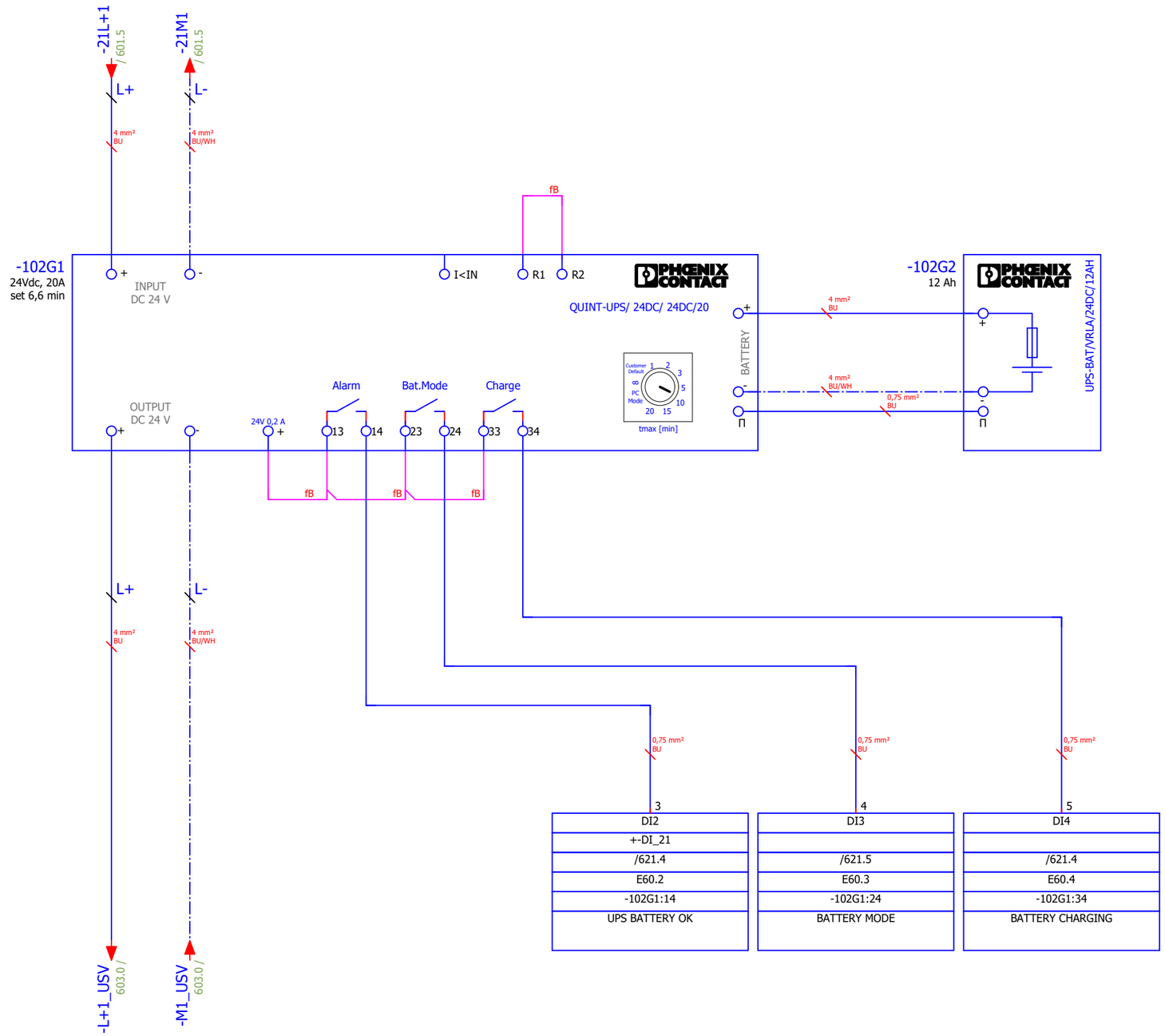
previous page:
++Container/293

Power supply unit from 400V AC

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602

Editor	Freqcon_DG			Statron	FREQCON	CONTROL VOLTAGE POWER SUPPLY UNIT	20241105_V1.2	= UNIT_03 Battery Container 2
Date	05.11.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet
Date								+

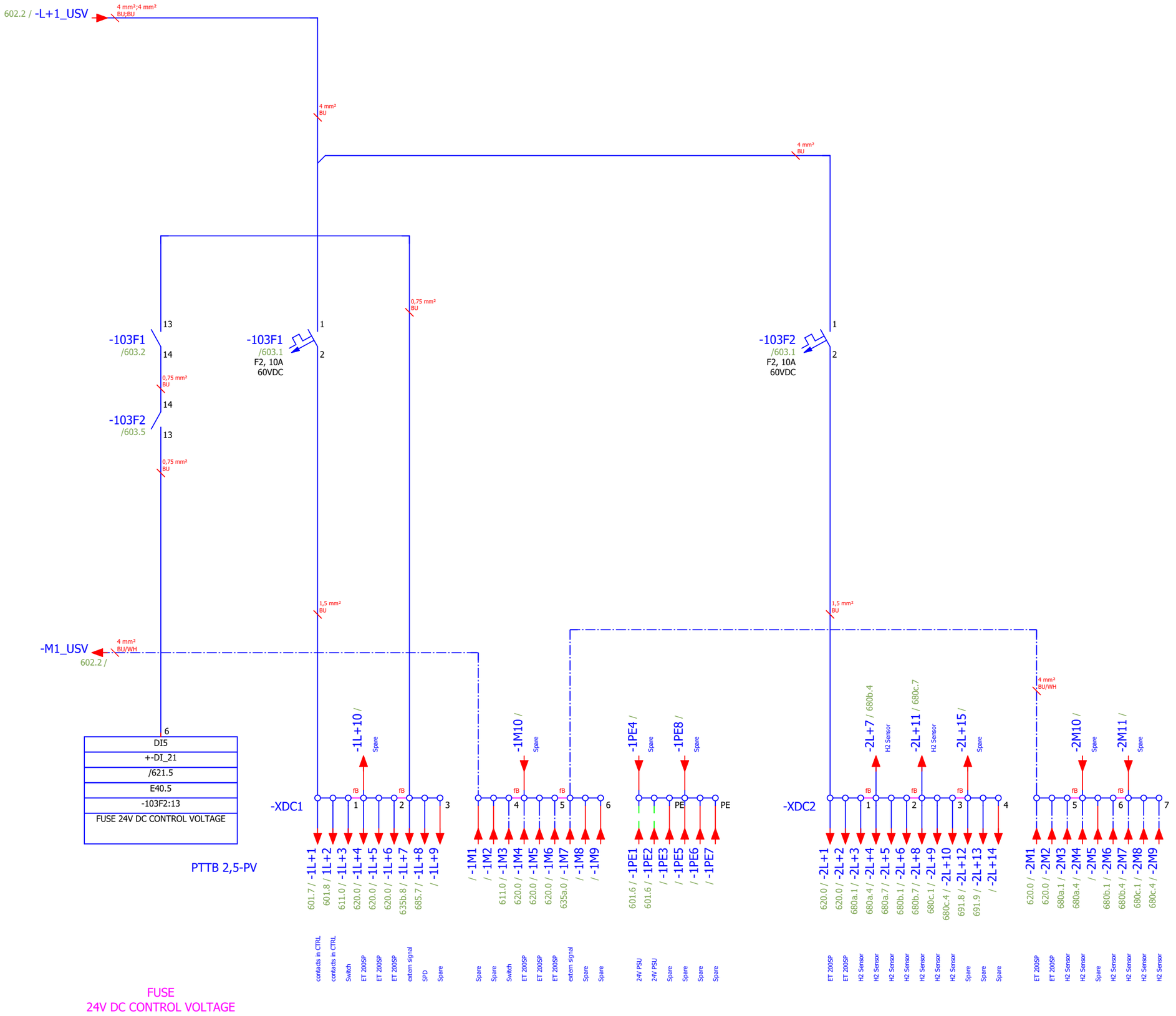
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total: 498



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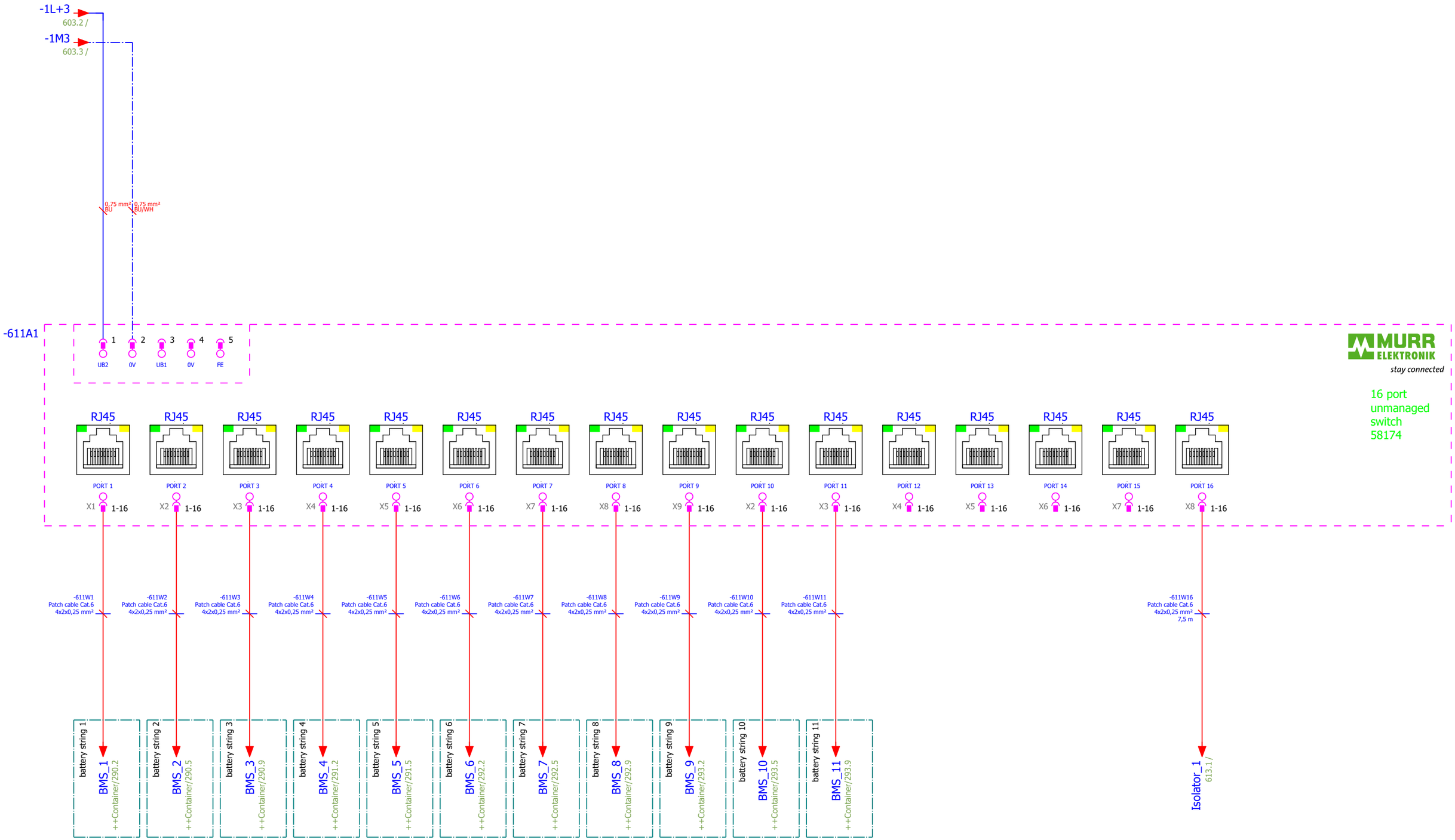
Editor	Freqcon_JD			Statron	FREQCON	CONTROL VOLTAGE UPS	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 602
Date								+	total: 498



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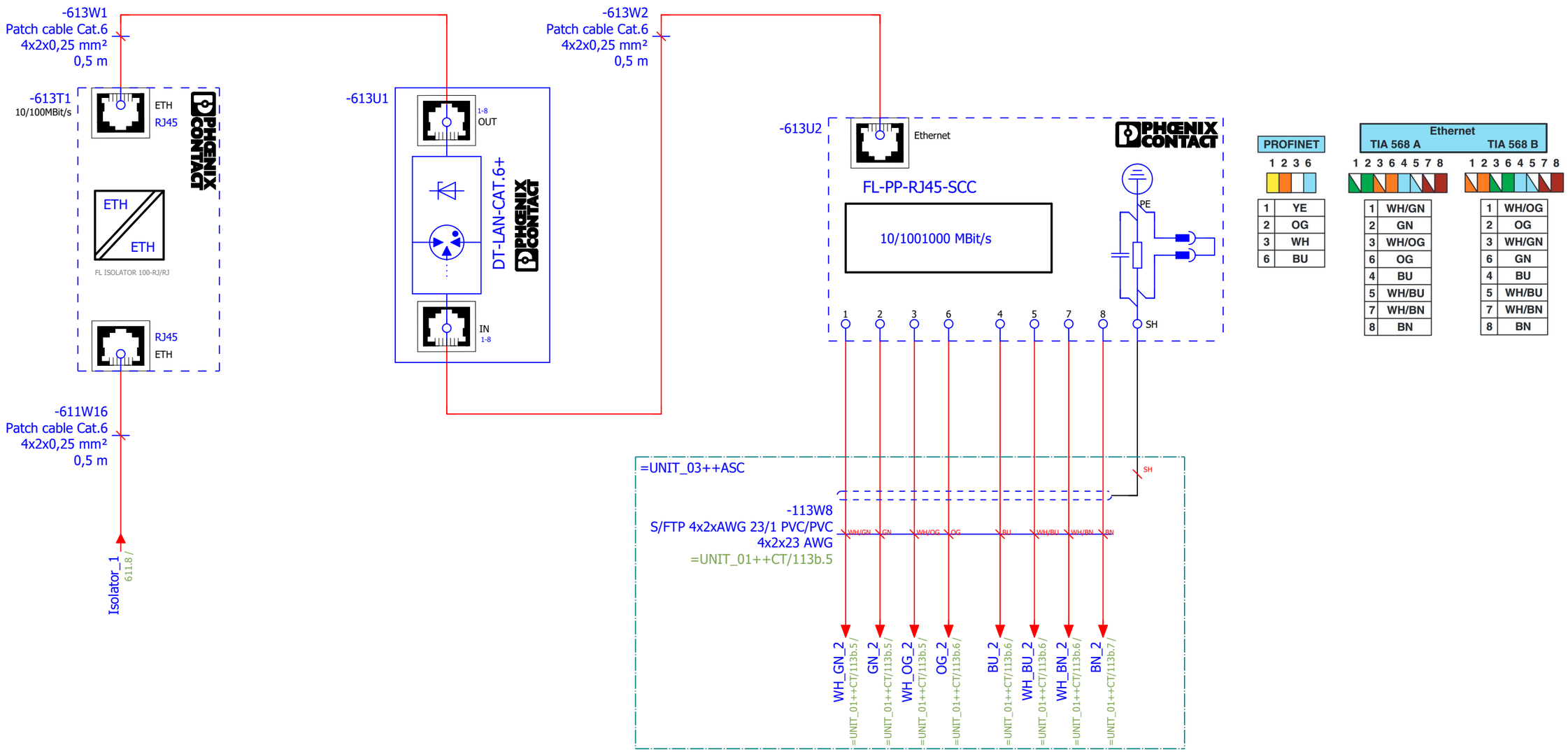
Editor	Freqcon_DG			Statron	FREQCON	CONTROL VOLTAGE FUSE	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	10.10.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxiliary cabinet	page: 603
Date								+	total: 498



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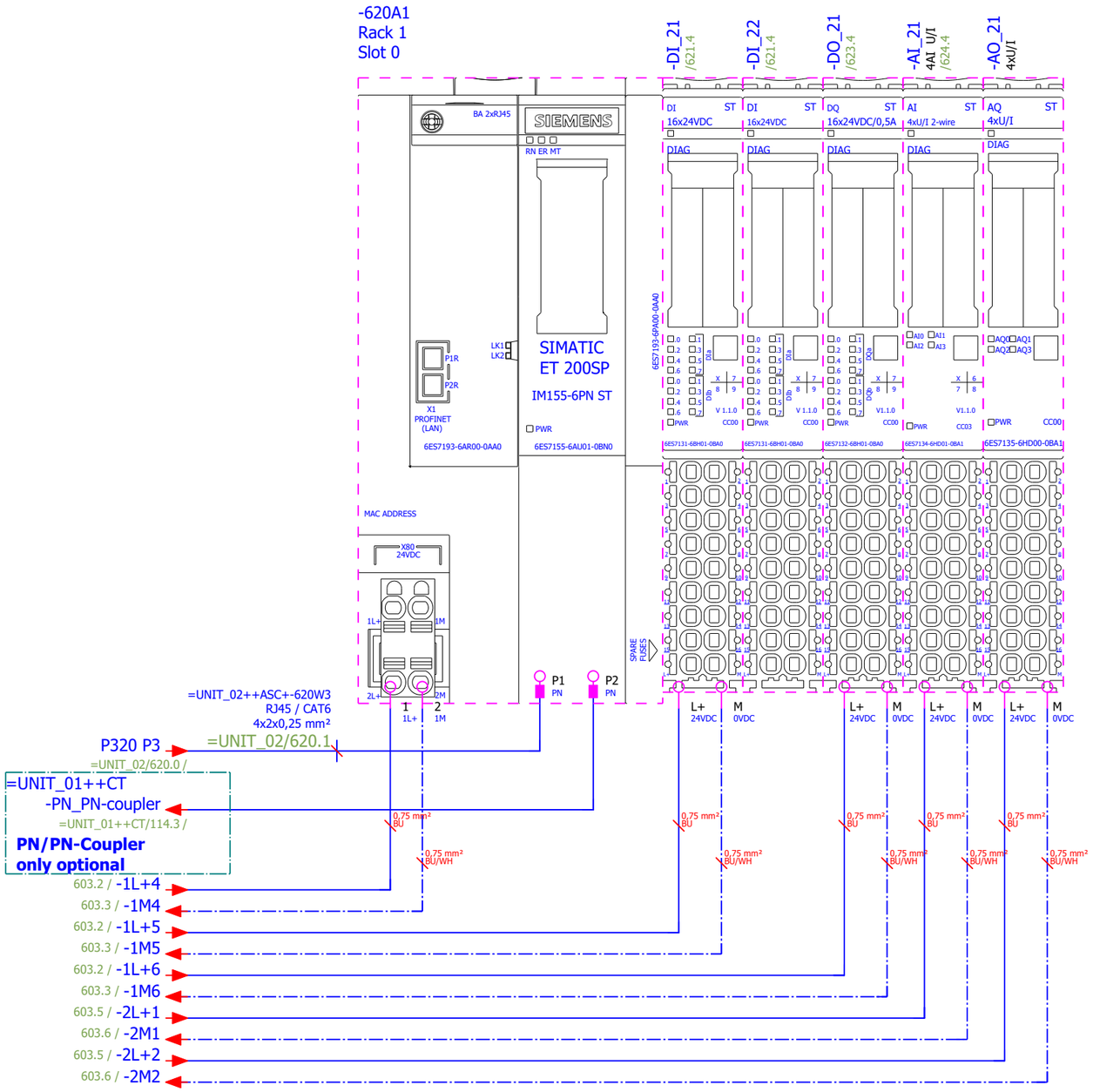
Editor	Freqcon_JD			Statron	FREQCON	ETHERNET SWITCH	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 611
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	ETHERNET / PROFINET ISOLATOR	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 613
Date								+	total: 498



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Editor	Freqcon_JD			Statron	FREQCON	ET200 24V DC ASC	20241105_V1.2	= UNIT_03	Battery Container 2
Date	02.07.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

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-DI_21

/620.3

400VAC Power Supply 24V DC OK	/601.7	DI0	1	E60.0	E60.1	2	DI1	/601.9	fuse 24V DC power supply unit
UPS BATTERY OK	/602.5	DI2	3	E60.2	E60.3	4	DI3	/602.6	BATTERY MODE
BATTERY CHARGING	/602.7	DI4	5	E60.4	E60.5	6	DI5	/603.1	FUSE 24V DC CONTROL VOLTAGE
Gassensor OK BAT 1-4	/680a.7	DI6	7	E60.6	E60.7	8	DI7	/680b.7	Gassensor OK BAT 5-8
Gassensor OK BAT 9-11	/680c.7	DI8	9	E61.0	E61.1	10	DI9	/635b.8	Shut-down to BESS
FUSE AND LIGHTNING PROTECTION	/684.9	DI10	11	E61.2	E61.3	12	DI11	/691.8	Fuse Exhaust Unit
Fuse Cooling Units	/691.9	DI12	13	E61.4	E61.5	14	DI13		
		DI14	15	E61.6	E61.7	16	DI15		
	/620.3	24VDC	L+			M	0VDC	/620.3	

-DI_22

/620.3

DI0	1	E60.0	E60.1	2	DI1
DI2	3	E60.2	E60.3	4	DI3
DI4	5	E60.4	E60.5	6	DI5
DI6	7	E60.6	E60.7	8	DI7
DI8	9	E61.0	E61.1	10	DI9
DI10	11	E61.2	E61.3	12	DI11
DI12	13	E61.4	E61.5	14	DI13
DI14	15	E61.6	E61.7	16	DI15
24VDC	L+			M	0VDC

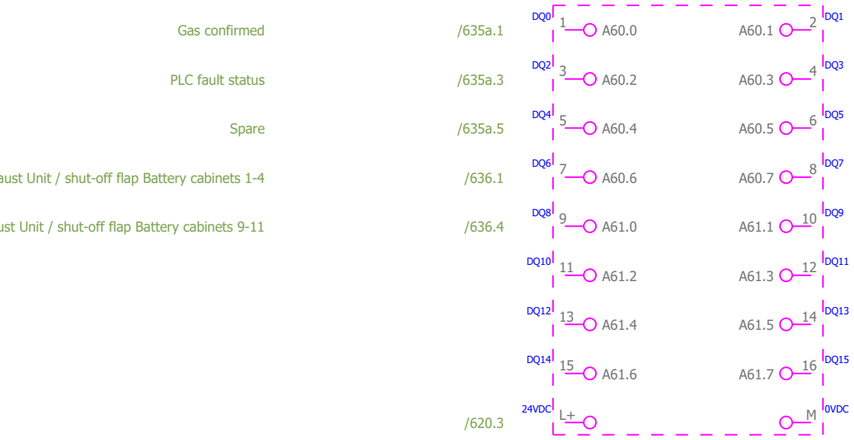
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0	1	2	3	4	5	6	7	8	9

-DO_21

/620.3



Gas confirmed	/635a.1	/635a.2	Smoke confirmed
PLC fault status	/635a.3	/635a.4	Thermal runaway
Spare	/635a.5	/635a.6	Spare
230V AC for Exhaust Unit / shut-off flap Battery cabinets 1-4	/636.1	/636.2	230V AC for Exhaust Unit / shut-off flap Battery cabinets 5-8
230V AC for Exhaust Unit / shut-off flap Battery cabinets 9-11	/636.4		
	/620.3	/620.4	

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Editor	Freqcon_JD			Statron	FREQCON	ET200SP DIGITAL OUTPUTS DO_21	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	14.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 623
Date								+	total: 498

-AI_21

/620.4



gas concentration BAT 1-4 /680a.2

gas concentration BAT 9-11 /680c.2

gas concentration BAT 1-4 /680a.2

gas concentration BAT 9-11 /680c.2

/620.4

/680b.2 gas concentration BAT 5-8

/680b.2 gas concentration BAT 5-8

/620.4

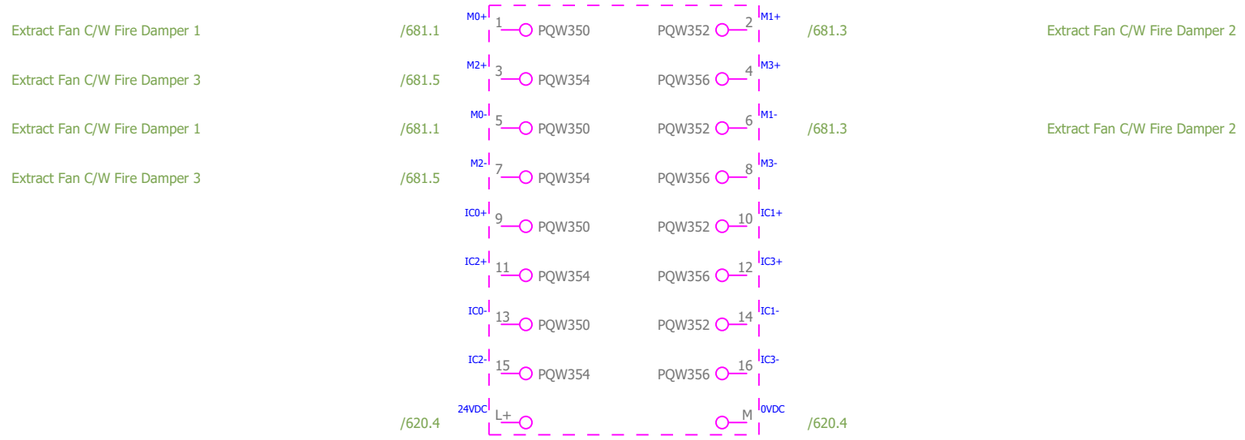
previous page: 623

next page: 625

Editor	Freqcon_JD			Statron	FREQCON	ET200SP ANALOG INPUTS AI_21	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	14.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 624
Date								+	total: 498

-AO_21

/620.4



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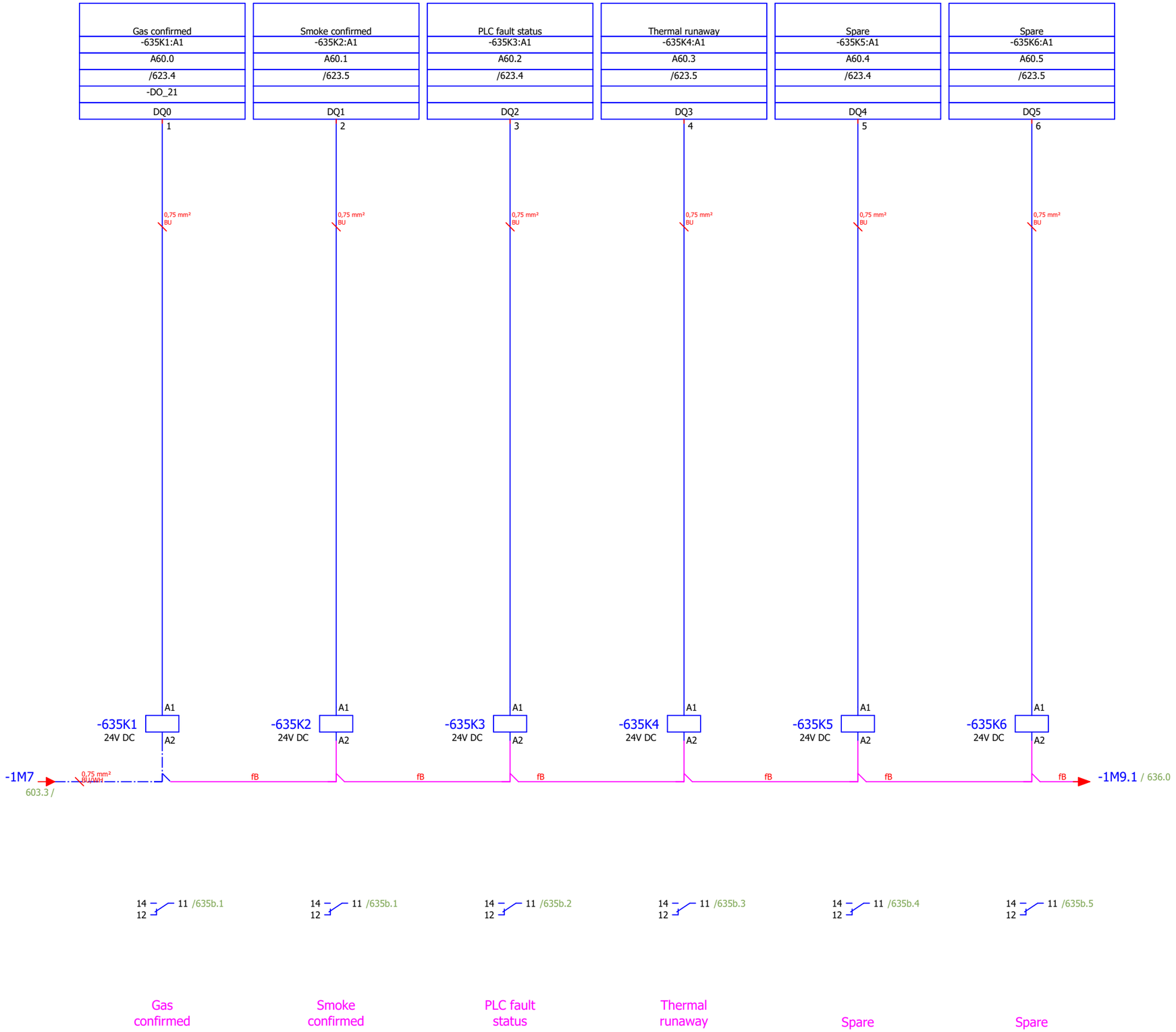
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Editor	Freqcon_JD			Statron	FREQCON	ET200SP ANALOG OUTPUTS AO_21	20241105_V1.2	= UNIT_03	Battery Container 2
Date	14.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

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0	1	2	3	4	5	6	7	8	9



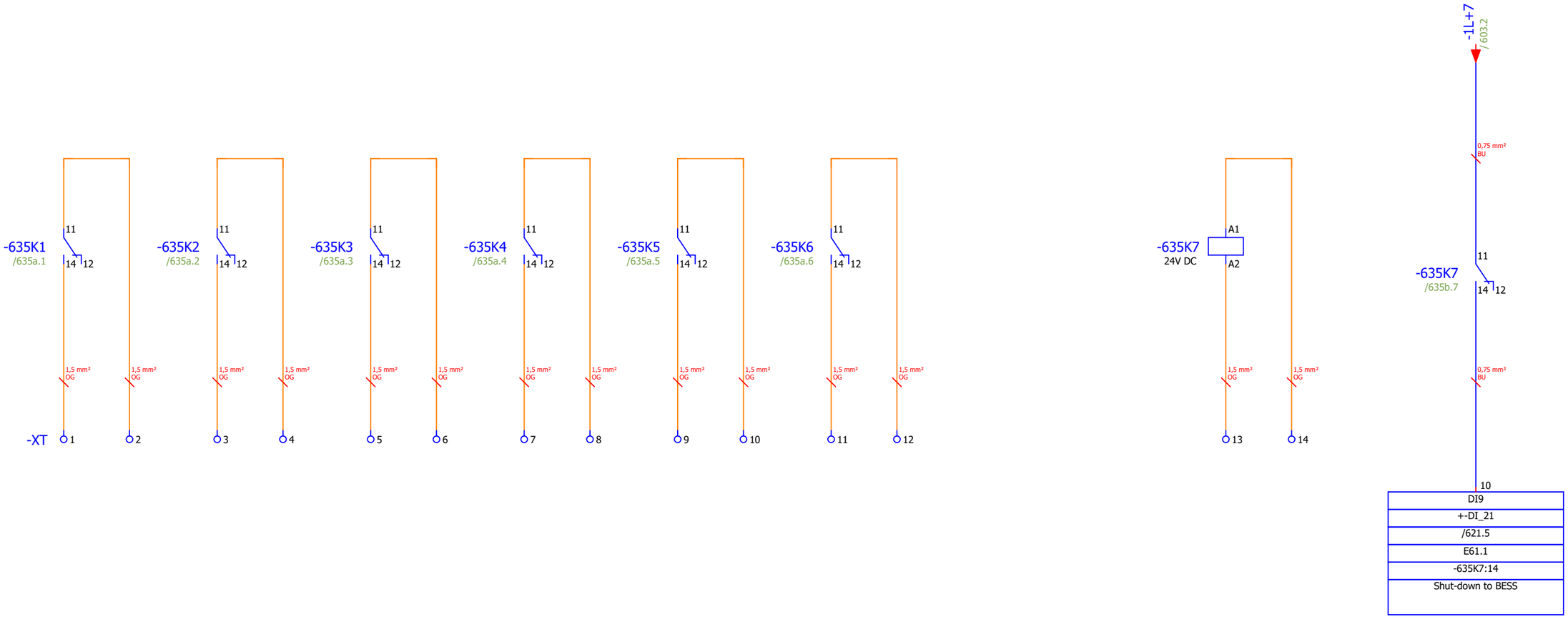
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Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS COMMUNICATION	20241105_V1.2	= UNIT_03	Battery Container 2
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

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Gas confirmed FGS

Smoke confirmed FGS

PLC fault status SIS

Thermal runaway SIS

Spare

Spare

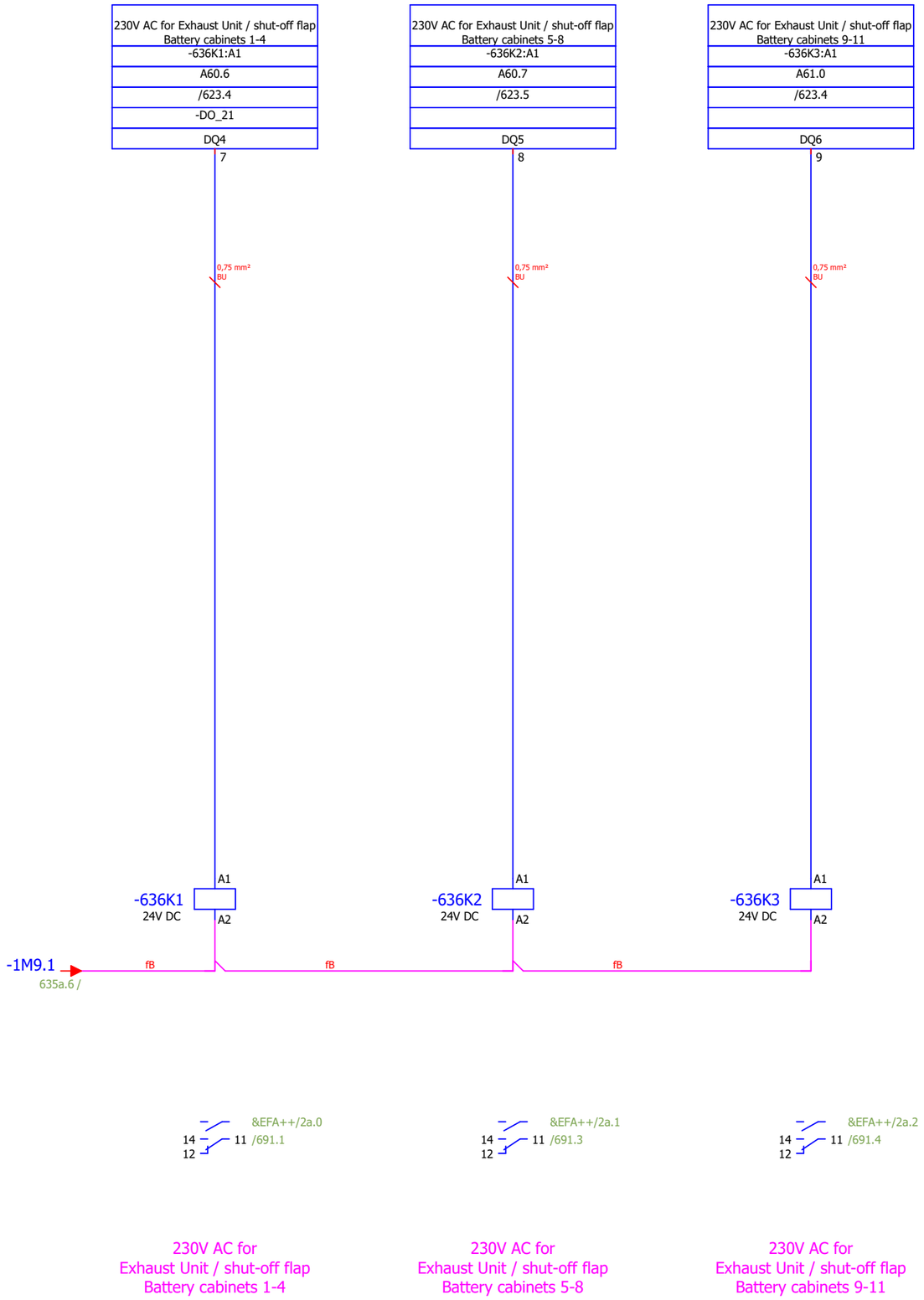
Shut-down to BESS

Shut-down to BESS

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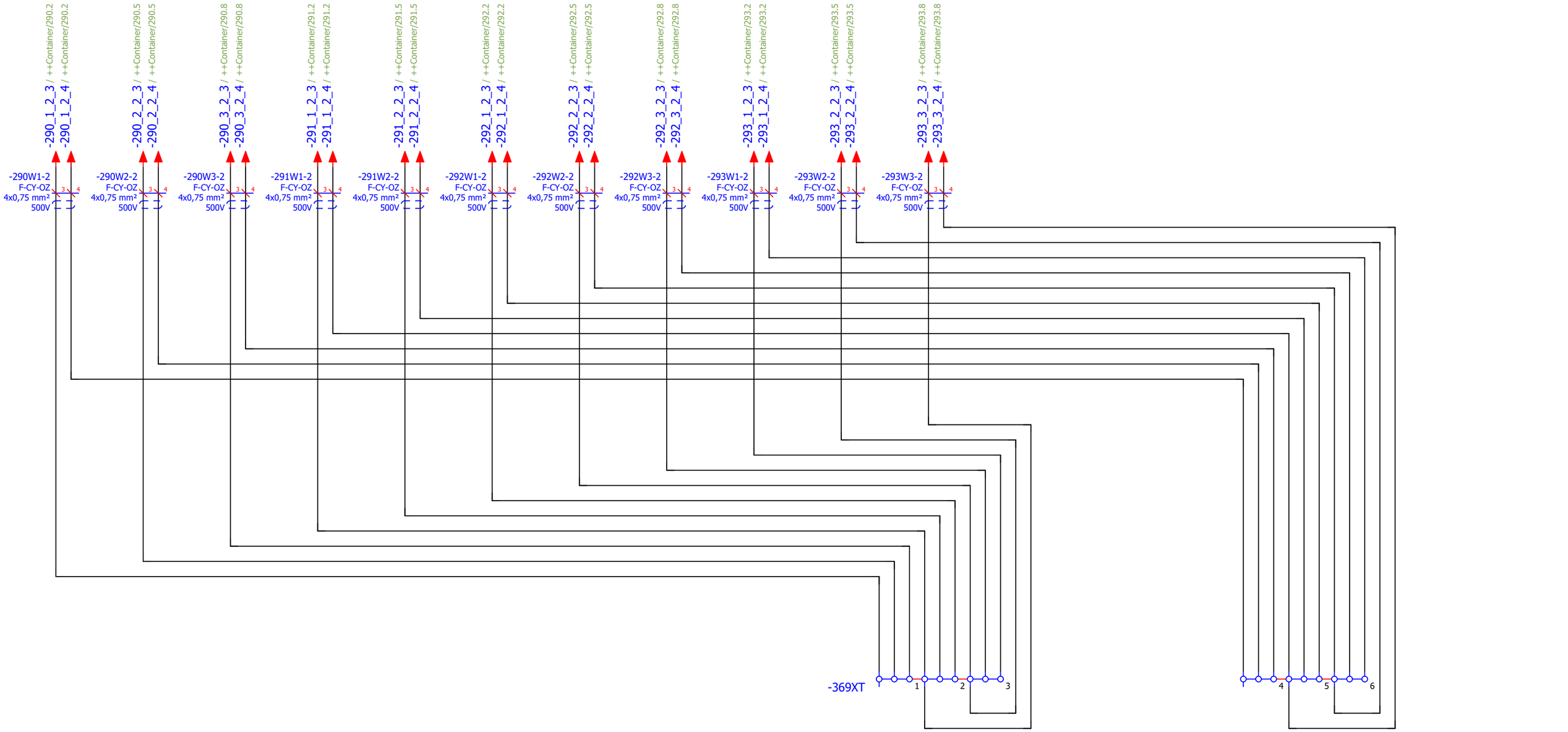
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Date	18.06.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet	page: 635b
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Editor	Freqcon_JD			Statron	FREQCON	OUTPUTS FIRE DAMPER	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 636
Date								+	total: 498



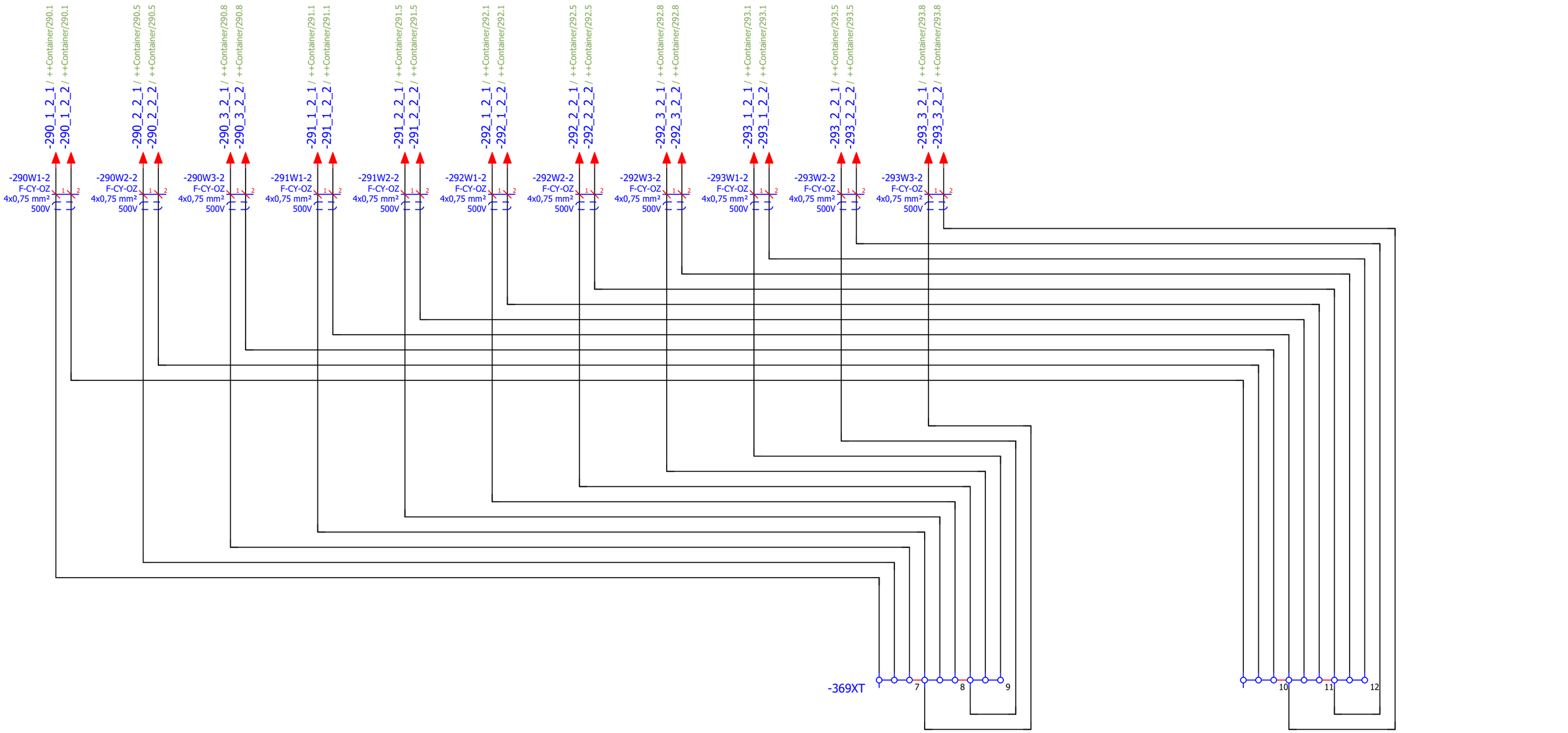
battery cabinet smoke detector
potential-free contacts
customer

battery cabinet smoke detector
potential-free contacts
customer

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Editor	Freqcon_JD			Statron	FREQCON	SMOKE POTENTIAL-FREE CONTACTS	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 669
Date								+	total: 498



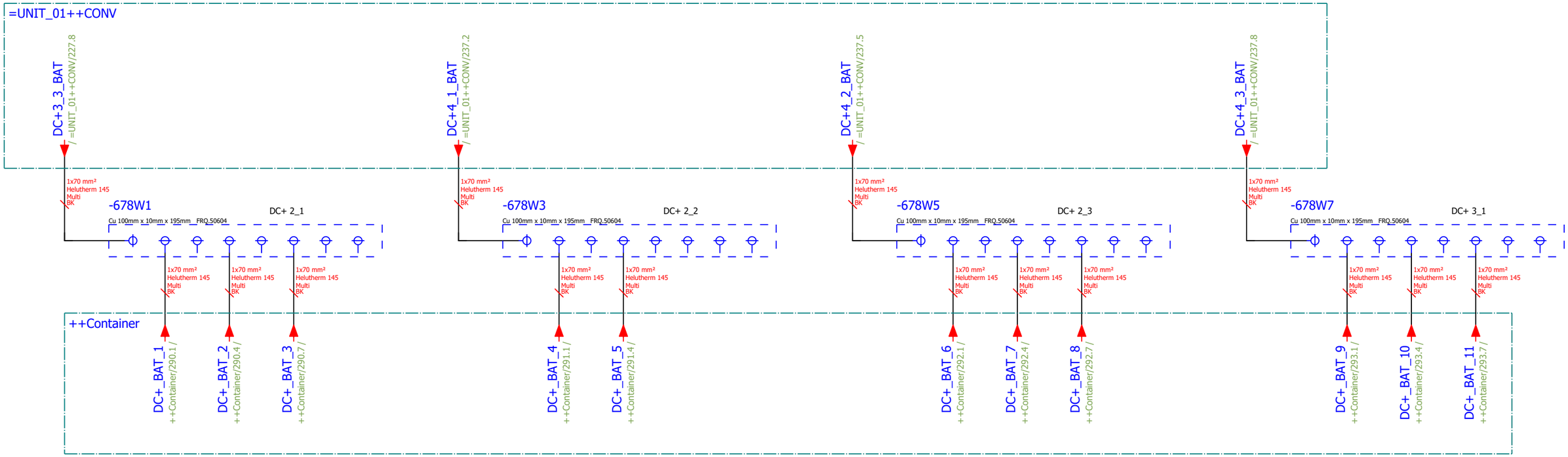
battery cabinet gas
potential-free contacts
customer

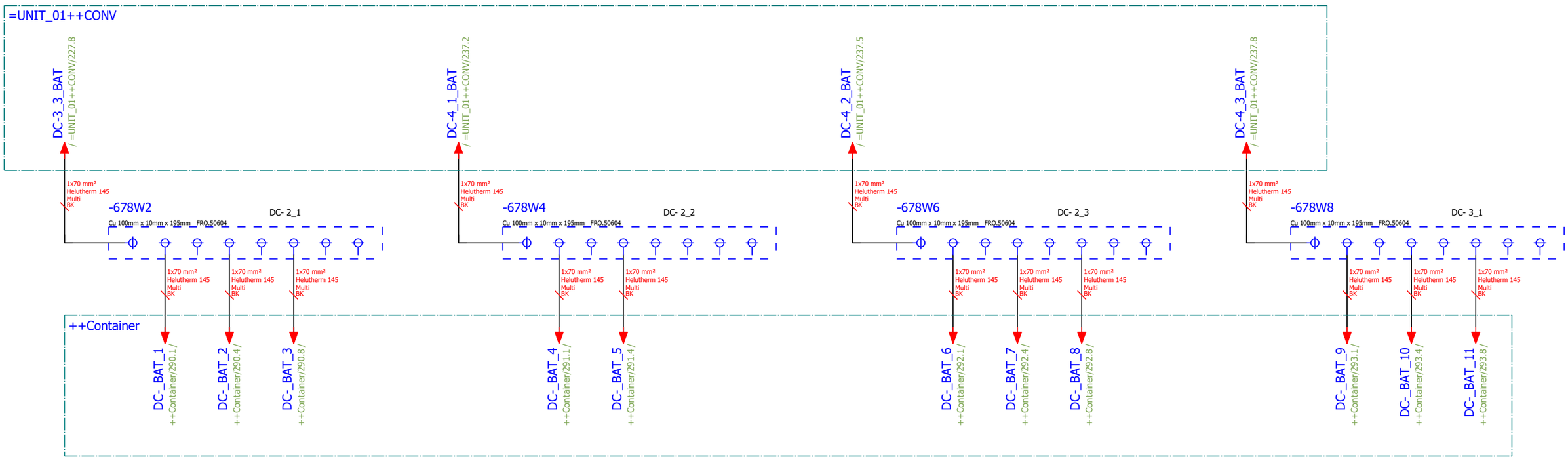
battery cabinet gas
potential-free contacts
customer

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Editor	Freqcon_JD			Statron	FREQCON	GAS POTENTIAL-FREE CONTACTS	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 670
Date								+	total: 498



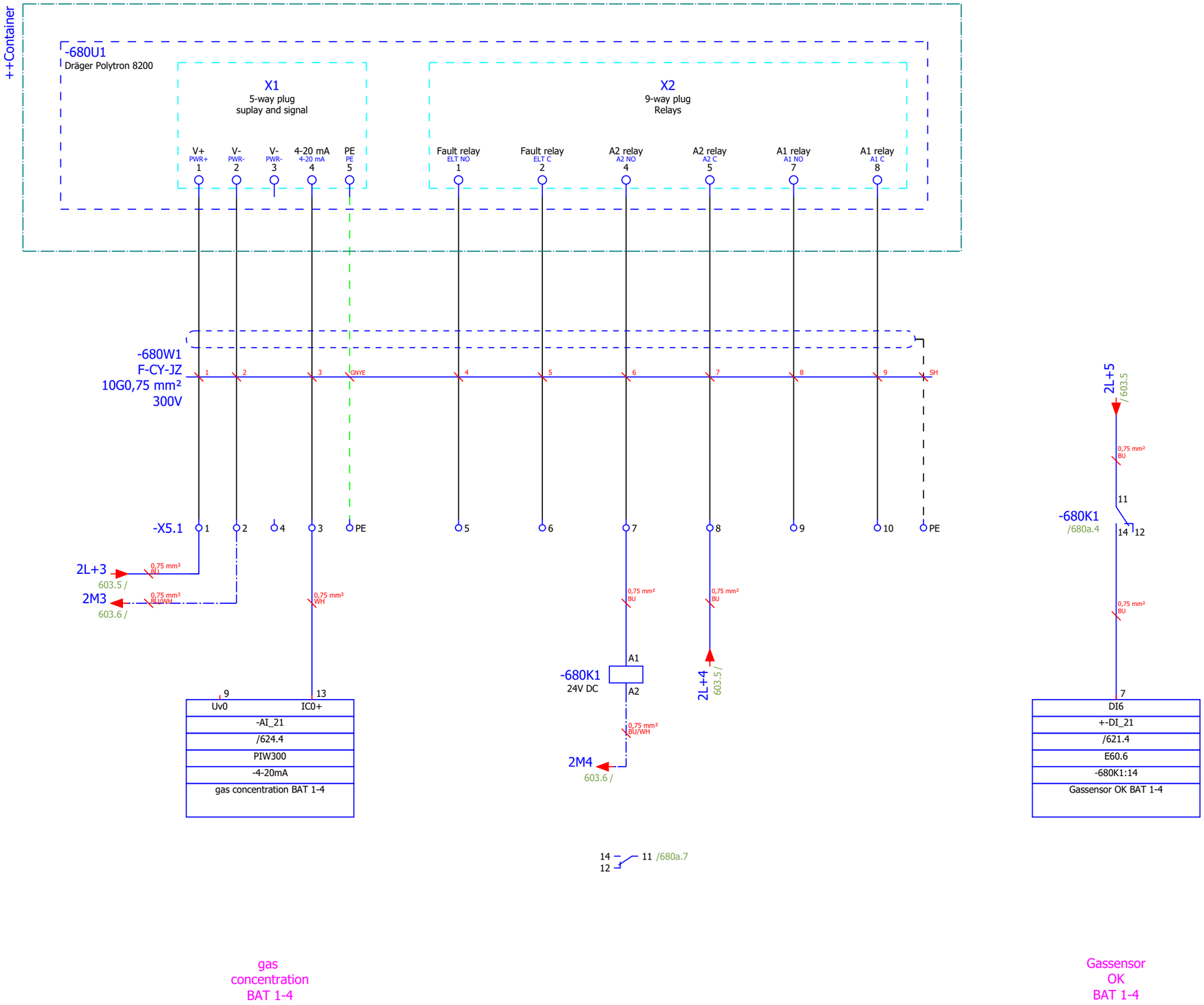


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Editor	Freqcon_JD			Statron	FREQCON	DC BATTERY CABINETS	20241105_V1.2	= UNIT_03	Battery Container 2
Date	18.06.2024							& EFS	Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet
Date								+	

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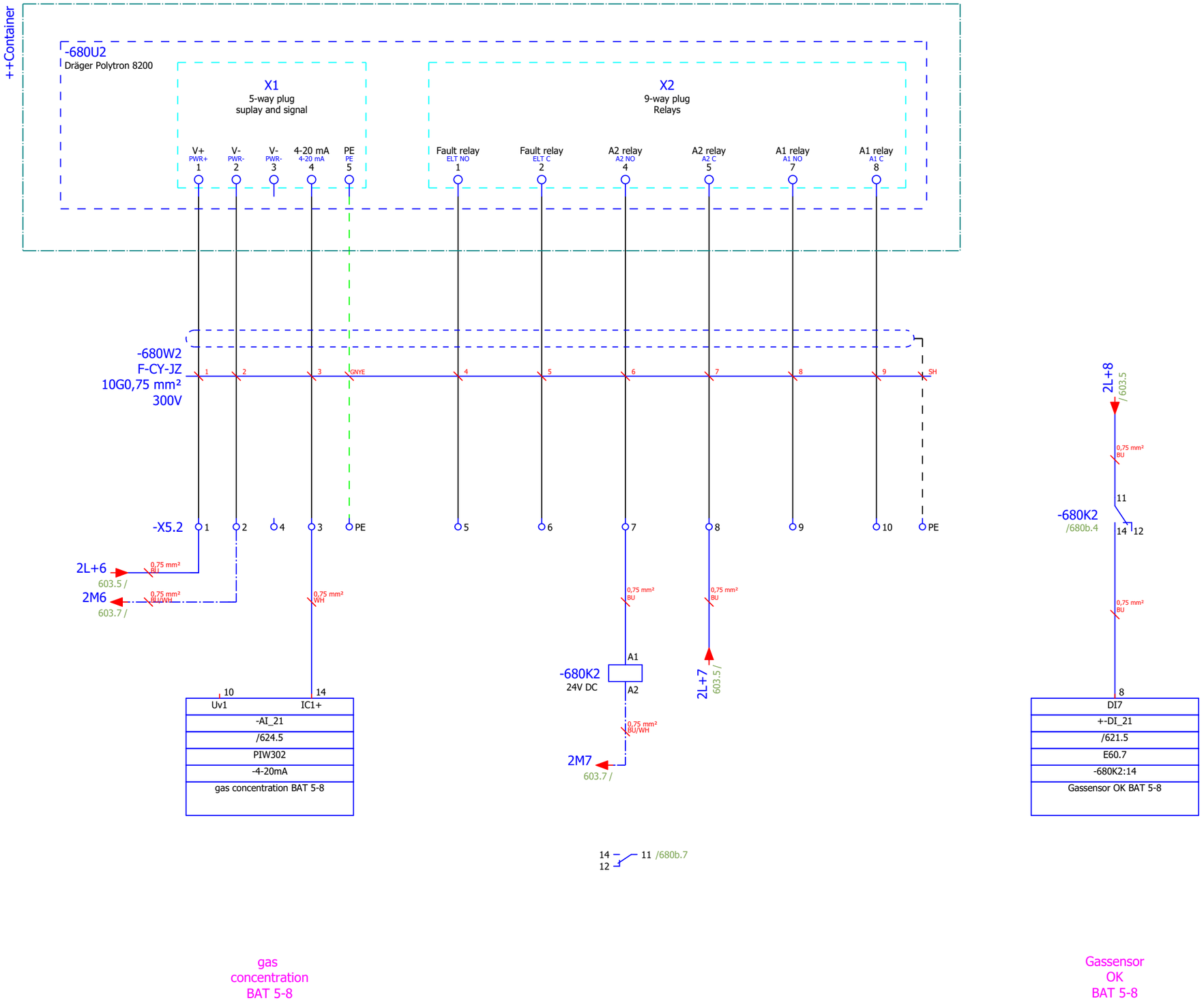
gas concentration BAT 1-4

Gassensor OK BAT 1-4

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Editor	Freqcon_JD			Statron	FREQCON	STATIONARY GAS DETECTOR BAT 1-4	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 680a
Date								+	total: 498



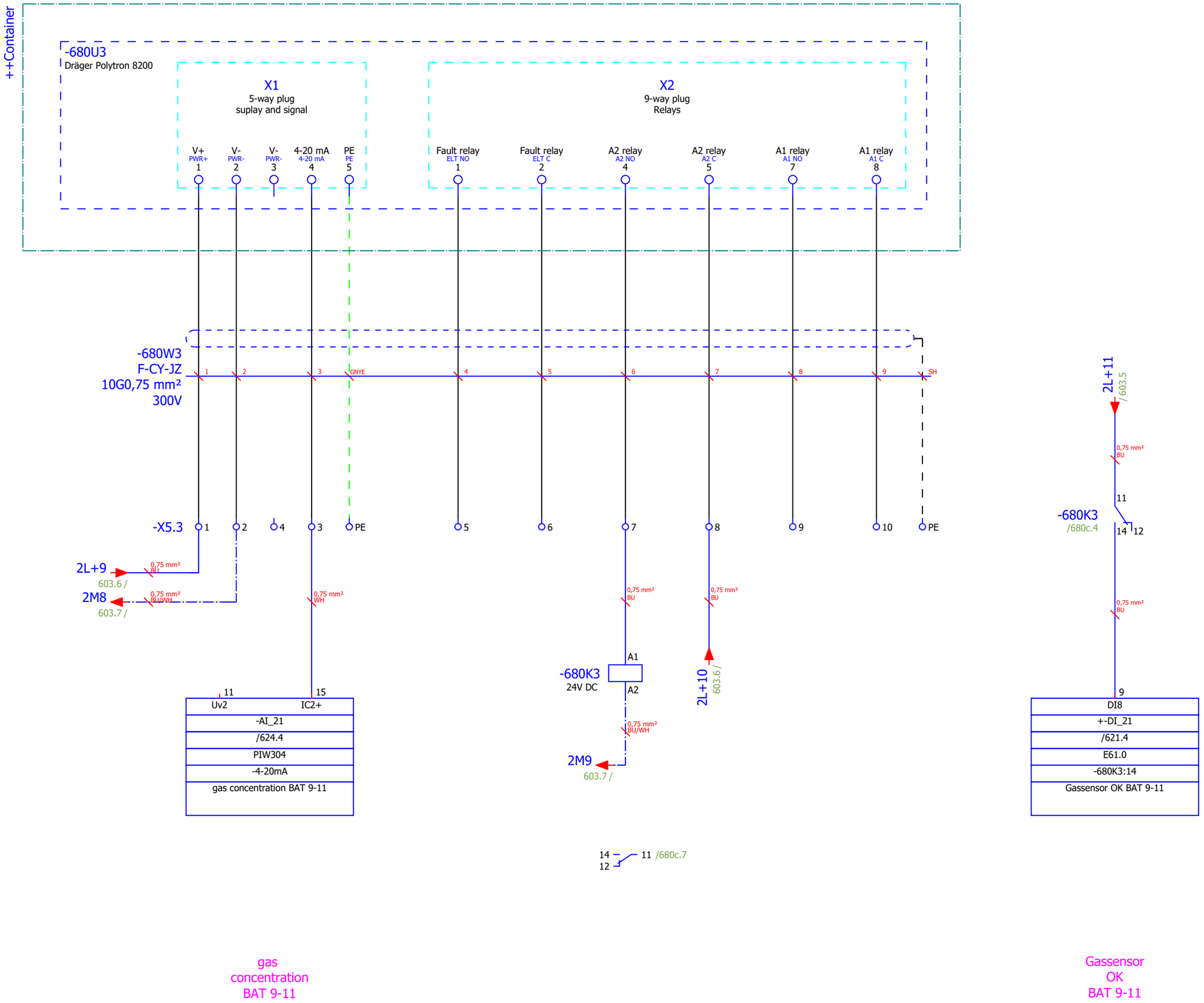
gas concentration BAT 5-8

Gassensor OK BAT 5-8

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Editor	Freqcon_JD			Statron	FREQCON	STATIONARY GAS DETECTOR BAT 5-8	20241105_V1.2	= UNIT_03 Battery Container 2
Date	18.06.2024							& EFS Circuit diagram
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet — page: 680b
Date								+ — total: 498



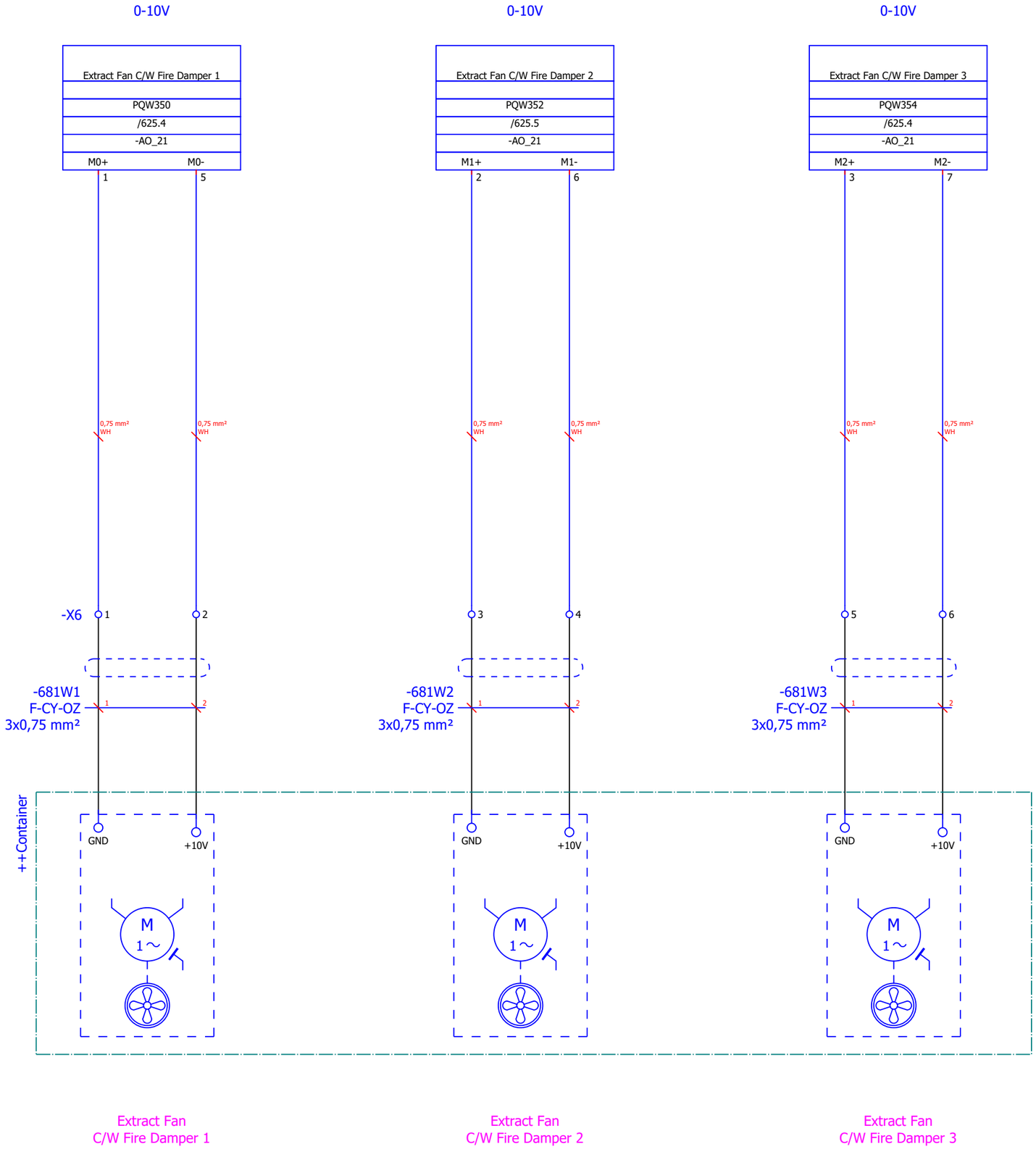
gas concentration BAT 9-11

Gassensor OK BAT 9-11

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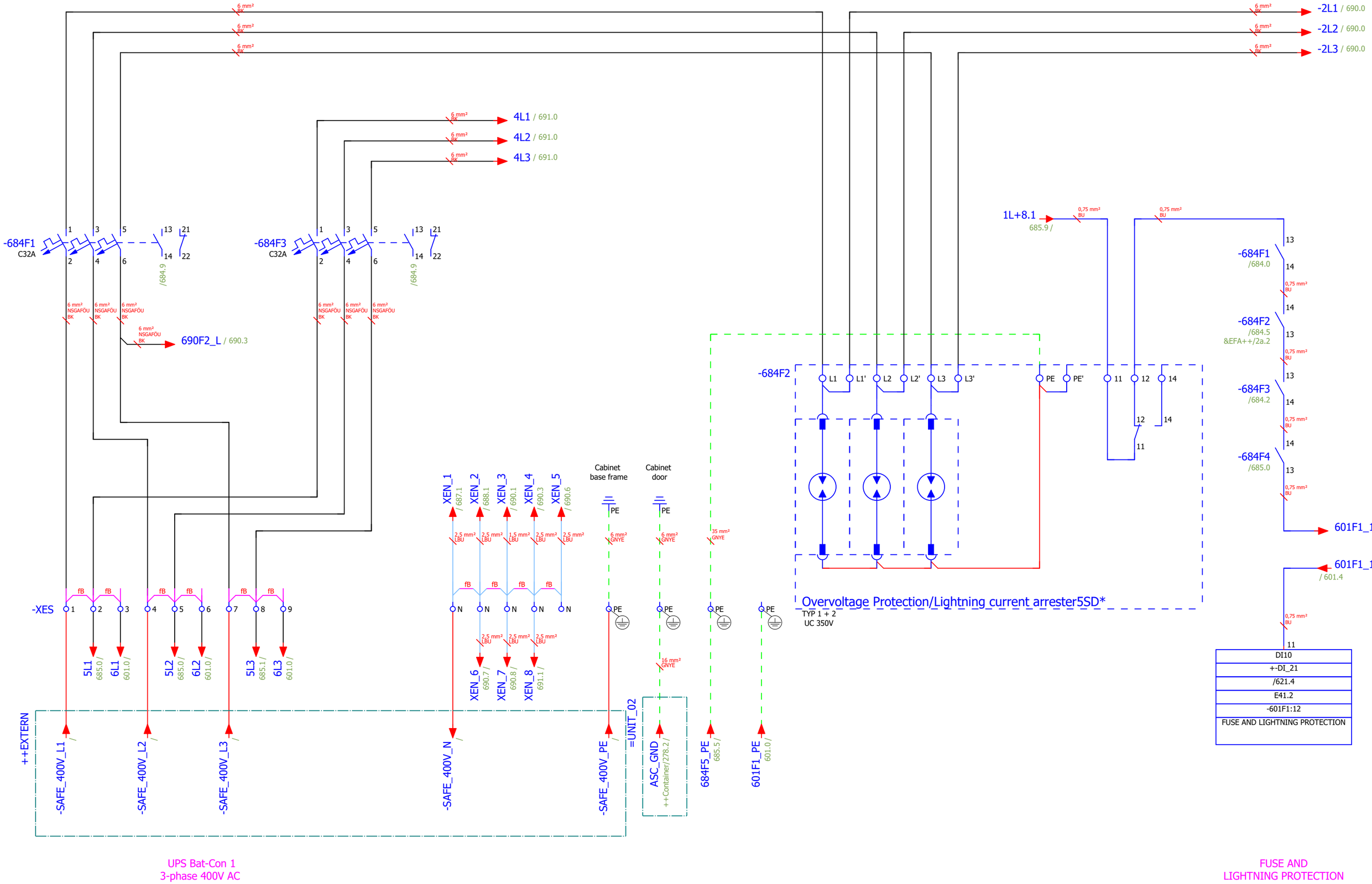
Editor	Freqcon_JD			Statron	FREQCON	STATIONARY GAS DETECTOR BAT 9-11	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 680c
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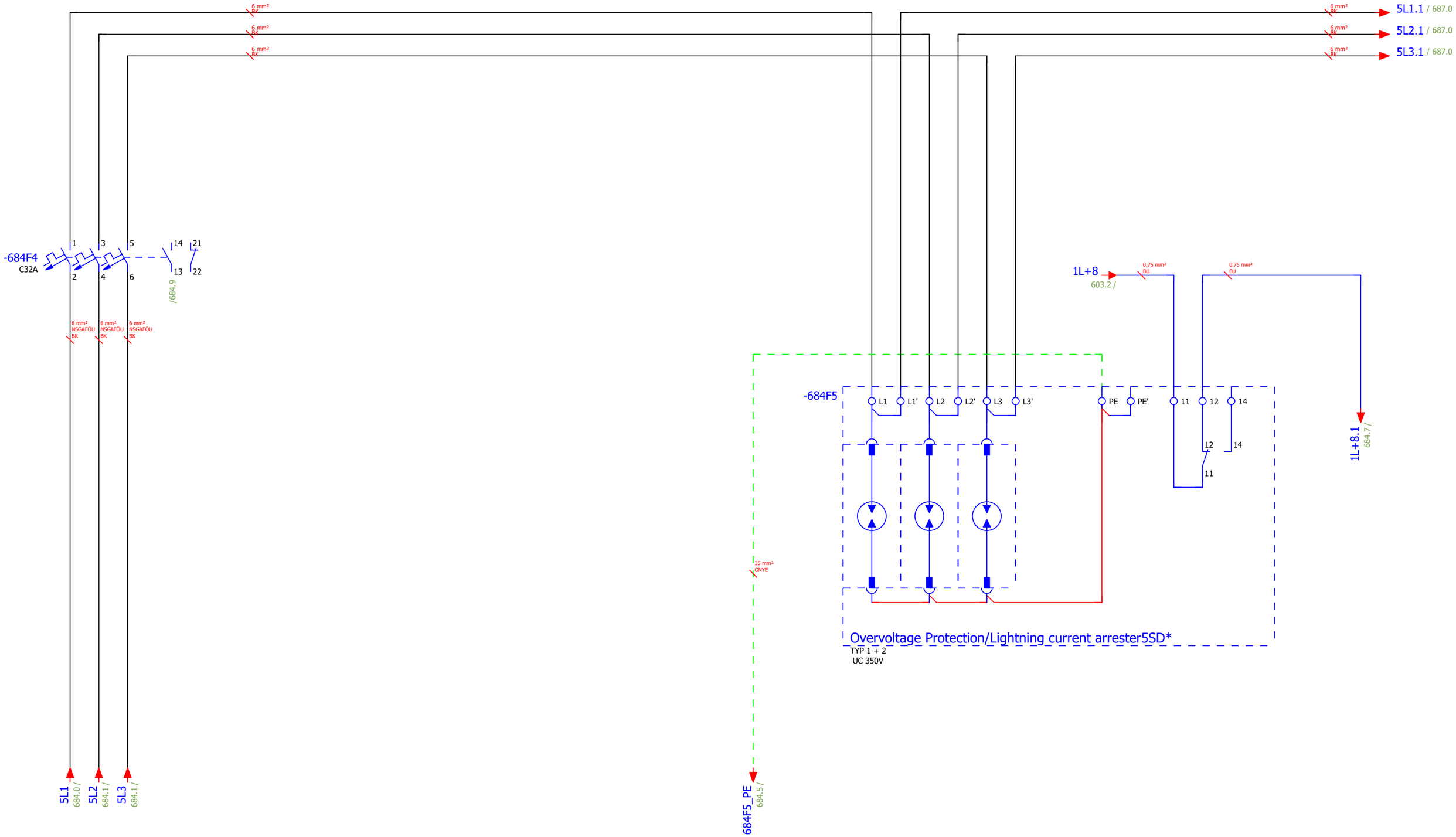
Editor	Freqcon_JD			Statron	FREQCON	EXTRACT FAN FIRE DAMPER	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	18.06.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 681
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Editor	Freqcon_DG			Statron	FREQCON	AUXILIARY SUPPLY 400V AC	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	05.11.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 684
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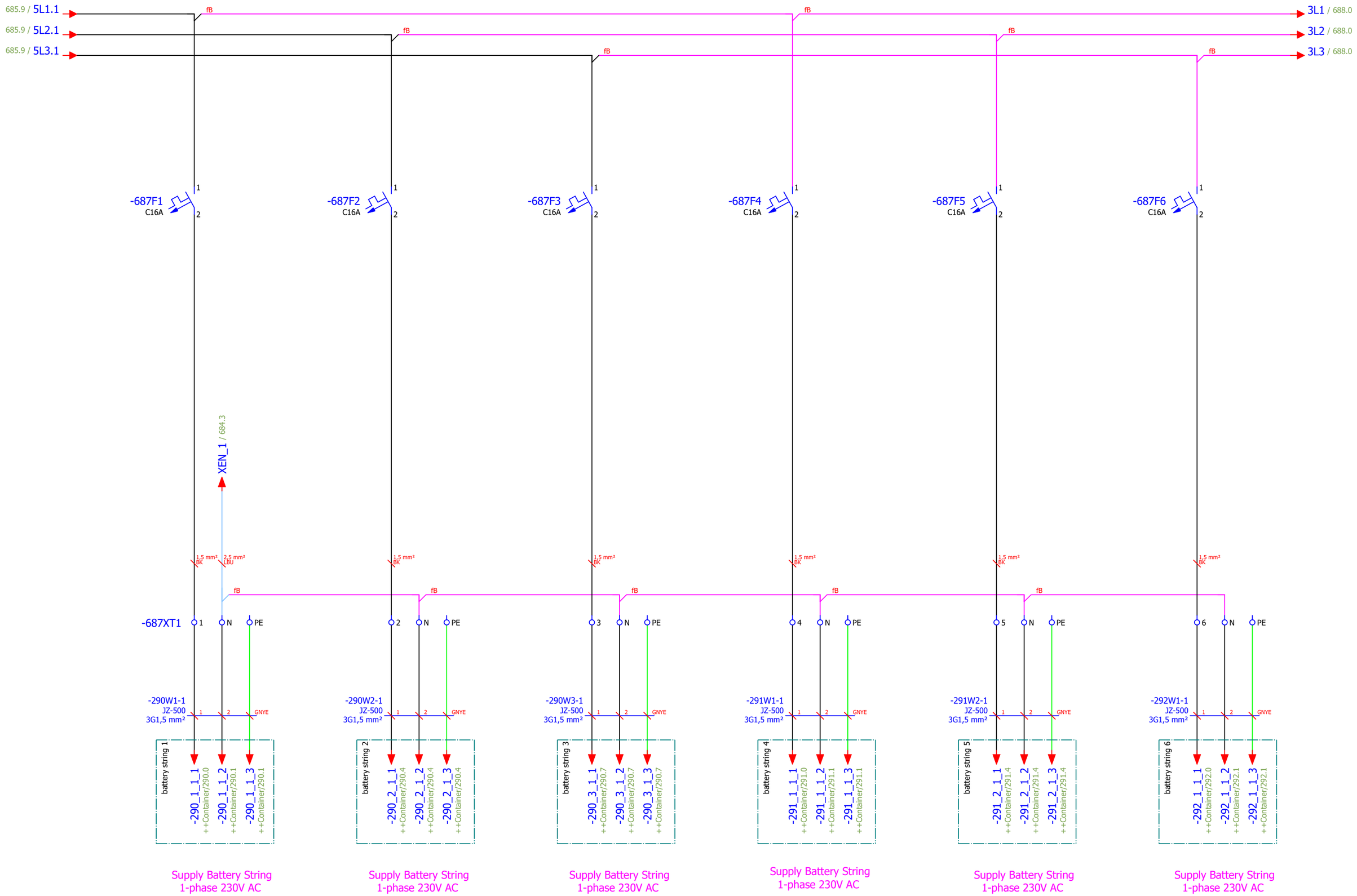


FUSE AND
LIGHTNING PROTECTION

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Editor	Freqcon_DG			Statron	FREQCON	AUXILIARY SUPPLY 400V AC	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	08.10.2024							& EFS Circuit diagram	
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Date	08.10.2024							& EFS Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 687
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687.9 / 3L1
687.9 / 3L2
687.9 / 3L3

fB

-688F1 C16A
-688F2 C16A
-688F3 C16A
-688F4 C16A
-688F5 C16A

XEN_2 / 684.3

1,5 mm² BK
2,5 mm² LBU

-687XT1 7 N PE
-687XT1 8 N PE
-687XT1 9 N PE
-687XT1 10 N PE
-687XT1 11 N PE

-292W2-1 JZ-500 3G1,5 mm²
-292W3-1 JZ-500 3G1,5 mm²
-293W1-1 JZ-500 3G1,5 mm²
-293W2-1 JZ-500 3G1,5 mm²
-293W3-1 JZ-500 3G1,5 mm²

1 2 GNYE

battery string 7
-292_2_1_1 ++Container/292.4
-292_2_1_2 ++Container/292.4
-292_2_1_3 ++Container/292.4

battery string 8
-292_3_1_1 ++Container/292.7
-292_3_1_2 ++Container/292.7
-292_3_1_3 ++Container/292.7

battery string 9
-293_1_1_1 ++Container/293.0
-293_1_1_2 ++Container/293.1
-293_1_1_3 ++Container/293.1

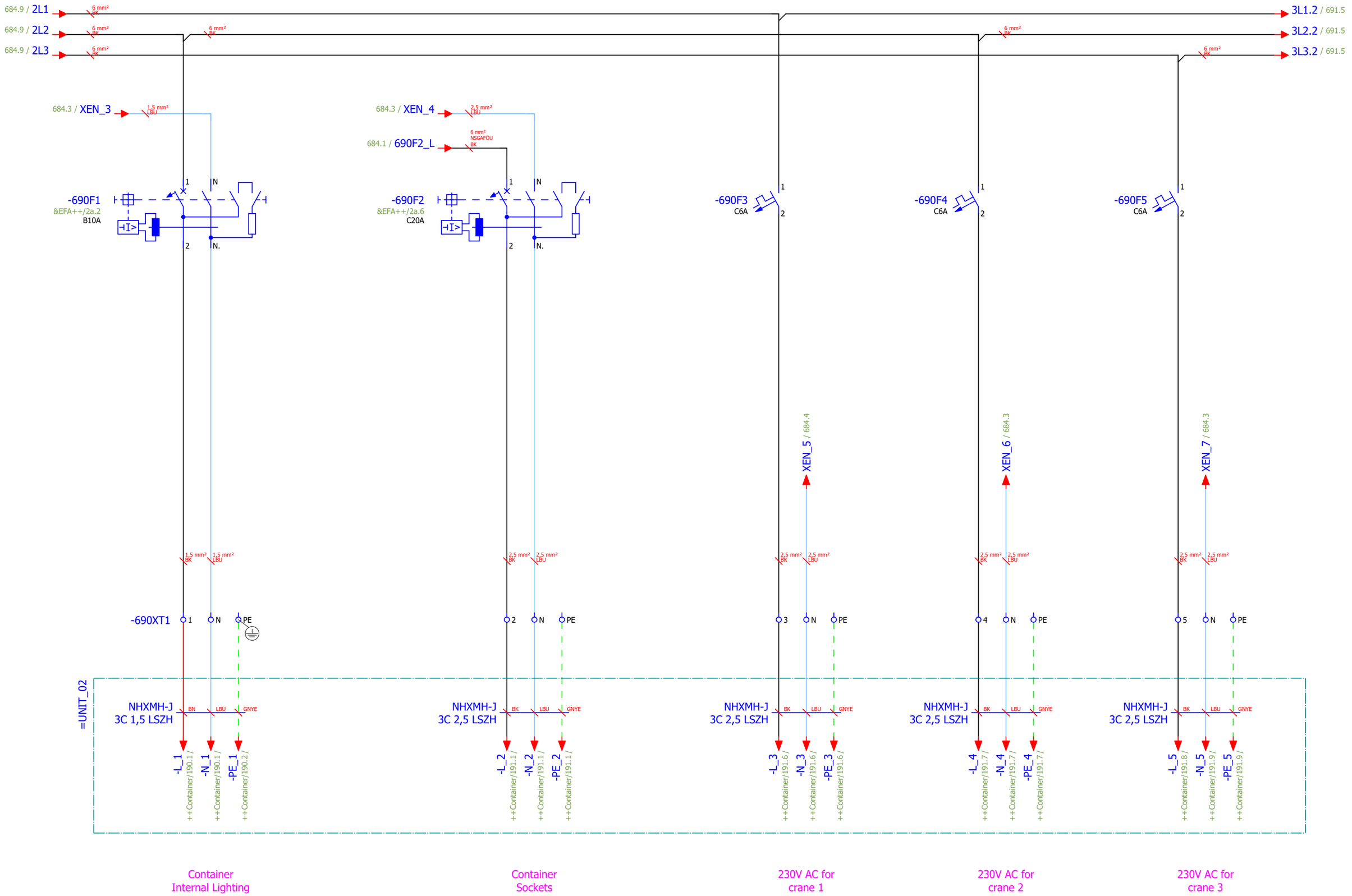
battery string 10
-293_2_1_1 ++Container/293.4
-293_2_1_2 ++Container/293.4
-293_2_1_3 ++Container/293.4

battery string 11
-293_3_1_1 ++Container/293.7
-293_3_1_2 ++Container/293.7
-293_3_1_3 ++Container/293.7

Supply Battery String 1-phase 230V AC

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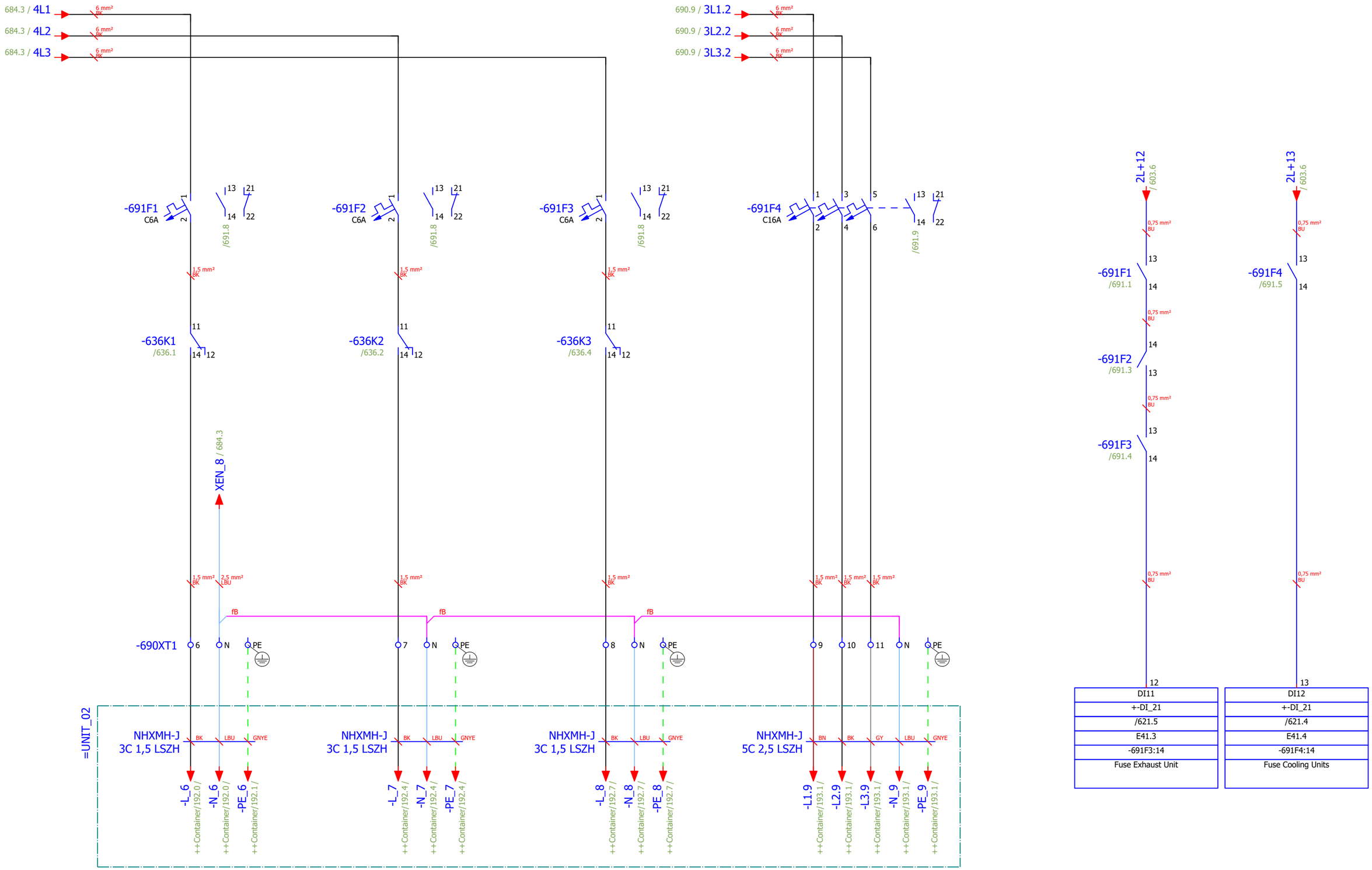
Editor	Freqcon_DG			Statron	FREQCON	AUXILIARY SUPPLY 400V / 230V AC DISTRIBUTION	20241105_V1.2	= UNIT_03 Battery Container 2	
Date	08.10.2024							& EFS Circuit diagram	
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Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC auxillary cabinet	page: 690
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Date	05.11.2024							& EFS	Circuit diagram	
Proved by				Shell Crosswind BESS FQ 1MW 5MWh Offshore			10354_23A2007	++ ASC	auxillary cabinet	page: 691
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