

# HYBEKO SHORE POWER MACHINE

Electrical schematic

Model: SP S-45XC Gen2

S.nr: SP45E-30004

**HYBEKO**

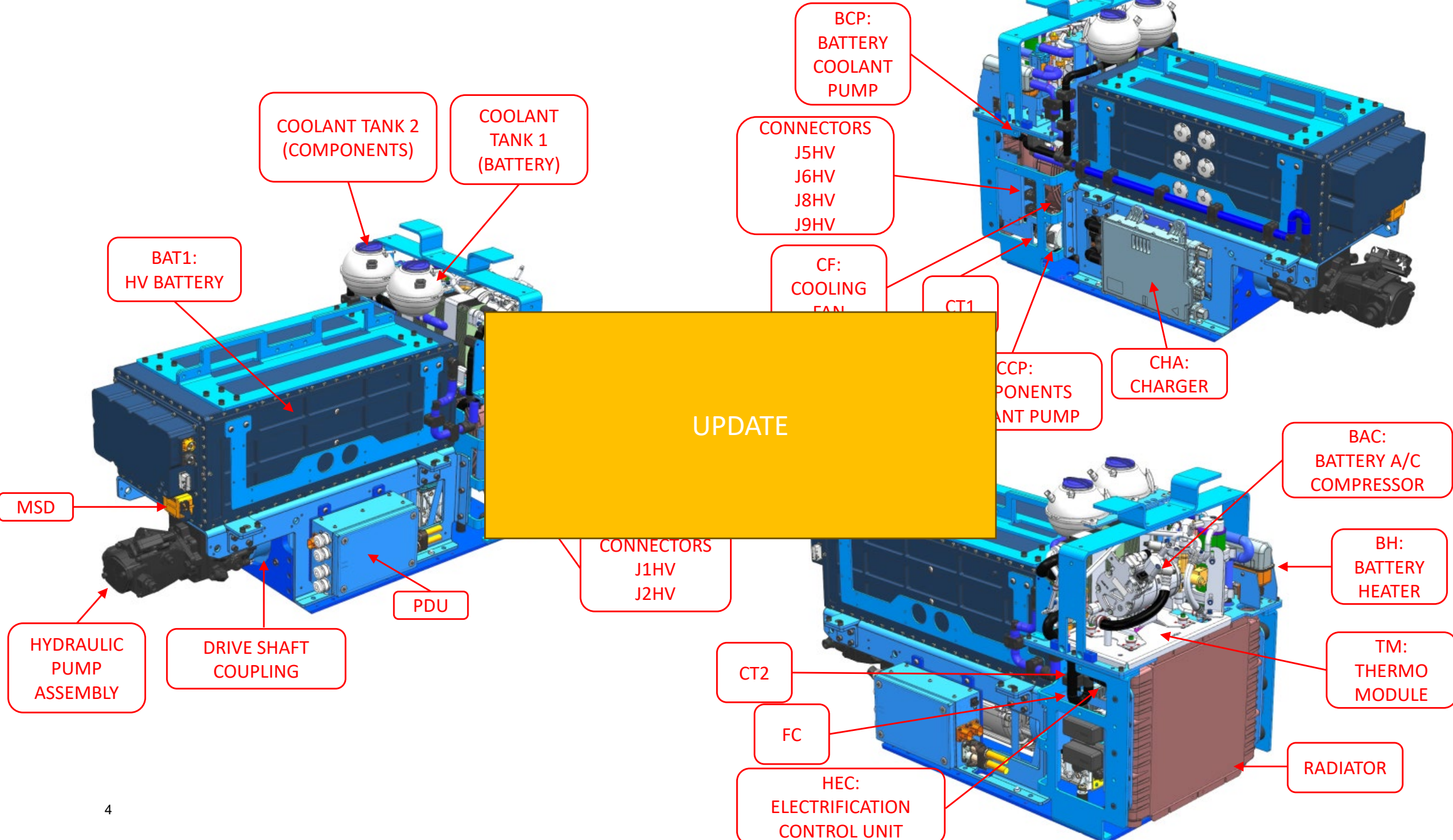
The logo for HYBEKO, featuring the brand name in a bold, red, sans-serif font. A thick blue horizontal bar is positioned directly beneath the text.

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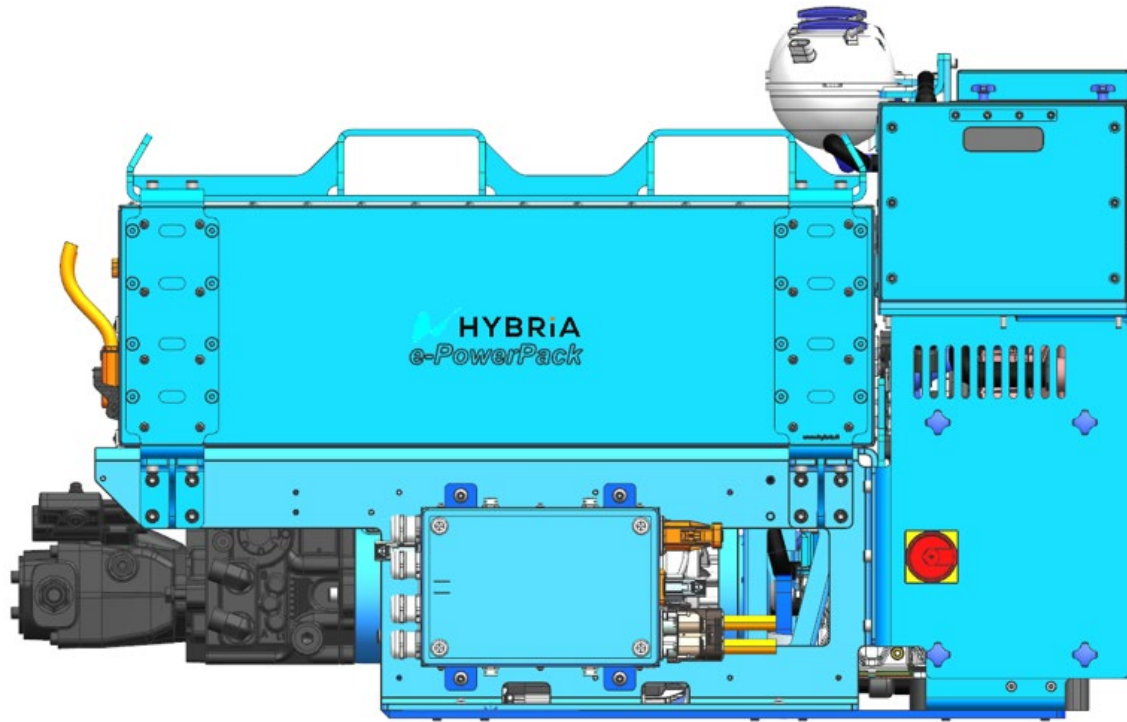
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# Electric power unit

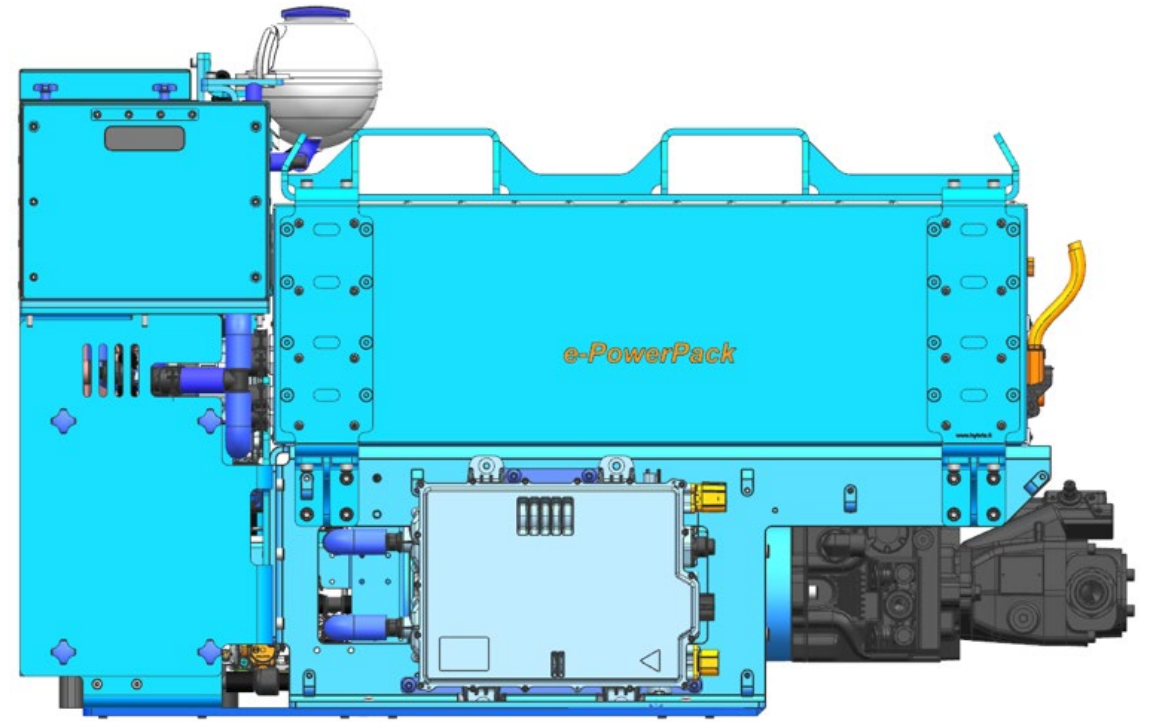
# Electric Power Unit assembly drawing – component identification



# Electric Power Unit assembly drawing

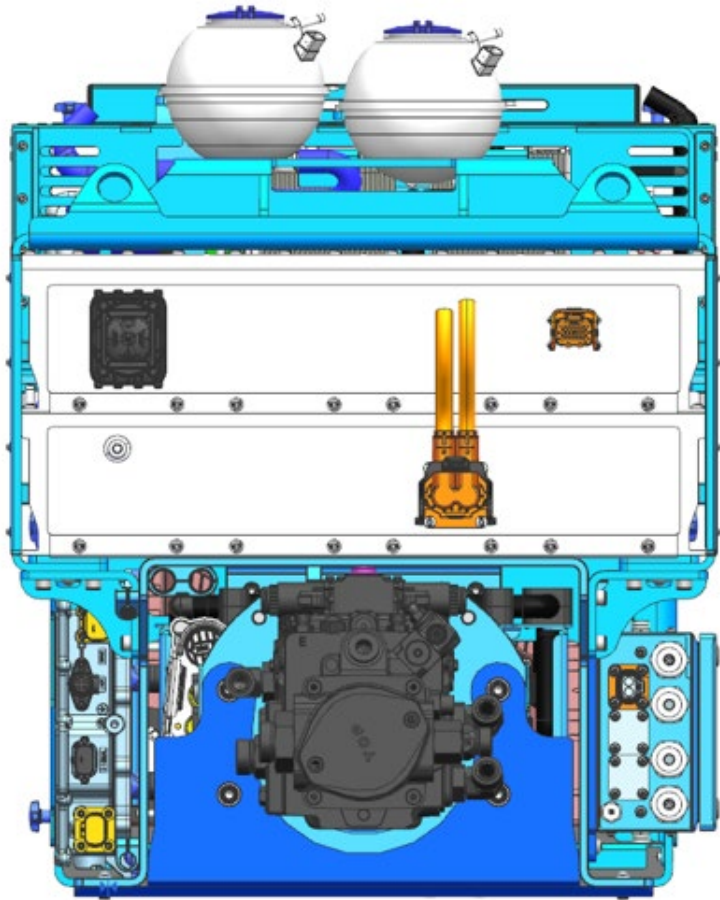


LEFT SIDE VIEW

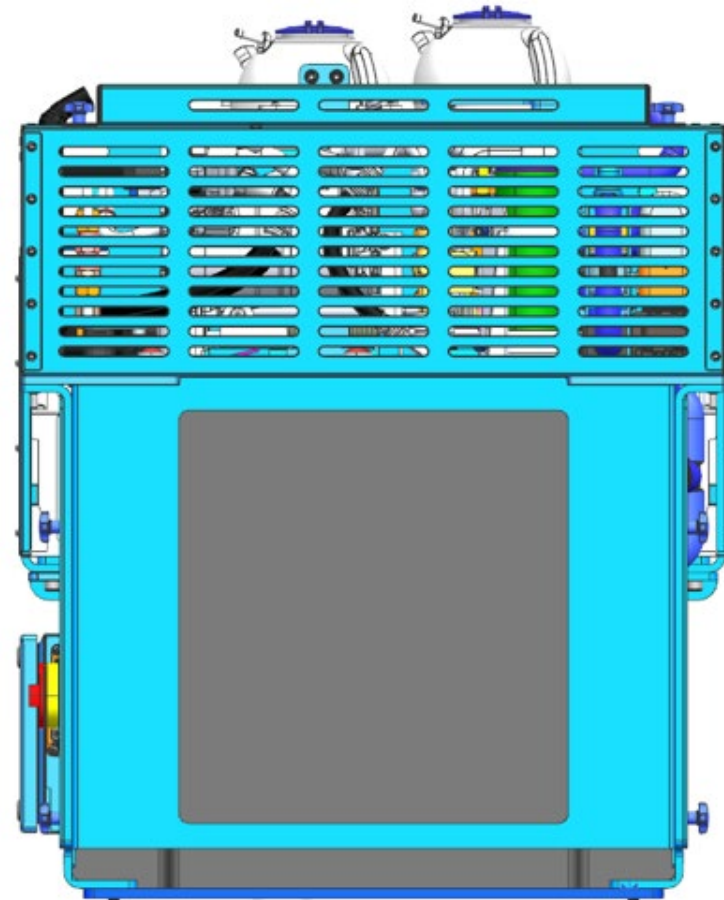


RIGHT SIDE VIEW

# Electric Power Unit assembly drawing

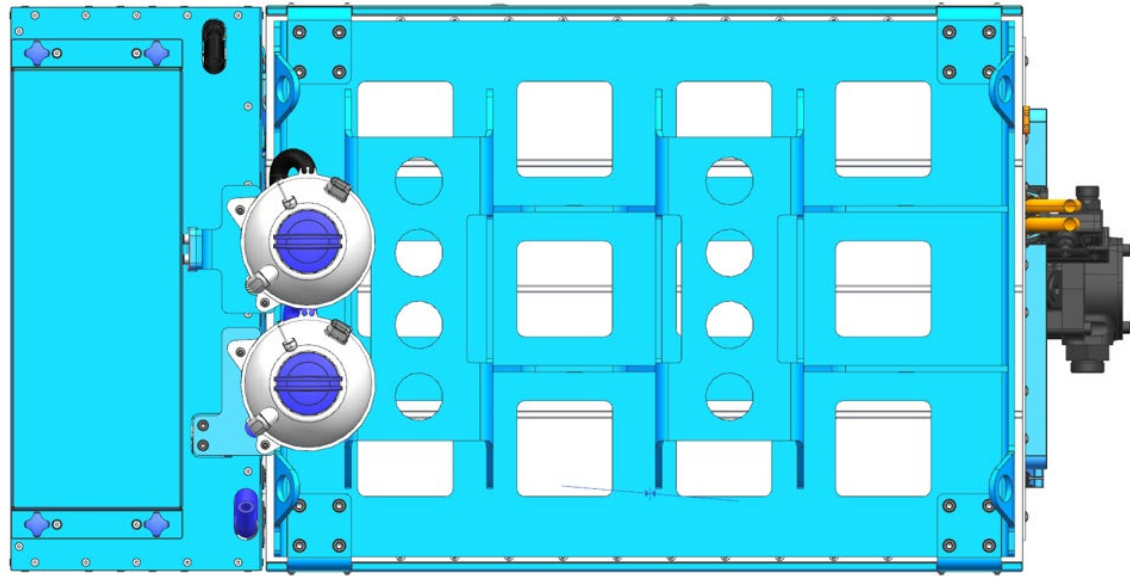


FRONT SIDE VIEW

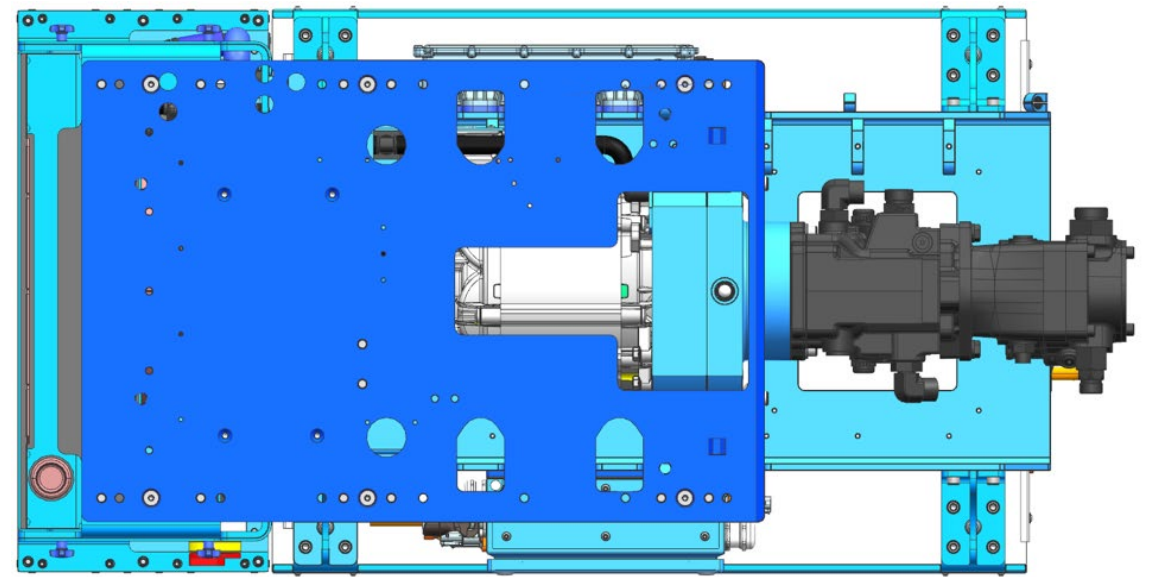


REAR SIDE VIEW

# Electric Power Unit assembly drawing



TOP SIDE VIEW




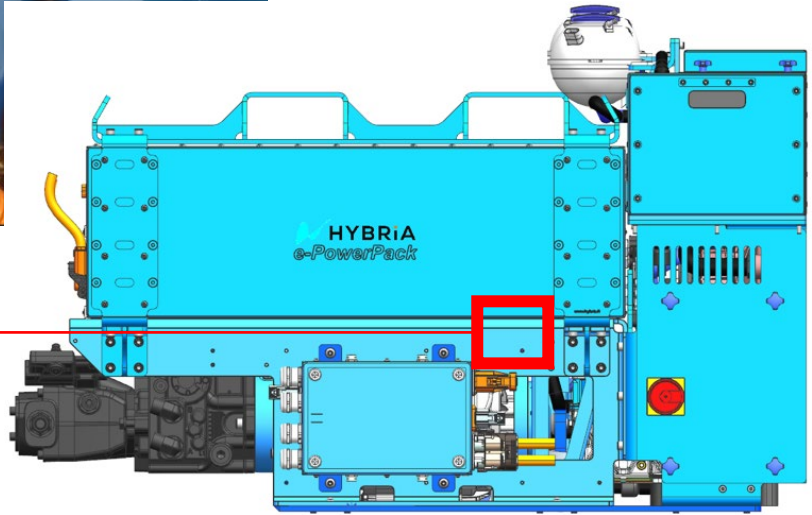
BOTTOM SIDE VIEW

# PRODUCT LABEL



EXAMPLE LABEL

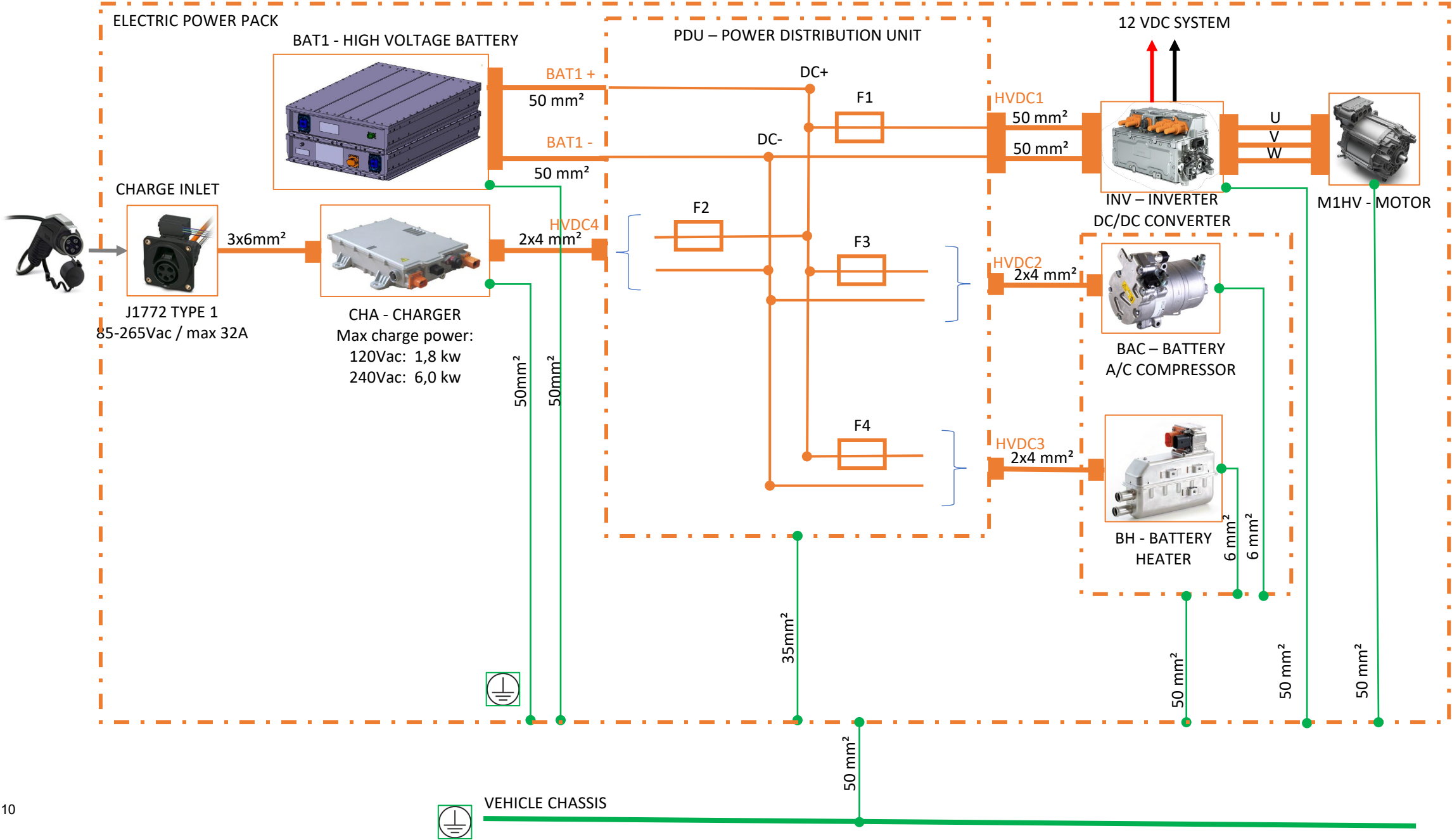
	<b>BATTERY:</b> Li-ion 35 kWh Vnom 350 Vdc (335-395 Vdc) Battery fuse 300 A Battery lifetime: 8 years
	<b>CHARGER:</b> Input 85-265 Vac, 32 A Connector SAE J1772 Type 1
<b>ELECTRIC POWER UNIT</b> Product code: A211108-001B Serial No: 004-20240504-002	<b>MECHANICAL POWER:</b> 55 kW <b>MASS:</b> 684 kg
<b>Manufacturer:</b> Hybria Ltd. <b>WWW.HYBRiA.FI</b>	<b>OPERATING TEMP:</b> -30 - 50 °C <b>STORAGE:</b> 20 ±5 °C - SOC 20-60%





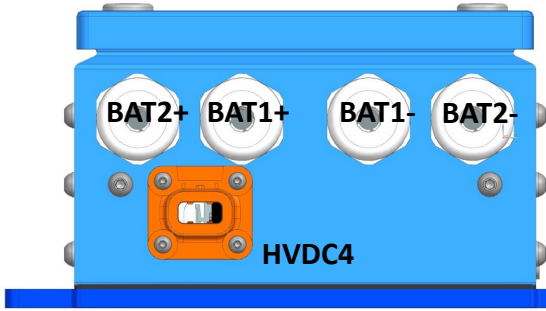
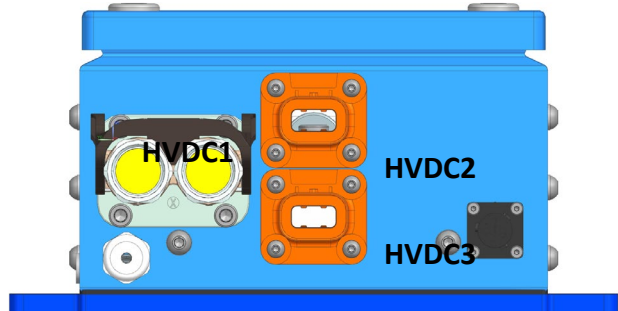
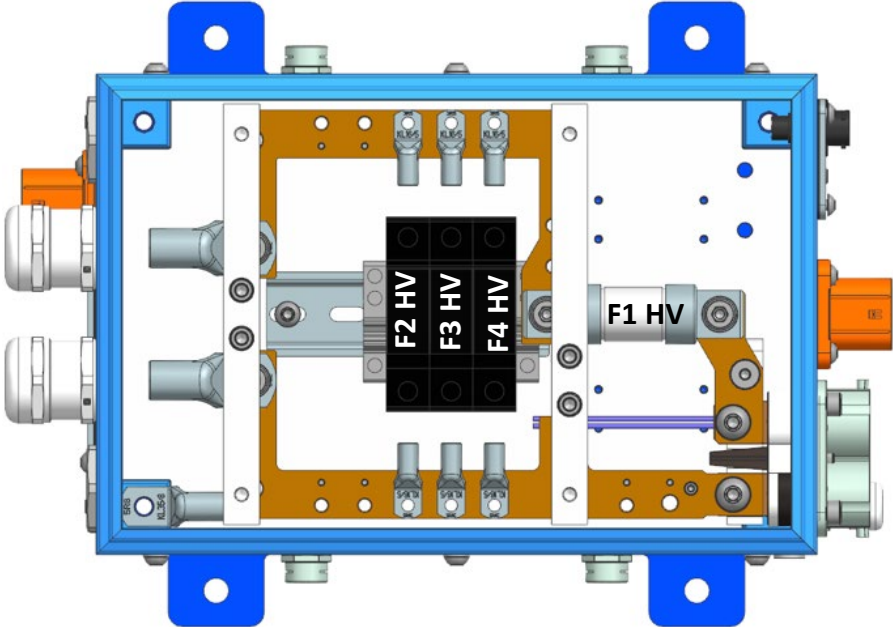
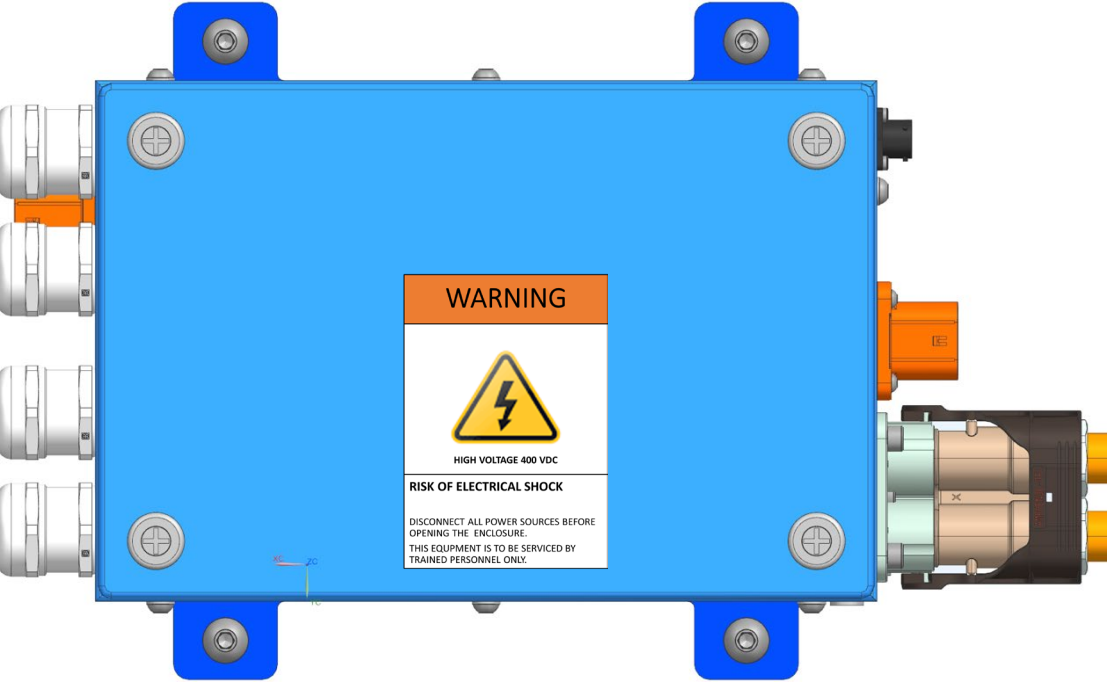
# HIGH VOLTAGE SYSTEM

# HIGH VOLTAGE SYSTEM OVERVIEW



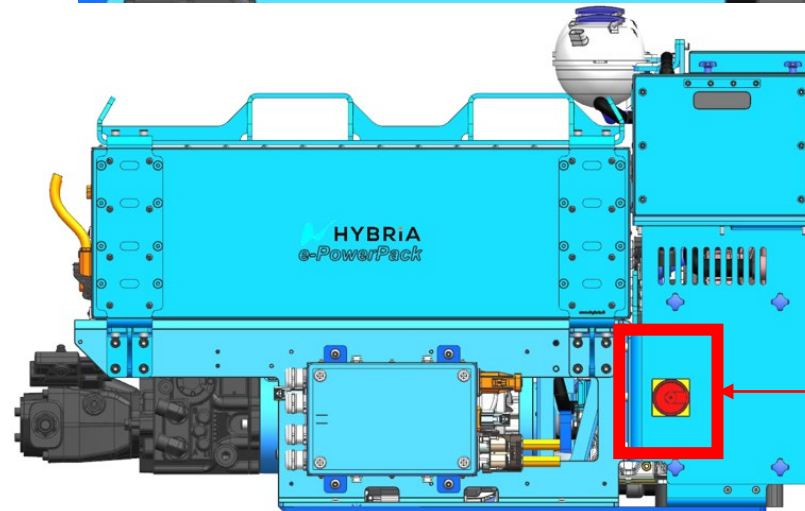
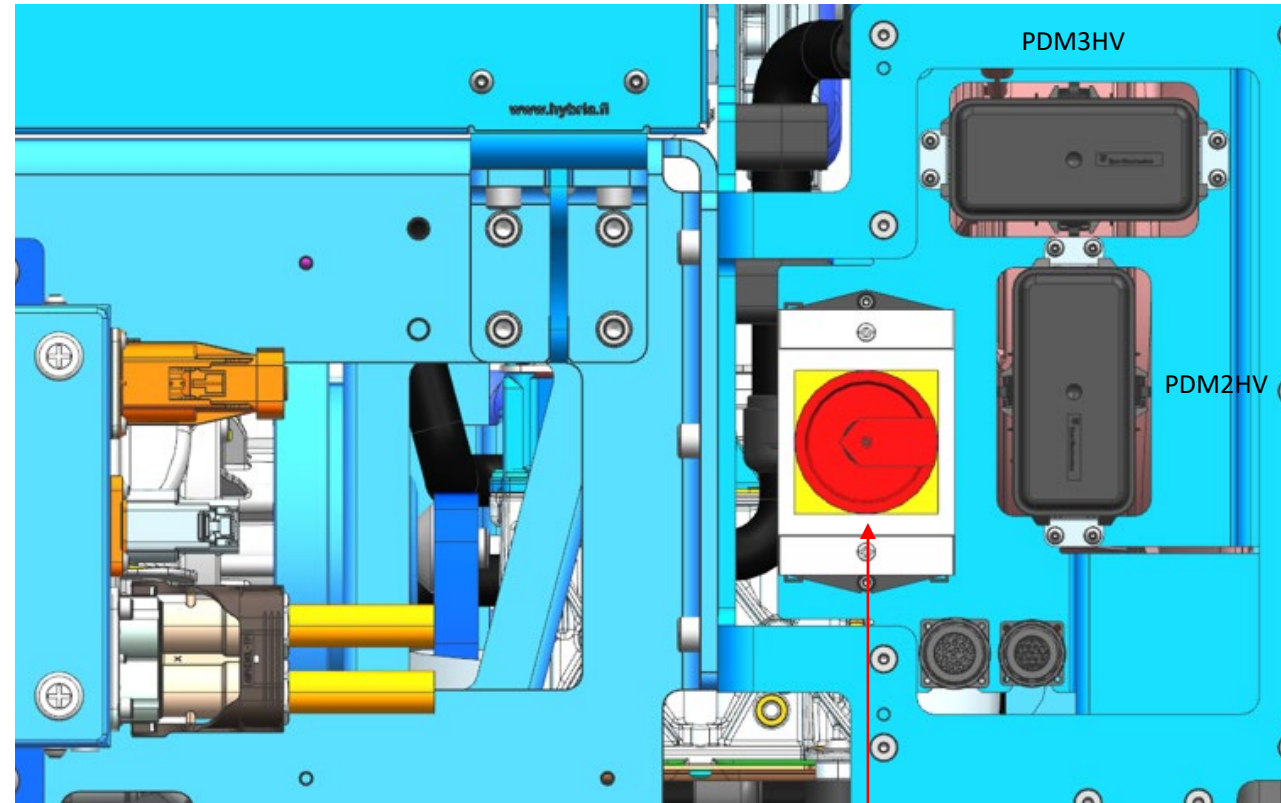
# PDU – Power distribution unit

FUSE No.	FUNCTION	RATING	COMPONENT
F1HV	Inverter	250A	Mersen MEV50A250-25G
F2HV	Charger	25A	Mersen MEV100C25
F3HV	HV compressor	25A	Mersen MEV100C25
F4HV	Battery heater	25A	Mersen MEV100C25



**BATTERY CONNECTIONS**  
 BAT2+ and BAT2- cable glands are installed only if the secondary HV battery will be used otherwise plugged,

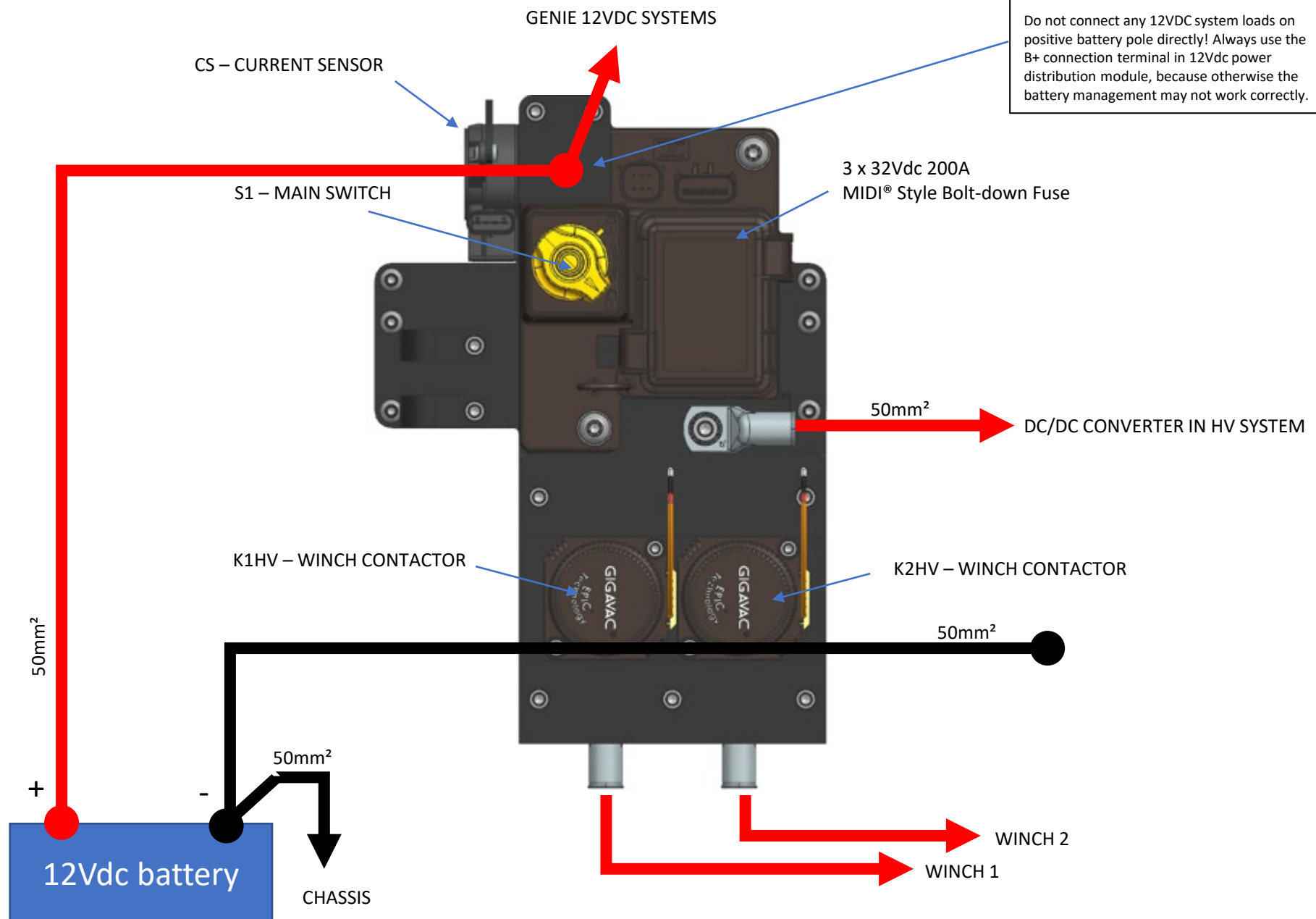
# S2 – Battery Main Switch



**S2 – Battery Main Switch**  
Switch S2 Battery main switch to OFF-position before any maintenance work with the system!

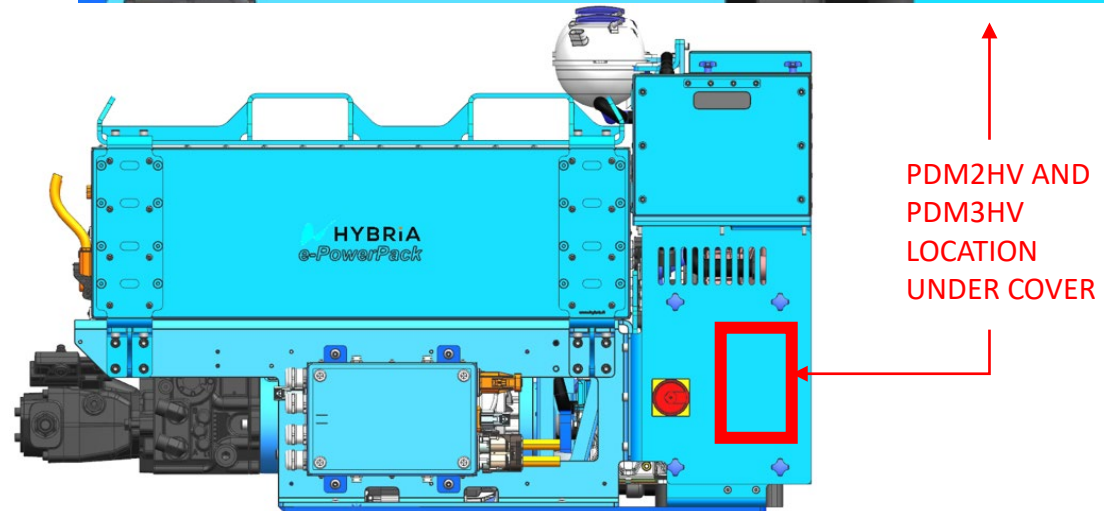
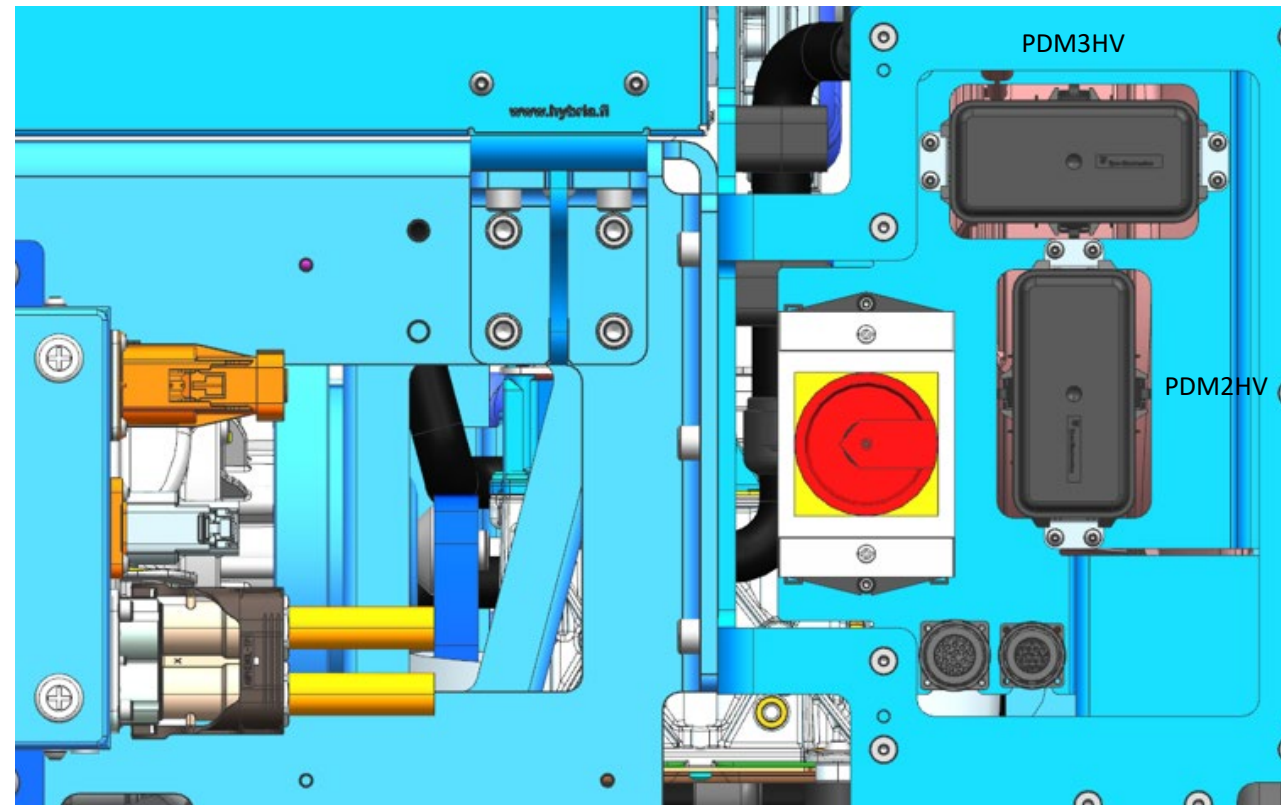
# LOW VOLTAGE SYSTEM

# 12VDC Power Distribution Module 1 – PDM1HV



**ADDITIONAL 12VDC SYTEM LOADS**  
Do not connect any 12VDC system loads on positive battery pole directly! Always use the B+ connection terminal in 12Vdc power distribution module, because otherwise the battery management may not work correctly.

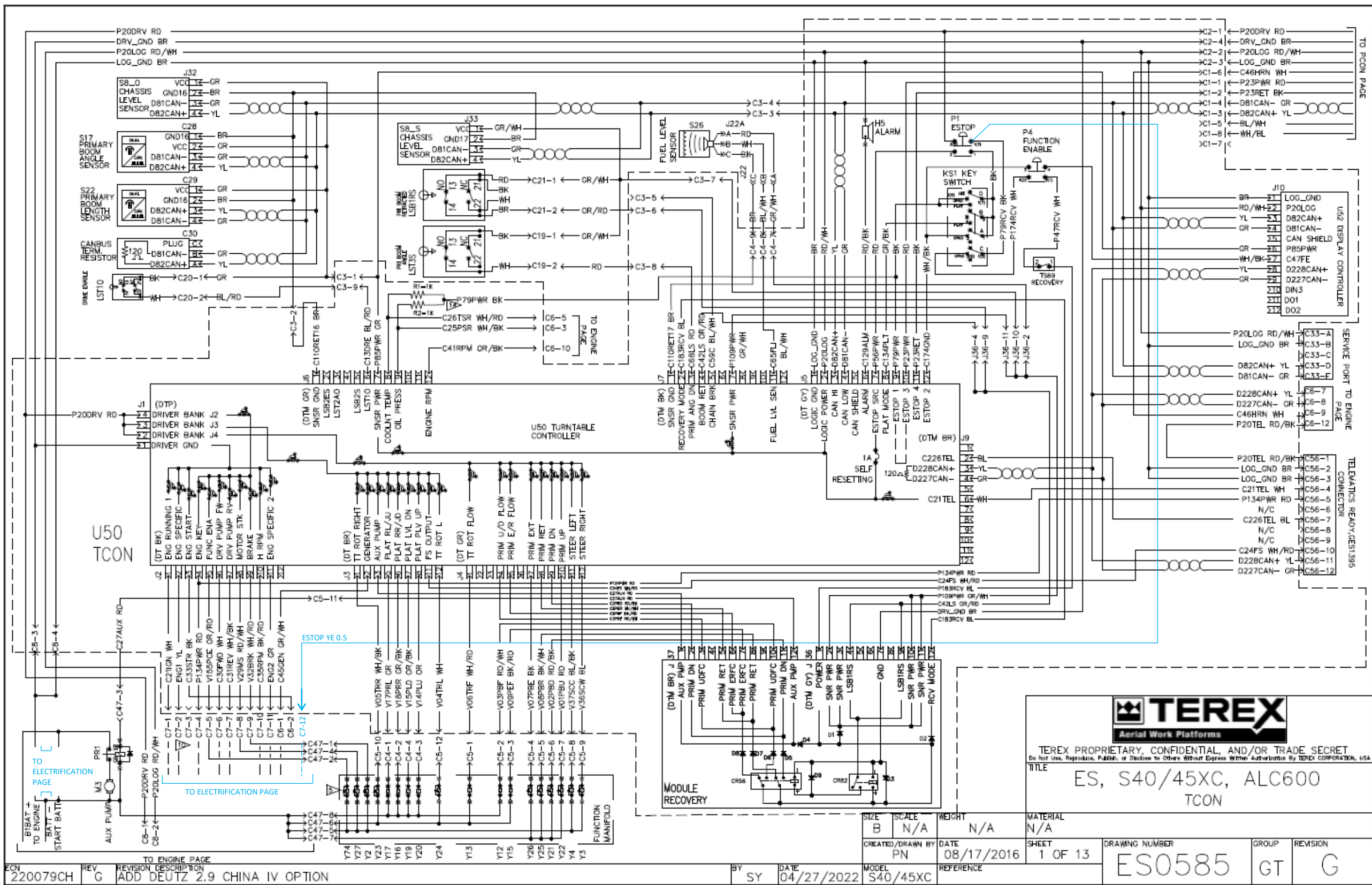
# 12VDC Power Distribution Module 2 and 3 – PDM2HV and PDM3HV



# 12VDC Power Distribution Module 2 and 3 – PDM2HV and PDM3HV

PDM2HV AND PDM3HV						FUSE No.	FUNCTION	RATING	COMPONENT
F10HV 25A	N/A	F19HV 10A	N/A	N/A	N/A	F10HV	CF – Cooling fan	25A	Mini 32Vdc blade fuse
CR1HV		CR13HV		N/A		F11HV	HEC – Electrification control unit	10A	Mini 32Vdc blade fuse
						F12HV	Logic, diagnostics	5A	Mini 32Vdc blade fuse
CR2HV		CR3HV		CR4HV		F13HV	KL30HV: HV Battery logic, PDU, Charge wake-up	5A	Mini 32Vdc blade fuse
						F14HV	KL30HV: Inverter, HMI	5A	Mini 32Vdc blade fuse
CR3HV		CR4HV		CR5HV		F15HV	KL30HV: Compressor, heater	5A	Mini 32Vdc blade fuse
						F16HV	HV Battery contactors	10A	Mini 32Vdc blade fuse
CR4HV		CR5HV		CR6HV		F17HV	BCP – Battery coolant pump	10A	Mini 32Vdc blade fuse
						F18HV	CCP – Components coolant pump	10A	Mini 32Vdc blade fuse
CR5HV		CR6HV		CR7HV		F19HV	K1HV, K2HV – Winch supply contactors	10A	Mini 32Vcd blade fuse
						RELAY No.			FUNCTION
CR6HV		CR7HV		CR8HV		CR1HV	CF – Cooling fan	ISO 7588-1 Mini relay	Song Chuan 896H-1CH-S-R1-12VDC
						CR2HV	KL30HV: HV Battery logic, PDU, Charge wake-up	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
CR7HV		CR8HV		CR9HV		CR3HV	KL30HV: Inverter, HMI	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR4HV	KL30HV: Compressor, heater	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
CR8HV		CR9HV		CR10HV		CR5HV	HV Battery contactors	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR6HV	BCP – Battery coolant pump	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
CR9HV		CR10HV		CR11HV		CR7HV	CCP – Components coolant pump	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR8HV	INV/Motor HVIL circuit	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
CR10HV		CR11HV		CR12HV		CR9HV	FW Drive enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR10HV	REV Drive enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
CR11HV		CR12HV		CR13HV		CR11HV	Brakes enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR12HV	SW inhibit	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
CR12HV		CR13HV		N/A		CR13HV	K1HV, K2HV – Winch supply contactors	ISO 7588-1 Mini relay	Song Chuan 896H-1CH-S-R1-12VDC
						N/A		N/A	





**TEREX**  
Aerial Work Platforms

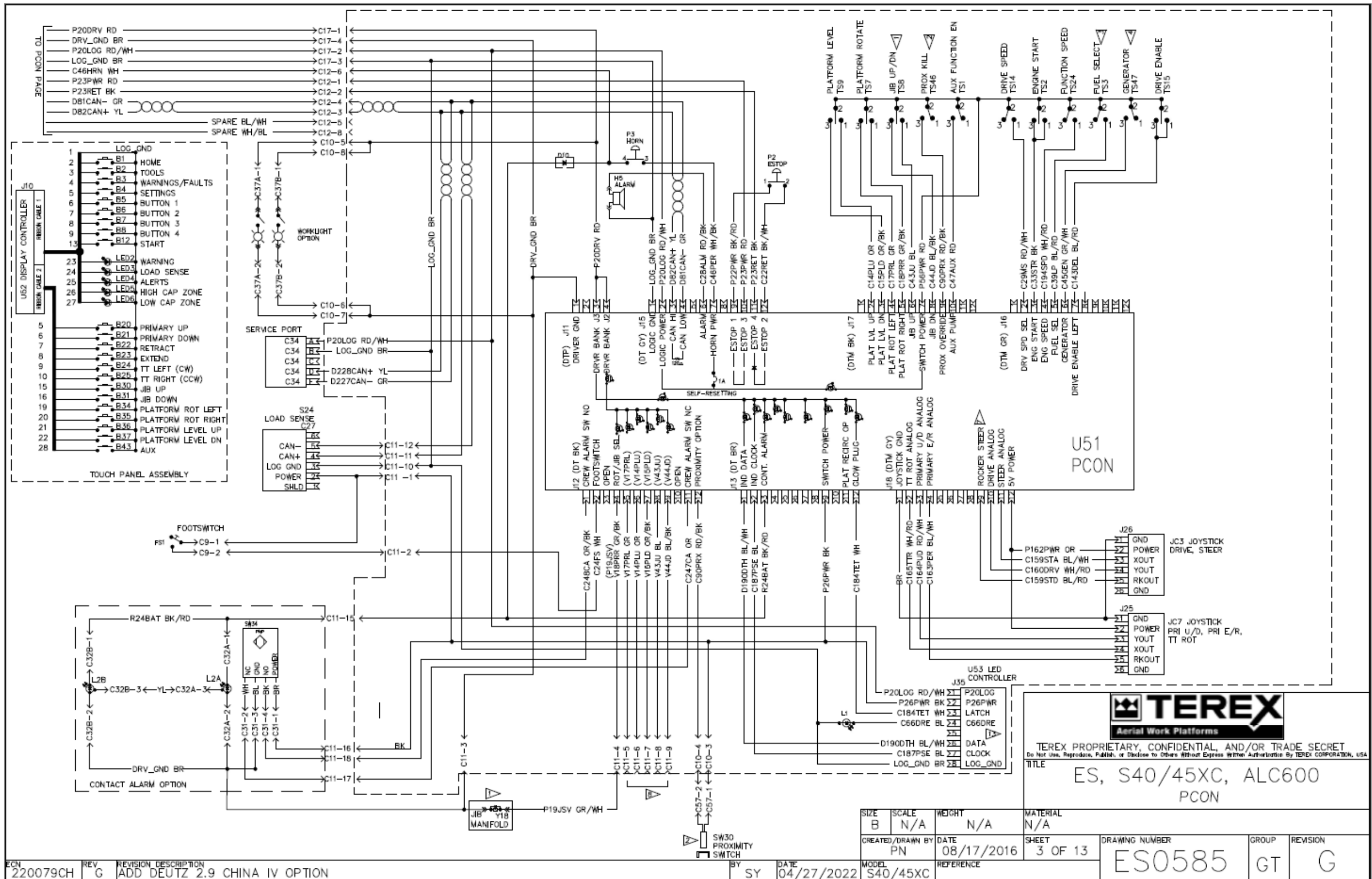
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TITLE  
**ES, S40/45XC, ALC600**  
TCON

ECN	REV	REVISION DESCRIPTION
220079CH	G	ADD DEUTZ 2.9 CHINA IV OPTION

BY	SY	DATE	04/27/2022	MODEL	S40/45XC	REFERENCE	
CREATED/DRAWN BY	PN	DATE	08/17/2016	SHEET	1 OF 13	DRAWING NUMBER	ES0585
				GROUP	GT	REVISION	G

TITLE Hybeko S-45XC Electric GEN2 – TCON PAGE		
MODEL HYBEKO S-45XC ELECTRIC GEN2	DRAWING NO D20240113-001B	PAGE 1/9
CREATED BY / DATE MHE 13.01.2024	REVISED BY / DATE MHE 07.06.2024	REVISION DESCRIPTION



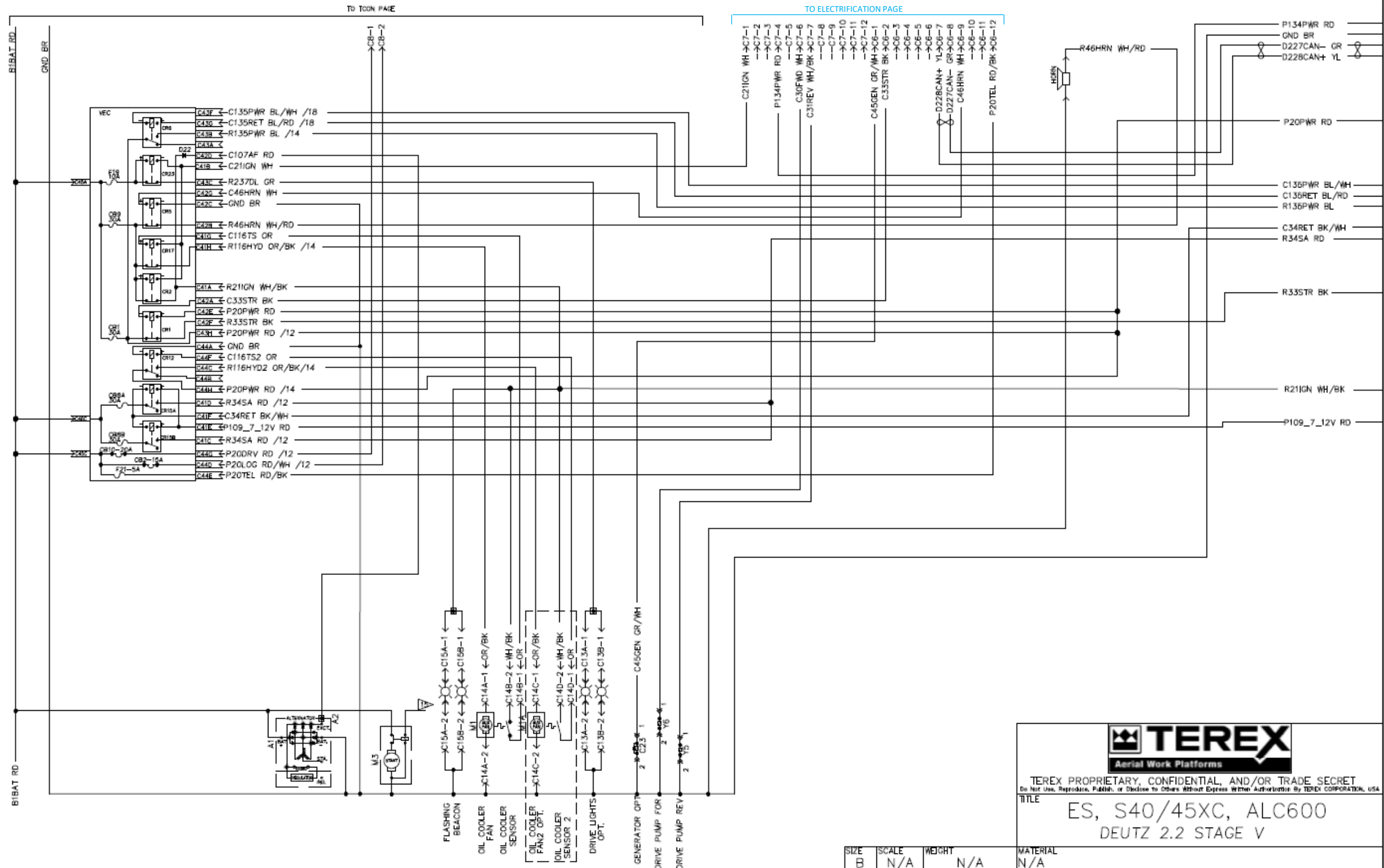
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TITLE  
ES, S40/45XC, ALC600  
PCON

SIZE B	SCALE N/A	WEIGHT N/A	MATERIAL N/A
CREATED/DRAWN BY PN	DATE 08/17/2016	SHEET 3 OF 13	DRAWING NUMBER ES0585
GROUP GT	REVISION G		

ECN	REV	REVISION DESCRIPTION
220079CH	G	ADD DEUTZ 2.9 CHINA IV OPTION

TITLE Hybeko S-45XC Electric GEN2- PCON PAGE		
MODEL HYBEKO S-45XC ELECTRIC GEN2	DRAWING NO D20240113-001B	PAGE 2/9
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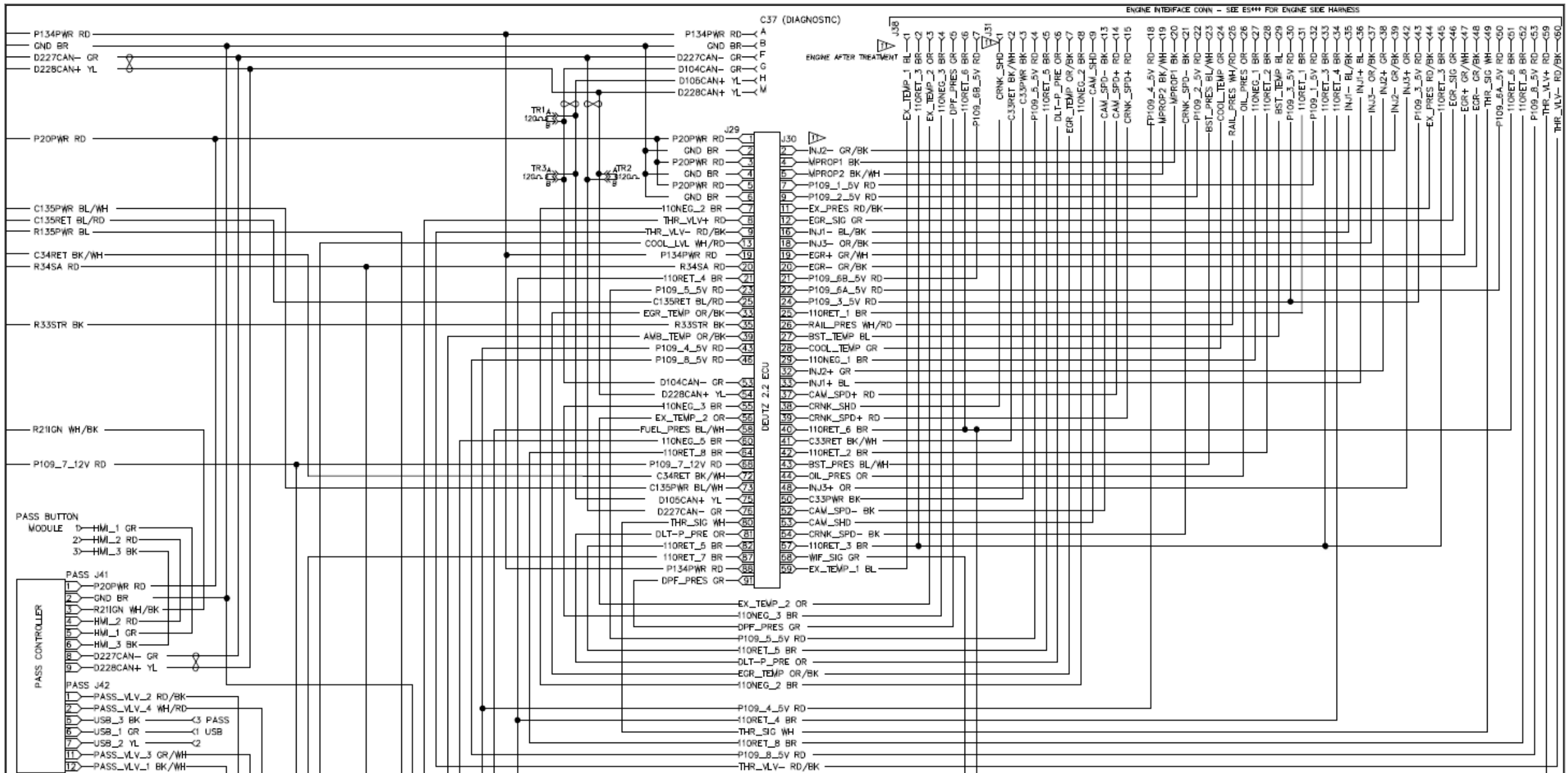
TITLE  
ES, S40/45XC, ALC600  
DEUTZ 2.2 STAGE V

SIZE B	SCALE N/A	WEIGHT N/A	MATERIAL N/A
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GROUP GT	REVISION G		

ECN	REV	REVISION DESCRIPTION
220079CH	G	ADD DEUTZ 2.9 CHINA IV OPTION

BY	DATE	MODEL	REFERENCE
SY	04/27/2022	S40/45XC	

TITLE Hybeko S-45XC Electric GEN2- ENGINE PAGE 1/2		
MODEL HYBEKO S-45XC ELECTRIC GEN2	DRAWING NO D20240113-001B	PAGE 3/9
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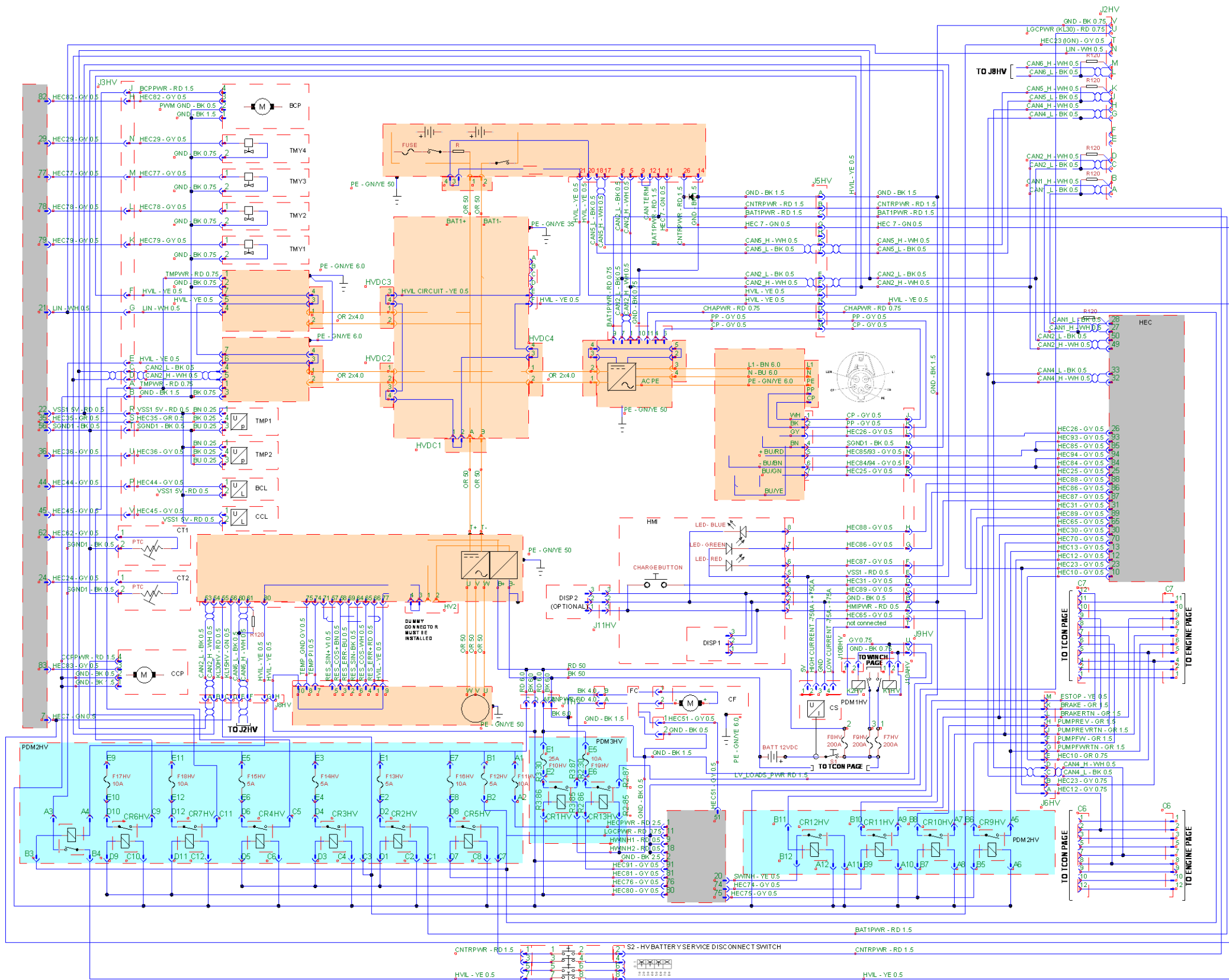
ES, S40/45XC, ALC600  
DEUTZ 2.2 STAGE V

**TWISTED PAIRS**  
 INJ1+ : INJ1-  
 INJ2+ : INJ2-  
 INJ3+ : INJ3-  
 MPROP1 : MPROP2  
 EGR+ : EGR-  
 THR\_VLV4+ : THR\_VLV-  
 RAIL\_PRES+ : P109\_1\_5V : 110RET\_1  
**TWISTED AND SHIELDED**  
 CAM\_SPD+ : CAM\_SPD- (CAM\_SHD)  
 CRNK\_SPD+ : CRNK\_SPD- (CRNK\_SHD)

SIZE B	SCALE N/A	WEIGHT N/A	MATERIAL N/A
CREATED/DRAWN BY PN	DATE 08/17/2016	SHEET 7 OF 13	DRAWING NUMBER ES0585
BY SY	DATE 04/27/2022	MODEL S40/45XC	GROUP GT
	REFERENCE		REVISION G

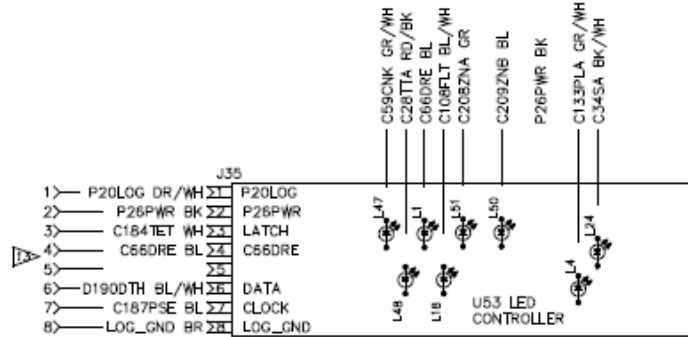
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CREATED BY / DATE MHE 13.01.2024	REVISED BY / DATE MHE 07.06.2024	REVISION DESCRIPTION Document created

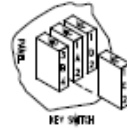


<b>TITLE</b> Hybeko S-45XC Electric GEN2- ELECTRIFICATION PAGE			
<b>MODEL</b> HYBEKO S-45XC ELECTRIC GEN2	<b>DRAWING NO</b> D20240113-001B	<b>PAGE</b> 5/9	
<b>CREATED BY / DATE</b> MHE 13.01.2024	<b>REVISED BY / DATE</b> MHE 07.06.2024	<b>REVISION DESCRIPTION</b> Document created	

# LED BOARD



# KS CONTACT DETAIL



CONTACT	GROUND/PLATFORM HEIGHTER TRIP-TABLE				
	KEYSWITCH POSITION				
	OFF	GROUND	PLATFORM		
A (NC)	HEAD OPEN	CLOSED	HEAD OPEN	POWER TO GROUND BOX	
B (NO)	OPEN	OPEN	HEAD CLOSED	POWER TO PLATFORM	
C (NC)	HEAD OPEN	CLOSED	HEAD OPEN	POWER TO RECOVERY SH	
D (NC)	HEAD OPEN	CLOSED	CLOSED	POWER TO PLATFORM STOP	

# GENIE MACHINE FUNCTIONS RELAY

- CR1 ENGINE START RELAY
- CR2 ENGINE RUN RELAY
- CR3 LOW RPM RELAY
- CR4 HIGH RPM RELAY
- CR5 HORN RELAY
- CR6 FUEL PUMP RELAY
- CR7 LPG SOLENOID RELAY
- CR15A GLOW PLUG RELAY A
- CR15B GLOW PLUG RELAY B
- CR23 DRIVE LIGHT RELAY
- CR39 AUXILIARY SHUT DOWN RELAY
- CB1 ENGINE CONTROL POWER
- CB2 SYSTEM CONTROL LOGIC POWER
- CB8 GLOW PLUG CB
- CB9 ENGINE RUN/OPTIONS/ACCESSORIES
- CB10 SYSTEM CONTROL DRIVER POWER
- F19 DRIVE LIGHT CB
- F21 TELEMATIC OPTION FUSE
- D1 ALTERNATOR FIELD DIODE

# CONNECTORS DESC.

- |   |                      |  |
|---|----------------------|--|
| CONNECTORS                              | CONNECTORS           | JACKS  |
| C1 BOOM CABLE (BASE) - CONTROLS         | C60                  | J1 TCON POWER                                    |
| C2 BOOM CABLE (BASE) - POWER            | C61 VEC2-BLACK-8 PIN | J2 TCON ENGINE                                   |
| C3 BOOM SENSORS                         | C62 VEC2-BLACK-8 PIN | J3 TCON FUNCTIONS                                |
| C4 FUNCTION MANIFOLD                    | C63 VEC2-BLUE-8 PIN  | J4 TCON FUNCTIONS                                |
| C5 FUNCTION MANIFOLD                    | C64 VEC2-GREEN-8 PIN | J5 TCON LOGIC                                    |
| C6 ENGINE                               | C65 VEC2-GRAY-2 PIN  | J6 TCON LIMIT SWITCHES                           |
| C7 ENGINE                               | C66 VEC2-BLACK-2 PIN | J7 TCON LIMIT SWITCHES                           |
| C8 ENGINE - POWER                       | C72 ECU              | J8 TCON UNUSED                                   |
| C9 FOOTSWITCH                           |                      | J9 TCON COMMUNICATION                            |
| C10 PLATFORM OPTIONS                    |                      | J10 DISCON                                       |
| C11 PLATFORM MANIFOLD                   |                      | J11 PCON POWER                                   |
| C12 BOOM CABLE (PLATFORM) - CONTROLS    |                      | J12 PCON FUNCTIONS                               |
| C13 DRIVE LIGHTS                        |                      | J13 PCON FUNCTIONS                               |
| C14 HYD OIL COOLER                      |                      | J14 PCON UNUSED                                  |
| C15 FLASHING BEACONS                    |                      | J15 PCON LOGIC                                   |
| C16 ENGINE DIAGNOSTIC PORT              |                      | J16 PCON TOGGLES                                 |
| C17 BOOM CABLE (PLATFORM) - POWER       |                      | J17 PCON TOGGLES                                 |
| C18 D2.9 ENGINE CONNECTOR               |                      | J18 PCON JOYSTICKS                               |
| C19 LST3S                               |                      | J19 PCON UNUSED                                  |
| C20 LST10                               |                      | J20 BOOM ANGLE SENSOR OPERATIONAL - NOT USED     |
| C21 LSB1RS                              |                      | J21 BOOM ANGLE SENSOR SAFETY - NOT USED          |
| C22 LSB2S                               |                      | J22 FUEL LEVEL SENSOR                            |
| C23 GEN FROM ENG HARN                   |                      | J23 PLATFORM LEVEL SENSOR OPERATIONAL - NOT USED |
| C24 WELDER ENCLOSURE                    |                      | J24 PLATFORM LEVEL SENSOR SAFETY - NOT USED      |
| C25 GM3.0 VEHICLE INTERFACE CONNECTOR 1 |                      | J25 BOOM FN JOYSTICK                             |
| C26 GM3.0 VEHICLE INTERFACE CONNECTOR 2 |                      | J26 DRIVE FN JOYSTICK                            |
| C27 LOAD SENSE                          |                      | J27 404D ECG-BLACK                               |
| C28 BOOM ANGLE SENSOR                   |                      | J28 404D ECG-GRAY                                |
| C29 BOOM EXTENSION STRING-POT           |                      | J29 D2.9/D2.2 ECU-1                              |
| C30 CANBUS TERMINATING RESISTOR         |                      | J30 D2.9/D2.2 ECU-2                              |
| C31 CREW ALARM PROXY SWITCH             |                      | J31 D2.9/D2.2 ENGINE INTERFACE                   |
| C32 CREW ALARM LIGHTS                   |                      | J32 CHASSIS TILT SENSOR OPERATIONAL              |
| C33 GBOX SERVICE PORT                   |                      | J33 CHASSIS TILT SENSOR SAFETY                   |
| C34 PBOX SERVICE PORT                   |                      | J34 D2011 ENGINE INTERFACE                       |
| C35 404D SPEED SENSOR                   |                      | J35 LED PCB                                      |
| C36 404D FUEL SOLENOID                  |                      | J36 RECOVERY MODULE POWER                        |
| C37 WORK LIGHTS                         |                      | J37 RECOVERY MODULE I/O                          |
| C38 DEUTZ D2011 ECU CONN1               |                      | J38 RPM SELEND                                   |
| C39 FORD VEHICLE INTERFACE CONNECTOR 1  |                      |  |
| C40 DEUTZ D2011 ECU CONN2               |                      |  |
| C41 VEC-BLACK-8 PIN                     |                      |  |
| C42 VEC-GRAY-8 PIN                      |                      |  |
| C43 VEC-BLUE-8 PIN                      |                      |  |
| C44 VEC-GREEN-8 PIN                     |                      |  |
| C45 VEC-GRAY-2 PIN                      |                      |  |
| C46 VEC-BLACK-2 PIN                     |                      |  |
| C47 FUNCTION ENABLE                     |                      |  |
| C48 BRAKE                               |                      |  |
| C49 MOTOR STROKE                        |                      |  |
| C50 DRIVE PUMP                          |                      |  |
| C51 ENGINE ECG1                         |                      |  |
| C52 ENGINE ECG2                         |                      |  |
| C53 PLAT RECIRC VALVE                   |                      |  |
| C56 TELEMATICS                          |                      |  |
| C57 ACP                                 |                      |  |
| C58                                     |                      |  |
| C59                                     |                      |  |
| C60 ENGINE RUN SIGNAL FOR OIL COOLER    |                      |  |

### NOTES

- ALL COMPONENTS ARE SHOWN WITH MACHINE IN THE STOWED AND OFF POSITION.
- SCHEMATIC IS BUILT ACCORDING TO GEP1460 AND GES1325.

- ▷ S45 ONLY, ENERGIZE FOR ROTATE FUNCTION
- ▷ AIRCRAFT PROTECTION ONLY
- ▷ LP/GAS ENGINE ONLY
- ▷ GENERATOR OPTION ONLY
- ▷ NO SUPPRESSION DIODE ON PROPORTIONAL VALVE COILS
- ▷ UNUSED
- ▷ STEER ROCKER OPTION
- ▷ NOT USE ON S40/45XC
- ▷ CONTACT OPTION
- ▷ ENG1: C5-2 C34SA/C27AUX/C39LP
- ▷ ENG2: C5-11 C34SA/C27AUX/C39LP

### TWISTED PAIRS

- INJ1 A33 - INJ1 A16
- INJ2 A03 - INJ2 A46
- INJ3 A02 - INJ3 A32
- INJ4 A18 - INJ4 A48
- EGRSOLPWR - EGRSOLGND
- CAMSPD A52 - CAMSPD A37
- CAMSPD SHD
- CRNKSPD A39 - CRNKSPD A54
- CRNKSPD SHD

### SHIELDED TWISTED PAIRS

- INJ1PWR - INJ1SIG : SHIELDED BY INJ\_SHD
- INJ2PWR - INJ2SIG : SHIELDED BY INJ\_SHD
- INJ3PWR - INJ3SIG : SHIELDED BY INJ\_SHD
- INJ4PWR - INJ4SIG : SHIELDED BY INJ\_SHD
- CAM+ - CAM- : SHIELDED BY SNSR\_SHD
- CNK+ - CNK- : SHIELDED BY SNSR\_SHD
- RPPWR - RPSIG1 - RPSIG2 : SHIELDED BY RP\_SHD

### TWISTED PAIRS

- SVC- : SVC+
- ETC- : ETC+
- EGR- : EGR+

### DETAIL ON SHEET 6

- ▷ R1 AND R2 ONLY USED ON D2011L03 AND FORD MSG425 ENGINES ONLY.
- ▷ WIRING IS ON SUPPLIED ENGINE HARNESS

### REFERENCE:

- HARNESS MAP: 1277933
- STANDARD VEC: 1269738
- PERKINS ENGINE, 2ND VEC: 1286594
- COMPONENT LEGEND CLASSIFICATION: GES1325



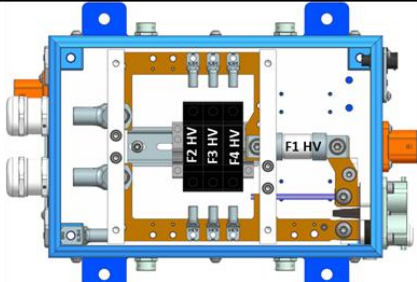
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TITLE  
ES, S40/45XC, ALC600  
NOTES, LEGEND AND DETAILS

SIZE B	SCALE N/A	WEIGHT N/A	MATERIAL N/A
CREATED/DRAWN BY PN	DATE 08/17/2016	SHEET 12 OF 13	DRAWING NUMBER ES0585
GROUP GT		REVISION G	

ECN 220079CH	REV G	REVISION DESCRIPTION ADD DEUTZ 2.9 CHINA IV OPTION	BY SY	DATE 04/27/2022	MODEL S40/45XC	REFERENCE
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TITLE Hybeko S-45XC Electric GEN2 - NOTES, LEGEND AND DETAILS		
MODEL HYBEKO S-45XC ELECTRIC GEN2	DRAWING NO D20240113-001B	PAGE 6/9
CREATED BY / DATE MHE 13.01.2024	REVISED BY / DATE MHE 07.06.2024	REVISION DESCRIPTION Document created

PDU	FUSE No.	FUNCTION	RATING	COMPONENT
	F1HV	Inverter	250A	Mersen MEV50A250-25G
	F2HV	Charger	25A	Mersen MEV100C25
	F3HV	HV compressor	25A	Mersen MEV100C25
	F4HV	Battery heater	25A	Mersen MEV100C25

PDM1HV	FUSE No.	FUNCTION	RATING	COMPONENT
	F7HV	Winch	200A	Mini 32Vdc bolt-down fuse
	F8HV	Winch	200A	Mini 32Vdc bolt-down fuse
	F9HV	INV - DC/DC CONVERTER OUTPUT	200A	Mini 32Vdc bolt-down fuse

PDM2HV AND PDM3HV	FUSE No.	FUNCTION	RATING	COMPONENT																															
<b>PDM3HV</b> <table border="1" data-bbox="134 796 873 1078"> <tr> <td>F10HV 25A</td> <td>N/A</td> <td>F19HV 10A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td colspan="2">CR1HV</td> <td colspan="2">CR13HV</td> <td colspan="2">N/A</td> </tr> </table>  <b>PDM2HV</b> <table border="1" data-bbox="134 1219 873 1512"> <tr> <td>F13HV 5A</td> <td>F14HV 5A</td> <td>F15HV 5A</td> <td>F16HV 5A</td> <td>F17HV 10A</td> <td>F18HV 10A</td> </tr> <tr> <td>CR2HV</td> <td>CR3HV</td> <td>CR4HV</td> <td>CR5HV</td> <td>CR6HV</td> <td>CR7HV</td> </tr> <tr> <td>F12HV 5A</td> <td rowspan="2">CR8HV</td> <td rowspan="2">CR9HV</td> <td rowspan="2">CR10HV</td> <td rowspan="2">CR11HV</td> <td rowspan="2">CR12HV</td> </tr> <tr> <td>F11HV 10A</td> </tr> </table>	F10HV 25A	N/A	F19HV 10A	N/A	N/A	N/A	CR1HV		CR13HV		N/A		F13HV 5A	F14HV 5A	F15HV 5A	F16HV 5A	F17HV 10A	F18HV 10A	CR2HV	CR3HV	CR4HV	CR5HV	CR6HV	CR7HV	F12HV 5A	CR8HV	CR9HV	CR10HV	CR11HV	CR12HV	F11HV 10A	F10HV	CF – Cooling fan	25A	Mini 32Vdc blade fuse
	F10HV 25A	N/A	F19HV 10A	N/A	N/A	N/A																													
	CR1HV		CR13HV		N/A																														
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	CR2HV	CR3HV	CR4HV	CR5HV	CR6HV	CR7HV																													
	F12HV 5A	CR8HV	CR9HV	CR10HV	CR11HV	CR12HV																													
	F11HV 10A																																		
	F11HV	HEC – Electrification control unit	10A	Mini 32Vdc blade fuse																															
	F12HV	Logic, diagnostics	5A	Mini 32Vdc blade fuse																															
	F13HV	KL30HV: HV Battery logic, PDU, Charge wake-up	5A	Mini 32Vdc blade fuse																															
	F14HV	KL30HV: Inverter, HMI	5A	Mini 32Vdc blade fuse																															
	F15HV	KL30HV: Compressor, heater	5A	Mini 32Vdc blade fuse																															
	F16HV	HV Battery contactors	10A	Mini 32Vdc blade fuse																															
F17HV	BCP – Battery coolant pump	10A	Mini 32Vdc blade fuse																																
F18HV	CCP – Components coolant pump	10A	Mini 32Vdc blade fuse																																
F19HV	K1HV, K2HV – Winch supply contactors	10A	Mini 32Vcd blade fuse																																
	<b>RELAY No.</b>	<b>FUNCTION</b>	<b>RELAY TYPE</b>	<b>COMPONENT</b>																															
CR1HV	CF – Cooling fan	ISO 7588-1 Mini relay	Song Chuan 896H-1CH-S-R1-12VDC																																
CR2HV	KL30HV: HV Battery logic, PDU, Charge wake-up	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR3HV	KL30HV: Inverter, HMI	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR4HV	KL30HV: Compressor, heater	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR5HV	HV Battery contactors	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR6HV	BCP – Battery coolant pump	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR7HV	CCP – Components coolant pump	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR8HV	INV/Motor HVIL circuit	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR9HV	FW Drive enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR10HV	REV Drive enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR11HV	Brakes enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR12HV	SW inhibit	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc																																
CR13HV	K1HV, K2HV – Winch supply contactors	ISO 7588-1 Mini relay	Song Chuan 896H-1CH-S-R1-12VDC																																



<b>TITLE</b> Hybeko S-45XC Electric GEN2 – FUSES, RELAYS		
<b>MODEL</b> HYBEKO S-45XC ELECTRIC GEN2	<b>DRAWING NO</b> D20240113-001B	<b>PAGE</b> 7/9
<b>CREATED BY / DATE</b> MHE 13.01.2024	<b>REVISED BY / DATE</b> MHE 07.06.2024	<b>REVISION DESCRIPTION</b> Document created

ID.	FUNCTION
BAT1	High voltage primary battery
BAC	Battery A/C compressor
BCP	Battery coolant pump
BH	Battery heater
CC	Charge connector
CCP	Components coolant pump
CF	Cooling fan
CHA	Charger
CS	Current sensor
CT1	Components coolant temperature – cold side
CT2	Components coolant temperature – hot side
DISP	Battery State of charge display
FC	Cooling fan controller
HEC	Electrification control unit
HMI	User interface assembly
HVIL	High voltage interlock
INV	Inverter
K1HV, K2HV	Winch Supply Contactors
S2	HV Battery Service Disconnect Switch
M1HV	Motor
PDM1HV	12Vdc Power Distribution Unit 1 for HV system
PDM2HV	12Vdc Power Distribution Unit 2 for HV system
PDM3HV	12Vdc Power Distribution Unit 3 for HV system
PDU	Power Distribution Unit – high voltage
TM	Thermo module
Y1	Thermo module change over valve
Y2	Thermo module 2-way valve
Y3	Thermo module 2-way valve
Y4	Coolant valve

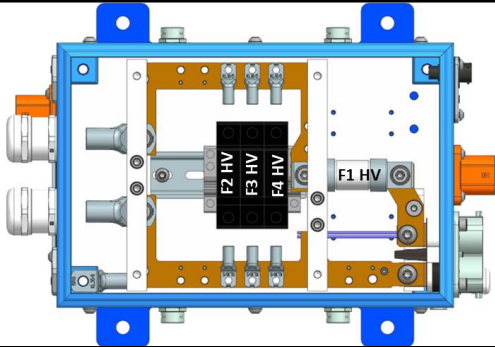



<b>TITLE</b> Hybeko S-45XC Electric GEN2 – NOTES		
<b>MODEL</b> HYBEKO S-45XC ELECTRIC GEN2	<b>DRAWING NO</b> D20240113-001B	<b>PAGE</b> 8/9
<b>CREATED BY / DATE</b> MHE 13.01.2023	<b>REVISED BY / DATE</b> MHE 07.06.2024	<b>REVISION DESCRIPTION</b> Document created



ANSI Symbol	ANSI Code	IEC 61346-2 Symbol	IEC Code	Description
	CON		KM	Contactor contact open
	CON		KM	Contactor contact closed
	CR		KA	Relay contact open
	CR		KA	Relay contact closed
	TR		KT	Timed contact, N.O. – on delay (TDE)
	TR		KT	Timed contact, N.C. – on delay (TDE)
	TR		KT	Timed contact, N.C.– off delay (TDO)
	TR		KT	Timed contact, N.O. – off delay (TDO)
	SS		SA	Selector switch
	PB		SB	Pushbutton N.O.
	PB		SB	Pushbutton N.C.
	PB		SB	Pushbutton mushroom head
	FL		SL	Liquid level switch
	FLS		SF	Flow switch
	PS		SP	Pressure switch
	TS		ST	Temperature switch
	LS		SQ	Limit switch
	PRS		SQ	Proximity switch
	LT		HL	Indicating light
	CR		KA	Control relay coil
	CON		KM	Contactor coil
	M		KM	Motor starter coil
	TR		KA	Timer coil
	SOL		YV	Solenoid coil
	CTR		EC	Electromechanical counter
	CB		QF	Circuit breaker
	T1		X1	Terminals (reference)
			XT	Fused terminals (reference)
	FU		FU	Fuse, protective

TITLE Hybeko S-45XC Electric GEN2 – SYMBOLS		
MODEL HYBEKO S-45XC ELECTRIC GEN2	DRAWING NO D20240113-001B	PAGE 9/9
CREATED BY / DATE MHE 13.01.2024	REVISED BY / DATE MHE 07.06.2024	REVISION DESCRIPTION Page added

PDU	FUSE No.	FUNCTION	RATING	COMPONENT
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	F3HV	HV compressor	25A	Mersen MEV100C25
	F4HV	Battery heater	25A	Mersen MEV100C25

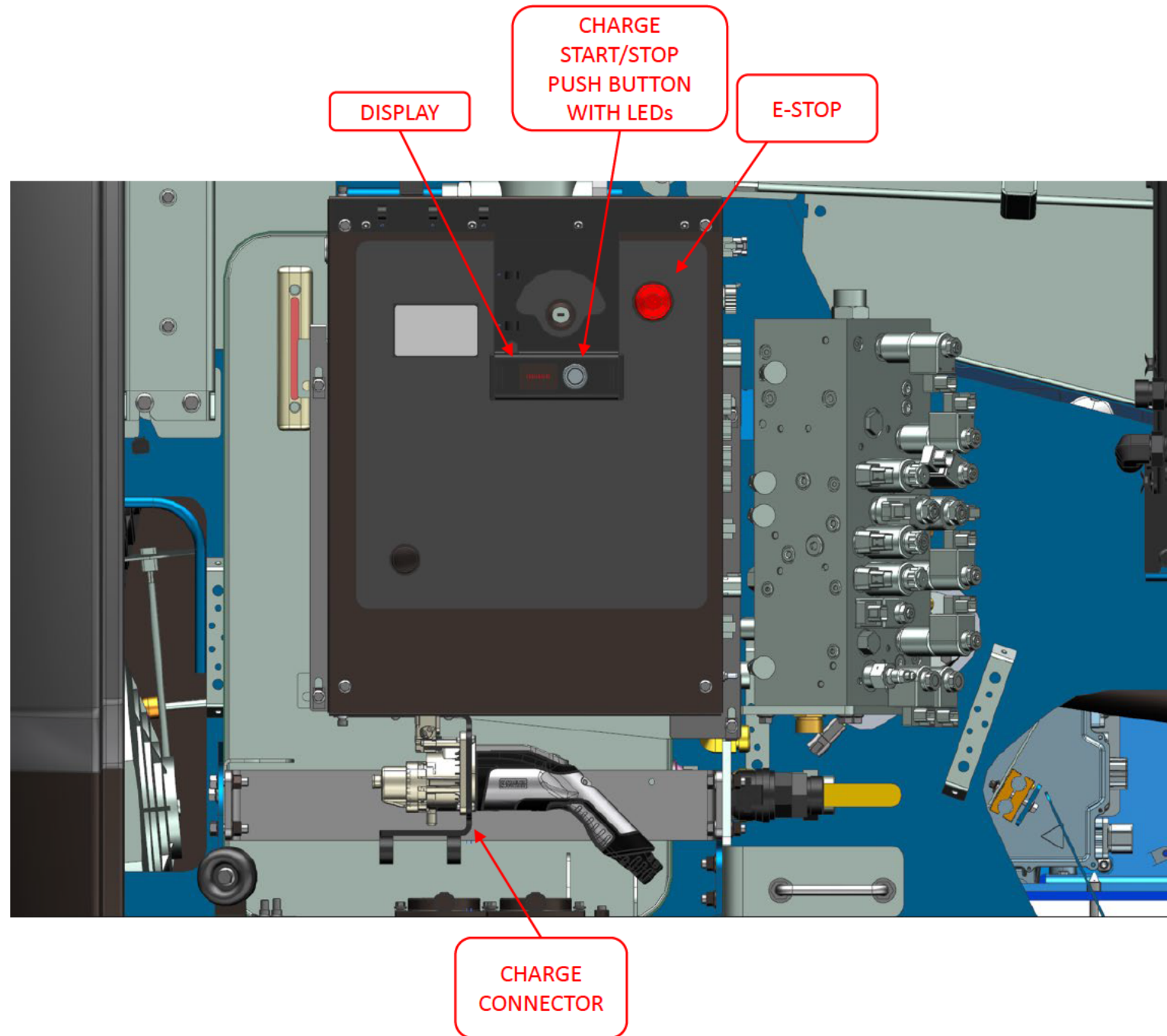
PDM1HV	FUSE No.	FUNCTION	RATING	COMPONENT
	F7HV	Winch	200A	Mini 32Vdc bolt-down fuse
	F8HV	Winch	200A	Mini 32Vdc bolt-down fuse
	F9HV	INV - DC/DC CONVERTER OUTPUT	200A	Mini 32Vdc bolt-down fuse

PDM2HV AND PDM3HV						FUSE No.	FUNCTION	RATING	COMPONENT
F10HV 25A	N/A	F19HV 10A	N/A	N/A	N/A	F10HV	CF – Cooling fan	25A	Mini 32Vdc blade fuse
CR1HV		CR13HV		N/A		F11HV	HEC – Electrification control unit	10A	Mini 32Vdc blade fuse
						F12HV	Logic, diagnostics	5A	Mini 32Vdc blade fuse
						F13HV	KL30HV: HV Battery logic, PDU, Charge wake-up	5A	Mini 32Vdc blade fuse
						F14HV	KL30HV: Inverter, HMI	5A	Mini 32Vdc blade fuse
						F15HV	KL30HV: Compressor, heater	5A	Mini 32Vdc blade fuse
						F16HV	HV Battery contactors	10A	Mini 32Vdc blade fuse
						F17HV	BCP – Battery coolant pump	10A	Mini 32Vdc blade fuse
						F18HV	CCP – Components coolant pump	10A	Mini 32Vdc blade fuse
						F19HV	K1HV, K2HV – Winch supply contactors	10A	Mini 32Vcd blade fuse
						RELAY No.	FUNCTION	RELAY TYPE	COMPONENT
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						CR3HV	KL30HV: Inverter, HMI	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
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CR7HV	CCP – Components coolant pump	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc						
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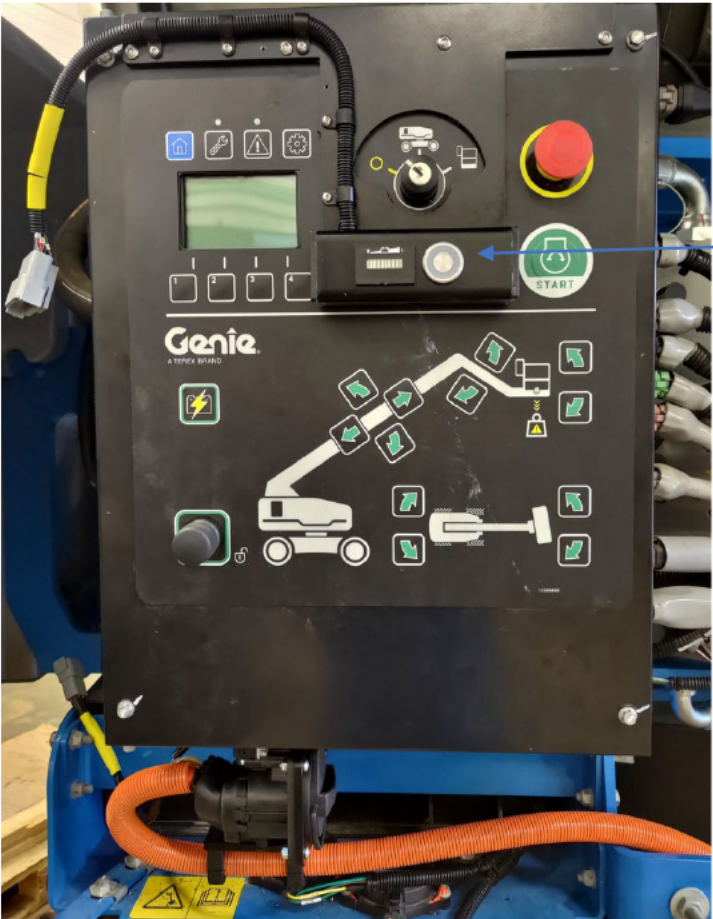
<b>ID.</b>	<b>FUNCTION</b>
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HVIL	High voltage interlock
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S2	HV Battery Service Disconnect Switch
M1HV	Motor
PDM1HV	12Vdc Power Distribution Unit 1 for HV system
PDM2HV	12Vdc Power Distribution Unit 2 for HV system
PDM3HV	12Vdc Power Distribution Unit 3 for HV system
PDU	Power Distribution Unit – high voltage
TM	Thermo module
Y1	Thermo module change over valve
Y2	Thermo module 2-way valve
Y3	Thermo module 2-way valve
Y4	Coolant valve

# HMI – USER INTERFACE

# HMI – User interface



# HMI – User interface



There is a multicolor LED (with red, green, blue light) for informing user about the status of the electric power pack.

In the middle of LED circle, there is a START/STOP CHARGING push button

**Starting and stopping the system takes some time. Please wait until the system LED informs that the system is ready to start/stop until you take further action.** If may need to learn new way of starting and stopping the operation modes.

LED STATES		
Color	Blinking	Meaning
Off	Off	System is off and can be restarted
Blue	1 Hz, 50% duty cycle	System is starting up or shutting down. Please wait
Blue	1 Hz, short pulse	Ready to start. Waiting for start button to be pressed ("engine start")
Blue	Steady	System is operational
Green	1 Hz, short pulse	Charger cable is plugged. Waiting for charge button to be pressed to start charging.
Green	1 Hz, 50% duty cycle	Charging in progress and charge plug is locked
Green	Steady	Charge complete. Press charge button to finish charging and unlock charge plug.
Red	Steady	Error active. System is not operational.  [machine alarm sound is also activated if that option is enabled in system parameters]



QTY	ITEM NUMBER/BIN	DESCRIPTION	MANUFACTURING PART NUMBER OR DRAWING NUMBER	REV LEVEL	COMMENTS
<b>BASE UNIT</b>					
10	1	BU-9X16R-EXT-LVD-NOS-CAN	BASE UNIT, 900 MHz, 100 mW, EXTERNAL ANTENNA, NO TRANSIENT SUPPRESSION, CAN	07318516	0-0
<b>PISTOL GRIP</b>					
20	1	PG-9X14-UMB-EXT	PISTOL GRIP, 900 MHz, 100MW, UMBILICAL, EXTERNAL ANTENNA	23260501	0-2
30	1	CU-GPH-LBL	CUSTOM GRAPHIC LABEL	WSMB-11456_LBL	0-0
<b>OTHER ITEMS</b>					
40	1	HN-1006	BASE UNIT CABLE ASSEMBLY, GREEN/BROWN CONNECTORS, 3 FT		
50	1	EXT-3-900	900 MHz ANTENNA EXTENSION KIT, INCLUDES 3" CABLE (J5-07) AND ANTENNA (BB3-06)		
60	1	BB3-06	900 MHz ANTENNA		
70	1	C4-20	50FT HANDHELD TETHER CONNECTION KIT (C6-12, C6-12, C6-13, C4-14)		
<b>DOCUMENTATION</b>					
80	1	SYSTEM DESIGN DOCUMENT		WSMB-11456	0-0
90	1	BU-xH16R MANUAL		U095.1.1	
100	1	PG-x14 MANUAL		U045.12.0	

-- REVISIONS --		
NO.	DATE	DESCRIPTION
A-0	09/27/2023	(ECJ) APPROVAL RELEASE

CUSTOMER: HYBEKO AS	
DESCRIPTION: SYSTEM BILL OF MATERIALS	
DRAWN: ECJ	SCALE: N/A
ENGINEER: GFM	SHEET: 1 OF 6

SIZE: B	DWG NO. WSMB-11456
REV: A-0	



CERVIS INC.						
QTY	ITEM NUMBER/BIN	DESCRIPTION	MANUFACTURING PART NUMBER OR DRAWING NUMBER	REV LEVEL	COMMENTS	
<b>ENCLOSURE WITH INTERNALS</b>						
10	1	BUSS BAR - GROUND RAIL	MULTIPURPOSE 110 COOPER BAR 1" X 36" X 3/16"	2557T583 McMASTER CARR		MUST BE MACHINED TO DWG# WSMB-11456-GND-BUSS
20	2	BUSS BAR - POWER RAIL	MULTIPURPOSE 110 COOPER BAR 1.5" X 12" X 3/16"	2557T591 McMASTER CARR		MUST BE MACHINED TO DWG# WSMB-11456-POS-BUSS
30	1	LABEL SET	ENCLOSURE LABEL SET	WSMB-11456-ENCL-LBL		
40	1	ENCLOSURE	STAINLESS STEEL 24" X 16" X 8"	SCE-24H1608SSLP		
50	1	ENCLOSURE INTERNAL PANEL	STAINLESS STEEL 24" X 16"	SCE-24P16		MUST BE MACHINED TO DWG# WSMB-11456-PLATE
60	6	0419003	REVERSING CONTRACTOR TROMBETTA 241.1231.A51	MURCAL INC TMT 214-1231-A51		
70	2	0419002	100 AMP AUTO RESET CIRCUIT BREAKER	BUS 181100F/WAYTEK WIRE 46935		
80	20	0419004	EYELET FOR 6GA WIRE 3/8"			
90	25		EYELET FOR 6GA WIRE 1/4"	7113k446 McMASTER CARR		
100	20	G1-20	SPADE CONNECTOR			
110	50		GENERAL PURPOSE WASHER	92916A395 McMASTER CARR		
120	50		THIN HEX NUT	92174A662 McMASTER CARR		
130	50		LOCK WASHER	93496A030 McMASTER CARR		
140	21	RIVET NUT	1/4"-20 THREAD HEAVY DUTY RIVET NUT	McMASTER CARR 95105A143		
<b>OTHER ITEMS</b>						
150	1	1.5" PANDUIT SHOP SUPPLY	1/4"-20 THREAD HEAVY DUTY RIVET NUT			
160	1	D8-07	6 POSITION TERMINAL STRIP			

CUSTOMER: HYBEKO AS

DESCRIPTION: ENCLOSURE BILL OF MATERIALS



DRAWN: ECJ  
ENGINEER: GFM

SCALE: N/A

SHEET: 2 OF 6

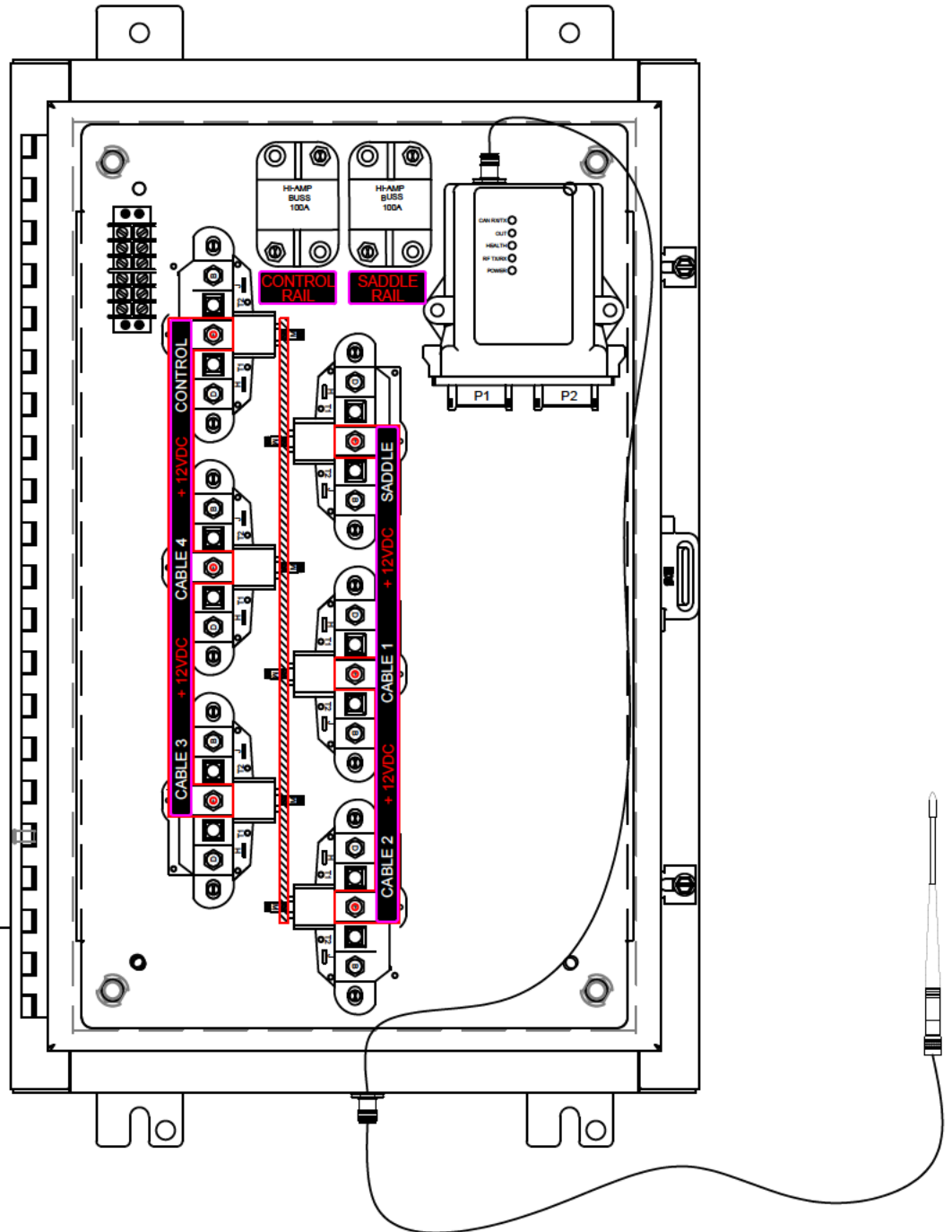
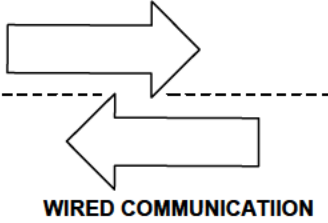
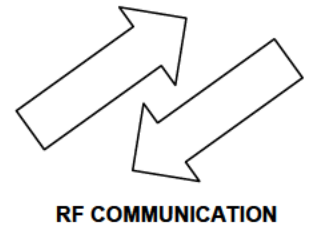
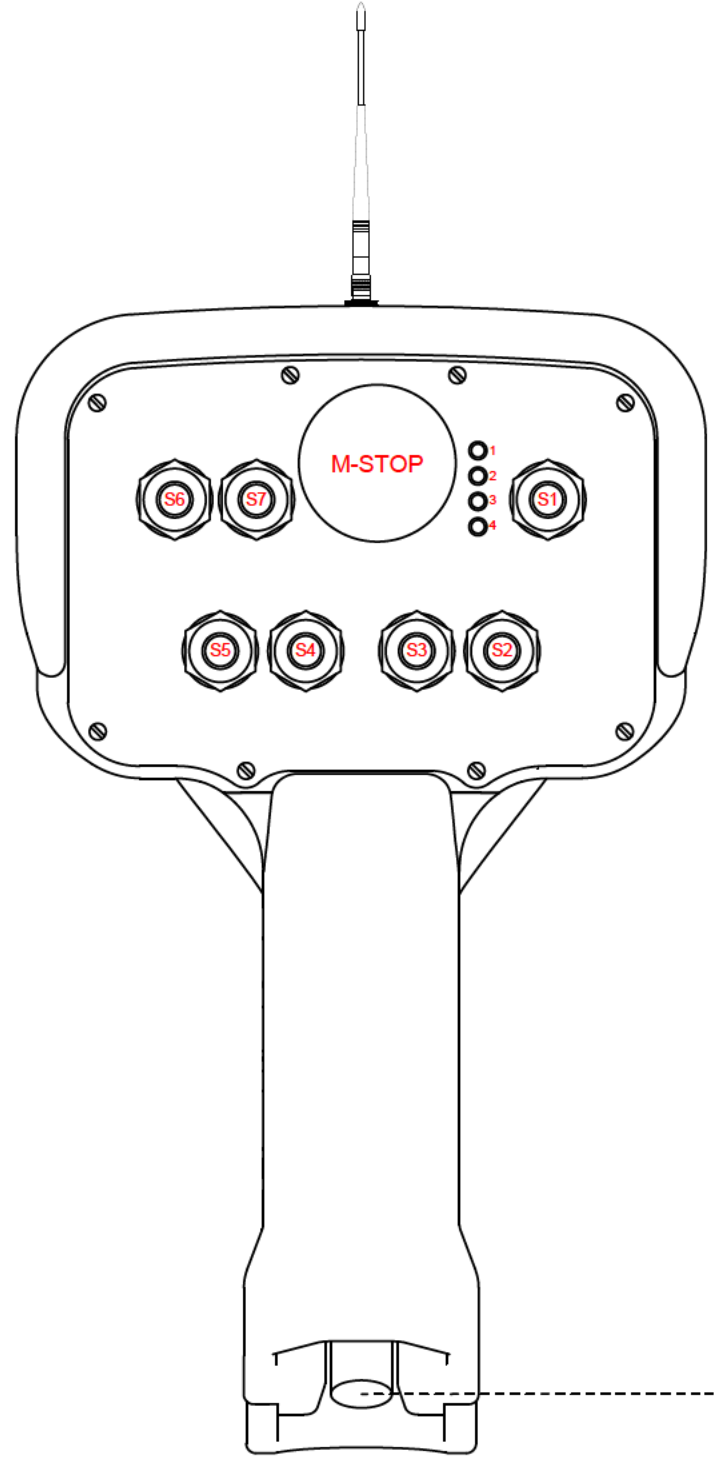
SIZE: B

DWG NO.

WSMB-11456

REV: A - 0





- NOTES:
- 1) REFERENCE THE 5-DIGIT PROJECT-SPECIFIC WS# (SEE TITLE BLOCK BELOW) WHEN ORDERING INDIVIDUAL PARTS OR A COMPLETE SYSTEM.
  - 2) APPLICATION SPECIFIC SPARE PARTS TO BE ORDERED USING PART NUMBERS REFERENCED ON SHEET 1 AND 2.
  - 3) CONFIGURATION WITH BASE UNIT IS TO BE 1:1.
  - 4) SYSTEM WILL UTILIZE DIRECT SEQUENCE SPREAD SPECTRUM FREQUENCY HOPPING TECHNOLOGY.
  - 5) LINK LOSS CRITERIA: 1 SEC

RANGE TEST \_\_\_\_\_

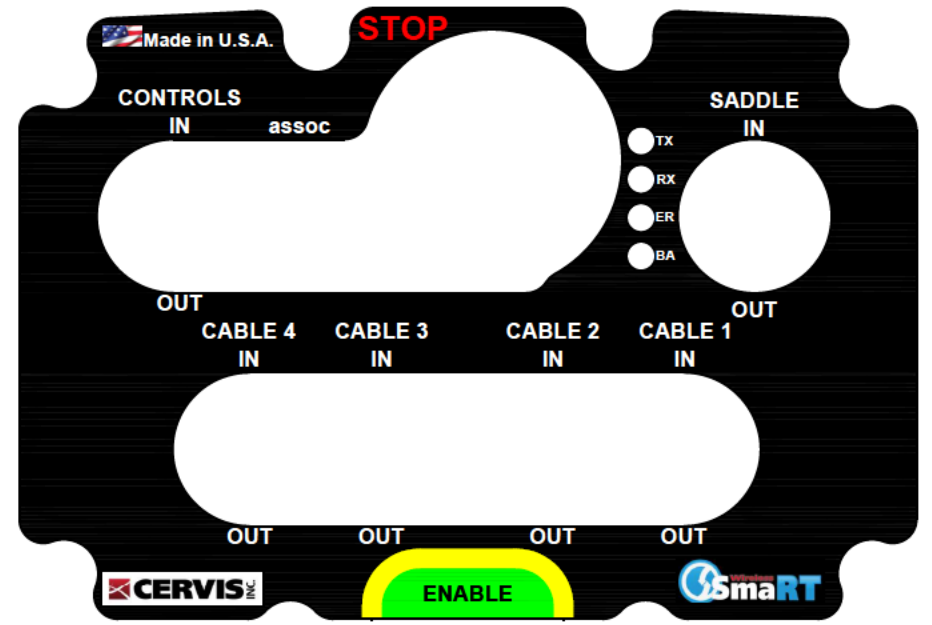
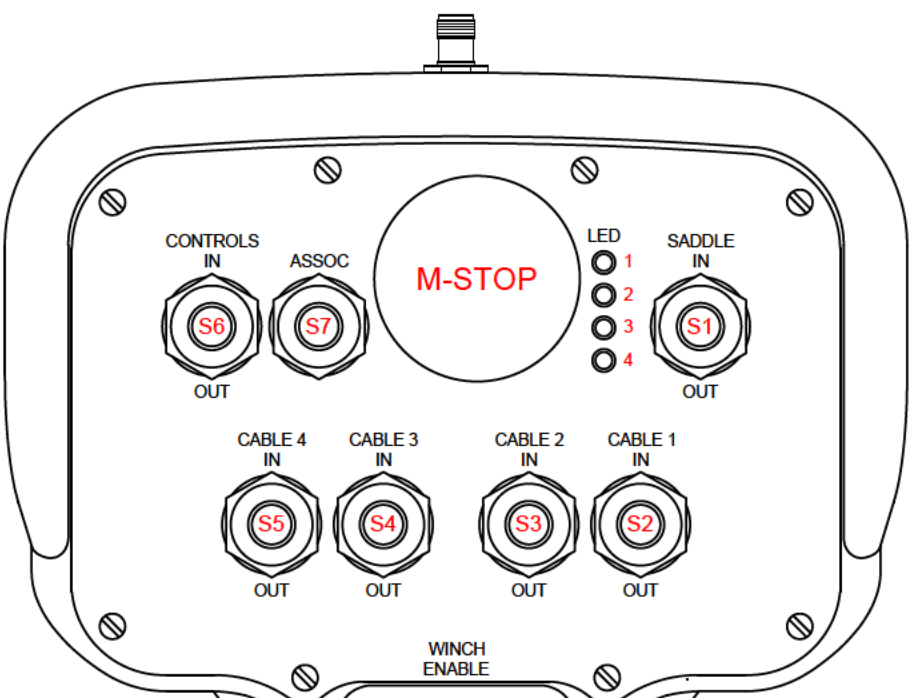
CUSTOMER: HYBEKO AS	
DESCRIPTION: SYSTEM DIAGRAM	
DRAWN: ECJ	SCALE: N/A
ENGINEER: GFM	SHEET: 3 OF 6



SIZE: B	DWG NO. WSMB-11456	REV: A - 0
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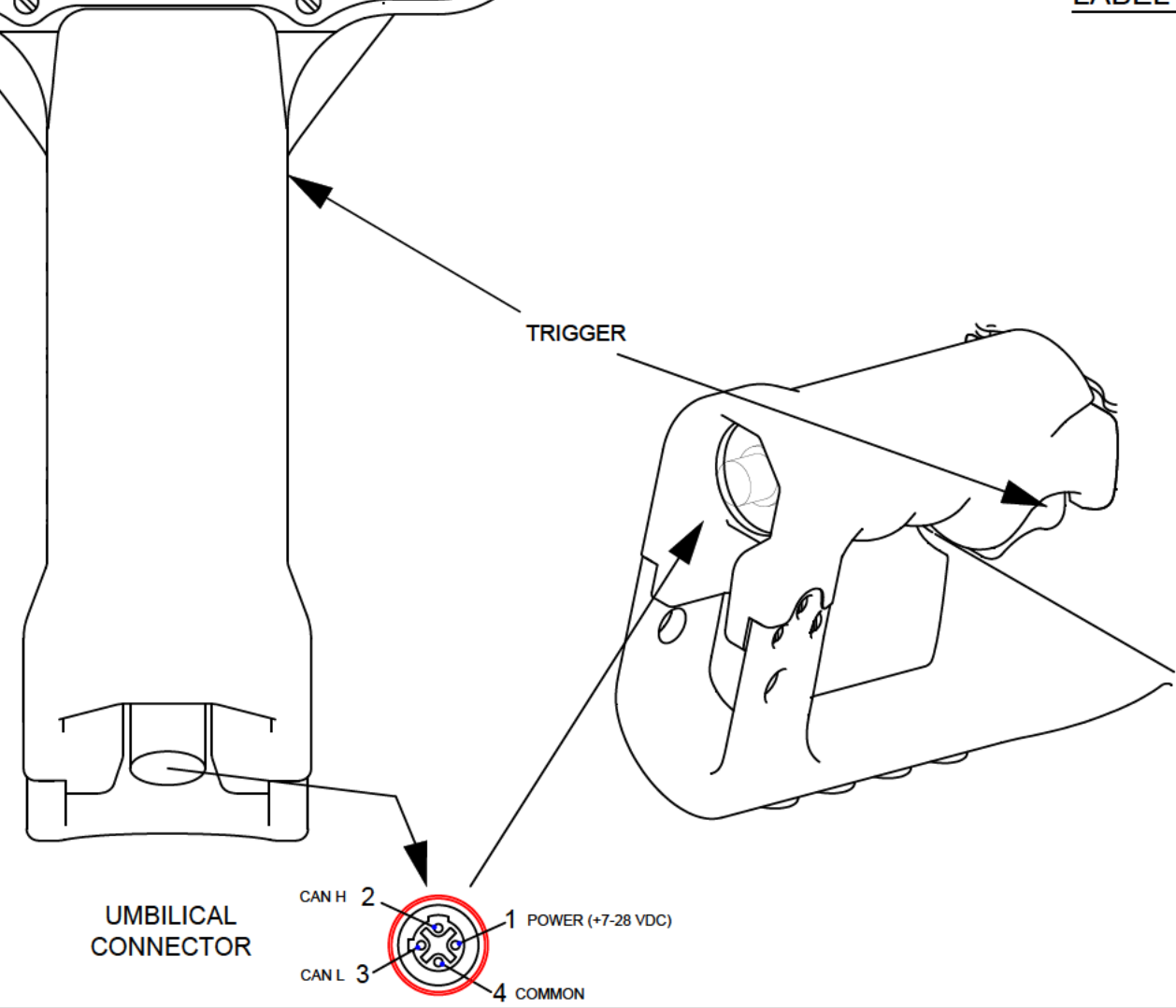
HANDHELD DETAILS		
INACTIVITY TIMEOUT	10 MINUTES	
ASSOCIATION	STANDARD DEFAULT	(S1+/S7+)
MIN/MAX ADJUSTMENT	N/A	
ASSOCIATION PROCEDURE	TRANSMITTER AND BASE UNIT MUST BE OFF.	
	1. M-STOP IN THE ON POSITION.	
	2. OPERATE SWITCHES S1+ AND S7+ AND HOLD.	
	3. ALL FOUR LED'S WILL TURN ON, CONTINUE TO HOLD SWITCHES.	
	4. ALL LED'S WILL TURN OFF AND "TX" LED WILL BEGIN TO BLINK.	
	5. TURN ON BASE UNIT.	
LOW VOLTAGE WARNING		
VOLTAGE SHUTDOWN		
UMBILICAL CHECK (IF APP)		
CHECK SUM:		
SOFTWARE:		
NOTES:		

- 9X - 900 MHz
- 2H - 2.4 GHz



LED	TX	GREEN
LED 1	TX	GREEN
LED 2	RX	AMBER
LED 3	ERR	RED
LED 4	BAT	AMBER

SWITCH TYPE	START UP CONDITION	RAISED
STOP	PUSH TO ACTIVATE/TWIST UP TO DEACTIVATE	RAISED
S1	3 POSITION MOMENTARY TOGGLE SWITCH	+
S2	3 POSITION MOMENTARY TOGGLE SWITCH	N
S3	3 POSITION MOMENTARY TOGGLE SWITCH	N
S4	3 POSITION MOMENTARY TOGGLE SWITCH	N
S5	3 POSITION MOMENTARY TOGGLE SWITCH	N
S6	3 POSITION MOMENTARY TOGGLE SWITCH	N
S7	3 POSITION MOMENTARY TOGGLE SWITCH	N
TRIGGER	SPRING RELEASE TRIGGER	RELEASED

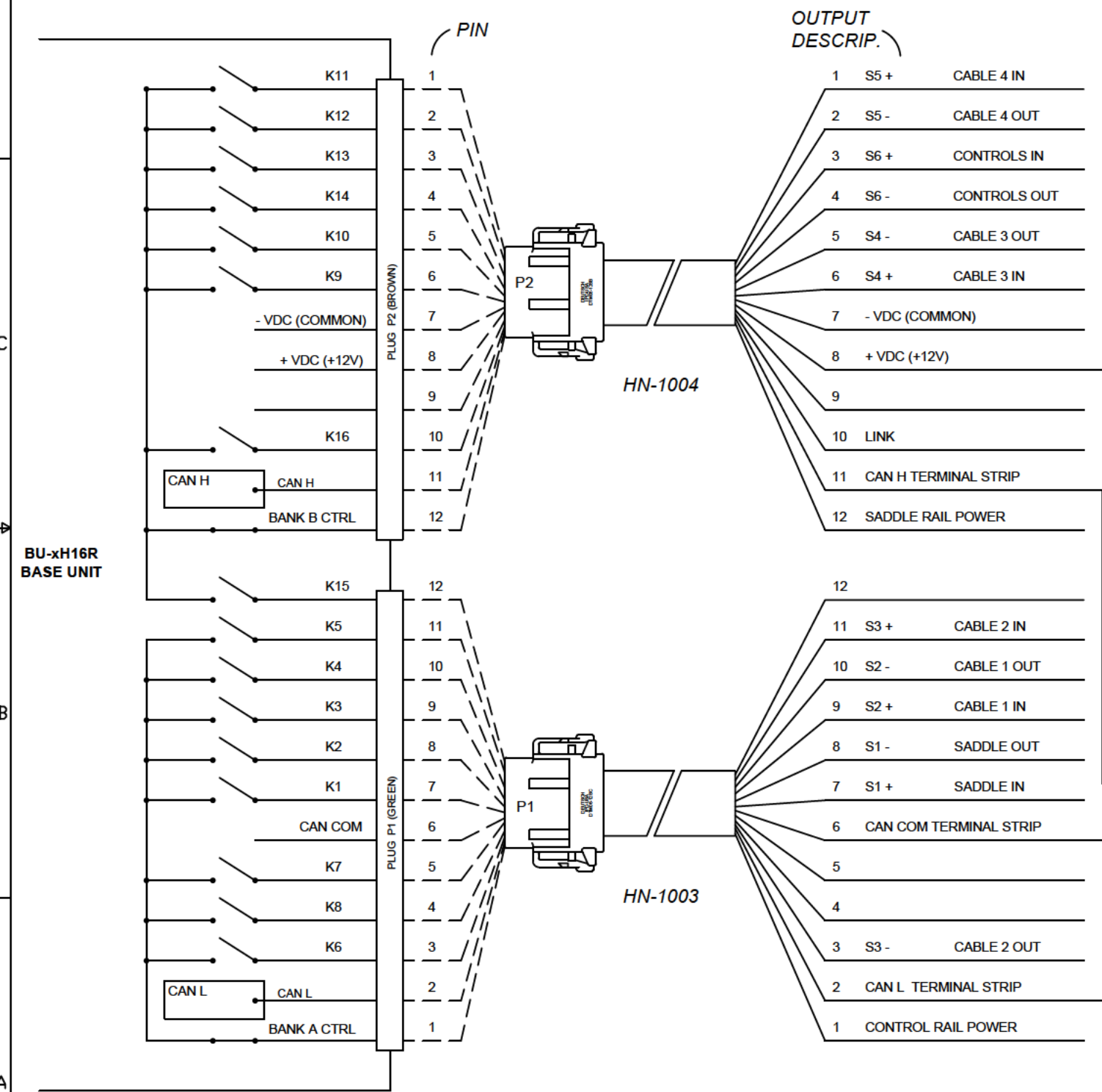


CUSTOMER: HYBEKO AS		
DESCRIPTION: HANDHELD CONFIGURATION		
DRAWN: ECJ	SCALE: N/A	SHEET: 4 OF 6
ENGINEER: GFM	SIZE: B	
DWG NO. WSMB-11456		REV: A - 0

BASE UNIT HARDWARE		
REQUIRED FIELDS	DESCRIPTION	DETAILS
CONTROL POWER	7-32 VDC	12VDC
ANTENNA OPTION	EXTERNAL	
CAN CONFIGURATION		
CAN TERMINATION	1.0kΩ (Standard default)	
CHECK SUM:		
SOFTWARE:		

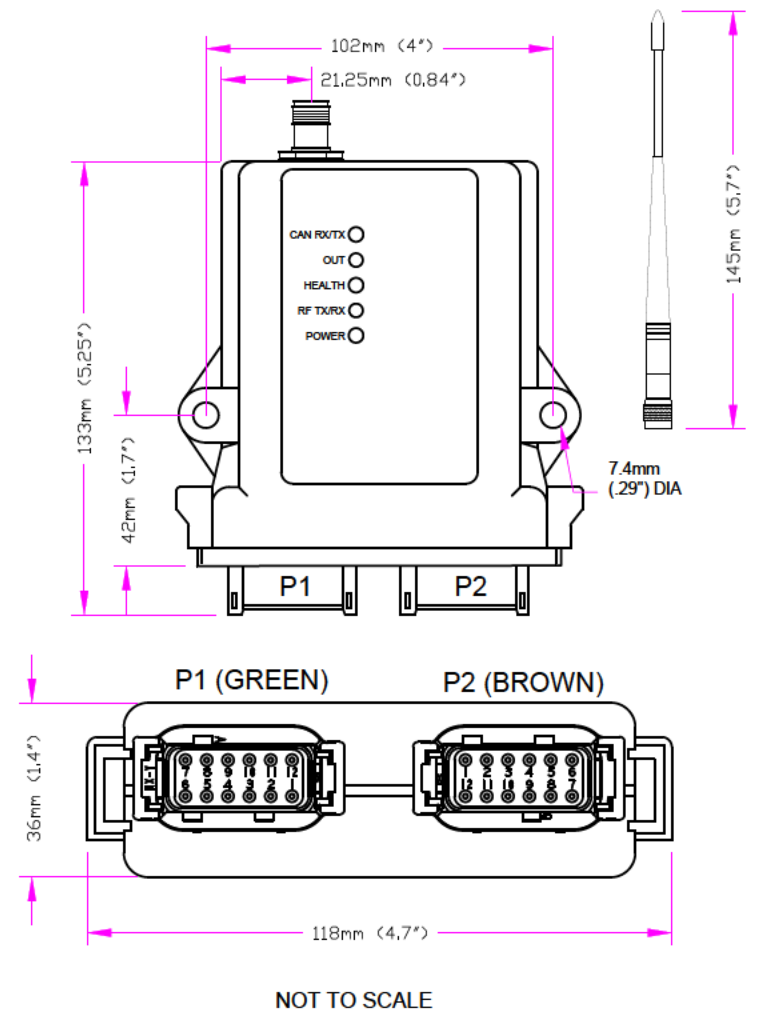
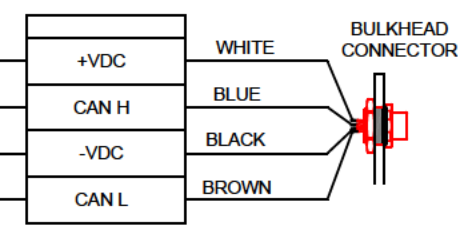
BASE UNIT SAFETY LINK	
WHEN ANY OF THE FOLLOWING OCCURS:	
<ul style="list-style-type: none"> <li>MACHINE STOP IS PRESSED</li> <li>HANDHELD UNIT GOES OUT OF RANGE</li> <li>HANDHELD UNIT DEACTIVATES DUE TO LOSS OF POWER, INACTIVITY TIMEOUT, OR DELIBERATE DEACTIVATION (OFF SWITCH)</li> </ul>	
X	
ENABLED	DISABLED
ALL LATCHED OUTPUTS UNLATCH AND ALL MOMENTARY OUTPUTS THAT ARE ACTIVE DEACTIVATE. UPON ACTIVATION OF THE HANDHELD, NO OUTPUTS ARE ALLOWED TO BE ACTIVATED UNTIL ALL SWITCHES (UNLESS MASKED) ARE FIRST CENTERED OR RETURNED TO THEIR NEUTRAL STATE.	ALL LATCHED OUTPUTS REMAIN LATCHED, BUT ALL MOMENTARY COMMANDS THAT ARE ACTIVE DEACTIVATE.
NOTE: IF HANDHELD UNIT IS POWERED ON AND A MOMENTARY COMMAND THAT WAS DEACTIVATED DUE TO RANGE IS STILL ACTIVE WHEN THE HANDHELD RETURNS IN RANGE THE OUTPUT WILL IMMEDIATELY BE ACTIVE AGAIN.	

		BASE UNIT SOFTWARE CONFIGURATION															
		OUTPUT CHANNEL															
		K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	K13	K14	K15	K16
TRANSMITTER ACTIVATION	S1+ + TRIGGER AND NOT S2,S3,S4,S5,S6	M															
	S1- + TRIGGER AND NOT S2,S3,S4,S5,S6		M														
	S2+ + TRIGGER			M													
	S2- + TRIGGER				M												
	S3+ + TRIGGER					M											
	S3- + TRIGGER						M										
	S4+ + TRIGGER							M									
S4- + TRIGGER								M									
S5+ + TRIGGER									M								
S5- + TRIGGER										M							
S6+ + TRIGGER AND NOT S1,S2,S3,S4,S5											M						
S6- + TRIGGER AND NOT S1,S2,S3,S4,S5												M					
LINK																	M

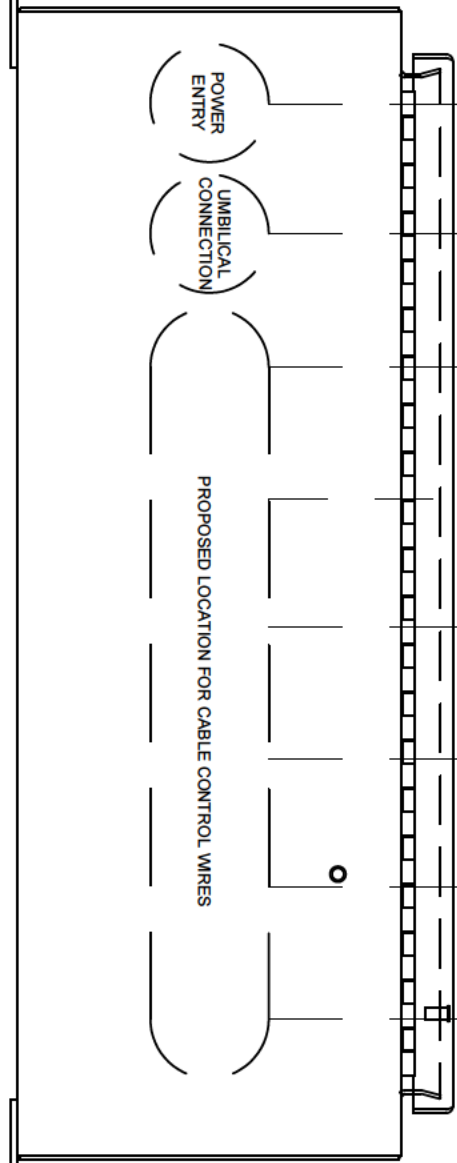


M = MOMENTARY  
 LA = LATCHING  
 UN = UNLATCHING  
 X = BUTTON INTERLOCKING

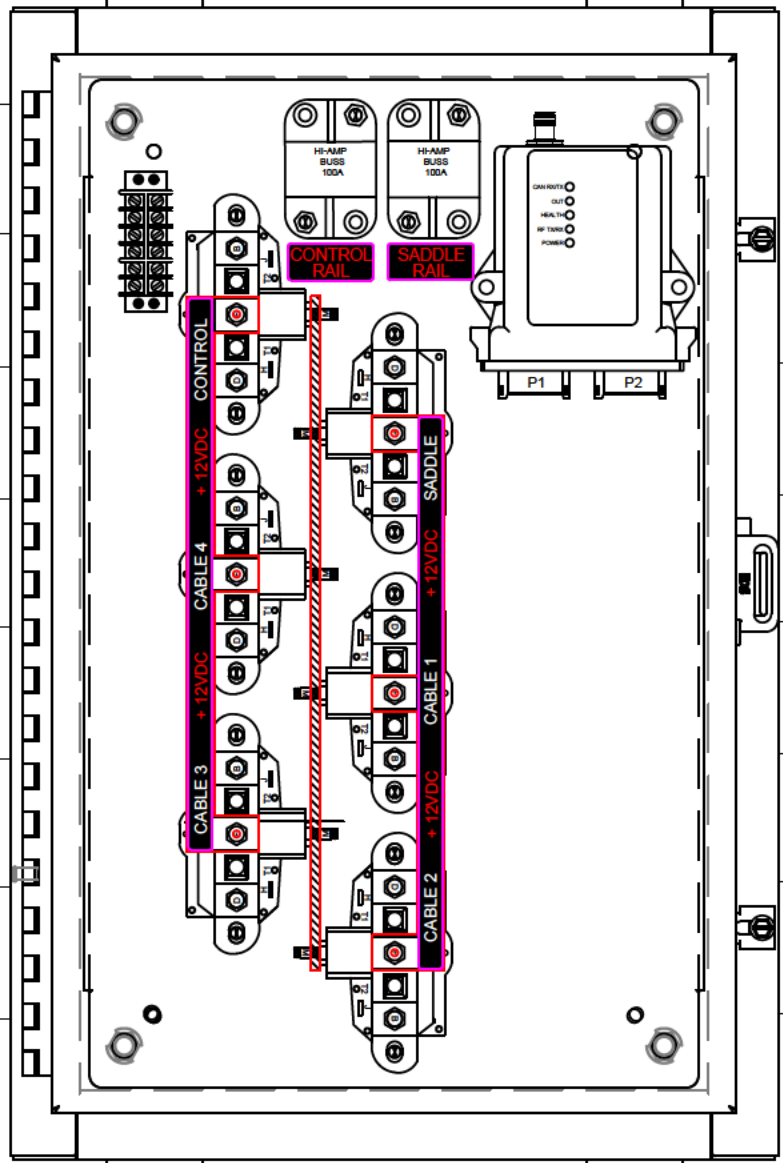
BASE UNIT LEDs	
CAN RX/TX	CAN Receive/Transmit
OUT	Output active
HEALTH	Health ok
RF TX/RX	RF Transmit/Receive
POWER	Power ok/fault



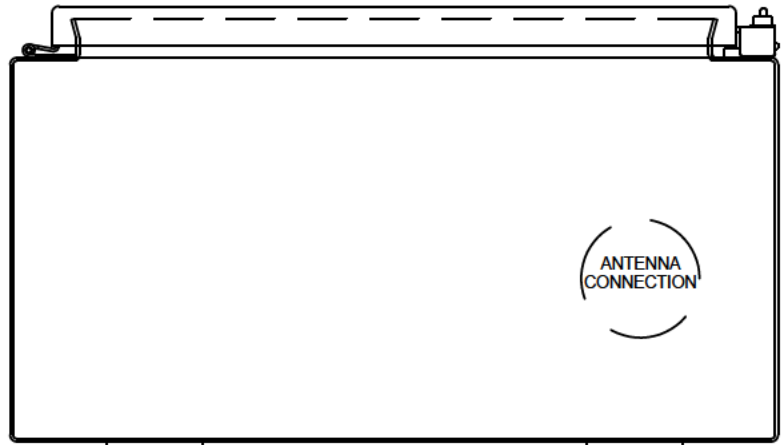
CUSTOMER: HYBEKO AS					
DESCRIPTION: BASE UNIT CONFIGURATION					
DRAWN: ECJ	SCALE: N/A	SHEET: 5 OF 6	SIZE: B	DWG NO. WSMB-11456	REV: A-0
ENGINEER: GFM					



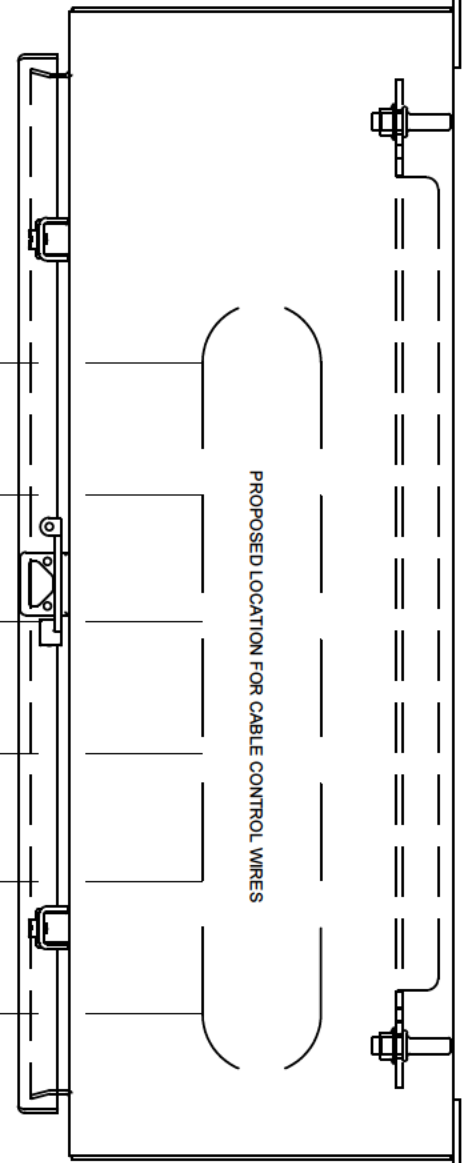
LEFT SIDE VIEW



FRONT VIEW

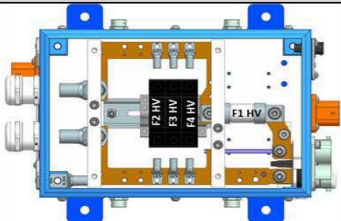



BOTTOM VIEW



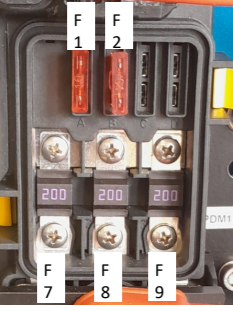
RIGHT SIDE VIEW

CUSTOMER: HYBEKO AS			
DESCRIPTION: ENCLOSURE LAYOUT			
DRAWN: ECJ	SCALE: N/A	SHEET: 6 OF 6	SIZE: B
ENGINEER: GFM			DWG NO. WSMB-11456

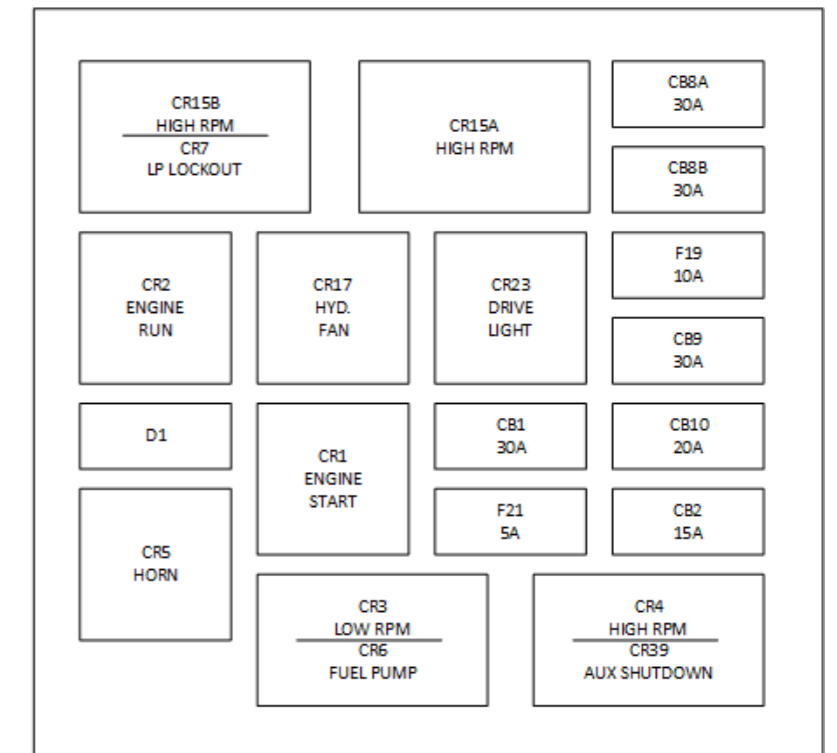
PDU	FUSE No.	FUNCTION	RATING	COMPONENT
	F1HV	Inverter	250A	Mersen MEV50A250-25G
	F2HV	Charger	25A	Mersen MEV100C25
	F3HV	HV compressor	25A	Mersen MEV100C25
	F4HV	Battery heater	25A	Mersen MEV100C25

PDM1HV	FUSE No.	FUNCTION	RATING	COMPONENT
	F7HV	Winch	200A	Mini 32Vdc bolt-down fuse
	F8HV	Winch	200A	Mini 32Vdc bolt-down fuse
	F9HV	INV - DC/DC CONVERTER OUTPUT	200A	Mini 32Vdc bolt-down fuse

PDM2HV AND PDM3HV						FUSE No.	FUNCTION	RATING	COMPONENT
F10HV 25A	N/A	F19HV 10A	N/A	N/A	N/A	F10HV	CF – Cooling fan	25A	Mini 32Vdc blade fuse
CR1HV		CR13HV		N/A		F11HV	HEC – Electrification control unit	10A	Mini 32Vdc blade fuse
F13HV 5A	F14HV 5A	F15HV 5A	F16HV 5A	F17HV 10A	F18HV 10A	F12HV	Logic, diagnostics	5A	Mini 32Vdc blade fuse
CR2HV	CR3HV	CR4HV	CR5HV	CR6HV	CR7HV	F13HV	KL30HV: HV Battery logic, PDU, Charge wake-up	5A	Mini 32Vdc blade fuse
F12HV 5A	CR8HV	CR9HV	CR10HV	CR11HV	CR12HV	F14HV	KL30HV: Inverter, HMI	5A	Mini 32Vdc blade fuse
F11HV 10A						F15HV	KL30HV: Compressor, heater	5A	Mini 32Vdc blade fuse
						F16HV	HV Battery contactors	10A	Mini 32Vdc blade fuse
						F17HV	BCP – Battery coolant pump	10A	Mini 32Vdc blade fuse
						F18HV	CCP – Components coolant pump	10A	Mini 32Vdc blade fuse
						F19HV	K1HV, K2HV – Winch supply contactors	10A	Mini 32Vdc blade fuse
						RELAY No.	FUNCTION	RELAY TYPE	COMPONENT
						CR1HV	CF – Cooling fan	ISO 7588-1 Mini relay	Song Chuan 896H-1CH-S-R1-12VDC
						CR2HV	KL30HV: HV Battery logic, PDU, Charge wake-up	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR3HV	KL30HV: Inverter, HMI	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR4HV	KL30HV: Compressor, heater	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR5HV	HV Battery contactors	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR6HV	BCP – Battery coolant pump	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR7HV	CCP – Components coolant pump	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR8HV	INV/Motor HVIL circuit	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR9HV	FW Drive enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR10HV	REV Drive enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR11HV	Brakes enable	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR12HV	SW inhibit	ISO 280 Ultra Micro	Song Chuan 303-1AH-C-R1 12 Vdc
						CR13HV	K1HV, K2HV – Winch supply contactors	ISO 7588-1 Mini relay	Song Chuan 896H-1CH-S-R1-12VDC

External components	Fuse no.	
	F1	Distance warning systems
	F2	Mascot 12V Charger
	F7	Winch
	F8	Winch
	F9	DC/DC converter

### Engine Relay Layout



Fuses		
F19	10A	Drive Light
F21	5A	Telematic option
CB1	30A	Engine control power
CB2	15A	System control logig power
CB8A	30A	Glow plug 1
CB8B	30A	Glow plug 2
CB9	30A	Engine run / option / acc.
CB10	20A	Sytem control driver power
Diode		
D1	6A	Alternator Ext
Relays		
CR1	Engine start	
CR2	Engine run	
CR3/CR6	Low rpm / Fuel pump	
CR4/CR39	High RPM / Fuel pump	
CR5	Horn	
C15A	Engine glow plug A	
CR15B / CR7	Engine glow plug B / LPG Solenoid	
CR17	Hydraulic oil cooler (otion)	
CR23	Drive light	
CR39	Aux shut down	

# HYBEKO

## OVERVIEW FUSES - RELAYS

TITLE  
Hybeko S-45XC Electric – FUSES, RELAYS AND NOTES

MODEL  
HYBEKO SP S-45XC

DRAWING NO

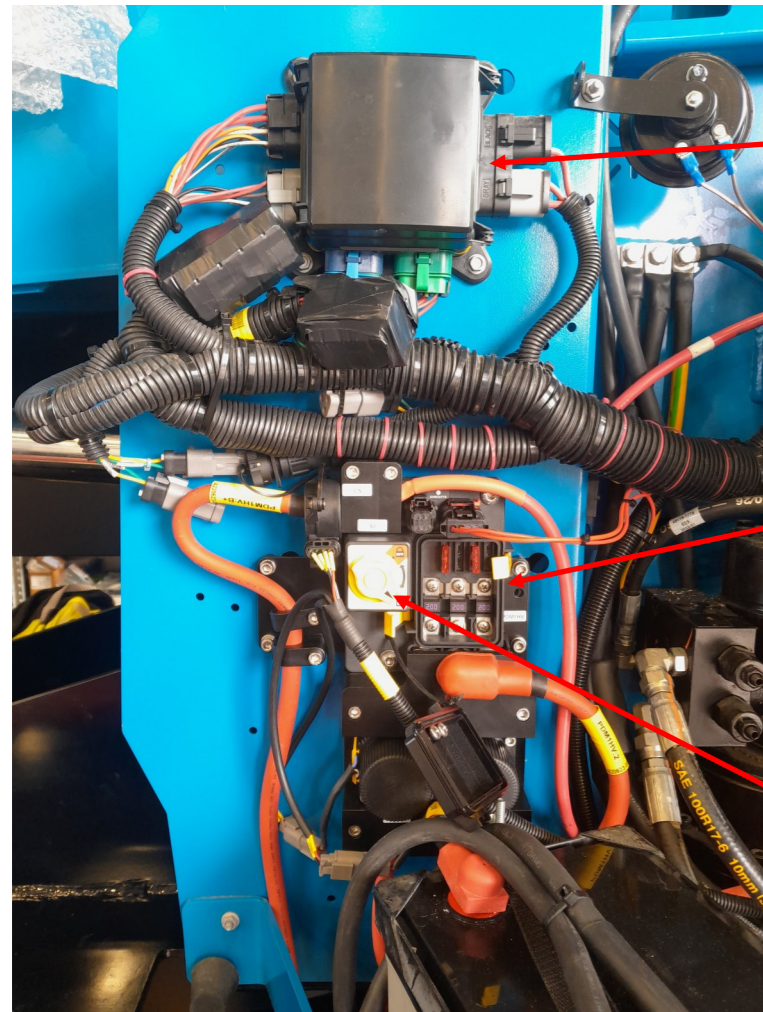
PAGE  
1

CREATED BY / DATE  
KHO 13.06.2024

REVISED BY / DATE

REVISION DESCRIPTION  
gen2

# Fuse box Overview



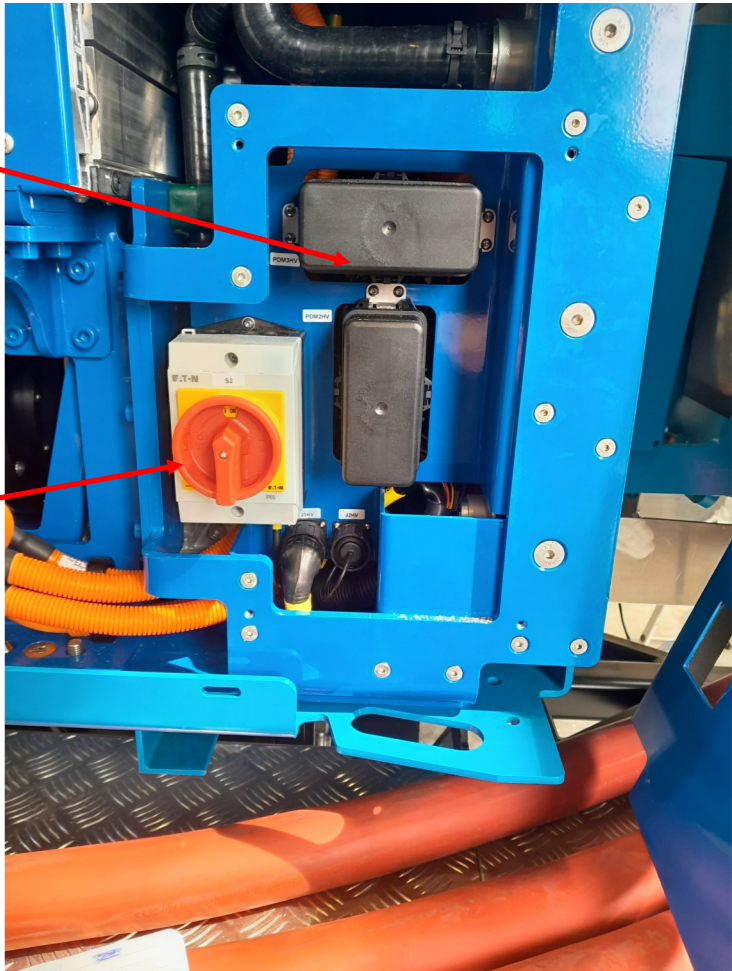
Engine Fuse box

Fuse box ext. components

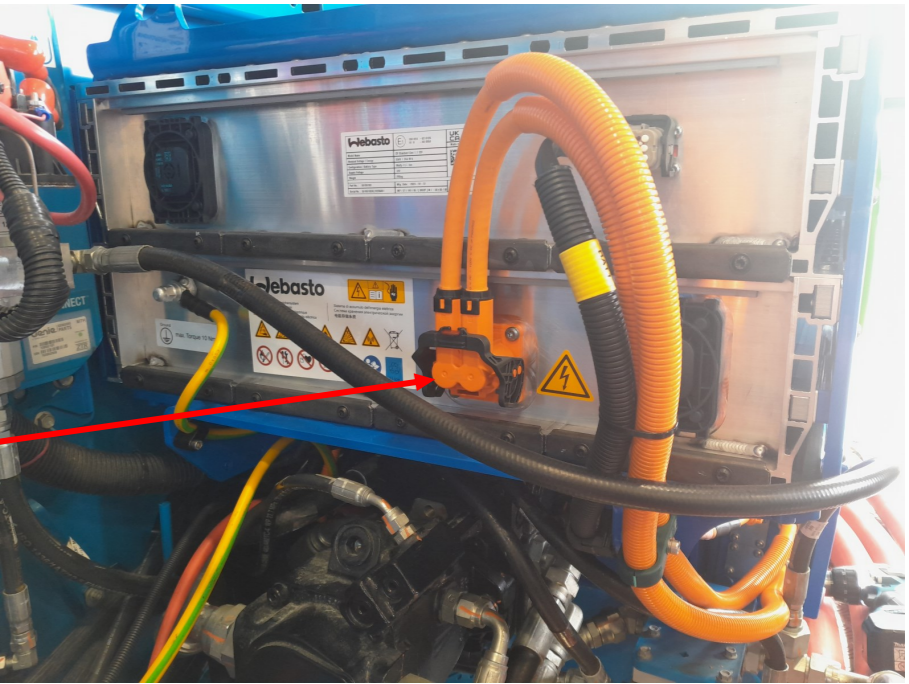
Main Switch low voltage system

PDM2 (power distribution module 2)  
Se Power Unit sheet for fuse overview

Main Power switch  
high voltage systems

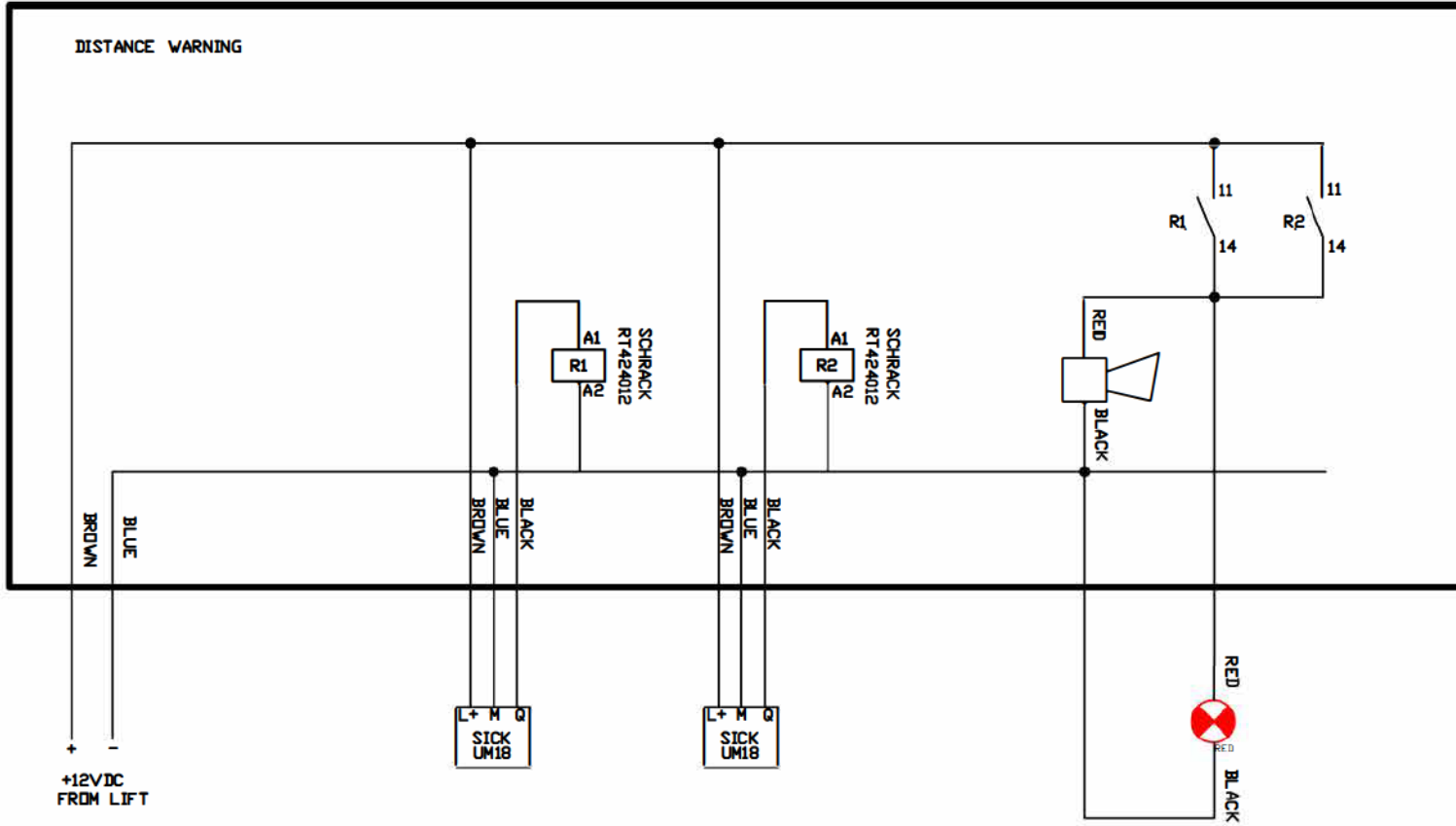


MSD (Manual service disconnect)  
Disconnect high-voltage battery  
from system



OVERVIEW FUSES - RELAYS

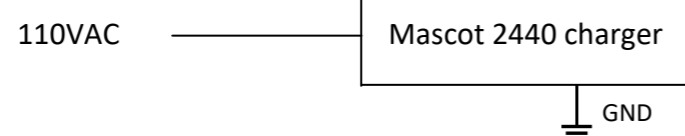
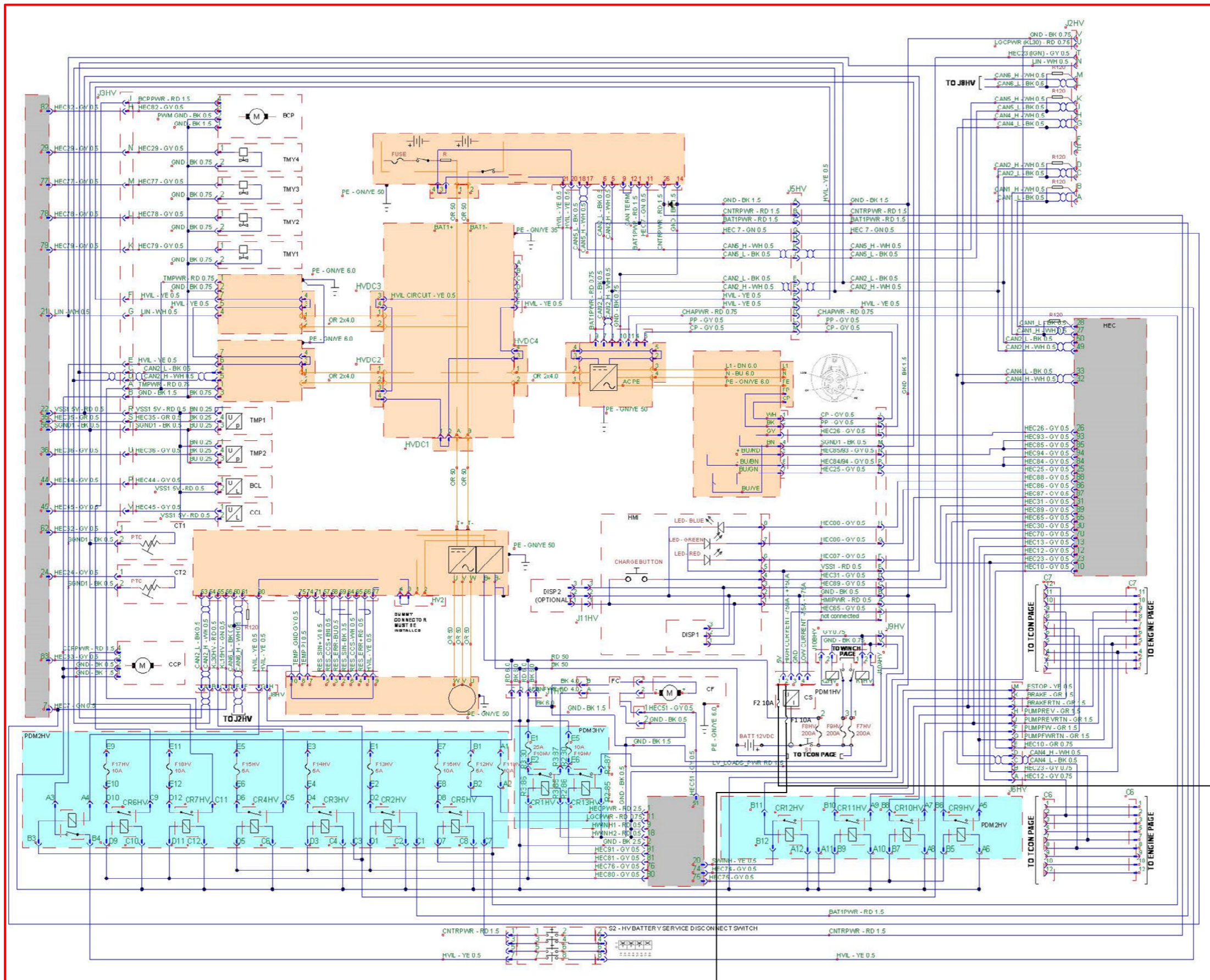
TITLE Hybeko S-45XC Electric – FUSES, RELAYS AND NOTES		
MODEL HYBEKO SP S-45XC	DRAWING NO	PAGE 2
CREATED BY / DATE KHO 13.06.2024	REVISED BY / DATE	REVISION DESCRIPTION gen2



To HSPM-S45XC-EL04

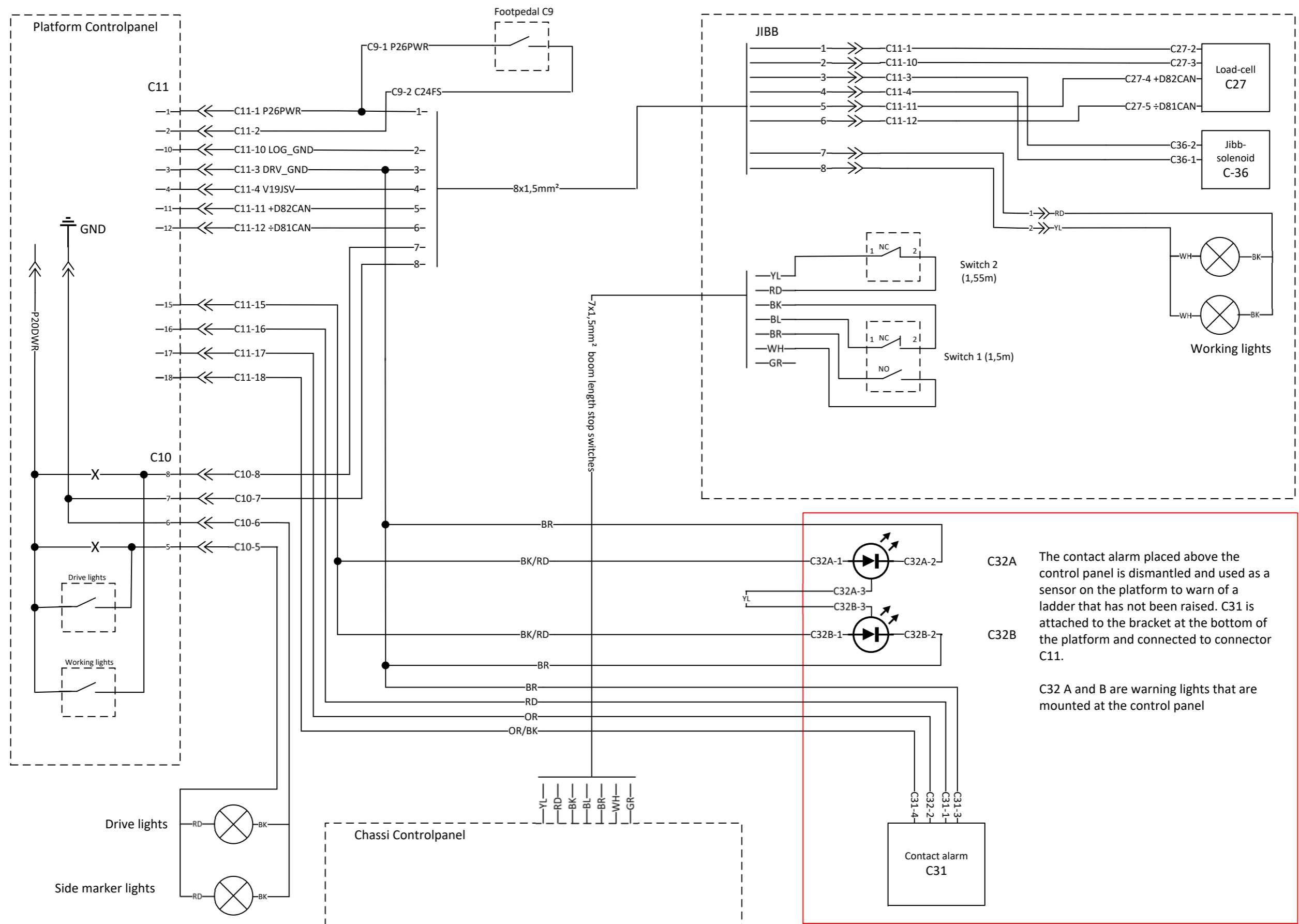
		HYBECO DISTANCE WARNING GAAREN SERVICE ELSKJEMAER										TEGNINGSNUMMER E 01 1					
1	As built																
REV.	BESKRIVELSE	DATO	SIGN.	TEGNET	DATO	24.11.23	SIGN.	GH	KONTR.	DATO	SIGN.	DISK NR.	ORDRE NR.	UNDER NR.	ARK NR.	REV.	

Drawing: D20240113-001B  
Hybria Electrification page



Project	Hybeko Shore Power Machine	Page	1
Drawing	Hybeko S-45XC Ext. components	Drawing no	HSPM-S45XC-EL04
Created by / Date	KHO / 08.03.2024	Rev.	1
		Rev. date	

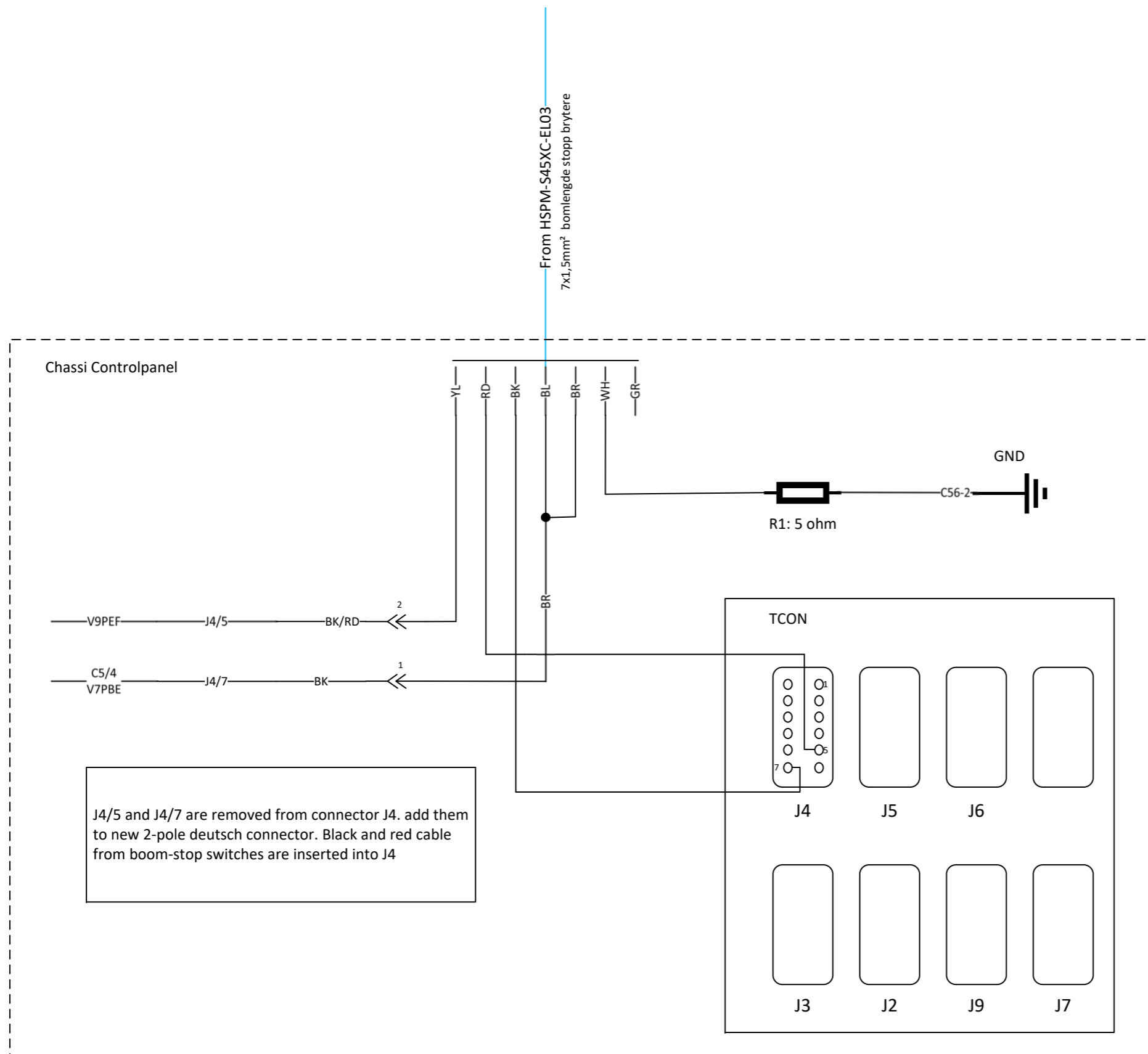




BL	Blue	WH	White	GR/BK	Green / Black	WH/BK	White / Black
BK	Black	YL	Yellow	GR/WH	Green 7 White	WH/RD	White / Red
BR	Brown	BL/BK	Blue / Black	OR/BK	Orange / Black	WH/YL	White / Yellow
GR	Green	BL/RD	Blue / Red	OR/RD	Orange / Red	YL/BK	Yellow / Black
OR	Orange	BL/WH	Blue / White	OR/WH	Orange / White		
PP	Purple	BK/RD	Blue / Red	RD/BK	Red / Black		
RD	Red	BK/WH	Black / White	RD/WH	Red / White		

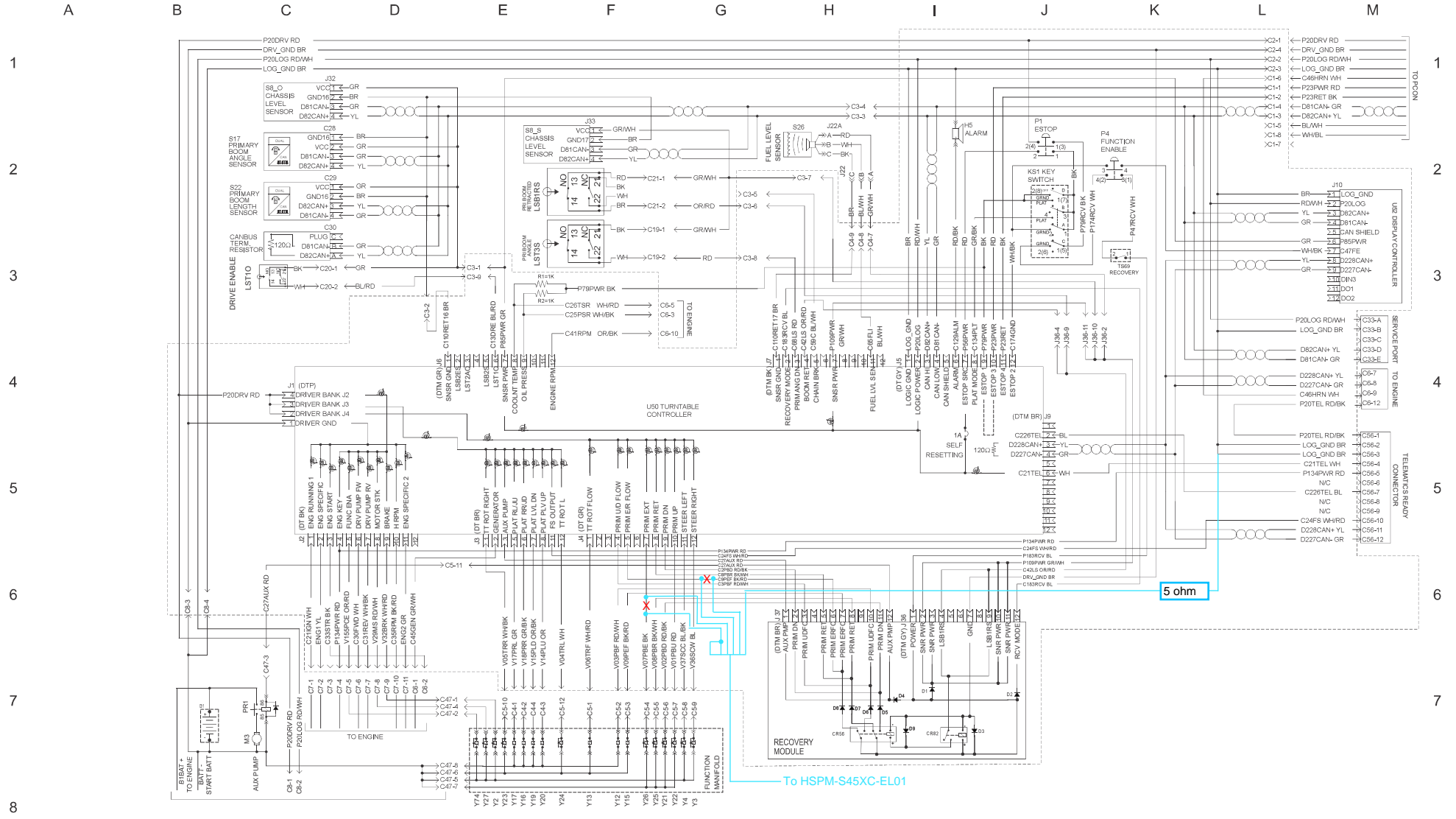



Project	Hybeko Shore Power Machine	Page	1 - 2
Drawing	Hybeko S-45XC Jibb-turtable	Drawing no	HSPM-S45XC-EL01
Created by / Date	KHO / 09.11.2023	Rev.	1
		Rev. date	



Project	Hybeko Shore Power Machine	Page	2 - 2
Drawing	Hybeko S-45XC Jibb-turntable	Drawing no	HSPM-S45XC-EL01
Created by / Date	KHO / 09.11.2023	Rev.	1
		Rev. date	

# Electrical Schematic, Turntable Controller



Project: <b>Hybeko Shore Power Machine</b>	
Drawing: <b>Boom ext stop 1.5m</b>	El-Skjema nr: <b>HSPM-S45XC-EL-03</b>
	
Drawing: Kjell Hegge-Olsen	
Date: 09.11.2023	