

1	2	3	4	5	6	7	8
=OHC							

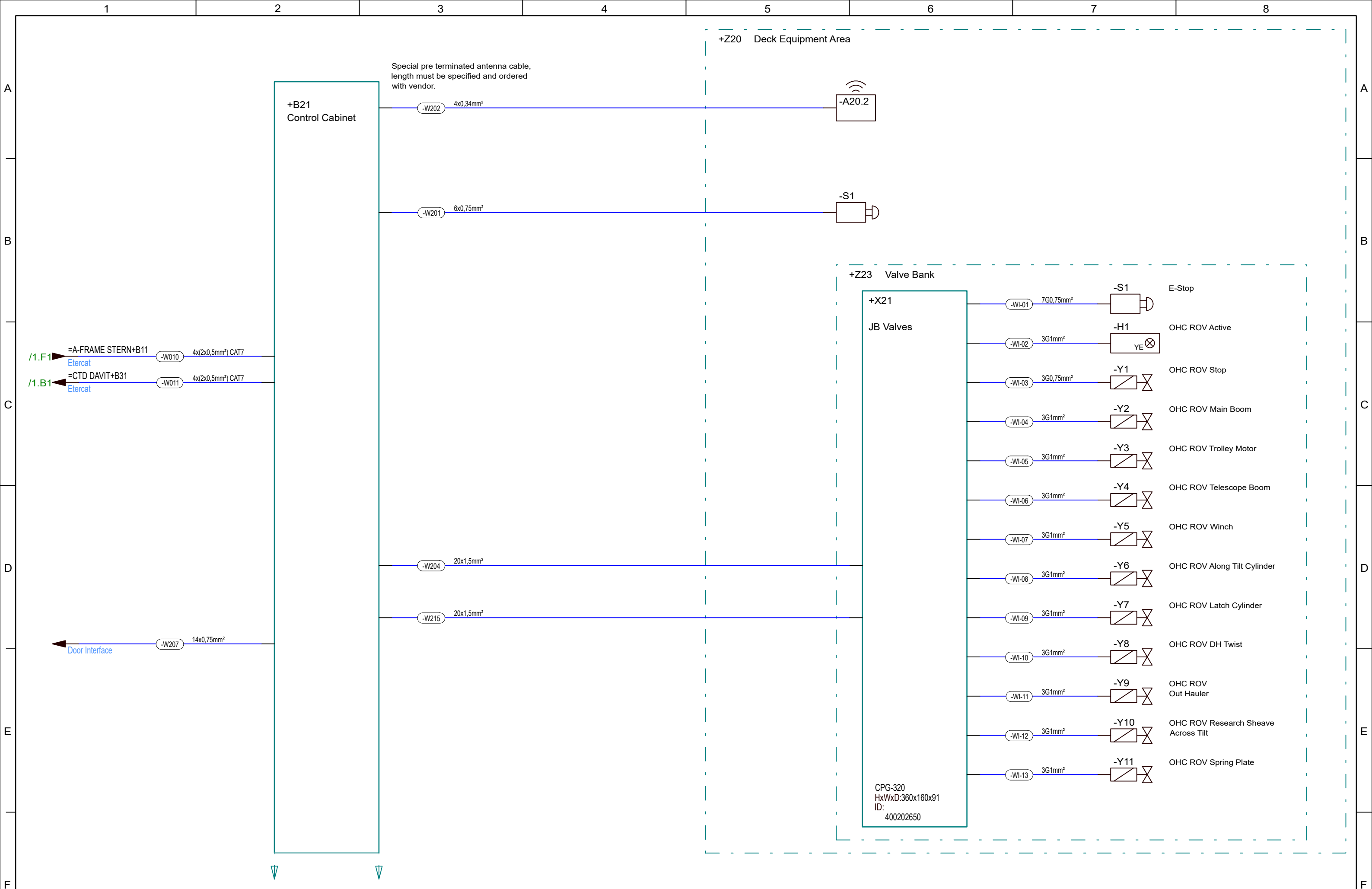
Customer : CNP Freire
Ship/Hull : MBARI
Project no. : 4/60185
Drawing no.: E-4502

Customer : CNP Freire
Ship/Hull : MBARI
Project no. : 4/60185
Drawing no.: E-4502

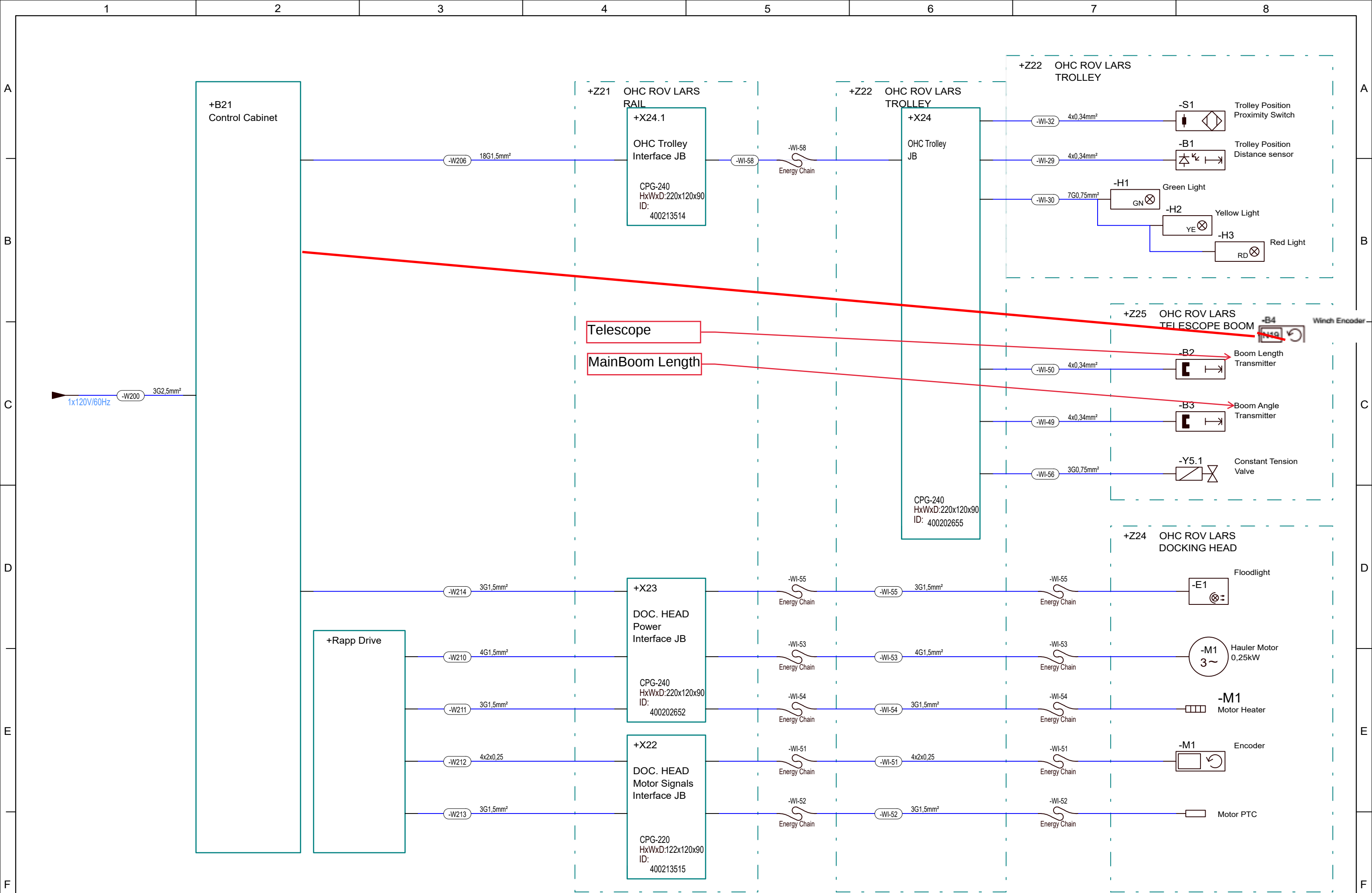
Customer : CNP Freire
Ship/Hull : MBARI
Project no. : 4/60185
Drawing no.: E-4502

Customer : CNP Freire
Ship/Hull : MBARI
Project no. : 4/60185
Drawing no.: E-4502

[illegible]



04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Single Line OHC ROV LARS	=OHC		E-4502 - 01	
03	For customer review	13.01.2023	GM	Drawn by	KS							
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								



04	Issued for production	07.07.2023	GM	Date	14.10.2021
03	For customer review	13.01.2023	GM	Drawn by	KS
02	For customer review	29.08.2022	RSI	Appr. by	EE
Rev.	Description	Date	Rev. by	Standard	

4/60185
CNP Freire
MBARI

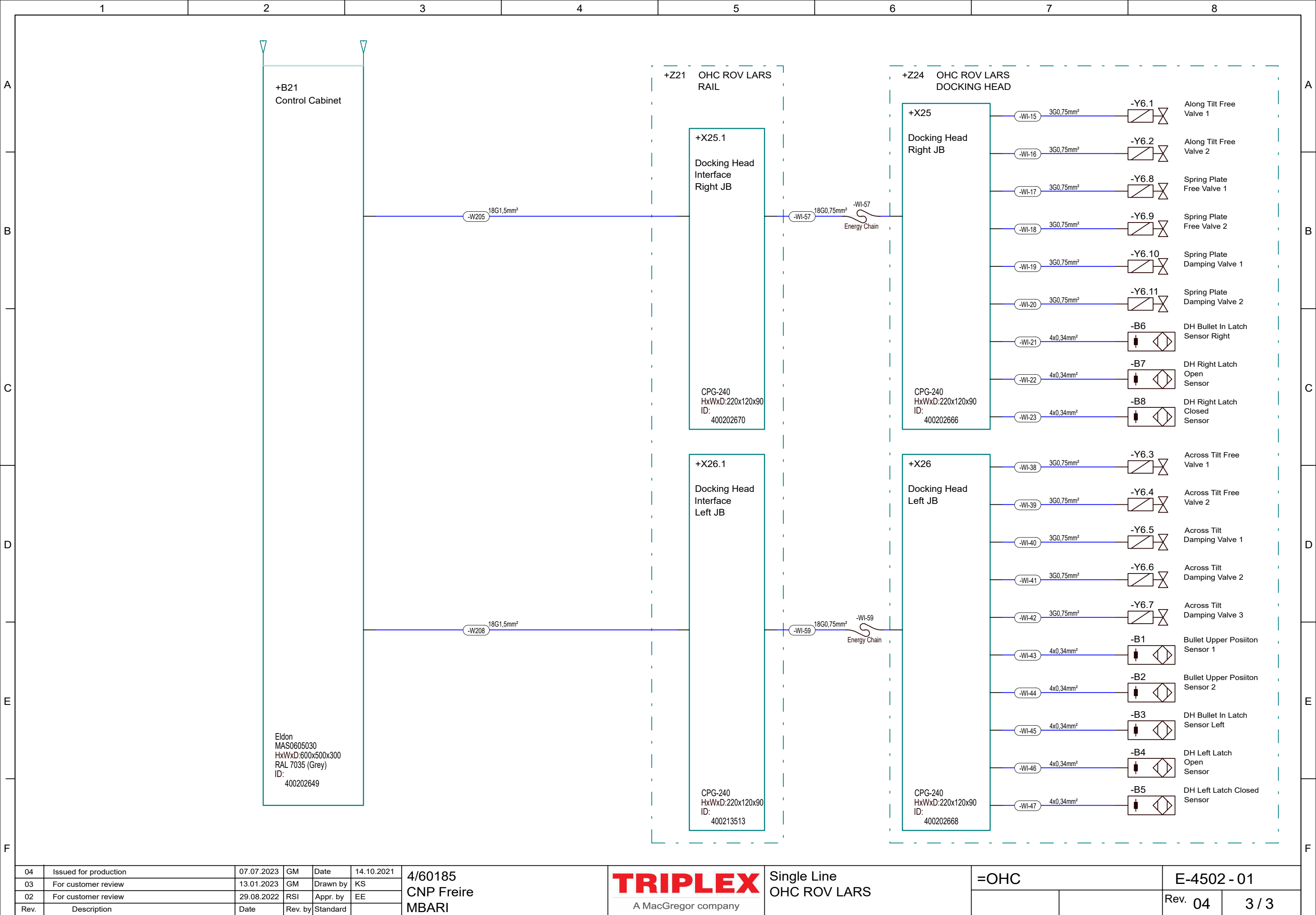


Single Line
OHC ROV LARS

=OHC

E-4502 - 01

Rev. 04 2 / 3



04	Issued for production	07.07.2023	GM	Date	14.10.2021
03	For customer review	13.01.2023	GM	Drawn by	KS
02	For customer review	29.08.2022	RSI	Appr. by	EE
Rev.	Description	Date	Rev. by	Standard	

4/60185
CNP Freire
MBARI

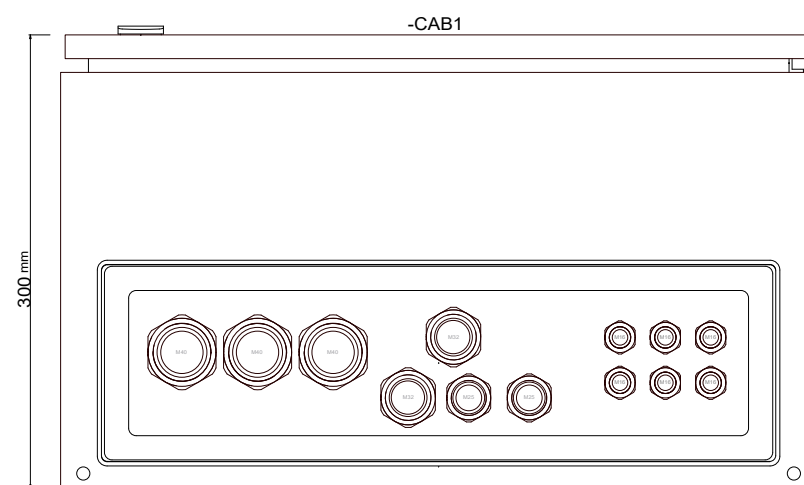
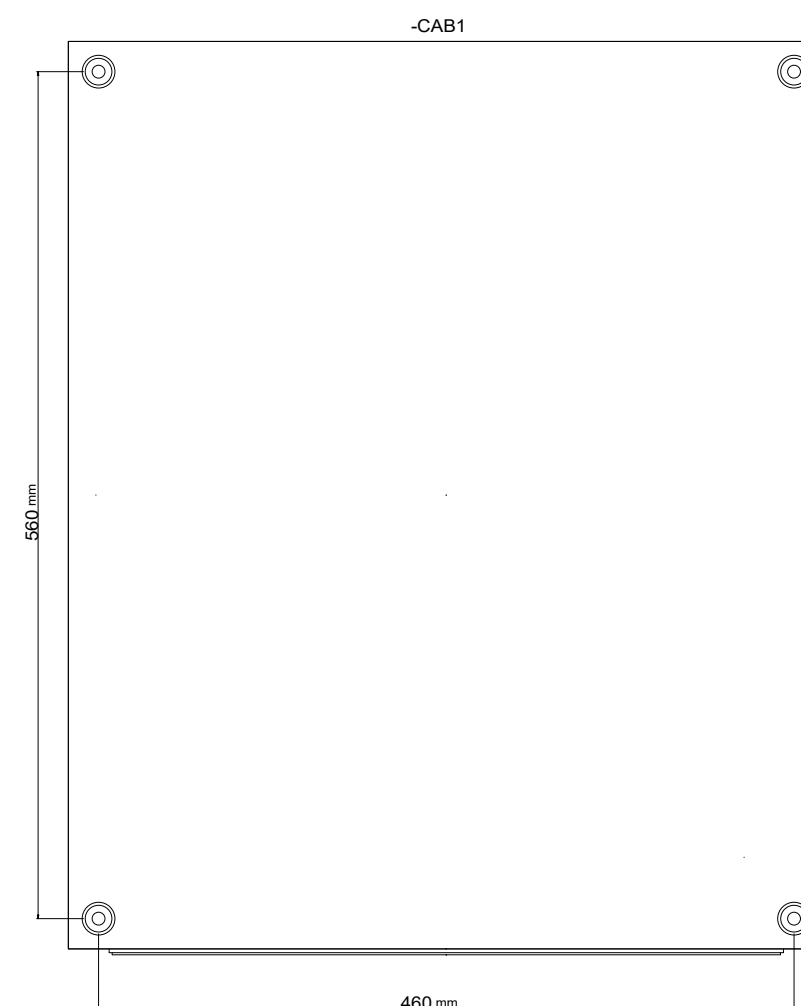
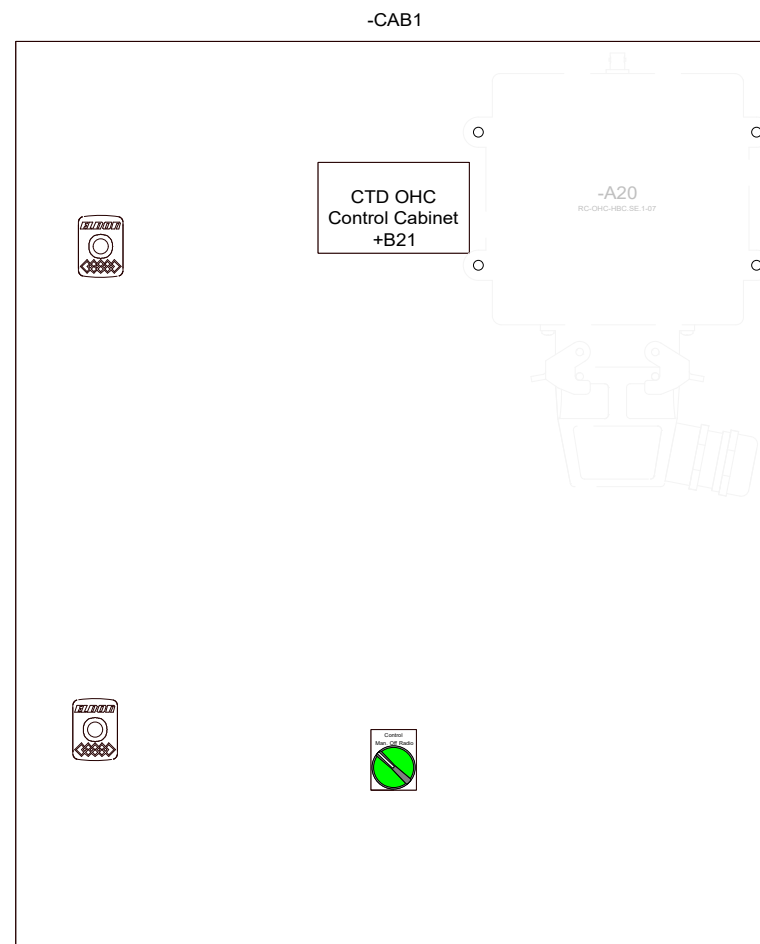


Single Line
OHC ROV LARS

=OHC

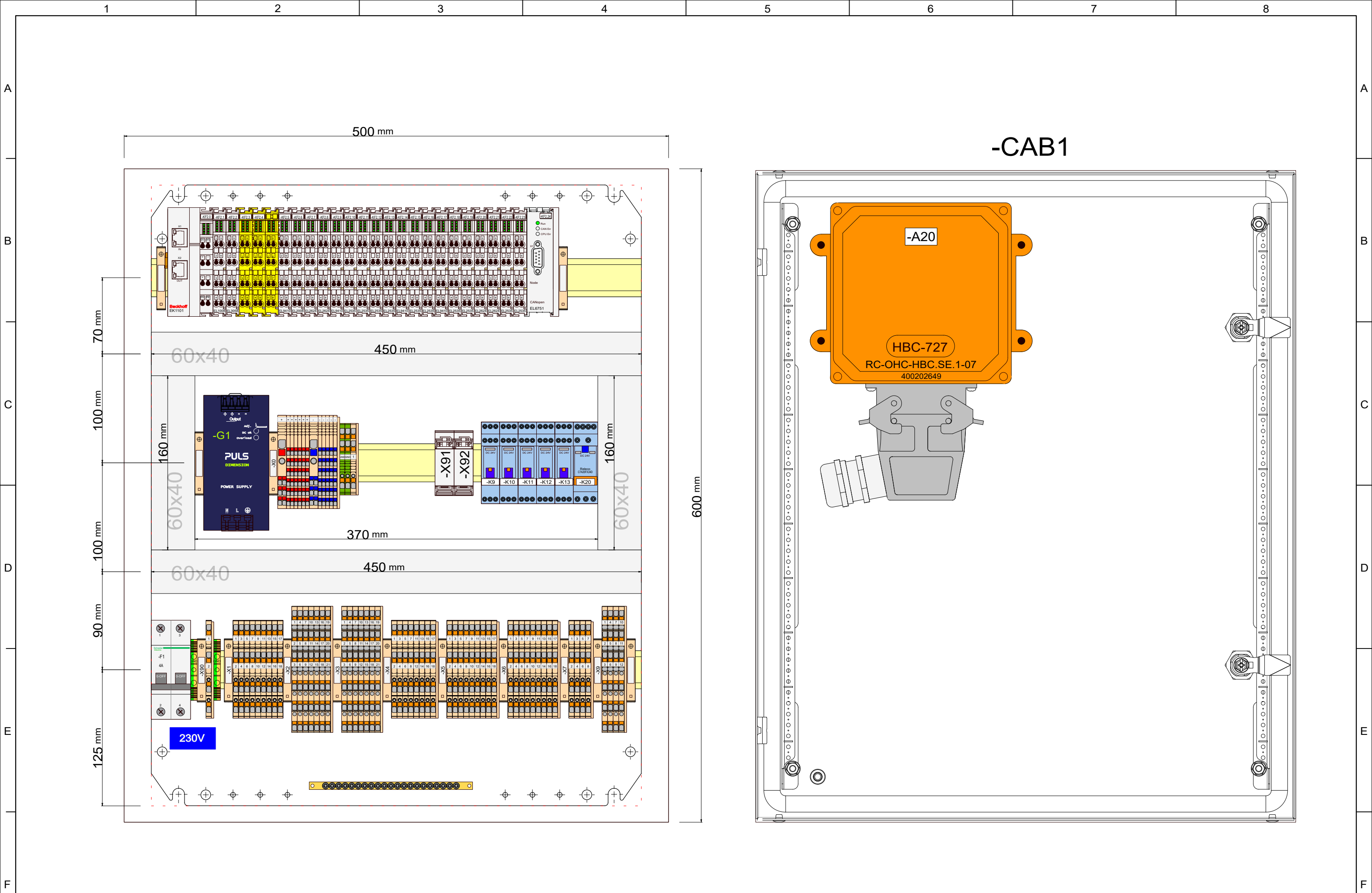
E-4502 - 01

Rev. 04 3 / 3

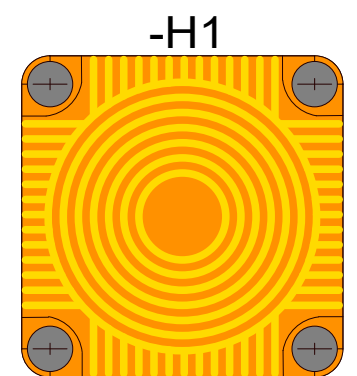
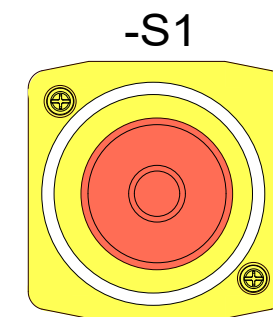
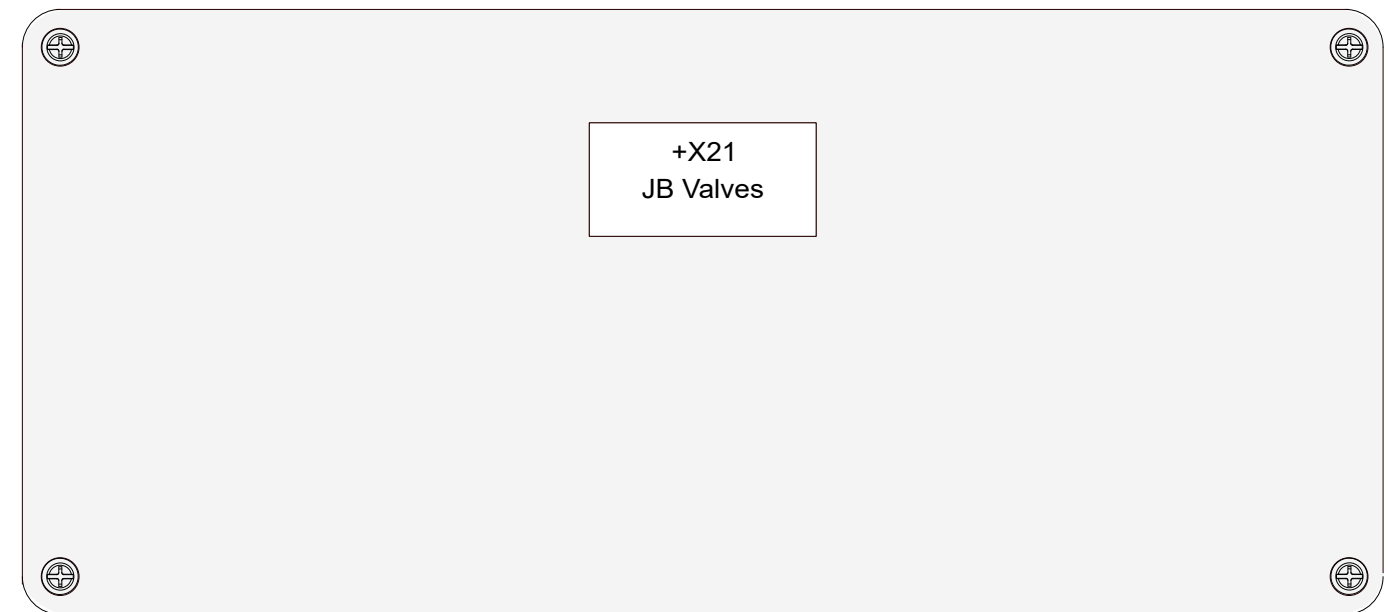
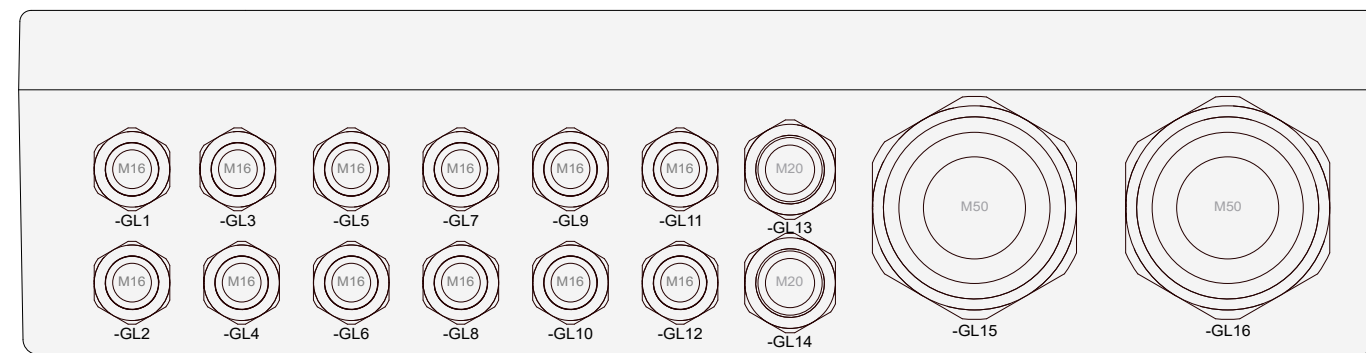
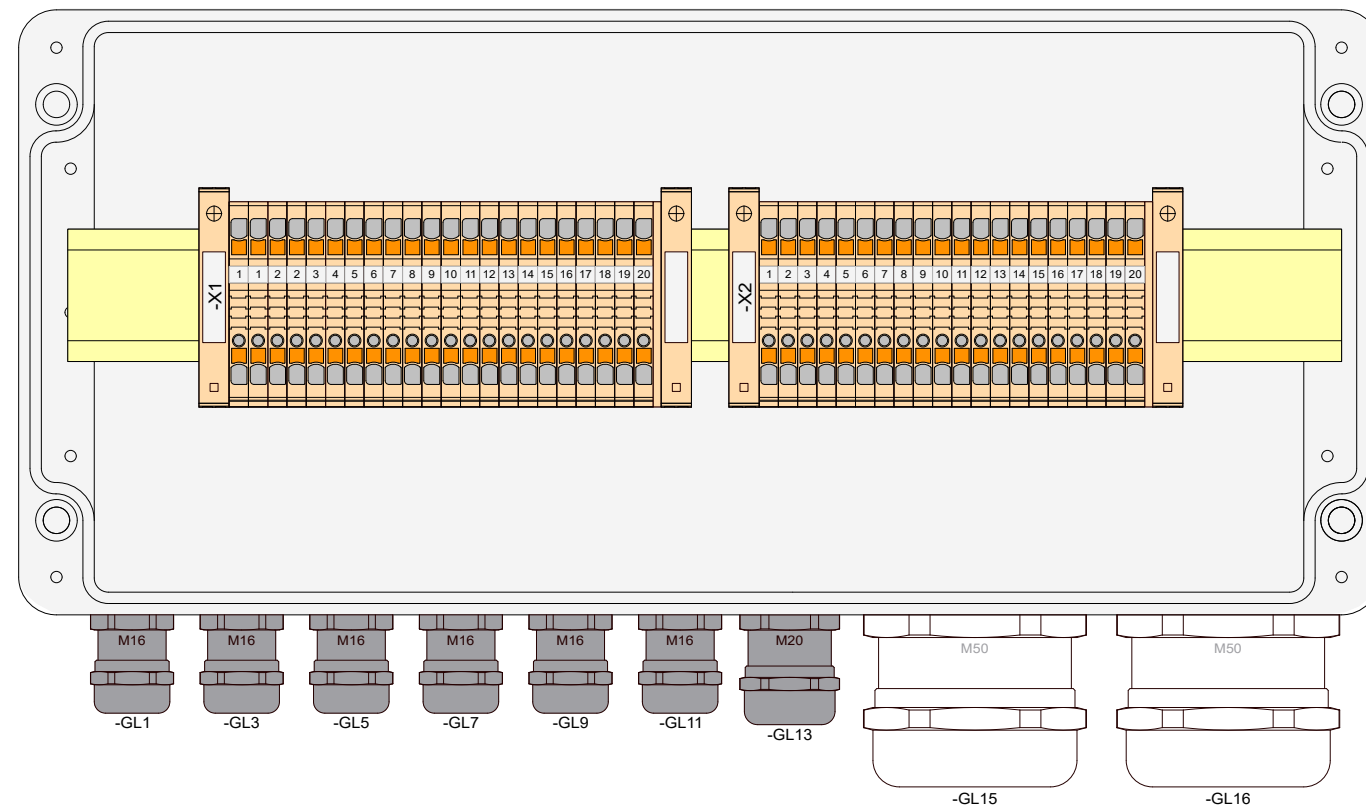


Product Data	
Manufacturer	Eldon
Article name	MAS0605030
WxHxD	600x500x300
IP	IP 66
RAL Code	RAL 7035 (Grey)
Material	Steel, Painted

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS Control Cabinet Radio - Outside	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS				+B21		Rev. 04	1 / 14
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								



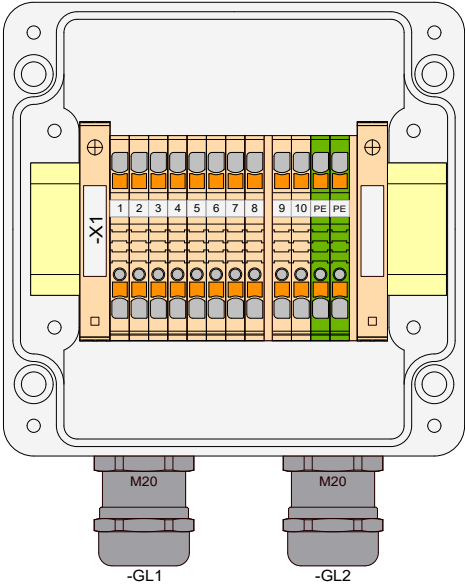
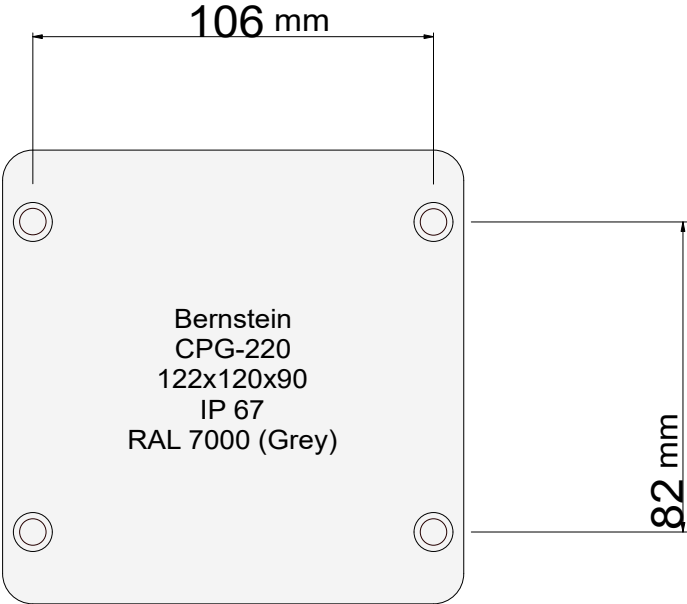
04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS Control Cabinet Radio - Inside	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS				+B21		Rev. 04	2 / 14
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								



Front View

Component installed on equipment

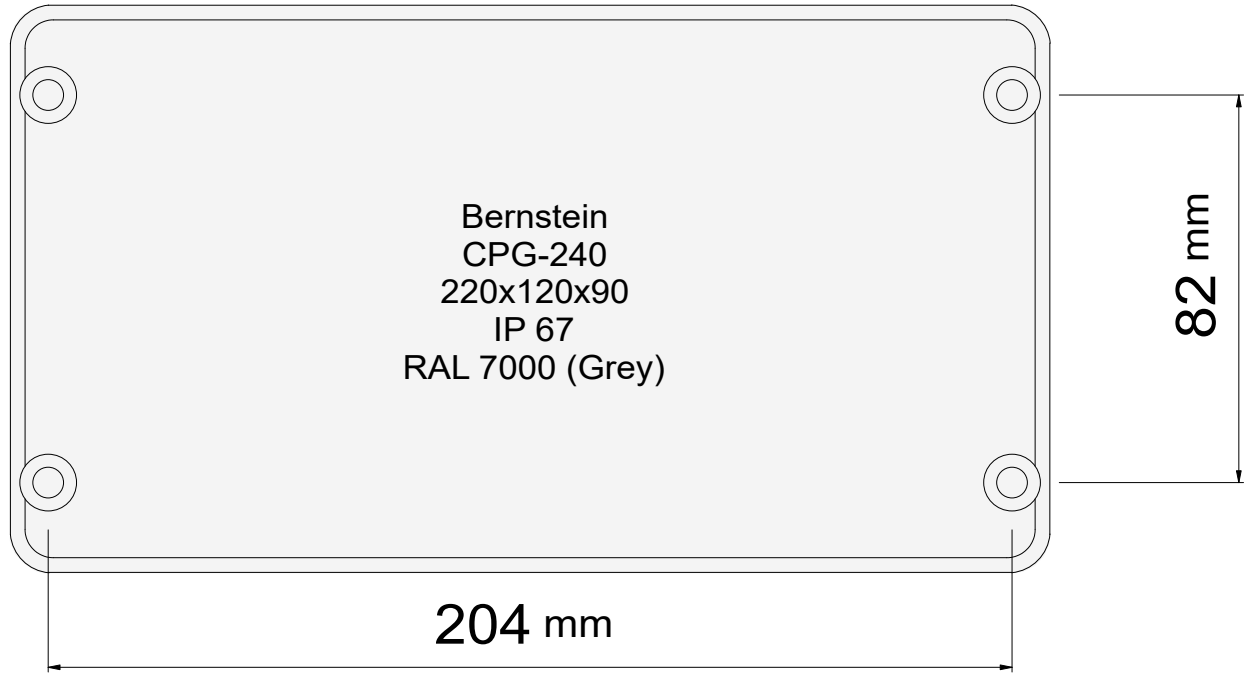
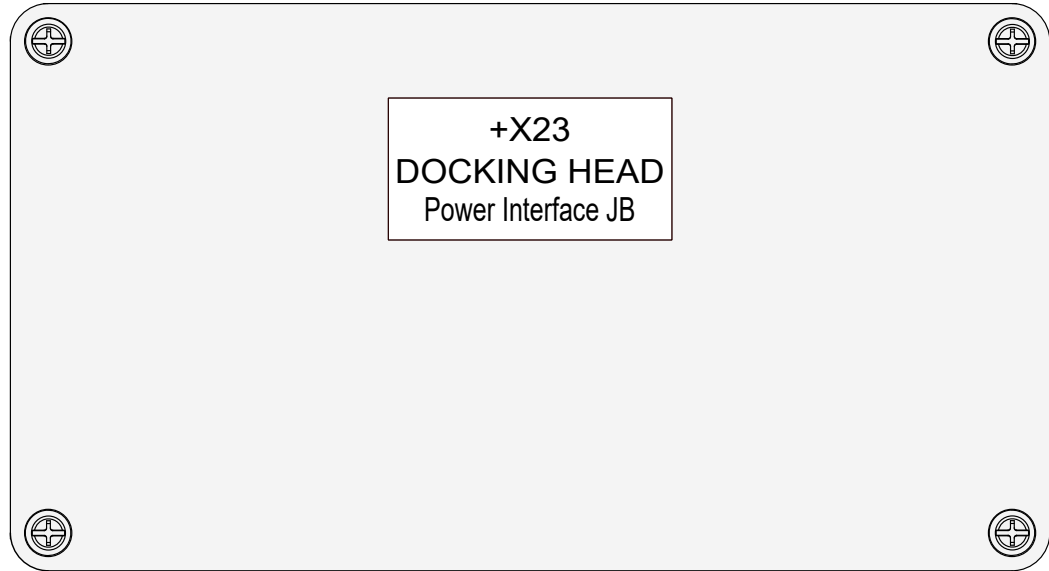
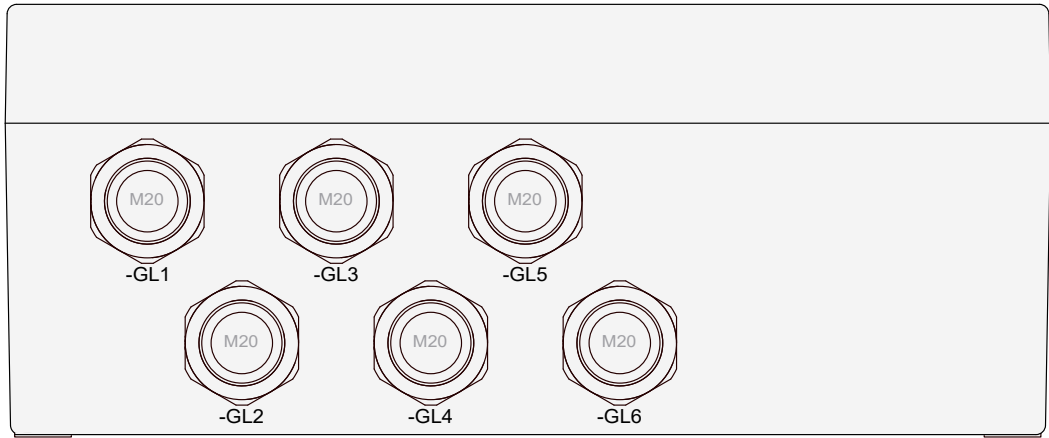
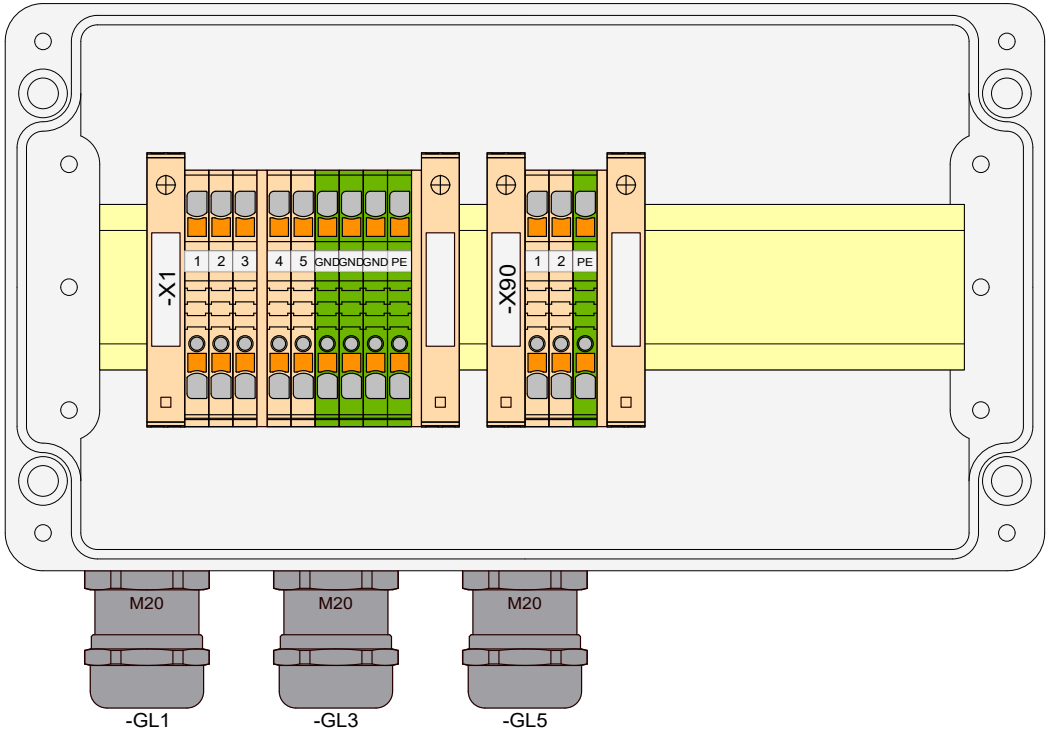
04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Valves	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS				+X21		Rev. 04	3 / 14
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								



Component installed on equipment

Product Data			
Manufacturer	Bernstein		
Article name	CPG-220		
WxHxD	122x120x90		
IP	IP 67		
RAL Code	RAL 7000 (Grey)		
Material	Polyester		

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Motor Signals	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS				+X22		Rev. 04	4 / 14
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								

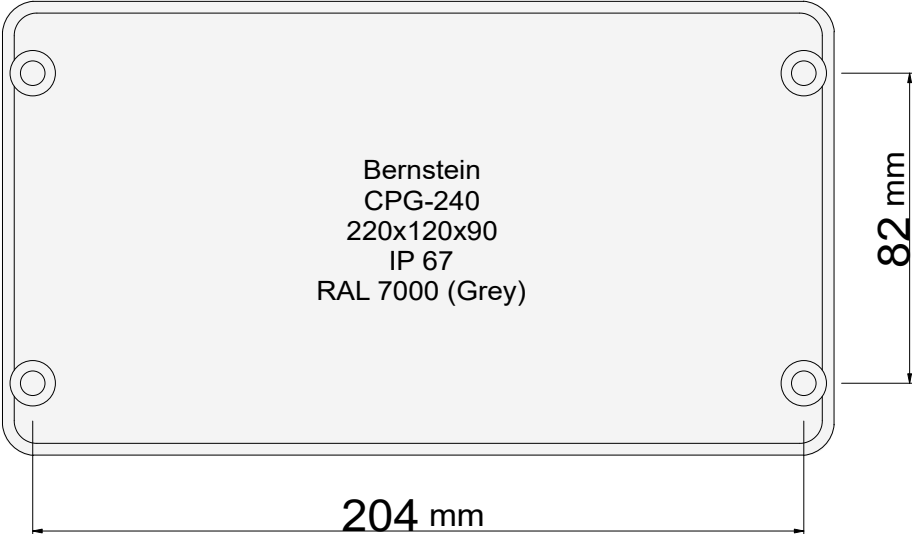
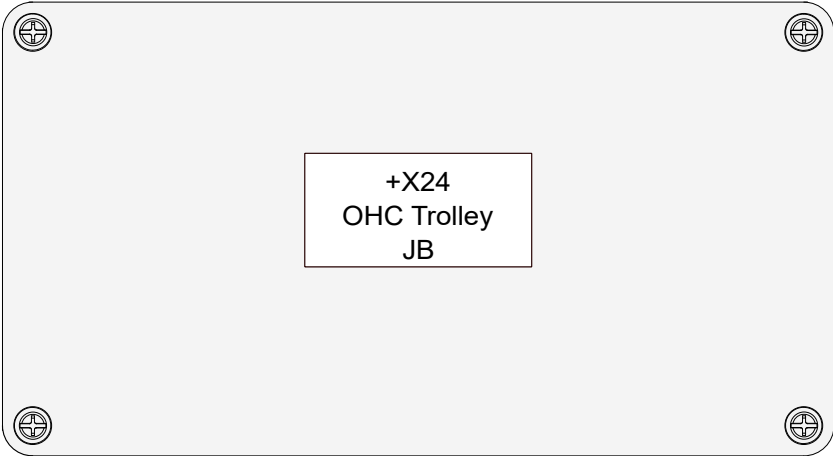
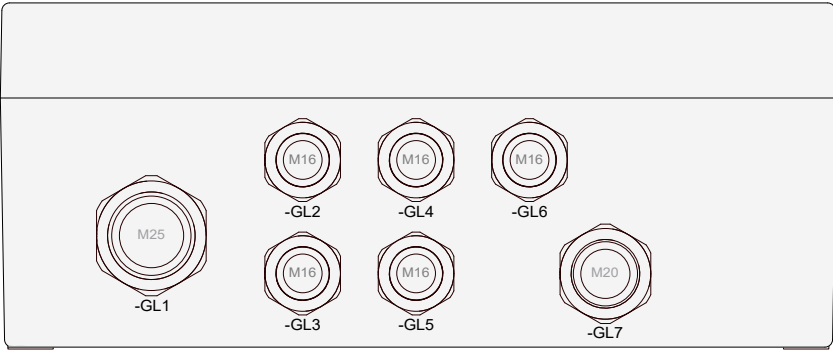
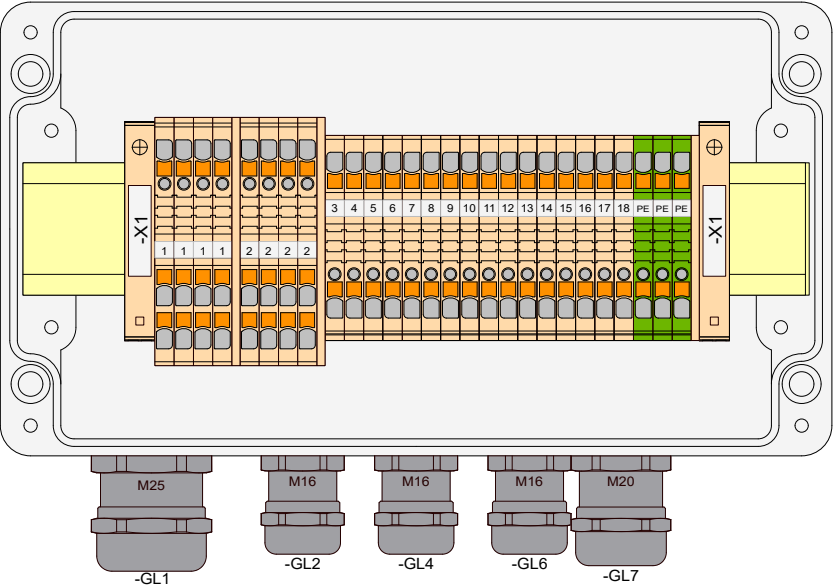


Rear View

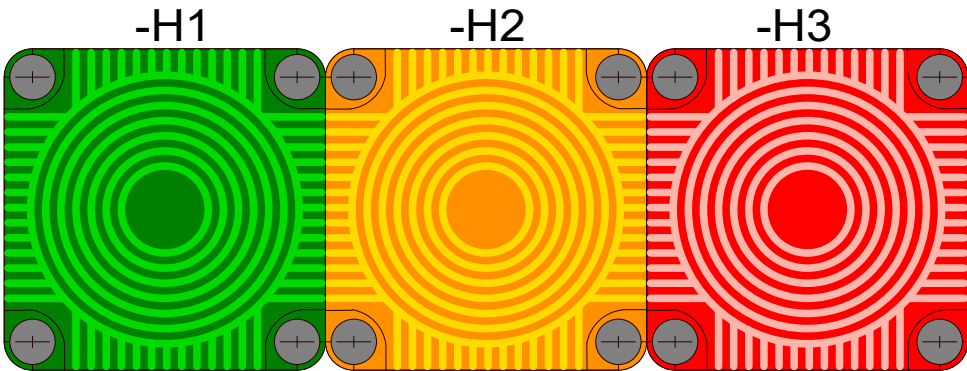
Component installed on equipment

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Motor Power	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS				+X23		Rev. 04	5 / 14
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								

All -X1:1 to be lasked
All -X1:2 to be lasked



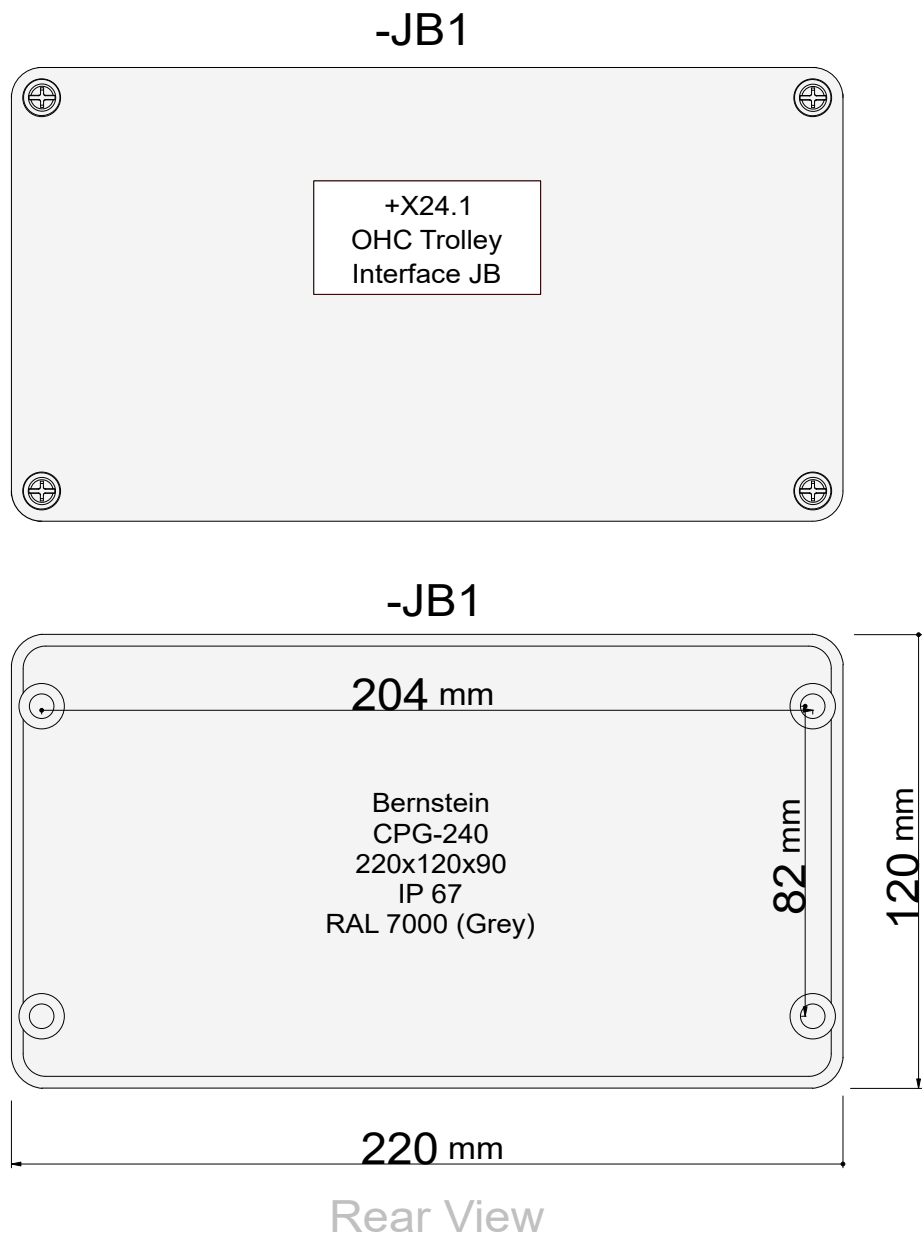
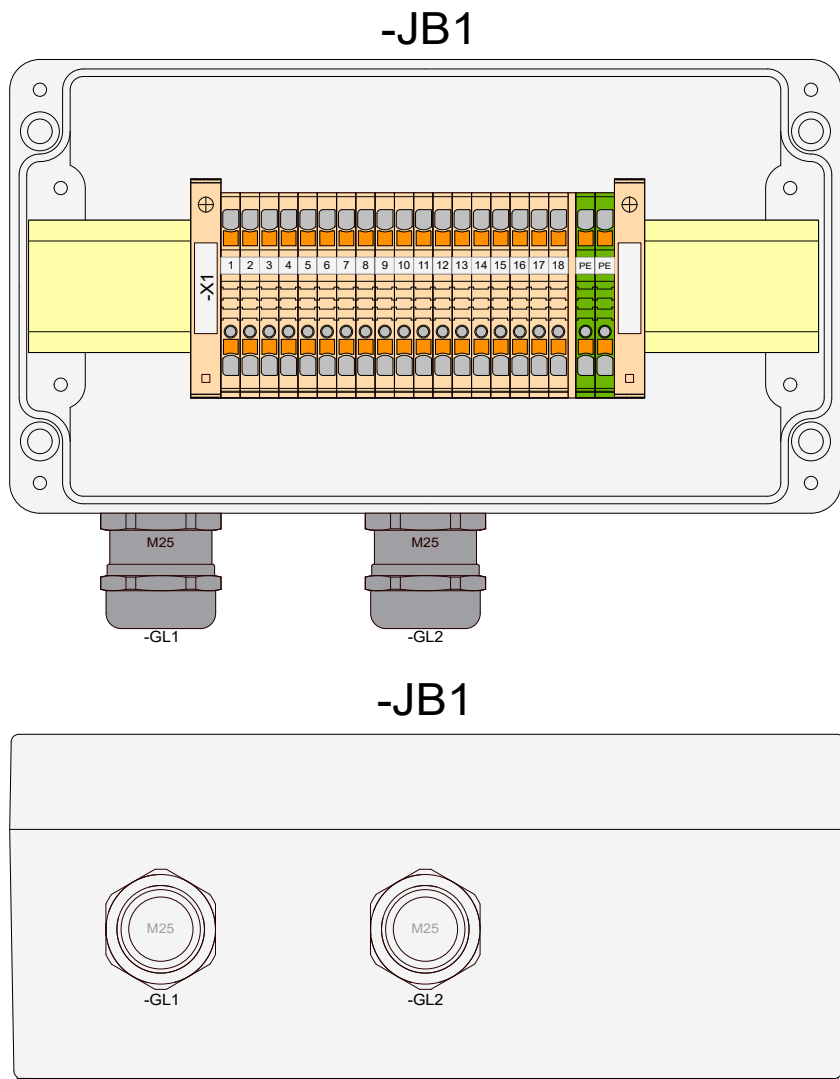
Rear View



Product Data			
Manufacturer	Bernstein		
Article name	CPG-240		
WxHxD	220x120x90		
IP	IP 67		
RAL Code	RAL 7000 (Grey)		
Material	Polyester		

ed on equipment

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Sensors Crane	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS				+X24		Rev. 04	6 / 14
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								

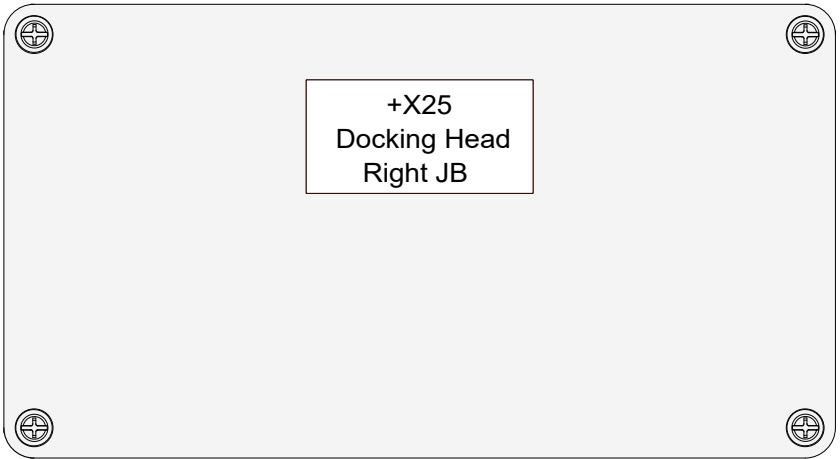
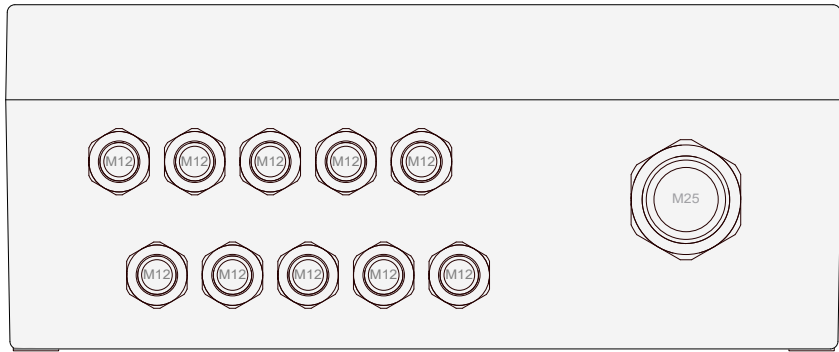
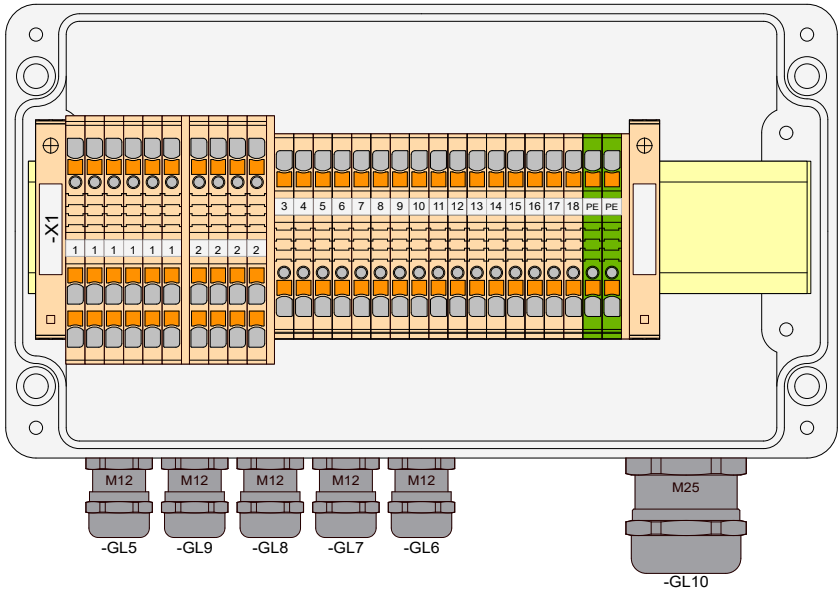


Component installed on equipment

Product Data			
Manufacturer	Bernstein		
Article name	CPG-240		
WxHxD	220x120x90		
IP	IP 67		
RAL Code	RAL 7000 (Grey)		
Material	Polyester		

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Sensors Crane Interface	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS				+X24.1		Rev. 04	7 / 14
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								

All -X1:1 to be lasked
All -X1:2 to be lasked

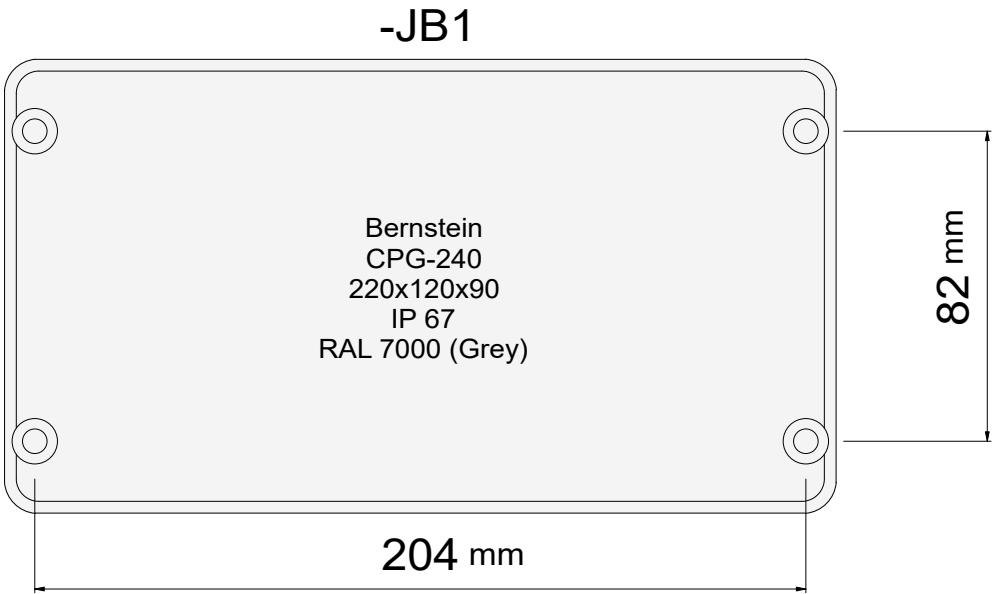
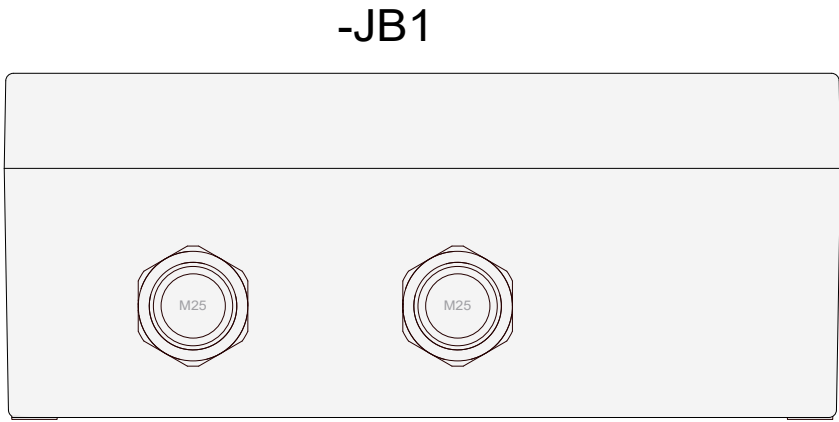
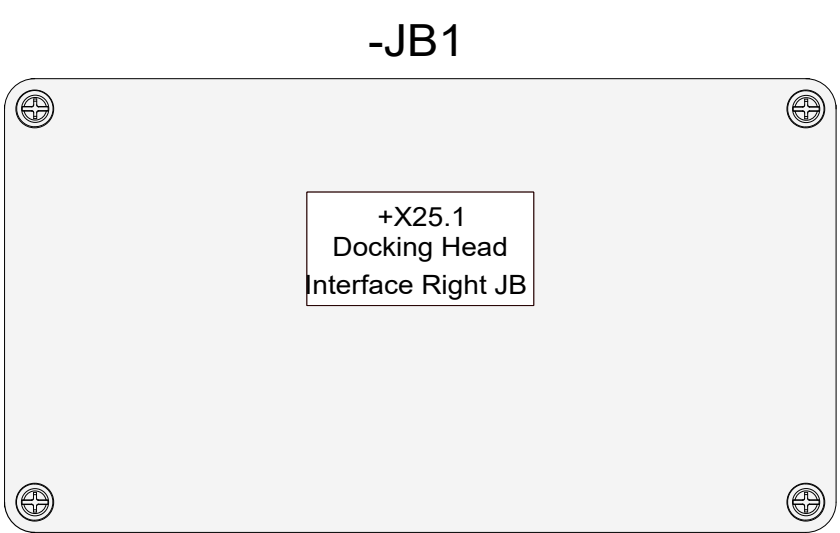
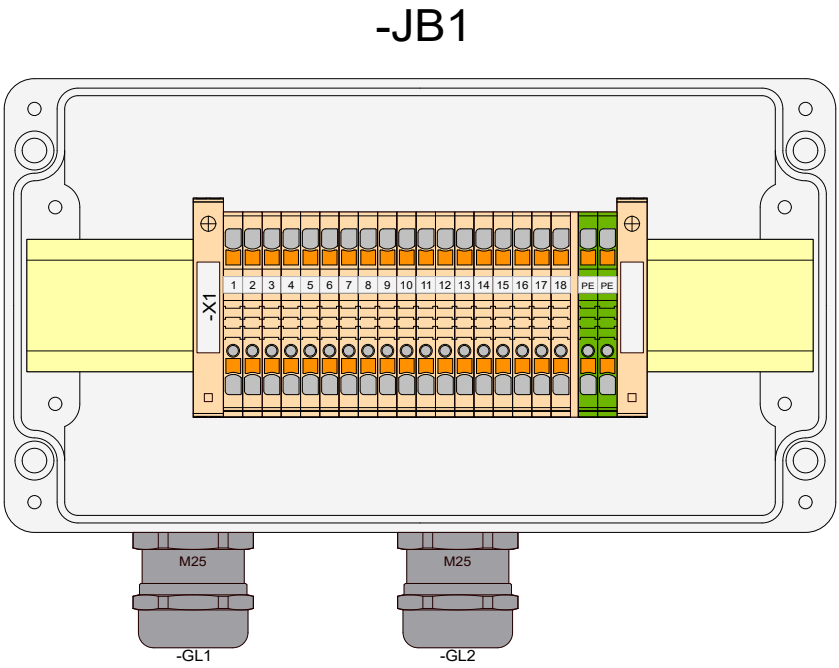


Rear View

Component installed on equipment

Product Data			
Manufacturer	Bernstein		
Article name	CPG-240		
WxHxD	220x120x90		
IP	IP 67		
RAL Code	RAL 7000 (Grey)		
Material	Polyester		

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Docking Head Right	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS				+X25		Rev. 04	8 / 14
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								



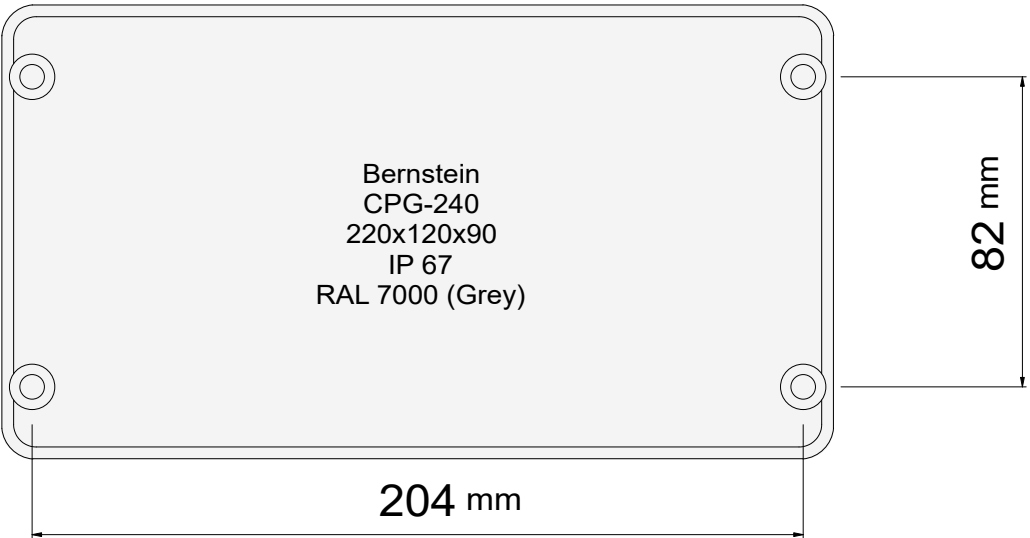
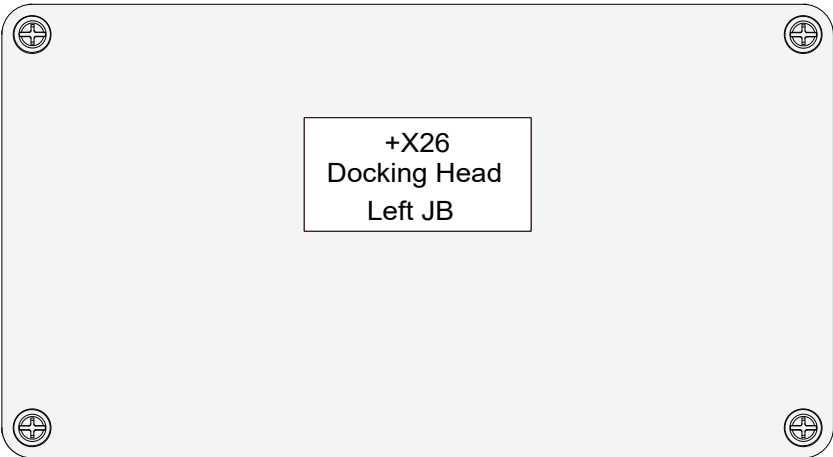
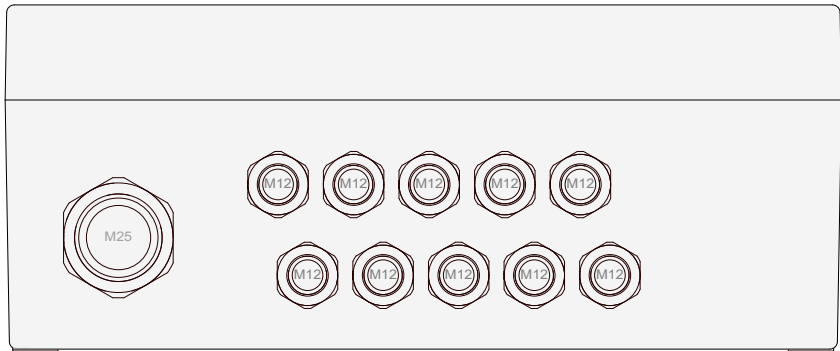
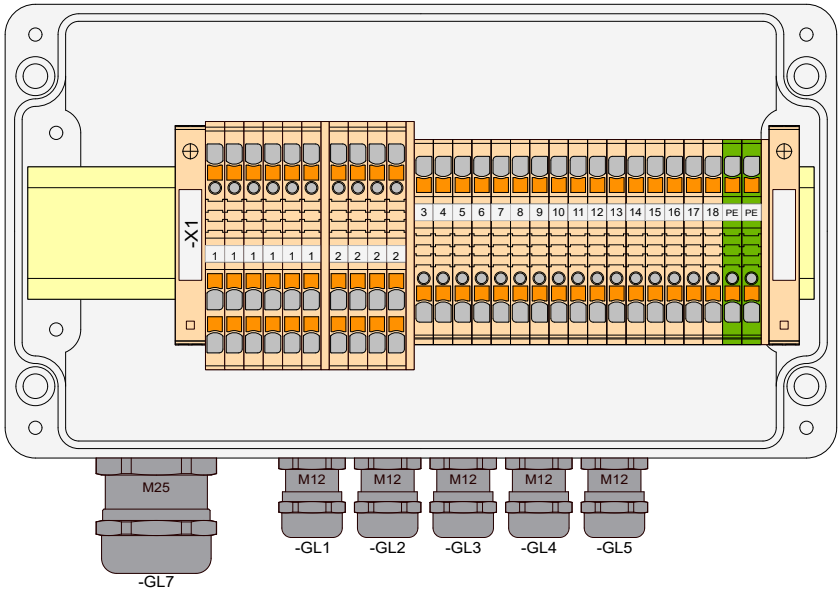
Rear View

Component installed on equipment

Product Data			
Manufacturer	Bernstein		
Article name	CPG-240		
WxHxD	220x120x90		
IP	IP 67		
RAL Code	RAL 7000 (Grey)		
Material	Polyester		

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Docking Head Interface	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS							
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard					+X25.1		Rev. 04	9 / 14

All -X1:1 to be lasked
All -X1:2 to be lasked

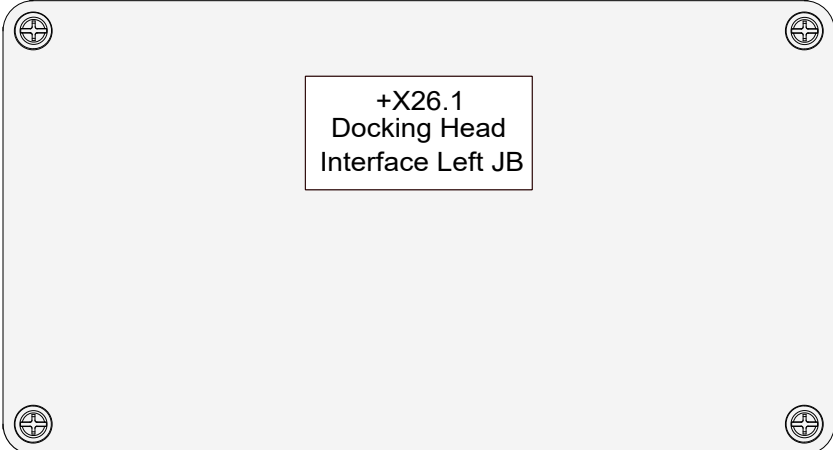
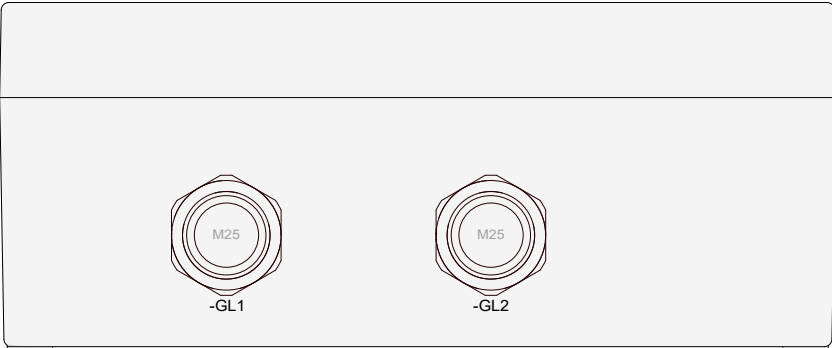
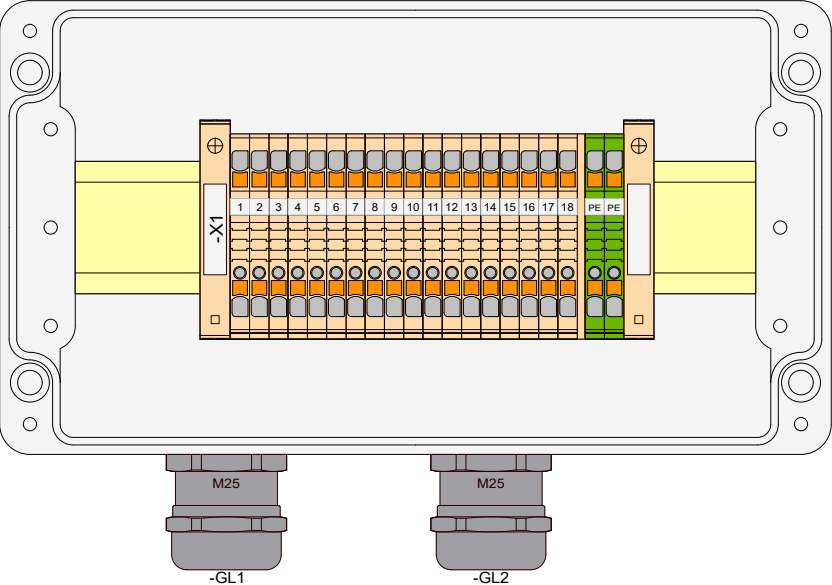


Rear View

Component installed on equipment

Product Data			
Manufacturer	Bernstein		
Article name	CPG-240		
WxHxD	220x120x90		
IP	IP 67		
RAL Code	RAL 7000 (Grey)		
Material	Polyester		

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Docking Head Left	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS							
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard					+X26		Rev. 04	10 / 14



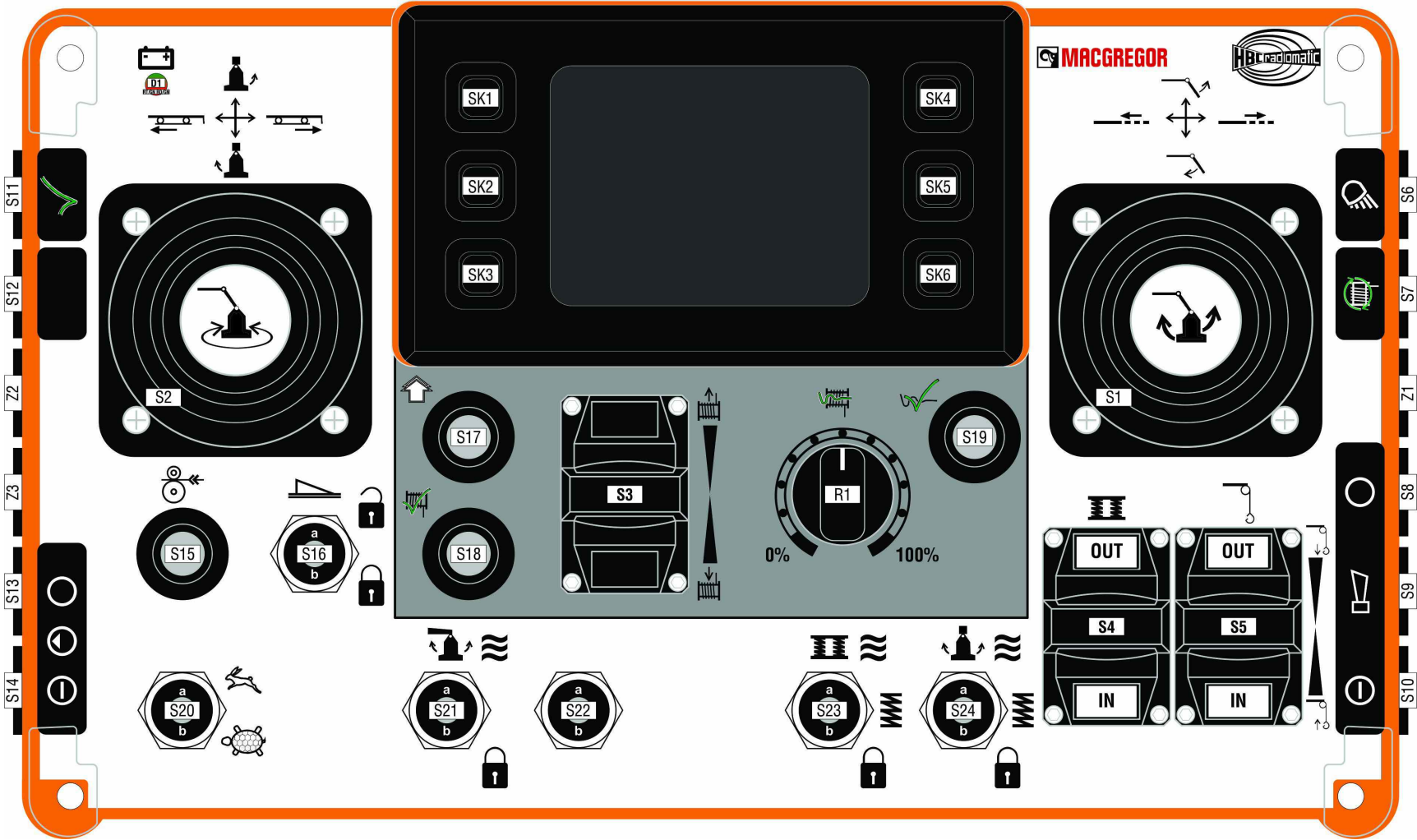
Rear View

Component installed on equipment

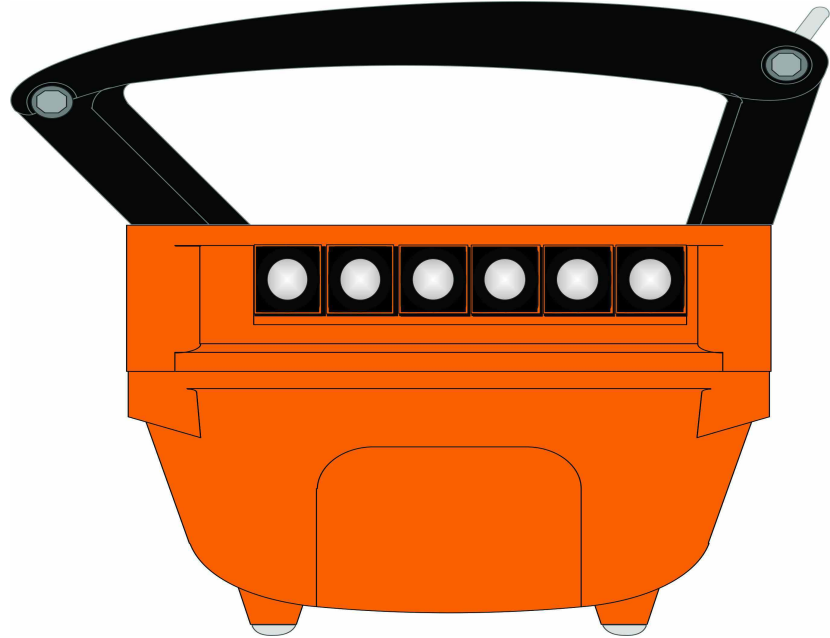
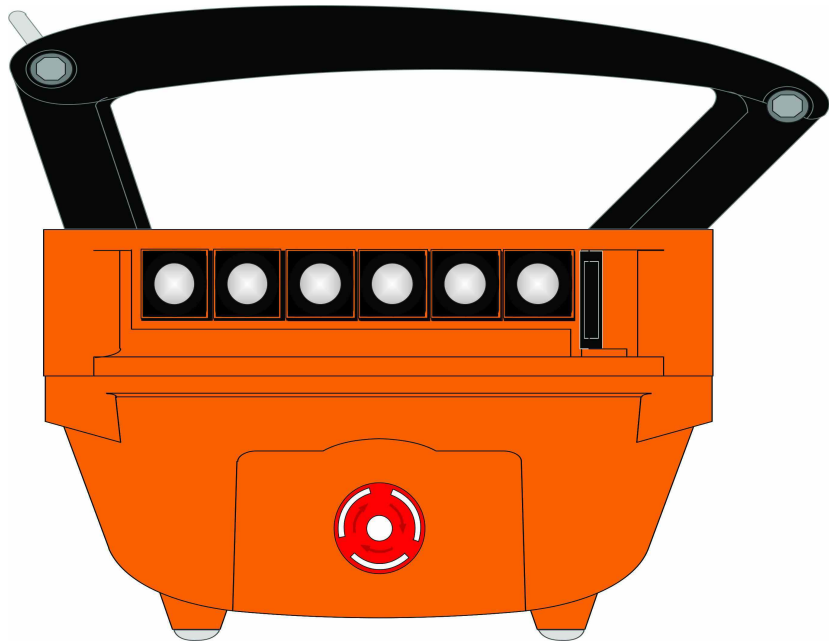
Product Data			
Manufacturer	Bernstein		
Article name	CPG-240		
WxHxD	220x120x90		
IP	IP 67		
RAL Code	RAL 7000 (Grey)		
Material	Polyester		

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS JB Docking Head Interface	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS							
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard					+X26.1		Rev. 04	11 / 14

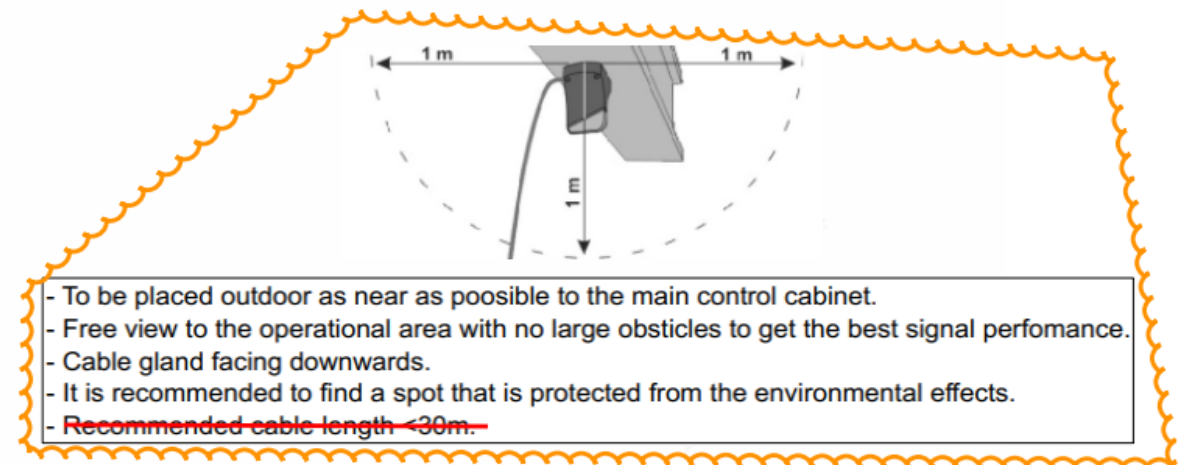
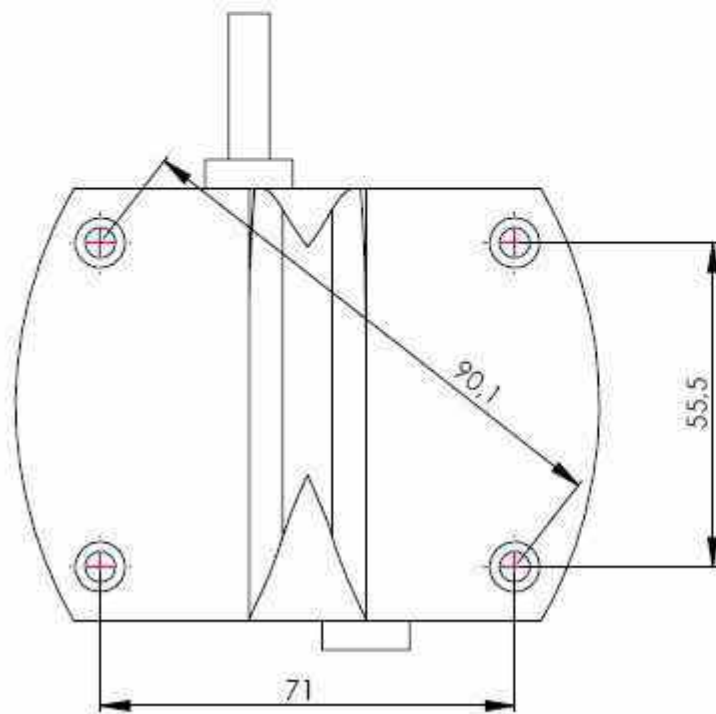
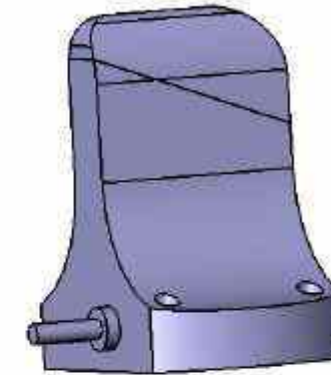
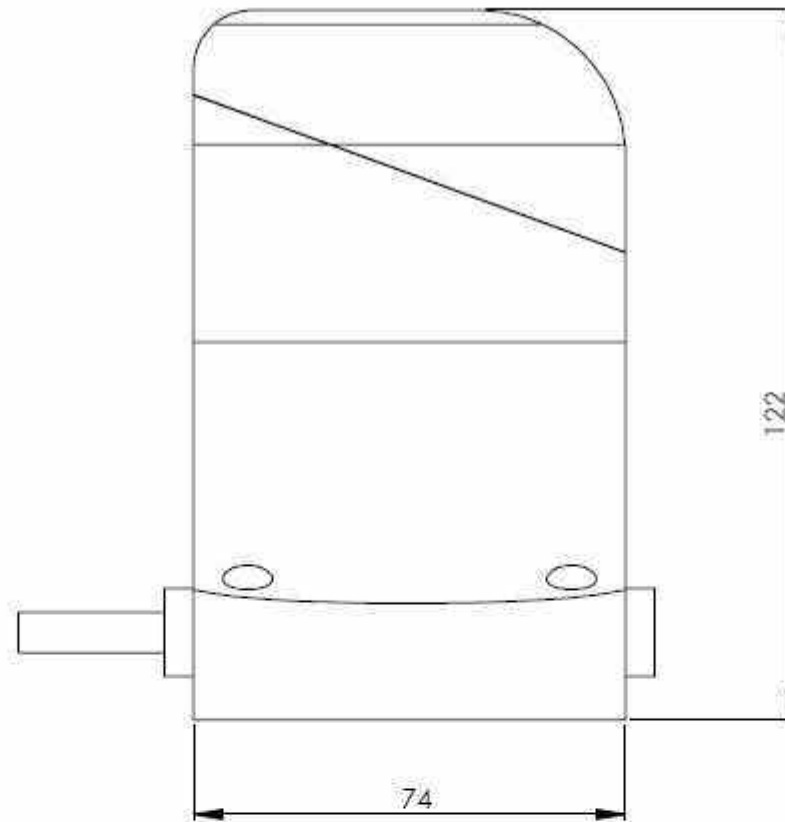
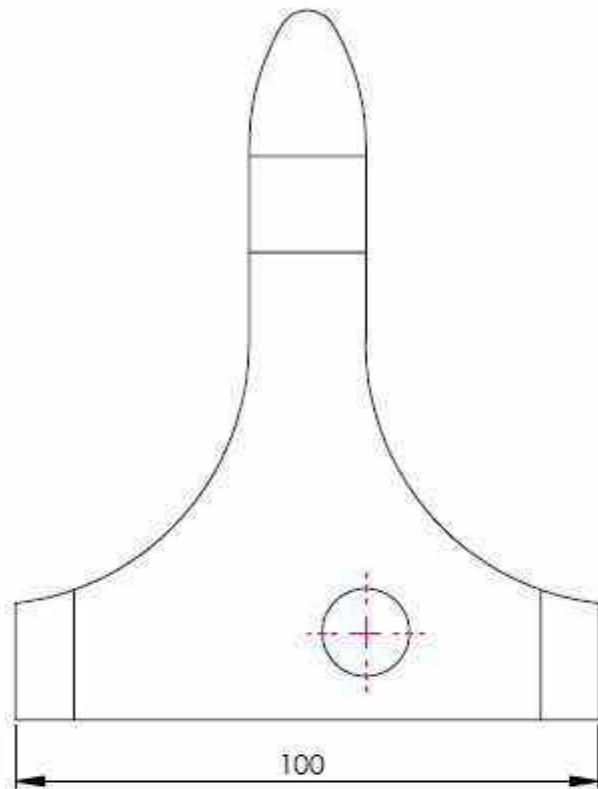
-A20.3



04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS RC Transmitter	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS							
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard					+A20		Rev. 04	12 / 14



04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Layout OHC ROV LARS RC Transmitter Side View	=OHC		E-4502 - 03	
03	For customer review	13.01.2023	GM	Drawn by	KS							
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard					+A20		Rev. 04	13 / 14



04	Issued for production	07.07.2023	GM	Date	14.10.2021
03	For customer review	13.01.2023	GM	Drawn by	KS
02	For customer review	29.08.2022	RSI	Appr. by	EE
Rev.	Description	Date	Rev. by	Standard	

4/60185
CNP Freire
MBARI

TRIPLEX
A MacGregor company

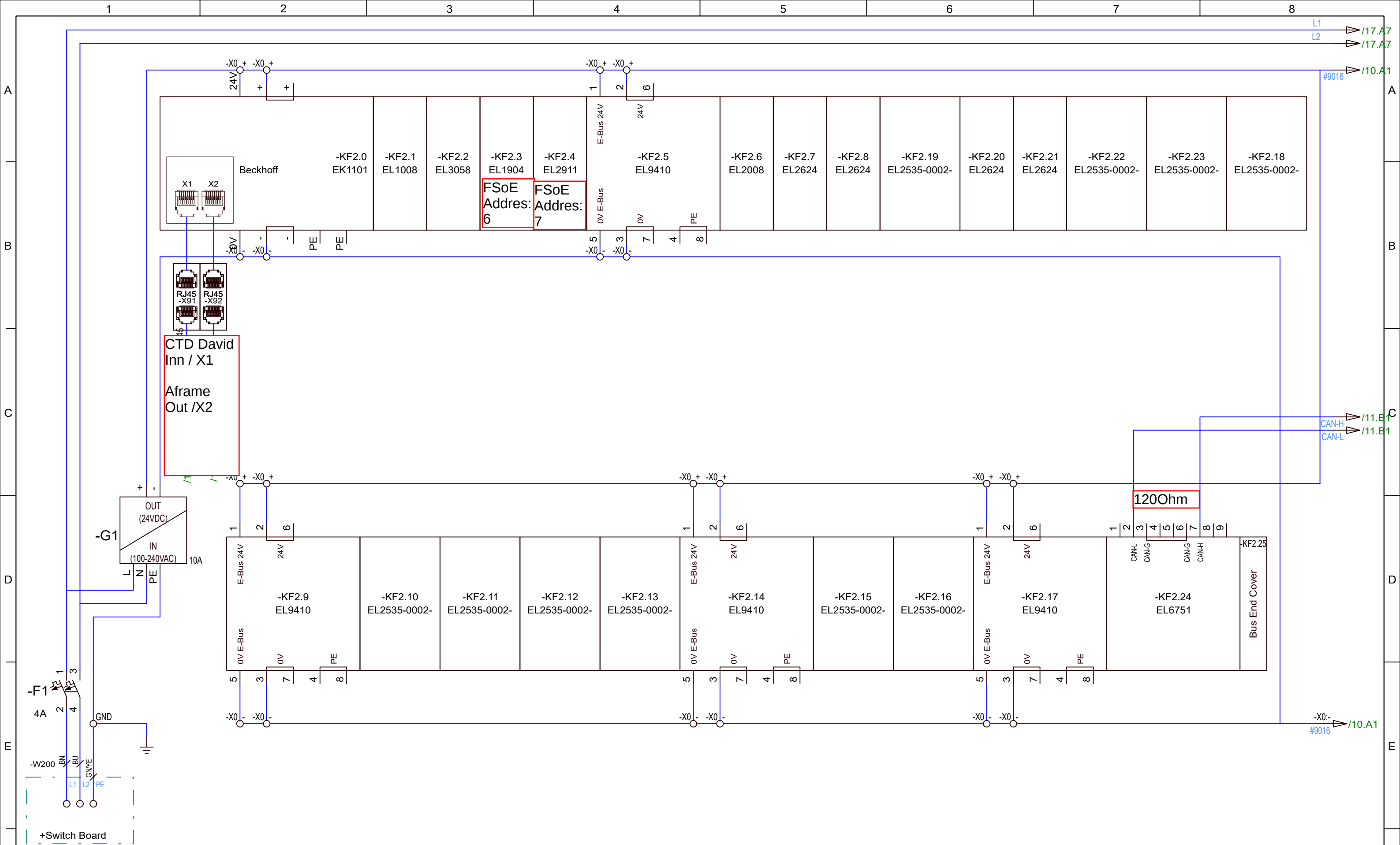
Layout
OHC ROV LARS
RC Antenna

=OHC

+A20

E-4502 - 03

Rev. 04 14 / 14



04	Issued for production	07.07.2023	GM	Date	14.10.2021
03	For customer review	13.01.2023	GM	Drawn by	KS
02	For customer review	29.08.2022	RSI	Appr. by	EE
Rev.	Description	Date	Rev. by	Standard	

4/60185
CNP Freire
MBARI



Circuit Diagram
OHC ROV LARS
Control Cabinet

=OHC

+B21

E-4502 - 04

Rev. 04

1 / 17

-KF2.1 Beckhoff EL1008									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	Digital Input	DI1	/11.C1	Control Cabinet	Switch	OHC	Manual Control	DI	
5	Digital Input	DI2	/11.C3	Control Cabinet	Switch	OHC	Radio Control	DI	
2	Digital Input	DI3	/12.B5	Control Cabinet	Contacts	OHC	Hangar Door 1 open	DI	
6	Digital Input	DI4	/12.B5	Control Cabinet	Contacts	OHC	Hangar Door 2 open	DI	
3	Digital Input	DI5		Control Cabinet	Switch	OHC	Pulse Switch	DI	
7	Digital Input	DI6	/14.A2	Trolley	Sensor	OHC	Prox Switch	DI	
4	Digital Input	DI7	Bullet in upper position (was KF2.16)					DI	
8	Digital Input	DI8						DI	

-KF2.2 Beckhoff EL3058									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	Analog Input	AI1	/14.A1	Trolley	Sensor	OHC	Distance Sensor	AI	4-20mA
5	Analog Input	AI2	/14.A5	Boom	Sensor	OHC	Angle Transmitter	AI	4-20mA
2	Analog Input	AI3	/14.A4	Boom	Sensor	OHC	Lenght Transmitter	AI	4-20mA
6	Analog Input	AI4						AI	4-20mA
3	Analog Input	AI5						AI	4-20mA
7	Analog Input	AI6						AI	4-20mA
4	Analog Input	AI7						AI	4-20mA
8	Analog Input	AI8						AI	4-20mA

-KF2.3 Beckhoff EL1904						
Pin	Pin Description	IO Type	Ref	PLC Comment 1	PLC Comment 2	PLC Symbolic Adress
1	+	I1	/10.B1	Emergency Stop		DIN/DOUT
2	-					
3	+	I2	/10.B1	Emergency Stop		DIN/DOUT
4	-					
5	+	I3	/10.B3	Emergency Stop		DIN/DOUT
6	-					
7	+	I4	/10.B3	Emergency Stop		DIN/DOUT
8	-					

-KF2.4 Beckhoff EL2911									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	+	DIO1	/10.B5	Spare	Emergency Stop	OHC	IN		
2	-								
5	+	DIO2	/10.B5	Spare	Emergency Stop	OHC	IN		
6	-								
3	+	DIO3	/10.B6	Spare	Emergency Stop	OHC	IN		
4	-								
7	+	DIO4	/10.B7	Spare	Emergency Stop	OHC	IN		
8	-								
4`	+	DIO5	/11.C5	Control Cabinet	Supply	OHC	IN		
3`	-								
8`	+	DIO6	/11.C5	Control Cabinet	Supply	OHC	IN		
7`	-								
2`	+	DIO7	/13.B1	Valve Bank	OHC	Stop Valve	OUT		
3`	-								
6`		DIO8							
7`	-								

-KF2.6 Beckhoff EL2008									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	Digital Output	DO1	/10.B2	Valve Bank	Emergency Stop	OHC	Light	DO	
5	Digital Output	DO2	/10.B4	Deck Area	Emergency Stop	OHC	Light	DO	
2	Digital Output	DO3	/10.B6	Spare	Emergency Stop	OHC	Light	DO	
6	Digital Output	DO4	/10.B7	Spare	Emergency Stop	OHC	Light	DO	
3	Digital Output	DO5	/14.A3	Trolley	Light	OHC	Green Light	DO	
7	Digital Output	DO6	/14.A3	Trolley	Light	OHC	Yellow	DO	
4	Digital Output	DO7	/14.A3	Trolley	Light	OHC	Red	DO	
8	Digital Output	DO8						DO	

-KF2.7 Beckhoff EL2624									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	Com	RO1	/11.C7	Control Cabinet	Relay	OHC	Floodlight	RO	NO
2	Relay Output NO								
5	Com	RO2	/12.B1	Control Cabinet	Relay	OHC	In Indor Position	RO	NO
6	Relay Output NO								
3	Com	RO3	/12.B2	Control Cabinet	Relay	OHC	In Oper. Position	RO	NO
4	Relay Output NO								
7	Com	RO4	/12.B6	Control Cabinet	Relay	OHC	LauRec Position	RO	NO
8	Relay Output NO								

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	 A MacGregor company	Circuit Diagram OHC ROV LARS IO List	=OHC		E-4502 - 04	
03	For customer review	13.01.2023	GM	Drawn by	KS				+B21		Rev. 04	3 / 17
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								

1

2

3

4

5

6

7

8

-KF2.8 Beckhoff EL2624									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	Com	RO1	/14.A6	Lars Telescope boom	Valve	OHC	Constant Tension	RO	NO
2	Relay Output NO								
5	Com	RO2	/16.B1	Docking Head	Valves	OHC	Along Tilt Valve 1	RO	NO
6	Relay Output NO								
3	Com	RO3	/16.B2	Docking Head	Valves	OHC	Along Tilt Valve 2	RO	NO
4	Relay Output NO								
7	Com	RO4	/16.B2	Docking Head	Valves	OHC	Spring Free Valve1	RO	NO
8	Relay Output NO								

-KF2.10 Beckhoff EL2535-0002-									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	PWM Output A1	PWM1	/13.B2	Valve Bank	Main Boom	Prop. Valve	Out	AO+	PWM
5	PWM Output A2								
3	0Va		/15.B2						
4	Digital Input	DI1	/13.B2					DI	
	PWM Output B1	PWM2		Valve Bank	Main Boom	Prop. Valve	In	AO+	PWM
6	PWM Output B2		/15.B3						
7	0Vb								
8	Digital Input	DI2						DI	

-KF2.11 Beckhoff EL2535-0002-									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	PWM Output A1	PWM1	/13.B3	Valve Bank	Trolley Motor	Prop. Valve	STBD	AO+	PWM
5	PWM Output A2								
3	0Va		/15.B3						
4	Digital Input	DI1	/13.B3					DI	
	PWM Output B1	PWM2		Valve Bank	Trolley Motor	Prop. Valve	PORT	AO+	PWM
6	PWM Output B2		/12.B8						
7	0Vb								
8	Digital Input	DI2						DI	

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Circuit Diagram OHC ROV LARS IO List		=OHC		E-4502 - 04	
03	For customer review	13.01.2023	GM	Drawn by	KS					+B21		Rev. 04	4 / 17
02	For customer review	29.08.2022	RSI	Appr. by	EE								
Rev.	Description	Date	Rev. by	Standard									

Printed: 07-Jul-23 11:33

Template:

-KF2.12 Beckhoff EL2535-0002-									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	PWM Output A1	PWM1	/13.B3	Valve Bank	OHC Telescope	Prop. Valve	Out	AO+	PWM
5	PWM Output A2								
3	0Va		/15.B4					DI	
4	Digital Input	DI1	/13.B4	Valve Bank	OHC Telescope	Prop. Valve	In	AO+	PWM
	PWM Output B1	PWM2							
6	PWM Output B2		/12.B7						
7	0Vb								
8	Digital Input	DI2						DI	

-KF2.13 Beckhoff EL2535-0002-									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	PWM Output A1	PWM1	/13.B4	Valve Bank	OHC Winch	Prop. Valve	Lower	AO+	PWM
5	PWM Output A2								
3	0Va		/12.B7					DI	
4	Digital Input	DI1	/13.B4	Valve Bank	OHC Winch	Prop. Valve	Lift	AO+	PWM
	PWM Output B1	PWM2							
6	PWM Output B2		/12.B8						
7	0Vb								
8	Digital Input	DI2						DI	

B21_KF2.14_EL9410

B21_KF2.15_EL2535-0002

B21_KF2.16_EL2535-0002

PWM Status Spring Plate Out

PWM Status Spring Plate In

Status

Digital input ProxSwitch DockingHead In Latch Right

Ready to enable

Warning

Error

TxPDO Toggle

PWM Control Spring Plate Out

PWM Control Spring Plate In

WcState

InfoData

B21_KF2.17_EL9410

Name

Online

Type

Size

>Addr...

In/Out

User ID

Linked to

Status

Status

WcState

InputToggle

State

AdsAddr

Control

PWM output

Control

PWM output

X

0x8011 (32785)

0

0

8

5.100.94.40.8.1:1037

X

0x0001 (1)

X

0

X

0x0001 (1)

X

0

Status_3F3...

Status_BB8...

BIT

BIT

UINT

AMSADDR

Control_F6...

INT

Control_F6...

INT

2.0

2.0

0.1

0.1

2.0

8.0

2.0

2.0

2.0

148.0

150.0

1522.1

1524.1

1746.0

1748.0

148.0

150.0

152.0

154.0

Input

Input

Input

Input

Input

Output

Output

Output

Output

0

0

0

0

0

0

0

0

status . ValveSpringPlateOut . gvlOHC.Handlinglo_in...

status . ValveSpringPlateIn . gvlOHC.Handlinglo_in

control . ValveSpringPlateOut . gvlOHC.Handlinglo_...

PWMOutput . ValveSpringPlateOut . gvlOHC.Handli...

control . ValveSpringPlateIn . gvlOHC.Handlinglo_ou...

PWMOutput . ValveSpringPlateIn . gvlOHC.Handling...

our class links to the whole status, if we used this digi input then the logic in PWM would execute, not ideel. same with no diagnostic led on card to indicate diginput. dont use digi input on PWM card for non related valve purpose for THAT valve output

1

2

3

4

5

6

7

8

-KF2.15									
Beckhoff EL2535-0002-									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	PWM Output A1	PWM1	/13.B5	Valve Bank	Along Tilt Cylinder	Prop. Valve	Out	AO+	PWM
5	PWM Output A2								
3	0Va		/16.B6					DI	
4	Digital Input	DI1	/13.B5	Valve Bank	Along Tilt Cylinder	Prop. Valve	In	AO+	PWM
	PWM Output B1	PWM2							
6	PWM Output B2		/16.B6						
7	0Vb							DI	
8	Digital Input	DI2							

-KF2.16									
Beckhoff EL2535-0002-									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	PWM Output A1	PWM1	/13.B8	Valve Bank	Spring Plate	Prop. Valve	Out	AO+	PWM
5	PWM Output A2								
3	0Va		/16.B5					DI	
4	Digital Input	DI1	/13.B8	Valve Bank	Spring Plate	Prop. Valve	In	AO+	PWM
	PWM Output B1	PWM2							
6	PWM Output B2		/15.B2						
7	0Vb							DI	
8	Digital Input	DI2							

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Circuit Diagram OHC ROV LARS IO List	=OHC		E-4502 - 04	
03	For customer review	13.01.2023	GM	Drawn by	KS				+B21		Rev. 04	6 / 17
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard								

Printed: 07-Jul-23 11:33

Template:

1	2	3	4	5	6	7	8																																																																																																												
-KF2.18 Beckhoff EL2535-0002- <table><tr><td>Pin</td><td>Pin Description</td><td>IO Type</td><td>Ref</td><td>IO Device Location</td><td>IO Device Type</td><td>IO Function Target</td><td>IO Function</td><td>IO Used</td><td>Signal</td></tr><tr><td>1</td><td>PWM Output A1</td><td rowspan="3">PWM1</td><td>/13.B5</td><td rowspan="3">Valve Bank</td><td rowspan="3">Latch Cylinder</td><td rowspan="3">Prop. Valve</td><td rowspan="3">Out</td><td rowspan="3"></td><td rowspan="3"></td></tr><tr><td>5</td><td>PWM Output A2</td><td></td></tr><tr><td>3</td><td>0Va</td><td></td></tr><tr><td>4</td><td>Digital Input</td><td>DI1</td><td>/13.B6</td><td rowspan="5">Valve Bank</td><td rowspan="5">Latch Cylinder</td><td rowspan="5">Prop. Valve</td><td rowspan="5">In</td><td></td><td></td></tr><tr><td></td><td>PWM Output B1</td><td rowspan="3">PWM2</td><td></td><td rowspan="3"></td><td rowspan="3"></td></tr><tr><td>6</td><td>PWM Output B2</td><td></td></tr><tr><td>7</td><td>0Vb</td><td></td></tr><tr><td>8</td><td>Digital Input</td><td>DI2</td><td></td><td></td><td></td></tr></table> -KF2.19 Beckhoff EL2535-0002- <table><tr><td>Pin</td><td>Pin Description</td><td>IO Type</td><td>Ref</td><td>IO Device Location</td><td>IO Device Type</td><td>IO Function Target</td><td>IO Function</td><td>IO Used</td><td>Signal</td></tr><tr><td></td><td>PWM Output A1</td><td rowspan="3">PWM1</td><td>/13.B6</td><td rowspan="3">Valve Bank</td><td rowspan="3">DH Twist</td><td rowspan="3">Prop. Valve</td><td rowspan="2">Out</td><td rowspan="2"></td><td rowspan="2"></td></tr><tr><td>5</td><td>PWM Output A2</td><td></td></tr><tr><td>3</td><td>0Va</td><td></td><td></td><td></td></tr><tr><td>4</td><td>Digital Input</td><td>DI1</td><td>/13.B6</td><td rowspan="5">Valve Bank</td><td rowspan="5">DH Twist</td><td rowspan="5">Prop. Valve</td><td rowspan="4">In</td><td rowspan="4"></td><td rowspan="4"></td></tr><tr><td>2</td><td>PWM Output B1</td><td rowspan="3">PWM2</td><td></td></tr><tr><td>6</td><td>PWM Output B2</td><td></td></tr><tr><td>7</td><td>0Vb</td><td></td></tr><tr><td>8</td><td>Digital Input</td><td>DI2</td><td></td><td></td><td></td></tr></table>								Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal	1	PWM Output A1	PWM1	/13.B5	Valve Bank	Latch Cylinder	Prop. Valve	Out			5	PWM Output A2		3	0Va		4	Digital Input	DI1	/13.B6	Valve Bank	Latch Cylinder	Prop. Valve	In				PWM Output B1	PWM2				6	PWM Output B2		7	0Vb		8	Digital Input	DI2				Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal		PWM Output A1	PWM1	/13.B6	Valve Bank	DH Twist	Prop. Valve	Out			5	PWM Output A2		3	0Va				4	Digital Input	DI1	/13.B6	Valve Bank	DH Twist	Prop. Valve	In			2	PWM Output B1	PWM2		6	PWM Output B2		7	0Vb		8	Digital Input	DI2			
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal																																																																																																										
1	PWM Output A1	PWM1	/13.B5	Valve Bank	Latch Cylinder	Prop. Valve	Out																																																																																																												
5	PWM Output A2																																																																																																																		
3	0Va																																																																																																																		
4	Digital Input	DI1	/13.B6	Valve Bank	Latch Cylinder	Prop. Valve	In																																																																																																												
	PWM Output B1	PWM2																																																																																																																	
6	PWM Output B2																																																																																																																		
7	0Vb																																																																																																																		
8	Digital Input	DI2																																																																																																																	
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal																																																																																																										
	PWM Output A1	PWM1	/13.B6	Valve Bank	DH Twist	Prop. Valve	Out																																																																																																												
5	PWM Output A2																																																																																																																		
3	0Va																																																																																																																		
4	Digital Input	DI1	/13.B6	Valve Bank	DH Twist	Prop. Valve	In																																																																																																												
2	PWM Output B1	PWM2																																																																																																																	
6	PWM Output B2																																																																																																																		
7	0Vb																																																																																																																		
8	Digital Input	DI2																																																																																																																	
<table><tr><td>04</td><td>Issued for production</td><td>07.07.2023</td><td>GM</td><td>Date</td><td>14.10.2021</td><td rowspan="3">4/60185 CNP Freire MBARI</td><td rowspan="3"> TRIPLEX A MacGregor company </td><td rowspan="3">Circuit Diagram OHC ROV LARS IO List</td><td colspan="2">=OHC</td><td colspan="2">E-4502 - 04</td></tr><tr><td>03</td><td>For customer review</td><td>13.01.2023</td><td>GM</td><td>Drawn by</td><td>KS</td><td rowspan="2">+B21</td><td rowspan="2"></td><td rowspan="2">Rev. 04</td><td rowspan="2">7 / 17</td></tr><tr><td>02</td><td>For customer review</td><td>29.08.2022</td><td>RSI</td><td>Appr. by</td><td>EE</td></tr><tr><td>Rev.</td><td>Description</td><td>Date</td><td>Rev. by</td><td>Standard</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> Printed: 07-Jul-23 11:33 Template:								04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Circuit Diagram OHC ROV LARS IO List	=OHC		E-4502 - 04		03	For customer review	13.01.2023	GM	Drawn by	KS	+B21		Rev. 04	7 / 17	02	For customer review	29.08.2022	RSI	Appr. by	EE	Rev.	Description	Date	Rev. by	Standard																																																																										
04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Circuit Diagram OHC ROV LARS IO List	=OHC		E-4502 - 04																																																																																																								
03	For customer review	13.01.2023	GM	Drawn by	KS				+B21		Rev. 04	7 / 17																																																																																																							
02	For customer review	29.08.2022	RSI	Appr. by	EE																																																																																																														
Rev.	Description	Date	Rev. by	Standard																																																																																																															

1	2	3	4	5	6	7	8																																																																				
<table><tr><th colspan="2">-KF2.20</th><th colspan="8">Beckhoff EL2624</th></tr><tr><th>Pin</th><th>Pin Description</th><th>IO Type</th><th>Ref</th><th>IO Device Location</th><th>IO Device Type</th><th>IO Function Target</th><th>IO Function</th><th>IO Used</th><th>Signal</th></tr><tr><td>1</td><td>Com</td><td rowspan="2">RO1</td><td rowspan="2">/16.B3</td><td rowspan="2">Docking Head</td><td rowspan="2">Valves</td><td rowspan="2">OHC</td><td rowspan="2">Spring Free Valve2</td><td rowspan="2">RO</td><td rowspan="2">NO</td></tr><tr><td>2</td><td>Relay Output NO</td></tr><tr><td>5</td><td>Com</td><td rowspan="2">RO2</td><td rowspan="2">/16.B3</td><td rowspan="2">Docking Head</td><td rowspan="2">Valves</td><td rowspan="2">OHC</td><td rowspan="2">Spring Damping Valve1</td><td rowspan="2">RO</td><td rowspan="2">NO</td></tr><tr><td>6</td><td>Relay Output NO</td></tr><tr><td>3</td><td>Com</td><td rowspan="2">RO3</td><td rowspan="2">/16.B4</td><td rowspan="2">Docking Head</td><td rowspan="2">Valves</td><td rowspan="2">OHC</td><td rowspan="2">Spring Damping Valve2</td><td rowspan="2">RO</td><td rowspan="2">NO</td></tr><tr><td>4</td><td>Relay Output NO</td></tr><tr><td>7</td><td>Com</td><td rowspan="2">RO4</td><td rowspan="2">/15.B5</td><td rowspan="2">Docking Head</td><td rowspan="2">Valves</td><td rowspan="2">OHC</td><td rowspan="2">Across Tilt Free V.2</td><td rowspan="2">RO</td><td rowspan="2">NO</td></tr><tr><td>8</td><td>Relay Output NO</td></tr></table>								-KF2.20		Beckhoff EL2624								Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal	1	Com	RO1	/16.B3	Docking Head	Valves	OHC	Spring Free Valve2	RO	NO	2	Relay Output NO	5	Com	RO2	/16.B3	Docking Head	Valves	OHC	Spring Damping Valve1	RO	NO	6	Relay Output NO	3	Com	RO3	/16.B4	Docking Head	Valves	OHC	Spring Damping Valve2	RO	NO	4	Relay Output NO	7	Com	RO4	/15.B5	Docking Head	Valves	OHC	Across Tilt Free V.2	RO	NO	8	Relay Output NO
-KF2.20		Beckhoff EL2624																																																																									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal																																																																		
1	Com	RO1	/16.B3	Docking Head	Valves	OHC	Spring Free Valve2	RO	NO																																																																		
2	Relay Output NO																																																																										
5	Com	RO2	/16.B3	Docking Head	Valves	OHC	Spring Damping Valve1	RO	NO																																																																		
6	Relay Output NO																																																																										
3	Com	RO3	/16.B4	Docking Head	Valves	OHC	Spring Damping Valve2	RO	NO																																																																		
4	Relay Output NO																																																																										
7	Com	RO4	/15.B5	Docking Head	Valves	OHC	Across Tilt Free V.2	RO	NO																																																																		
8	Relay Output NO																																																																										
<table><tr><th colspan="2">-KF2.21</th><th colspan="8">Beckhoff EL2624</th></tr><tr><th>Pin</th><th>Pin Description</th><th>IO Type</th><th>Ref</th><th>IO Device Location</th><th>IO Device Type</th><th>IO Function Target</th><th>IO Function</th><th>IO Used</th><th>Signal</th></tr><tr><td>1</td><td>Com</td><td rowspan="2">RO1</td><td rowspan="2">/15.B4</td><td rowspan="2">Docking Head</td><td rowspan="2">Valves</td><td rowspan="2">OHC</td><td rowspan="2">Across Tilt Free V.1</td><td rowspan="2">RO</td><td rowspan="2">NO</td></tr><tr><td>2</td><td>Relay Output NO</td></tr><tr><td>5</td><td>Com</td><td rowspan="2">RO2</td><td rowspan="2">/15.B5</td><td rowspan="2">Docking Head</td><td rowspan="2">Valves</td><td rowspan="2">OHC</td><td rowspan="2">Across Tilt Damp V.1</td><td rowspan="2">RO</td><td rowspan="2">NO</td></tr><tr><td>6</td><td>Relay Output NO</td></tr><tr><td>3</td><td>Com</td><td rowspan="2">RO3</td><td rowspan="2">/15.B6</td><td rowspan="2">Docking Head</td><td rowspan="2">Valves</td><td rowspan="2">OHC</td><td rowspan="2">Across Tilt Damp V.2</td><td rowspan="2">RO</td><td rowspan="2">NO</td></tr><tr><td>4</td><td>Relay Output NO</td></tr><tr><td>7</td><td>Com</td><td rowspan="2">RO4</td><td rowspan="2">/15.B6</td><td rowspan="2">Docking Head</td><td rowspan="2">Valves</td><td rowspan="2">OHC</td><td rowspan="2">Across Tilt Damp V.3</td><td rowspan="2">RO</td><td rowspan="2">NO</td></tr><tr><td>8</td><td>Relay Output NO</td></tr></table>								-KF2.21		Beckhoff EL2624								Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal	1	Com	RO1	/15.B4	Docking Head	Valves	OHC	Across Tilt Free V.1	RO	NO	2	Relay Output NO	5	Com	RO2	/15.B5	Docking Head	Valves	OHC	Across Tilt Damp V.1	RO	NO	6	Relay Output NO	3	Com	RO3	/15.B6	Docking Head	Valves	OHC	Across Tilt Damp V.2	RO	NO	4	Relay Output NO	7	Com	RO4	/15.B6	Docking Head	Valves	OHC	Across Tilt Damp V.3	RO	NO	8	Relay Output NO
-KF2.21		Beckhoff EL2624																																																																									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal																																																																		
1	Com	RO1	/15.B4	Docking Head	Valves	OHC	Across Tilt Free V.1	RO	NO																																																																		
2	Relay Output NO																																																																										
5	Com	RO2	/15.B5	Docking Head	Valves	OHC	Across Tilt Damp V.1	RO	NO																																																																		
6	Relay Output NO																																																																										
3	Com	RO3	/15.B6	Docking Head	Valves	OHC	Across Tilt Damp V.2	RO	NO																																																																		
4	Relay Output NO																																																																										
7	Com	RO4	/15.B6	Docking Head	Valves	OHC	Across Tilt Damp V.3	RO	NO																																																																		
8	Relay Output NO																																																																										
<table><tr><td>04</td><td>Issued for production</td><td>07.07.2023</td><td>GM</td><td>Date</td><td>14.10.2021</td><td rowspan="3">4/60185 CNP Freire MBARI</td><td rowspan="3"> TRIPLEX A MacGregor company </td><td rowspan="3">Circuit Diagram OHC ROV LARS IO List</td><td colspan="2">=OHC</td><td colspan="2">E-4502 - 04</td></tr><tr><td>03</td><td>For customer review</td><td>13.01.2023</td><td>GM</td><td>Drawn by</td><td>KS</td><td>+B21</td><td></td><td>Rev. 04</td><td>8 / 17</td></tr><tr><td>02</td><td>For customer review</td><td>29.08.2022</td><td>RSI</td><td>Appr. by</td><td>EE</td><td></td><td></td><td></td><td></td></tr><tr><td>Rev.</td><td>Description</td><td>Date</td><td>Rev. by</td><td>Standard</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Circuit Diagram OHC ROV LARS IO List	=OHC		E-4502 - 04		03	For customer review	13.01.2023	GM	Drawn by	KS	+B21		Rev. 04	8 / 17	02	For customer review	29.08.2022	RSI	Appr. by	EE					Rev.	Description	Date	Rev. by	Standard																										
04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Circuit Diagram OHC ROV LARS IO List	=OHC		E-4502 - 04																																																																
03	For customer review	13.01.2023	GM	Drawn by	KS				+B21		Rev. 04	8 / 17																																																															
02	For customer review	29.08.2022	RSI	Appr. by	EE																																																																						
Rev.	Description	Date	Rev. by	Standard																																																																							

A

B

C

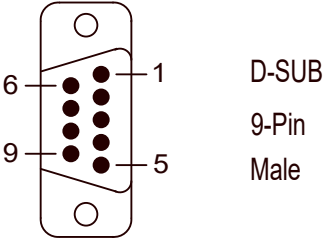
D

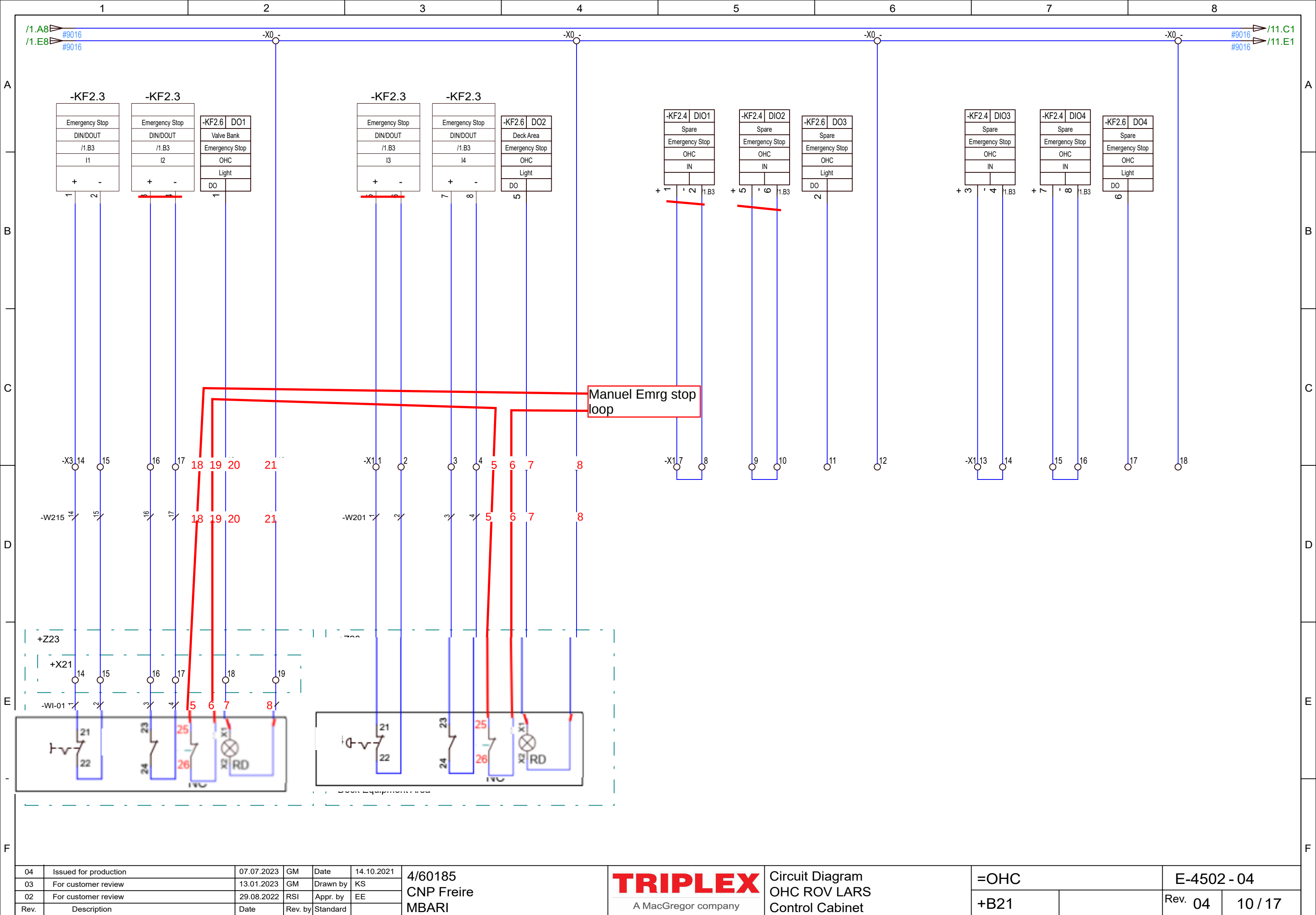
E

F

-KF2.22 Beckhoff EL2535-0002-									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	PWM Output A1	PWM1	/13.B7	Valve Bank	OUT Hauler	Prop. Valve	Out		
5	PWM Output A2								
3	0Va								
4	Digital Input	DI1	/13.B7	Valve Bank	OUT Hauler	Prop. Valve	In		
	PWM Output B1	PWM2							
6	PWM Output B2								
7	0Vb								
8	Digital Input	DI2							

-KF2.23 Beckhoff EL2535-0002-									
Pin	Pin Description	IO Type	Ref	IO Device Location	IO Device Type	IO Function Target	IO Function	IO Used	Signal
1	PWM Output A1	PWM1	/13.B7	Valve Bank	Across Tilt Out	Prop. Valve	Tilt Out		
5	PWM Output A2				Research Sheave				
3	0Va								
4	Digital Input	DI1	/13.B8	Valve Bank	Across Tilt In	Prop. Valve	Tilt In		
	PWM Output B1	PWM2							
6	PWM Output B2				Research Sheave				
7	0Vb								
8	Digital Input	DI2							

-KF2.24 Beckhoff EL6751					
DSUB-9	Pin Description	IO Type	Ref		
1		CAN	/1.E7		
2	CAN-L				
3	CAN-G				
4					
5					
6	CAN-G				
7	CAN-H				
8					
9					



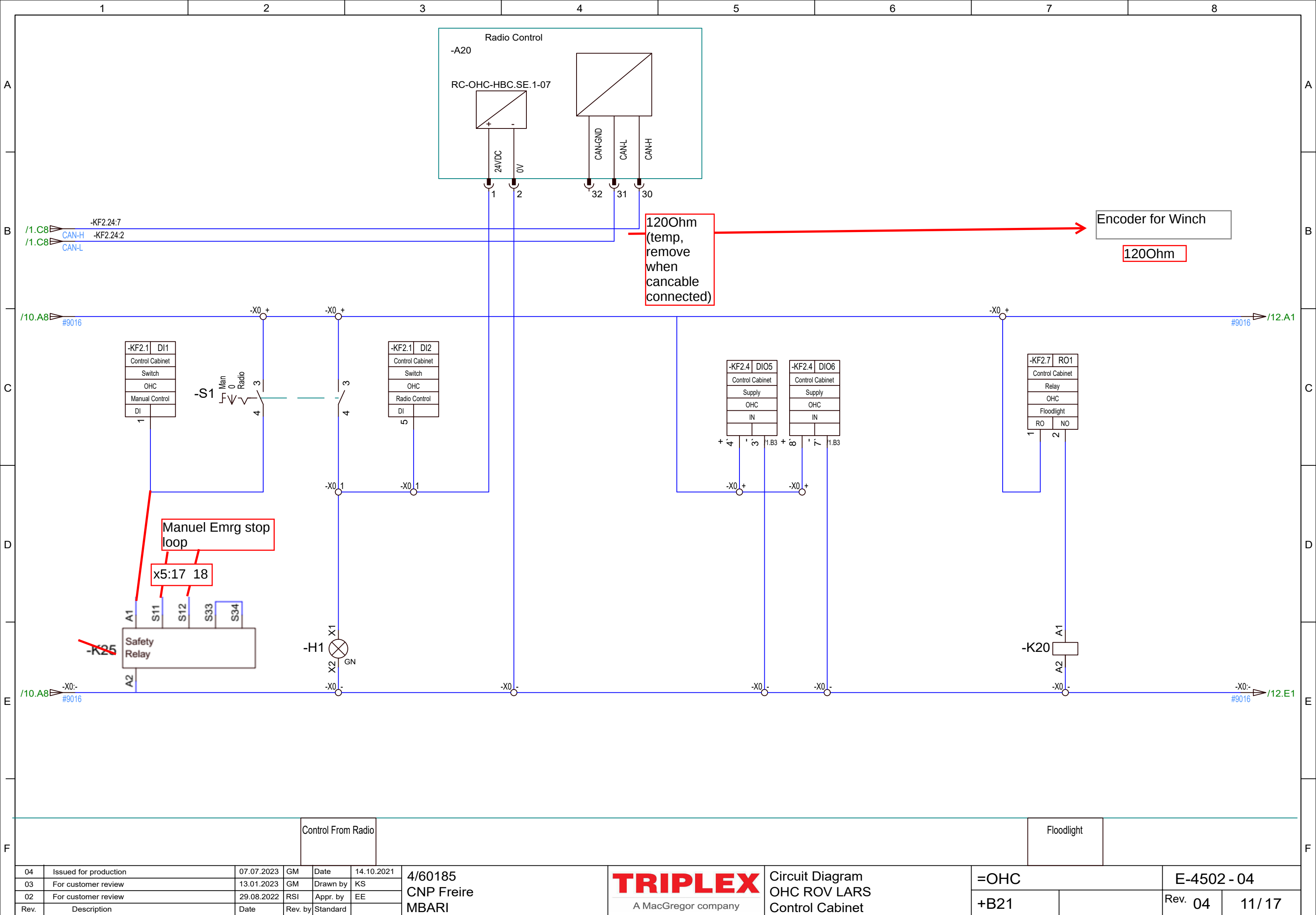
04	Issued for production	07.07.2023	GM	Date	14.10.2021
03	For customer review	13.01.2023	GM	Drawn by	KS
02	For customer review	29.08.2022	RSI	Appr. by	EE
Rev.	Description	Date	Rev. by	Standard	

4/60185
CNP Freire
MBARI



Circuit Diagram
OHC ROV LARS
Control Cabinet

=OHC		E-4502 - 04	
+B21		Rev. 04	10 / 17



04	Issued for production	07.07.2023	GM	Date	14.10.2021
03	For customer review	13.01.2023	GM	Drawn by	KS
02	For customer review	29.08.2022	RSI	Appr. by	EE
Rev.	Description	Date	Rev. by	Standard	

4/60185
CNP Freire
MBARI



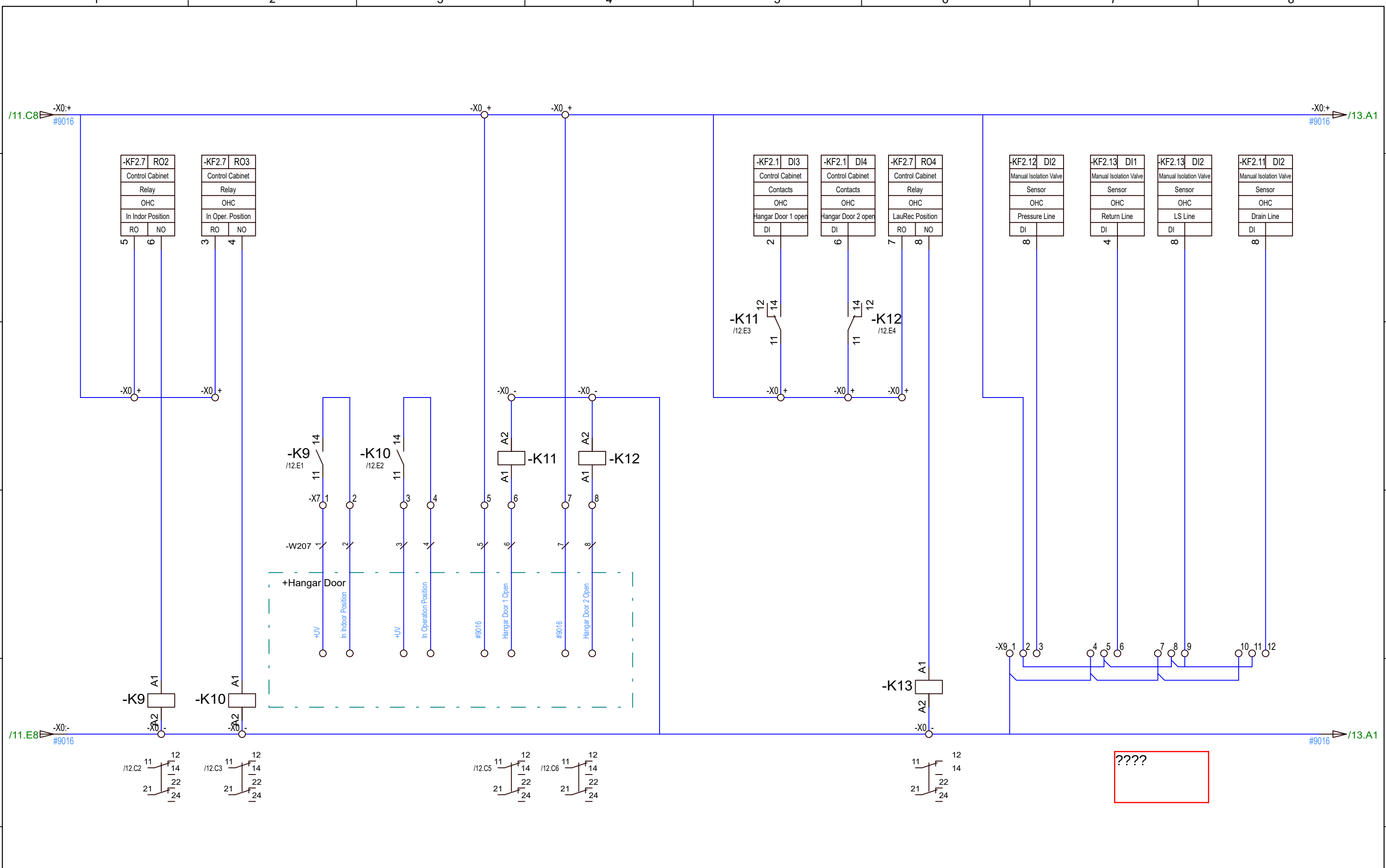
Circuit Diagram
OHC ROV LARS
Control Cabinet

=OHC

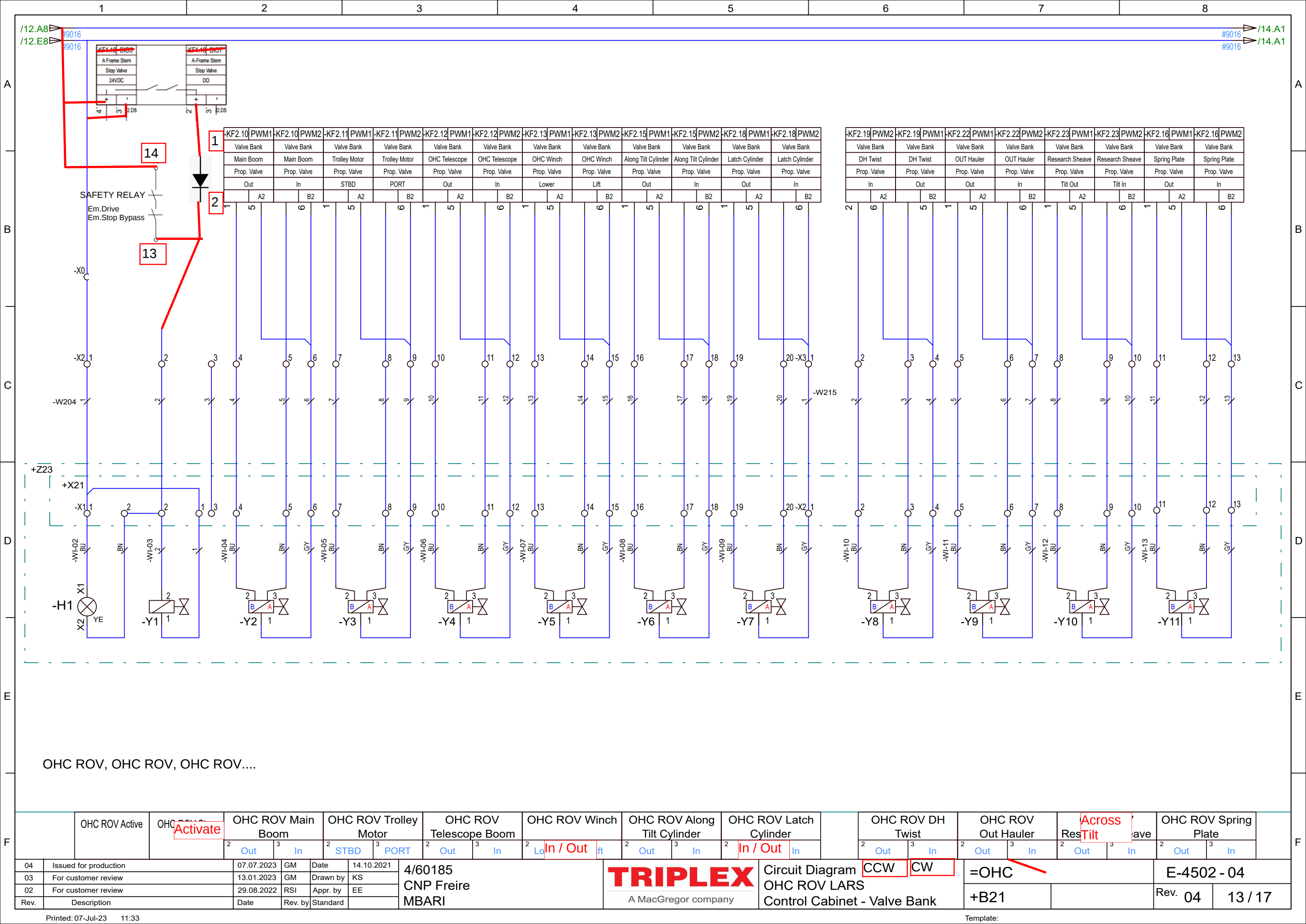
+B21

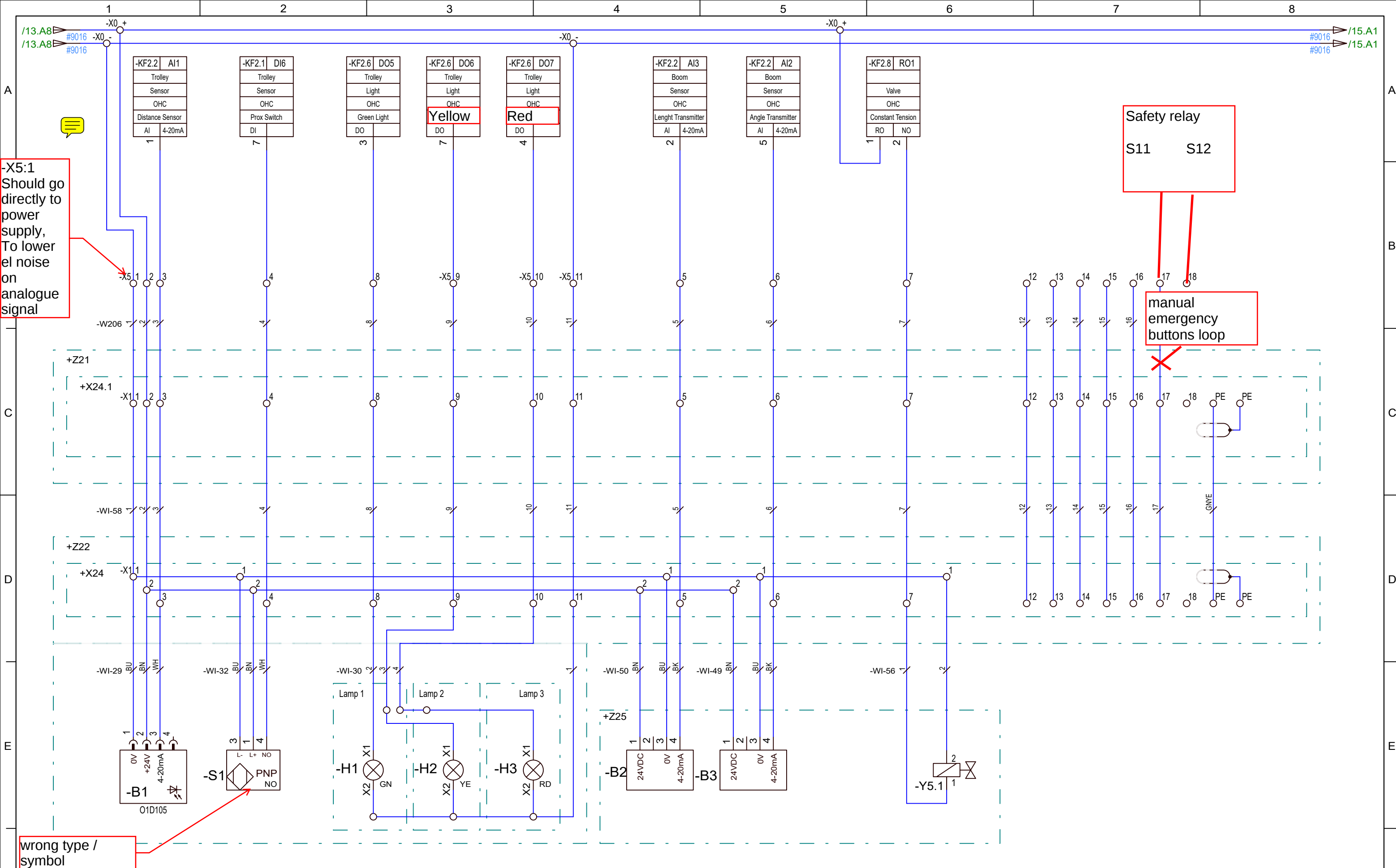
E-4502 - 04

Rev. 04 11/17

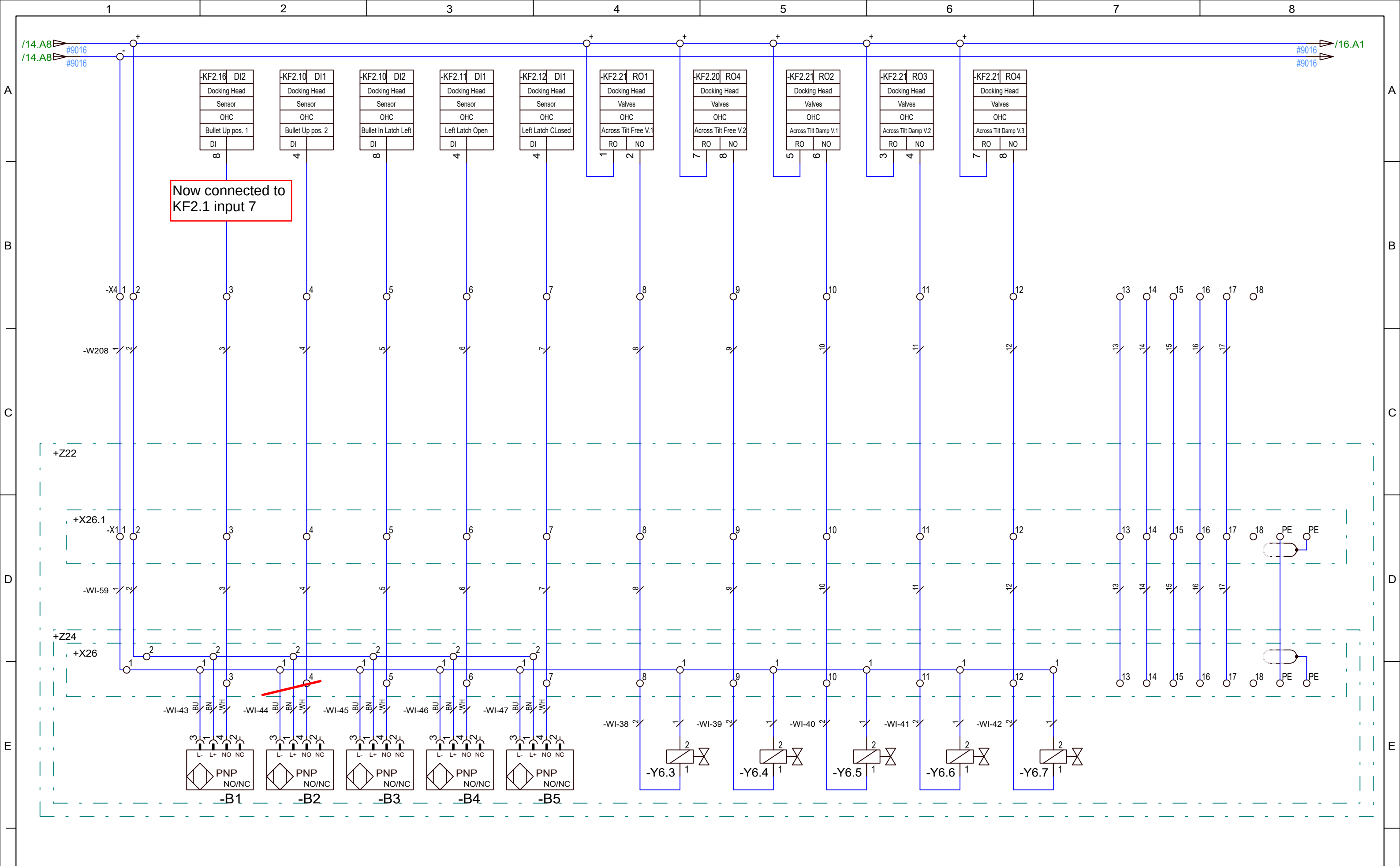


		In Indoor Position	In Operation Position					Hangar Door 1 Open	Hangar Door 2 Open				Option In LauRec Position				
04	Issued for production		07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Circuit Diagram OHC ROV LARS Control Cabinet	=OHC		E-4502 - 04					
03	For customer review		13.01.2023	GM	Drawn by	KS				+B21		Rev. 04	12 / 17				
02	For customer review		29.08.2022	RSI	Appr. by	EE											
Rev.	Description		Date	Rev. by	Standard												

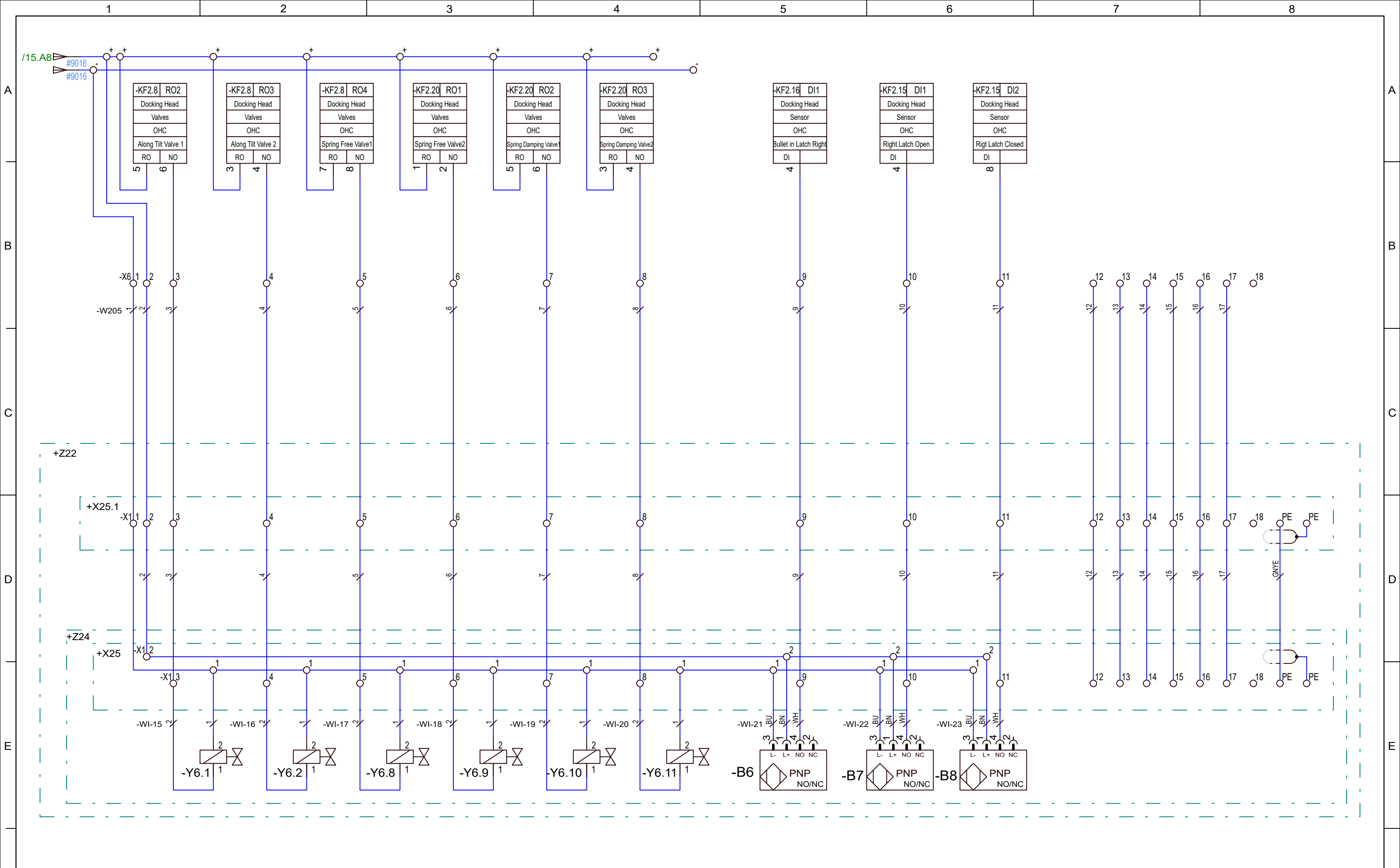




Trolley Position Distance sensor		Trolley Position Proximity Switch		Green Light		Yellow Light		Red Light		Boom Length Transmitter		Boom Angle Transmitter		Constant Tension Valve	
04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI		TRIPLEX A MacGregor company		Circuit Diagram OHC ROV LARS Control Cabinet - Sensors		=OHC +B21		E-4502 - 04 Rev. 04 14 / 17	
03	For customer review	13.01.2023	GM	Drawn by	KS										
02	For customer review	29.08.2022	RSI	Appr. by	EE										
Rev.	Description	Date	Rev. by	Standard											



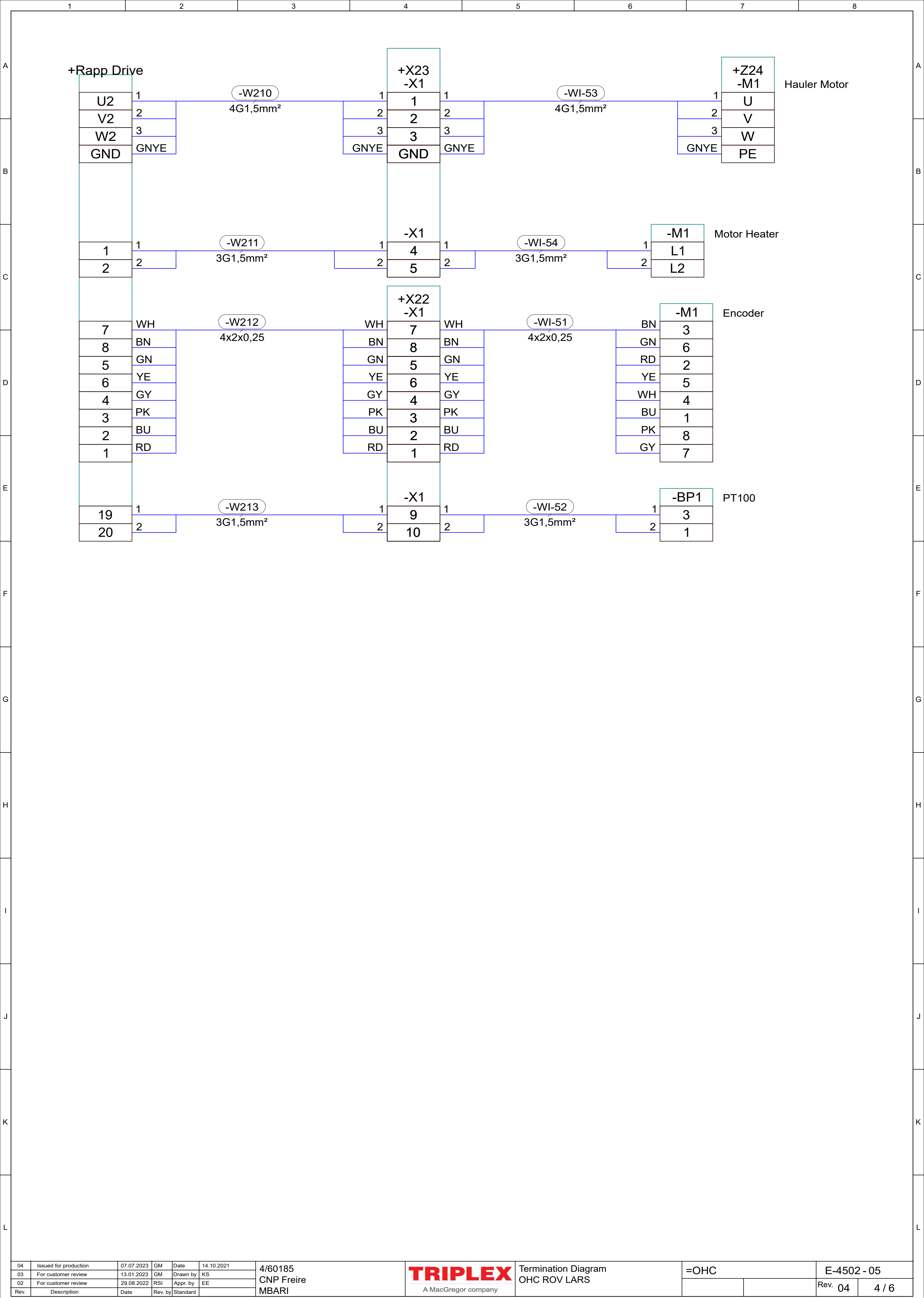
F			Bullet Upper Posiiton Sensor 1		Bullet Upper Posiiton Sensor 2		DH Bullet In Latch Sensor Left		DH Left Latch Open Sensor		DH Left Latch Closed Sensor				Across Tilt Free Valve 1		Across Tilt Free Valve 2		Across Tilt Damping Valve 1		Across Tilt Damping Valve 2		Across Tilt Damping Valve 3				F
	04	Issued for production		07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI		TRIPLEX A MacGregor company		Circuit Diagram OHC ROV LARS Control Cabinet - DH Left JB		=OHC		E-4502 - 04											
	03	For customer review		13.01.2023	GM	Drawn by	KS																				
	02	For customer review		29.08.2022	RSI	Appr. by	EE																				
	Rev.	Description		Date	Rev. by	Standard								+B21			Rev. 04	15 / 17									



		Along Tilt Free Valve 1		Along Tilt Free Valve 2		Spring Plate Free Valve 1		Spring Plate Free Valve 2		Spring Plate Damping Valve 1		Spring Plate Damping Valve 2		DH Bullet In Latch Sensor Right		DH Right Latch Open Sensor		DH Right Latch Closed Sensor			
04	Issued for production			07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI						TRIPLEX A MacGregor company		Circuit Diagram OHC ROV LARS Control Cabinet - DH Right JB		=OHC		E-4502 - 04	
03	For customer review			13.01.2023	GM	Drawn by	KS														
02	For customer review			29.08.2022	RSI	Appr. by	EE														
Rev.	Description			Date	Rev. by	Standard															











	1	2	3	4	5	6	7	8																																																																																																																																																																																																																
A	<table><tr><td>Device ID</td><td>Device</td><td>Part No.</td><td>El. No.</td><td>Qty</td><td>Unit</td><td>Description</td><td>Manufacturer</td><td>Link</td></tr><tr><td>-S1</td><td>ZB4BZ009</td><td>07961012</td><td>43 027 45</td><td>1</td><td>Pcs</td><td>CONTR. ACC, SOCKET, METAL</td><td>Schneider</td><td></td></tr><tr><td>-S1</td><td>ZBE101</td><td>07961013</td><td>43 004 23</td><td>2</td><td>Pcs</td><td>CONTR. ACC, CONTACTBLOCK, 1NO</td><td>Schneider</td><td></td></tr><tr><td>-TAG1</td><td>US-EMLP 100X60 4 Line</td><td>07958308</td><td></td><td>1</td><td>Pcs</td><td>TAG, SIGN, THERMOMARK CARD, W/GLUE</td><td>Phoenix Contact</td><td></td></tr><tr><td>-TAG2</td><td>US-EMLP-HA 24</td><td>400075270</td><td></td><td>1</td><td>Pcs</td><td>TAG, SIGN, THERMOMARK CARD</td><td>Phoenix Contact</td><td></td></tr><tr><td>-X0</td><td>AEP 3C 2.5</td><td>400069937</td><td>12 694 11</td><td>1</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, END PLATE</td><td>Weidmüller</td><td></td></tr><tr><td>-X0</td><td>AEP AP11</td><td></td><td></td><td>1</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, END PLATE</td><td>Weidmüller</td><td></td></tr><tr><td>-X0..-X7,-X9,-X90</td><td>AEB 35 SC/1</td><td>400073887</td><td>12 654 34</td><td>14</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, END LOCK</td><td>Weidmüller</td><td></td></tr><tr><td>-X0 (1)</td><td>A3C 2.5</td><td>400069932</td><td>12 654 01</td><td>1</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, DOUBLE</td><td>Weidmüller</td><td></td></tr><tr><td>-X0 (-)</td><td>AAP11 6/6X1.5 LO-LI BL</td><td>400074009</td><td></td><td>1</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN,</td><td>Weidmüller</td><td></td></tr><tr><td>-X0 (-,-,-,-,-)</td><td>AAP11 1.5 LI BL</td><td>400074009</td><td></td><td>5</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN,</td><td>Weidmüller</td><td></td></tr><tr><td>-X0 (+)</td><td>AAP11 6/6X1.5 LO-LI RD</td><td>400074009</td><td></td><td>1</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN,</td><td>Weidmüller</td><td></td></tr><tr><td>-X0 (+,+,+,+,+,+)</td><td>AAP11 1.5 LI RD</td><td>400074009</td><td></td><td>6</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN,</td><td>Weidmüller</td><td></td></tr><tr><td>-X0 (GND)</td><td>JORDSKINNE 21</td><td>07918007</td><td></td><td>1</td><td>Pcs</td><td>RAIL, GRN, BRASS, 21 SLOT</td><td>Weidmüller</td><td></td></tr><tr><td>-X0 (GND),-X90 (GND)</td><td>WPE 4</td><td>07918003</td><td>12 688 16</td><td>2</td><td>Pcs</td><td>-TERMINAL BLOCK, GND, 101010</td><td>Weidmüller</td><td></td></tr><tr><td>-X0 (GND,GND)</td><td>A3C 2.5 PE</td><td>400074010</td><td>12 654 16</td><td>2</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, GND</td><td>Weidmüller</td><td></td></tr><tr><td>-X1 (1,3,5,7,9,11,13,15,17),-X4 (1,3,5,7,9,11,13,15,17),-X5 (1,3,5,7,9,11,13,15,17),-X6 (1,3,5,7,9,11,13,15,17),-X7 (1,3,5,7),-X90 (1)</td><td>A2T 2.5</td><td>400073880</td><td>12 654 14</td><td>41</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, TWO HIGHTS</td><td>Weidmüller</td><td></td></tr><tr><td>-X2..-X3,-X9</td><td>AEP 3T 2.5</td><td>400209845</td><td>12 694 40</td><td>3</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, END PLATE</td><td>Weidmüller</td><td></td></tr><tr><td>-X2 (1,1,4,4,7,10,13,16,19),-X3 (1,4,7,10,13,16,19),-X9 (1,4,7,10)</td><td>A3T 2.5</td><td></td><td></td><td>20</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, THREE HIGHTS</td><td>Weidmüller</td><td></td></tr><tr><td>-X4..-X7,-X90</td><td>AEP 2T 2.5</td><td>400073883</td><td>12 694 40</td><td>5</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, END PLATE</td><td>Weidmüller</td><td></td></tr><tr><td>-X91,-X92</td><td>IE-TO-RJ45-FJ-B</td><td>07930061</td><td></td><td>2</td><td>Pcs</td><td>CONNECTOR, FEMALE, RJ45, RAIL MOUNT</td><td>Weidmüller</td><td></td></tr><tr><td>-X93 (1)</td><td>A3T 2.5 DL</td><td></td><td></td><td>1</td><td>Pcs</td><td>TERMINAL BLOCK, SNAP-IN, THREE HIGHTS</td><td>Weidmüller</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>								Device ID	Device	Part No.	El. No.	Qty	Unit	Description	Manufacturer	Link	-S1	ZB4BZ009	07961012	43 027 45	1	Pcs	CONTR. ACC, SOCKET, METAL	Schneider		-S1	ZBE101	07961013	43 004 23	2	Pcs	CONTR. ACC, CONTACTBLOCK, 1NO	Schneider		-TAG1	US-EMLP 100X60 4 Line	07958308		1	Pcs	TAG, SIGN, THERMOMARK CARD, W/GLUE	Phoenix Contact		-TAG2	US-EMLP-HA 24	400075270		1	Pcs	TAG, SIGN, THERMOMARK CARD	Phoenix Contact		-X0	AEP 3C 2.5	400069937	12 694 11	1	Pcs	TERMINAL BLOCK, SNAP-IN, END PLATE	Weidmüller		-X0	AEP AP11			1	Pcs	TERMINAL BLOCK, SNAP-IN, END PLATE	Weidmüller		-X0..-X7,-X9,-X90	AEB 35 SC/1	400073887	12 654 34	14	Pcs	TERMINAL BLOCK, SNAP-IN, END LOCK	Weidmüller		-X0 (1)	A3C 2.5	400069932	12 654 01	1	Pcs	TERMINAL BLOCK, SNAP-IN, DOUBLE	Weidmüller		-X0 (-)	AAP11 6/6X1.5 LO-LI BL	400074009		1	Pcs	TERMINAL BLOCK, SNAP-IN,	Weidmüller		-X0 (-,-,-,-,-)	AAP11 1.5 LI BL	400074009		5	Pcs	TERMINAL BLOCK, SNAP-IN,	Weidmüller		-X0 (+)	AAP11 6/6X1.5 LO-LI RD	400074009		1	Pcs	TERMINAL BLOCK, SNAP-IN,	Weidmüller		-X0 (+,+,+,+,+,+)	AAP11 1.5 LI RD	400074009		6	Pcs	TERMINAL BLOCK, SNAP-IN,	Weidmüller		-X0 (GND)	JORDSKINNE 21	07918007		1	Pcs	RAIL, GRN, BRASS, 21 SLOT	Weidmüller		-X0 (GND),-X90 (GND)	WPE 4	07918003	12 688 16	2	Pcs	-TERMINAL BLOCK, GND, 101010	Weidmüller		-X0 (GND,GND)	A3C 2.5 PE	400074010	12 654 16	2	Pcs	TERMINAL BLOCK, SNAP-IN, GND	Weidmüller		-X1 (1,3,5,7,9,11,13,15,17),-X4 (1,3,5,7,9,11,13,15,17),-X5 (1,3,5,7,9,11,13,15,17),-X6 (1,3,5,7,9,11,13,15,17),-X7 (1,3,5,7),-X90 (1)	A2T 2.5	400073880	12 654 14	41	Pcs	TERMINAL BLOCK, SNAP-IN, TWO HIGHTS	Weidmüller		-X2..-X3,-X9	AEP 3T 2.5	400209845	12 694 40	3	Pcs	TERMINAL BLOCK, SNAP-IN, END PLATE	Weidmüller		-X2 (1,1,4,4,7,10,13,16,19),-X3 (1,4,7,10,13,16,19),-X9 (1,4,7,10)	A3T 2.5			20	Pcs	TERMINAL BLOCK, SNAP-IN, THREE HIGHTS	Weidmüller		-X4..-X7,-X90	AEP 2T 2.5	400073883	12 694 40	5	Pcs	TERMINAL BLOCK, SNAP-IN, END PLATE	Weidmüller		-X91,-X92	IE-TO-RJ45-FJ-B	07930061		2	Pcs	CONNECTOR, FEMALE, RJ45, RAIL MOUNT	Weidmüller		-X93 (1)	A3T 2.5 DL			1	Pcs	TERMINAL BLOCK, SNAP-IN, THREE HIGHTS	Weidmüller											
	Device ID	Device	Part No.	El. No.	Qty	Unit	Description	Manufacturer	Link																																																																																																																																																																																																															
-S1	ZB4BZ009	07961012	43 027 45	1	Pcs	CONTR. ACC, SOCKET, METAL	Schneider																																																																																																																																																																																																																	
-S1	ZBE101	07961013	43 004 23	2	Pcs	CONTR. ACC, CONTACTBLOCK, 1NO	Schneider																																																																																																																																																																																																																	
-TAG1	US-EMLP 100X60 4 Line	07958308		1	Pcs	TAG, SIGN, THERMOMARK CARD, W/GLUE	Phoenix Contact																																																																																																																																																																																																																	
-TAG2	US-EMLP-HA 24	400075270		1	Pcs	TAG, SIGN, THERMOMARK CARD	Phoenix Contact																																																																																																																																																																																																																	
-X0	AEP 3C 2.5	400069937	12 694 11	1	Pcs	TERMINAL BLOCK, SNAP-IN, END PLATE	Weidmüller																																																																																																																																																																																																																	
-X0	AEP AP11			1	Pcs	TERMINAL BLOCK, SNAP-IN, END PLATE	Weidmüller																																																																																																																																																																																																																	
-X0..-X7,-X9,-X90	AEB 35 SC/1	400073887	12 654 34	14	Pcs	TERMINAL BLOCK, SNAP-IN, END LOCK	Weidmüller																																																																																																																																																																																																																	
-X0 (1)	A3C 2.5	400069932	12 654 01	1	Pcs	TERMINAL BLOCK, SNAP-IN, DOUBLE	Weidmüller																																																																																																																																																																																																																	
-X0 (-)	AAP11 6/6X1.5 LO-LI BL	400074009		1	Pcs	TERMINAL BLOCK, SNAP-IN,	Weidmüller																																																																																																																																																																																																																	
-X0 (-,-,-,-,-)	AAP11 1.5 LI BL	400074009		5	Pcs	TERMINAL BLOCK, SNAP-IN,	Weidmüller																																																																																																																																																																																																																	
-X0 (+)	AAP11 6/6X1.5 LO-LI RD	400074009		1	Pcs	TERMINAL BLOCK, SNAP-IN,	Weidmüller																																																																																																																																																																																																																	
-X0 (+,+,+,+,+,+)	AAP11 1.5 LI RD	400074009		6	Pcs	TERMINAL BLOCK, SNAP-IN,	Weidmüller																																																																																																																																																																																																																	
-X0 (GND)	JORDSKINNE 21	07918007		1	Pcs	RAIL, GRN, BRASS, 21 SLOT	Weidmüller																																																																																																																																																																																																																	
-X0 (GND),-X90 (GND)	WPE 4	07918003	12 688 16	2	Pcs	-TERMINAL BLOCK, GND, 101010	Weidmüller																																																																																																																																																																																																																	
-X0 (GND,GND)	A3C 2.5 PE	400074010	12 654 16	2	Pcs	TERMINAL BLOCK, SNAP-IN, GND	Weidmüller																																																																																																																																																																																																																	
-X1 (1,3,5,7,9,11,13,15,17),-X4 (1,3,5,7,9,11,13,15,17),-X5 (1,3,5,7,9,11,13,15,17),-X6 (1,3,5,7,9,11,13,15,17),-X7 (1,3,5,7),-X90 (1)	A2T 2.5	400073880	12 654 14	41	Pcs	TERMINAL BLOCK, SNAP-IN, TWO HIGHTS	Weidmüller																																																																																																																																																																																																																	
-X2..-X3,-X9	AEP 3T 2.5	400209845	12 694 40	3	Pcs	TERMINAL BLOCK, SNAP-IN, END PLATE	Weidmüller																																																																																																																																																																																																																	
-X2 (1,1,4,4,7,10,13,16,19),-X3 (1,4,7,10,13,16,19),-X9 (1,4,7,10)	A3T 2.5			20	Pcs	TERMINAL BLOCK, SNAP-IN, THREE HIGHTS	Weidmüller																																																																																																																																																																																																																	
-X4..-X7,-X90	AEP 2T 2.5	400073883	12 694 40	5	Pcs	TERMINAL BLOCK, SNAP-IN, END PLATE	Weidmüller																																																																																																																																																																																																																	
-X91,-X92	IE-TO-RJ45-FJ-B	07930061		2	Pcs	CONNECTOR, FEMALE, RJ45, RAIL MOUNT	Weidmüller																																																																																																																																																																																																																	
-X93 (1)	A3T 2.5 DL			1	Pcs	TERMINAL BLOCK, SNAP-IN, THREE HIGHTS	Weidmüller																																																																																																																																																																																																																	
F	04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	 A MacGregor company	Part List OHC ROV LARS	=OHC		E-4502 - 07																																																																																																																																																																																																												
	03	For customer review	13.01.2023	GM	Drawn by	KS				+B21		Rev. 04	3 / 17																																																																																																																																																																																																											
	02	For customer review	29.08.2022	RSI	Appr. by	EE																																																																																																																																																																																																																		
	Rev.	Description	Date	Rev. by	Standard																																																																																																																																																																																																																			

1		2		3		4		5		6		7		8											
A	Device ID		Device		Part No.		El. No.		Qty		Unit		Description		Manufacturer		Link								
	-GL1..-GL6		ST-M 20 x 1.5		07928033		12 477 14		6		Pcs		CABLE GLAND, PLASTIC, SKINTOP, Ø6-12		Lapp										
	-JB1		CPG-240		07904004				1		Pcs		JUNCTION BOX, POLYESTER, 220x120x90		Bernstein										
	-RAIL1		TS 35X7.5 6.2MM HULLET		07940001		12 692 14		0.183		M		RAIL, PERFORATED, TS35 x 7,5 x 6,2mm		Weidmüller										
	-TAG1		US-EMLP 60X30		07958306		12 684 08		1		Pcs		TAG, SIGN, THERMOMARK CARD, W/GLUE		Phoenix Contact										
	-X1		AEP 2C 2.5		400069933		12 694 10		3		Pcs		TERMINAL BLOCK, SNAP-IN, END PLATE		Weidmüller										
	-X1 (1-5),-X90 (1-2)		A2C 2.5		400069931		12 654 00		7		Pcs		TERMINAL BLOCK, SNAP-IN, SINGLE		Weidmüller										
	-X1 (GND,GND,GND,PE),-X90 (PE)		A2C 2.5 PE		400074009		12 654 15		5		Pcs		TERMINAL BLOCK, SNAP-IN, GND		Weidmüller										
-X1,-X90		AEB 35 SC/1		400073887		12 654 34		4		Pcs		TERMINAL BLOCK, SNAP-IN, END LOCK		Weidmüller											
B																									
C																									
D																									
E																									
F																									
04		Issued for production		07.07.2023		GM		Date		14.10.2021		4/60185 CNP Freire MBARI		TRIPLEX		Part List OHC ROV LARS		=OHC		E-4502 - 07					
03		For customer review		13.01.2023		GM		Drawn by		KS								+X23				Rev. 04		6 / 17	
02		For customer review		29.08.2022		RSI		Appr. by		EE															
Rev.		Description		Date		Rev. by		Standard																	
Printed: 07-Jul-23 11:33																		Template:							

1		2		3		4		5		6		7		8											
A	Device ID		Device		Part No.		El. No.		Qty		Unit		Description		Manufacturer		Link								
	-GL1,-GL2		ST-M 25 x 1.5		07928034		12 477 15		2		Pcs		CABLE GLAND, PLASTIC, SKINTOP, Ø12-18		Lapp										
	-JB1		CPG-240		07904004				1		Pcs		JUNCTION BOX, POLYESTER, 220x120x90		Bernstein										
	-RAIL1		TS 35X7.5 6.2MM HULLET		07940001		12 692 14		0.209		M		RAIL, PERFORATED, TS35 x 7,5 x 6,2mm		Weidmüller										
	-TAG1		US-EMLP 60X30		07958306		12 684 08		1		Pcs		TAG, SIGN, THERMOMARK CARD, W/GLUE		Phoenix Contact										
	-X1		AEB 35 SC/1		400073887		12 654 34		2		Pcs		TERMINAL BLOCK, SNAP-IN, END LOCK		Weidmüller										
	-X1		AEP 2C 2.5		400069933		12 694 10		1		Pcs		TERMINAL BLOCK, SNAP-IN, END PLATE		Weidmüller										
	-X1 (1-18)		A2C 2.5		400069931		12 654 00		18		Pcs		TERMINAL BLOCK, SNAP-IN, SINGLE		Weidmüller										
B	-X1 (PE,PE)		A2C 2.5 PE		400074009		12 654 15		2		Pcs		TERMINAL BLOCK, SNAP-IN, GND		Weidmüller										
C																									
D																									
E																									
F																									
04		Issued for production		07.07.2023		GM		Date		14.10.2021		4/60185		CNP Freire		MBARI		TRIPLEX		Part List		=OHC		E-4502 - 07	
03		For customer review		13.01.2023		GM		Drawn by		KS										A MacGregor company		OHC ROV LARS			
02		For customer review		29.08.2022		RSI		Appr. by		EE												+X24.1		Rev. 04	
Rev.		Description		Date		Rev. by		Standard																8 / 17	

[illegible]

[illegible]

[illegible]

1		2		3		4		5		6		7		8	
Device ID		Device		Part No.		El. No.		Qty	Unit	Description			Manufacturer		Link
-S1		XALK178W3B140G		400208317		4322660		1	Pcs	CONTR. PUSH, EM STOP			Schneider		

[illegible]

1		2		3		4		5		6		7		8	
Device ID		Device		Part No.		El. No.		Qty	Unit	Description			Manufacturer		Link
-H1		853 300 55		400063431				1	Pcs	LAMP, BEACON, LED, YE, 24V			Werma		
-S1		XALK178W3B140G		400208317		4322660		1	Pcs	CONTR. PUSH, EM STOP			Schneider		
-Y1		Hawe STOP VALVE						1	Pcs	VALVE, ON/OFF			Hawe		
-Y2..-Y13		Hawe PROP VALVE						12	Pcs	VALVE, PROPOTIONAL			Hawe		
										</					

1		2		3		4		5		6		7		8	
Device ID		Device		Part No.		El. No.		Qty	Unit	Description			Manufacturer		Link
-B1..-B8		NBB4-12GM50-A2-V1-M1		400112792				8	Pcs	SENSOR, PROX, Ø12, NO/NC, SN4, M12, -40. .70°C			 Inductive sensor NRN15-18GS40-A2-V1 ■ Reduction factor = 1 ■ Magnetic field resistant ■ Stainless steel housing		
-BP1		INO-OEM202P-PT300		400091230				1	Pcs	PT300 ->, 4-20mA Transmitter, AUTEK-INO- OEM202P-PT300--50/150°C-M12-Ø13,5x72					
-E1		FL60 9000 850 120 M24 MB		400072975				1	Pcs	FLOODLIGHT, LED, 80W, 120V, MEDIUM BEAM					
-Y6.1,-Y6.2,-Y6.3,-Y6.4,-Y6.5, -Y6.6,-Y6.7,-Y6.8,-Y6.9,-Y6. 10,-Y6.11		Hawe STOP VALVE						11	Pcs	VALVE, ON/OFF			Hawe		

04	Issued for production	07.07.2023	GM	Date	14.10.2021	4/60185 CNP Freire MBARI	TRIPLEX A MacGregor company	Part List OHC ROV LARS	=OHC		E-4502 - 07	
03	For customer review	13.01.2023	GM	Drawn by	KS							
02	For customer review	29.08.2022	RSI	Appr. by	EE							
Rev.	Description	Date	Rev. by	Standard					+Z24		Rev. 04	16 / 17

Printed: 07-Jul-23 11:33 Template: