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ABB

No.4528, Kangxin Highway,  
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Latest revision:  
Rev 04  
3/29/2021

Prepared by, date: Clyde

Approved by, date: Yang X. Gao



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RA/RDP

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Status:  
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Mounting location: +

Document no.  
3HAC065464-009

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Customer :  
Drawing number : 3HAC065464-009  
Drawing version : Rev 04

Manufacture : ABB Engineering (Shanghai) Ltd.  
Type : Industrial robot controller  
Type of installation :  
Control cabinet : OmniCore C90XT  
Mains voltage : 220~230VAC, 50/60Hz  
Supply :  
Control voltage :  
Year of construction : 2019

Project start :  
Project manager :  
Last revision :  
Designed by :  
Designed date : 3/29/2021  
Number of pages : 94

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Frontpage

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Rev 04 2021/03/29

1. Removed auto-stop connection on harness W025, added notes to K2-X14.
2. Changed the description of AC\_INPUT contacts from " L, N, PE " to " L1, L2 or N, PE"
3. Added the connected information of GS safety function.

Rev 03 2020/07/31.

Add IRB 1300 connection

Rev 02 2020/06/30

1. Changed B1(CTM) 24V power connection from K2-X19(24V\_IO\_EXT) to K2-X5(24V\_IO\_INT).
2. Page 6, 6.a, 6.b, 6.c changed to page 6, 6.a, 6.b.
3. Added E-stop status output information.
4. Changed front panel interface silk-screen name.

Rev 01 2020/03/25

1. Delete the connector X81 and connection cables.
2. Delete the adapter X105 and connection cables.
3. Delete the adapter X107.
4. Update the page template.

Rev 00 2019/10/14

New release

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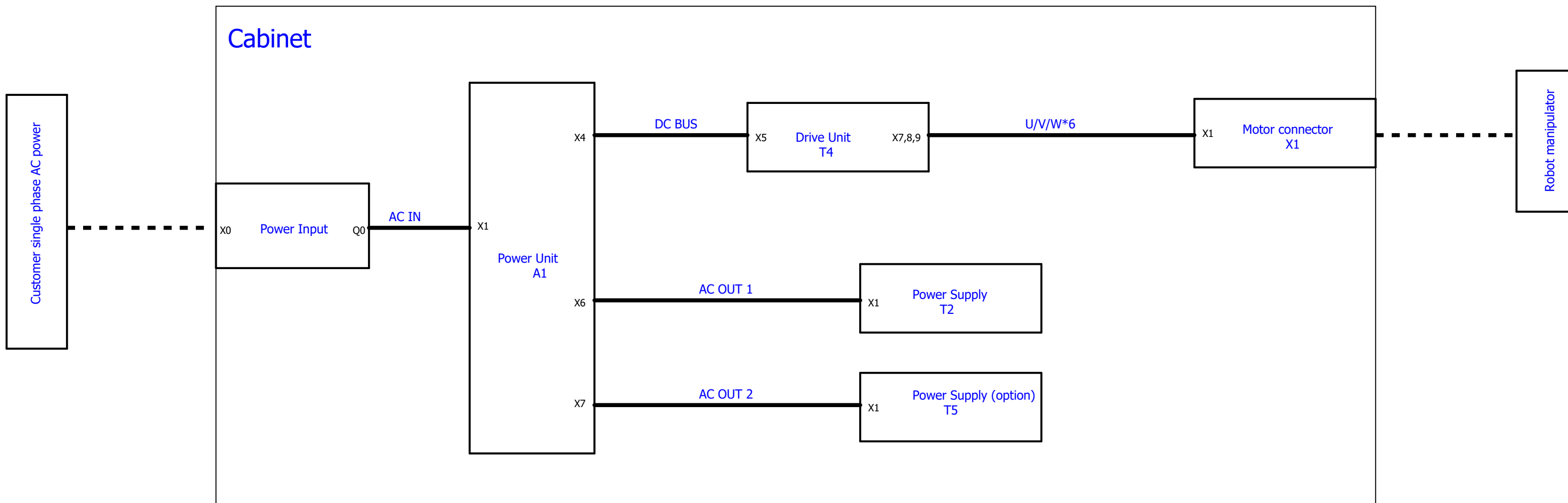
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Power circuit

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Block diagram

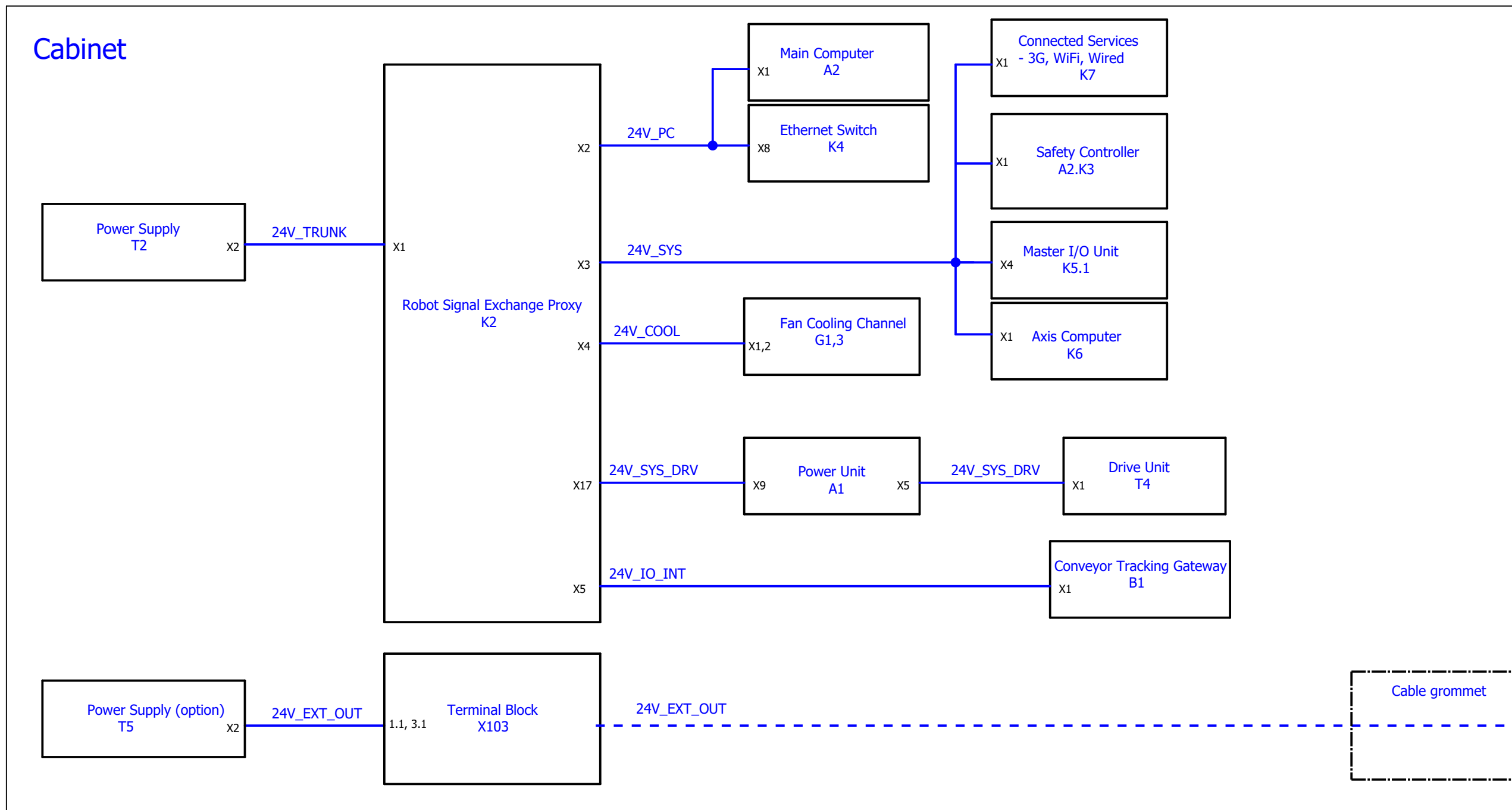
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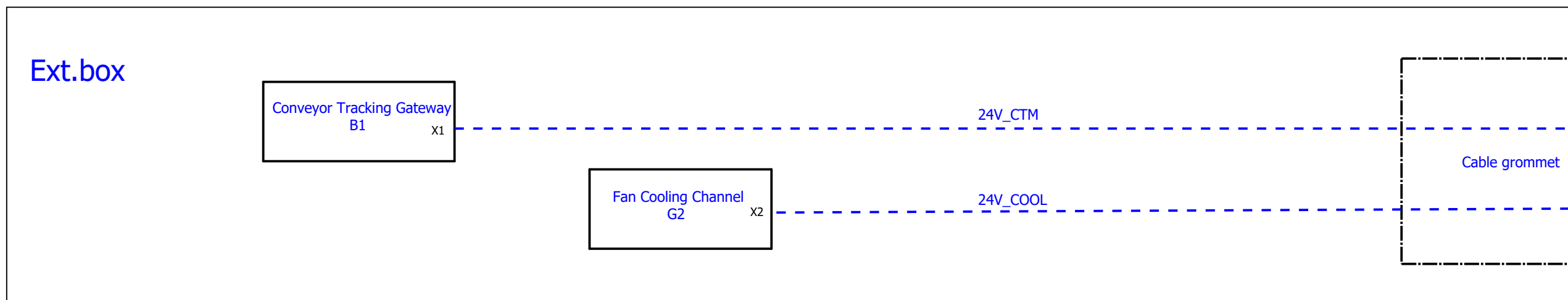
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# Cabinet



# Ext.box



24VDC logical power circuit

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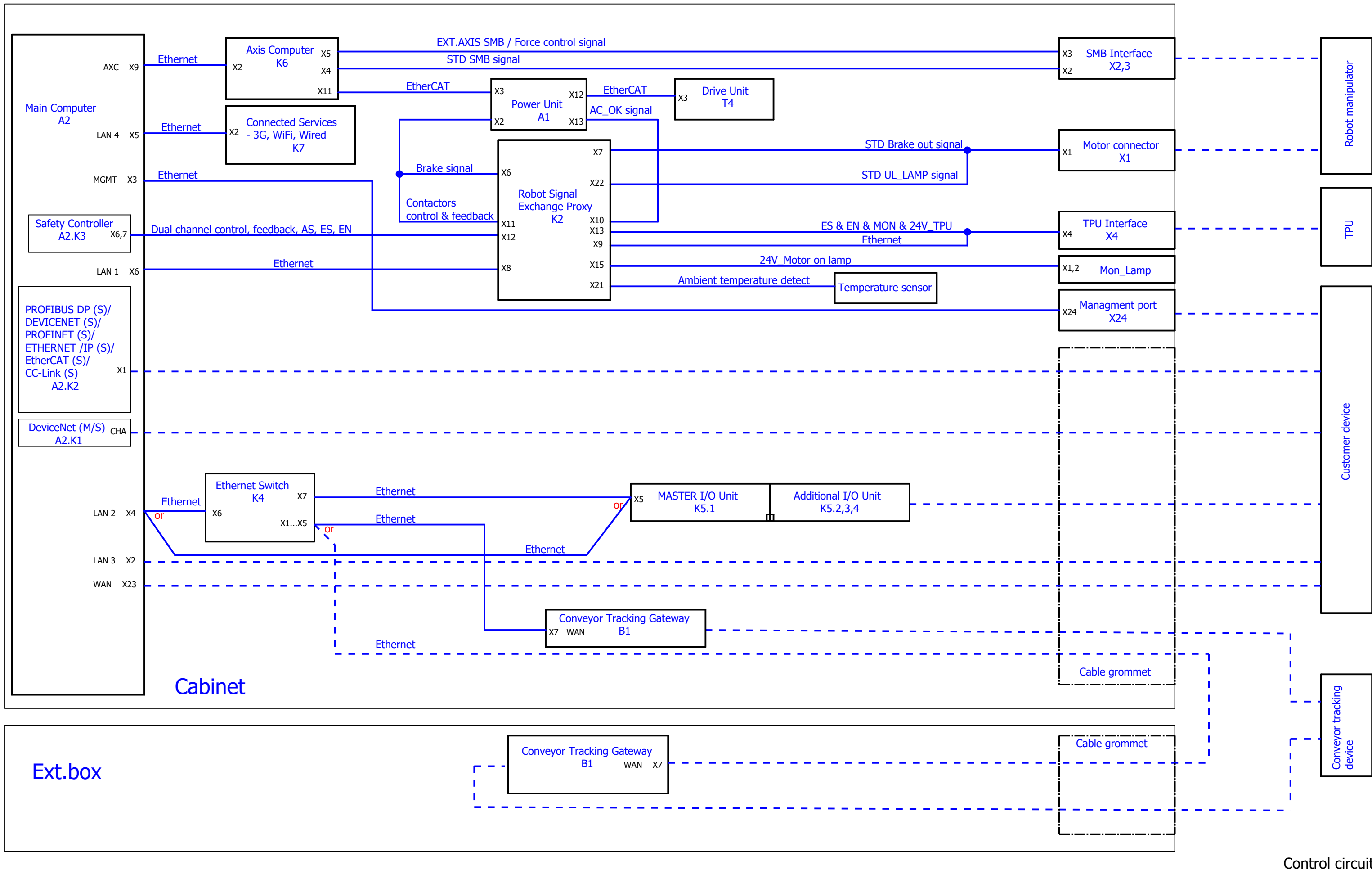
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**Block diagram**

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Control circuit

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**Block diagram**

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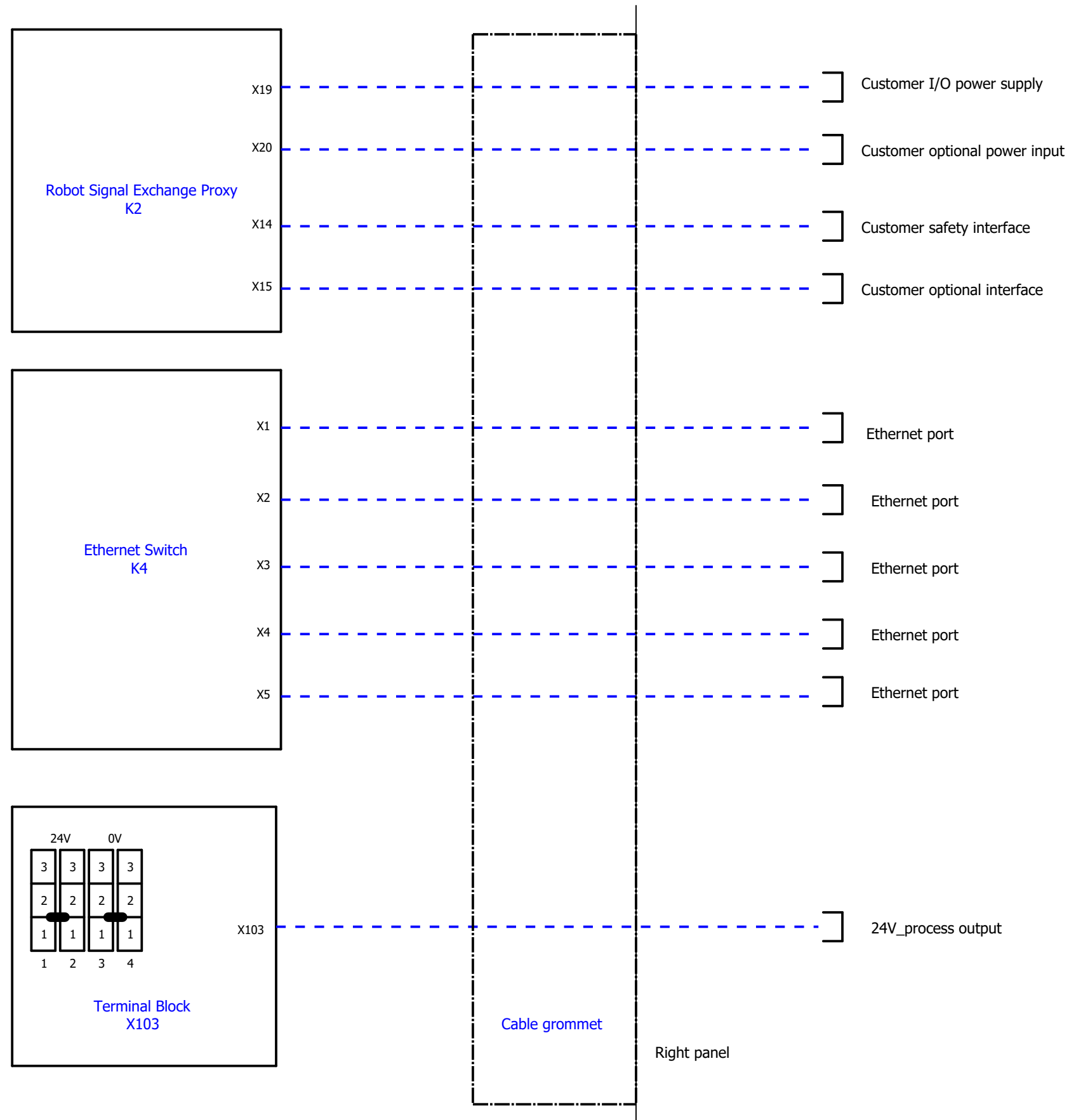
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Customer interface

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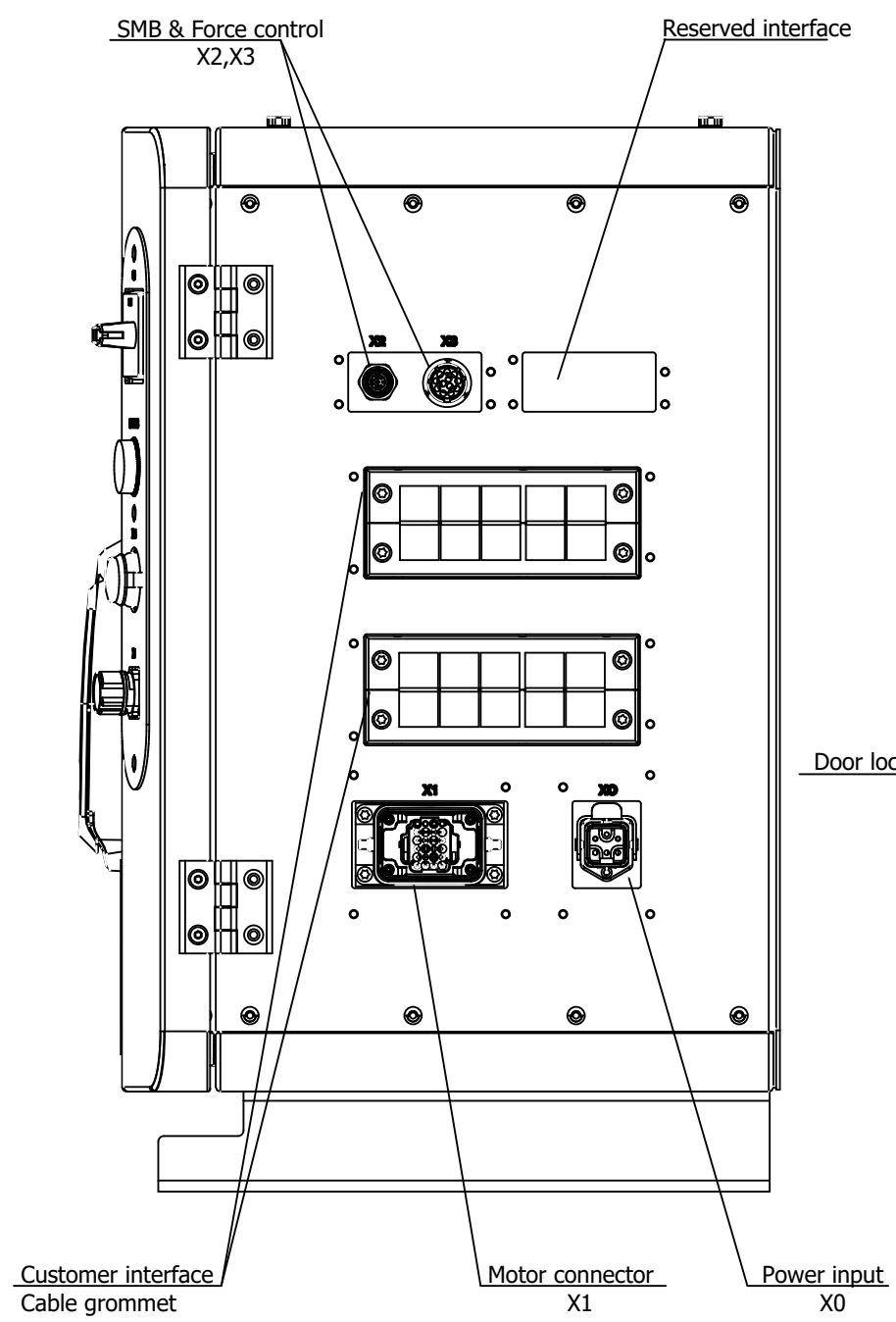
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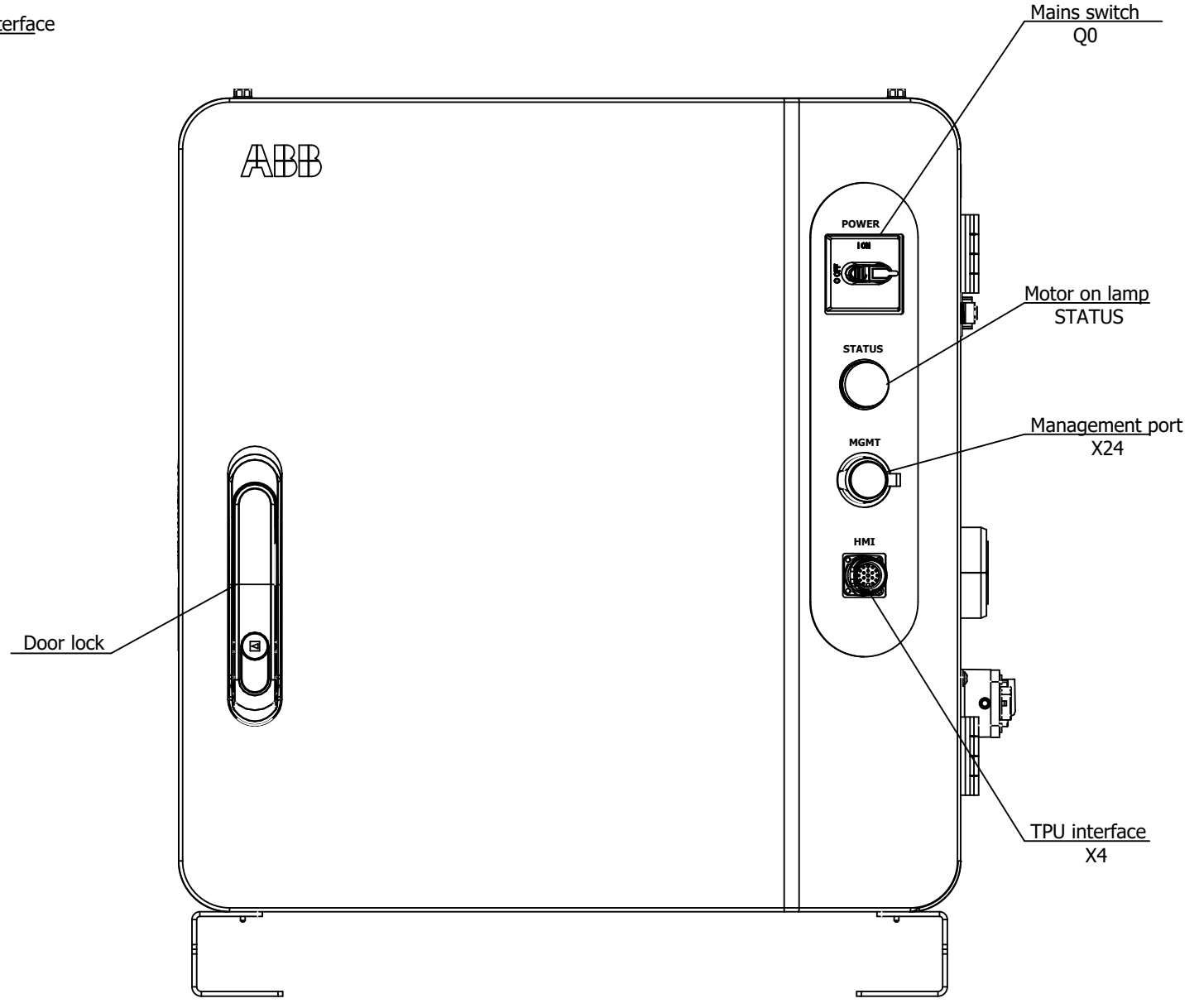
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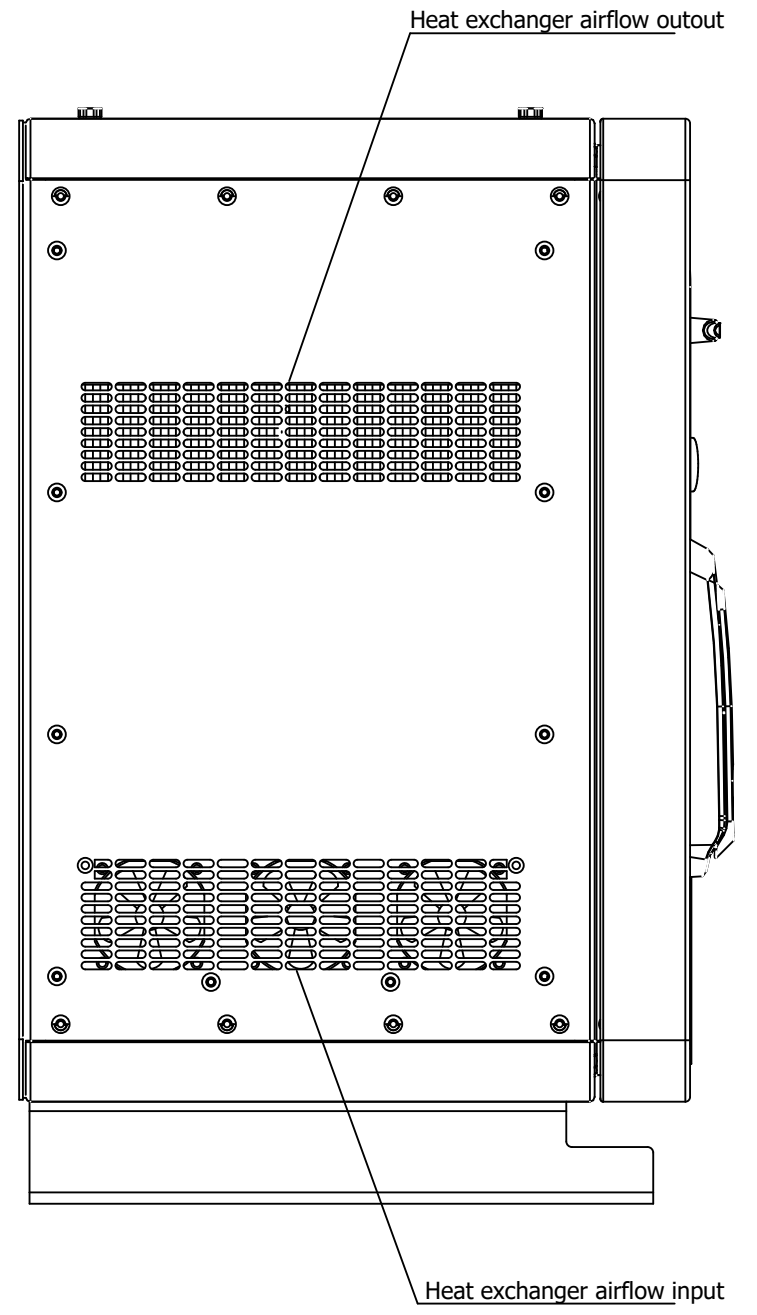
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Right View



Front view



Left View

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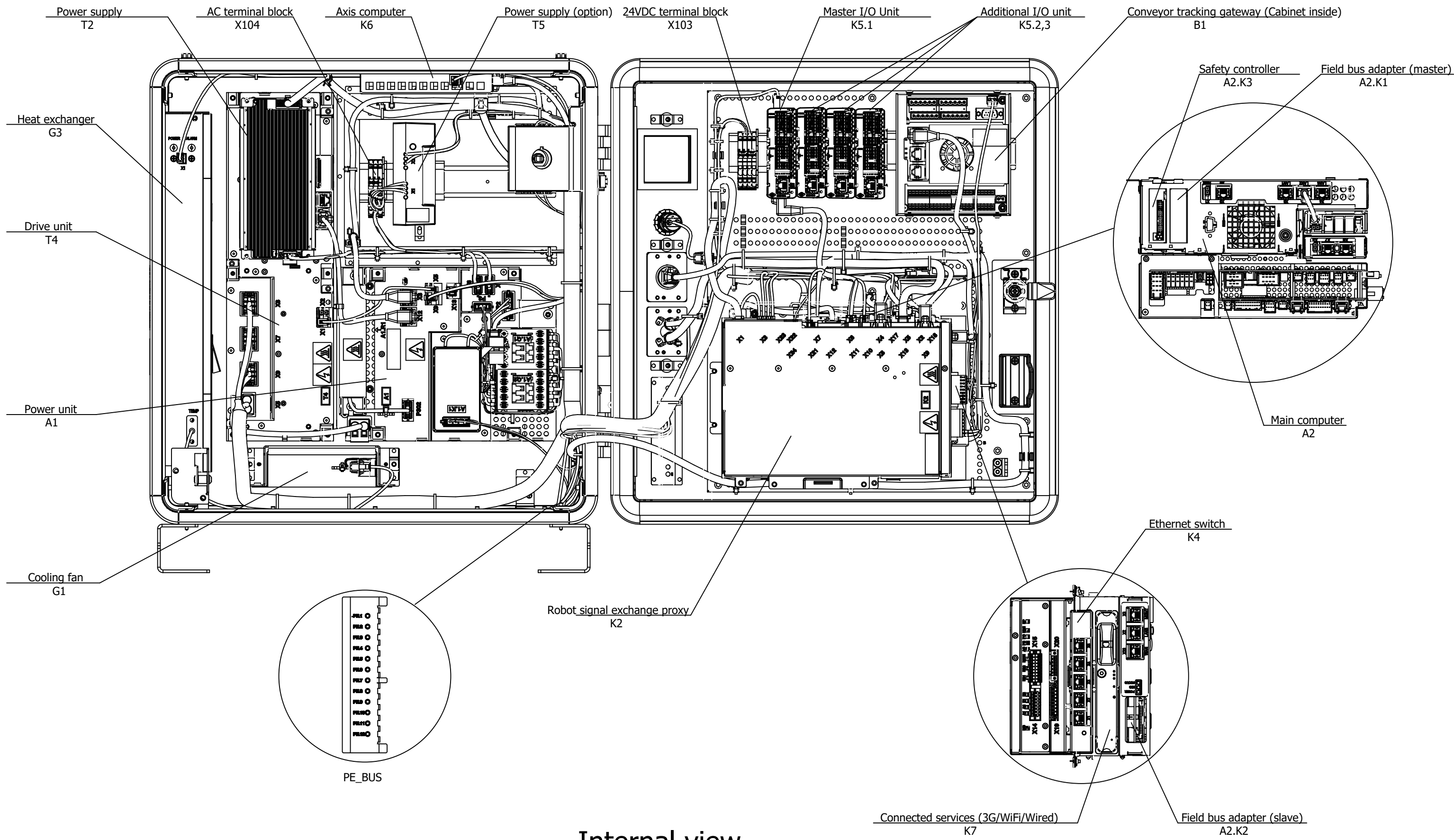
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Cabinet - U1

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## Internal view

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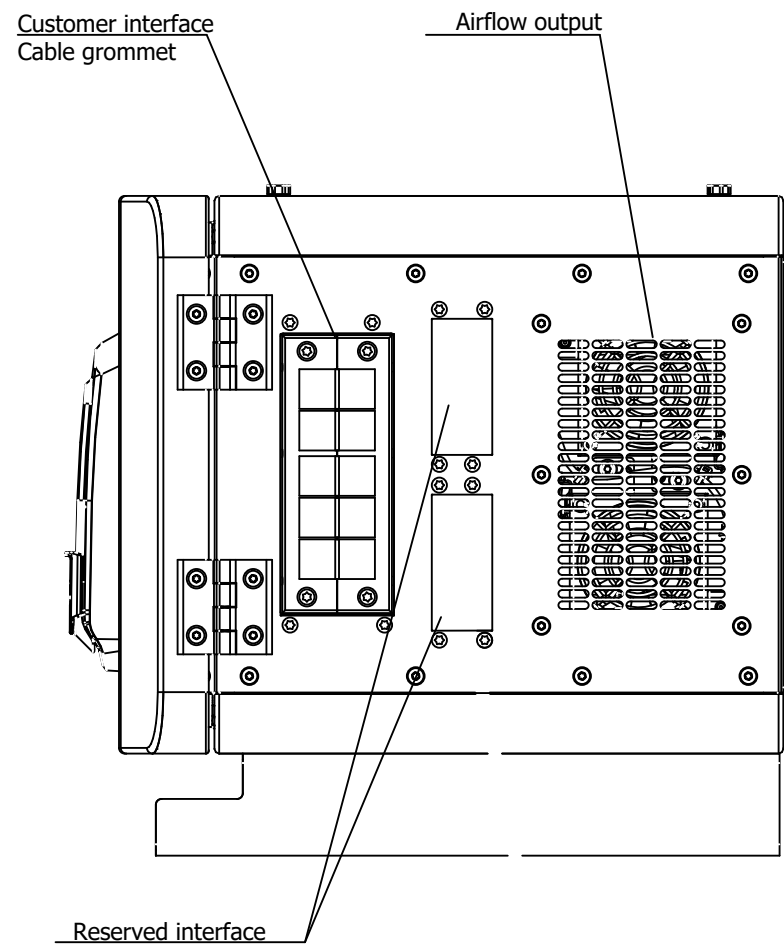
### Cabinet - U1

Status:  
Approved

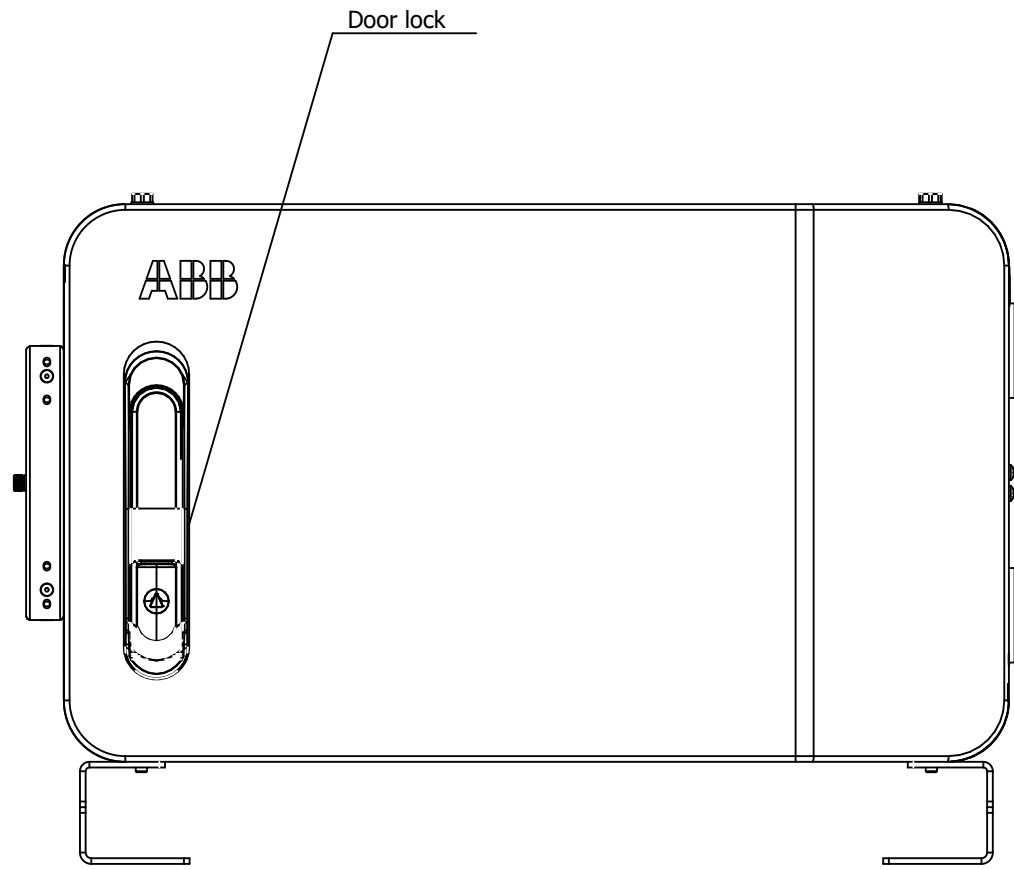
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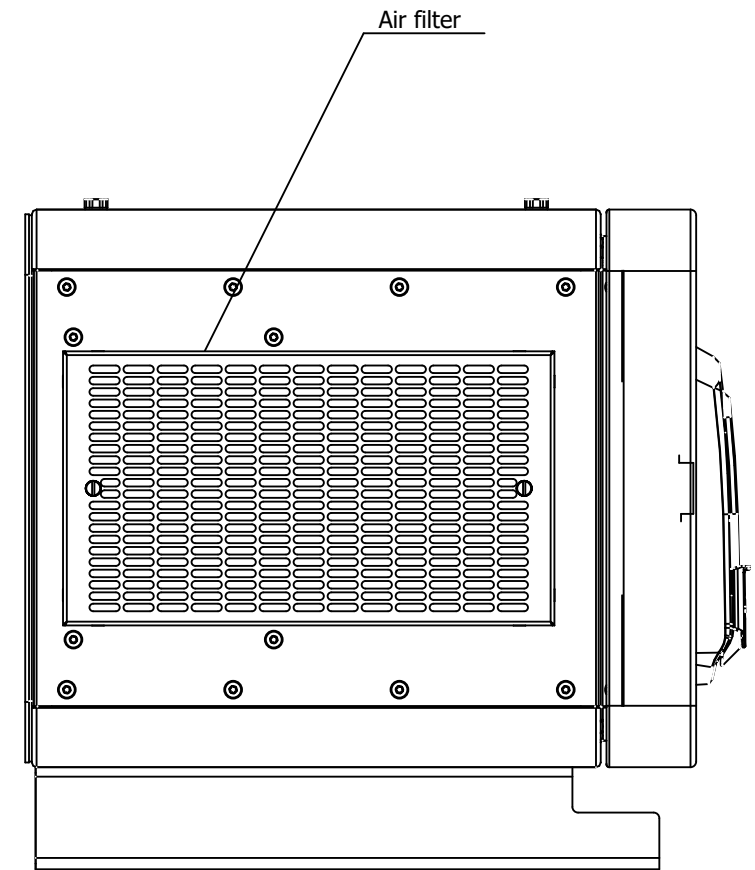
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Right View



Front view



Left View

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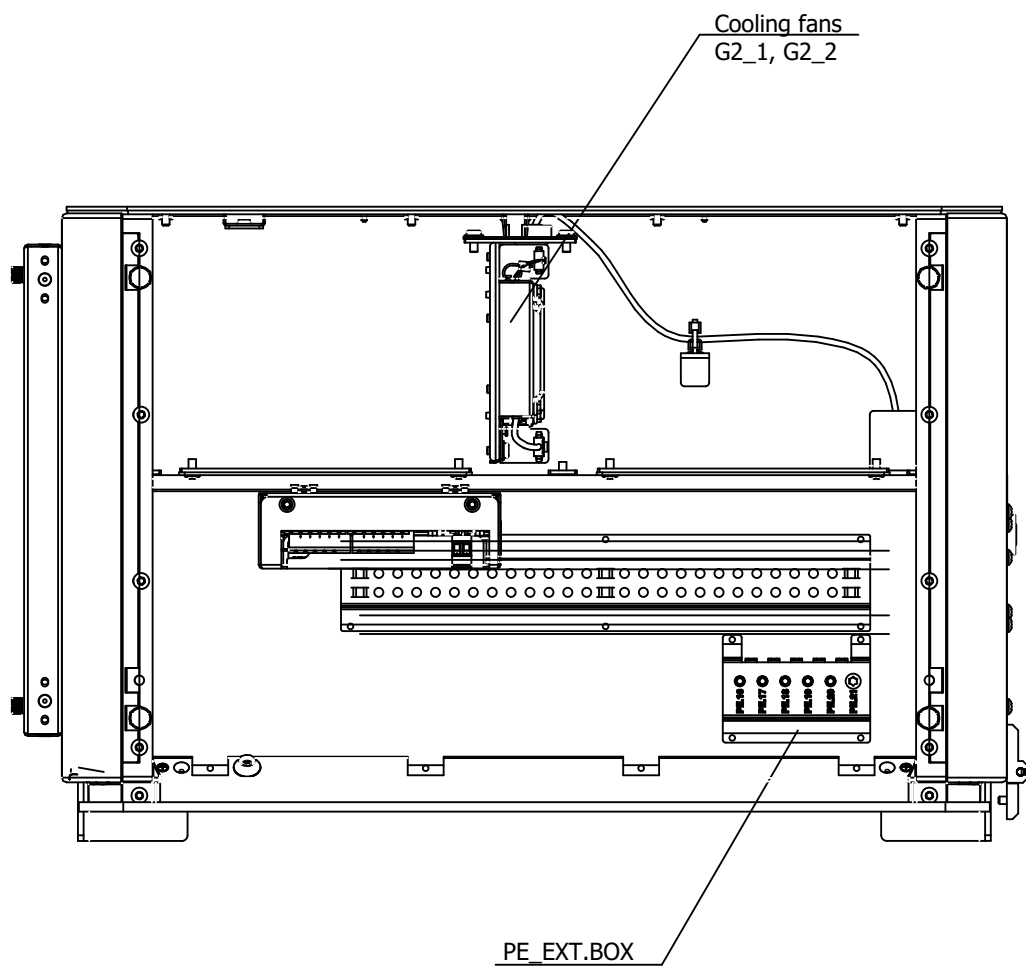
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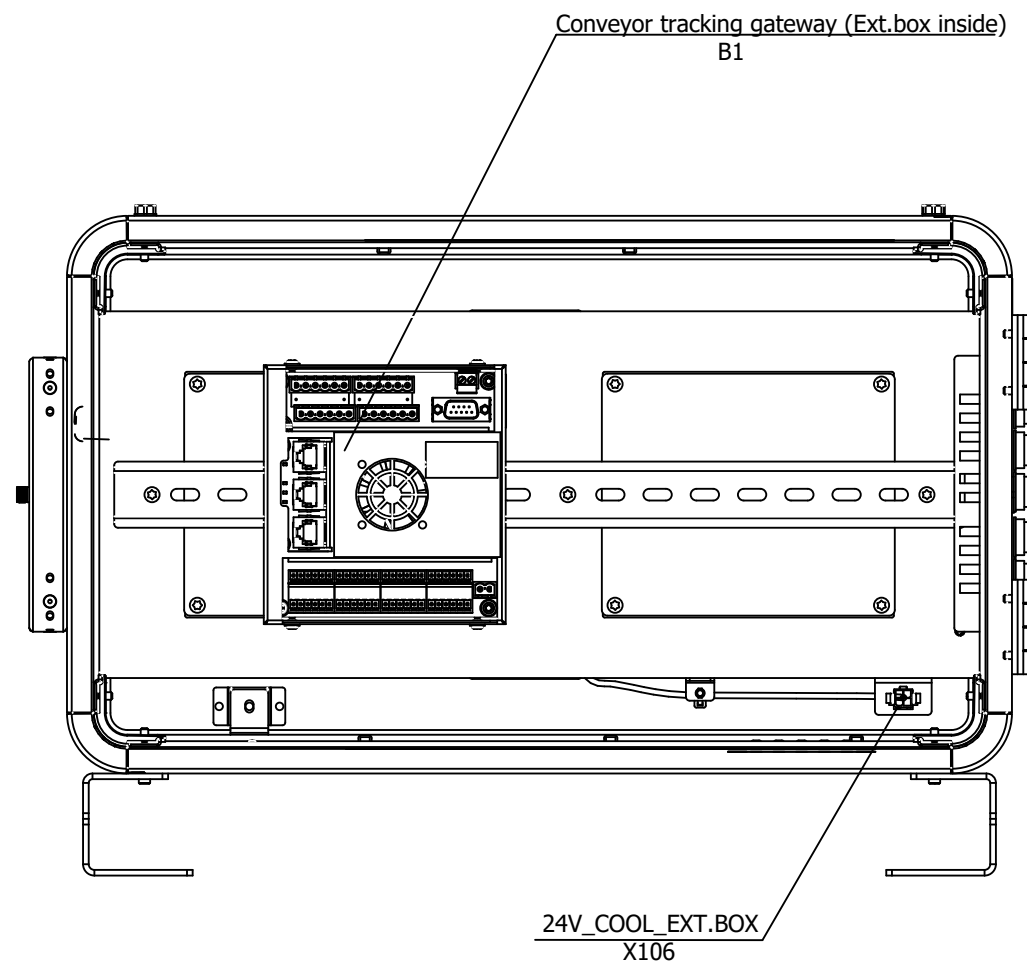
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Internal top view



Internal front view

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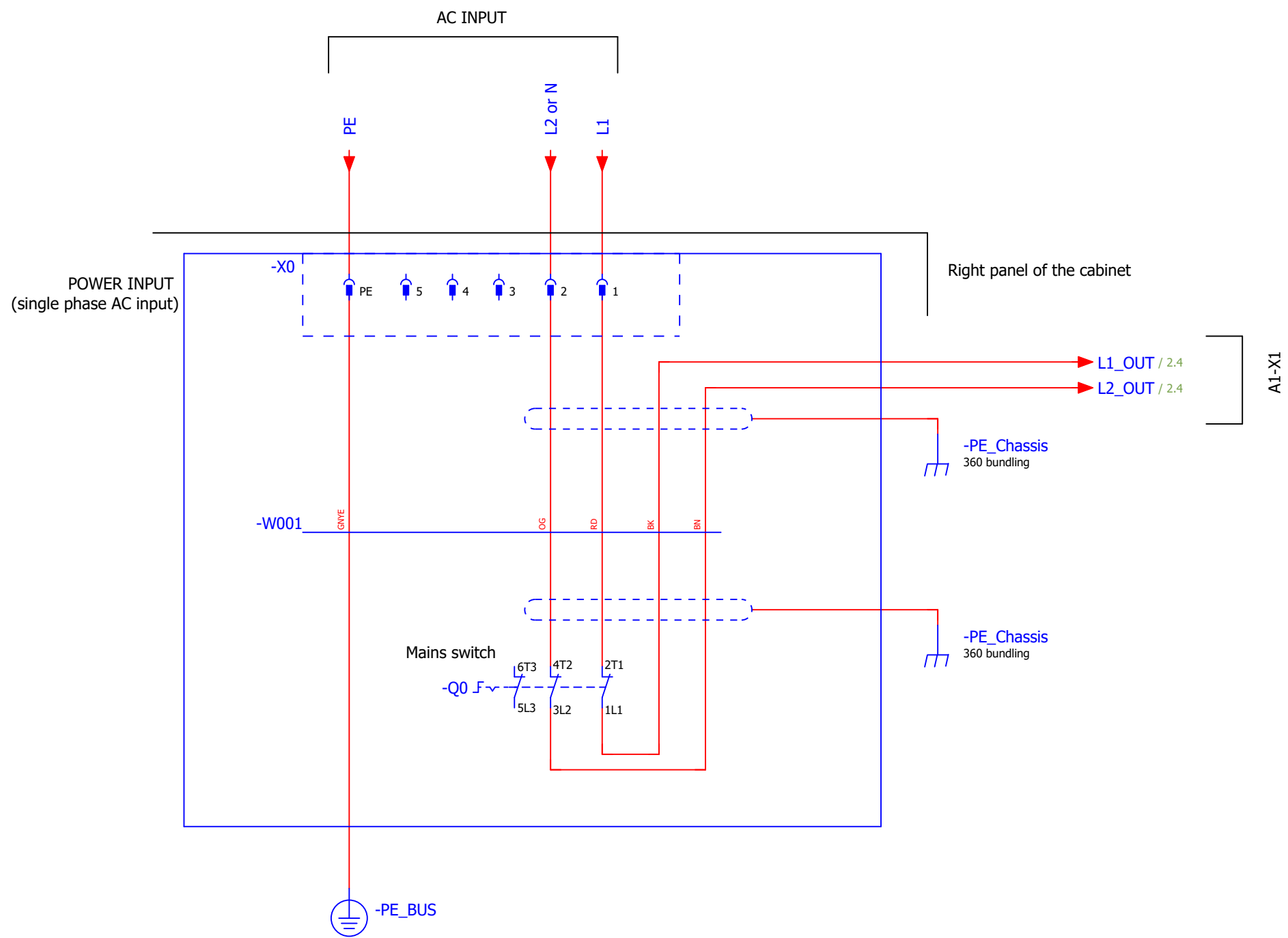
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EXT. BOX - U2

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POWER INPUT

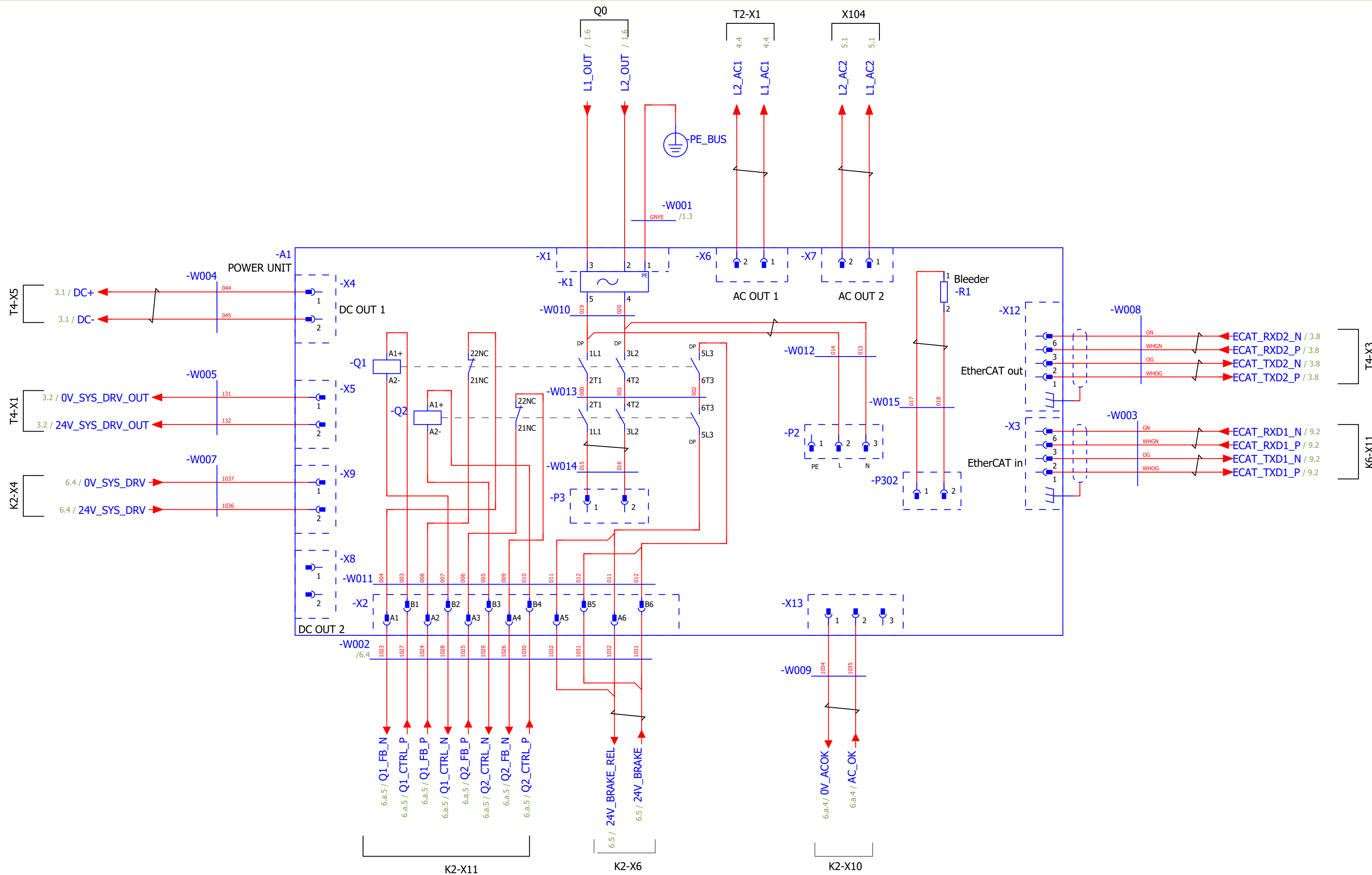
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High-level function: = SCH  
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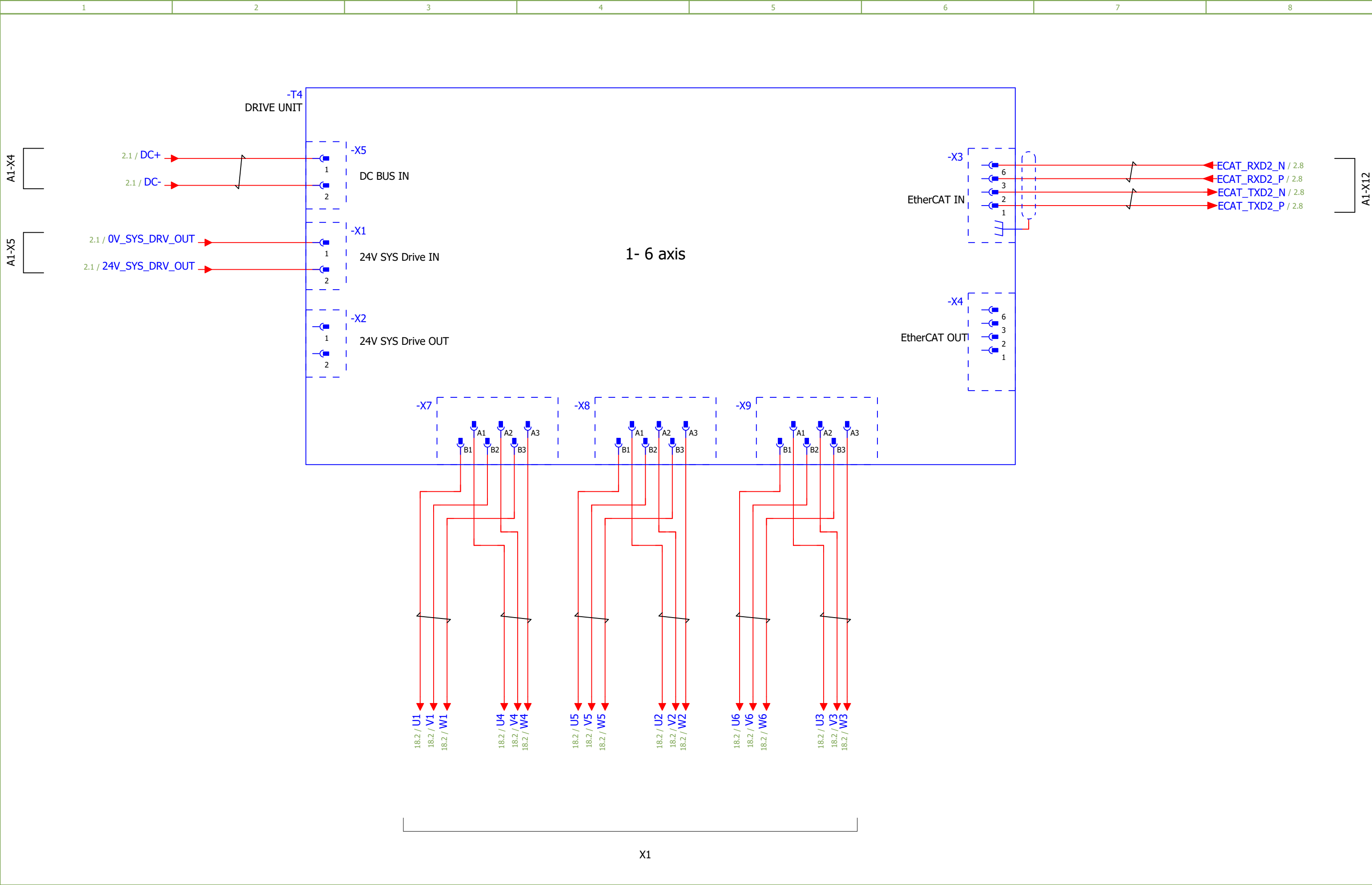
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**POWER UNIT- A1**

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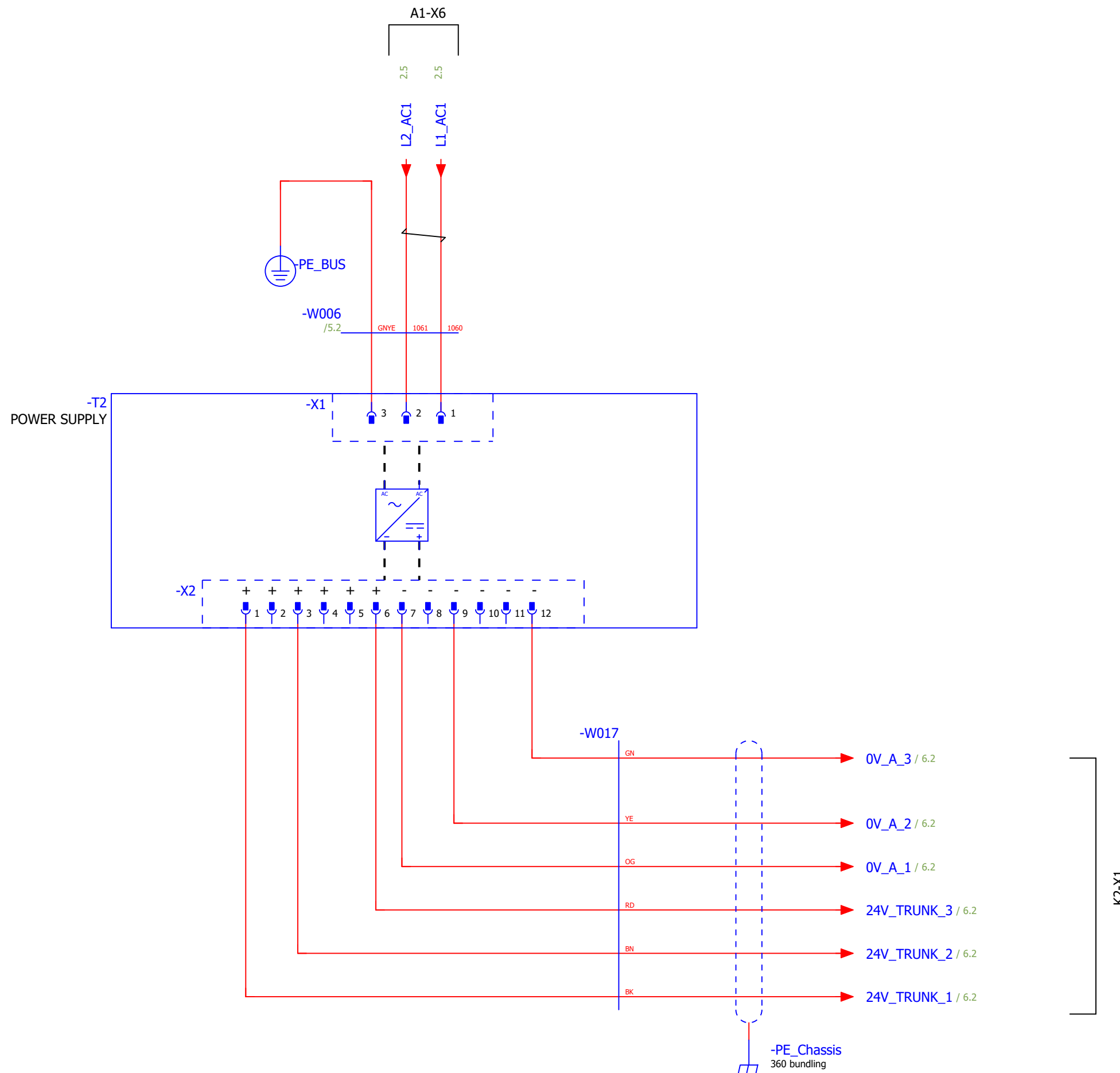
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**DRIVE UNIT- T4**

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POWER SUPPLY-T2

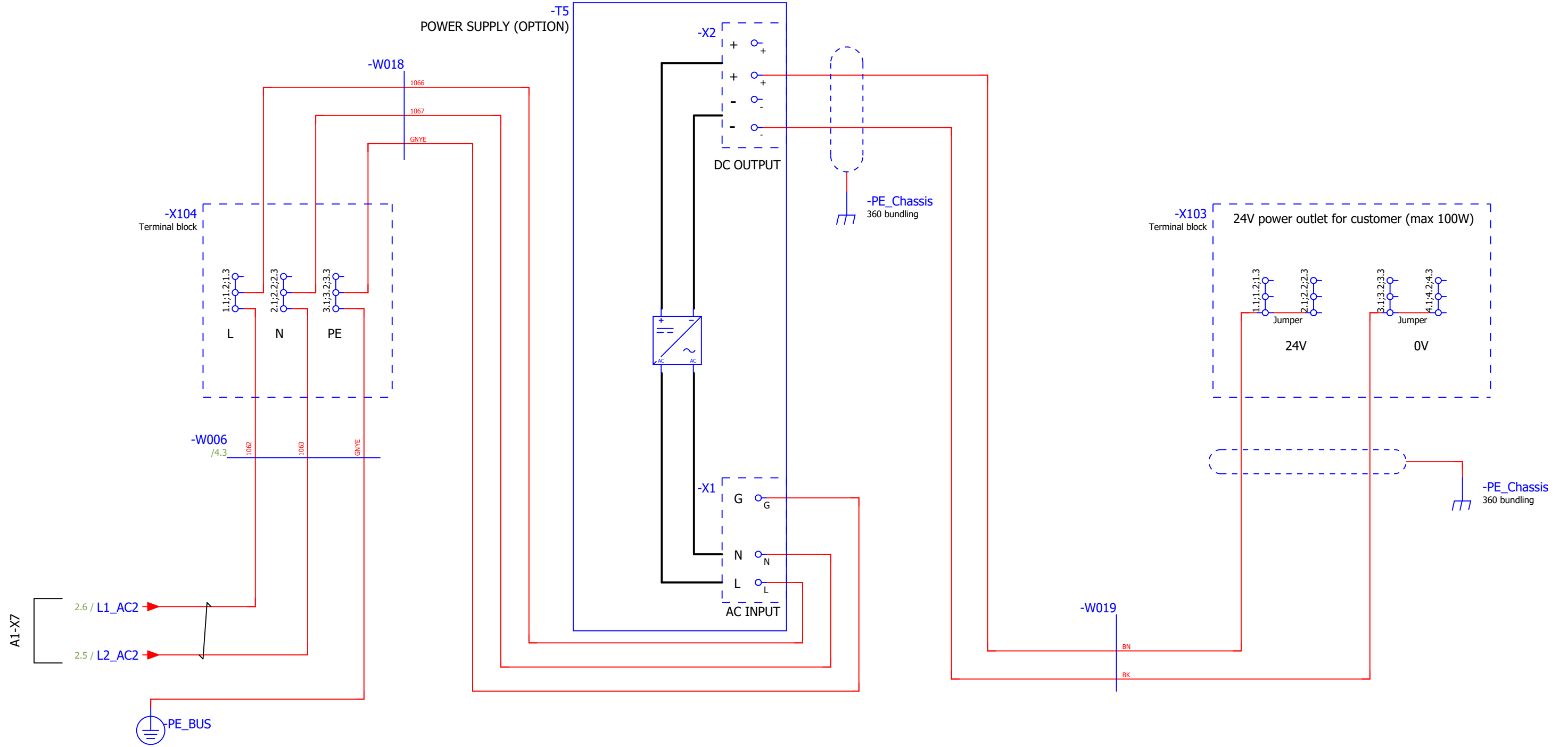
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High-level function: = SCH  
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POWER SUPPLY (OPTION)- T5

Status:  
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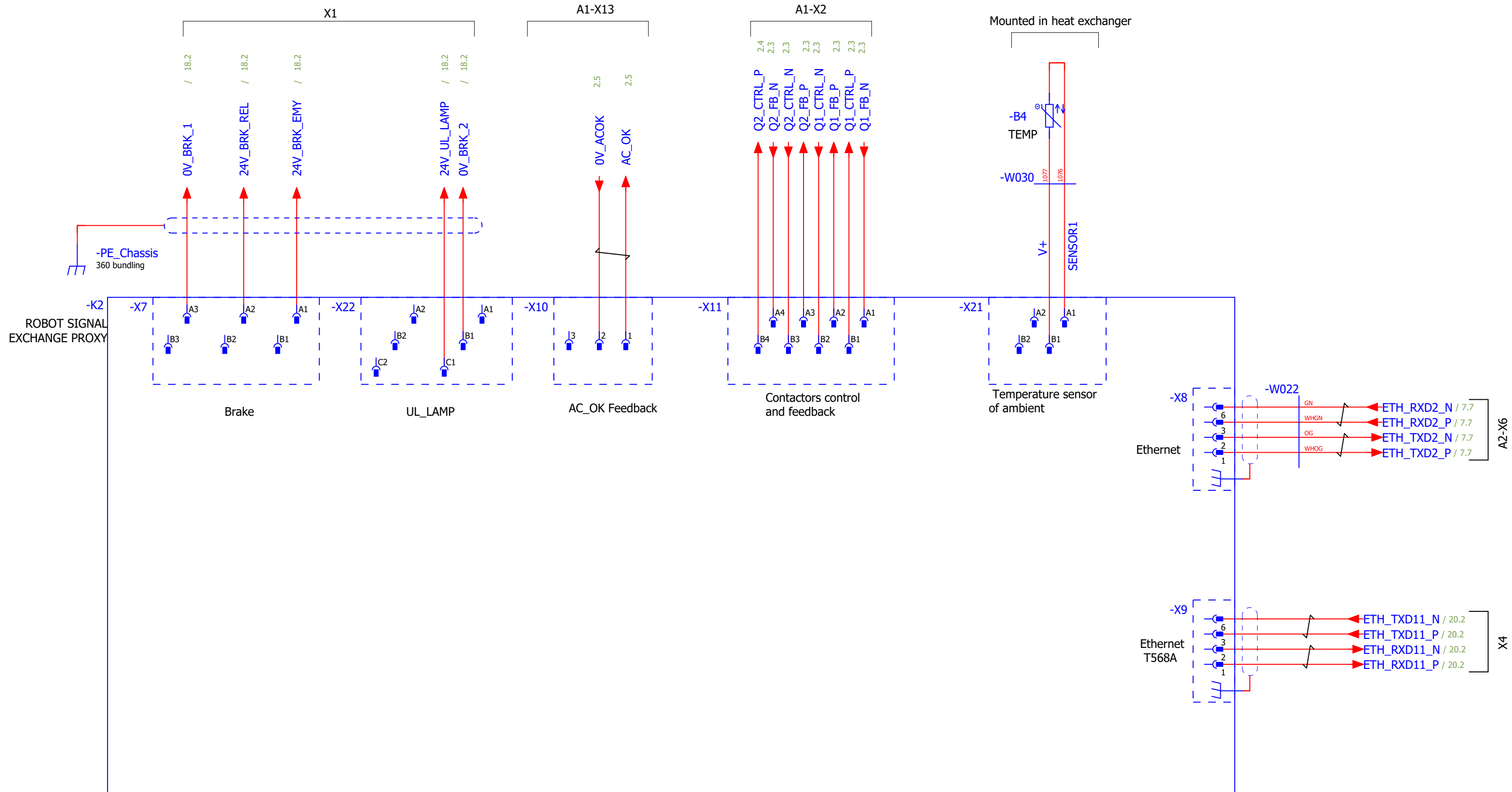
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### ROBOT SIGNAL EXCHANGE PROXY - K2

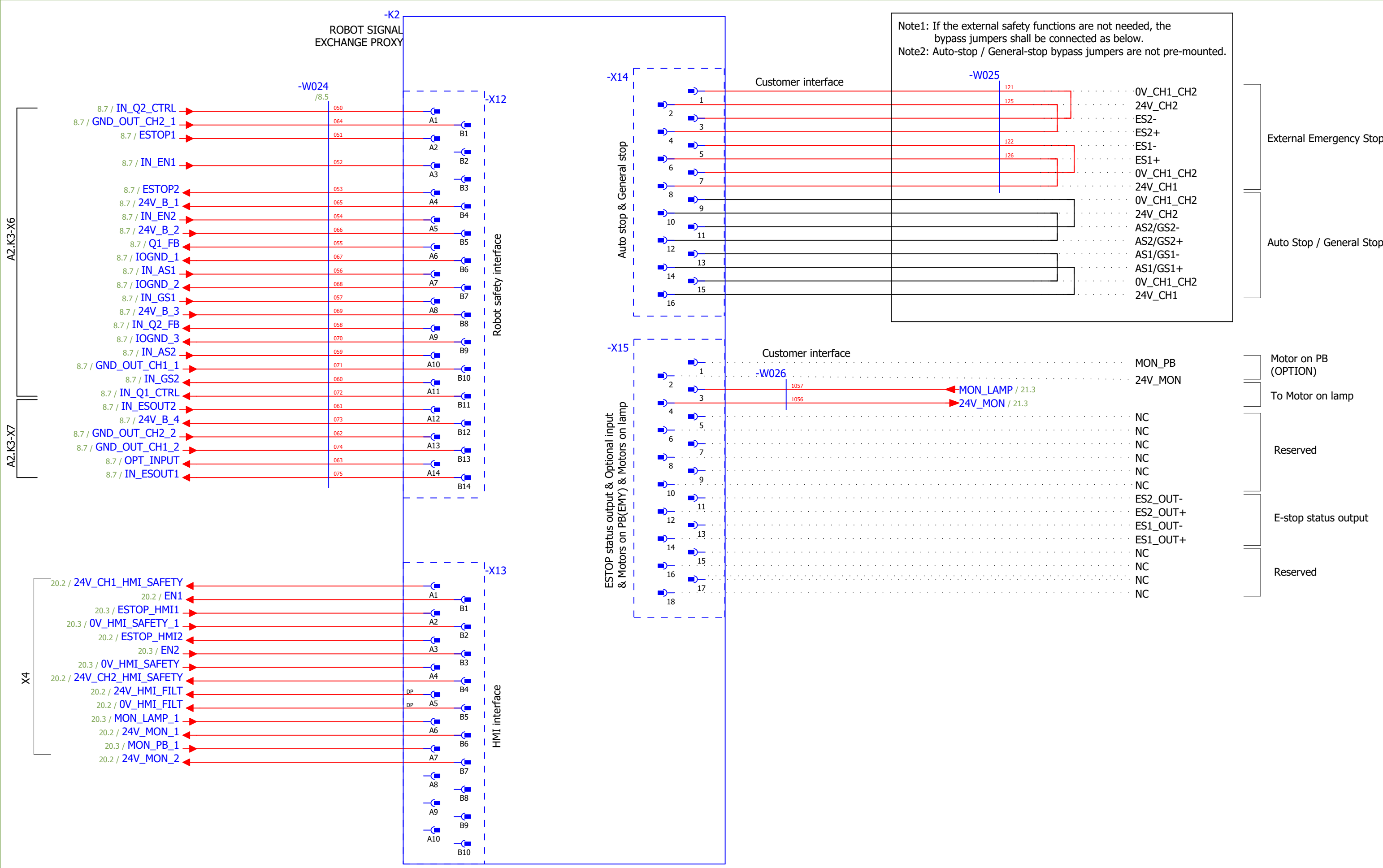
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Note1: If the external safety functions are not needed, the bypass jumpers shall be connected as below.  
 Note2: Auto-stop / General-stop bypass jumpers are not pre-mounted.

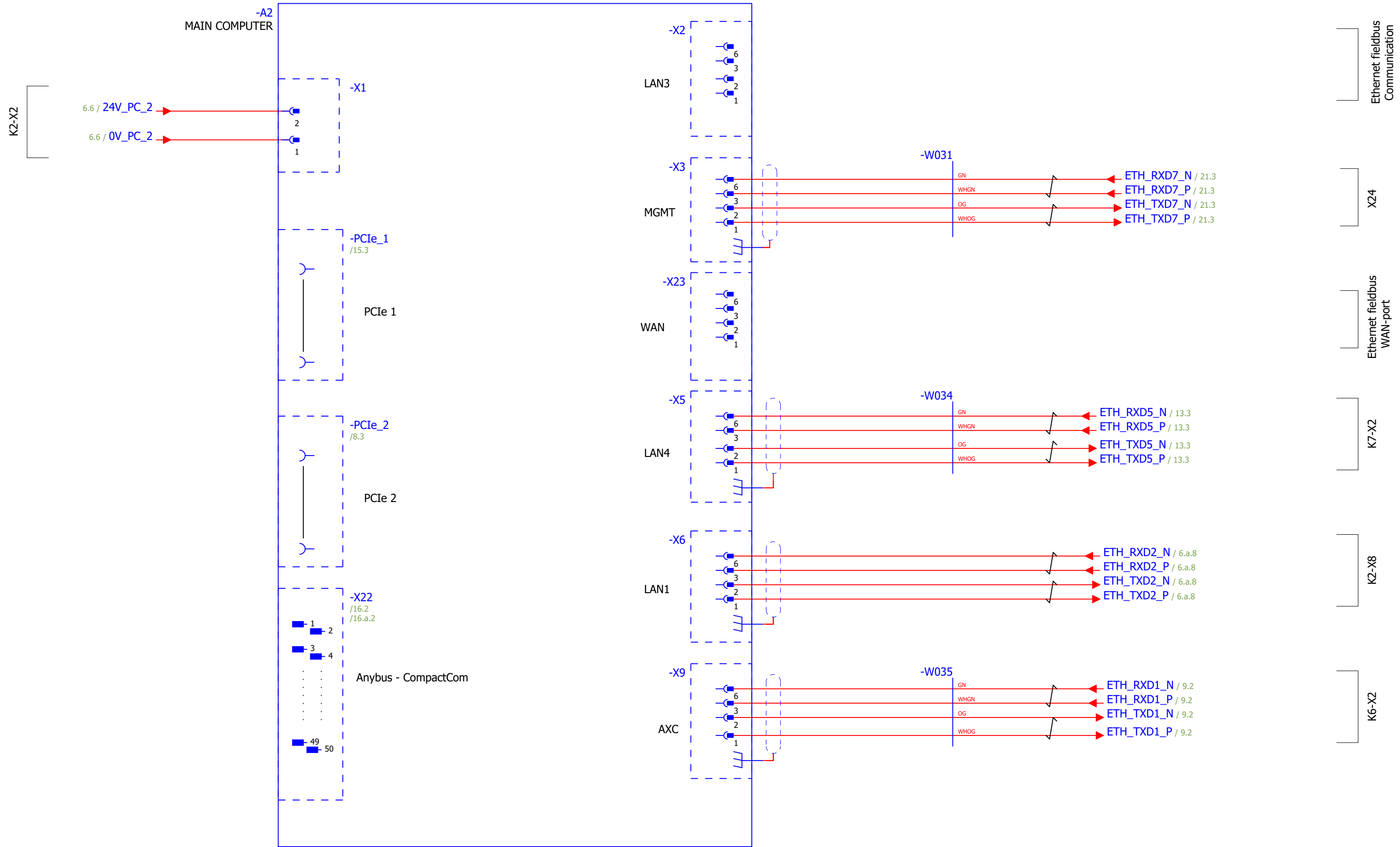
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**ROBOT SIGNAL EXCHANGE PROXY - K2**

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**MAIN COMPUTER - A2**

Status:  
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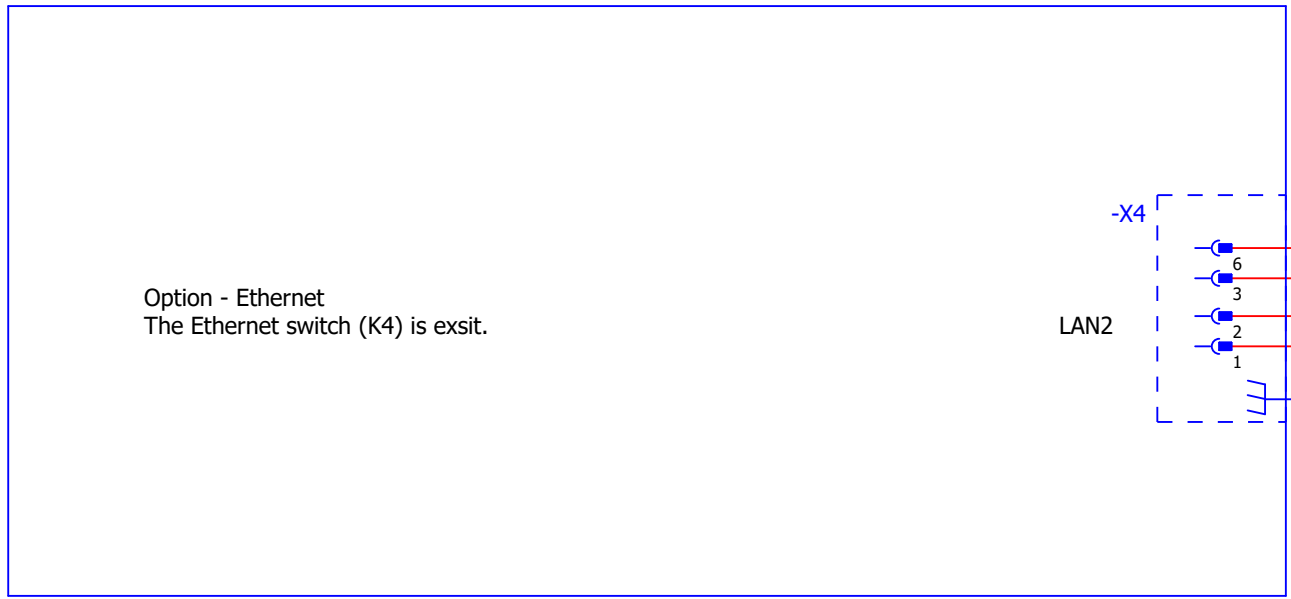
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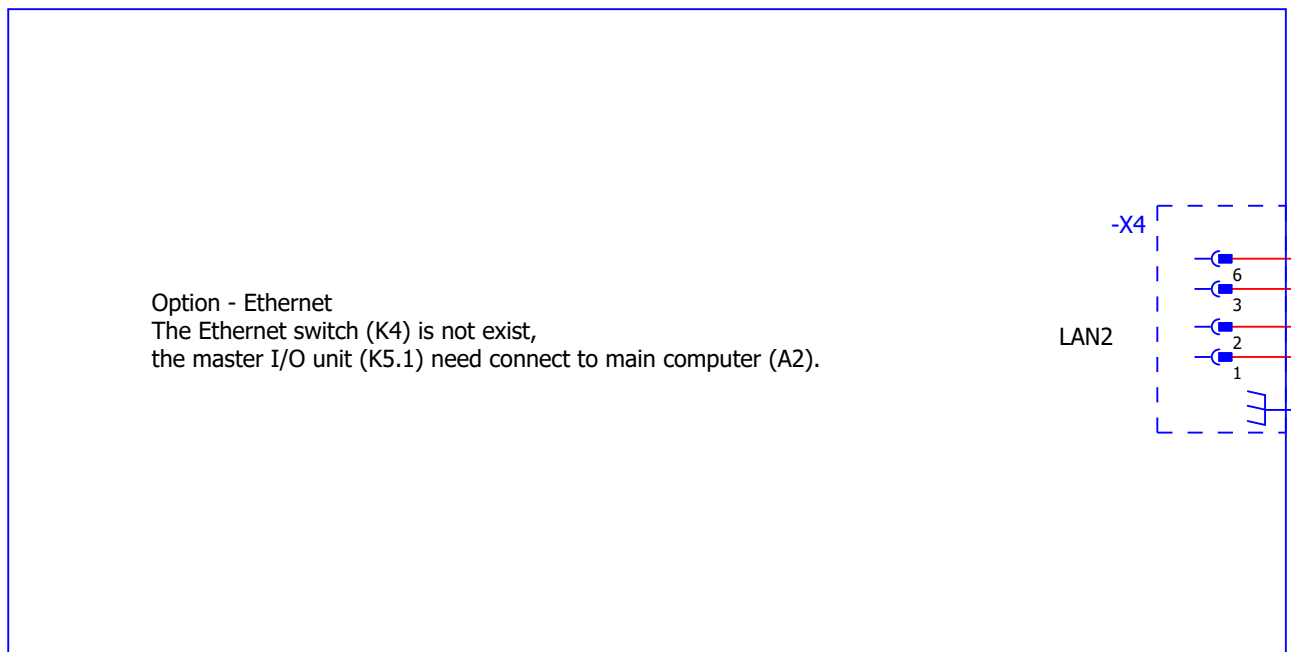
-A2  
MAIN COMPUTER



Option - Ethernet  
The Ethernet switch (K4) is exist.

K4-X6

-A2  
MAIN COMPUTER



Option - Ethernet  
The Ethernet switch (K4) is not exist,  
the master I/O unit (K5.1) need connect to main computer (A2).

K5.1-X5

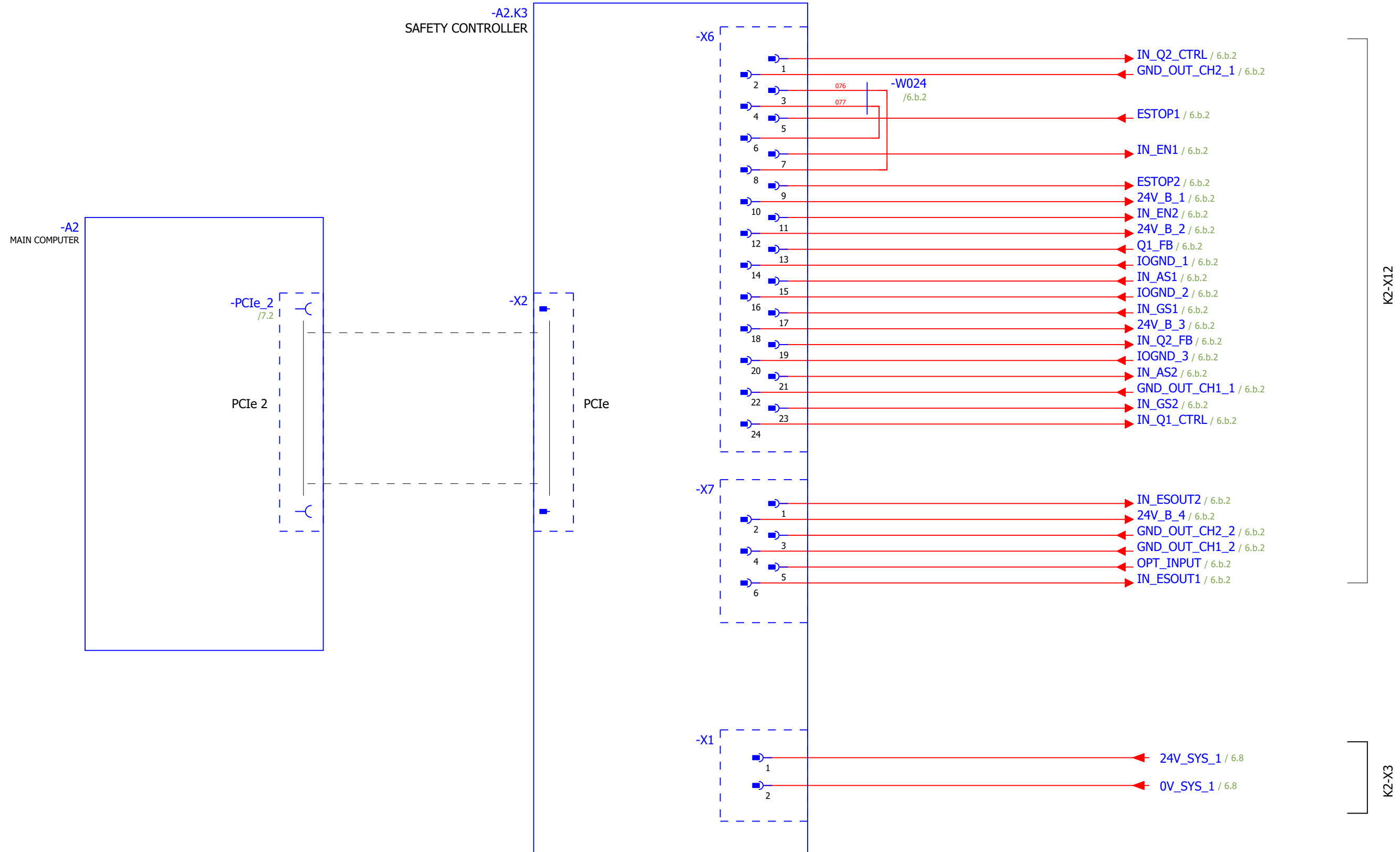
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**MAIN COMPUTER - A2**

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**SAFETY CONTROLLER- A2.K3**

Status:  
Approved

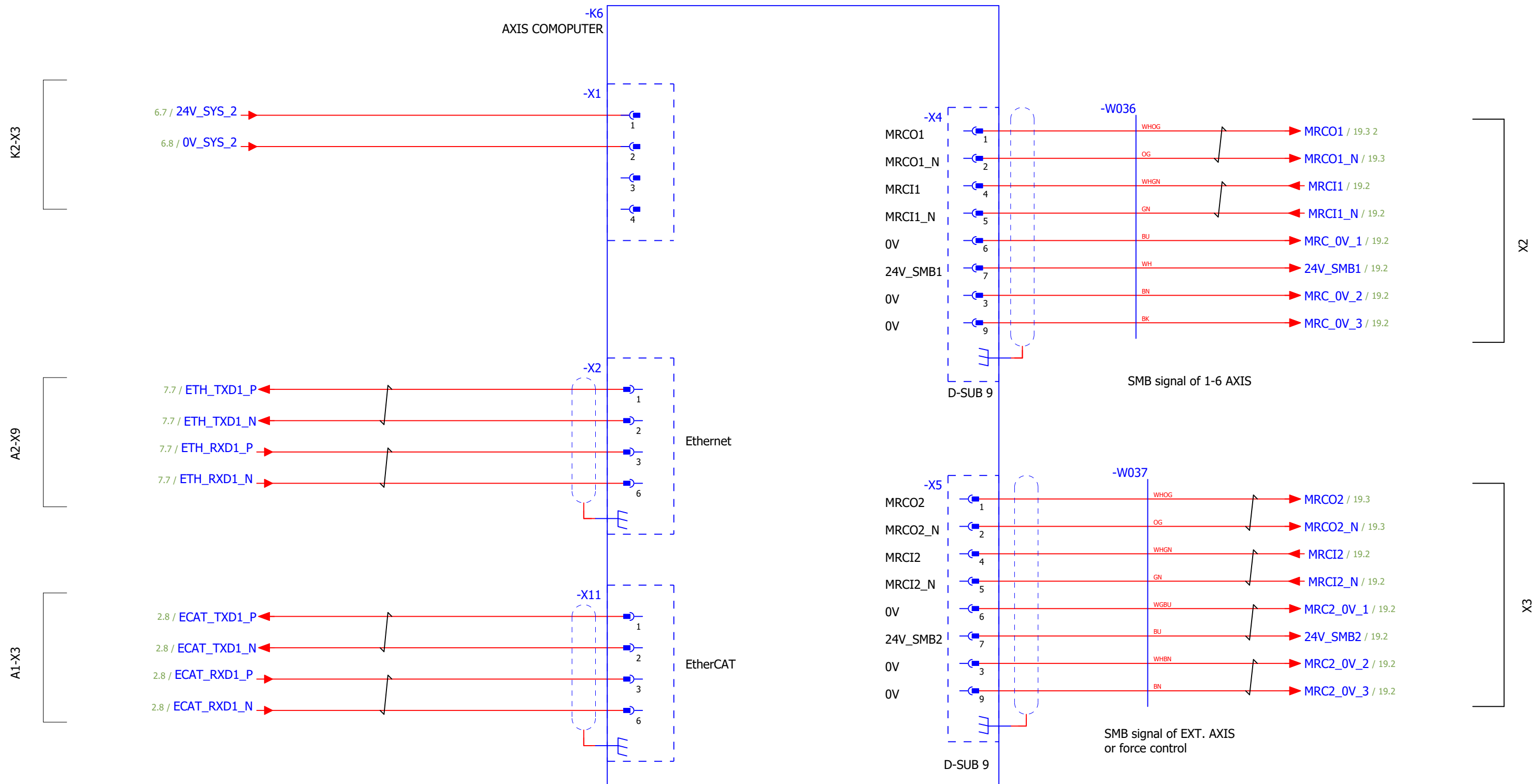
High-level function: = SCH  
Mounting location: + U1

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**AXIS COMPUTER - K6**

Status:  
Approved

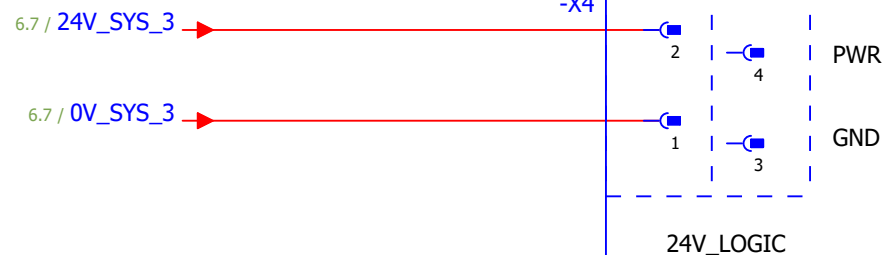
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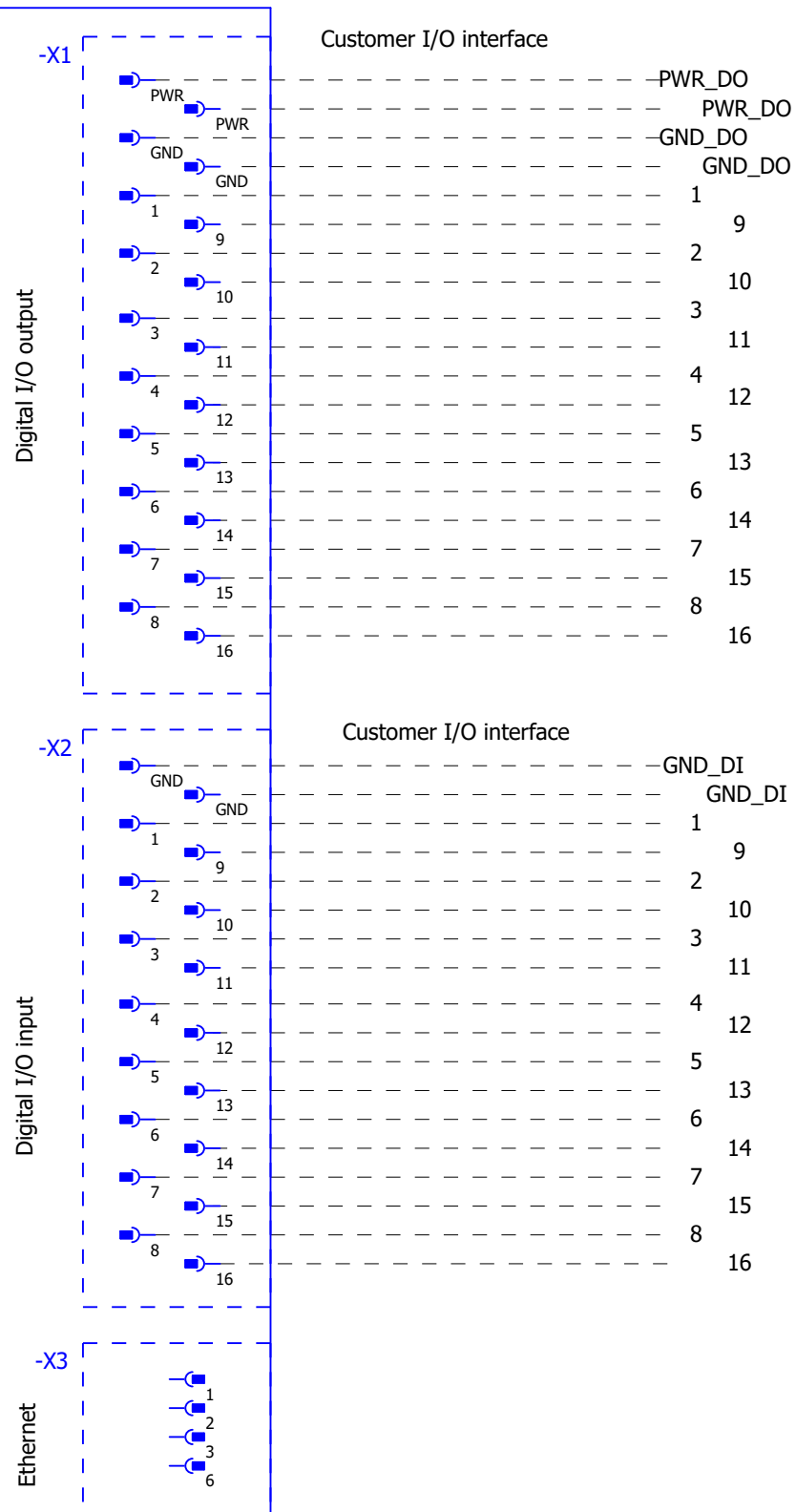
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K2-X3



-K5.1  
MASTER I/O UNIT

24V\_LOGIC



24V\_PROCESS  
CUSTOMER DO  
OUTPUT CH1~16

CUSTOMER DI  
INPUT CH1~16

Latest revision:  
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MASTER I/O UNIT - K5.1

Status:  
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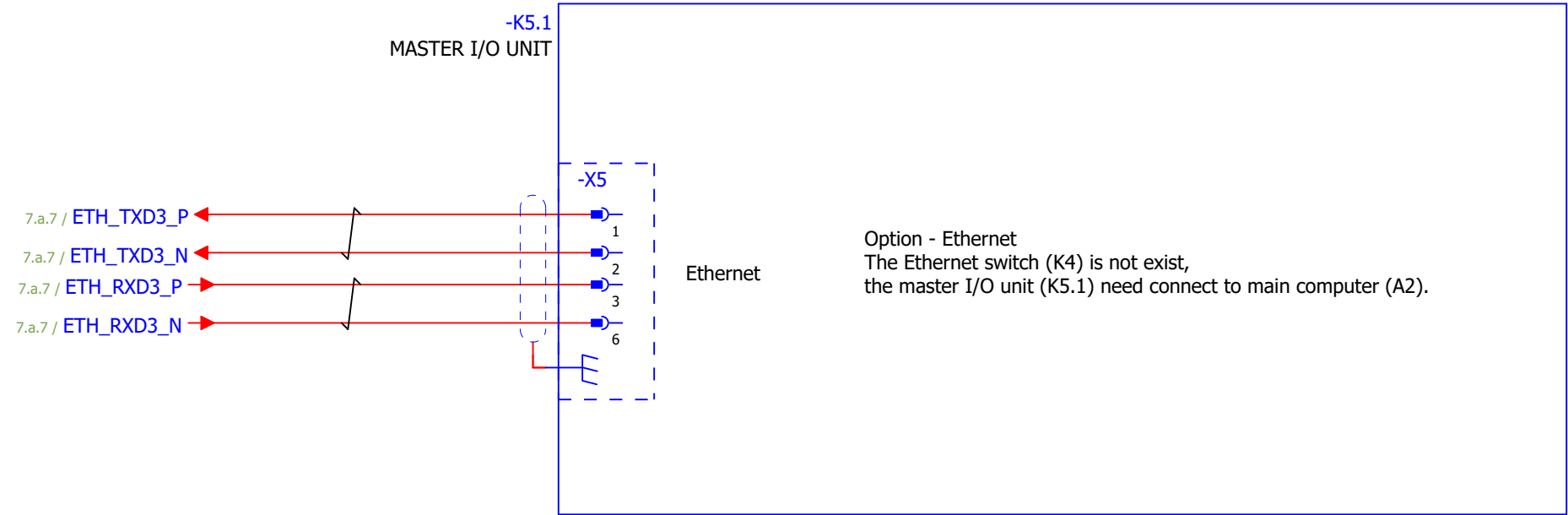
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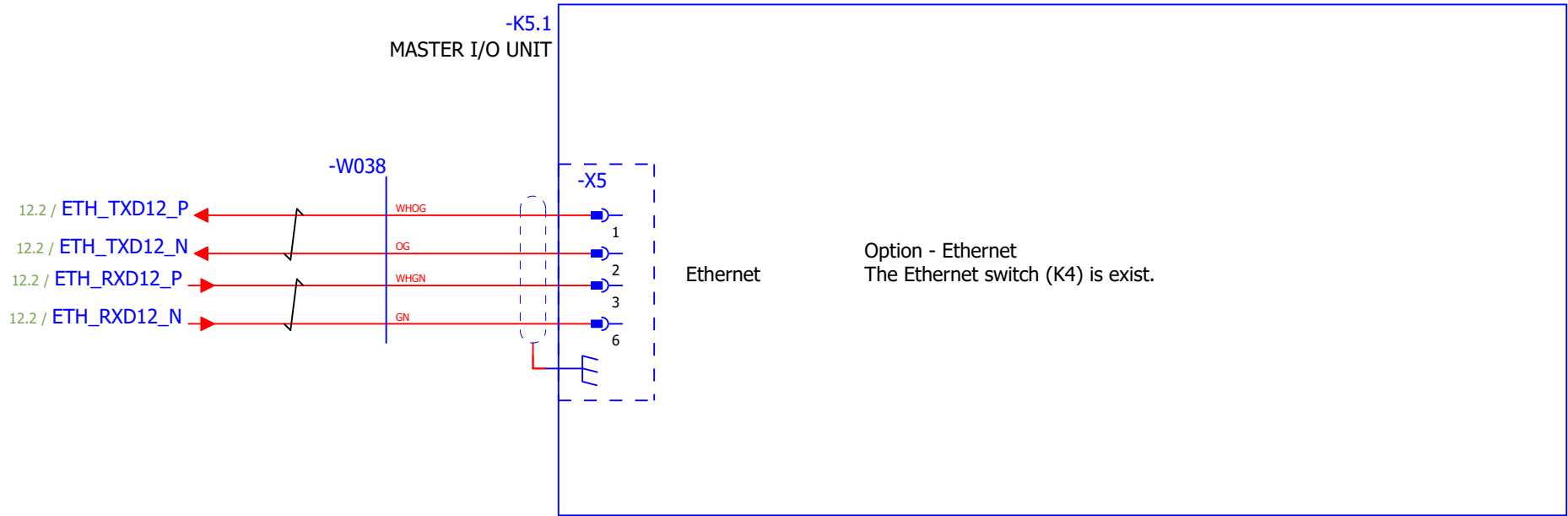
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A2-X4



K4-X7



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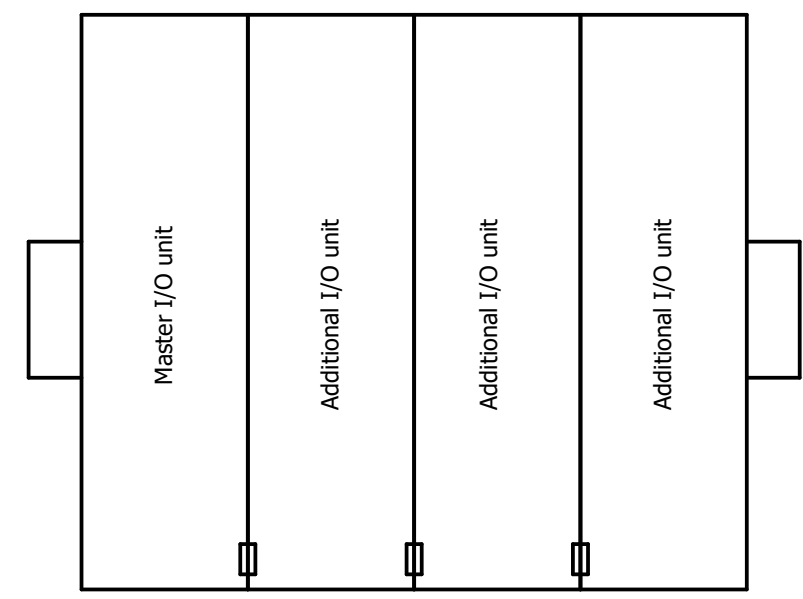
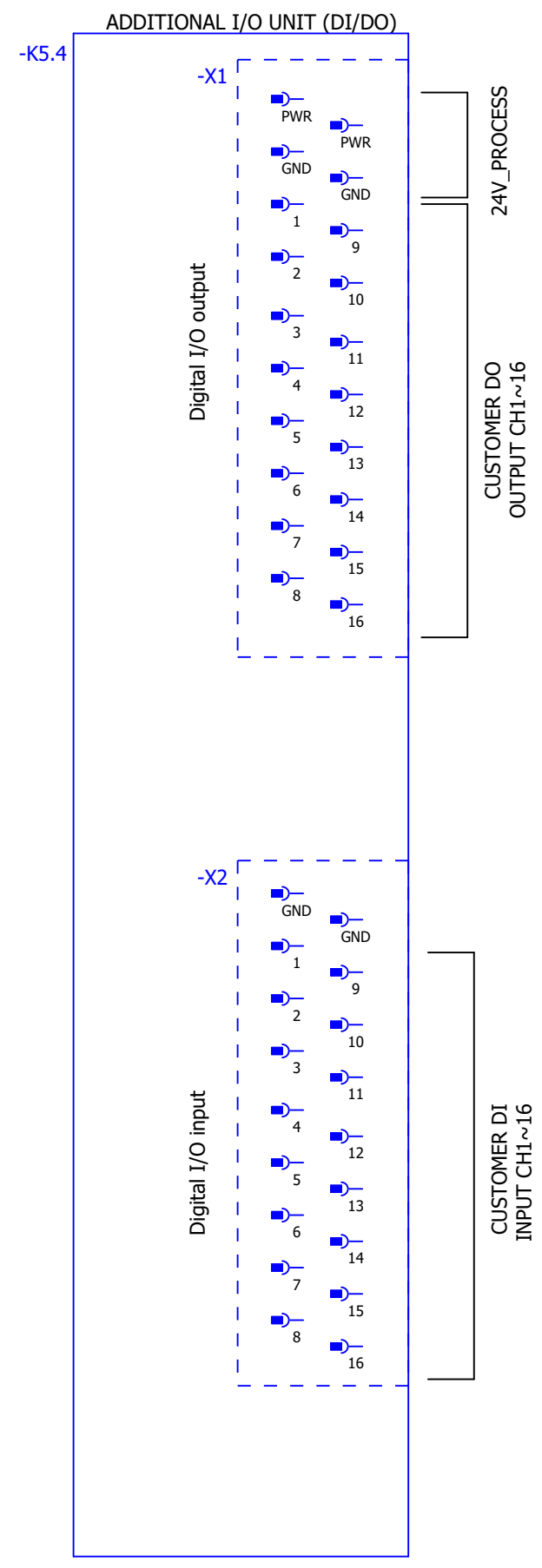
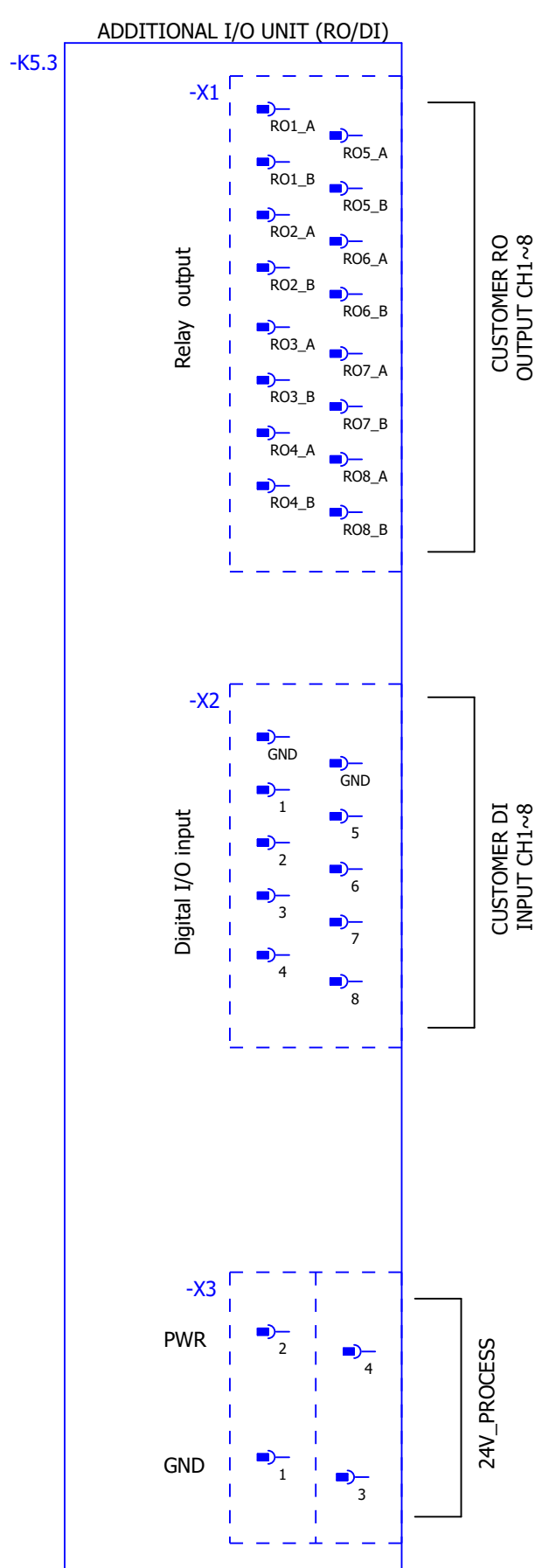
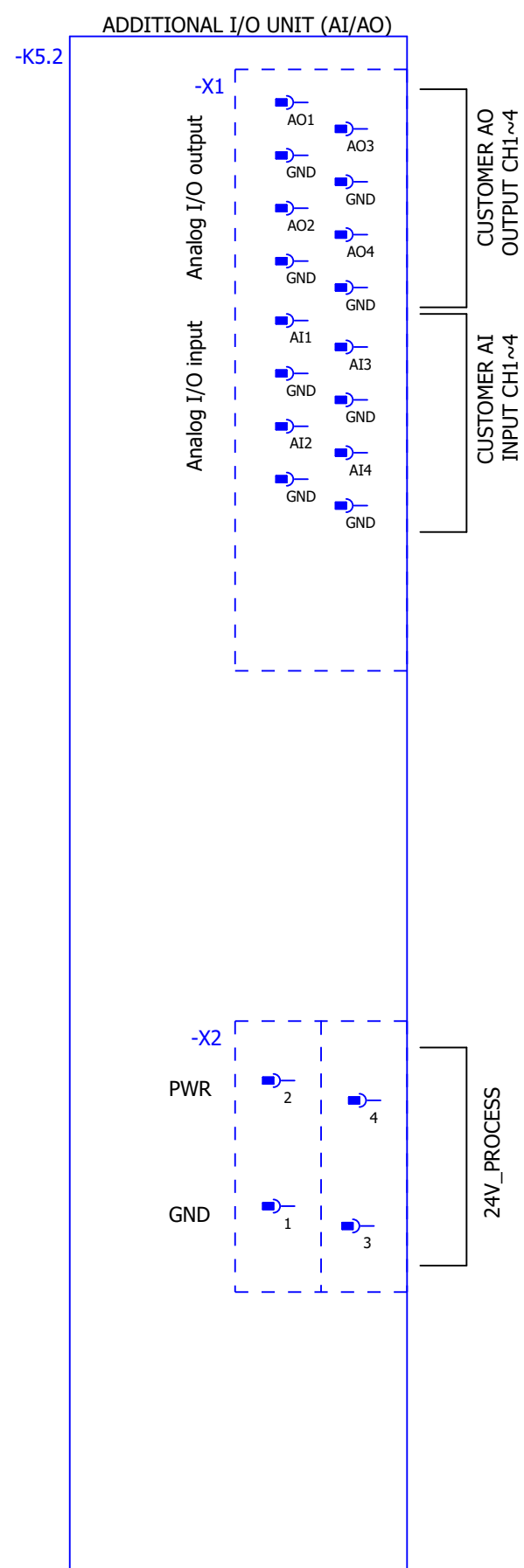
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**MASTER I/O UNIT - K5.1**

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Master I/O unit must install at the left.

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**ADDITIONAL I/O UNIT - K5.2,3,4**

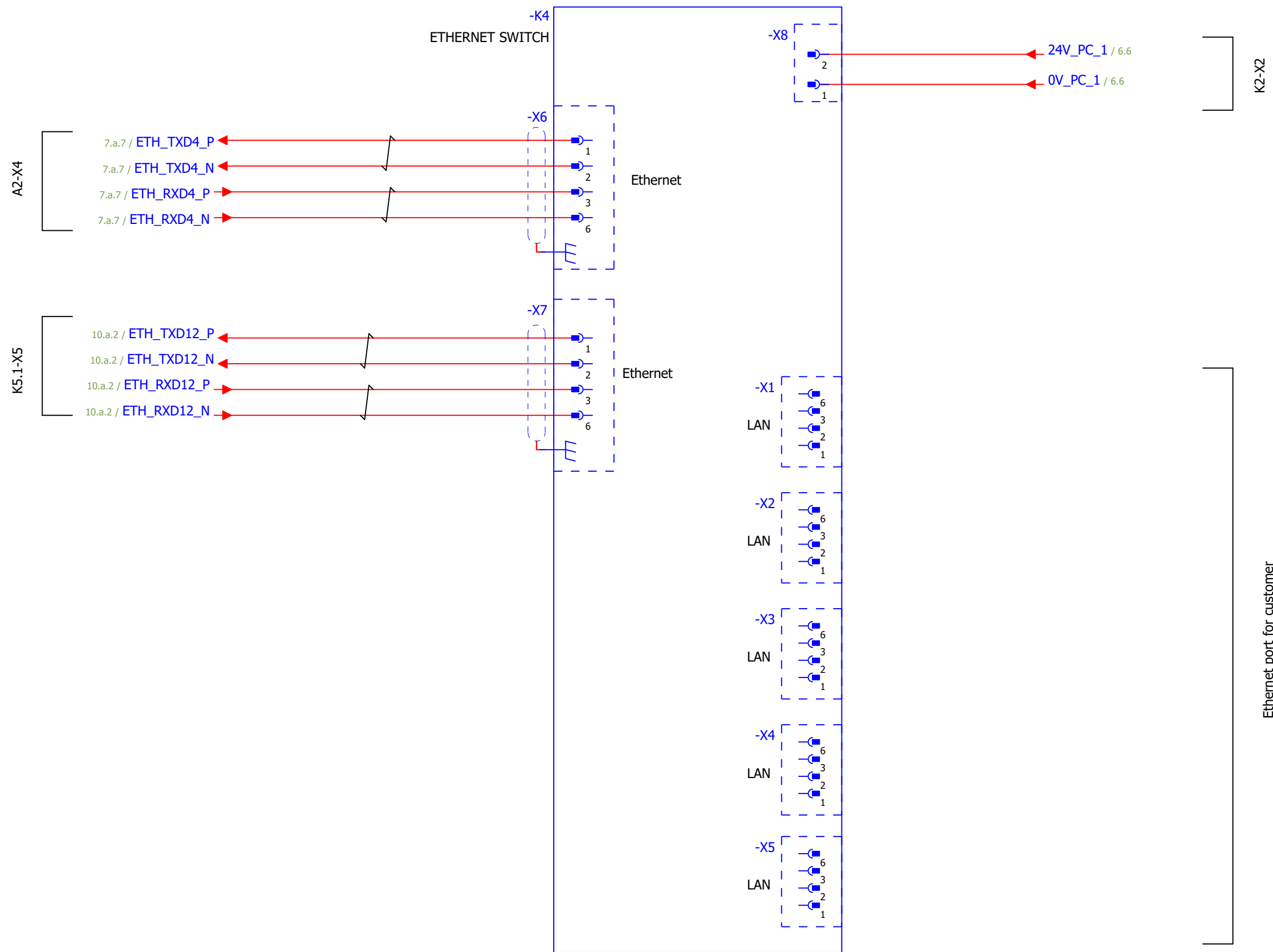
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### ETHERNET SWITCH - K4

Status:  
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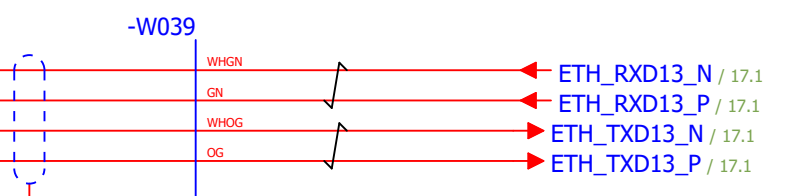
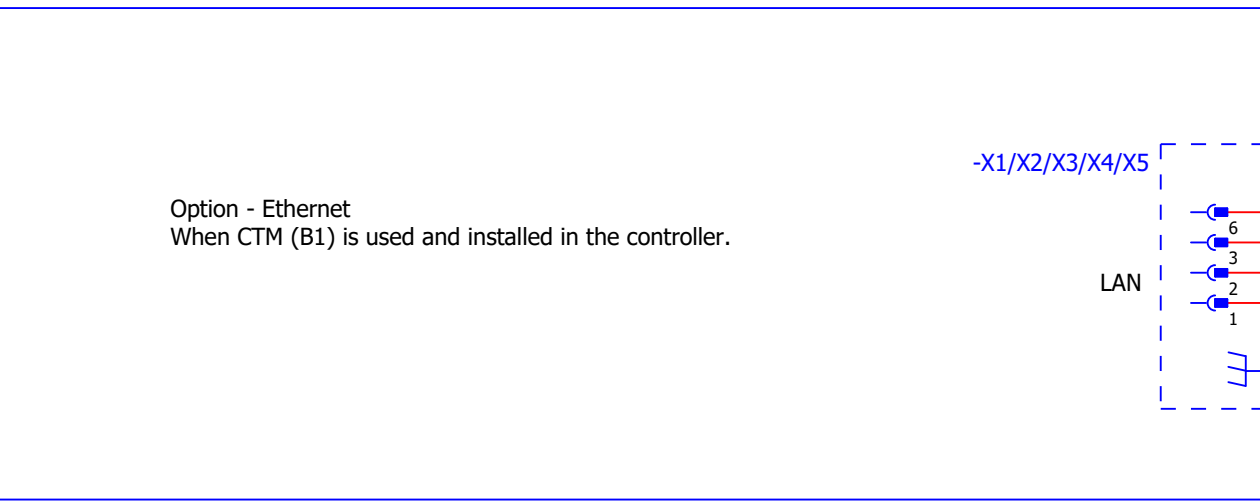
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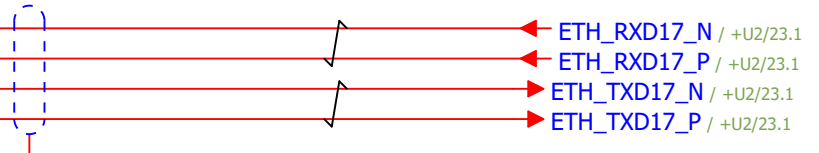
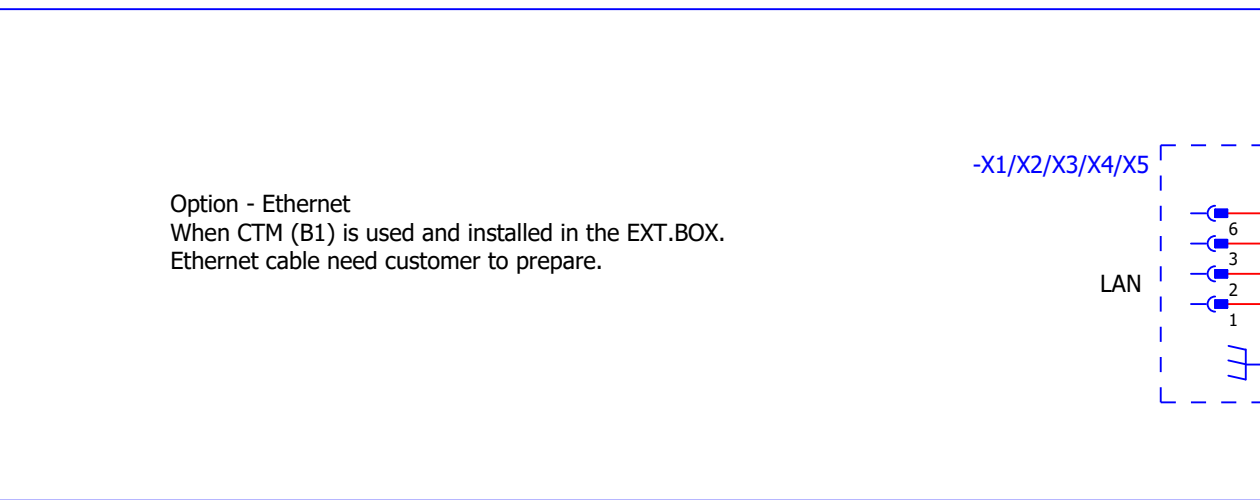
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-K4  
ETHERNET SWITCH



B1-X7

-K4  
ETHERNET SWITCH



B1-X7 in EXT.BOX

Customer Ethernet interface

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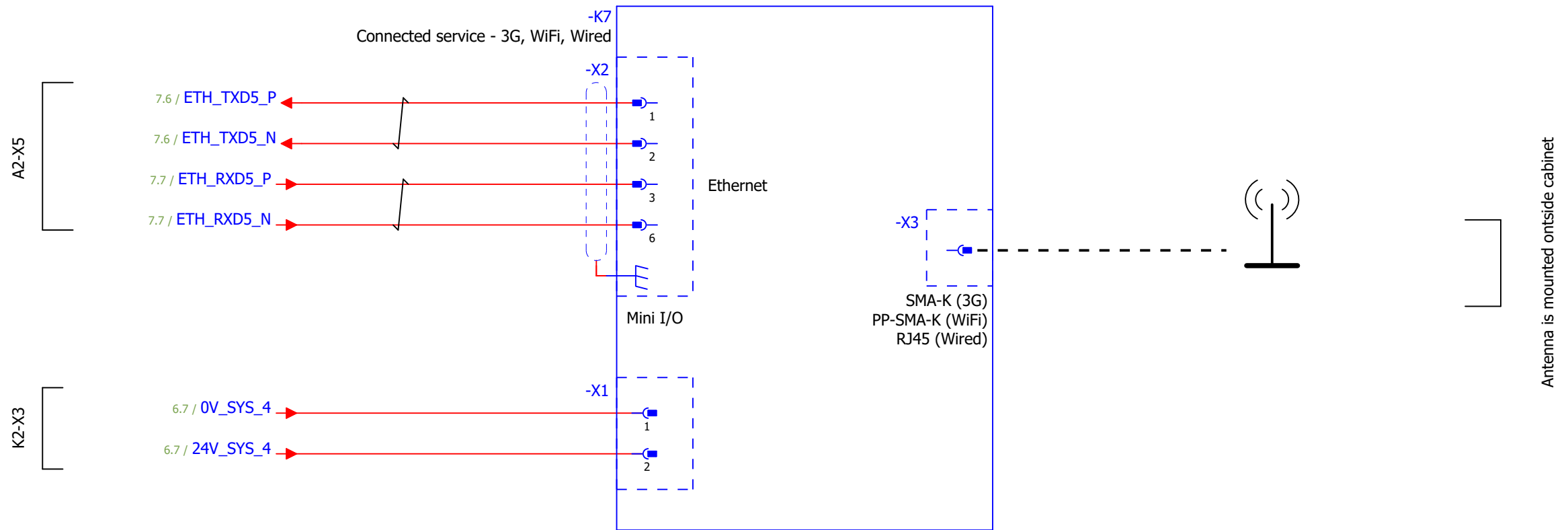
**ETHERNET SWITCH - K4**

Status:  
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CONNECTED SERVICES - 3G, WiFi, Wired- K7

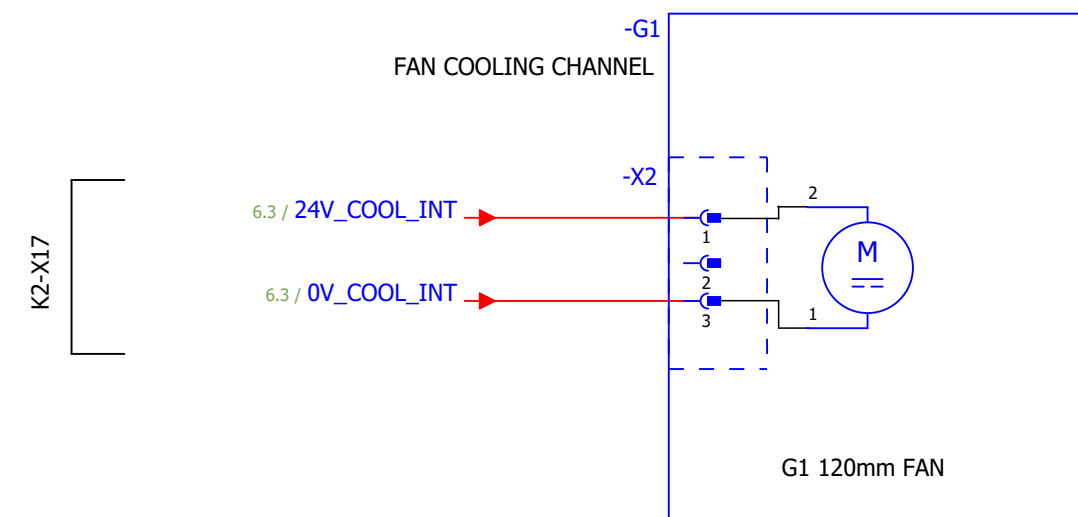
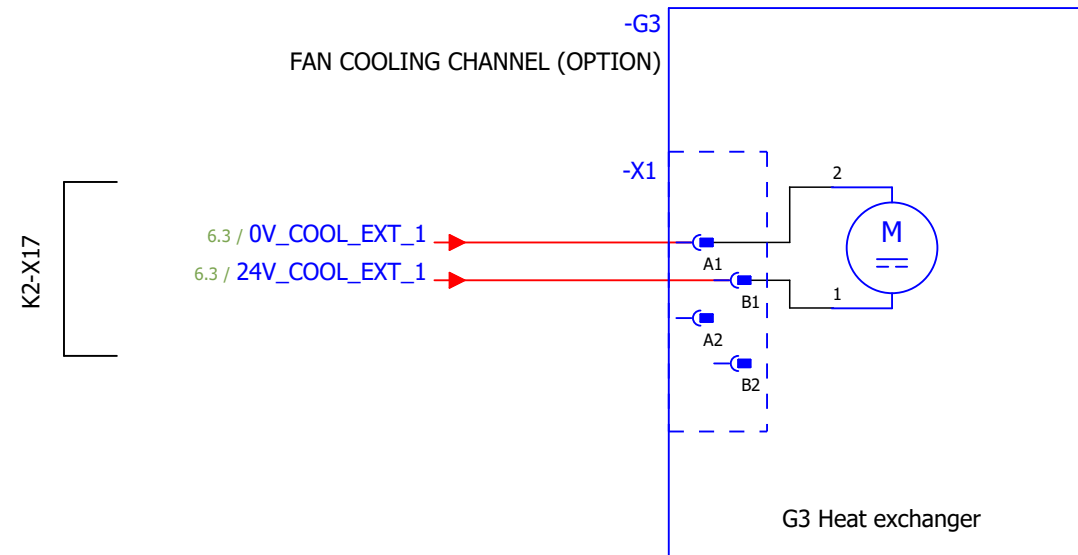
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### FAN COOLING CHANNEL - G1,3

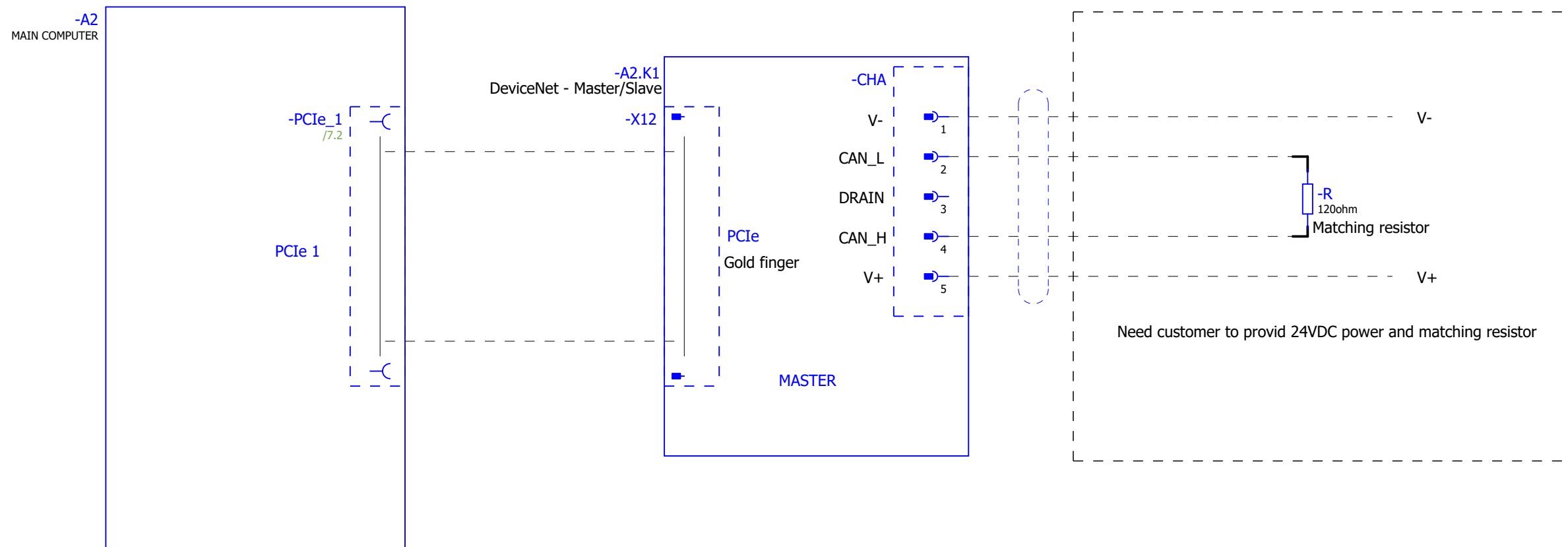
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FIELD BUS ADAPTER MASTER - A2.K1

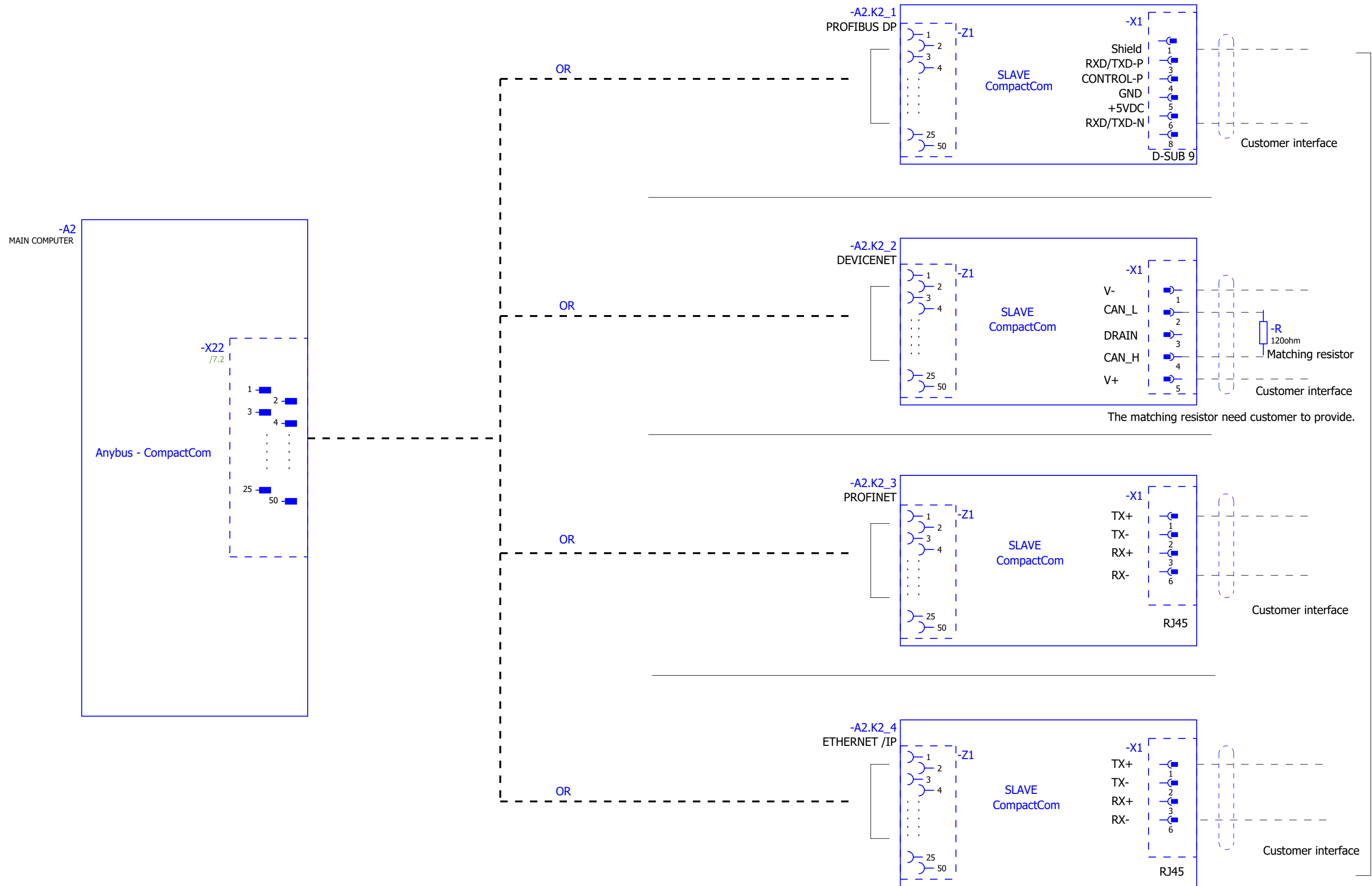
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OPTION & HARNESS TO CUSTOMER I/O

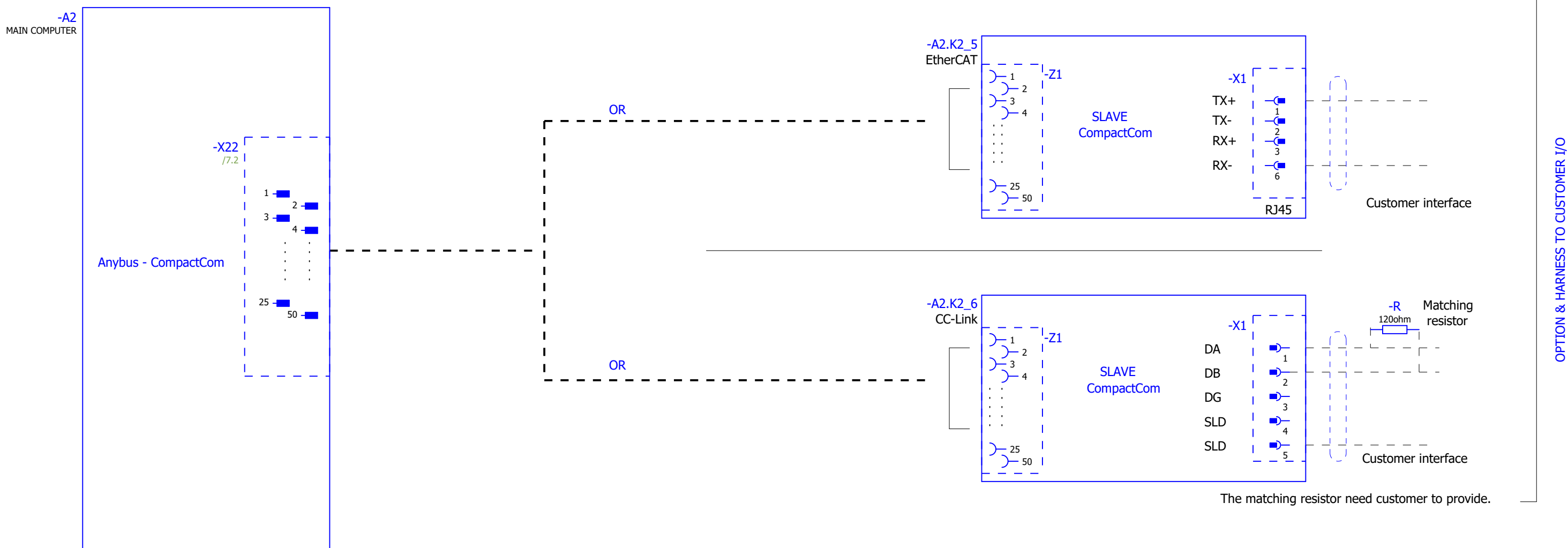
Latest revision: Rev 04 5/12/2020	Prepared by, date: Clyde	Approved by, date: Yang X. Gao
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**FIELD BUS ADAPTER SLAVE - A2.K2**

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**FIELD BUS ADAPTER SLAVE - A2.K2**

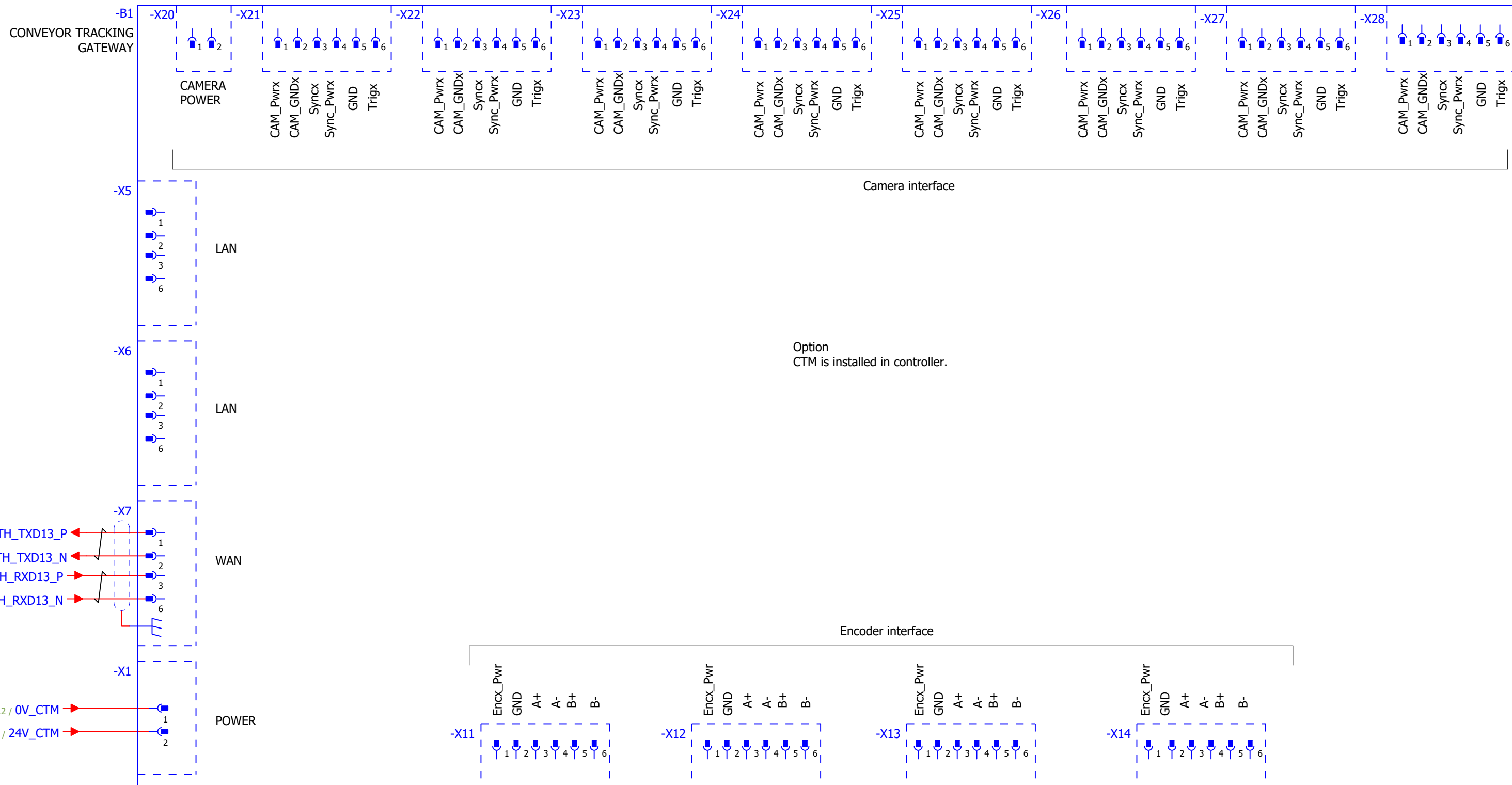
Status:  
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High-level function: = SCH  
Mounting location: + U1

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**CONVEYOR TRACKING GATEWAY - B1**

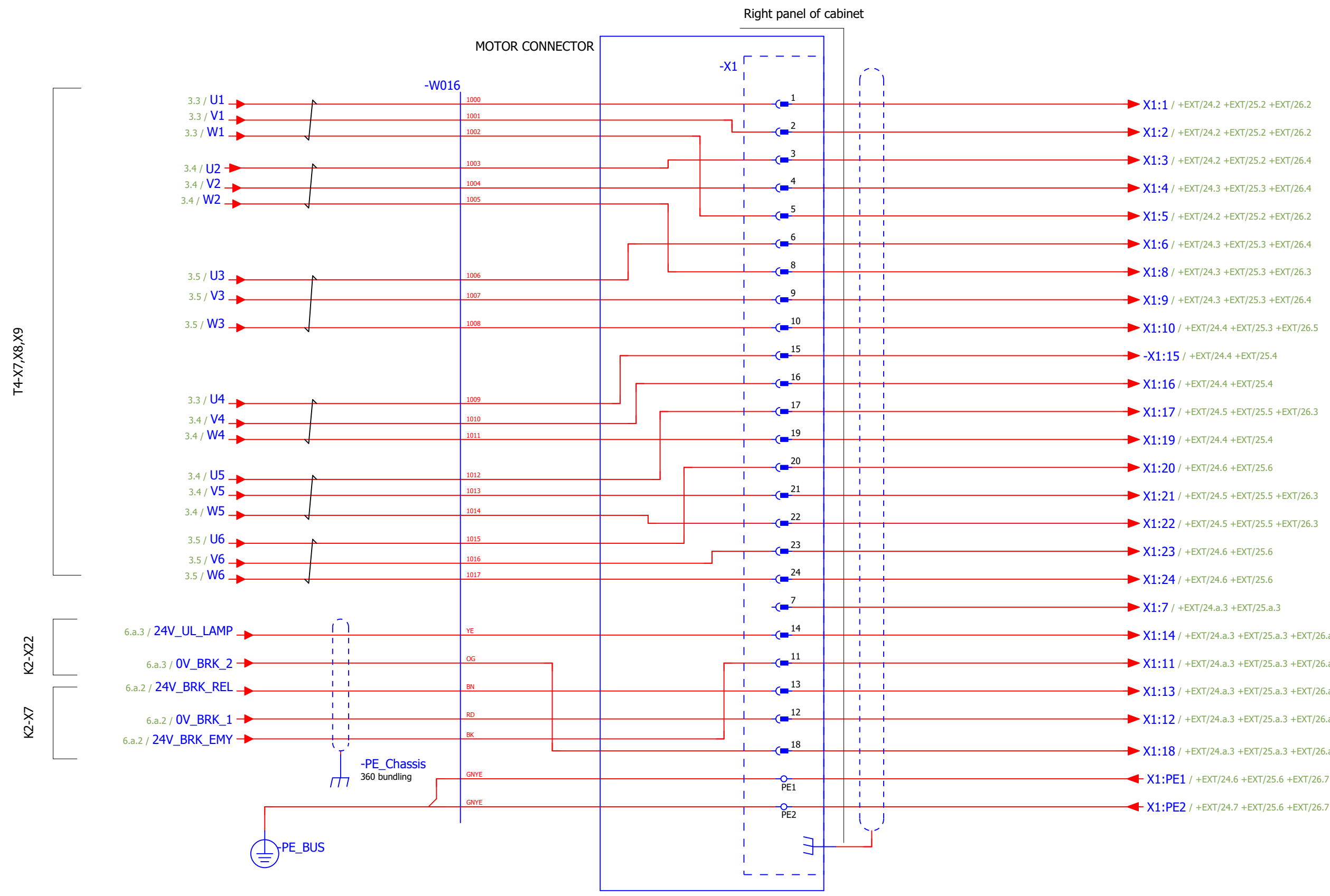
Status:  
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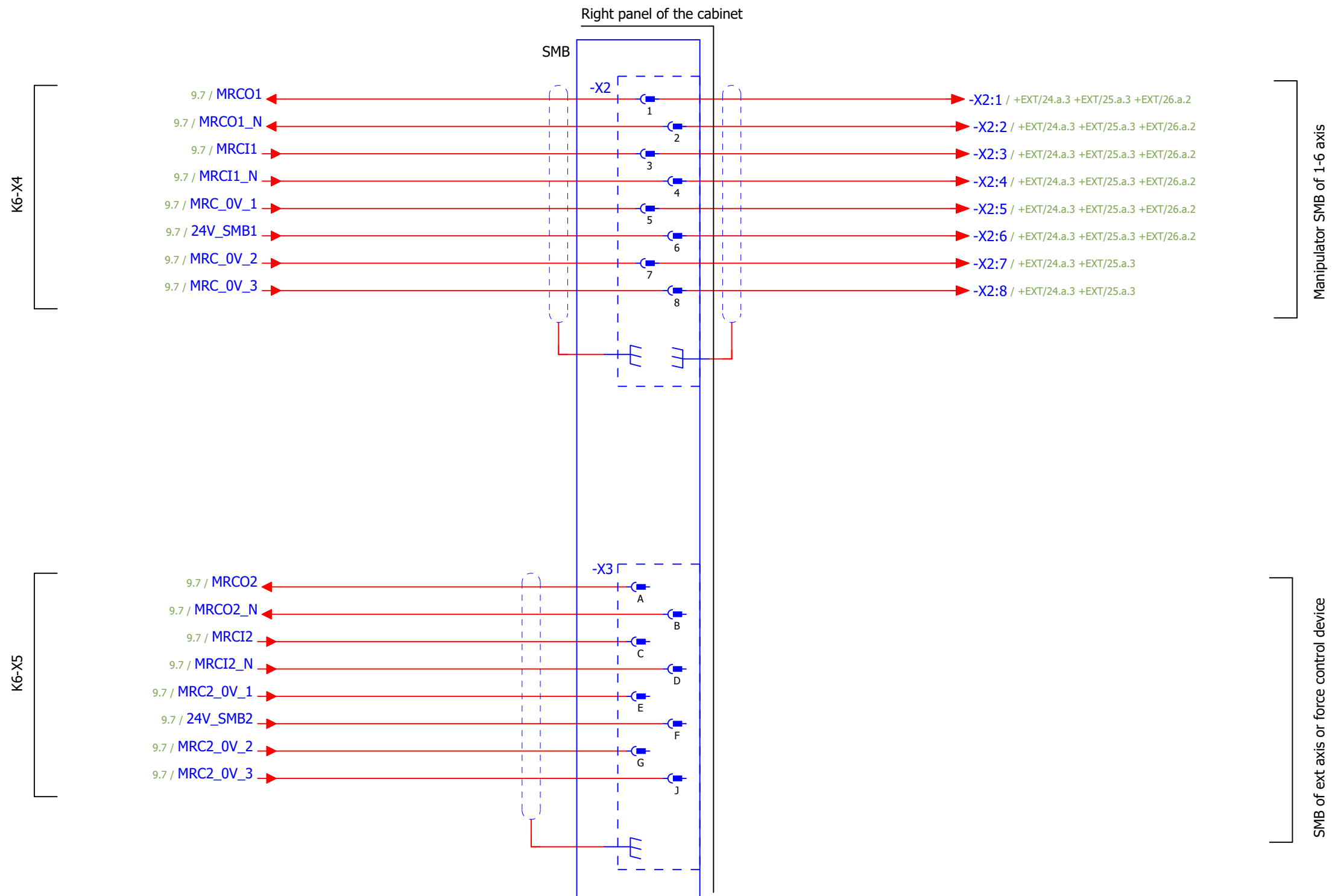
**MOTOR CONNECTOR - X1**

Status:  
Approved

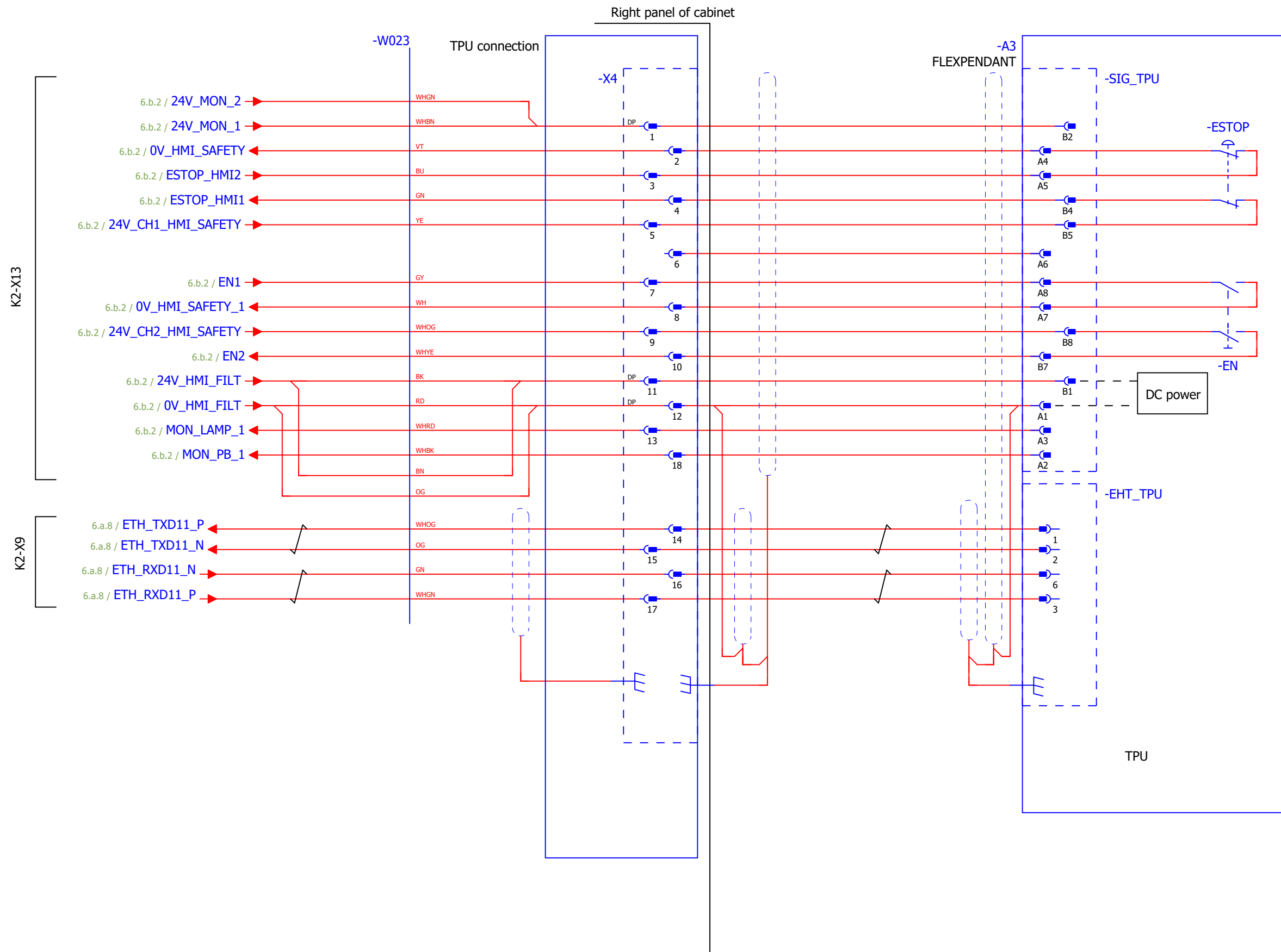
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High-level function: = SCH  
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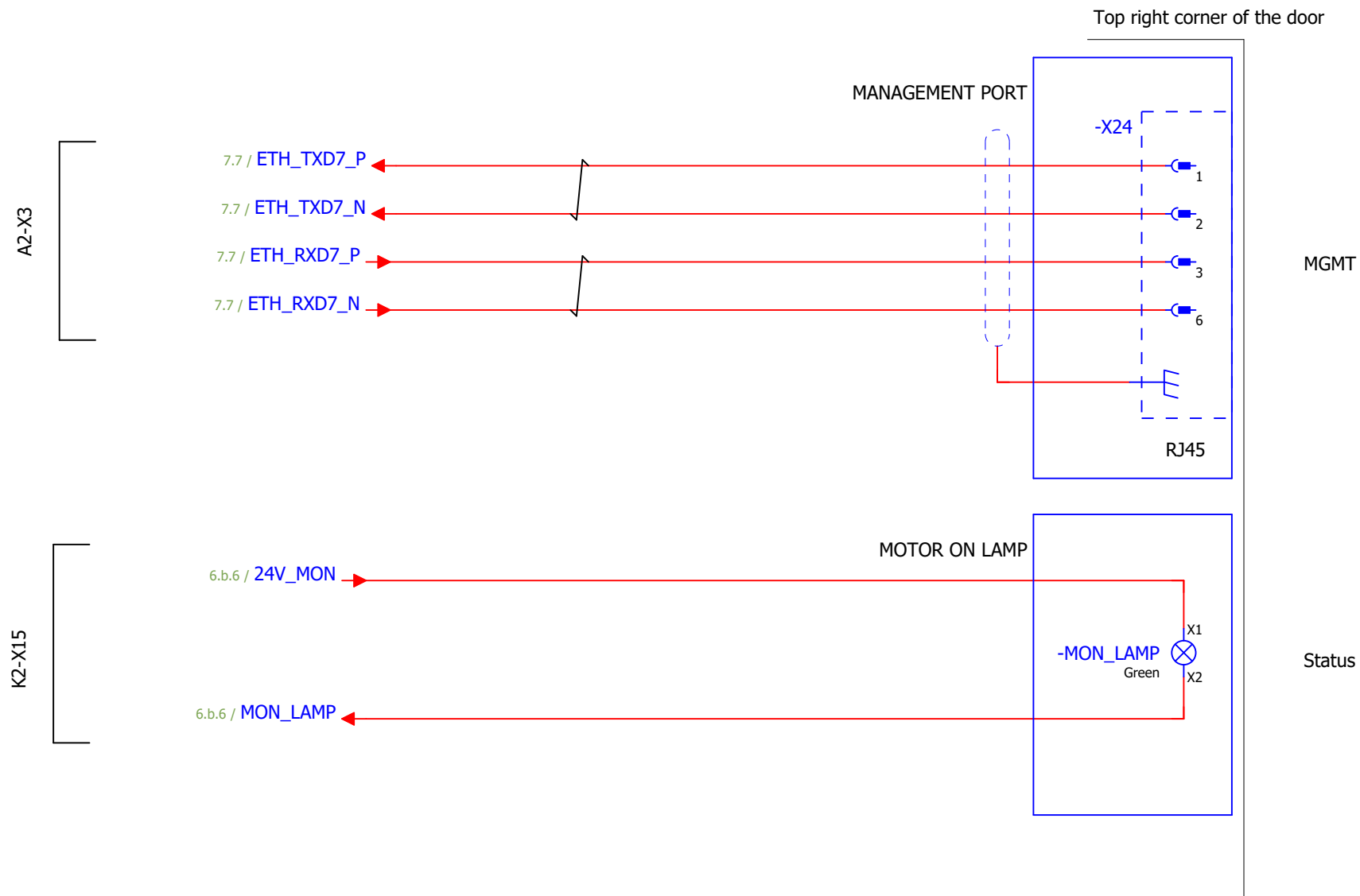
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TPU - HMI SIGNAL CONNECTORS - X4

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### MANAGEMENT PORT & MOTOR ON LAMP - X24

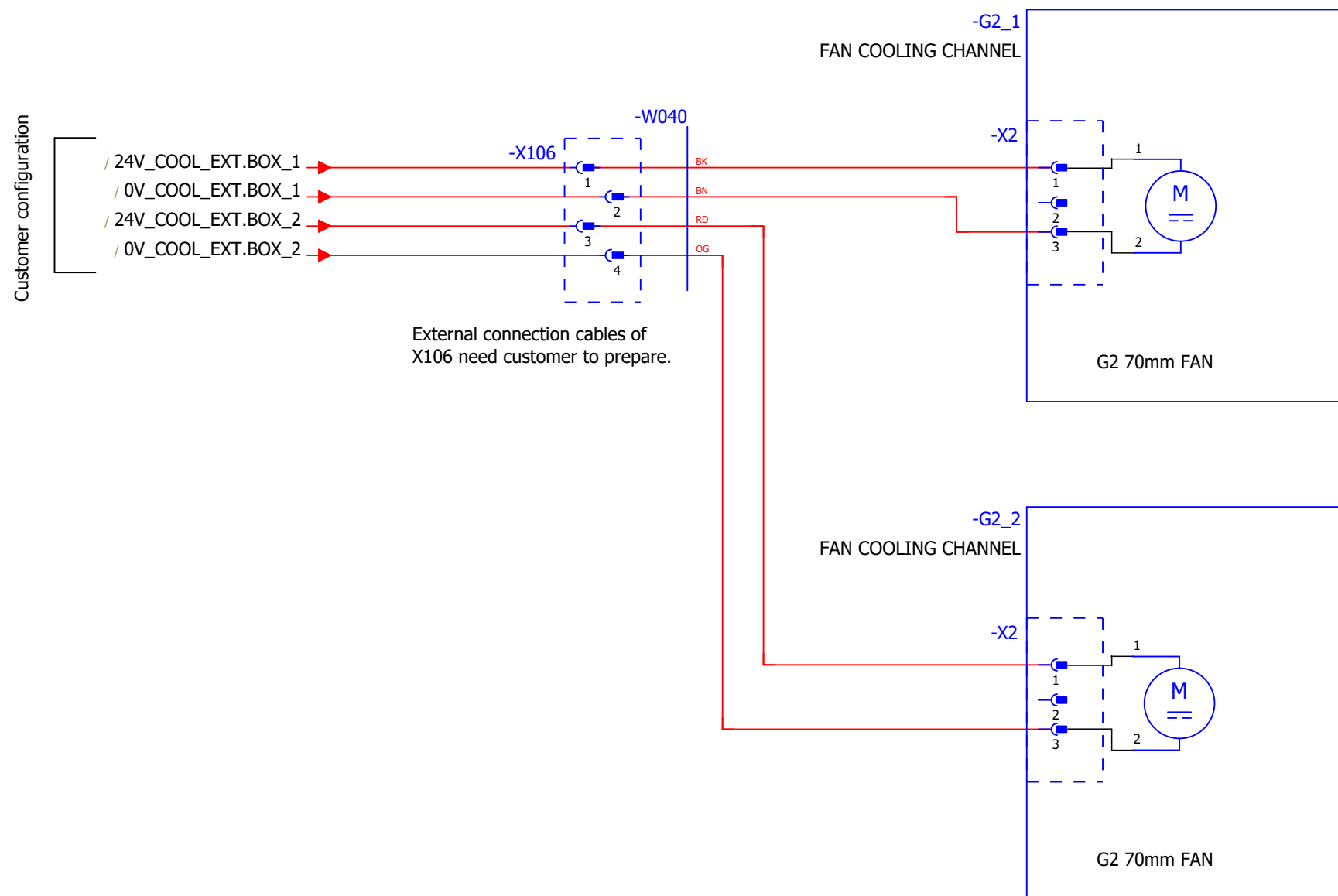
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### FAN COOLING CHANNEL - G2

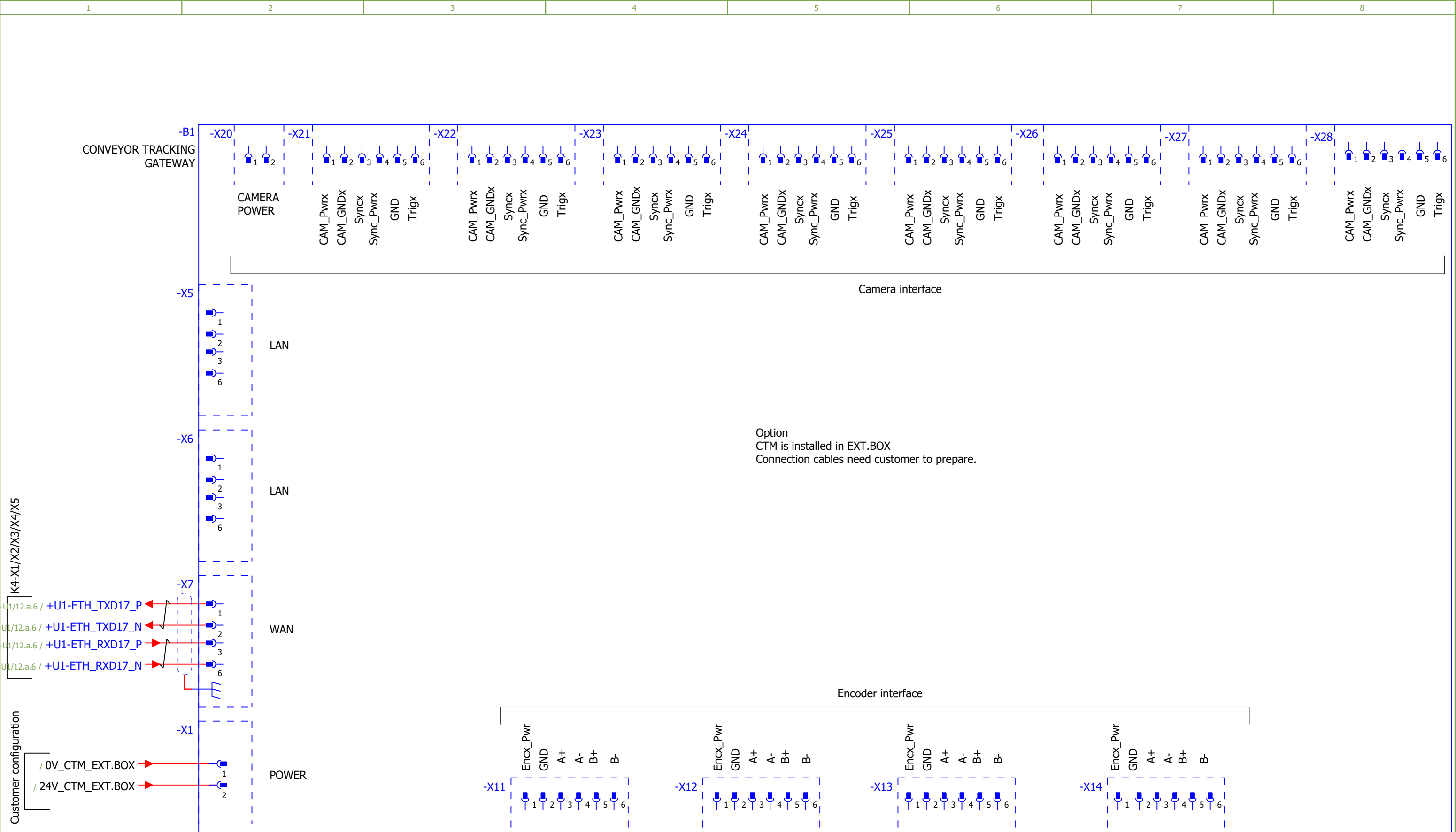
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High-level function: = SCH  
Mounting location: + U2

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**CONVEYOR TRACKING GATEWAY - B1**

Status:  
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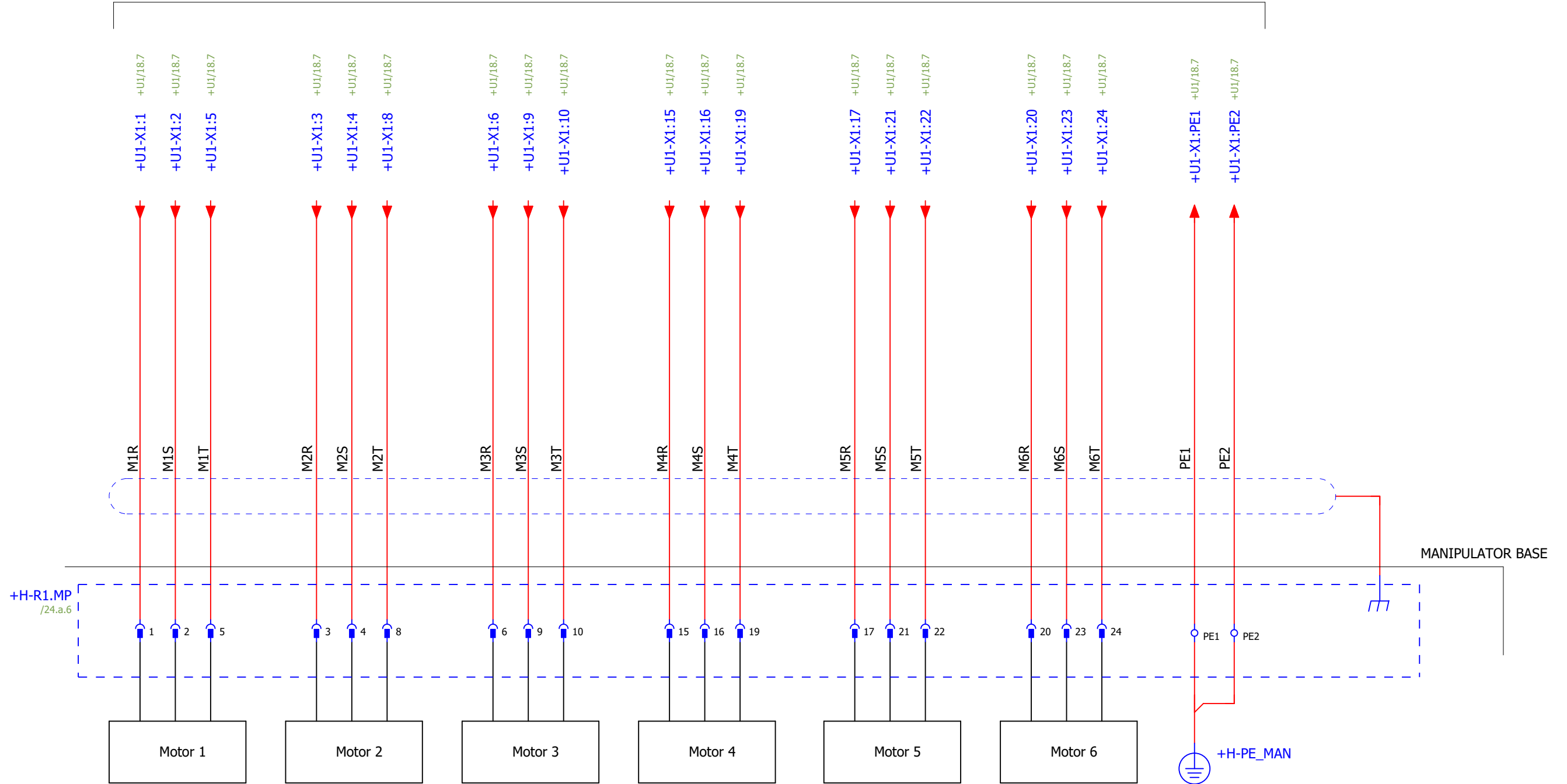
High-level function: = SCH  
 Mounting location: + U2

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# IRB 1100, IRB 1300 cabinet

Controller interface  
+U1-X1



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SERVO DRIVE SYSTEM IRB 1100, IRB 1300

Status:  
Approved

High-level function: = SCH  
Mounting location: + EXT

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Controller interface  
+U1-X1

- +U1/18.7 / +U1-X1:14
- +U1/18.7 / +U1-X1:18
- +U1/18.7 / +U1-X1:7
- +U1/18.7 / +U1-X1:13
- +U1/18.7 / +U1-X1:11
- +U1/18.7 / +U1-X1:12

Controller interface  
+U1-X2

- +U1/19.5 / +U1-X2:1
- +U1/19.5 / +U1-X2:2
- +U1/19.5 / +U1-X2:3
- +U1/19.5 / +U1-X2:4
- +U1/19.5 / +U1-X2:5
- +U1/19.5 / +U1-X2:6
- +U1/19.5 / +U1-X2:7
- +U1/19.5 / +U1-X2:8

MANIPULATOR BASE

+H-R1.MP /24.1

- 14
- 18
- 7
- 13
- 11
- 12

- 24V\_LAMP
- Reserved
- Reserved
- 24V\_BRAKE REL
- 24V\_BRAKE EMY
- 0V

Brake & Lamp

+H-R1.SMB

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

- SDI
- SDI-N
- SDO
- SDO-N
- 0V
- 24V
- Reserved
- Reserved

SMB board

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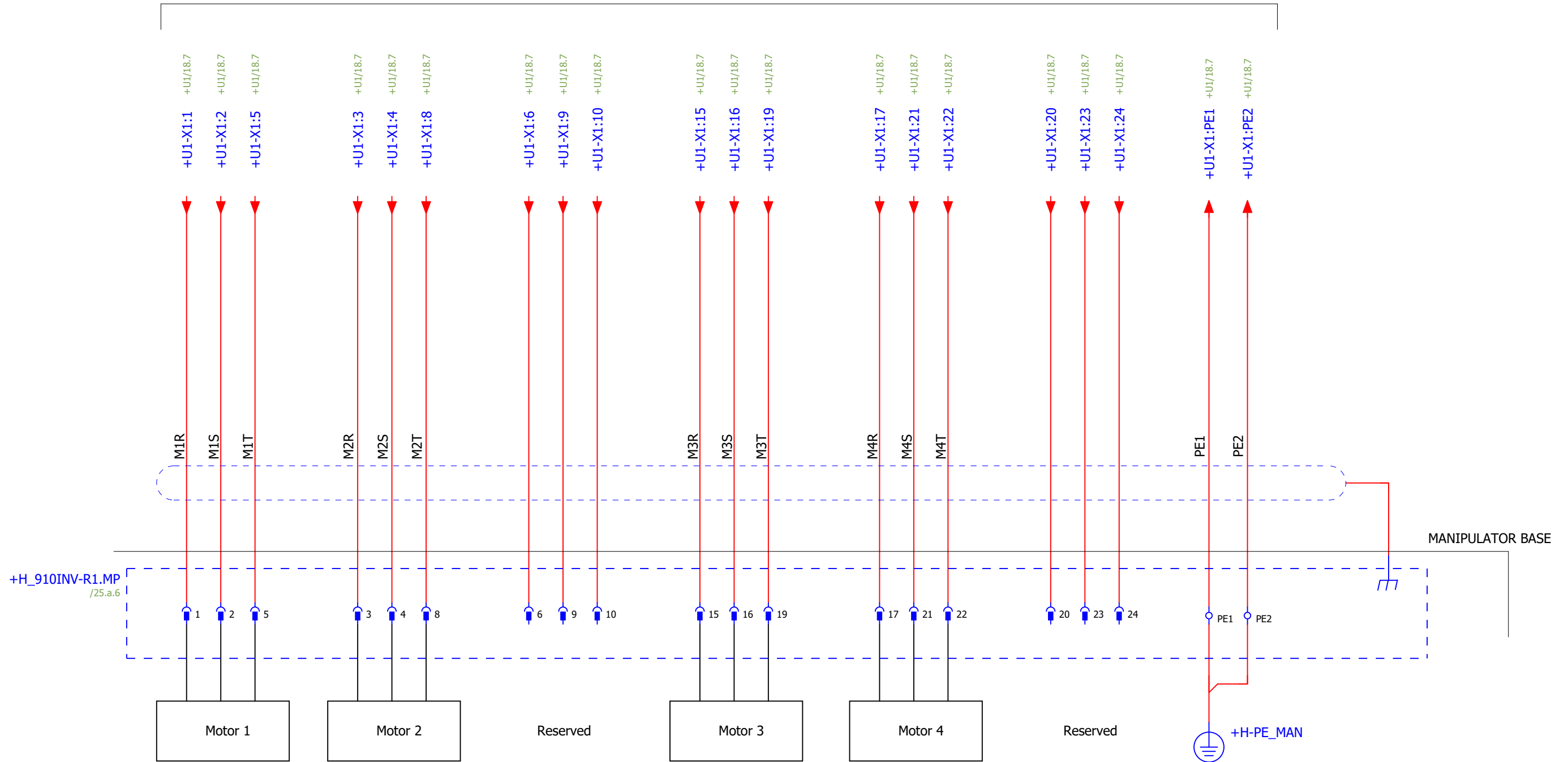
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**CONTROL CABLE IRB 1100, IRB1300**

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# IRB 910INV cabinet

Controller interface  
+U1-X1



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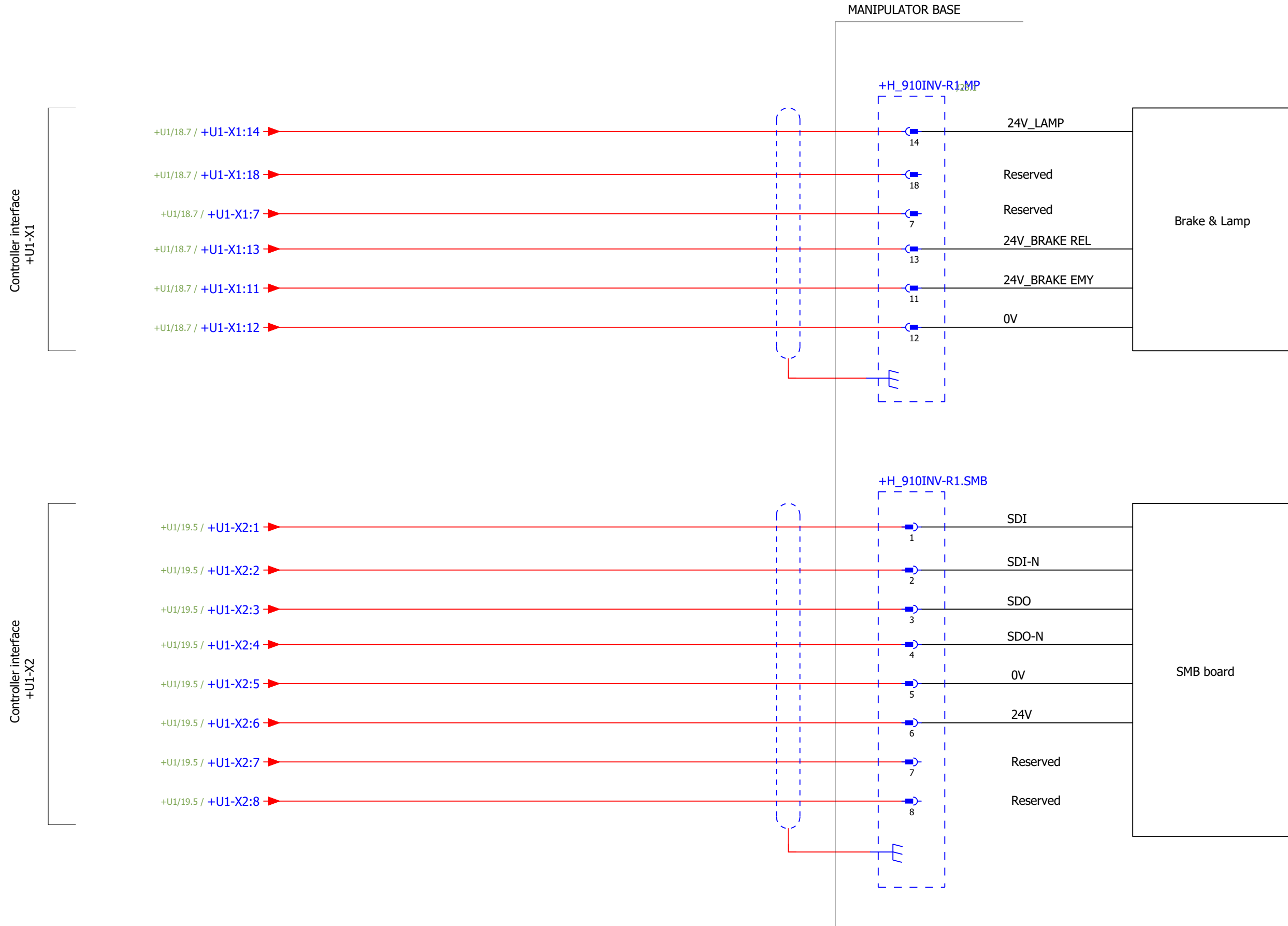
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**SERVO DRIVE SYSTEM IRB 910INV**

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# Cable diagram

-W016

Harness Motors power LV 6-axis

				Connection point A				Connection point B						
Wire no.	Specification	Size (AWG)	Lgth. (mm)	Item description	: term	Type	Ref.	Item description	: term	Type	Ref.	Remark	Rev	Page
Shield				PE_Chassis				PE_Chassis						18
1000	BK UL1015, twisted_1, 3HAB7885-60	14		T4-X7	B1			X1	1			U1		
1001	BK UL1015, twisted_1, 3HAB7885-60	14		T4-X7	B2			X1	2			V1		
1003	BK UL1015, twisted_2, 3HAB7885-60	14		T4-X8	A1			X1	3			U2		
1004	BK UL1015, twisted_2, 3HAB7885-60	14		T4-X8	A2			X1	4			V2		
1002	BK UL1015, twisted_1, 3HAB7885-60	14		T4-X7	B3			X1	5			W1		
1006	BK UL1015, twisted_3, 3HAB7885-60	14		T4-X9	A1			X1	6			U3		
1005	BK UL1015, twisted_2, 3HAB7885-60	14		T4-X8	A3			X1	8			W2		
1007	BK UL1015, twisted_3, 3HAB7885-60	14		T4-X9	A2			X1	9			V3		
1008	BK UL1015, twisted_3, 3HAB7885-60	14		T4-X9	A3			X1	10			W3		
BK	3HAC046147-012, 6wires+shield	18		K2-X7	A1			X1	11			24V_BRK_EMY		
RD	3HAC046147-012, 6wires+shield	18		K2-X7	A3			X1	12			0V_BRK		
BN	3HAC046147-012, 6wires+shield	18		K2-X7	A2			X1	13			24V_BRK_REL		
YE	3HAC046147-012, 6wires+shield	18		K2-X22	C1			X1	14			24V_UL_LAMP		
1009	BK UL1015, twisted_4, 3HAB7885-60	14		T4-X7	A1			X1	15			U4		
1010	BK UL1015, twisted_4, 3HAB7885-60	14		T4-X7	A2			X1	16			V4		
1012	BK UL1015, twisted_5, 3HAB7885-60	14		T4-X8	B1			X1	17			U5		
OG	3HAC046147-012, 6wires+shield	18		K2-X22	B1			X1	18			0V_BRK		
1011	BK UL1015, twisted_4, 3HAB7885-60	14		T4-X7	A3			X1	19			W4		
1015	BK UL1015, twisted_6, 3HAB7885-60	14		T4-X9	B1			X1	20			U6		
1013	BK UL1015, twisted_5, 3HAB7885-60	14		T4-X8	B2			X1	21			V5		
1014	BK UL1015, twisted_5, 3HAB7885-60	14		T4-X8	B3			X1	22			W5		
1016	BK UL1015, twisted_6, 3HAB7885-60	14		T4-X9	B2			X1	23			V6		
1017	BK UL1015, twisted_6, 3HAB7885-60	14		T4-X9	B3			X1	24			W6		
GNYE	GNYE UL1015, 3HAB7917-2	14		PE_BUS				X1	PE1			PE1		
GNYE	GNYE UL1015, 3HAB7917-2	14		PE_BUS				X1	PE2			PE2		

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Prepared by, date: Clyde			Approved by, date: Yang X. Gao		Document no. 3HAC065464-009	Page: 023 Next: 024 Total: 94	















# Cable diagram

-W023


Harness TPU connection

				Connection point A				Connection point B						
Wire no.	Specification	Size (AWG)	Lgth. (mm)	Item description	: term	Type	Ref.	Item description	: term	Type	Ref.	Remark	Rev	Page
WHGN	Twisted_2, 3HAC025999-001 cat5e SF/UTP	26		K2-X9	1			X4	17			RXD+		20
GN	Twisted_2, 3HAC025999-001 cat5e SF/UTP	26		K2-X9	2			X4	16			RXD-		
WHOG	Twisted_1, 3HAC025999-001 cat5e SF/UTP	26		K2-X9	3			X4	14			TXD+		
OG	Twisted_1, 3HAC025999-001 cat5e SF/UTP	26		K2-X9	6			X4	15			TXD-		
YE	3HAC063242-032, 16wires	22		K2-X13	A1			X4	5			ESTOP1_TPU_A		
GN	3HAC063242-032, 16wires	22		K2-X13	A2			X4	4			ESTOP1_TPU_B		
BU	3HAC063242-032, 16wires	22		K2-X13	A3			X4	3			ESTOP2_TPU_A		
VT	3HAC063242-032, 16wires	22		K2-X13	A4			X4	2			ESTOP2_TPU_B		
BK	3HAC063242-032, 16wires	22		K2-X13	A5			X4	11			24V_TPU		
BN	3HAC063242-032, 16wires	22		K2-X13	A5			X4	11			24V_TPU		
WHRD	3HAC063242-032, 16wires	22		K2-X13	A6			X4	13			MON_LAMP		
WHBK	3HAC063242-032, 16wires	22		K2-X13	A7			X4	18			MON_PB		
GY	3HAC063242-032, 16wires	22		K2-X13	B1			X4	7			EN1		
WH	3HAC063242-032, 16wires	22		K2-X13	B2			X4	8			GND		
WHYE	3HAC063242-032, 16wires	22		K2-X13	B3			X4	10			EN2		
WHOG	3HAC063242-032, 16wires	22		K2-X13	B4			X4	9			24V_CH2		
OG	3HAC063242-032, 16wires	22		K2-X13	B5			X4	12			GND_TPU		
RD	3HAC063242-032, 16wires	22		K2-X13	B5			X4	12			GND_TPU		
WHBN	3HAC063242-032, 16wires	22		K2-X13	B6			X4	1			24V_MON		

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ABB Engineering (Shanghai) Ltd.  
No.4528, Kangxin Highway,  
Pudong New District, Shanghai,  
201319, P. R. China

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# Cable diagram

-W024

Harness dual channel safety

				Connection point A				Connection point B						
Wire no.	Specification	Size (AWG)	Lgth. (mm)	Item description	: term	Type	Ref.	Item description	: term	Type	Ref.	Remark	Rev	Page
050	BU UL1569, 3HAB8303-16	26		A2.K3-X6	1			K2-X12	A1			IN_Q2_CTRL		6.b
064	BU UL1569, 3HAB8303-16	26		A2.K3-X6	2			K2-X12	B1			GND_OUT-CH2		
076	BU UL1569, 3HAB8303-16	26		A2.K3-X6	3			A2.K3-X6	8			Short circuit		
077	BU UL1569, 3HAB8303-16	26		A2.K3-X6	4			A2.K3-X6	6			Short circuit		
051	BU UL1569, 3HAB8303-16	26		A2.K3-X6	5			K2-X12	A2			ESTOP1		
052	BU UL1569, 3HAB8303-16	26		A2.K3-X6	7			K2-X12	A3			IN_EN1		
053	BU UL1569, 3HAB8303-16	26		A2.K3-X6	9			K2-X12	A4			ESTOP2		
065	BU UL1569, 3HAB8303-16	26		A2.K3-X6	10			K2-X12	B4			24V_B		
054	BU UL1569, 3HAB8303-16	26		A2.K3-X6	11			K2-X12	A5			IN_EN2		
066	BU UL1569, 3HAB8303-16	26		A2.K3-X6	12			K2-X12	B5			24V_B		
055	BU UL1569, 3HAB8303-16	26		A2.K3-X6	13			K2-X12	A6			Q1_FB		
067	BU UL1569, 3HAB8303-16	26		A2.K3-X6	14			K2-X12	B6			IOGND		
056	BU UL1569, 3HAB8303-16	26		A2.K3-X6	15			K2-X12	A7			IN_AS1		
068	BU UL1569, 3HAB8303-16	26		A2.K3-X6	16			K2-X12	B7			IOGND		
057	BU UL1569, 3HAB8303-16	26		A2.K3-X6	17			K2-X12	A8			IN_GS1		
069	BU UL1569, 3HAB8303-16	26		A2.K3-X6	18			K2-X12	B8			24V_B		
058	BU UL1569, 3HAB8303-16	26		A2.K3-X6	19			K2-X12	A9			IN_Q2_FB		
070	BU UL1569, 3HAB8303-16	26		A2.K3-X6	20			K2-X12	B9			IOGND		
059	BU UL1569, 3HAB8303-16	26		A2.K3-X6	21			K2-X12	A10			IN_AS2		
071	BU UL1569, 3HAB8303-16	26		A2.K3-X6	22			K2-X12	B10			GND_OUT_CH1		
060	BU UL1569, 3HAB8303-16	26		A2.K3-X6	23			K2-X12	A11			IN-GS2		
072	BU UL1569, 3HAB8303-16	26		A2.K3-X6	24			K2-X12	B11			IN_Q1_CTRL		
061	BU UL1569, 3HAB8303-16	26		A2.K3-X7	1			K2-X12	A12			IN_OPT_OUT2		
073	BU UL1569, 3HAB8303-16	26		A2.K3-X7	2			K2-X12	B12			24V_B		
062	BU UL1569, 3HAB8303-16	26		A2.K3-X7	3			K2-X12	A13			GND_OUT_CH2		
074	BU UL1569, 3HAB8303-16	26		A2.K3-X7	4			K2-X12	B13			GND_OUT_CH1		
063	BU UL1569, 3HAB8303-16	26		A2.K3-X7	5			K2-X12	A14			OPT_INPUT		

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