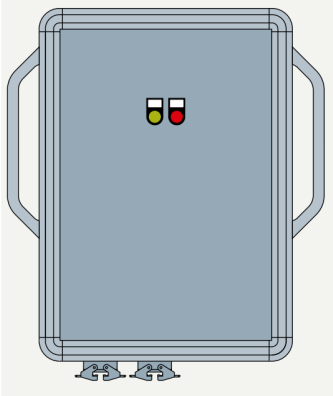
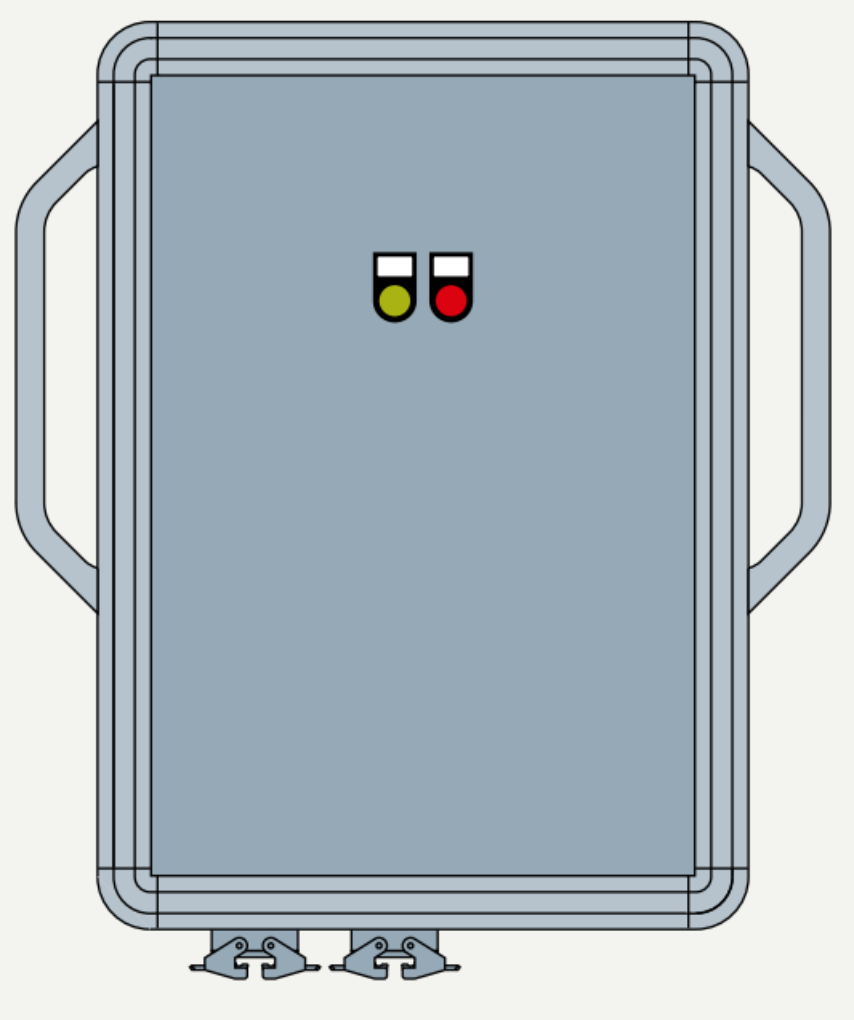


SIEMENS A5E43491109B Standard Performance Frequency Converter User Manual

Contents

SIEMENS

SIEMENS A5E43491109B Standard Performance Frequency Converter



Product Information

Specifications

- **Edition**: 04/2023
- **Product:** SINAMICS Standard Performance Frequency Converter
- **Type**: Distributed converter box
- **Website**: www.siemens.com/drives

Product Usage Instructions

1. **Safety Note**
   The safety note provides important information regarding personal safety and property damage. It contains notices that should be observed to prevent any harm or damage.
2. **Description**
   The SINAMICS Standard Performance Frequency Converter is a distributed converter box designed for specific tasks. It is important to understand its features and capabilities.
3. **Mounting**
   The mounting process is crucial for proper installation and operation of the frequency converter. Follow the instructions provided in the manual to ensure correct mounting.
4. **Connection**
   The connection section provides an overview of the interfaces and explains how to connect the line supply and

motor to the converter.

1. **Overview of the Interfaces**
   Understand the different interfaces available on the converter box and their functions. This section provides detailed information on each interface and its purpose.
2. **Connecting the Line Supply and Motor**
   Follow the step-by-step instructions to properly connect the line supply and motor to the distributed converter box. This ensures safe and efficient operation of the product.

5. **Diagnostics**
   The diagnostics section provides information on how to troubleshoot and diagnose any potential issues or errors that may occur during the usage of the frequency converter.
6. **Equipment Manual**
   The equipment manual contains additional information and guidelines for operating the SINAMICS Standard Performance Frequency Converter. Refer to this section for any specific instructions or details.
7. **Technical Specifications**
   This section provides detailed technical specifications of the frequency converter, including dimensions, circuit diagrams, and other relevant information.
8. **Dimension Drawings**
   Refer to the dimension drawings to understand the physical dimensions and layout of the distributed converter box. This helps in planning the installation and ensuring proper fit.
9. **Circuit Diagrams**
   The circuit diagrams provide a visual representation of the electrical connections and components within the frequency converter. Use these diagrams as a reference during installation and troubleshooting.

Frequently Asked Questions (FAQ)

- **Q: What should I do if I encounter an error message on the frequency converter?**
  A: If you encounter an error message, refer to the diagnostics section of the manual for troubleshooting steps. If the issue persists, contact qualified personnel for further assistance.
- **Q: Can I operate the SINAMICS Standard Performance Frequency Converter without proper training?**
  A: No, the product should only be operated by personnel qualified for the specific task. Ensure that you have received appropriate training and have a good understanding of the relevant documentation and safety instructions before using the frequency converter.

Legal information

Warning notice system
This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

- **DANGER** indicates that death or severe personal injury will result if proper precautions are not taken.
- **WARNING** indicates that death or severe personal injury may result if proper precautions are not taken.
- **CAUTION** indicates that minor personal injury can result if proper precautions are not taken.
- **NOTICE** indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel
The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following

WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Disclaimer of Liability
We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Safety note

WARNING

Danger to life if the safety instructions and residual risks are not observed
If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur.

- Observe the safety instructions given in the hardware documentation.
- Consider the residual risks for the risk evaluation.

Description

Basic scope of delivery

- The distributed converter box can be ordered with Article No. C-200269683.
- The basic scope of the distributed converter box comprises the following main components:
  - Control cabinet for distributed mounting in the plant
  - “SINAMICS G120” converter to control a motor

The converter comprises the following components

- CU250S-2 Control Unit, Article No. 6SL3246-0BA22-1FA0
- PM250 Power Module, Article No. 6SL3225-0BE32-2AA0
    - Brake rectifier from Murr Elektronik, Article No. 50003

The internal interconnection of the brake rectifier is different in the distributed converter box produced from May 2023, which increases availability by means of an electronic control.

Scope of delivery of the PROFINET interface
When ordering the distributed converter box from the factory, specify the PROFINET interface variant and the fiber-optic cable type.

The following variants are available:

- Variant 1
    - “Fiber-optic cable connection“ (POF or glass optical fiber) with the following components in the basic scope of delivery:
    - “SCALANCE XF-200IRT managed” switch, Article No. 6GK5204-2AA00-2BD2
    - “BA 2xRJ45” bus adapter, Article No. 6ES7193-6AR00-0AA0
- In addition, to connect the fiber-optic cable, a bus adapter is required as media converter depending on the specific fiber-optic cable used:
- Variant 1.1: POF (plastic) or HCS fiber-optic cable
    - BA 2xSCRJ bus adapter, Article No. 6ES7193-6AP00-0AA0 Variant 1.2: Multimode glass fiber-optic cable
    - BA 2xLC bus adapter, Article No. 6ES7193-6AG00-0AA0
- Variant 2
    - “Copper connection”
    - When connecting a copper PROFINET cable, neither switch nor bus adapter is required. The PROFINET cable is directly connected to the PROFINET interface of the converter.

More information
You can find more information about the components of the distributed converter box on the Internet:

- CU250S-2 operating instructions (**https://support.industry.siemens.com/cs/ww/en/view/109782994**)
- Hardware installation manual for PM250 Power Modules (**https://support.industry.siemens.com/cs/ww/en/view/109482010**)
- Scalance X202-2P IRT (**https://support.industry.siemens.com/cs/en/en/view/102051962**)
- Murr Elektronik Brake rectifier (**https://shop.murrelektronik.com/Elektronik-im-Schaltschrank/Aktive-Interfacetechnik/Bremsgleichrichter/Aktiver-Bremsgleichrichter-50003.html?listtype=search&searchparam=50003&src=search&srchPage=1&perPage=10&pos=1**)

Mounting

Mounting options

The distributed inverter box is available in two mounting versions.

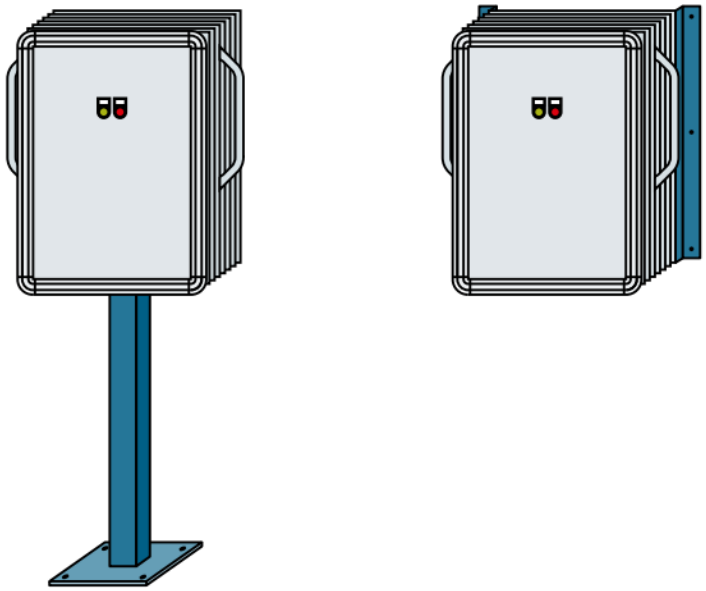


Figure 3-1 Floor mounting "With supporting foot" and wall mounting "With mounting brackets"

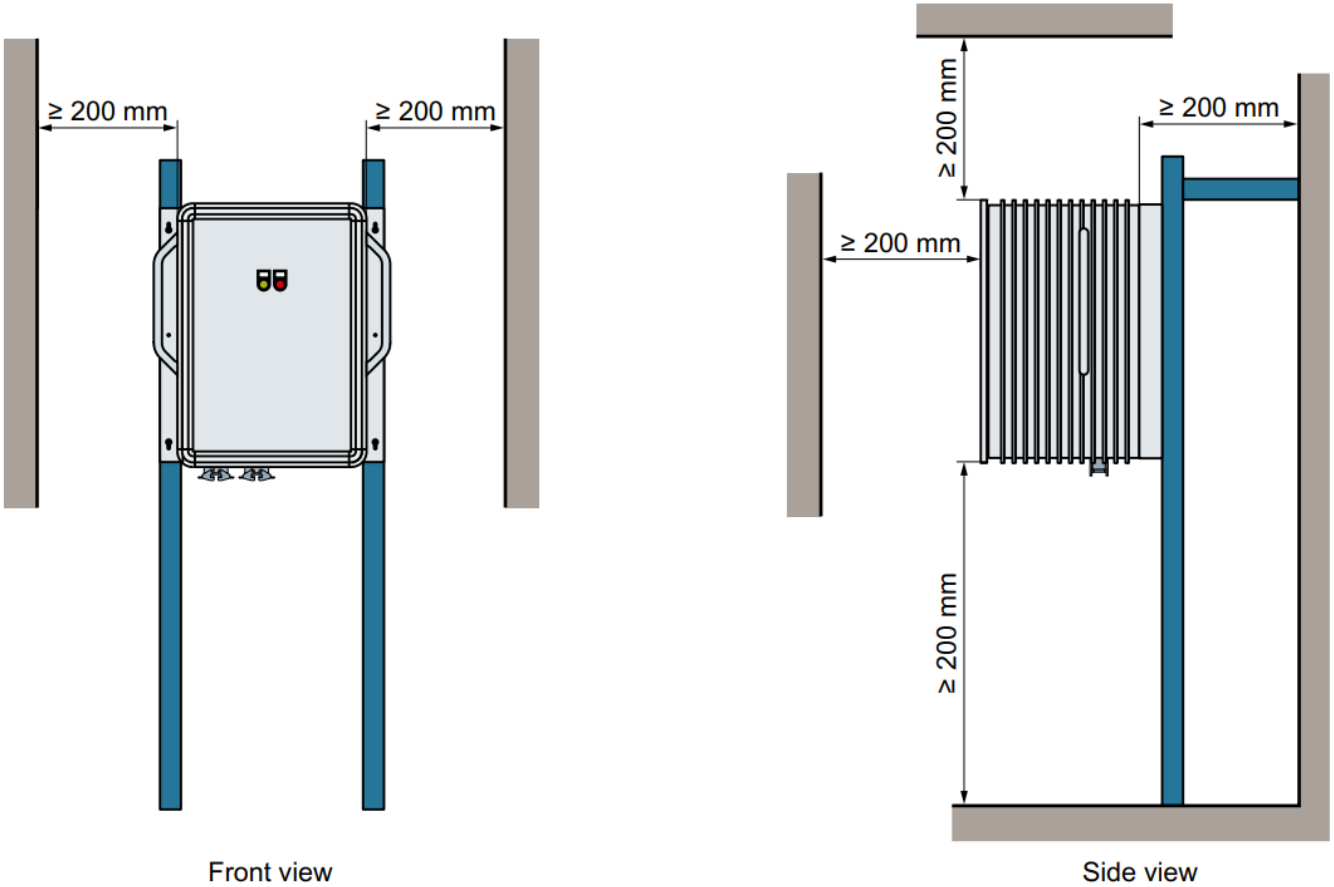
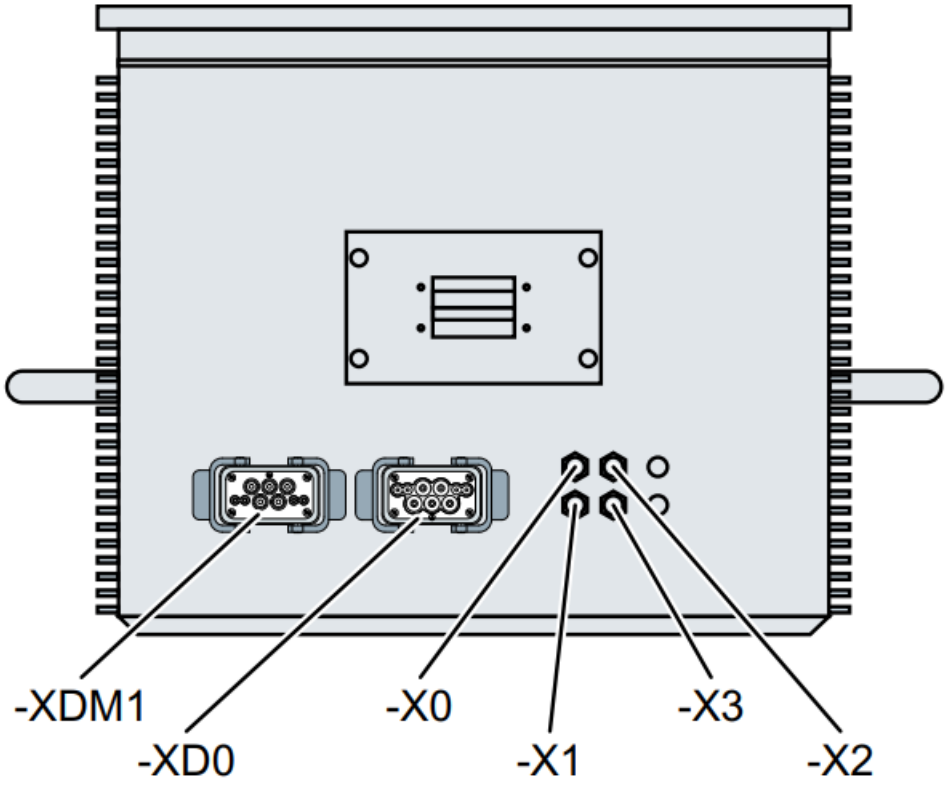
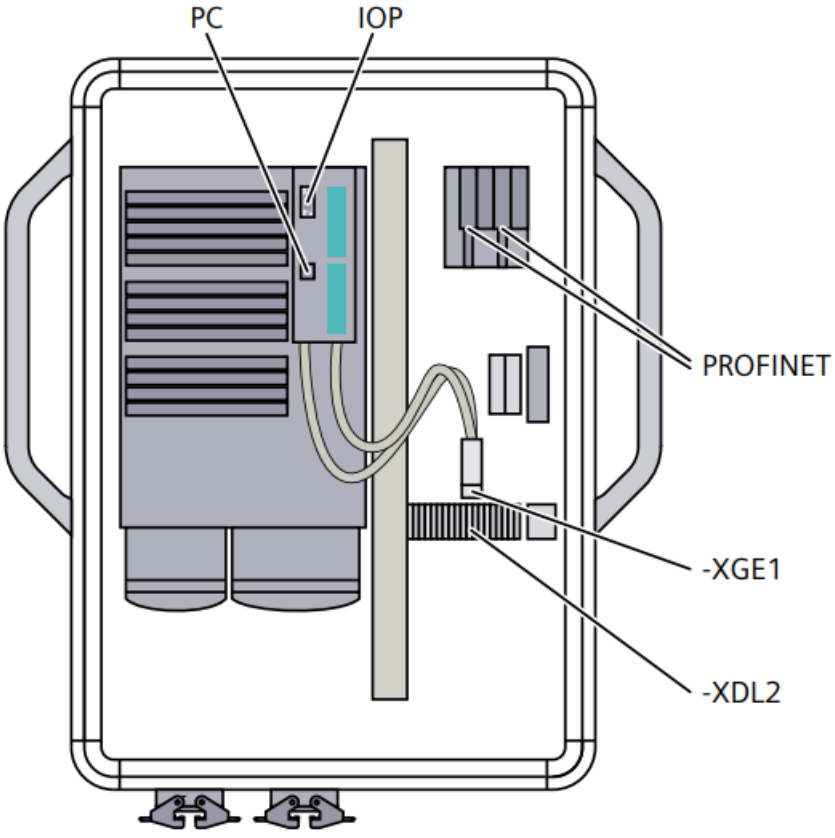


Figure 3-2 Mounting on profile bars, clearance for heat dissipation



"Fiber-optic cable connection" variant



"Copper connection" variant

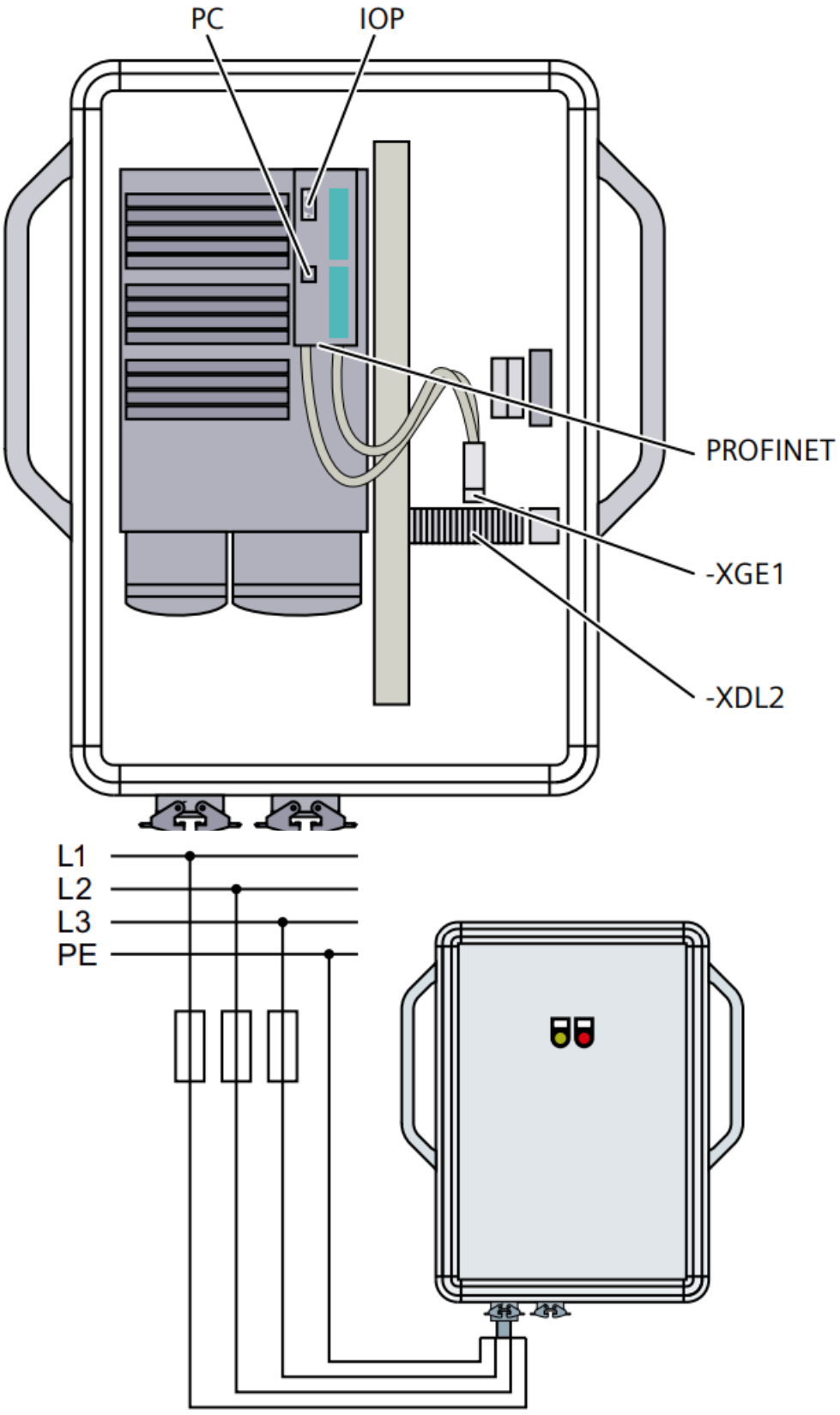
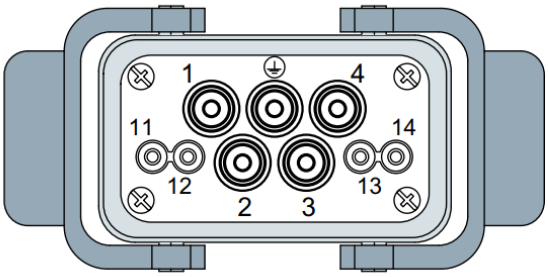
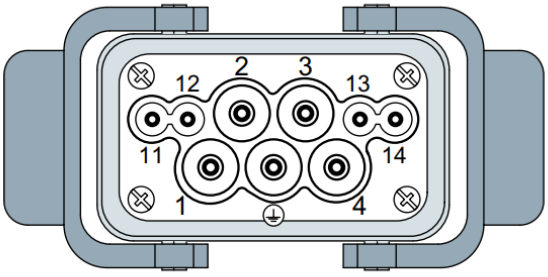
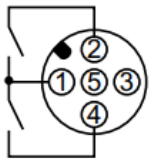


Figure 4-1 Overcurrent protection device

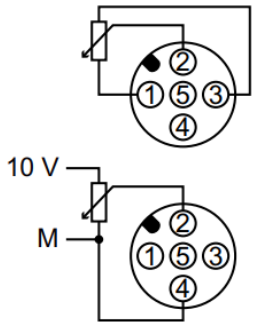
-XDM1, Han K 4/4, pin	Pin	Assignment
	1	L1
	2	L2
	3	L3
	4	Not assigned
	⏚	Protective conductor
	11 ... 14	Not assigned

-XD0, Han K 4/4, socket	Pin	Assignment
	1	U2
	2	V2
	3	W2
	4	Not assigned
	⏚	Protective conductor
	11	Motor holding brake 180 V DC+
	12	Motor holding brake 180 V DC-
	13	Temperature sensor +
	14	Temperature sensor -

-X0, M12, socket	Pin	Assignment	Connection example
	1	24 V output	
	2	Digital input DI 1+	
	3	0 V	
	4	Digital input DI 0	
	5	PE	

-X1, M12, socket	Pin	Assignment
	1	24 V output
	2	Digital input DI 3+
	3	0 V
	4	Digital input DI 2
	5	PE

-X2, M12, socket	Pin	Assignment
	1	24 V output
	2	Digital input DI 5+
	3	0 V
	4	Digital input DI 4
	5	PE

-X3, M12, socket	Pin	Assignment	Connection examples
	1	10 V output	
	2	Analog input AI 0+	
	3	0 V	
	4	Analog input AI 0-	
	5	PE	

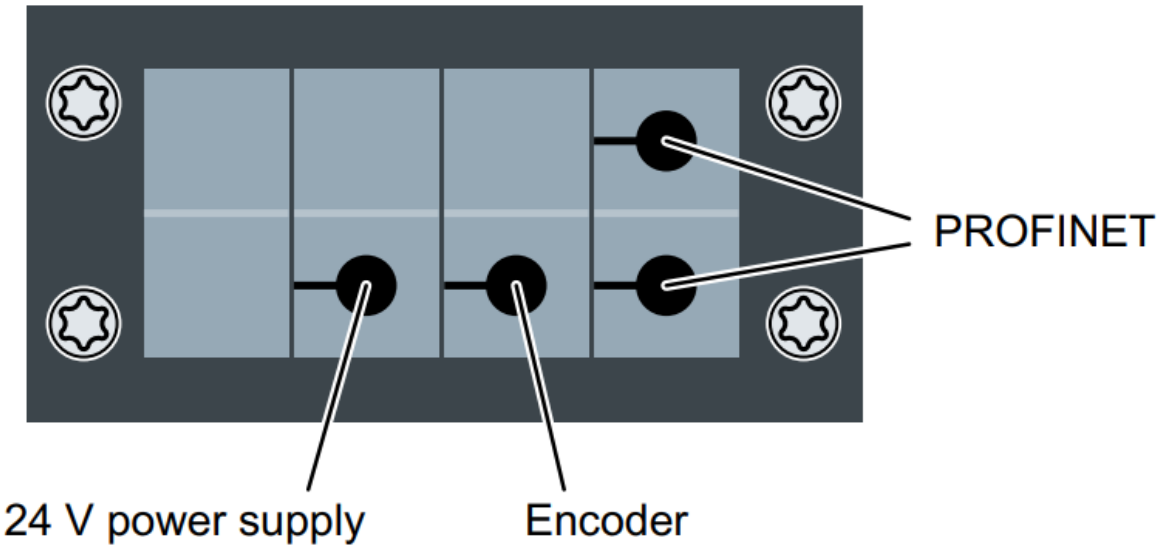


Figure 4-2 Cable entry

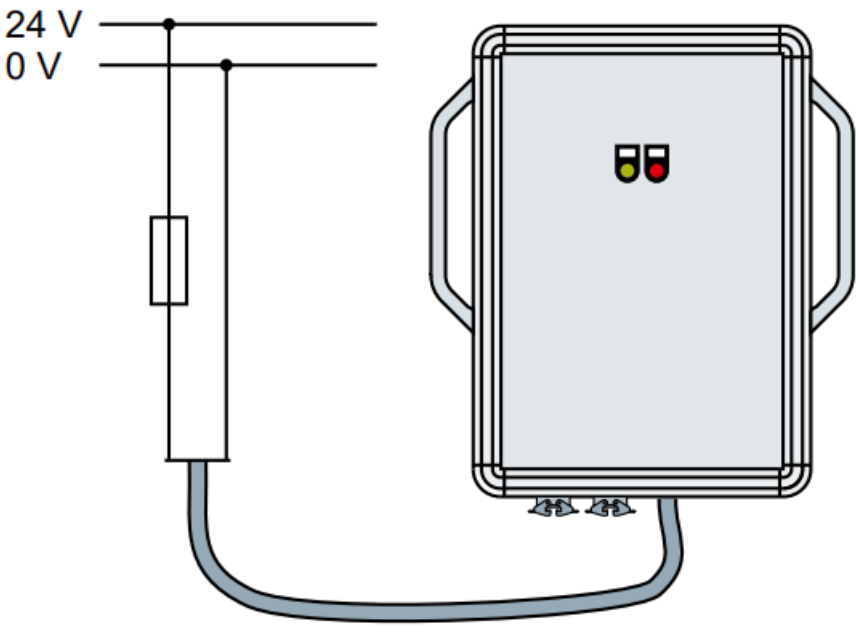


Figure 4-3 Overcurrent protection device

Use an LV HRC fuse 6A GL/GG, 500 V.

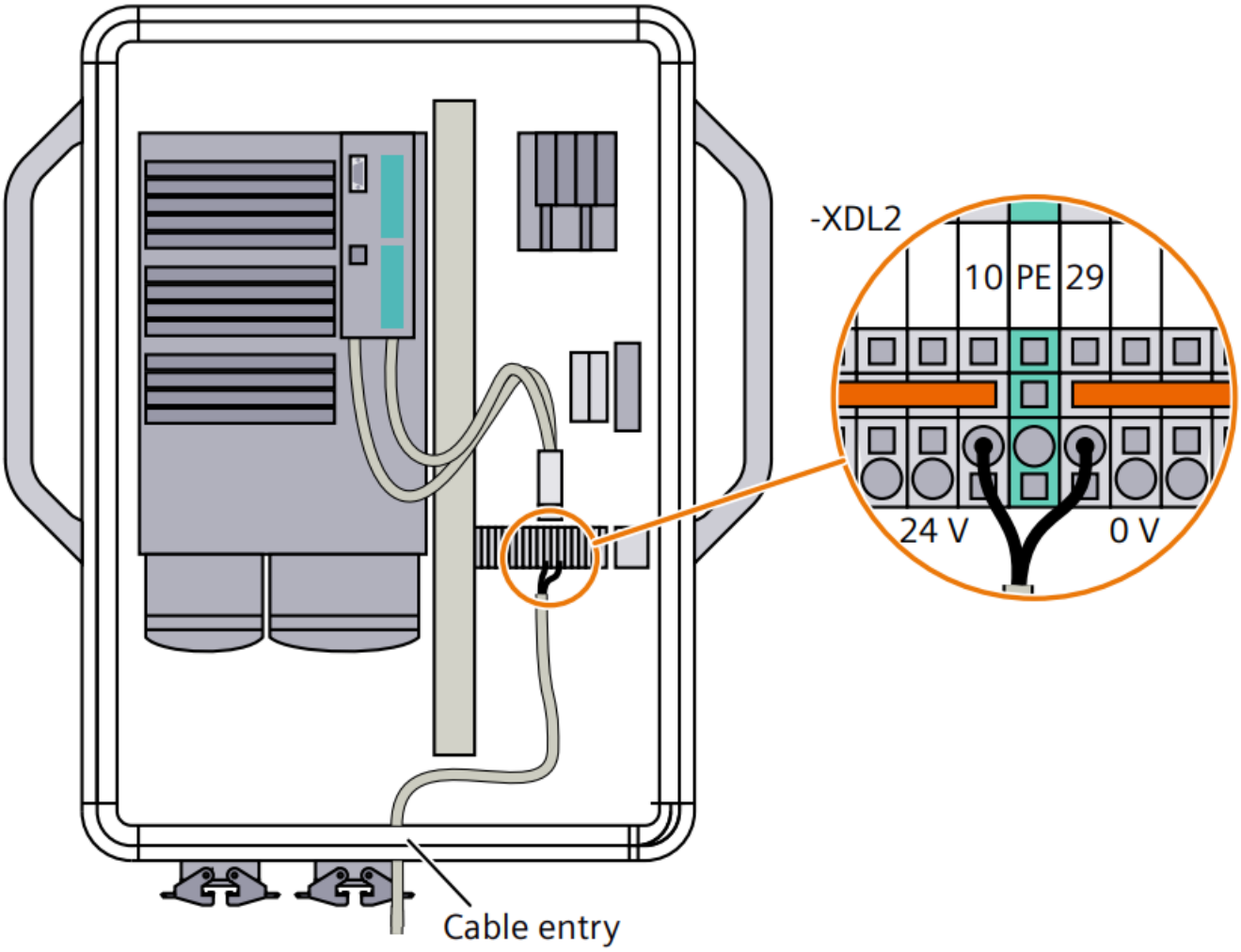


Figure 4-4 24 V connection

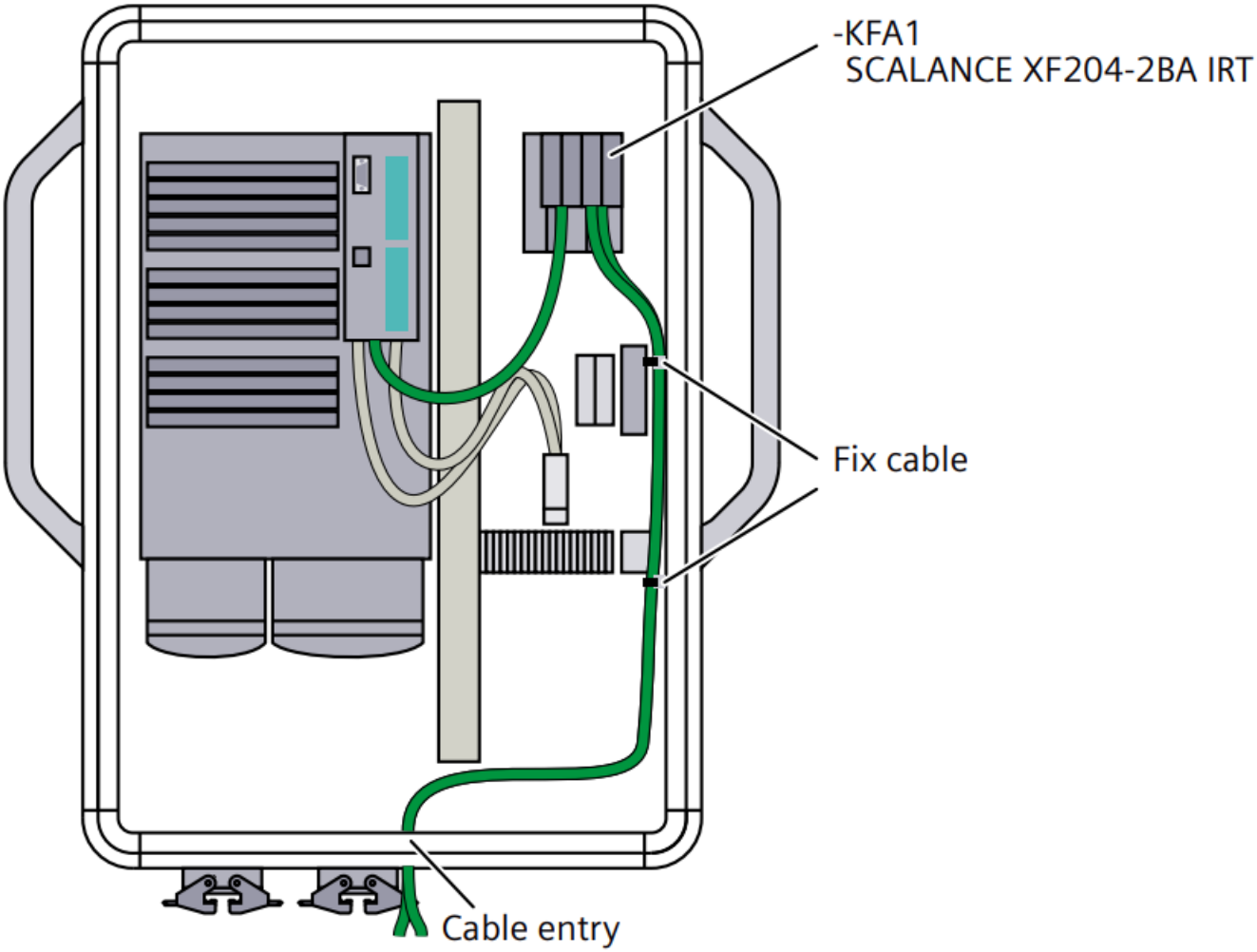


Figure 4-5 Connecting PROFINET to SCALANCE

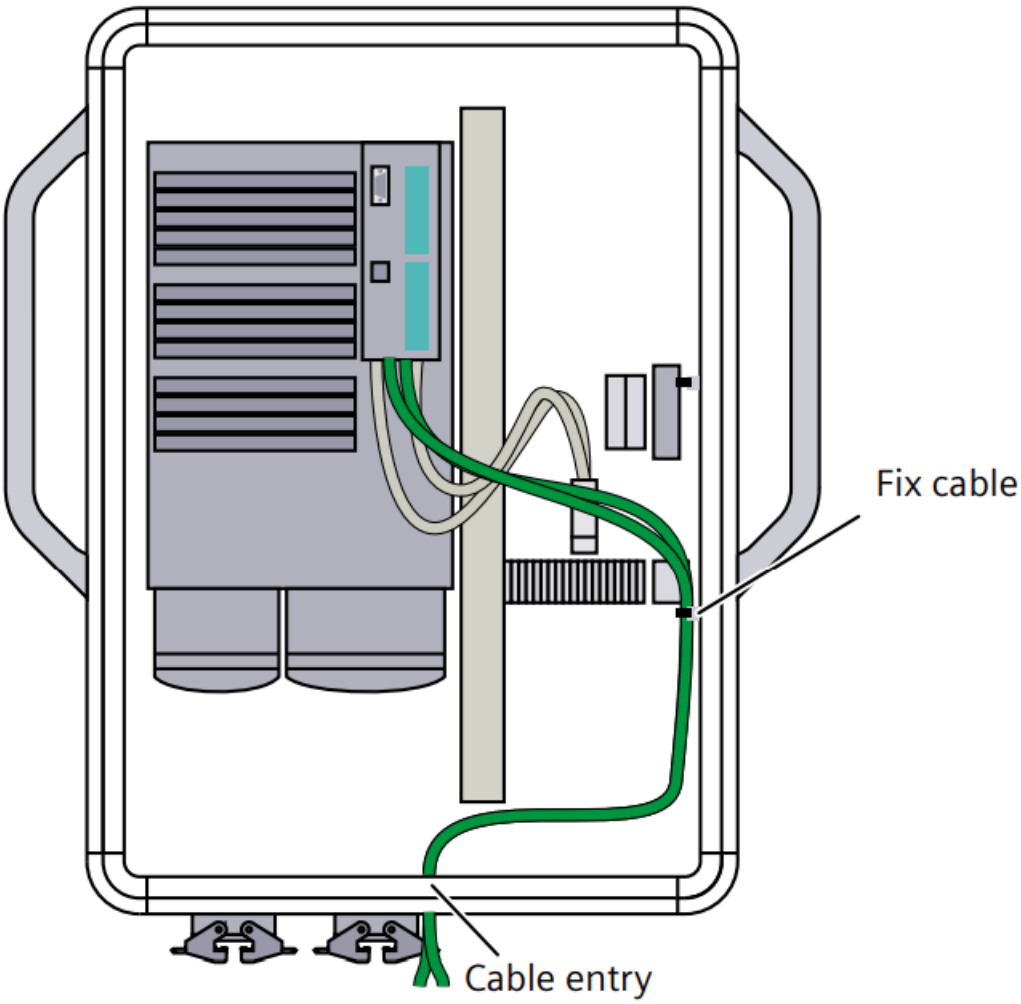


Figure 4-6 PROFINET connection at the converter

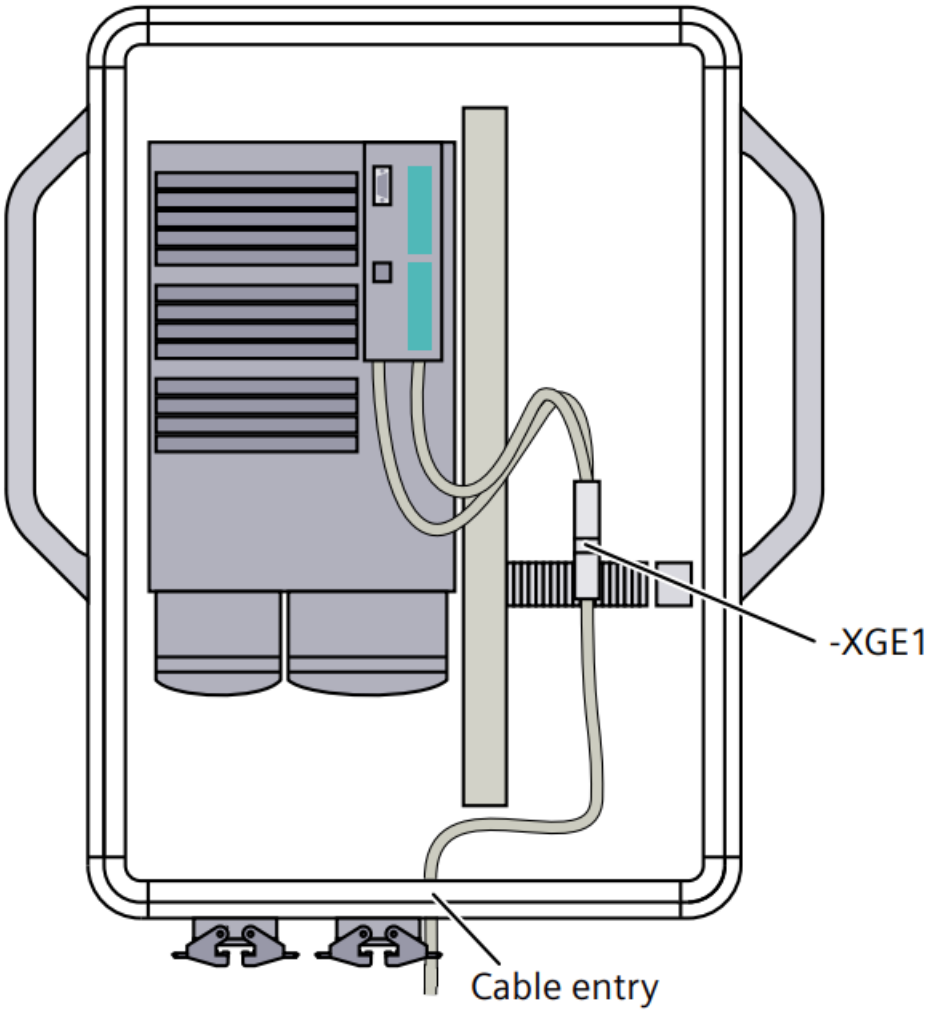
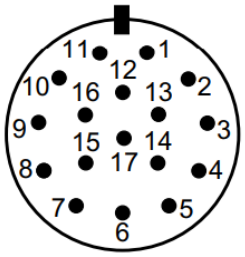
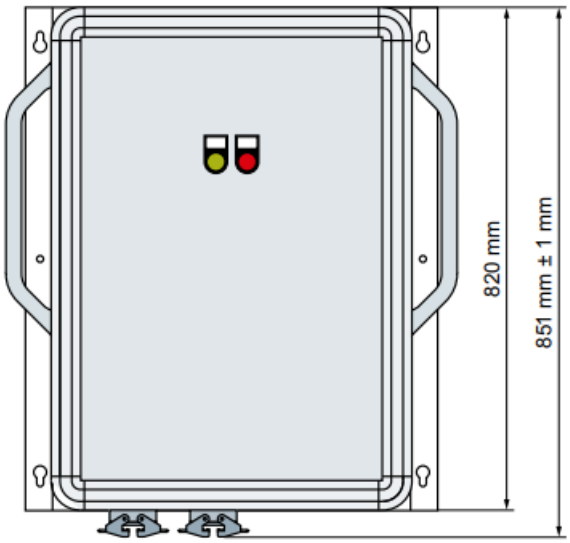
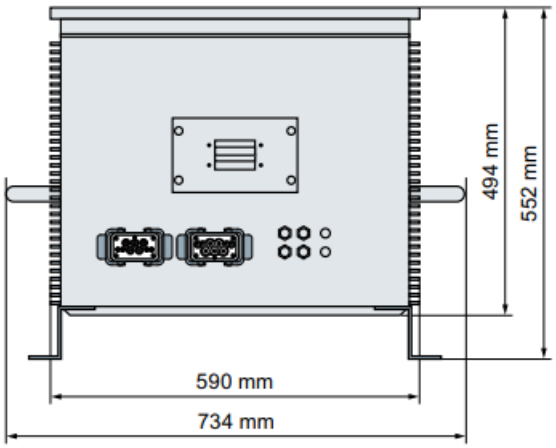


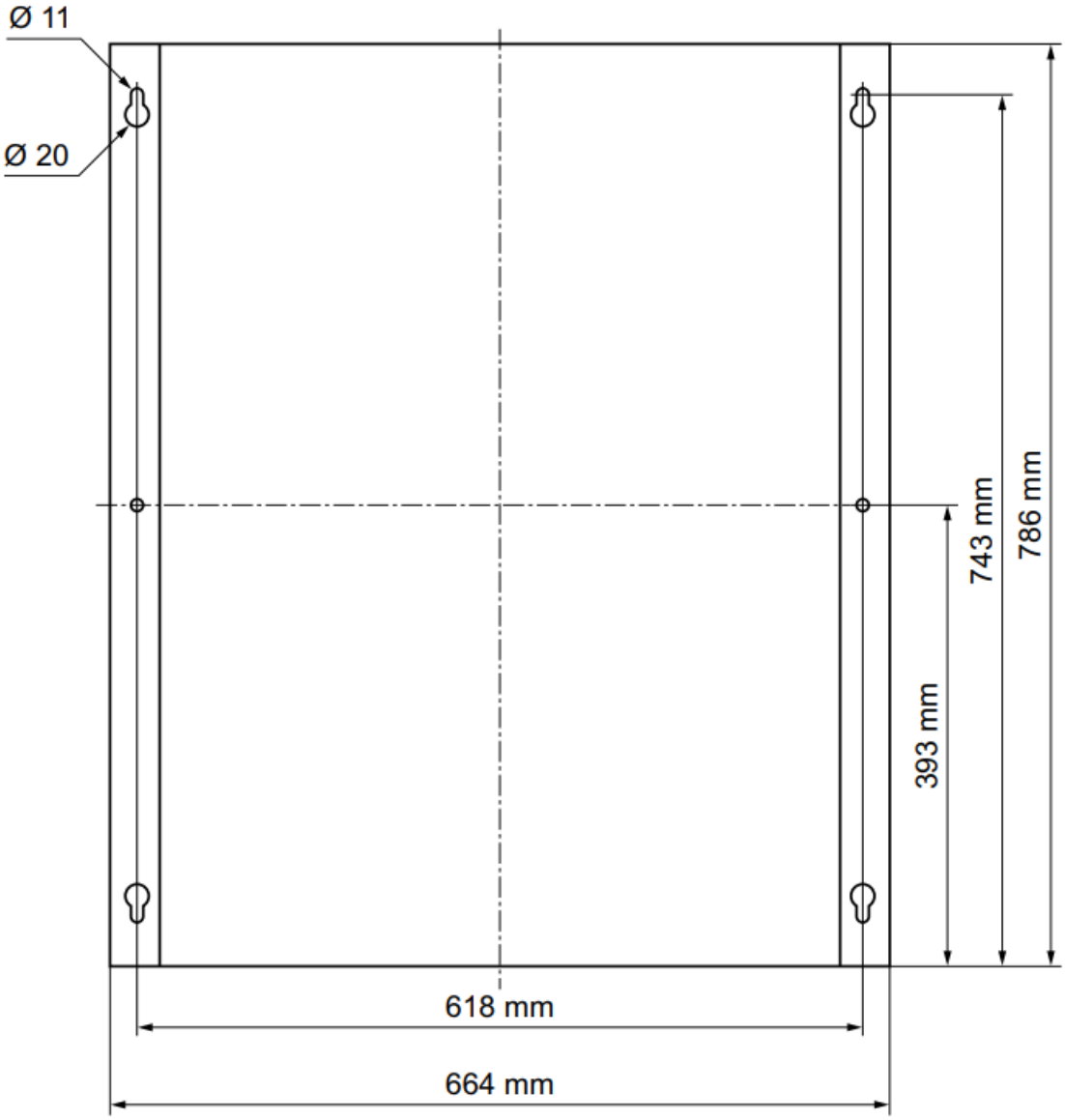
Figure 4-7 Encoder connection to -XGE1

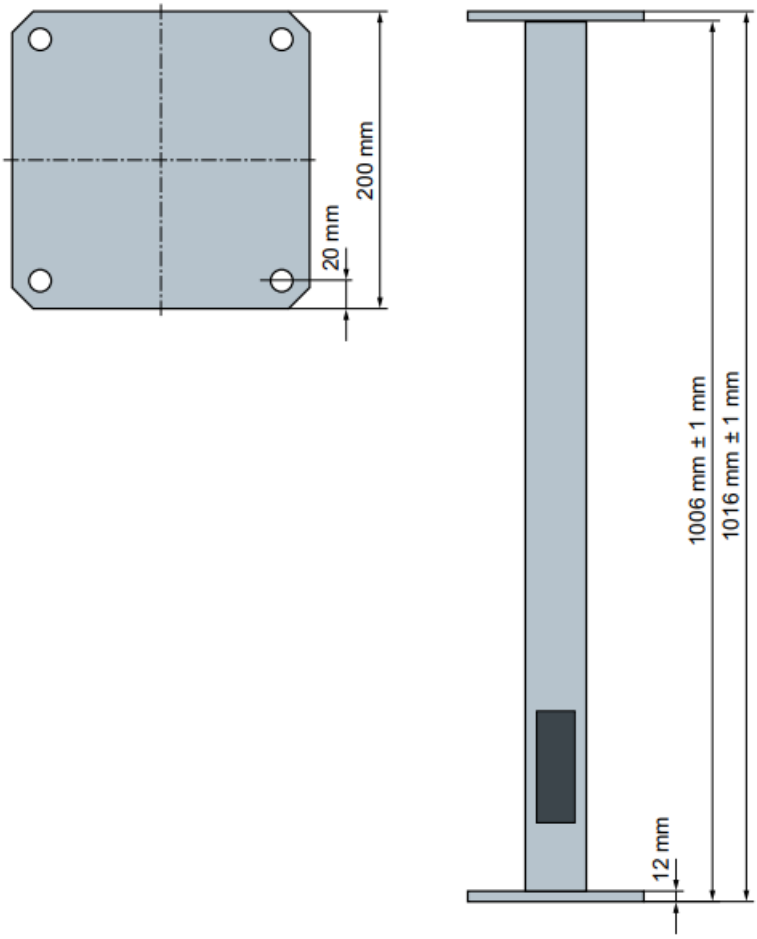
-XGE1, M23, socket	Pin	Assignment
	1 ... 6	Not assigned
	7	24 V output
	8	CLOCK+
	9	CLOCK-
	10	0 V
	11	Shield
	12	B+
	13	B-
	14	Data+
	15	A+
	16	A -
	17	Data-

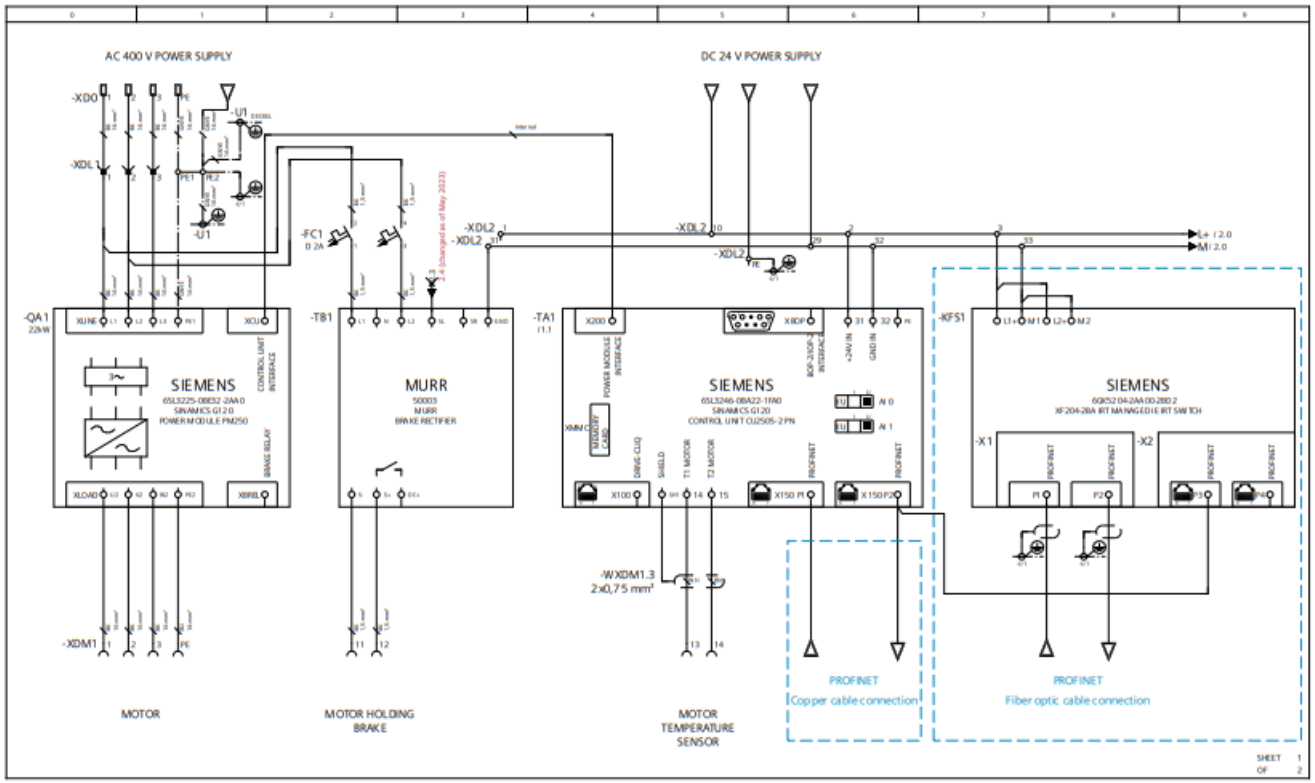
Indicator lights	Inverter status
	-PF1 lights up green: The inverter is ready.
	-PF2 lights up red: The inverter signals a fault.

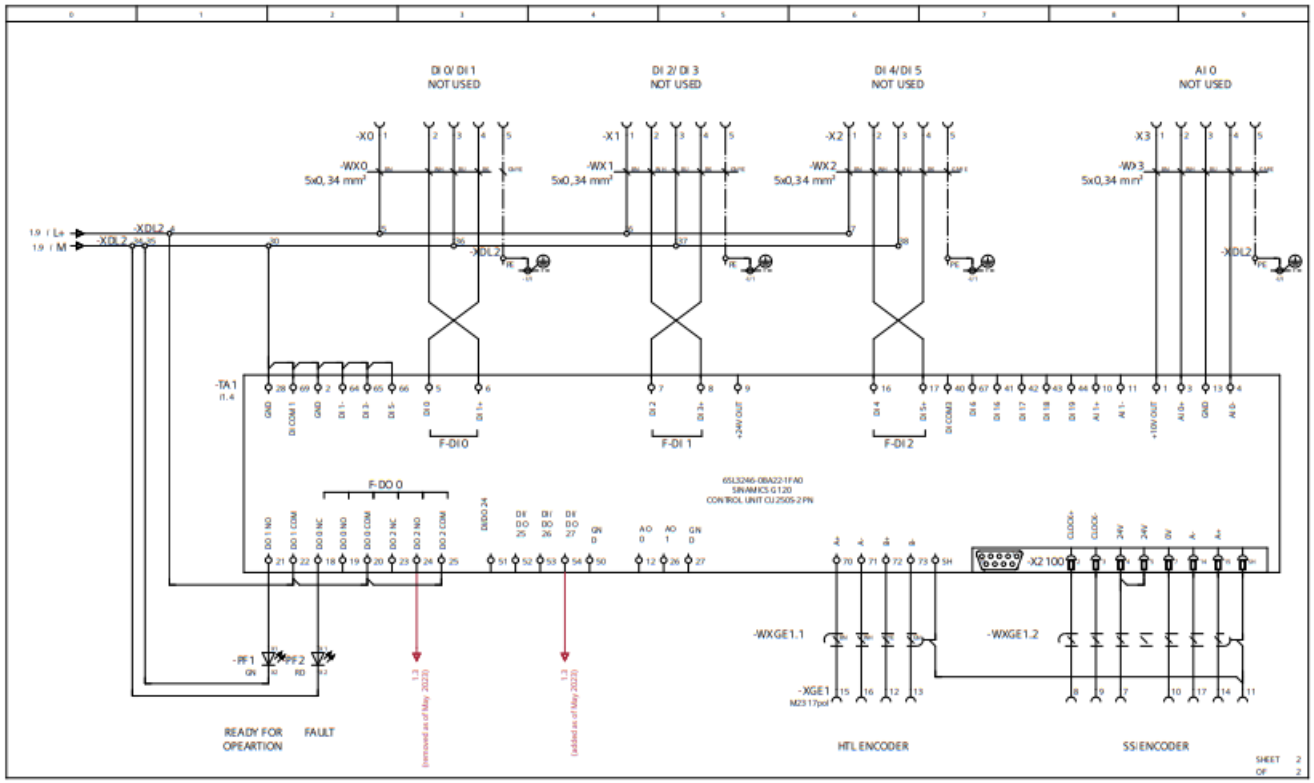

820 mm
851 mm ± 1 mm

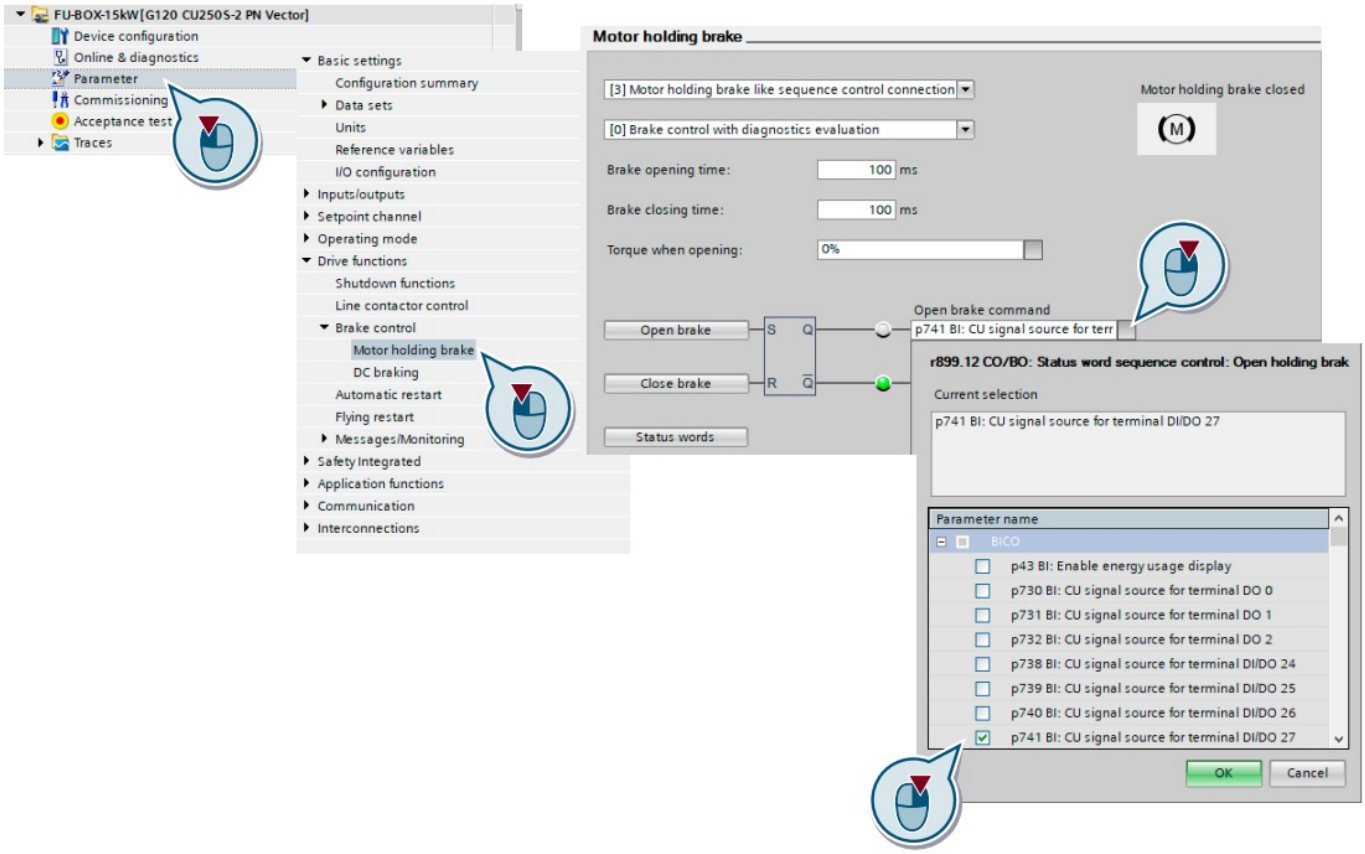

494 mm
552 mm
590 mm
734 mm


Ø 11
Ø 20
393 mm
743 mm
786 mm
618 mm
664 mm

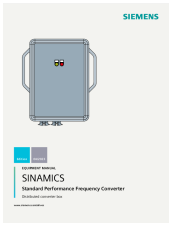

200 mm
20 mm
1006 mm ± 1 mm
1016 mm ± 1 mm
12 mm


AC 400 V POWER SUPPLY
DC 24 V POWER SUPPLY
-XDO
-XDL1
-XDL2
-QA1
22kW
SIEMENS
6SL3225-0BE32-2AA0
SINAMICS G120
POWER MODULE PM250
-TB1
MURR
50003
MURR
BRAKE RECTIFIER
-TA1
/1.1
SIEMENS
6SL3246-0BA22-1FA0
SINAMICS G120
CONTROL UNIT CU250S-2 PN
-KFS1
SIEMENS
6GK5204-2AA00-2BD2
XF204-2BA IRT MANAGED ETHERNET SWITCH
-X1
-X2
PROFINET
-WXDM1.3
2x0,75 mm²
-XDM1
L+ / 2.0
M / 2.0
MOTOR
MOTOR HOLDING BRAKE
MOTOR TEMPERATURE SENSOR
PROFINET
Copper cable connection
PROFINET
Fiber optic cable connection
SHEET 1
OF 2


DI 0/ DI 1
NOT USED
DI 2/ DI 3
NOT USED
DI 4/ DI 5
NOT USED
AI 0
NOT USED
-X0
-X1
-X2
-X3
-WX0
-WX1
-WX2
-WX3
5x0,34 mm²
-XDL2
-TA1
F-DI 0
F-DI 1
F-DI 2
F-DO 0
6SL3246-0BA22-1FA0
SINAMICS G120
CONTROL UNIT CU250S-2 PN
-X2 100
-WXGE1.1
-WXGE1.2
-XGE1
M23 17pol
-PF1
-PF2
READY FOR
OPEARTION
FAULT
HTL ENCODER
SSI ENCODER
(removed as of May 2020)
(added as of May 2020)
SHEET 2
OF 2



Documents / Resources

	SIEMENS A5E43491109B Standard Performance Frequency Converter [pdf] User Manual A700000010361187, A5E43491109B AD, A5E43491109B Standard Performance Frequency Converter, A5E43491109, Standard Performance Frequency Converter, Performance Frequency Converter, Frequency Converter, Converter

References

- SIOS
- SIOS
- SIOS

- SIOS
- SIOS
- Elektronik im Schaltschrank Murrelektronik Shop
- Aktiver Bremsgleichrichter Murrelektronik Shop
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- SIOS
- SIOS
- SIOS
- User Manual