

# IndraControl PR31 and VR31

Control cabinet PC and panel PC

**Operating Instructions**  
**R911397433**

Edition 02



## **Change Record**

Edition 02, 2020-06

Refer to [tab. 1-1 "Change record" on page 1](#)

## **Change Record**

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Development Automation Systems Control Platform JüKö (MaKo/MePe)

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# 1 About this documentation

## Editions of this documentation

Edition	Release date	Note
01	2019-07	First edition
02	2020-06	Device VR3112 supplemented

Tab. 1-1: Change record

## 1.1 Overview on target groups and product phases

In the following illustration, the framed activities, product phases and target groups refer to the present documentation.

Example: In the product phase "Mounting (assembly/installation)", the "mechanic/electrician" can execute the activity "install" using this documentation.

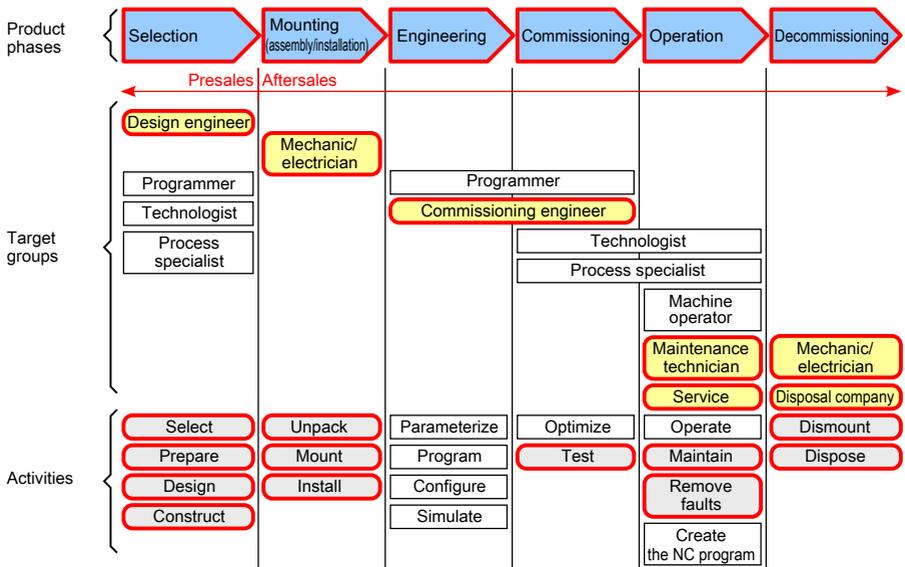


Fig. 1-1: Assigning the present documentation to the target groups, product phases and activities of the target group

## 1.2 Purpose

This document instructs the technical staff of the machine manufacturer on how to perform the mechanical and electrical installation safely and on how to commission the device.

Required qualification: Individual who is able to assess the tasks assigned and to identify possible safety risks owing to qualification in the subject, knowledge and experience. The individual should also be familiar with the standards and regulations.

### 1.3 Scope

This operating instruction applies to all control cabinet PCs and panel PCs whose type code starts either with "PR31..." or "VR31...": The type code is located on the type plate of the device, also refer to [chapter 2.1 "Product identification" on page 2](#).

### 1.4 Further documents

Title	Part number and document type
VAP 01	<a href="#">R911339613</a>
Power Supply Unit	Operating Instructions
VAU 02.1	<a href="#">R911384727</a>
Uninterruptible Power Supply	Operating Instructions
PR and VR Devices	<a href="#">R911384733</a>
Software Applications	Project Planning Manual
PR and VR Devices	<a href="#">R911384727</a>
Accessories	Project Planning Manual
VAC 08.1	<a href="#">R911400465</a>
CDI+ splitter	Operating Instructions

Tab. 1-2: Required and supplementing documentation

### 1.5 Customer feedback

Customer requests, comments or suggestions for improvement are of great importance to us. Please email your feedback on the documentations to [Feedback.Documentation@boschrexroth.de](mailto:Feedback.Documentation@boschrexroth.de). Directly insert comments in the electronic PDF document and send the PDF file to Bosch Rexroth.

## 2 Product identification and scope of delivery

### 2.1 Product identification

Description	Example
Part number	PN: R911123456
Type code	TYPE: PR3100...
Serial number	SN: 123456789123456
Plant	(7260)

Description	Example
Manufacturing date	MD: 17W40
Name of origin	Made in...
Company address	Bosch Rexroth AG, 97816 Lohr, Germany
CE conformity marking	CE
Rexroth barcode	
Test marking	I-V-C-B-T-V
Voltage specification	In 24 V DC
Current specification	In 2.5 A
Ambient temperature	T(amb) 0-55 °C
Software release	FW: W10IOT 2016 LTSB 1V02
Certification markings	UL, FCC, China-RoHS, ...

Tab. 2-1: Specifications on the type plate, example

## 2.2 Scope of delivery

- Control cabinet PC or panel PC
- Safety instructions
- Assembling kit, depends on the device type
- 24 V connection terminal
- Firmware image USB recovery stick

## 3 Using safety instructions

### 3.1 Structure of the safety instructions

The safety instructions are structured as follows:

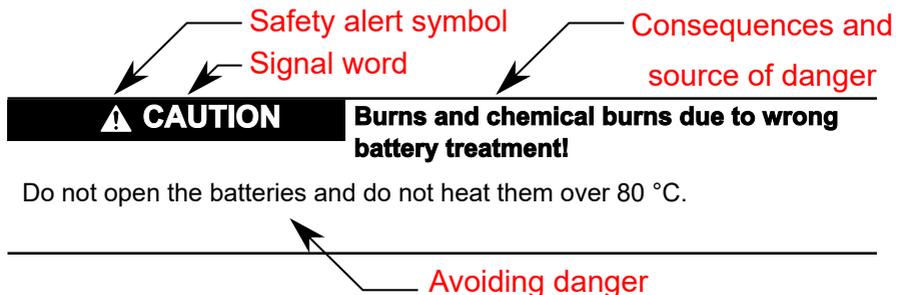


Fig. 3-1: Structure of the safety instructions

## 3.2 Explaining signal words and safety alert symbol

The safety instructions in this documentation contain specific signal words (danger, warning, caution, notice) and, if necessary, a safety alert symbol (according to ANSI Z535.6-2006).

The signal word draws attention to the safety instruction and indicates the risk potential.

The safety alert symbol (triangular safety reflector with exclamation marks), preceding the signal words Danger, Warning, Caution indicates hazards for persons.

---

### **DANGER**

In case of non-compliance with this safety instruction, death or serious injury **will** occur.

---

---

### **WARNING**

In case of non-compliance with this safety instruction, death or serious injury **can** occur.

---

---

### **CAUTION**

In case of non-compliance with this safety instruction, minor or moderate injury can occur.

---

---

### **NOTICE**

In case of non-compliance with this safety instruction, material damage can occur.

---

## 3.3 Symbols used

Pointers are displayed as follows:



This is a note.

---

Tips are displayed as follows:



This is a tip.

---

### 3.4 Explaining the signal alert symbol on the device



If this symbol is on your device, you have to observe the documentation on the device. The respective documentation informs on the type of hazard as well as the steps required to avoid this hazard.

## 4 Intended use

The PR31 and VR31 control cabinet and panel PCs are PC-based machine operator and visualization terminals. Depending on the application or configuration, they can also meet the control functionality. The devices are intended for the following use cases:

- Operator terminals, visualization terminals and programming terminals with an integrated soft control in stand-alone machines
- Operator terminals, visualization terminals and programming terminals for connected IndraControl controls

### **NOTICE**

**The device might be destructed if not the expressly stated accessories, mounting parts and other components, cables, lines, software and firmware are used.**

The PR31 and VR31 control cabinet and panel PCs may only be used as intended and with the accessories, mounting parts and other components specified in this documentation. Components that are not expressly mentioned must neither be attached nor connected. The same applies to cables and lines.

Only to be operated with the component configurations and combinations expressly defined and with the software and firmware specified in the corresponding functional description.

Typical areas of application of the operator display:

- Handling and assembly systems
- Packaging and food processing machines
- Printing and paper converting machines
- Machine tools
- Wood processing machines

The devices may only be operated under the mounting and installation conditions, the position and the ambient conditions (temperature, degree of protection, humidity, EMC etc.) specified in the related documentation.

## 5 Spare parts, accessories and wear parts

### 5.1 External 24 V power supply unit

Ordering code	Part number	Description
VAP01.1H-W23-024-010-NN	R911171065	External 24 V power supply unit for IndraControl V-devices

Tab. 5-1: External 24 V power supply unit for the operator display

### 5.2 Uninterruptible power supply

Ordering code	Part number	Description
VAU02.1S-024-024-072-NN	R911385289	Uninterruptible Power Supply 24 V DC, 72 watt with RS232 interface

Tab. 5-2: Uninterruptible power supply (UPS)

### 5.3 Splitter

Connecting unit to connect two operator displays with the same resolution and the same version to one control cabinet PC.

Ordering code	Part number	Description
VAC08.1SSP-HDM-2D2-NNNN	R911175117	Splitter for CDI+ interface

### 5.4 Connecting cables for CDI+ interface



Malfunctions caused by using inappropriate CDI+ cables.  
Use only cables listed in the following overview.

Ordering code	Part number	Description
RKB0008/000,5 (*****_*****_*****)	R911171484	Length: 0.5 m
RKB0008/001,0 (*****_*****_*****)	R911171485	Length: 1 m
RKB0008/002,5 (*****_*****_*****)	R911170151	Length: 2.5 m
RKB0008/005,0 (*****_*****_*****)	R911170152	Length: 5 m
RKB0008/007,5 (*****_*****_*****)	R911172971	Length: 7.5 m
RKB0008/010,0 (*****_*****_*****)	R911170153	Length: 10 m
RKB0008/015,0 (*****_*****_*****)	R911171183	Length: 15 m
RKB0008/020,0 (*****_*****_*****)	R911171184	Length: 20 m
RKB0008/025,0 (*****_*****_*****)	R911170154	Length: 25 m
RKB0008/030,0 (*****_*****_*****)	R911171381	Length: 30 m
RKB0008/035,0 (*****_*****_*****)	R911171369	Length: 35 m

Ordering code	Part number	Description
RKB0008/040,0 (*****_*****_*****)	R911171382	Length: 40 m
RKB0008/050,0 (*****_*****_*****)	R911171383	Length: 50 m
RKB0008/055,0 (*****_*****_*****)	R911173779	Length: 55 m
RKB0008/060,0 (*****_*****_*****)	R911173780	Length: 60 m
RKB0008/065,0 (*****_*****_*****)	R911173781	Length: 65 m
RKB0008/070,0 (*****_*****_*****)	R911173782	Length: 70 m

**Tab. 5-3:** Connecting cables to control cabinet PC, panel PC and operator display. Further cable lengths are available on request.



Further cable lengths are available on request.

## 5.5 USB connecting cables (USB 2.0)

Ordering code	Part number	Description
RKB0019/000,5 (*****_*****_*****)	R911171165	USB connecting cable, length 0.5 m
RKB0019/001,0 (*****_*****_*****)	R911171166	USB connecting cable, length 1 m
RKB0019/003,0 (*****_*****_*****)	R911171167	USB connecting cable, length 3 m
RKB0019/005,0 (*****_*****_*****)	R911171168	USB connecting cable, length 5 m

## 5.6 Connecting cables of the display port

The listed display port cables are provided with a special shielding. The display port cables meet the following specifications:

- Conform to the display port 1.2
- Resolutions up to 4096 x 2160
- Supports HDCP 1.3 and DPCP

Ordering code	Part number	Description
RKB0063/003,0 (*****_*****_*****)	R911391713	Connecting cable of the display port, length 3 m
RKB0063/005,0 (*****_*****_*****)	R911391714	Connecting cable of the display port, length 5 m

## 5.7 Wear parts

Wear parts are not subject to any warranty.

### 5.7.1 CMOS battery

The service life of the CMOS battery of type BR2032 is 5 to 7 years.

## 6 Ambient conditions

Humidity	85% at 40°C (non-condensing)
Operating temperature	0 to 55°C (with airflow 0.3 m/s)
Storage temperature	-20 to 60°C
Shock protection	DIN EN 60068-2-27
Overvoltage category	2
Contamination level	2, no condensation allowed
Mechanical strength	IEC 60068-2-64 Acceleration: SSD 2G

**Tab. 6-1:** Ambient conditions



The ambient air must not contain acids, alkaline solutions, corrosive agents, salts, metal vapors and other electrically conductive contaminants in high concentrations

The ambient air must be free from dust, housings and installation compartments must comply with the min. degree of protection IP 54 according to DIN VDE 0470-1.



This is a product that corresponds to the limit values of the emitted interference of class A (industrial environments), but not of class B (residential area and small enterprises).

When using the product in residential areas or small enterprises, the operator has to take actions to prevent radio interferences (also refer to DIN EN 55022).

### **NOTICE**

#### **Defective product due to gases jeopardizing functions**

Due to the risk of corrosion, avoid sulphurous gases (e.g. sulphur dioxide (SO<sub>2</sub>) and hydrogen sulphide (H<sub>2</sub>S)). The product is not resistant against these gases.

**NOTICE**

**Failure of the product due to contaminated air**

- The ambient air must not contain acids, alkaline solutions, corrosive agents, salts, metal vapors and other electrically conductive contaminants in high concentrations
- The devices to be installed into the housing and installation compartments must at least comply with the degree of protection IP 54 according to DIN EN 60529.
- The device shall be provided in a suitable fire enclosure in the end-use application.

## 7 Technical data

### 7.1 PC box

	PR3100
CPU	ATOM x5 E3940 1.6 GHz Quad Core
GPU	Intel® HD Graphics 500
Memory	DDR3L, 4 GB RAM, 8 GB optional
Audio	Analog output
Bulk memory	64 GByte or 256 GByte SSD
Mini PCIe (internal)	1 × Mini PCIe ● mPCIe interface module
Ethernet ports	2 × Gbit i210 with synchronous cycle
Serial ports	1 × RS-232 1 × RS-232, RS-422, RS-485
Serial port speed	115 kbps max.
USB	2 × USB 2.0 2 × USB 3.0
Display port	1 × DP
CDI+tx	1 × CDI+tx operating display connection at a large distance (optional)
TPM	TPM 2.0 (onboard) chip: INFINEON_SLB 9665TT2.0
RTC battery	Button cell BR2032
Mounting	Front upright mounting
Input voltage	24 V DC +25 %, -20 % with IEC 61131-2
Power consumption	60 W max.

PR3100	
Weight	2.8
Degree of protection	IP20

**Tab. 7-1:** Technical data of PR3100

2 × GBit LAN (optional)	
Controller	Intel® I350-AM2 LAN Controller
Ethernet	10/100/1000 Mbps

**Tab. 7-2:** Technical data 2 × GBit LAN

RS-422/485, electrically isolated (optional)	
COM interface type	RS-422/485
Host interface	USB 2.0
Plug-in connector	2 x D-Sub, 9-pin, male.
Insulation protection	2,000 V DC
ESD protection	15 KV
EFT protection	2,500 V
Surge protection	1,000 V DC

**Tab. 7-3:** Technical data RS-422/485, electrically isolated

RS-232, electrically isolated (optional)	
COM interface type	RS-232
Host interface	USB2.0
Plug-in connector	2x D-Sub 9-pin, male.
Insulation protection	2,000 V DC
ESD protection	15 KV
EFT protection	2,500 V
Surge protection	1,000 V DC

**Tab. 7-4:** Technical data of the RS-232, electrically isolated

## 7.2 Panel PC

	VR3110	VR3112	VR3115	VR3121
Display	257 mm TFT (10.1")	307 mm TFT (12")	396 mm TFT (15")	546 mm TFT (21")
	1280 × 800 pixels	1280 × 800 pixels	1366 × 768 pixels	1920 × 1080 pixels
	16.2 million colors	16.2 million colors	16.2 million colors	16.7 million colors

<b>Weight</b>	Approx. 4.1 kg	Approx. 5.1 kg	Approx. 7.0 kg	Approx. 9.4 kg
<b>Operation</b>	Projected capacitive 10-point multitouch			
<b>Surface of the front panel</b>	Chemically strengthened front glass			
<b>Degree of protection</b>	Front panel IP 66			

**Tab. 7-5:** Technical data of VR3110, VR3112, VR3115 and VR3121

## 7.3 Optical characteristic values

### 7.3.1 TFT

The maximum permissible number and type of pixel errors of TFT displays depends on the manufacturer and is defined by the respective incoming inspection of the vendor.

### 7.3.2 Input system or multi-touch front

The maximum permissible number, type and size of defects on the front, on the glass or between the display and the front – such as trapped dust, dirt and scratches is defined in the FT quality guideline.

## 8 Standards

The products have been developed according to the current German edition of the standards at the time of product development.

### 8.1 Standards used

Standard	Description
EN 60204-1	Safety of machinery – Electrical equipment of machines
EN 61000-6-4	Generic standards – Emission standard (industrial environments)
EN 61000-6-2	Generic standards – Noise immunity (industrial environments)
EN 60068-2-6	Vibration test
EN 60068-2-27	Shock test
EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

**Tab. 8-1:** Standards used

### 8.2 FCC

This device was tested and complies with the limit values for a digital device of class A as per part 15 of the FCC rules. These limit values should ensure an appropriate protection against harmful interferences if the device is operated in an industrial area. This device creates and uses high-frequency, it can radiate it

and it can cause harmful interferences of the wireless communication if it is not installed and used as specified in the operating instructions. Harmful interferences can result if this device is operated on a residential area. In this case, the user has to eliminate the interferences at his own expense.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interferences.
- This device has to tolerate any receiving interferences, including interferences that can cause undesired operation.

## 8.3 CE marking

### 8.3.1 Declaration of conformity

The electronic products described in these instructions comply with the requirements and the target of the following EU directive and the following harmonized European standards:

EMC directive 2014/30/EU

The electronic products described in the present instructions are intended for use in industrial environments and comply with the following requirements:

Standard	Title
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) Part 6-2: Generic standards – Immunity for industrial environments
DIN EN 61000-6-4	Electromagnetic compatibility (EMC) Part 6-4: Generic standards – Emission standard for industrial environments

**Tab. 8-2:** Standards for electromagnetic compatibility (EMC)



#### **Loss of CE conformity due to modifications at the device**

CE marking applies only to the device upon delivery. After modifying the device, verify the CE conformity.

## 8.4 UL/CSA certified

The devices are certified acc. to

- UL 61010-2-201 (Industrial Control Equipment) and
- CSA22.2 No. 61010-2-201 (CSA)

UL file no. E210730.

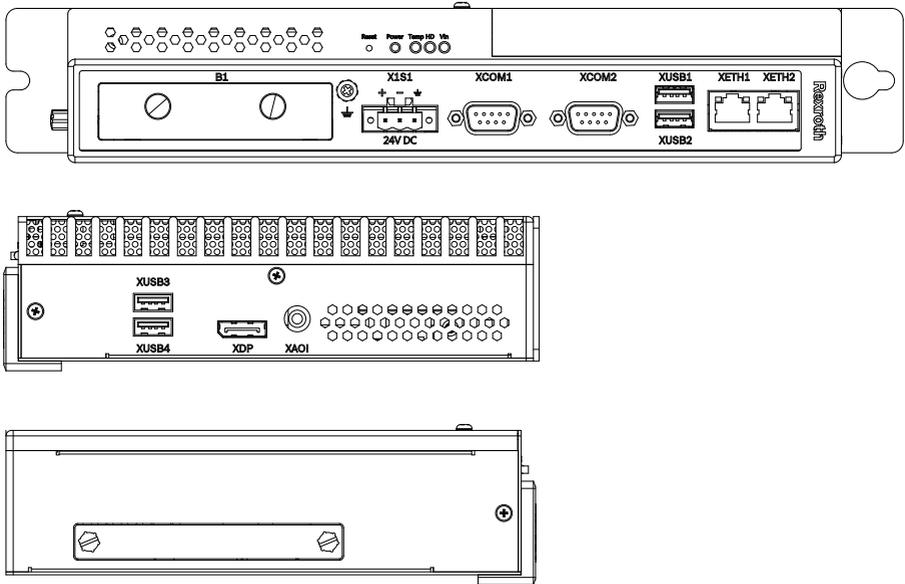
However, there can be combinations or extension stages with a limited or missing certification. Thus, verify the registration according to the UL marking on the device.



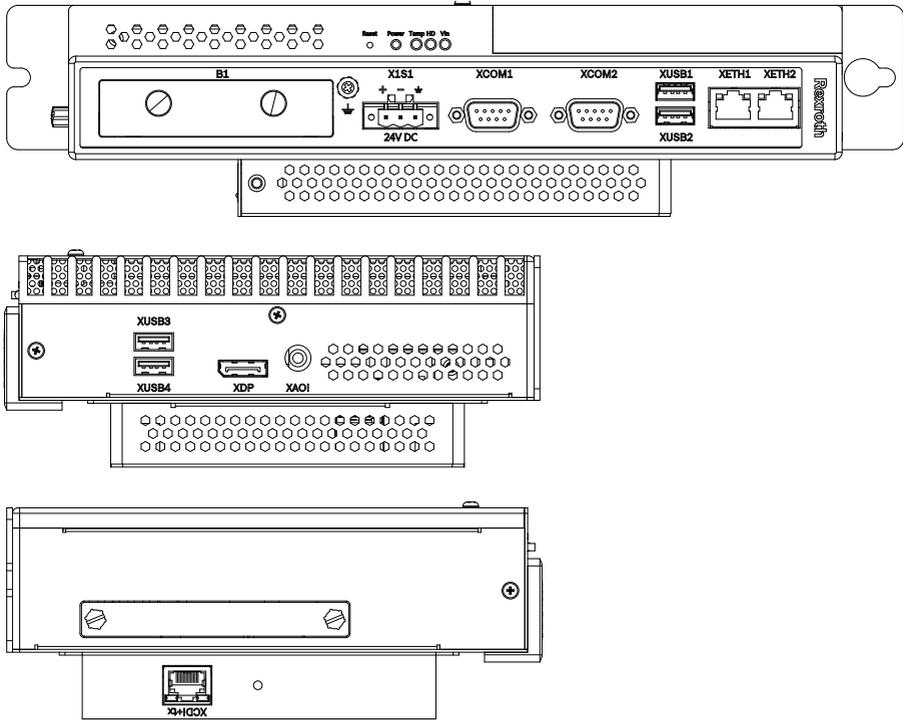
**Loss of UL/CSA conformity due to modifications at the device**

UL and CSA marking applies only to the device upon delivery. After modifying the device, verify the UL and the CSA conformity.

## 9 Interfaces



**Fig. 9-1:** Interfaces PR31 without CD+ interface. At the front side (up), at the upper housing site (middle) and the mass memory slot at the bottom of the housing (down).



**Fig. 9-2:** Interfaces PR31 with CDI+ interface. At the front side (up), at the upper housing site (middle), the mass memory slot and the CDI+ interface at the bottom of the housing (down).

## 9.1 Overview

The following connections are available:

Labeling at the housing	Connection type	Connection type (at the device)	Mating connector or cable (from outside)
X1S1	PC voltage supply	Male connector strip, 3-pin	Female connector strip, 3-pin
XCOM1/2	Serial interfaces	D-SUB plug, 9-pin	D-SUB socket, 9-pin
XETH1, XETH2	Ethernet interfaces	RJ45 socket, 8-pin	RJ45 plug (twisted pair, 8-wire)
XUSB1, XUSB2	USB3.0 interfaces	USB socket, 8-pin, type A	USB plug, 8-pin, type A
XUSB3, XUSB4	USB2.0 interfaces	USB socket, 4-pin, type A	USB plug, 4-pin, type A

Labeling at the housing	Connection type	Connection type (at the device)	Mating connector or cable (from outside)
XDP	Connection for external monitor	Display port socket, (20-pin)	Display port plug, (20-pin)
XAOI	Connection for external audio	3.5 mm jack socket	3.5 mm jack plug
XDI+tx	Connection for a remote operating display Optional	RJ45 socket, 8-pin	RJ45 plug (twisted pair, 8-wire)

Tab. 9-1: Interfaces

**NOTICE**

**Malfunions due to insufficient shielding!**

Use only shielded cables and metallic or conductive connector/coupling covers with large-area shield support.

## 9.2 PC voltage supply X1S1

The 24 V DC voltage supply for the control cabinet PC is connected via the "X1S1" connection.

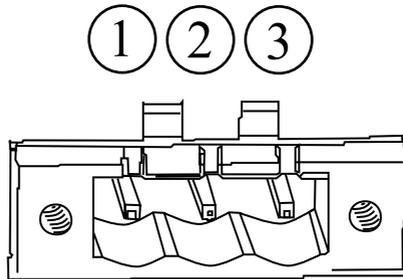


Fig. 9-3: Interface for 24 V voltage supply

Pin	Function
①	+24 V supply voltage
②	0 V supply voltage
③	Functional earth

Tab. 9-2:

## 9.3 USB interfaces XUSB1 to XUSB4

The devices are provided with four USB interfaces on the connector panel (XUSB1/2: USB 3.0, XUSB3/4: USB 2.0).

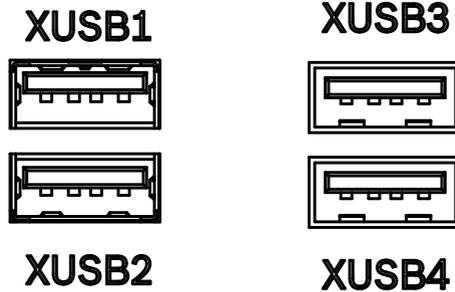


Fig. 9-4: USB interfaces



The maximum current carrying capacity per USB socket is 500 mA for the USB2.0 and 900mA for the USB3.0.

## 9.4 Ethernet interfaces XETH1 and XETH2

The control cabinet PC can be connected to an Ethernet network via the Ethernet interfaces XETH1 and XETH2.

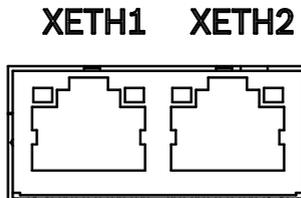


Fig. 9-5: Ethernet interfaces

## 9.5 DisplayPort XDP

At the display port (XDP), an operating display DR or a monitor can be connected to the display port interface. An active converter is required to connect a DVI or HDMI monitor, as the internal graphics card does not provide any automatic detection and switching between DVI-HDMI protocol and display port protocol. No image is shown if a passive adapter is used.

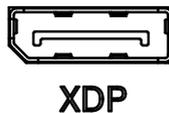


Fig. 9-6: Display port interfaces

## 9.6 Long distance XCDI+tx

At the long-distance (XCDI+tx), a cable length of up to 100 m can be used to interconnect remote operating displays to the individual devices.

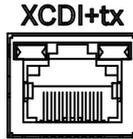


Fig. 9-7: XCDI+ connection

## 9.7 Optional extension modules

### 9.7.1 Ethernet interfaces

#### Gigabit Ethernet

PCIe 2 port Gigabit Ethernet.

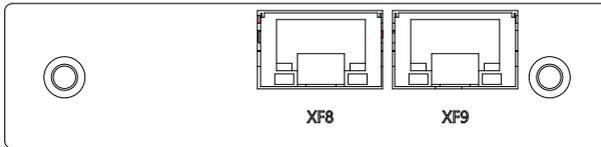


Fig. 9-8: Optional extension module 2 port Gigabit Ethernet

### 9.7.2 Serial interfaces

#### RS-422/485, electrically isolated

The RS-422/485 interfaces are two electrically galvanically isolated interfaces that are connected internally to the PC via the USB2.0 host.

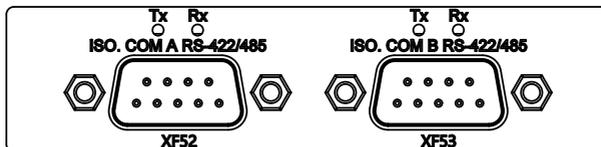
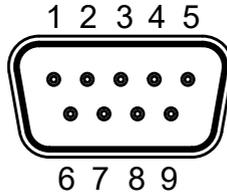


Fig. 9-9: Optional extension module, RS-422/485, electrically isolated



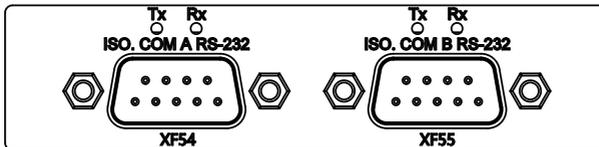
**Fig. 9-10:** Pin assignment RS-422/485, 9-pin, male

Pin	RS-422	RS-485
1	Tx-	Data-
2	Tx+	Data+
3	Rx+	-
4	Rx-	-
5	GND	GND
6	RTS-	-
7	RTS+	-
8	CTS+	-
9	CTS-	-

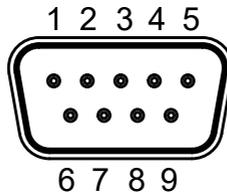
**Tab. 9-3:** Pin assignment RS-422/485, 9-pin, male

### RS-232, electrically isolated

The RS-232 interfaces are two electrically galvanically isolated interfaces that are connected internally to the PC via the USB2.0 host.



**Fig. 9-11:** Optional extension module, RS-232, electrically isolated



**Fig. 9-12:** Pin assignment RS-232, 9-pin, male

Pin	RS-232
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Tab. 9-4: Pin assignment RS-232, 9-pin, male

## 10 Mounting, demounting and electric installation

### **NOTICE**

Mechanic damage due to incorrect mounting torque.

Tighten the screws and nuts with the corresponding torque according to the following table.

Thread	Tightening torque
M2.5	0.4 Nm
M3	0.7 Nm
M4	1.4 Nm
M5	2.8 Nm
M6	3.0 Nm

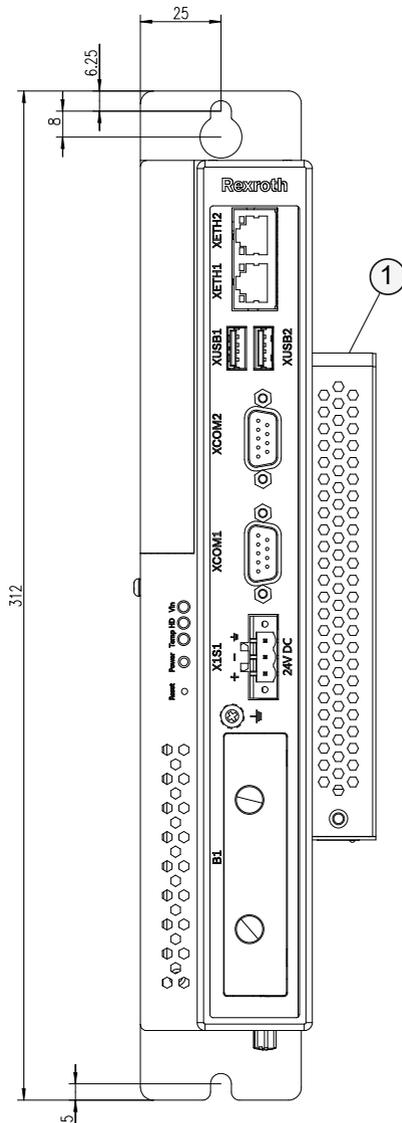
Tab. 10-1: Tightening torque

### 10.1 Dimensions of the PC box

The control cabinet PC can be mounted in front upright mounting using mounting holes. For the corresponding dimension, refer to the following figures:



Fasten the devices using M6 screws.



① Optional CDI+ box

**Fig. 10-1:** Mounting dimensions for device, front upright mounting

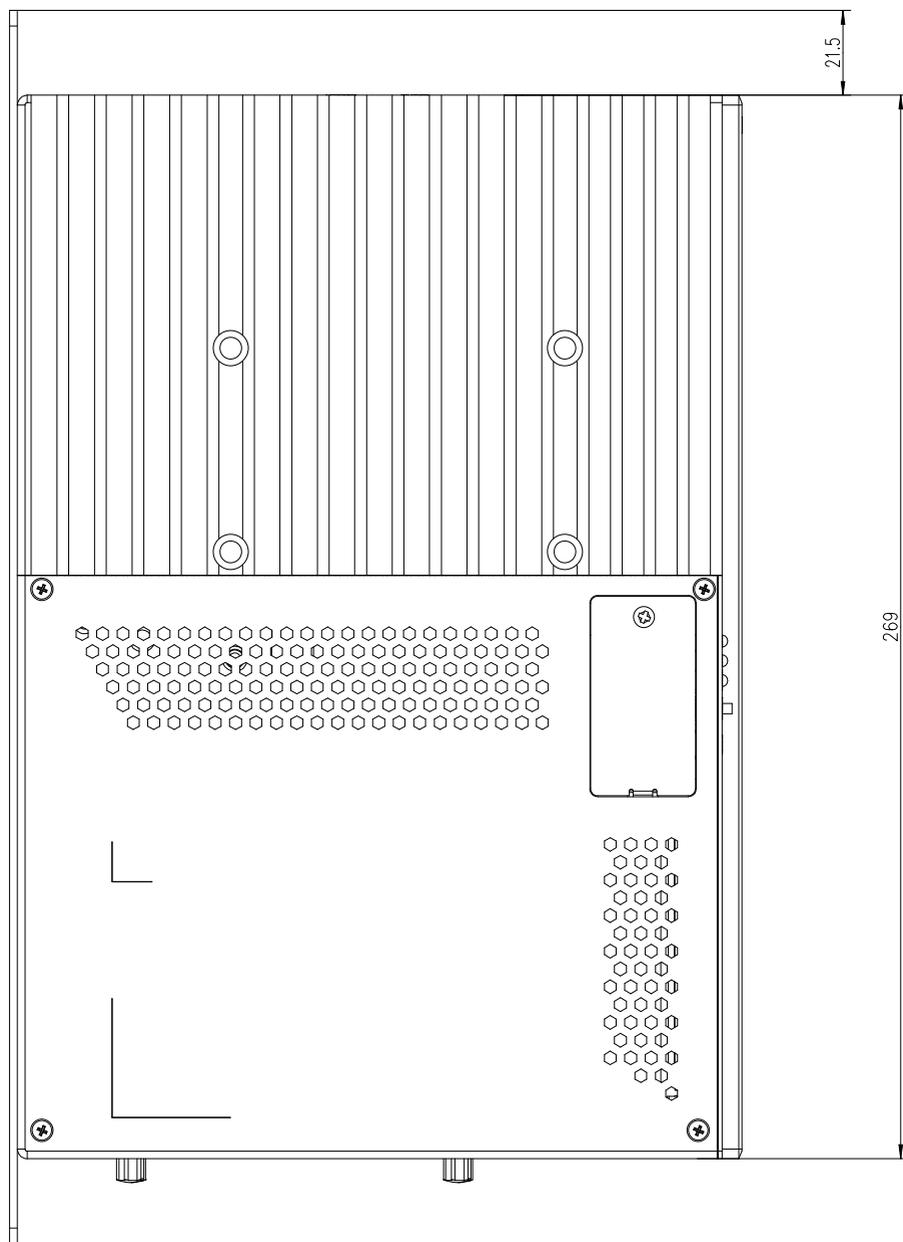
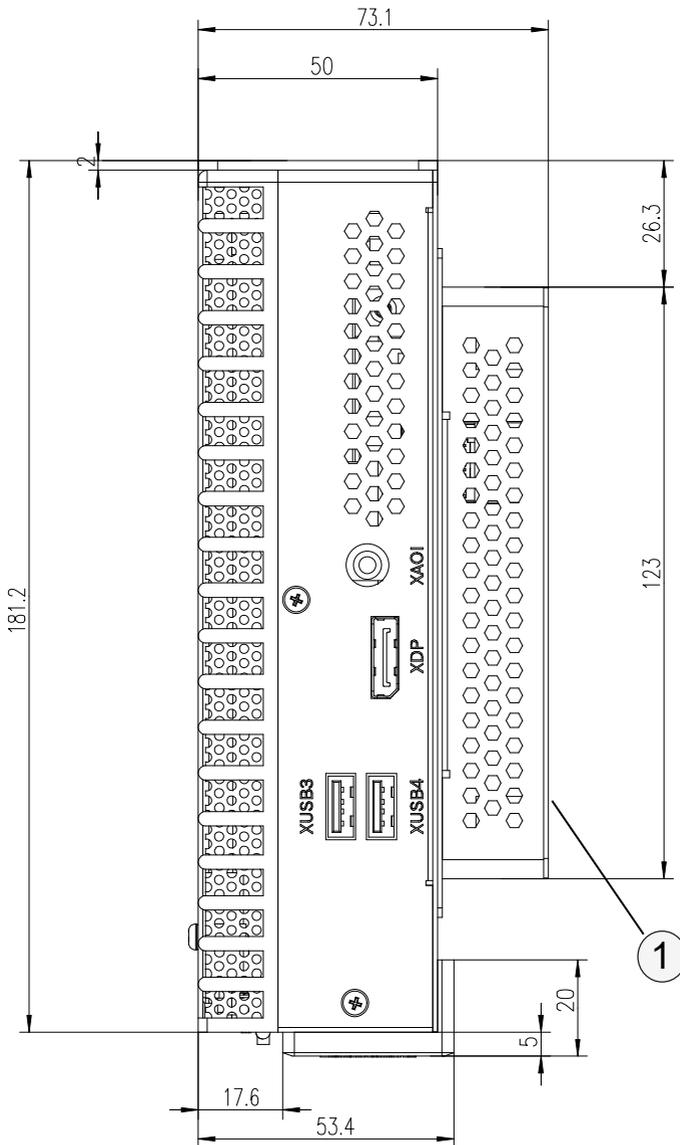


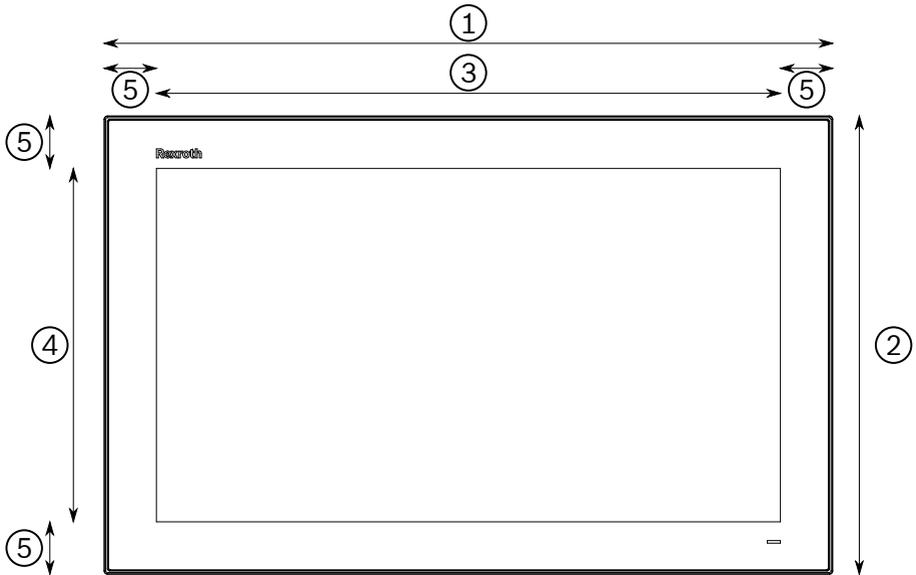
Fig. 10-2: Housing dimensions, left side view



① Optional CDI+ box

**Fig. 10-3:** Housing dimensions, top view

## 10.2 Housing dimensions of the panel PCs, front views VR3110, VR3112, VR3115 and VR3121

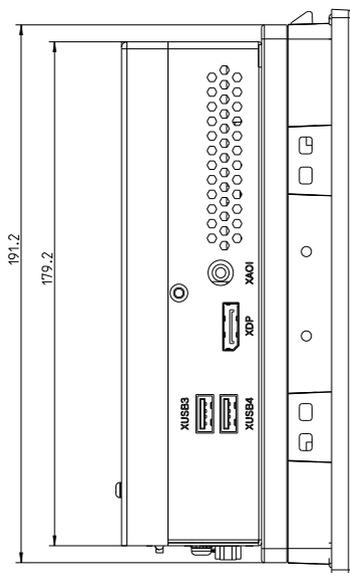


**Fig. 10-4:** Front view of the Panel PC

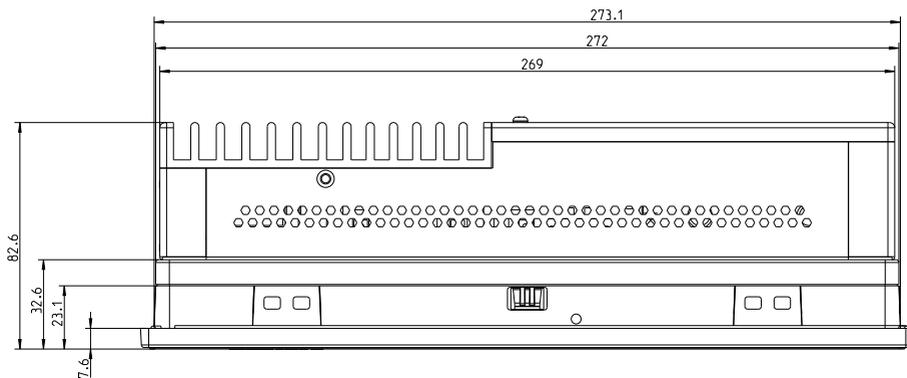
	①	②	③	④	⑤
Display size	Device width	Device height	Display width	Display height	Frame width
10"	283	202	218	137	33
12"	329	231	262	165	33
15"	420	269	346	195	37
21"	558	350	478	270	40

**Tab. 10-2:** Housing dimensions of the VR3110, VR3115 and VR3121 in millimeters

### 10.3 Housing dimensions of the panel PC VR3110



**Fig. 10-5:** Housing dimensions of the device VR3110, left side view



**Fig. 10-6:** Housing dimensions of the device VR3110, top view

### 10.4 Housing dimensions of the panel PC VR3112

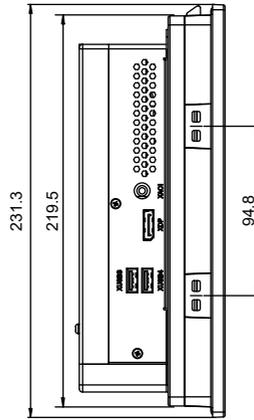


Fig. 10-7: Housing dimensions of the device VR3112, left side view

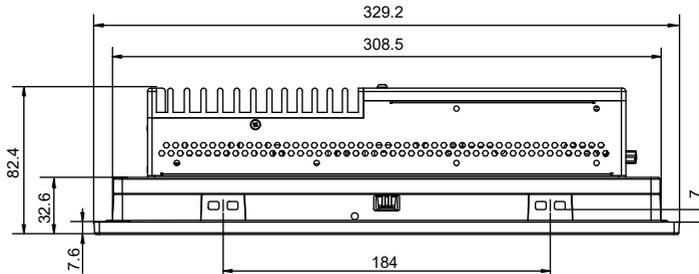
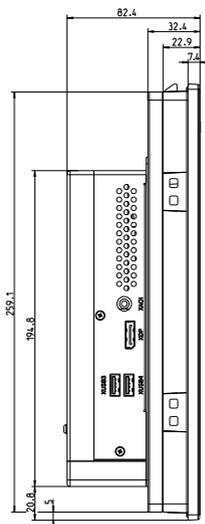
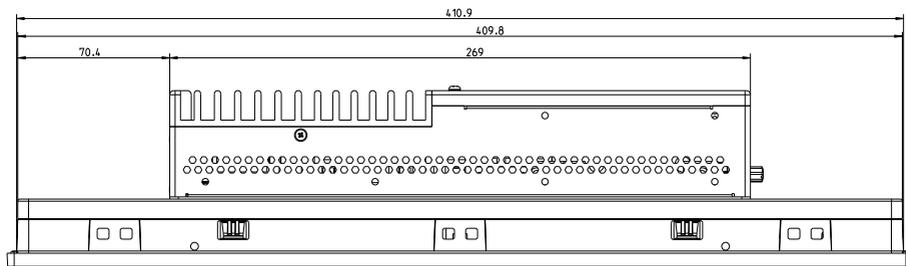


Fig. 10-8: Housing dimensions of the device VR3112, top view

## 10.5 Housing dimensions of the panel PC VR3115



**Fig. 10-9:** Housing dimensions of the device VR3115, left side view



**Fig. 10-10:** Housing dimensions of the device VR3115, top view

## 10.6 Housing dimensions of the panel PC VR3121



The panel PC of type VR3121 is available as horizontal and as vertical variant. Only the horizontal variant is described in the following, as the variants differ only in the front labeling.

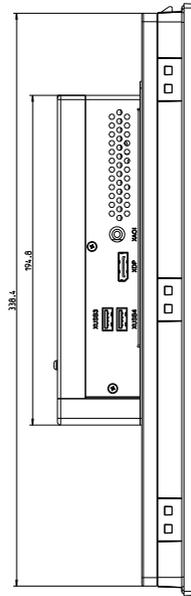


Fig. 10-11: Housing dimensions of the device VR3121, left side view

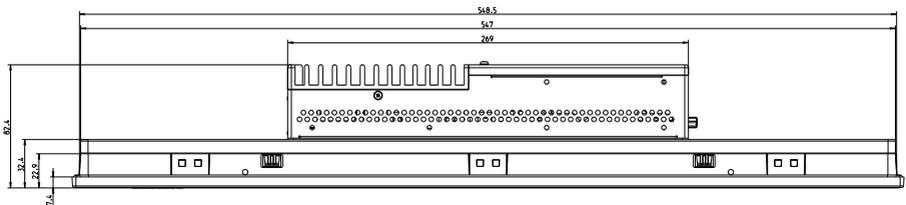


Fig. 10-12: Housing dimensions of the device VR3121, top view

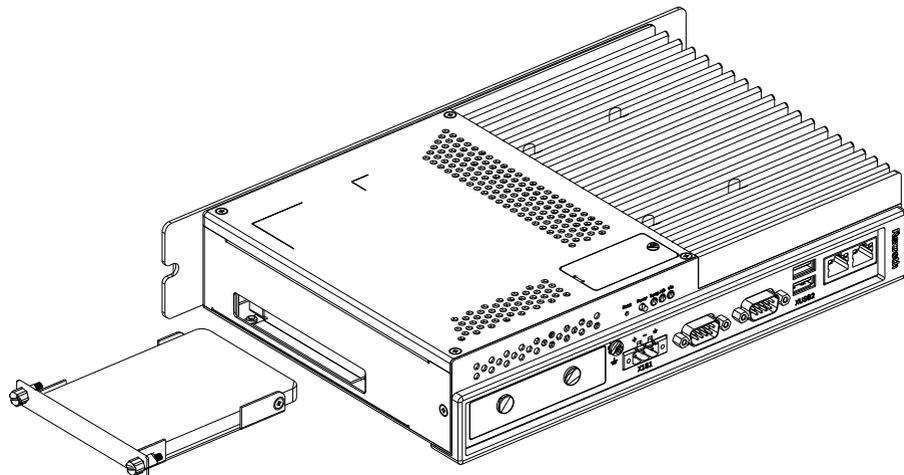
## 10.7 Installation notes

- Provide a space of 50 mm on all sides for sufficient cooling and cable routing.
- The LED display on the operator panel must not be covered.
- Wire all cables in loops. Use strain reliefs for all cables.
- Install the operator display only vertically, with a max. deviation of  $\pm 45^\circ$ , measured from the vertical.
- Do not lay the CDI cables in parallel to motor cables or to other noise sources, as the CDI connection can be disturbed. Keep the maximum distance possible from interference sources.

## 10.8 Installing components

### 10.8.1 SSD and C-Fast mass memory installation

The devices PR/VR31 are provided with a slot which is either equipped with an SSD memory or with a C-Fast memory (ordering option).



**Fig. 10-13:** Bulk memory integration

### 10.8.2 Replacing the CMOS battery

To replace the CMOS battery BR2032, open the cover on the top of the housing.

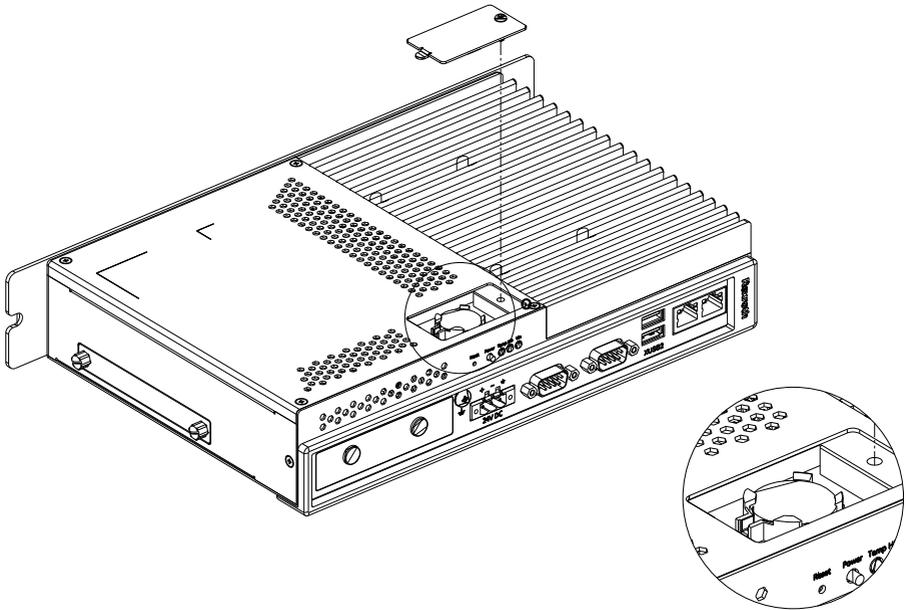


Fig. 10-14: Replacing the CMOS battery



Ensure the correct polarity when inserting the new CSMO battery!

## 10.9 Device mounting of the panel PC

Install the panel PC as follows:



### Loss of degree of protection IP 66!

The housing in which the panel PC is installed, has to meet the following conditions:

- Free from impurities
- Sufficient mechanical strength and flatness

These criteria influence the required IP degree of protection to a great extent.

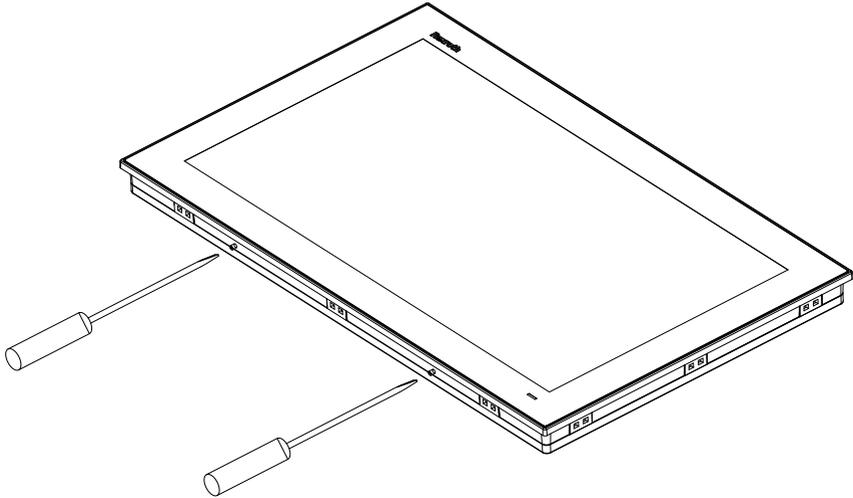
Further required measures have to be taken depending on the mounting location, e. g. the stabilization of the mounting frame.



### Material thickness to mount the Panel PC:

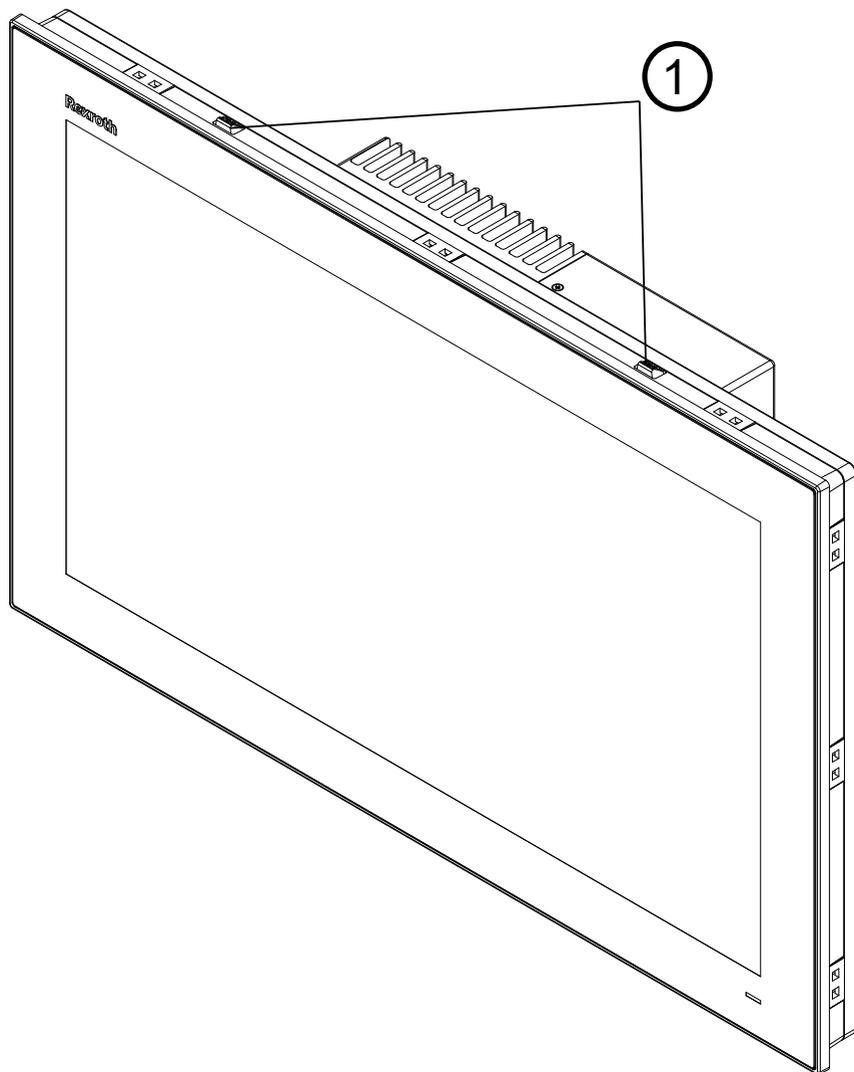
The panel PC is installed into the housing. The material thickness of the housing has to be between 2 mm and 6 mm.

1. Creating a mounting cut-out, refer to [chapter 10.10 "Mounting cut-out"](#) on [page 34](#)
2. Remove two mounting screws at the bottom of the display. These screws fixedly attach the display when inserted into the mounting cut-out.



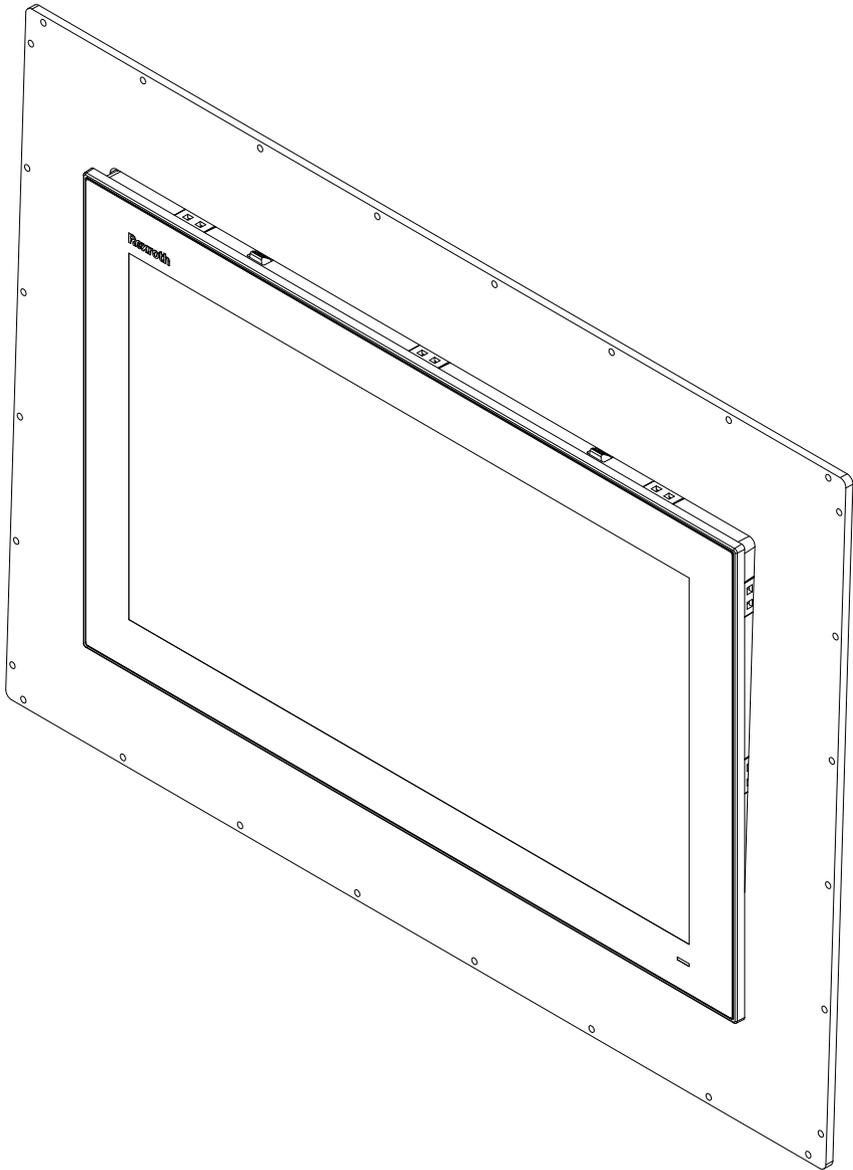
**Fig. 10-15:** Mounting screws at the bottom of the display

3. Install the panel PC into the mounting cut-out. The detents fasten the panel PC in the opening.



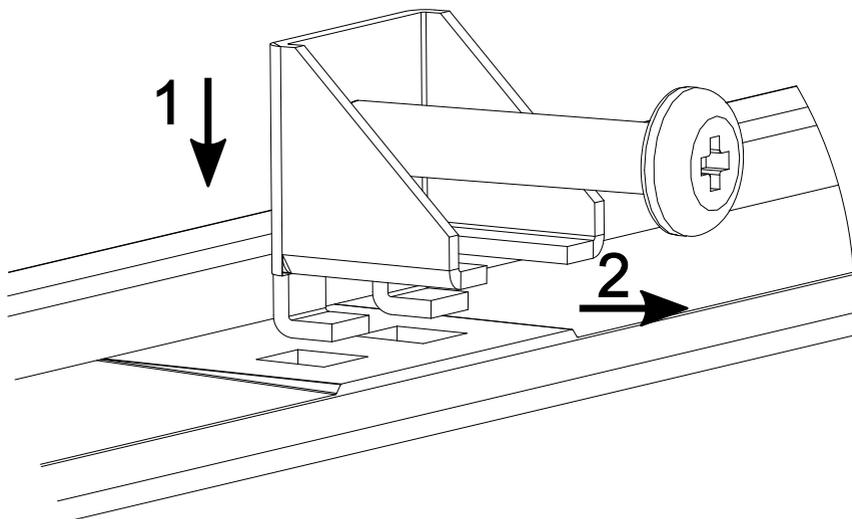
① Detents

**Fig. 10-16:** Detents on the upper side of the display

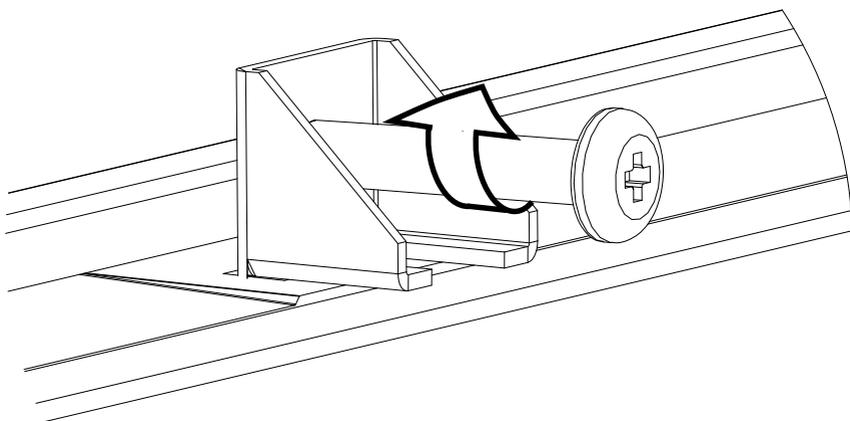


**Fig. 10-17:** Display in the mounting cut-out

4. Insert each fastening element into an opening and pull the fastening element back until it is in the rear part of the opening:



**Fig. 10-18:** Inserting fastening element into the opening  
5. Tighten the cross-slotted screws.

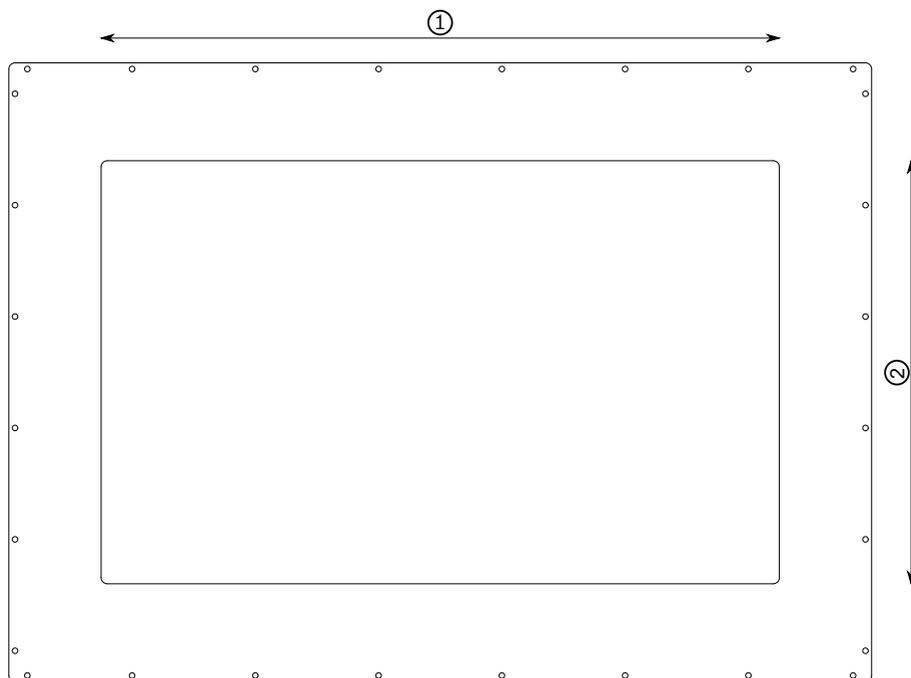


**Fig. 10-19:** Panel PC holders



To ensure a high degree of moisture resistance, use a mounting torque of 0.5 Nm (4.5 lb-in).

## 10.10 Mounting cut-out



① Mounting cut-out

**Fig. 10-20:** Mounting cut-out

Display size	Width ①	Height ②
10"	275.00 mm, tolerance $\pm 0.7$	194.00 mm, tolerance $\pm 0.4$
12"	308.50 mm, tolerance $\pm 0.7$	219.50 mm, tolerance $\pm 0.4$
15"	412.40 mm, tolerance $\pm 0.7$	261.70 mm, tolerance $\pm 0.4$
21"	550.30 mm, tolerance $\pm 0.7$	341.80 mm, tolerance $\pm 0.4$

**Tab. 10-3:** Mounting cut-out in millimeters



Ensure the IP protection class:

- Observe the tolerance specifications for the mounting cut-out!
- Observe the wall thickness for the mounting cut-out! Minimum of 2 mm and maximum of 6 mm.
- Consider the weight of the display and of the PC. Especially if there is a strong vibration. Reinforce the front plate with slates at the internal side close of the mounting cut-out if required.

## 10.11 Demounting

1. Disconnect the panel PC from voltage.
2. Remove all connected cables.
3. Loosen the screws of the fastening elements.
4. Remove the fastening elements.
5. Press the detents of the installation aid from top. Ensure that the panel PC is prevented from falling out of the mounting cut-out!
6. Remove the panel PC from the mounting frame.

## 10.12 Electric installation

### 10.12.1 Connecting the control cabinet PC to operator display

Connection diagram

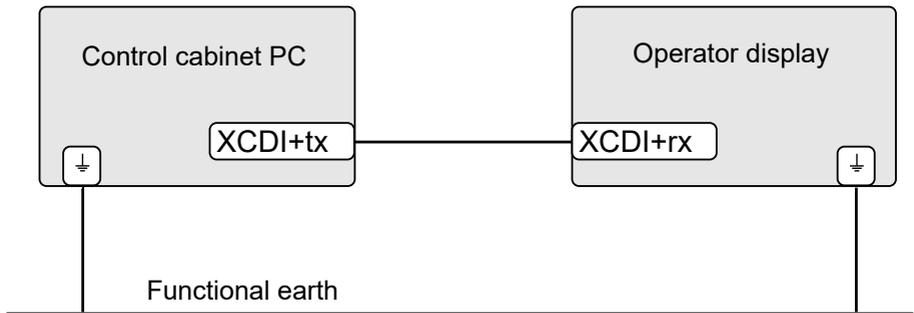


Fig. 10-21: Wiring the control cabinet PC to the operating display

### Connection

1. Connect the functional earth.



2. Connect the XCDI+tx interface at the control cabinet PC to the XCDI+rx interface at the respective operating display using a CDI+ cable.

**NOTICE****Material damages to electronics due to missing functional earth!**

Ensure that the functional earth is connected, as otherwise the electronics can be destroyed by a potential difference between the operating display and the control cabinet PC if the voltage supply is interrupted to only one device and established again. A direct connection of the functional earth between the operator display and the control cabinet PC is optimal. If the functional earth is connected to a neutral point, the control cabinet PC has to be connected to this neutral point as well.



When installing CDI cables with a diameter of 7.4 mm, observe the following bending radius:

- Radius (when bended once while routing):  $4 \times$  cable diameter
- Minimum bending radius (when moved permanently):  $8 \times$  cable diameter
- Optimum bending radius (when moved permanently):  $12.5 \times$  cable diameter

**Operation breakdown due to mechanical forces on the CDI cables.**

Avoid mechanical stress (tensile, compressive, torsional and lateral forces) caused by plugs to the RJ45 socket.

**Malfunctions caused by using inappropriate cables.**

Use only cables listed in [chapter 5.4 "Connecting cables for CDI+ interface"](#) on page 6

### 10.12.2 Connecting the control cabinet PC to multiple operating displays

Up to three operating displays of the type DR/DE can be connected serially to the PR3 devices using the CDI+ interface. The operating displays only operate in the "Clone" mode. The advanced mode can only be used if a second display is connected to the display port. The touch function is always active on all operating displays. Entries can not be blocked at individual operating displays.

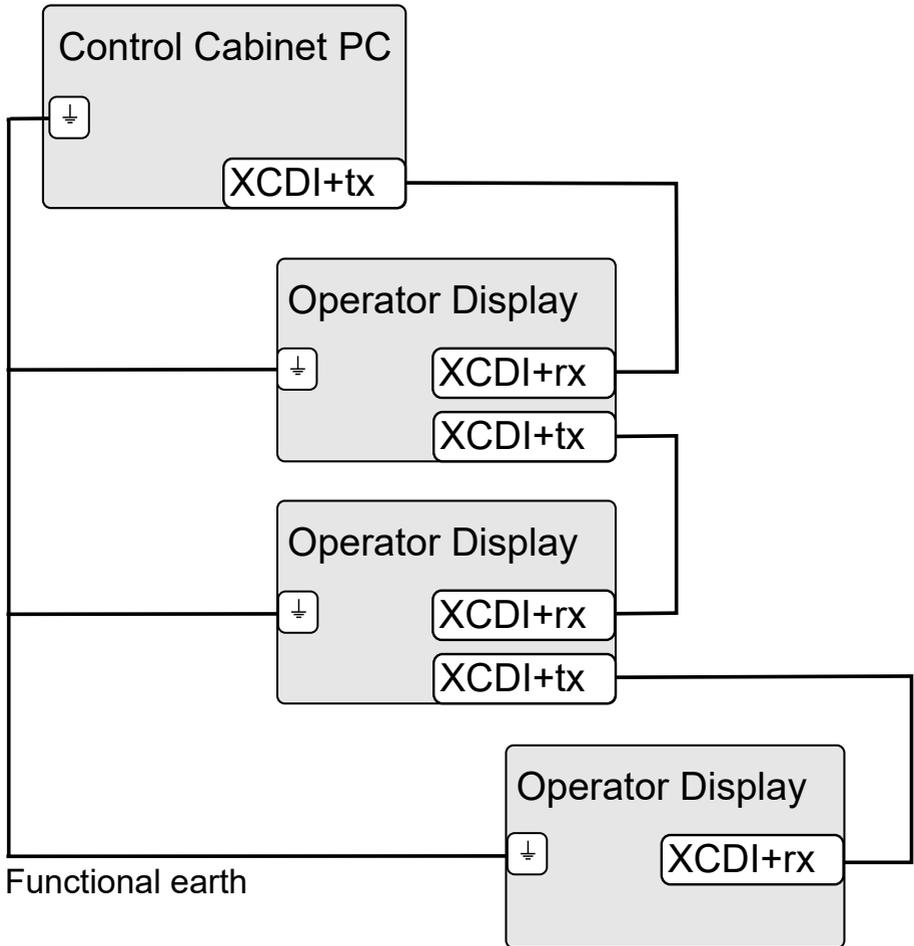


Fig. 10-22: Wiring up to three operating displays using CDI+ at a control cabinet PC



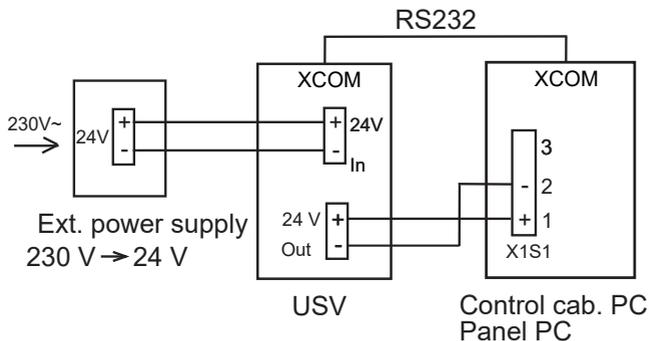
Note for operating displays that devices in the variant "CDI+rx/tx" are required at the first and second location. The variant with "CDI+rx" is sufficient for the last location.

### 10.12.3 Connecting the control cabinet PC to the 24 V voltage supply

1. Connect the "X1S1" interface for the 24 V voltage supply to the industrial power supply unit.

For the voltage supply, use a 24 V industrial power supply unit acc. to DIN EN 60742, classification VDE 551, for example "VAP01.1H-W23-024-010-NN" (part number R911171065).

#### 10.12.4 Overall connection diagram- Power supply unit, UPS and control cabinet PC



**Fig. 10-23:** Overall connection diagram - Power supply unit, UPS and control cabinet PC

## 11 Commissioning

### 11.1 IT security

The operation of installations, systems and machines requires the implementation of an integral concept for state-of-the-art IT security. Bosch Rexroth products are part of this integral concept. Bosch Rexroth product characteristics have to be taken into consideration in an integral IT security concept. The relevant characteristics are documented in the IT security guideline ([R911342562](#)).

### 11.2 Configuring the extension modules "RS-422/RS-485"

The extension module "RS-422/RS-485" has to be configured before use. Therefore, a jumper "CN2" and a slide switch are available at "SW1".

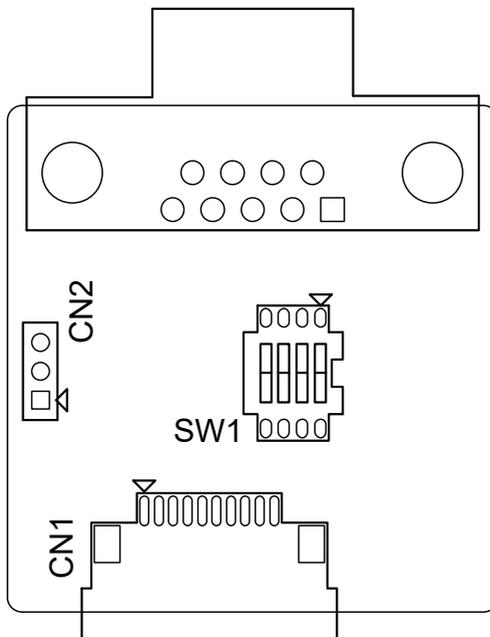


Fig. 11-1: Configuring the extension modules RS-422/RS-485

Pin	Description
1-2	RS-422 master
2-3	RS-485/RS-422 slave (default setting)

Tab. 11-1: Master and slave settings of RS-422 and RS-485 at CN2

Terminating resistor	Switch positions
120 ohms	1(D+/-) on
	2(RX+/-) on
	3,4 off
300 ohms	3(D+/-) on
	4(RX+/-) on
	1,2 off

Tab. 11-2: Terminating resistor settings of RS-422 and RS-485 at SW1

## 12 Device description

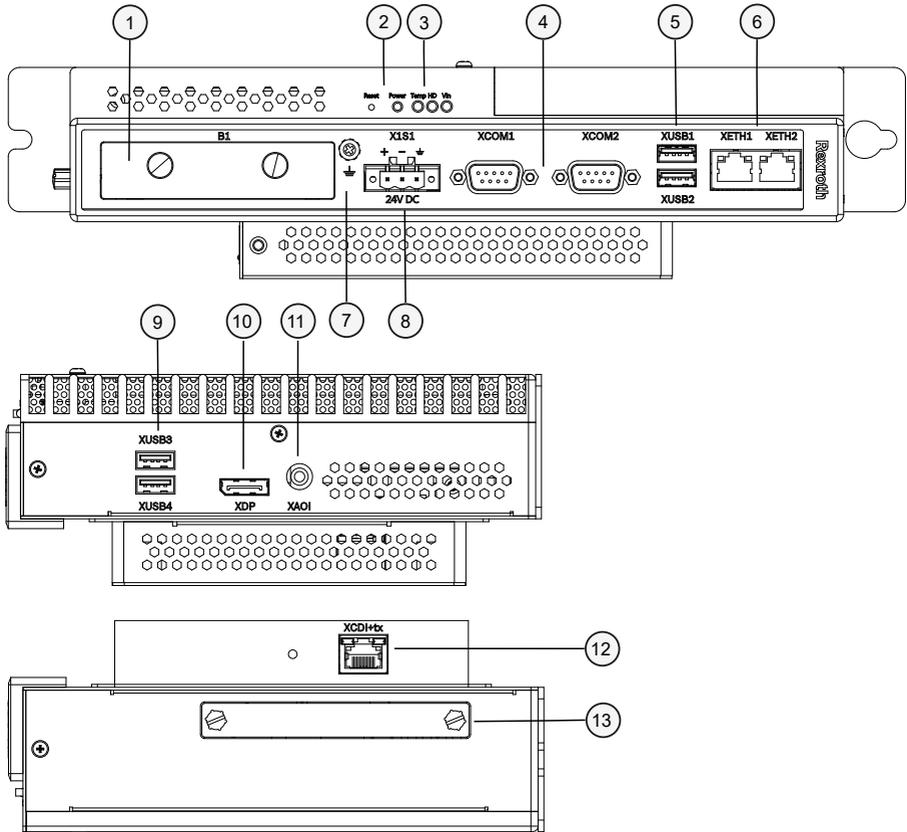
### 12.1 Display



① Status displays

**Fig. 12-1:** Front view

## 12.2 PC box



- ① mPCIe interface module
- ② Power and Reset button
- ③ Status LED
- ④ Serial interfaces
- ⑤ USB Interfaces (USB3.0)
- ⑥ Ethernet interfaces
- ⑦ Functional earth
- ⑧ Voltage supply
- ⑨ USB interfaces (USB2.0)
- ⑩ Display port interfaces
- ⑪ Analog audio interface
- ⑫ CDI+tx (optional!)
- ⑬ Bulk memory

Fig. 12-2: PC box

### 12.2.1 Reset and power button

Reset button	Press less than three seconds	Hardware reset
	Press more than three seconds	Windows recovery
Power button	On, off	

Tab. 12-1: Reset and power buttons

### 12.2.2 Operating and error display of the display

A status LED is positioned in the lower area of the front plate.

Symbol, LED	Display	Description	Action
Power	LED green	Normal operation	-
	LED off	No supply voltage of 24 V DC	Check supply voltage
	LED orange	Panel PC is booting	-

**Tab. 12-2:** Status LEDs for operating and error display on the front panel

### 12.2.3 Operating and error display of the PC box

The status LED are located at the interfaces, refer to [on page 0](#) ④.

Symbol, LED	Display	Description	Action
Temp	LED red	Overtemperature	Reduce the ambient temperature!
	LED off	Normal temperature	-
HD	LED flashing green	Hard disk access	-
V <sub>IN</sub>	LED green	Supply voltage (24 V DC) OK	-
	LED off	Supply voltage (24 V DC) not present or insufficient	Check the supply voltage at the power supply unit!

**Tab. 12-3:** Status LEDs for operating and error display at the PC box

## 13 Error causes and troubleshooting

For information on the error display on the front panel, refer to [chapter 12.2.2 "Operating and error display of the display" on page 42](#)

Errors	Correction
No image visible	<ul style="list-style-type: none"> <li>● Connect the supply voltage and check the X1S1 connection</li> <li>● Connect the display port or CDI+ cables correctly</li> <li>● If panels with a display port are used, use only Bosch Rexroth display cables to connect the panels, refer to <a href="#">chapter 5.6 "Connecting cables of the display port" on page 7</a>.</li> <li>● Use only active DVI and HDMI display port adapters. When using simple passive adapters, no image is displayed at the DVI or HDMI monitor.</li> </ul>
Distorted display due to incorrect display resolution	<ul style="list-style-type: none"> <li>● Set the correct display resolution in the graphics driver. The standard resolution of the Windows images (also for the recovery sticks) is FullHD (1920×1080). Set the correct value once if displays with a smaller resolution are used</li> <li>● Restart the control cabinet PC</li> </ul>

Tab. 13-1: Error causes and troubleshooting

## 14 Maintenance



Only the maintenance works at the device listed in this chapter are permitted.

For further information in the event of repair, please contact the Bosch Rexroth Service.

### **NOTICE**

**Loss of IP degree of protection due to incorrect maintenance.**

Ensure that the IP degree of protection remains during maintenance!

### 14.1 Cleaning notes

#### **NOTICE**

**Dissolving front glass sealing with solvent!**

- Do not use solvents
- Do not use high pressure cleaning device

## 14.2 Scheduled maintenance tasks

- Check all plug and terminal connections of the components for proper tightness and possible damage at least once a year
- Check for wire breaks or crimped lines.
- Damaged parts must be replaced immediately.

## 15 Ordering information

### 15.1 Accessories and spare parts

For ordering information on accessories and spare parts, refer to [chapter 5 "Spare parts, accessories and wear parts" on page 6](#)





## 16.1 Return

For disposal, our products can be returned free of charge. However, the products must be free from remains such as oil, grease or other impurities.

Furthermore, the products returned for disposal must not contain any undue foreign substances or external components.

Send the products free of charge to the following address:

Bosch Rexroth AG  
Bürgermeister-Dr.-Nebel-Straße 2  
97816 Lohr am Main, Germany

## 16.2 Packaging

The packaging material consists of cardboard, plastics, wood or styrofoam. Packaging material can be recycled anywhere.

For ecological reasons, please do not return empty packages.

## 16.3 Recycling

For disposal, unmount the devices completely. Recycle the different materials individually. Housing parts belong to metal.

Dispose the electronic components of the device, e.g. drives and hard disks, as defined in the electronic equipment act.

Plastic parts of the products can contain flame retardants. These plastic parts are labeled according to EN ISO 1043 and have to be recycled or disposed separately as per the relevant legal provisions.

## 16.4 Batteries and accumulators

The end user within the EU is legally obligated to return used batteries. Outside the validity of the EU Directive 2006/66/EC, comply with the national regulations.

Batteries and accumulators can contain hazardous substances, which can harm the environment or health when improperly stored or disposed of.

## 17 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts offer you advice and assistance should you have any queries. You can contact us **24/7**.

### Service Germany

Our technology-oriented Competence Center in Lohr, Germany, is responsible for all your service-related queries for electric drive and controls.

Contact the **Service Hotline** and **Service Helpdesk** under:

Phone: +49 9352 40 5060  
Fax: +49 9352 18 4941  
E-mail: [service.svc@boschrexroth.de](mailto:service.svc@boschrexroth.de)  
Internet: <http://www.boschrexroth.com>

Additional information on service, repair (e.g. delivery addresses) and training can be found on our internet sites.

### **Service worldwide**

Outside Germany, please contact your local service office first. For hotline numbers, refer to the sales office addresses on the internet.

### **Preparing information**

To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

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## Notes

**Bosch Rexroth AG**

P.O. Box 13 57

97803 Lohr a.Main, Germany

Bgm.-Dr.-Nebel-Str. 2

97816 Lohr a.Main, Germany

Phone +49 9352 18 0

Fax +49 9352 18 8400

[www.boschrexroth.com/electrics](http://www.boschrexroth.com/electrics)



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