

ctrlX HMI DE0015, DE0021

Multi-Touch Displays (Housing Devices)



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1 About this documentation

1.1 Change record

Table 1: Editions of this documentation

Edition	Release date	Note
01	2020-09	First edition
02	2021-02	Initial commissioning supplemented, E-STOP notes supplemented
03	2021-08	Instruction on device assembly added

1.2 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.

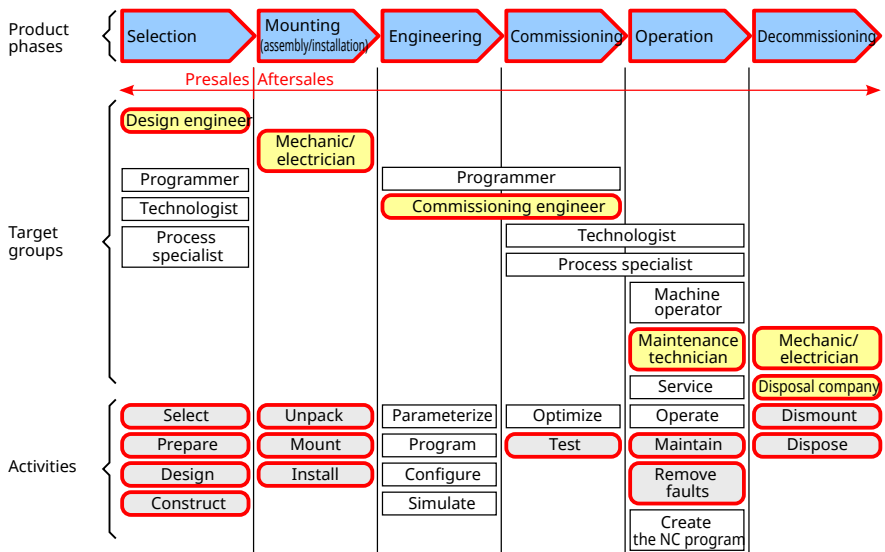


Fig. 1: Assigning the present documentation to the target groups, product phases and activities of the target group

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

1.4 Scope

This operating instruction applies to all multi-touch displays whose type code starts with “DE00....”. The type code is located on the type plate of the device, also refer to .

1.5 Related documentations

Table 2: Related documentations

Title	Part number and document type
Rexroth IndraControl	➔ R911339613
VAP 01	Operating Instructions
Power Supply Unit	
Rexroth IndraControl	➔ R911384733
PR and VR Devices	Project Planning Manual
Software Applications	
VAU 02.1	➔ R911384726
Uninterruptible Power Supply	Operating Instructions
Rexroth IndraControl	➔ R911397432
PR31 and VR31	Operating Instructions
Control Cabinet PC and Panel PC	
Rexroth IndraControl	➔ R911384697
PR4 and VR4	Operating Instructions
Control Cabinet PC and Panel PC	

1.6 Customer feedback

Customer requests, comments or suggestions for improvement are of great importance. Please email your feedback on the documentations to ➔ Feedback.Documentation@boschrexroth.de. Directly insert comments into the electronic PDF document and send the PDF file to Bosch Rexroth.

2 Product identification and scope of delivery

2.1 Product identification

Table 3: Specifications on the type plate, example

Meaning	Example
Part number	PN: R911123456
Type code	TYPE: DE00...
Serial number	SN: 123456789123456
Plant	(7260)
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	Un DC 24 V
Current specification	In 1.5 A
Ambient temperature	T(amb) 0-55 °C
Certification markings	UL, FCC, China-RoHS, ...

2.2 Scope of delivery

- Multi-touch display
- Safety instructions
- 24 V connection terminal
- E-Stop connection terminal
- Key connection terminal

3 Using safety instructions

3.1 Structure of the safety instructions

The safety instructions are structured as follows:

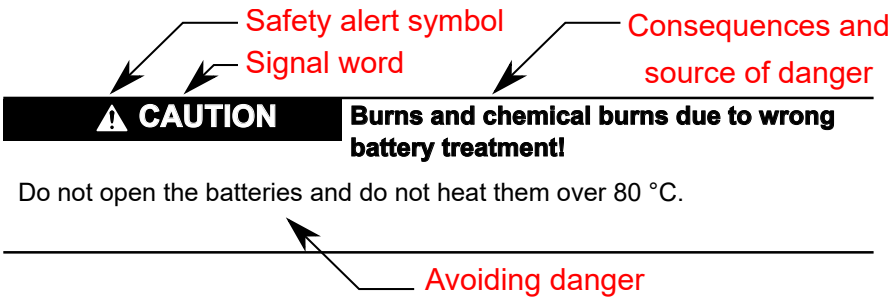


Fig. 2: Structure of the safety instructions

3.2 Explaining signal words and the 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 signal graphics (warning triangle with exclamation mark), added in front of the signal words Danger, Warning and Caution refer to hazards to individuals.

⚠ 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



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

4.1 General information on the intended use

The Bosch Rexroth operator displays are passive operator and visualization terminals. They form a PC-based operator terminal when used with a Bosch Rexroth control cabinet PC.

NOTICE

Risk of damaging the device if not expressly stated accessories, mounting parts and other components, cables, lines, software and firmware are used.

The operator displays 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 operator displays 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 this documentation.

4.2 Intended use of E-STOP control units

E-STOP control units are electromechanical switching devices to protect persons. E-STOP control units are used for a fast switch-off, to reach a safe state for machines, vehicles and systems and to avoid or reduce hazards and damages to people and machines.

The following regulations apply in particular to commissioning, use and technical inspections:

- Machinery directive 2006/42/EC
- Safety regulations
- Accident prevention regulations/safety rules

Manufacturers and operators of machines with an E-STOP control unit are responsible to comply with the operating manual and the current safety guidelines and rules.

To install and operate E-STOP control units, assess the risk for an intended use. Note the following requirements:

- EN ISO 13849-1:2015
- EN ISO 13849-2:2012
- EN ISO 13850:2015
- EN 60204-1/A1:2009

5 Spare parts, accessories and wear parts

5.1 External 24 V power supply unit

Table 4: External 24 V power supply unit for the operator display

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

5.2 Uninterruptible power supply

Table 5: Uninterruptible power supply (UPS)

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

5.3 Connecting cables for CDI+ interface



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

Table 6: Connecting cables to control cabinet PC, panel PC and operator display.

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
RKB0008/040,0 (*****_*****_*****)	R911171382	Length: 40 m
RKB0008/050,0 (*****_*****_*****)	R911171383	Length: 50 m
RKB0008/055,0 (*****_*****_*****)	R911173779	Length: 55 m

Ordering code	Part number	Description
RKB0008/060,0 (*****_*****_*****)	R911173780	Length: 60 m
RKB0008/065,0 (*****_*****_*****)	R911173781	Length: 65 m
RKB0008/070,0 (*****_*****_*****)	R911173782	Length: 70 m



Further cable lengths are available on request.

5.4 USB connecting cables (USB 2.0)

Table 7: USB connecting cable (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

5.5 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 × 2160
- Supports HDCP 1.3 and DPCP

Table 8: Connecting cable of the display port

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

5.6 Support arm adapter

Table 9: Support arm adapter

Ordering code	Part number	Description
VAS09.1-001-NNN-NN	R911404269	VESA adapter
VAS09.1-002-NNN-NN	R911404270	Adapter for tube mounting for the Rittal program "CP40" or the Bernstein program "CS-480 B.Flex". For matching couplings, refer to ➔ Chapter 5.6.1 "Housing coupling for VAS09.1-002-NNN-N" on page 13

5.6.1 Housing coupling for VAS09.1-002-NNN-N



The matching housing couplings for our support arm adapters cannot be ordered at Bosch Rexroth. Contact the mentioned manufacturers.

Table 10: Housing coupling for VAS09.1-002-NNN-NN

Ordering code	Vendor	Description
CP6664.000	Rittal	Housing coupling, rotatable, inclinable stainless steel Square-shaped mounting surface, 35 mm × 35 mm
CP6664.500	Rittal	Housing fastening, rigid, stainless steel Square-shaped mounting surface, 35 mm × 35 mm
CP6501.050	Rittal	Housing coupling, rotatable, inclinable stainless steel, graphite grey Square-shaped mounting surface, 46 mm × 46 mm
1014800001	Bernstein	Coupling CS-480 B.Flex Square-shaped mounting surface, 46 mm × 46 mm

5.7 Wear parts

5.7.1 General information



Wear parts are not subject to any warranty.

5.7.2 Backlight

The service life of the backlight is limited. After this period, the backlight will produce only 50 % of its original brightness. The service life is 50,000 hours if the ambient temperature is 25 °C.

6 Ambient conditions

6.1 Ambient conditions of the ctrlX HMI

Table 11: 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: 2G

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

7 Technical data

7.1 General technical data

Table 12: Technical data of the display

	DE0015	DE0021
Display	396 mm TFT (15") 1366 × 768 pixels 16.7 million colors	546 mm TFT (21") 1920 × 1080 pixels 16.7 million colors
Weight	6.8 kg (without support arm adapter) 8.2 kg (with VAS09.1-002) 8.5 kg (with VAS09.1-001)	9.6 kg (without support arm adapter) 11 kg (with VAS09.1-002) 11.3 kg (with VAS09.1-001)
Power consumption	20.6 W max.	32 W max.
Input voltage	DC 24 V +25 %, -20 %	DC 24 V +25 %, -20 %
Operation	Projected capacitive 10-point multitouch	Projected capacitive 10-point multitouch
Surface of the front panel	Chemically strengthened front glass	Chemically strengthened front glass
Graphic interfaces	• CDI+ • Display port • HDMI	• CDI+ • Display port • HDMI
Degree of protection	Front panel IP 65	Front panel IP 65
USB	1 × USB 2.0 (type B) at the plugboard 2 × USB 2.0 (type A) at the plugboard 1 × USB 2.0 (type A) on the front Per USB port max. 500 mA	1 × USB 2.0 (type B) at the plugboard 2 × USB 2.0 (type A) at the plugboard 1 × USB 2.0 (type A) on the front Per USB port max. 500 mA

7.2 E-STOP button

Table 13: Service life value of the E-STOP button

Mechanics	Electrics
B10: 65000	B10: 18922161
B10d = 130000	B10d = 37844322
Exclusion of failure at <6.050 switching cycles	Exclusion of failure at <6.050 switching cycles

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

8.1 Standards used: E-STOP button

Standard	Meaning
The E-STOP button is identified as safety component according to machinery directive 2006/42/EC (annex V-10, E-STOP devices) by the vendor. The compliance with the directive is proven by adherence to the following European standards:	
IEC 60947-1	Low-voltage switchgear and controlgear – Part 1: General rules
IEC 60947-5-1	Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices
IEC 60947-5-5	Low-voltage switchgear and controlgear - Part 5-5: Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function
ISO13849-1	Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
IEC 13850	Safety of machinery – Emergency stop function – Principles for design

8.2 CE marking

8.2.1 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:

Table 14: Standards for electromagnetic compatibility (EMC)

Standard	Title
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) Part 6-2: Generic standards – Noise immunity for industrial environments (IEC 61000-6-2:2019)
DIN EN 61000-6-4	Electromagnetic compatibility (EMC) Part 6-4: Generic standards – Emission standard for industrial environments (IEC 61000-6-4:2007+A1:2011)



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.

8.3 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.

8.4 UL/CSA certified

The devices are certified according to

- UL 62368 (Industrial Control Equipment) and
- CSA22.2 No. 61010-2-201 (CSA)

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

9.1 Interface overview

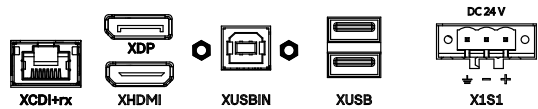


Fig. 3: Interfaces

The following connections are available:

Table 15: Interfaces

Labeling at the housing	Connection type	Connection type (at the device)	Mating connector or cable (from outside)
XCDI+rx	RJ-45 interface (video and data interface)	RJ45 socket	RJ45 plug
XDP	Video connection to the control cabinet PC	Display port socket, 20 pin	Display port plug, 20 pin
XHDMI	Video connection to the control cabinet PC	HDMI female connector, type A, 19 pin	HDMI connector, type A, 19 pin
XUSB	USB 2.0 interfaces	USB socket, 4-pin, type A	USB plug, 4-pin, type A
XUSBIN	USB2.0 interface to the control cabinet PC	USB socket, 4-pin, type B	USB plug, 4-pin, type B
X1S1	DC 24 V voltage supply	Male connector strip, 3-pin	Female connector strip, 3-pin
NOTICE	Malfunctions 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 DC 24 V voltage supply for the display is connected via the “X1S1” connection.

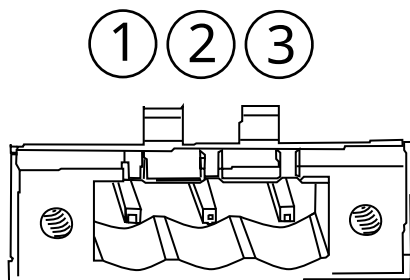


Fig. 4: Interface for 24 V voltage supply

Table 16: Pin assignment

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

9.3 USB interfaces XUSB

The devices are provided with two USB interfaces (USB 2.0) on the connector panel.



The maximum current carrying capacity is 500 mA per USB port.

9.4 USB interfaces XUSBIN

If a display is connected via the display port (XDP) or via HDMI (XHDMI), the USB signals of the touch and the connected USB devices have to be connected to the control cabinet PC via XUSBIN.

When using XCDI+rx, these USB signals of the touch and the connected USB devices are also transferred. A separate connection to the control cabinet PC via XUSBIN is not required.

9.5 Display port XDP

The display port interface "XDP" connects the operator display DR to the display port interface of a control cabinet PC.

9.6 Long distance XCDI+rx

The long distance interface "XCDI+rx" connects the operator display DR to the long distance XCDI+tx interface of a control cabinet PC.

9.7 XHDMI

The HDMI interface "XHDMI" connects the operator display DE to the HDMI interface of a control cabinet PC.

9.8 Interface keypad

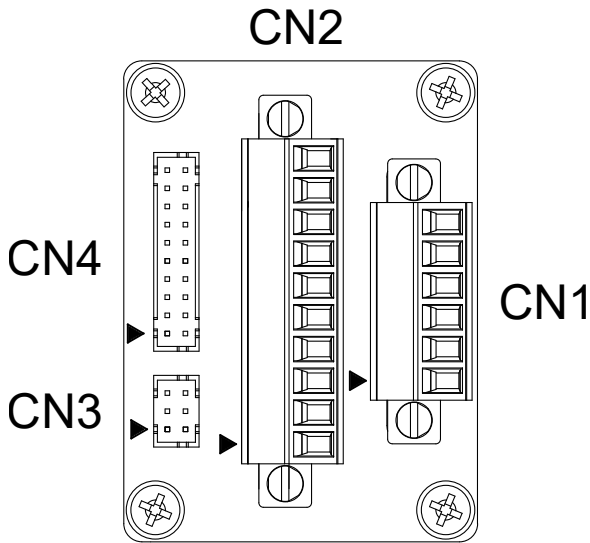


Fig. 5: USB interfaces CN1 to CN4 of the keypad

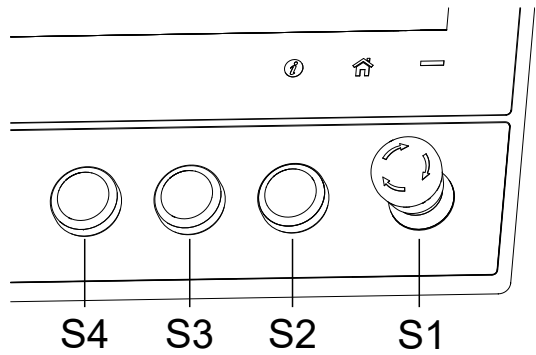


Fig. 6: E-STOP button and pushbutton S2, S3 and S4

⚠ WARNING

Death or lethal injury due to incorrect handling of the E-STOP button

- The E-STOP button can be used as operating element in an E-STOP circuit.
- The E-STOP circuit has to be designed by the machine manufacturer.
- Only qualified staff may connect the E-STOP button and check it afterwards.
- It has to be connected acc. to the connection scheme ➔ Chapter 9.8.2 “Keypad connection scheme” on page 20.
- The max. load current is 500 mA.

9.8.1 Overview

Table 17: Keypad interfaces

Name at the housing	Connection type	Connector type (integrated)	Mating connector or cable (from outside)
CN1	Keypad connection	Phoenix pin contact strip, 6-pin, MCV 1,5/6-G-3,5	Phoenix socket strip, 6-pin, FK-MCP 1,5/6-ST-3,5
CN2	Keypad connection	Phoenix pin contact strip, 10-pin, MCV 1,5/10-G-3,5	Phoenix socket strip, 10-pin, FK-MCP 1,5/10-ST-3,5

9.8.2 Keypad connection scheme

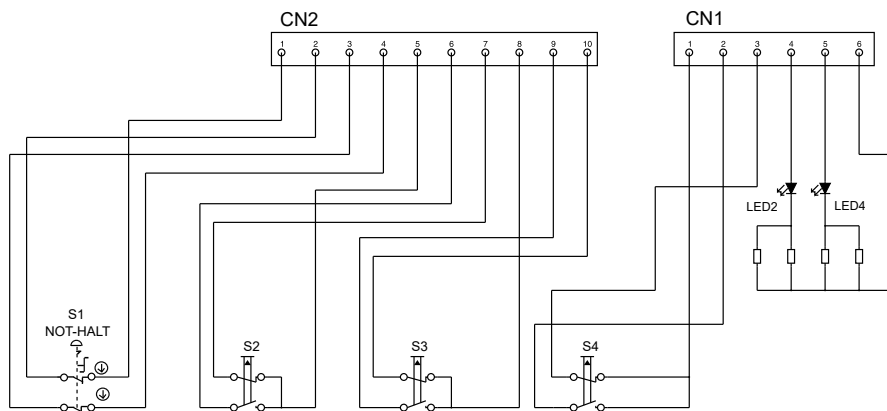


Fig. 7: Keypad connection diagram

9.8.3 Pin assignment of the keypad

Table 18: Pin assignment of keypad CN1

Pin	Function
1	S4 (blue) N/O contact, N/C contact
2	S4 (blue) N/O contact
3	S4 (blue) N/C contact
4	LED2 in S2 24 V
5	LED4 in S4 24 V
6	LED2 and LED4 0 V, GND

Table 19: Pin assignment of keypad CN2

Pin	Function
1	S1 (E-STOP) N/C contact 1
2	S1 (E-STOP) N/C contact 1
3	S1 (E-STOP) N/C contact 2
4	S1 (E-STOP) N/C contact 2
5	S2 (white) N/O contact, N/C contact
6	S2 (white) N/O contact
7	S2 (white) N/C contact
8	S3 (black) N/O contact, N/C contact
9	S3 (black) N/O contact
10	S3 (black), N/C contact

10 Mounting, dismounting and electric installation

10.1 General information

NOTICE	Mechanical damage due to incorrect mounting torque. Tighten the screws and nuts with the corresponding torque according to the following table.
---------------	---

Table 20: Tightening torque

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

10.2 Housing dimensions of the display

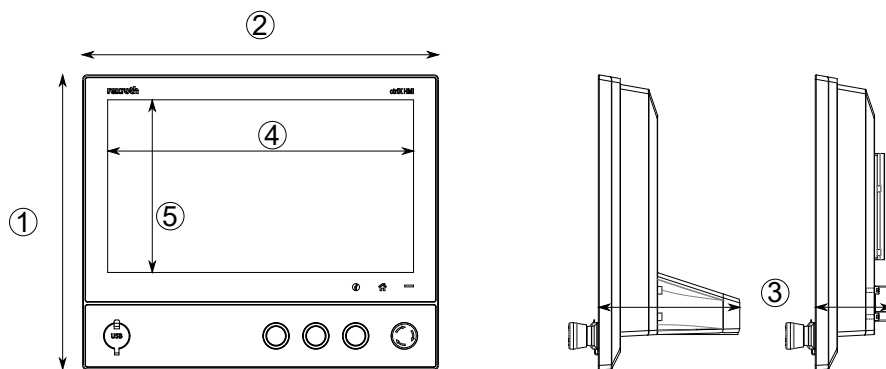


Fig. 8: Front view of the display

Table 21: Housing dimensions of the display in diameters

Display size	Device height	Device width	Device depth	Display width	Display height
	①	②	③	④	⑤
15" (tube)	333	402	160	346	195
15" (VESA)	333	402	87	346	195
21" (tube)	420	546.8	160	478	270
21" (VESA)	420	546.8	87	478	270

10.3 Device mounting of the display

The display is intended for a VESA-compliant mounting (VAS09.1-001) and for the tube mounting (VAS09.1-001). For all required and matching couplings for the tube mounting, refer to ➔ Chapter 5.6 "Support arm adapter" on page 12.

10.3.1 Fastening to the support arm adapter (VESA) with VAS09.1-001

The DE displays are provided with four M4 threads in square arrangement of 100 x 100 on their rear side to fasten a support arm adapter.



The provided screws can be used for VESA fastenings up to a material thickness of 1.0 mm. Use longer screws for VESA fastenings with a greater material thickness!

Mount the display as follows:

- 1 Attach the support arm with four M4 screws at the support arm adapter.

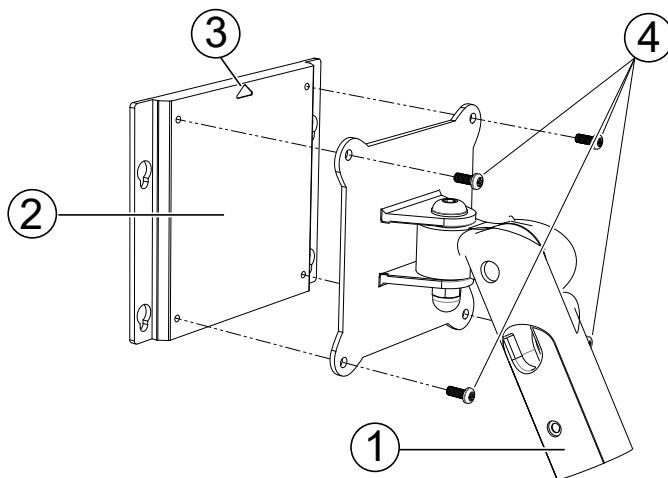


Fig. 9: Support arm at adapter

- ① Support arm
- ② Adapter
- ③ Marking for the alignment towards the top
- ④ Four M4 screws

- 2 Screw two M5 screws into the upper bolt holes on the rear side of the device.

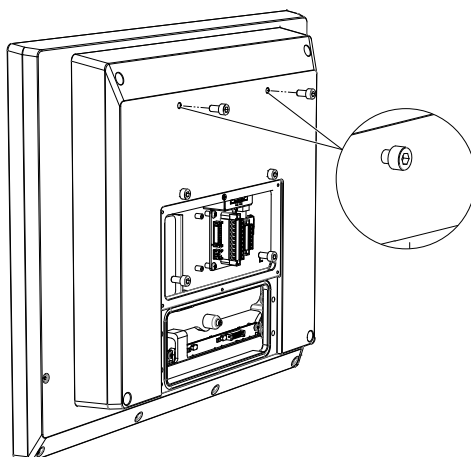


Fig. 10: Two M5 screws for the support arm adapter

- 3 Hang the device into the support arm adapter.

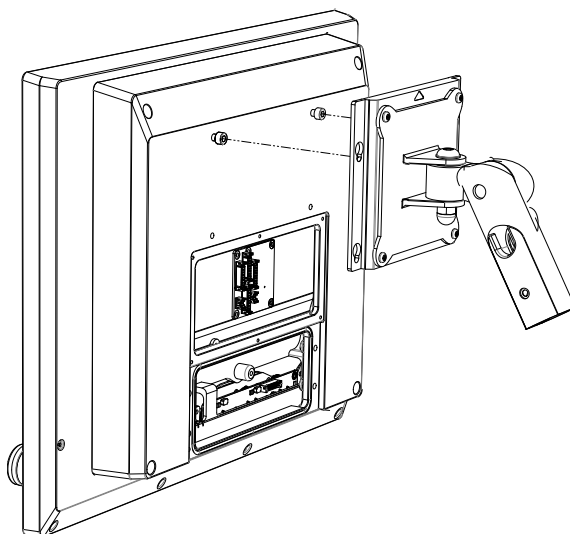


Fig. 11: Hanging the device into the support arm adapter

- 4 Fasten the support arm adapter in the lower bolt holes with two M5 screws.

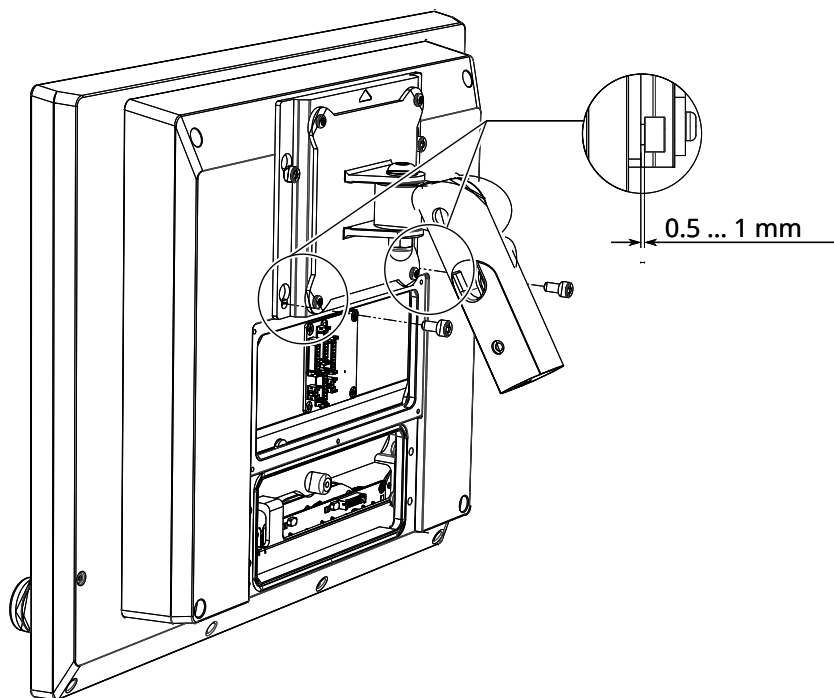


Fig. 12: Fastening the support arm adapter

- 5 Route the cables through the cable bushing of the cover and fasten the cover with four M5 screws.

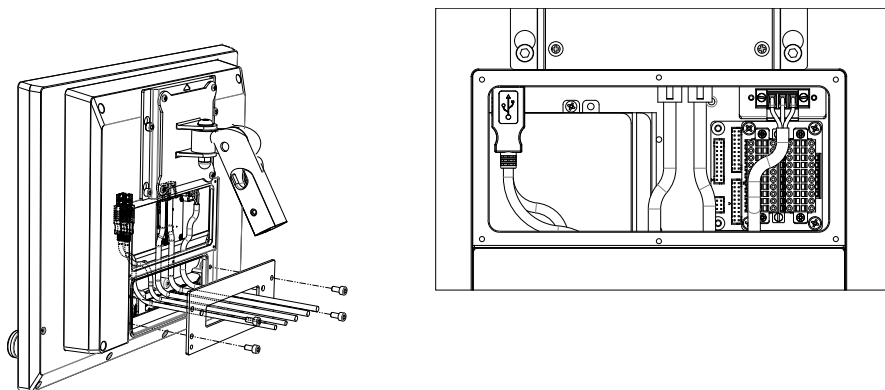


Fig. 13: Cable bushing

- 6 Close the cable bushing with three M5 screws. Attach the routing frame to the display with two M5 screws.

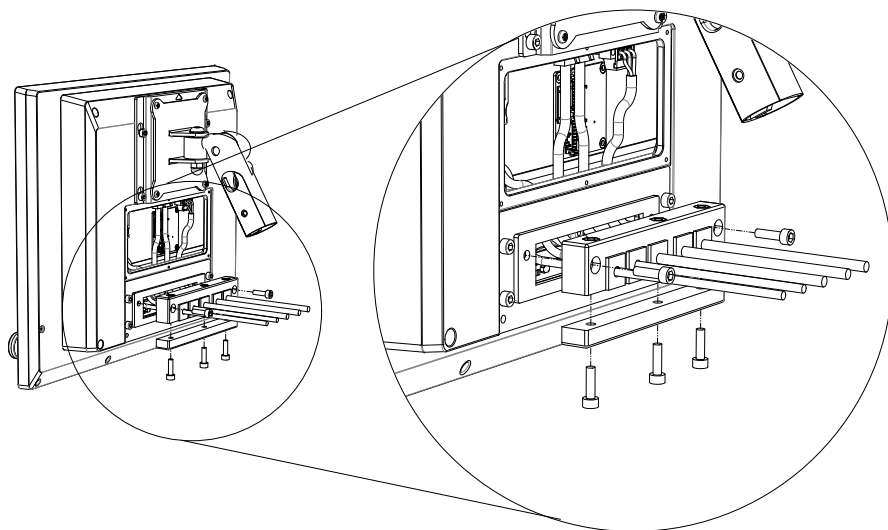


Fig. 14: Routing

- 7 Tighten the housing cover with six M3 screws.

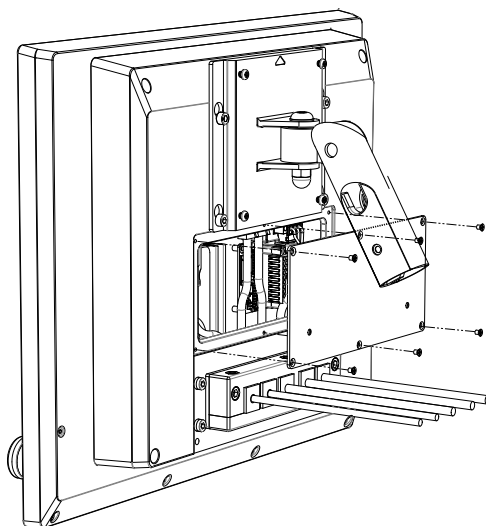


Fig. 15: Tightening the housing cover

- 8 Remove the VESA support arm fixture from the upper mounting position and hang it into the lower screws.

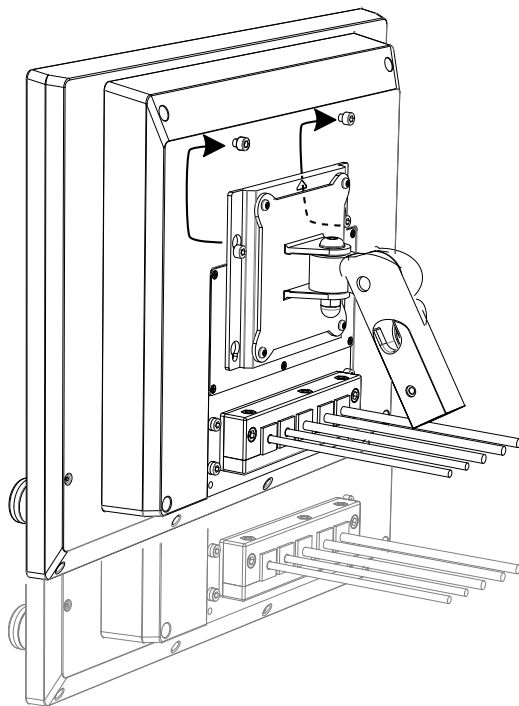


Fig. 16: Rehanging the support arm adapter

- 9 Remove the upper screws and screw them into the lower bolt holes of the support arm adapter.

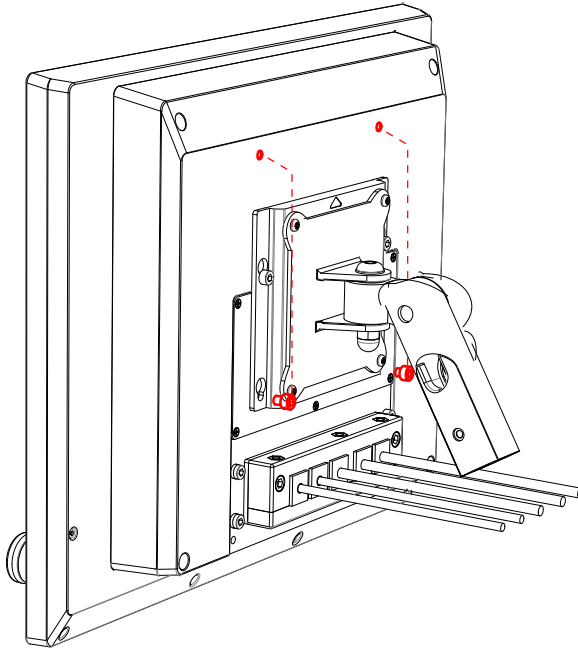


Fig. 17: Repositioning adapter screws

10.3.2 Fastening to an adapter for the tube mounting with VAS09.1-002

The adapter for the tube mounting is intended to be mounted at the lower housing cover. If you attach the device to the adapter, ensure that the screws used are suitable for the device weight.

Mount the adapter for the tube mounting as follows:

- 1 Loosen the four screws of the plastic cover and the six M3 screws of the housing cover on the rear side of the device.

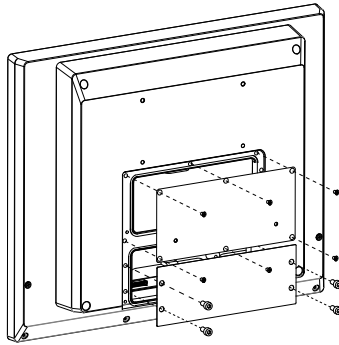


Fig. 18: Removing the cover

- 2 Loosen the four M3 screws of the adapter cover.

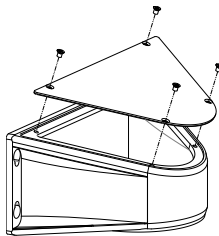


Fig. 19: Removing the adapter cover

- 3 Attach the adapter to the housing coupling with four M5 or M6 screws

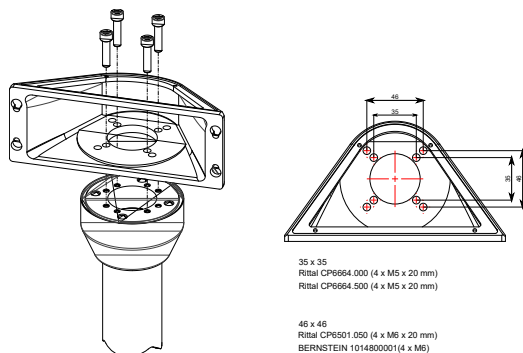


Fig. 20: Attach the adapter to the tube coupling

- 4 Tighten the adapter cover with four M3 screws, see Fig. 19.
- 5 Route the connecting cable through the fixture and fasten the device with four M5 screws.

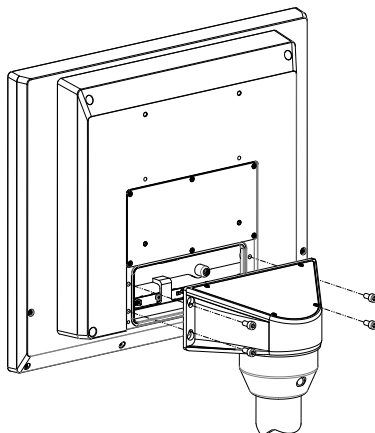


Fig. 21: Tightening the support arm during *standing* mounting

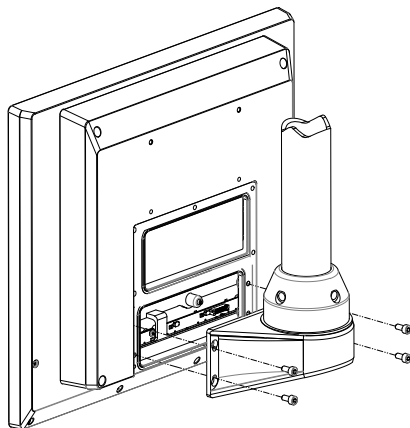


Fig. 22: Tightening the support arm during *hanging* mounting

- 6 Connect all cables.
- 7 Tighten the housing cover with the six M3 screws.

10.4 Installation notes

- When mounting the display, ensure an ergonomic operation. Additionally, ensure that all moving machine components can be seen by the operator at any time
- Avoid installation positions exposed to direct UV and sunlight. Direct sunlight reduces the readability at the screen and causes additional warming
- The LED display on the operator panel must not be covered.
- Wire all cables in loops. Use strain reliefs for all cables
- To maintain the degree of protection IP 65, use only a cable bushing of the sealing gasket fitting to the cable cross sections. If required, use the fitting sealing gasket
- 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

10.5 Dismounting

1. ➤ Disconnect the operator display from voltage.
2. ➤ Remove all connected cables.
3. ➤ Loosen the screws at the support arm fixture.
4. ➤ Remove the display from the support arm fixture.

10.6 Device dismantling for disposal

10.6.1 Opening device

1. ➞ Remove the four screws of the back cover.
2. ➞ Remove the six screws of the interface cover.
3. ➞ Remove the four screws of the transport cover.

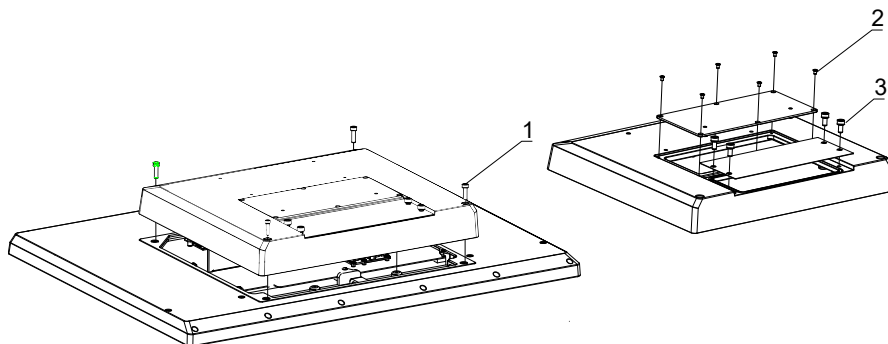


Fig. 23: Opening device

10.6.2 Disassembling switch panel

1. ➞ Remove the twelve screws of the switch panel.
2. ➞ Remove the two screws of the USB board.
3. ➞ Remove the three screws of the board of the E-STOP button.
4. ➞ Remove the six screws of the pushbutton board.
5. ➞ Rotate the four fastening rings to remove the pushbutton.
6. ➞ Remove the three screws of the USB rubber gasket.

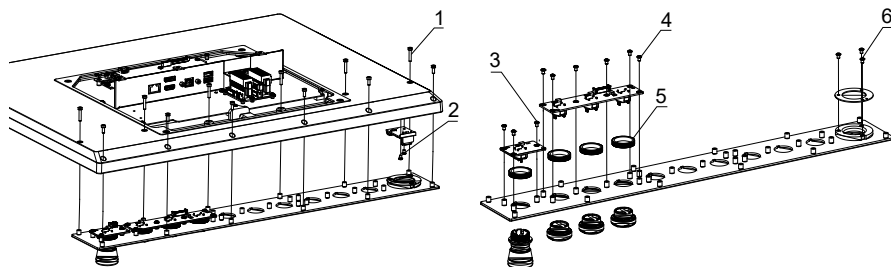


Fig. 24: Disassembling switch panel

10.6.3 Removing internal components

1. ➤ Remove the six screws of the mainboard.
2. ➤ Remove the four screws of the intermediate support.
3. ➤ Remove the three screws of the interface cover plate.
4. ➤ Remove the four screws of the connection terminal blocks of the keypad.
5. ➤ Remove the four screws of the connector panel of the touchscreen.
6. ➤ Remove the two screws of the connector panel of the display.

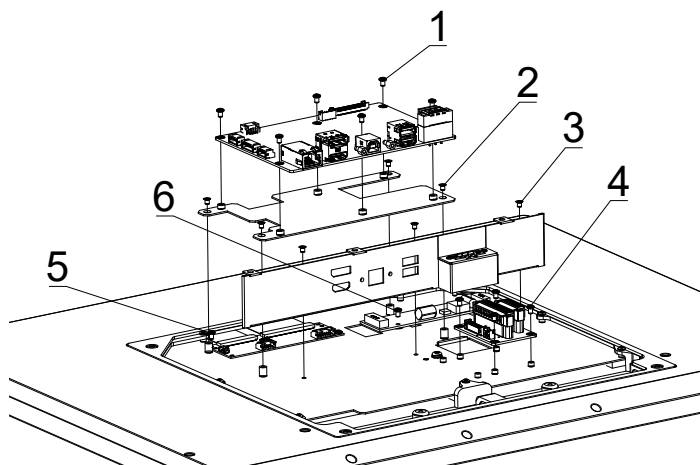


Fig. 25: Removing internal components

10.7 Electric installation

10.7.1 Connecting the display to the 24 V voltage supply

- ➔ 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).

UPS



The display immediately darkens in case of a power failure if the operator display is directly connected to the 24 V supply voltage without UPS. The user cannot execute any actions via the operator display during the shutdown of the control cabinet PC.

If the operator display is connected together with the control cabinet PC to the “24 V Out” of the external UPS (VAU 02.1), the user can still access the operator display during shutdown due to a power failure.

10.7.2 Connecting the control cabinet PC to operator display

Exemplary connection diagram of a CDI+ display connection.

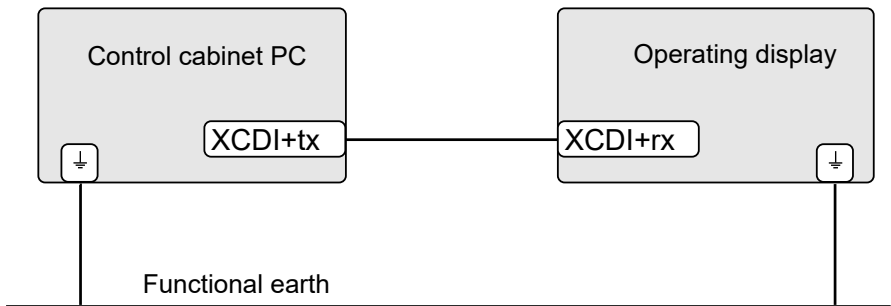


Fig. 26: Wiring the control cabinet PC to the operating display

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 display has to be connected to this neutral point as well.



When wiring Bosch Rexroth CDI cables with a diameter of 7.4 mm, observe the following bending radii:

- 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 the section "Accessories"

11 Commissioning

11.1 Prerequisites for the initial commissioning

- Mounted control cabinet PC (PR31, PR4x)
- Mounted multi-touch display DE
- Control cabinet PC and multi-touch display with a voltage supply of DC 24 V
- Video and USB connection set up:
 - CDI+ connection (RKB008)
 - or*
 - Displayport cable und USB cable (RKB0063/RKB0019)

11.2 Commissioning video and multi-touch operation

11.2.1 Single display DE either at the control cabinet PC PR31 or PR4x

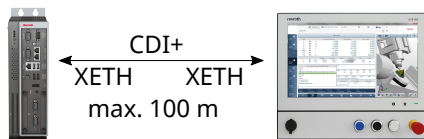


Fig. 27: Connection via the long distance interface CDI+

After switching on the control cabinet PC and the DE display, the display detects the CDI+ connection and “RX” is shown in the lower left corner of the display. The DE device in the On-Screen menu is provided with the standard setting CDI+ connection (“Input rx”). Thus, the video output and the multi-touch operation are available immediately after the initial start.

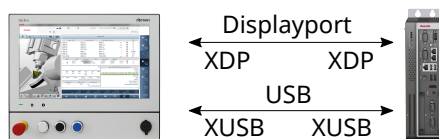


Fig. 28: Connection via standard interface

After switching on the control cabinet PC and the DE display, the display detects the Displayport connection and “DP” is shown in the lower left corner of the display. To ensure a proper function of the video and USB connection, set the video input via the On-Screen menu on the Displayport (“Input DP”).

🏠 “Home” key

- Open On-Screen menu
- Confirm selected menu item

⌂ “i” key

- Navigate in the menu

Brightness	■	Input	DP
Video Input	■	Input	HDMI
PIP		Input	RX
Touch		Exit	
Exit			

Fig. 29:



If the video connection and the USB connection have to be modified for a DE device after a successful initial commissioning, always set the new connection in the On-Screen menu to ensure a correct functioning.

11.2.2 Two DE displays at the control cabinet PCs PR31 and PR4x

A display is connected to the control cabinet PC via a CDI+ connection and another display is connected via a Displayport connection and a USB connection.

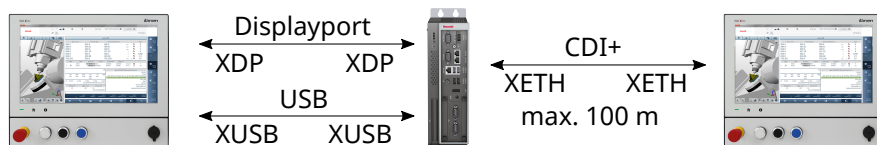


Fig. 30: Connection via standard interface and long distance interface CDI+

After switching on the control cabinet PC and the two DE displays, the switch-on behavior is identical to the behavior of the single display operation described above. The displays detect the current connection. "DP" or "RX" is shown in the lower left corner of the display. To ensure a proper function of the video and USB connection for the DE device with Displayport and USB connection, set the video input via the On-Screen menu on the Displayport ("Input DP").



If the video connection and the USB connection have to be modified for a DE device after a successful initial commissioning, always set the new connection in the On-Screen menu to ensure a correct functioning.

Setting up the multi-touch operation in the extended Desktop mode:

1. ➔ Restart the Windows Control Panel
2. ➔ Select "Tablet PC Settings" and press the "Setup" button.
3. ➔ The message "Touch this screen to identify it as touchscreen" is displayed.
4. ➔ Touch the screen. Message: "Press enter to proceed to the next step to complete your configuration" is displayed.
5. ➔ Repeat the steps 3 and 4 for the second display.

11.3 IT security

Operating systems and machines requires the implementation of a comprehensive concept for state-of-the-art IT security. Bosch Rexroth products are part of this comprehensive concept. The properties of the Bosch Rexroth products have to be considered for a comprehensive IT Security concept. For the required properties, refer to the IT Security Guideline (➔ R911342562).

12 Device description

12.1 General information

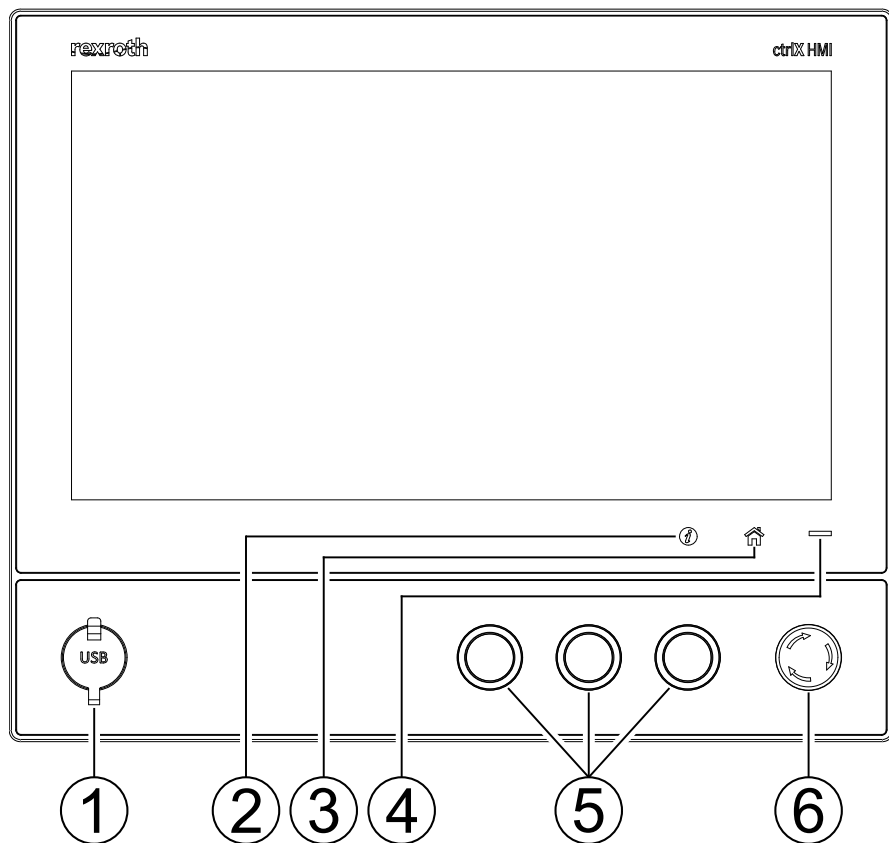


Fig. 31: Front view

- ① USB 2.0 interface
- ② "i" touch key
- ③ "Home" touch key
- ④ Status displays
- ⑤ Three pushbuttons
- ⑥ E-STOP button

12.2 "On Screen" menu

Make the display settings of the DE devices via the "On Screen" menu. To operate the "On Screen" menu, use the two touch buttons i and Home on the front of the DE devices:

"Home" key	• Opening the "On Screen" menu • Confirming the selected menu item.
"i" key	Navigating within a menu



If there is no operation for five seconds, the currently selected setting is applied automatically.

12.2.1 Brightness

The screen brightness is set via the "On Screen" menu under the menu item Brightness.

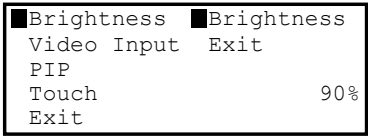


Fig. 32: On Screen menu – Brightness

- ➔ Press the "Home" key to open the On Screen menu.
- ➔ Press the "i" key to toggle to the menu item "Brightness".
- ➔ Press the "Home" key to confirm the selection to go to the "Brightness" menu.
- ➔ Press the "Home" key to set the brightness between 0 and 100 percent.
- ➔ Press the "i" key to toggle to "Exit".
- ➔ Press the "Home" key to confirm the selection.



If the brightness is 0, the display on the screen cannot be seen anymore.

12.2.2 Video Input

To set the video interface used (XCDI+rx, XDP, XHDMI), go to the On Screen menu under the menu item "Video Input".

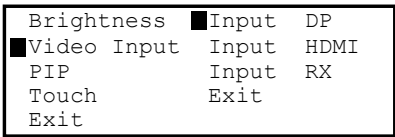


Fig. 33: On Screen menu – Video Input

- ➔ Press the "Home" key to open the On Screen menu.

2. ➞ Press the "i" key to toggle to the menu item "Video Input".
3. ➞ Press the "Home" key to confirm the selection to go to the "Video Input" menu.
4. ➞ Press the "i" key to select the video interface to be used.
 - "DP" for display port (XDP)
 - "HDMI" for HDMI (XHDMI)
 - "RX" for CDI+rx (XCDI+rx)
5. ➞ Press the "Home" key to confirm the selection.
6. ➞ Press the "i" key to toggle to "Exit".
7. ➞ Press the "Home" key to confirm the selection.



Upon delivery, the default value is "RX" for CDI+rx (XCDI+rx).

12.2.3 Touch

To set the touch (XCDI+rx, XDP, XHDMI), go to the On Screen menu under the menu item "Touch".

Brightness	■ Always Off
Video Input	Off for 60 sec
PIP	Always On
■ Touch	Exit
Exit	

Fig. 34: On Screen menu – Touch

1. ➞ Press the "Home" key to open the On Screen menu.
2. ➞ Press the "i" key to toggle to the menu item Touch.
3. ➞ Press the "Home" key to confirm the selection to go to the "Touch" menu.
4. ➞ Press the "i" key to select different functionalities:
 - "Always Off" to disable the touch function
 - "Off for 60 sec" to disable the touch function for 60 seconds, e.g. for cleaning purposes
 - "Always On" to enable the touch
5. ➞ Press the "Home" key to confirm the selection.
6. ➞ Press the "i" key to toggle to "Exit".
7. ➞ Press the "Home" key to confirm the selection.



If the touch function is disabled via "Always Off" or "Off for 60 sec", the status LED flashes green on the front while it is disabled.

12.3 Operating and error display

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

Table 22: Status LED for operating and error display on the front panel

Symbol, LED	Display	Meaning	Action
Power	LED green	Normal mode	-
	LED off	No supply voltage of DC 24 V	Check the supply voltage
	LED orange	- No screen signal present - Connected control cabinet PC is booting	- Check video connection - Wait until the system completed booting

13 Error causes and troubleshooting

13.1 Error causes and troubleshooting

For information on the error display on the front panel, refer to ➔ Chapter 12.3 “Operating and error display” on page 40

Table 23: Error causes and troubleshooting

Error	Correction
No image visible	- Connect the supply voltage and check the X1S1 connection - Connect the display port or CDI+ cables correctly - If panels with display port are used, use only Bosch Rexroth display cables to connect the panels, refer to .
Distorted display due to incorrect display resolution	- Set the correct display resolution in the graphic driver. The standard resolution of the Windows images (also for the recovery sticks) is FullHD (1920 × 1080). Set the correct value once when displays with a smaller resolution are used - Restart the control cabinet PC
“NO SIGNAL” on the display	- Check the cabling of the graphic interface. - Check the selected video interface and correct the setting in “On Screen” menu if required. Setting upon delivery: “RX” (for XCDI+rx).

14 Maintenance

14.1 General information



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 unchanged during maintenance!

14.2 Display

The backlight is subject to wear.

A fading backlight causes a progressive deterioration display readability. Thus, a replacement is necessary. For further information, please contact the Bosch Rexroth Service.

14.3 Cleaning notes

NOTICE

Dissolving front glass sealing with solvent!

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

14.4 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 "Spare parts, accessories and wear parts".

15.2 Type code for DE devices

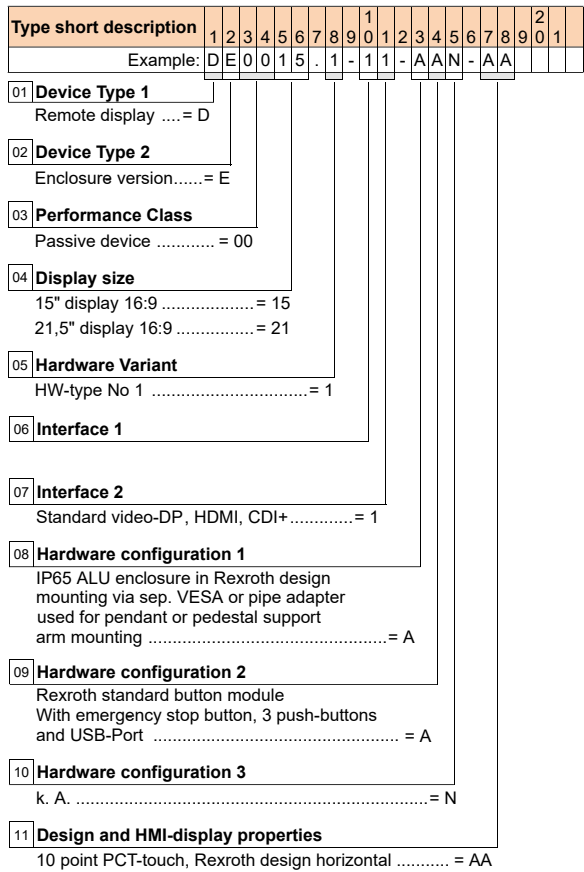


Fig. 35: Type code for DE devices

Ordering information

15.3 Type code for VAS devices

Type short description	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2
Example:	V	A	S	0	9	.	1	-	0	0	1	-	N	N	N	-	N	N	-	N	N	0
01 Product IndraControl V Accessory = VAS																						
02 Line Support arm adapter = 09																						
03 Hardware version Version No. 1 = 1																						
04 Design VESA adapter..... = 001 Adapter for pipe mounting of <i>Rittal CP40 or Bernstein CS-480</i> <i>B.Flex</i> = 002																						
05 Variant Standard = NNN																						
06 Other design None = NN																						

Fig. 36: Type code for VAS devices

16 Disposal

16.1 Device disassembly

To prepare the disposal, refer to the notes on the device disassembly: ➔ Chapter 10.6 “Device dismantling for disposal” on page 32.

17 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts provide you with advice and assistance. 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**

Email: ➔ 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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