

# » User Guide «



## CC300 Operator Panel Model 2-DH47-0010

**User Guide** (Version 1.1)

P/N: XXXX-XXXX



 CC300 Operator Panel - User Guide

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Kontron S&T AG

Lise-Meitner-Str. 3-5

86156 Augsburg

Germany

[www.kontron.com](http://www.kontron.com)

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**Intended Use: The CC300 Operator panel is designed for the use in industrial facilities only.**

### **⚠ CAUTION**

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**Handling and operation of the product is permitted only for trained personnel within a work place that is access controlled. Please follow the “General Safety Instructions for IT Equipment” supplied with the system.**

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# 1. Table of Contents

- 1. Table of Contents .....5**
- 1.1. Table of Figures..... 7
- 2. Introduction .....9**
- 2.1. Symbols used in this User Guide..... 10
- 3. Important Instructions.....11**
- 3.1. Note on the Warranty..... 11
- 3.2. Exclusion of Accident Liability Obligation ..... 11
- 3.3. Liability Limitation / Exemption from the Warranty Obligation ..... 11
- 4. General Safety Instructions for.....12**
- 4.1. Electrostatic Discharge (ESD)..... 14
  - 4.1.1. Grounding Methods..... 14
- 4.2. Instructions for the Lithium Battery ..... 15
- 5. Electromagnetic Compatibility .....16**
- 5.1. Electromagnetic Compatibility (EU) ..... 16
- 5.2. FCC and RSS Statement (USA & Canada) ..... 16
- 5.3. Nameplate of the CC300 Operator Panel..... 17
- 6. Scope of Delivery.....18**
- 7. Product Description .....19**
- 7.1. Front Side View ..... 22
  - 7.1.1. On/Off Button ..... 23
  - 7.1.2. RFID Read/Write Zone ..... 23
  - 7.1.3. Emergency Stop Switch ..... 24
  - 7.1.4. Buttons for Tilting the CC300 Operator Panel..... 25
  - 7.1.5. Touch Display ..... 25
  - 7.1.6. Touch Display Care and Cleaning..... 25
  - 7.1.7. Traversing Buttons..... 26
  - 7.1.8. Markings for the USB Ports ..... 26
  - 7.1.9. Permissive Button and Program Interrupt Button ..... 27
  - 7.1.10. Rotary/Push Button with Display ..... 27
- 7.2. Rear View ..... 28
  - 7.2.1. Harting Connector ..... 29
  - 7.2.2. Connection Cables for the Linear Actuator ..... 29
  - 7.2.3. Grounding Cable (PE)..... 30
  - 7.2.4. LAN Cables ..... 30
- 7.3. Left and Right Side View ..... 31
  - 7.3.1. USB Ports ..... 32
- 7.4. Top and Bottom View ..... 33
- 7.5. Accessing internal Components..... 34

7.5.1. Opening the CC300 Operator Panel.....	34
7.5.2. Closing the CC300 Operator Panel.....	37
<b>8. Cabinet Installation.....</b>	<b>38</b>
<b>9. Maintenance and Prevention .....</b>	<b>43</b>
9.1. Replacing the Lithium Battery.....	43
9.2. Replacing the Emergency Stop Switch .....	46
9.2.1. Replacing the Button of the Emergency Stop Switch .....	46
9.2.2. Replacing the Auxiliary Switch Block.....	46
9.3. Replacing the Rotary/Push Button.....	48
9.4. Replacing the Cable Gland.....	50
<b>10. Technical Data .....</b>	<b>53</b>
10.1. External Connectors and Interfaces .....	54
10.2. Electrical Specifications .....	55
10.3. Environmental Specifications.....	56
10.4. Mechanical Specifications .....	56
10.5. International Compliance, Approvals and Certificates .....	59
<b>11. Interfaces – Pin Assignments.....</b>	<b>61</b>
11.1.1. Harting Connector.....	61
11.1.2. LAN 0, LAN 2 and LAN 3 Cable .....	62
11.1.3. LAN 1 Cable .....	62
11.1.4. DP Connector (Standard: DisplayPort 1.2).....	63
11.1.5. USB Ports.....	64
11.1.6. Grounding Cable (PE) .....	64

## 1.1. Table of Figures

Fig. 1: CC300 Operator Panel - Nameplate .....	17
Fig. 2: Bottom view .....	21
Fig. 3: Right view .....	21
Fig. 4: Front view.....	21
Fig. 5: Rear view .....	21
Fig. 6: Left view .....	21
Fig. 7: Top view .....	21
Fig. 8: Front view of the CC300 operator panel .....	22
Fig. 9: On/Off button.....	23
Fig. 10: RFID-read/write zone .....	23
Fig. 11: Emergency stop switch .....	24
Fig. 12: Buttons for tilting out and in the CC300 operator panel.....	25
Fig. 13: Traversing buttons below the touch display.....	26
Fig. 14: Markings for laterally mounted USB 2.0 ports .....	26
Fig. 15: Permissive button and program interrupt button .....	27
Fig. 16: Rotary/push button with illumination and display .....	27
Fig. 17: Rear side of the CC300 operator panel.....	28
Fig. 18: Harting connector .....	29
Fig. 19: Grounding cable .....	30
Fig. 20: LAN cables .....	30
Fig. 21: Right side of the CC300 operator panel.....	31
Fig. 22: Left side of the CC300 operator panel .....	31
Fig. 23: USB ports.....	32
Fig. 24: Top view of the CC300 operator panel .....	33
Fig. 25: Bottom view of the CC300 operator panel.....	33
Fig. 26: Carefully open the CC300 a few inches.....	35
Fig. 27: Unlocking and removing the auxiliary switch block.....	35
Fig. 28: CC300 operator panel, fully opened .....	36
Fig. 29: CC300 Operator Panel installed in an industrial cabinet .....	38
Fig. 30: Threaded holes and contact surfaces for holder mounting .....	38
Fig. 31: Mounting the CC300 Operator Panel to the left holder .....	39
Fig. 32: Mounting the cable gland to the cabinet.....	39
Fig. 33: Threaded holes and contact surface for guide sleeve mounting .....	40
Fig. 34: Mounting the guide sleeve of the actuator to the CC300 .....	40
Fig. 35: Inserting the forcer into the guide sleeve of the actuator .....	41
Fig. 35: Attaching the top cover of the CC300 cabinet.....	41
Fig. 36: Inserting the forcer into the guide sleeve of the actuator .....	42
Fig. 37: Button (cap) of the rotary/push button.....	43

Fig. 38: Unscrew the cap holder of the rotary/push button ..... 43

Fig. 39: Rotary/push button and CMOS battery, pulled out of the housing..... 44

Fig. 40: Removing the rotary/push button (shown with battery removed)..... 44

Fig. 41: Position of the label on the cap holder of the rotary/push button ..... 45

Fig. 42: Button of the emergency stop switch ..... 46

Fig. 43: Dismantling the auxiliary switch block ..... 47

Fig. 44: Switch module, cable, and mounting flange ..... 47

Fig. 45: Button (cap) of the rotary/push button ..... 48

Fig. 46: Unscrew the cap holder of the rotary/push button ..... 48

Fig. 47: Rotary/push button and CMOS battery, pulled out of the housing..... 48

Fig. 48: Removing the rotary/push button (shown with battery removed)..... 49

Fig. 49: Position of the label on the cap holder of the rotary/push button ..... 49

Fig. 50: Remove screws of the cable gland bracket ..... 50

Fig. 51: Detached cable gland with bracket ..... 50

Fig. 52: Take the bracket out of the cable gland..... 51

Fig. 53: Cables and cable gland bracket after removing the cable gland ..... 51

Fig. 54: Insert cables from the thicker end into the cable gland ..... 52

Fig. 55: Cable gland with inserted bracket (shown without cables) ..... 52

Fig. 56: Dimensioned view of the CC300 glass front (print side - reversed image)..... 57

Fig. 57: Dimensioned rear and side view of the CC300 operator panel ..... 58



## 2. Introduction

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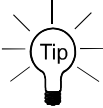
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Lise-Meitner-Str. 3-5

86156 Augsburg  
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## 2.1. Symbols used in this User Guide

Symbol	Meaning
	This symbol indicates the danger of injury to the user or the risk of damage to the product if the corresponding warning notices are not observed.
	This symbol indicates that the product or parts thereof may be damaged if the corresponding warning notices are not observed.
	This symbol indicates general information about the product and the user guide.
	This symbol indicates detail information about the specific product configuration.
	This symbol precedes helpful hints and tips for daily use.

## 3. Important Instructions

This chapter contains instructions which must be observed when using the CC300 Operator Panel. The manufacturer's instructions provide useful information on your device.

### 3.1. Note on the Warranty

Due to their limited service life, parts which by their nature are subject to a particularly high degree of wear (wearing parts) are excluded from the warranty beyond that provided by law. This applies to batteries, for example.

### 3.2. Exclusion of Accident Liability Obligation

Kontron Europe GmbH shall be exempted from the statutory accident liability obligation if the user fails to observe the included document: "General Safety Instructions for IT Equipment" the hints in this manual or eventually the warning sign labels on the device.

### 3.3. Liability Limitation / Exemption from the Warranty Obligation

In the event of damage to the device caused by failure to observe the included document "General Safety Instructions for IT Equipment", the hints in this manual or eventually the warning signs label on the device, Kontron Europe GmbH shall not be required to honor the warranty even during the warranty period and shall be exempted from the statutory accident liability obligation.

## 4. General Safety Instructions

Please read this section carefully and observe the instructions for your own safety and correct use of the device.

Observe the warnings and instructions on the device and in the manual.

The CC300 Operator Panel has been built and tested by Kontron Europe in accordance to UL 61010-1 - Edition 3 - Revision Date 2019/07/19 and left the company in a perfectly safe condition.

In order to maintain this condition and ensure safe operation, the user must observe the instructions and warnings contained in this manual.

- This product shall be supplied by 60950-1 LPS or NEC Class 2 power supply.
- The device must be used in accordance with the instructions for use.
- The electrical installations in the room must correspond to the requirements of the local (country-specific) regulations.
- For DC power connection:  
The DC power source should be able to be switched off and on via an isolating switch.  
The unit is only completely disconnected from the DC main power source, when the DC power cord is disconnected either from the power source or the unit. Therefore, the DC power cord and its connectors must always remain easily accessible.
- Do not place the device in direct sunlight, near heat sources or in a damp place. Make sure the device has adequate ventilation.
- Only devices and components which fulfill the requirements of an SELV circuit (safety extra low voltage) in accordance with EN60950 may be connected to the interfaces of the system.
- The device is designed to be used in vertical (diagonal) position.
- The device generates heat during operation. Make sure it is adequately ventilated. Do not cover the cooling fins on the rear side of the device.
- Maintenance or repair on the open device may only be carried out by qualified personnel authorized by Kontron Europe GmbH which is aware of with the associated dangers.
- The device may only be opened in accordance with the description in this user guide for replacing the Lithium battery. The device must be switched off and disconnected from the power source.
- Only approved original accessories (optional parts) approved by Kontron Europe GmbH may be used.
- The DC-input must fulfill SELV requirements of EN60950-1 standard.
- The chassis of the CC300 Operator Panel must be protective earthed by establishing a **large-area contact** between the grounding cable and an appropriate grounding connection point.

- ❑ It must be assumed that safe operation is no longer possible,
  - if the device has visible damage or
  - if the device no longer functions.

In these cases the device must be shut down and secured against unintentional operation.



## 4.1. Electrostatic Discharge (ESD)

A sudden discharge of electrostatic electricity can destroy static-sensitive devices or micro-circuitry. Therefore proper packaging and grounding techniques are necessary precautions to prevent damage. Always take the following precautions:

1. Transport boards in ESD-safe containers such as boxes or bags.
2. Keep electrostatic sensitive parts in their containers until they arrive at the ESD-safe workplace.
3. Always be properly grounded when touching a sensitive board, component, or assembly.
4. Store electrostatic-sensitive boards in protective packaging or on antistatic mats.

### 4.1.1. Grounding Methods

The following measures help to avoid electrostatic damages to the device:

1. Cover workstations with approved antistatic material. Always wear a wrist strap connected to workplace as well as properly grounded tools and equipment.
2. Use antistatic mats, heel straps, or air ionizers for more protection.
3. Always handle electrostatic sensitive components by their edge or by their casing.
4. Avoid contact with pins, leads, or circuitry.
5. Turn off power and input signals before inserting and removing connectors or connecting test equipment.
6. Keep work area free of non-conductive materials such as ordinary plastic assembly aids and styrofoam.
7. Use field service tools such as cutters, screwdrivers, and vacuum cleaners which are conductive.
8. Always place drives and boards PCB-assembly-side down on the foam.

## 4.2. Instructions for the Lithium Battery

The installed mainboard is equipped with a lithium battery.

For the replacing of this battery please observe the instructions described in the “**Replacing the Lithium Battery**” chapter.



### Warning

Danger of explosion when replacing with wrong type of battery. Replace only with the same or equivalent type recommended by the manufacturer. The lithium battery type must be UL listed.



Do not dispose of lithium batteries in general trash collection. Dispose of the battery according to the local regulations dealing with the disposal of these special materials, (e.g. to the collecting points for dispose of batteries).

## 5. Electromagnetic Compatibility

### 5.1. Electromagnetic Compatibility (EU)

This product is intended only for use in industrial areas. The most recent version of the EMC guidelines (EMC Directive 2004/108/EC) and/or the German EMC laws apply. If the user modifies and/or adds to the equipment (e.g. installation of expansion cards) the prerequisites for the CE conformity declaration (safety requirements) may no longer apply.

#### **Warning!**

**This is a class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.**

### 5.2. FCC and RSS Statement (USA & Canada)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

In addition to containing other required statements specified elsewhere in this standard or in the applicable RSS.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.



Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

(English): This Class A digital apparatus complies with the Canadian ICES-003.

(French): Cet appareil numérique de la class A est conforme à la norme NMB-003 du Canada.

### 5.3. Nameplate of the CC300 Operator Panel

The nameplate is located at the bottom rear side of the cabinet (see also Fig. 17, Pos. 8).



Fig. 1: CC300 Operator Panel - Nameplate

## 6. Scope of Delivery

Scope of Delivery:	<input type="checkbox"/> CC300 Operator Panel
Optional Parts:	<input type="checkbox"/> DP cable <input type="checkbox"/> Blind panel <input type="checkbox"/> Add-on panel <input type="checkbox"/> Expansion panel <input type="checkbox"/> Expansion panel 2F

## 7. Product Description

The CC300 operator panel is a Human Machine Interface (HMI) system designed for demanding industrial applications. As a workstation system with integrated touch screen display it is designed for installation in an instrument panel or other cabinets. For better handling and readability the operator panel can be tilted continuously out of its vertical position up to a maximum tilt angle of 45 degrees by a linear actuator (outwards, with the lower edge ahead).

The CC300 operator panel consists of two main parts, the front plate and the rear cover.

The front of the CC300 operator panel is designed in glass; between the glass and the 21.5" display a PCAP touch (capacitive touch with multi-touch capability) is laminated on the glass. In addition, the glass front supports an emergency stop switch, an RFID antenna, capacitive buttons with LED backlight and a rotary/push button with LED backlight.

The rear cover consists of die cast aluminum and serves the following functions: Heat sink of the system, chassis for assembling of electronic modules, holder of the linear actuator (of the external tilting mechanism) and cable gland for all outgoing cables.

The CC300 operator panel accommodates an INTEL processor architecture board that will host the "LINUX 64 Bit" operating system. All components, hardware and hardware drivers are designed to support 100% the "ENGEL LINUX x86 64 Bit" operating system. An M.2 drive is installed as storage device. Optionally, the CC300 operator panel can be equipped with a 2.5" SSD or HDD drive.

The CC300 operator panel has two externally accessible USB 3.0 ports located at the left side of the chassis. The position of the USB ports is marked on the front plate with backlit symbols.

The CC300 operator panel provides four external LAN ports with three different NICs. Thus, it can be connected simultaneously e.g. to the corporate LAN and to a stored program control (SPC).

Via the RFID read/write zone at the glass front of the CC300 operator panel e.g. smart cards can be read or written contactless.

The CC300 operator panel is designed for 24V DC operation.



The CC300 operator panel will not meet any safety functions!

Monitoring of all safety-related components (emergency stop, protective covers etc.) will be performed by particular safety modules of the terminal equipment.



The CC300 operator panel complies with IP54 protection class (IP54 not evaluated by UL).

The CC300 operator panel is a fanless system. The cooling of the unit is performed by the surface and the cooling fins of the aluminum cover on the rear side of the chassis.



When powering on the CC300 operator panel, make sure that the cooling fins are not obstructed.



Fig. 2: Bottom view

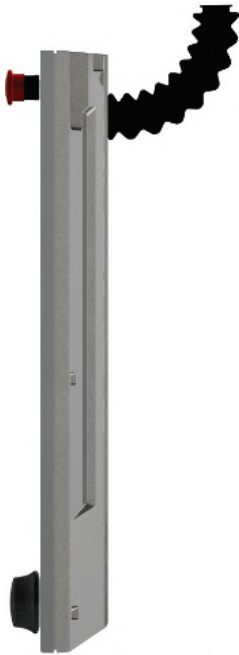


Fig. 3: Right view



Fig. 4: Front view



Fig. 5: Rear view

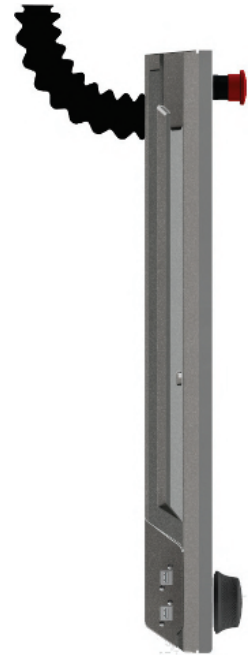


Fig. 6: Left view

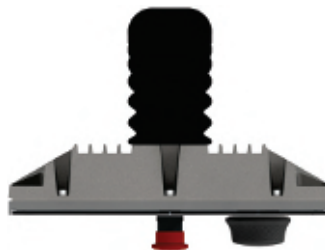


Fig. 7: Top view

Views of the CC300 operator panel (Fig. 2 to Fig. 7) with cable gland, without tilting mechanism.

7.1. Front Side View

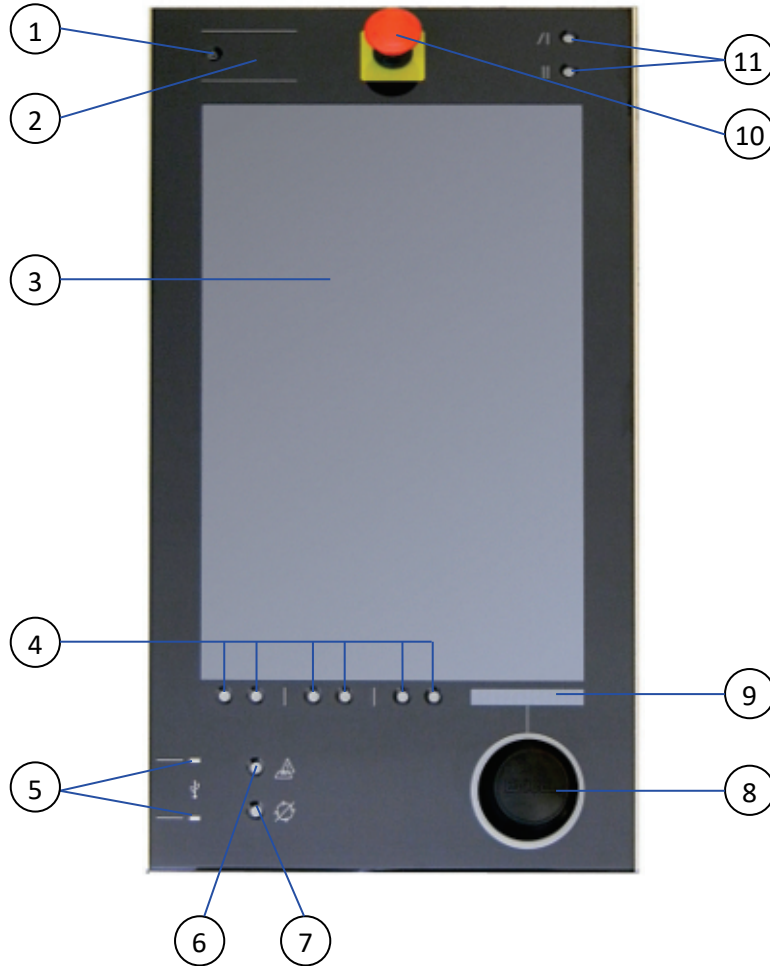


Fig. 8: Front view of the CC300 operator panel

Legend for Fig. 8:

- |   |  |
|---|--|
| 1 On/Off button   | 7 Program interrupt button   |
| 2 RFID read/write zone                                  | 8 Rotary/push button (backlit)   |
| 3 21.5" TFT display with multi-touch                    | 9 Display of the rotary/push button  |
| 4 Traversing buttons                                    | 10 Emergency stop switch   |
| 5 Markings for the two USB ports<br>(laterally mounted) | 11 Buttons for tilting out and in the<br>operator panel (up to 45 degrees<br>max.) |
| 6 Permissive button                                     |  |

### 7.1.1. On/Off Button

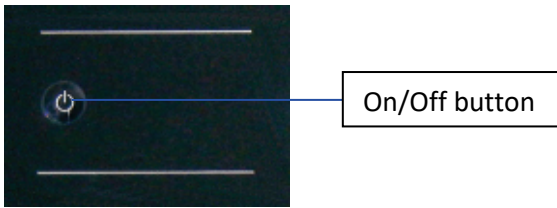


Fig. 9: On/Off button

The On/Off button allows to boot up/shut down the system. It is a capacitive button with white LED backlight, located top left on the front plate (see also Fig. 8, Pos. 1).



Even when the system is turned off via the On/Off button there is still a standby-voltage on the mainboard. The system is not completely disconnected from the main power supply (DC) by switching off via the On/Off button.

The unit is only completely disconnected from the DC main power supply, when the DC power is cut off by an isolating switch or when the power cord is disconnected either from the DC main power or the unit. Therefore, the DC power cord and its connectors must always remain easily accessible.

To avoid the risk of data loss, always shut down the system before you cut off the power using an isolating switch!

### 7.1.2. RFID Read/Write Zone

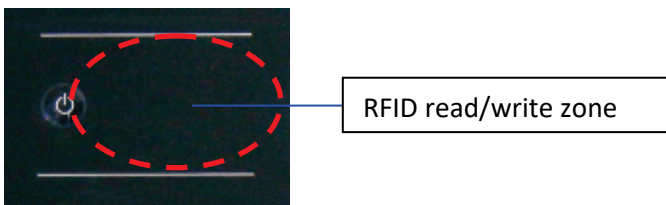


Fig. 10: RFID-read/write zone

On the right side of the On/Off button the RFID read/write zone is located (see also Fig. 8, Pos. 2). At this position the RFID antenna is mounted to the rear side of the front glass. RFID-equipped objects (e.g. ID cards, smart cards, RFID labels) can be read or written by the CC300 operator panel, when held against the front glass within the read/write zone. The RFID data will be processed by the installed software (e.g. user login with different authorizations for different user accounts).

### 7.1.3. Emergency Stop Switch

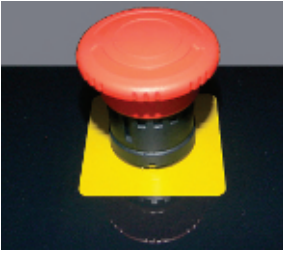


Fig. 11: Emergency stop switch

The emergency stop switch is located centered above the display on the glass front (see also Fig. 8, Pos. 10). The emergency stop button has to be pressed firmly. The switch locks in place and can only be released by turning the knob clockwise.

The emergency stop switch has four (optional: six) switching contacts that cut off the connected 24 V circuits when being pressed.



**Even though the emergency stop switch is installed in the CC300 operator panel, it is not connected to or monitored by the CC300 electronics!**

The emergency stop switch is installed in the CC300 operator panel for the purpose of easy and quick accessibility but it has an entirely independent function.

When the emergency stop switch is pressed, the CC300 operator panel will not be halted or switched off.



**The emergency stop switch may only be connected by trained personnel.**

**The responsibility for safety lies with the customer. The emergency stop switch was only mounted mechanically.**



**Only connect to a power supply delivering the specified input rating and complying with the requirements of Safety Extra Low Voltage (SELV) and Limited Power Source (LPS) according to IEC UL/IEC 60950-1 or Limited energy circuit according to UL/IEC 61010-1 or Class 2 according to UL1310.**



#### 7.1.4. Buttons for Tilting the CC300 Operator Panel



Fig. 12: Buttons for tilting out and in the CC300 operator panel

For better handling and readability the operator panel can be tilt continuously out of its vertical position up to a maximum tilt angle of 45 degrees by a linear actuator.

By pressing the “Tilt out” button, the CC300 operator panel tilts outwards (with the lower edge ahead) until the button is released. When the maximum tilt angle of 45 degrees is reached, the tilt-out process will also be stopped.

By pressing the “Tilt in” button, the CC300 operator panel tilts back (with the lower edge ahead) in the direction of the vertical mounting position until the button is released. When the vertical mounting position is reached, the tilt-in process will also be stopped.

The “Tilt out” and “Tilt in” buttons, as well as their symbols, are backlit white. During being pressed, the particular button and the corresponding symbol are backlit blue.

#### 7.1.5. Touch Display

The CC300 operator panel is equipped with a 21.5” TFT display and a capacitive touch (PCAP) with multi-touch capability (see also Fig. 8, Pos. 3). The surface of the display and the touch is protected by the front glass. The touch display responds to the light touch of a finger or glove (the touch display is factory-calibrated for operation with the PU-coated glove types *Solidstar 1327* and *Camapur Cut 620*) and offers the same degree of user comfort as a computer mouse.

For technical specification of the touch display refer to the chapter 10 “Technical Data”.



Do not use a hard or a pointed object (like a screw driver) to operate the touch screen or the capacitive buttons, since it can scratch or damage the front glass.

#### 7.1.6. Touch Display Care and Cleaning



The front panel and the touch screen are protected by a continuous glass plate that should be handled with care and cleaned regularly.

Use a lint-free cloth with mild detergent (e.g. glass cleaner) and water for cleaning the glass front. Do not

use strong or abrasive detergents or solvents, which could attack plastic parts (e.g. the rotary/push button) or scratch the front glass.



The capacitive touch screen is factory-calibrated and needs no recalibration.

### 7.1.7. Traversing Buttons



Fig. 13: Traversing buttons below the touch display

Directly below the touch display, arranged in pairs, six traversing buttons are located, (see also Fig. 8, Pos. 4), which are processed by the capacitive touch of the display. The function of the buttons may be changed by the software; the current function will be displayed on the display directly above the corresponding buttons.

### 7.1.8. Markings for the USB Ports

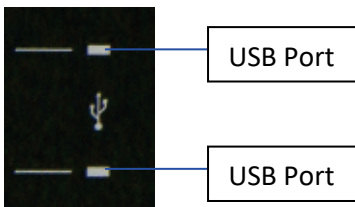


Fig. 14: Markings for laterally mounted USB 2.0 ports

At the bottom left of the front plate, an USB symbol and two markings for the positions of the laterally (behind the front plate) mounted USB ports are located (see also Fig. 8, Pos. 5 and Fig. 23). The USB symbol and the markings are backlit white.

### 7.1.9. Permissive Button and Program Interrupt Button

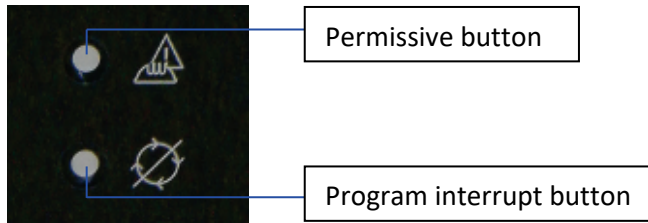


Fig. 15: Permissive button and program interrupt button

Below the traverse buttons, on the right of the USB markings, the permissive button (see also Fig. 8, Pos. 6) and the program interrupt button (see also Fig. 8, Pos. 7) are located.

The capacitive permissive button will be used in certain situations in addition to a traverse button or a button displayed on the display. In idle mode, the permissive button and its related symbol are backlit white. The backlight changes to blue when the permissive button is pressed.

By pressing the capacitive program interrupt button (error acknowledgement button), all upcoming error messages will be acknowledged and a running automatic cycle will be interrupted. In idle mode, the program interrupt button and its related symbol are backlit *white*. The backlight changes to *orange* when the program interrupt button is pressed.

### 7.1.10. Rotary/Push Button with Display

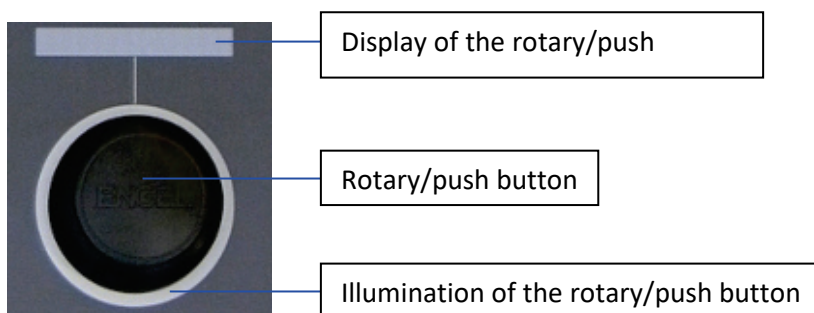


Fig. 16: Rotary/push button with illumination and display

At the bottom right of the front plate, below the touch display, the rotary/push button with display is located (see also Fig. 8, Pos. 8 and Pos. 9). The rotary/push button can be adjusted to the left and to the right to a maximum of 30 degrees and is self-resetting when released. Furthermore, the rotary/push button provides a push button function. Around the rotary/push button a white backlit ring is mounted that can change its color to red, green and orange by software.

The display of the rotary/push button is part of the touch display and visualizes the set values.

7.2. Rear View

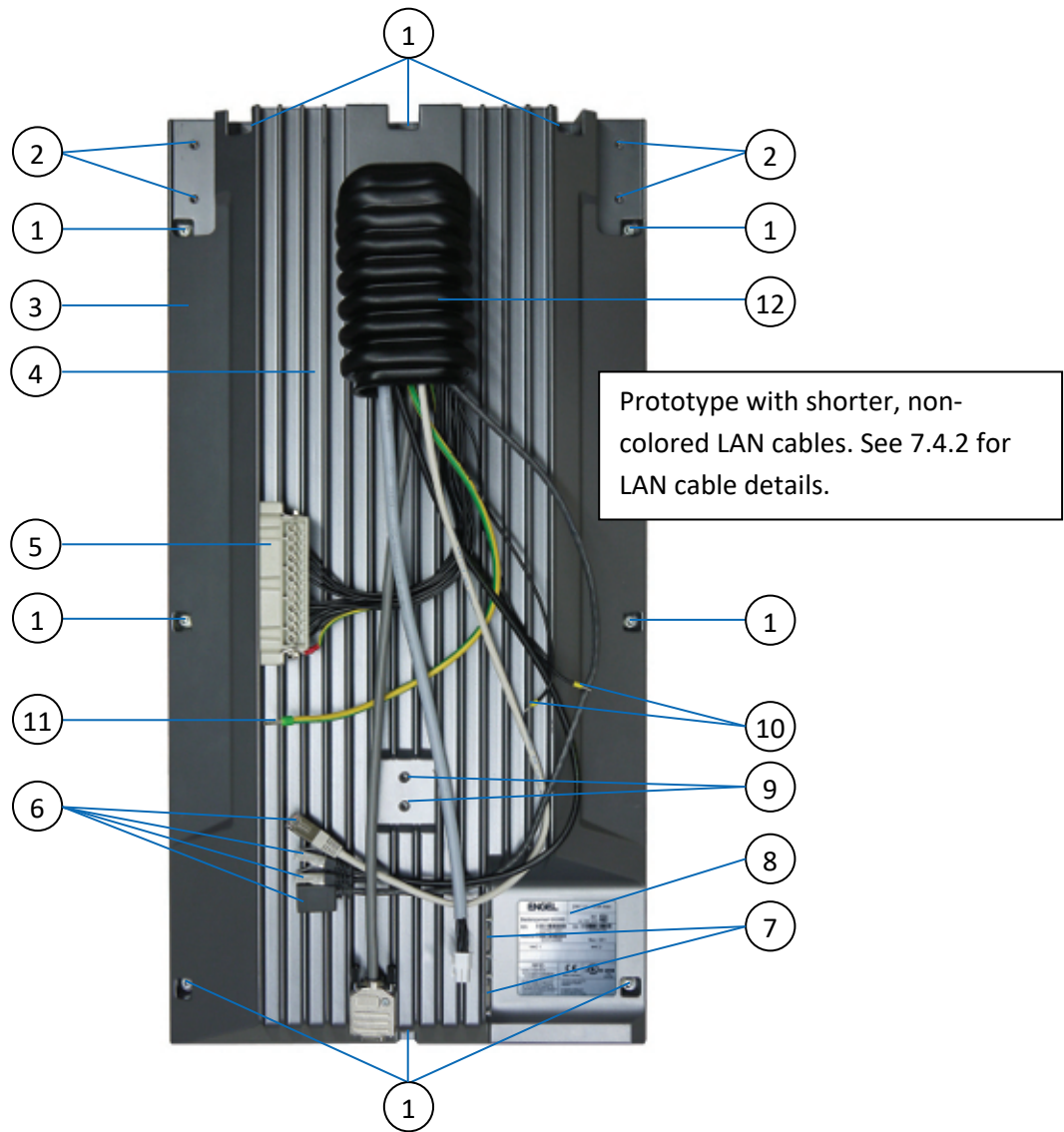


Fig. 17: Rear side of the CC300 operator panel

Legend for Fig. 17 :

- |  |   |
|--|---|
| 1 Screws that secure the rear cover at the front plate     | 7 2x USB 3.0 ports                                |
| 2 Threaded holes for mounting the CC300                    | 8 Nameplate                                       |
| 3 Aluminum rear cover of the CC300                         | 9 Threaded holes for mounting the linear actuator |
| 4 Cooling fins of the aluminum rear cover                  | 10 Connection cables for the linear actuator      |
| 5 Harting connector (24-pole)                              | 11 Grounding cable                                |
| 6 4x LAN cables (Ethernet 10/100/1000; 3x male, 1x female) | 12 Cable gland (flexible cable inlet)             |



Optionally, an additional DP cable (DisplayPort cable) can be connected to the mainboard and led out through the cable gland. A digital display can be connected to the DP cable.

### 7.2.1. Harting Connector



Fig. 18: Harting connector

All outgoing cables of the CC300 operator panel are routed through the cable gland at the rear side of the cabinet (see also Fig. 17, Pos. 12). Except for the cables for the linear actuator and the grounding cable, all single wires are combined in the 24-pole Harting connector (Fig. 18). For the pin assignment of the Harting connector, refer to chapter 11.1.1 “Harting Connector”.

#### 7.2.1.1. Power Supply via the Harting Connector

The power supply of the CC300 operator panel will be provided via pin 7 (24 Volts; cable No. 6) and pin 19 (0 Volts; cable No. 5) of the Harting connector.



**Only connect to a power supply delivering the specified input rating and complying with the requirements of Safety Extra Low Voltage (SELV) and Limited Power Source (LPS) according to IEC UL/IEC 60950-1 or Limited energy circuit according to UL/IEC 61010-1 or Class 2 according to UL1310.**

#### 7.2.1.2. Control and Signal Lines

The power supply of the linear actuator, the interrupt circuits 1 to 4 (optional: 1 to 6) of the emergency stop switch and other control lines (power transformer switch-off, Dig In 1) are also routed through the 24-pin Harting connector. For the pin assignment of the Harting connector, refer to chapter 11.1.1 “Harting Connector”.

### 7.2.2. Connection Cables for the Linear Actuator

The two single cables marked “1” and “2” (see Fig. 17, Pos. 10) will be connected to the linear actuator of the tilting mechanism. The maximum allowed connection power is 44 W.

7.2.3. Grounding Cable (PE)

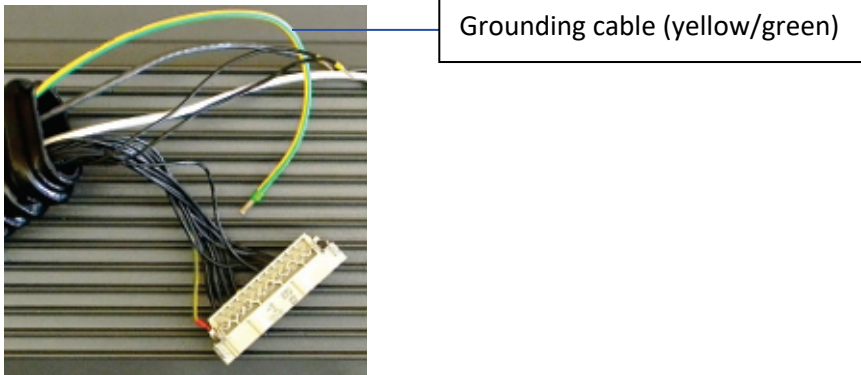


Fig. 19: Grounding cable

The CC300 operator panel must be grounded by establishing a **large-area contact** between the grounding cable (see also Fig. 17, Pos. 11) and an appropriate grounding contact. The cross section of the grounding cable is 6 mm<sup>2</sup>.

7.2.4. LAN Cables

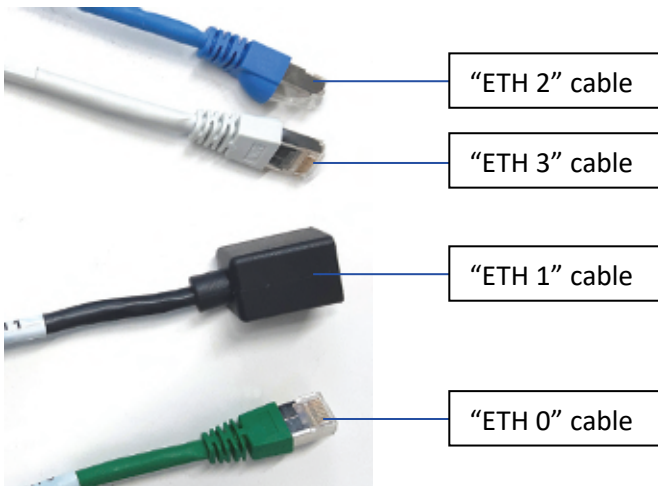


Fig. 20: LAN cables

The “ETH 0” LAN cable (green) is equipped with a male RJ 45 connector (Ethernet 10/100/1000).  
 The “ETH 1” LAN cable (black) is equipped with a female RJ 45 connector (Ethernet 10/100/1000).  
 The “ETH 2” LAN cable (blue) is equipped with a male RJ 45 connector (Ethernet 10/100/1000).  
 The “ETH 3” LAN cable (white) is equipped with a male RJ 45 connector (Ethernet 10/100/1000).



ETH 2 and ETH 3 are internally connected to a switch and share a common MAC address. To avoid network problems, do not connect both LAN cables (ETH2 and ETH3) to the same network device (e.g. Ethernet switch).

7.3. Left and Right Side View

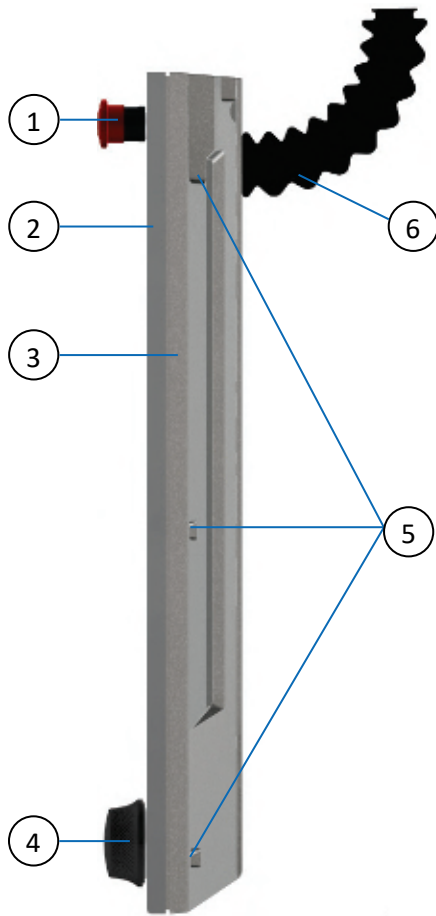


Fig. 21: Right side of the CC300 operator panel

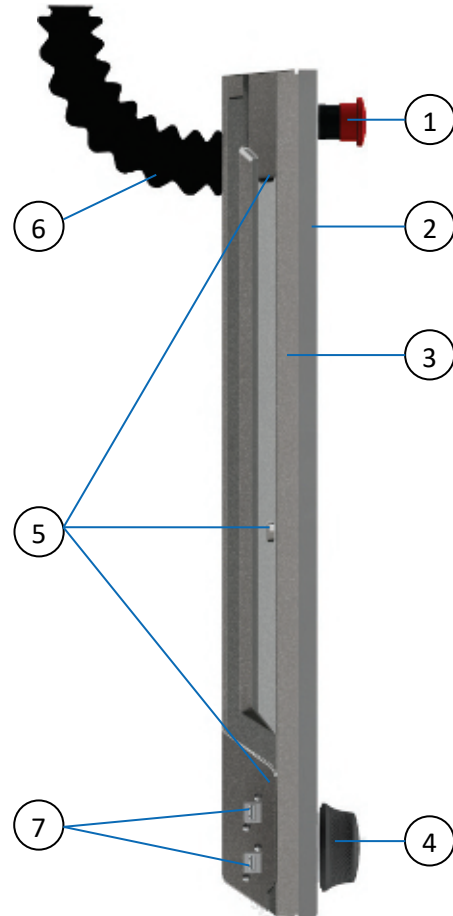


Fig. 22: Left side of the CC300 operator panel

**Legend for Fig. 21 and Fig. 22:**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1 Emergency stop switch</li> <li>2 Front plate of the CC300</li> <li>3 Aluminum rear cover of the CC300</li> <li>4 Rotary/push button</li> </ul> | <ul style="list-style-type: none"> <li>5 Screws that secure the rear cover at the front plate</li> <li>6 Cable gland</li> <li>7 Cavity with 2x USB 3.0 ports</li> </ul> |
|---|---|

7.3.1. USB Ports



*Fig. 23: USB ports*

In a cavity at the left side of the aluminum cover, two USB 3.0 ports (see also Fig. 22, Pos. 7) are located. The cavity is deep enough that plugged-in USB sticks will not restrain the tilting mechanism of the CC300 operator panel.



7.4. Top and Bottom View

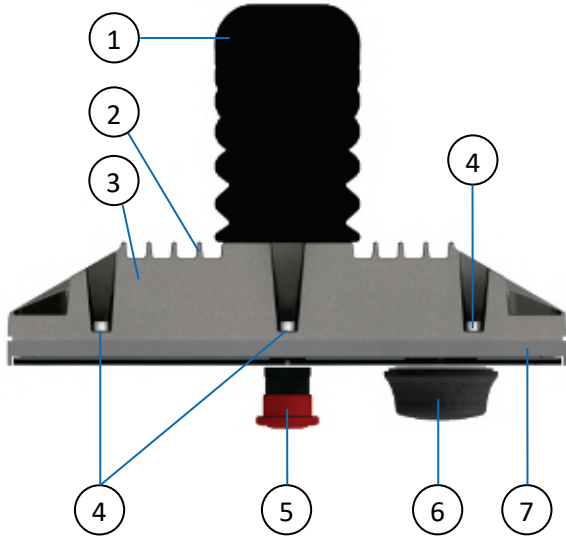


Fig. 24: Top view of the CC300 operator panel

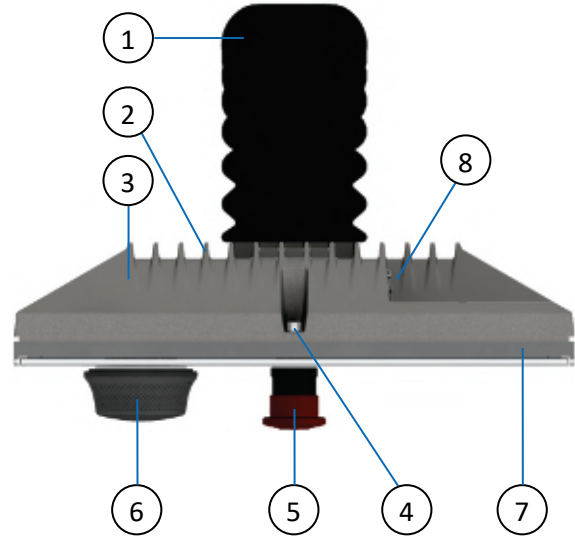


Fig. 25: Bottom view of the CC300 operator panel

**Legend for Fig. 24 and Fig. 25:**

- |  |                            |
|--|----------------------------|
| 1 Cable gland  | 5 Emergency stop switch    |
| 2 Cooling fins of the aluminum rear cover              | 6 Rotary/push button       |
| 3 Aluminum rear cover of the CC300                     | 7 Front plate of the CC300 |
| 4 Screws that secure the rear cover at the front plate | 8 2x USB 3.0 Ports         |

## 7.5. Accessing internal Components

This section contains important information that you must read before accessing internal components. Follow these procedures properly when handling any internal components of the system.



The replacement of the lithium battery (optional: the installation and removal of memory modules, drives or cables) should only be carried out by qualified specialists, in accordance with the description contained in this manual.

Before removing the cover of the CC300 operator panel in order to gain access to the internal components, the system must be powered down and the power cord has to be disconnected from the power source.

It is not allowed to operate the system without installed cover.



Please observe the safety instruction for handling assemblies with static sensitive device. Disregarding of this warning instruction can result in damage to the device.

### 7.5.1. Opening the CC300 Operator Panel

To open the CC300 operator panel, perform the following steps:

1. Place the device on a soft underlayment (e.g. a thick PE foam sheet) with the front plate facing down (see Fig. 26). Make sure that the underlayment is dimensioned so that only the glass plate rests on the underlayment and the emergency stop switch and the rotary/push button **do not** rest on the underlayment or table.
2. Remove the 10x screws (M5 x 10) and the bonded seals that fix the rear cover to the front plate (see Fig. 17, Pos. 1).



The screws (M5 x 10) and the bonded seals must be replaced after 3 to 5 times of tightening and loosening for continuing compliance with IP54 protection class!

3. Lift the rear cover on the left side (seen from behind, with the emergency stop switch at the top!) carefully a few inches (see Fig. 26).

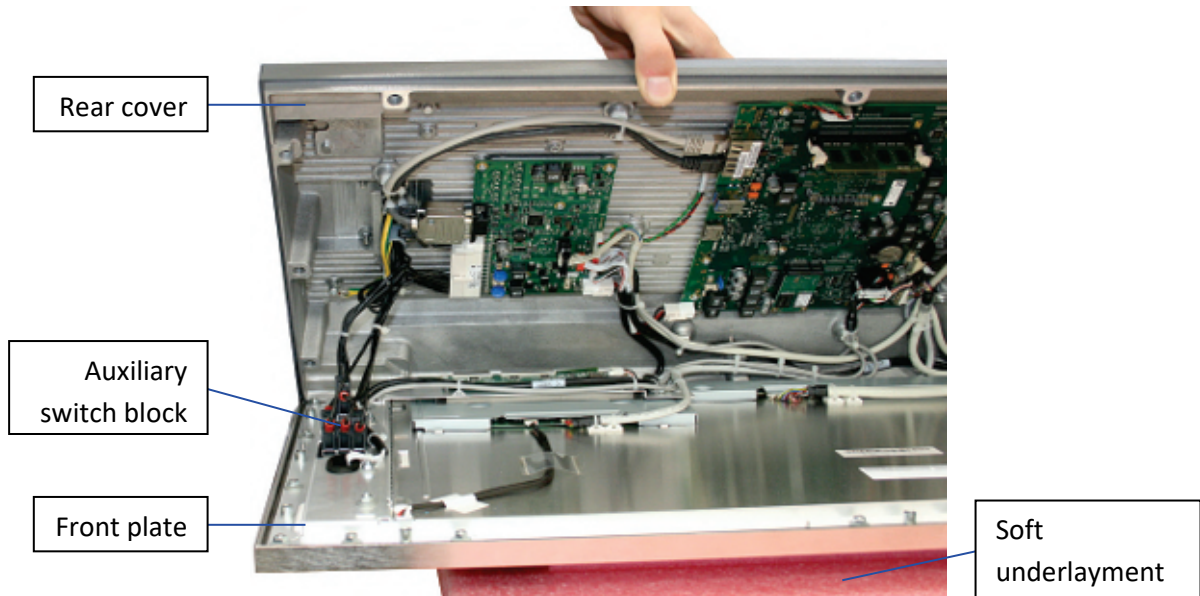


Fig. 26: Carefully open the CC300 a few inches



**Attention: The device can only be opened fully after the auxiliary switch block (of the emergency stop switch) has been removed!**

(It is recommended that the rear cover is held by a second person while the auxiliary switch block is removed!)

4. Unlock the auxiliary switch block with a screwdriver and pull it out of its mounting (see Fig. 27).

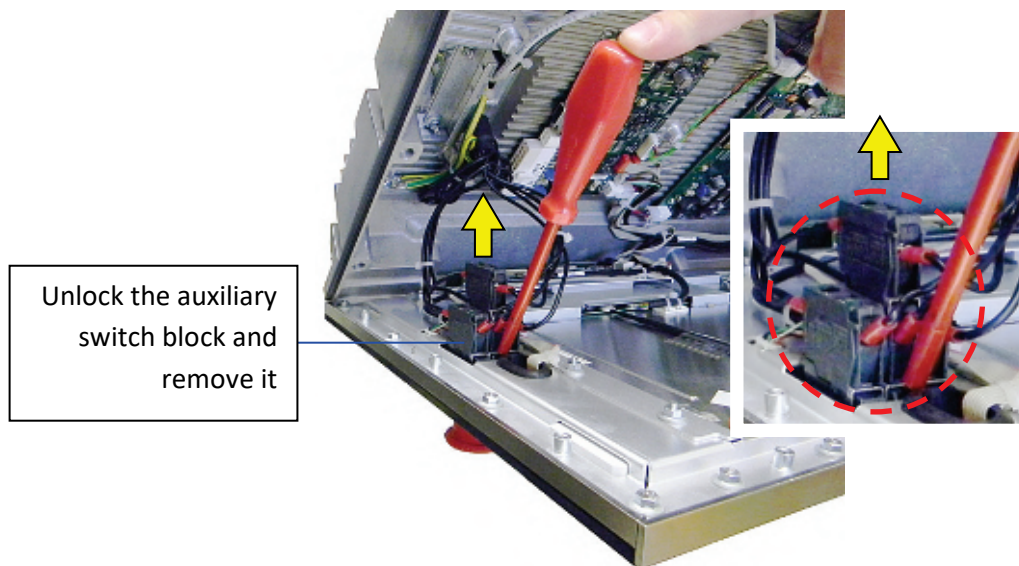


Fig. 27: Unlocking and removing the auxiliary switch block

5. Now the CC300 operator panel can be folded apart carefully.

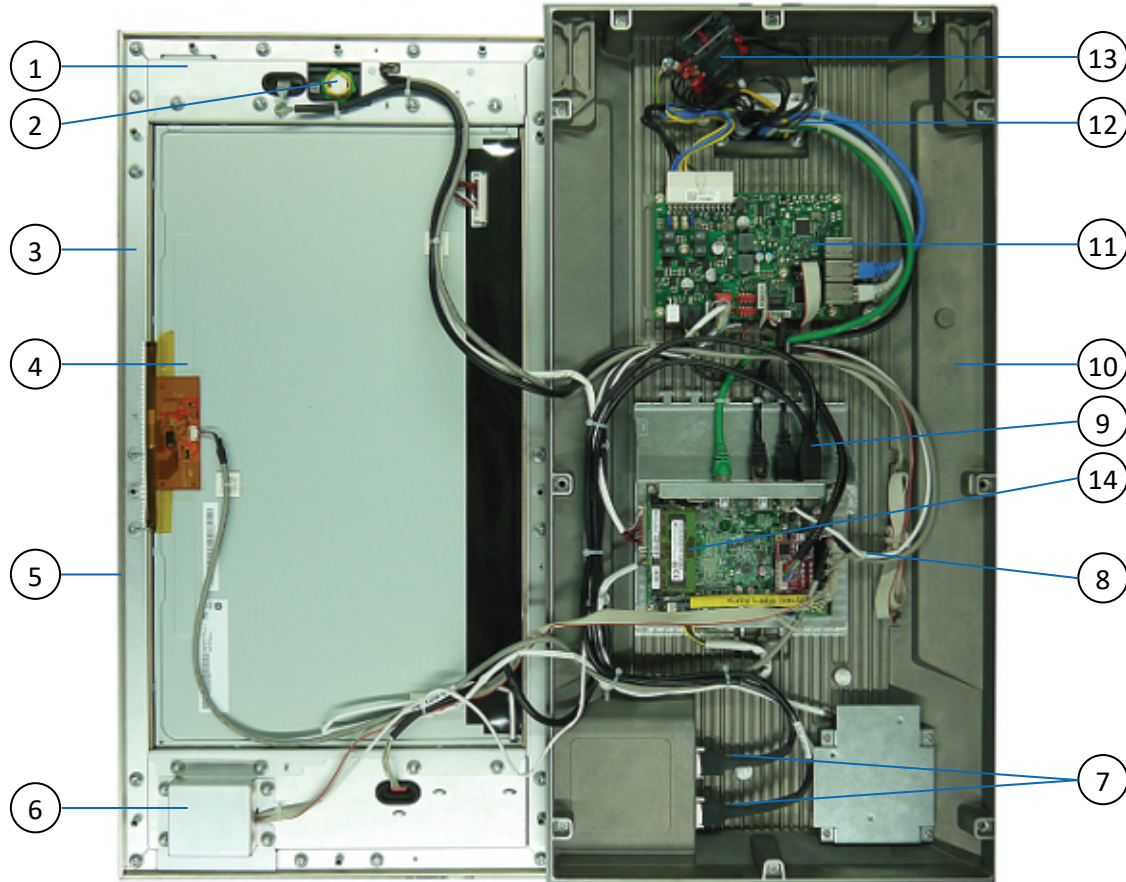


Fig. 28: CC300 operator panel, fully opened

**Legend for Fig. 28:**

- |   |   |    |   |
|---|---|----|---|
| 1 | Circuit area above the display  | 8  | Battery cable from CMOS battery (pos. 6) to CPU board |
| 2 | Mounting of the auxiliary switch block (of the emergency stop switch) | 9  | CPU board (mainboard)                                 |
| 3 | Front plate with aluminum frame                                       | 10 | Aluminum rear cover                                   |
| 4 | Display with capacitive touch   | 11 | I/O board   |
| 5 | Surrounding seal  | 12 | Mounting and opening of the cable gland               |
| 6 | Housing of rotary/push button and CMOS battery                        | 13 | Auxiliary switch block (detached)                     |
| 7 | 2x USB ports (externally accessible)                                  | 14 | DRAM module   |

### 7.5.2. Closing the CC300 Operator Panel

Closing the CC300 operator panel will be performed in reversed order:

1. Carefully fold the aluminum rear cover back onto the front plate, but leave the rear cover open a few inches (see Fig. 26).  
It is recommended that the rear cover is held by a second person while the auxiliary switch block is inserted into its mounting!
2. Press the auxiliary switch block of the emergency stop switch (see Fig. 28, Pos.13) into its mounting so that it clicks into place (see Fig. 28, Pos.2 and Fig. 27).
3. Carefully close the housing completely. Make sure that no cables are jammed and that the surrounding seal is in correct position and will not be damaged (see Fig. 28, Pos. 5).
4. Fix the rear cover to the front plate with the 10x screws (M5 x 10) and bonded seals removed in chapter 7.5.1 “Opening the CC300 Operator Panel”, step 2 (see Fig. 17, Pos. 1).



**Do not exceed the maximum torque of 2.7 Nm when fastening the cabinet screws!**

## 8. Cabinet Installation

For operation, the CC300 Operator Panel will be installed into an industrial cabinet.



*Fig. 29: CC300 Operator Panel installed in an industrial cabinet*

To install the CC300 Operator Panel into its cabinet, proceed as follows:

1. Mount the CC300 to the holders of the cabinet. At least two persons are needed for this operation: One holds the CC300, the other screws it to the left and right holder.

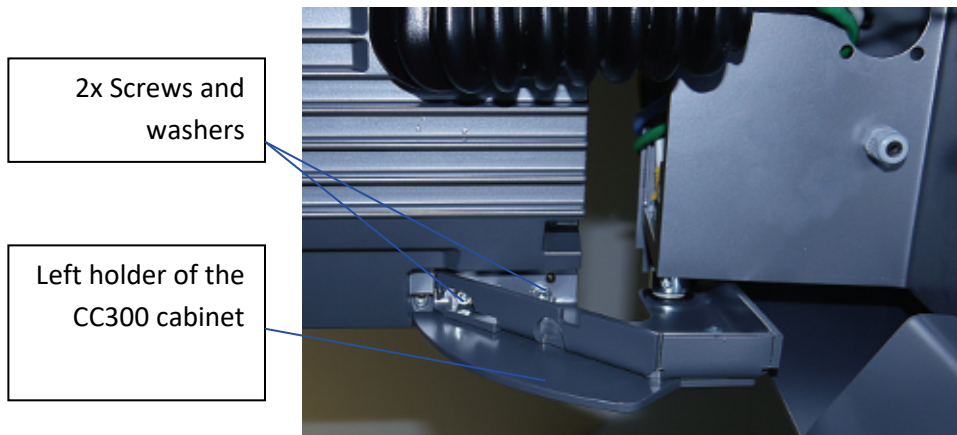


**The left and right holder (or any other holders which are suitable for mounting the CC300) must be mounted directly and firmly to the attachment points of the CC300 without any space between the contact surface of the holder and the contact surface of the CC300 (see Fig. 30 and Fig. 31).**

**Minimum requirements for the mounting screws: Property class 8.8 (minimum) M5 screws. The screws must be screwed in to a minimum depth of 4 mm and a maximum depth of 7.5 mm.**

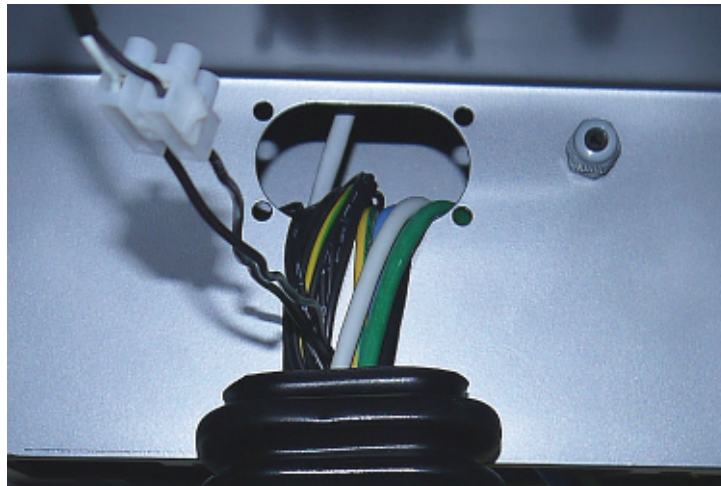


*Fig. 30: Threaded holes and contact surfaces for holder mounting*



*Fig. 31: Mounting the CC300 Operator Panel to the left holder*

2. Route all cables from the cable gland through the cable opening of the cabinet.



*Fig. 32: Mounting the cable gland to the cabinet*

3. Screw the free end of the cable gland to the cable opening
4. Route the two cables for the actuator back to the actuator using the second cable feedthrough and connect it to the actuator.
5. Mount the guide sleeve of the actuator to the rear of the CC300 cabinet with 2x screws and washers.



**The guide sleeve must be mounted directly and firmly to the attachment point of the CC300 without any space between the contact surface of the guide sleeve and the contact surface of the CC300 (see Fig. 33 and Fig. 34).**

**Minimum requirements for the mounting screws: Property class 8.8 (minimum) M5 screws. The screws must be screwed in to a minimum depth of 4 mm and a maximum depth of 7.5 mm.**

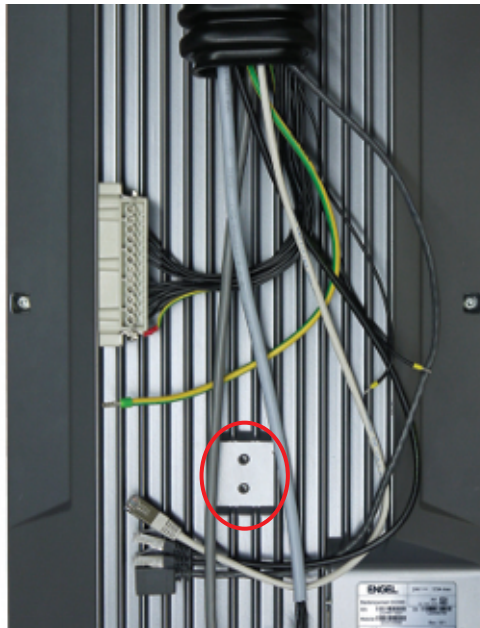


Fig. 33: Threaded holes and contact surface for guide sleeve mounting

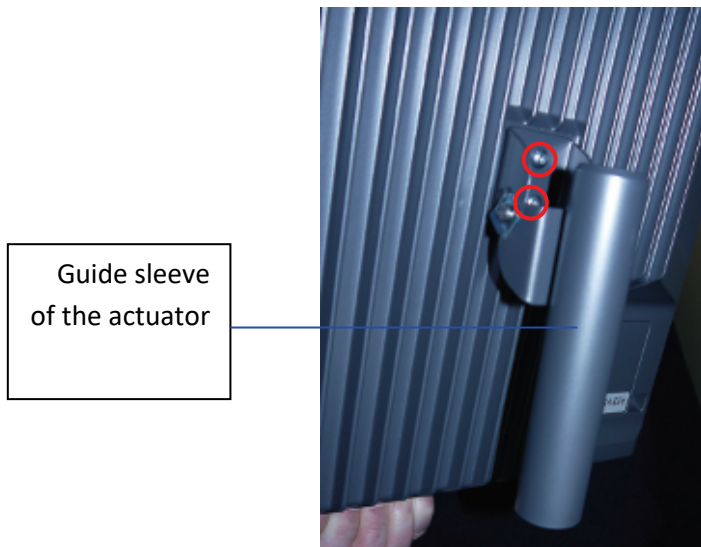


Fig. 34: Mounting the guide sleeve of the actuator to the CC300



6. Insert the forcer of the actuator into the guide sleeve

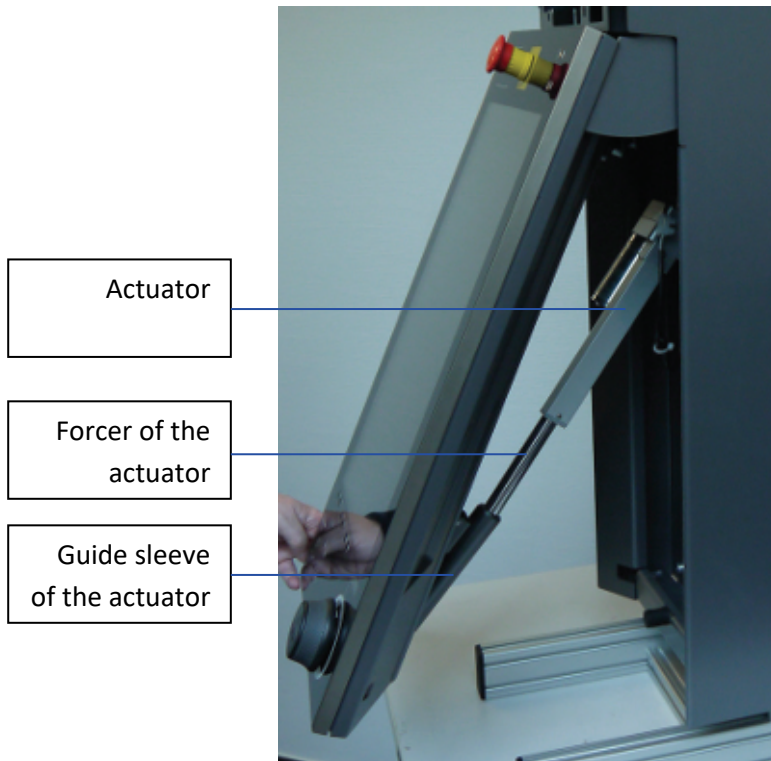


Fig. 35: Inserting the forcer into the guide sleeve of the actuator

7. Attach the top cover to the cabinet

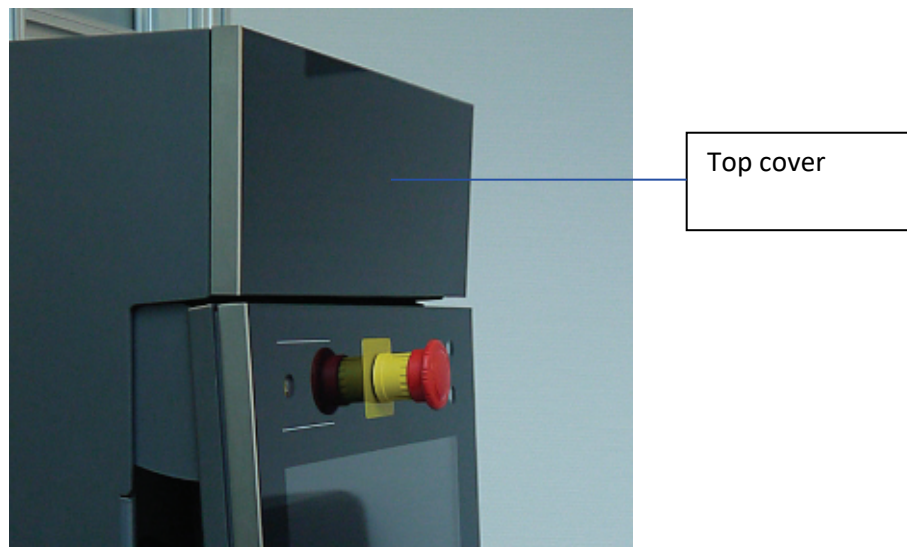


Fig. 36: Attaching the top cover of the CC300 cabinet

- 8. Connect the Harting connector to its mating connector at the rear side of the cabinet and lock it in place

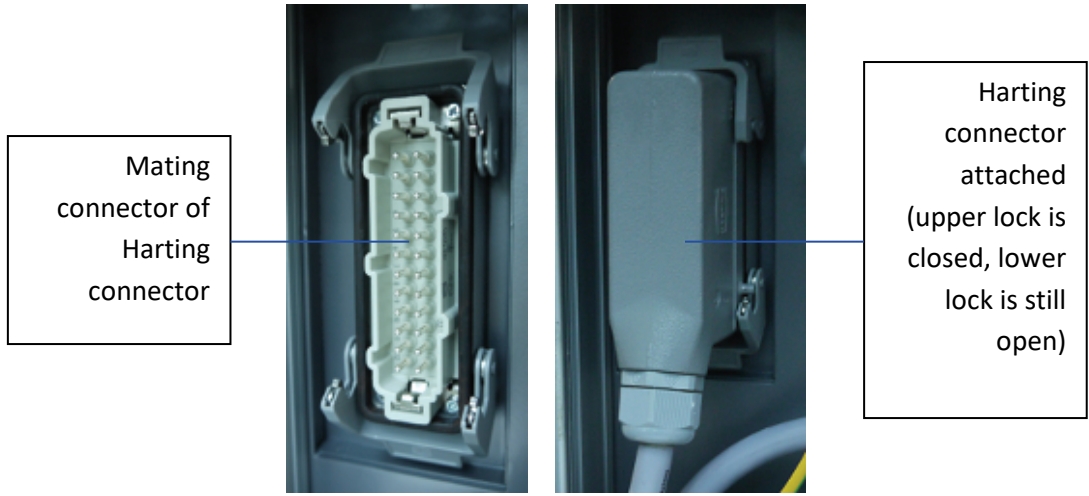


Fig. 37: Inserting the forcer into the guide sleeve of the actuator

- 9. Connect the grounding cable to the appropriate grounding connector and all the remaining cables to their corresponding connectors.

Further information about cabling and connecting the CC300 Operator panel to the corresponding devices is not subject of this manual.



The Harting connector 09 33 024 2601 must not be used for disconnecting or connecting while product is in operation. Furthermore, this connector is to be used only with female connector 09 33 024 2701.

## 9. Maintenance and Prevention

Kontron Europe systems require minimal maintenance and care to keep them operating correctly.

- Occasionally wipe the system with a soft dry cloth.
- You should only remove persistent dirt by use of a soft, slightly damp cloth (use only a mild detergent).
- For the touch screen cleaning refer to the chapter 7.1.6. “Touch Display Care and Cleaning”.

### 9.1. Replacing the Lithium Battery

The mainboard of the CC300 operator panel is equipped with a lithium CMOS battery. To replace the lithium battery, proceed as follows:

1. Pull the button (cap) of the rotary/push button off of the glass front. The cap holder of the rotary/push button with three screws is now accessible from the outside (see Fig. 46, Fig. 47).



Fig. 38: Button (cap) of the rotary/push button

2. Remove three 2.5 mm (0.98 inch) Allen screws from the rotary/push button at the glass front (see Fig. 47).



Fig. 39: Unscrew the cap holder of the rotary/push button

3. Pull the rotary/push button and the lithium battery carefully out of the front panel.

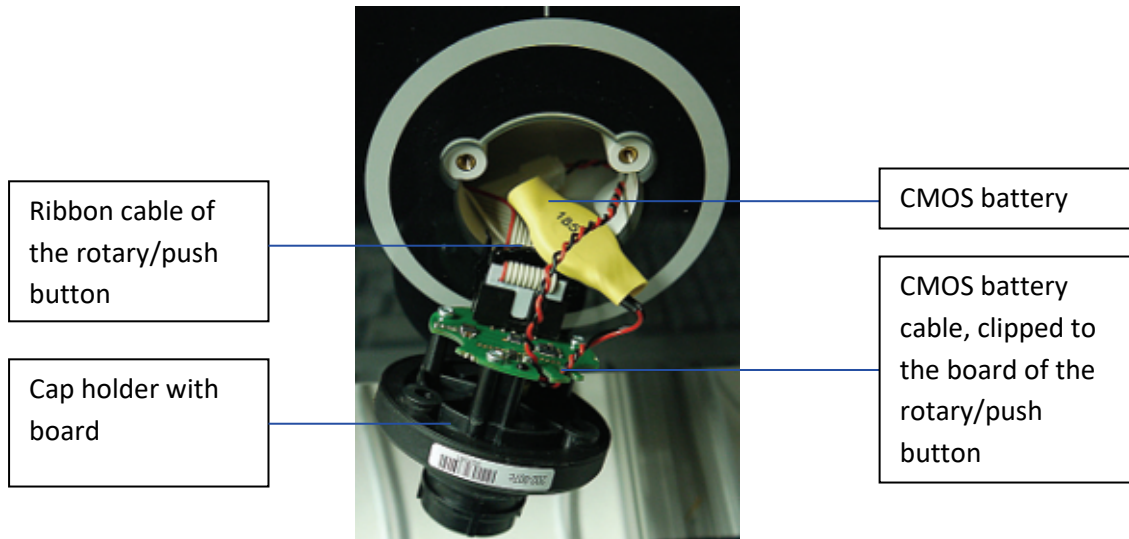


Fig. 40: Rotary/push button and CMOS battery, pulled out of the housing

4. Remove the battery cable from the board of the rotary/push button (see Fig. 40).

5. Removing the lithium battery: Press down the cable lock and pull the battery cable connector out of its mating connector (see Fig. 41).

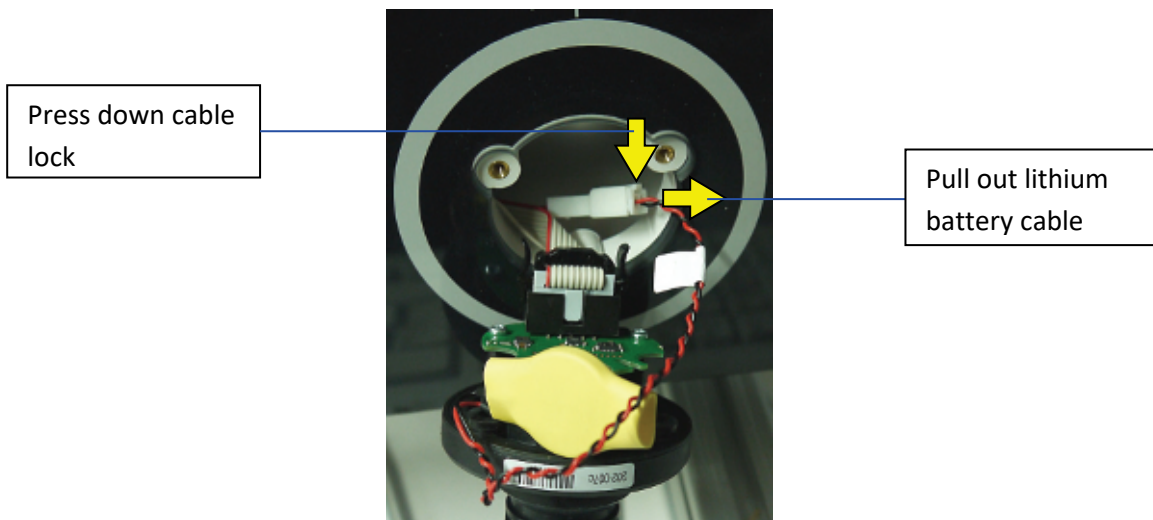


Fig. 41: Removing the rotary/push button (shown with battery removed)

6. Install the new lithium battery in reverse order:

- Plug the battery cable into the mating connector until it locks in place
- Re-attach the battery cable to the rotary/push button board as a strain relief
- Insert the battery and the rotary/push button into the opening of the front panel
- Attach the holder of the rotary/push button so that the white label on the side of the cap holder is in top position (see Fig. 42).
- Secure the rotary/push button with the 3 Allen screws removed in step 2. Fasten the screws to a torque of 0.32 Nm.

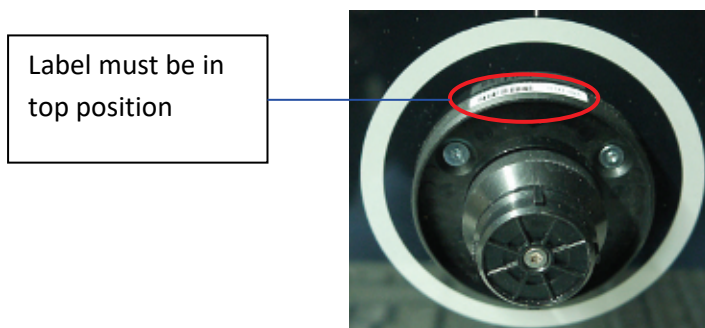


Fig. 42: Position of the label on the cap holder of the rotary/push button

7. Reattach the button (cap) of the rotary/push button at the glass front. In neutral position, the „Engel“ writing on the button should be horizontal (see Fig. 42).



The lithium battery must only be replaced with the same type of battery or with a type of battery recommended by Kontron Europe GmbH. The type of the lithium battery must be UL listed.



Do not dispose of lithium batteries in general trash collection. Dispose of the battery according to the local regulations dealing with the disposal of these special materials, (e.g. to the collecting points for dispose of batteries).

## 9.2. Replacing the Emergency Stop Switch

The emergency stop switch consists of the button mounted in the front plate and the auxiliary switch block attached to the rear side of the button. To replace the particular components of the emergency stop switch, proceed as follows:

### 9.2.1. Replacing the Button of the Emergency Stop Switch

1. Open the CC300 operator panel, as described in chapter 7.5.1 “Opening the CC300 Operator Panel”, steps 1 to 5. The auxiliary switch block will thereby be removed from the pushbutton in step 4.
2. Loosen and remove the plastic cap nut from the button of the emergency stop switch using an appropriate tool (see Fig. 43) and pull the button out (from the outside of the glass front).
3. When inserting the new button, make sure that the large cut-out of the inner part of the button points in the direction of the red connector (see Fig. 43).
4. Tighten the cap nut to a torque of 2.2 Nm.

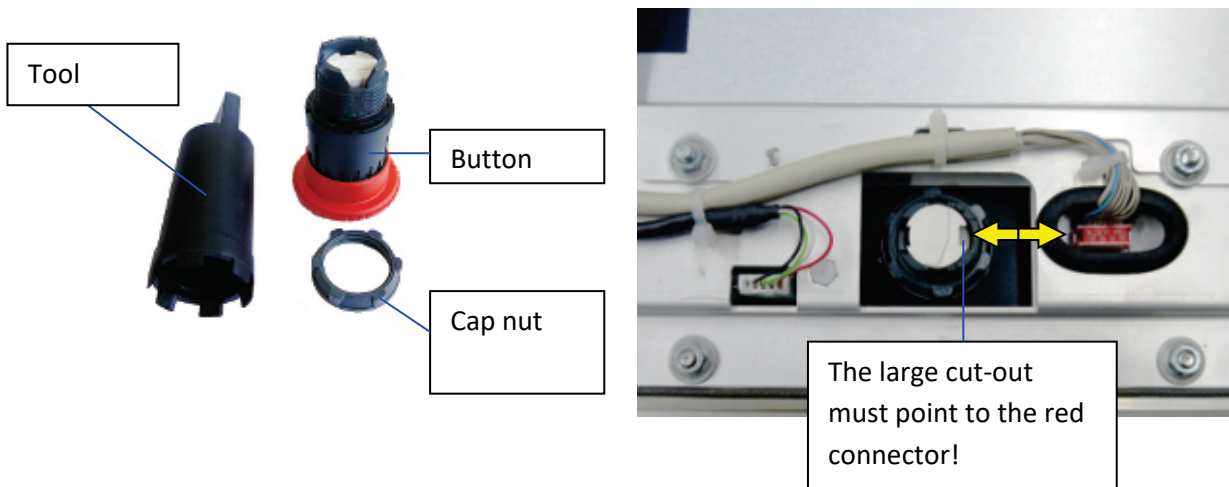


Fig. 43: Button of the emergency stop switch

### 9.2.2. Replacing the Auxiliary Switch Block

The auxiliary switch block consists of four switch modules. Three of them are engaged next to each other on the mounting flange, the fourth switch module is engaged to the rear of the middle switch. By pressing the emergency stop switch, all four switches are operated simultaneously. To replace the switch modules, proceed as follows:

1. Open the CC300 operator panel, as described in chapter 7.5.1 “Opening the CC300 Operator Panel”, steps 1 to 5. The auxiliary switch block will thereby be removed from the pushbutton in step 4 (see Fig. 27 and Fig. 28, Pos. 13).

2. Detach the switch modules from the mounting flange (and from each other respectively) by pushing the locks outwards with a small screwdriver (see Fig. 44).

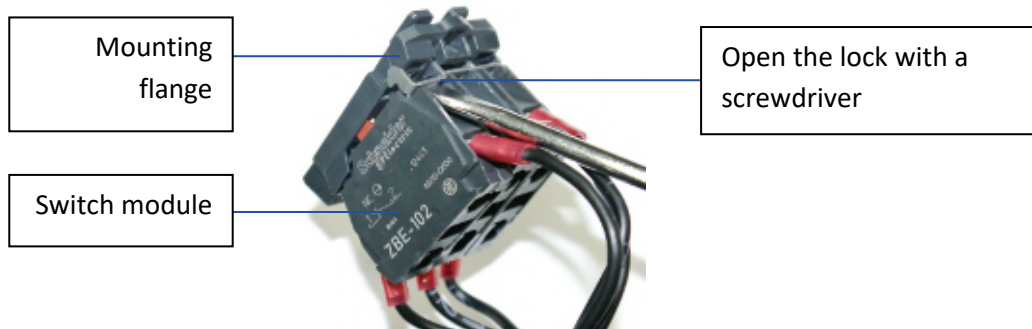


Fig. 44: Dismantling the auxiliary switch block

3. The cables are fitted with fork type cable lugs which are fastened with screws to the switch modules (two cables per switch). Loosen the screws and pull the cables and the lugs out of the switch module. The individual modules can now be replaced (see Fig. 45).

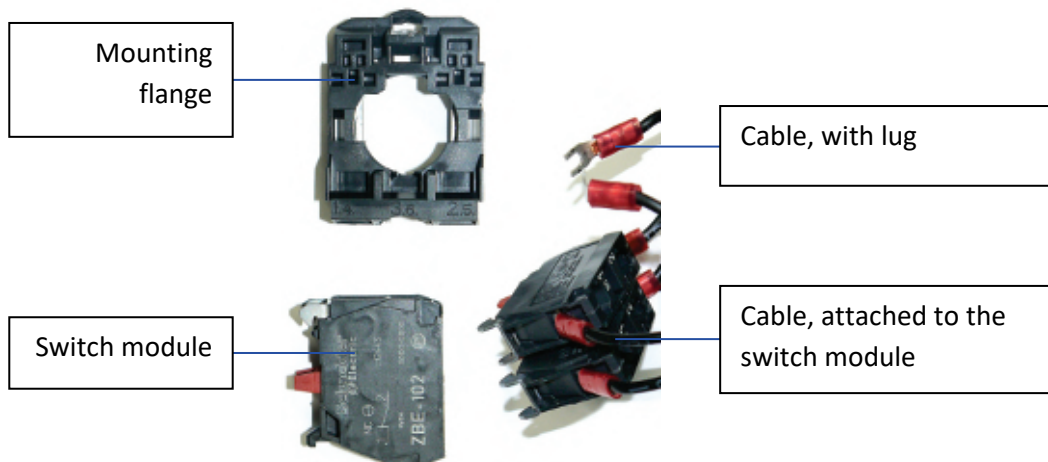


Fig. 45: Switch module, cable, and mounting flange

4. The new switch modules will be mounted in reversed order:
  - Attach the cable lugs to the switch modules and fasten the screws.
  - Attach the switch modules to the mounting flange (three modules will be attached next to each other directly to the mounting flange and the fourth module will be attached to the rear side of the middle module).
  - Close the CC300 operator panel as described in chapter 7.5.2 “Closing the CC300 Operator Panel”.

### 9.3. Replacing the Rotary/Push Button

To replace the complete rotary/push button , proceed as follows:

1. Pull the button (cap) of the rotary/push button off of the glass front. The cap holder of the rotary/push button with three screws is now accessible from the outside (see Fig. 46, Fig. 47).



Fig. 46: Button (cap) of the rotary/push button

2. Remove three 2.5 mm (0.98 inch) Allen screws from the rotary/push button at the glass front (see Fig. 47).



Fig. 47: Unscrew the cap holder of the rotary/push button

3. Pull the rotary/push button and the CMOS battery carefully out of the front panel.
4. Remove the battery cable from the board of the rotary/push button (see Fig. 48)

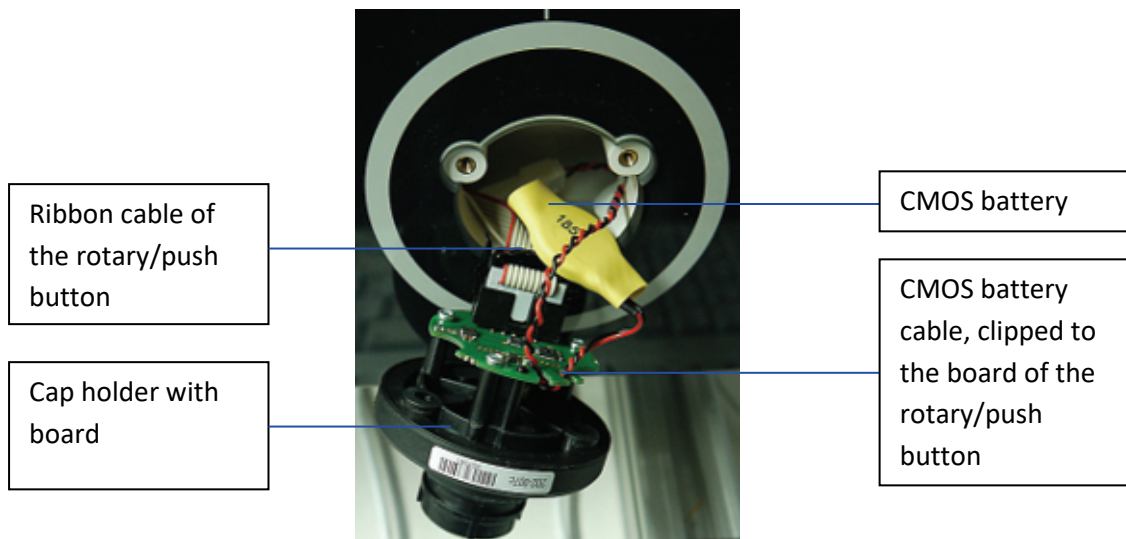


Fig. 48: Rotary/push button and CMOS battery, pulled out of the housing

5. Removing the rotary/push button: Press the two arms of the cable lock together and pull the ribbon cable connector out.



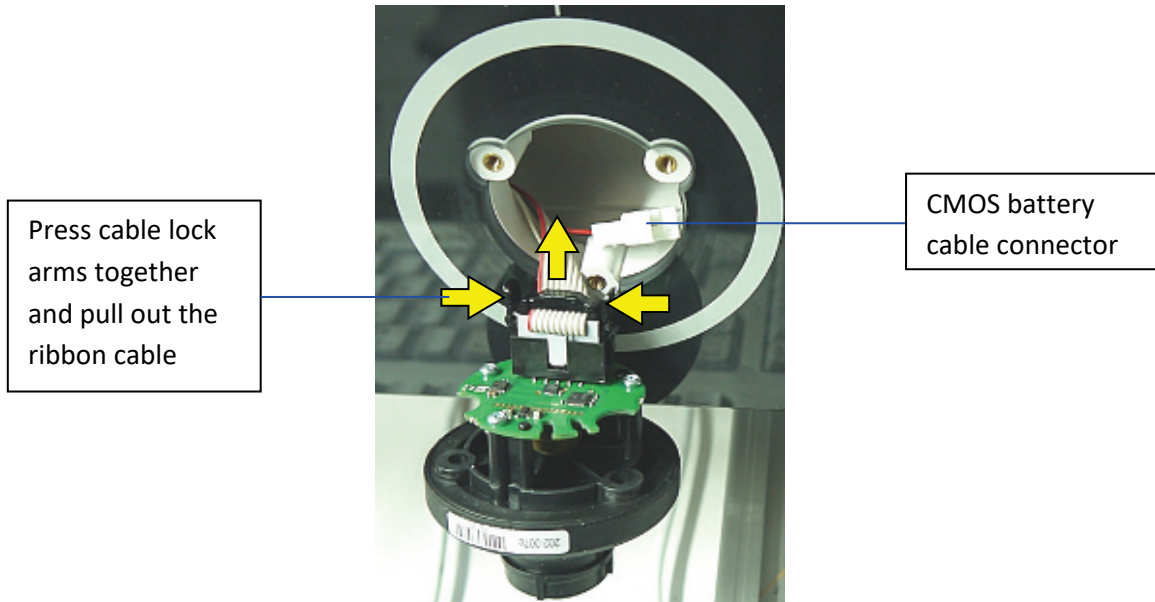


Fig. 49: Removing the rotary/push button (shown with battery removed)

6. Install the new rotary/push button module in reverse order:

- Plug the ribbon cable into the connector of the rotary/push button board until it locks in place
- Re-attach the battery cable to the rotary/push button board as a strain relief
- Insert the battery and the rotary/push button into the opening of the front panel
- Attach the holder of the rotary/push button so that the white label on the side of the cap holder is in top position (see Fig. 50).
- Secure the rotary/push button with the 3 Allen screws removed in step 2. Fasten the screws to a torque of 0.32 Nm.

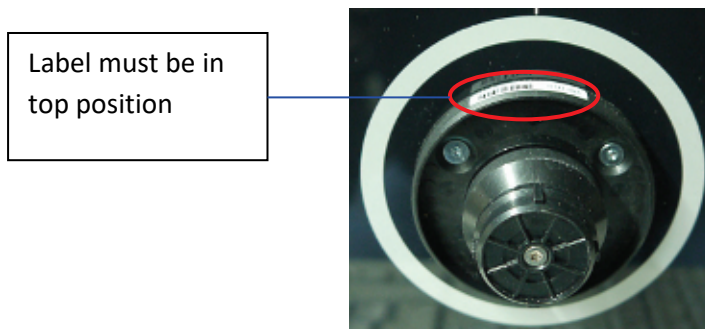


Fig. 50: Position of the label on the cap holder of the rotary/push button

7. Reattach the button (cap) of the rotary/push button at the glass front. In neutral position, the „Engel“ writing on the button should be horizontal.

### 9.4. Replacing the Cable Gland

To replace the cable gland, proceed as follows:

1. Open the CC300 operator panel as described in chapter 7.5.1 “Opening the CC300 Operator Panel”, steps 1 to 5. The bracket of the cable gland is located at the top inside the aluminum rear cover (see Fig. 28, Pos. 12).
2. Remove the four retaining screws that secure the cable gland bracket and the cable holder (strain relief) at the inside of the cabinet (see Fig. 51). The cable straps which secure the cables at the cable holder do not need to be removed!

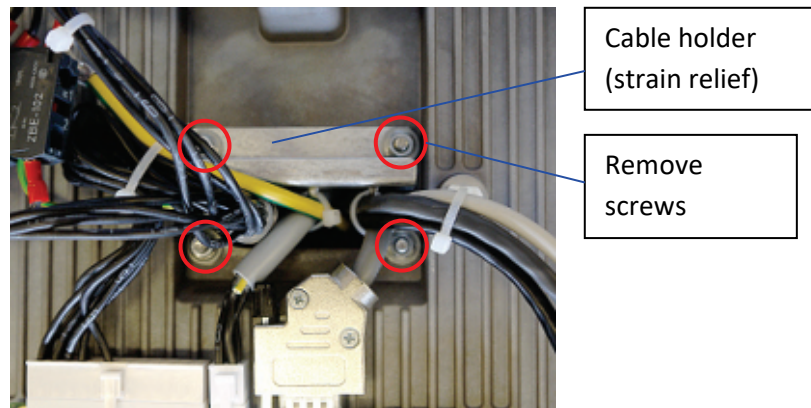


Fig. 51: Remove screws of the cable gland bracket

3. Pull the cable gland and the cable gland bracket out of the cabinet while the cables are still inserted (see Fig. 52).

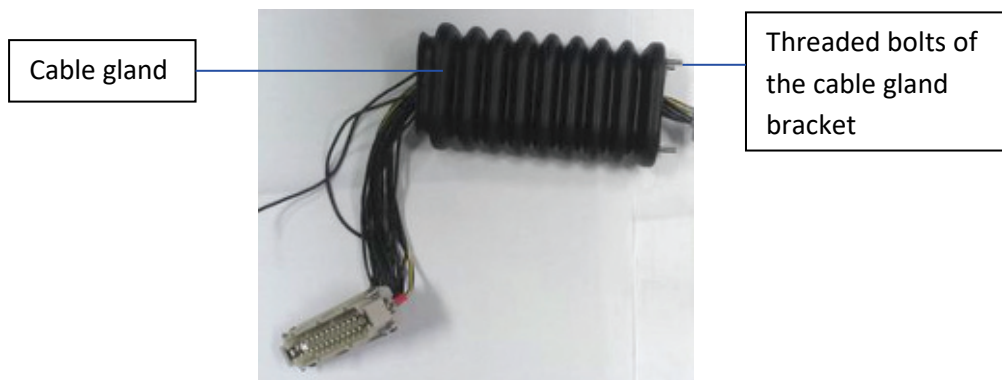


Fig. 52: Detached cable gland with bracket

4. Take the bracket out of the cable gland (with the cables still inserted). Later, the cables will be pulled out of the cable gland but the bracket will remain on the cables (see Fig. 53).

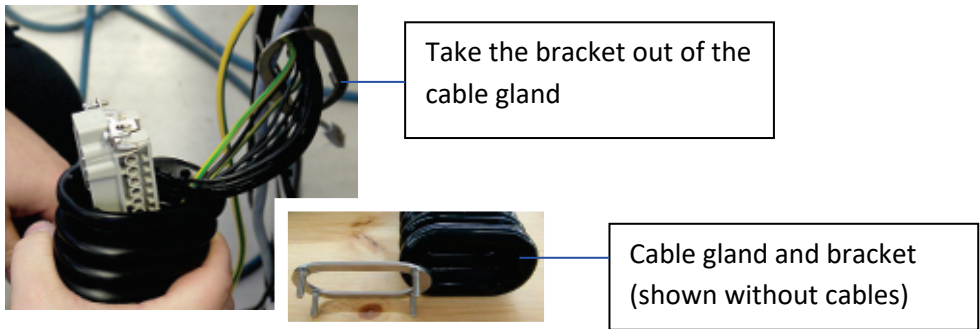


Fig. 53: Take the bracket out of the cable gland

5. Pull the cables out of the cable gland successively. Begin with the single cables with smaller connectors to obtain maximum space for the largest connector. Finally, pull the Harting connector out of the cable gland. The cable gland is now free and can be replaced. The cable gland bracket remains on the cables (see Fig. 54).

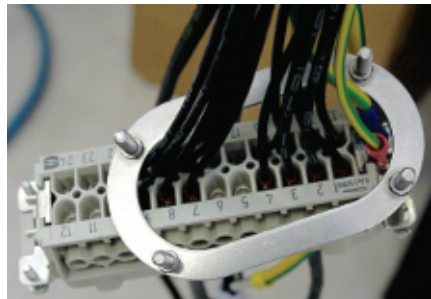
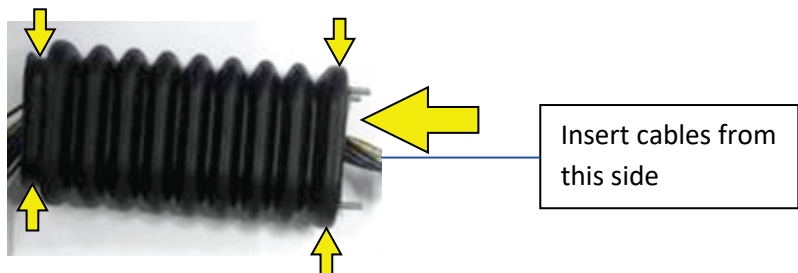


Fig. 54: Cables and cable gland bracket after removing the cable gland

6. The new cable gland will be installed in reversed order:

- Make sure that all cables are inserted through the ring of the cable gland bracket.
- Thread the cables through the new cable gland. Start with the Harting connector. Only then thread the remaining cables through the cable gland. The cables must be inserted from the “thicker end” (the side ending with a ridge) into the cable gland so that they come out at the “thinner end” (neck between two ridges; see Fig. 55, Fig. 52).



*Fig. 55: Insert cables from the thicker end into the cable gland*

- Reinsert the bracket into the cable gland (see Fig. 56)



*Fig. 56: Cable gland with inserted bracket (shown without cables)*

- Reattach the cable gland with the cable gland bracket to the cabinet by inserting the threaded bolts of the bracket into the corresponding holes.
- Put the cable holder (strain relief) onto the two upper threaded bolts from the inside of the rear cover (see Fig. 51).
- Fasten the four M4 nuts of the cable gland bracket to a torque of 1.3 Nm (see also Fig. 51).
- Close the CC300 operator panel as described in chapter 7.5.2 “Closing the CC300 Operator Panel”.

## 10. Technical Data

CC300 Operator Panel	Technical Data
<b>System</b>	Customer-specific HMI panel PC with glass front
<b>Operating System</b>	ENGEL LINUX x86 64bit
<b>Cooling Concept</b>	Fanless system
<b>Cabinet</b>	Front: glass front with aluminum frame, Rear: die cast aluminum cover
<b>Protection Class</b>	IP 54 (entire system)
<b>Power Supply</b>	24 V DC (see also chapter 10.2 "Electrical Specifications")
<b>External Interfaces</b>	See chapter 10.1 "External Connectors and Interfaces"
<b>Display</b>	TFT LCD Display, 21.5", 1920x1080, 16:9 portrait format, multi-touch, contrast: 400:1, 16 million colors, brightness: 250 cd minimum, LED backlight, view angle: 85x85x85x85 minimum Optionally, an additional external display can be connected via DP cable
<b>Touch Screen</b>	Capacitive PCAP multi-touch
<b>RFID</b>	EM65 (Euromap Standard RFID ISO15693), 13.56 Mhz, read and write functionality, implementation for user login
<b>Emergency Stop Switch</b>	Four (optional: six) emergency stop circuits (24V break circuits), switch is self-locking and can only be unlocked by turning the button
<b>Front Glass</b>	Clear glass, thermally tempered, thickness: 5mm (+/- 0.2 mm), printed on the rear side, 5 capacitive buttons integrated in the glass, LED backlight for buttons and symbols
<b>Buttons in the Glass Front</b>	Capacitive buttons (milled in the front glass) with LED backlight, partly with software-controlled color change when pressed
<b>Rotary/Push Button</b>	Can be adjusted to the left/right to a maximum of 30 degrees, self-resetting when released, push button function, white backlit ring that can change its color to red, green and orange by software
<b>Mainboard</b>	EXC-KLU 3965U
<b>CPU</b>	Intel Celeron 3965U 2.2 GHz
<b>Memory</b>	2GB (1 socket, SO DIMM, DDR3, 1.066 MHz)
<b>Drives</b>	1x M.2, 30 GB (optional: 2.5" HDD/SSD via SATA, drive bay available)
<b>LAN</b>	4x Ethernet 10/100/1000
<b>IO Board</b>	EN01-0153 IO board, reverse voltage protection and short circuit protection

### 10.1. External Connectors and Interfaces

Interface	Amount	Position	Data
LAN cable	4	external	<ul style="list-style-type: none"> <li>▪ Type: 10/100/1000 Mbit</li> <li>▪ Connector: RJ45</li> <li>▪ Source: CPU board &amp; IO board</li> </ul>
DP cable optional	1	external	<ul style="list-style-type: none"> <li>▪ Type: Display port</li> <li>▪ Connector: DP (DisplayPort)</li> <li>▪ Source: CPU board</li> </ul>
Power cable	1	external	<ul style="list-style-type: none"> <li>▪ Type: Power Connector Main</li> <li>▪ Connector: Harting 24-pin</li> <li>▪ Source: I/O board</li> </ul>
Emergency Stop circuits	1	external	<ul style="list-style-type: none"> <li>▪ Type: Control</li> <li>▪ Connector: 8 wires in Harting connector</li> <li>▪ Source: Emergency Stop switch</li> </ul>
USB Port	2	external	<ul style="list-style-type: none"> <li>▪ Type: USB 3.0</li> <li>▪ Connector: USB A</li> <li>▪ Source: CPU board</li> </ul>
Grounding (PE) cable	1	external	<ul style="list-style-type: none"> <li>▪ Type: Functional Earth</li> <li>▪ Connector: End-sleeve</li> <li>▪ Source: Chassis internal</li> </ul>

10.2. Electrical Specifications

CC300 Operator Panel	Electrical Data	
<b>Power Supply</b>	24 V panel power supply => 24 VDC (+/- 20%), 3.5 A 24 VDC (+/- 20%), 3.5 A max.	
24V panel power supply	24 VDC (+/- 20%), 3.5 A max.	
24V power transformer (linear actuator)	24 VDC (+/- 20%), 3 A max.	
<b>Component</b>	Theoretical Value	
CPU Board (including Intel Celeron 3965U)	20	W
LCD Panel	13	W
SSD M.2	1.8	W
I/O-Board	2	W
RFID	1	W
Rotary/push button	2	W
USB internal 2x - power	1	W
<b>Total dissipated internal</b>	<b>40.8</b>	W
USB external 2x	9	W
Linear actuator CAHB	44	W
<b>Total input power (including all possible loads)</b>	<b>93.8</b>	W

### 10.3. Environmental Specifications

<b>Thermal Management</b>	Passive Cooling (CPU and entire system)
<b>Operating Temperature</b>	+5°C to 40°C (41°F to 104°F)
<b>Storage/Transit Temperature</b>	-20°C to +60°C (-4°F to 140°F)
<b>Operating Rel. Humidity</b>	5% to 93%, non-condensing
<b>Storage/Transit Rel. Humidity</b>	5% to 93%, non-condensing
<b>Operating Altitude</b>	0 m to 3000 m (0 ft. to 6560 ft.)
<b>Storage/Transit Altitude</b>	0 m to 5000 m (0 ft. to 32800 ft.)
<b>Operating Shock</b>	15 G, 11 ms duration, half-sine
<b>Storage/Transit Shock</b>	30 G, 11 ms duration, half-sine
<b>Operating Vibration</b>	5 Hz to 150 Hz, 0.5 G
<b>Storage/Transit Vibration</b>	5 Hz to 150 Hz, 1.0 G
<b>Protection Class</b>	IP54 (entire system)

### 10.4. Mechanical Specifications

<b>Dimensions</b>	<b>CC300 Operator Panel</b>
<b>Height</b>	675 mm (26.57")
<b>Width</b>	346 mm (13.62")
<b>Depth</b>	76 mm (2.99")
<b>Weight</b>	13 kg (28.66 lbs)



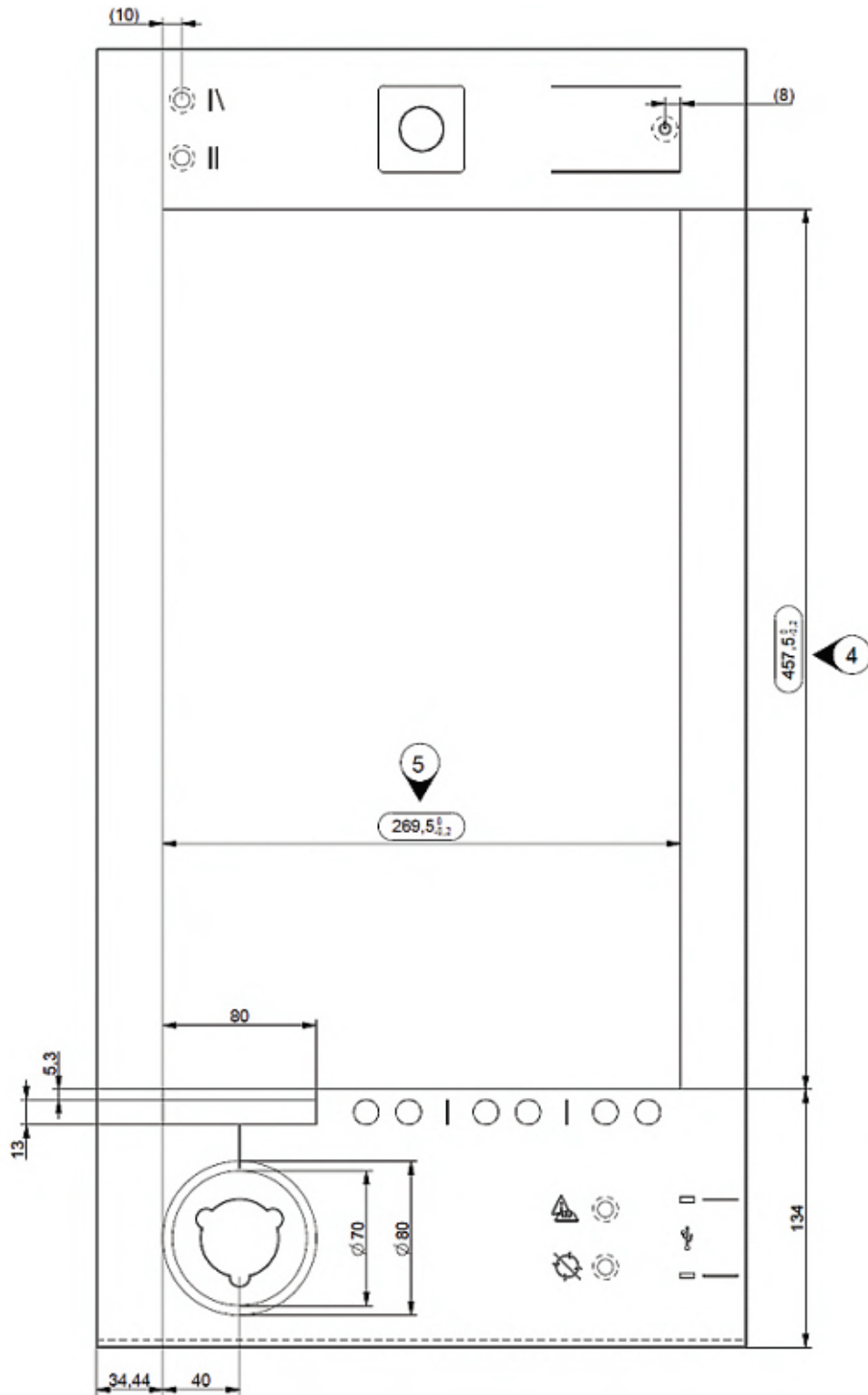


Fig. 57: Dimensioned view of the CC300 glass front (print side - reversed image)

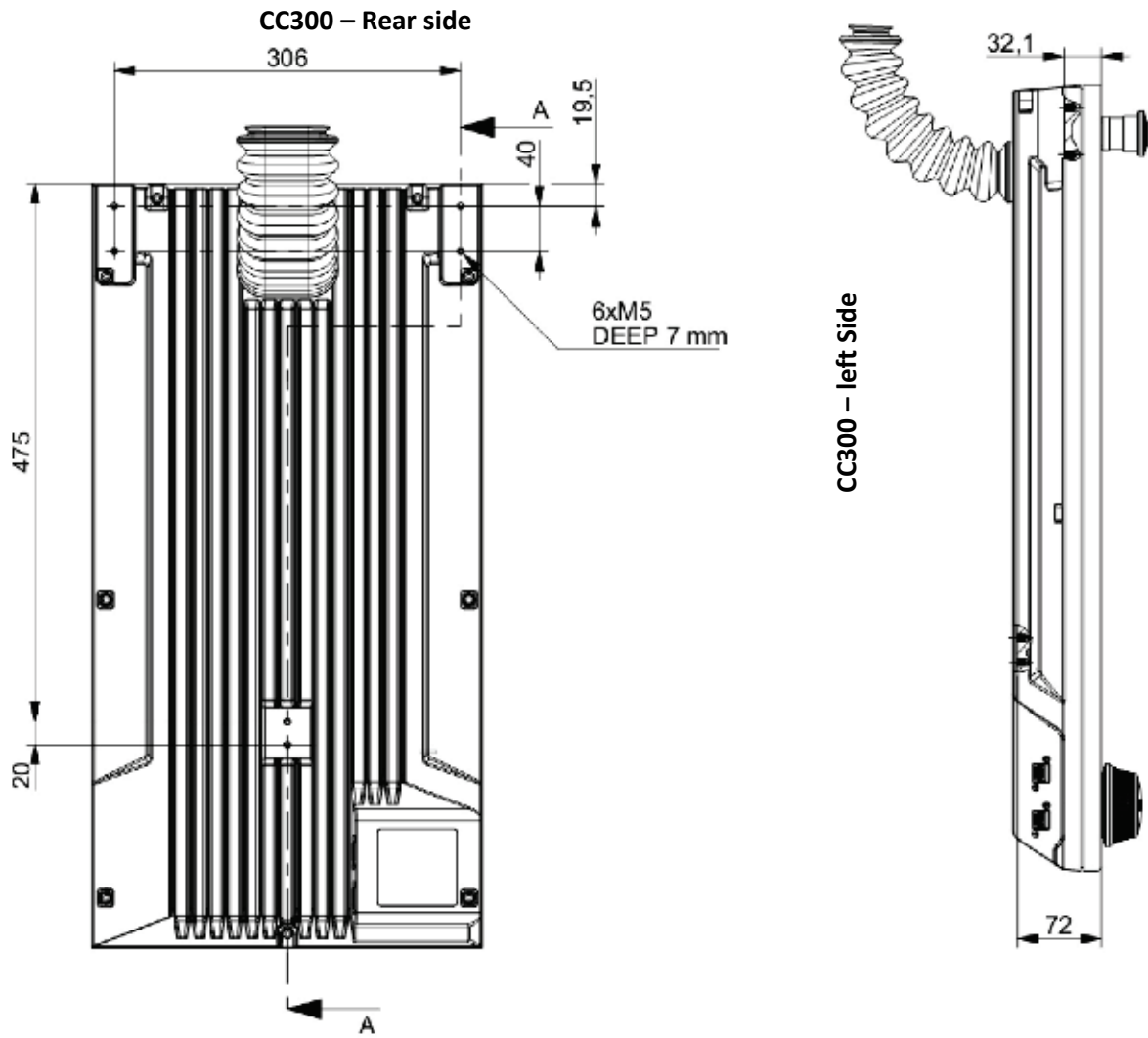


Fig. 58: Dimensioned rear and side view of the CC300 operator panel

### 10.5. International Compliance, Approvals and Certificates

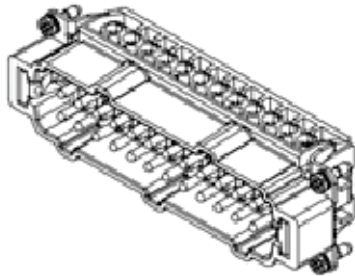
CE-Mark Compliant with EU Directives	Electromagnetic Compatibility	Directive 2014/30/EU
	Low Voltage	Directive 2014/35/EU
	Radio Equipment Directive (RED)	Directive 2014/53/EU
	RoHS II	Directive 2011/65/EU
EMC 2014/30/EU Emission	EN 55011 / CISPR 11	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
	EN 61000-6-4 EN 55032 / CISPR 32	Electromagnetic compatibility (EMC), Part 6-4: Generic standards - Emission standard for industrial environment
EMC 2014/30/EU Immunity	EN 61000-6-2	Electromagnetic compatibility (EMC), Part 6-2: Generic standards- Immunity for industrial environment
EMC 2014/53/EU Article 3.1(b)	EN 301 489-1 V2.2.1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
	EN 301 489-3 V2.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz
RF Spectrum Efficiency & Spurious Emission 2014/53/EU Article 3.2	EN 300 330 V2.1.1	Short Range Devices (SRD);Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
EMC CFR 47 Part 15, Subpart B & C	ANSI C63.4 CISPR 16 ICES-003	The American National Standards Institute standard ANSI C63.4 is the key standard for measuring electrical and electronic equipment for showing compliance to FCC and Industry Canada regulations.
Safety 2014/35/EU	IEC 61010-1 EN 61010-1 UL 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements.
	IEC 61010-2-201 EN 61010-2-201 UL 61010-2-201	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-201: Particular requirements for control equipment.

Safety and Health 2014/35/EU 2014/53/EU Article 3.1(a)	EN 62479	Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz).
WEEE 2002/96/EC	The Waste Electrical and Electronic Equipment Directive (WEEE Directive)	Compliant with the Waste Electrical and Electronic Equipment (WEEE) directive to reduce waste of electrical and electronic equipment, encourage recycling and environmental disposal and increase the environmental awareness of producers.

# 11. Interfaces – Pin Assignments

Low-active signals are indicated by a minus sign.

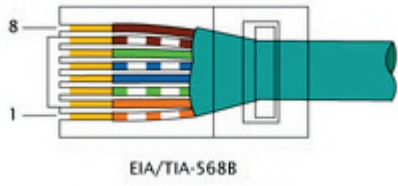
## 11.1.1. Harting Connector



24-pole Harting connector (Type Harting HAN 24 E, wire cross section: AWG 18)

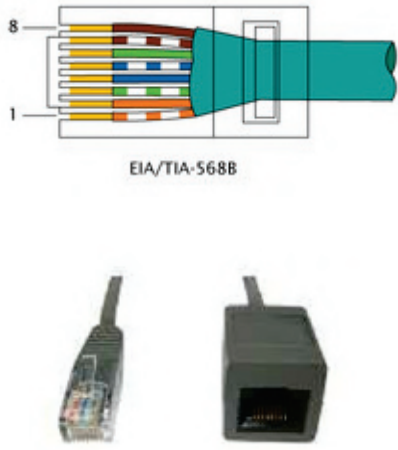
Pin No.	Wire No.	Signal Name	Pin	Wire No.	Signal Name
Pin 1	8	Emergency Stop channel 1 - 1	Pin 13	12	Emergency Stop channel 1 - 2
Pin 2	9	Emergency Stop channel 2 - 1	Pin 14	13	Emergency Stop channel 2 - 2
Pin 3	10	Emergency Stop channel 3 - 1	Pin 15	14	Emergency Stop channel 3 - 2
Pin 4	11	Emergency Stop channel 4 - 1	Pin 16	15	Emergency Stop channel 4 - 2
Pin 5		Emergency Stop channel 5 - 1 (not implemented)	Pin 17		Emergency Stop channel 5 - 2 (not implemented)
Pin 6		Emergency Stop channel 6 - 1 (not implemented)	Pin 18		Emergency Stop channel 6 - 2 (not implemented)
Pin 7	6	24V panel power supply	Pin 19	5	0V panel power supply
Pin 8	4	24V power transformer (linear actuator)	Pin 20	3	0V power transformer (linear actuator)
Pin 9	7	Power transformer switch-off	Pin 21	16	Dig In 1
Pin 10		free	Pin 22		free
Pin 11		free	Pin 23		free
Pin 12		free	Pin 24		free
Connector grounding (lateral)					

11.1.2. LAN 0, LAN 2 and LAN 3 Cable

Pin	Signal Name	Standard Modular Plug (RJ45)
1	MDI0+	 <p>EIA/TIA-568B</p>
2	MDI0-	
3	MDI1+	
4	MDI2+	
5	MDI2-	
6	MDI1-	
7	MDI3+	
8	MDI3-	


(The LAN cable is connected to the LAN 0 port of the mainboard and led out of the cabinet.)

11.1.3. LAN 1 Cable

Pin	Signal Name	Standard Modular Plug/Socket (RJ45)
1	MDI0+	 <p>EIA/TIA-568B</p>
2	MDI0-	
3	MDI1+	
4	MDI2+	
5	MDI2-	
6	MDI1-	
7	MDI3+	
8	MDI3-	

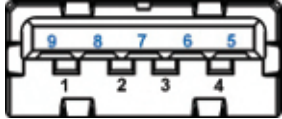
(The LAN extension cable is connected to the LAN 1 port of the mainboard and led out of the cabinet.)

11.1.4. DP Connector (Standard: DisplayPort 1.2)

Pin	Signal Name	20-pin DP Connector
1	ML LANE 0+	
2	GND (ML LANE 0)	
3	ML LANE 0-	
4	ML LANE 1+	
5	GND (ML LANE 1)	
6	ML LANE 1-	
7	ML LANE 2+	
8	GND (ML LANE 2)	
9	ML LANE 2-	
10	ML LANE 3+	
11	GND (ML LANE 3)	
12	ML LANE 3-	
13	AUX_SEL#	
14	Pull-down to GND	
15	AUX CH+	
16	GND (AUX CH)	
17	AUX CH-	
18	Hotplug	
19	GND (GND_DDC)	
20	+3.3V (DDC EEPROM power) 750mA fused	

(The DisplayPort is located on the mainboard and can be optionally led out of the cabinet via DP cable or DP extension cable.)

11.1.5. USB Ports

USB 2.0 contact pins		USB 3.0 contact pins		9-pin USB Connector Type A Version 3.0/2.0
Pin	Signal Name	Pin	Signal Name	
1	VCC, fused (900 mA max.)	5	StdA_SSRX-	
2	Data-	6	StdA_SSRX+	
3	Data+	7	GND_DRAIN	
4	GND	8	StdA_SSTX-	
		9	StdA_SSTX+	

The two externally accessible USB 3.0 ports are connected to the mainboard via cable. The 5V outputs are electronically fused. Each port supports up to 900mA.

11.1.6. Grounding Cable (PE)

	Grounding Cable (PE)
Cross section: 6mm <sup>2</sup> Cable color: Yellow/green Connector: End sleeve 6.0mm <sup>2</sup> /12mm	