



Installation and Operating instructions for

**CP6700-0001-0050/
CP6706-0001-0050**

„Economy“ Built-in Panel PC

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BECKHOFF

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1 Foreword

1.1 Notes on the Documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards. It is essential that the following notes and explanations are followed when installing and commissioning these components.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

1.1.1 Liability Conditions

The documentation has been prepared with care. The products described are, however, constantly under development. For that reason the documentation is not in every case checked for consistency with performance data, standards or other characteristics. In the event that it contains technical or editorial errors, we retain the right to make alterations at any time and without warning. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

All pictures shown in the documentation are exemplary. Illustrated configurations can differ from standard.

1.1.2 Trademarks

Beckhoff®, TwinCAT®, EtherCAT®, Safety over EtherCAT®, TwinSAFE® and XFC® are registered trademarks of and licensed by Beckhoff Automation GmbH.

Other designations used in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owners.

1.1.3 Patent Pending

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents: EP1590927, EP1789857, DE102004044764, DE102007017835 with corresponding applications or registrations in various other countries.

The TwinCAT Technology is covered, including but not limited to the following patent applications and patents: EP0851348, US6167425 with corresponding applications or registrations in various other countries.

1.1.4 Copyright

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1.1.5 State at Delivery






All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

1.1.6 Delivery conditions

In addition, the general delivery conditions of the company Beckhoff Automation GmbH & Co. KG apply.


1.2 Description of safety symbols

The following safety symbols are used in this operating manual. They are intended to alert the reader to the associated safety instructions.


 DANGER	<p>Acute risk of injury!</p> <p>If you do not adhere the safety advise adjoining this symbol, there is immediate danger to life and health of individuals!</p>
 WARNING	<p>Risk of injury!</p> <p>If you do not adhere the safety advise adjoining this symbol, there is danger to life and health of individuals!</p>
 CAUTION	<p>Hazard to individuals!</p> <p>If you do not adhere the safety advise adjoining this symbol, there is obvious hazard to individuals!</p>
 Attention	<p>Hazard to devices and environment</p> <p>If you do not adhere the notice adjoining this symbol, there is obvious hazard to materials and environment.</p>
 Note	<p>Note or pointer</p> <p>This symbol indicates information that contributes to better understanding.</p>

1.3 Basic safety measures

Before the Panel PC is switched off, software that is running must be properly closed. Otherwise it is possible that data on the storage medium is lost. Please read the section [Switching the Panel PC on and off](#).

 Warning	<p>Switch off all parts of the equipment, then uncouple the Panel PC</p> <p>Before opening the housing, and whenever the Panel PC is not being used for control purposes (such as during functional checks after a repair), all parts of the equipment must first be switched off, after which the Panel PC is to be disconnected from the equipment.</p>
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Disconnect the device by unplugging the connectors on the rear side of the Panel PC. Items of equipment that have been switched off must be secured against being switched on again.

 Warning	<p>Do not exchange any parts when under power</p> <p>When components are being fitted or removed, the supply voltage must be switched off.</p> <p>Fitting work on the Panel PC can result in damage:</p> <ul style="list-style-type: none">• if metal objects such as screws or tools fall onto operating circuit boards• if connecting cables internal to the Panel PC are removed or inserted during operation.
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1.4 Operator's obligation to exercise diligence

The operator must ensure that

- the product is only used as intended (see chapter [Product Description](#))
- the product is in a sound condition and in working order during operation
- the product is operated, maintained and repaired only by suitably qualified and authorized personnel
- the personnel is instructed regularly about relevant occupational safety and environmental protection aspects, and is familiar with the operating manual and in particular the safety notes contained herein
- the operation manual is in good condition and complete, and always available for reference at the location of the product.



Note

Do not open the housing of the Panel PC!

For technical support contact [Beckhoff Service](#).

1.4.1 National regulations

Depending on the type of machine and plant in which the Panel PC is used, national regulations governing the controllers of such machines will apply, and must be observed by the operator. These regulations cover, amongst other things, the intervals between inspections of the controller. The operator must initiate such inspections in good time.

1.4.2 Procedure in the event of a fault

In the event of faults at the Panel PC, the list in the section [Troubleshooting](#) can be used to determine the measures to be taken.

1.4.3 Operator requirements

Anyone who uses the Panel PC must have read these operating instructions and must be familiar with all the functions of the software installed on the Industrial PC to which he has access.

2 Product Description

2.1 Product overview



CP670x-0001-0050 | “Economy” Panel PC

With its highly integrated 3½-inch motherboard, the CP6700-0001-0050 and CP6706-0001-0050 built-in Panel PCs are ideally suited for use in machine construction and plant engineering, for example with the TwinCAT automation software under Windows Embedded Compact 7 or Windows Embedded Standard 7. The CP670x is conceived for installation in the front of a control cabinet and has a 7-inch or 10.1-inch touch screen display. Equipped with an Intel® Atom™ with up to four cores and a CFast card the CP670x contains no rotary components. The CP670x is supplied with a 24 V power supply unit. The CFast card and the lithium battery of the system clock are accessible from the rear in the connector bracket.

The Panel PC offers the following benefits:

- aluminium front with steel sheet rear cover
- 10.1-inch TFT display, 1024 x 600 WSVGA (CP6700-0001-0050) or 7-inch TFT display, 800 x 480 WVGA (CP6706-0001-0050)
- touchscreen
- all connectors at the bottom of the rear side
- 1 slot for one CFast card accessible from the rear side
- lithium battery of the system clock, accessible from the rear side
- pull-out clamping levers for fast installation without loose parts
- protection class front side IP 54, rear side IP 20
- operating temperature 0...55 °C.

2.2 Appropriate Use

The CP670x built-in Panel PC is designed for installation in the front of a control cabinet or control housing. A steel plate housing with aluminum front contains a TFT display with touch screen.



Danger

Risk of explosion!

The Panel PC must not be used where there is a risk of explosion.

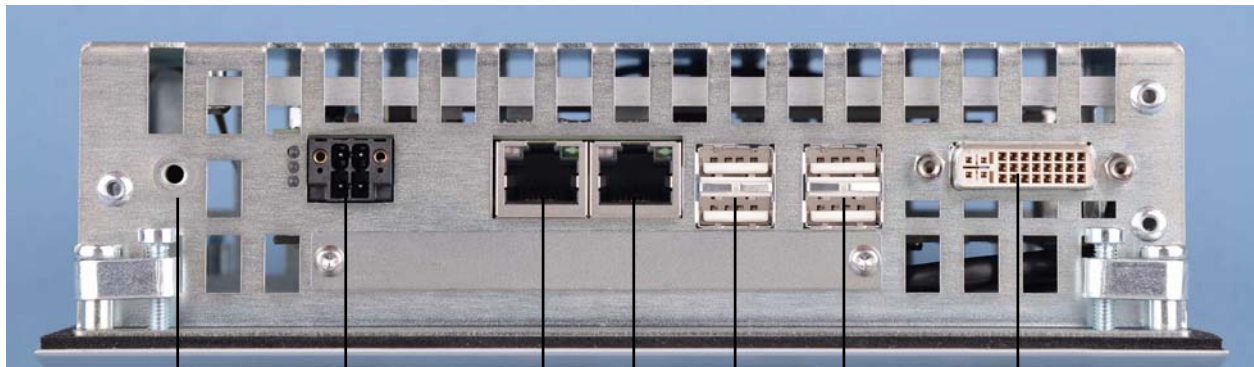
2.3 Access to the connectors

The connectors of the Panel PC are located at the bottom of the housing.



Picture: Bottom view

2.4 Interfaces



Protective Earthing (PE)	X101 Power	X103 LAN2	X104 LAN1	X107 USB	X105 USB	X109 DVI-I out
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2.4.1 Power Supply (X101)

The power supply for the Panel PC is established via the socket (X101), see also chapter [Pin assignment of the connector](#).

The power supply connector is included in delivery.

2.4.2 Network connection LAN1, LAN2 (X104, X103)

The RJ-45 connectors (X104, X103) allow the PC to be connected to a 100/1000 BASE-T Local Area Network (LAN).

2.4.3 USB output (X105 - X108)


The four USB interfaces (X105 - X108, connector type A) are used for connecting peripheral devices with USB connection. USB2.0 standard is supported.

2.4.4 DVI-I out (Digital Visual Interface) (X109)

The DVI connection (X109) is used for transferring the video signal. DVI-I standard is supported.

2.4.5 Protective Earthing (PE)

The low-resistance protective earthing of the Panel PC is established via the screw connection (PE).

 CAUTION	<p>Protective Earthing (PE)</p> <p>The protective conductor connection must not be used for other potentials. "PE" and "0V" (24V system power supply) must be connected to the same potential (connected in the control cabinet).</p> <p>The wiring in the control cabinet must occur in accordance to the standard EN 60204-1:2006 (PELV = Protective Extra Low Voltage).</p> <p>EN 60204-1:2006 part 6.4.1: b): One side of the circuit or one point of the power source must be connected to the protective earth conductor system.</p>
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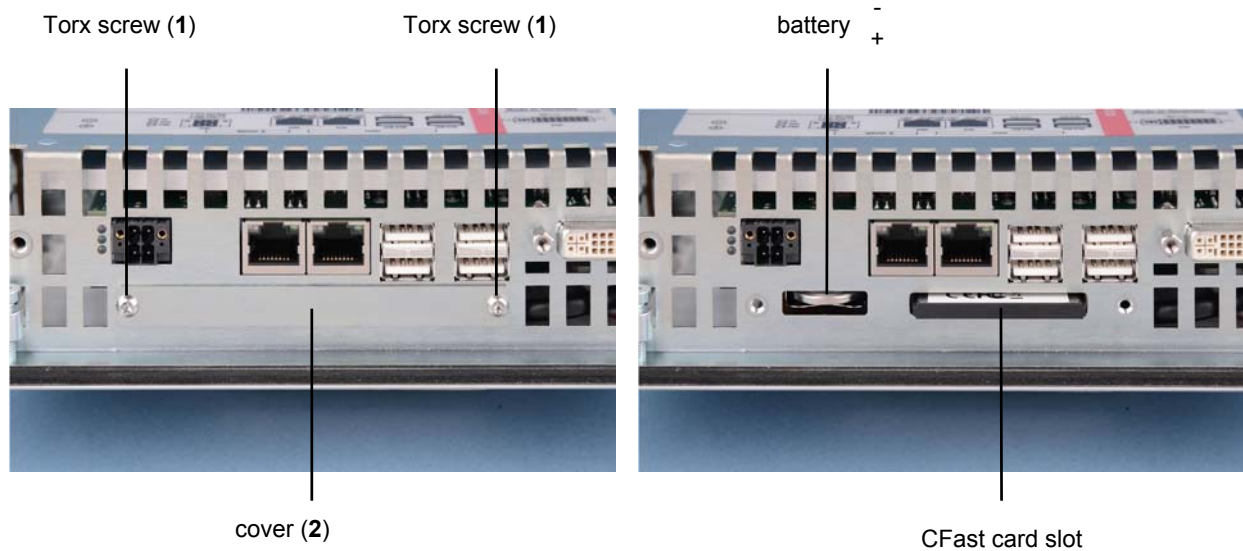
**CAUTION****Breaking the Power Supply/ Shutting down**

Never disconnect the ground connection when switching off the device. Always disconnect the 24V cable, other wise electricity can still flow due to the screen in dependence of the device.



Any connected devices with its own power supply must have the same potential for "PE" and "GND" like the Panel PC system (no potential difference).

2.5 Access to the battery and the CFast card slot

The battery and the CFast card slot are located behind a cover at the bottom side of the Panel PC:

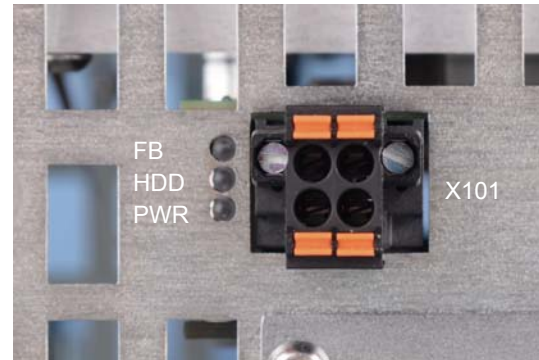


For replacing the battery and installation of the CFast card first unloose the two Torx screws (1) with a screw driver T10. The cover plate (2) can now be removed.

 WARNING	<p>Danger of Explosion!</p> <p>Replace battery only with the identical type or an alternative type recommended by the manufacturer. Notice correct polarity!</p>
 WARNING	<p>Handling of Lithium Batteries</p> <p>Lithium Batteries should not be recharged, exposed to fire, opened and they should be protected against sunlight and moisture.</p>

2.6 Status-LEDs

The Status-LEDs are located near the power supply connector (**X101**):



Description of the Status-LEDs:

1	FB (Fieldbus):	red blue blue/ red blinking green green/ red blinking	TwinCAT Stop TwinCAT Config TwinCAT Config (Fieldbus Error) TwinCAT Run TwinCAT Run (Fieldbus Error)
2	HDD (Hard disk):	red	Access to a memory device
3	PWR (Power):	green off	Industrial PC is busy Industrial PC is off


3 Installation

3.1 Transport and Unpacking

The specified storage conditions must be observed (see chapter [Technical Data](#)).

3.1.1 Transport

Despite the robust design of the unit, the components are sensitive to strong vibrations and impacts. During transport, your device should therefore be protected from excessive mechanical stress. Therefore, please use the original packaging.

 Attention	Danger of damage to the unit If the device is transported in cold weather or is exposed to extreme variations in temperature, make sure that moisture (condensation) does not form on or inside the device.
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Prior to operation, the unit must be allowed to slowly adjust to room temperature. Should condensation occur, a delay time of approximately 12 hours must be allowed before the unit is switched on.

3.1.2 Unpacking

Proceed as follows to unpack the unit:

1. Remove packaging.
2. Do not discard the original packaging. Keep it for future relocation.
3. Check the delivery for completeness by comparing it with your order.
4. Please keep the associated paperwork. It contains important information for handling the unit.
5. Check the contents for visible shipping damage.


If you notice any shipping damage or inconsistencies between the contents and your order, you should notify Beckhoff Service.

3.2 Installation in the control cabinet

The Panel PC CP670x is designed for mounting in control cabinets in machine and plant engineering applications. The ambient conditions specified for operation must be observed (see chapter [Technical Data](#)).


3.2.1 Preparation of the control cabinet

The control cabinet wall must be prepared with the required mounting opening according to the Panel PC's dimensions (see chapter [Assembly dimensions](#)).

 Note	<p>Circulation of air</p> <p>When the unit is installed in an enclosure, adequate space for ventilation must be provided.</p> <p>The clearance above and below the housing must be at least 5 cm in order to ensure adequate ventilation of the Panel PC.</p>
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Please note the following points during installation of the Panel PC:

- Position the Panel PC in such a way that reflections on the screen are avoided as far as possible.
- Use the position of the screen as a guide for the correct installation height; it should be optimally visible for the user at all times.
- The Panel PC should not be exposed to direct sunlight.
- When the unit is in its mounting position, the ventilation openings must not be obstructed.

 Attention	<p>Avoid extreme environmental conditions</p> <p>Extreme environmental conditions should be avoided as far as possible. Protect the Panel PC from dust, moisture and heat.</p> <p>The ventilation slots of the Panel PC must not be covered.</p>
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3.2.2 Installation in a control cabinet wall

For installation of the Panel PC proceed as follows:

1. Insert the Panel PC at the intended control cabinet wall position and protect it from falling out, prior to final mounting.
2. Release the clamping levers, turn the clamping levers to the side and retighten the screws (see chapter [Mounting of the Panel PC](#)).

3.2.3 Mounting of the Panel PC

The Panel PC is installed in the cabinet wall with clamping levers. For the cutout dimension of the Panel PC see chapter [Assembly dimensions](#), the wall thickness is between 1 mm and 5 mm.



1. Insert the Panel PC into the cutout.
2. Release the clamping levers with a 2.5 mm Allen key.



3. Turn the clamping levers to the side through 90°.



4. Retighten the screws.

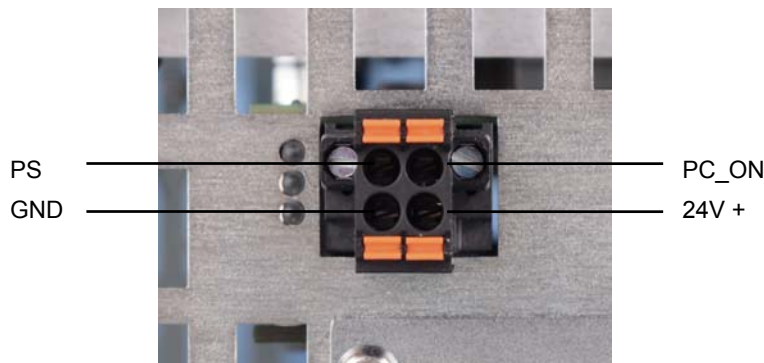


3.3 Power Supply of the Industrial PC

The Industrial PC is fitted with a 24 V_{DC} power supply unit.

3.3.1 Pin assignment of the connector

The power supply and the external circuit of the Industrial PC are connected via the 4-pole plug connector (Phoenix DFMC 1,5/2-STF-3,5 BK – 1708595):



Pin	Function	Pin	Function
PS	Power-Status Output	PC_ON	PC_ON Input
GND	0 V	24V +	Power Supply



Note

Conductive cross-section

The connector is specified for 8 A and can lift conductive cross-sections until 1.5 mm².

3.3.2 Cable Cross Sections

For the connection of the power supply, wiring with a cable-cross-section of 1.5 mm² must be used.

With bigger distances between voltage source and PC, you take the voltage drop as a function of the cable-cross-section as well as voltage fluctuations of your distribution voltage into account, so that is secured that the voltage doesn't fall under 22 V at the power supply.



Attention

Insert fuse

The power supply must be protected with maximum 16 A.

3.3.3 Check voltage rating and connect

Fitted with the 24 V_{DC} power supply unit:

1. Check that the external power supply is providing the correct voltage.
2. Insert the power supply cable that you have assembled into the Industrial PC's power supply socket. Then connect it to your external 24 V power supply.

3.3.4 Configuration for shutting down the PC

The connections for shutting down the Industrial PCs are established via the **PC_ON** input and the **Power Status** output.

3.3.5 PC_ON and Power Status functions

- If the **PC_ON** input is connected to 24 V via a switch, the PC shuts down according to the rules. The **PC_ON** signal is inverted, i.e. the PC shuts down if the 24 V connection is live.
- Once the PC has shut down, the **Power Status** output is switched from 24 V to 0 V. Via this output a signal lamp can be connected or a contactor for de-energizing the whole system. The maximum load for the **Power Status** output is 0.5 A and a suitable fuse should be provided.

3.4 Connecting the Panel PC



Attention

The mains plug must be disconnected

Please read the documentation for the external devices prior to connecting them!

During thunderstorms, plug connector must neither be inserted nor removed!

When disconnecting a plug connector, always handle it at the plug. Do not pull the cable!

3.4.1 Connecting cables

The connections are located at the bottom of the Panel PC and are documented in the chapter [Interfaces](#).

When connecting cables to the Panel PC, please adhere to the following order:

- Disconnect the Panel PC from the power supply.
- Connect all cables at the Panel PC and at the devices to be connected.
- Ensure that all screw connections between connectors and sockets are tight!
- Reconnect all devices to the power supply.

3.4.2 Earthing measures

The low-resistance protective earthing of the Panel PC is established via the screw connection (PE).

Establish a low-impedance connection from the earthing point on the Panel PC housing (see chapter [Protective Earthing \(PE\)](#)) to the central earthing point on the control cabinet wall, in which the computer is being installed.

4 Operating Instructions


4.1 Switching the Panel PC on and off


4.1.1 Switching on

The Panel PC does not have its own mains power switch. As soon as the power supply is switched on the Panel PC is activated.

4.1.2 Shutting down and switching off

Control software such as is typically used on Industrial PCs permits various users to be given different rights. A user who may not close software may also not switch the Panel PC off, since data can be lost from the storage medium by switching off while software is running.

 Warning	<p>First shut down, then switch off!</p> <p>If the Panel PC is switched off as the software is writing a file to the storage medium, the file will be destroyed. Control software typically writes something to the storage medium every few seconds, so that the probability of causing damage by switching off while the software is running is very high.</p>
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 Warning	<p>Switch off power supply</p> <p>When you have shut down the Panel PC, you have to switch off power supply for at least 10 seconds before rebooting the system. After resetting power supply the Panel PC will start booting automatically.</p>
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4.1.3 First switching on and driver installation

When you switch on the Industrial PC for the first time, the pre-installed operating system (optional) will be started. In this case, all the required drivers for any additional, optional hardware components ordered with the PC will already have been installed.

If the PC was ordered without operating system, you have to install the operating system and the driver software for any auxiliary hardware yourself. Please follow the instructions in the documentation for the operating system and the additional devices.


4.2 Operation

The operation of the Panel PC occurs via the Touch Screen.

 Warning	<p>Risk of damaging the Touch Screen</p> <p>The touch screen may only be actuated by finger tips or with the touch screen pen. The operator may wear gloves but there must be no hard particles such as metal shavings, glass splinters embedded in the glove.</p>
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4.3 Servicing and maintenance

4.3.1 Cleaning

 DANGER	<p>Disconnect power supply</p> <p>Switch off the device and all connected devices, and disconnect the device from the power supply.</p>
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The device can be cleaned with a soft, damp cleaning cloth. Do not use any aggressive cleaning materials, thinners, scouring material or hard objects that could cause scratches.


4.3.2 Maintenance

The Panel PC is maintenance-free.

4.3.3 Replacing the battery on the motherboard

A used battery on the motherboard has to be replaced. See also chapter [Access to the battery and the CFast card slot](#).

 WARNING	<p>Danger of Explosion!</p> <p>Replace battery only with the identical type or an alternative type recommended by the manufacturer. Notice correct polarity!</p>
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 WARNING	<p>Handling of Lithium Batteries</p> <p>Lithium Batteries should not be recharged, exposed to fire, opened and they should be protected against sunlight and moisture.</p>
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The used battery must be disposed of in accordance with national electronics scrap regulations.

4.4 Emergency procedures

In case of fire, the Panel PC should be extinguished with powder or nitrogen.

4.5 Shutting down


4.5.1 Disposal


 Note	<p>Observe national electronics scrap regulations</p> <p>Observe the national electronics scrap regulations when disposing of the device.</p>
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In order to dispose of the device, it must be removed and fully dismantled:

- Housing components (polycarbonate, polyamide (PA6.6)) are suitable for plastic recycling.
- Metal parts can be sent for metal recycling.
- Electronic parts such as disk drives and circuit boards must be disposed of in accordance with national electronics scrap regulations.

5 Troubleshooting


 Note	<p>Pixel errors</p> <p>Pixel errors in the TFT display are production-caused and represent no complaint-reason!</p>
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 Note	<p>Anomalies of the Touchscreen</p> <p>Anomalies of the touchscreen sensor are production-caused and represent no complaint-reason!</p>
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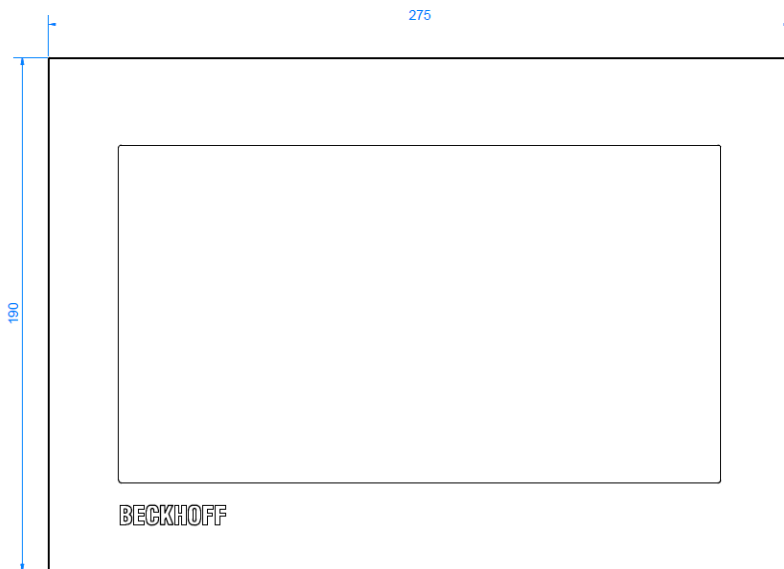
Fault	Cause	Measures
The Panel PC shows no function	No power supply to the Panel PC Cable not connected	Check power supply cable 1. Correctly connect cable 2. Call Beckhoff Service
Panel PC boots, software starts, but control does not operate correctly	Cause of the fault is either in the software or in parts of the plant outside the Panel PC	Call the manufacturer of the machine or the software
The Panel PC functions only partially or only part of the time, e.g. no or dark picture	Faulty backlight in the display Defective components in the Panel PC	Call Beckhoff Service Call Beckhoff Service
	Bad or missing ground connection of the user	User must stand on the floor with ordinary shoes

6 Assembly dimensions

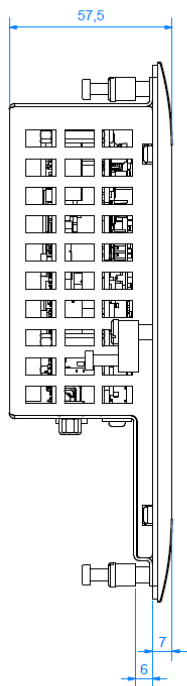
CP6700-0001-0050

 Warning	<p>Notice mounting orientation</p> <p>The assembly of the unit must take place with the orientation diagrammed here.</p>
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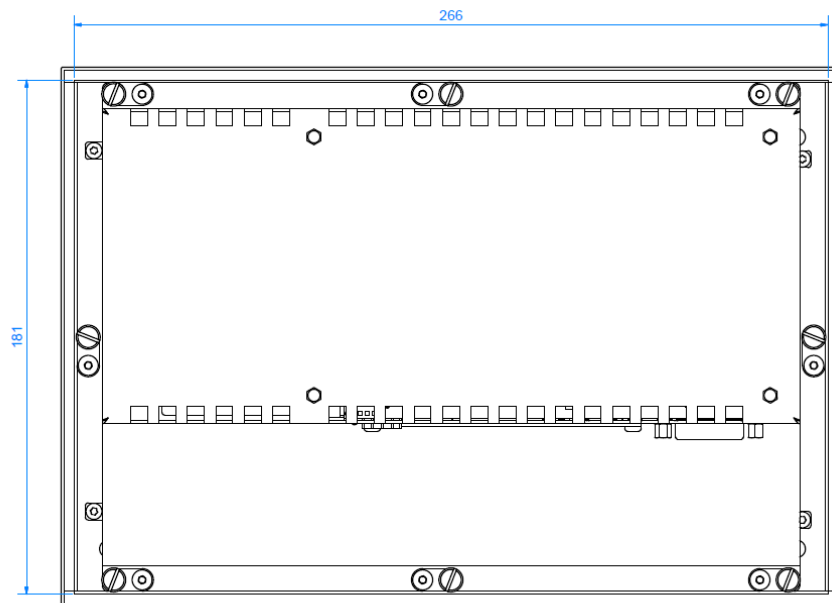
All dimensions are in mm.



front view




side view

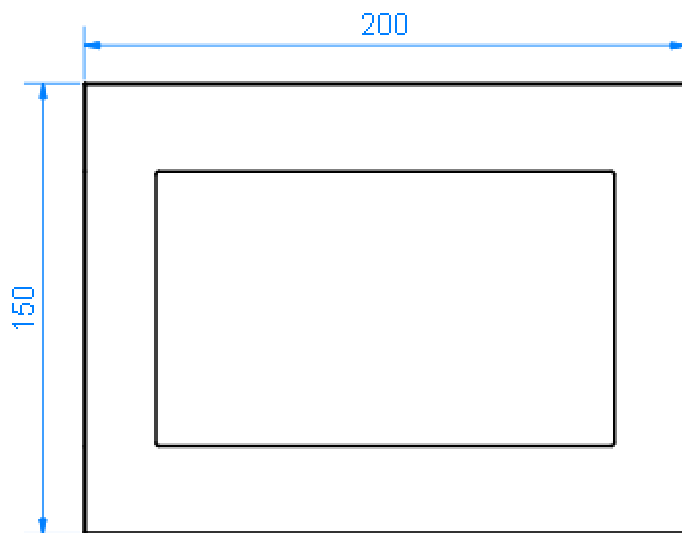


rear view with cut out

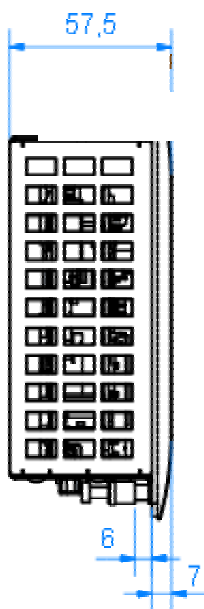
CP6706-0001-0050

 Achtung	<p>Einbaulage beachten</p> <p>Die Montage des Gerätes muss mit der dargestellten Ausrichtung erfolgen.</p>
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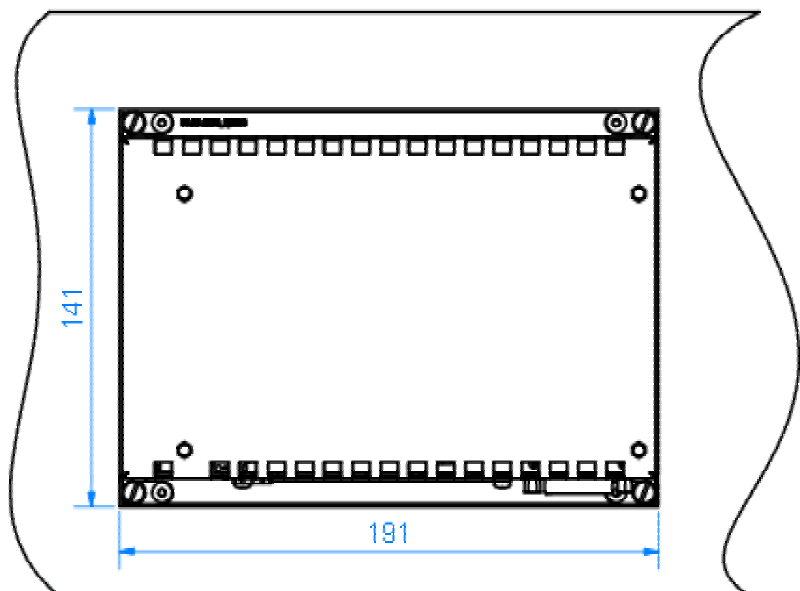
All dimensions are in mm.



front view





left view



rear view with cut out

7 Technical Data

 Danger	<p>Risk of explosion!</p> <p>Do not use the Panel PC in areas of explosive hazard!</p>
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 Note	<p>Pixel errors</p> <p>Pixel errors in the TFT display are production-caused and represent no complaint-reason!</p>
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 Note	<p>Anomalies of the Touchscreen</p> <p>Anomalies of the touchscreen sensor are production-caused and represent no complaint-reason!</p>
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Product name	CP6700-0001-0050/ CP6706-0001-0050
Dimensions (B x H x T)	See chapter Assembly dimensions
Weight	CP6700-0001-0050: approx. 1.8 kg CP6706-0001-0050: approx. 1.3 kg
Supply voltage	24 V _{DC} (20,4 – 28,8 V _{DC})
Power consumption (in basic configuration)	CP6700-0001-0050: max. 19 W CP6706-0001-0050: max. 19 W
Interfaces	1 DVI-I interface 2 On Board Ethernet Adapter 100/1000BASE-T with RJ45 connection 4 USB 2.0 interfaces
Protection class	Front side IP54, rear side IP20
Shock resistance (Sinusoidal vibration)	EN 60068-2-6: 10 to 58 Hz: 0.035 mm 58 to 500 Hz: 0.5 G (~ 5 m/ s ²)
Shock resistance (Shock)	EN 60068-2-27: 5 G (~ 50 m/ s ²), duration: 30 ms
EMC compatibility	Resistance to interference conforms to EN 61000-6-2
EMC compatibility	Emission of interference conforms to EN 61000-6-4
Permissible ambient temperature	0°C to +55°C (operation) -25°C to +65°C (transport/ storage)
Permissible relative humidity	to 95%, no condensation
Transport and storage	The same values for atmospheric humidity and shock resistance are to be observed during transport and storage as in operation. Suitable packaging of the Panel PC can improve the resistance to impact during transport.
Certifications	CE

8 Appendix

8.1 Beckhoff Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

8.1.1 Beckhoff branches and partner companies

Please contact your Beckhoff branch office or partner company for [local support and service](#) on Beckhoff products!

The contact addresses for your country can be found in the list of Beckhoff branches and partner companies: www.beckhoff.com. You will also find further [documentation](#) for Beckhoff components there.

8.1.2 Beckhoff company headquarters

Beckhoff Automation GmbH & Co. KG
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Beckhoff Support

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If servicing is required, please quote the **project number** of your product.

8.2 Approvals for USA and Canada

8.3 FCC Approvals for the United States of America

FCC: Federal Communications Commission Radio Frequency Interference Statement

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 a 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 a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**Note****Technical modifications**

Technological changes to the device may cause the loss of the FCC approval.

8.4 FCC Approval for Canada

FCC: Canadian Notice

This equipment does not exceed the Class A limits for radiated emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.of Communications“.