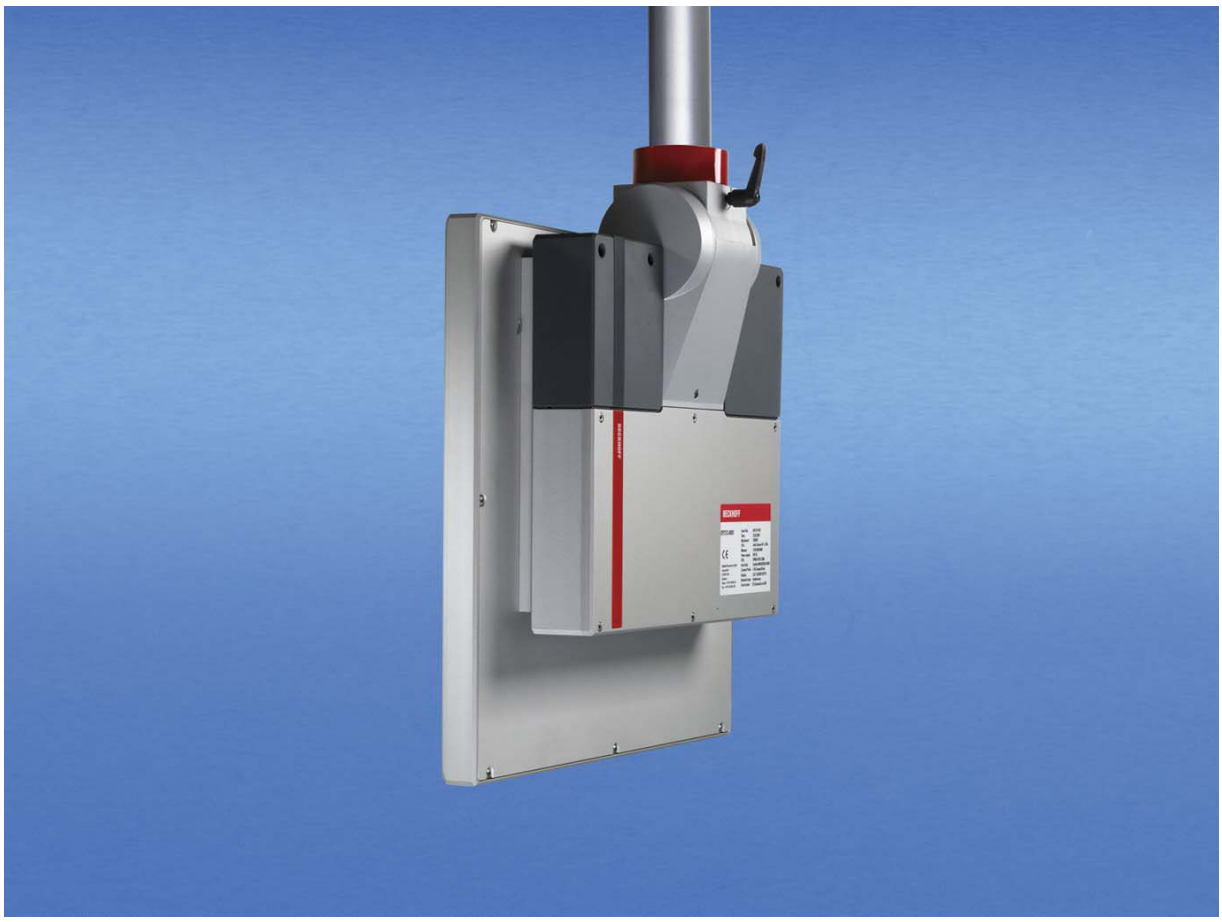

Installation and Operating instructions for

“Economy” Panel PC CP72xx

Version: 2.0
Date: 2016-11-09

BECKHOFF

Table of contents

Foreword

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.

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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.

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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.

Delivery conditions

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

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

Basic safety measures

Only switch the PC off after closing the software

Before the Industrial 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 Industrial PC on and off.*

Attention	**Switch off all parts of the equipment, then uncouple the fieldbus** Before opening the housing of the PC, and whenever the PC is being used for purposes other than plant control, such as during functional tests following repair, all parts of the equipment must first be switched off, after which the Industrial PC can be uncoupled from the plant. Pulling out the fieldbus connection plug uncouples the PC (optional). Items of equipment that have been switched off must be secured against being switched on again.

The Industrial PC's power supply unit must be supplied with $24V_{DC}$.

 **CAUTION**	**Do not open the power supply unit while voltage is applied!** The supply voltage must be switched off before the power supply unit housing is opened.

Attention	**Do not exchange any parts when under power** When components are being fitted or removed, the supply voltage must be switched off. Fitting work on the Industrial PC can result in damage: • if metal objects such as screws or tools fall onto operating circuit boards. • if connecting cables internal to the PC are removed or inserted during operation. • if plug-in cards are removed or inserted when the PC is switched on.

 **DANGER**	**High Voltage!** Displays used for the Control Panel's LC-display are operated with a voltage of up to 1000 V, depending on type. For that reason: **The supply voltage must be disconnected before the housing of the Control Panel is opened.**

Operator's obligation to exercise diligence

The operator must ensure that

- the Industrial PC is only used for its intended purpose (see chapter *Product Description*).
- the Industrial PC is only operated in a sound condition and in working order (see chapter *Maintenance*).
- the Industrial PC 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 instruction manual is in good condition and complete, and always available for reference at the place of installation of the Industrial PC.
- none of the safety and warning notes attached to the Industrial PC are removed, and all notes remain legible.
- every user is familiar with all the functions of the software installed on the Industrial PC to which he has access.

National regulations depending on the machine type

Depending on the type of machine and plant in which the Industrial 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.

Note	**Only trained persons may open the Industrial PC housing** The operator is responsible for ensuring that only trained electrical staff opens the housing of the Industrial PC.

Procedure in the event of a fault

In the event of faults at the Industrial PC, the list in the section *Troubleshooting* can be used to determine the measures to be taken.

Operator requirements

Read the operating instructions

Anyone who uses the Industrial PC must have read these operating instructions.

Software knowledge

Every user must be familiar with all the functions of the software installed on the Industrial PC to which he has access.

Product Description

Appropriate Use

The CP72xx Panel PC with 3½" motherboard is designed for mounting behind a Beckhoff Control Panel. Cooling is achieved via heat sink structure between the Control Panel and the add-on PC. A fan inside the closed housing ensures that the heat is distributed evenly.

The Industrial PC is designed for mounting arm installation.

DANGER	**Do not use the Panel PC in areas of explosive hazard!** The Panel PC must not be used where there is a risk of explosion.

Structure

Rear view of theCP72xx

Access to the connectors

In order to get access to the connectors, first unscrew the according M4-cross-head screws (**1**) (see photo above). The plastic caps (**2**) can then be taken off easily.

View to the connectors

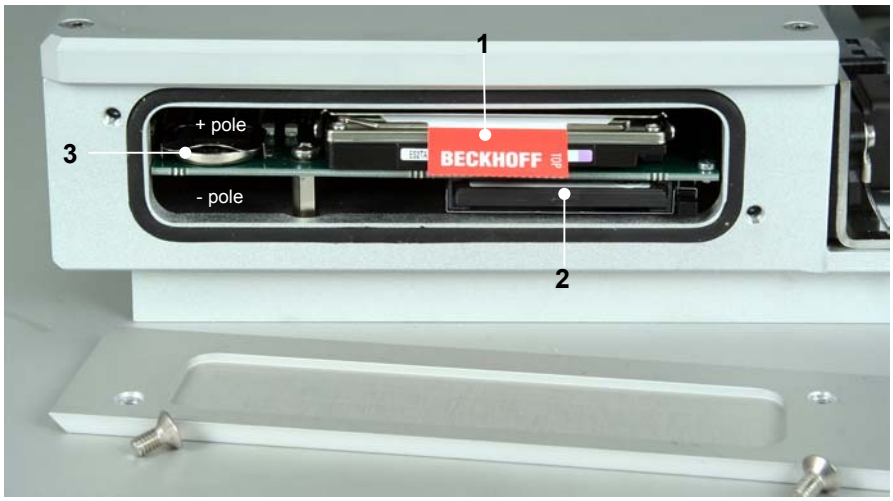
The picture shows the view to the connectors when the plastic caps are removed.

Access to memory and battery

Removing the drive cover

After unscrewing the two Allen screws (see arrows) the drive cover can be taken off.

View to the hard-disk drive (optional) and the memory card



Removing the drive cover allows access to the IDE-hard-disk (**1**) (optional), the Compact-Flash-memory card (**2**) and the lithium battery of the system clock (**3**).

Removing the hard-disk drive and the memory card

The hard-disk drive and the memory card can now be pulled out. Here, changing the lithium battery is also possible.

The installation takes place in reverse order.

WARNING	**Danger of Explosion!** Replace battery only with the identical type or an alternative type recommended by the manufacturer. Notice correct polarity!

WARNING	**Handling of Lithium Batteries** Lithium Batteries should not be recharged, exposed to fire, opened and they should be protected against sunlight and moisture.

Interfaces

Power supply

Power supply

The power supply connection of the Industrial PC and the connection with the UPS (optional) is established via the power supply socket (**X101**).

Network connection

Network connection

The Ethernet-interface with RJ-45-connector (**X106**) allows the PC to be connected to a network (LAN). In the basic configuration a Gigabit-port is available.

Additional plug-in cards (optional)

Type plate

There are notes at the Industrial PC and in the connection area which provide information about the hardware configuration of the Industrial PC at the time it was supplied.

Installation Instructions

Please also refer to chapter *Foreword*.

Transport and Unpacking

The specified storage conditions must be observed (see chapter *Technical data*).

Transport

Despite the robust design of the unit, the components are sensitive to strong vibrations and impacts. During transport, your Control Panel 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. 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.

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

Installation of the Panel PC

The Panel PC series CP72xx is designed for mounting arm installation. A Control Panel is installed in the front of the IP65 Panel PC.

The ambient conditions specified for operation must be observed (see the section *Technical data*).

Note	**Circulation of air** When the unit is installed in an enclosure, adequate space for ventilation and for opening the PC must be provided.

Please note the following points during installation of the PC:

- Position the 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 PC should not be exposed to direct sunlight.

Attention	**Avoid extreme environmental conditions** Extreme environmental conditions should be avoided as far as possible. Protect the rear of your PC from dust, humidity and heat. The clearance above and below the housing must be at least 20 cm in order to ensure adequate ventilation of the PC. The cooling ribs of the PC must not be covered.

Mounting arm installation

Rotatable mounting arm adapter

The industrial PC is designed for mounting arm installation using a 48 mm diameter mounting arm tube. The case features an integrated rotatable mounting arm adapter.

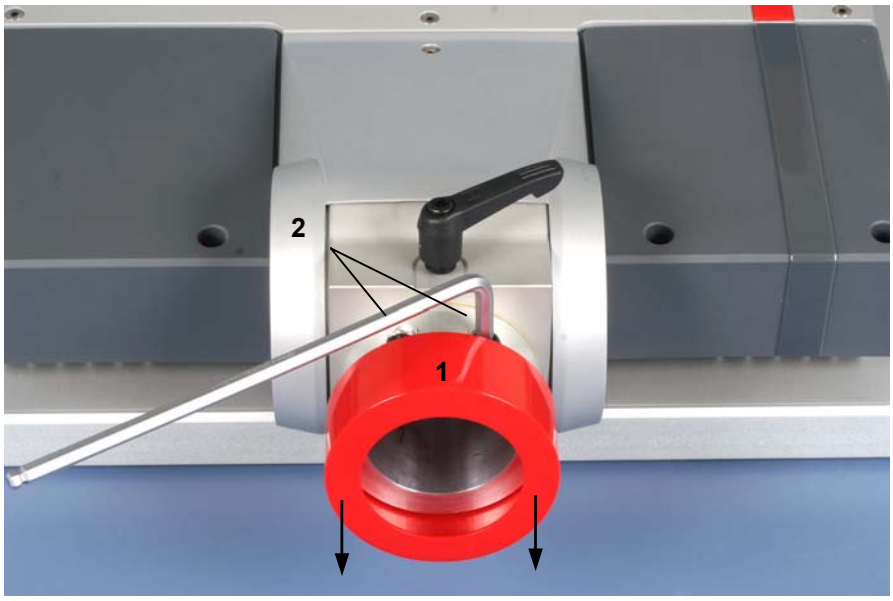
Rotatable and tiltable mounting arm adapter (optional)

The swivelling range of the tiltable mounting arm adapter (optional) amounts to approx. 45°.

Mounting arm installation

For Installation the Industrial PC at the mounting arm, first push back the red ring cover (**1**) (see arrows).

Now you get access to the allen head screws (**2**), with which the mounting arm tube is fixed in the adapter.



The picture shows the rotatable and tiltable mounting arm adapter (optional).

Earthing measures

Earthing measures

Earthing connections dissipate interference from external power supply cables, signal cables or cables to peripheral equipment.

The picture shows the earthing connection in the wiring area of the PC (see arrow). The earthing cable is laid through the support arm.

Power Supply Connection

Supplied mains power unit

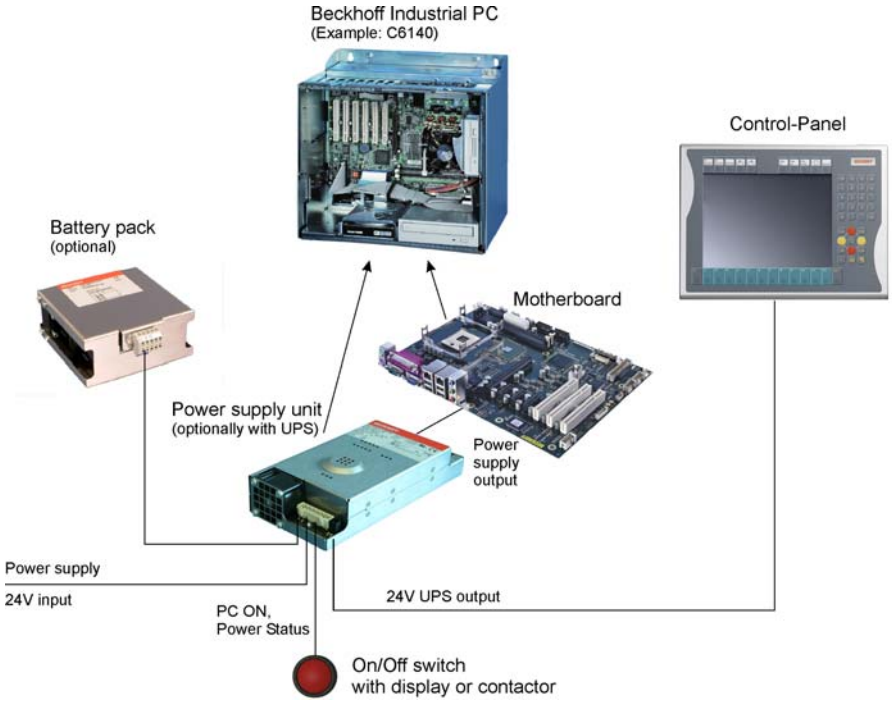
The Industrial PC is fitted with a 24 V_{DC} power supply unit .

Note	**Uninterruptible power supply (UPS)** When the Industrial PC is provided with a power supply unit with integrated UPS (order option) you can realize an uninterruptible power supply (UPS) using the battery pack C9900-U330.

WARNING	**Danger of Explosion!** Danger of Explosion if using other battery packs!

Beckhoff power supply technology

Schematic diagram of power supply unit wirings



Innovative solution for shutting down Industrial PCs

Industrial PCs equipped with a UPS are in actual use frequently switched off by simply turning off the supply voltage. In this case the PC shuts down via the battery. However, over time this reduces the service life of the battery.

The new Beckhoff power supply technology approach addresses this problem and now offers the user the option of switching the PC off without the need for using the battery, thereby reducing the load on the battery.

In addition to the main switch this innovative solution uses an ON/OFF switch for the machine. Basically, the main switch remains switched on and provides the power supply for the PC during shutdown.

Once the PC has shut down, the PC power supply unit issues a signal to indicate that the process is complete and that the main voltage can be switched off. This can be done manually via a signal lamp connection or via a contactor. With this solution the main switch generally only has to be switched off if the control cabinet has to be opened.

In order to maintain a screen display for the Industrial PC in the event of a power failure, the power supply unit is equipped with a UPS output for connecting a Control Panel. This enables a power failure to be visualised and displayed to the user. Once the PC has shut down, the UPS output is switched off in order to avoid total discharge of the battery.

Note	**Internal connection** The UPS output of the CP72xx power supply unit is internally connected with the panel

For a detailed functional description please refer to section *Connecting Power Supply*.

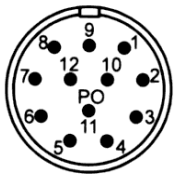
Pin assignment of the power supply connector

The power supply and the external circuit for switching the Industrial PC on and off are connected via the 12-pole plug connector .

Pin assignment CP72xx

Pin assignment for connecting the power supply, the switch and the battery pack (optional)

View connector-sided



Male connector

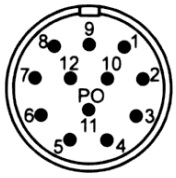
Connector 12-pole Coninvers RC-12P1N1126000

Pin	Wire	Function	
1	1	-	Battery Pack (with UPS)
2	2	+	
3	3	NC	
4	ye/gn	⏚	
5	4	-	24 V DC Power Supply
6	5	+	
7	6	PC_ON	
8	7	Power-Status	

Pin assignment CP72x4 with 24-inch display (discontinued)

Pin assignment for connecting the power supply, the switch and the battery pack (optional)

View connector-sided



Male connector

Connector 12-pole Coninvers RC-12P1N1126000

Pin	Wire	Function	
1	1	-	Battery Pack (with UPS)
2	2	+	
3	3	NC	
4	ye/gn	⏚	
5	4	-	24 V DC Power Supply PC Unit
6	5	+	
7	6	PC_ON	
8	7	Power-Status	
9	8	-	Battery Pack (with UPS)
10	9	+	
11	10	-	24 V DC Power Supply Display
12	11	+	

Pre-assembled cable sets for the power supply

Pre-assembled power supply cables

For easy installation of the power supply there are pre-assembled connection cables of different length and with IP65 connectors available (see table).

Order number	Denomination
C9900-K271	Power supply cable IP65 for CP72xx, length 5 m, pre-assembled, M23-female connector, screwable, 8-wire, second end open
C9900-K272	Power supply cable IP65 for CP72xx, length 10 m, pre-assembled, M23-female connector, screwable, 8-wire, second end open
C9900-K275	Power supply cable IP65 for CP72x4 with 24-inch display, length 5 m, pre-assembled, M23-female connector, screwable, 12-wire, second end open
C9900-K276	Power supply cable IP65 for CP72x4 with 24-inch display, length 10 m, pre-assembled, M23-female connector, screwable, 12-wire, second end open
C9900-K277	Power supply cable IP65 for CP72xx up to 19-inch display, length 20 m, pre-assembled, M23-female connector, screwable, 12-wire, second end open

Fitting the power supply cable with IP65 connector

Basic configuration without connecting cable and connector

In the basic configuration of the Industrial PC there is no connection cable provided for connecting the power supply. For connecting the power supply following connectors can be used:

Cable 8-pole for CP72xx

Coninvers female connector Series RC 12-pole

(Crimp Coninvers RM-12S1N8A1100, Coninvers Connector 12-pole, with metric screw connection M16)

Cable 12-pole for CP72x4 (discontinued)

Coninvers female connector Series RC 12-pole

(Crimp Coninvers RM-12S1N8A1300, Coninvers Connector 12-pole, with metric screw connection M20)

The connectors and special tools for the assembly are available via the company Coninvers *http://www.coninvers.com* as well as different distributors.

Connecting Power Supply

The external wiring consists of the connection of the power supply, the battery pack (optional) and the connection of customised components for shutting down the PC.

Cable Cross Sections

Note cable cross sections, avoid voltage drop!

For the connection of the power supply, wiring with a cable-cross-section of 1.0 mm^2 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 10 A.

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.

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.
- If the **PC_ON** input is *NOT* connected by the user, the PC can be booted in the familiar way by connecting the supply voltage and shut down via the battery by switching off the supply voltage.

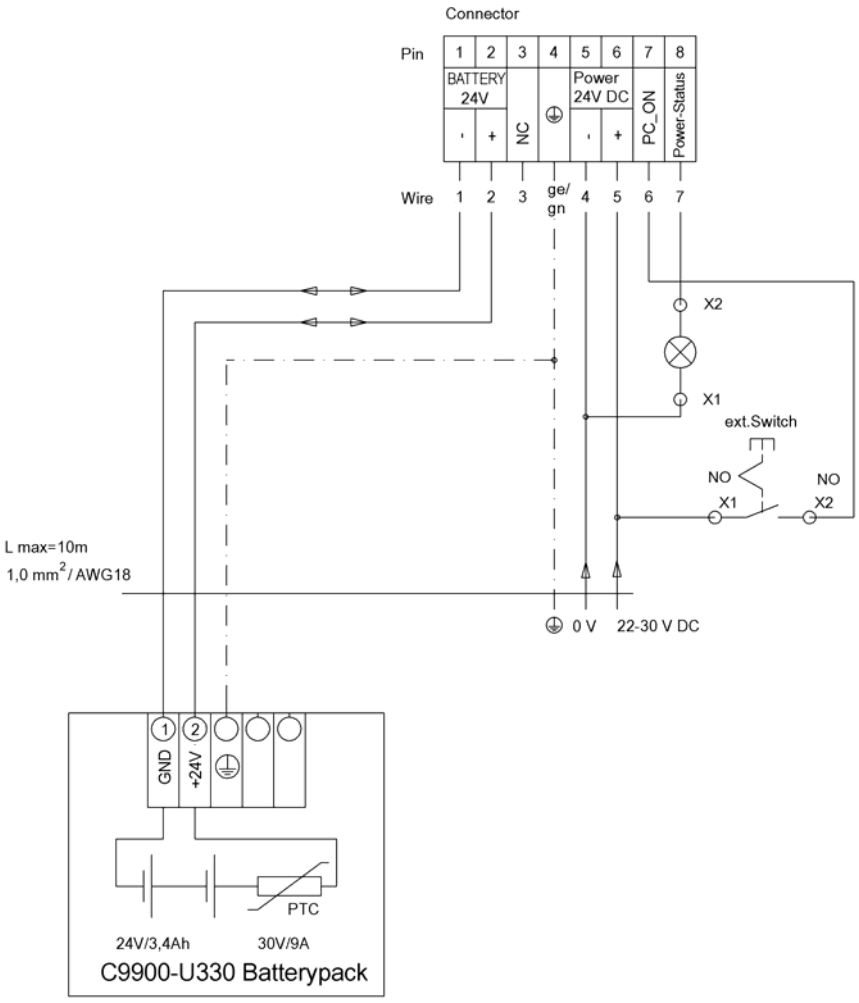
Attention	**Service life of the rechargeable battery** This procedure significantly reduces the service life of the rechargeable battery and should therefore not be used.

- 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-energising the whole system. The maximum load for the Power Status output is 0.5 A and a suitable fuse should be provided.

Wiring diagram CP72xx

Wiring according to the wiring diagram (the circuit of PC_ON and Power-Status is symbolical):

Wiring diagram power supply and external wiring

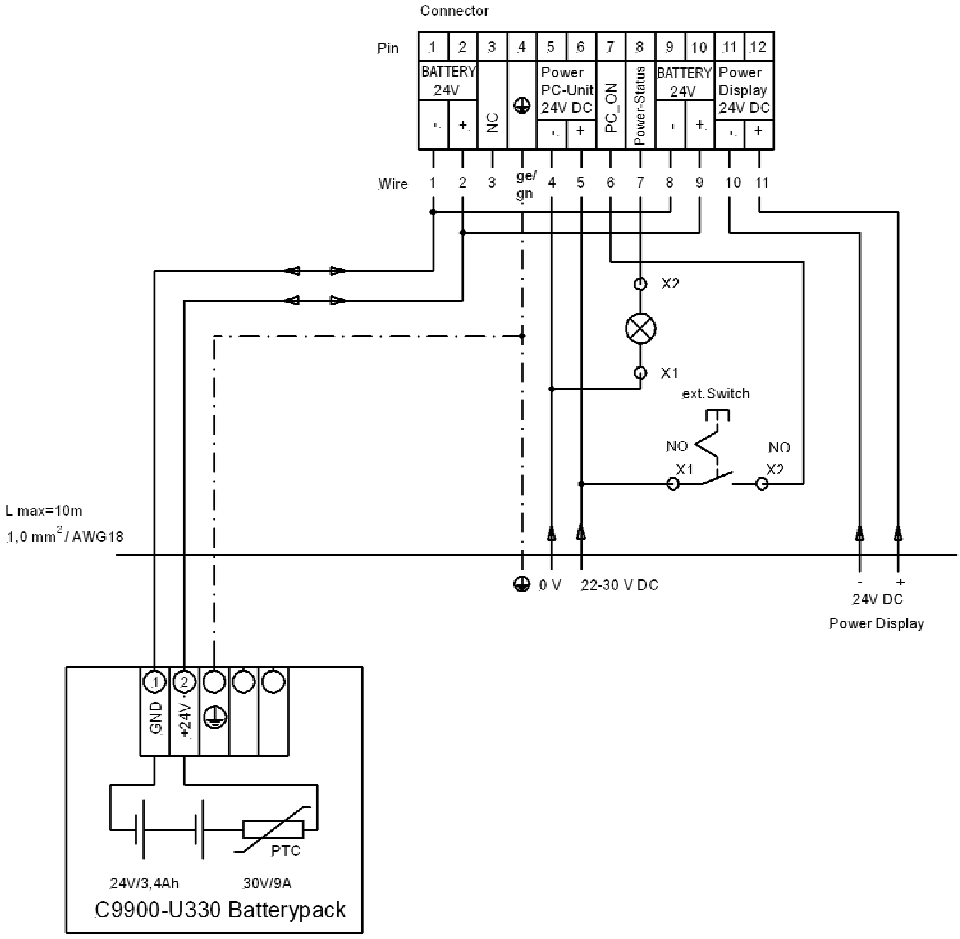


Note	**Connection of the Battery Pack** Connection of the Battery Pack in combination with integrated UPS (order option).

Wiring diagram
CP72x4 with 24-inch display (discontinued)

Wiring according to the wiring diagram (the circuit of PC_ON and Power-Status is symbolical):

Wiring diagram power supply and external wiring



Note	**Connection of the Battery Pack** Connection of the Battery Pack in combination with integrated UPS (order option).

Connecting the Network

Pre-assembled network cables

Pre-assembled network cables

For easy installation of the network connection there are pre-assembled connection cables of different length and with IP65 – RJ45 connectors available (see table).
In addition to the specified network cables, cables for further configuration are available.

Order number	Denomination
C9900-K281	Network cable for CP72xx, length 3 m, pre-assembled, Harting-Push-Pull-Ethernet-connector IP65, second cable end RJ45 IP20
C9900-K282	Network cable for CP72xx, length 5 m, pre-assembled, Harting-Push-Pull-Ethernet-connector IP65, second cable end RJ45 IP20
C9900-K283	Network cable for CP72xx, length 10 m, pre-assembled, Harting-Push-Pull-Ethernet-connector IP65, second cable end RJ45 IP20
C9900-K284	Network cable for CP72xx, length 15 m, pre-assembled, Harting-Push-Pull-Ethernet-connector IP65, second cable end RJ45 IP20
C9900-K285	Network cable for CP72xx, length 20 m, pre-assembled, Harting-Push-Pull-Ethernet-connector IP65, second cable end RJ45 IP20
C9900-K286	Network cable for CP72xx, length 30 m, pre-assembled, Harting-Push-Pull-Ethernet-connector IP65, second cable end RJ45 IP20
C9900-K287	Network cable for CP72xx, length 40 m, pre-assembled, Harting-Push-Pull-Ethernet-connector IP65, second cable end RJ45 IP20
C9900-K288	Network cable for CP72xx, length 50 m, pre-assembled, Harting-Push-Pull-Ethernet-connector IP65, second cable end RJ45 IP20

Fitting the network cable with IP65 connector

Basic configuration without network cable and connector

In the basic configuration of the Industrial PC there is a connector cap provided without connector.

For network connection following *Harting Push Pull connector RJ45, 8-pole* can be used:

- *Connector RJ45 8-pole Harting Push Pull connector-set according to IEC24702, white No. 09 45 145 1500*

The connector and special tools for the assembly are available via the company Harting http://www.harting.de/ as well as different distributors.

USB-interface (optional)

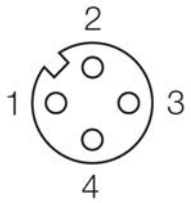
Order option C9900-E187

Optionally a USB 2.0 interface with 4-pole-connector (M12-female connector IP65) in the connection area is available with order option C9900-E187:

Order number	Denomination
C9900-E187	IP65 connector M12 in the wiring area of a CP72xx for one USB 2.0 Port

Pin assignment for connecting the USB-interface (optional)

Pin assignment, view connector-sided



Female connector 4-pole Escha 8029477

Pin	Signal	Color
1	**VCC**	Red
2	**D -**	White
3	**GND**	Black
4	**D +**	Green

Pre-assembled USB-cables

Pre-assembled USB-cables

For easy installation of the USB-interface in the wiring area there are pre-assembled USB-cables of different length and with IP65-connectors available (see table).

Note

Usage of the Cables

These USB-cables can not be used for connecting the following options:

- C9900-E190 (USB-A in the wiring area of a CP72xx for one USB 2.0 Port)
- C9900-E169 (2-port USB socket inside the Control Panel back plane)

Order number	Denomination
C9900-K291	USB cable for CP72xx, length 3 m, assembled, M12 connector IP65, screw type, 4 pin, second end USB-B connector
C9900-K292	USB cable for CP72xx, length 5 m, assembled, M12 connector IP65, screw type, 4 pin, second end USB-B connector

Fitting the USB-cable with IP65 connector

Required connector

For connecting the USB-interface the following connector is needed cable-sided:

- *Connector 4-pole round shield Binder 99142981404*

For further information see *http://www.binder-connector.de/*.

RS232-interface (optional)

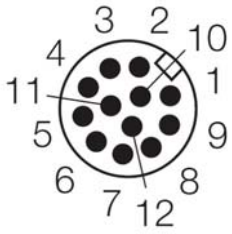
Order option C9900-E186

Optionally a RS232-interface with 12-pole-connector (M12-female connector IP65) is available in the connection area with order option C9900-E186:

Order number	Denomination
C9900-E186	IP65-connector M12 in the wiring area of a CP72xx for one serial interface RS232

Pin assignment for connecting the RS232-interface (optional)

Pin assignment,
view connector-sided



SG 12-pole M12
Escha 8029505

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	SGND
6	DSR
7	RTS
8	CTS
9	RI
10	NC
11	NC
12	NC

Pre-assembled serial interface cables

Pre-assembled RS232-cables

For easy installation of the serial interface in the wiring area there are pre-assembled RS232-cables of different length and with IP65-connectors available (see table).

Order number	Denomination
C9900-K295	Serial interface cable RS232 for CP72xx, length 3 m, assembled, M12 connector IP65, screw type, 12 pin, second end D-Sub 9 pin plug
C9900-K296	Serial interface cable RS232 for CP72xx, length 5 m, assembled, M12 connector IP65, screw type, 12 pin, second end D-Sub 9 pin plug
C9900-K297	Serial interface cable RS232 for CP72xx, length 10 m, assembled, M12 connector IP65, screw type, 12 pin, second end D-Sub 9 pin plug

Fitting the RS232-interface cable with IP65 connector

Required connector

For connecting the RS232-interface the following connector is needed cable-sided:

- *Cable with connector M12 12-pole, 12x0,14mm² 5m Escha 8028494*

For further information see http://www.escha.de/.

Connecting devices

Attention	**Power supply plug** The power supply plug must be withdrawn! 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!

Connecting cables

The connections are located at the top of the Industrial PC and are documented in the *Product Description* chapter.

When connecting the cables to the Industrial PC, proceed according to the following sequence:

- Switch off all the devices that are to be connected.
- Disconnect all the devices that are to be connected from the power supply.
- Connect all the cables between the Industrial PC and to the devices that are to be connected.
- Connect all data transfer cables (if present) to the appropriate plug-in receptacles of the data/telecommunication networks.
- Reconnect all devices to the power supply.

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.

Attention	**Use same type of rechargeable battery** If a 24 V UPS is installed, the same type of rechargeable battery must be used.

Operating Instructions

Please also refer to chapter *Foreword.*

Switching the Industrial PC on and off

Switch on

The Industrial PC does not have its own mains switch. The Industrial PC will start when the equipment is switched on, or when it is connected to the power supply.

Shutting down and switching off

When the plant is switched off, or when it is disconnected from its power supply, the Industrial PC will be switched 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 Industrial PC off, since data can be lost from the hard disk by switching off while software is running.

Attention	**First shut down, then switch off the PC** If the Industrial 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.

Attention	**Switch off power supply** When you have shut down the Industrial PC, you have to switch off power supply for at least 10 seconds before rebooting the system. After resetting power supply the PC will start booting automatically.

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.

Keyboard codes

Type-dependent number of keys

Depending on the precise type, the Control Panel can have fewer keys than those described here.

Operation

The cursor is the blinking character that marks the point at which the next character entered will be displayed. The cursor is also known as the insertion point. The cursor keys each move the cursor one place in the associated direction.

The Home key moves the cursor to the beginning of the line, while the End key moves it to the end of the line.

The *Pg Up* key scrolls one page back, the *Pg Dn* key scrolls one page forward.

The Tab key takes the cursor to the next input field, while Shift and Tab moves to the previous input field.

The mouse cursor can be moved over the screen with the aid of the touch screen or of the touch pad (optional). The keys correspond to the left and right hand keys of a Microsoft mouse.

The *Del* key deletes the character to the right of the cursor.

The *Ins* key causes characters to the right of the cursor to be overwritten. The overwrite mode is cancelled by pressing the key again.

Print-Screen prints a hard copy of a text screen on the printer.

The Pause key stops the computer until another key is pressed (only under MS-DOS).

Your input is confirmed with the Enter key.

Backspace deletes the character to the left of the cursor.

If the Shift key is pressed at the same time as another key, then instead of the numbers you obtain the character printed above the number, and you obtain upper case letters instead of lower case letters.

Pressing the *Caps Lock* key once activates and locks the *Shift* key. Pressing the *Shift* key cancels this function.

Rather like the effect of the *Shift* key, *Ctrl* and *Alt* also change the meaning of another key that is pressed at the same time.

This key brings up the Start menu of the operating system in use (Windows 95, 98, ME, NT, 2000, XP).

Pressing this key opens the property sheet of the active (or marked) object.

The *Esc* key has the effect of closing dialog windows and of interrupting some of the computer's working operations.

All other keys bring the character printed on them onto the display at the position of the cursor.

The meaning of the function keys, *F1* to *F10*, is determined by the software and is displayed at the bottom edge of the display.

The function of the special keys above the display is also determined by the software. The function is displayed at the top edge of the display. The special keys each have an orange LED controlled by the software.

Maintenance

Please also refer to chapter *Foreword*.

Cleaning the Industrial PC

Attention	**Disconnect from power supply** Switch off the Industrial PC and all connected devices, and disconnect the Industrial PC from the power supply.

The Industrial PC can be cleaned with a soft, damp cloth. Do not use any aggressive cleaning materials, thinners, scouring material or hard objects that could cause scratches.

Servicing

The Industrial PC requires no maintenance.

Replacing the battery on the motherboard

A used battery on the motherboard has to be replaced. See also chapter *Access to memory and battery.*

 **WARNING**	**Danger of Explosion!** Replace battery only with the identical type or an alternative type recommended by the manufacturer. Notice correct polarity!

 **WARNING**	**Handling of Lithium Batteries** Lithium Batteries should not be recharged, exposed to fire, opened and they should be protected against sunlight and moisture.

The used battery must be disposed of in accordance with national electronics scrap regulations.

Emergency procedures

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

Shutting down

Disposal

Dismantling the Industrial PC

The device must be fully dismantled in order to dispose of it. The housing can be sent for metal recycling.

Observe national electronics scrap regulations

Electronic parts such as disk drives and circuit boards must be disposed of in accordance with national electronics scrap regulations.

UPS Software Components (optional)

Installing the UPS driver software

For operating the power supply unit as a UPS, the UPS driver software and the associated UPS driver must be installed on the Industrial PC.

On delivery of the Beckhoff Industrial PC with operating system the software is already installed. Should the software not be installed on your PC, the drivers can be installed from the driver CD provided.

Installation on the PC

Installation

To install the UPS driver software, execute file **Beckhoff_UPS_vx.xx.xx.exe** from the subdirectory of **UPS\…** from the CD provided on the Industrial PC (Driver-archive for the Industrial-PC, C9900-S700-xxxx).

The program is self-extracting and will guide the user through the installation routine.

Help files

Beckhoff Information System

The driver software comes with a detailed help function.
The help files can be called up either directly from the configuration register by clicking the Help button, or under via *Start* > *Programs* > *Beckhoff* > *UPS software components*.

Troubleshooting

Please also refer to chapter *Foreword.*

Note	**Pixel errors** Pixel errors in the TFT display are production-caused and represent no complaint-reason!

Fault correction

Fault	Cause	Procedure
Nothing happens after the Industrial PC has been switched on	No power supply to the Industrial PC Other cause	Check power supply cable. Call Beckhoff Service
The Industrial PC does not boot fully	Setup settings are incorrect Other cause	Check the setup settings Call Beckhoff Service
Computer 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 Industrial PC	Call the manufacturer of the machine or the software
Memory device error	Faulty memory device	Check memory in another device Call Beckhoff Service
USB error while TwinCAT access via USB	Cycle time in TwinCAT is set on 10 ms (standard)	Increase the cycle time up to 50 ms till 80 ms
The Industrial PC functions only partially or only part of the time, e.g. no or dark picture, but memory drive responds when switching on	Defective components in the Industrial PC	Call Beckhoff Service

Beckhoff Support & Service

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

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.

Beckhoff Headquarters

Beckhoff Automation GmbH & Co. KG
Huelshorstweg 20
33415 Verl
Germany

Phone:	+49(0)5246/963-0
Fax:	+49(0)5246/963-198
e-mail:	info@beckhoff.com

Beckhoff Support

Beckhoff offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with wide-ranging services:

- worldwide support
- design, programming and commissioning of complex automation systems
- training program for Beckhoff system components

Hotline:	+49(0)5246/963-157
Fax:	+49(0)5246/963-9157
e-mail:	support@beckhoff.com

Beckhoff Service

The Beckhoff service center supports you in all matters of after-sales service:

- on-site service
- repair service
- spare parts service
- hotline service

Hotline:	+49(0)5246/963-460
Fax:	+49(0)5246/963-479
e-mail:	service@beckhoff.com

Quote the project number

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

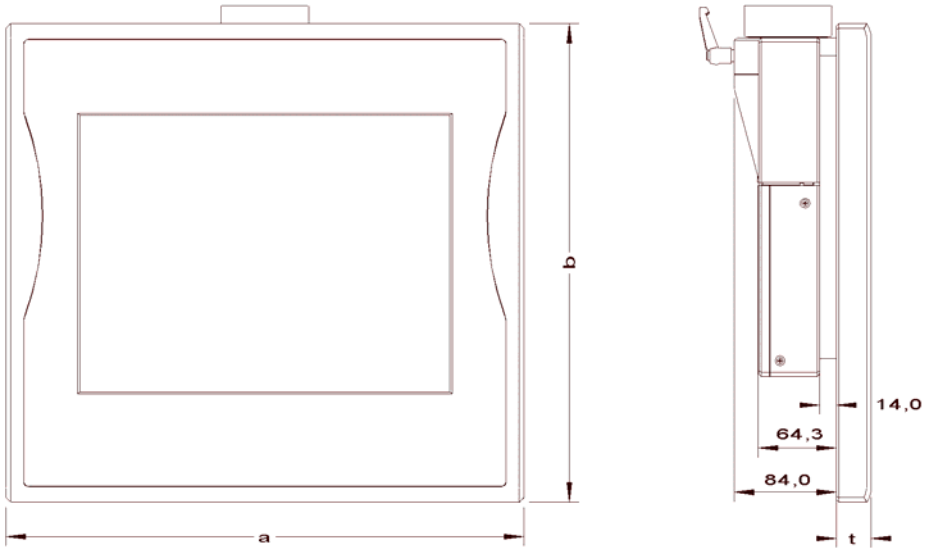
Appendix

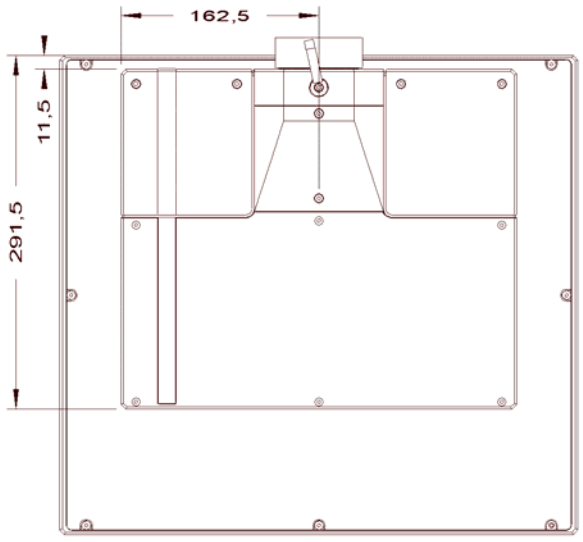
Assembly dimensions

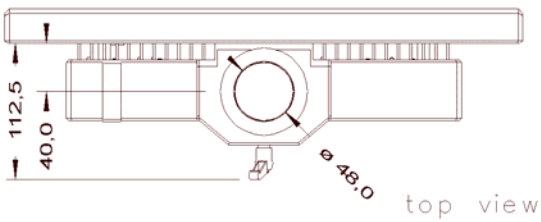
The illustrations show the measurements of the Panel-PCs. Please refer to the tables for the dimensions of the Control Panel. All Dimensions in mm.

CP72xx

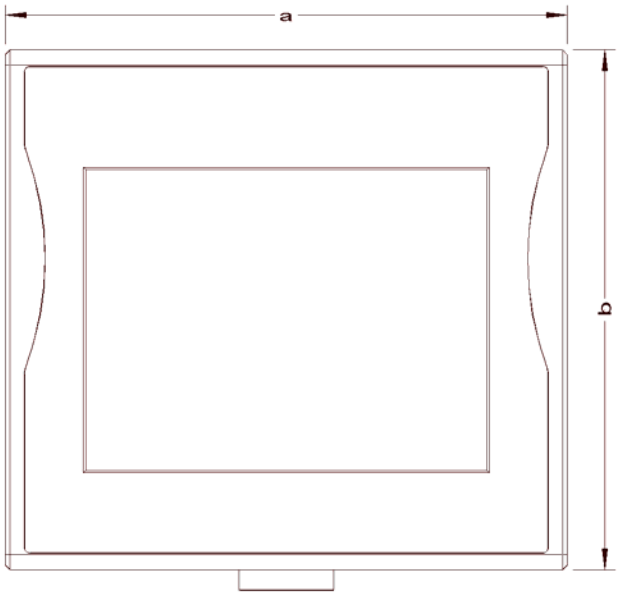
Mounting arm installation from top, rotatable



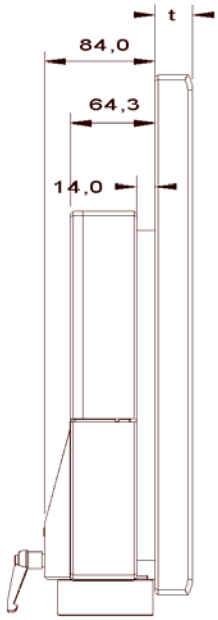




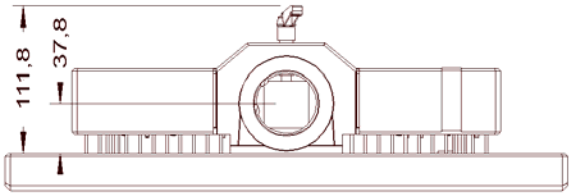
CP72xx *Mounting arm installation from bottom, rotatable*



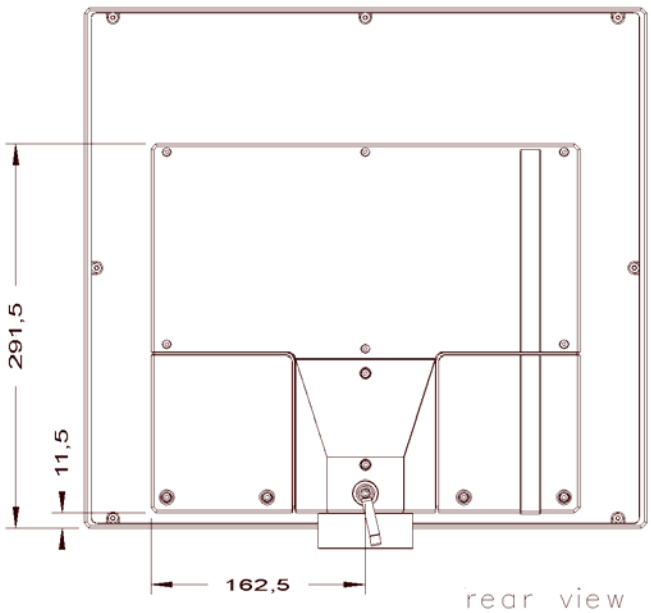
front view



left view

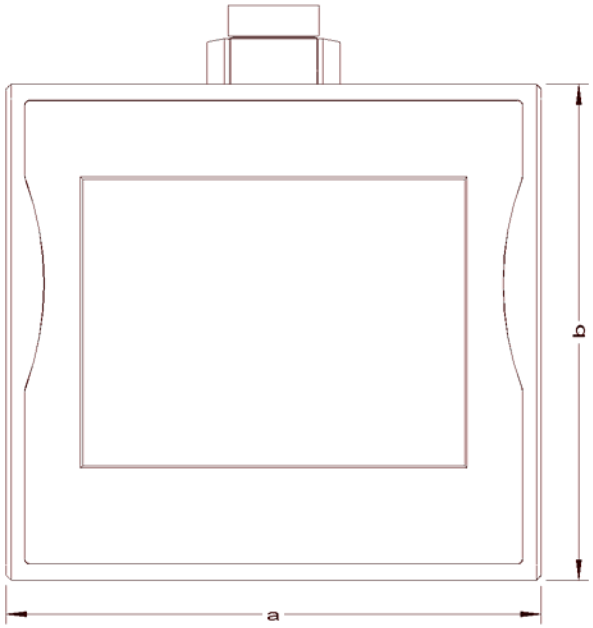


bottom view

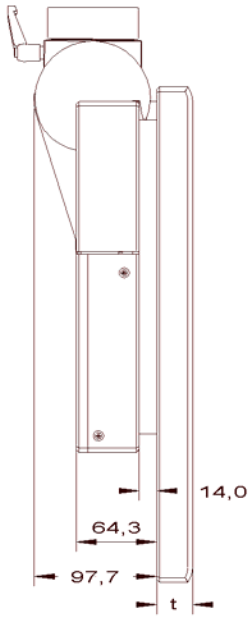


rear view

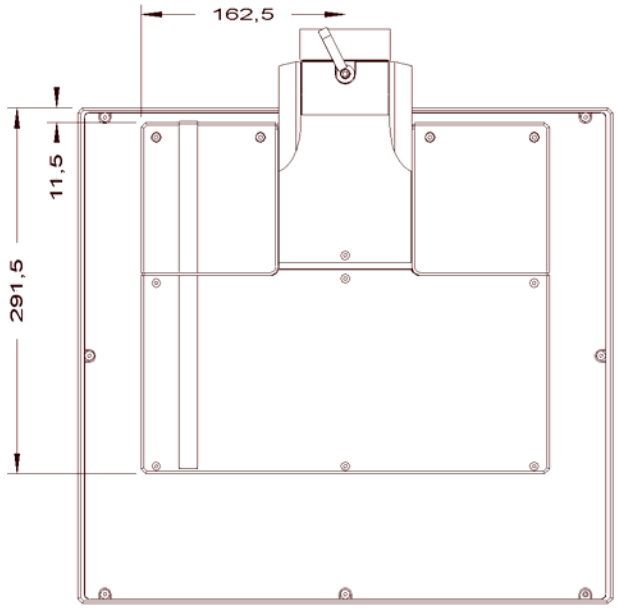
CP72xx *Mounting arm installation from top, rotatable and tiltable*



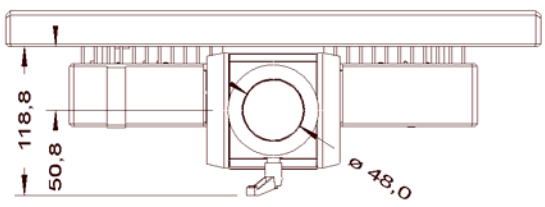
front view



left view

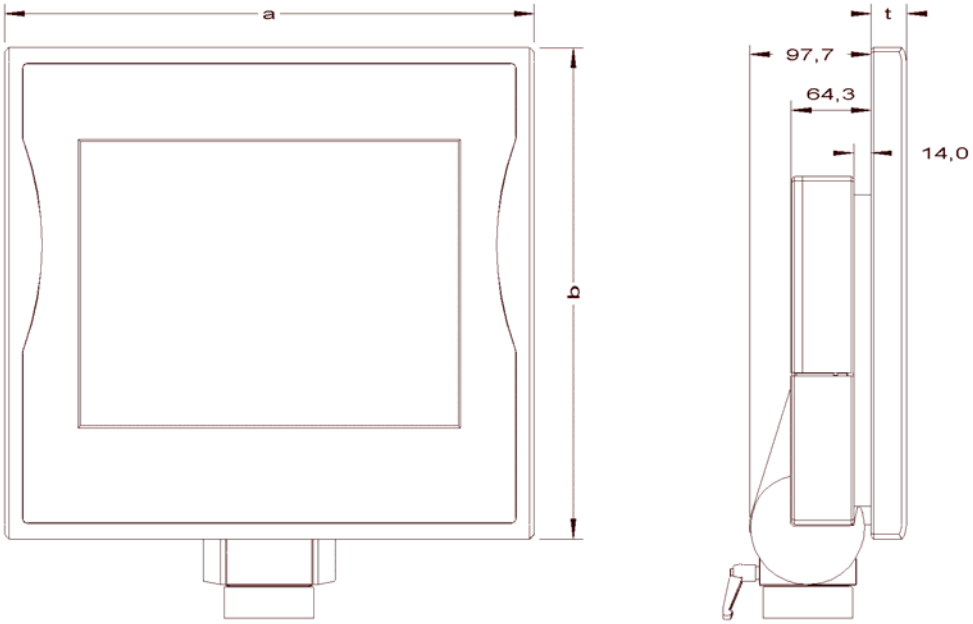


rear view

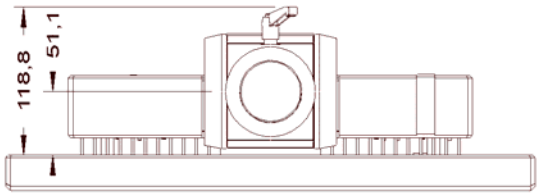


top view

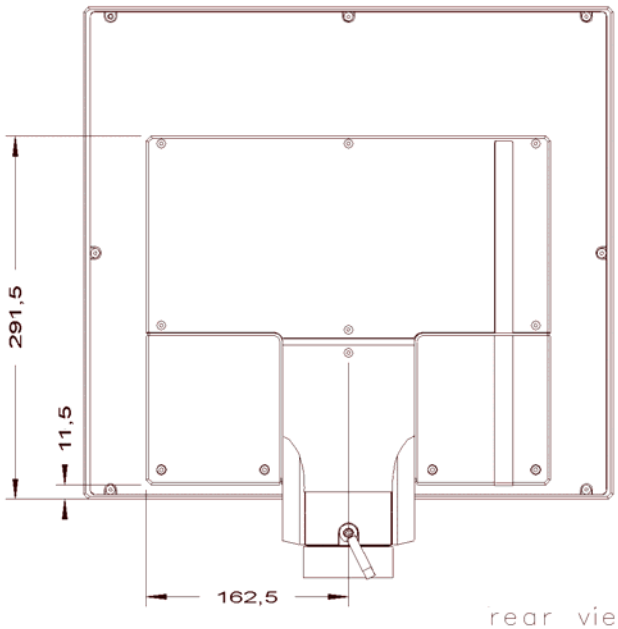
CP72xx *Mounting arm installation from bottom, rotatable and tiltable*



front view left view



bottom view



rear view

Dimensions and total weight

Display only

without touch screen

Dimensions		a	b	t	Weight
CP7201-0000	12“ Display	353.8	326.3	27.5	9.7 kg
CP7202-0000	15“ Display	426	395	28.5	11.4 kg
CP7203-0000	19“ Display	504	455	45	16.3 kg
CP7204-00xx	24“ Display	610	450	64	16,0 kg

with touch screen

Dimensions		a	b	t	Weight
CP7201-0001	12“ Display	353.8	326.3	27.5	9.7 kg
CP7202-0001	15“ Display	426	395	28.5	11.6 kg
CP7203-0001	19“ Display	504	455	45	16.1 kg
CP7204-00x1	24“ Display	610	450	64	16,0 kg

With function keys

without touch screen

Dimensions		a	b	t	Weight
CP7211-0000	12“ Display	353.8	326.3	27.5	9.7 kg
CP7212-0000	15“ Display	426	395	28.5	11.4 kg
CP7213-0000	19“ Display	504	455	45	16.3 kg

with touch screen

Dimensions		a	b	t	Weight
CP7211-0001	12“ Display	353.8	326.3	27.5	9.7 kg
CP7212-0001	15“ Display	426	395	28.5	11.6 kg
CP7213-0001	19“ Display	504	455	45	16.1 kg

Numeric keyboard

without touch screen

Dimensions		a	b	t	Weight
CP7221-0000	12“ Display	406	308.3	27.5	9.9 kg
CP7222-0000	15“ Display	515	370.2	28.5	12.0 kg
CP7223-0000	19“ Display	563	426	45	16.6 kg

with touch screen

Dimensions		a	b	t	Weight
CP7221-0001	12“ Display	406	308.3	27.5	10.0 kg
CP7222-0001	15“ Display	515	370.2	28.5	12.3 kg
CP7223-0001	19“ Display	563	426	45	16.5 kg

with touch pad

Dimensions		a	b	t	Weight
CP7221-0002	12“ Display	406	308.3	27.5	10.2 kg
CP7222-0002	15“ Display	515	370.2	28.5	12.0 kg
CP7223-0002	19“ Display	563	426	45	16.6 kg

Alphanumeric keyboard

without touch screen

Dimensions		a	b	t	Weight
CP7231-0000	12“ Display	426	370.2	27.5	10.6 kg
CP7232-0000	15“ Display	483	410.2	28.5	12.3 kg
CP7233-0000	19“ Display	504	535	45	17.8 kg

with touch screen

Dimensions		a	b	t	Weight
CP7231-0001	12“ Display	426	370.2	27.5	10.7 kg
CP7232-0001	15“ Display	483	410.2	28.5	12.5 kg
CP7233-0001	19“ Display	504	535	45	17.6 kg

with touch pad

Dimensions		a	B	t	Weight
CP7231-0002	12“ Display	426	370.2	27.5	10.8 kg
CP7232-0002	15“ Display	483	410.2	28.5	12.3 kg
CP7233-0002	19“ Display	504	535	45	17.7 kg

Appendix

Technical data

Dimensions and weight	See section *Assembly dimensions*	
Do not use the PC in areas of explosive hazard	**The Industrial PC may not be used in areas of explosive hazard.**	
	The following conditions must be observed during operation:	
Environmental conditions	**Ambient temperature:**	0 to 45°C
	Atmospheric humidity:	Maximum 95%, non-condensing
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)
	During reading of CD-ROM:	10 to 58 Hz: 0.019 mm
		58 to 500 Hz: 0.25 G (~ 2.5 m/ s^2)
	Impact:	
	(EN 60068-2-27)	5 G (~ 50 m/ s²), duration: 30 ms
	During reading of CD-ROM:	5 G (~ 50 m/ s²), duration: 11 ms
Protection class	**Protection class:**	IP65
Power supply 24 V_{DC} power pack	**Supply voltage:**	24 V_{DC} (22 – 30 V_{DC})
	Power consumption:	approx. 55 W for the basic version, approx. 69 W with 12“ display approx. 80 W with 15“ display approx. 87 W with 19“ display approx. 160 W with 24“ display
	If operated with USV:	additional 30 W (while charging)
EMC compatibility	**Resistance to interference:**	conforms to EN 61000-6-2
	Emission of interference:	conforms to EN 61000-6-4
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 Industrial PC can improve the resistance to impact during transport. The ambient temperature during storage and transport must be between -20°C and +65°C.	

Note	**Pixel errors** Pixel errors in the TFT display are production-caused and represent no complaint-reason!

Approvals

FCC: Federal Communications Commission Radio Frequency Interference Statement

FCC Approval for USA

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.

FCC: Canadian Notice

FCC Approval for Canada

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.