



Installation and Operating instructions for **CP79xx Control Panel**

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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.

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.

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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.

Copyright

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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.

Delivery conditions

In addition, the general delivery conditions of the company Beckhoff Automation GmbH 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 [Functional description](#).

 Attention	<p>Switch off all parts of the equipment, then uncouple the fieldbus</p> <p>Before opening the housing of the Control Panel, and whenever the Control Panel 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 Control Panel can be uncoupled from the plant.</p> <p>Pulling out the fieldbus connection plug uncouples the Control Panel (optional).</p> <p>Items of equipment that have been switched off must be secured against being switched on again.</p>
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The Control Panel's power supply unit must be supplied with 24V_{DC}.

 CAUTION	<p>Do not open the power supply unit while voltage is applied!</p> <p>The supply voltage must be switched off before the power supply unit housing is opened.</p>
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 Attention	<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 Control Panel 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 Control Panel are removed or inserted during operation.
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 DANGER	<p>High Voltage!</p> <p>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:</p> <p>The supply voltage must be disconnected before the housing of the Control Panel is opened.</p>
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Operator’s obligation to exercise diligence


The operator must ensure that

- the Control Panel is only used for its intended purpose (see chapter *Product Description*).
- the Control Panel is only operated in a sound condition and in working order (see chapter *Servicing and maintenance*).
- the instruction manual is in good condition and complete, and always available for reference at the place of installation of the Control Panel.
- the Control Panel 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.
- none of the safety and warning notes attached to the Control Panel are removed, and all notes remain legible.

National regulations depending on the machine type

Depending on the type of machine and plant in which the Control Panel 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	<p>Do not open the housing of the Control Panel!</p> <p>For technical support contact Beckhoff Service.</p>
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Procedure in the event of a fault

In the event of faults at the Control Panel, 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 Control Panel 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 CP79xx Control Panel is designed for industrial application in machine and plant engineering. An aluminum housing contains a TFT display, touch-screen/ pad (optional), and a PC keyboard (optional). The panel is installed via the 4 mounting holes in the backplane or the mounting arm system adapter (optional).

The DVI/USB extension technology integrated in the CP79xx “Economy” DVI/USB Control Panel enables remote Panel operation at a distance of up to 50 m from the PC via a standard cable.

 <p>DANGER</p>	<p>Do not use the Control Panel in areas of explosive hazard!</p> <p>The Control Panel must not be used where there is a risk of explosion.</p>
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Connections

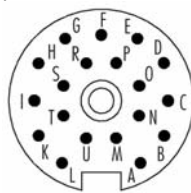
Control Panel CP79xx connections



Pin assignment

X 101
DVI-Extended input

SG 19-pole M16 built-in-PCB-sold. IP67
BINDER (BINDER 09-0463-90-19
prod. 723 M16X0,75)

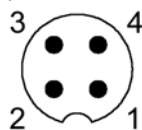


view solder connection sided

Pin	Signal	Pin	Signal
A	Shield	L	IN_TMDS_C+
B	IN_TMDS_2+	M	GND
C	GND	N	IN_TMDS_2-
D	IN_TMDS_1-	O	IN_TMDS_1+
E	GND	P	GND
F	IN_TMDS_0-	R	IN_TMDS_0+
G	GND	S	HPD_DVI
H	+ 5V_DVI	T	GND
I	GND	U	IN_TMDS_C-
K	I2C-CLK		

X 102
Power supply

SG 4-pole M12 built-in-PCB-sold. IP67
BINDER (BINDER 09-3431-90-04
prod. 763 M12X1)

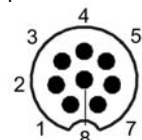


view solder connection sided

Pin	Signal	Pin	Signal
1	+ 24V	3	GND
2	NC	4	NC

X 103
USB-Extended input

SG 8-pole M9 built-in-PCB-sold. IP67
BINDER (BINDER 09-0427-30-08
prod. 712 M9X0,5)



view solder connection sided

Pin	Signal	Pin	Signal
1	+5V USB	5	RB TRN IN DM
2	BR RCV- N DM	6	RB TRN IN DP
3	BR RCV IN DP	7	+15V USB E
4	GND USB	8	GND USB

Connector description

DVI-Extended (Digital Visual Interface-Extended)

DVI-E input

The DVI-E connection (**X101**) is used for transferring the video signal from the Industrial PC to the Control Panel.

The graphics signal is transferred directly via a DVI cable over a distance of 50 m max. Such a cable length leads to strong distortion of the graphics signal on arrival at the Control Panel. The CP79xx "Economy" Control Panel features a signal processor that restores the DVI signal. The PC requires a conventional DVI output.



Note

The transmission rate of the DDC file has to be limited

At large distance between PC and Control Panel, the transmission rate of the DDC file has to be limited.

See also chapter [Setting the transmission rate](#).

Power supply

Power supply

The power supply for the Control Panel is established via the 4-pole M12 socket (**X102**).

USB-Extended interface

USB-Extended input

The Control Panel is connected with the *CU8800 USB to USB extended converter box* via the USB-Extended input (**X103**).

In order to realize a distance of 50 m without hubs, with USB extended the USB signal is converted so that it can be transferred via 50 m CAT5 cables commonly used for Ethernet wiring. In the Control Panel the signal is converted back to USB.

Protective Earthing

Protective Earthing

The low resistance protective earthing connection is established via the ground bolt, which is located near the power supply connector.



Control Panel Connecting Kits

Cable Set	
C9900-K434	Connecting kit 3 m for CP79xx including: 3 m DVI cable, 3 m CAT5 cable for USB-E, USB to USB-E converter CU8800 for mounting rail installation close to the PC and 1 m USB cable to connect the USB to USB-E converter to the PC
C9900-K435	Connecting kit 5 m for CP79xx including: 5 m DVI cable, 5 m CAT5 cable for USB-E, USB to USB-E converter CU8800 for mounting rail installation close to the PC and 1 m USB cable to connect the USB to USB-E converter to the PC
C9900-K436	Connecting kit 10 m for CP79xx including: 10 m DVI cable, 10 m CAT5 cable for USB-E, USB to USB-E converter CU8800 for mounting rail installation close to the PC and 1 m USB cable to connect the USB to USB-E converter to the PC
C9900-K437	Connecting kit 20 m for CP79xx including: 20 m DVI cable, 20 m CAT5 cable for USB-E, USB to USB-E converter CU8800 for mounting rail installation close to the PC and 1 m USB cable to connect the USB to USB-E converter to the PC
C9900-K438	Connecting kit 30 m for CP79xx including: 30 m DVI cable, 30 m CAT5 cable for USB-E, USB to USB-E converter CU8800 for mounting rail installation close to the PC and 1 m USB cable to connect the USB to USB-E converter to the PC
C9900-K439	Connecting kit 40 m for CP79xx including: 40 m DVI cable, 40 m CAT5 cable for USB-E, USB to USB-E converter CU8800 for mounting rail installation close to the PC and 1 m USB cable to connect the USB to USB-E converter to the PC
C9900-K440	Connecting kit 50 m for CP79xx including: 50 m DVI cable, 50 m CAT5 cable for USB-E, USB to USB-E converter CU8800 for mounting rail installation close to the PC and 1 m USB cable to connect the USB to USB-E converter to the PC

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:

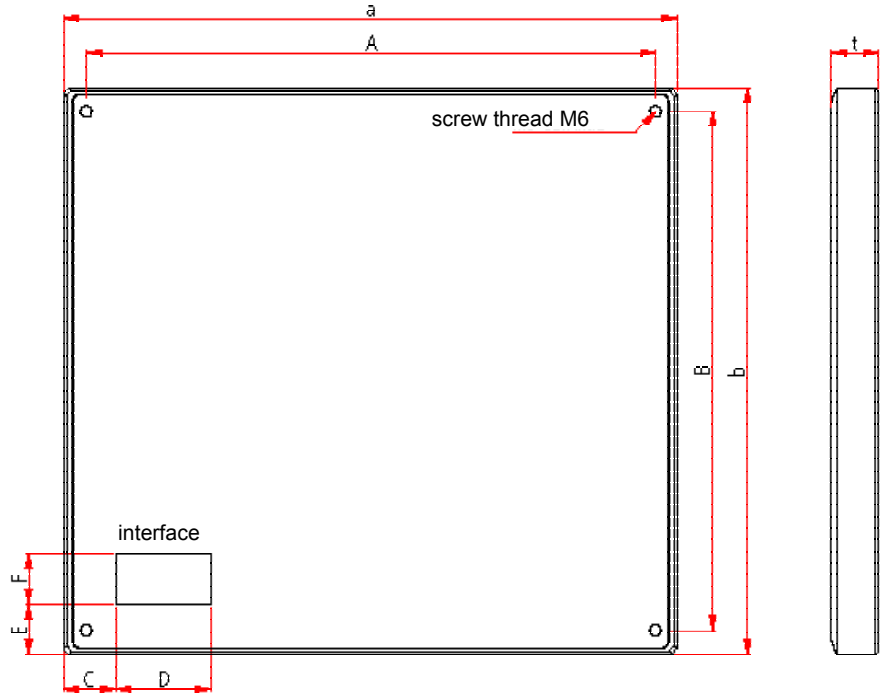
1. Remove packaging.
2. Do not discard the original packaging. Keep it for future relocation.
3. Check the delivery for completeness by comparing it with your order.
4. Please keep the associated paperwork. It contains important information for handling the unit.
5. Check the contents for visible shipping damage.
6. If you notice any shipping damage or inconsistencies between the contents and your order, you should notify Beckhoff Service.

Assembly

Assembly dimensions

All dimensions are in mm.

CP79xx Control Panel



Without keys

Dimensions		a	b	t	A	B	C	D	E	F
CP7909	6.5" Display	267.9	173	38	241.9	149	160	50	50	50
CP7901	12" Display	353.8	326.3	27.5	327.6	303.7	33	50	12	50
CP7902	15" Display	426	395	28.5	399.8	367.4	35	50	18	50
CP7903	19" Display	504	455	45	474	430	30	50	20	50
CP7904	24" Display	610	450	53	580	410	47	65	12.5	45

Function keys

Dimensions		a	b	t	A	B	C	D	E	F
CP7919	6.5" Display	267.9	213	38	241.9	189	60	50	50	50
CP7911	12" Display	353.8	326.3	27.5	327.6	303.7	33	50	12	50
CP7912	15" Display	426	395	28.5	399.8	367.4	35	50	18	50
CP7913	19" Display	504	455	45	474	430	30	50	20	50



Numeric keypad

Dimensions		a	b	t	A	B	C	D	E	F
CP7929	6.5" Display	336	213	38	310	189	30	50	15	50
CP7921-0000/1	12" Display	406	308.3	27.5	374.8	280.7	34	50	14	50
CP7921-0002	12" Display	439.8	308.3	27.5	408.6	280.7	66	50	14	50
CP7922	15" Display	515	370.2	28.5	483.8	342.6	36	50	30	50
CP7923	19" Display	563	426	45	533	401	30	50	20	50

Alphanumeric keypad

Dimensions		a	b	t	A	B	C	D	E	F
CP7931-0000/1	12" Display	406	370.2	27.5	379.8	342.6	35	50	28	50
CP7931-0002	12" Display	426	370.2	27.5	399.8	342.6	44	50	74	50
CP7932	15" Display	483	410.2	28.5	458.8	387.6	32	50	78	50
CP7933	19" Display	504	535	45	474	510	30	50	100	50

Connecting the Control Panel

 <p>DANGER</p>	<p>Risk of explosion!</p> <p>The Control Panel must never be connected or disconnected in an area that is subject to explosion hazard! Risk of explosion!</p>
 <p>Attention</p>	<p>Power supply plug</p> <p>The mains plug must be disconnected!</p> <p>Please read the documentation for the external devices prior to connecting them.</p> <p>During thunderstorms, plug connector must neither be inserted nor removed.</p> <p>When disconnecting a plug connector, always handle it at the plug. Do not pull the cable!</p>

Connecting cables

The connections are located at the rear of the Control Panel and are documented in the [Product Description](#) section.

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

- Switch off the Industrial PC.
- Disconnect all the devices that are to be connected from the power supply.
- Connect all cables at the Control Panel 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.

Protective Earthing

Protective Earthing

The low resistance protective earthing connection is established via the ground bolt, which is located near the power supply connector.



Operating Instructions

Please also refer to chapter [Foreword](#).

Functional description


Switch on

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


Shutting down and switching off


When the plant is switched off, or when it is disconnected from its power supply, the Control Panel 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 storage medium by switching off while software is running.

 Attention	<p>First shut down, then switch off the PC</p> <p>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.</p>
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Operation

 Note	<p>The Control Panel's membrane keypad may only be actuated by fingertips</p> <p>Attempts to actuate it with other objects can easily result in the destruction of the device. Neither may the membrane keypad be operated with a touch screen pen.</p>
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 Note	<p>The touch screen may only be actuated by fingertips or with the touch screen pen</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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Setting the transmission rate

Setting the transmission rate

At large distance between PC and Control Panel, the transmission rate of the DDC file has to be limited. The DDC file is transmitted from the Control Panel to the PC in order to transfer the display information like timing and resolution.

Video BIOS

The video bios of the graphic card or, using the on-board graphic, the video bios of the motherboard contains the definition of the transmission rate for the DDC file. This value has to be 50 kHz or less. Otherwise the screen is not displayed or not until windows is started.

Windows Graphic Driver

Windows graphic drivers also include a value for the transmission rate of the DDC file.
 If Windows is running and no image is displayed, then use a graphic driver with a value of 50 kHz or less for DDC file transmission.

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.



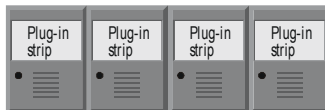
The *Esc* key has the effect of closing dialog windows and of interrupting some of the computer's working operations.



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.

Servicing and maintenance

Please also refer to chapter [Foreword](#).

Cleaning the Control Panel



Attention

Switch off the Industrial PC

Switch off the Industrial PC and all devices connected to it, so that keys cannot be unintentionally actuated.

The front of the Control Panel 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.

Servicing

The Control Panel requires no maintenance.



Note

Do not open the housing of the Control Panel!

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

Emergency procedures

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

Shutting down

Disposal

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

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

Dismantle the Control Panel

Observe national electronics scrap regulations

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
The Control Panel shows no function when the Industrial PC has been started	No power supply to the Industrial PC Cable not connected	Check power supply cable 1. Correctly connect cable 2. 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 Control Panel	Call the manufacturer of the machine or the software
No screen	Transmission rate is too high when using DVI cables longer than 20 m	Limit transmission rate for DDC file to 50 kHz
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 Control Panel functions only partially or only part of the time, e.g. no or dark picture	Defective components in the Control Panel	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
Eiserstraße 5
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

Technical data

<i>Dimensions</i>	Dimensions (W x H x D): See section Assembly dimensions
<i>Operation in areas that are subject to explosion hazard</i>	The Control Panel must not be used where there is a risk of explosion.
<i>Environmental conditions</i>	The following conditions must be observed during operation: Ambient temperature: 0 to 55°C Atmospheric humidity: Maximum 95%, non-condensing
<i>Shock resistance</i>	Sinusoidal vibration: (EN 60068-2-6) 10 to 58 Hz: 0.035 mm 58 to 500 Hz: 0.5 G (~ 5 m/ s ²) Impact: (EN 60068-2-27/ 29) 5 G (~ 50 m/ s ²), duration: 30 ms
<i>Protection class</i>	Control Panel: IP65 Connector plug: IP67
<i>Power supply</i>	Supply voltage: 24 V _{DC} (20.4 – 28.8 V _{DC}) Power consumption: approx. 10 W with 6.5" display approx. 14 W with 12" display approx. 25 W with 15" display approx. 32 W with 19" display approx. 54 W with 24" display
<i>EMC compatibility</i>	Resistance to interference: according to EN 61000-6-2 Emission of interference: according to EN 61000-6-4
<i>Transport and storage</i>	The same values for atmospheric humidity and shock resistance are to be observed during transport and storage as in operation. Suitable packaging of the Control Panel 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!
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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.