Touch Panels with Capacitive Glass Touch

User manual

PHOENIX CONTACT
INSPIRING INNOVATIONS

User manual

Touch Panels with Capacitive Glass Touch

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Designation: UM EN TP 3XXXX/P

Revision: 00

Order No.: —

This user manual is valid for:

Designation	Order No.
TP 3070W/P	2403459
TP 3090W/P	2403460
TP 3120W/P	2403461
TP 3156W/P	2403462
TP 3185W/P	2403862

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1 Important Notes

1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

There are three different categories of personal injury that are indicated with a signal word.

DANGER
This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
This indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE
This symbol together with the signal word NOTE and the accompanying text alert the reader to a situation which may cause damage or malfunction to the device, hardware/ software, or surrounding property.

This symbol and the accompanying text provide the reader with additional information or refer to detailed sources of information.

1.2 Safety Notes

- Read this manual carefully before using the operating device. Keep this manual in a place where it is always accessible to all users.
- Proper transportation, handling and storage, placement and installation of this product are prerequisites for its subsequent flawless and safe operation.
- This user manual contains the most important information for the safe operation of the device.
- The user manual, in particular the safety notes, must be observed by all personnel working with the device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

1.3 Intended Use

- The device is designed for use in the industry.
- The device is state-of-the art and has been built to the latest standard safety requirements. However, dangerous situations or damage to the machine itself or other property can arise from the use of this device.
- The device fulfills the requirements of the EMC directives and harmonized European standards. Any modifications to the system can influence the EMC behavior.

NOTICE: Radio Interference
This is a class A device. This device may cause radio interference in residential areas. In this case, the user may be required to introduce appropriate countermeasures, and to bear the cost of same.

1.4 Target Group

The use of products described in this manual is oriented exclusively to:

- Qualified electricians or persons instructed by them, who are familiar with applicable standards and other regulations regarding electrical engineering and, in particular, the relevant safety concepts.
- Qualified application programmers and software engineers, who are familiar with the safety concepts of automation technology and applicable standards.

2 Installation and Commissioning

2.1 Unpacking the Device

Unpack all parts carefully and check the contents for any visible damage in transit. Also check whether the shipment matches the specifications on your delivery note.

If you notice damages in transit or discrepancies, please contact us immediately.

2.2 Mounting the Device

NOTICE: Damage
When installing the device, leave a gap of at least 30 mm (1.181") around the device to ensure sufficient air circulation.

NOTICE: Damage
When the operating device is installed horizontally, please note that additional sources of heat beneath the operating device may result in heat accumulation.
Make sure to allow sufficient heat dissipation!
Please observe the permissible temperature range specified in the technical data when operating the device.

NOTICE: Damage
In order to ensure the degree of protection specified in the technical data, observe the following points:

- A tolerance of ±0.5 mm is maintained for the mounting cutout.
- The seal lies flat against the mounting surface.
- The number of mounting brackets, given in the technical data, is used.
- The threaded pins of the mounting brackets are tightened uniformly to a maximum torque of 1 Nm.

The device can be easily and quickly mounted from the rear of the device. A panel thickness of 1 mm to 6 mm (0.039" to 0.236") is permitted for proper mounting.

1. Cut the mounting cutout in the housing for the device size to be installed.
2. Push the device through the mounting cutout from the front.

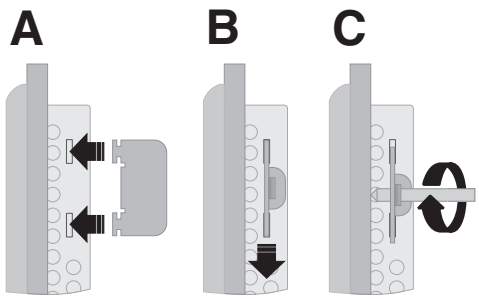

Figure 2-1 Mounting the device using a mounting bracket

3. Fix the mounting brackets in the recesses provided (A).
4. Pull the mounting brackets down until the snap into place (B).
5. Secure the device using the threaded pins (C).

2.2.1 Front Panel Dimensions

2.2.1.1 TP 3070W/P

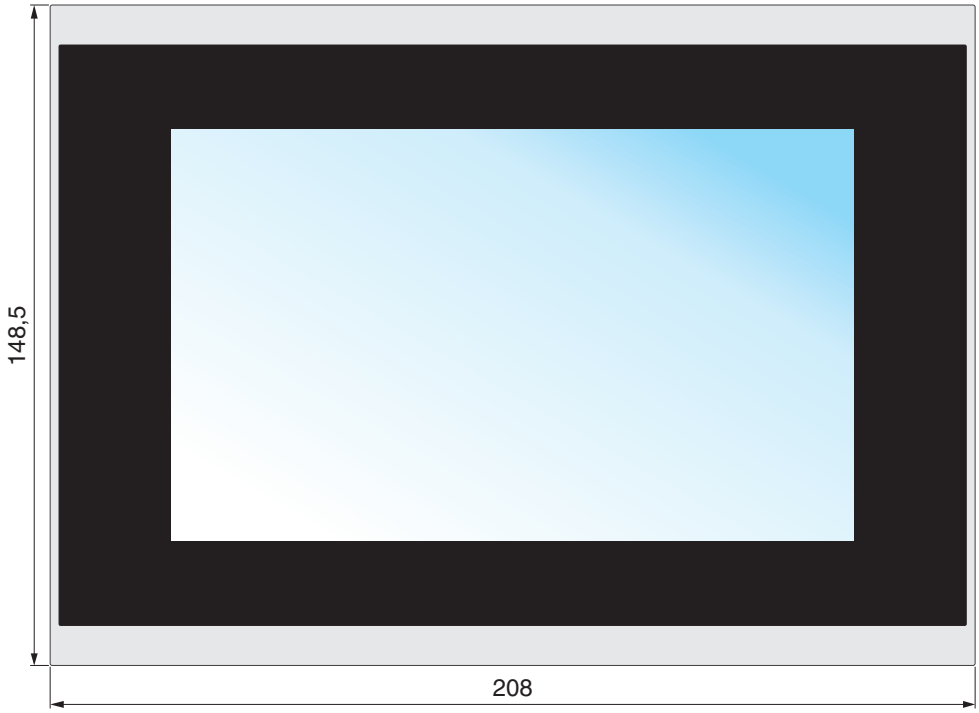

Figure 2-2 Front panel (dimensions in mm)

2.2.1.2 TP 3090W/P

Figure 2-3 Front panel (dimensions in mm)

2.2.1.3 TP 3120W/P

Figure 2-4 Front panel (dimensions in mm)

2.2.1.4 TP 3156W/P

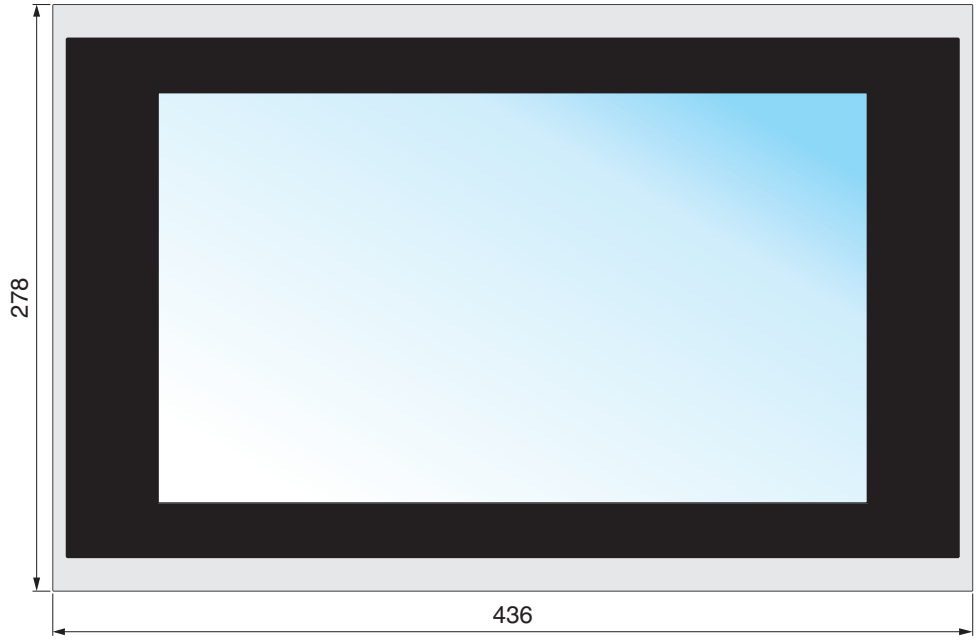

Figure 2-5 Front panel (dimensions in mm)

2.2.1.5 TP 3185W/P

Figure 2-6 Front panel (dimensions in mm)

2.2.2 Mounting Cutout

2.2.2.1 TP 3070W/P

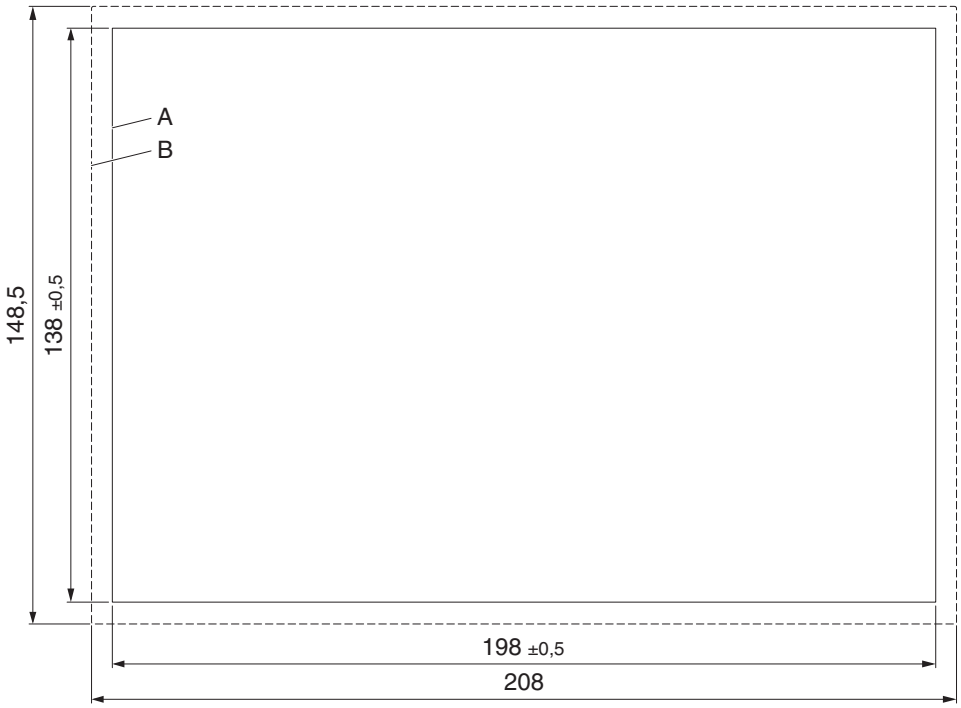

Figure 2-7 Mounting cutout (dimensions in mm)

A Mounting Cutout
B Front Panel

2.2.2.2 TP 3090W/P

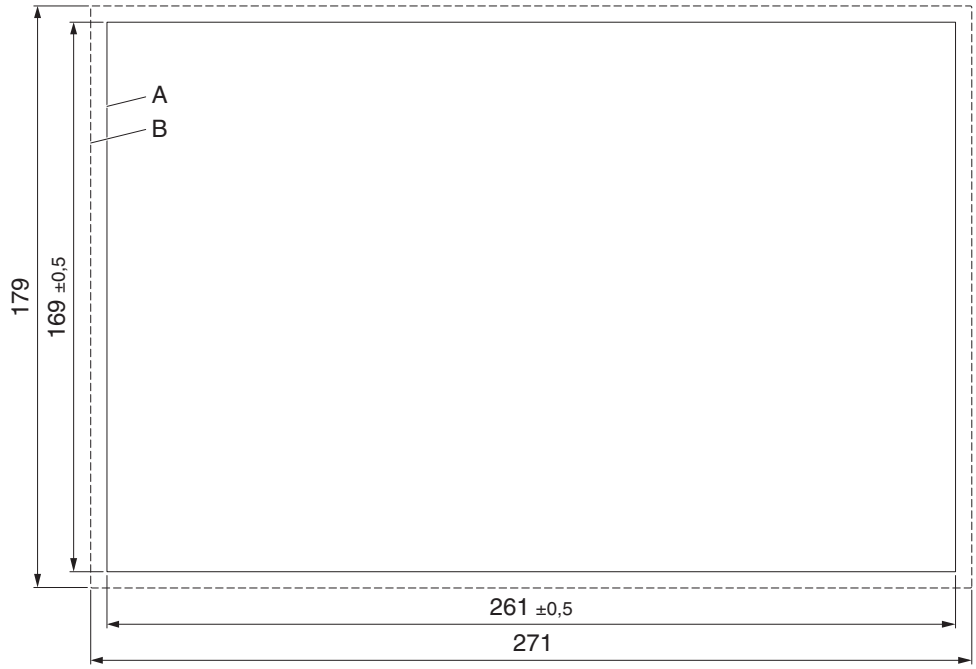

Figure 2-8 Mounting cutout (dimensions in mm)

A Mounting Cutout
B Front Panel

2.2.2.3 TP 3120W/P

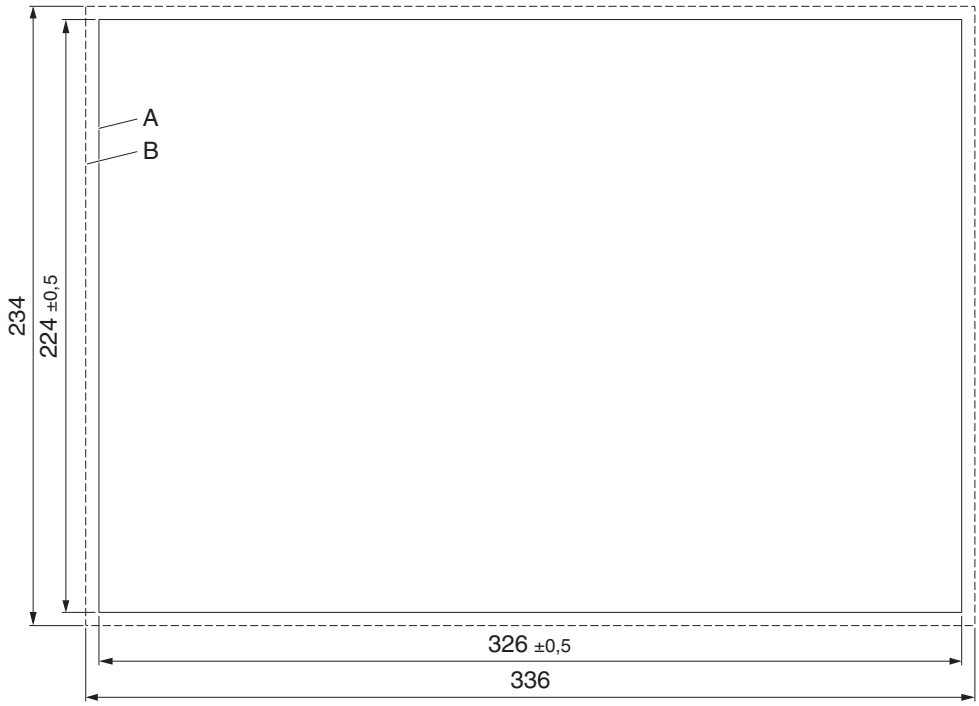

Figure 2-9 Mounting cutout (dimensions in mm)

A Mounting Cutout
B Front Panel

2.2.2.4 TP 3156W/P

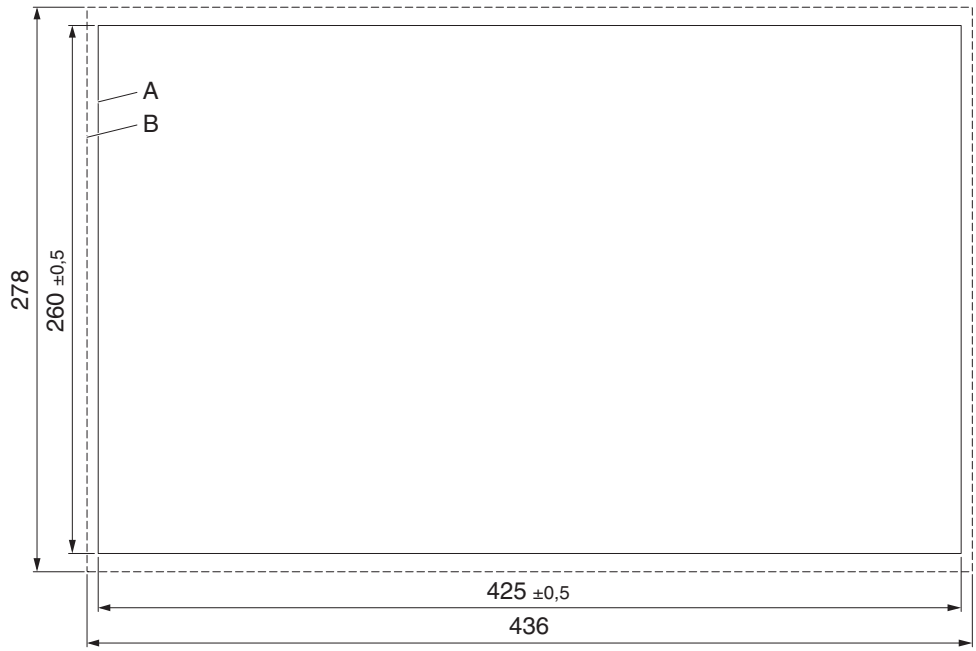

Figure 2-10 Mounting cutout (dimensions in mm)

A Mounting Cutout
B Front Panel

2.2.2.5 TP 3185W/P

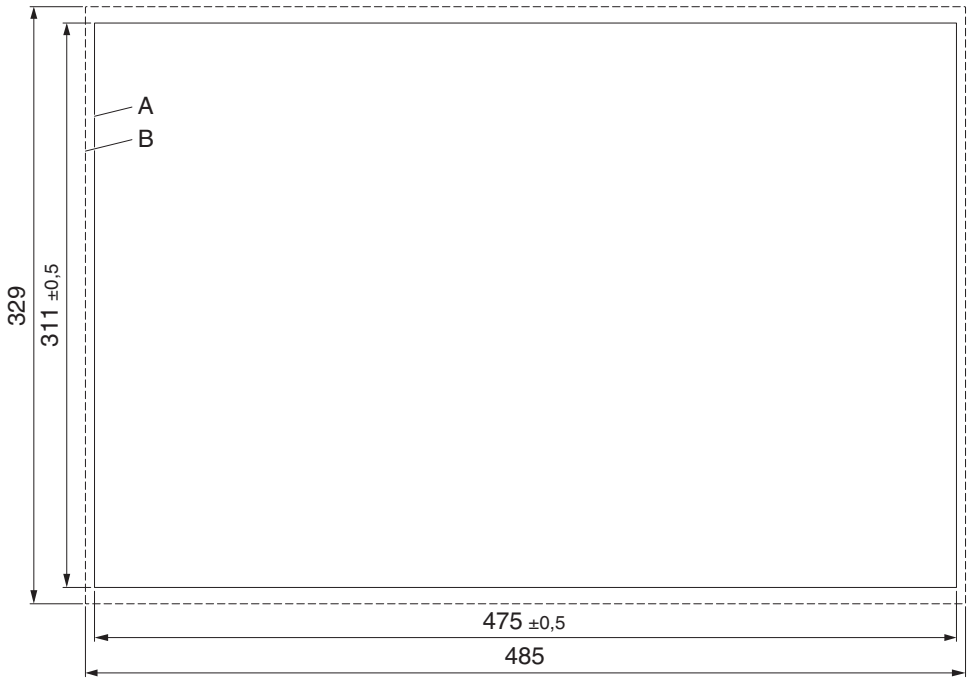

Figure 2-11 Mounting cutout (dimensions in mm)

A Mounting Cutout
B Front Panel

2.2.3 Side View, Mounting Depth

2.2.3.1 TP 3070W/P

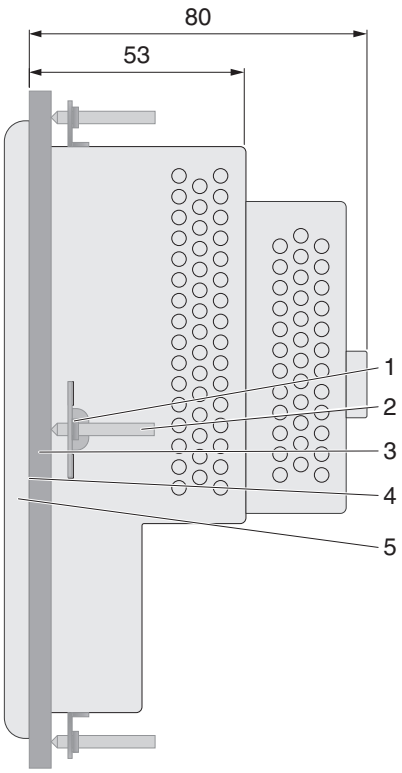

Figure 2-12 Side view, mounting depth (dimensions in mm)

1 Mounting Bracket
2 Threaded Pin
3 Mounting Surface Thickness 1 mm to 6 mm
4 Circumferential Seal
5 Front Panel

2.2.3.2 TP 3090W/P

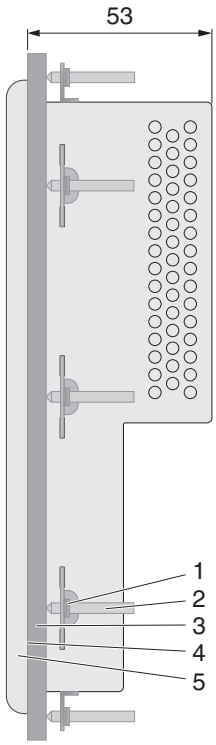

Figure 2-13 Side view, mounting depth (dimensions in mm)

1 Mounting Bracket
2 Threaded Pin
3 Mounting Surface Thickness 1 mm to 6 mm
4 Circumferential Seal
5 Front Panel

2.2.3.3 TP 3120W/P

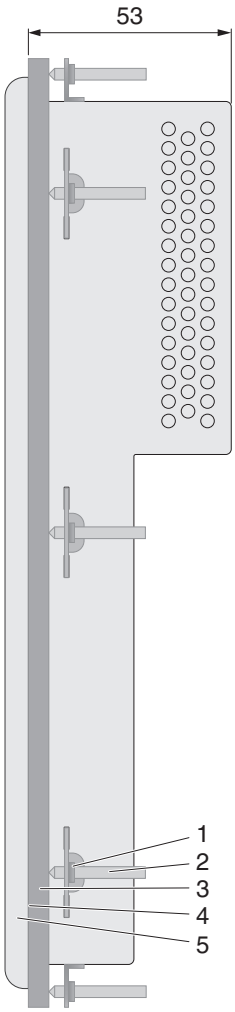

Figure 2-14 Side view, mounting depth (dimensions in mm)

1 Mounting Bracket
2 Threaded Pin
3 Mounting Surface Thickness 1 mm to 6 mm
4 Circumferential Seal
5 Front Panel

2.2.3.4 TP 3156W/P

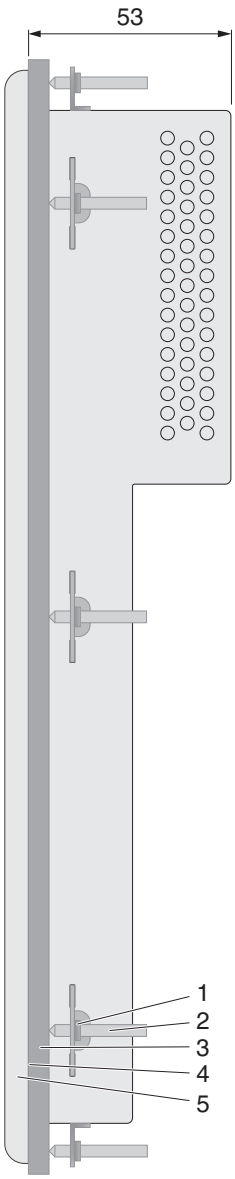

Figure 2-15 Side view, mounting depth (dimensions in mm)

1 Mounting Bracket
2 Threaded Pin
3 Mounting Surface Thickness 1 mm to 6 mm
4 Circumferential Seal
5 Front Panel

2.2.3.5 TP 3185W/P

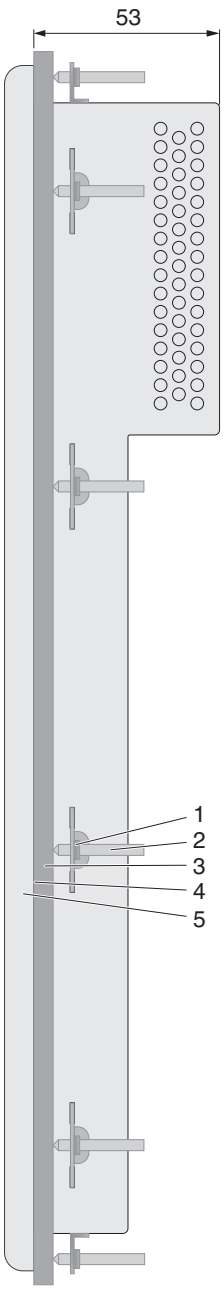

Figure 2-16 Side view, mounting depth (dimensions in mm)

1 Mounting Bracket
2 Threaded Pin
3 Mounting Surface Thickness 1 mm to 6 mm
4 Circumferential Seal
5 Front Panel

2.3 Connecting the Device

2.3.1 Supply Voltage

The supply voltage is supplied via pin strip X1. A suitable socket strip is supplied.

Refer to the technical data for the permissible supply voltage of the operating device.

The device has reverse polarity protection. In case of wrong polarity, the device will not operate.

This is a protection class I device. For safe operation, safety extra-low voltage (SELV) in accordance with DIN EN 61131 must be used for the supply voltage.

Connector in the operating device: 3 pin pin strip

Table 2-1 Pin assignment supply voltage

Pin	Designation	Function
1	⏚	Noiseless ground / functional earth ground (FE)
2	0 V	Supply voltage 0 V (GND)
3	⎓ 24 V	Supply voltage ⎓ 24 V

DANGER: Hazardous voltages
Hazardous voltages can exist inside electrical installations that can pose a danger to humans. Coming in contact with live parts may result in electric shock!

NOTICE: Damage
Cables with finely stranded copper conductors with a minimum cross-section of 0.75 mm^2 (18 AWG) and a maximum cross-section of 2.5 mm^2 (14 AWG) must be used for the supply voltage.
You must adhere to the following torques at the connector:
Screw connection of terminal blocks: 0.22 Nm (minimal) to 0.25 Nm (maximum)
Screw flange: 0.3 Nm (maximum)

Use the following procedure to connect the device to the supply voltage:

1. Strip approx. 30 mm (1.181") off the outer cable sheath and approx. 5 mm (0.197") off the wires.

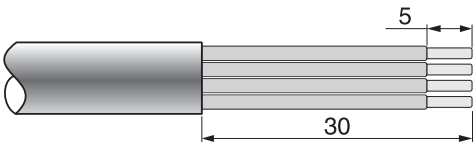

Figure 2-17 Preparing the cable

2. Fit the wires with wire end ferrules and connect the wires to the socket strip.
3. Plug the socket strip onto pin strip X1.
4. Secure the socket strip in place with a screw-type locking to prevent it from slipping out.

2.3.2 Grounding

The grounding is performed with a slip-on sleeve (noiseless ground / functional earth ground).

NOTICE: Damage
A separate copper conductor must always be provided for the grounding. The conductor must have a minimum cross-section of 1.5 mm^2 (16 AWG) and must be kept as short as possible.

1. Strip approx. 5 mm (0.197") off the wires.
2. Fit the stripped wires with a slip-on sleeve.
3. Plug the slip-on sleeve on the flat tab.

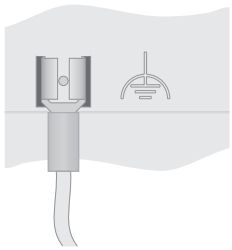

Figure 2-18 Noiseless ground

2.4 Switching On

The Windows Embedded Compact 7 operating system is installed on the operating device. Running on the operating system is the visualization runtime software Visu+.

Automatic start of programs

The file "starter.bat“ is automatically running after the boot sequence. You can use it to automatically launch programs.

In the delivery state, the file "starter.bat" is renamed to "_starter.bat" and therefore inactive.

You can use the file "starter.bat" as follows:

1. Open your FTP program or the Windows Explorer and enter the ip address of the operating device (example: ftp://149.208.160.232).
2. Rename the existing file "_starter.bat" to "starter.bat".
3. Download an existing file "starter.bat" from the root directory on your local file system or create a new file with this name.
4. Edit the file "starter.bat" with your favorite editor (for example "Notepad") and add the following content:

\FlashDrv\MyFolder\MyProgram.exe -parameter

With the appropriate paths, different memory areas of the operating device can be accessed:

Memory type	Path
USB stick	\HardDisk\
Internal	\FlashDrv\

5. Save the file.
6. Copy the file "starter.bat" with the FTP program or the Windows Explorer into the root directory of the operating device.
7. Restart the operating device.

Your application is started after the boot sequence.

The operating device allows you - by starting the cockpit during the startup phase - to make changes to the device configuration.

Cockpit at system startup

To start the cockpit, do the following:

1. Wait during the startup phase until the following dialog is displayed.

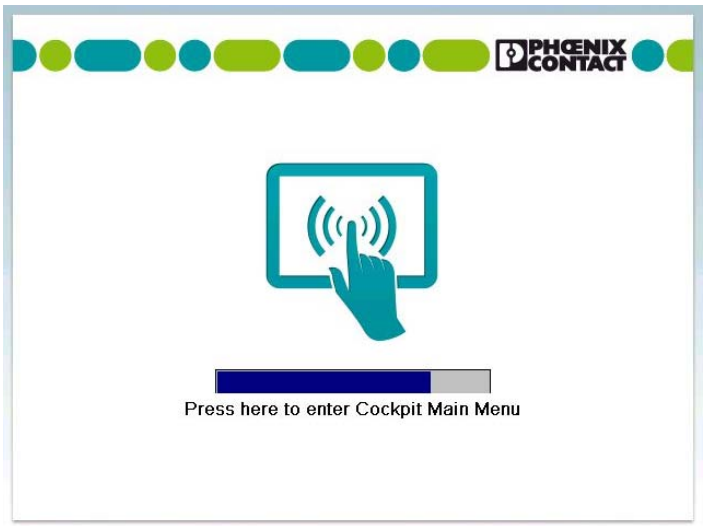

Figure 2-19 Cockpit startup phase

2. Press the button to start the cockpit before the progress bar is down.

You can customize the language of the cockpit interface with the **Regional settings** menu item.

3. Press the button **Regional Settings**.
4. Select the desired language.
5. Confirm your selection with the green check.

Using desktop icon to start cockpit

You can start the cockpit via the desktop icon at already started operating devices with active desktop:

1. Briefly press twice on the desktop icon.
2. Press the button to start the cockpit before the progress bar is down.

You can customize the language of the cockpit interface with the **Regional settings** menu item.

3. Press the button **Regional Settings**.
4. Select the desired language.
5. Confirm your selection with the green check.

2.4.1 Menu Structure

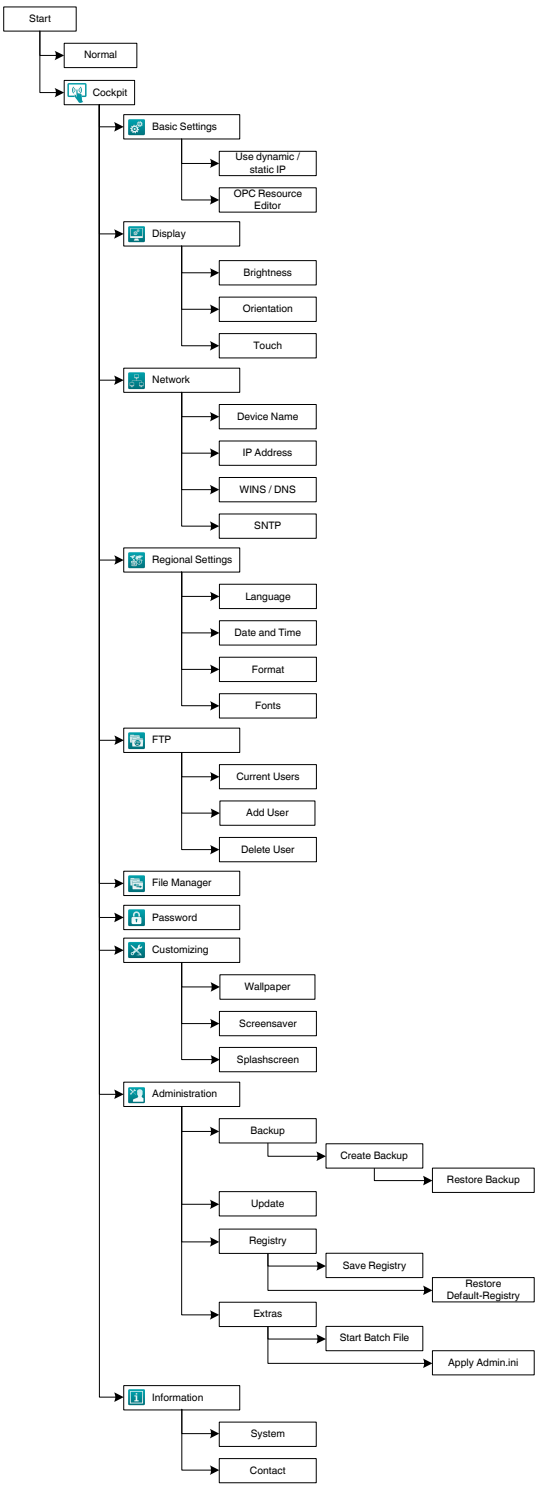

Figure 2-20 Menu structure

2.4.2 Settings and Functions

Some settings are password-protected. The default password is "+-+-".

2.4.2.1 Basic Settings

This category offers the following functions:

– Configure the dynamic / static IP address
– Start of OPC resource editor

Use Dynamic IP (DHCP)

1. Select the radio button to automatically receive the network configuration from the DHCP server.
2. Confirm your selection with the green check.

Note that the IP address is only indicated if the operating device is physically connected to the network.

Use Static IP

1. Select the radio button to assign an IP address and subnet mask to the operating device.
2. Confirm your selection with the green check.

Note that the IP address is only indicated if the operating device is physically connected to the network.

Start OPC Resource Editor

1. Press the **Start OPC Resource Editor** button.

The OPC resource editor is started.

2. Add new resources or edit the settings of an existing resource.
3. Press the **OK** button.
4. Confirm your selection with the green check.

2.4.2.2 Display

This category offers the following functions:

- Brightness and orientation of the display
- Activation of the screen saver
- Dimming and switching off the backlight
- Calibration of the touch

Brightness

1. Adjust the brightness using the slider or the buttons.
2. Confirm your selection with the green check.

Dim backlight

The brightness of the backlight is reduced after the defined time (minutes). The value "0" disables the function.

Activate screen saver

The screen saver is turned on after the defined time (minutes). The value "0" disables the function.

Turn off backlight

The brightness of the backlight is switched off after the defined time (minutes). The value "0" disables the function.

The default graphic for the screen saver can be replaced by a custom graphics in the bitmap format. To do this, use the menu item **customizing** or save the graphic in the folder „\FlashDrv\Screensaver\“ with the file name „Screensaver.bmp“ manually.

Orientation

1. Turn the orientation using the buttons to the desired position.
2. Confirm your selection with the green check.

Depending on device type, the new orientation is accepted immediately or after a reboot of the operating device.

Calibrate Touch

1. Press the **Recalibrate** button.

Depending on device type the calibration is automatically started immediately or after a reboot of the operating device.

2. Press the displayed marks to calibrate the touch screen.

2.4.2.3 Network

You can configure the network settings with the **Network** menu item.

Device Name

You can define a device name with a maximum of 15 characters. Via network, the device can be accessed with the device name instead of the ip address.

Confirm your selection with the green check.

IP Address

Use Dynamic IP (DHCP)

The network configuration is automatically obtained from the DHCP server.

Confirm your selection with the green check.

Use Static IP

Manually assign an ip address, subnet mask and gateway of the operating device.

Confirm your selection with the green check.

WINS / DNS

Optionally, enter the ip addresses for the WINS / DNS server.

Confirm your selection with the green check.

The input fields are only active when you set up a static ip address.

SNTP

Enter the ip address of an intranet or internet time server. Define an interval in milliseconds for time synchronization.

Confirm your selection with the green check.

2.4.2.4 Regional Settings

This category offers the following functions:

- Configuration of the cockpit language
- Set date and time
- Configuration of the user interface and input language
- Loading of additional fonts

Language

1. Select the desired language.
2. Confirm your selection with the green check.

Date and Time

1. Press the **Open "Date and Time"** button.

The system dialog for date and time opens.

2. Set the date and time.
3. Press the **OK** button.
4. Confirm your selection with the green check.

Format

1. Press the **Open "Regional Settings"** button.

The system dialog for the regional and language settings will open.

2. Adjust the settings for your region.
3. Press the **OK** button.
4. Confirm your selection with the green check.

Fonts

Use additional fonts

The fonts in the default or user-specific directory will be installed automatically when you start the operating device.

Depending on the number and size of fonts, the system start-up take correspondingly more time.

Don't use additional fonts

No additional fonts are installed.

Choose fonts directory

The fonts in this directory are used if the "Use additional fonts" option is active. If no directory is given the appropriate default directory (\FlashDrv\Fonts\) is used.

2.4.2.5 FTP

You can configure FTP access to the operating device via the **FTP** menu.

Current Users

The list box displays all existing FTP users.

Add User

1. Enter a **user name** and **password** for the new FTP user.
2. Press the **Add User** button.

To change the password of an existing user, follow these steps:

1. Select the user name in the list box.
2. Enter the new password.
3. Press the **Add User** button to confirm the password.

Delete User

1. Select a user name in the **Current Users** list.
2. Press the **Delete User** button to delete the selected user.

Allow anonymous

This option allows FTP access with the user name and password "Anonymous“:

1. Select the **Allow anonymous** option.

2. Confirm your selection with the green check.
3. Restart the operating device for the changes to take effect.

2.4.2.6 File Manager

Use the file manager to copy files and directories between the storage medias (USB stick <-> device memory). You can also delete files and directories.

Copy

1. Select one or multiple files / folders.

2. Press the buttons to copy the data to the USB stick or to the device memory.

Delete

1. Select one or multiple file(s) / folder(s).
2. Press the **Delete** button to delete the data from the USB stick or the device memory.

2.4.2.7 Password

The category **Password** allows you to protect certain menu items in the cockpit with a password.

Current password

1. Enter a password for the protected categories.

2. Confirm your selection with the green check.

Password protected

1. Select the menu items which shall get a password protection.
2. Confirm your selection with the green check.

2.4.2.8 Customizing

This category offers the following functions:

– Define custom wallpapers
– Specify the image for the screensaver
– Define Custom Splashscreen

Wallpaper

Browse wallpaper

You can select an individual background image as follows:

1. Press the **Browse wallpaper** button.

> The file name of the background image must contain the resolution of the appropriate operating device. Example for a operating device with the resolution 800 x 480: „800x480.bmp“.

2. Navigate within the dialog to the file in the BMP format.
3. Select the file.
4. Confirm the dialog with the green check.

Start update wallpapaer

You can apply the selected image as follows:

1. Press the **Start update wallpaper** button.

The successful update is confirmed with a dialog.

2. Confirm the dialog with the green check.

Screensaver

Browse screensaver image

You can select an individual screensaver image as follows:

1. Press the **Browse screensaver image** button.

> The file name for the screensaver image must be „Screensaver.bmp “.

2. Navigate within the dialog to the file in the BMP format.
3. Select the file.
4. Confirm the dialog with the green check.

Start update screensaver image

You can apply the selected image as follows:

1. Press the **Start update screensaver image** button.

The successful update is confirmed with a dialog.

2. Confirm the dialog with the green check.

Splashscreen

Browse Splashscreen

A user-specific startup graphic must satisfy the following criteria:

– The format is bitmap (BMP)
– The color depth is 24 bits
– The resolution of the graphic does not exceed the resolution of the operating device

The splash screen graphic is not displayed if the resolution of the image exceeds the resolution of the operating device.

You can select an individual graphic for the splashscreen as follows:

1. Press the **Browse Splashscreen** button.

A selection dialog box appears.

With the appropriate paths, different memory areas of the operating device can be accessed:

Memory type	Path
USB stick	\HardDisk\
Internal	\FlashDrv\

2. Navigate within the dialog to the folder containing the file in BMP format.
3. Select the file.
4. Confirm the dialog with the green check.

Start Update Splashscreen Image

You can confirm the selected graphic as follows:

1. Press the **Start Update Splashscreen Image** button.

The successful update is confirmed with a dialog.

2. Confirm the dialog with the green check.

2.4.2.9 Administration

This category offers the following functions:

– Backup of the data / configuration
– Update of the firmware
– Restore the default registry
– Execute a batch file / Admin.ini

Backup

Create backup

1. Insert a USB stick into the female connector of the operating device.
2. Press the **Create Backup** button.

The files are copied to the directory "Backup" on the USB stick. A dialog lets you know if there is already a directory „Backup“ with data on the USB stick. If you confirm this dialog the backup is cancelled.

The successful backup will be confirmed with a dialog.

Restore backup

NOTICE
When restoring the backup all data in the flash memory of the operating device will be deleted.

The process of backup and restore all settings is possible only with identical device types.

1. Insert a USB stick into the female connector of the operating device.
2. Press the **Restore Backup** button.

NOTICE
Do not interrupt the power supply during the process. After canceling an process, the operating device may not be operational anymore.

The backup files are copied from the directory "Backup" to the flash memory of the operating device.

The successful backup will be confirmed with a dialog.

3. Restart the operating device.

Update

Choose Update File

Avoid the start of further applications by opening the cockpit directly after a restart. Running applications can impair the update procedure.

1. Copy a valid firmware update file (FW_xxx.zip) to a USB stick.
2. Insert a USB stick into the female connector of the operating device.
3. Press the **Choose Update File** button.

A selection dialog box appears.

With the appropriate paths, different memory areas of the operating device can be accessed:

Memory type	Path
USB stick	\HardDisk\
Internal	\FlashDrv\

4. Select the firmware update file.
5. Confirm your selection with the green check.

The select firmware update file is displayed in the field **Firmware to install**.

Start update

1. Press the button **Start update** to run the firmware update with the selected file.

A dialog box appears.

2. Confirm your selection with the green check.

NOTICE
Do not interrupt the power supply during the process. After canceling an process, the operating device may not be operational anymore.

The update is carried out automatically. This might take several minutes.

After the update process, a dialog will be displayed.

3. Press the **OK** button to restart the operating device.

Registry

Save Registry

The registry is saved completely.

Restore Default Registry

Destroys the current registry and activates the default registry of the image.

Extras

Start Batch File

1. Open your FTP program or the Windows Explorer and enter the ip address of the operating device (example: ftp://149.208.160.232).
2. Download an existing file "project.bat" from the root directory on your local file system or create a new file with this name.
3. Edit the file "project.bat" with your favorite editor (e.g. "Notepad") and add the following content:

\FlashDrv\MyFolder\MyProgram.exe -parameter

With the appropriate paths, different memory areas of the operating device can be accessed:

Memory type	Path
USB stick	\HardDisk\
Internal	\FlashDrv\

4. Save the file.
5. Copy the file "project.bat" with the FTP program or the Windows Explorer into the root directory of the operating device.
6. Restart the operating device and press the cockpit button during startup.
7. Press the **Administration** button.
8. Press the **Extras** area.
9. Press the **Start Batch File** button.

Your application will be started immediately.

Apply Admin.ini

1. Edit the file "Admin.ini" in the root directory of your USB stick with your favorite editor (e.g. "Notepad").

If the "Admin.ini" does not exist, create the file.

2. Add the desired functions (see table) to the file or edit an existing entry.
3. Save the file.
4. Insert a USB stick into the female connector of the operating device.
5. Press the cockpit button during startup of the operating device.
6. Press the **Administration** button.
7. Press **Extras** to activate the area.
8. Press the **Apply Admin.ini** button.

The activated parameters are confirmed with a dialog.

9. Confirm this and the following dialogs with the **OK** button to complete the administration.
10. Remove the USB stick and restart the operating device.

Observe upper and lower case for all entries!

Possible contents of the file Admin.ini:

Start=explorer.exe	Starts the explorer
Start=MyProgram.exe	Starts the application MyProgram.exe Initial directory is windows. Use the following syntax to start an application on the usb stick: Start=\\\\HardDisk\\MyProgram.exe Use multiple entries to start several applications.
Registry=Default	Destroys the current registry and activates the default registry of the image. The change becomes effective on the next device reboot.
Lock=On	The button to start the cockpit is locked. The button is only active when a USB stick with the file Admin.ini is detected.
Lock=Off	The button to start the cockpit is activated.
Mode=Development	The shell has full functionality. The change becomes effective on the next device reboot.
Mode=Standard	The Shell is restricted: No task bar and task switch available. Desktop contains the cockpit icon only. The change becomes effective on the next device reboot.
DeviceName=MyName	Defines the device name of the operating device
;DeviceName=MyName	Comment, no impact

2.4.2.10 Information

This category offers the following informations:

– Data to the operating device
– Contact Information

System

The following informations are displayed:

– Device type
– Article number
– Serial number
– Hardware / firmware version
– Image version
– Runtime version
– OPCServer version

2.4.2.11 Default values

The following default settings are configured in the cockpit:

Table 2-2 Default values of Cockpit

Menu item	Setting	Default value	Comment
Display	Brightness	30	
	Dim backlight	0	Disabled
	Activate screensaver	0	Disabled
	Turn off backlight	0	Disabled
	Orientation	0	
Password	Current password	+-+-	
	Password protected	Administration, Display, Network, Regional Settings, Password, FTP, Customizing, File Manager	
FTP	Allow anonymous	Enabled	The user "Anonymous" with the password "Anonymous" has access to the operating device.
	Current Users	No available	
Regional settings	Language	English	
	Fonts	Do not use additional fonts	The fonts in the default or user-specific directory will not be installed automatically when you start the operating device.
	Fonts directory	\FlashDrv\Fonts	
Network	Device name	Compact	
	IP address -> Use dynamic IP (DHCP)	Enabled	
	SNTP -> Server	Ntp1.fau.de	
	SNTP -> Interval (ms)	1209600000	

2.5 Visualization

Input of charactes

A on-screen keyboard (soft input panel) for character input is displayed at the display. The size of the on-screen keyboard is loaded - depending on the display resolution - from a configuration file:

Resolution	Configuration file
< 640 x 480	\VISUPCE_INI\SmallDisplay\VisuPCE.INI
≥ 640 x 480	\VISUPCE_INI\LargeDisplay\VisuPCE.INI

The configuration can be modified as follows:

1. Open your FTP program or the Windows Explorer and enter the ip address of the operating device (example: ftp://149.208.160.232).
2. Download an existing file "VisuPCE.INI" from the appropriate directory on your local file system.
3. Edit the file "VisuPCE.INI" with your favorite editor (for example "Notepad") and adjust the values to your needs.
4. Save the file.
5. Copy the file "VisuPCE.INI" with the FTP program or Windows Explorer back in the appropriate directory of the operating device.
6. Restart the operating device.

2.5.1 System Variables

With the help of the system variables you control internal functions of the operating devices. The value of system variables you can display or influence in a process screen. Depending on the system variable you have read or write access. These variables are available if you use the communication driver "Sütron Hardware Access" in the programming software.

The available system variables of all products are displayed in the programming software. The products described in this user manual support the following system variables:

Table 2-3

GET_BACKLIGHT_STATE	
Description	Determine status of the backlight
Return value	0 = Off 1 = On

Table 2-4

GET_BRIGHTNESS_VALUE	
Description	Determine the brightness of the display
Return value	1 to 30

Table 2-5

GET_TEMPERATURE_VALUE	
Description	Determine the temperature of the operating device
Return value	Temperature in °C

Table 2-6

SET_ALARM_BRIGHTNESS_STATE	
Description	Adjust brightness of the display with alarms
Parameter	0 = Brightness is set to the original value 1 = Brightness is set to the value of the system variable SET_ALARM_BRIGHTNESS_VALUE gesetzt

Table 2-7

SET_ALARM_BRIGHTNESS_VALUE	
Description	Set the brightness of the display with alarms
Parameter	1 to 30

Table 2-8

SET_BACKLIGHT_ON_OFF	
Description	Switch backglight on / off
Parameter	0 = On 1 = Off

Table 2-9

SET_BRIGHTNESS_VALUE	
Description	Set the brightness of the display
Parameter	1 to 30

Table 2-10

SET_BUZZER_ON_OFF	
Description	Switch internal buzzer on / off
Parameter	0 = Off 1 = On

Table 2-11

SET_HORN_ON_OFF	
Description	Switch internal buzzer on / off. If there is no external buzzer, the internal buzzer is automatically used.
Parameter	0 = Off 1 = On

2.6 Identification

The operating device can be identified using the nameplate on the rear of the device.

Figure 2-21 Nameplate (example)

1 Device type, article number
2 Software version (at time of delivery)
3 MAC address
4 Voltage and power specification
5 Serial number

3 Control and Display Elements

3.1 Touchscreen

The device is equipped with a capacitive touch screen. This touch screen is different in the operation of a resistive touch screen:

– The capacitive touch screen reacts to touch and not to pressure like the resistive touch
– The operation of the capacitive touch screen is carried out exclusively with the fingertips
– Conventional touch pins and gloves are not suitable for the operation

3.2 Display

DANGER: Toxic
If the display is damaged, avoid touching, swallowing or breathing in the liquids or gases which may leak out!

DANGER: Corrosive
If the display is damaged, avoid touching, swallowing or breathing in the liquids or gases which may leak out!

Pixel failures, which can occur with TFT displays, are due to production and no complaint reason!

The operating device is equipped with different displays (see technical data) depending on variant.

4 Interfaces of the Device

4.1 Standard Interfaces

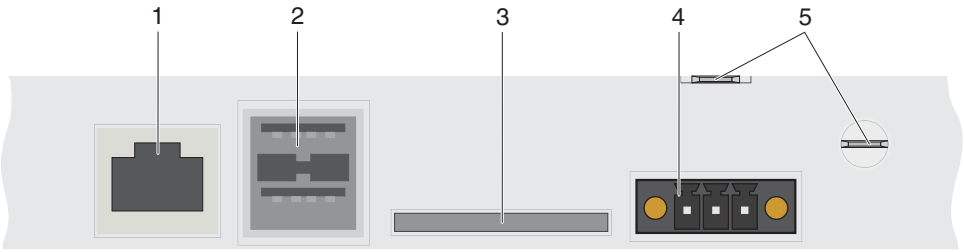

Figure 4-1 Standard interfaces

1 Female Connector X5 (Ethernet)
2 Female Connector X9, X10 (USB Host - Type A)
3 Slot for SD / SDHC Memory Card
4 Connector X1 (Supply Voltage)
5 Flat Push-on Connection for Noiseless Grounding - position varies dependent on the device type

4.1.1 Ethernet (X5)

A 10/100Base-T Ethernet interface is located at the operating device.

4.1.1.1 Pin Assignment

Connector in the operating device: RJ45 female connector.

Table 4-1 Assignment of the Ethernet interface

Pin	Designation	Function
1	Tx+	Transmitted Data, Positive Polarity
2	Tx-	Transmitted Data, Negative Polarity
3	Rx+	Received Data, Positive Polarity
4	n.c.	Not Connected
5	n.c.	Not Connected
6	Rx-	Received Data, Negative Polarity
7	n.c.	Not Connected
8	n.c.	Not Connected

4.1.1.2 Cable

NOTICE
Use a twisted pair cable of category 5 (CAT 5). The maximum cable length is 100 m (328.084 feet).

See the IEEE 802.3 standard for further information.

4.1.1.3 Diagnostics

Ethernet diagnostics LEDs are located at the operating device.

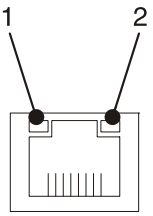

Figure 4-2 Position of the ethernet diagnostics LEDs

Table 4-2 Ethernet diagnostics LEDs

LED	Color	State	Designation	Function
1	Green	On	ACT/LNK	Connected
		Flashing		Sending / receiving ethernet data telegram
2	Yellow	On	SPD 10/100	Operation in 100 MBit/s mode
		Off		Operation in 10 MBit/s mode or disconnected

4.1.2 USB (X9, X10)

Two host interfaces are available on the operating device.

NOTICE:
Using hardware not suitable for industrial use (for example keyboard, mouse, memory card) in industrial environments may decrease safety of operation. This includes hardware intended for home and office use.

4.1.2.1 Cable

For the specification of a suitable cable, please refer to the „Universal Serial Bus Specification Rev. 2.0“.

NOTICE:
Use industrial-suited USB cables with a length of maximally 2.5 m (8.202 feet).

4.1.3 Memory Card

At the underside of the operating device you can plug in an SD card.

NOTICE:
Using hardware not suitable for industrial use (for example keyboard, mouse, memory card) in industrial environments may decrease safety of operation. This includes hardware intended for home and office use.

4.1.3.1 Inserting the memory card

When you insert the memory card, make sure the front side (side with contacts is below) of the memory card is visible. Insert the memory card until it snaps into place.

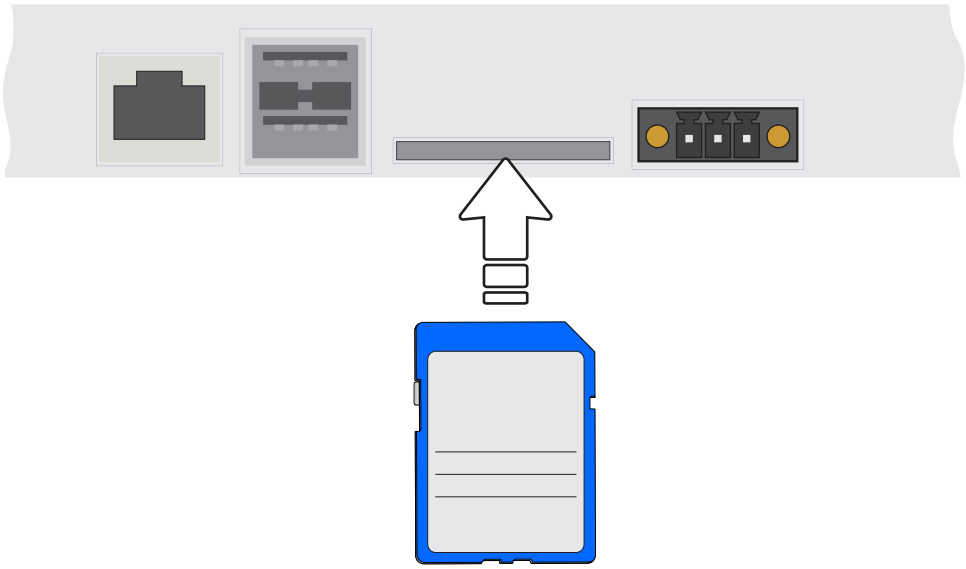

Figure 4-3 Inserting the memory card

4.1.3.2 Ejecting the memory card

To remove, push the memory card into the operating device until it clicks. The memory card bounces when released automatically out of the operating device. Now you can remove the memory card.

5 Maintenance and Servicing

5.1 Maintenance Interval

The following maintenance intervals are recommended for this operating device:

Table 5-1 Maintenance interval

Maintenance work	Interval
Changing the Battery	4 Years

5.2 Front Panel

Only use a damp cloth to remove any dirt from the front panel.

5.3 Fuse

NOTICE: Damage
The semiconductor fuse cannot be replaced!

A semiconductor fuse is used to protect the device. Once the fuse has been tripped, the device must be disconnected from the supply voltage to allow the semiconductor fuse to regenerate. At an ambient temperature of 20 °C (68 °F), the regeneration takes approximately 20 seconds. The higher the ambient temperature, the longer the regeneration takes.

5.4 Battery

The minimum battery life is 5 years, even under unfavorable operating conditions.

We recommend you change the battery approximately every 4 years as part of the regular maintenance work.

5.4.1 Changing the Battery

CAUTION: Explosive
Do not throw lithium batteries into fire, do not heat to 100 °C or higher and do not recharge.

CAUTION: Toxic
Do not open lithium batteries.

NOTICE: Damage
Batteries must only be changed by authorized and trained experts!

NOTICE: Damage
For changing the battery you may only use replacement batteries inclusive cover (Art.-No. 2401518) of Phoenix Contact.

NOTICE: Damage
Electrostatic discharge can damage electronic components. Observe the ESD protective measures!

The battery change is made possible by an appropriate outbreak at the enclosure:

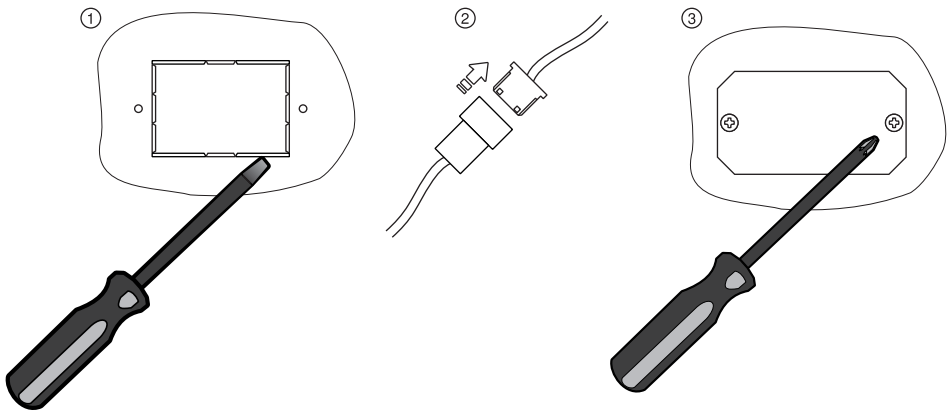

Figure 5-1 Changing the battery

1. Disconnect the operating device from the supply voltage.
2. Remove the breakable sheet metal part with a flat head screwdriver from the rear of the enclosure (1) or loosen the screws (3) using a cross head screwdriver when a cover already exists.

You may disconnect the connector from the PCB by excessive pulling on the battery cable.

3. Pull the sheet metal part with the old battery carefully through the outbreak until the connectors (2) are visible.
4. Disconnect the old battery at the connector from the operating device (2).
5. Connect the new battery with the connector at the operating device.
6. Fix the cover using a cross head screwdriver and the enclosed screws (3).

5.4.2 Battery Disposal

Do not dispose of used batteries in the household waste! Dispose of these according to the currently valid national regulations.

The manufacturer is obliged to mark batteries with this symbol before first placing into market. The symbol is extended by the chemical symbols if the following limiting values are exceeded:

More than 0.0005 mass percent mercury	Hg
More than 0.002 mass percent cadmium	Cd
More than 0.004 mass percent lead	Pb

Batteries can be given back free of charge after use at the place of purchase.

According to the §11 of the battery law, final consumers are obligedly to give old batteries back to gathering points which attached to the common take back system or manufacturer-specific take back systems.

NOTICE: Damage
To prevent short circuitry in the collection boxes, insulate the poles of each battery with insulation tape or put each single battery into a plastic bag.

6 Technical Data

6.1 General

Touch Screen	
Type	Projected capacitive
Operation	With the finger

Ethernet	
X5 Ethernet	10/100Base-T

USB	
Corresponds to the „Universal serial bus specification Rev. 2.0“	
X9, X10 Host	Min.: 1.5 Mbit/s Max.: 12 Mbit/s Max. output current 100 mA per output

Central Processing Unit	
Central processing unit	ARM Cortex™-A8
Clock frequency	1 GHz
Other features	Real-time clock, battery monitoring

Memory	
Flash	128 MByte / 1 GByte (maximum)
LPDDR	128 MByte / 512 MByte (maximum)
SRAM	Not available / 1 MByte (maximum)
SD/SDHC interface	2 GByte / 32 GByte (maximum)

Connection Method
Female and male connector strip PHOENIX CONTACT MINI COMBICON, 3 pin
RJ45 female connector
USB female connector A

Environmental Conditions	
Temperature during operation	0 °C to 50 °C (32 °F to 122 °F)

Environmental Conditions	
Temperature during storage, transport	- 25 °C to + 70 °C (-13°F to + 158°F)
Relative air humidity for operation and storage	20 % to 85 %, no condensation
Application area	Degree of pollution 2, overvoltage category III No direct solar radiation

Standards and Guidelines	
Interference immunity	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-6-2
Emitted interference	EN 61000-6-4 EN 50011 limit class value A EN 50022 limit class value A
Equipment requirements	EN 61131
Storage and transportation	EN 61131 part 2
Power supply	EN 61131 part 2
Electromagnetic compatibility	2004/108/EG
Degree of protection	EN 60529
Impact load, shocks	EN 60068 part 2-27
Sinusoidal vibrations	EN 60068 part 2-6
Corrosion protection	IEC 60068

NOTICE: Radio Interference
This is a class A device. This device may cause radio interference in residential areas. In this case, the user may be required to introduce appropriate countermeasures, and to bear the cost of same.

6.2 TP 3070W/P

Display	
Size (diagonal) in cm (inch)	17.78 (7)
Type	TFT (color)
Resolution (pixels)	800 x 480
Colors	16.77 million
Viewing angle (left / right / up / down) in °	70 / 70 / 60 / 60
Half-life backlighting	50,000 h
Brightness in cd/m^2	400
Display area (H x W) in mm (Inch)	91.4 x 152.4 (3.598 x 6.0)

Electrical Data	
Supply voltage	24 V DC (SELV / PELV in accordance with DIN EN 61131)
Residual ripple	10 % maximum
Minimum voltage	18 V
Maximum voltage	30 V
Power consumption, typical at 24 V (standard / field bus)	0.4 A / 0.6 A
Connected load (standard / field bus)	9.6 W / 14.4 W
Fuse	Semiconductor fuse, self-resetting
Protection against polarity reversal	Integrated

Front Panel and Enclosure	
Enclosure	Steel sheet, galvanized
Front panel material	Aluminium, brushed, anodized natural finish
Glass substrate	Anti glare; gloss value (at 60°): 85 (+/- 5) Impact resistance: IK9
Front panel (H x W x D) in mm (Inch)	148.5 x 208 x 6 (5.846 x 8.188 x 0.236)
Seal	Circumferential rubber seal on the rear
Mounting cutout (H x W) in mm (Inch)	138 x 198 (5.433 x 7.795)
Mounting brackets	6
Mounting depth in mm (Inch) - (standard / field bus)	About 53 / 80 (2.086 / 3.149)
Degree of protection	Front: IP65 Rear: IP20
Total weight	About 1300 g

Approvals
CE, UL, cUL

6.3 TP 3090W/P

Display	
Size (diagonal) in cm (inch)	22.86 (9)
Type	TFT (color)
Resolution (pixels)	800 x 480
Colors	16.77 million
Viewing angle (left / right / up / down) in °	85 / 85 / 85 / 85
Half-life backlighting	70.000 h
Brightness in cd/m^2	800
Display area (H x W) in mm (Inch)	118 x 197 (4.645 x 7.755)

Electrical Data	
Supply voltage	24 V DC (SELV / PELV in accordance with DIN EN 61131)
Residual ripple	10 % maximum
Minimum voltage	18 V
Maximum voltage	30 V
Power consumption, typical at 24 V (standard / field bus)	0.8 A
Connected load (standard / field bus)	19.2 W
Fuse	Semiconductor fuse, self-resetting
Protection against polarity reversal	Integrated

Front Panel and Enclosure	
Enclosure	Steel sheet, galvanized
Front panel material	Aluminium, brushed, anodized natural finish
Glass substrate	Anti glare; gloss value (at 60°): 85 (+/- 5) Impact resistance: IK9
Front panel (H x W x D) in mm (Inch)	179 x 271 x 6 (7.047 x 10.669 x 0.236)
Seal	Circumferential rubber seal on the rear
Mounting cutout (H x W) in mm (Inch)	169 x 261 (6.653 x 10.275)
Mounting brackets	8
Mounting depth in mm (Inch) - (standard / field bus)	About 53 (2.086)
Degree of protection	Front: IP65 Rear: IP20
Total weight	About 1800 g

Approvals
CE, UL, cUL

6.4 TP 3120W/P

Display	
Size (diagonal) in cm (inch)	30.73 (12.1)
Type	TFT (color)
Resolution (pixels)	1280 x 800
Colors	65535
Viewing angle (left / right / up / down) in °	88 / 88 / 88 / 88
Half-life backlighting	50,000 h
Brightness in cd/m^2	320
Display area (H x W) in mm (Inch)	163.2 x 261.1 (6.425 x 10.28)

Electrical Data	
Supply voltage	24 V DC (SELV / PELV in accordance with DIN EN 61131)
Residual ripple	10 % maximum
Minimum voltage	18 V
Maximum voltage	30 V
Power consumption, typical at 24 V (standard / field bus)	0.8 A
Connected load (standard / field bus)	19.2 W
Fuse	Semiconductor fuse, self-resetting
Protection against polarity reversal	Integrated

Front Panel and Enclosure	
Enclosure	Steel sheet, galvanized
Front panel material	Aluminium, brushed, anodized natural finish
Glass substrate	Anti glare; gloss value (at 60°): 85 (+/- 5) Impact resistance: IK9
Front panel (H x W x D) in mm (Inch)	234 x 336 x 6 (9.212 x 13.228 x 0.236)
Seal	Circumferential rubber seal on the rear
Mounting cutout (H x W) in mm (Inch)	224 x 326 (8.818 x 12.834)
Mounting brackets	12
Mounting depth in mm (Inch) - (standard / field bus)	About 53 (2.086)
Degree of protection	Front: IP65 Rear: IP20
Total weight	About 2700 g

Approvals
CE, UL, cUL

6.5 TP 3156W/P

Display	
Size (diagonal) in cm (inch)	39.6 (15.6)
Type	TFT (color)
Resolution (pixels)	1366 x 768
Colors	65535
Viewing angle (left / right / up / down) in °	80 / 80 / 80 / 80
Half-life backlighting	70.000 h
Brightness in cd/m^2	320
Display area (H x W) in mm (Inch)	194 x 344 (7.637 x 13.543)

Electrical Data	
Supply voltage	24 V DC (SELV / PELV in accordance with DIN EN 61131)
Residual ripple	10 % maximum
Minimum voltage	18 V
Maximum voltage	30 V
Power consumption, typical at 24 V (standard / field bus)	1.0 A
Connected load (standard / field bus)	24 W
Fuse	Semiconductor fuse, self-resetting
Protection against polarity reversal	Integrated

Front Panel and Enclosure	
Enclosure	Steel sheet, galvanized
Front panel material	Aluminium, brushed, anodized natural finish
Glass substrate	Anti glare; gloss value (at 60°): 85 (+/- 5) Impact resistance: IK9
Front panel (H x W x D) in mm (Inch)	278 x 436 x 6 (10.944 x 17.165 x 0.236)
Seal	Circumferential rubber seal on the rear
Mounting cutout (H x W) in mm (Inch)	260 x 425 (10.236 x 16.732)
Mounting brackets	12
Mounting depth in mm (Inch) - (standard / field bus)	About 53 (2.086)
Degree of protection	Front: IP65 Rear: IP20
Total weight	About 4000 g

Approvals
CE, UL, cUL

6.6 TP 3185W/P

Display	
Size (diagonal) in cm (inch)	47 (18.5)
Type	TFT (color)
Resolution (pixels)	1366 x 768
Colors	65535
Viewing angle (left / right / up / down) in °	85 / 85 / 80 / 80
Half-life backlighting	50,000 h
Brightness in cd/m^2	240
Display area (H x W) in mm (Inch)	230 x 410 (9.055 x 16.141)

Electrical Data	
Supply voltage	24 V DC (SELV / PELV in accordance with DIN EN 61131)
Residual ripple	10 % maximum
Minimum voltage	18 V
Maximum voltage	30 V
Power consumption, typical at 24 V (standard / field bus)	1.2 A
Connected load (standard / field bus)	28.8 W
Fuse	Semiconductor fuse, self-resetting
Protection against polarity reversal	Integrated

Front Panel and Enclosure	
Enclosure	Steel sheet, galvanized
Front panel material	Aluminium, brushed, anodized natural finish
Glass substrate	Anti glare; gloss value (at 60°): 85 (+/- 5) Impact resistance: IK9
Front panel (H x W x D) in mm (Inch)	329 x 485 x 6 (12.952 x 19.094 x 0.236)
Seal	Circumferential rubber seal on the rear
Mounting cutout (H x W) in mm (Inch)	311 x 475 (12.244 x 18.7)
Mounting brackets	12
Mounting depth in mm (Inch) - (standard / field bus)	About 53 (2.086)
Degree of protection	Front: IP65 Rear: IP20
Total weight	About 5600 g

Approvals
CE

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