



## Manual eWin 15" Panel PCD7.D6150WTC010



|          |   |      |
|----------|---|------|
| <b>0</b> | <b>Table of Contents</b>                              |      |
| 0.1      | Document Process .....                                | 3    |
| 0.2      | Trademarks .....                                      | 3    |
| 0.3      | Preface .....   | 3    |
| <b>1</b> | <b>Safety Instructions</b>                            |      |
| 1.1      | General .....   | 1-1  |
| 1.2      | Installation instructions .....                       | 1-2  |
| 1.3      | Operation .....                                       | 1-2  |
| 1.4      | Service and Maintenance .....                         | 1-2  |
| 1.5      | Removal and Disposal .....                            | 1-3  |
| 1.6      | Air in the Touchscreen Monitor .....                  | 1-3  |
| <b>2</b> | <b>Installation</b>                                   |      |
| 2.1      | Space Requirements .....                              | 2-1  |
| 2.2      | Installation Procedure .....                          | 2-2  |
| 2.2.1    | Connections to the Controller .....                   | 2-3  |
| 2.2.2    | Other Connections and Peripheral Devices .....        | 2-3  |
| <b>3</b> | <b>Replacing Hardware</b>                             |      |
| 3.1      | Replacing Fans and Filters .....                      | 3-1  |
| 3.2      | Replacing the 2.5" SATA Mass Storage .....            | 3-4  |
| 3.3      | Replacing a CompactFlash or a CFast memory card ..... | 3-6  |
| 3.4      | Replacing the Battery .....                           | 3-7  |
| <b>4</b> | <b>Technical Data</b>                                 |      |
| <b>5</b> | <b>Resistance to Chemicals</b>                        |      |
| 5.1      | Metal Casings .....                                   | 5-1  |
| 5.2      | Touch Display and Coating .....                       | 5-2  |
| 5.2.1    | Autotex F157/207 .....                                | 5-2  |
| 5.2.2    | Touch Display Surface .....                           | 5-3  |
| 5.2.3    | Autotex .....   | 5-3  |
| <b>6</b> | <b>Operator Panel Diagrams</b>                        |      |
| 6.1      | Connections .....                                     | 6-1  |
| 6.2      | Communications Connections .....                      | 6-1  |
| 6.3      | PCD7.D6150WTC010 Overview .....                       | 6-2  |
| <b>7</b> | <b>Additional Installation Instructions</b>           |      |
| 7.1      | Earthing the Operator Panel .....                     | 7-1  |
| 7.2      | Ethernet Connection in the Operator Panel .....       | 7-2  |
| 7.3      | Improved EMC Protection .....                         | 7-4  |
| 7.4      | Ambient temperature .....                             | 7-5  |
| 7.5      | Safety .....  | 7-6  |
| 7.6      | Cable and Bus RS-485 Terminals .....                  | 7-8  |
| 7.7      | Boot Sequence .....                                   | 7-8  |
| 7.8      | Calling up the BIOS .....                             | 7-9  |
| 7.9      | Reset Switch .....                                    | 7-10 |

**A Annex**

A.1 Icons .....A-1  
A.2 Contact Details .....A-2



## 0.1 Document Process

| Version | Updated    | Published  | Comments           |
|---------|------------|------------|--------------------|
| EN01    | 2014-20-02 | -          | - New Document     |
| ENG02   | 2016-03-23 | 2016-03-23 | - new phone number |
|         |            |            |                    |
|         |            |            |                    |
|         |            |            |                    |
|         |            |            |                    |
|         |            |            |                    |
|         |            |            |                    |

## 0.2 Trademarks

Saia PCD® is a registered trademark of Saia-Burgess Controls AG.

Technical changes are subject to the latest technical developments.

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## 0.3 Preface

All operator panels have been developed to meet the requirements of user interface communication. The product offers integrated functions such as text display and text control, dynamic display, time channels and alarm and recipe management.

This manual describes the installation of the operator panel.

# 1 Safety Instructions

The installer and owner and/or operator of the operator terminal must read and understand this installation manual.

1

## 1.1 General

- Read the Safety Instructions carefully.
- Check the goods immediately on delivery for any damage during transit. Inform the supplier immediately if any damage is detected.
- Do not use the operator panel in explosive atmospheres.
- The supplier accepts no liability for equipment that has been modified, changed or adapted.
- The only replacement parts and accessories permitted are those manufactured in accordance with the supplier's specifications.
- Read the Instructions for Installation and Use carefully before installing, using or repairing the operator panel.
- Fluids, metal filings or pieces of wire must not be allowed to fall into the openings of the operator panel under any circumstances, as this could cause fire or electric shocks.
- The operator panel may only be used by qualified staff.
- If the operator panel is located in an environment where the temperature is either lower or higher than the values recommended in this manual, the liquid crystals in the display may freeze or become isotropic (liquid).
- The LCD contains a liquid which is a strong irritant. Rinse any areas of skin that come into contact with this liquid in plenty of water. If the substance gets into your eyes, keep your eyes open, rinse thoroughly with water and consult a doctor.
- The illustrations in this manual are intended to provide explanations. As a specific installation is influenced by numerous factors, the supplier cannot guarantee that actual practice will match the illustrations.
- Nor can the supplier guarantee that the operator panel is suitable for your particular application. No form of liability can be accepted for your product design, installation or operation.
- You are recommended to switch the operator terminal off and restart it at least once before any components/cards are installed or before the operator terminal is connected to external devices such as, e.g., serial devices.

## 1.2 Installation instructions

- The operator panel is designed for installation on a fixed site on a flat surface, and subject to the following prerequisites:
  - There is no substantial risk of explosion.
  - There are no strong magnetic fields.
  - There is no direct exposure to sunlight.
  - No large or sudden variations in temperature will occur.
- Install the product as described in the attached Installation Instructions.
- Earth the product as described in the attached Installation Instructions.
- The operator panel should only be installed by qualified staff.
- High voltage, signal and power-supply cables must be kept separate from each other.
- Ensure that the voltage and polarity of the power source are correct before connecting the product to the power supply.
- The peripheral equipment must be suitable for the installation location and the intended purpose.

## 1.3 Operation

- Keep the operator panel clean.
- The emergency switch and other safety functions must not be controlled from the operator panel.
- Do not use excessive force and do not use any pointed or sharp items when operating the keys, display, etc.

## 1.4 Service and Maintenance

- Repairs may only be carried out by specially trained expert personnel.
- Guarantee rights are defined for each specific contract.
- Shut off the power supply to the equipment before carrying out any cleaning or maintenance work.
- Clean the display and the surrounding front cover with a soft cloth and a mild cleaning agent.
- A battery installed the wrong way round may create a risk of explosion. Only use batteries that have been recommended by the supplier.

## 1.5 Removal and Disposal

- Full or partial recycling of the operator panel must be carried out in accordance with the applicable regulations in force.
- Bear in mind that the following components contain substances that may endanger health and the environment: Lithium battery, electrolytic condensers and screen.

1

## 1.6 Air in the Touchscreen Monitor

- The layered construction of the touchscreen monitor contains air, and air bubbles may occasionally be visible. This purely aesthetic display will have no effect whatsoever on the correct functioning of the operator panel. This optical effect may occur under certain combinations of environmental factors such as temperature, humidity and atmospheric pressure.



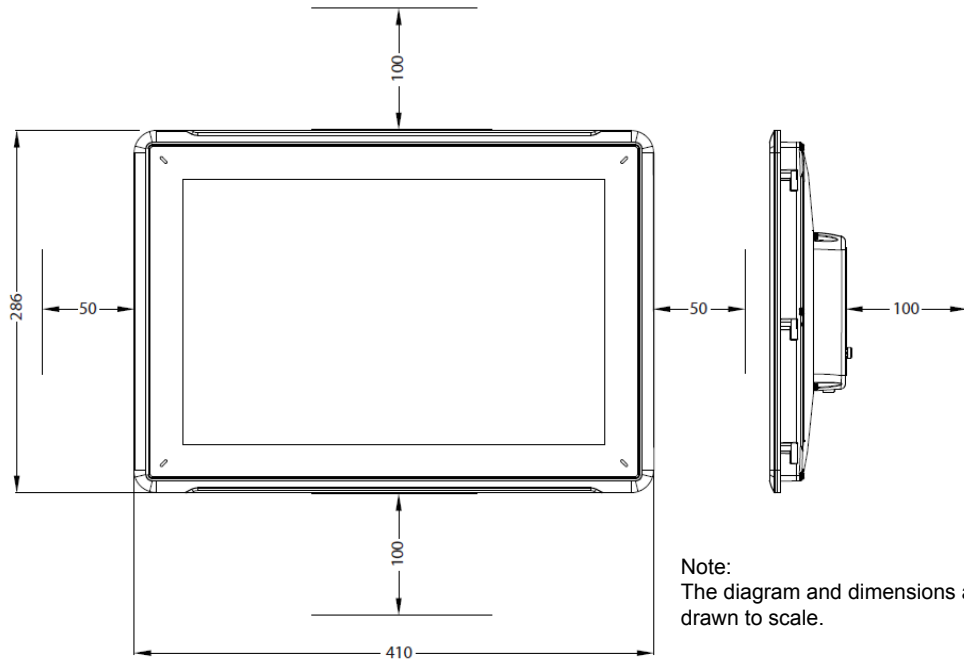
## 2 Installation

### 2.1 Space Requirements

- Maximum thickness of the installation plate: 8 mm
- Space required in millimetres for installation of the operator panel:

2

#### PCD7.D6150WTC010



Note:  
The diagram and dimensions are not drawn to scale.



Warning: The openings in the casing help with air circulation and must not be covered.

## 2.2 Installation Procedure

The following is required:

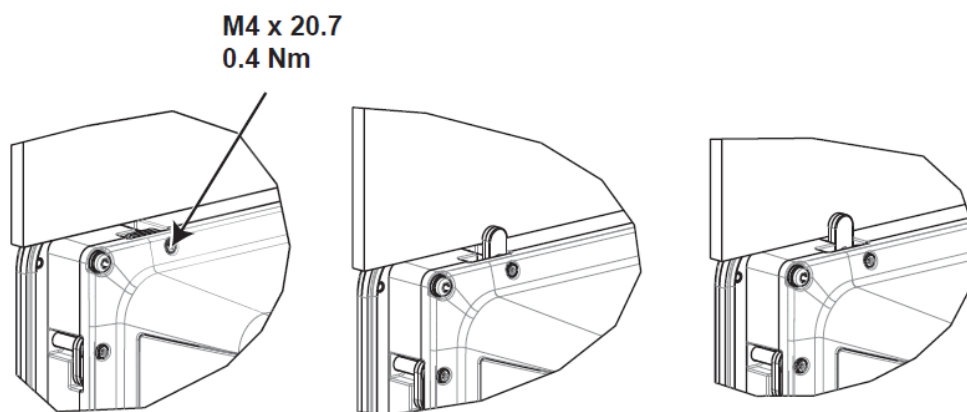
- A Torx TX7 screwdriver

1. Unpack the components supplied and check that they are all present.  
Inform the supplier of any damage that has occurred.



Note: Place the operator panel on a stable surface during installation.  
The operator panel may be damaged if it is dropped.

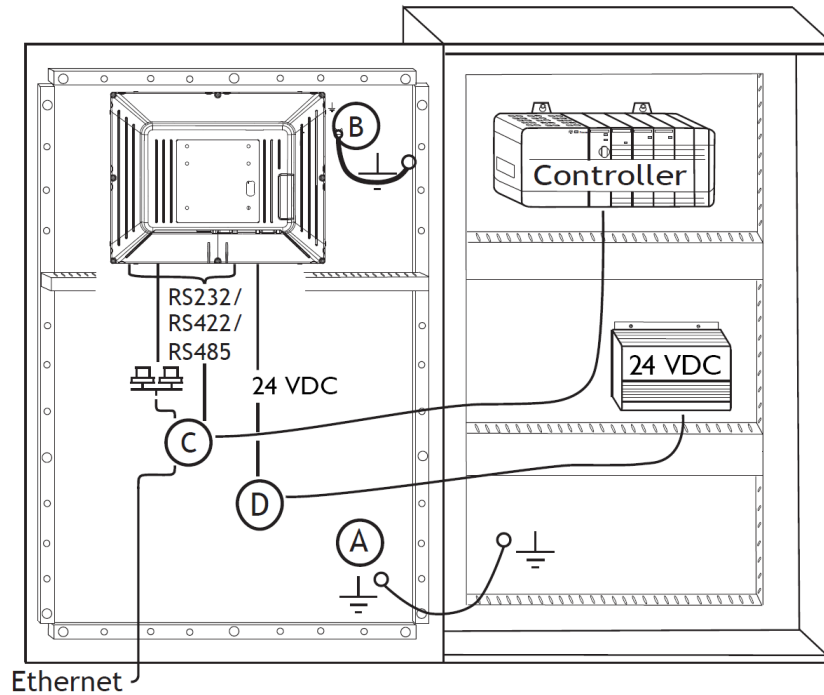
2. Use the cut-out dimensions in the overview drawing in the operator panel section diagrams and in the technical data sheet to cut the correct size of opening in the cabinet.
3. Mount the operator panel in its installed position using M4 Torx screws and fix the integrated clamps tightly against the operator panel.



4. Connect the cables in the sequence indicated (see drawing and steps in sequence below).

Warning:

- Ensure that the operator panel and controls share the same electrical earth (reference potential) to avoid communication errors.
- The operator panel must be at ambient temperature before start-up. If there is a risk of condensation forming, make sure the operator panel is dry before connecting to the mains power.
- Check that the voltage and polarity of the power supply are correct.
- Use shielded communication cables only.
- High-voltage cables must be kept separate from the signal and supply circuits.



2

- Connect cable A.
- Connect cable B. To do this, use an M5 screw and an earth conductor (as short as possible) with a minimum cross section of 2.5 mm<sup>2</sup>.
- Connect cable C.
- Connect cable D. The recommended cable cross section is 1.5 mm<sup>2</sup>.

5. Carefully remove the plastic film from the operator panel display to avoid damage from static electricity.

### 2.2.1 Connections to the Controller

You can find more information about the cables connecting the operator panel and the controller(s) in the help file for the relevant driver.

### 2.2.2 Other Connections and Peripheral Devices

Cables, peripheral equipment and accessories must be designed to suit the application and the existing environmental conditions. Your supplier can provide you with more information and recommendations.

## 3 Replacing Hardware

This section provides information about replacing hardware elements of the operator panel. When doing this, only use components and materials included in the latest version of the parts list.

### 3.1 Replacing Fans and Filters

3

The following is required:

- A new fan
- A Torx-TX10 and a TX20 screwdriver

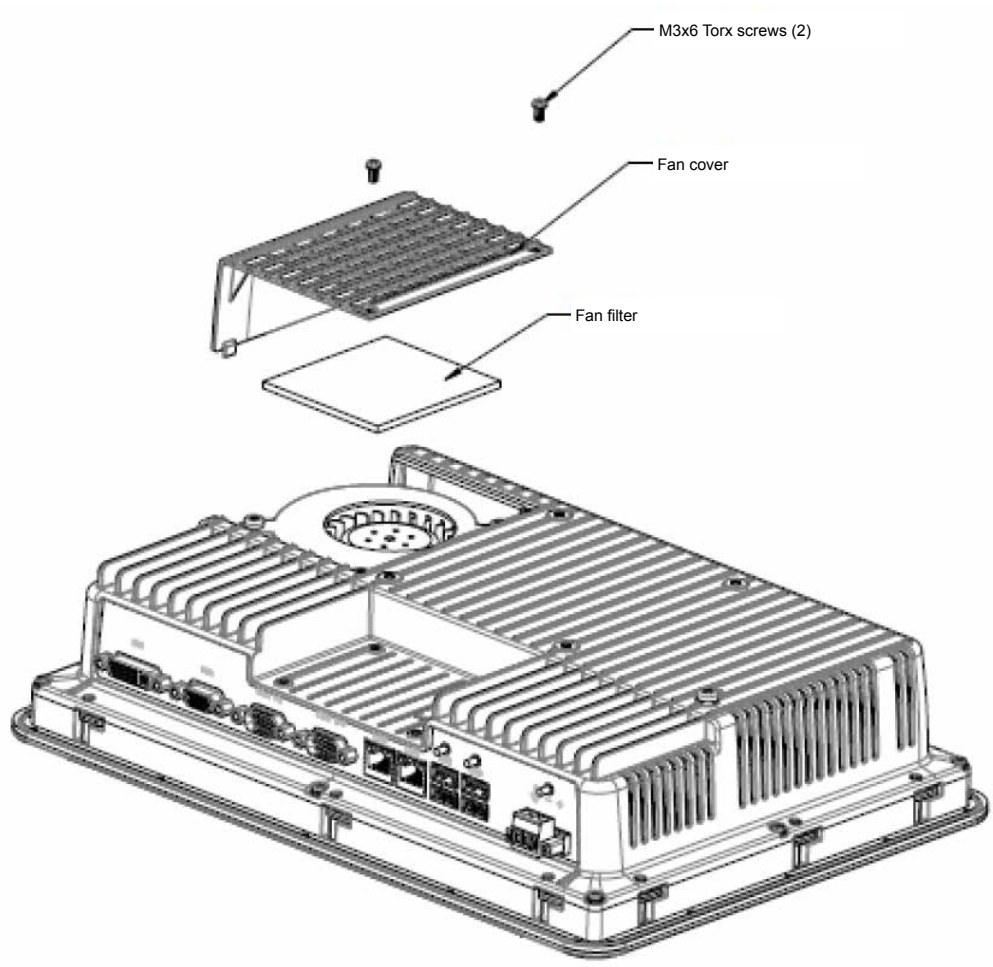


Note: Take the necessary ESD prevention measures.

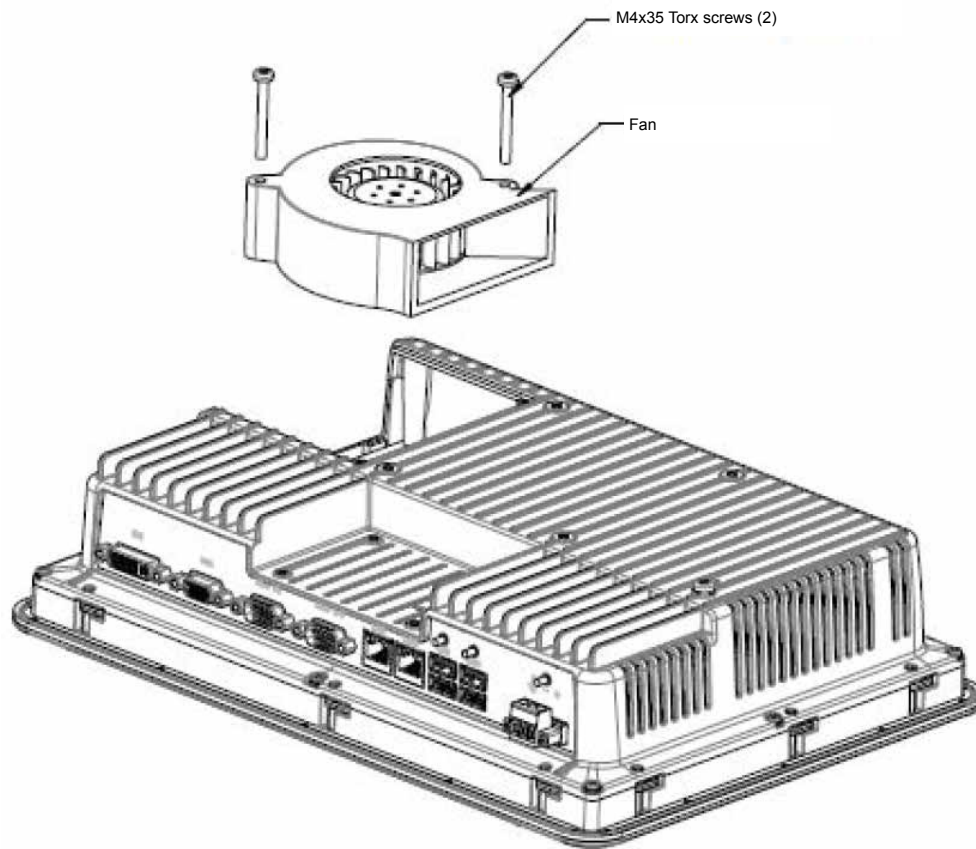
Proceed as follows when changing fans and fan filters.

1. Switch off the operator panel.
2. Unscrew the two M3x6 Torx screws and remove the fan cover.

3. Remove the fan filter.



4. Unscrew the two M4x35 Torx screws and remove the fan.



3

5. Replace the fan and filter in the reverse sequence. Tighten the fan screws to a maximum torque of 0.4 Nm.

## 3.2 Replacing the 2.5" SATA Mass Storage

The following is required:

- A new 2.5" SATA mass storage device
- A Torx TX10 screwdriver



Note: Take the necessary ESD prevention measures.

3

When changing the 2.5" SATA mass storage device, proceed as follows:

1. Switch off the operator panel.
2. Remove the eight M3x8 Torx screws from the rear panel and remove the front frame.



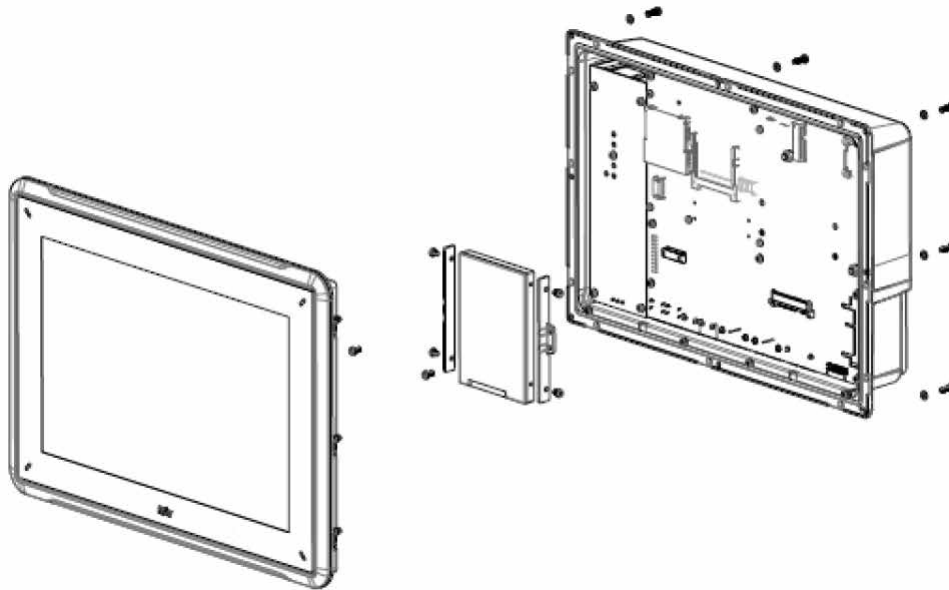
Warning: When dismantling, it is important to pay attention to the cable connecting the front and rear parts. When pulling the cable out, please ensure that the cable is returned to the correct position when reassembling.



Note: Electronic components may only be replaced by experienced trained technicians. Incorrect handling of electrical components or a wrong connection of a cable may cause the equipment to be destroyed.

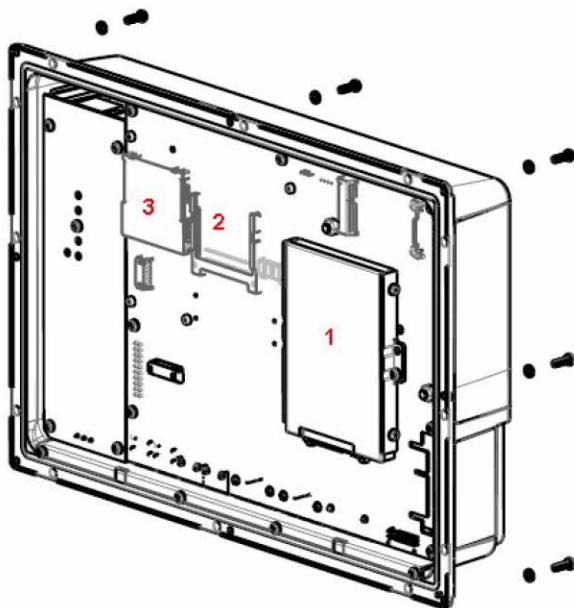
3. Unscrew the four M3x4 Torx screws from the two hard disk mountings. Remove the two hard disk mountings.
4. Unscrew the two M3x6 Torx screws that are holding the CPU boards in place.

5. Detach the hard disk from the hard disk connection on the CPU board.



3

6. Repeat the steps in reverse order with the new hard disk.



1. 2.5-inch SATA mass storage device
2. Compact flash-card slot
3. CFast card slot



### 3.3 Replacing a CompactFlash or a CFast memory card

The following is required:

- A new CompactFlash or CFast memory card
- A TX10 Torx screwdriver

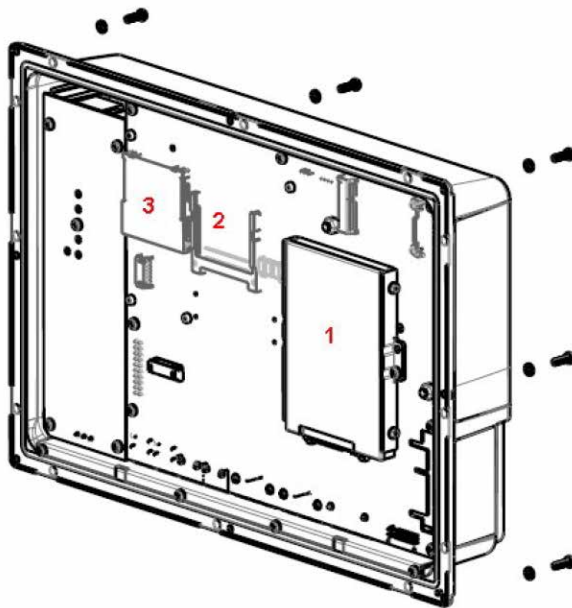


Note: Take the necessary ESD prevention measures.

3

Replace a memory card as possible:

1. Switch off the operator panel.
2. Follow the instructions in the Chapter “Replacing the 2.5" SATA mass storage device” to remove the front frame unit.
3. Install the new memory card in the slot provided (see illustration below).



1. 2.5-inch SATA mass storage device
2. Compact flash-card slot
3. CFast card slot

4. Repeat the steps in reverse order.

### 3.4 Replacing the Battery

The following is required:

- A new battery of type BR2032 (or CR2032).
- A Torx screwdriver

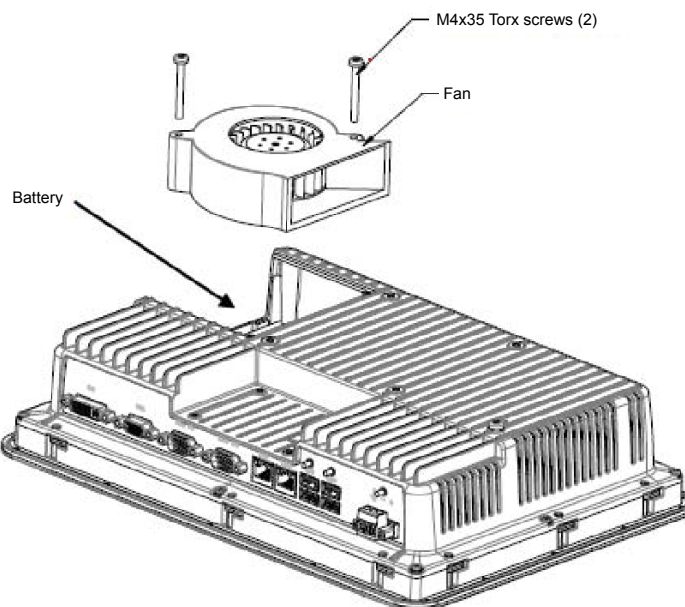


Note: Take the necessary ESD prevention measures.

3

This is how you replace the battery:

1. Switch off the operator panel.
2. Follow the instructions in the chapter “Replacing fans and filters” to remove the fan and access the battery.
3. Replace the battery.
4. Repeat the steps in reverse order.



## 4 Technical Data

| Parameters  | PCD7.D6150WTC010  |
|---|---|
| Front cover, W×H×D                                | 410 × 286 × 83 mm   |
| Cut-out dimensions, W×H                           | 394 × 270 mm  |
| Installation depth                                | 76 mm (176 mm including clearance)  |
| Individual mountings                              | VESA 100 × 100<br>Note: The maximum screw length for the VESA fitting is 5.5 mm. Using longer screws may cause damage.  |
| Front cover protection class                      | IP 65   |
| Rear side protection class                        | IP 20   |
| Material for touch display                        | Polyester on glass, resistant coating: Autotex F157 or F207 <sup>(1)</sup> .  |
| Touchscreen contacts:                             | 1 million touchscreen contacts  |
| Protective material on the rear side              | Powder-coated aluminium   |
| Frame material                                    | Powder-coated aluminium   |
| Weight  | 5.4 kg  |
| Serial connection for COM1 RS-232 and COM2 RS-485 | 9-pin D sub-connection using RS-232 RTS/CTS, fitted socket with standard fixing screws 4-40 UNC.  |
| Serial connection for COM3 RS-232 and COM4 RS-485 | 9-pin D sub-connection using RS-232 RTS/CTS, fitted socket with standard fixing screws 4-40 UNC.  |
| Ethernet  | 2 × 10/100/1000 Base-T (shielded RJ45)  |
| USB   | 4 × USB Host 2.0, max. output current 500 mA  |
| Processor   | Intel® Celeron® B810E (2 × 1.6 GHz), 2 MB L2 Cache, Intel® QM67 Chipset   |
| External storage media                            | via USB   |
| RAM   | 2 GB DDR-3 SO-DIMM 1333 MHz   |
| LED   | 1 × Multicolour   |
| Real-time clock                                   | Yes (on chip)   |
| Battery   | Lithium battery type BR 2032 (or CR 2032), replaceable  |
| electrical consumption at nominal voltage         | 114 W   |
| Fuse  | 10A   |
| Power supply                                      | DC input range: 18-32 VDC (140 W)<br>ATX Standard<br>CE: The power supply must comply with IEC 60950 and IEC 61558-2-4.<br>UL and cUL: The power must be supplied under the conditions for power supply Class II. |

|                              |   |
|------------------------------|---|
| Display                      | TFT-LCD with backlit LED. 1280 × 800 pixels, 16.7 million colours.                                    |
| VGA                          | 1 × VGA: Max. resolution 2048 × 1536@75 Hz  |
| DVI                          | 1 × DVI-D single connection:<br>Max. resolution 1600 × 1200<br>or 1920 × 1200 (with reduced blanking) |
| Active display area, W x H   | 331.2 × 207.0 mm  |
| Operating temperature        | 0°C – +50°C   |
| Storage temperature          | -20°C – +70°C   |
| Relative humidity            | 5% – 85% non-condensing   |
| Approvals and certifications | Information is available at<br><a href="http://www.sbc-support.com">www.sbc-support.com</a>           |

<sup>(1)</sup> You will find further information in the section “Chemical resistance”.

## 5 Resistance to Chemicals

### 5.1 Metal Casings

Frames and casings are made from powder-coated aluminium. This powder coating resists the impact of the following chemicals without any visible effects:

|                      |                     |
|----------------------|---------------------|
| Acetic acid 10%      | Phosphoric acid 4%  |
| Citric acid 10%      | Phosphoric acid 10% |
| Diesel               | Sea water           |
| Distilled water      | Sodium chloride 20% |
| Edible oils          | Sulphuric acid 20%  |
| Heating oil          | Tap water           |
| Hydrogen peroxide 3% |                     |

The powder coating partially resists the effect of the following chemicals at room temperature:

|                         |                     |
|-------------------------|---------------------|
| Butanol                 | Nitric acid 10%     |
| Hydrochloric acid 5%    | Phosphoric acid 43% |
| Isopropyl alcohol       | Turpentine          |
| Sodium hypochlorite 10% |                     |



Note: If contact with one of the above chemicals is unavoidable, it is advisable to test the effect of the substance prior to use on a part of the metal casing that is not highly visible.

The powder coating does not resist, or barely resists, the effect of the following chemicals at room temperature:

|                          |                      |                             |
|--------------------------|----------------------|-----------------------------|
| Concentrated acetic acid | Methyl ethyl ketone  | Toluene                     |
| Acetone                  | Nitric acid 30%      | Trichlorethylene            |
| Ammoniac 5%              | Phenol               | Xylene                      |
| Concentrated ammoniac    | Sodium hydroxide 30% | Petrol, 97 octane, unleaded |
| Ethyl acetate            |                      | Petrol, 98 octane, leaded   |

## 5.2 Touch Display and Coating

### 5.2.1 Autotex F157/207

Autotex F157 or F207 covers the coating surrounding the touch display.

#### Resistance to solvents

In accordance with DIN 42115 part 2, Autotex F157/F207 is resistant to the following chemicals for more than 24 hours without displaying visible effects:

|  |  |   |
|--|--|---|
| Acetonitrile                               | Diesel Downey / Lenor <sup>(1)</sup>   | Phosphoric acid (<30%)                  |
| Dissolved scouring powder (Ajax/Vim)       | Ethanol                                | Potassium ferrocyanide/<br>ferricyanide |
| Alkaline carbonate solution <sup>(1)</sup> | Glycerine                              | Potassium hydroxide (<30%)              |
| Ammoniac (<40%) <sup>(1)</sup>             | Glycol                                 | Pure turpentine                         |
| Acetic acid (<50%)                         | Gumption <sup>(1)</sup>                | SBP 60/95 <sup>(1)</sup>                |
| Dissolved Ariel powder <sup>(1)</sup>      | Hydrochloric acid (<36%)               | Sulphuric acid (<10%)                   |
| Bleach <sup>(1)</sup>                      | Linseed oil                            | Tomato ketchup                          |
| Castor oil                                 | Methanol                               | Trichloroacetic acid (<50%)             |
| Sodium hydroxide (<40%) <sup>(1)</sup>     | Nitric acid (<10%)                     | White spirit                            |
| Drilling oil                               | Paraffin oil                           | Windex <sup>(1)</sup>                   |
| Cyclohexanol                               | Dissolved Persil powder <sup>(1)</sup> | Wisk                                    |
| Diacetone alcohol                          | White spirit <sup>(1)</sup>            | -                                       |

<sup>(1)</sup> An extremely faint shine was observed on the structure.

In accordance with DIN 42115 part 2, Autotex is resistant for maximum 1 hour to glacial acetic acid without displaying visible effects.

Autotex is not resistant to high-pressure steam at over 100°C or to the following chemicals:

|                               |                    |
|-------------------------------|--------------------|
| Concentrated inorganic acids  | Benzyl alcohol     |
| Concentrated etching solution | Methylene chloride |

## 5.2.2 Touch Display Surface

The surface of the touch display on the operator panel is resistant to the following solvents without displaying visible effects:

| Solvent     | Time   |
|-------------|--------|
| Acetone     | 10 min |
| Isopropanol | 10 min |
| Toluene     | 5 hrs  |

## 5.2.3 Autotex

5

The use of the Autoflex EBA180L touchscreen protective film is recommended.

### Resistance to solvents

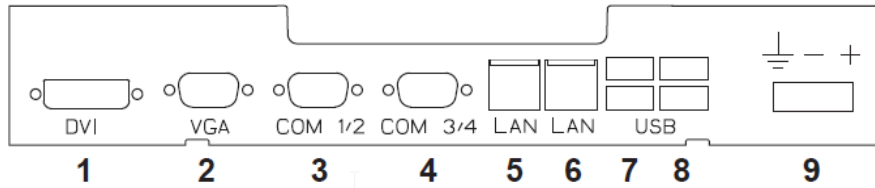
Autoflex EBA180L resists the effects of the same chemicals as Autotex F157 or F207 as described in the section on Autoflex F157/207.

### Use outdoors

Like all polyester-based films, Autoflex EBA 180L must not be exposed to direct sunlight for any length of time.

## 6 Operator Panel Diagrams

### 6.1 Connections



| Pos. | Connection         | Description  |
|------|--------------------|--|
| 1    | DVI                | External Monitor                                     |
| 2    | VGA                | External Monitor                                     |
| 3    | COM 1/2            | Communications connections                           |
| 4    | COM 3/4            | Communications connections                           |
| 5    | LAN (connection B) | 1 × 10/100/1000 Base-T (shielded RJ-45); Intel 82574 |
| 6    | LAN (connection A) | 1 × 10/100/1000 Base-T (shielded RJ-45); Intel 82559 |
| 7    | USB                | 2 × USB Host 2.0, max. output current 500 mA         |
| 8    | USB                | 2 × USB Host 2.0, max. output current 500 mA         |
| 9    | Power supply       | DC input range: 18-32 VDC (140 W)<br>ATX standard    |

6

### 6.2 Communications Connections

| Pin | Serial connection, 9-pin plug |                | Serial connection, 9-pin plug |                |
|-----|-------------------------------|----------------|-------------------------------|----------------|
|     | COM1                          | COM2           | COM3                          | COM4           |
| 1   | -                             | RS-485 Tx+/Rx+ | -                             | RS-485 Tx+/Rx+ |
| 2   | RS-232 RxD                    | -              | RS-232 RxD                    | -              |
| 3   | RS-232 TxD                    | -              | RS-232 TxD                    | -              |
| 4   | -                             | -              | -                             | -              |
| 5   | GND                           | GND            | GND                           | GND            |
| 6   | -                             | RS-485 Tx-/Rx- | -                             | RS-485 Tx-/Rx- |
| 7   | RS-232 RTS                    | -              | -                             | RS-422 RTS+    |
| 8   | RS-232 CTS                    | -              | -                             | RS-422 RTS-    |
| 9   | -                             | -              | -                             | -              |

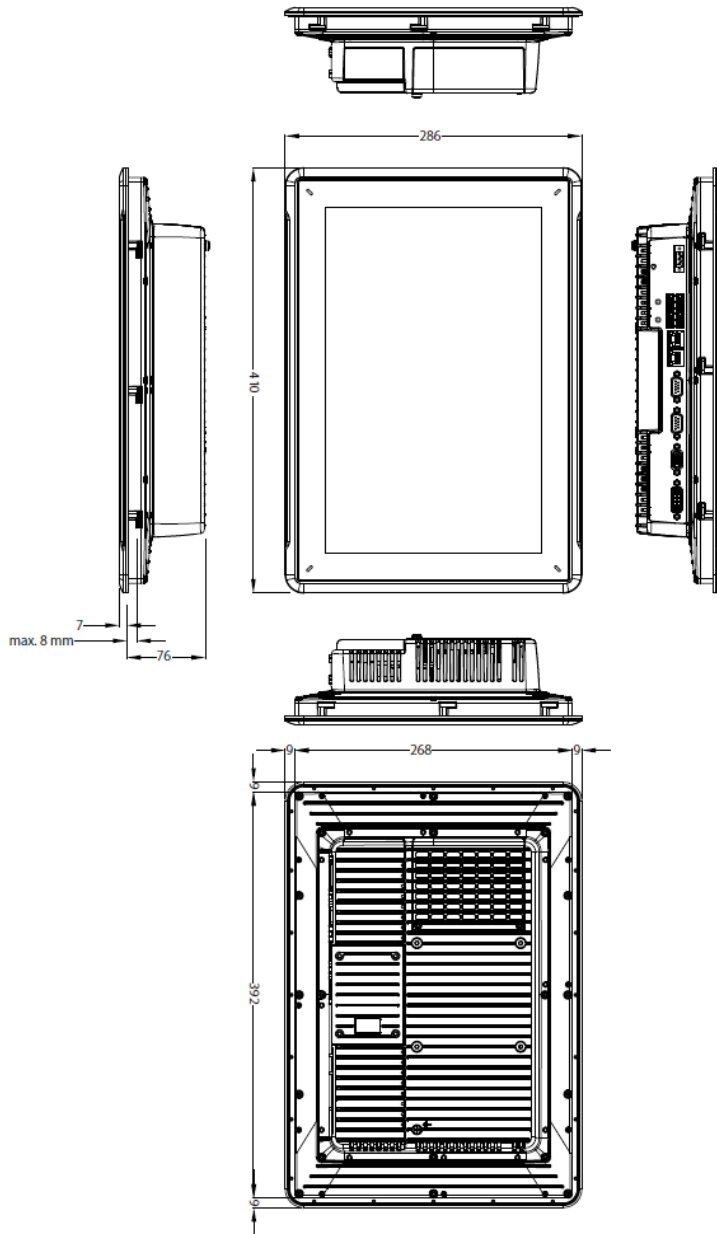
Note: The RS422 interface is not yet available



Note: A Y splitter cable CAB109 is required to run two communications ports over the same physical connection.



### 6.3 PCD7.D6150WTC010 Overview



6

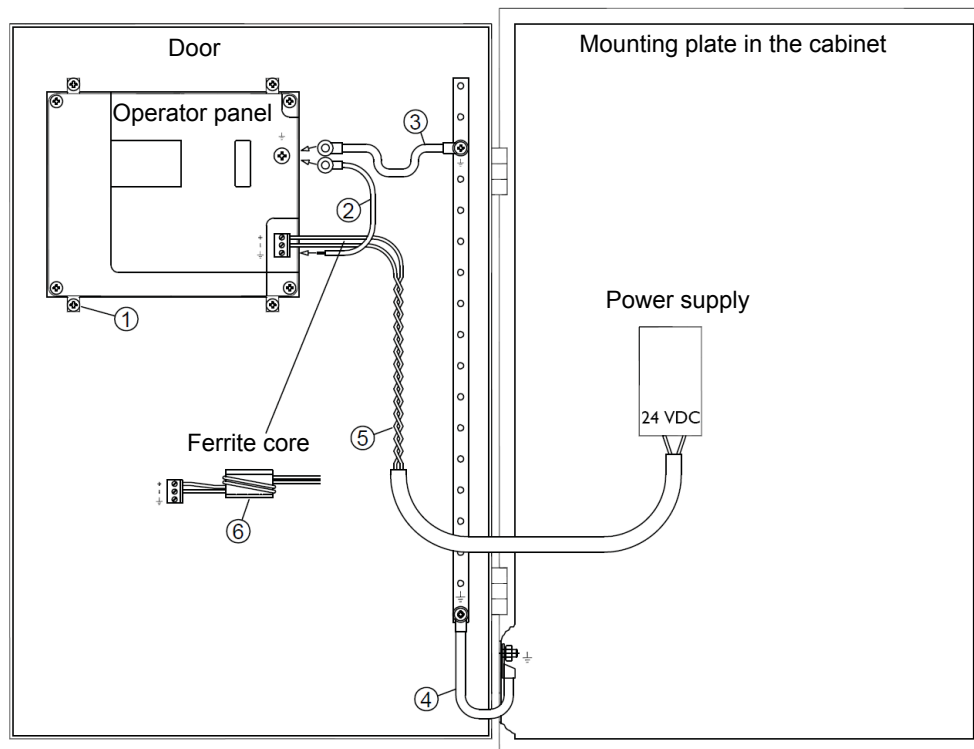


Note: A Step CAD file is available on the website at [www.sbc-support.com](http://www.sbc-support.com)

## 7 Additional Installation Instructions

Please follow the recommendations below if communication problems occur, for example in environments with interference or at temperatures close to the limits.

### 7.1 Earthing the Operator Panel



7

The fixing clamps for the operator panel do not provide a safe earth connection between the panel and the equipment cabinet; see 1 in the above diagram.

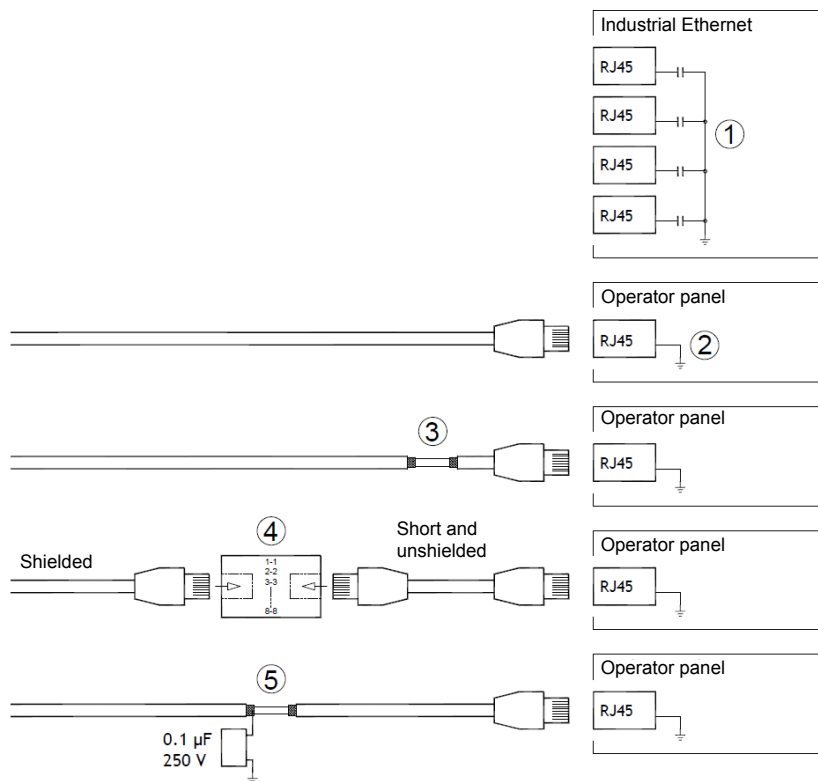
1. Connect a 2.5-mm<sup>2</sup> cable between the quick-connect socket and the operator panel casing; see 2 in the above diagram.
2. Connect a 6-mm<sup>2</sup> or 4-mm<sup>2</sup> cable or an earth strap between the housing of the operator panel and the nearest earth point on the door; see 3 in the above diagram.
3. Attach a strong but short earthing braid between the door and the equipment cabinet; see 4 in the above diagram.
4. Twist the cable and insert it into the 24 VDC supply; see 5 in the above diagram. The minimum cross section for the cable is 2.5 mm<sup>2</sup>.  
Two turns around the ferrite core will provide four times the suppression of a single turn.  
Three turns around the ferrite core will provide nine times the suppression of a single turn.

A ferrite core suppresses interference to the 24 V power supply; see 6 in the above diagram.



Note: The earth wires must be short and have a large cross section. A long, thin earth wire will have very high impedance (resistance) at high frequencies and will not earth interference. Multi-core cables are preferable to single core with the same cross section. A braided cable with the same cross section is even better. The ideal solution is a short but strong earthing braid.

## 7.2 Ethernet Connection in the Operator Panel



In some industrial Ethernet installations the shielding of the RJ45 connection is attached to the casing via a condenser; see 1 in the above diagram.

The Ethernet shielding for the operator panel is directly connected to the casing; see 2 in the above diagram.

1. Check whether the shielding for the other Ethernet entity is earthed directly or via a condenser.



Note: In many cases it is not recommended to connect both ends of shielded Ethernet cables to the casing. This could cause a humming or earth loop. Even unshielded cable would create fewer communication errors.

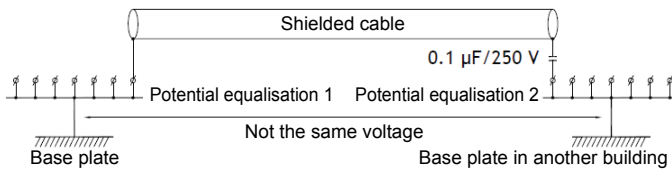
One solution is to use a shielded Ethernet cable, whose shielding is only connected at one end. Another option is to remove the shielding; see 3 in the above diagram.

A more elegant solution is to extend the shielded Ethernet cable with a length of unshielded Ethernet cable; see 4 in the above diagram.

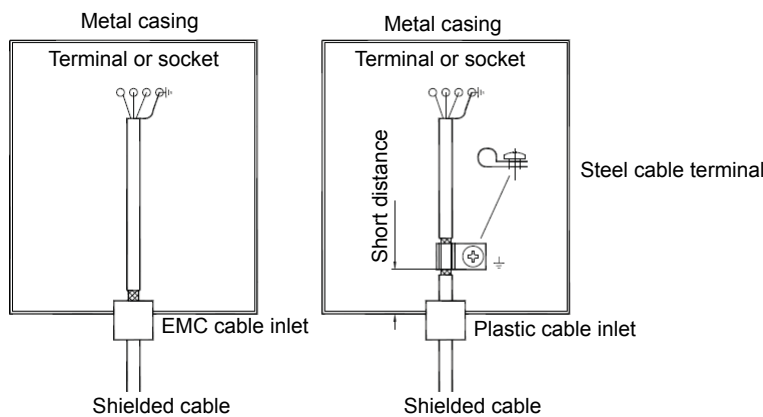
You can earth the shielding using a 0.1- $\mu$ F/250 V external plastic condenser; see 5 in the above diagram. This connects the high frequency fluctuations to earth.

### 7.3 Improved EMC Protection

- First use the original cable supplied with the device.
- For RS-232 communications, use a shielded cable.
- For RS-422 and RS-485 communications, use a twisted-pair cable and a shielded cable.
- Use the appropriate cable for each type of bus: Ethernet, Profibus, CC-Link, CAN, DeviceNet, etc.
- Carry out the installation and connections in accordance with the specification that applies for the relevant bus standard.
- Use shielded Ethernet cable, if possible with foil and a braid shield.
- The shielding for the D-sub connector must be connected all the way round (360°) the connector housing.
- Connect the shielding at both ends.



With longer distances there is a risk of a difference in the earth potential. In this case, the shielding should only be connected at one end. Alternatively the other end of the shielding may be earthed using a 0.1-μF/250 V plastic condenser. If subjected to HF, then both ends must be earthed, for LF one end only to avoid 50/60 Hz earth loops.



1. Use an EMC cable connector or a normal plastic cable connector, remove the outer sleeve and attach the shielding to the installation plate using a 360° metal cable clamp.

- Lay the 24 VDC and communication cable in one channel and the 230/380 VAC cable in a different one. If you have to cross the cables, only do so at 90°.

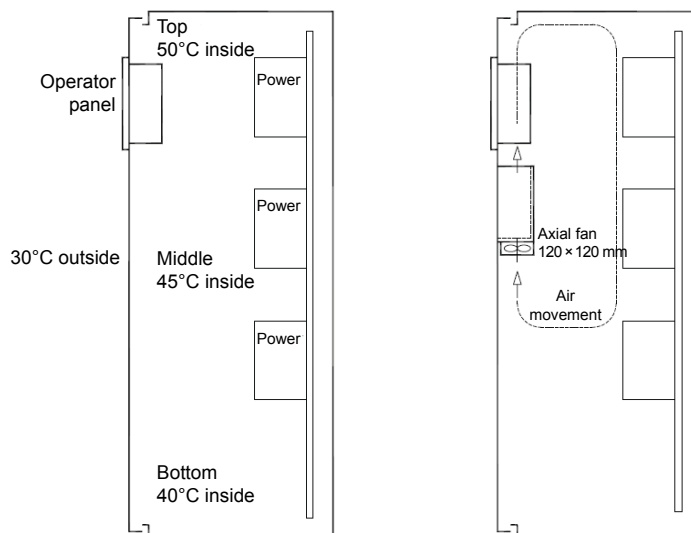
Avoid combining cables for stronger 24 VDC outputs with the communication cable.

Ferrite cores connected to the shielded cables can be used to suppress minor interference. Large pieces of ferrite connected to unshielded cables in locations where the wires can be wrapped two to four times around the core are 5 to 25 times more effective.

## 7.4 Ambient temperature

The maximum ambient temperature for the operator panel is listed in the specifications. The ambient temperature refers to the temperature in the equipment cabinet which cools the electronic elements of the operator panel.

7



In most cases the ambient temperature for the operator panel is significantly higher than the ambient temperature for the equipment cabinet. If the cabinet is large and contains several pieces of equipment that generate heat, the temperature in the upper part of the cabinet will be noticeably higher than the theoretically anticipated rise in temperature. All electronic components are sensitive to heat. The service life of an electrolytic condenser is reduced by 50% with an increase in temperature of 8 to 10°C. A rise in temperature of 15 to 20°C reduces its service life by 75%, etc.

Rittal offers a practical program for estimating the likely average temperature in the cabinet and also a program to control the temperature in the equipment cabinet.

An enamelled steel cabinet produces a radiation heat value of 5.5 W/m<sup>2</sup> and °C.

The temperature can be balanced by installing a fan in the cabinet, as moving air has a considerably greater cooling effect compared to static air.

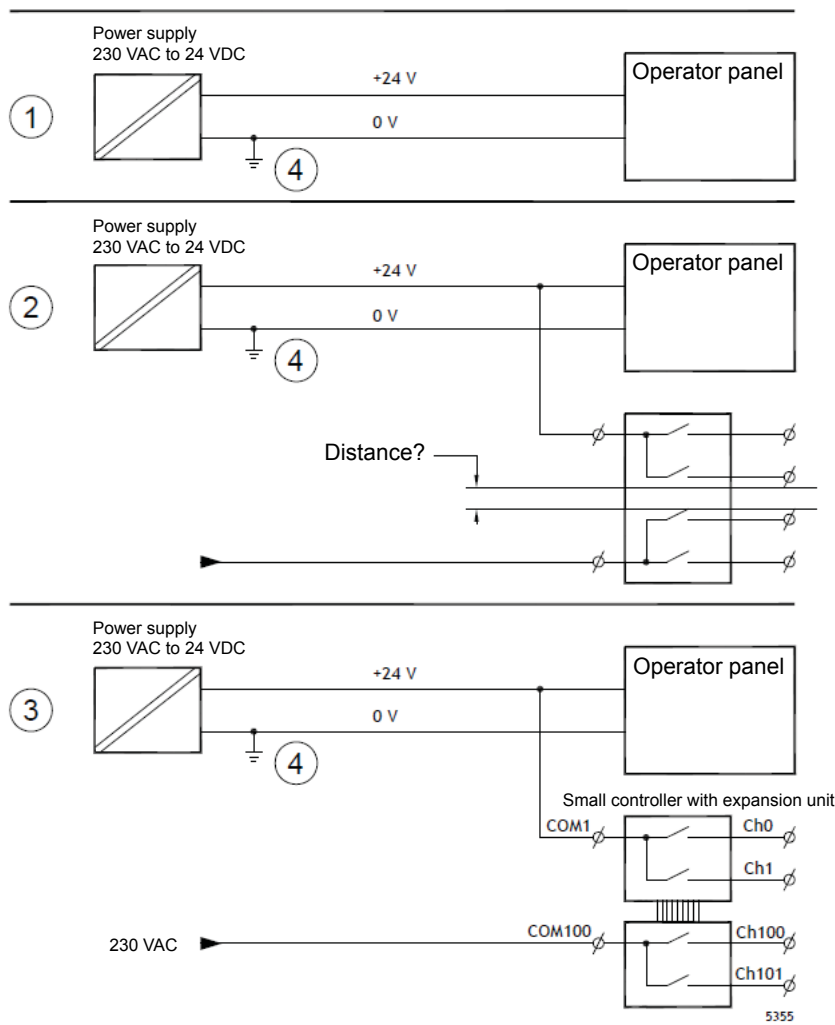
Install the fan in the cooler area to blow cold air onto the operator panel. If the fan is mounted at the top and sucks warm air upwards, the operating temperature of the fan itself will be increased, reducing its service life.

The power dissipation of the operator panel equals the power supply voltage multiplied by the current. Effectively, no current flows to external consumers and the inputs do not give rise to any power loss.

### 7.5 Safety

Most operator panels are supplied with 24 VDC.

7



No problems will arise if you install a power supply that meets the safety standards and which only supplies the operator panel. See 1 in the above diagram.

But if you are using a 24 V unit that also supplies other units, you must take the appropriate measures; see 2 in the above diagram. The operator panel does not have insulation as required by the safety requirements in the event of a short circuit between 230 VAC and 24 VDC. It is assumed that providing 24 V power is safer, e.g. SELV in accordance with EN60950 (protection from electric shocks) and UL950.

Example:

the following example explains why a safe 24 VDC supply may be disrupted if a 24 VDC relay contact is combined with a 230 VAC relay contact in a small controller. Make sure that the distances and the creepage distance between 24 VDC and 230 VAC comply with EN60950 or UL950. If this is not the case, then provide the operator panel with its own 24 V unit.

If there is an adequate distance between the relay contacts for 24 VDC and 230 VAC, the same 24 V unit can be used to supply all components. See 3 in the above diagram.

7

Connect 0 V to the 24 V unit with the earth. This has three advantages:

- Increased safety. The 24 V supply is not live if there is a faulty connection or a short circuit between 0 V (24 V) and the 230 V phase.
- Fluctuations in the 24 V supply are earthed.
- There is no risk of the 24 V supply showing a high value compared to earth. This is not unusual, owing to the presence of high static electricity.



## 7.6 Cable and Bus RS-485 Terminals

- Shielded, twisted-pair cables must be used to be able to use the maximum transmission distance and the maximum transmission speed. The mutual capacitance must not exceed 52.5 pF/m and the cable cross section must be at least 0.25 mm<sup>2</sup> (AWG24).
- 0 V, the reference voltage for communications, should be in the cables. Install two pairs for bi-directional communication: one for the communication and one for 0 V.
- The shielding must be earthed at one end. The other end would normally also be earthed. Over longer distances, or with a difference in the earth potential, the shielding should be earthed using a 0.1-μF/250 V plastic condenser to avoid earth current along the shielding braid. Some manufacturers recommend earthing the shielding at each node. Different manufacturers offer different systems for the end of the bus.

Depending on the receiver construction, the bus cables may be on a single level or require pull-up or pull-down resistors to avoid false signals being recognised when the bus is in sleep mode (when all transmission units are off).

**7**

## 7.7 Boot Sequence

The boot sequence is the sequence in which the hardware storage devices are read.

If F7 is pressed during the boot process, a drop-down menu will appear displaying all the available bootable devices.

The boot sequence can only be changed temporarily. At the next start-up, the boot sequence will revert to the works setting.

## 7.8 Calling up the BIOS



Warning: The BIOS settings for this program may only be changed by computer technicians. Certain changes could result in the failure of your operator panel to function correctly.



Note: Before making changes to the BIOS setup you should note the setup information for future reference.



Note: You are recommended to switch the operator panel off and restart it at least once before any components/cards are installed or before the operator panel is connected to external devices such as, e.g., serial devices.

1. Connect a USB keyboard.
2. Connect the power supply and switch the operator panel on.
3. During the boot process, press the F2 key immediately after initialisation of the keyboard. The initialisation is displayed in the LEDs on the keyboard.

If F2 is pressed before the keyboard is initialised, pressing the key will have no effect.

If you wait too long and the logo for the operating system is displayed, please wait a little longer until the desktop of the operating system appears. Now switch the operator panel off and try again.



Note: The key used to call up the BIOS setup may vary in different models and CPU boards. It is generally one of the following keys: ESC, DEL, F1 or F2. You can find further information in the BIOS manual.

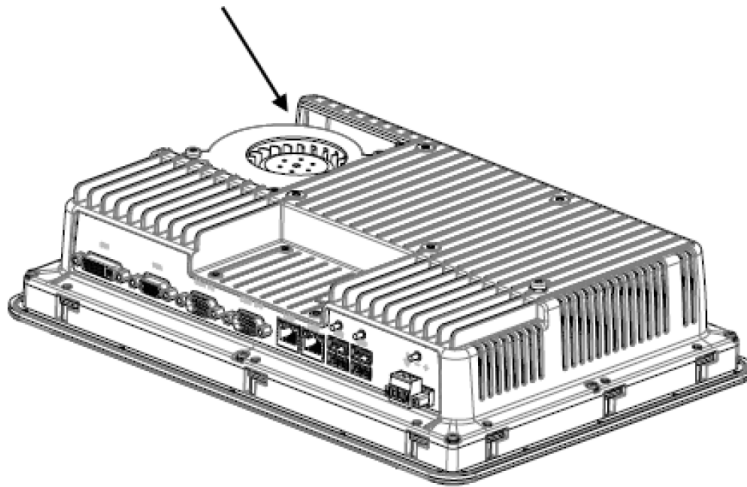
System setup allows you to:

- Change the system configuration (newly installed hardware).
- Define boot devices and sequences.
- Set up or change user options such as passwords.
- Read the installed storage and environmental parameters such as the CPU temperature.

You can find further information in the BIOS manual.

## 7.9 Reset Switch

The reset switch is located under the fan cover.



Information on how to remove the fan cover to access the reset switch can be found in the chapter “Replacing fans and filters”.

## A Annex

### A.1 Icons



This symbol indicates that more information exists on this topic in this or another manual, or in technical documents. There are no direct links to these documents.



This symbol indicates instructions that must be strictly adhered to.



This symbol warns the reader that touching components may lead to damage from electrostatic discharge.  
Recommendation: at least touch the system's negative terminal (PGU port casing) before touching the electronic components. A better solution is to wear an earthed strap on your wrist connected to the system's negative terminal.



The explanations next to this symbol are only valid for the Saia PCD® classic series.



The explanations next to this symbol are only valid for the Saia PCD® xx7 series.

## A.2 Contact Details

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