

# **4PP065.0571-B00**

## **Technical documentation**

Version: **1.00 (July 2013)**

Model no.: **4PP065.0571-B00**

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<b>1 Views</b>	<b>3</b>
<b>2 General Information</b>	<b>5</b>
2.1 Order data	5
2.1.1 Description	5
2.1.2 Version information	5
2.1.3 Supported interface modules	5
<b>3 Fully assembled device - Technical data</b>	<b>6</b>
3.1 Diagnostic LEDs	6
3.1.1 Diagnostic LEDs up to AR I2.96, D3.01 and A3.06	6
3.1.2 Diagnostic LEDs starting with AR J2.96, E3.01 and B3.06	7
3.1.3 ACT / LNK LEDs for the RJ45 interface	7
3.2 Connection elements	8
3.2.1 X2X Link port	8
3.2.2 USB ports	9
3.2.3 Ethernet interface	10
3.2.4 Supply voltage	10
3.2.5 Operating mode and node number switches	11
3.3 Technical data	12
3.4 Dimensions	15
3.5 Cutout installation	16
3.6 Panel overlay design	17
3.7 Slide-in labels	18
<b>4 Commissioning</b>	<b>19</b>
4.1 Mounting instructions	19
4.2 Mounting orientation	21
4.3 Installing interface modules	22
4.4 Touch screen calibration	22
4.5 Screen rotation	22
<b>5 Maintenance</b>	<b>23</b>
5.1 Cleaning	23
5.2 Changing the battery	23
5.2.1 General information	23
5.2.2 Battery status evaluation	23
5.2.3 Procedure for changing the battery	24
5.3 Changing the CompactFlash card	25
5.3.1 Removing the CompactFlash card	25
5.3.2 Inserting the CompactFlash card	26
5.4 Preventing screen burn-in on LCD/TFT displays	27
5.4.1 How can this be avoided?	27

# 1 Views



Figure 1: 4PP065.0571-B00 - Oblique view



Figure 2: 4PP065.0571-B00 - Rear view

## 2 General Information

### Information:

B&R does its best to keep technical descriptions as current as possible. The latest version of this technical description can be downloaded in PDF format from the B&R website at [www.br-automation.com](http://www.br-automation.com). The 4PP065.0571-B00 is a variant of the B&R standard device 4PP065.0571-X74F. Specifications that are not listed here are identical to those for the B&R standard device and must be taken from the Power Panel User's Manual.

### 2.1 Order data


Model number	Short description	Figure
	<b>Power Panel 65</b>	
4PP065.0571-B00	cHMI PP65 TFT C QVGA 5.7in FT,X2X,ETH	

Table 1: 4PP065.0571-B00 - Order data

#### 2.1.1 Description

The 4PP065.0571-B00 is a variant of the standard device 4PP065.0571-X74F, with the following modifications:

- Panel overlay design and slide-in labels same as standard PP45 (but PP45/PP65 imprint)
- No embossing around display
- Display with dim backlighting

#### 2.1.2 Version information

Version	Date	Comment	Responsible
1.00 (starting with Rev. A0)	22-Jul-13	First edition	Anna Sigl

Table 2: Version information

#### 2.1.3 Supported interface modules

Support for interface modules is provided starting with the following Automation Runtime versions:

Automation Runtime version	Interface modules			
	4PP065.IF10-1	4PP065.IF23-1	4PP065.IF24-1	4PP065.IF33-1
	C2.96	C2.96	A3.07	C2.96

Table 3: 4PP065.0571-X74F – Supported interface modules

## 3 Fully assembled device - Technical data

### 3.1 Diagnostic LEDs

There are four diagnostic LEDs on the back of the PP65.

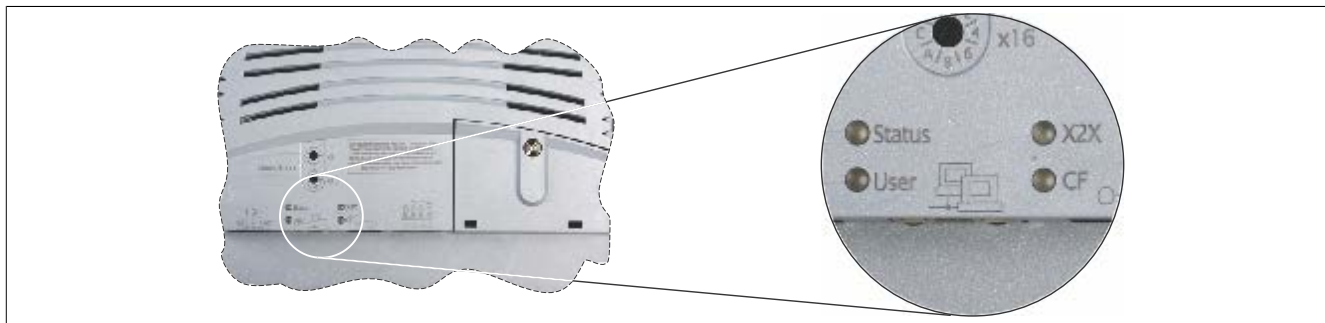


Figure 3: 4PP065.0571-X74F - Diagnostic LEDs

#### Information:

The behavior of the Status LED has changed starting with AR J2.96, E3.01 and B3.06.

#### 3.1.1 Diagnostic LEDs up to AR I2.96, D3.01 and A3.06

LED	Color	Status	Description
Status	Red	On	Error / Reset
	Orange	On	Boot or Ready mode
User	Green	On / Off	LED operable by the user (with the AsHW library)
X2X	Orange	On	Module sending data via the X2X Link interface
CF	Orange	On	CompactFlash card being accessed

Table 4: 4PP065.0571-X74F - Diagnostic LEDs up to AR I2.96, D3.01 and A3.06

### 3.1.2 Diagnostic LEDs starting with AR J2.96, E3.01 and B3.06

LED	Color	Status	Description
Status	see "Table 6: 4PP065.0571-X74F - Status LED blink code" on page 7		
User	Green	On / Off	LED operable by the user (with the AsHW library)
X2X	Orange	On	Module sending data via the X2X Link interface
CF	Orange	On	CompactFlash card being accessed

Table 5: 4PP065.0571-X74F - Diagnostic LEDs starting with AR J2.96, E3.01 and B3.06

Blink codes (200 ms pattern)	Description
[Red]	Error / Reset
[Green]	No errors, normal operation
[Orange]	Battery not installed or battery capacity too low
[Orange]	CompactFlash media not found
[Reserved]	Reserved for future blink codes

Table 6: 4PP065.0571-X74F - Status LED blink code

Because blink codes can only signal one error at a time, errors with higher priority take precedence. Fatal errors have a higher priority than less significant errors (e.g. low battery capacity).

### 3.1.3 ACT / LNK LEDs for the RJ45 interface

There are two additional LEDs for the Ethernet interface.

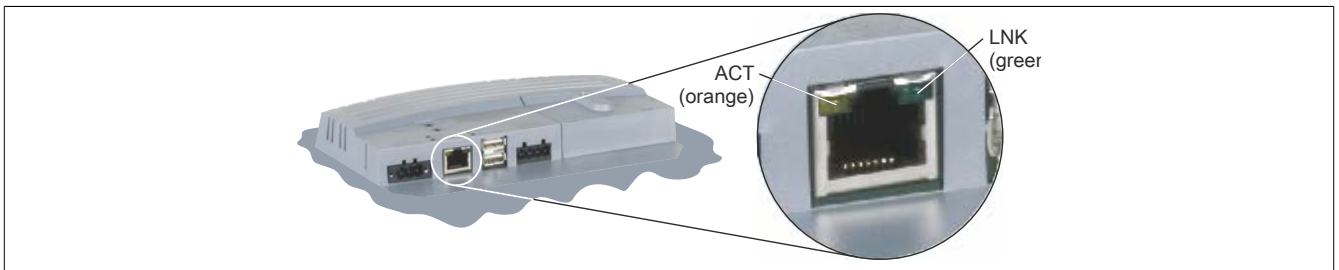


Figure 4: 4PP065.0571-X74F - ACT/LNK LEDs for the RJ45 port

LED	Color	Status	Description
ACT	Orange	On	No Ethernet activity on the bus
		Blinking	Ethernet activity on the bus
LNK	Green	On	A link to the remote station has been established.

Table 7: 4PP065.0571-X74F - ACT/LNK LEDs for the RJ45 port

### 3.2 Connection elements

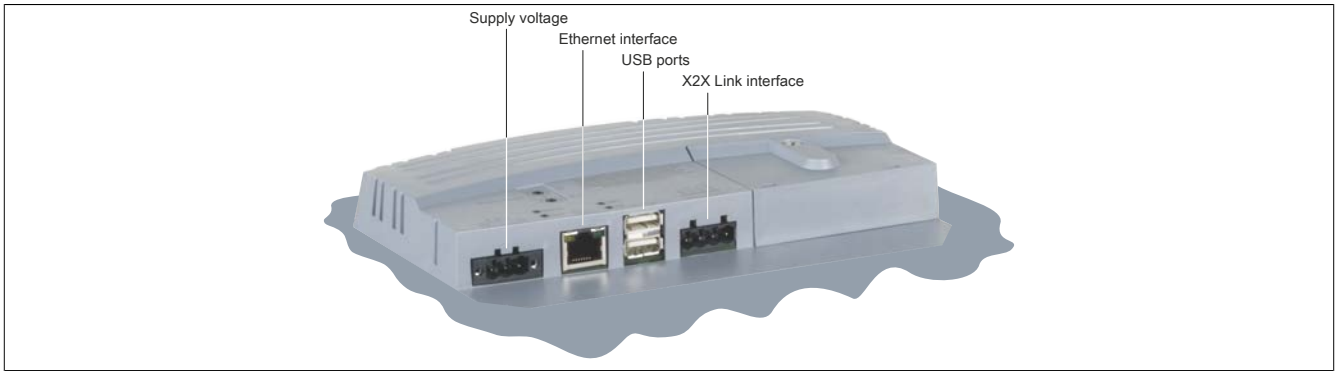


Figure 5: 4PP065.0571-X74F - Connection elements

#### 3.2.1 X2X Link port

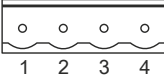

Interface	Pinout		
User interface X2X Link  X2X X2X I X2X I SHLD      4-pin male multipoint connector	Terminal	X2X Link	
	1	X2X	X2X data
	2	X2X	X2X ground
	3	X2X I	X2X data inverted
	4	SHLD	Shield
Required accessories			
0TB704.9	Terminal block accessory, 4-pin, screw clamp, 1.5 mm <sup>2</sup>		
0TB704.91	Terminal block accessory, 4-pin, cage clamp, 2.5 mm <sup>2</sup>		

Table 8: 4PP065.0571-X74F - X2X Link pinout



### 3.2.2 USB ports

This Power Panel 65 device features a USB 2.0 (Universal Serial Bus) host controller with two USB ports that are accessible externally.

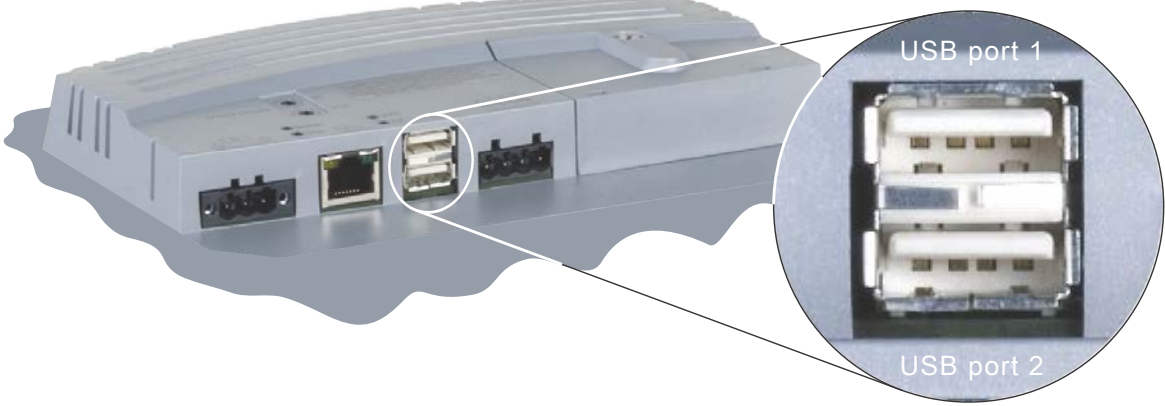
USB interface	
	
Transfer rate <sup>1)</sup>	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), high speed (480 Mbit/s)
Power supply	Max. 500 mA per port <sup>2)</sup>

Table 9: 4PP065.0571-X74F - USB interface

- 1) The actual value depends on the operating system or driver being used.  
 2) Each USB port is protected by a maintenance-free "USB current-limiting circuit breaker" (max. 500 mA).

#### Warning!

Peripheral USB devices can be connected to these USB ports. Due to the vast number of USB devices available on the market, B&R cannot guarantee their performance. B&R does ensure the performance of all USB devices that they provide.

#### Caution!

Because this interface is designed according to general PC specifications, extreme care should be exercised with regard to EMC, cable routing, etc.

### 3.2.3 Ethernet interface


Interface	Pinout		
	Terminal		
Ethernet interface  RJ45 twisted pair socket (10BaseT/100BaseT)	1	RXD	Receive signal
	2	RXD\	Receive signal inverted
	3	TXD	Transmit signal
	4	Termination	Termination
	5	Termination	Termination
	6	TXD\	Transmit signal inverted
	7	Termination	Termination
	8	Termination	Termination

Table 10: 4PP065.0571-X74F - Ethernet interface pinout

### 3.2.4 Supply voltage

The pinout can be found either in the following table or printed on the back of the Power Panel. The Power Panel has reverse polarity protection that prevents the supply voltage from being connected incorrectly and damaging the device. Overload protection must be provided by an external fuse (5 A, fast-acting).

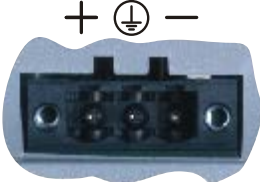
Supply voltage	Pinout	
	Terminal	Assignment
 3-pin multipoint plug	+	+ 24 VDC
	⏚	Functional ground
	-	GND
	<b>Required accessories</b>	
0TB103.9	Connector, 24 VDC, 3-pin female, 3.31 mm <sup>2</sup> screw clamp, protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, 3.31 mm <sup>2</sup> cage clamp, protected against vibration by the screw flange	

Table 11: 4PP065.0571-X74F - Supply voltage pinout

## Caution!

The functional ground must be connected to ground (e.g. control cabinet) using the shortest possible path. Using the largest possible conductor cross section on the supply plug is recommended.

### 3.2.5 Operating mode and node number switches

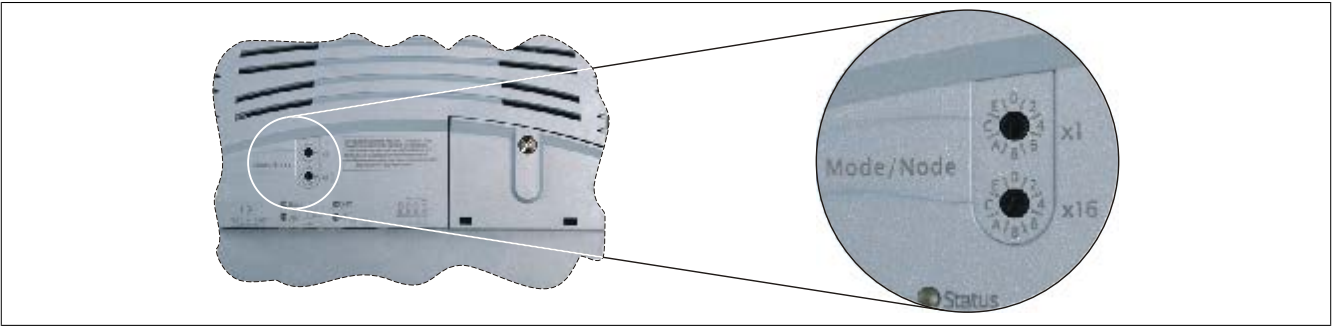


Figure 6: 4PP065.0571-X74F - Operating mode and node number switches

The Power Panel 65 device is equipped with 2 hex switches that can be used as operating mode or node number switches. Switch positions 01 - FE are used to set the INA station number of the Ethernet interface.

Switch position	Description
00	Reserved
01 - FE	<b>INA node number</b> of the Ethernet interface
FF	<b>Diagnostics mode:</b> The CPU boots in Diagnostics mode. Does not initialize program sections in User RAM and User FlashPROM. After being in diagnostics mode, the CPU always boots with a cold restart.

Table 12: 4PP065.0571-X74F - Operating mode and node number switches

### 3.3 Technical data

Product ID	4PP065.0571-B00
<b>General information</b>	
B&R ID code	\$E187
LEDs	
Quantity	4
CF (CompactFlash)	Orange
Status	Red/Green
X2X	Orange
User	Green
Battery	
Type	Renata 950 mAh
Service life	4 years <sup>1)</sup>
Removable	Yes, accessible from the outside
Design	Lithium Ion
Backup capacitor	
Buffer time	10 min
Certification	
CE	Yes
cULus	Yes
CE	Yes
cULus	Yes
GOST-R	Yes
<b>Controller</b>	
Boot loader, operating system	
PP65 supported beginning with version	Automation Runtime, C2.96
Processor	
Type	Geode LX800, 32-bit x86
Clock frequency	500 MHz
L1 cache	128 kB (64 kB I-cache / 64 kB D-cache)
L2 cache	128 kB
Expanded command set	MMX technology, 3D Now
Floating point unit (FPU)	Yes
Flash	4 MB (for firmware)
Cooling	Passive via heat sink
Mode/Node switches	2, 16 positions each
Remanent variables	32 kB
Watchdog	MTCX <sup>2)</sup>
Real-time clock	
Accuracy	At 25°C: typ. 30 ppm (2.5 seconds) per day <sup>3)</sup>
Battery-buffered	Yes
Power failure logic	
Controller	MTCX <sup>2)</sup>
Buffer time	10 ms
Graphics	
Controller	Geode LX800
Memory	8 MB shared memory (allocated in RAM)
Standard memory	
RAM	128 MB DDR SDRAM
User RAM	200 kB SRAM
PP65 Compact IF slot	1
<b>Interfaces</b>	
CompactFlash slot 1	
Quantity	1
Type	Type I
Design	Primary IDE device
USB	
Quantity	2
Type	USB 1.1, USB 2.0
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), high speed (480 Mbit/s)
Current load	Max. 500 mA per connection
Ethernet	
Quantity	1
Controller	Intel 82551ER
Design	Shielded RJ45 port (10/100 Base-T)
Transfer rate	10/100 Mbit/s
Max. baud rate	100 Mbit/s
Cables	S/STP (Category 5)
Status LEDs	Link/Activity
X2X	
Design	4-pin male multipoint connector

Table 13: 4PP065.0571-B00 - Technical data

Product ID	4PP065.0571-B00
<b>Product ID</b>	
X2X	
Quantity	1
Type	X2X Link master
Design	4-pin male multipoint connector
Number of stations	Max. 253
Distance between stations	Max. 100 m
Network topology	Line
Internal bus supply	No
Bus terminating resistor	Internal
<b>Display</b>	
Type	Color TFT
Diagonal	5.7" (144 mm)
Colors	262,144 <sup>4)</sup>
Resolution	QVGA, 320 x 240 pixels
Contrast	350:1
Viewing angles	
Horizontal	Direction R / Direction L = 60°
Vertical	Direction U = 65° / Direction D = 50°
Backlight	
Brightness	250 cd/m <sup>2</sup>
Half-brightness time	50,000 h
Touch screen	
Technologies	Analog, resistive
Controller	B&R, 12-bit
Transmittance	70% ±10%
Screen rotation	Yes
<b>Keys</b>	
Design	Membrane keypad with metallic snap-action disks
Total keys	10 membrane keys
Function keys	10 (with slide-in labels)
<b>Electrical characteristics</b>	
Nominal voltage	24 VDC ±25%
Nominal current	0.45 A
Starting current	Max. 2.8 A
Power consumption	Typ. 10 W
Electrical isolation	No
<b>Operating conditions</b>	
Installation at altitudes above sea level	
Maximum	3000 m
Protection in accordance with EN 60529	Back: IP20 (only with an inserted CompactFlash card) Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection
<b>Environmental conditions</b>	
Temperature	
Operation	0 to 50°C
Storage	-20 to 70°C
Transport	-20 to 70°C
Relative humidity	
Operation	10 to 90%, non-condensing
Storage	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <90%, non-condensing
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
<b>Mechanical characteristics</b>	
Housing	
Material	Polyester
Front	
Design	B&R design
Panel membrane	
Material	Polyester
Light background	Pantone 427 C
Dark gray border around display	Pantone 432 C
Color legend strips	Pantone 428 C and Pantone 151 C
Front	Multi-layered overlay with insertion slots for key labels

Table 13: 4PP065.0571-B00 - Technical data

## Fully assembled device - Technical data

Product ID	4PP065.0571-B00
Dimensions	
Width	203 mm
Height	145 mm
Depth	56.5 mm
Weight <sup>5)</sup>	0.75 kg

Table 13: 4PP065.0571-B00 - Technical data

- 1) Typical service life (at 50% buffer operation, 25°C when device off, 50°C when device on).  
Maximum service life in 24h operation (no buffer): 6 years at 25°C, 5 years at 50°C.  
Maximum service life when device switched off: 2 years at 25°C, 1 year at 50°C.
- 2) Maintenance Controller Extended.
- 3) At max. specified ambient temperature: typ. 50 ppm (4 s), worst case 100 ppm (8 s).
- 4) The actual number of colors depends on the graphics memory, the graphics mode set and the graphics driver used.
- 5) Weight including fasteners and battery (46.5 g) but without an interface module

### 3.4 Dimensions

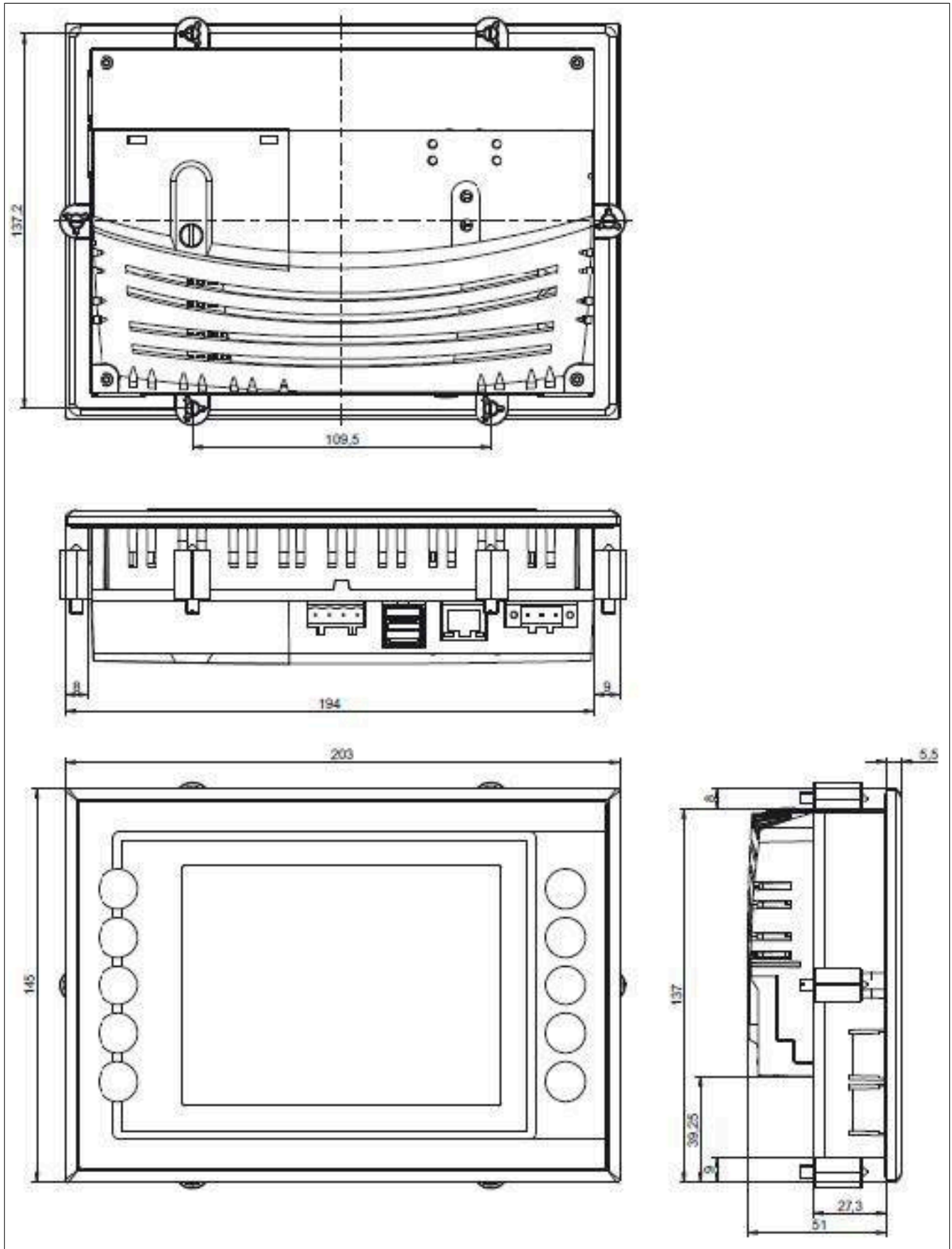


Figure 7: 4PP065.0571-B00 - Dimensions

### 3.5 Cutout installation

The cutout hole must to be made according to the following dimensions for cutout installations. These devices are best mounted in a cutout installation using the mounting clips on the housing or clamping blocks (various designs possible).

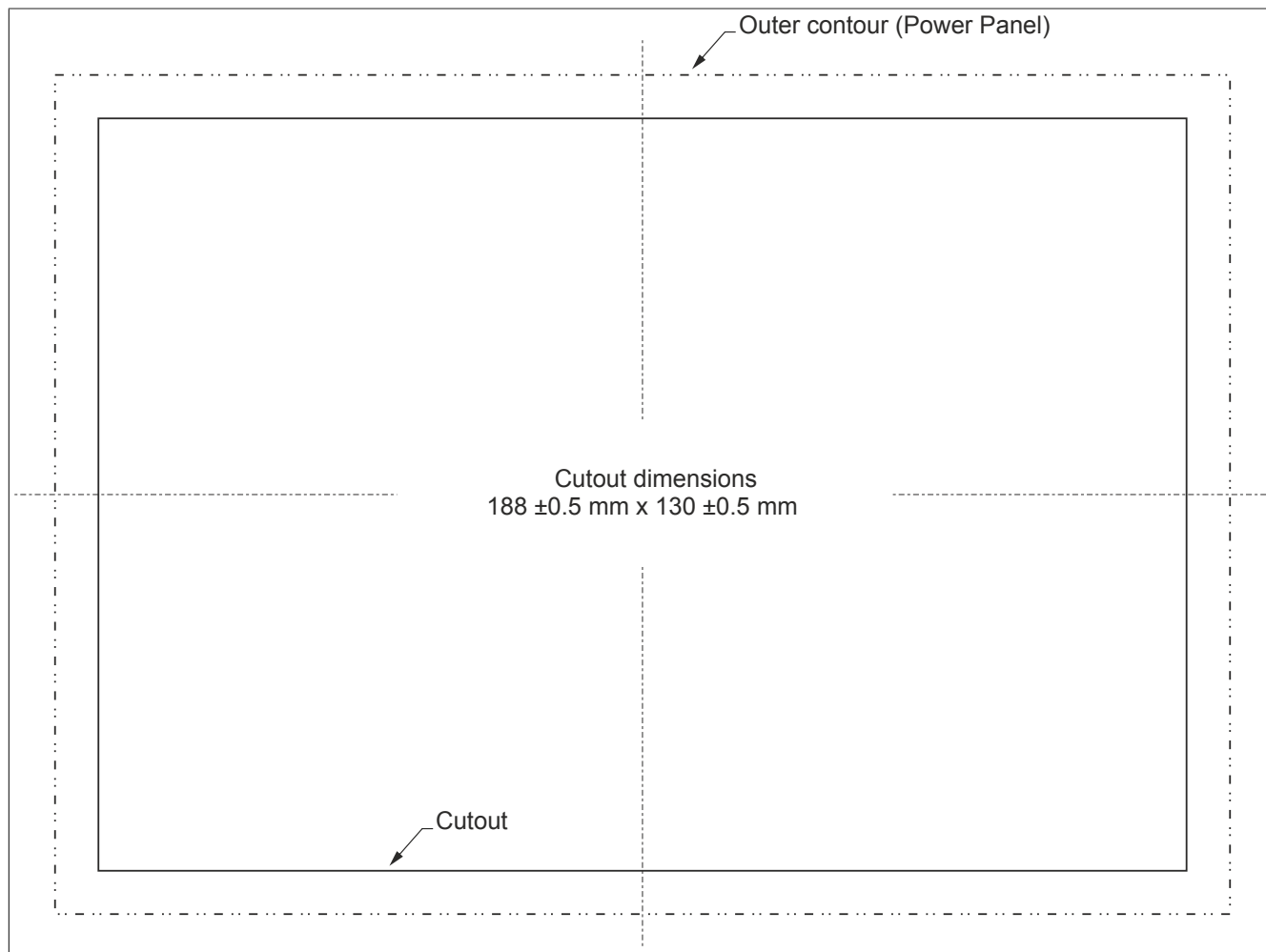


Figure 8: 4PP065.0571-B00 - Cutout installation



### 3.6 Panel overlay design

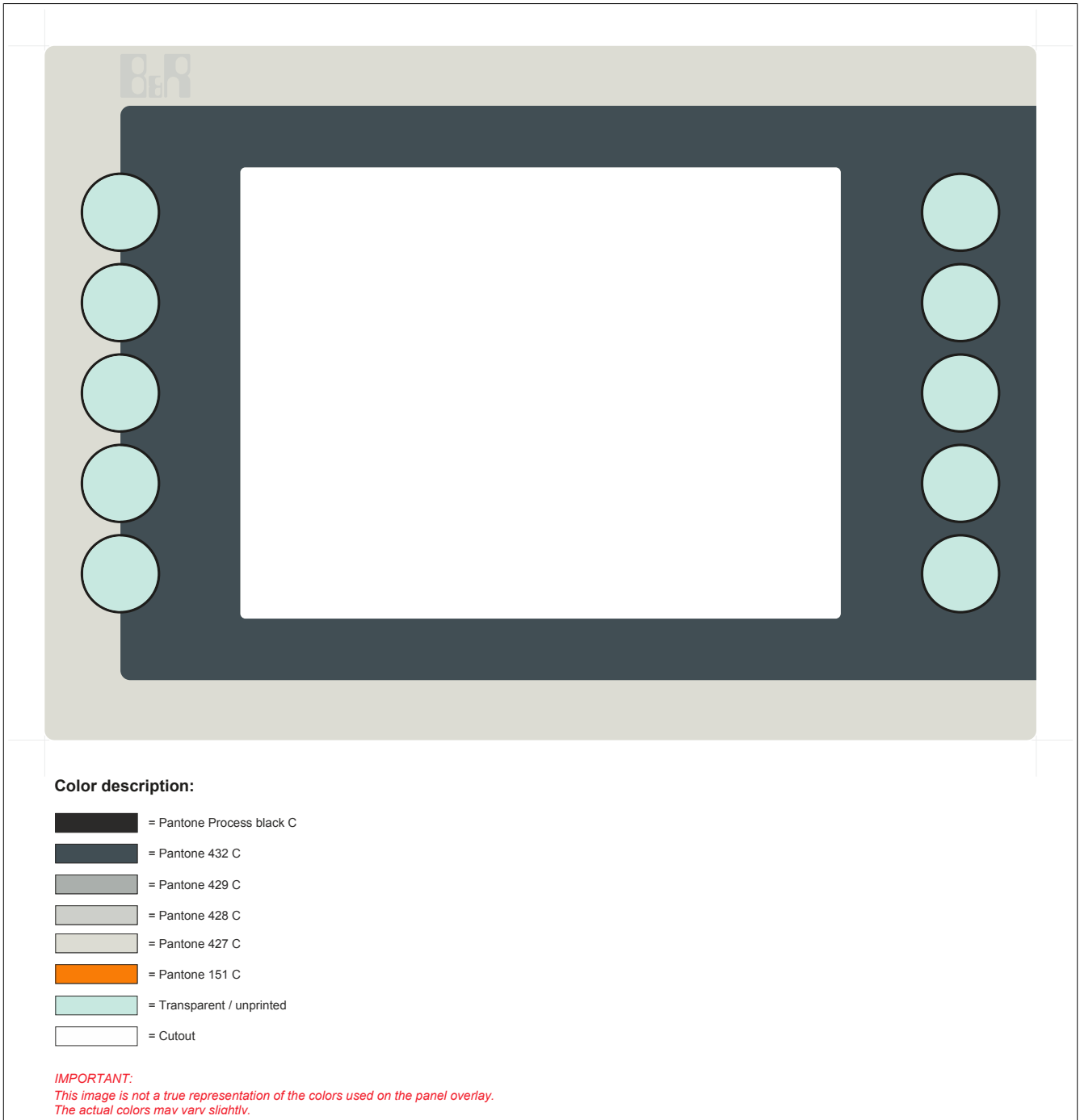


Figure 9: 4PP065.0571-B00 - Panel overlay design

### 3.7 Slide-in labels



Figure 10: 4PP065.0571-B00 - Slide-in labels

## 4 Commissioning

### 4.1 Mounting instructions

The Power Panel must be mounted using the retaining clips included in delivery (with a torque of 0.6 Nm). Each Power Panel comes with six retaining clips (two each for top/bottom and one each for left/right).

In order to guarantee sufficient air circulation, allow the specified amount of space above, below, to the side and behind the Power Panel. The minimum specified spacing is indicated in the following diagrams. This applies to all Power Panel variants.

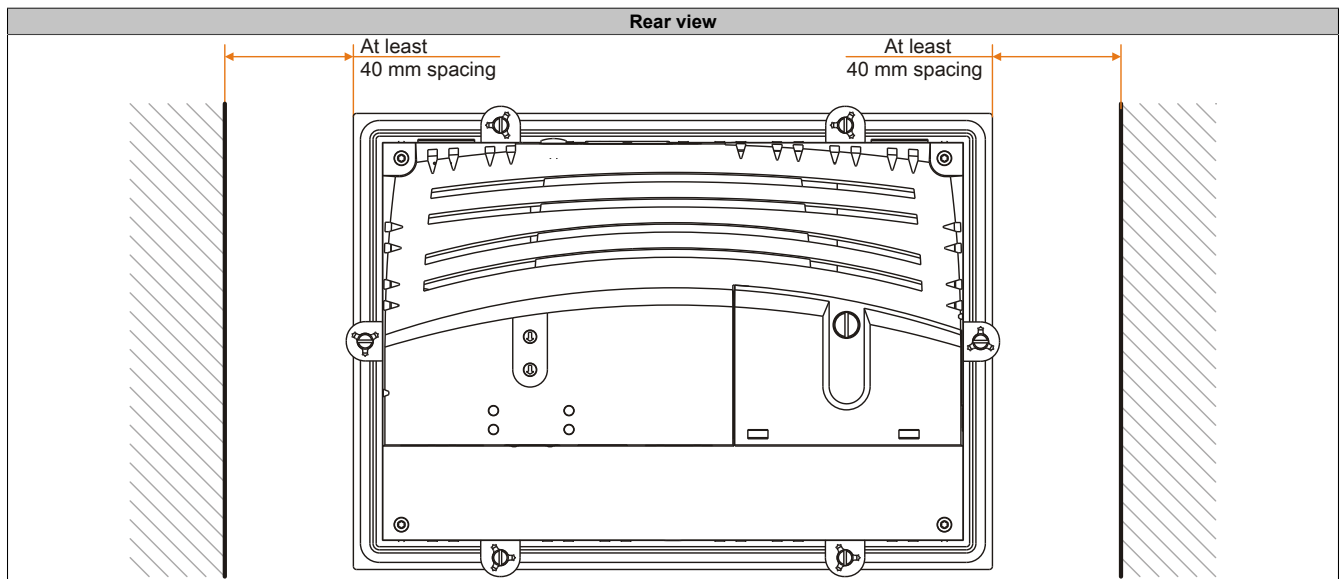


Table 14: Spacing for air circulation - Rear view

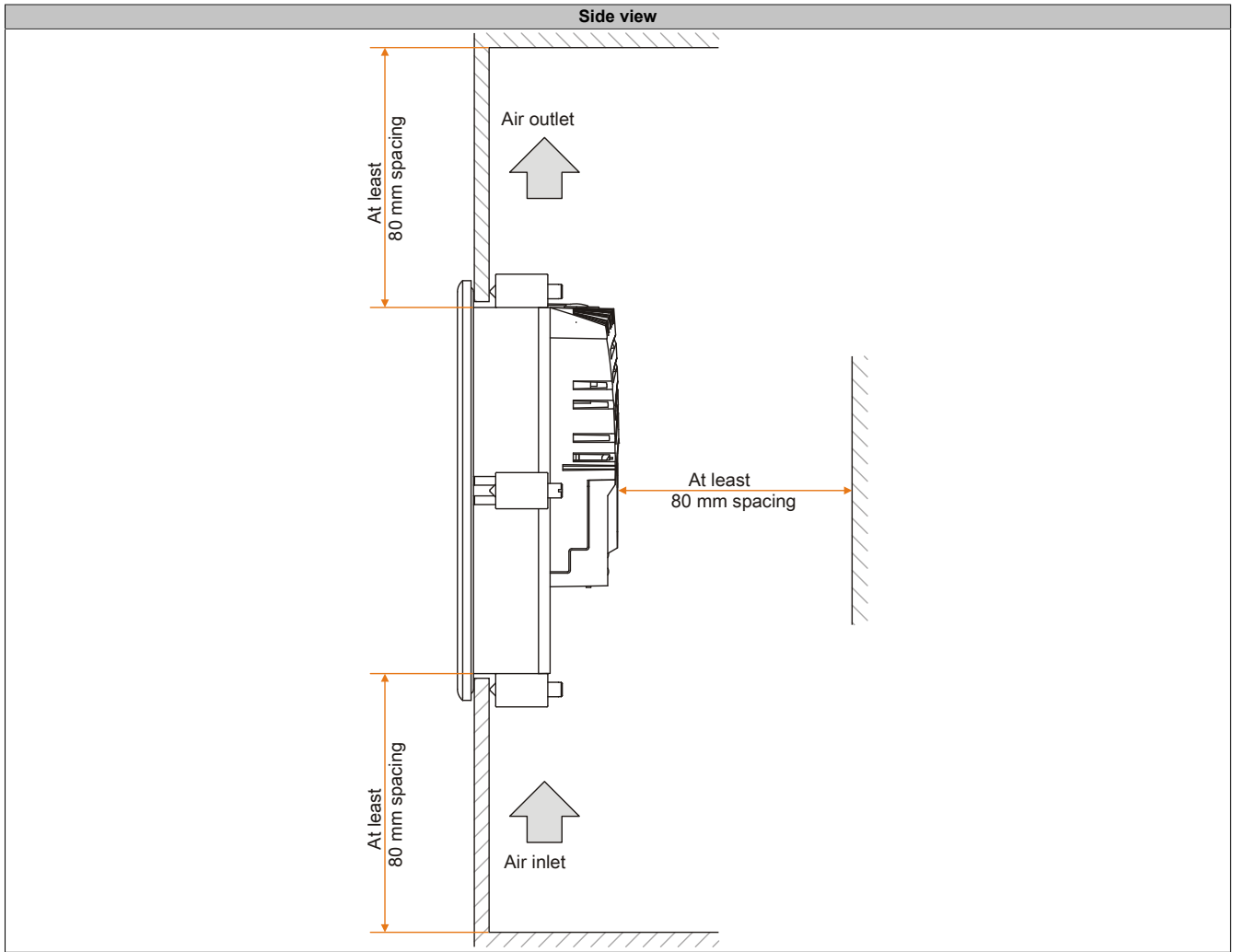


Table 15: Spacing for air circulation - Side view

## 4.2 Mounting orientation

The following diagram shows the approved mounting orientations for Power Panel devices. These mounting orientations apply to all Power Panel variants.

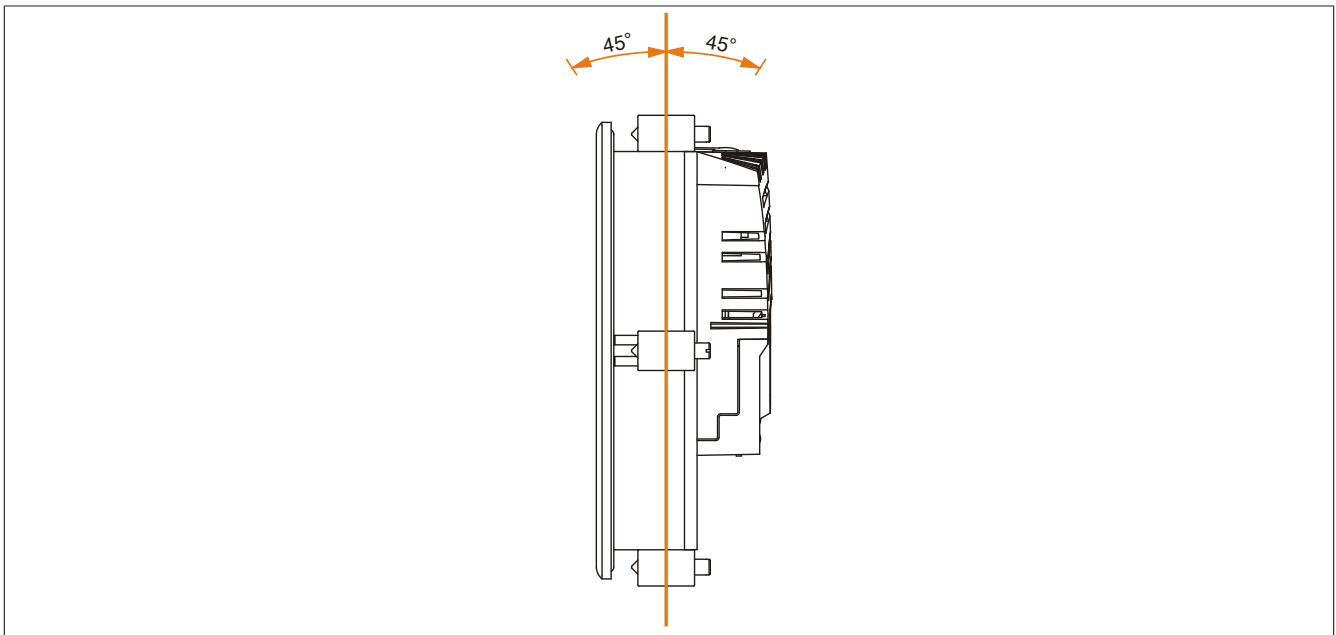


Figure 11: Power Panel - Mounting orientations

### Caution!

The maximum permitted ambient temperature can be found in the technical data for the respective Power Panel device.

### 4.3 Installing interface modules

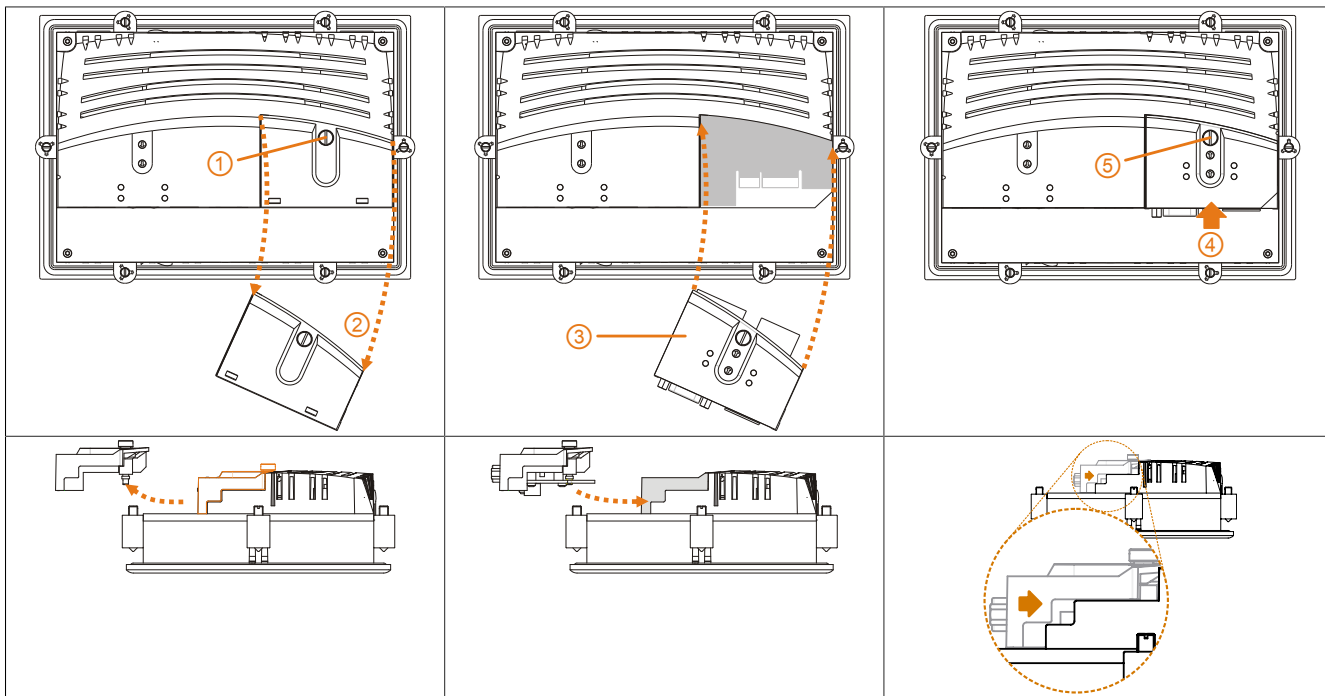


Table 16: Installing PP65 interface modules in the Power Panel 65

- 1) Remove the screws from the cover.
- 2) Remove the cover.
- 3) Insert the interface module into the PP65.
- 4) Apply light pressure until the interface module is inserted all the way.
- 5) Secure the interface module with the screws (max. 0.6 Nm).

### 4.4 Touch screen calibration

B&R touch screen devices are equipped with a touch controller that supports hardware calibration. As a result, devices are pre-calibrated when delivered. This is an advantageous feature when replacing devices of the same model or type since it avoids having to recalibrate the new device. Nevertheless, calibrating the device is still recommended in order to achieve the best results and to better adapt the touch screen to the user's preferences.

### 4.5 Screen rotation

It is possible to rotate screen contents by 90° using the graphic driver's screen rotation function. Automation Runtime supports this function.

In Automation Studio 2.7.x or 3.0.x, the screen orientation can be defined when a project is created as well as later when editing the project.

## 5 Maintenance

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### 5.1 Cleaning

#### **Danger!**

**Power Panel devices may only be cleaned when switched off in order to prevent unintended functions from being triggered when handling the touch screen or pressing keys.**

Power Panel devices should be cleaned with a moist cloth. The cloth should be moistened with water and detergent, a screen cleaning agent or alcohol (ethanol). The cleaning agent should be applied to the cloth beforehand, not sprayed directly on the Power Panel device! Aggressive solvents, chemicals, scouring agents, pressurized air or steam jets should never be used.

#### **Information:**

**Displays with a touch screen should be cleaned regularly.**

### 5.2 Changing the battery

#### 5.2.1 General information

The battery buffers the internal real-time clock (RTC) and SRAM data (remanent and permanent variables, User RAM). The battery's buffer lifespan is at least 3 years (at 50°C, 18.5 µA for the components being supplied and a self-discharge of 40%).

It is only necessary to change the battery on devices with a lithium battery (see the technical data for the Power Panel device).

#### 5.2.2 Battery status evaluation

The status of the battery is determined immediately after the Power Panel is started and subsequently checked by the system every 24 hours. During this measurement, the battery is subjected to a brief load (approximately 1 second) and then evaluated. Once determined, the battery status can be read in a customer application using the BatteryStatusCPU data point or the HwGetBatteryInfo function (AsHW library).

Battery status	Description
OK	Data buffering is intact.
BAD	From the point when battery capacity is recognized as insufficient (BAD), data buffering is intact for approximately another 500 hours

Table 17: Battery status

From the point when battery capacity is recognized as insufficient, data buffering is intact for approximately another 500 hours

#### **Information:**

**The battery should only be changed by qualified personnel.**

### 5.2.3 Procedure for changing the battery

- Disconnect the power supply to the Power Panel.
- Touch the housing or ground connection in order to discharge any electrostatic charge from your body.
- Remove the battery cover from the top of the Power Panel device using a screwdriver (1).

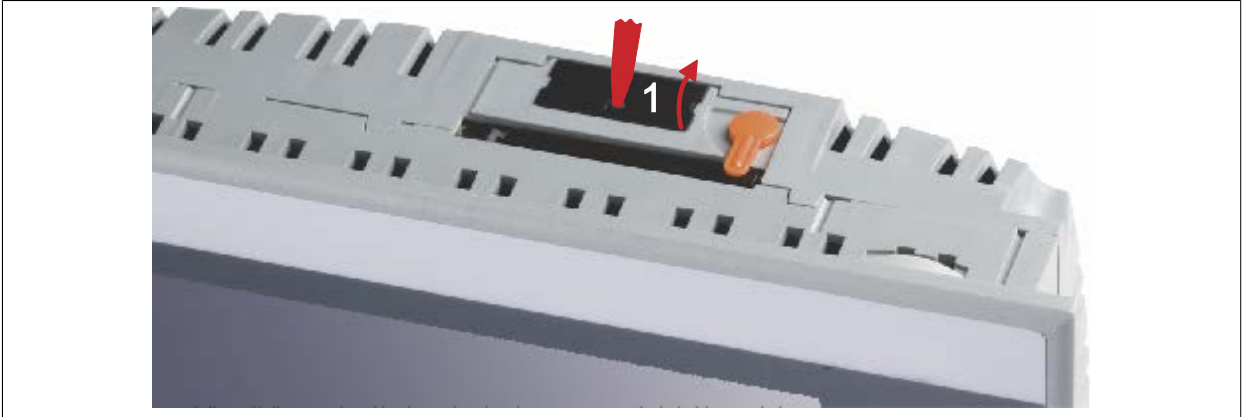


Figure 12: Changing the battery - Removing the battery cover

- Carefully remove the used battery from its fitting by pulling the removal strip (2).

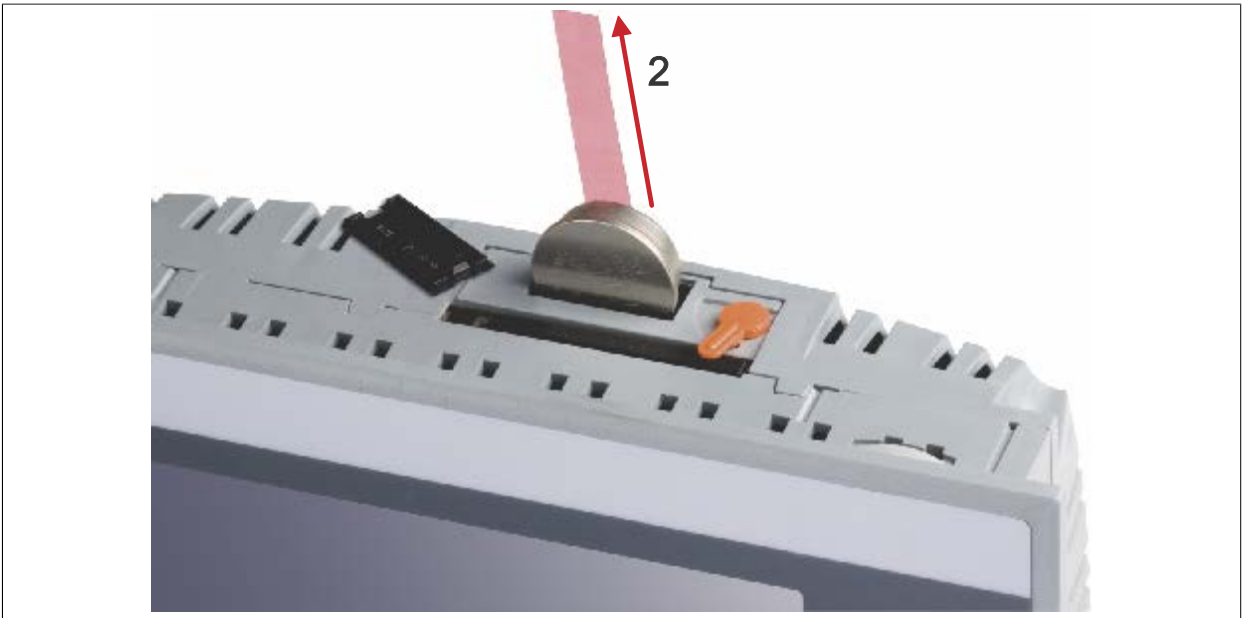


Figure 13: Changing the battery - Removing the battery

- In order to prevent a short circuit, do not touch the new battery with pliers or uninsulated tweezers. The battery should not be held by its edges.

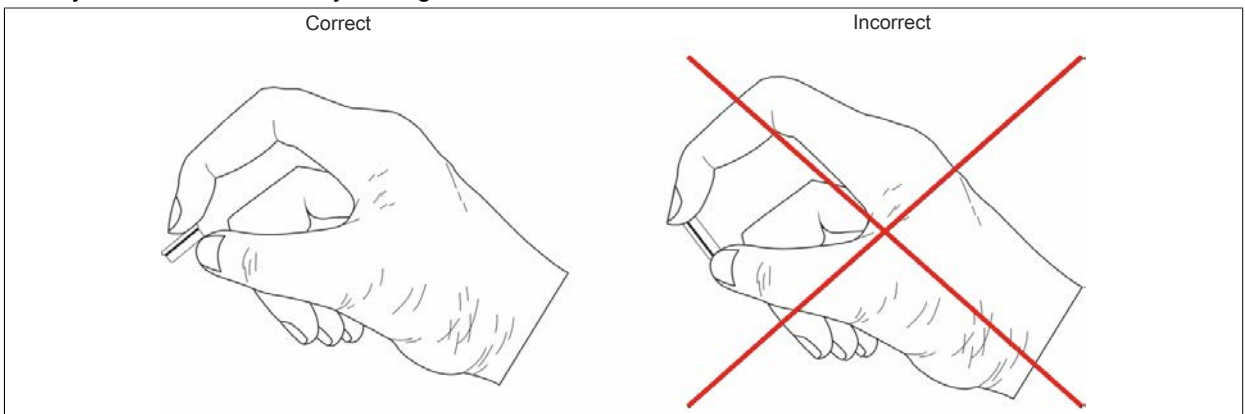


Figure 14: Battery handling



- Insert the new battery with the correct polarity. To make the next battery change easier, be sure the removal strip is in place when inserting the battery.
- Replace the battery cover.
- Reconnect the power supply to the Power Panel.
- Reset the date and time (using B&R Automation Studio).

## Warning!

Lithium batteries are considered hazardous waste. Used batteries should be disposed of in accordance with applicable local regulations.

## 5.3 Changing the CompactFlash card

### 5.3.1 Removing the CompactFlash card

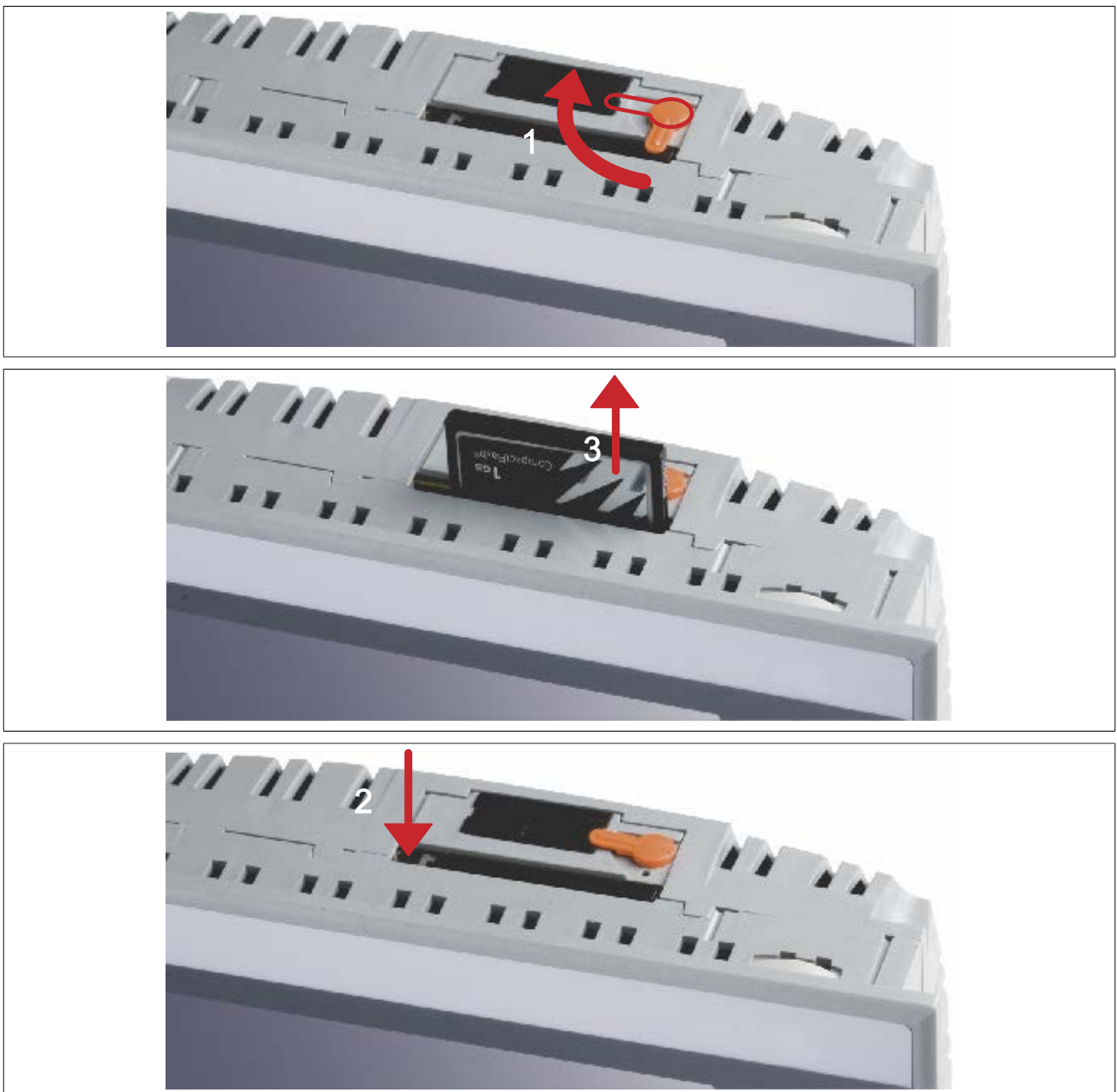
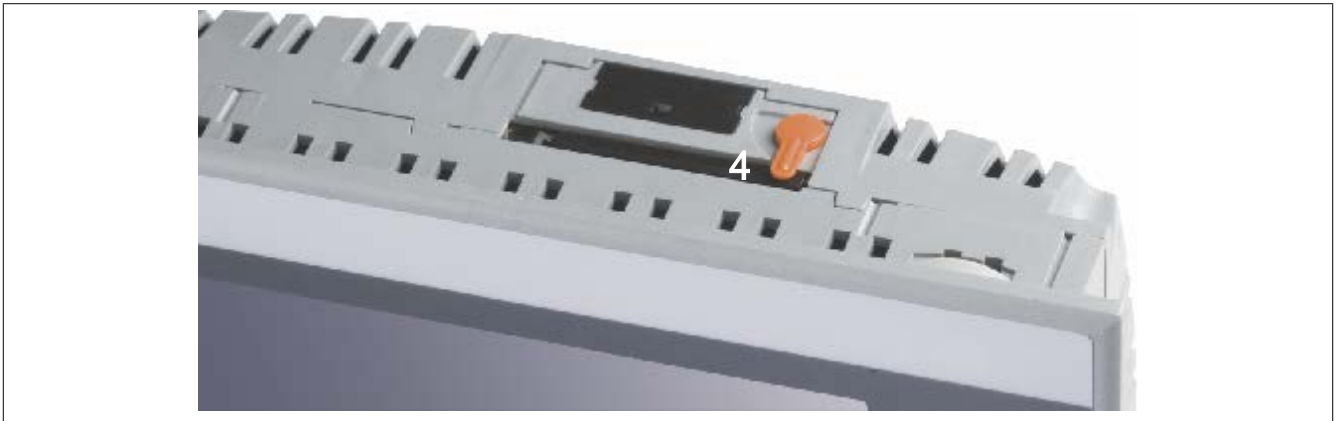
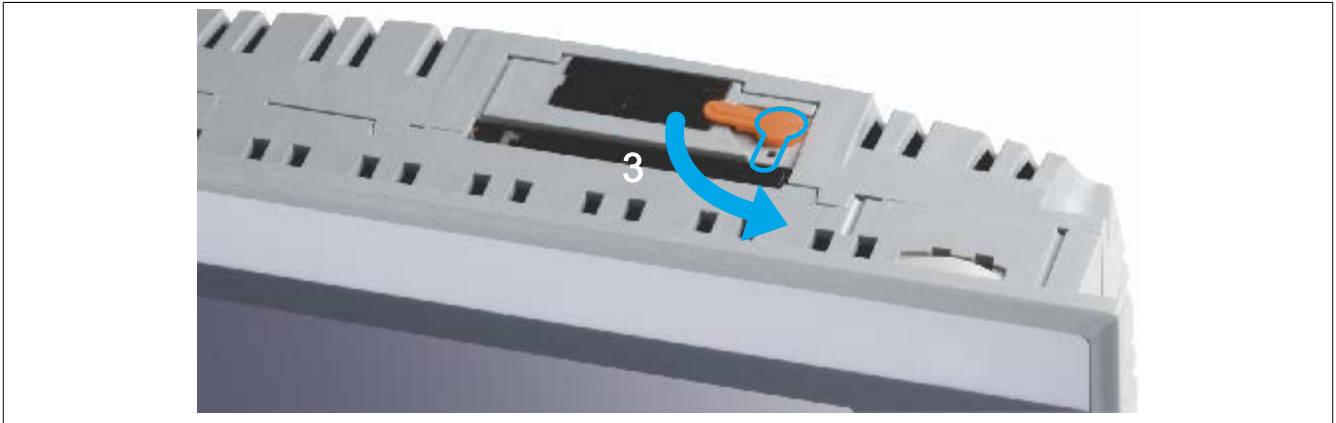
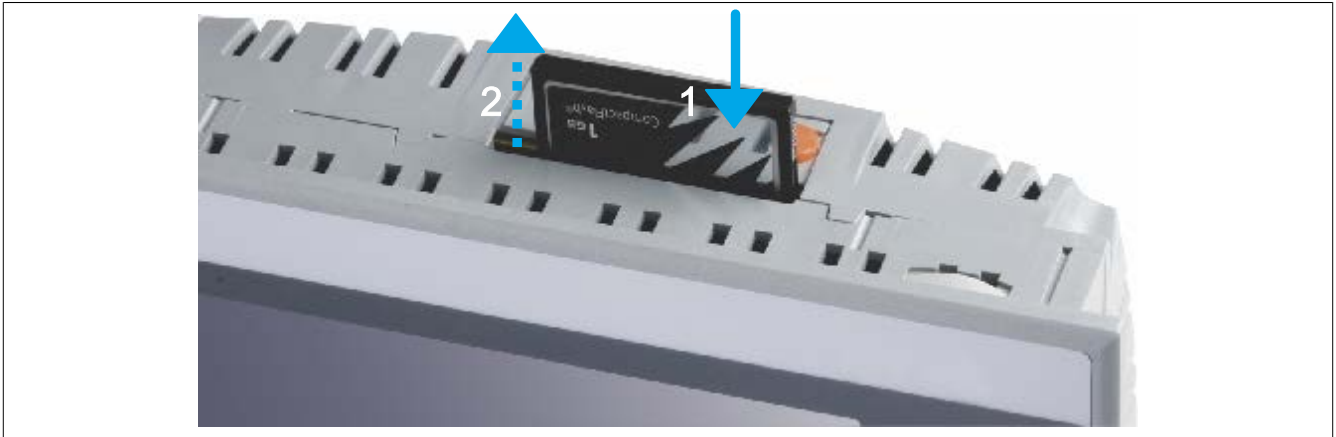


Figure 15: Removing the CompactFlash card

Rotate the orange CompactFlash safety latch away from the CompactFlash slot (1). Then press the CompactFlash ejection lever with a screwdriver (2) until the CompactFlash card is ejected. The CompactFlash card can now be removed by hand (3).

### 5.3.2 Inserting the CompactFlash card



Insert the CompactFlash card by hand (contact side first) into the CompactFlash slot until it is flush with the front of the device (1). This will push the ejection lever out to the same level (2). The CompactFlash slot is mechanically designed to prevent the card from being inserted incorrectly. If inserted incorrectly, the CompactFlash card will not go in all the way and the ejection lever will not extend out. Finally, rotate the safety latch over the CompactFlash slot (3) to secure the CompactFlash card (4).

## 5.4 Preventing screen burn-in on LCD/TFT displays

Screen burn-in (afterimages, display memory effect, image retention or image sticking) occurs on LCD/TFT displays if a static image is displayed for a prolonged period of time. This static screen content causes the build-up of parasitic capacitances within the LCD components that prevent liquid crystal molecules from returning to their original state. This condition is unpredictable and can depend on the following factors:

- Type of image displayed
- Color composition of the image
- Length of time that the image is displayed
- Ambient temperature

### 5.4.1 How can this be avoided?

There is no perfect solution. There are ways to significantly reduce this effect, however:

- Avoid static images or screen content.
- Use non-static screensavers when the display is not in use.
- Change images frequently.
- Turn off the display when not in use.

Turning off the backlight does not help prevent screen burn-in.

Figure 1:	4PP065.0571-B00 - Oblique view.....	3
Figure 2:	4PP065.0571-B00 - Rear view.....	4
Figure 3:	4PP065.0571-X74F - Diagnostic LEDs.....	6
Figure 4:	4PP065.0571-X74F - ACT/LNK LEDs for the RJ45 port.....	7
Figure 5:	4PP065.0571-X74F - Connection elements.....	8
Figure 6:	4PP065.0571-X74F - Operating mode and node number switches.....	11
Figure 7:	4PP065.0571-B00 - Dimensions.....	15
Figure 8:	4PP065.0571-B00 - Cutout installation.....	16
Figure 9:	4PP065.0571-B00 - Panel overlay design.....	17
Figure 10:	4PP065.0571-B00 - Slide-in labels.....	18
Figure 11:	Power Panel - Mounting orientations.....	21
Figure 12:	Changing the battery - Removing the battery cover.....	24
Figure 13:	Changing the battery - Removing the battery.....	24
Figure 14:	Battery handling.....	24
Figure 15:	Removing the CompactFlash card.....	25

Table 1:	4PP065.0571-B00 - Order data.....	5
Table 2:	Version information.....	5
Table 3:	4PP065.0571-X74F – Supported interface modules.....	5
Table 4:	4PP065.0571-X74F - Diagnostic LEDs up to AR I2.96, D3.01 and A3.06.....	6
Table 5:	4PP065.0571-X74F - Diagnostic LEDs starting with AR J2.96, E3.01 and B3.06.....	7
Table 6:	4PP065.0571-X74F - Status LED blink code.....	7
Table 7:	4PP065.0571-X74F - ACT/LNK LEDs for the RJ45 port.....	7
Table 8:	4PP065.0571-X74F - X2X Link pinout.....	8
Table 9:	4PP065.0571-X74F - USB interface.....	9
Table 10:	4PP065.0571-X74F - Ethernet interface pinout.....	10
Table 11:	4PP065.0571-X74F - Supply voltage pinout.....	10
Table 12:	4PP065.0571-X74F - Operating mode and node number switches.....	11
Table 13:	4PP065.0571-B00 - Technical data.....	12
Table 14:	Spacing for air circulation - Rear view.....	19
Table 15:	Spacing for air circulation - Side view.....	20
Table 16:	Installing PP65 interface modules in the Power Panel 65.....	22
Table 17:	Battery status.....	23