

4EPIMC30.104P-30K

1 Order data


Order number	Short description	Figure
	Power Panel C30	
4EPIMC30.104P-30K	SMARTMOLD C30, 10.4", SVGA (600 x 800)	
	Optional accessories	
	Terminal blocks	
0TB2103.9110	Accessory terminal block, 3-pin, push-in terminal block 2.5 mm ²	

Table 1: 4EPIMC30.104P-30K - Order data

2 Technical data

Order number	4EPIMC30.104P-30K
General information	
B&R ID code	0xF36E
Cooling	Passive
Power button	No
Reset button	Yes
Status indicators	Supply voltage OK, operating state, module status, Ethernet
Buzzer	No
Support	
Controller redundancy	No
ACOPOS support	No
Visual Components support	Yes
Safety support	No
Certifications	
CE	Yes
Terminal	
Processor	
Type	ARM Cortex-A8
Clock frequency	1 GHz
L1 cache	
Data code	24 kB
Program code	32 kB
L2 cache	256 kB
DRAM	256 MB
Application memory	
Type	512 MB flash memory
Data retention	10 years
Writable data amount	
Guaranteed	40 TB
Results for 5 years	21.9 GB/day
Guaranteed erase/write cycles	20,000
Error-correcting code (ECC)	Yes
Display	
Type	TFT color
Diagonal	10.4" (264 mm)
Colors	16.7 million (RGB, 8 bits per channel) ¹⁾
Resolution	SVGA, 800 x 600 pixels
Contrast	Typ. 500:1 / Min. 400:1
Viewing angles	
Horizontal	Direction L = Typ. 70° / Min. 60° Direction R = Typ. 60° / Min. 50°
Vertical	Direction U / Direction D = Typ. 70° / Min. 60°
Backlight	
Brightness	Typ. 350 cd/m² / Min. 300 cd/m²
Half-brightness time ²⁾	30,000 h
Screen rotation	Yes
Interfaces	
Interface IF3	
Type	Ethernet
Variant	1x RJ45 shielded
Line length	Max. 100 m between 2 nodes (segment length)
Max. transfer rate	10/100 Mbit/s
Transfer	
Physical layer	10BASE-T/100BASE-TX
Half-duplex	Yes
Full-duplex	Yes
Autonegotiation	Yes
Auto-MDI/MDIX	Yes
Interface IF4	
Type	USB 2.0
Variant	Type A
Current-carrying capacity	0.49 A
Keys	
Variant	Membrane keypad with metallic snap-action disks
Total keys	65 membrane keys (26 with LED)
Cursor keys	Yes
Number block	Yes
Electrical properties	
Nominal voltage	24 VDC ±25%
Nominal current	0.35 A
Inrush current	Max. 2.8 A

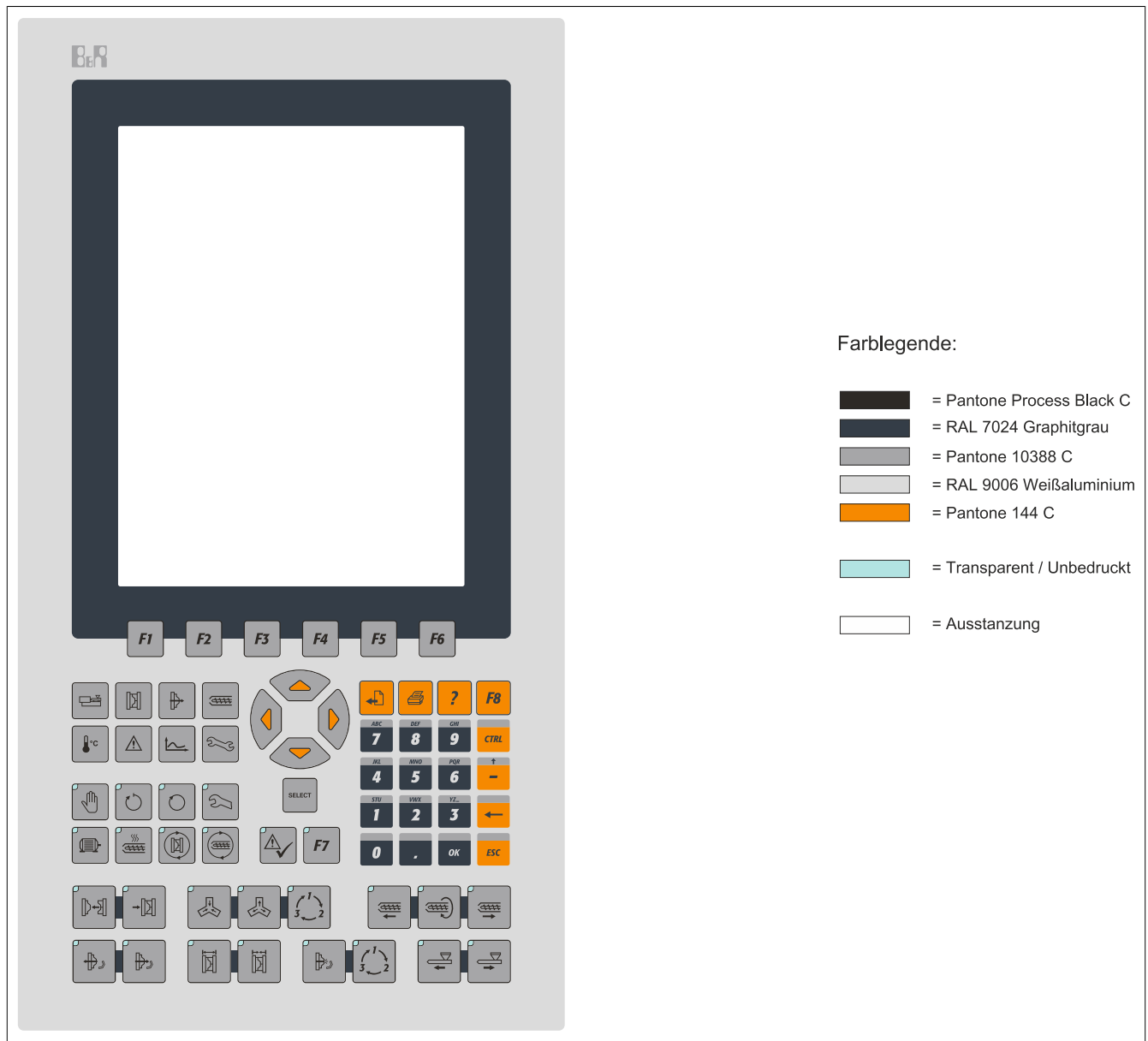
Table 2: 4EPIMC30.104P-30K - Technical data

Order number		4EPIMC30.104P-30K
Power consumption ³⁾		Typ. 4.8 W / Max. 8.4 W
Fuse		3.5 A slow-blow, internal ⁴⁾
Reverse polarity protection		Yes
Galvanic isolation		No
Electrical isolation		Ethernet (IF3) to other interfaces and to device
Operating conditions		
Installation elevation above sea level		
0 to 2000 m		No limitation
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Maximum		3000 m
Degree of protection per EN 60529		Back: IP20
		Front: IP65, protected against dust and hose-directed water
Ambient conditions		
Temperature		
Operation		0 to 50°C
Storage		-20 to 70°C
Transport		-20 to 70°C
Relative humidity		5 to 95%, non-condensing
Mechanical properties		
Housing		
Material		Plastic
Front		
Panel overlay		
Material		Polyester
Dimensions		
Width		259.6 mm
Height		475 mm
Depth		39.3 mm
Weight		1.95 kg

Table 2: 4EPIMC30.104P-30K - Technical data

- 1) The actual number of available colors depends on the graphics memory, configured graphics mode and graphics driver being used.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can increase the half-brightness time by approximately 50%.
- 3) Power consumption including all interfaces.
- 4) The internal fuse cannot be replaced by the user or reset.

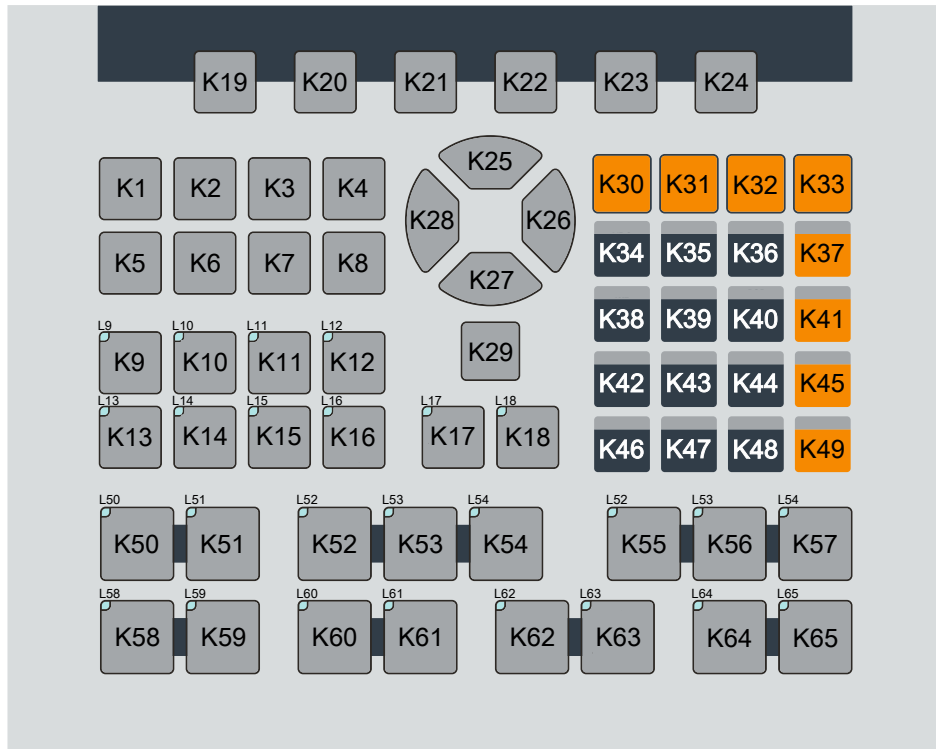
2.1 Panel overlay design



Information:

This color print is not a true color print, i.e. the colors of the panel overlay may deviate slightly.

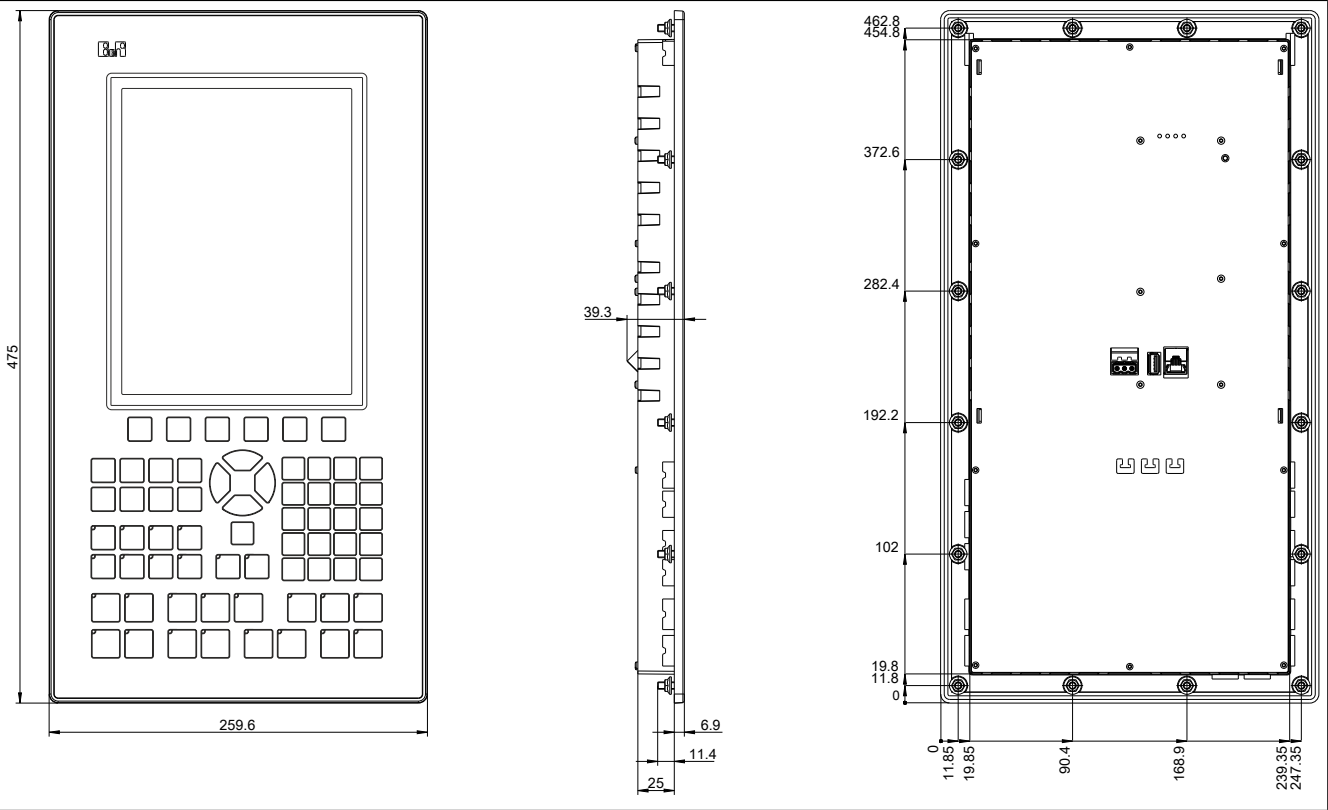
2.2 Key and LED matrix



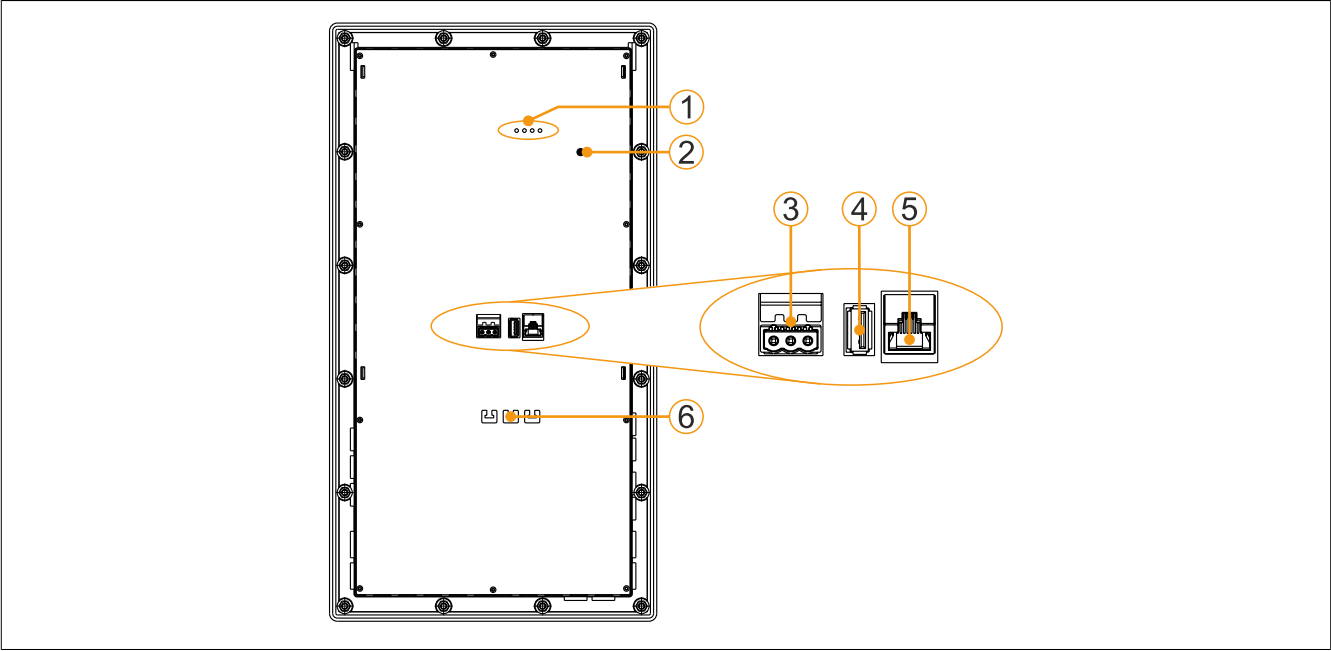
Key and LED assignments - VC

Key	Bit	LED	Bit	Key	Bit	LED	Bit	Key	Bit	LED	Bit
K1	0			K23	22			K45	44		
K2	1			K24	23			K46	45		
K3	2			K25	24			K47	46		
K4	3			K26	25			K48	47		
K5	4			K27	26			K49	48		
K6	5			K28	27			K50	49	L50	49
K7	6			K29	28			K51	50	L51	50
K8	7			K30	29			K52	51	L52	51
K9	8	L9	8	K31	30			K53	52	L53	52
K10	9	L10	9	K32	31			K54	53	L54	53
K11	10	L11	10	K33	32			K55	54	L55	54
K12	11	L12	11	K34	33			K56	55	L56	55
K13	12	L13	12	K35	34			K57	56	L57	56
K14	13	L14	13	K36	35			K58	57	L58	57
K15	14	L15	14	K37	36			K59	58	L59	58
K16	15	L16	15	K38	37			K60	59	L60	59
K17	16	L17	16	K39	38			K61	60	L61	60
K18	17	L18	17	K40	39			K62	61	L62	61
K19	18			K41	40			K63	62	L63	62
K20	19			K42	41			K64	63	L64	63
K21	20			K43	42			K65	64	L65	64
K22	21			K44	43						

3 Dimensions



4 Connection elements



Legend			
1	"LED status indicators" on page 9	2	"Reset button" on page 9
3	"+24 VDC power supply" on page 7	4	"USB interface IF4" on page 8
5	"Ethernet interface IF3" on page 8	6	Shielding and strain relief

4.1 +24 VDC power supply

Danger!

The device is only permitted to be supplied with a SELV/PELV power supply unit or with safety extra-low voltage (SELV) per EN 60950.

The necessary 3-pin connector is not included in delivery; for suitable accessories, see "0TB2103.9110".

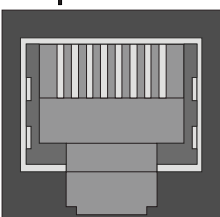
The device is protected against overload and reverse polarity by a soldered fuse (3.5 A, slow-blow). If the fuse is defective (e.g. due to overload), the device must be sent to B&R for repairs. If the polarity is reversed, it is not necessary to replace the fuse.

Pin	Description	Figure
1	+	
2	Functional ground	
3	-	
<ul style="list-style-type: none">Reverse polarity protection3-pinMale		
Electrical properties		
Nominal voltage		24 VDC ±25%, SELV
Nominal current		0.35 A
Inrush current		Max. 2.8 A
Galvanic isolation		No

4.2 Ethernet interface IF3

IF3	
Variant	RJ45, female
Wiring	S/STP (Cat 5e)
Transfer rate	10/100 Mbit/s
Cable length	Max. 100 m (min. Cat 5e)
LED "Link" / ETH status	
See "LED status indicators" on page 9.	
-	

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4.3 USB interface IF4

The Power Panel is equipped with a USB 2.0 host controller with 1 USB interface, which in terminal mode can only be used to update the Power Panel and is not for permanent use.

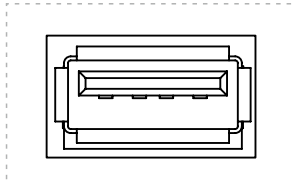
The USB interface is only permitted to be used for service purposes.

Warning!

USB peripheral devices can be connected to the USB interfaces. Due to the variety of USB devices available on the market, B&R cannot guarantee their functionality. The functionality of USB devices available from B&R is ensured.

Notice!

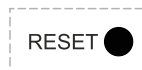
Due to the general PC specification, these USB interfaces must be handled with the utmost care with regard to EMC, cable routing, etc.

USB interface IF4		
Standard	USB 2.0	
Variant	Type A, female	
Transfer rate	Low speed (1.5 Mbit/s)	
	Full speed (12 Mbit/s)	
	High speed (480 Mbit/s)	
Current-carrying capacity ¹⁾	Max. 0.49 A	
Cable length	Max. 3 m	
-		

1) The USB interface is protected by a maintenance-free "USB current-limiting switch" (max. 0.5 A).

4.4 Reset button

The reset button can be used to switch to one of 3 operating modes. The following key codes are used to select the desired operating mode:



Operating mode ¹⁾	Key code / Description
RUN	Key code: 1. Press key briefly (<2 s). 2. As soon as LED "R/E" lights up red, the button can be released. A hardware reset is triggered. <ul style="list-style-type: none"> All application programs are stopped. The outputs of all connected modules are set to zero. The controller then boots into service mode by default. The startup mode that follows after pressing the reset button can be set in Automation Studio. <ul style="list-style-type: none"> SERVICE mode (default) Warm restart Cold restart DIAGNOSIS mode
DIAGNOSIS	Key code: 1. Press and hold key (>2 s). 2. LED "R/E" lights up red and then goes dark. 3. As soon as LED "R/E" goes dark, the button can be released. The device is started in mode DIAGNOSIS . Program sections in User RAM and in the User FlashPROM are not initialized. A warm restart always take place after exiting mode DIAGNOSIS.
BOOT	Key code: 1. Press key briefly (<2 s). 2. As soon as LED "R/E" lights RED, the button can be released. 3. Short pause (<2 s) 4. Press the key. 5. As soon as LED "R/E" is no longer lit, the button can be released. The device changes to mode BOOT . Boot AR is started. In this mode, the runtime system can be installed with Automation Studio via the online interface. User flash memory is erased only when the download begins.

1) The operating mode can be seen in the display during the startup phase of the device.

4.5 LED status indicators



Description	Color	Status	Description
ETH	Green	On	The link to the remote station is established.
		Blinking	The link to the remote station is established, and Ethernet activity is taking place on the bus.
RUN	Green	On	Mode RUN: The application is running.
ERROR	Red	On	Mode BOOT, SERVICE or DIAGNOSIS
RDY/F (optional)	Yellow	On	Mode BOOT, SERVICE or DIAGNOSIS
	Red	On	Not used

5 Commissioning

5.1 Installation

5.1.1 Requirements for the cables used

Notice!

To meet the UL certification requirements, copper cables must be used that are designed for an operating temperature $>70^{\circ}\text{C}$.

5.1.2 Requirements

When installing the Power Panel, it is important to ensure that the surface and wall thickness meet the following conditions:

Installation cutout property	Value
Permissible deviation from evenness Note: This condition must also be observed when the device is installed.	$\leq 0.5 \text{ mm}$
Permissible surface roughness in the area of the gasket	$\leq 120 \text{ }\mu\text{m}$ (Rz 120)
Min. wall thickness	2 mm
Max. wall thickness	6 mm

Notice!

The degree of protection provided by the device (see technical data) can only be maintained if it is installed in an appropriate housing that has at least the same degree of protection and in accordance with the above requirements.

Notice!

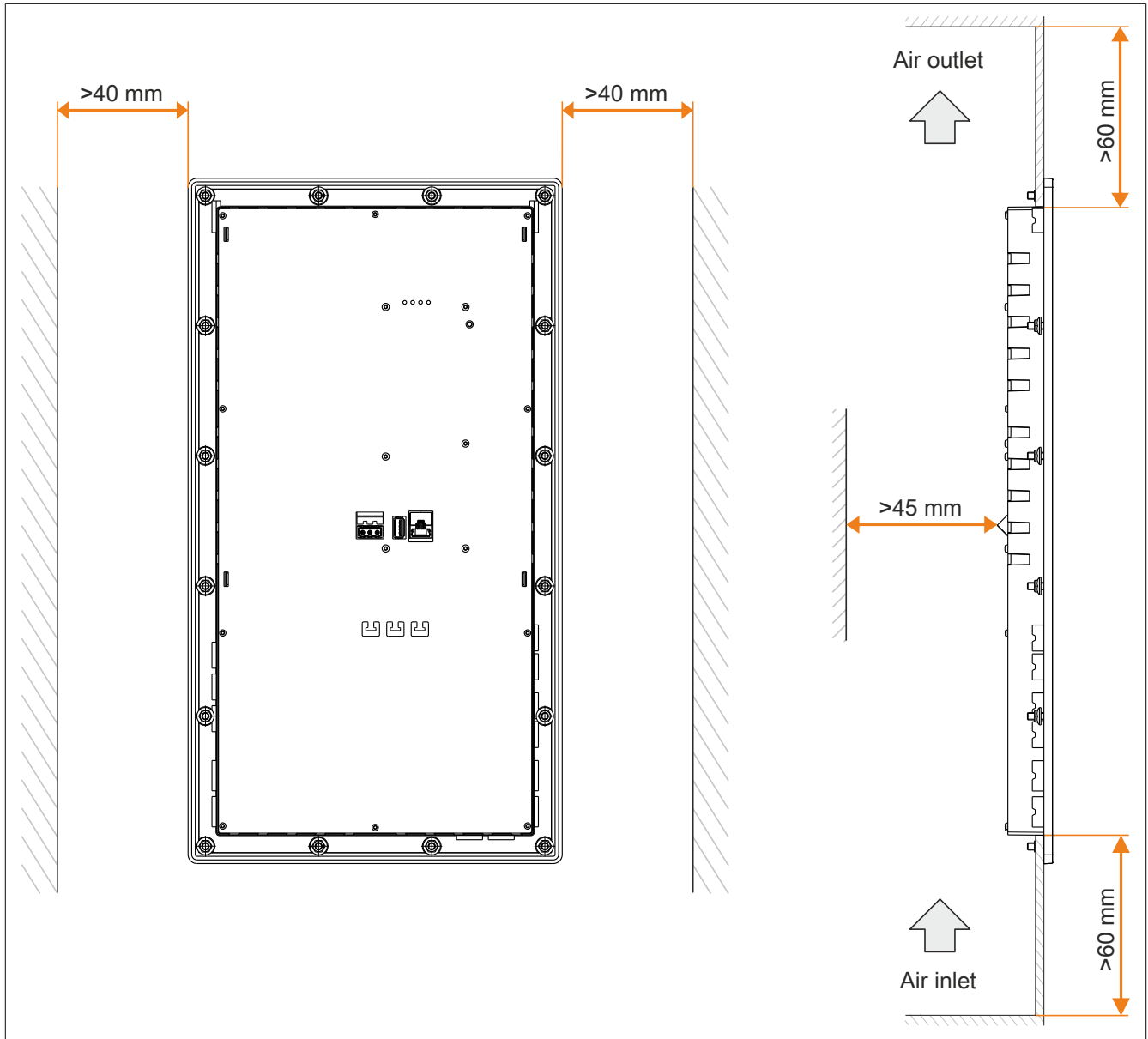
The device must ultimately be installed in a protective housing with sufficient rigidity (per IEC 61010-1 and IEC 61010-2-201).

5.1.3 Installation instructions

Panel 4EPIMC30.104P-30K must be installed with M4 nuts (tightening torque: 0.4 Nm).

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 schematic diagrams. This applies to all Power Panel variants.

Air circulation



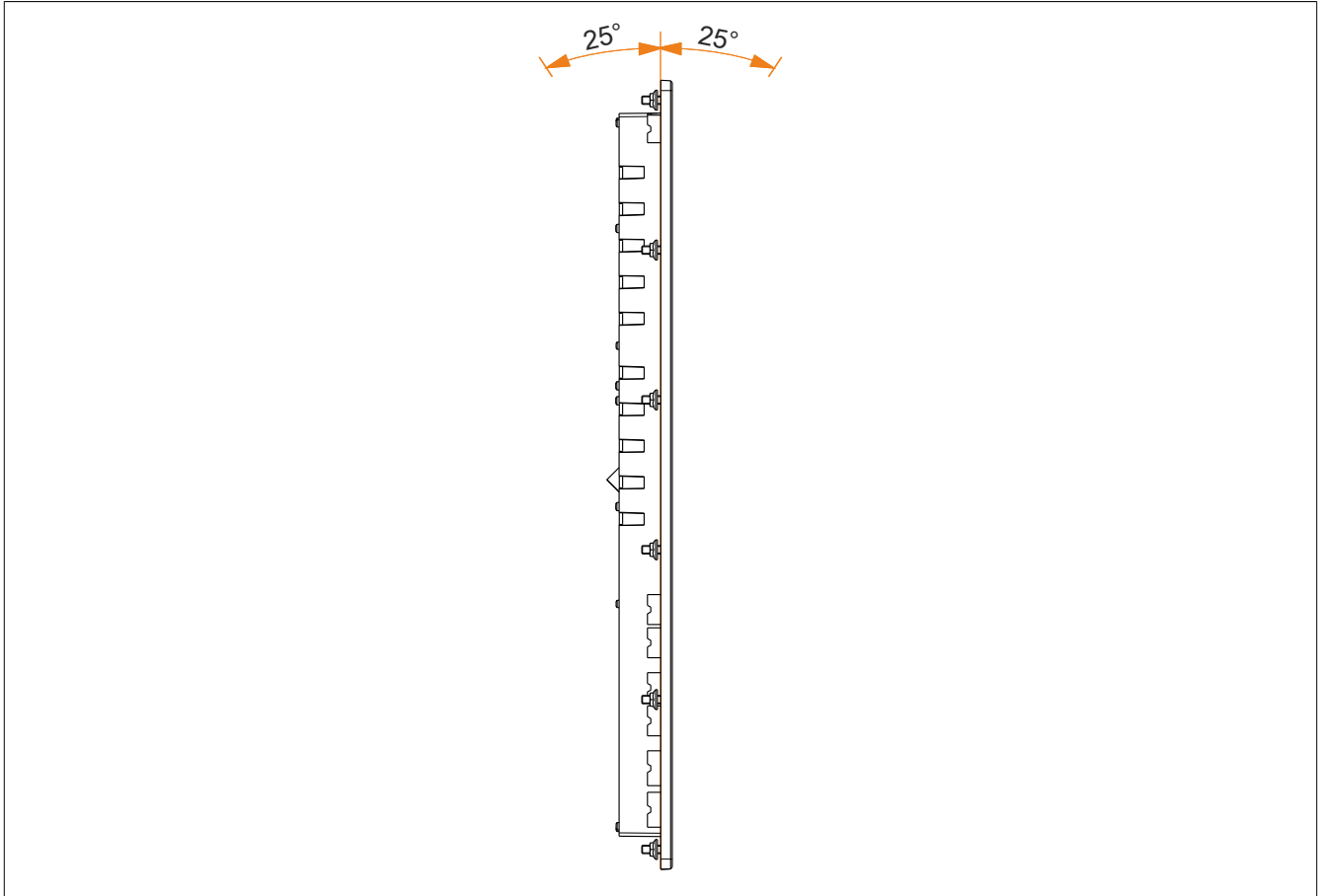
Information:

The specified spacing for air circulation is based on worst-case operation at the maximum specified ambient temperature (see "Temperature specifications" in section ["Technical data" on page 2](#)).

If the specified spacing for air circulation cannot be observed, then the internal housing temperature must be monitored by the user and appropriate measures taken if they are exceeded (see ["Temperature monitoring" on page 17](#)).

5.1.4 Mounting orientations

The following diagram shows the specified mounting orientation of panel 4EPIMC30.104P-30K.



5.1.5 Grounding


Functional ground is a current path of low impedance between circuits and ground. It is used to improve immunity to interference, for example, and not as a protective measure. It serves only to divert interference, not to protect against contact with persons.

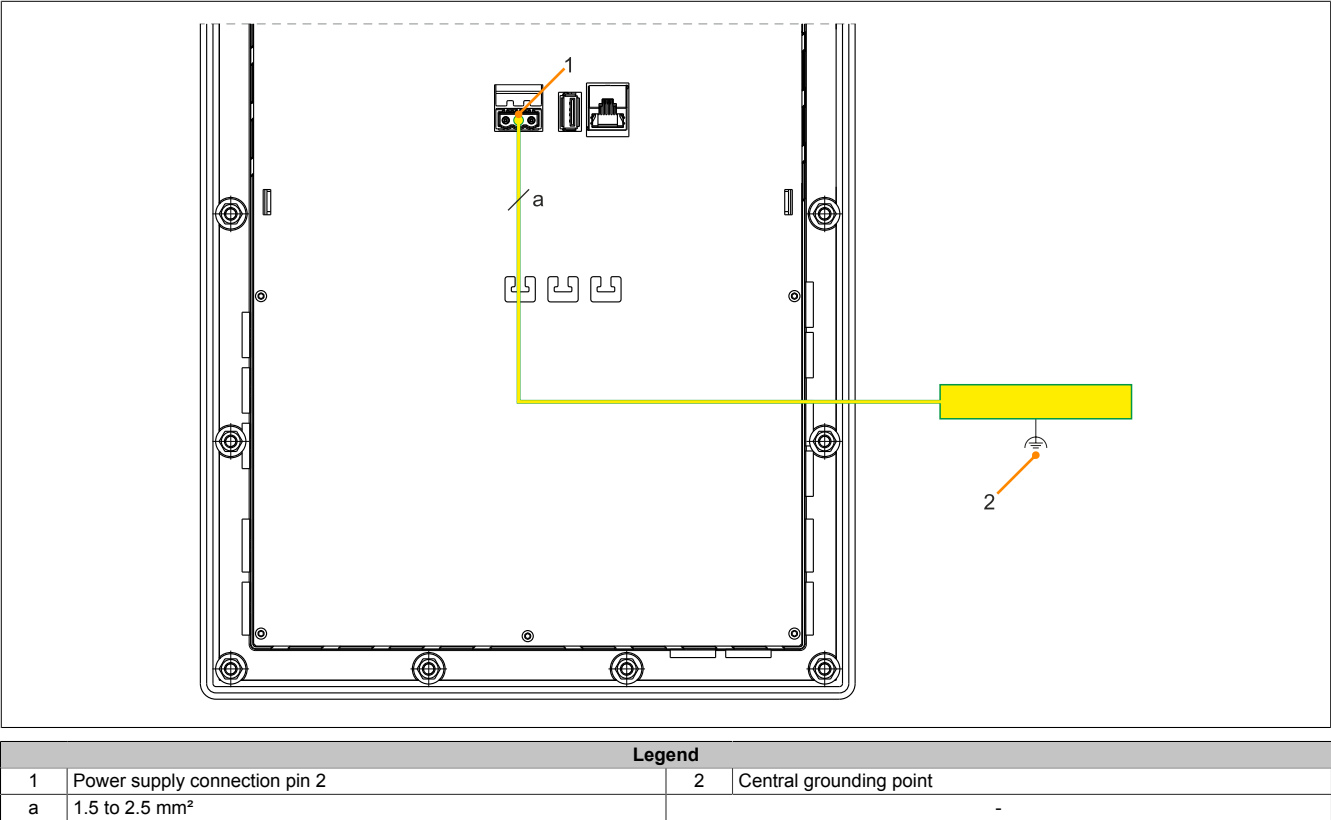
The device is equipped with 1 functional ground connection:

- Functional ground connection of the power supply

The following points must be observed to ensure that electrical interference is safely diverted:

- Connect the device to the central grounding point (e.g. the control cabinet or the system) using the shortest possible low-resistance path.
- Cable design with at least 2.5 mm² per connection. If a cable with wire end sleeve is used at terminal block 0TB2103.9110, a cable with a maximum of 1.5 mm² per connection is possible.
- Observe the shielding concept of the conductors. All data cables connected to the device must be shielded.

The functional ground on the B&R device is marked with the following symbol: 



5.1.6 Securing the connecting cables

With the 4EPIMC30.104P-30K, the cables can be relieved of tensile stress using cable ties on the back of the device.



Figure 1: Installing connecting cables

Information:

B&R recommends maintaining a bend radius of at least 5x the cable diameter if no specification has been specified by the cable manufacturer.

6 Maintenance

6.1 Cleaning

Power Panel devices should be cleaned with a moist cloth. Use only water with detergent, screen cleaner or alcohol (ethanol) to moisten the cloth. Apply the cleaning agent to the cloth first; do not spray it directly onto the Power Panel! Never use aggressive solvents, chemicals, abrasive cleaners, compressed air or steam cleaners.

Notice!

Cleaning the label on the back of the unit is only permitted with a dry cloth. This ensures readability of the thermal print during the service life of the device.

Information:

The display should be cleaned at regular intervals.

6.2 User tips for increasing the display's service life

Pixel errors

Information:

Displays can contain faulty pixels (pixel errors) due to the manufacturing process. They are not grounds for initiating a complaint or warranty claim.

6.2.1 Backlight

The service life of the backlight is specified by its "half-brightness time". An operating time of 50,000 hours would mean that the display brightness would still be 50% after this time.

How can the service life of backlights be extended?

- Set the display brightness to the lowest value comfortable for the eyes.
- Use dark images.
- Reducing the brightness by 50% can increase the half-brightness time by approximately 50%.

6.2.2 Screen burn-in

Image persistence refers to the "burning in" of a static image on a display after being displayed for a long time. It does not only occur with static images, however. Image persistence is also referred to in the technical literature as screen burn-in, image retention, memory effect, memory sticking or ghost image.

There are 2 different types:

- Area type: This type can be seen in a dark gray image. The effect disappears if the display is switched off for a long time.
- Line type: This can result in permanent damage.

What causes image persistence?

- Static images
- No screensaver
- Sharp transitions in contrast (e.g. black/white)
- High ambient temperatures
- Operation outside of specifications

How can image persistence be reduced?

- Switch continuously between static and dynamic images.
- Prevent excessive differences in brightness between foreground and background elements.
- Use colors with similar brightness.
- Use complementary colors for subsequent images.
- Use screensavers.

7 Operation

The following minimum software versions are required to operate the 4EPIMC30.104P-30K.

- AS: 4.8
- AR: A4.82 XEPIMC100
- VC: 4.72.1

7.1 Terminal mode

Information:

VC version 4.72.1 is required to operate the 4EPIMC30.104P-30K in terminal mode.

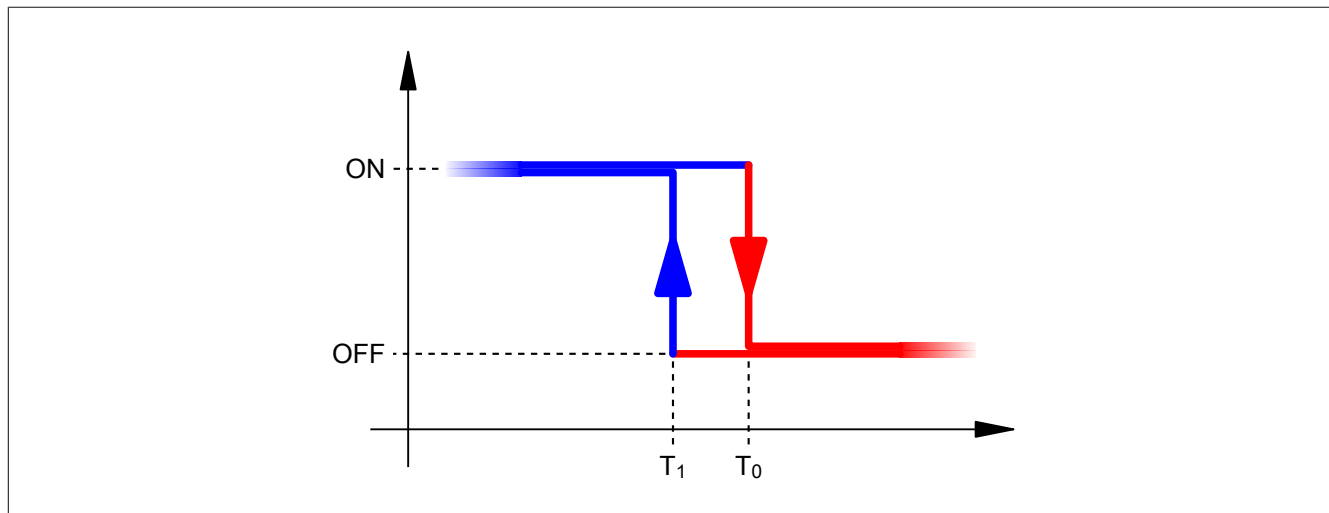
In terminal mode, the USB interface of the device is disabled.

To re-enable the USB interface, operating mode BOOT must be selected; see ["Reset button" on page 9](#).

8 Temperature monitoring

Automatic overtemperature shutdown

To prevent damage to the device, the inner temperature of the device is monitored continuously by multiple sensors. If the internal temperature of the Power Panel reaches or exceeds the switch-off temperature, an automatic shutdown occurs (OFF). The device is switched on again (ON) when the temperature drops at least 5°C below the switch-off temperature.



Temperature monitoring for the automatic shutdown is carried out at two places within the device:

Temperature monitoring	Switch-off temperature T_0	Switch-on temperature T_1	Datapoint
AR processor	100°C	95°C	TemperatureCPU

The following errors are entered in the logbook in the event of shutdown:

Error number	Short error text
9204	PLC restart triggered by the PLC CPU's temperature monitoring.
9210	Warning: Halt/Service after watchdog or manual reset.

Monitoring by the application

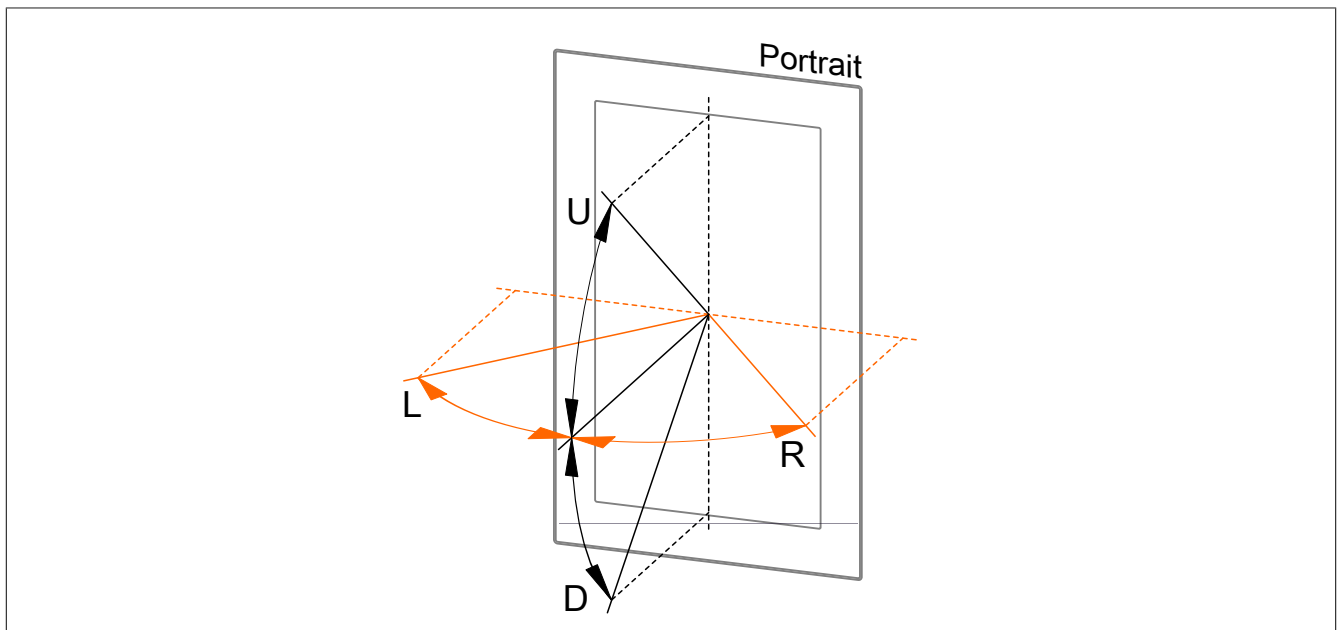
The application can also monitor temperatures and, if necessary, take appropriate corrective measures before an automatic shutdown occurs.

The following data points are available for this:

Datapoint	Description
TemperatureCPU	Temperature of the AR processor
TemperatureENV	Temperature of the mainboard
TerminalTemperatureCPU	Temperature of the terminal processor

9 Viewing angles

For the viewing angles values (U, D, R, L) of the display types, see the technical data of the respective device.



Legend	Display viewing angle
U	From top
D	From bottom
L	From left
R	From right

The viewing angles are specified for the horizontal (L, R) and vertical (U, D) axes in reference to the vertical axis of the display. The specified viewing angles above always refer to the standard mounting orientation of the respective Power Panel.

10 Surface resistance

Chemical resistance of the front glass per ASTM D 1308-02 and ASTM F 1598-95 for an exposure time of 24 hours without visible changes:

- Acetone
- Alkaline cleaning agents
- Ammonia 5%
- Gasoline (unleaded)
- Beer
- Brake fluid
- Chlorine-alkaline cleaning and disinfecting agents (pH value min. 11) 1.5%
- Hydrogen chloride 6%
- Coca-Cola
- Diesel
- Diesel oil
- Dimethylbenzene
- Vinegar
- Ethanol
- Grease
- Ammonia-based glass cleaners
- Sidolin glass cleaner
- Graphite
- Hydraulic fluid (Skydrol)
- Isopropanol
- Coffee
- Ink
- Lysol
- Methylbenzene
- Methyl ethyl ketone
- Naphtha
- Caustic soda 5%
- Nitric acid 70%
- Hydrochloric acid 5%
- Lubricants
- Sulphuric acid 40%
- Suntan oil and UV radiation
- Cooking oil
- Stamping ink
- Tea
- Turpentine
- Turpentine oil replacement (thinner)
- Trichloroethylene