

4XP0000.00-KA4

Technical documentation

Version: **1.11 (December 2020)**
Order no.: **4XP0000.00-KA4**

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1 Views



Figure 1: 4XP0000.00-KA4 - Oblique view



Figure 2: 4XP0000.00-KA4 - Rear view

2 General information

Information:

B&R makes every effort 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.

This user's manual is not intended for end customers! It is the responsibility of the machine manufacturer or system provider to provide the safety guidelines relevant to end customers in the operating instructions for the end customer in the respective local language.

2.1 Order data


Model number	Short description	Figure
	Keypad modules	
4XP0000.00-KA4	X2X keypad module, black, 6 B&R illuminated ring keys, 4-color (green, yellow, red, white), emergency stop switch, IP65 protection, fast mounting using 2 screws, connection made using M8/M12 circular connectors	

Table 1: 4XP0000.00-KA4 - Order data

2.1.1 Description

4XP0000.00-KA4 is a generally available add-on keypad with the following specifications:

- X2X keyboard, black
- Aluminum front with anodized surface
- 6 B&R illuminated ring keys (green, yellow, white, red)
- E-stop for direct wiring
- Front and back: IP65 protection
- Fast mounting using 2 screws

2.1.2 Version information

Version	Date	Comment
1.11	December 2020	Updated data sheet. <ul style="list-style-type: none"> • Added suitable attachment cables, see section "Accessories" on page 17.
1.10	2017-03-14	Updated data sheet. <ul style="list-style-type: none"> • Updated information about power supply. • Updated IP65 protection on front and back. • Updated UL certification. • Updated emergency stop.
1.00	2013-03-07	First edition

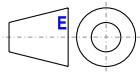
2.2 Organization of safety notices

Safety notices in this manual are organized as follows:

Safety notice	Description
Danger!	Disregarding these safety guidelines and notices can be life-threatening.
Caution!	Disregarding these safety guidelines and notices can result in severe injury or substantial damage to property.
Warning!	Disregarding these safety guidelines and notices can result in injury or damage to property.
Information:	This information is important for preventing errors.

Table 2: Organization of safety notices

2.3 Guidelines



European dimension standards apply to all dimension diagrams.

All dimensions in mm.

Unless otherwise specified, the following general tolerances apply:

Nominal dimension range	General tolerance per DIN ISO 2768 medium
Up to 6 mm	±0.1 mm
Over 6 to 30 mm	±0.2 mm
Over 30 to 120 mm	±0.3 mm
Over 120 to 400 mm	±0.5 mm
Over 400 to 1000 mm	±0.8 mm

Table 3: Nominal dimension ranges

3 General safety guidelines

3.1 Intended use

Programmable logic controllers, operating and monitoring devices (e.g. industrial PCs, Power Panels, Mobile Panels) as well as uninterruptible power supplies from B&R have been designed, developed and manufactured for normal use in industry. They have not been designed, developed and manufactured for use that involves fatal risks or hazards that could result in death, injury, serious physical harm or other loss without the assurance of exceptionally stringent safety precautions. In particular, this includes the use of these systems to monitor nuclear reactions in nuclear power plants, flight control systems, air traffic control, the control of mass transport vehicles, medical life support systems and the control of weapon systems.

3.2 Protection against electrostatic discharge

Electrical assemblies that can be damaged by electrostatic discharge (ESD) must be handled accordingly.

3.2.1 Packaging

- **Electrical assemblies with housing:**
Do not require special ESD packaging but must be handled properly (see "Electrical assemblies with housing").
- **Electrical assemblies without housing:**
Are protected by ESD-suitable packaging.

3.2.2 Regulations for proper ESD handling

Electrical assemblies with housing

- Do not touch the connector contacts of connected cables.
- Do not touch the contact tips on circuit boards.

Electrical assemblies without housing

The following applies in addition to "Electrical assemblies with housing":

- All persons handling electrical assemblies and devices in which electrical assemblies are installed must be grounded.
- Assemblies are only permitted to be touched on the narrow sides or front plate.
- Always place assemblies on suitable surfaces (ESD packaging, conductive foam, etc.). Metallic surfaces are not suitable surfaces!
- Assemblies must not be subjected to electrostatic discharges (e.g. due to charged plastics).
- A minimum distance of 10 cm from monitors or television sets must be maintained.
- Measuring instruments and devices must be grounded.
- Test probes of floating potential measuring instruments must be discharged briefly on suitable grounded surfaces before measurement.

Individual components

- ESD protective measures for individual components are implemented throughout B&R (conductive floors, shoes, wrist straps, etc.).
- The increased ESD protective measures for individual components are not required for handling B&R products at customer locations.

3.3 Regulations and measures

Electronic devices are generally not failsafe. If the programmable logic controller, operating or control device or uninterruptible power supply fails, the user is responsible for ensuring that connected devices (such as motors) are brought to a safe state.

When using programmable logic controllers as well as when using operating and monitoring devices as control systems in conjunction with a Soft PLC (e.g. B&R Automation Runtime or similar product) or Slot PLC (e.g. B&R LS251 or similar product), the safety measures that apply to industrial controllers (protection by protective equipment such as emergency stops) must be observed in accordance with applicable national and international regulations. This also applies to all other connected devices, such as drives.

All work such as installation, commissioning and servicing are only permitted to be carried out by qualified personnel. Qualified personnel are persons who are familiar with the transport, installation, assembly, commissioning and operation of the product and have the appropriate qualifications for their job (e.g. IEC 60364). National accident prevention regulations must be observed.

The safety guidelines, information about connection conditions (nameplate and documentation) and limit values specified in the technical data must be read carefully before installation and commissioning and must be strictly observed.

3.4 Transport and storage

During transport and storage, devices must be protected against undue stress (mechanical stress, temperature, humidity, aggressive atmosphere).

3.5 Installation

- The devices are not ready for use and must be installed and wired according to the requirements of this documentation in order to comply with EMC limit values.
- Installation must be carried out according to the documentation using suitable equipment and tools.
- Devices are only permitted to be installed in a voltage-free state and by qualified personnel. The control cabinet must first be disconnected from the power supply and secured against being switched on again.
- General safety regulations and national accident prevention regulations must be observed.
- The electrical installation must be carried out in accordance with relevant regulations (e.g. wire cross section, fuse protection, protective ground connection).

3.6 Operation

3.6.1 Protection against contact with electrical parts

In order to operate programmable logic controllers, operating and monitoring devices and uninterruptible power supplies, it is necessary for certain components to carry dangerous voltages over 42 VDC. Touching one of these components can result in a life-threatening electric shock. There is a risk of death, serious injury or damage to property.

Before switching on programmable logic controllers, operating and monitoring devices and uninterruptible power supplies, it must be ensured that the housing is properly connected to ground potential (PE rail). The ground connection must also be made if the operating and monitoring device and uninterruptible power supply are only connected for testing purposes or only operated for a short time!

Before switching on, live parts must be securely covered. All covers must be kept closed during operation.

3.6.2 Ambient conditions - Dust, moisture, aggressive gases

The use of operating and monitoring devices (e.g. industrial PCs, Power Panels, Mobile Panels) and uninterruptible power supplies in dusty environments must be avoided. This can otherwise result in dust deposits that affect the functionality of the device, especially in systems with active cooling (fans), which may no longer ensure sufficient cooling.

The presence of aggressive gases in the environment can also result in malfunctions. In combination with high temperature and relative humidity, aggressive gases – for example with sulfur, nitrogen and chlorine components – trigger chemical processes that can very quickly impair or damage electronic components. Blackened copper surfaces and cable ends in existing installations are indicators of aggressive gases.

When operated in rooms with dust and condensation that can endanger functionality, operating and monitoring devices such as Automation Panels or Power Panels are protected on the front against the ingress of dust and moisture when installed correctly (e.g. cutout installation). The back of all devices must be protected against the ingress of dust and moisture, however, or the dust deposits must be removed at suitable intervals.

3.6.3 Programs, viruses and malicious programs

Any data exchange or installation of software using data storage media (e.g. floppy disk, CD-ROM, USB flash drive) or via networks or the Internet poses a potential threat to the system. It is the direct responsibility of the user to avert these dangers and to take appropriate measures such as virus protection programs and firewalls to protect against them and to use only software from trustworthy sources.

3.7 Cybersecurity disclaimer for products

B&R products communicate via a network interface and were developed for secure connection with internal and, if necessary, other networks such as the Internet.

Information:

In the following, B&R products are referred to as "product" and all types of networks (e.g. internal networks and the Internet) are referred to as "network".

It is the sole responsibility of the customer to establish and continuously ensure a secure connection between the product and the network. In addition, appropriate security measures must be implemented and maintained to protect the product and entire network from any security breaches, unauthorized access, interference, digital intrusion, data leakage and/or theft of data or information.

B&R Industrial Automation GmbH and its subsidiaries are not liable for damages and/or losses in connection with security breaches, unauthorized access, interference, digital intrusion, data leakage and/or theft of data or information.

The aforementioned appropriate security measures include, for example:

- Segmentation of the network (e.g. separation of the IT network from the control network¹⁾)
- Use of firewalls
- Use of authentication mechanisms
- Encryption of data
- Use of anti-malware software

Before B&R releases products or updates, they are subjected to appropriate functional testing. Independently of this, we recommend that our customers develop their own test processes in order to be able to check the effects of changes in advance. Such changes include, for example:

- Installation of product updates
- Significant system modifications such as configuration changes
- Deployment of updates or patches for third-party software (non-B&R software)
- Hardware replacement

These tests should ensure that implemented security measures remain effective and that systems in the customer's environment behave as expected.

¹⁾ The term "control network" refers to computer networks used to connect control systems. The control network can be divided into zones, and there can be several separate control networks within a company or site. The term "control systems" refers to all types of B&R products such as controllers (e.g. X20), HMI systems (e.g. Power Panel T30), process control systems (e.g. APROL) and supporting systems such as engineering workstations with Automation Studio.

4 Complete system - Technical data

4.1 Device interfaces

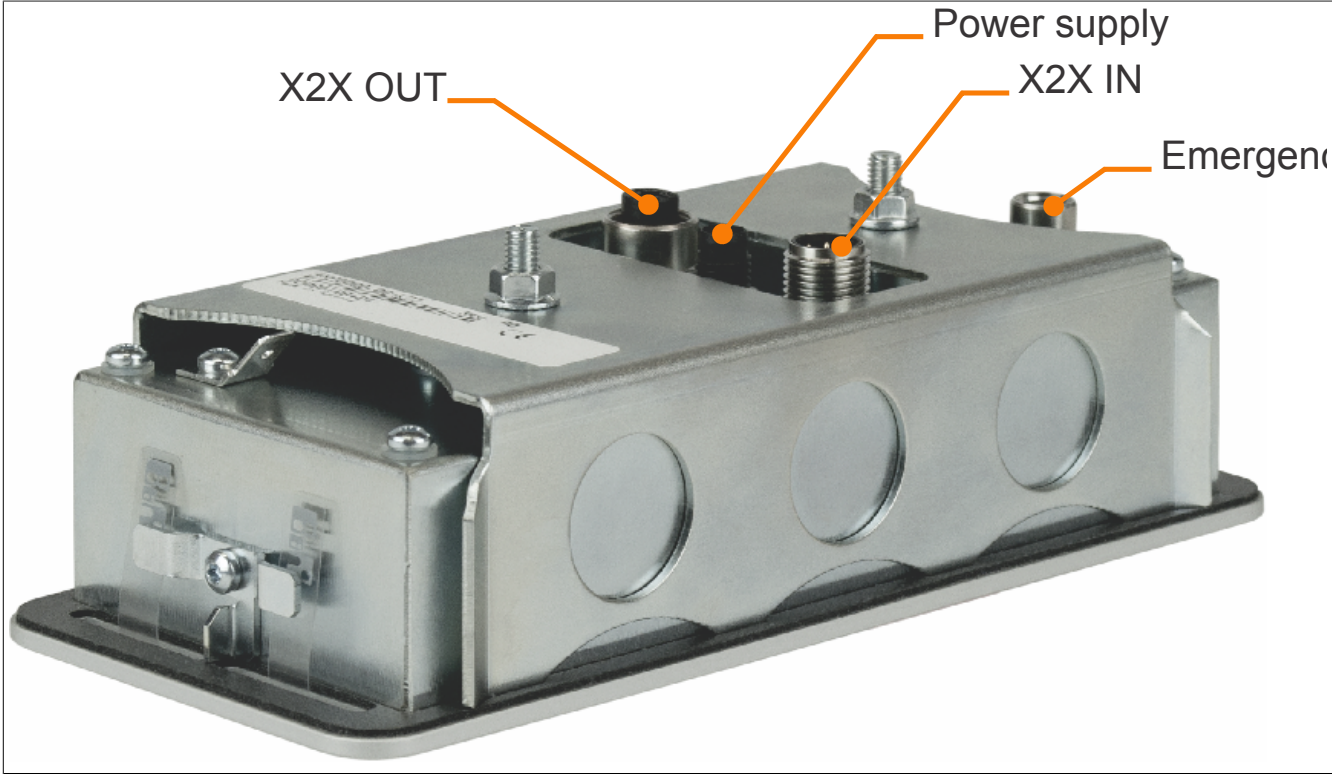


Figure 3: 4XP0000.00-KA4 - Device interfaces

4.1.1 X2X interface



X2X IN & OUT (M12 connectors)		
X2X IN		
Pin	Description	
1	X2X +	
2	X2X	
3	X2X ⊥	
4	X2X \	
X2X OUT		
Pin	Description	
1	X2X +	
2	X2X	
3	X2X ⊥	
4	X2X \	

Table 4: X2X IN & OUT (M12 connectors)

Information:

The connector's pin assignments are designed so that standard X67 bus cables can be used.

4.1.2 Power supply


24 VDC voltage supply (M8 connector)		
Power supply		
Pin	Description	
1	24 V DC	
2	24 V DC	
3	GND	
4	GND	

Table 5: Power supply

Information:

No bus power supply is necessary to operate the device (X2X Link power supply). The panel does not have a power supply to provide bus voltage to additional devices.

The bus power supply is simply routed from the X2X IN connection to the X2X OUT connection and can only supply additional bus stations using power supply modules with an X2X Link power supply.


4.1.3 Functional ground

A functional grounding clip is located next to the power supply connector. This grounding clip (functional ground) must be connected to a central grounding point on the control cabinet using a 6.3 mm tab connector and the shortest possible path with the least resistance possible (e.g. copper strip, at least 2.5 mm²).

Notice!

The functional ground (pin 2) must be connected to ground (e.g. control cabinet) using the shortest possible path. Using the largest possible conductor cross section on the power supply connector is recommended.

4.1.4 Emergency stop RAFI, 1.30.273.511/0300

Emergency stop 1.30.273.511/0300		
Manufacturer	RAFI	
Type	RAFIX 22 FS+	
Manufacturer number	1.30.273.511/0300	
Contact function	Maintained	
Resetting	By rotating to the right	
Service life	50,000	
B10 value	65,000	

4.1.4.1 Switching element RAFI, 1.20.126.704/9000

Switching element 1.20.126.704/9000		
Manufacturer	RAFI	
Type	RAFIX FS	
Manufacturer number	1.20.126.704/9000	
Contact system	Self-cleaning bridge contact	
Contacts	2x normally closed contact	
Normally closed contact with positive separation per IEC 60947-5-1	Yes	
Connection	Connector 2.8 x 0.8 mm	
Service life	1,000,000 at 250 V / 1 A	

Table 6: Switching element 1.20.126.704/9000

Information:

For additional technical data, see the manufacturer's website: www.rafi.de.

4.2 Technical data

Model number	4XP0000.00-KA4	
General information		
Certifications		
CE	Yes	
UL	cULus E115267 Industrial control equipment	
Interfaces		
X2X		
Type	X2X slave	
Variant	4-pin M12 connector	
Internal bus power supply	Yes	
Distance between 2 stations	100 m	
Electrical isolation	Yes	
Keys		
Illuminated ring keys	6x B&R illuminated ring keys	
Illuminated ring keys		
Color	Red, green, yellow, white	
Features		
Emergency stop		
Type	Rafix 22FS 1.30.273.511/0300	
Contact element	2x normally closed contact	
Electrical properties		
Nominal voltage	24 VDC	
Power consumption	Max. 8 watts	
Voltage range	18 - 30 VDC	
Current consumption	Max. 320 mA (at nominal voltage)	
Operating conditions		
Degree of protection per EN 60529	<ul style="list-style-type: none">••	Front: IP65 Back: IP65
Ambient conditions		
Temperature		
Operation	0 to +50°C	
Storage	-20 to +60°C	
Transport	-20 to +60°C	
Relative humidity		
Operation	T ≤ 40°C: 5 to 85%, non-condensing T > 40°C: < 75%, non-condensing	
Storage	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: < 75%, non-condensing	
Transport	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: < 75%, non-condensing	
Elevation		
Operation	Max. 3000 m	
Mechanical properties		
Housing		
Material	Sheet metal, galvanized	
Front		
Frame	Naturally anodized aluminum	
Design	RAL 9005	
Panel overlay		
Material	Polyester	
Gasket	Flat gasket around display front	
Dimensions		
Width	77 mm	
Height	175 mm	
Depth	86 mm	
Weight	600 g	

Table 7: 4XP0000.00-KA4 - Technical data

4.3 Dimensions

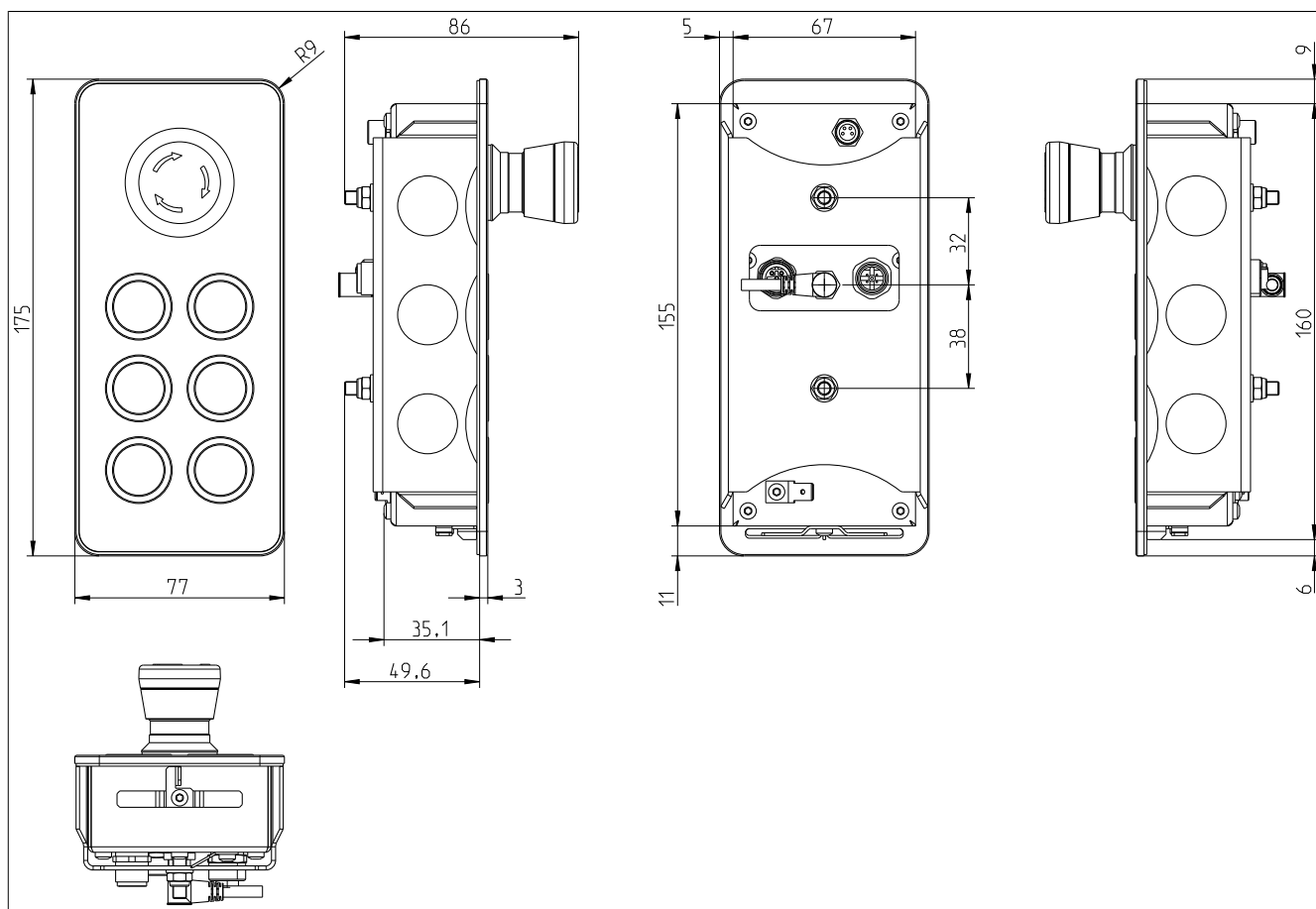


Figure 4: 4XP0000.00-KA4 - Dimensions

4.4 Installation guidelines

Mount the device in the cutout using the mounting bracket and an M5 Durlok nut (maximum torque 1.2 Nm).



Figure 5: 4XP0000.00-KA4 - Installation guidelines

4.5 Cutout installation

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

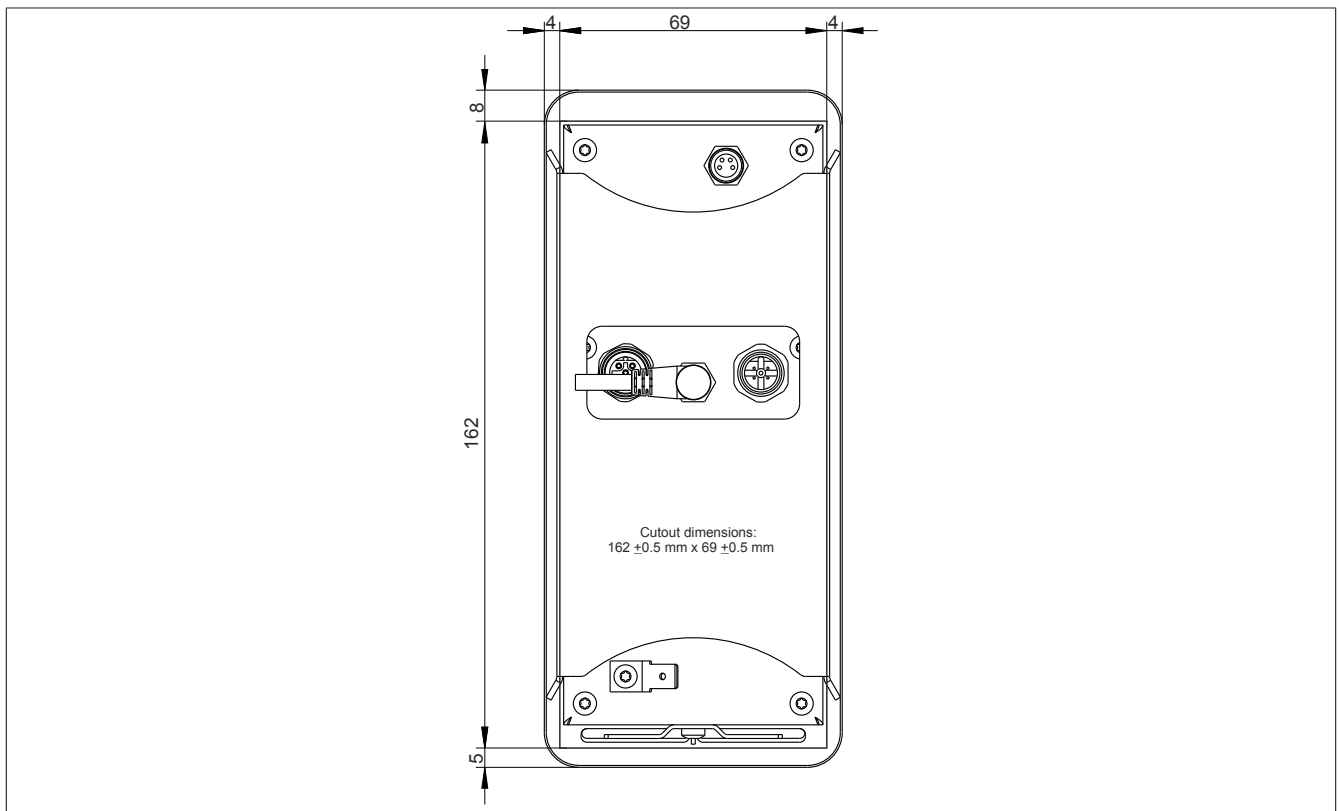


Figure 6: 4XP0000.00-KA4 - Cutout installation

Warning!

Ensure that slide-in labels do not become caught when installing the module.

4.6 Panel overlay design

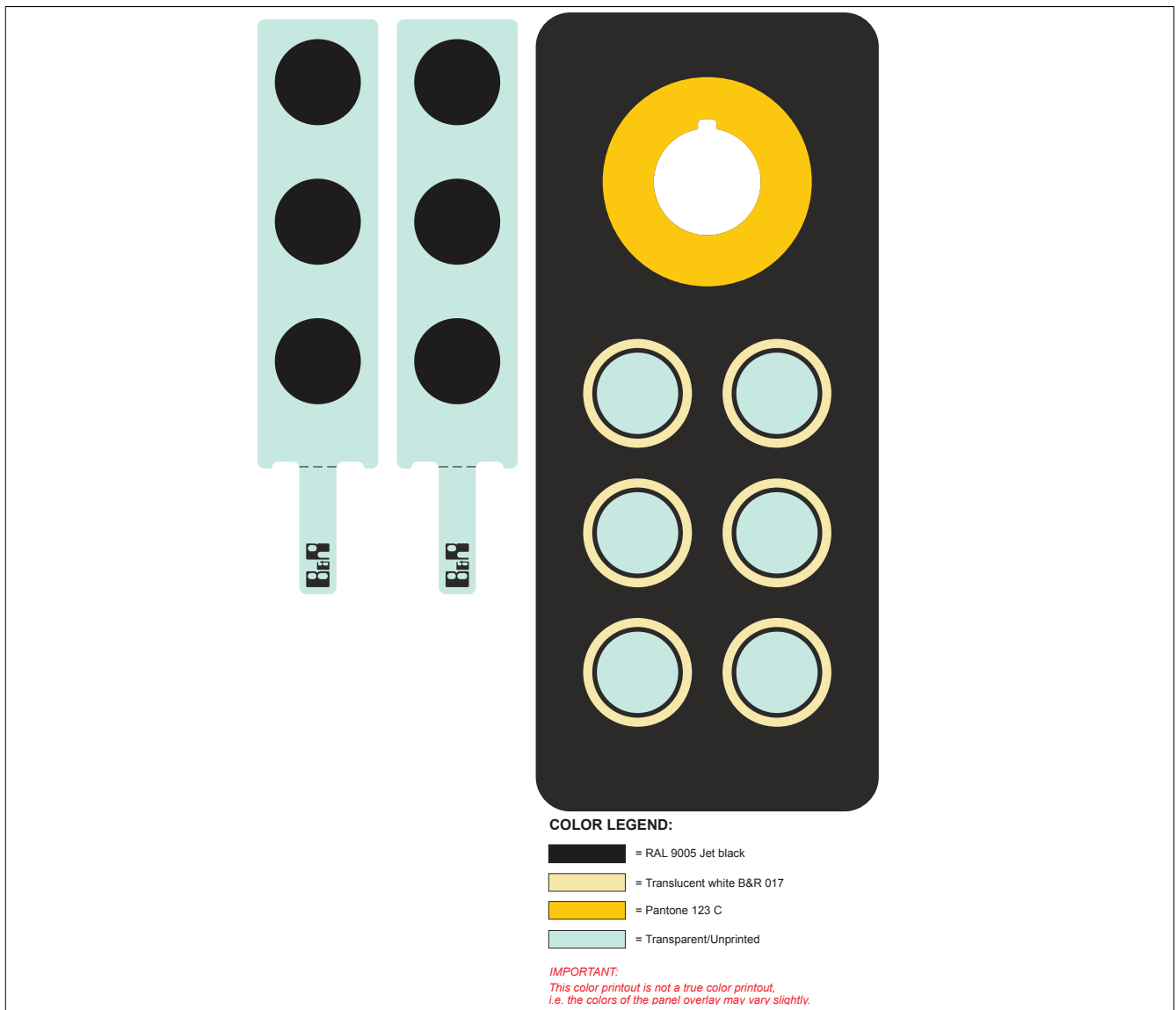


Figure 7: 4XP0000.00-KA4 - Panel overlay design

4.7 Device label

This label is attached to the back as a way to identify the interfaces.

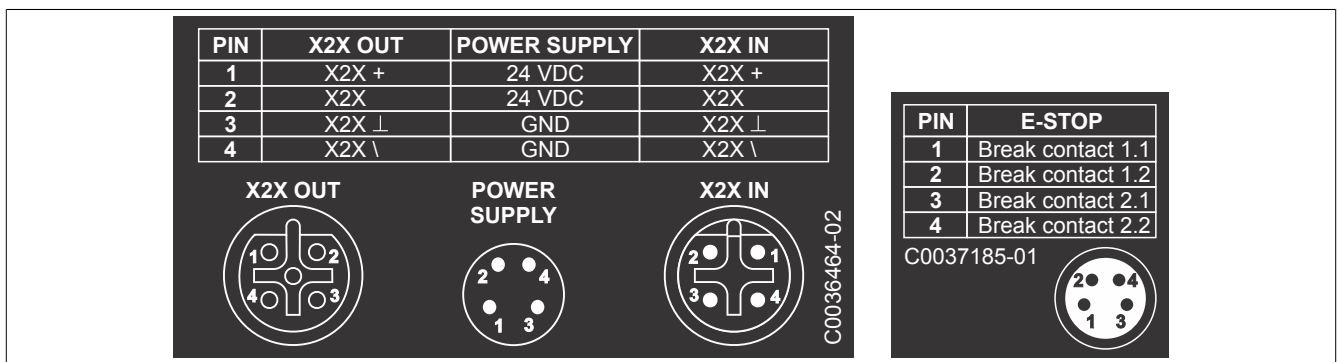


Figure 8: 4XP0000.00-KA4 - Device label

4.8 Key and LED configuration

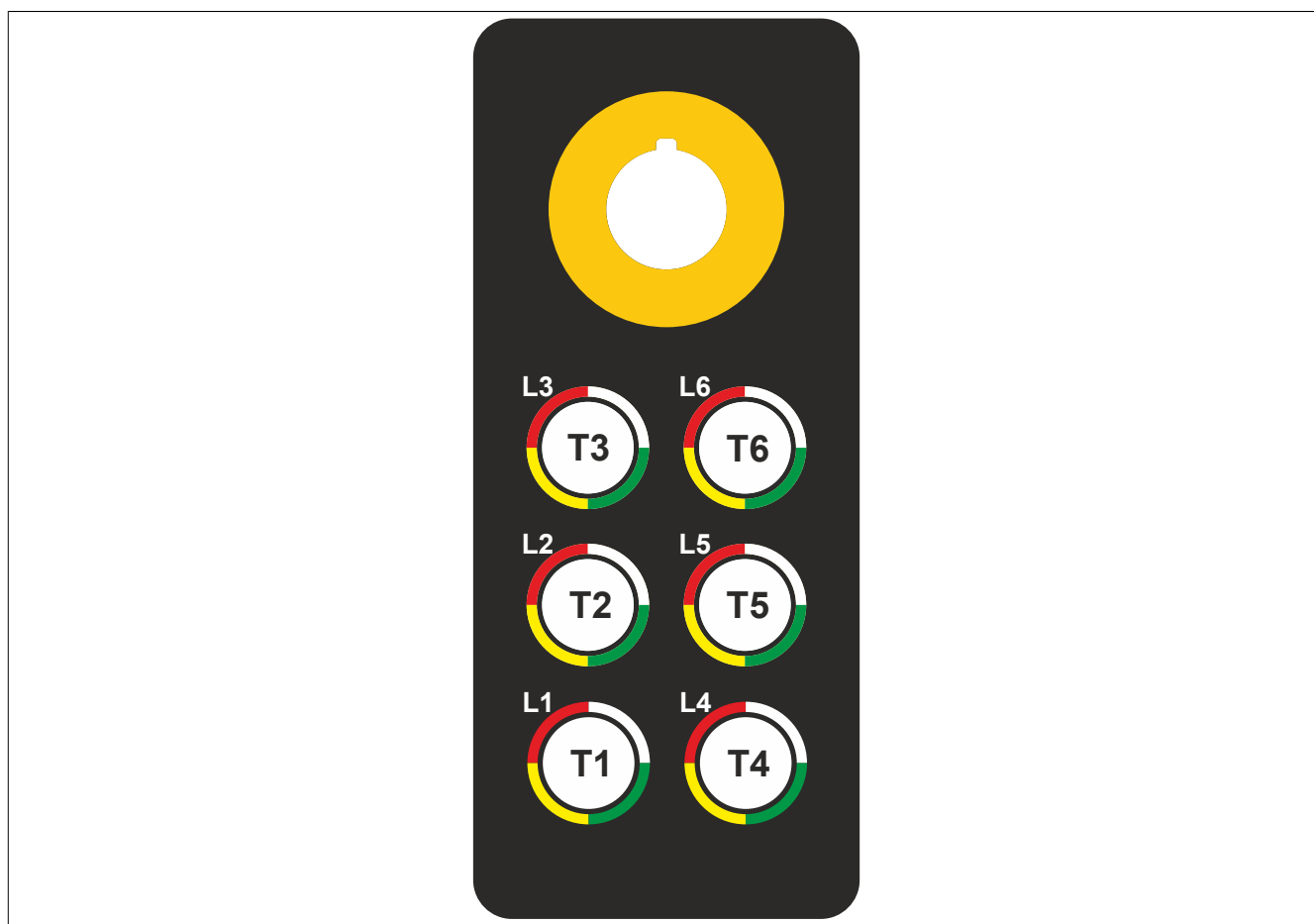


Figure 9: 4XP0000.00-KA4 - Key and LED matrix

5 Accessories

5.1 Attachment cables

Interface	Suitable attachment cables	
X2X (M12)	X2X Link connection cable: X67CA0X01.xxxx	X2X Link connection cable, angled: X67CA0X11.xxxx
	X2X open-ended cable: X67CA0X41.xxxx	X2X open-ended cable, angled: X67CA0X51.xxxx
Power supply (M8)	Power attachment cable: X67CA0P20.xxxx	Power attachment cable, angled: X67CA0P30.xxxx
Emergency switch-off (M8)	Power attachment cable: X67CA0P40.xxxx	Power attachment cable, angled: X67CA0P50.xxxx

6 Environmentally friendly disposal

All programmable logic controllers, operating and monitoring devices and uninterruptible power supplies from B&R are designed to have as little impact on the environment as possible.

6.1 Separation of materials

To ensure that devices can be recycled in an environmentally friendly manner, it is necessary to separate out the different materials.

Component	Disposal
Programmable logic controllers Operating and monitoring devices Uninterruptible power supplies Batteries and rechargeable batteries Cables	Electronics recycling
Paper/Cardboard packaging	Paper/Cardboard recycling
Plastic packaging material	Plastic recycling

Disposal must be carried out in accordance with applicable legal regulations.

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