

4XP0000.00-K74

Technical documentation

Version: **1.60 (March 2017)**
4XP0000.00-K74

All information contained in this manual is current as of its creation/publication. We reserve the right to change the contents of this manual without notice. The information contained herein is believed to be accurate as of the date of publication; however, Bernecker + Rainer Industrie-Elektronik Ges.m.b.H. makes no warranty, expressed or implied, with regard to the products or documentation contained within this manual. In addition, Bernecker + Rainer Industrie-Elektronik Ges.m.b.H. shall not be liable for any incidental or consequential damages in connection with or arising from the furnishing, performance or use of the product(s) in this documentation. Software names, hardware names and trademarks are registered by their respective companies.

1 Views.....	3
2 General information.....	5
2.1 Order data.....	5
2.1.1 Description.....	5
2.1.2 Version information.....	5
2.2 Organization of safety notices.....	6
2.3 Guidelines.....	6
3 Complete system - Technical data.....	7
3.1 Device interfaces.....	7
3.1.1 X2X interface.....	7
3.1.2 Power supply.....	7
3.1.3 Functional ground.....	8
3.2 Technical data.....	9
3.3 Dimensions.....	10
3.4 Cutout installation.....	11
3.5 Installation guidelines.....	12
3.6 Panel overlay design.....	13
3.6.1 Slide-in label design.....	13
3.7 Device label.....	14
3.8 Key and LED configurations.....	15
4 Safety guidelines.....	16
4.1 Intended use.....	16
4.2 Protection against electrostatic discharge.....	16
4.2.1 Packaging.....	16
4.2.2 Guidelines for proper ESD handling.....	16
4.3 Policies and procedures.....	17
4.4 Transport and storage.....	17
4.5 Installation.....	17
4.6 Operation.....	17
4.6.1 Protection against touching electrical parts.....	17
4.6.2 Environmental conditions - Dust, moisture, corrosive gases.....	17
4.6.3 Viruses and dangerous programs.....	18
4.7 Environmentally friendly disposal.....	18
4.7.1 Separation of materials.....	18

1 Views



Figure 1: 4XP0000.00-K74 - Oblique view



Figure 2: 4XP0000.00-K74 - 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

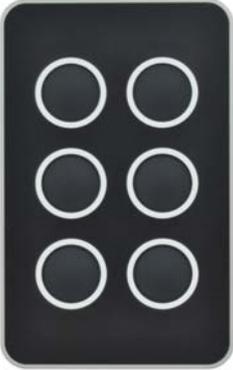
Model number	Short description	Figure
	Keypad modules	
4XP0000.00-K74	X2X keypad module, black, 6 B&R illuminated ring keys, 4-color (green, yellow, red, white), IP65 protection, fast mounting using single screw; connection made using M8/M12 circular connectors	

Table 1: 4XP0000.00-K74 - Order data

2.1.1 Description

4XP0000.00-K74 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)
- Front and back: IP65 protection
- Fast mounting using a single screw

2.1.2 Version information

Version	Date	Comment	Responsible
1.00 (starting with Rev. A0)	2011-08-05	First edition	Anna Sigl
1.10	2012-01-13	Added the key and LED configuration	Anna Sigl
1.20	2012-03-21	Keyboard redesigned	Anna Sigl
1.30 (Rev. C0 and higher)	2012-03-28	Changed the connector pinout	Anna Sigl
1.40	2013-01-11	Added temperature specifications	Anna Sigl
1.50	2014-07-25	Corrections to German and English documentation	Anna Sigl
1.60	2017-03-02	Updated data sheet. <ul style="list-style-type: none"> • Updated information about power supply. • Updated IP65 protection on front and back. • Updated UL certification. 	Nadine Koch

Table 2: Version information

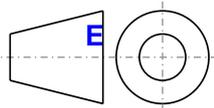
2.2 Organization of safety notices

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 3: Organization of safety notices

2.3 Guidelines



European dimension standards apply to all dimension diagrams in this document.

All dimensions are specified in mm.

Unless otherwise specified, the following general tolerances apply:

Range of nominal sizes	General tolerance according to DIN ISO 2768 (medium)
Up to 6 mm	±0.1 mm
For 6 to 30 mm	±0.2 mm
For 30 to 120 mm	±0.3 mm
For 120 to 400 mm	±0.5 mm
For 400 to 1000 mm	±0.8 mm

Table 4: Range of nominal sizes

3 Complete system - Technical data

3.1 Device interfaces



Figure 3: 4XP0000.00-K74 - Device interfaces

3.1.1 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 5: X2X IN & OUT (M12 connectors)

Information:

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

3.1.2 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 6: 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.

3.1.3 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).

Important!

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.

3.2 Technical data

Model number	4XP0000.00-K74	
General information		
Certification		
CE	Yes	
UL	cULus E115267 Industrial Control Equipment	
Interfaces		
X2X		
Type	X2X slave	
Design	4-pin M12 connector	
Internal bus 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	
Electrical characteristics		
Nominal voltage	24 VDC	
Power consumption	Max. 8 watts	
Voltage range	18 - 30 VDC	
Current consumption	Max. 320 mA (at nominal voltage)	
Operating conditions		
EN 60529 protection	• •	Front: IP65 Back: IP65
UL 50 protection	Front: Type 4X indoor use only	
Environmental 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 characteristics		
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	123 mm	
Depth	52.6 mm	
Weight	450 g	

Table 7: 4XP0000.00-K74 - Technical data

3.3 Dimensions

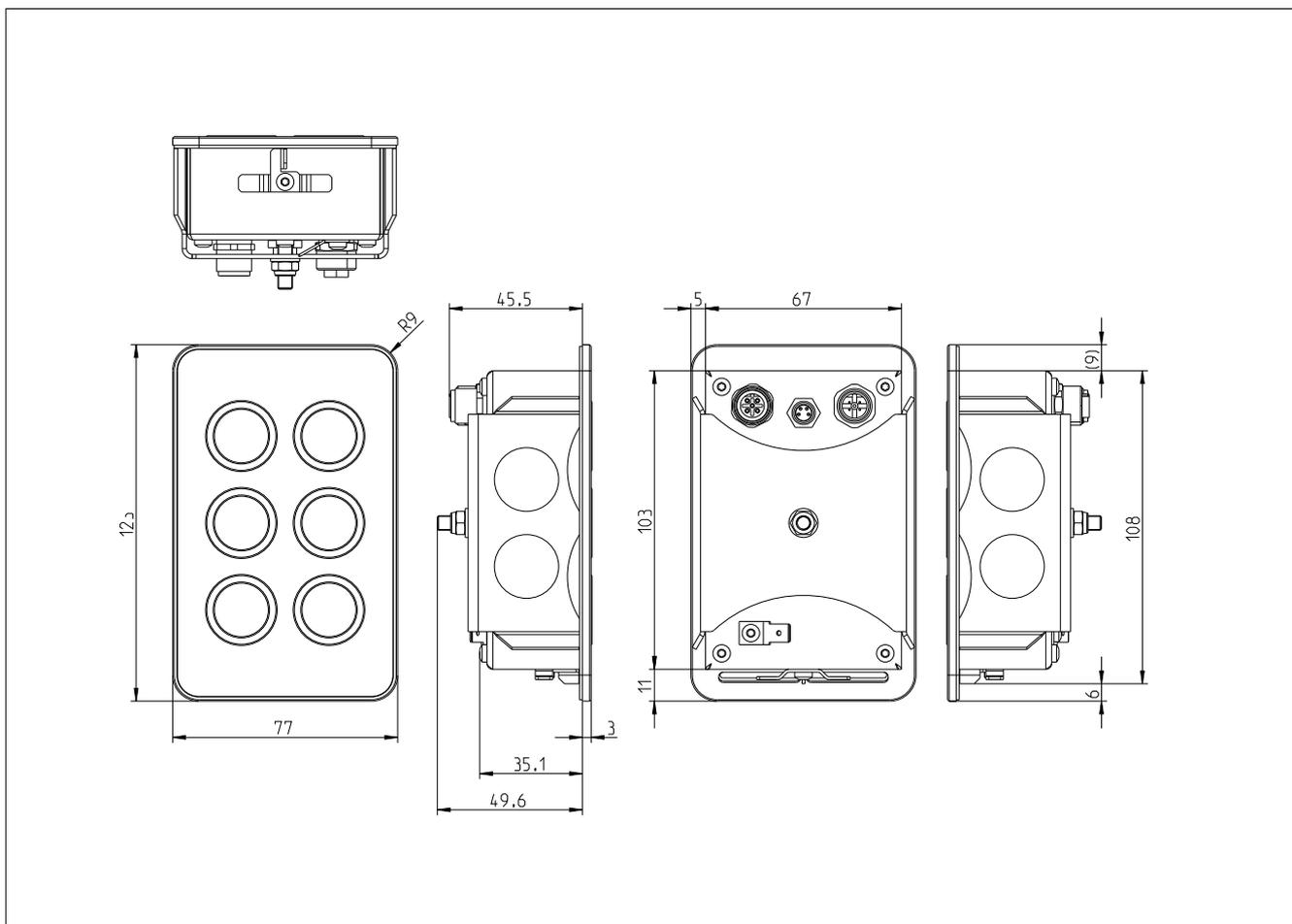


Figure 4: 4XP0000.00-K74 - Dimensions

3.4 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).

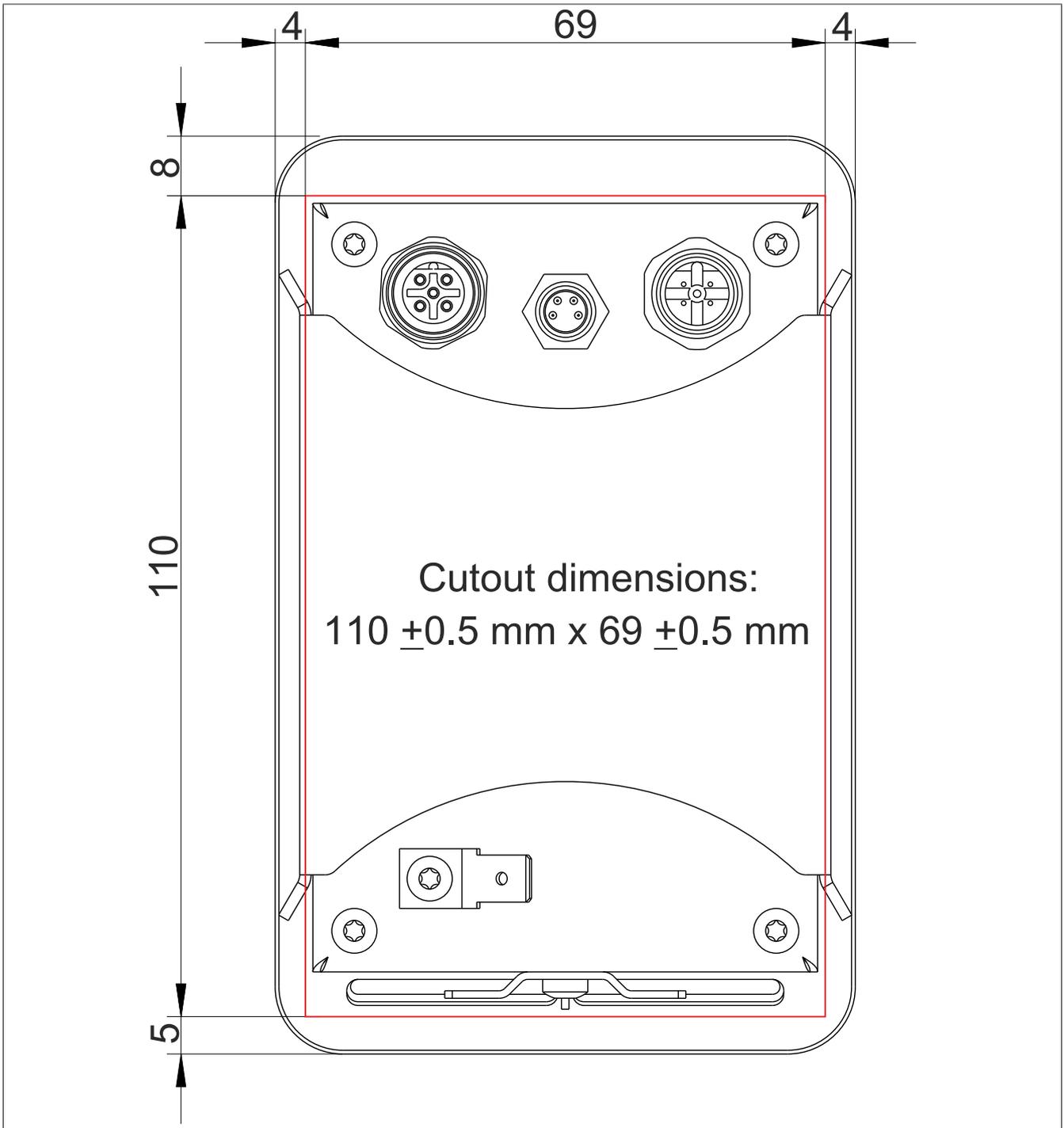


Figure 5: 4XP0000.00-K74 - Cutout installation

Warning!

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

3.5 Installation guidelines

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



Figure 6: 4XP0000.00-K74 - Installation guidelines

3.6 Panel overlay design

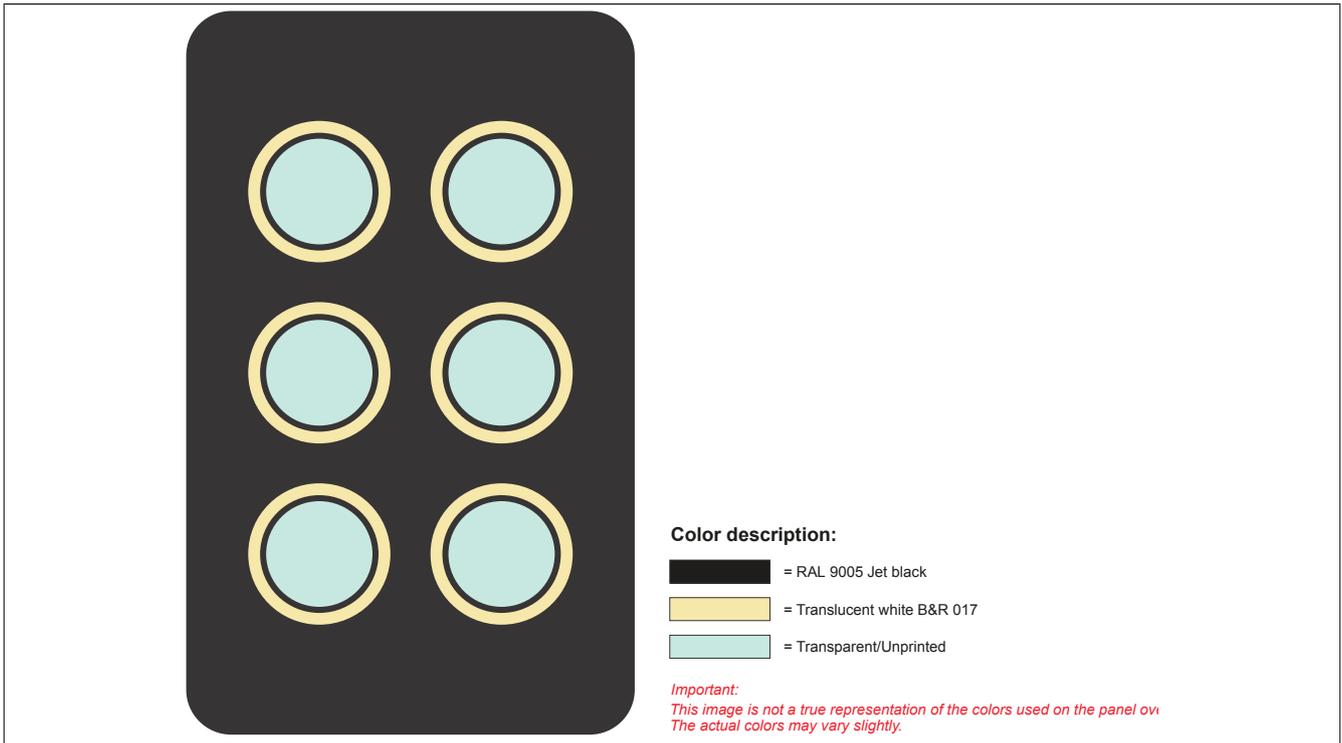


Figure 7: 4XP0000.00-K74 - Panel overlay design

3.6.1 Slide-in label design

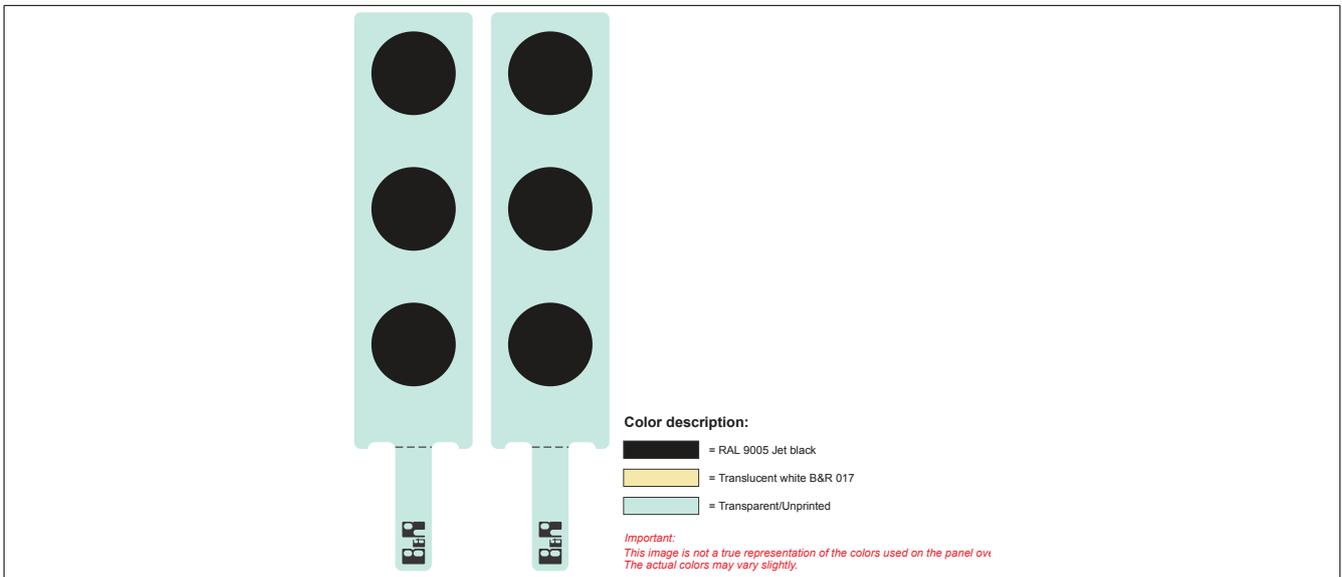


Figure 8: 4XP0000.00-K74 - Slide-in label design

3.7 Device label

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

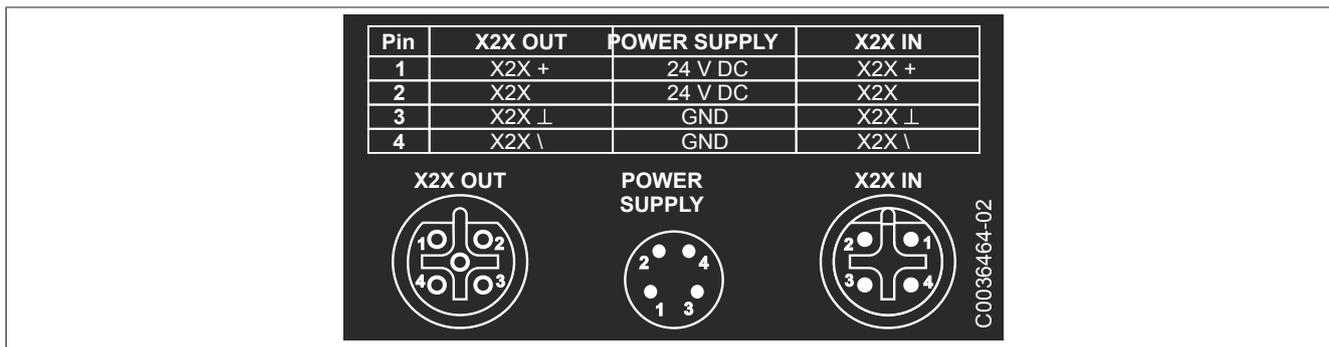


Figure 9: 4XP0000.00-K74 - Device label

3.8 Key and LED configurations

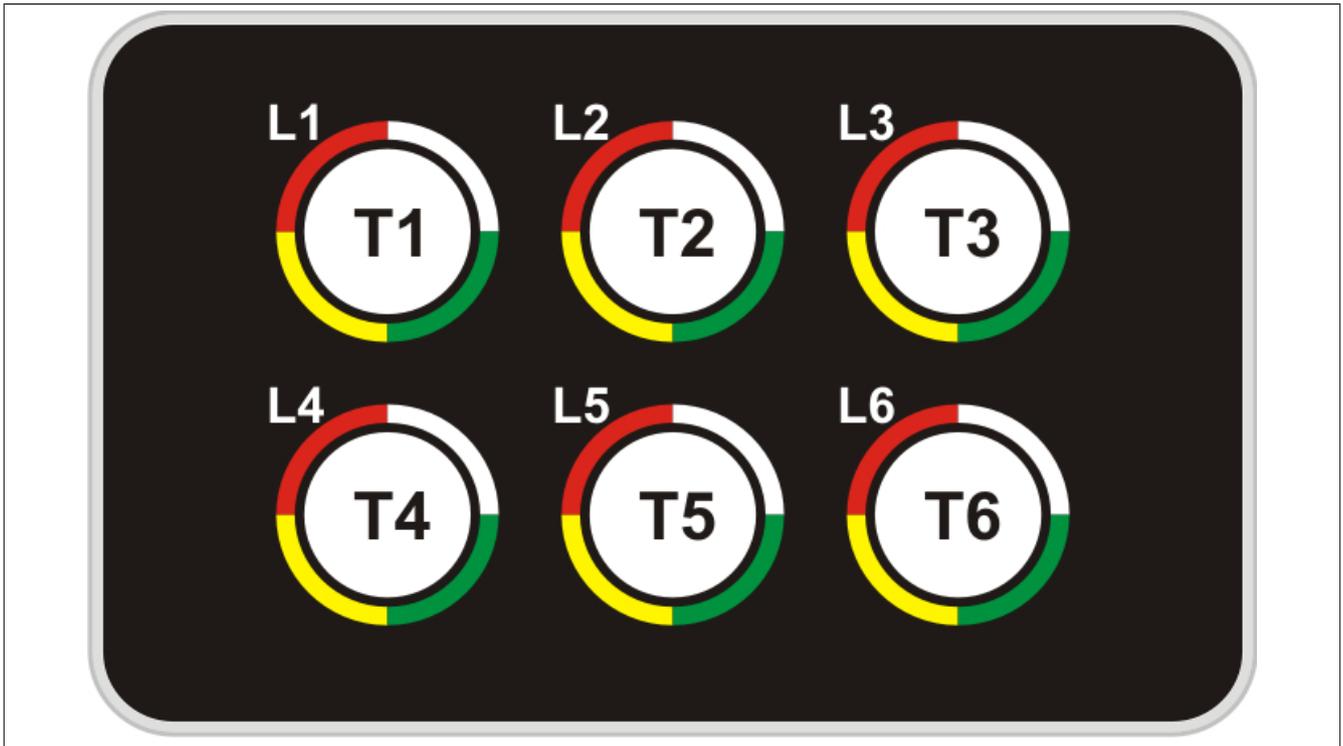


Figure 10: 4XP0000.00-K74 - Key and LED matrix

4 Safety guidelines

4.1 Intended use

Programmable logic controllers (PLCs), operating/monitoring devices (industrial PCs, Power Panels, Mobile Panels, etc.) and B&R uninterruptible power supplies have been designed, developed and manufactured for conventional use in industrial environments. They were not designed, developed and manufactured for any use involving serious risks or hazards that could lead to death, injury, serious physical damage or loss of any kind without the implementation of exceptionally stringent safety precautions. In particular, such risks and hazards include the use of these devices to monitor nuclear reactions in nuclear power plants, their use in flight control or flight safety systems as well as in the control of mass transportation systems, medical life support systems or weapons systems.

4.2 Protection against electrostatic discharge

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

4.2.1 Packaging

- **Electrical components with a housing**
...do not require special ESD packaging but must be handled properly (see "Electrical components with a housing").
- **Electrical components without a housing**
...are protected by ESD-suitable packaging.

4.2.2 Guidelines for proper ESD handling

Electrical components with a housing

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

Electrical components without a housing

The following points apply in addition to the points listed under "Electrical components with a housing":

- Any persons handling electrical components or devices with installed electrical components must be grounded.
- Components are only permitted to be touched on their narrow sides or front plate.
- Components should always be stored in a suitable medium (ESD packaging, conductive foam, etc.). Metallic surfaces are not suitable storage surfaces!
- Components should not be subjected to electrostatic discharge (e.g. through the use of charged plastics).
- Ensure a minimum distance of 10 cm from monitors and TV sets.
- Measuring instruments and equipment must be grounded.
- Probes on potential-free measuring instruments must be discharged on sufficiently grounded surfaces before taking measurements.

Individual components

- ESD protective measures for individual components are thoroughly integrated at B&R (conductive floors, footwear, arm bands, etc.).
- These increased ESD protective measures for individual components are not necessary for customers handling B&R products.

4.3 Policies and procedures

Electronic devices are never completely failsafe. If the programmable control system, operating/monitoring device or uninterruptible power supply fails, the user is responsible for ensuring that other connected devices, e.g. motors, are brought to a secure state.

When using programmable logic controllers or operating/monitoring devices as control systems together with a soft PLC (e.g. B&R Automation Runtime or comparable product) or slot PLC (e.g. B&R LS251 or comparable product), safety precautions relevant to industrial control systems (e.g. the provision of safety devices such as emergency stop, etc.) must be observed in accordance with applicable national and international regulations. The same applies for all other devices connected to the system, such as drives.

All tasks such as the installation, commissioning and servicing of devices are only permitted to be carried out by qualified personnel. Qualified personnel are those familiar with the transport, mounting, installation, commissioning and operation of devices who also have the appropriate qualifications (e.g. IEC 60364). National accident prevention regulations must be observed.

The safety notices, connection descriptions (type plate and documentation) and limit values listed in the technical data are to be read carefully before installation and commissioning and must be observed.

4.4 Transport and storage

During transport and storage, devices must be protected against undue stress (mechanical loads, temperature, moisture, corrosive atmospheres, etc.).

4.5 Installation

- These devices are not ready for use upon delivery and must be installed and wired according to the specifications in this documentation in order for the EMC limit values to apply.
- Installation must be performed according to this documentation using suitable equipment and tools.
- Devices are only permitted to be installed by qualified personnel without voltage applied. Before installation, voltage to the control cabinet must be switched off and prevented from being switched on again.
- General safety guidelines and national accident prevention regulations must be observed.
- Electrical installation must be carried out in accordance with applicable guidelines (e.g. line cross sections, fuses, protective ground connections).

4.6 Operation

4.6.1 Protection against touching electrical parts

To operate programmable logic controllers, operating and monitoring devices, and uninterruptible power supplies, certain components must carry dangerous voltage levels over 42 VDC. Touching one of these parts can result in a life-threatening electric shock. This could lead to death, severe injury or damage to property.

Before turning on the programmable logic controller, operating/monitoring devices or uninterruptible power supply, the housing must be properly grounded (PE rail). Ground connections must be established even when testing or operating operating/monitoring devices or the uninterruptible power supply for a short time!

Before switching on the device, all parts that carry voltage must be securely covered. During operation, all covers must remain closed.

4.6.2 Environmental conditions - Dust, moisture, corrosive gases

The use of operating/monitoring devices (e.g. industrial PCs, Power Panels, Mobile Panels, etc.) and uninterruptible power supplies in very dusty environments should be avoided. Dust collection on the devices can affect functionality and may prevent sufficient cooling, especially in systems with active cooling systems (fans).

The presence of corrosive gases can also lead to malfunctions. When combined with high temperature and humidity, corrosive gases – e.g. with sulfur, nitrogen and chlorine components – can induce chemical reactions that can damage electronic components very quickly. Signs of the presence of corrosive gases are blackened copper surfaces and cable ends on existing equipment.

For operation in dusty or moist conditions, correctly installed (e.g. cutout installations) operating/monitoring devices like the Automation Panel or Power Panel are protected on the front. The back of all devices must be protected from dust and moisture and cleaned at suitable intervals.

4.6.3 Viruses and dangerous programs

This system is subject to potential risk each time data is exchanged or software is installed from a data medium (e.g. diskette, CD-ROM, USB flash drive, etc.), a network connection or the Internet. The user is responsible for assessing these dangers, implementing preventive measures such as virus protection programs, firewalls, etc. and making sure that software is only obtained from trusted sources.

4.7 Environmentally friendly disposal

All B&R programmable controllers, operating/monitoring devices and uninterruptible power supplies are designed to inflict as little harm as possible on the environment.

4.7.1 Separation of materials

It is necessary to separate different materials so the device can undergo an environmentally friendly recycling process.

Component	Disposal
Programmable logic controllers Operating/Monitoring devices Uninterruptible power supply Batteries and rechargeable batteries Cables	Electronics recycling
Cardboard box / Paper packaging	Cardboard box / Paper recycling
Plastic packaging	Plastic recycling

Table 8: Environmentally friendly disposal

Disposal must comply with applicable legal regulations.

Figure 1:	4XP0000.00-K74 - Oblique view.....	3
Figure 2:	4XP0000.00-K74 - Rear view.....	4
Figure 3:	4XP0000.00-K74 - Device interfaces.....	7
Figure 4:	4XP0000.00-K74 - Dimensions.....	10
Figure 5:	4XP0000.00-K74 - Cutout installation.....	11
Figure 6:	4XP0000.00-K74 - Installation guidelines.....	12
Figure 7:	4XP0000.00-K74 - Panel overlay design.....	13
Figure 8:	4XP0000.00-K74 - Slide-in label design.....	13
Figure 9:	4XP0000.00-K74 - Device label.....	14
Figure 10:	4XP0000.00-K74 - Key and LED matrix.....	15

Table index

Table 1:	4XP0000.00-K74 - Order data.....	5
Table 2:	Version information.....	5
Table 3:	Organization of safety notices.....	6
Table 4:	Range of nominal sizes.....	6
Table 5:	X2X IN & OUT (M12 connectors).....	7
Table 6:	Power supply.....	7
Table 7:	4XP0000.00-K74 - Technical data.....	9
Table 8:	Environmentally friendly disposal.....	18