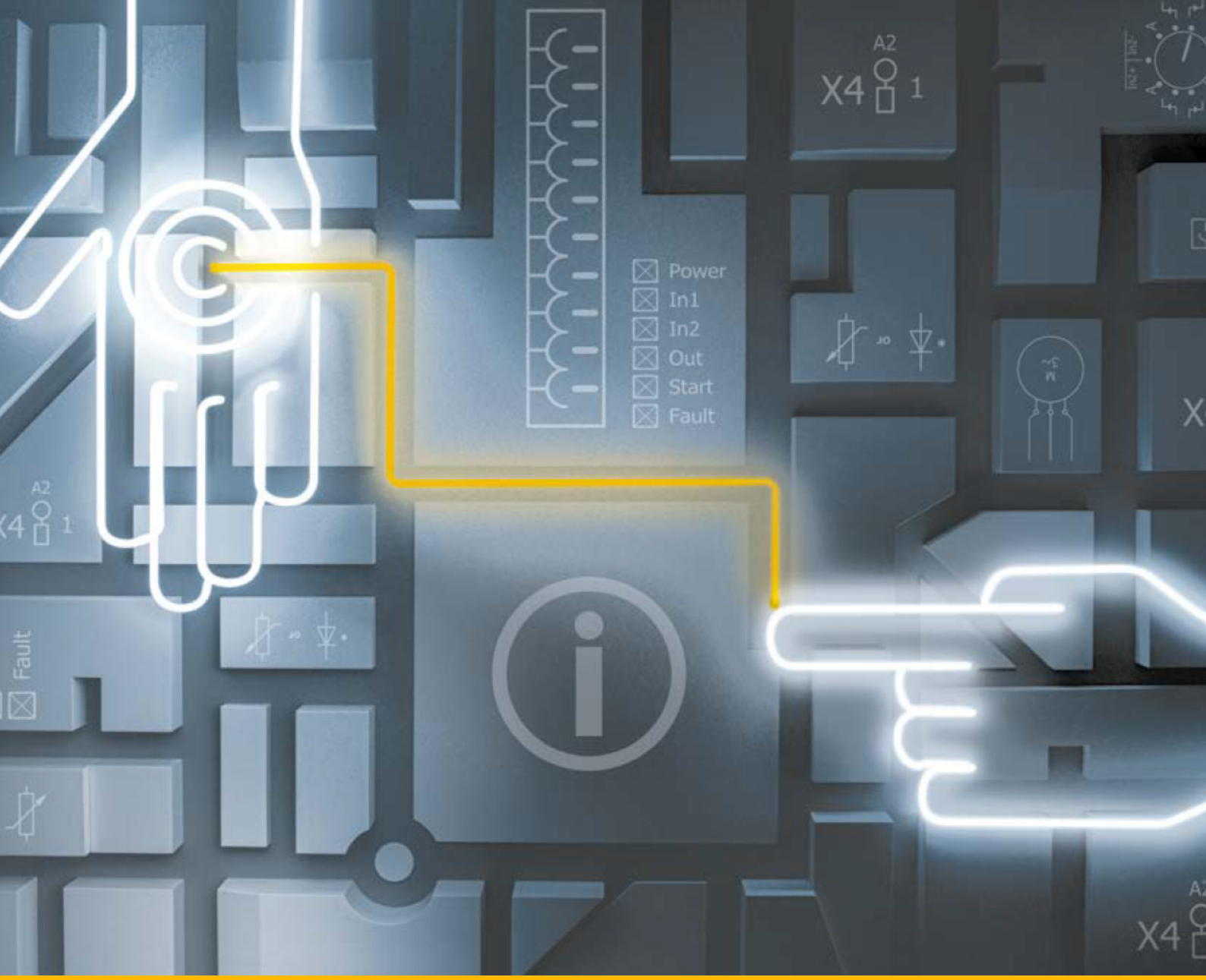


PNOZ X6

PILZ
THE SPIRIT OF SAFETY

Operating Manual-19588-EN-08
- Safety relays




This document is the original document.

Where unavoidable, for reasons of readability, the masculine form has been selected when formulating this document. We do assure you that all persons are regarded without discrimination and on an equal basis.

Introduction

Validity of documentation

This documentation is valid for the product PNOZ X6. It is valid until new documentation is published.

This operating manual explains the function and operation, describes the installation and provides guidelines on how to connect the product.

Using the documentation

This document is intended for instruction. Only install and commission the product if you have read and understood this document. The document should be retained for future reference.

Definition of symbols

Information that is particularly important is identified as follows:

DANGER!

This warning must be heeded! It warns of a hazardous situation that poses an immediate threat of serious injury and death and indicates preventive measures that can be taken.

WARNING!

This warning must be heeded! It warns of a hazardous situation that could lead to serious injury and death and indicates preventive measures that can be taken.

CAUTION!

This refers to a hazard that can lead to a less serious or minor injury plus material damage, and also provides information on preventive measures that can be taken.

NOTICE

This describes a situation in which the product or devices could be damaged and also provides information on preventive measures that can be taken. It also highlights areas within the text that are of particular importance.

INFORMATION

This gives advice on applications and provides information on special features.

Safety

Intended use

The safety relay PNOZ X6 provides a safety-related interruption of a safety circuit.

The safety relay meets the requirements of EN 60947-5-1 and EN 60204-1 and may be used in applications with:

- E-STOP pushbuttons
- Safety gates

Improper use

The following is deemed improper use in particular:

- Any component, technical or electrical modification to the product,
- Use of the product outside the areas described in this operating manual,
- Use of the product outside the technical details (see chapter entitled Technical Details [17]).

NOTICE

EMC-compliant electrical installation

The product is designed for use in an industrial environment. The product may cause interference if installed in other environments. If installed in other environments, measures should be taken to comply with the applicable standards and directives for the respective installation site with regard to interference.

Safety regulations

Safety assessment

Before using a device, a safety assessment in accordance with the Machinery Directive is required.

The product as an individual component fulfils the functional safety requirements in accordance with EN ISO 13849 and EN 62061. However, this does not guarantee the functional safety of the overall plant/machine. To achieve the relevant safety level of the overall plant/machine's required safety functions, each safety function needs to be considered separately.

Use of qualified personnel

The products may only be assembled, installed, programmed, commissioned, operated, maintained and decommissioned by persons who are competent to do so.

A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. To be able to inspect, assess and operate devices, systems and machines, the person has to be informed of the state of the art and the applicable national, European and international laws, directives and standards.

It is the company's responsibility only to employ personnel who

- Are familiar with the basic regulations concerning health and safety / accident prevention,
- Have read and understood the information provided in the section entitled Safety
- Have a good knowledge of the generic and specialist standards applicable to the specific application.

Warranty and liability

All claims to warranty and liability will be rendered invalid if

- The product was used contrary to the purpose for which it is intended,
- Damage can be attributed to not having followed the guidelines in the manual,
- Operating personnel are not suitably qualified,
- Any type of modification has been made (e.g. exchanging components on the PCB boards, soldering work etc.).

Disposal

- In safety-related applications, please comply with the mission time T_M in the safety-related characteristic data.
- When decommissioning, please comply with local regulations regarding the disposal of electronic devices (e.g. Electrical and Electronic Equipment Act).

For your safety

The unit meets all the necessary conditions for safe operation. However, please note the following:

- Note for overvoltage category III: If voltages higher than low voltage (>50 VAC or >120 VDC) are present on the unit, connected control elements and sensors must have a rated insulation voltage of at least 250 V.

Unit features

- Positive-guided relay outputs:
  - 3 safety contacts (N/O), instantaneous
- Connection options for:
  - E-STOP pushbutton
  - Safety gate limit switch
  - Start button
- Operation with and without simultaneity monitoring
- LED display for:
  - Supply voltage
  - Switch status of the safety contacts
- See order reference for unit types

Safety features

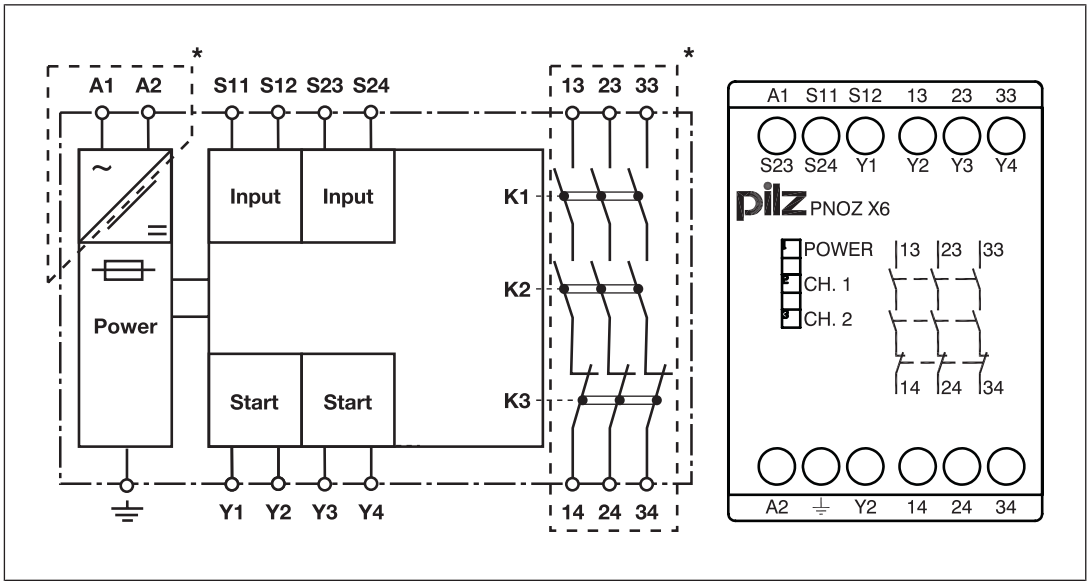
The safety relay meets the following safety requirements:

- The circuit is redundant with built-in self-monitoring.
- The safety function remains effective in the case of a component failure.
- The correct opening and closing of the safety function relays is tested automatically in each on-off cycle.

Block diagram/terminal configuration

Types: AC

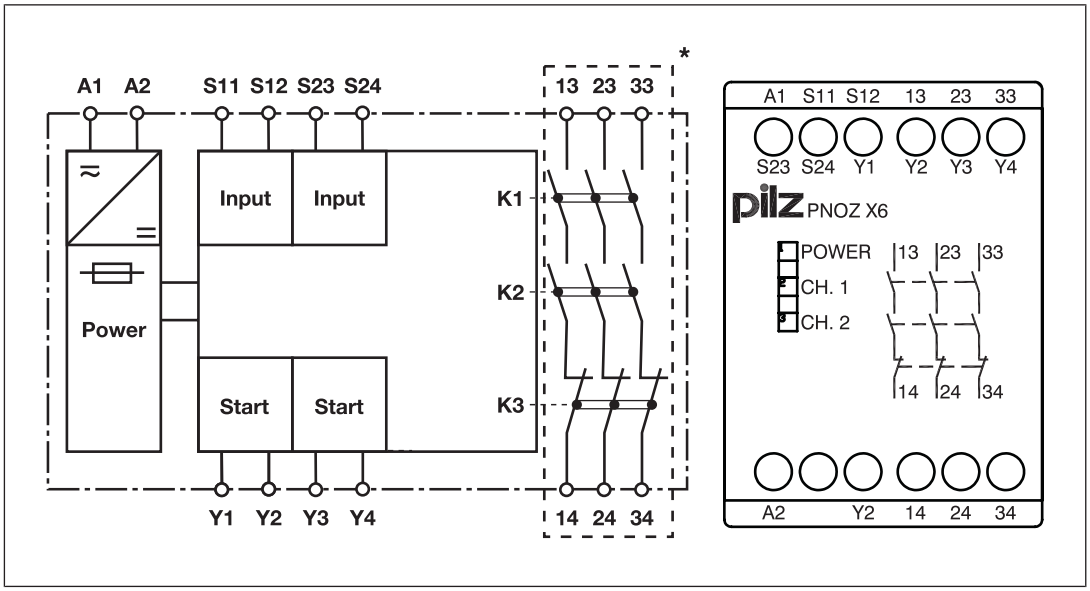
- U_B: 42 VAC; Order no. 774721
- U_B: 110 - 120 VAC; Order no. 774725
- U_B: 230 - 240 VAC; Order no. 774726



*Insulation between the non-marked area and the relay contacts: Basic insulation (overvoltage category III), Protective separation (overvoltage category II)

Type: AC/DC

- U_B: 24 VAC/DC; Order no. 774729



*Insulation between the non-marked area and the relay contacts: Basic insulation (overvoltage category III), Protective separation (overvoltage category II)

Function Description

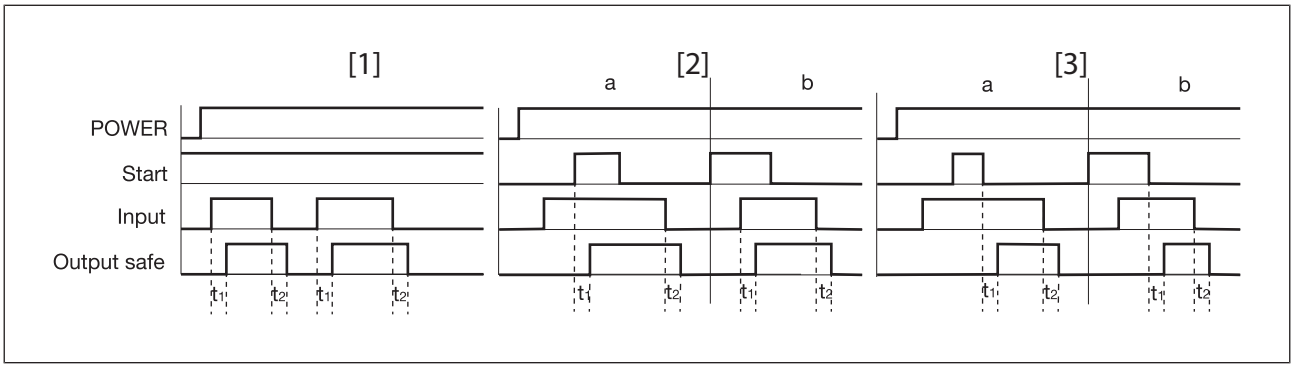
The safety relay PNOZ X6 provides a safety-oriented interruption of a safety circuit. When supply voltage is supplied the "POWER" LED is lit. The unit is ready for operation when the start circuit and feedback loop Y1-Y2 is closed.

- Input circuit is closed (e.g. safety gate closed):
  - The LEDs "CH.1" and "CH.2" are lit.
  - The safety contacts 13-14, 23-24 and 33-34 are closed. The unit is active.
- Input circuit is opened (e.g. safety gate opened):
  - The LEDs "CH.1" and "CH.2" go out.
  - Safety contacts 13-14, 23-24 and 33-34 are opened redundantly.

Operating modes

- Single-channel operation: No redundancy in the input circuit, earth faults in the start and input circuit are detected.
- Dual-channel operation without detection of shorts across contacts: Redundant input circuit, detects PNOZ X6
  - earth faults in the start and input circuit,
  - short circuits in the input circuit.
- Automatic start: Unit is active once the input circuit has been closed.
- Manual start: Unit is active once the input circuit and the start circuit are closed.
- Monitored start: Unit is active once
  - the input circuit is closed and then the start circuit is closed and opened again.
  - the start circuit is closed and then opened again once the input circuit is closed.
- Increase in the number of available contacts by connecting contact expandsion modules or external contactors/relays.

Timing diagram



Legend

- Power: Supply voltage
- Start: Start circuit
- Input: Input circuit
- Output safe: Safety contacts
- [1]: Automatic start
- [2]: Manual start
- [3]: Monitored start
- a: Input circuit closes before start circuit
- b: Start circuit closes before input circuit
- t_1: Switch-on delay
- t_2: Delay-on de-energisation

Installation

- The unit should be installed in a control cabinet with a protection type of at least IP54.
- Use the notch on the rear of the unit to attach it to a DIN rail (35 mm).
- When installed vertically: Secure the unit by using a fixing element (e.g. retaining bracket or end angle).

Wiring

Please note:

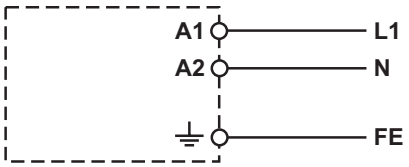
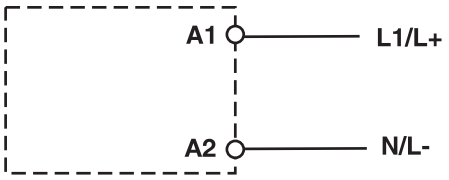
- Information given in the "Technical details [17]" must be followed.
- The output contacts 13-14, 23-24, 33-34 are safety contacts.
- Do not connect undesignated terminals.
- To prevent contact welding, a fuse should be connected before the output contacts (see Technical details [17]).
- Calculation of the max. cable length l_{max} in the input circuit:

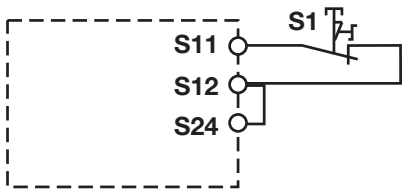
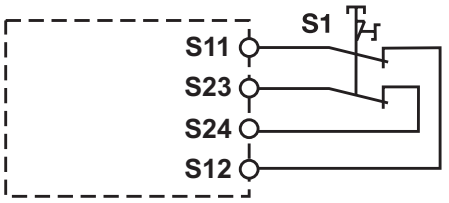
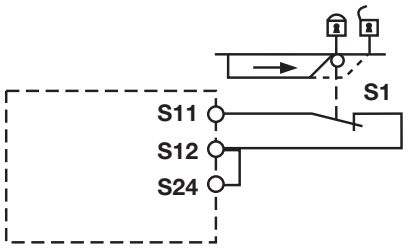
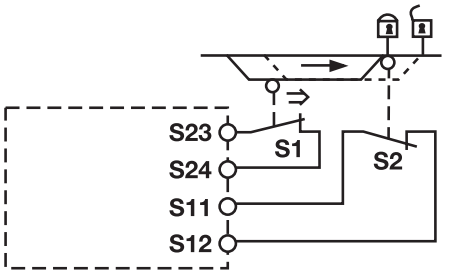
$$l_{max} = \frac{R_{lmax}}{R_l / km}$$

R_{lmax} = max. overall cable resistance (see Technical details [17])
R_l / km = cable resistance/km

- Use copper wiring with a temperature stability of 60/75 °C.
- To prevent EMC interferences (particularly common-mode interferences) the measures described in EN 60204-1 must be executed. This includes the separate routing of cables of the control circuits (input, start and feedback loop) from other cables for energy transmission or the shielding of cables, for example.
- Adequate protection must be provided on all output contacts with capacitive and inductive loads.
- Do not switch low currents using contacts that have been used previously with high currents.
- With 24 V AC/DC units:
  The power supply must meet the regulations for extra low voltages with protective electrical separation (SELV, PELV).

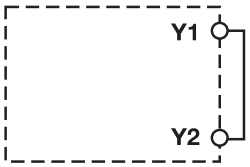
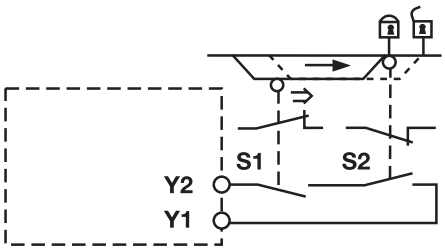
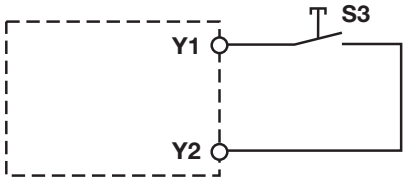
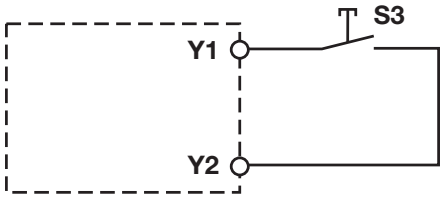
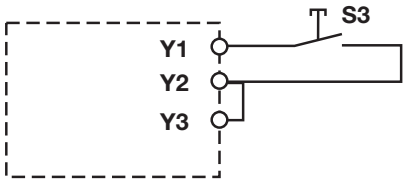
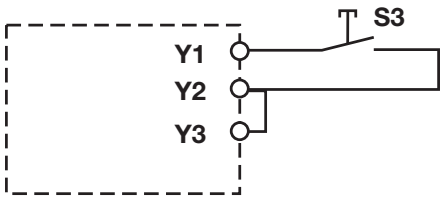
Preparing for operation

Supply voltage	AC	24 VAC/DC
		

Input circuit	Single-channel	Dual-channel
E-STOP **without** detection of shorts across contacts		
Safety gate **without** detection of shorts across contacts		

NOTICE

With single-channel wiring the safety level of your machine/plant may be lower than the safety level of the unit (see Safety characteristic data [📖 25]).

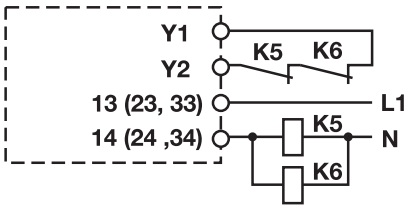
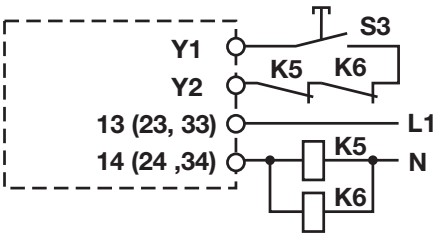
Start circuit	E-STOP wiring (single-channel, dual-channel), safety gate (single-channel)	Safety gate (dual-channel)
Automatic start		
Manual start		
Monitored start		

NOTICE

In the event of an automatic start or manual start with bridged start contact (fault):

The unit starts up automatically when the safeguard is reset, e.g. when the E-STOP pushbutton is released. Use external circuit measures to prevent an unexpected restart.

Simultaneity S1 and S2	Simultaneity max. 200 ms	Simultaneity ∞
		

Feedback loop	Automatic start	Manual start
Contacts from external contactors		

Legend

- S1/S2: E-STOP/safety gate switch
- S3: Reset button
- ⇑: Switch operated
- : Gate open
- : Gate closed

Operation

When the relay outputs are switched on, the mechanical contact on the relay cannot be tested automatically. Depending on the operational environment, measures to detect the non-opening of switching elements may be required under some circumstances.

When the product is used in accordance with the European Machinery Directive, a check must be carried out to ensure that the safety contacts on the relay outputs open correctly. Open the safety contacts (switch off output) and start the device again, so that the internal diagnostics can check that the safety contacts open correctly

- for SIL CL 3/PL e at least 1x per month
- for SIL CL 2/PL d at least 1x per year

NOTICE

The safety functions should be checked after initial commissioning and each time the plant/machine is changed. The safety functions may only be checked by qualified personnel.

Status indicators

LEDs indicate the status and errors during operation:

LED on

POWER

Supply voltage is present.

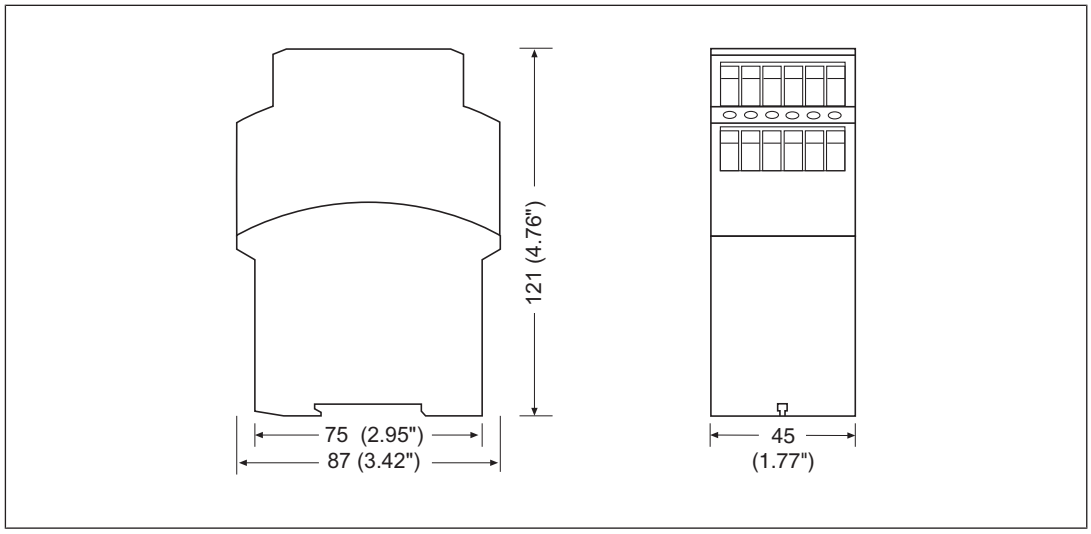
CH.1
Safety contacts of channel 1 are closed.

CH.2
Safety contacts of channel 2 are closed.

Faults – Interference

- Earth fault: The supply voltage fails and the safety contacts open. Once the cause of the respective fault has been rectified and the supply voltage is switched off for approx. 1 minute, the unit is ready for operation again.
- Contact malfunctions: If the contacts have welded, reactivation will not be possible after the input circuit has opened.
- LED "POWER" does not light: Short circuit or no supply voltage.

Dimensions in mm



Technical details Order no. 774721, 774725

General	774721	774725
Certifications	CCC, CE, EAC, TÜV, UKCA, cU-Lus Listed	CCC, CE, EAC, TÜV, UKCA, cU-Lus Listed
Electrical data	**774721**	**774725**
Supply voltage		
Voltage	42 V	110 - 120 V
Kind	AC	AC
Voltage tolerance	-15 %/+10 %	-15 %/+10 %
Output of external power supply (AC)	6,5 VA	6,5 VA
Frequency range AC	50 - 60 Hz	50 - 60 Hz
Duty cycle	100 %	100 %
Inputs	**774721**	**774725**
Quantity	2	2
Voltage at		
Input circuit DC	24 V	24 V
Start circuit DC	24 V	24 V
Feedback loop DC	24 V	24 V
Current at		
Input circuit DC	50 mA	50 mA
Start circuit DC	100 mA	100 mA
Feedback loop DC	100 mA	100 mA
Max. overall cable resistance Rl-max		
Single-channel at UB AC	100 Ohm	100 Ohm
Dual-channel without detection of shorts across contacts at UB AC	200 Ohm	200 Ohm
Relay outputs	**774721**	**774725**
Number of output contacts		
Safety contacts (N/O), instant-aneous	3	3
Max. short circuit current IK	1 kA	1 kA
Utilisation category		
in accordance with the standard	EN 60947-4-1	EN 60947-4-1

Relay outputs	774721	774725
Utilisation category of safety contacts		
AC1 at	**400 V**	**400 V**
Min. current	**0,01 A**	**0,01 A**
Max. current	**5 A**	**5 A**
Max. power	**2000 VA**	**2000 VA**
AC1 at	**240 V**	**240 V**
Min. current	**0,01 A**	**0,01 A**
Max. current	**8 A**	**8 A**
Max. power	**2000 VA**	**2000 VA**
DC1 at	**24 V**	**24 V**
Min. current	**0,01 A**	**0,01 A**
Max. current	**8 A**	**8 A**
Max. power	**200 W**	**200 W**
Utilisation category		
in accordance with the standard	**EN 60947-5-1**	**EN 60947-5-1**
Utilisation category of safety contacts		
AC15 at	**230 V**	**230 V**
Max. current	**5 A**	**5 A**
DC13 (6 cycles/min) at	**24 V**	**24 V**
Max. current	**7 A**	**7 A**
Utilisation category in accordance with UL		
Voltage	**240 V AC G. P.**	**240 V AC G. P.**
with current	**8 A**	**8 A**
Voltage	**24 V DC Resistive**	**24 V DC Resistive**
with current	**5 A**	**5 A**
Pilot Duty	**B300, R300**	**B300, R300**
External contact fuse protection, safety contacts		
in accordance with the standard	**EN 60947-5-1**	**EN 60947-5-1**
Max. melting integral	**240 A²s**	**240 A²s**
Blow-out fuse, quick	**10 A**	**10 A**
Blow-out fuse, slow	**6 A**	**6 A**
Blow-out fuse, gG	**10 A**	**10 A**
Circuit breaker 24V AC/DC, characteristic B/C	**6 A**	**6 A**
Contact material	**AgSnO2 + 0,2 µm Au**	**AgSnO2 + 0,2 µm Au**

Conventional thermal current while loading several contacts	774721	774725
Ith per contact at UB AC; AC1: 240 V, DC1: 24 V		
Conv. therm. current with 1 contact	**8 A**	**8 A**
Conv. therm. current with 2 contacts	**7,3 A**	**7,3 A**
Conv. therm. current with 3 contacts	**6 A**	**6 A**
Times	**774721**	**774725**
Switch-on delay		
with automatic start typ.	**270 ms**	**270 ms**
with automatic start max.	**370 ms**	**370 ms**
with automatic start after power on typ.	**260 ms**	**260 ms**
with automatic start after power on max.	**350 ms**	**350 ms**
Delay-on de-energisation		
with E-STOP typ.	**15 ms**	**15 ms**
with E-STOP max.	**30 ms**	**30 ms**
with power failure typ.	**150 ms**	**150 ms**
with power failure max.	**200 ms**	**200 ms**
Recovery time at max. switching frequency 1/s		
after E-STOP	**50 ms**	**50 ms**
after power failure	**250 ms**	**250 ms**
Supply interruption before de-energisation	**20 ms**	**20 ms**
Environmental data	**774721**	**774725**
Climatic suitability	**EN 60068-2-78**	**EN 60068-2-78**
Ambient temperature		
Temperature range	**-10 - 55 °C**	**-10 - 55 °C**
Storage temperature		
Temperature range	**-40 - 85 °C**	**-40 - 85 °C**
Climatic suitability		
Humidity	**93 % r. h. at 40 °C**	**93 % r. h. at 40 °C**
Condensation during operation	**Not permitted**	**Not permitted**
EMC	**EN 60947-5-1, EN 61000-6-2, EN 61326-3-1**	**EN 60947-5-1, EN 61000-6-2, EN 61326-3-1**
Vibration		
in accordance with the standard	**EN 60068-2-6**	**EN 60068-2-6**
Frequency	**10 - 55 Hz**	**10 - 55 Hz**
Amplitude	**0,35 mm**	**0,35 mm**

Environmental data	774721	774725
Airgap creepage		
in accordance with the standard	**EN 60947-1**	**EN 60947-1**
Overvoltage category	**III / II**	**III / II**
Pollution degree	**2**	**2**
Rated insulation voltage	**250 V**	**250 V**
Rated impulse withstand voltage	**4 kV**	**4 kV**
Protection type		
Housing	**IP40**	**IP40**
Terminals	**IP20**	**IP20**
Mounting area (e.g. control cabinet)	**IP54**	**IP54**
Mechanical data	**774721**	**774725**
Mounting position	**Any**	**Any**
Mechanical life	**10,000,000 cycles**	**10,000,000 cycles**
Material		
Bottom	**PPO UL 94 V1**	**PPO UL 94 V1**
Front	**ABS UL 94 V0**	**ABS UL 94 V0**
Top	**PPO UL 94 V1**	**PPO UL 94 V1**
Connection type	**Screw terminal**	**Screw terminal**
Mounting type	**Fixed**	**Fixed**
Conductor cross section with screw terminals		
1 core flexible	**0,2 - 4 mm², 24 - 10 AWG**	**0,2 - 4 mm², 24 - 10 AWG**
2 core with the same cross section, flexible with crimp connectors, no plastic sleeve	**0,2 - 2,5 mm², 24 - 14 AWG**	**0,2 - 2,5 mm², 24 - 14 AWG**
2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors	**0,2 - 2,5 mm², 24 - 14 AWG**	**0,2 - 2,5 mm², 24 - 14 AWG**
Torque setting with screw terminals	**0,5 Nm**	**0,5 Nm**
Stripping length with screw terminals	**6 mm**	**6 mm**
Dimensions		
Height	**87 mm**	**87 mm**
Width	**45 mm**	**45 mm**
Depth	**121 mm**	**121 mm**
Weight	**390 g**	**390 g**

Where standards are undated, the 2022-09 latest editions shall apply.

Technical details Order no. 774726, 774729

General	774726	774729
Certifications	CCC, CE, EAC, TÜV, UKCA, cU-Lus Listed	CCC, CE, EAC, TÜV, UKCA, cU-Lus Listed
Electrical data	**774726**	**774729**
Supply voltage		
Voltage	230 - 240 V	24 V
Kind	AC	AC/DC
Voltage tolerance	-15 %/+10 %	-15 %/+10 %
Output of external power supply (AC)	6,5 VA	3 VA
Output of external power supply (DC)	–	2 W
Frequency range AC	50 - 60 Hz	50 - 60 Hz
Residual ripple DC	–	160 %
Duty cycle	100 %	100 %
Inputs	**774726**	**774729**
Quantity	2	2
Voltage at		
Input circuit DC	24 V	24 V
Start circuit DC	24 V	24 V
Feedback loop DC	24 V	24 V
Current at		
Input circuit DC	50 mA	50 mA
Start circuit DC	100 mA	55 mA
Feedback loop DC	100 mA	55 mA
Max. overall cable resistance Rl-max		
Single-channel at UB DC	–	100 Ohm
Single-channel at UB AC	100 Ohm	100 Ohm
Dual-channel without detection of shorts across contacts at UB DC	–	200 Ohm
Dual-channel without detection of shorts across contacts at UB AC	200 Ohm	200 Ohm
Relay outputs	**774726**	**774729**
Number of output contacts		
Safety contacts (N/O), instant-aneous	3	3
Max. short circuit current IK	1 kA	1 kA
Utilisation category		
in accordance with the standard	EN 60947-4-1	EN 60947-4-1

Relay outputs	774726	774729
Utilisation category of safety contacts		
AC1 at	**400 V**	**400 V**
Min. current	**0,01 A**	**0,01 A**
Max. current	**5 A**	**5 A**
Max. power	**2000 VA**	**2000 VA**
AC1 at	**240 V**	**240 V**
Min. current	**0,01 A**	**0,01 A**
Max. current	**8 A**	**8 A**
Max. power	**2000 VA**	**2000 VA**
DC1 at	**24 V**	**24 V**
Min. current	**0,01 A**	**0,01 A**
Max. current	**8 A**	**8 A**
Max. power	**200 W**	**200 W**
Utilisation category		
in accordance with the standard	**EN 60947-5-1**	**EN 60947-5-1**
Utilisation category of safety contacts		
AC15 at	**230 V**	**230 V**
Max. current	**5 A**	**5 A**
DC13 (6 cycles/min) at	**24 V**	**24 V**
Max. current	**7 A**	**7 A**
Utilisation category in accordance with UL		
Voltage	**240 V AC G. P.**	**240 V AC G. P.**
with current	**8 A**	**8 A**
Voltage	**24 V DC Resistive**	**24 V DC Resistive**
with current	**5 A**	**5 A**
Pilot Duty	**B300, R300**	**B300, R300**
External contact fuse protection, safety contacts		
in accordance with the standard	**EN 60947-5-1**	**EN 60947-5-1**
Max. melting integral	**240 A²s**	**240 A²s**
Blow-out fuse, quick	**10 A**	**10 A**
Blow-out fuse, slow	**6 A**	**6 A**
Blow-out fuse, gG	**10 A**	**10 A**
Circuit breaker 24V AC/DC, characteristic B/C	**6 A**	**6 A**
Contact material	**AgSnO2 + 0,2 µm Au**	**AgSnO2 + 0,2 µm Au**

Conventional thermal current while loading several contacts	774726	774729
Ith per contact at UB AC; AC1: 240 V, DC1: 24 V		
Conv. therm. current with 1 contact	**8 A**	**8 A**
Conv. therm. current with 2 contacts	**7,3 A**	**7,3 A**
Conv. therm. current with 3 contacts	**6 A**	**6 A**
Ith per contact at UB DC; AC1: 240 V, DC1: 24 V		
Conv. therm. current with 1 contact	–	**8 A**
Conv. therm. current with 2 contacts	–	**8 A**
Conv. therm. current with 3 contacts	–	**8 A**
Times	**774726**	**774729**
Switch-on delay		
with automatic start typ.	**270 ms**	**250 ms**
with automatic start max.	**370 ms**	**350 ms**
with automatic start after power on typ.	**260 ms**	**260 ms**
with automatic start after power on max.	**350 ms**	**350 ms**
Delay-on de-energisation		
with E-STOP typ.	**15 ms**	**15 ms**
with E-STOP max.	**30 ms**	**30 ms**
with power failure typ.	**150 ms**	**110 ms**
with power failure max.	**200 ms**	**160 ms**
Recovery time at max. switching frequency 1/s		
after E-STOP	**50 ms**	**50 ms**
after power failure	**250 ms**	**200 ms**
Supply interruption before de-energisation	**20 ms**	**20 ms**
Environmental data	**774726**	**774729**
Climatic suitability	**EN 60068-2-78**	**EN 60068-2-78**
Ambient temperature		
Temperature range	**-10 - 55 °C**	**-10 - 55 °C**
Storage temperature		
Temperature range	**-40 - 85 °C**	**-40 - 85 °C**
Climatic suitability		
Humidity	**93 % r. h. at 40 °C**	**93 % r. h. at 40 °C**
Condensation during operation	**Not permitted**	**Not permitted**
EMC	**EN 60947-5-1, EN 61000-6-2, EN 61326-3-1**	**EN 60947-5-1, EN 61000-6-2, EN 61326-3-1**

Environmental data	774726	774729
Vibration		
in accordance with the standard	**EN 60068-2-6**	**EN 60068-2-6**
Frequency	**10 - 55 Hz**	**10 - 55 Hz**
Amplitude	**0,35 mm**	**0,35 mm**
Airgap creepage		
in accordance with the standard	**EN 60947-1**	**EN 60947-1**
Overvoltage category	**III / II**	**III / II**
Pollution degree	**2**	**2**
Rated insulation voltage	**250 V**	**250 V**
Rated impulse withstand voltage	**4 kV**	**4 kV**
Protection type		
Housing	**IP40**	**IP40**
Terminals	**IP20**	**IP20**
Mounting area (e.g. control cabinet)	**IP54**	**IP54**
Mechanical data	**774726**	**774729**
Mounting position	**Any**	**Any**
Mechanical life	**10,000,000 cycles**	**10,000,000 cycles**
Material		
Bottom	**PPO UL 94 V1**	**PPO UL 94 V1**
Front	**ABS UL 94 V0**	**ABS UL 94 V0**
Top	**PPO UL 94 V1**	**PPO UL 94 V1**
Connection type	**Screw terminal**	**Screw terminal**
Mounting type	**Fixed**	**Fixed**
Conductor cross section with screw terminals		
1 core flexible	**0,2 - 4 mm², 24 - 10 AWG**	**0,2 - 4 mm², 24 - 10 AWG**
2 core with the same cross section, flexible with crimp connectors, no plastic sleeve	**0,2 - 2,5 mm², 24 - 14 AWG**	**0,2 - 2,5 mm², 24 - 14 AWG**
2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors	**0,2 - 2,5 mm², 24 - 14 AWG**	**0,2 - 2,5 mm², 24 - 14 AWG**
Torque setting with screw terminals	**0,5 Nm**	**0,5 Nm**
Stripping length with screw terminals	**6 mm**	**6 mm**
Dimensions		
Height	**87 mm**	**87 mm**
Width	**45 mm**	**45 mm**
Depth	**121 mm**	**121 mm**
Weight	**390 g**	**295 g**

Where standards are undated, the 2022-09 latest editions shall apply.

Safety characteristic data

NOTICE

You must comply with the safety characteristic data in order to achieve the required safety level for your plant/machine.

Operating mode	EN ISO 13849-1: 2015 PL	EN ISO 13849-1: 2015 Category	EN IEC 62061 SIL CL/ maximum SIL	EN IEC 62061 PFH_D [1/h]	EN/IEC 61511 SIL	EN/IEC 61511 PFD	EN ISO 13849-1: 2015 T_M [year]
–	PL e	Cat. 4	SIL 3	2,31E-09	SIL 3	2,03E-06	20

Explanatory notes for the safety-related characteristic data:

- Safety characteristic data in accordance with EN IEC 62061 and EN/IEC 61511 was calculated based on EN/IEC 61508.
- T_M is the maximum mission time in accordance with EN ISO 13849-1. The value also applies as the retest interval in accordance with EN/IEC 61508-6 and EN/IEC 61511 and as the proof test interval and mission time in accordance with EN IEC 62061.

All the units used within a safety function must be considered when calculating the safety characteristic data.

INFORMATION

A safety function's SIL/PL values are **not** identical to the SIL/PL values of the units that are used and may be different. We recommend that you use the PAScal software tool to calculate the safety function's SIL/PL values.

Supplementary data

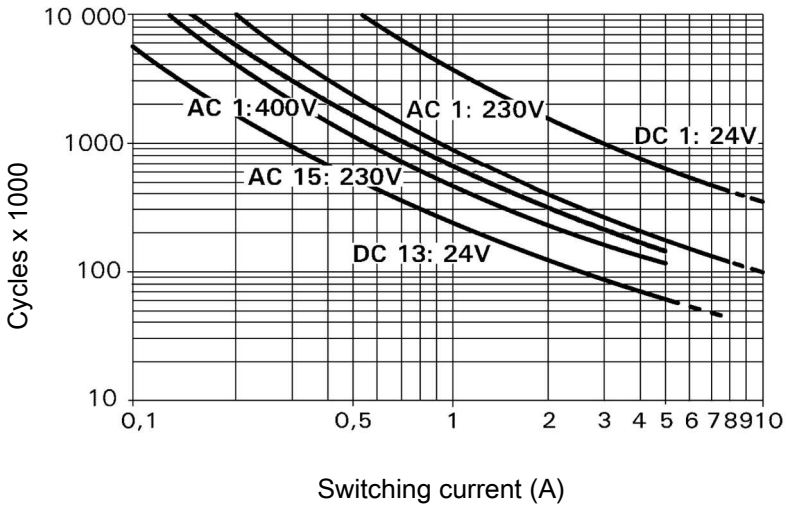
CAUTION!

It is essential to consider the relay's service life graphs. The relay outputs' safety-related characteristic data is only valid if the values in the service life graphs are met.

The PFH value depends on the switch frequency and the load of the relay output.
If the service life graphs are not accessible, the stated PFH value can be used irrespective of the switch frequency and the load, as the PFH value already considers the relay's B10d value as well as the failure rates of the other components.

Service life graph

The service life graphs indicate the number of cycles from which failures due to wear must be expected. The wear is mainly caused by the electrical load; the mechanical load is negligible.



Example

- Inductive load: 0.2 A
- Utilisation category: AC15
- Contact service life: 4 000 000 cycles

Provided the application to be implemented requires fewer than 4 000 000 cycles, the PFH value (see Technical details) can be used in the calculation.

To increase the service life, sufficient spark suppression must be provided on all output contacts. With capacitive loads, any power surges that occur must be noted. With DC contactors, use flywheel diodes for spark suppression.

Order reference

Product type	Features	Connection type	Order no.
PNOZ X6	42 VAC	Screw terminals	774721
PNOZ X6	110 - 120 VAC	Screw terminals	774725
PNOZ X6	230 - 240 VAC	Screw terminals	774726
PNOZ X6	24 VAC/DC	Screw terminals	774729

EC declaration of conformity

This product/these products meet the requirements of the directive 2006/42/EC for machinery of the European Parliament and of the Council. The complete EC Declaration of Conformity is available on the Internet at www.pilz.com/downloads.
Authorised representative: Norbert Fröhlich, Pilz GmbH & Co. KG, Felix-Wankel-Str. 2, 73760 Ostfildern, Germany

UKCA-Declaration of Conformity

This product(s) complies with following UK legislation: Supply of Machinery (Safety) Regulation 2008.
The complete UKCA Declaration of Conformity is available on the Internet at www.pilz.com/downloads.

Representative: Pilz Automation Technology, Pilz House, Little Colliers Field,
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