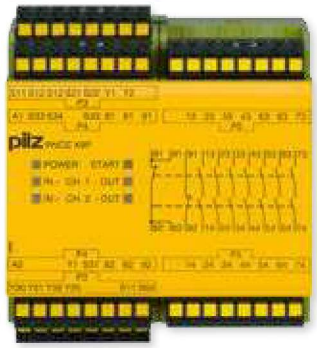
# Safety relays PNOZ X

Safety relays from the product group PNOZ X are proven through their reliability and robustness and have a wide application range in the most varied of safety applications. PNOZ is the most widely used safety relay in the world. One PNOZ is used per safety function.

PNOZ X1P

PNOZ X3P



PNOZ X9P

**Customised safety for each application**

Technical features are the voltage-free, electromechanical contacts in 2-relay technology. The sizes vary from 22.5 to 90 mm, the number of contacts from two to eight. Whatever your safety requirement – PNOZ X has already proved itself a million times over in tough industrial environments. Why not take advantage!

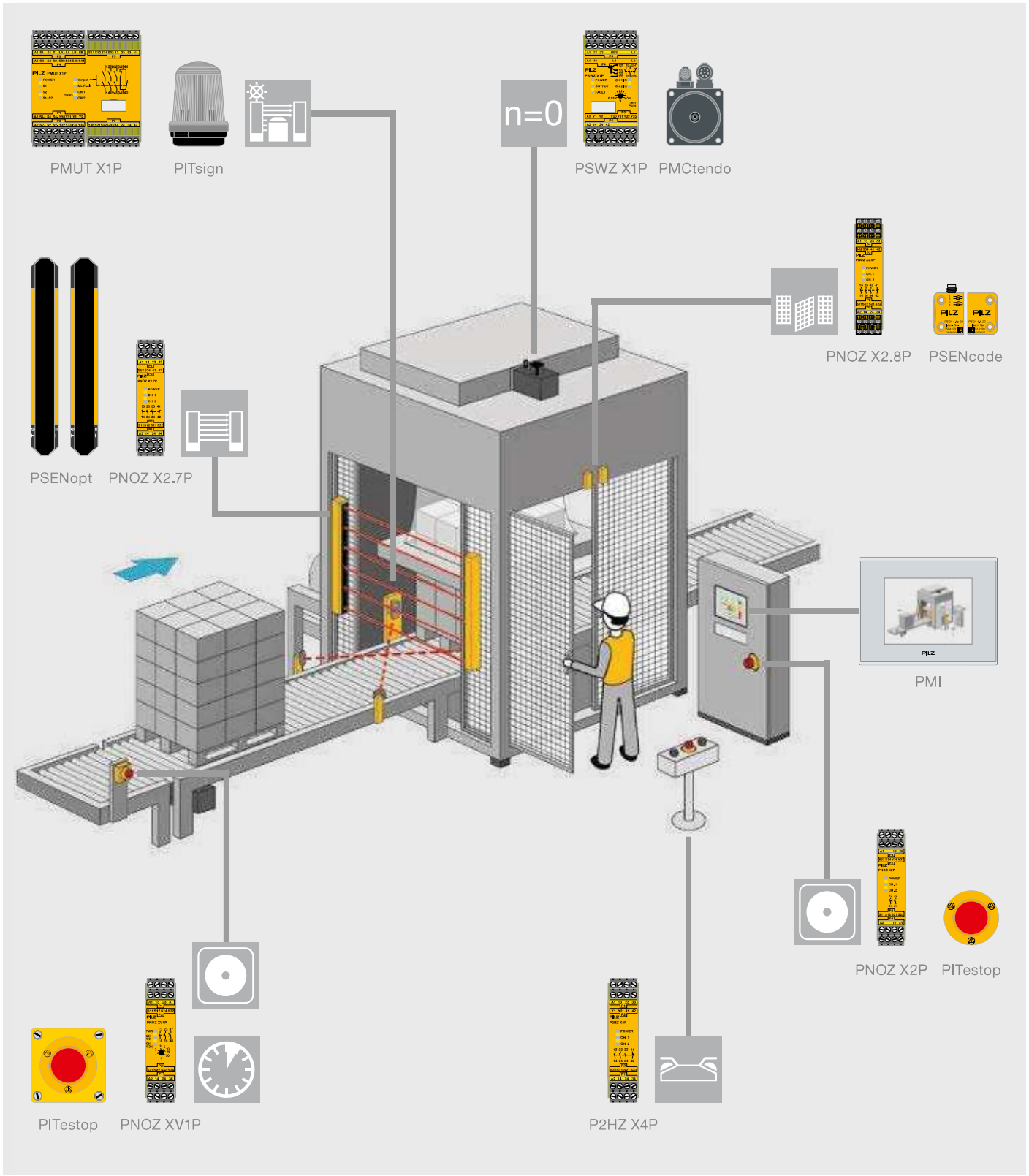
**Your benefits at a glance**

- Technology proven over many years of use
- Huge selection of products
- For all safety functions such as monitoring E-STOP devices, safety gates, light beam devices, muting, pressure-sensitive mats and two-hand control and many more
- Delayed and instantaneous contact expansion modules, safe timers, safe monitoring relays for standstill, speed and other functions
- Excellent price/ performance ratio
- Rapid commissioning thanks to plug-in terminals
- Maximum safety with minimum space requirement
- Complete solution comprising evaluation devices, compatible sensor technology, control and signal devices
- Low storage costs thanks to universal power supply and plug-in terminals

Keep up-to-date on safety relays PNOZ X:

Webcode: web150097

Online information at www.pilz.com




Example: using safety relays PNOZ X on a packaging machine.

# Selection guide – PNOZ X



## Safety relays PNOZ X

| Type | Application | | | | | | | Performance Level (PL) – EN ISO 13849-1 |
|---|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  | | |
| PNOZ X1P | ◆ | ◆ | | | | | | e |
| PNOZ X2P | ◆ | ◆ | | | | | | e |
| PNOZ X2.7P | ◆ | ◆ | ◆ | | | | | e |
| PNOZ X2.8P | ◆ | ◆ | ◆ | | | | | e |
| PNOZ X3P | ◆ | ◆ | ◆ | | | | | e |
| PNOZ X7P | ◆ | ◆ | | | | | | e |
| PNOZ X8P | ◆ | ◆ | ◆ | | | | | e |
| PNOZ X9P | ◆ | ◆ | ◆ | | | | | e |
| PNOZ X10.11P | ◆ | ◆ | ◆ | | | | | e |
| PNOZ X11P | ◆ | ◆ | ◆ | | | | | e |
| PNOZ XV1P | ◆ | ◆ | ◆ | | | | | e (d) [2] |
| PNOZ XV3P | ◆ | ◆ | ◆ | | | | | e (d) [2] |
| PNOZ XV3.1P | ◆ | ◆ | ◆ | | | | | e (d) [2] |
| PMUT X1P | ◆ | | ◆ | ◆ | | | | e |
| P2HZ X1P | | | | | ◆ | | EN 574, Type IIIC | e |
| P2HZ X4P | | | | | ◆ | | EN 574, Type IIIC | e |
| PSWZ X1P | | | | | | ◆ | | e |
| PZE X4P | Contact expansion | | | | | | | e |

| Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 | Output contacts | | | | Supply voltage ($U_B$) | Dimensions (H x W x D) in mm |
|---|---|---|---|---|---|---|
| | Safe | | Non-safety-related | | | |
| |  |  |  |  | | |
| 3 | 3 | - | 1 | - | 24 V DC | 101/94 [1] x 22.5 x 121 |
| 3 | 2 | - | - | - | ▸ 24 V AC/DC<br>▸ 48 … 240 V AC/DC | 101/94 [1] x 22.5 x 121 |
| 3 | 3 | - | 1 | - | ▸ 24 V AC/DC<br>▸ 24 … 240 V AC/DC | 101/94 [1] x 22.5 x 121 |
| 3 | 3 | - | 1 | - | ▸ 24 V AC/DC<br>▸ 24 … 240 V AC/DC | 101/94 [1] x 22.5 x 121 |
| 3 | 3 | - | 1 | 1 | ▸ 24 V AC/DC<br>▸ 24 … 240 V AC/DC | 101/94 [1] x 45 x 121 |
| 3 | 2 | - | - | - | ▸ 24 V AC/DC<br>▸ 110 … 120, 230 … 240 V AC | 101/94 [1] x 22.5 x 121 |
| 3 | 3 | - | 2 | 2 | ▸ 24 V DC<br>▸ 24, 110, 230 V AC | 101/94 [1] x 45 x 121 |
| 3 | 7 | - | 2 | 2 | ▸ 12 V DC<br>▸ 24 V DC, 100 … 240 V AC | 101/94 [1] x 90 x 121 |
| 3 | 6 | - | 4 | - | 24 V DC | 101/94 [1] x 90 x 121 |
| 3 | 7 | - | 1 | 2 | ▸ 24 V DC, 24 V AC<br>▸ 110 … 120, 230 … 240 V AC | 101/94 [1] x 90 x 121 |
| 3 | 2 | 1 | - | - | 24 V DC | 101/94 [1] x 22.5 x 121 |
| 3 | 3 | 2 | - | - | 24 V DC | 101/94 [1] x 45 x 121 |
| 3 | 3 | 2 | 1 | - | ▸ 24 V DC<br>▸ 24 … 240 V AC/DC | 101/94 [1] x 90 x 121 |
| 3 | 3 | - | 1 | 5 | 24 V DC | 101/94 [1] x 90 x 121 |
| 3 | 3 | - | 1 | 2 | ▸ 24 V DC<br>▸ 24, 42, 110, 115, 230, 240 V AC | 101/94 [1] x 45 x 121 |
| 3 | 3 | - | 1 | - | 24 V AC/DC | 101/94 [1] x 22.5 x 121 |
| 3 | 2 | - | 1 | 1 | 24 … 240 V AC/DC | 101/94 [1] x 45 x 121 |
| 3 | 4 | - | - | - | 24 V DC | 101/94 [1] x 22.5 x 121 |

[1] Height incl. spring-loaded terminals/plug-in screw terminals
[2] Value applies to instantaneous (delayed) safety contacts

Technical documentation on safety relays PNOZ X:

Webcode: web150635

Online information at www.pilz.com

# Technical details – PNOZ X



## Safety relays PNOZ X


PNOZ X1P


PNOZ X2P

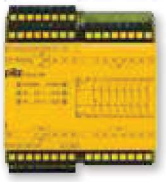

PNOZ X2.7P

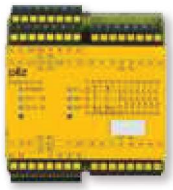

PNOZ X2.8P

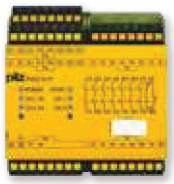

PNOZ X3P


PNOZ X7P


PNOZ X8P


PNOZ X9P


PNOZ X10.11P


PNOZ X11P

| Type | Features |
|---|---|
| **PNOZ X1P** | 1-channel operation |
| **PNOZ X2P** | ▸ 2-channel operation with detection of shorts across contacts<br>▸ Automatic or monitored start can be selected |
| **PNOZ X2.7P** | ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored start |
| **PNOZ X2.8P** | ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Automatic start |
| **PNOZ X3P** | ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected<br>▸ 1 semiconductor output<br>▸ Safety gate function with N/C / N/O combination |
| **PNOZ X7P** | 1-channel operation |
| **PNOZ X8P** | ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected<br>▸ 2 semiconductor outputs |
| **PNOZ X9P** | ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected<br>▸ 2 semiconductor outputs |
| **PNOZ X10.11P** | ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected |
| **PNOZ X11P** | ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected<br>▸ 2 semiconductor outputs |

| Outputs: Voltage/current/ rating | Approvals | Order number<br>Spring-loaded terminals | <br>Plug-in screw terminals |
|---|---|---|---|
| DC1: 24 V/6 A/150 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 787 100 | 777 100 |
| DC1: 24 V/6 A/150 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 24 V AC/DC _____ 787 303<br>▸ 48 … 240 V AC/DC ____ 787 307 | ▸ 24 V AC/DC _____ 777 303<br>▸ 48 … 240 V AC/DC ____ 777 307 |
| DC1: 24 V/6 A/150 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 24 V AC/DC _____ 787 305<br>▸ 24 … 240 V AC/DC ____ 787 306 | ▸ 24 V AC/DC _____ 777 305<br>▸ 24 … 240 V AC/DC ____ 777 306 |
| DC1: 24 V/6 A/150 W | CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA, CCC | ▸ 24 V AC/DC _____ 787 301<br>▸ 24 … 240 V AC/DC ____ 787 302 | ▸ 24 V AC/DC _____ 777 301<br>▸ 24 … 240 V AC/DC ____ 777 302 |
| DC1: 24 V/8 A/200 W | CE, cULus Listed, EAC (Eurasian), TÜV, KOSHA, CCC | ▸ 24 V AC/DC _____ 787 310<br>▸ 24 … 240 V AC/DC ____ 787 313 | ▸ 24 V AC/DC _____ 777 310<br>▸ 24 … 240 V AC/DC ____ 777 313 |
| DC1: 24 V/6 A/150 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 24 V AC/DC _____ 787 059<br>▸ Others available on request | ▸ 24 V AC/DC _____ 777 059<br>▸ Others available on request |
| DC1: 24 V/8 A/200 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 24 V AC _____ 787 770<br>▸ 24 V DC _____ 787 760<br>▸ Others available on request | ▸ 24 V AC _____ 777 770<br>▸ 24 V DC _____ 777 760<br>▸ Others available on request |
| DC1: 24 V/8 A/200 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 24 V DC _____ 787 609<br>▸ 24 V DC, 100 … 240 V AC _____ 787 606 | ▸ 12 V DC _____ 777 607<br>▸ 24 V DC _____ 777 609<br>▸ 24 V DC, 100 … 240 V AC _____ 777 606 |
| DC1: 24 V/8 A/200 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 787 750 | 777 750 |
| DC1: 24 V/8 A/200 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 24 V DC, 24 V AC _____ 787 080<br>▸ 110 … 120 V AC _____ 787 083<br>▸ 230 … 240 V AC _____ 787 086 | ▸ 24 V DC, 24 V AC _____ 777 080<br>▸ 110 … 120 V AC, 24 V DC _____ 777 083<br>▸ 230 … 240 V AC, 24 V DC _____ 777 086 |

Technical documentation on safety relays PNOZ X:

Webcode: web150635

Online information at www.pilz.com

# Technical details – PNOZ X



## Safety relays PNOZ X

PNOZ XV1P

PNOZ XV3P

PNOZ XV3.1P

PMUT X1P

P2HZ X1P

P2HZ X4P

PSWZ X1P

PZE X4P

| Type | Features |
|---|---|
| **PNOZ XV1P** | ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected |
| **PNOZ XV3P** | ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected |
| **PNOZ XV3.1P** | ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected<br>▸ Universal power supply 24 … 240 V AC/DC |
| **PMUT X1P** | ▸ Up to 4 muting sensors<br>▸ Monitoring and switching muting lamps<br>▸ Parallel and sequential muting<br>▸ Simultaneity monitoring<br>▸ 5 semiconductor outputs<br>▸ Reset input<br>▸ Override function via key switch in the case of a fault<br>▸ LED status indicators |
| **P2HZ X1P** | 2 semiconductor outputs |
| **P2HZ X4P** | 22.5 mm width |
| **PSWZ X1P** | ▸ Safe standstill monitoring<br>▸ 1 or 2-channel operation<br>▸ No external components required<br>▸ Fault signal if simultaneity time is exceeded<br>▸ Reset input<br>▸ Detects open circuits |
| **PZE X4P** | 1-channel operation |

| Outputs: Voltage/current/ rating | Approvals | Order number | |
|---|---|---|---|
| | | Spring-loaded terminals | Plug-in screw terminals |
| DC1: 24 V/5 A/125 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 0.1 … 3 s ____ 787601<br>▸ 1 … 30 s ____ 787602 | ▸ 0.1 … 3 s ____ 777601<br>▸ 1 … 30 s ____ 777602 |
| DC1: 24 V/8 A/200 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 3 s ____ 787512<br>▸ 30 s ____ 787510<br>▸ Others available on request | ▸ 3 s ____ 777512<br>▸ 30 s ____ 777510<br>▸ Others available on request |
| DC1: 24 V/8 A/200 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 3 s selectable, 24 … 240 V AC/DC ____ 787532<br>▸ 30 s selectable, 24 … 240 V AC/DC ____ 787530<br>▸ Others available on request | ▸ 3 s selectable, 24 … 240 V AC/DC ____ 777532<br>▸ 30 s selectable, 24 … 240 V AC/DC ____ 777530<br>▸ Others available on request |
| DC1: 24 V/8 A/200 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 788010 | 778010 |
| DC1: 24 V/5 A/125 W | CE, cULus Listed, EAC (Eurasian), BG, CCC | ▸ 24 V DC ____ 787340<br>▸ Others available on request | ▸ 24 V DC ____ 777340<br>▸ Others available on request |
| DC1: 24 V/5 A/125 W | CE, cULus Listed, EAC (Eurasian), BG, KOSHA, CCC | ▸ 24 V AC ____ 787354<br>▸ 24 V DC ____ 787355 | ▸ 24 V AC ____ 777354<br>▸ 24 V DC ____ 777355 |
| DC1: 24 V/6 A/150 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ $U_M$: 0.5 V ____ 787949<br>▸ $U_M$: 3 V ____ 787950<br>▸ $U_M$: 0.0075 … 0.5 V ____ 787951 | ▸ $U_M$: 0.5 V ____ 777949<br>▸ $U_M$: 0.5 V, coated version ____ 777959<br>▸ $U_M$: 3 V ____ 777950<br>▸ $U_M$: 0.0075 … 0.5 V ____ 777951 |
| DC1: 24 V/6 A/150 W | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 787585 | 777585 |

Technical documentation on safety relays PNOZ X:

Webcode: web150635

Online information at www.pilz.com

# Safety relay PNOZcompact

The safety relay is optimised for functionality and can be used in all areas of engineering. In series machine production in particular, the use of the PNOZcompact has many advantages thanks to its concentrated functionality: This allows high-volume projects with a high degree of standardisation to be implemented economically. Choose a PNOZ safety relay – the original and a byword for safety relays.

PNOZ c1

PNOZ c2

**Square, simple, yellow**

You want to safely monitor an E-STOP device, safety gate or light beam device? Is it important to you to save time through simple installation and maintenance? Then we have the right solution for you – the safety relay PNOZcompact.

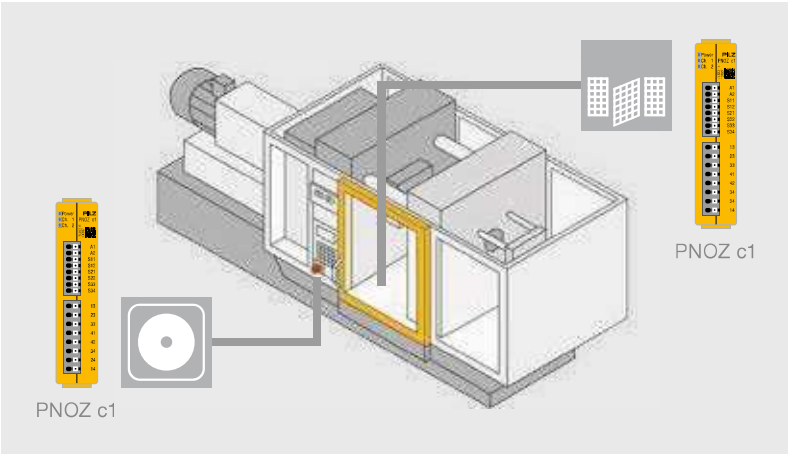
PNOZ c1 is ideal for monitoring E-STOP devices or safety gates. A block diagram with connection example is printed on the side of the unit and is a great help. PNOZ c2 is predestined for the safe monitoring of type 4 light beam devices, e.g. PSENopt from Pilz, or sensors with OSSD outputs in accordance with EN 61496-1 with a guaranteed maximum reaction time of 12 ms. You save time through simple installation because the transmitter and receiver are supplied with voltage directly via the evaluation device.

## Safety relay PNOZcompact

**Common features**

- PL e of EN ISO 13849-1, Safety Integrity Level (SIL) CL 3 of IEC 62061
- Supply voltage ($U_B$): 24 V DC
- LEDs to display operating voltage and switch status
- Spring-loaded terminals fixed on the device

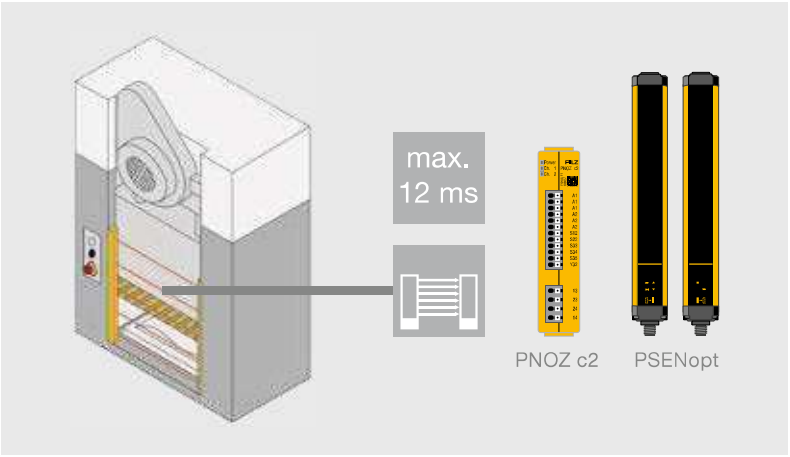
| Type | Application area | Dimensions (H x W x D) in mm |
|---|---|---|
| **PNOZ c1** | E-STOP relay and safety gate monitor | 105 [1] x 22.5 x 100 |
| **PNOZ c2** | For monitoring type 4 light beam devices or sensors with OSSD outputs in accordance with EN 61496-1 | 105 [1] x 22.5 x 100 |




Monitor an E-STOP device or safety gate –
in any application – safe, simple, compact.
Use one safety relay per safety function.

**Your benefits at a glance**

- Save space in the control cabinet thanks to the compact design
- Simple installation and maintenance saves you time: push-in spring-loaded terminals fixed on the device, can be connected without the need for tools
- Tool-free assembly: simply attach the device to the top hat rail




Monitor light beam devices, e.g. PSENopt from Pilz, or sensors
with OSSD outputs safely, simply and in a compact form.
All common light beam devices can also be connected.

Keep up-to-date on safety relays PNOZcompact:

Webcode: web150086

Online information at www.pilz.com

| Features | Approvals | Order number |
|---|---|---|
| ▸ 3 safety contacts/1 auxiliary contact (3 N/O/1 N/C)<br>▸ 2-channel wiring with detection of shorts across contacts<br>▸ Manual or automatic start<br>▸ STOP category: 0 | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 710001 |
| ▸ 2 safety contacts (N/O)/1 semiconductor output<br>▸ 2-channel wiring without detection of shorts across contacts<br>▸ Monitored or automatic start<br>▸ Guaranteed maximum reaction time: 12 ms | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 710002 |

[1] Height incl. spring clip

# Safety relay PNOZelog

You can use the product group PNOZelog to monitor up to four safety functions. PNOZelog combines the experience from electromechanical safety relays with the benefits of modern electronics and is 100% wear-free.

PNOZ e1.1p

PNOZ e6.1p

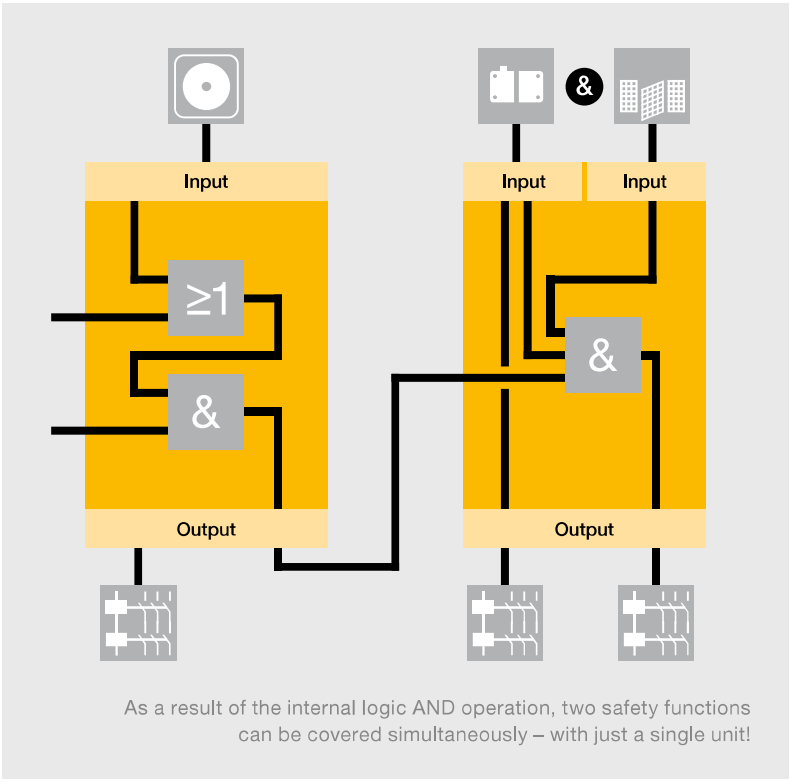
**Extended diagnostics, easy to link**

Wear-resistance, safety, long service life and high availability ensure it is cost-effective to use. What's more, the PNOZelog can be linked simply through logic AND/OR operations. Diagnostics on the PNOZelog have been extended. Power-up tests, self-checking and runtime tests guarantee maximum safety.

**Complete safety functions through logic function operations**

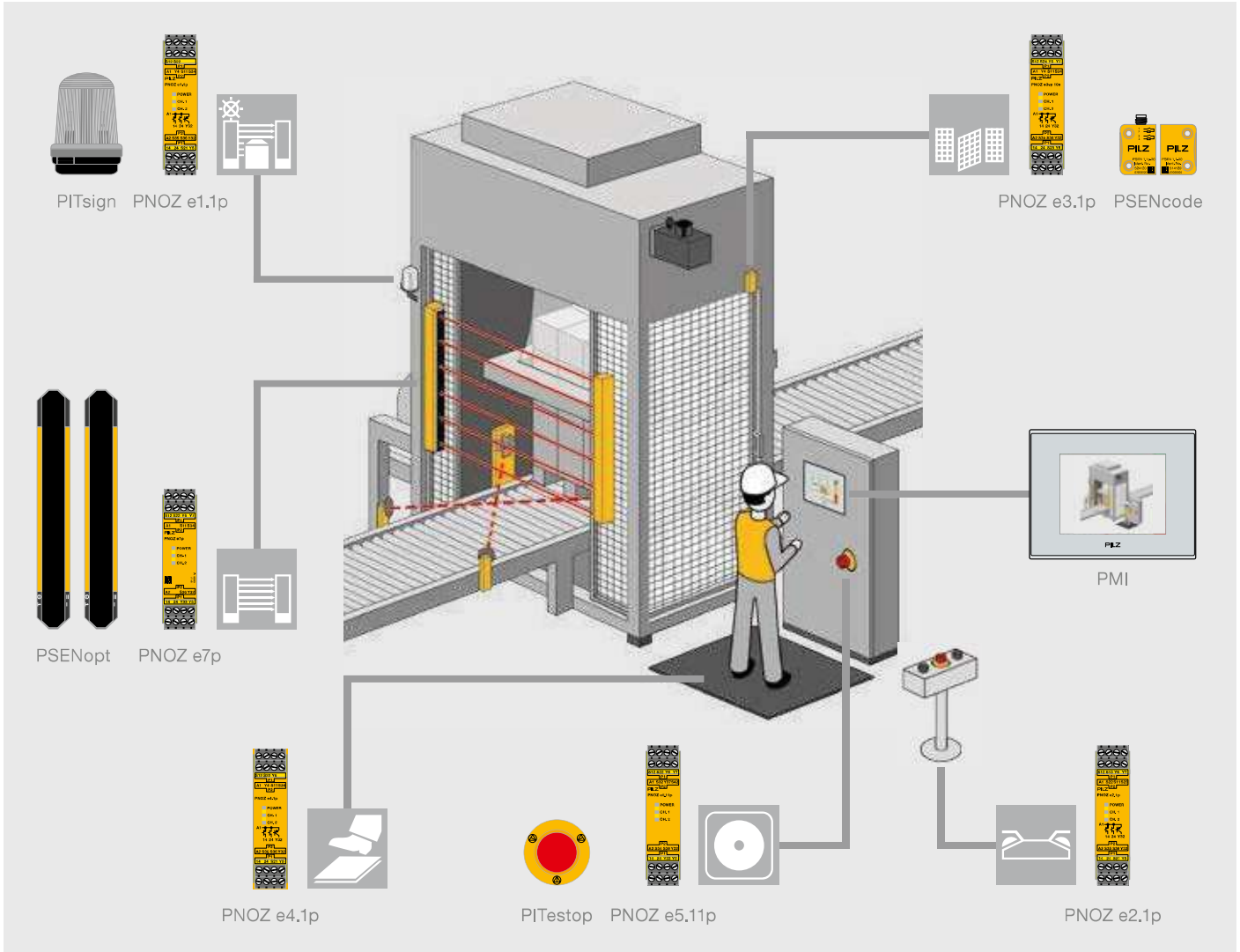
Units in the PNOZelog product range can be linked via logic operations to form complete safety functions. AND/OR operations are both available. The use of logic functions means that the output requires no additional wiring. As a result, both outputs on the PNOZelog units are freely available. As many units as necessary can be connected in series – ideal for monitoring up to four safety functions.


PNOZelog can be linked through logic AND/OR operations.




As a result of the internal logic AND operation, two safety functions can be covered simultaneously – with just a single unit!

Less wiring due to linkable outputs.




**Your benefits at a glance**

- Less wiring thanks to simple logic operations (AND/OR)
- High availability thanks to extended diagnostics
- Consistent use of semiconductor technology means no maintenance is necessary – there are no malfunctions due to contact welding, contamination, bounce or burning
- Continuous self-checks provide the highest level of safety – fault detection is not linked to the on/off cycle
- Long service life, even with frequent operations or cyclical functions
- Safe switching operations even on the smallest of loads
- Rapid commissioning thanks to plug-in terminals; no additional tools are required
- Complete solution comprising evaluation devices, compatible sensor technology and control and signal devices

Keep up-to-date on safety relays PNOZelog:

Webcode: web150101

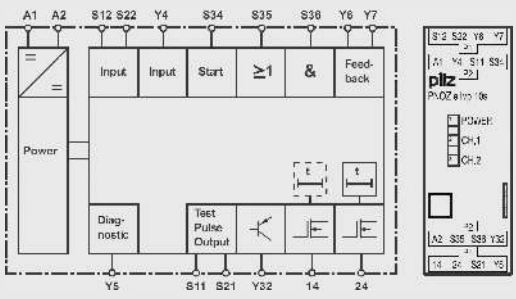
Online information at www.pilz.com

# Selection guide – PNOZelog



## Safety relay PNOZelog

| Type | Application | | | | | | Performance Level (PL) – EN ISO 13849-1 |
|---|---|---|---|---|---|---|---|
| |  |  |  |  |  | | |
| PNOZ e1p | ◆ | ◆ | ◆ | | | | e |
| PNOZ e1.1p | ◆ | ◆ | ◆ | | | | e |
| PNOZ e1vp | ◆ | ◆ | ◆ | | | | e |
| PNOZ e2.1p | | | | ◆ | | EN 574, Type IIIC | e |
| PNOZ e2.2p | | | | ◆ | | EN 574, Type IIIA | e |
| PNOZ e3.1p | | ◆ | | | | | e |
| PNOZ e3vp | | ◆ | | | | | e |
| PNOZ e4.1p | | | | | ◆ | | d |
| PNOZ e4vp | | | | | ◆ | | d |
| PNOZ e5.11p | ◆ | ◆ | ◆ | | | | e |
| PNOZ e5.13p | ◆ | ◆ | ◆ | | | | e |
| PNOZ e6.1p | ◆ | ◆ | ◆ | | | | e |
| PNOZ e6vp | ◆ | ◆ | ◆ | | | | e |
| PNOZ e7p | | | ◆ | | | | e |
| PNOZ e8.1p with PLID d1 | ◆ | ◆ | ◆ | | | | d |




Block diagram of PNOZ e1vp

### Linking of multiple units using PNOZ e1vp as an example

The units of the PNOZelog product range can be logically linked to each other and to units of the PNOZmulti product range. On the PNOZelog, input S35 is intended for the logical OR operation and input S36 for the logical AND operation. Safety outputs 14 and 24 of the PNOZelog are suitable for logical operations.

| Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 | Semiconductor outputs | | | Relay outputs | | Logic operations | |
|---|---|---|---|---|---|---|---|
| | Safe | | Non-safety-related | Safe | | | |
| |  |  |  |  |  | & | ≥1 |
| 3 | 2 | | 1 | - | - | | |
| 3 | 2 | | 1 | - | - | ◆ | ◆ |
| 3 | 2 | ◆ | 1 | - | - | ◆ | ◆ |
| 3 | 2 | | 1 | - | - | ◆ | ◆ |
| 1 | 2 | | 1 | - | - | ◆ | ◆ |
| 3 | 2 | | 1 | - | - | ◆ | ◆ |
| 3 | 2 | ◆ | 1 | - | - | ◆ | ◆ |
| 2 | 2 | | 1 | - | - | ◆ | ◆ |
| 2 | 2 | ◆ | 1 | - | - | ◆ | ◆ |
| 3 | 2 | | 2 | - | - | ◆ [1)] | |
| 3 | 2 | | 2 | - | - | ◆ [1)] | |
| 3 | 2 | | 1 | 4 | - | ◆ | ◆ |
| 3 | 2 | ◆ | 1 | 4 | - | ◆ | ◆ |
| 3 | 2 | | 1 | - | - | ◆ | |
| 2 | 2 | | 2 | - | - | ◆ | ◆ |

[1)] Also AND-linked internally

Technical documentation on safety relays PNOZelog:

Webcode: web150635

Online information at www.pilz.com

# Technical details – PNOZelog



## Safety relay PNOZelog


PNOZ e1.1p


PNOZ e2.1p


PNOZ e3.1p


PNOZ e4.1p

| Type | Application area | Outputs | Outputs: Voltage/ current/ rating |
|---|---|---|---|
| **PNOZ e1p** | Emergency stop, safety gate and light beam monitoring | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs | 24 V DC/ 2 A/50 W |
| **PNOZ e1.1p** | Emergency stop, safety gate and light beam monitoring | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs | 24 V DC/ 2 A/50 W |
| **PNOZ e1vp** | Emergency stop, safety gate and light beam monitoring | Using semiconductor technology:<br>▸ 2 safety outputs delayed/ instantaneous, delay-on de-energisation selectable<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs | 24 V DC/ 2 A/50 W |
| **PNOZ e2.1p**<br>**PNOZ e2.2p** | PNOZ e2.1p: in accordance with EN 574, requirement class IIIC; PNOZ e2.2p: in accordance with EN 574, requirement class IIIA: two-hand monitoring | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs | 24 V DC/ 2 A/50 W |
| **PNOZ e3.1p** | Safety gate monitoring | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs | 24 V DC/ 2 A/50 W |
| **PNOZ e3vp** | Safety gate monitoring | Using semiconductor technology:<br>▸ 2 safety outputs delayed/ instantaneous, delay-on de-energisation selectable<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs | 24 V DC/ 2 A/50 W |
| **PNOZ e4.1p** | Evaluation device for safety mats | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs | 24 V DC/ 2 A/50 W |
| **PNOZ e4vp** | Evaluation device for safety mats | Using semiconductor technology:<br>▸ 2 safety outputs delayed/ instantaneous, delay on de-energisation selectable<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs | 24 V DC/ 1.5 A/40 W |

**Common features**

- Supply voltage ($U_B$): 24 V DC
- Dimensions (H x W x D) in mm: 101/94 [1] x 22.5 x 121

| Features | Approvals | Order number | |
|---|---|---|---|
| | | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Monitored or automatic start can be selected<br>▸ Selectable monitoring of shorts across contacts | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 130 | 774 130 |
| ▸ Monitored or automatic start can be selected<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ Selectable monitoring of shorts across contacts | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 133 | 774 133 |
| ▸ Delay time selectable<br>▸ Monitored or automatic start can be selected<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ Selectable monitoring of shorts across contacts | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 10 s ____ 784 131<br>▸ 300 s ____ 784 132 | ▸ 10 s ____ 774 131<br>▸ 300 s ____ 774 132 |
| ▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ Shorts across contacts are monitored via two test pulse outputs<br>▸ Status indicator<br>▸ Feedback loop for monitoring external contactors | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ PNOZ e2.1p: 784 136<br>▸ PNOZ e2.2p: 784 135 | ▸ PNOZ e2.1p: 774 136<br>▸ PNOZ e2.2p: 774 135 |
| ▸ Evaluation device for safety sensors PSEN 2.1p-10 and PSEN 2.1p-11 and position switch with N/C / N/O combination<br>▸ Monitored or automatic start can be selected<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ Selectable monitoring of shorts across contacts | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 139 | 774 139 |
| ▸ Evaluation device for safety sensors PSEN 2.1p-10 and PSEN 2.1p-11 and position switch with N/C / N/O combination<br>▸ Delay time selectable, either monitored or automatic start possible<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ Selectable monitoring of shorts across contacts | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 10 s ____ 784 137<br>▸ 300 s ____ 784 138 | ▸ 10 s ____ 774 137<br>▸ 300 s ____ 774 138 |
| ▸ For connecting pressure-sensitive mats from Mayser (type SM/BK) and Bircher (type ESM5x)<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 180 | 774 180 |
| ▸ For connecting pressure-sensitive mats from Mayser (type SM/BK) and Bircher (type ESM5x)<br>▸ Delay time selectable<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ With or without reset function | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 10 s ____ 784 181 | 10 s ____ 774 181 |

[1] Height incl. spring-loaded terminals/plug-in screw terminals

Technical documentation on safety relays PNOZelog:

Webcode: web150635

Online information at www.pilz.com

# Technical details – PNOZelog



## Safety relay PNOZelog

PNOZ e5.11p

PNOZ e5.13p

PNOZ e6.1p

PNOZ e7p

| Type | Application area | Outputs | Outputs: Voltage/ current/rating |
|---|---|---|---|
| **PNOZ e5.11p** | Combination unit for monitoring 2 safety functions, AND-linked internally, AND input for logical connection of multiple units | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 2 auxiliary outputs | 24 V DC/ 1.5 A/40 W |
| **PNOZ e5.13p** | Combination unit for monitoring 2 safety functions, AND-linked internally, AND input for logical connection of multiple units | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 2 auxiliary outputs | 24 V DC/ 1.5 A/40 W |
| **PNOZ e6.1p** | Emergency stop, safety gate and light beam monitoring | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs<br>Relay outputs:<br>▸ 4 safety contacts (N/O) | Outputs using semiconductor technology:<br>24 VDC/4 A/50 W<br>Relay outputs:<br>DC1:<br>24 V/6 A/150 W |
| **PNOZ e6vp** | Emergency stop, safety gate and light beam monitoring | Using semiconductor technology:<br>▸ 2 safety outputs delayed/ instantaneous, delay on de-energisation selectable<br>▸ 1 auxiliary output, can be switched to a diagnostic output<br>▸ 2 test pulse outputs<br>Relay outputs:<br>▸ 4 safety contacts (N/O) | Outputs using semiconductor technology:<br>24 V/4 A/50 W<br>Relay outputs:<br>DC1:<br>24 V/6 A/150 W |
| **PNOZ e7p** | Safety light beam devices, start buttons | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 2 test pulse outputs<br>▸ 1 auxiliary output | 24 V DC/ 1.5 A/40 W |
| **PNOZ e8.1p** | Evaluation device for safe line monitoring with PLID d1 | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 2 auxiliary outputs | 24 V DC/ 1.5 A/40 W |

**Common features**

- Supply voltage ($U_B$): 24 V DC
- Dimensions (H x W x D) in mm: 101/94 [1] x 22.5 x 121, PNOZ e6.1p and PNOZ e6vp: 101/94 [1] x 45 x 121 mm

| Features | Approvals | Order number | |
|---|---|---|---|
| | | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Connection possibilities for E-STOP pushbuttons, safety gate limit switches, start buttons, proximity switches, position switches with N/C / N/C combination<br>▸ For processing signals from output switching elements of light grids (OSSDs)<br>▸ Monitored or automatic start can be selected | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 190 | 774 190 |
| ▸ Connection possibilities for E-STOP pushbuttons, safety gate limit switches, start buttons, proximity switches, PSEN 2.x safety sensors, position switches with N/C / N/C or N/C / N/O combination<br>▸ For processing signals from output switching elements of light grids (OSSDs)<br>▸ Monitored or automatic start can be selected | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 191 | 774 191 |
| ▸ Connection possibilities for E-STOP pushbuttons, safety gate limit switches, start buttons, proximity switches<br>▸ For processing signals from output switching elements of light grids (OSSDs)<br>▸ Monitored or automatic start can be selected<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ Selectable monitoring of shorts across contacts | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 192 | 774 192 |
| ▸ Connection possibilities for E-STOP pushbuttons, safety gate limit switches, start buttons, proximity switches<br>▸ For processing signals from output switching elements of light grids (OSSDs)<br>▸ Delay time selectable<br>▸ Monitored or automatic start can be selected<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ Selectable monitoring of shorts across contacts | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 193 | 774 193 |
| ▸ Connection possibilities for safety light beam devices PSEN op2S-1-1, PSEN op4S-1-1, PSEN op4S-1-2, start buttons<br>▸ Two operating modes selectable<br>▸ Monitored or automatic start can be selected<br>▸ One linking input for logic AND connections between multiple units | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 784 197 | 774 197 |
| ▸ Connection possibilities for PLID d1, E-STOP pushbuttons, safety gate limit switches, start buttons, proximity switches, position switches with N/C / N/C combination<br>▸ For processing signals from output switching elements of light grids (OSSDs)<br>▸ Monitored or automatic start can be selected<br>▸ Monitoring of shorts across contacts can be selected for E-STOP application | TÜV, UL/cUL, CCC | 784 198 | 774 198 |

[1] Height incl. spring-loaded terminals/plug-in screw terminals

Technical documentation on safety relays PNOZelog:

Webcode: web150635

Online information at www.pilz.com

# Safe line inspection device PLIDdys – Safe power-



The safe line inspection device PLIDdys provides safe power-up on two-wire connections, ensuring maximum safety on long cable routes.

PLID d1 + PNOZ e8.1p

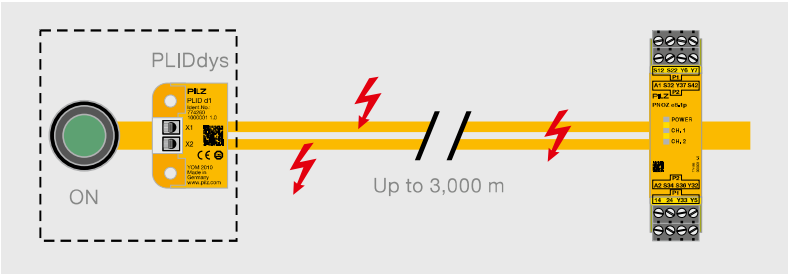
With PLIDdys, unintended power-up or plant start-up can be excluded in the event of an error. This is particularly beneficial on interlinked plants or on plant sections distributed over a wide area, which may not always be clearly visible. The extremely compact design means that PLIDdys can be easily retrofitted in an existing plant and incorporated in, for example, the sensor or switch. In combination with the evaluation device PNOZ e8.1p, the line inspection device PLIDdys is the optimum solution for safe cables/connections.

## Selection guide – Safe line inspection device PLIDdys

PLID d1 C

| Type | Application area |
|---|---|
| **PLID d1** | Line inspection device PLIDdys in combination with the evaluation device PNOZ e8.1p |
| **PNOZ e8.1p** | Evaluation device for safe line inspection with PLID d1 |

# up in conjunction with PNOZ e8.1p




Monitoring for potential wiring errors and protection against power-up in the event of an error.

**Your benefits at a glance**

- All potential wiring errors are detected through constant line inspection by PLIDdys, no need for customised tests
- PLIDdys can be looped into the existing wiring, so few additional costs
- Easy to integrate into existing plants thanks to its small dimensions
- Saves costs, as the prevailing periphery can be retained
- Suitable for cable lengths up to 3,000 metres

**Example applications of the line inspection device PLIDdys**

Safe inspection of long cable routes in critical environments

- Cable cars, lift systems
- Wind turbines
- Conveyor belts in open cast mining or underground
- Tunnel boring machinery
- Press lines
- Fairground rides
- Drag chain applications
- Interlinked/distributed plant sections

| Features | Approvals | Order number |
|---|---|---|
| ▸ Cable cross section 0.5 mm² ... 1.5 mm²<br>▸ Maximum cable length 3,000 m<br>▸ Cable resistance max. 220 Ω<br>▸ Power supply 24 V DC<br>▸ Weight 10 g<br>▸ Temperature range –30 °C ... +70 °C<br>▸ Dimensions (H x W x D) in mm: 36 x 26 x 12.1 [1] | TÜV, UL/cUL | ▸ PLID d1 C with spring-loaded terminals _____ 784 260<br>▸ PLID d1 with plug-in screw terminals _____ 774 260 |
| ▸ Outputs using semiconductor technology:<br>- 2 safety outputs<br>- 2 auxiliary outputs<br>▸ Outputs: Voltage/current/rating: 24 VDC/1.5 A/40 W<br>▸ Monitored or automatic start can be selected<br>▸ Monitoring of shorts across contacts can be selected for E-STOP application<br>▸ Dimensions (H x W x D) in mm: 101/94 [2] x 22.5 x 121 | TÜV, UL/cUL, CCC | ▸ PNOZ e8.1p C with spring-loaded terminals _____ 784 198<br>▸ PNOZ e8.1p with plug-in screw terminals _____ 774 198 |

[1] Depth incl. spring-loaded terminals/plug-in screw terminals
[2] Height incl. spring-loaded terminals/plug-in screw terminals

Keep up-to-date on safe line inspection device PLIDdys:

Webcode: web150901

Online information at www.pilz.com

# Safety relays PNOZpower

The safety relays PNOZpower are suitable for monitoring E-STOP devices, safety gates and light beam devices. PNOZpower can switch currents of up to 16 A AC/DC per contact. An overall breaking capacity of 40 A is available per module.

PNOZ p1p

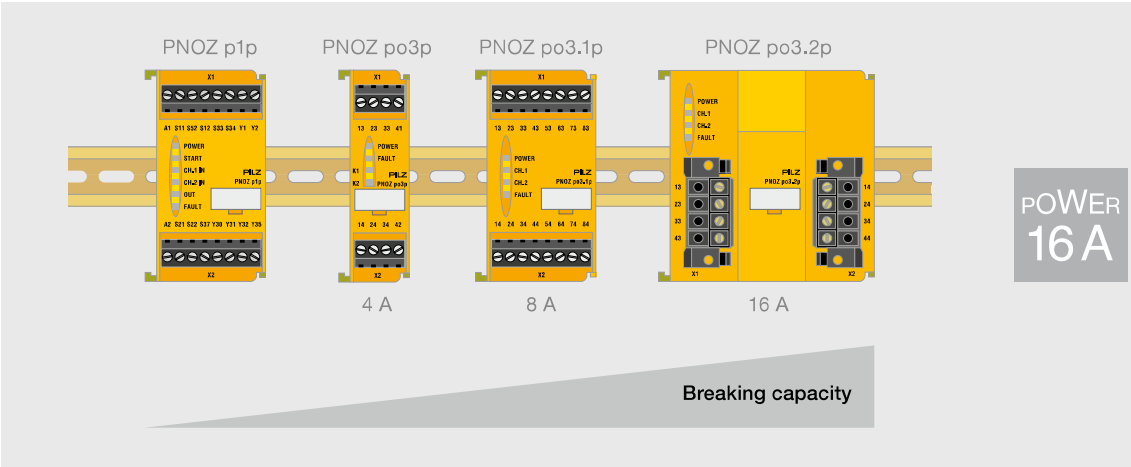
PNOZ po3p

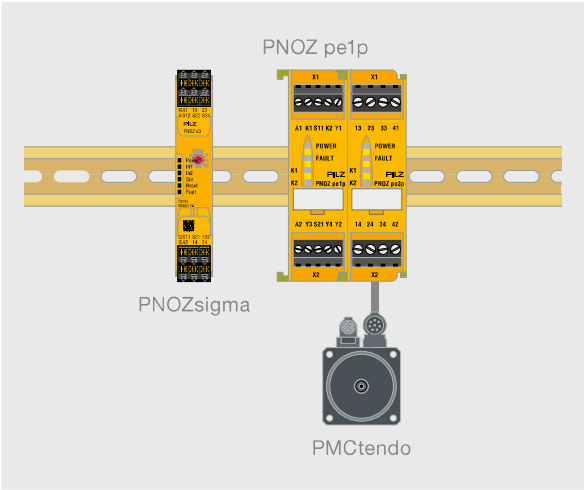
**Switching high loads safely**

External contactors and contactor combinations are no longer required. The control circuit and main circuit are switched with one safety relay. The EC type examination is valid for the whole safety circuit.

**Modular and flexible**

The base unit processes the inputs; the output modules are specifically matched to the respective load. The number and capacity of the required safety contacts can be scaled, depending on the application. A maximum of five modules can be connected to the base unit. Modules are wired to the base unit via an internal bus system.






**Volt-free switching with the PNOZ pe1p control module**
In conjunction with at least one expansion module from the PNOZpower range, the PNOZ pe1p control module safely shuts down motors or supply voltages on valves and contactors.

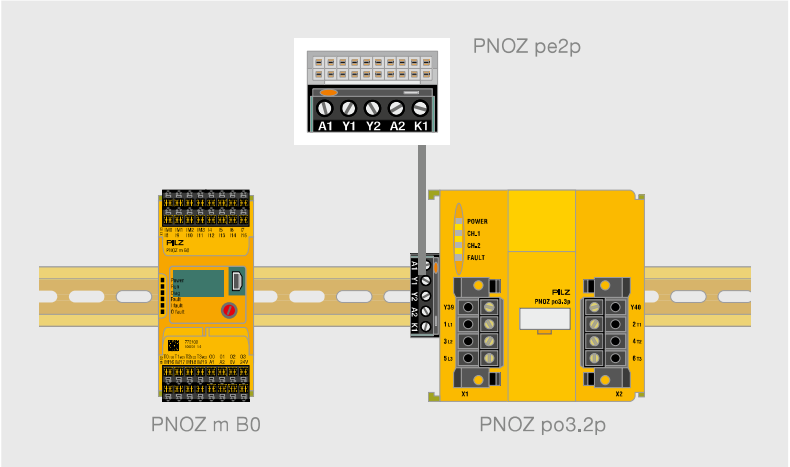
The PNOZ pe1p can be controlled using the following evaluation devices:

- Safety relays PNOZsigma, PNOZ X and PNOZelog
- Configurable small controllers PNOZmulti

Benefit to you: Potential-free switching up to 16 A.

**Your benefits at a glance**

- External contactor combinations and their respective wiring are no longer required, saving costs, space and commissioning time
- Diagnostics via LED: operating and fault status is visible on each module, resulting in reduced downtimes
- Plug-in connection terminals: pre-wired and easy to exchange if there is a fault
- Redundant load switching
- Scalable and flexible by selecting compatible modules – you only pay for the functions that you actually use
- Complete solution comprising evaluation devices, compatible sensor technology and control and signal devices




The PNOZpower safety relays and the PNOZmulti configurable small controllers can be combined simply using the coupling connector PNOZ pe2p.

**Connection to PNOZmulti**
Specially developed for connection to the PNOZmulti configurable small controllers, PNOZpower units can be docked via the coupling connector PNOZ pe2p.

Keep up-to-date on safety relays PNOZpower:

Webcode: web150107

Online information at www.pilz.com

# Selection guide – PNOZpower



## Base units – Safety relays PNOZpower

| Type | Application area | Application | | | | Performance Level (PL) – EN ISO 13849-1 |
|---|---|---|---|---|---|---|
| | |  |  |  |  | |
| **PNOZ p1p** | Base unit | ◆ | ◆ | ◆ | | e |
| **PNOZ p1vp** | Base unit, delayed | ◆ | ◆ | ◆ | ◆ | e (d) [1] |

## Contact expansion modules – Safety relays PNOZpower

| Type | Output contacts | | Performance Level (PL) – EN ISO 13849-1 |
|---|---|---|---|
| | Safe  | Non-safety-related  | |
| **PNOZ po3p** | 3 | 1 | e |
| **PNOZ po3.1p** | 8 | - | e |
| **PNOZ po3.2p** | 4 | - | e |
| **PNOZ po3.3p** | 3 | - | e |
| **PNOZ po4p** | 4 | - | e |

## Accessories – Safety relays PNOZpower

| Type | Application area | Application | Performance Level (PL) – EN ISO 13849-1 |
|---|---|---|---|
| **PNOZ pe1p** | Control module | For control via safety contacts or safe semiconductor outputs | e |
| **PNOZ pe2p** | Bus interface | Coupling connector for connecting PNOZpower expansion modules to a higher-level controller | e |
| **PNOZ pps1p** | Power supply | - | - |

| Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 | Number of expansion modules | Supply voltage | Dimensions (H x W x D) in mm |
|---|---|---|---|
| 3 | Min. 1, max. 4 expansion modules | 24 V DC | 94 x 45 x 135 |
| 3 | Min. 1, max. 8 expansion modules (max. 4 delayed and 4 instantaneous) | 24 V DC | 94 x 45 x 135 |

[1] Value applies to instantaneous (delayed) safety contacts

| Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 | Number of expansion modules | | | Dimensions (H x W x D) in mm |
|---|---|---|---|---|
| | AC1 | AC3 | DC1 | |
| 3 | 240 V/4 A/960 VA | - | 24 V/4 A/96 W | 94 x 22.5 x 121 |
| 3 | 240 V/8 A/2000 VA | - | 24 V/8 A/200 W | 94 x 45 x 121 |
| 3 | 240 V/16 A/4000 VA | - | 24 V/16 A/400 W | 94 x 90 x 135 |
| 3 | 240 V/16 A/4000 VA<br>400 V/10 A/4000 VA<br>500 V/8 A/4000 VA | 240 V/3.0 kW<br>400 V/5.5 kW<br>500 V/4.0 kW | 24 V/16 A/400 W | 94 x 90 x 135 |
| 3 | 240 V/4 A/960 VA | - | 24 V/4 A/96 W | 94 x 22.5 x 121 |

| Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 | Number of expansion modules | Supply voltage | Dimensions (H x W x D) in mm |
|---|---|---|---|
| 3 | Min. 1, max. 4 expansion modules | 24 V DC | 94 x 22.5 x 121 |
| 3 | Min. 1, max. 6 expansion modules | 24 V DC | 29 x 23.5 x 22 |
| - | - | 100 … 240 V AC | 94 x 45 x 121 |

Technical documentation on safety relays PNOZelog:

Webcode: web150635

Online information at www.pilz.com

# Technical details – PNOZpower



## Safety relays PNOZpower


PNOZ p1p


PNOZ pe1p


PNOZ pe2p


PNOZ pps1p


PNOZ po3p


PNOZ po3.2p

| Type | Application area | Inputs/outputs | Supply voltage |
|---|---|---|---|
| **PNOZ p1p** | Base unit | 2 semiconductor outputs | 24 V DC |
| **PNOZ p1vp** | Base unit, delayed | 2 semiconductor outputs | 24 V DC |
| **PNOZ pe1p** | Control module | Expansion module control output connected to the PNOZpower bus | 24 V DC |
| **PNOZ pe2p** | Bus interface | Output connected to PNOZpower bus | 24 V DC |
| **PNOZ pps1p** | Power supply | - | 100 … 240 V AC/DC |
| **PNOZ po3p**<br>**PNOZ po4p** | Expansion modules | ▸ PNOZ po3p:<br>- 3 safety contacts (N/O)<br>- 1 auxiliary contact (N/C)<br>▸ PNOZ po4p:<br>- 4 safety contacts (N/O) | Via PNOZpower bus |
| **PNOZ po3.1p** | Expansion module | 8 safety contacts (N/O) | Via PNOZpower bus |
| **PNOZ po3.2p** | Expansion module | 4 safety contacts (N/O) | Via PNOZpower bus |
| **PNOZ po3.3p** | Expansion module | 3 safety contacts (N/O) | Via PNOZpower bus |

| Features | Approvals | Order number<br><br>Plug-in screw terminals |
|---|---|---|
| ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected<br>▸ Connection between PNOZ p1p and expansion modules via PNOZpower bus, using jumpers on the back of the unit | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 773300 |
| ▸ Dual-channel wiring, with or without detection of shorts across contacts<br>▸ Monitored or automatic start can be selected<br>▸ Delay time can be selected via rotary switch and potentiometer<br>▸ Connection between PNOZ p1vp and expansion modules via PNOZpower bus, using jumpers on the back of the unit | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ 30 s ____ 773950<br>▸ 300 s ____ 773951 |
| ▸ 1-channel operation, without detection of shorts across contacts<br>▸ 2-channel operation, with or without detection of shorts across contacts<br>▸ Connection between PNOZ pe1p and expansion modules via PNOZpower bus, using jumpers on the back of the unit<br>▸ Status indicator for output relay, supply voltage and fault<br>▸ Connection for feedback loop | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 773900 |
| ▸ Control via safety contacts or safe semiconductor outputs<br>▸ 1-channel operation, without detection of shorts across contacts<br>▸ Connection between PNOZ pe2p and expansion modules via PNOZpower bus | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 779125 |
| ▸ Galvanic isolation<br>▸ Short-circuit-proof<br>▸ 24 V DC at plug-in connector on back of unit for PNOZpower bus and at terminals<br>▸ LEDs for supply voltage, output voltage and fault | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 773200 |
| ▸ 2-channel operation with the ability to detect short circuits via the base unit<br>▸ LEDs for switch status of channels 1/2, supply voltage and fault | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | ▸ PNOZ po3p: 773634<br>▸ PNOZ po4p: 773635 |
| | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 773630 |
| | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 773631 |
| ▸ 2-channel operation with the ability to detect short circuits via the base unit<br>▸ LEDs for switch status of channels 1/2, supply voltage and fault<br>▸ Suitable for safety-related switching of loads with utilisation category AC3 (e.g. motor)<br>▸ External start/stop input for non-safety-related load switching | CE, cULus Listed, EAC (Eurasian), TÜV, CCC | 773632 |

Technical documentation on safety relays PNOZelog:

Webcode: web150635

Online information at www.pilz.com