# Relays for functional safety PNOZ®, configurable control system PNOZmulti

pilz

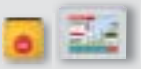
Electronic monitoring relays PMDsigma and PMDsrange;
Safety relays PNOZ X, PNOZsigma, PNOZelog and PNOZpower;
Configurable safety relays PNOZmulti Mini;
Configurable control system PNOZmulti

**The optimum safety solution for every requirement.**

the spirit of safety

# Business activities

## Components

| | | |
|---|---|---|
| **Sensor technology** | ▸ Safe proximity switches<br>▸ Safe rope pull switches<br>▸ Safety switches<br>▸ Safety bolts<br>▸ Safe hinge switches<br>▸ Safety gate systems<br>▸ Safety light beams/curtains/grids<br>▸ Camera-based protection and measuring systems<br>▸ Safe camera systems |  |
| **Control technology** | ▸ Relays for electrical safety<br>▸ Relays for functional safety<br>▸ Configurable control systems<br>▸ Compact programmable control systems<br>▸ Modular programmable control systems<br>▸ Decentralised periphery |  |
| **Networks** | ▸ Network components<br>▸ Industrial communication | SafetyNET p® |
| **Drive technology** | ▸ Motion control systems<br>▸ Servo amplifiers<br>▸ Motors |  |
| **Operator and visualisation systems** | ▸ Control and signal devices<br>▸ Operator terminals |  |
| **Software** | ▸ System software and tools<br>▸ Application software |  |

## Systems

| | | |
|---|---|---|
| **Automation system PSS 4000** | ▸ Control systems<br>▸ Real-time Ethernet<br>▸ Software platform |  <br>SafetyNET p®<br>PAS 4000 |

## Services

| | | | |
|---|---|---|---|
| **Consulting and engineering** | ▸ Risk Assessment<br>▸ Safety Concept<br>▸ Safety Design<br>▸ System Implementation<br>▸ Safety Validation | ▸ CE Marking<br>▸ International Compliance Services<br>▸ Plant Assessment<br>▸ Inspection of ESPE |  |
| **Training** | ▸ Seminars<br>▸ Courses | |  |

# Support

**Technical help round the clock!**

Technical support is available from Pilz round the clock. This service is provided free of charge beyond standard business hours.

**Americas**
- Brazil
  +55 11 8245-8267
- Mexico
  +52 55 5572 1300
- USA (toll-free)
  +1 877-PILZUSA (745-9872)

**Asia**
- China
  +86 21 62494658-216
- Japan
  +81 45 471-2281
- Korea
  +82 2 2263 9540

**Australia**
- Australia
  +61 3 95446300

**Europe**
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  +43 1 7986263-0
- Belgium, Luxembourg
  +32 9 3217575
- England
  +44 1536 462203
- France
  +33 3 88104000
- Germany
  +49 711 3409-444
- Ireland
  +353 21 4804983
- Italy
  +39 031 789511
- Scandinavia
  +45 74436332
- Spain
  +34 938497433
- Switzerland
  +41 62 88979-30
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# Pilz – Complete automation

**Total customer proximity**

Pilz has a tradition as a family-run company stretching back over 60 years. Real proximity to customers is visible in all areas, instilling confidence through individual consultation, total flexibility and reliable service. Worldwide, round the clock, in 24 subsidiaries and branch offices.

**Benefit-oriented innovations**

Our customer proximity is the basis for our innovative strength. We are always oriented towards current market requirements, which is why we can offer innovative automation solutions in every case. Market leadership in safe automation secures our leadership in research and technology. Customer proximity and innovation belong together and are mutually dependent.

**Overall solutions**

Pilz is your solution supplier for all automation functions. Including standard control functions. Pilz developments protect man, machine and the environment. Our automation solutions incorporate our knowledge and experience from the stringent demands of safety technology, as well as the sum of our knowledge gained from over 60 years' experience of general automation technology.

All our experience and knowledge go into individual products and sophisticated system solutions.

- Sensor technology
- Control technology
- Networks
- Drive technology
- Operator and visualisation systems
- Software
- Automation system PSS 4000
- Consulting and engineering
- Training

**the spirit of safety**

With their knowledge, enthusiasm, creativity and courage to take the unconventional route, our staff have made us what we are today: one of the leading brands in automation technology.

More than 1 300 staff, each one of them an ambassador for safety, make sure that your company's most valuable asset – your staff – can work safely and free from injury.


# Safety relays PNOZ® – The original

**Applications worldwide**

Every day, PNOZ safety relays prove themselves in millions of applications worldwide. With its PNOZ safety relays Pilz is world market leader.

**Synonym for safety**

In 1987 Pilz developed the first emergency stop relay to protect man and machine. That was a milestone in safety technology. The name PNOZ is now synonymous with safety relays.

**For each application**

In consultation with our customers we are constantly developing the technology for numerous applications. Our current product portfolio includes the following product ranges:

- PNOZ X
- PNOZsigma
- PNOZelog
- PNOZpower
- PNOZmulti Mini
- PNOZmulti

That way you get the optimum safety solution for each requirement!

**Contents**

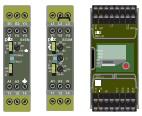
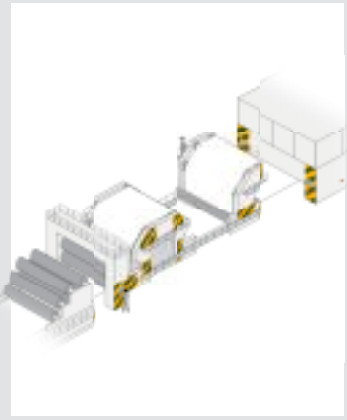
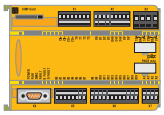
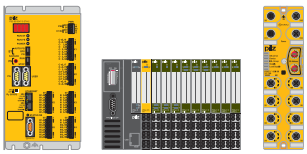


# Solution suppliers for safety and standard

Pilz offers a universal concept for solutions that can be applied right across industry. Whether you need safety or standard control functions, machine or plant, centralised or decentralised, a single product or a total solution: With Pilz you will definitely find a solution for your automation function.

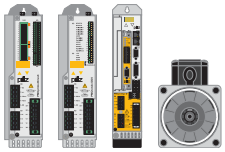
**Are you looking for a flexible solution for your automation functions?**

- **PMD:** Electronic monitoring relays such as voltage or true power monitors, for example.
- **PNOZ:** Safety relays for simple plant and machinery with up to four safety functions. Safe monitoring of emergency stops, safety gates and light curtains/ light grids, for example.
- **PNOZmulti:** The safety circuit is created using a simple configuration tool. Can be used from four safety functions.
- **PSS:** Programmable control systems for use on complex machinery or distributed plants, to monitor safety-related functions and/or for complete machine control.
- **Industrial communication:** Transfer input/output signals and control data reliably and safely.

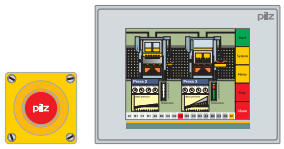
| Your requirements: | Our solution: |
|---|---|
|  |  *PMD relays for electrical safety* |
|  |  *PNOZ relays for functional safety* |
|  |  *PNOZmulti configurable control system* |
| |  *PSS programmable control systems* |
| | SafetyBUS p® SafetyNET p® induraNET p® *Industrial communication networks* |

**Supplementary product areas:**

*Sensor technology*



*Drive technology*



*Operator and visualisation systems*

*Software*

*Services*

**Products and systems for safety and standard**

Besides “Control technology” and “Networks”, other product ranges also contain first-class components, which you can use individually or combine to form a system.

**Sensor technology**, used in conjunction with Pilz safe control technology, offers a co-ordinated, complete solution that’s economical, approved and safe. The focus is always on the protection of man and machine, in compliance with the standards and regulations.

**Drive technology** provides overall solutions for automating your machinery. From controller operation through to movement of highly dynamic drives, including all safety aspects.

**Operator and visualisation systems** provide diagnostic and visualisation devices, plus control and signal devices as part of the Pilz solution. The focus is always on fast, simple configuration. Machine downtimes are clearly reduced thanks to the overall diagnostic concept PVIS.

**Software** includes system software, user software and software tools. Here you’ll find the right tool for every task. From product-related software to diagnostic software, through to the PAScal Safety Calculator.

**Automation system PSS 4000** for standard and safety is the ideal system for automation solutions in all industries. Reduce engineering effort and costs, now!

**Services** in the machine safety field are available from Pilz for all phases of the machine lifecycle: from identification of the danger points through to implementation of safety concepts and overall solutions. From risk assessment through to ESPE inspection. Pilz also offers a comprehensive range of training courses and seminars, covering generic issues relating to machinery safety as well as Pilz products.

*The whole range of business activities at a glance:*

Webcode 0326

*Online information at www.pilz.com*

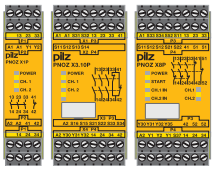


# Safety relays PNOZ® and configurable con

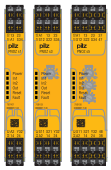
The optimum safety solution for each application! For us, safety is more than just a product. Safe control technology is based on experience and innovation.

We are continually expanding our product range in consultation with our customers. Based on their different features and functionalities, our safety relays can be divided into the following product ranges:

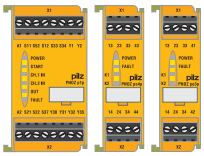
### PNOZ X



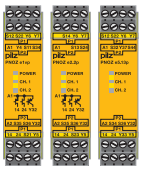
### PNOZsigma



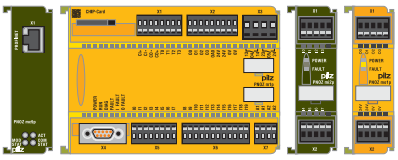
### PNOZpower



### PNOZelog



### PNOZmulti



**PNOZ X**

- Customised safety for each function
- Electromechanical, volt-free
- Universal power supply

**PNOZsigma**

- Maximum functionality in minimum width
- Operating modes and times are selectable
- Scalability thanks to modular structure

**PNOZelog**

- Easy to link
- Non-wearing
- Extended diagnostics

**PNOZpower**

- High loads from 8 A to 16 A
- Switch motor loads directly
- Modular output contacts

**PNOZmulti**

- Freely configurable
- Multifunctional
- Configurable control system

# trol system PNOZmulti

**Finding your PNOZ**

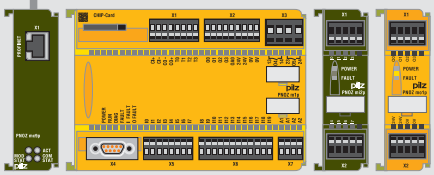
This diagram will help you to choose. You have specific requirements, we have the right solution!

START

More than four safety functions/ configurable?

**Yes**

**PNOZmulti Mini**
*Further information from page 48*



**PNOZmulti**
*Further information from page 54*

**No**

Breaking capacity > 8 A?

**Yes**

**PNOZsigma**
*Further information from page 22*

**No**

**No**

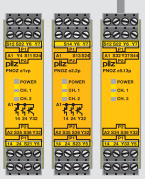
Ability to link safety functions?

**Yes**

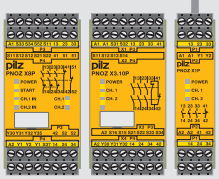
Good scalability/ user-friendly diagnostics?

**Yes**

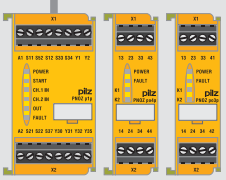
**No**



**PNOZelog**
*Further information from page 32*



**PNOZ X**
*Further information from page 14*



**PNOZpower**
*Further information from page 40*



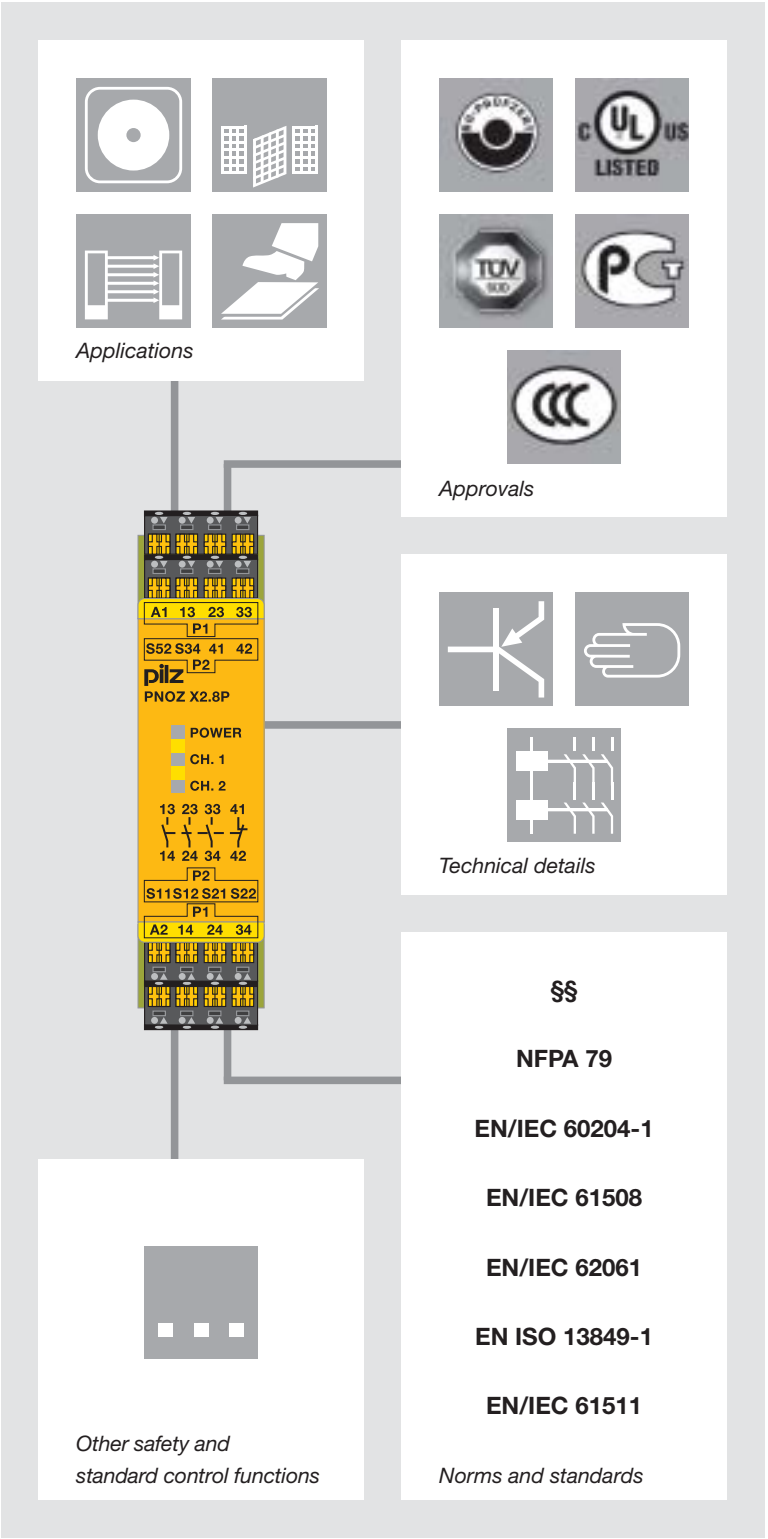
# The standard in safe control technology

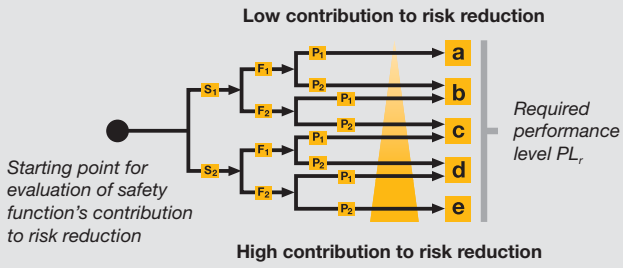
**It pays to use safety technology**

The protection of man and machine through the targeted control of hazardous movements, cost savings thanks to fewer accidents, reduced downtimes and fewer production losses – these are real benefits that you can enjoy when you use safe control technology from Pilz.

**Safety relays PNOZ – Certified worldwide**

When using PNOZ safety relays, the aim is to keep the risk to man and machine as low as possible. Internationally co-ordinated statutory instruments have been introduced to ensure that the same level of protection is guaranteed in all countries. Our safety relays comply with these international standards and regulations. The PNOZ safety relay has been approved by BG, TÜV and many other notified bodies and offers users considerable benefits. Long service life and high availability ensure it is cost-effective to use.






*Risk analysis in accordance with EN 13849-1*

**EN ISO 13849-1**

As the successor standard to EN 954-1, EN ISO 13849-1 is based on the familiar categories. Equally, it examines complete safety functions, including all the components involved in their design. EN ISO 13849-1 goes beyond the qualitative approach of EN 954-1 to include a quantitative assessment of the safety functions. A performance level (PL) is used for this, building upon the categories.

| Consequences | | Class CL = Fr + Pr + Av | | | | |
|---|---|---|---|---|---|---|
| | Se | 3-4 | 5-7 | 8-10 | 11-13 | 14-15 |
| Death, losing an eye or arm | 4 | SIL 2 | SIL 2 | SIL 2 | SIL 3 | SIL 3 |
| Permanent, losing fingers | 3 | | OM | SIL 1 | SIL 2 | SIL 3 |
| Reversible, medical attention | 2 | | | OM | SIL 1 | SIL 2 |
| Reversible, first aid | 1 | | | | OM | SIL 1 |

*Risk assessment and definition of the required safety integrity level (SIL)*

**Safety assessment in accordance with EN/IEC 62061**

According to the standard EN/IEC 62061, safety requirements in control technology can be divided into safety integrity levels. SIL 3 represents the highest risk reduction and protection level, where the safety function must always be maintained. The risk is estimated through consideration of the severity of injury (Se), the frequency and duration of exposure to the hazard (Fr), probability of occurrence of a hazardous event (Pr) and the possibility of avoiding or limiting the harm (Av).

**Your benefits at a glance**

The use of PNOZ safety relays offers you:

- The security and innovative power of one of the leading brands in automation technology
- The appropriate solution for each application
- High plant availability thanks to user-friendly diagnostics
- Low downtimes for your plant or machinery
- Optimum cost/ performance ratio
- Faster commissioning, for example, through units with plug-in terminals
- Maximum safety with minimum space requirement
- Simple wiring, fast commissioning
- A solid partner with expertise
- Certified safety, because our products comply with international standards and regulations and have been tested and approved worldwide
- Quality guarantee, we are certified to DIN ISO 9001
- Use of products that are geared towards the future, thanks to innovative developments
- Complete solution comprising evaluation devices, compatible sensor technology and control and signal devices

*Find out more about the standards:*

Webcode 0240

*Online information at www.pilz.com*



# Electrical safety with the electronic monito

**Simpler than it's ever been**

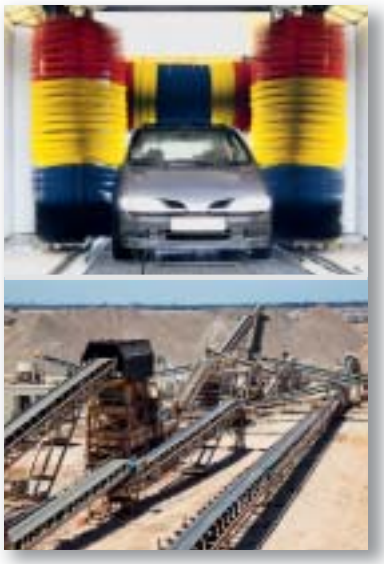
On electronic monitoring relays, electrical safety is the focus. Voltage, current, temperature, phase sequence or similar variables are monitored, for example.

You can reduce the number of hazardous situations for man and machine and increase the service life of plant and machinery. Save costs and guarantee an efficient production cycle.

**Applications PMD s10**

Using the measured true power, it is possible to derive variables such as fill level, volume, torque or air pressure, for example. The following applications illustrate potential areas of use, by way of example:

- Contamination on sieves or filters on ventilation systems
- To check for dry running or pump blockage
- Viscosity of fluids on mixers
- Wear and tear on tools
- To control the brush pressure on car washes
- To monitor conveyors for blockages or wear and tear



## Selection guide – Electronic monitoring relays PMDsigma

*PMD s20*

| Type | Application area | Dimensions (H x W x D) in mm |
|---|---|---|
| **PMD s10** | Monitors and converts true power for single/three-phase AC/DC supplies, relay and analogue outputs, monitors overload and underload | 98 x 45 x 120 |
| **PMD s20** | Monitors the insulation resistance of unearthed AC/DC systems | 98 x 45 x 120 |

# ring relays PMDsigma

### Applications PMD s20

The PMD s20 can be used to monitor the insulation resistance of unearthed AC/DC systems. Thanks to the separate supply voltage, monitoring of the de-energised system is possible. Typical application areas include:

- Clinical operating theatres
- Offshore installations such as wind turbines, clarification plants and shiplifts
- Electroplating and surface finishing systems

### Your benefits at a glance

- For universal use: only one unit to stock
- Quick and easy settings, just turn and click, so set-up and commissioning times are short
- Error-proof: menu-based configuration
- Ideal when exchanging units: configuration is stored on the chip card
- Simple diagnostics via the display mean minimum downtimes
- Approved for applications worldwide

| Features | Order number |
|---|---|
| ▸ Measuring range is set automatically<br>▸ Switching thresholds are infinitely adjustable<br>▸ Function parameter settings are menu-driven (via display and encoder with key function)<br>▸ Analogue outputs for current and voltage. Voltage output 0 … 10 V. Current output convertible from 0 … 20 mA to 4 … 20 mA.<br>▸ Relay outputs for monitoring underload and overload<br>▸ Suitable for use with frequency-controlled motors and current transformers<br>▸ Supply voltage: 24 … 240 VAC/DC<br>▸ Output contacts: 2 auxiliary contacts (C/O)<br>▸ Measuring voltage 3 AC: 100 … 550 V<br>▸ Measuring voltage 1 AC: 60 … 320 V<br>▸ Measuring current: 1 … 12 A | ▸ Spring-loaded terminals<br>PMD s10 C ..... 761 100<br>▸ Plug-in screw terminals<br>PMD s10 ..... 760 100 |
| ▸ Insulation resistance: selectable from 10 … 200 kΩ<br>▸ Voltage:<br>- Voltage supply via universal power supply: 24 … 240 VAC/DC<br>- Measuring voltage of the IT system to be monitored: 0 … 400 VAC/DC<br>▸ Frequency: 50 … 60 Hz<br>▸ Start-up suppression: selectable from 0 … 30 s<br>▸ Reaction time: selectable from 0 … 30 s<br>▸ Hysteresis: selectable from 0 … 50 % | ▸ Spring-loaded terminals<br>PMD s20 C ..... 761 120<br>▸ Plug-in screw terminals<br>PMD s20 ..... 760 120 |

*Keep up-to-date on PMDsigma:*

Webcode 4089

*Online information at www.pilz.com*

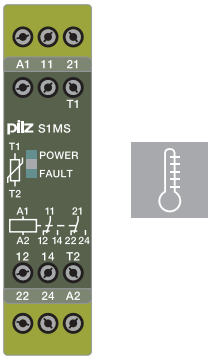


# Electronic monitoring relays PMDsrange

**Reliably taking control of every situation**

Reliable electronic monitoring and control of plant and machinery is at the heart of our range of monitoring relays. PMDsrange units in 22.5 mm slimline housing cover the widest range of functions.

In addition to current, voltage and insulation monitors, the range also includes relays for true power, phase sequence and thermistor monitoring. Quick and easy installation, practical terminals, a variety of operator elements as well as luminous displays all help to make commissioning easier and ensure the units are perfectly tailored to the specific application.




## Selection guide – Electronic monitoring relays PMDsrange

### S3UM

Monitors AC voltages for overvoltage and undervoltage, phase sequence/ failure and asymmetry, three-phase

- Monitors supplies with and without neutral conductors
- Trip device for undervoltage and overvoltage
- Evaluates phase sequence
- Detects asymmetry and phase failure

- Supply voltage ($U_B$): AC: 120, 230 V; DC: 24 V
- Output contacts: 1 auxiliary contact (C/O)
- Measuring voltage ($U_M$): AC: 42, 230, 100/110, 400/440, 415/460, 500/550 V, selectable
- Dimensions (H x W x D): 87 x 22.5 x 122 mm

Order number [1]:
- 24 VDC ($U_B$), 230 VAC ($U_M$) ..... 837 260
- 24 VDC ($U_B$), 400/440 VAC ($U_M$) ..... 837 270
- 24 VDC ($U_B$), 415/460 VAC ($U_M$) ..... 837 280

### S1PN

Monitors phase sequence and phase failure on three-phase supplies

- Measuring voltage up to 690 VAC
- Detects asymmetry
- Monitors phase sequence, phase failure, fuse

- Supply voltage ($U_B$): AC: 200 … 240, 400 … 500, 550 … 690 V
- Output contacts: 2 auxiliary contacts (2 C/O)
- Dimensions (H x W x D): 87 x 22.5 x 121 mm

Order number [1]:
- 200 … 240 V ..... 890 200
- 400 … 500 V ..... 890 210
- 550 … 690 V ..... 890 220

### S1IM

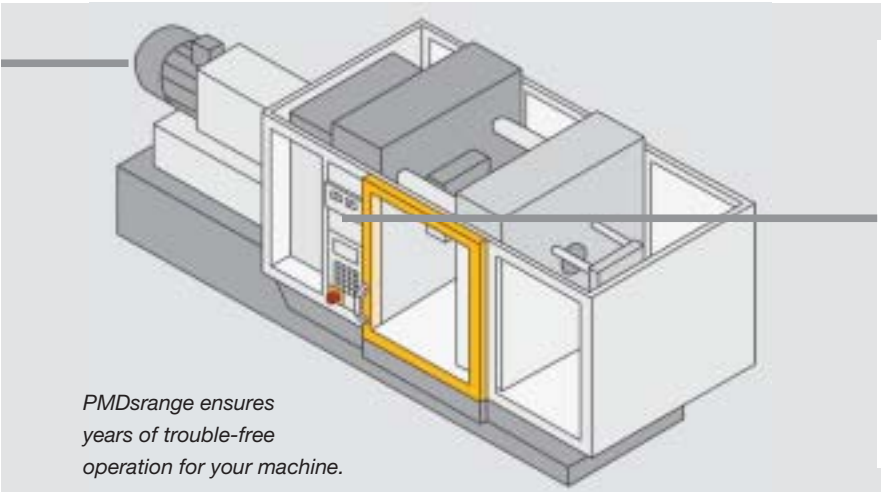
Monitors AC/DC currents for max. current values, single-phase

- 12 measuring ranges can be selected from 0.002 to 15 A
- Reaction time can be set to up to 10 seconds
- Either normally energised or normally de-energised mode
- Galvanic isolation between measuring and supply voltage

- Supply voltage: 24, 42 … 48, 110 … 127, 230 … 240 V; DC: 24 V
- Output contacts: 1 auxiliary contact (C/O)
- Dimensions (H x W x D): 87 x 22.5 x 121 mm

Order number [1]:
- 110 … 130 VAC ($U_B$), 15 A ($I_M$) ..... 828 040
- 230 … 240 VAC ($U_B$), 15 A ($I_M$) ..... 828 050
- 24 VDC ($U_B$), 15 A ($I_M$) ..... 828 035

[1] *Additional versions on request*



*PMDsrange ensures years of trouble-free operation for your machine.*


U≋

## S1EN

Ω⏚

Monitors insulation and earth faults on AC/DC supplies, single and three-phase

- For DC and AC supplies
- Normally energised mode
- Fault latching or automatic reset
- Normal/test mode

- Supply voltage: 24 … 240 VAC/DC
- Output contacts: 1 auxiliary contact (C/O)
- Rated mains voltage (monitored supply): 50 kΩ version: AC/DC: 0 … 240 V 200 kΩ version: AC/DC: 0 … 400 V
- Dimensions (H x W x D): 87 x 22.5 x 121 mm

Order number [1]:
- 24 … 240 VAC/DC ($U_B$), 50 kΩ ..... 884100
- 24 … 240 VAC/DC ($U_B$), 200 kΩ ..... 884110

## S1WP

P≋

Monitors and converts true power, DC supplies and single/three-phase AC supplies, relay and analogue output, monitors overload and underload

- 9 different measuring ranges
- Large voltage measuring range
- Analogue output can be switched for current and voltage
- Relay output for monitoring underload and overload
- Suitable for use with frequency-controlled motors

- Supply voltage: DC: 24 V, AC/DC: 230 V
- Output contacts: 1 auxiliary contact (C/O)
- Measuring voltage: 3 AC/1 AC/DC: 0 … 120, 0 … 240, 0 … 415, 0 … 550 V
- Dimensions (H x W x D): 87 x 22.5 x 122 mm

Order number [1]:
- 9 A ($I_M$), 24 VDC ($U_B$), 0 … 240 VAC/DC..... 890010
- 9 A ($I_M$), 24 VDC ($U_B$), 0 … 415 VAC/DC.....890020
- 9 A ($I_M$), 24 VDC ($U_B$), 0 … 550 VAC/DC..... 890030

## S1MS

Monitors the temperature of PTC temperature sensors to protect the motor from overheating

- For DC and AC supplies
- Normally energised mode
- Automatic reset

- Supply voltage: AC: 48, 110, 230, 400 V; AC/DC: 24 V
- Output contacts: 2 auxiliary contacts (2 C/O)
- Dimensions (H x W x D): 87 x 22.5 x 122 mm

Order number [1]:
- 24 VAC/DC ($U_B$) ..... 839775
- 230 VAC ($U_B$)..... 839760
- 400 VAC ($U_B$).....839770

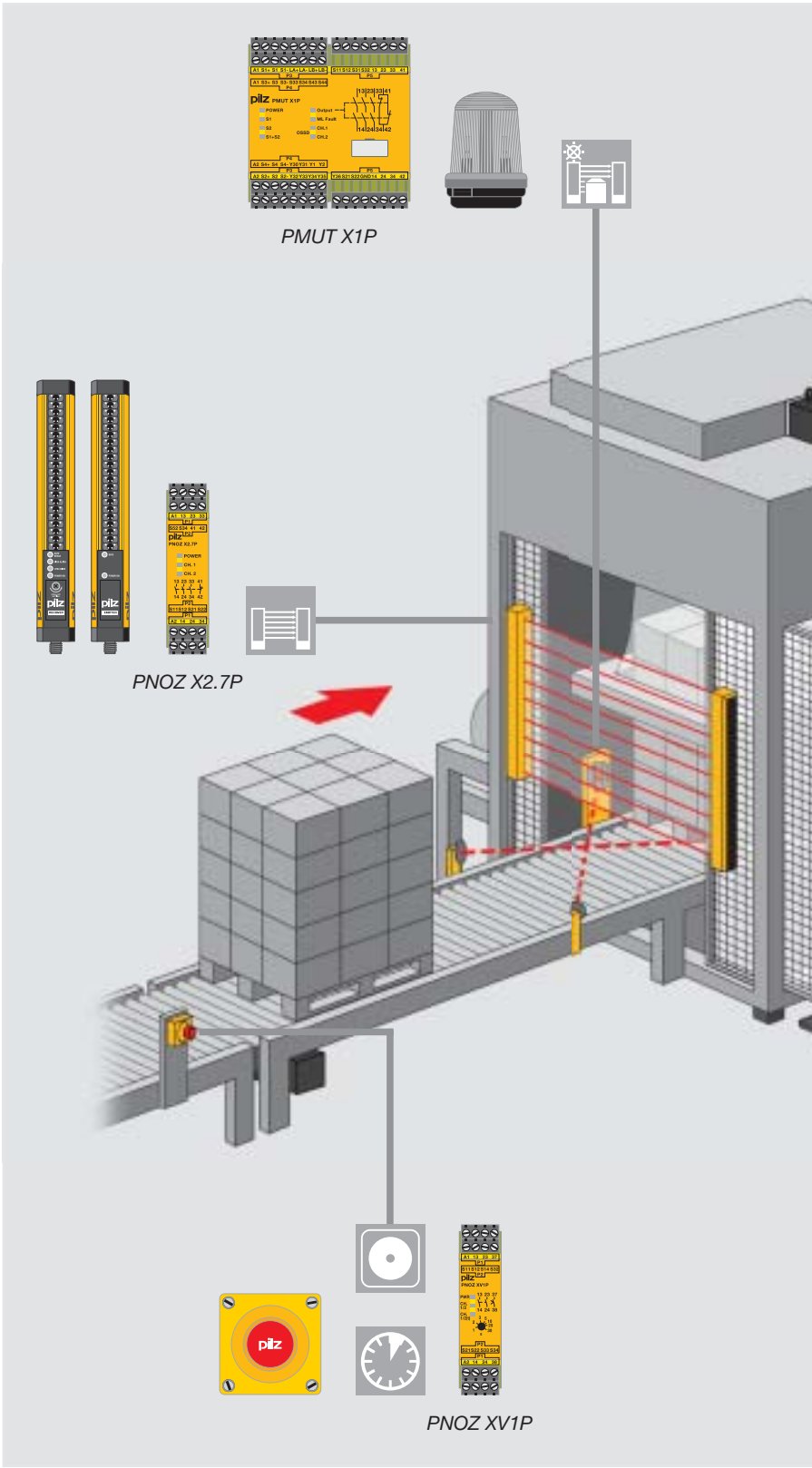
*Order number features: $U_B$ = Supply voltage; $U_M$ = Measuring voltage; $I_M$ = Measuring current*



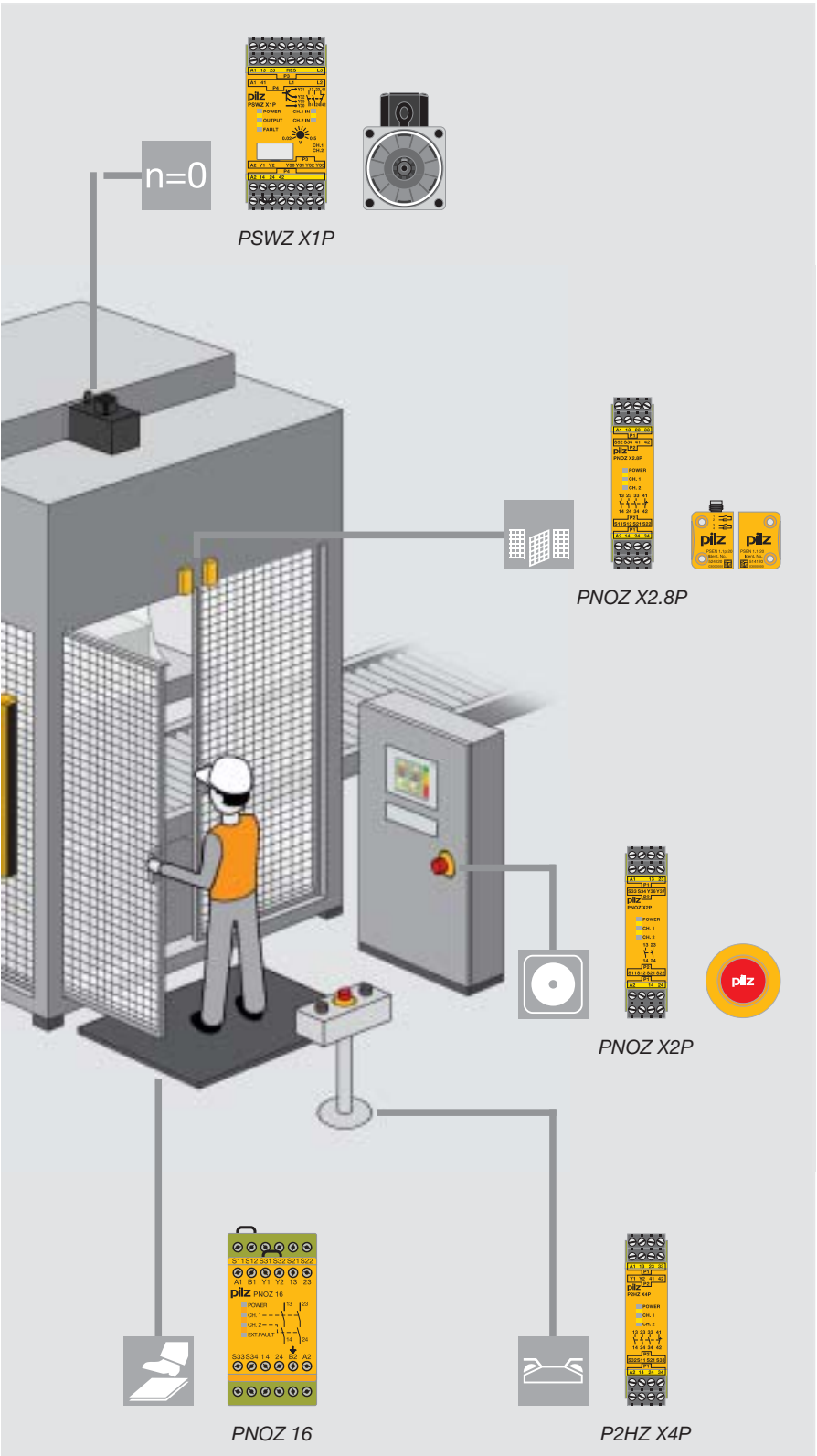
# Safety relays PNOZ X

**Customised safety for each application**

Safety relays from the PNOZ X product range are proven through their reliability and robustness and have developed 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. Its technical features are based on voltage-free, electromechanical contacts in 2 relay technology. 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 the rugged everyday industrial environment. Why not take advantage!




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




## Your benefits at a glance

- Technology proven over many years of use
- Huge selection of products
- For all safety functions such as emergency stop devices, safety gates, light beam devices, muting, pressure sensitive mats, two-hand control and much 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 PNOZ X safety relays:*

Webcode 0210

*Online information at www.pilz.com*



# Selection guide – PNOZ X

## Safety relays – PNOZ X

| Type | Application | | | | | | Performance Level (PL) – EN ISO 13849-1 | Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | n=0 | | |
| PNOZ X1P | ◆ | ◆ | | | | | e | 3 |
| PNOZ X2P | ◆ | ◆ | | | | | e | 3 |
| PNOZ X2.7P | ◆ | ◆ | ◆ | | | | e | 3 |
| PNOZ X2.8P | ◆ | ◆ | ◆ | | | | e | 3 |
| PNOZ X3P | ◆ | ◆ | ◆ | | | | e | 3 |
| PNOZ X7P | ◆ | ◆ | | | | | e | 3 |
| PNOZ X8P | ◆ | ◆ | ◆ | | | | e | 3 |
| PNOZ X9P | ◆ | ◆ | ◆ | | | | e | 3 |
| PNOZ X10.11P | ◆ | ◆ | ◆ | | | | e | 3 |
| PNOZ X11P | ◆ | ◆ | ◆ | | | | e | 3 |
| PNOZ XV1P | ◆ | ◆ | ◆ | | | | e (d) [1)] | 3 |
| PNOZ XV3P | ◆ | ◆ | ◆ | | | | e (d) [1)] | 3 |
| PNOZ XV3.1P | ◆ | ◆ | ◆ | | | | e (d) [1)] | 3 |
| PMUT X1P | ◆ | | ◆ | ◆ | | | e | 3 |
| P2HZ X1P | | | | | ◆ | | e | 3 |
| P2HZ X4P | | | | | ◆ | | e | 3 |
| PSWZ X1P | | | | | | ◆ | e | 3 |
| PZE X4P | Contact expansion | | | | | | e | 3 |

| Category (in accordance with EN 954-1) | | | Output contacts | | | | Housing width in mm |
|---|---|---|---|---|---|---|---|
| | | | Safe | | Non-safe | | |
| 2 | 3 | 4 |  |  |  |  | |
| ◆ | ◆ | ◆ | 3 | - | 1 | - | 22.5 |
| ◆ | ◆ | ◆ | 2 | - | - | - | 22.5 |
| ◆ | ◆ | ◆ | 3 | - | 1 | - | 22.5 |
| ◆ | ◆ | ◆ | 3 | - | 1 | - | 22.5 |
| ◆ | ◆ | ◆ | 3 | - | 1 | 1 | 45.0 |
| ◆ | ◆ | ◆ | 2 | - | - | - | 22.5 |
| ◆ | ◆ | ◆ | 3 | - | 2 | 2 | 45.0 |
| ◆ | ◆ | ◆ | 7 | - | 2 | 2 | 90.0 |
| ◆ | ◆ | ◆ | 6 | - | 4 | - | 90.0 |
| ◆ | ◆ | ◆ | 7 | - | 1 | 2 | 90.0 |
| ◆ | ◆ | ◆ | 2 | 1 | - | - | 22.5 |
| ◆ | ◆ | ◆ | 3 | 2 | - | - | 45.0 |
| ◆ | ◆ | ◆ | 3 | 2 | 1 | - | 90.0 |
| ◆ | ◆ | ◆ | 3 | - | 1 | 5 | 90.0 |
| EN 574, Type IIIC | EN 574, Type IIIC | EN 574, Type IIIC | 3 | - | 1 | 2 | 45.0 |
| EN 574, Type IIIC | EN 574, Type IIIC | EN 574, Type IIIC | 3 | - | 1 | - | 22.5 |
| ◆ | ◆ | ◆ | 2 | - | 1 | 1 | 45.0 |
| Depends on base unit | | | 4 | - | - | - | 22.5 |

*[1] Value applies for instantaneous (delayed) safety contacts*

*Technical documentation on PNOZ X safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZ X

## Safety relays – PNOZ X

*PNOZ X1P*

*PNOZ X2.7P*

*PNOZ X3P*

*PNOZ X9P*

| Type | Supply voltage | Outputs: Voltage/current/ rating | Dimensions (H x W x D) in mm |
|---|---|---|---|
| **PNOZ X1P** | 24 VDC | DC1: 24 V/6 A/150 W | 101/94 [1] x 22.5 x 121 |
| **PNOZ X2P** | ▸ 24 VAC/DC<br>▸ 48 … 240 VAC/DC | DC1: 24 V/6 A/150 W | 101/94 [1] x 22.5 x 121 |
| **PNOZ X2.7P**<br>**PNOZ X2.8P** | ▸ 24 VAC/DC<br>▸ 24 … 240 VAC/DC | DC1: 24 V/6 A/150 W | 101/94 [1] x 22.5 x 121 |
| **PNOZ X3P** | ▸ 24 VAC/DC<br>▸ 24 … 240 VAC/DC | DC1: 24 V/8 A/200 W | 101/94 [1] x 45 x 121 |
| **PNOZ X7P** | ▸ 24 VAC/DC<br>▸ 110 … 120,<br>230 … 240 VAC | DC1: 24 V/6 A/150 W | 101/94 [1] x 22.5 x 121 |
| **PNOZ X8P** | ▸ 24 VDC<br>▸ 24, 110, 115,<br>120, 230 VAC | DC1: 24 V/8 A/200 W | 101/94 [1] x 45 x 121 |
| **PNOZ X9P** | ▸ 24 VDC<br>▸ 24 VDC,<br>100 … 240 VAC | DC1: 24 V/8 A/200 W | 101/94 [1] x 90 x 121 |
| **PNOZ X11P** | ▸ 24 VDC, 24 VAC<br>▸ 110 … 120,<br>230 … 240 VAC | DC1: 24 V/8 A/200 W | 101/94 [1] x 90 x 121 |

| Features | Order number | |
|---|---|---|
| | Spring-loaded terminals | Plug-in screw terminals |
| ▸ 1-channel operation | 787 100 | 777 100 |
| ▸ 2-channel operation with detection of shorts across contacts<br>▸ Automatic or monitored reset can be selected | ▸ 24 VAC/DC ..... 787 303<br>▸ 48 … 240 VAC/DC..... 787 307 | ▸ 24 VAC/DC ..... 777 303<br>▸ 48 … 240 VAC/DC..... 777 307 |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ PNOZ X2.7P: Monitored reset<br>▸ PNOZ X2.8P: Automatic reset | ▸ PNOZ X2.7P C<br>- 24 VAC/DC..... 787 305<br>- 24 … 240 VAC/DC ..... 787 306<br>▸ PNOZ X2.8P C<br>- 24 VAC/DC..... 787 301<br>- 24 … 240 VAC/DC ..... 787 302 | ▸ PNOZ X2.7P<br>- 24 VAC/DC..... 777 305<br>- 24 … 240 VAC/DC ..... 777 306<br>▸ PNOZ X2.8P<br>- 24 VAC/DC..... 777 301<br>- 24 … 240 VAC/DC ..... 777 302 |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected<br>▸ 1 semiconductor output<br>▸ Safety gate function with N/C / N/O combination | ▸ 24 VAC/DC ..... 787 310<br>▸ 24 … 240 VAC/DC..... 787 313 | ▸ 24 VAC/DC ..... 777 310<br>▸ 24 … 240 VAC/DC..... 777 313 |
| ▸ 1-channel operation | ▸ 24 VAC/DC ..... 787 059<br>▸ More available on request | ▸ 24 VAC/DC ..... 777 059<br>▸ More available on request |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected<br>▸ 2 semiconductor outputs | ▸ 24 VAC..... 787 770<br>▸ 24 VDC ..... 787 760<br>▸ More available on request | ▸ 24 VAC..... 777 770<br>▸ 24 VDC ..... 777 760<br>▸ More available on request |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected<br>▸ 2 semiconductor outputs | ▸ 24 VDC ..... 787 609<br>▸ 24 VDC, 100 … 240 VAC ..... 787 606 | ▸ 24 VDC ..... 777 609<br>▸ 24 VDC, 100 … 240 VAC ..... 777 606 |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected<br>▸ 2 semiconductor outputs | ▸ 24 VDC, 24 VAC ..... 787 080<br>▸ 110 … 120 VAC ..... 787 083<br>▸ 230 … 240 VAC ..... 787 086 | ▸ 24 VDC, 24 VAC ..... 777 080<br>▸ 110 … 120 VAC, 24 VDC ..... 777 083<br>▸ 230 … 240 VAC, 24 VDC ..... 777 086 |

*[1] Height with spring-loaded terminals/plug-in screw terminals*

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on PNOZ X safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZ X

## Safety relays – PNOZ X

*PNOZ XV1P*

*PNOZ XV3P*

*PMUT X1P*

*PZE X4P*

| Type | Supply voltage | Outputs: Voltage/current/ rating | Dimensions (H x W x D) in mm |
|---|---|---|---|
| **PNOZ XV1P** | 24 VDC | DC1: 24 V/5 A/125 W | 101/94 [1] x 22.5 x 121 |
| **PNOZ XV3P** | 24 VDC | DC1: 24 V/8 A/200 W | 101/94 [1] x 45 x 121 |
| **PNOZ XV3.1P** | ▸ 24 VDC<br>▸ 24 … 240 VAC/DC | DC1: 24 V/8 A/200 W | 101/94 [1] x 90 x 121 |
| **PMUT X1P** | 24 VDC | DC1: 24 V/8 A/200 W | 101/94 [1] x 90 x 121 |
| **P2HZ X1P** | ▸ 24 VDC<br>▸ 24, 42, 48, 110, 115, 120, 230, 240 VAC | DC1: 24 V/2 A/50 W | 101/94 [1] x 45 x 121 |
| **P2HZ X4P** | 24 VAC/DC | DC1: 24 V/5 A/125 W | 101/94 [1] x 22.5 x 121 |
| **PSWZ X1P** | 24 … 240 VAC/DC | DC1: 24 V/6 A/150 W | 101/94 [1] x 45 x 121 |
| **PZE X4P** | 24 VDC | DC1: 24 V/5 A/120 W | 101/94 [1] x 22.5 x 121 |

| Features | Order number | |
|---|---|---|
| | Spring-loaded terminals | Plug-in screw terminals |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected | ▸ 0.1 … 3 s ..... 787 601<br>▸ 1 … 30 s ..... 787 602 | ▸ 0.1 … 3 s ..... 777 601<br>▸ 1 … 30 s ..... 777 602 |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected | ▸ 3 s ..... 787 512<br>▸ 30 s ..... 787 510<br>▸ More available on request | ▸ 3 s ..... 777 512<br>▸ 30 s ..... 777 510<br>▸ More available on request |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected<br>▸ Universal power supply 24 … 240 VAC/DC | ▸ 3 s selectable, 24 … 240 VAC/DC..... 787 532<br>▸ 30 s selectable, 24 … 240 VAC/DC..... 787 530<br>▸ More available on request | ▸ 3 s selectable, 24 … 240 VAC/DC..... 777 532<br>▸ 30 s selectable, 24 … 240 VAC/DC..... 777 530<br>▸ More available on request |
| ▸ 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 | 788 010 | 778 010 |
| ▸ 2 semiconductor outputs | ▸ 24 VDC ..... 787 340<br>▸ More available on request | ▸ 24 VDC ..... 777 340<br>▸ More available on request |
| ▸ 22.5 mm width | ▸ 24 VAC..... 787 354<br>▸ 24 VDC ..... 787 355 | ▸ 24 VAC..... 777 354<br>▸ 24 VDC ..... 777 355 |
| ▸ 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 | ▸ $U_M$: 0.5 V ..... 787 949<br>▸ $U_M$: 3 V ..... 787 950 | ▸ $U_M$: 0.5 V ..... 777 949<br>▸ $U_M$: 3 V ..... 777 950 |
| ▸ 1-channel operation | 787 585 | 777 585 |

*[1] Height with spring-loaded terminals/plug-in screw terminals*

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on PNOZ X safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Safety relays PNOZsigma

*PNOZsigma brings maximum efficiency – from planning to service.*

**Maximum functionality in minimum width**

The compact safety relays PNOZsigma combine many years of experience with today's very latest safety technology: you can achieve maximum safety and cost-effectiveness with minimum effort.

**All-round efficiency – From planning to service**

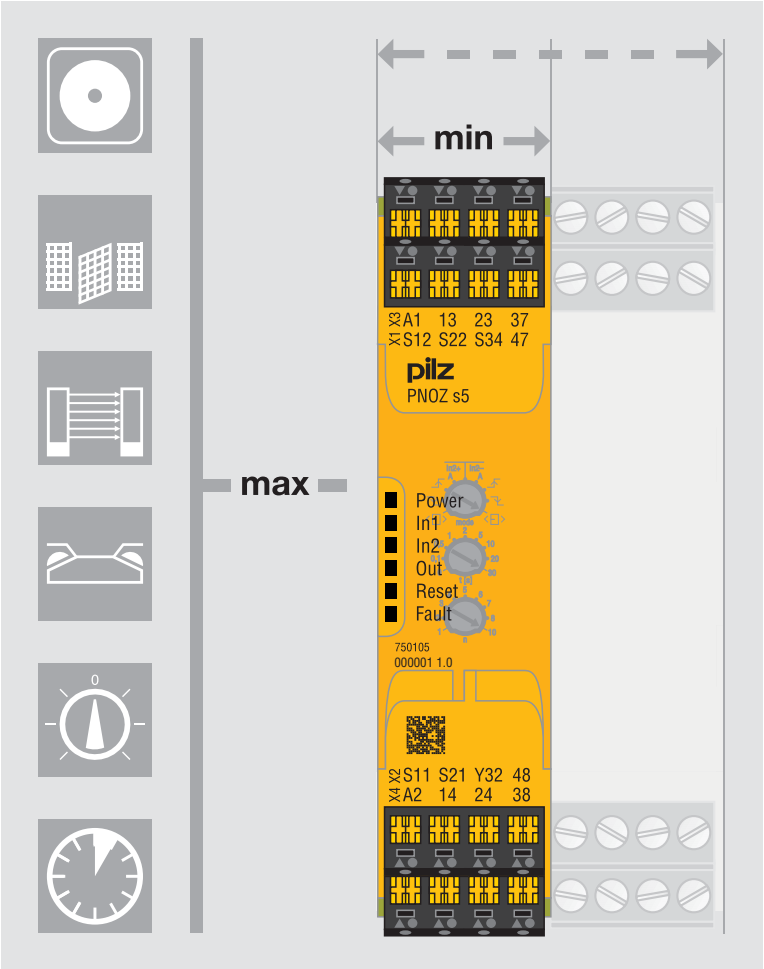
With particularly narrow housing widths and multifunctionality compressed into each unit, PNOZsigma provides maximum functionality in minimum width. Use safety technology that

- saves more space,
- is more flexible,
- quicker
- and therefore more efficient.

**Up to 50 % space saving**

- Widths from 12.5 mm
- Housing is up to 50 % narrower with the same functionality [1)]
- Reduced space requirement in the control cabinet saves costs

[1)] *Compared with standard electromechanical safety relays on the market*



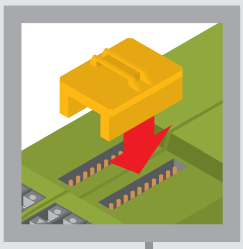

**Fewer types – suitable for a variety of uses**

- Selectable operating modes and timers enable each unit to be flexible in its application
- A single unit type monitors various safety functions
- Your stockholding can be reduced to a few unit types

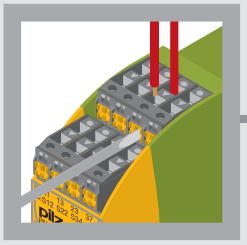
**Your benefits at a glance**

- Up to 50 % space saving in the control cabinet
- Rapid commissioning and expansion
- High availability and diagnostics in seconds
- Few unit types covering many safety functions

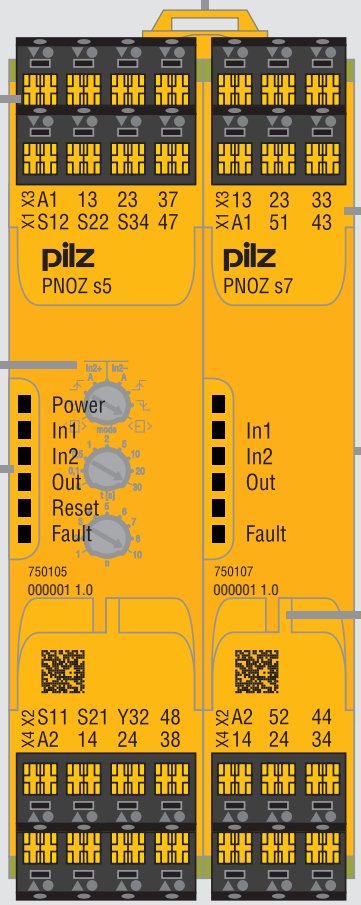
*20% reduction in wiring: Contact expansion via connectors*



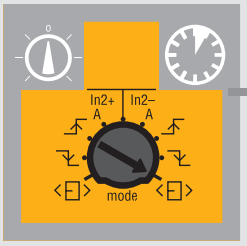
*Rapid installation: new – innovative spring-loaded terminals, chambers operated individually*



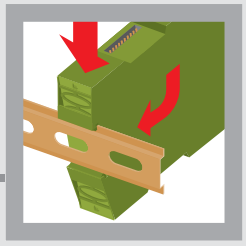
*Simple configuration: designation and position of the terminals is the same on all unit types*



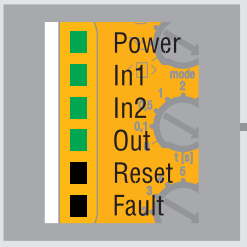

*Maximum flexibility: Operating modes and timer functions are selectable*



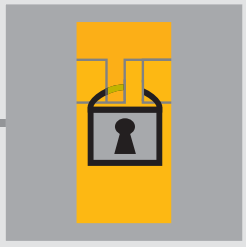

*Rapid assembly via spring clips: no need for tools*



*Diagnostics in seconds: via 6 LEDs – no external measuring devices required*




*Safe from manipulation: setting elements have a lockable cover*



*Keep up-to-date on PNOZsigma safety relays:*

Webcode 0994

*Online information at www.pilz.com*



# The sum of our experience – PNOZsigma

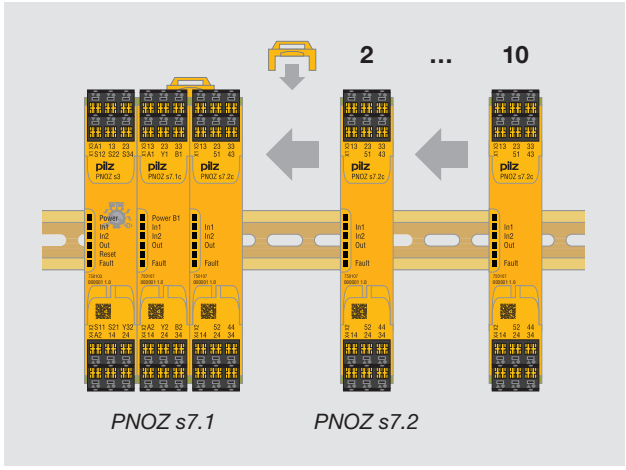
**Multiple expansion with PNOZ s7.1 and PNOZ s7.2**

With a base unit and a PNOZ s7.1, the number of safety contacts can be expanded almost without limit. Up to ten PNOZ s7.2 can be connected to a PNOZ s7.1. If you need more contacts, an additional PNOZ s7.1 can be added to the series. No wiring is involved – just a connector and one simple hand movement.

At just 17.5 mm wide, the PNOZ s7.1 has three safety contacts, while the PNOZ s7.2 has four safety contacts plus one auxiliary contact. They can be combined with other PNOZsigma expansion units at any time.

**Your benefits at a glance**

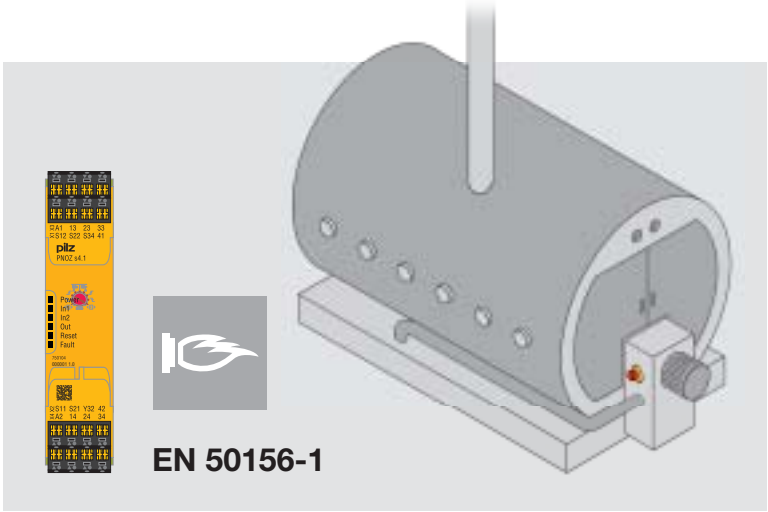
- Rapid commissioning
- Fewer unit types to keep in stock
- No additional accessories, everything is supplied with the unit
- Easier to maintain because units can be installed or removed individually




*Rapid contact expansion – it's easy with PNOZsigma!*

**Safe firing with PNOZ s4.1**

Thanks to three safe, diverse safety contacts, the PNOZ s4.1 is approved for use in burner controls. It is approved in accordance with the standard EN 50156-1 for electrical equipment on furnaces, in particular with regard to the requirements for application design and installation.



# Monitor speed safely with PNOZ s30

**PNOZ s30 is in control**

The speed monitor PNOZ s30 provides safe monitoring of standstill, speed and direction of rotation. So the right speed monitoring solution is available for each application.

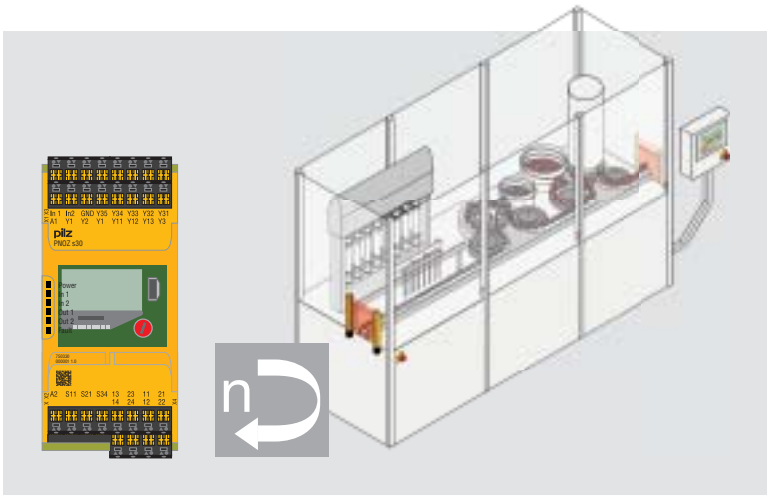
**Applications PNOZ s30**

The PNOZ s30 can be used to monitor standstill, speed and direction of rotation. Typical application areas include:

- Amusement parks
- Balancing machines
- High bay racking
- Centrifuges
- Filling machines

**Your benefits at a glance**

- Increased productivity and safety for operating personnel
- Rotary knob (push and turn) saves time during setup and when exchanging units
- Productivity is increased by avoiding unnecessary shutdown processes
- Suitable for all common motor feedback systems and proximity switches




*Keep up-to-date on PNOZsigma safety relays:*

Webcode 0994

*Online information at www.pilz.com*



# Selection guide – PNOZsigma

## Safety relays – PNOZsigma

| Type | Application | Performance Level (PL) – EN ISO 13849-1 | Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 |
|---|---|---|---|
| **PNOZ s1** | ◆ ◆ | c | 2 |
| **PNOZ s2** | ◆ ◆ | e | 3 |
| **PNOZ s3** | ◆ ◆ ◆ | e | 3 |
| **PNOZ s4** | ◆ ◆ ◆ | e | 3 |
| **PNOZ s4.1** | ◆ ◆ ◆ | e | 3 |
| **PNOZ s5** | ◆ ◆ ◆ ◆ | e | 3 |
| **PNOZ s6** | ◆ | e | 3 |
| **PNOZ s6.1** | ◆ | e | 3 |
| **PNOZ s7** | Contact expansion | e | 3 |
| **PNOZ s7.1** | Contact expansion | e | 3 |
| **PNOZ s7.2** | Contact expansion | e | 3 |
| **PNOZ s8** | Contact expansion | c | 2 |
| **PNOZ s9** | Contact expansion or safe timer relay ◆ | e | 3 |
| **PNOZ s10** | Contact expansion | e | 3 |
| **PNOZ s11** | Contact expansion | e | 3 |

| Type | Application | Performance Level (PL) – EN ISO 13849-1 | Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 |
|---|---|---|---|
| **PNOZ s30** | Speed monitor | e | 3 |

| Category (in accordance with EN 954-1) | Output contacts Safe | | Auxiliary contacts | | Universal power supply 48 … 240 VAC/DC | Housing width in mm |
|---|---|---|---|---|---|---|
| |  |  |  |  | | |
| 3 | 2 | - | - | 1 | | 12.5 |
| 4 | 3 | - | 1 | 1 | | 17.5 |
| 4 | 2 | - | - | 1 | | 17.5 |
| 4 | 3 | - | 1 | 1 | ◆ | 22.5 |
| 4 | 3 | - | 1 | 1 | ◆ | 22.5 |
| 4 | 2 | 2 | - | 1 | ◆ | 22.5 |
| EN 574, Type IIIC | 3 | - | 1 | 1 | ◆ | 22.5 |
| EN 574, Type IIIA | 3 | - | 1 | 1 | ◆ | 22.5 |
| Depends on base unit | 4 | - | 1 | - | | 17.5 |
| Depends on base unit | 3 | - | - | - | | 17.5 |
| Depends on base unit | 4 | - | 1 | - | | 17.5 |
| Depends on base unit | 2 | - | - | 1 | | 12.5 |
| Depends on base unit, Cat. 4 as timer | - | 3 | 1 | - | | 17.5 |
| Depends on base unit | 4 | - | 1 | - | | 45.0 |
| Depends on base unit | 8 | - | 1 | - | | 45.0 |

| Category (in accordance with EN 954-1) | Output contacts Safe | | Auxiliary contacts | | Universal power supply 24 … 240 VAC/DC | Housing width in mm |
|---|---|---|---|---|---|---|
| |  |  |  |  | | |
| 3 | 2 | - | 2 | 4 | ◆ | 45.0 |

*Technical documentation on PNOZsigma safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZsigma

## Safety relays – PNOZsigma

*PNOZ s1*

*PNOZ s3*

*PNOZ s5*

*PNOZ s6*

| Type | Supply voltage ($U_B$) | Outputs: Voltage/current/ rating | Dimensions (H x W x D) in mm |
|---|---|---|---|
| **PNOZ s1** | 24 VDC | DC1: 24 V/3 A/75 W | 102/98 [1] x 12.5 x 120 |
| **PNOZ s2** | 24 VDC | DC1: 24 V/8 A/200 W | 102/98 [1] x 17.5 x 120 |
| ★ **PNOZ s3** | 24 VDC | DC1: 24 V/8 A/200 W | 102/98 [1] x 17.5 x 120 |
| ★ **PNOZ s4** | ▸ 24 VDC<br>▸ 48 … 240 VAC/DC | DC1: 24 V/8 A/200 W,<br>DC1: 24 V/6 A/150 W | 102/98 [1] x 22.5 x 120 |
| **PNOZ s4.1** | ▸ 24 VDC<br>▸ 48 … 240 VAC/DC | DC1: 24 V/6 A/150 W | 102/98 [1] x 22.5 x 120 |
| ★ **PNOZ s5** | ▸ 24 VDC<br>▸ 48 … 240 VAC/DC | DC1: 24 V/6 A/150 W | 102/98 [1] x 22.5 x 120 |
| **PNOZ s6** | ▸ 24 VDC<br>▸ 48 … 240 VAC/DC | DC1: 24 V/8 A/200 W,<br>DC1: 24 V/6 A/150 W | 102/98 [1] x 22.5 x 120 |
| **PNOZ s6.1** | ▸ 24 VDC<br>▸ 48 … 240 VAC/DC | DC1: 24 V/8 A/200 W,<br>DC1: 24 V/6 A/150 W | 102/98 [1] x 22.5 x 120 |

| Features | Order number | |
|---|---|---|
| | Spring-loaded terminals | Plug-in screw terminals |
| ▸ 1-channel operation<br>▸ Manual/automatic reset | 24 VDC ..... 751 101 | 24 VDC ..... 750 101 |
| ▸ 1-channel operation<br>▸ Monitored reset<br>▸ Manual/automatic reset<br>▸ Safe separation | 24 VDC ..... 751 102 | 24 VDC ..... 750 102 |
| ▸ 1 and 2-channel operation<br>▸ Detection of shorts across contacts<br>▸ Monitored reset<br>▸ Manual/automatic reset<br>▸ Start-up testing | 24 VDC ..... 751 103 | 24 VDC ..... 750 103 |
| ▸ 1 and 2-channel operation<br>▸ Detection of shorts across contacts<br>▸ Monitored reset<br>▸ Manual/automatic reset<br>▸ Start-up testing | ▸ 24 VDC ..... 751 104<br>▸ 48 … 240 VAC/DC..... 751 134 | ▸ 24 VDC ..... 750 104<br>▸ 48 … 240 VAC/DC..... 750 134 |
| ▸ 1 and 2-channel operation<br>▸ Detection of shorts across contacts<br>▸ Monitored reset<br>▸ Manual/automatic reset<br>▸ Start-up testing<br>▸ 3 safe, diverse safety contacts<br>▸ Approved in accordance with the standard EN 50156-1 for electrical equipment for furnaces | ▸ 24 VDC ..... 751 124<br>▸ 48 … 240 VAC/DC..... 751 154 | ▸ 24 VDC ..... 750 124<br>▸ 48 … 240 VAC/DC..... 750 154 |
| ▸ 1 and 2-channel operation<br>▸ Detection of shorts across contacts<br>▸ Monitored reset<br>▸ Manual/automatic reset<br>▸ Start-up testing<br>▸ Timer functions: delay-on de-energisation<br>▸ Time range: 0 … 300 s | ▸ 24 VDC ..... 751 105<br>▸ 48 … 240 VAC/DC..... 751 135 | ▸ 24 VDC ..... 750 105<br>▸ 48 … 240 VAC/DC..... 750 135 |
| ▸ 2-channel operation<br>▸ Detection of shorts across contacts | ▸ 24 VDC ..... 751 106<br>▸ 48 … 240 VAC/DC..... 751 136 | ▸ 24 VDC ..... 750 106<br>▸ 48 … 240 VAC/DC..... 750 136 |
| ▸ 2-channel operation<br>▸ Detection of shorts across contacts | ▸ 24 VDC ..... 751 126<br>▸ 48 … 240 VAC/DC..... 751 156 | ▸ 24 VDC ..... 750 126<br>▸ 48 … 240 VAC/DC..... 750 156 |

[1] *Height with spring-loaded terminals/plug-in screw terminals*

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on PNOZsigma safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZsigma

## Safety relays – PNOZsigma

*PNOZ s7.1*

*PNOZ s8*

*PNOZ s10*

*PNOZ s30*

| Type | Supply voltage ($U_B$) | Outputs: Voltage/current/ rating | Dimensions (H x W x D) in mm |
|---|---|---|---|
| **PNOZ s7** | 24 VDC | DC1: 24 V/8 A/200 W | 102/98 [1)] x 17.5 x 120 |
| **PNOZ s7.1** | 24 VDC | DC1: 24 V/8 A/200 W | 102/98 [1)] x 17.5 x 120 |
| **PNOZ s7.2** | 24 VDC | DC1: 24 V/8 A/200 W | 102/98 [1)] x 17.5 x 120 |
| **PNOZ s8** | 24 VDC | DC1: 24 V/3 A/75 W | 102/98 [1)] x 12.5 x 120 |
| **PNOZ s9** | 24 VDC | DC1: 24 V/8 A/200 W | 102/98 [1)] x 17.5 x 120 |
| **PNOZ s10** | 24 VDC | DC1: 24 V/12 A/300 W | 102/98 [1)] x 45.0 x 120 |
| **PNOZ s11** | 24 VDC | DC1: 24 V/8 A/200 W | 102/98 [1)] x 45.0 x 120 |
| **PNOZ s30** | 24 VDC | DC1: 24 V/2 A/50 W | 102/98 [1)] x 45.0 x 120 |

| Features | Order number | |
|---|---|---|
| | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Safe separation | 24 VDC ..... 751 107 | 24 VDC ..... 750 107 |
| ▸ Cascading module for connection to PNOZ s7.2<br>▸ Safe separation of safety contacts<br>▸ LEDs for input and switch status<br>▸ Can also be used with other safety control devices, without a PNOZsigma base unit: one input circuit affects the output relays | 24 VDC ..... 751 167 | 24 VDC ..... 750 167 |
| ▸ Contact expansion module in conjunction with PNOZ s7.1 | 24 VDC ..... 751 177 | 24 VDC ..... 750 177 |
| - | 24 VDC ..... 751 108 | 24 VDC ..... 750 108 |
| ▸ Safe separation<br>▸ Timer functions: delay-on energisation, delay-on de-energisation, pulsing, retriggerable<br>▸ Time range: 0 … 300 s | 24 VDC ..... 751 109 | 24 VDC ..... 750 109 |
| ▸ Safe separation | 24 VDC ..... 751 110 | 24 VDC ..... 750 110 |
| ▸ Safe separation | 24 VDC ..... 751 111 | 24 VDC ..... 750 111 |
| ▸ Safe speed monitor<br>▸ Parameters are entered by rotary knob (push and turn)<br>▸ Advance warning of shutdown when a certain threshold is reached | 24 VDC ..... 751 330 | 24 VDC ..... 750 330 |

*[1] Height with spring-loaded terminals/plug-in screw terminals*

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on PNOZsigma safety relays:*

Webcode 0685

*Online information at www.pilz.com*

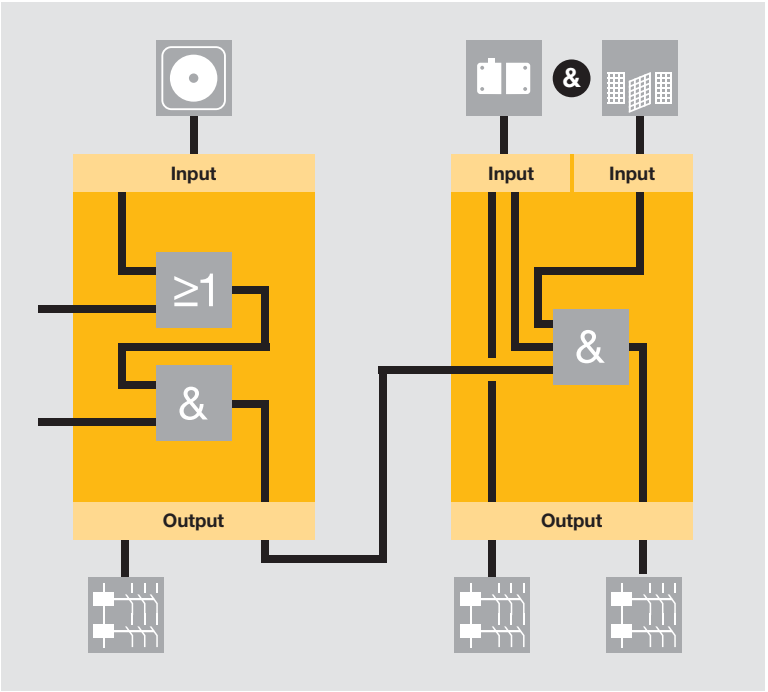


# Safety relays PNOZelog


*PNOZelog can be linked through logic AND/OR operations.*

**Extended diagnostics, easy to link**

Ideal for monitoring up to four safety functions, the innovative PNOZelog product range combines the experience of the electromechanical safety relays with the benefits of modern electronics. Wear-resistance, safety, long service life and high availability ensure it is cost-effective to use. PNOZelog is also easy to link through logic AND/OR operations. Diagnostics on the PNOZelog have been extended. Power-up tests, self-checking and runtime tests guarantee maximum safety.




*Less wiring due to linkable outputs.*

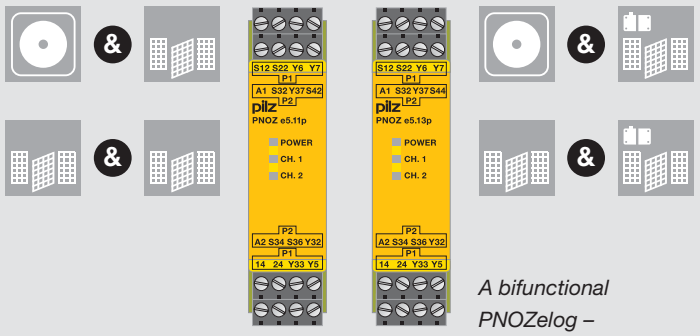
**Complete safety functions through logic function operations**

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. Both outputs on the PNOZelog units are available. As many units as necessary can be connected in series – ideal for monitoring up to four safety functions.

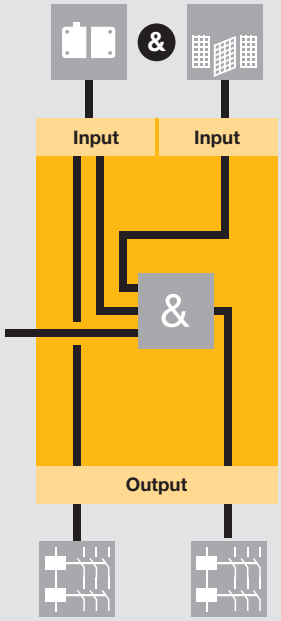
**“2-in-1” – the bifunctional PNOZelog**

Do you require emergency stop or safety gate monitoring within a compact safety unit? Monitor two safety functions simultaneously with just a single unit. You save on wiring. With a width of just 22.5 mm, the space requirement within the control cabinet is reduced to a minimum. Maximum functionality is achieved through the internal logic AND operation. Each safety function has a separate signal output.

- PNOZ e5.11p simultaneously monitors an emergency switching off device/ safety gate combination or two safety gates
- The PNOZ e5.13p can also be connected to the PSENmag safety switches




*A bifunctional PNOZelog – Minimum space, maximum functionality.*




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

**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 PNOZelog safety relays:*

Webcode 0209

*Online information at www.pilz.com*



# Selection guide – PNOZelog

## Safety relays – PNOZelog

| Type | Application | | | | | Performance Level (PL) – EN ISO 13849-1 | Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 |
|---|---|---|---|---|---|---|---|
| |  |  |  |  |  | | |
| **PNOZ e1p** | ◆ | ◆ | ◆ | | | e | 3 |
| **PNOZ e1.1p** | ◆ | ◆ | ◆ | | | e (d) [1] | 3 |
| **PNOZ e1vp** | ◆ | ◆ | ◆ | | | e (d) [1] | 3 |
| **PNOZ e2.1p** | | | | ◆ | | e (d) [1] | 3 |
| **PNOZ e2.2p** | | | | ◆ | | e (d) [1] | 3 |
| **PNOZ e3.1p** | | ◆ | | | | e (d) [1] | 3 |
| **PNOZ e3vp** | | ◆ | | | | e (d) [1] | 3 |
| **PNOZ e4.1p** | | | | | ◆ | d | 2 |
| **PNOZ e4vp** | | | | | ◆ | d | 2 |
| **PNOZ e5.11p** | ◆ | ◆ | | | | e (d) [1] | 3 |
| **PNOZ e5.13p** | ◆ | ◆ | | | | e (d) [1] | 3 |
| **PNOZ e6.1p** | ◆ | ◆ | ◆ | | | e (d) [1] | 3 |
| **PNOZ e6vp** | ◆ | ◆ | ◆ | | | e (d) [1] | 3 |
| **PNOZ e7p** | ◆ | ◆ | ◆ | | | e | 3 |

| Category (in accordance with EN 954-1) | | | Semiconductor outputs | | | Relay outputs | | Logic operations | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Safe | | Non-safe | Safe | | | |
| 2 | 3 | 4 |  |  |  |  |  | & | ≥1 |
| ◆ | ◆ | ◆ | 2 | | 1 | - | - | | |
| ◆ | ◆ | ◆ | 2 | | 1 | - | - | ◆ | ◆ |
| ◆ | ◆ | ◆ | 2 | ◆ | 1 | - | - | ◆ | ◆ |
| EN 574, Type IIIC | EN 574, Type IIIC | EN 574, Type IIIC | 2 | | 1 | - | - | ◆ | ◆ |
| EN 574, Type IIIA | EN 574, Type IIIA | EN 574, Type IIIA | 2 | | 1 | - | - | ◆ | ◆ |
| ◆ | ◆ | ◆ | 2 | | 1 | - | - | ◆ | ◆ |
| ◆ | ◆ | ◆ | 2 | ◆ | 1 | - | - | ◆ | ◆ |
| | ◆ | | 2 | | 1 | - | - | ◆ | ◆ |
| | ◆ | | 2 | ◆ | 1 | - | - | ◆ | ◆ |
| ◆ | ◆ | | 2 | | 2 | - | - | ◆ [2)] | |
| ◆ | ◆ | | 2 | | 2 | - | - | ◆ [2)] | |
| ◆ | ◆ | ◆ | 2 | | 1 | 4 | - | ◆ | ◆ |
| ◆ | ◆ | ◆ | 2 | ◆ | 1 | 4 | - | ◆ | ◆ |
| ◆ | ◆ | ◆ | 2 | | 1 | - | - | ◆ | |

*[1)] without (with) logic AND connection*

*[2)] Also AND-linked internally*

*Technical documentation on PNOZelog safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZelog

## Safety relays – PNOZelog

*PNOZ e1.1p*

*PNOZ e2.1p*

*PNOZ e3.1p*

| 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 VDC/ 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 VDC/ 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 VDC/ 2 A/50 W |
| **PNOZ e2.1p**<br>**PNOZ e2.2p** | PNOZ e2.1p:<br>In accordance with EN 574, requirement class IIIC;<br>PNOZ e2.2p:<br>In accordance with EN 574, Type 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 VDC/ 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 VDC/ 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 VDC/ 2 A/50 W |

**Common features**

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

| Features | Order number | |
|---|---|---|
| | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Evaluation device for non-contact, coded safety switches PSENcode<br>▸ Monitored or automatic reset can be selected<br>▸ Selectable monitoring of shorts across contacts | 784 130 | 774 130 |
| ▸ Evaluation device for non-contact, coded safety switches PSENcode<br>▸ Monitored or automatic reset 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 | 784 133 | 774 133 |
| ▸ Evaluation device for non-contact, coded safety switches PSENcode<br>▸ Monitored or automatic reset 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 | ▸ 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 display<br>▸ Feedback loop for monitoring external contactors | ▸ 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 position switches and for non-contact, magnetic safety switches PSENmag (Series 2)<br>▸ Monitored or automatic reset 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 | 784 139 | 774 139 |
| ▸ Evaluation device for position switches and for non-contact, magnetic safety switches PSENmag (Series 2)<br>▸ Monitored or automatic reset 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 | ▸ 10 s .....784 137<br>▸ 300 s .....784 138 | ▸ 10 s .....774 137<br>▸ 300 s .....774 138 |

*[1] Height with spring-loaded terminals/plug-in screw terminals*

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on PNOZelog safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZelog

## Safety relays – PNOZelog

*PNOZ e4.1p*

*PNOZ e5.11p*

*PNOZ e6.1p*

*PNOZ e7p*

| Type | Application area | Outputs | Outputs: Voltage/ current/ rating |
|---|---|---|---|
| **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 VDC/ 2 A/50 W |
| **PNOZ e5.11p** | Combined unit for monitoring emergency switching off relay and/or safety gate, AND-linked internally | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 2 auxiliary outputs | 24 VDC/ 1.5 A/40 W |
| ★ **PNOZ e5.13p** | Combined unit for monitoring emergency switching off relay and/or safety gate, AND-linked internally | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 2 auxiliary outputs | 24 VDC/ 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, emergency stop pushbuttons, safety gate limit switches, reset buttons | Using semiconductor technology:<br>▸ 2 safety outputs<br>▸ 2 test pulse outputs<br>▸ 1 auxiliary output | Outputs using semiconductor technology:<br>24 VDC |

### Common features

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

| Features | Order number | |
|---|---|---|
| | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Used to connect Mayser safety mats, type: SM/BK<br>▸ Suitable for controlling PSS/SafetyBUS p/PNOZmulti<br>▸ One AND and one OR input for logic AND/OR connections between several PNOZelog units<br>▸ With or without reset function | 784180 | 774180 |
| ▸ 2 safety functions in one unit, AND-linked internally<br>▸ Evaluation device for position switches and non-contact, coded safety switches PSENcode<br>▸ One AND input for logic AND connections between several PNOZelog units<br>▸ Monitored or automatic reset can be selected | 784190 | 774190 |
| ▸ 2 safety functions in one unit, AND-linked internally<br>▸ Evaluation device for position switches, non-contact safety switches PSENcode and PSENmag (Series 2.X)<br>▸ Monitored or automatic reset can be selected<br>▸ One AND input for logic AND connections between several PNOZelog units | 784191 | 774191 |
| ▸ Connection option for emergency stop pushbuttons, safety gate limit switches, reset buttons, safety mats and safe edges made by Haake, proximity switch evaluation devices<br>▸ Monitored or automatic reset 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 | 784192 | 774192 |
| ▸ Connection option for emergency stop pushbuttons, safety gate limit switches, reset buttons, safety mats and safe edges made by Haake, proximity switch evaluation devices<br>▸ Monitored or automatic reset 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 | 784193 | 774193 |
| ▸ Connection option for emergency stop pushbuttons, safety gate limit switches, reset buttons, safety mats and safe edges made by Haake, proximity switch evaluation devices<br>▸ Monitored or automatic reset 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 | 784197 | 774197 |

*[1] Height with spring-loaded terminals/plug-in screw terminals*

★ *Type recommended by Pilz for the majority of your applications*

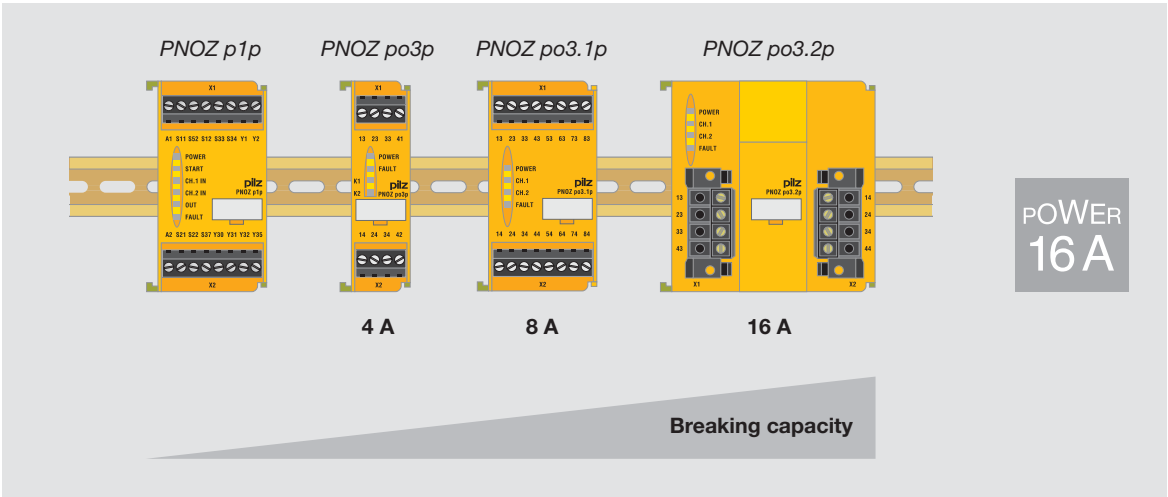
*Technical documentation on PNOZelog safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Safety relays PNOZpower



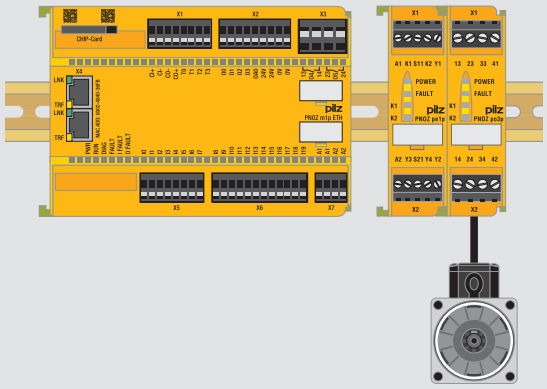

**Switching high loads safely**

PNOZpower safety relays are suitable for monitoring emergency 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. In each case, 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 module 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.

*PNOZ pe1p*



**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 driven via:

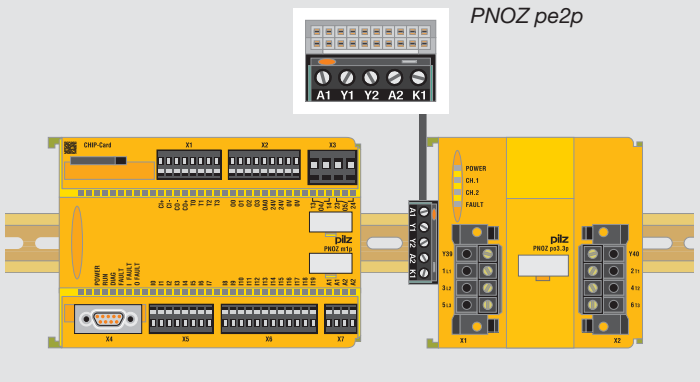
- The safety relays PNOZelog, PNOZ X and PNOZsigma
- The configurable control system PNOZmulti
- The programmable control systems PSS
- The safe bus system SafetyBUS p

The benefit to you:
Volt-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 can be scanned on each module, resulting in fewer 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

*PNOZ pe2p*




*PNOZpower safety relays and the PNOZmulti configurable control system are easily combined using the coupling connector PNOZ pe2p.*

**Connection to PNOZmulti**

Specially developed for connection to the PNOZmulti configurable control system, PNOZpower units can be docked via the coupling connector PNOZ pe2p.

*Keep up-to-date on PNOZpower safety relays:*

Webcode 0245

*Online information at www.pilz.com*



# Selection guide – PNOZpower

## Safety relays – PNOZpower

| Type | Scope | Application | Performance Level (PL) – EN ISO 13849-1 |
|---|---|---|---|
| **PNOZ p1p** | Base unit | ◆ ◆ ◆ | e |
| **PNOZ p1vp** | Base unit, delayed | ◆ ◆ ◆ ◆ | e (d) [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 control system | e |
| **PNOZ pps1p** | Power supply | - | - |

## Safety relays – PNOZpower

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

| Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 | Number of expansion modules | Supply voltage | Housing width in mm |
|---|---|---|---|
| 3 | Min. 1, max. 4 expansion modules | 24 VDC | 45.0 |
| 3 | Min. 1, max. 8 expansion modules (max. 4 delayed and 4 instantaneous) | 24 VDC | 45.0 |
| 3 | Min. 1, max. 4 expansion modules | 24 VDC | 22.5 |
| 3 | Min. 1, max. 6 expansion modules | 24 VDC | 23.5 |
| - | - | 100 … 240 VAC | 45.0 |

*[1] Value applies for instantaneous (delayed) safety contacts*

| Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 | Outputs: Voltage/current/rating | | | Housing width in mm |
|---|---|---|---|---|
| | AC1 | AC3 | DC1: | |
| 3 | 240 V/4 A/960 VA | - | 24 V/4 A/96 W | 22.5 |
| 3 | 240 V/8 A/2 000 VA | - | 24 V/8 A/200 W | 45.0 |
| 3 | 240 V/16 A/4 000 VA | - | 24 V/16 A/400 W | 90.0 |
| 3 | 240 V/16 A/4 000 VA<br>400 V/10 A/4 000 VA<br>500 V/8 A/4 000 VA | 240 V/3.0 kW<br>400 V/5.5 kW<br>500 V/4.0 kW | 24 V/16 A/400 W | 90.0 |
| 3 | 240 V/4 A/960 VA | - | 24 V/4 A/96 W | 22.5 |

*Technical documentation on PNOZpower safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZpower

## Safety relays – PNOZpower

*PNOZ p1p*

*PNOZ pe1p*

*PNOZ pe2p*

| Type | Scope | Supply voltage | Dimensions (H x W x D) in mm |
|---|---|---|---|
| **PNOZ p1p** | Base unit | 24 VDC | 94 x 45 x 135 |
| **PNOZ p1vp** | Base unit, delayed | 24 VDC | 94 x 45 x 135 |
| **PNOZ pe1p** | Control module | 24 VDC | 94 x 22.5 x 135 |
| **PNOZ pe2p** | Bus interface | 24 VDC | 22 x 23.5 x 29 |

| Features | Order number<br><br>Plug-in<br>screw terminals |
|---|---|
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected<br>▸ 2 semiconductor outputs<br>▸ Connection between PNOZ p1p and expansion modules via PNOZpower bus, using jumpers on the back of the unit | 773 300 |
| ▸ 2-channel operation with or without detection of shorts across contacts<br>▸ Monitored or automatic reset can be selected<br>▸ 2 semiconductor outputs<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 | ▸ 30 s.....773 950<br>▸ 300 s.....773 951 |
| ▸ 1-channel operation, without detection of shorts across contacts<br>▸ 2-channel operation, with or without detection of shorts across contacts<br>▸ Expansion module control output connected to the PNOZpower bus<br>▸ Connection between the PNOZ pe1p and expansion modules via the 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 | 773 900 |
| ▸ Driven via safety contacts or safe semiconductor outputs<br>▸ 1-channel operation, without detection of shorts across contacts<br>▸ Output connected to PNOZpower bus<br>▸ Connection between PNOZ pe2p and expansion modules via the PNOZpower bus | 779 125 |

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on PNOZpower safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZpower

## Safety relays – PNOZpower

*PNOZ po3p*

*PNOZ po3.2p*

*PNOZ pps1p*

| Type | Scope | Inputs/outputs | Supply voltage |
|---|---|---|---|
| **PNOZ po3p/ 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 |
| **PNOZ pps1p** | Power supply | - | 100 … 240 VAC/DC |

| Outputs: Voltage/current/ rating | Dimensions (H x W x D) in mm | Features | Order number<br><br>Plug-in screw terminals |
|---|---|---|---|
| AC1: 240 V/4 A/960 VA<br>DC1: 24 V/4 A/96 W | 94 x 22.5 x 135 | ▸ 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 | ▸ PNOZ po3p.....773634<br>▸ PNOZ po4p.....773635 |
| AC1: 240 V/8 A/2000 VA<br>DC1: 24 V/8 A/200 W | 94 x 45 x 135 | ▸ 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 | 773630 |
| AC1: 240 V/16 A/4000 VA,<br>400 V/10 A/4000 VA<br>DC1: 24 V/16 A/400 W | 94 x 90 x 144 | ▸ 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 | 773631 |
| AC1: 240 V/16 A/4000 VA;<br>400 V/10 A/4000 VA;<br>500 V/8 A/4000 VA<br>AC3: 240 V/3 kW;<br>400 V/5.5 kW;<br>500 V/4 kW<br>DC1: 24 V/16 A/400 W | 94 x 90 x 144 | ▸ 2-channel operation with the ability to detect short circuits via the base unit<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<br>▸ LEDs for switch status of channels 1/2, supply voltage and fault | 773632 |
| - | 94 x 45 x 135 | ▸ Galvanic isolation<br>▸ Short circuit-proof<br>▸ 24 VDC at the plug-in connector on the back of the unit for the PNOZpower bus and at the terminals<br>▸ LEDs for supply voltage, output voltage and fault | 773200 |

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on PNOZpower safety relays:*

Webcode 0685

*Online information at www.pilz.com*



# The new configurable safety relay – PNOZ

**The new PNOZmulti Mini – ingeniously simple and simply ingenious!**

With the development of the configurable safety relay PNOZmulti Mini, Pilz now has a universal, scalable product range, providing stand-alone and system solutions.

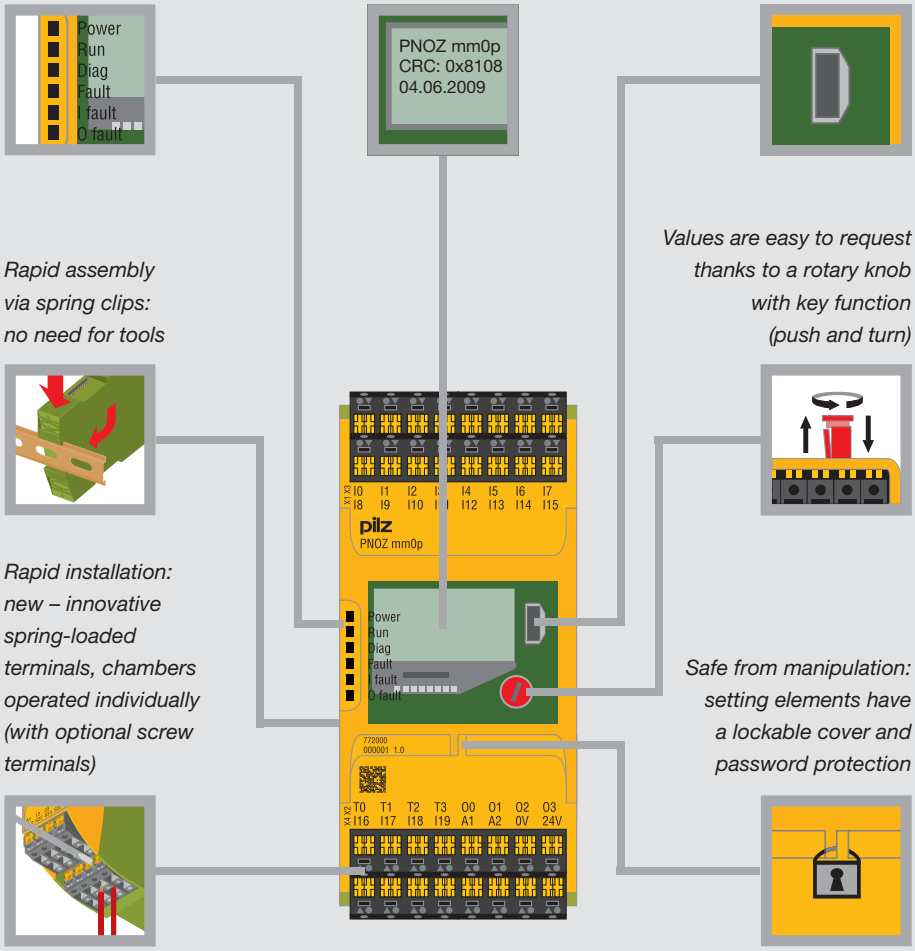
But the best is still to come: Because whether you opt for the new, configurable, entry-level safety relay, the expandable, proven PNOZmulti control system or in future the networkable control system PSSuniversal multi, all the functions are created in familiar, simple fashion, based on the principle of the PNOZmulti Configurator.

Even with its more compact and smaller design with a width of only 45 mm, in every case the PNOZ mm0p has all of the proven functions of the PNOZmulti.

*Simple overview: via 6 LEDs – no external measuring devices required*

*Simple diagnostics: integrated display for showing information and diagnostics*

*Simple configuration with the PNOZmulti Configurator via a standard USB interface*

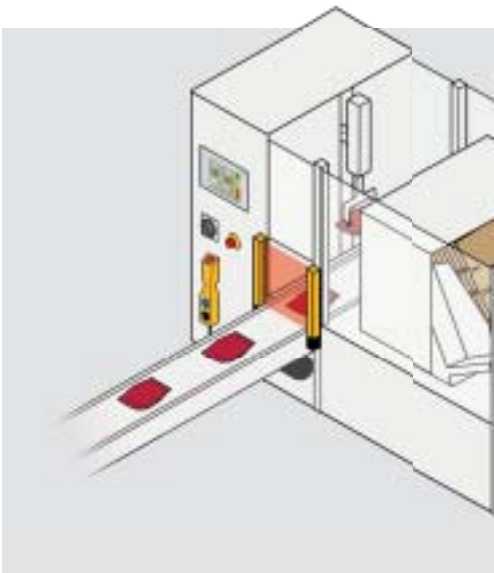



*Rapid assembly via spring clips: no need for tools*

*Values are easy to request thanks to a rotary knob with key function (push and turn)*

*Rapid installation: new – innovative spring-loaded terminals, chambers operated individually (with optional screw terminals)*

*Safe from manipulation: setting elements have a lockable cover and password protection*



# multi Mini

**Base unit PNOZ mm0p**

- Configurable input and output modules
- Non-expandable
- PVIS support
- Individual customer text is shown on the display

**Base unit PNOZ mm0.1p**

- Expandable:
  - to the left – with PNOZ mml1p, PNOZ mml2p and PNOZ mmc1p
  - to the right – with PNOZ s7 to PNOZ s11
- Decentralisation:
  - Sensor technology can be connected via the PDP67 F 8DI ION

**Expansion module PNOZ mml1p**

The safe link module PNOZ mml1p enables data to be exchanged simply between several PNOZmulti Mini base units as well as between PNOZmulti Mini and PNOZmulti.

**Expansion module PNOZ mml2p**

- Ability to connect up to four expansion modules to the PNOZ mm0.1p
- Ability to connect a maximum of four decentralised input modules PDP67 F 8DI ION to the expansion modules
- Up to four sensors are possible per decentralised input module
- Ability to connect all contact/ electronic sensors in series

Relay contacts can be multiplied by combining PNOZ mm0.1p and PNOZsigma. Further information on PNOZsigma is available from page 22.

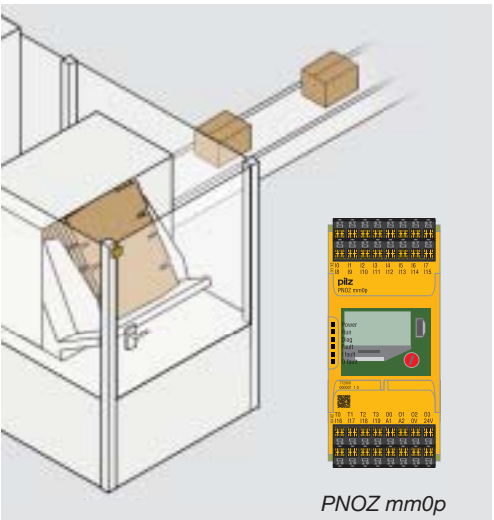
**Your benefits at a glance**

- Configurable inputs and outputs
- Compact design
- Simple diagnostics thanks to integrated display
- Configuration rather than wiring with the proven PNOZmulti Configurator
- PVIS support
- Customer texts can be displayed
- Save up to 40 % of time and costs in all engineering phases
- Less wiring and saves a lot of space in the control cabinet
- Introduction to the world of the PNOZmulti

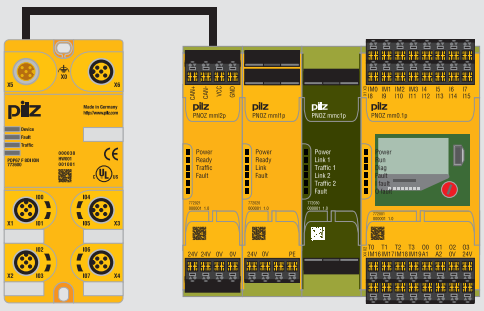
*Keep up-to-date on the configurable safety relays PNOZmulti Mini:*

Webcode 6061

*Online information at www.pilz.com*



*PNOZ mm0p*



*PNOZ mm0.1p*



# Selection guide – PNOZmulti Mini

## Configurable safety relays – PNOZmulti Mini

| Type | Scope |
|---|---|
| **PNOZ mmc1p** | Communication module, Ethernet TCP/IP |
| **PNOZ mmc2p** | Communication module, serial interface |
| **PNOZ mml1p** | Safe link module Multi-Link |
| **PNOZ mml2p** | Safe link module PDP67 |

| Performance Level (PL) – EN ISO 13849-1 | Safety Integrity Level (SIL) CL – claim limit in accordance with IEC 62061 | Connection of expansion modules to base unit | |
|---|---|---|---|
| | | PNOZ mm0p<br><br>3 … 6 safety functions | PNOZ mm0.1p<br><br>≥ 4 safety functions |
| - | - | | ◆ |
| - | - | | ◆ |
| e | 3 | ◆ | ◆ |
| e | 3 | | ◆ |

*Technical documentation on configurable safety relays PNOZmulti Mini:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZmulti Mini

## Configurable safety relays – PNOZmulti Mini

*PNOZ mm0p*

| Type | Scope | Application area |
|---|---|---|
| **PNOZ mm0p** | Base unit –<br>From 3 … 6 safety functions | Emergency stop devices, two-hand buttons, safety gate limit switches, light beam devices, scanners, enable switches, PSEN safety gate switches, operating mode selector switches, muting, safety mats, sensors |
| **PNOZ mm0.1p** | Base unit –<br>From 4 safety functions and for standard control functions | |
| **PNOZ mmc1p** | Communication module | Ethernet TCP/IP |
| **PNOZ mmc2p** | Communication module | Serial interface |
| **PNOZ mml1p** | Safe link module | Multi-Link |
| **PNOZ mml2p** | Safe link module | Link module PDP67 |

| Features | Order number | | |
|---|---|---|---|
| | Excl. terminals | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Configurable using PNOZmulti Configurator via chip card or USB interface<br>▸ Exchangeable program memory<br>▸ 20 inputs<br>▸ 4 safe semiconductor outputs (SIL CL 3)<br>▸ 4 test pulse outputs<br>▸ Supply voltage ($U_B$): 24 VDC<br>▸ Voltage/current/rating: 24 VDC/2 A/48 W, outputs using semiconductor technology<br>▸ Dimensions (H x W x D): 102/98 [1] x 45 x 120 mm<br>▸ PNOZ mm0.1p:<br>- Expandable to the left using the link modules PNOZ mml1p, PNOZ mml2p and the communication module PNOZ mmc1p (Ethernet TCP/IP)<br>- Expandable to the right using the PNOZ s7 to PNOZ s11<br>- Decentralisation: Sensor technology can be connected via the PDP67 F 8DI ION | 772 000<br><br>Mini USB cable<br>▸ 3 m.....312 992<br>▸ 5 m.....312 993 | 751 008<br>(1 set) | 750 008<br>(1 set) |
| | 772 001<br><br>Mini USB cable<br>▸ 3 m.....312 992<br>▸ 5 m.....312 993 | 751 008<br>(1 set) | 750 008<br>(1 set) |
| ▸ Can be configured using the PNOZmulti Configurator<br>▸ Transmission rate 10 Mbit/s<br>▸ Status indicators via LEDs<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit via a link on the back of the unit<br>▸ Subscriber for standard Ethernet TCP/IP | 772 030 | - | - |
| ▸ Can be configured using the PNOZmulti Configurator<br>▸ Status indicators via LEDs<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit via a link on the back of the unit<br>▸ Serial interface RS232 | 772 031 | 751 004<br>(1 set) | 750 004<br>(1 set) |
| Link module to safely connect the following PNOZmulti base units:<br>▸ PNOZmulti and PNOZmulti<br>▸ PNOZmulti Mini and PNOZmulti Mini<br>▸ PNOZmulti and PNOZmulti Mini | 772 020 | 751 004<br>(1 set) | 750 004<br>(1 set) |
| Link module to connect decentralised modules | 772 021 | 751 004<br>(1 set) | 750 004<br>(1 set) |

*[1] Height with spring-loaded terminals/plug-in screw terminals*

*Technical documentation on configurable safety relays PNOZmulti Mini:*

Webcode 0685

*Online information at www.pilz.com*



# Configurable control system PNOZmulti –

*Simply order the demo CD-ROM – you'll be amazed.*

**Ingeniously simple, simply ingenious**

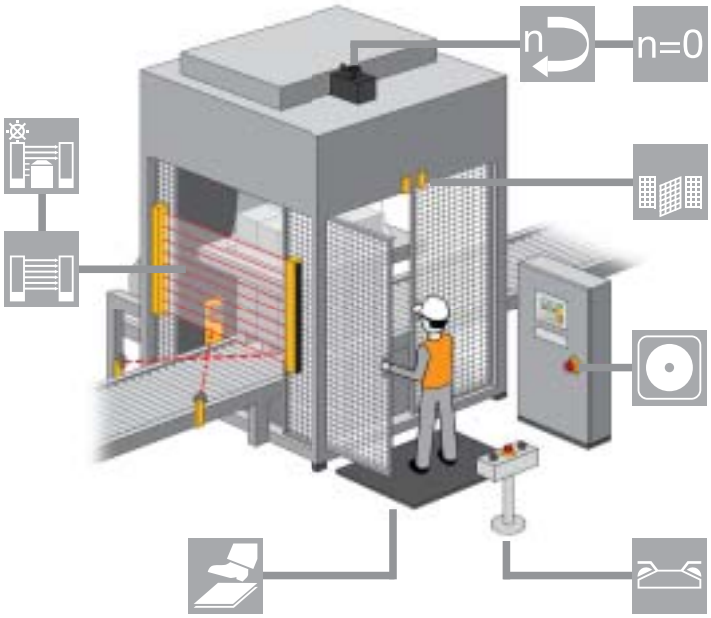
The configurable control system PNOZmulti is multifunctional, freely configurable and tailor-made for use in many areas of mechanical engineering. Safety functions such as

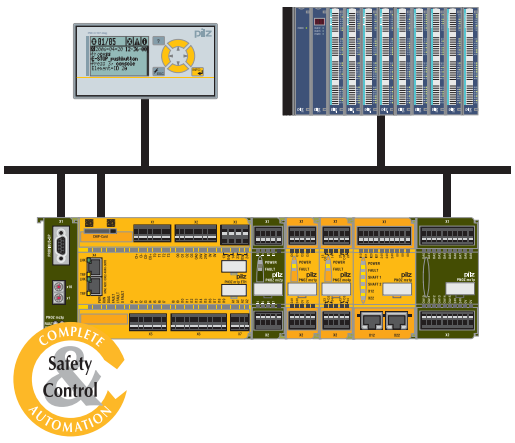
- Emergency stop devices,
- Safety gates,
- Light beam devices
- and many others

are safely monitored.

All the safety functions are created directly on the PC via the proven PNOZmulti Configurator and can be stored on a chip card and downloaded to the base unit.

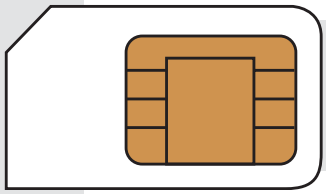
In using the PNOZmulti you're backing the original – the continual expansion of the product range safeguards your investment.




PROFIBUS
DeviceNet
INTERBUS
CANopen
Modbus TCP
CC-Link
PROFINET
EtherNet/IP

# The original

**The right module for every requirement …**

If your plant expands, the PNOZmulti simply expands with it. Expansion modules are available to extend the modular system; these can be used in any combination to suit the requirement:

- Input and output modules
- Fieldbus modules
- Safe speed and standstill monitors
- Safe link modules, such as PNOZ ml1p, for the safe interconnection of several PNOZmulti base units
- Safe analogue modules, such as PNOZ ma1p or PNOZ ml2p, for the safe interconnection of decentralised periphery

**… even for special applications**

- PNOZ m2p for press applications
- PNOZ m3p for burner management

*Example: using the PNOZmulti configurable control system on a packaging machine.*

*Keep up-to-date on configurable control systems PNOZmulti:*

Webcode 2816

*Online information at www.pilz.com*



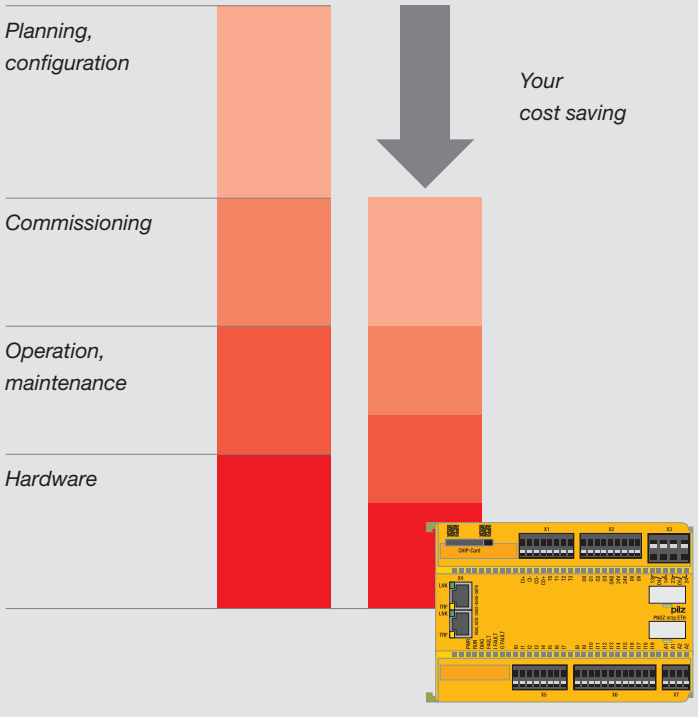
# Modular and flexible

**Your benefits at a glance**

- One system to cover safety-related and standard control functions
- Ideal for covering applications of four safety functions and above
- Up to 40 % potential savings in all engineering phases thanks to a freely and intuitively configurable graphics configuration tool
- Chip card for data transfer; easy copy function is of particular interest to series users
- No need to draw complex circuit diagrams: simply print out your configuration
- Simple wiring means short commissioning times
- Subsequent modifications and adjustments to the configuration are simple to make
- Simple and economical to expand through selection of compatible modules
- Simple, user-friendly diagnostics mean short downtimes and high plant availability
- Saves a lot of space in the control cabinet
- Certified worldwide
- Possible to have a complete solution comprising evaluation devices, compatible sensor technology and control and signal devices

**From planning to maintenance**

Bring your machinery to market more quickly. Compared with conventionally wired solutions you can save up to 40 % of your time and costs – in all engineering phases – during design, configuration, commissioning, operation and maintenance.




*40 % cost savings in all engineering phases by using PNOZmulti.*

**Safe and economical in all industries**

PNOZmulti is used in numerous applications across the widest range of industries. The intelligent dovetailing of safety-related and standard control functions, a modular concept and simple configuration mean the system can control from the simplest machine to distributed plants. PNOZmulti is so flexible that it can also be adapted to suit your application – guaranteed.

Application areas may include:

- General mechanical engineering: e.g. lathes, milling and drilling machines
- Plastics processing machines: e.g. blow moulding machines
- Laser machines: e.g. laser welding and laser punching machines
- Packaging machines: e.g. drink dispensing and palletising machines
- Forming technology: Hydraulic presses, eccentric presses, press brakes, small presses and punch presses
- Robot cells: processing, welding and spraying robots
- Print and paper industry: e.g. printing, enveloping and paper machines
- Other applications e.g. in the air industry, in pleasure parks, in cablecar technology, in the automotive industry, in the pharmaceutical industry and many other sectors

Today, the PNOZmulti is the most widely used safety system in the world. We can also monitor your plant or machinery, whatever the application – just ask. Your safety is our standard.



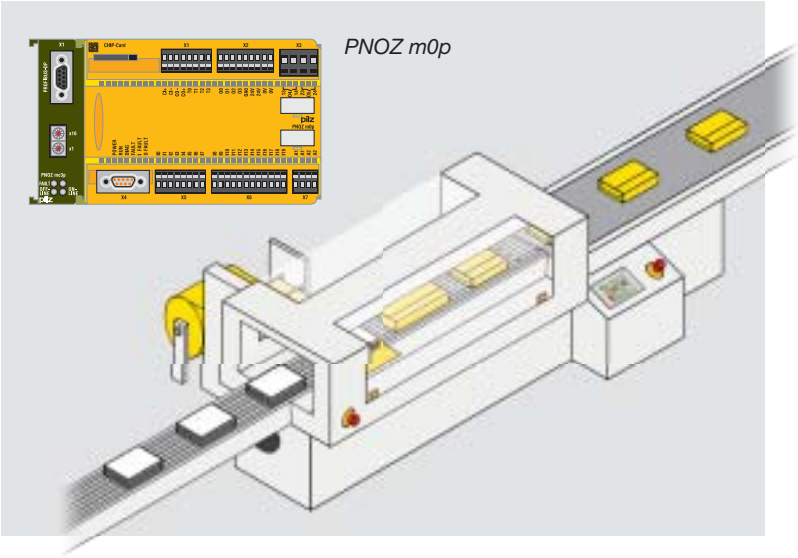


# The basis for each application: many func

*Ideal for three to six safety functions!*

**Base unit PNOZ m0p – The compact solution …**

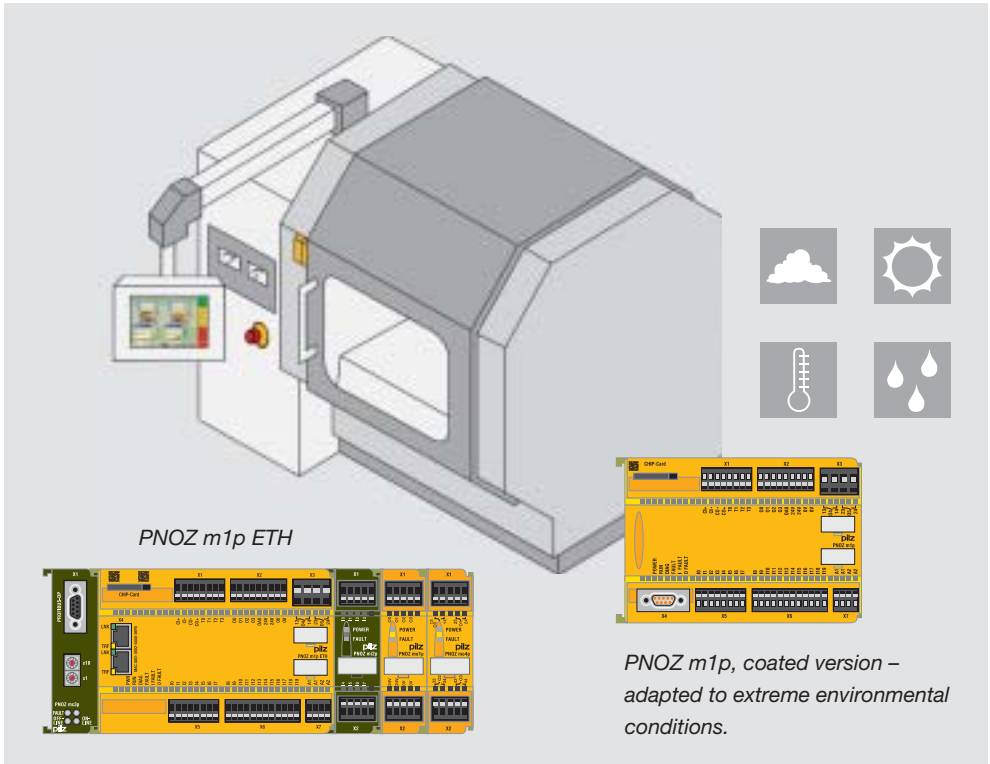
… reduces your costs even further thanks to simple diagnostics, for example via fieldbus modules for all common fieldbus systems. Particularly suitable for use on small machines, the PNOZ m0p manages without any expansion modules.



*PNOZ m0p*

**PNOZ m1p – The all-rounder …**

… is ideal for small to medium-sized machines. Standard control functions can also be monitored alongside the safety functions. The PNOZ m1p is expandable and, depending on the type and number of expansion modules, there are almost no limits for the application of the PNOZmulti.



*PNOZ m1p ETH*

*PNOZ m1p, coated version – adapted to extreme environmental conditions.*

**PNOZ m1p, coated version – Tough …**

… and specially designed for use in a rugged everyday industrial environment, the units' PCB boards are varnished and therefore protected from environmental influences. The benefits include an expanded temperature range, tolerance of condensation and resistance to corrosive gas.

**PNOZ m1p ETH – Faster than ever …**

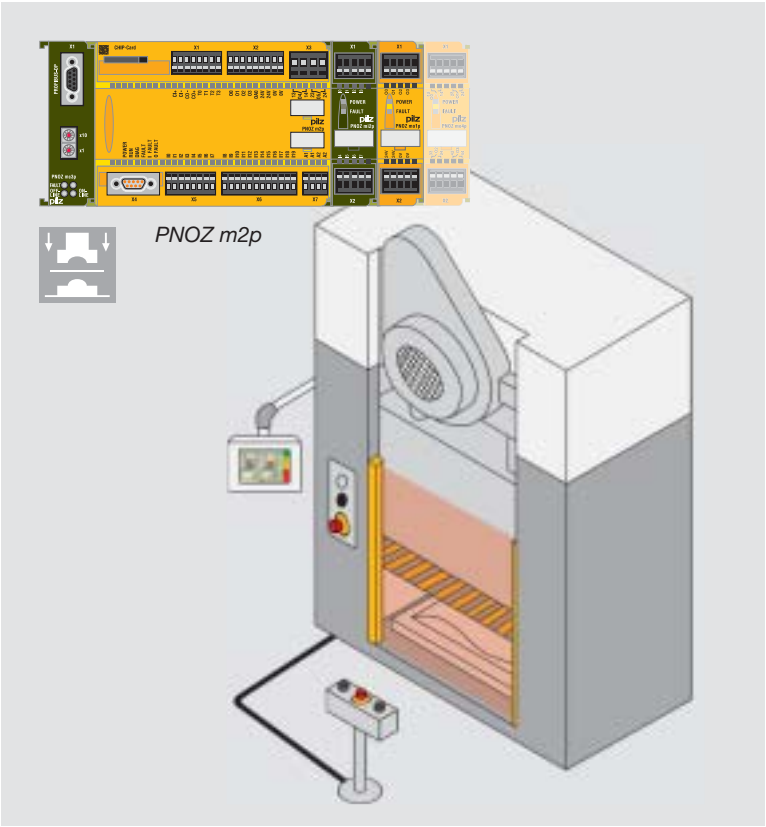
… communication via the Ethernet interface.

# tions – one solution!

**PNOZ m2p –**
**Withstands plenty …**

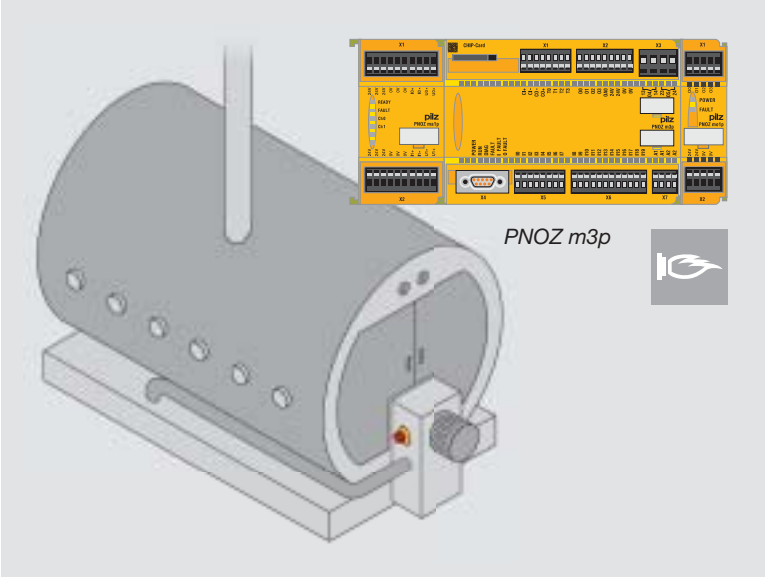
… and is specially designed to control and monitor small and average-sized eccentric and hydraulic presses. Approved software blocks are available for operating modes such as set-up mode, single-stroke and automatic, and to monitor safety light curtains in single-break or double-break mode; these blocks make the system simple and economical to use.

In conjunction with the dual-pole semiconductor output module PNOZ mo3p, the PNOZ m2p can control press safety valves safely and economically.



*PNOZ m2p*

*All base units: 20 inputs, 4 safe semiconductor and 2 relay outputs.*



*PNOZ m3p*

**PNOZ m3p – Safe firing and monitoring …**

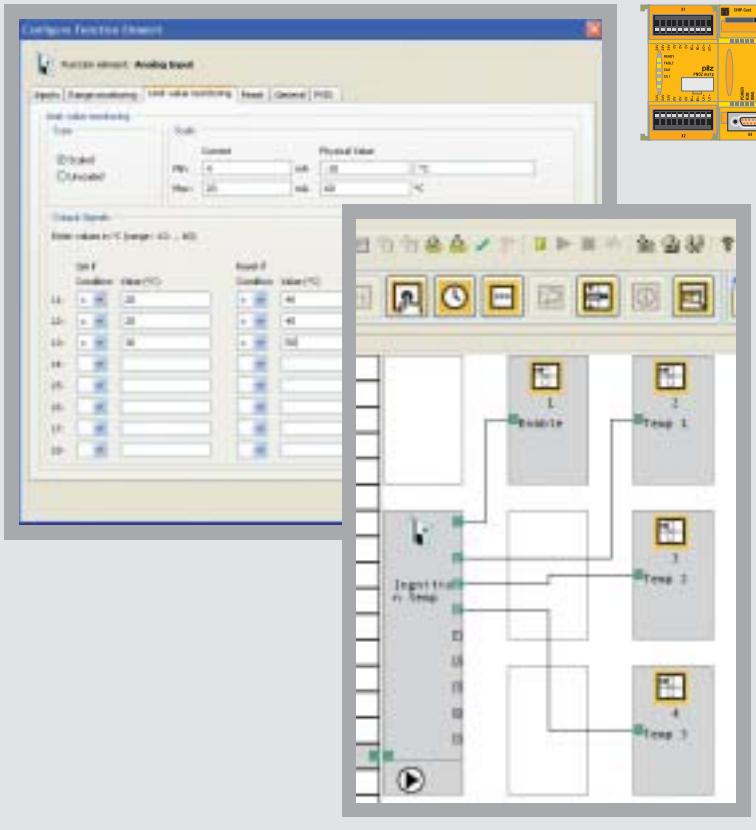
… with the PNOZ m3p. The safe ignition of the fuel and the monitoring of a furnace during operation are safety-related criteria that prevent an explosion with serious damages. With the configurable control system PNOZ m3p you have a safety-related solution to hand that fulfils these requirements.



# For increased cost-effectiveness

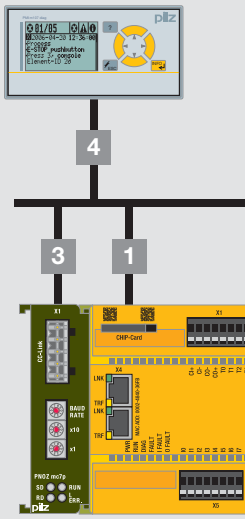
**Monitoring analogue input signals safely**

The safe analogue input module PNOZ ma1p provides two independent, safe inputs. Up to eight limit values can be defined for each input with just a few clicks of the mouse in the PNOZmulti Configurator. The inputs are suitable for connecting transducers or encoders with standardised 10 V voltage signals or 20 mA current signals. As users you benefit from rapid commissioning and reduced wiring. With its analogue input module, the PNOZmulti is particularly suitable for the process engineering sector, as well as for cable car and chair lift design and burner controls.



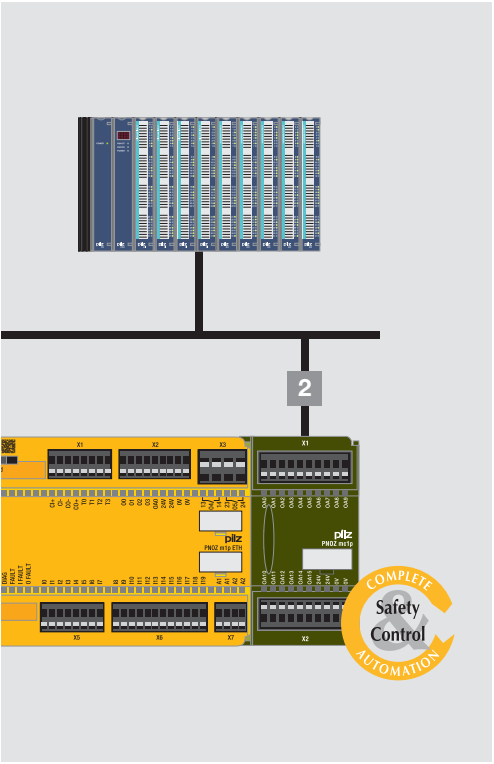
*PNOZ ma1p – with two safe analogue inputs.*

PROFIBUS
DeviceNet
INTERBUS
CANopen
Modbus TCP
CC-Link
PROFINET
EtherNet/IP




**Diagnostics with PNOZmulti – Always in the picture**

User-friendly diagnostic and control information guarantees short downtimes and high plant availability. With PNOZmulti there are several options for diagnostics:




1 Ethernet interface

2 Status messages to the PLC: PNOZ mc1p

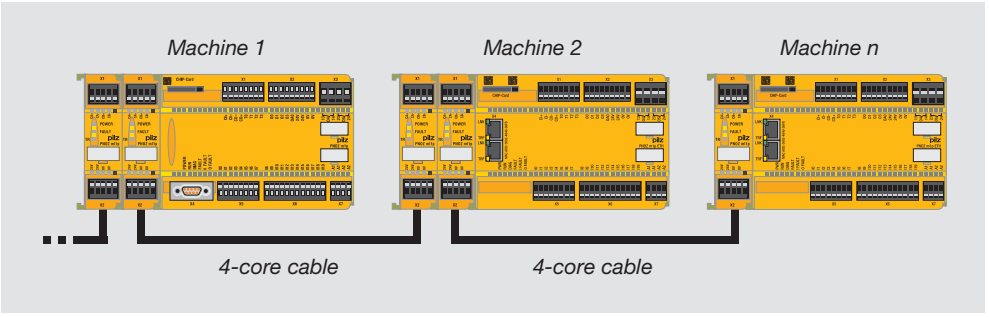
3 Two-way signalling and control: All common fieldbus systems such as PROFIBUS-DP, DeviceNet, Interbus, CANopen or CC-Link

4 Diagnostic system PMImicro diag

**Reduce downtimes with PVIS**

Thanks to the modern PVIS diagnostic concept, PNOZmulti and PMI operator terminals can provide an overall, integrated diagnostic solution. If a fault occurs, features such as plain text messages with precise information on the location, clearly defined responsibilities and integrated first fault display all ensure that production is quickly restarted. The PNOZmulti Configurator contains the PNOZmulti project, texts for diagnostics, proposed solutions and more. The benefits are obvious: there's less configuration required, greater flexibility and downtimes are reduced.

PVIS®
Based on Pilz Diagnostic Concept




*PNOZ ml1p – for the safe connection of PNOZmulti base units.*

**Even complex tasks can be mastered within a network**

The safe link module PNOZ ml1p enables data to be exchanged simply between several PNOZmulti base units. The benefit: if a unit's physical limits are exhausted, users can employ several PNOZmulti devices, enabling them to monitor and control more complex machinery. Selective shutdown and commissioning of plant sections are also a possibility.

The modular structure of the PNOZmulti enables you to connect up to six PNOZ ml1p link modules to each base unit, allowing both ring and tree structures to be established. You can quickly and easily allocate the information to be transferred within the PNOZmulti Configurator. No specialist knowledge of safe bus systems is required, nor do the connected devices need to be specifically addressed.

*Further information on the diagnostic concept PVIS:*

Webcode 5069

*Online information at www.pilz.com*



# Selection guide – PNOZmulti

## Configurable control system – PNOZmulti

| Type | Scope | Performance Level (PL) [1] – EN ISO 13849-1 | Safety Integrity Level (SIL) CL [1] – claim limit in accordance with IEC 62061 |
|---|---|---|---|
| **PNOZ mi1p** | Safe input module | e | 3 |
| **PNOZ mi2p** | Input module | e | 3 |
| **PNOZ ma1p** | Safe analogue input module | e | 3 |
| **PNOZ mo1p** | Safe semiconductor output module | e | 3 |
| **PNOZ mo3p** | 2-pole, safe semiconductor output module | e | 3 |
| **PNOZ mo2p** | Safe relay output module | e | 3 |
| **PNOZ mo4p** | Safe relay output module | e | 3 |
| **PNOZ mo5p** | Safe relay output module | e | 3 |
| **PNOZ mc1p** | Output module | - | - |
| **PNOZ ms1p/ PNOZ ms2p/ PNOZ ms2p HTL/ PNOZ ms3p/ PNOZ ms4p** | Safe speed/standstill monitoring module | e | 3 |
| **PNOZ ml1p** | Safe link module Multi-Link | e | 3 |
| **PNOZ ml2p** | Safe link module PDP | e | 3 |
| **PNOZ mc2p** | EtherCAT fieldbus module | - | - |
| **PNOZ mc3p** | PROFIBUS-DP fieldbus module | - | - |
| **PNOZ mc4p** | DeviceNet fieldbus module | - | - |
| **PNOZ mc5p** | Interbus fieldbus module | - | - |
| **PNOZ mc5.1p** | Fieldbus module, Interbus FO | - | - |
| **PNOZ mc0p** | Power supply for Interbus fieldbus modules PNOZ mc5p and PNOZ mc5.1p | - | - |
| **PNOZ mc6p** | CANopen fieldbus module | - | - |
| **PNOZ mc7p** | CC-Link fieldbus module | - | - |
| **PNOZ mc8p** | Ethernet/IP/Modbus fieldbus module | - | - |
| **PNOZ mc9p** | PROFINET fieldbus module | - | - |

**Connection of expansion modules to base unit [2]**

| PNOZ m0p<br><br>3 … 6<br>safety functions | PNOZ m1p/<br>PNOZ m1p ETH<br><br>≥ 4<br>safety functions | PNOZ m1p<br>(coated version)<br><br>≥ 4<br>safety functions | PNOZ m2p<br>(press applications)<br><br>≥ 4<br>safety functions | PNOZ m3p<br>(burner<br>management)<br><br>≥ 4<br>safety functions |
|---|---|---|---|---|
| | ◆ | ◆ | ◆ | ◆ |
| | ◆ | | ◆ | ◆ |
| | ◆ | ◆ | ◆ | ◆ |
| | ◆ | ◆ | ◆ | ◆ |
| | ◆ | | ◆ | ◆ |
| | ◆ | ◆ | ◆ | ◆ |
| | ◆ | ◆ | ◆ | ◆ |
| | ◆ | ◆ | ◆ | ◆ |
| | ◆ | ◆ | ◆ | ◆ |
| | ◆ | ◆ [3] | ◆ | ◆ |
| ◆ | ◆ | ◆ | ◆ | ◆ |
| ◆ | ◆ | ◆ | ◆ | ◆ |
| ◆ | ◆ | | ◆ | ◆ |
| ◆ | ◆ | | ◆ | ◆ |
| ◆ | ◆ | ◆ | ◆ | ◆ |
| ◆ | ◆ | | ◆ | ◆ |
| ◆ | ◆ | | ◆ | ◆ |
| ◆ | ◆ | | ◆ | ◆ |
| ◆ | ◆ | ◆ | ◆ | ◆ |
| ◆ | ◆ | ◆ | ◆ | ◆ |
| ◆ | ◆ | ◆ | ◆ | ◆ |
| ◆ | ◆ | | ◆ | ◆ |

*[1] Maximum achievable value, depending on the application, e.g. number of outputs*

*[2] All base units comply with Performance Level e and Safety Integrity Level (SIL) CL 3*

*[3] Only for PNOZ ms2p*

*Technical documentation on the configurable control system PNOZmulti:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZmulti

## Base units – PNOZmulti Controller

*PNOZ m0p*

| Type | Scope | Application area |
|---|---|---|
| **PNOZ m0p** | Base unit –<br>From 3 … 6 safety functions<br><br>Fieldbus modules can be connected; no other expansion modules can be connected | Emergency stop devices, two-hand buttons, safety gate limit switches, light beam devices, scanners, enable switches, PSEN safety gate switches, operating mode selector switches, muting, safety mats, sensors |
| ★ **PNOZ m1p/ PNOZ m1p ETH/ PNOZ m1p (coated version)** | Base unit –<br>From 4 safety functions and for standard control functions | |
| **PNOZ m2p** | Base unit –<br>Specifically for press applications | As PNOZ m1p, additional monitoring of operating modes such as setup, single-stroke and automatic, safety light curtains in single-break and double-break mode, camshafts with run monitoring, press safety valves |
| **PNOZ m3p** | Base unit –<br>Specifically for burner management | As PNOZ m1p, additional control and monitoring of furnaces, e.g. monitoring of safety sequences, combustion air pressure, ignition, flame, external compound controller and tightness control; control of safety valves, ignition valves, exhaust valves, ignition, external compound controller and combustion air blower |

## Input modules – PNOZmulti I/O

*PNOZ mi1p*

| Type | Application area | Inputs/outputs |
|---|---|---|
| **PNOZ mi1p/ PNOZ mi1p (coated version)** | Safe input module | 8 safe inputs |
| **PNOZ mi2p** | Input module | 8 inputs |

| Features | Order number<br>Excl. terminals | Spring-loaded terminals | Plug-in screw terminals |
|---|---|---|---|
| ▸ Configurable using PNOZmulti Configurator via chip card or RS 232 interface/ Ethernet interface<br>▸ Exchangeable program memory<br>▸ Diagnostic interface<br>▸ Fieldbus modules can be connected<br>▸ PNOZ m1p/PNOZ m2p: Max. 8 expansion modules can be connected<br>▸ Inputs/outputs:<br>- 20 freely configurable inputs, 4 test pulse outputs, 1 auxiliary output<br>- Outputs using semiconductor technology: 4 safety outputs<br>- Relay outputs: 2 safety contacts<br>▸ Supply voltage ($U_B$): 24 VDC<br>▸ Voltage/current/rating:<br>- Outputs using semiconductor technology: 24 VDC/2 A/48 W<br>- Relay outputs: DC1: 24 V/6 A/144 W<br>▸ Dimensions (H x W x D): 94 x 135 x 121 mm | 773 110 | 783 100<br>(1 set) | 793 100<br>(1 set) |
| | ▸ PNOZ m1p.....773 100<br>▸ PNOZ m1p ETH.....773 103<br>▸ PNOZ m1p (coated version).....773 105 | 783 100<br>(1 set) | 793 100<br>(1 set) |
| | 773 120 | 783 100<br>(1 set) | 793 100<br>(1 set) |
| | 773 125 | 783 100<br>(1 set) | 793 100<br>(1 set) |

★ *Type recommended by Pilz for the majority of your applications*

| Features | Order number<br>Excl. terminals | Spring-loaded terminals | Plug-in screw terminals |
|---|---|---|---|
| ▸ Max. 8 input modules can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mi1p.....773 400<br>▸ PNOZ mi1p (coated version).....773 405 | 783 400<br>(1 set) | 793 400<br>(1 set) |
| ▸ Max. 8 input modules can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | 773 410 | 783 400<br>(1 set) | 793 400<br>(1 set) |

[1] *not for PNOZ mi2p*

*Technical documentation on the configurable control system PNOZmulti:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZmulti

## Input modules – PNOZmulti I/O

*PNOZ ma1p*

| Type | Application area | Inputs/outputs |
|---|---|---|
| **PNOZ ma1p/ PNOZ ma1p (coated version)** | Safe analogue input module | 2 analogue inputs for voltage or current measurement (configurable) |

## Output modules – PNOZmulti I/O

*PNOZ mo1p*

*PNOZ mc1p*

| Type | Application area | Inputs/outputs | Supply voltage |
|---|---|---|---|
| **PNOZ mo1p/ PNOZ mo1p (coated version)** | Safe semiconductor output module: switching 24 V actuators | Outputs using semiconductor technology: 4 safety outputs | 24 VDC |
| **PNOZ mo2p/ PNOZ mo2p (coated version)** | Safe relay output module: Volt-free switching of actuators | Relay outputs: 2 safety outputs | 24 V DC via base unit |
| **PNOZ mo3p** | Safe semiconductor output module, 2-pole | 2-pole outputs using semiconductor technology: 2 safety outputs | 24 V DC via expansion module |
| **PNOZ mo4p/ PNOZ mo4p (coated version)** | Safe relay output module: Volt-free switching of actuators | Relay outputs: 4 safety outputs | 24 V DC via base unit |
| **PNOZ mc1p/ PNOZ mc1p (coated version)** | Output module: Status message to PLC | 16 auxiliary outputs using semiconductor technology | 24 VDC |

**Common features**

- Dimensions (H x W x D): 94 x 22.5 x 121 mm, PNOZ mc1p: 94 x 45 x 121 mm

| Features | Order number | | |
|---|---|---|---|
| | Excl. terminals | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Range monitoring (4 range limits can be configured)<br>▸ Threshold value monitoring (8 limit values can be configured)<br>▸ Voltage range: -10.24 … +10.2375 V<br>▸ Current range: 0 … 25.59 mA<br>▸ Installed to the left of the base unit<br>▸ Max. 4 PNOZ ma1p units can be connected to the base unit<br>▸ Status indicators<br>▸ Dimensions (H x W x D): 94 x 45 x 121 mm | ▸ PNOZ ma1p .....773 812<br>▸ PNOZ ma1p (coated version) .....773 813 | 783 700 (1 set) | 793 700 (1 set) |

| Outputs: Voltage/current/ rating | Features | Order number | | |
|---|---|---|---|---|
| | | Excl. terminals | Spring-loaded terminals | Plug-in screw terminals |
| 24 VDC/2 A/48 W | ▸ Max. 6 semiconductor output modules can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mo1p .....773 500<br>▸ PNOZ mo1p (coated version) .....773 505 | 783 400 (1 set) | 793 400 (1 set) |
| DC1: 24 V/6 A | ▸ Max. 6 semiconductor output modules can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mo2p .....773 520<br>▸ PNOZ mo2p (coated version) .....773 525 | 783 520 (1 set) | 793 520 (1 set) |
| 24 VDC/2 A | ▸ Max. 6 semiconductor output modules can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | 773 510 | 783 400 (1 set) | 793 400 (1 set) |
| DC1: 24 V/6 A | ▸ Max. 6 semiconductor output modules can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mo4p .....773 536<br>▸ PNOZ mo4p (coated version) .....773 537 | 783 536 (1 set) | 793 536 (1 set) |
| - | ▸ Max. 8 output modules can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mc1p .....773 700<br>▸ PNOZ mc1p (coated version) .....773 705 | 783 700 (1 set) | 793 700 (1 set) |

*Technical documentation on the configurable control system PNOZmulti:*

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*Online information at www.pilz.com*



# Technical details – PNOZmulti

## Monitoring module – PNOZmulti I/O

*PNOZ ms1p*

| Type | Application area | Dimensions (H x W x D) in mm |
|---|---|---|
| **PNOZ ms1p/ PNOZ ms2p/ PNOZ ms2p HTL/ PNOZ ms3p/ PNOZ ms4p** | Safe speed and standstill monitoring module up to Performance Level (PL) e | 94 x 45 x 121 |

## Link module – PNOZmulti COM

*PNOZ ml1p*

| Type | Application area | Dimensions (H x W x D) in mm |
|---|---|---|
| **PNOZ ml1p/ PNOZ ml1p (coated version)/ PNOZ ml2p** | Link module: for safe connection of two PNOZmulti base units | 94 x 22.5 x 121 |

## Cable – PNOZmulti PAA

*PNOZ msi1AP*

| Type | Application area | Dimensions (H x W x D) in mm |
|---|---|---|
| **PNOZ msi1AP ... and more** | Connection cable for PNOZ ms1p/ PNOZ ms2p/PNOZ ms3p to connect incremental encoders | On request |
| **PNOZ mli1p** | Connection cable for the PNOZ ml1p | 5 m, 10 m, 50 m |

| Features | Order number | | |
|---|---|---|---|
| | Excl. terminals | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Incremental encoders are connected via connection cable<br>▸ Independent monitoring of two axes with up to 8 limit values<br>▸ Max. 4 modules can be connected to the base unit<br>▸ PNOZ ms1p/PNOZ ms2p:<br>- Proximity detectors are connected directly to the terminals<br>▸ PNOZ ms2p HTL:<br>- Incremental encoder with differential output signals from 0.5 Vss to 30 Vss, i.e. now also suitable for HTL encoders<br>- Independent from the supply voltage of the incremental encoder, i.e. also for encoders with 8 V supply voltage, for example<br>▸ PNOZ ms4p:<br>- Monitoring of one axis with up to 16 limit values | ▸ PNOZ ms1p .....773 800<br>▸ PNOZ ms2p .....773 810<br>▸ PNOZ ms2p HTL .....773 815<br>▸ PNOZ ms3p .....773 820<br>▸ PNOZ ms4p .....773 831 | 783 800 (1 set) | 793 800 (1 set) |

| Features | Order number | | |
|---|---|---|---|
| | Excl. terminals | Spring-loaded terminals | Plug-in screw terminals |
| ▸ Point-to-point connection via 4-core screened cable<br>▸ Transfer of 32 bit input data and 32 bit output data<br>▸ PNOZ ml1p:<br>- Several PNOZmulti base units can be networked by connecting additional link modules – either in tree or in ring structure<br>▸ PNOZ ml2p:<br>- Decentralised modules can be connected | ▸ PNOZ ml1p .....773 540<br>▸ PNOZ ml1p (coated version) .....773 545<br>▸ PNOZ ml2p .....773 602 | 783 400 (1 set) | 793 400 (1 set) |

| Features | Order number |
|---|---|
| ▸ Used to connect an incremental encoder to the speed monitors PNOZ ms1p/PNOZ ms2p/PNOZ ms3p<br>▸ Connection cable for all common makes of drive<br>▸ Connection to drive and incremental encoder via 25-pin or 15-pin D-Sub male and female connector, or wired with stranded cable<br>▸ Variable cable lengths | ▸ PNOZ msi1AP 25/25 Si/Ha, 2.5 m ..... 773 840<br>▸ PNOZ msi5p 15/15 Bo/Rex, 2.5 m..... 773 857<br>▸ PNOZ msi15p 15/15 PMCtendo, 2.5 m ..... 773 874<br><br>▸ Other versions available |
| ▸ Ready-made as spring-loaded or screw terminal type<br>▸ Shielded | ▸ 5 m..... 773 890<br><br>▸ Additional versions available on request |

★ *Type recommended by Pilz for the majority of your applications*

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Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZmulti

## Fieldbus modules – PNOZmulti COM

| | Type | Application area | Supply voltage ($U_B$) |
|---|---|---|---|
|  *PNOZ mc3p* | **PNOZ mc3p** | Fieldbus module PROFIBUS-DP | 24 VDC via base unit |
|  *PNOZ mc4p* | **PNOZ mc4p/ PNOZ mc4p (coated version)** | Fieldbus module DeviceNet | 24 VDC via base unit |
|  *PNOZ mc5p* | **PNOZ mc5p** | Fieldbus module Interbus | 24 VDC via base unit |
|  *PNOZ mc5.1p* | **PNOZ mc5.1p** | Fieldbus module Interbus FO | 24 VDC via base unit |
|  *PNOZ mc0p* | **PNOZ mc0p** | Power supply for fieldbus modules PNOZ mc5p and PNOZ mc5.1p | 24 VDC |

| Dimensions (H x W x D) in mm | Features | Order number |
|---|---|---|
| 94 x 22.5 x 119 | ▸ Can be configured using the PNOZmulti Configurator<br>▸ Station addresses from 0 … 99, selected via rotary switch<br>▸ Status indicators via LEDs<br>▸ Subscriber (Slave) on PROFIBUS-DP<br>▸ Transmission rate: Max. 12 Mbit/s<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | 773 721 |
| 94 x 22.5 x 122 | ▸ Can be configured using the PNOZmulti Configurator<br>▸ Station addresses from 0 … 63, selected via DIP switch<br>▸ Status indicators via LEDs<br>▸ Subscriber (Slave) on DeviceNet<br>▸ Transmission rate: 125, 250, 500 kbit/s<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mc4p..... 773 722<br>▸ PNOZ mc4p (coated version) .... 773 729 |
| 94 x 22.5 x 119 | ▸ Can be configured using the PNOZmulti Configurator<br>▸ Status indicators via LEDs<br>▸ Subscriber (Slave) on Interbus<br>▸ Transmission rate selected via jumper<br>▸ Transmission rate: 500 kbit/s, 2 Mbit/s<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | 773 723 |
| 94 x 22.5 x 121 | ▸ Can be configured using the PNOZmulti Configurator<br>▸ Subscriber (Slave) on Interbus with fibre-optic cable<br>▸ Transmission rate, selectable between 500 kbit/s or 2 Mbit/s<br>▸ Status indicators for communication with Interbus and for errors<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ FSMA connection technology<br>▸ Connected to base unit using jumpers on the back of the unit | 773 728 |
| 94 x 22.5 x 121 | ▸ Interface to connect the base unit and a fieldbus module<br>▸ Galvanic isolation<br>▸ Max. 1 fieldbus module (PNOZ mc5p or PNOZ mc5.1p) can be connected<br>▸ Status indicators<br>▸ Plug-in terminals (either with cage clamp terminals or screw connection)<br>▸ Connected to base unit and fieldbus module using jumpers on the back of the unit | ▸ 773 720<br>▸ Spring-loaded terminals (1 set)..... 783 400<br>▸ Plug-in screw terminals (1 set)..... 793 400 |

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on the configurable control system PNOZmulti:*

Webcode 0685

*Online information at www.pilz.com*



# Technical details – PNOZmulti

## Fieldbus modules – PNOZmulti COM

| | Type | Application area | Supply voltage ($U_B$) |
|---|---|---|---|
|  *PNOZ mc6p* | **PNOZ mc6p/ PNOZ mc6p (coated version)** | Fieldbus module CANopen | 24 VDC via base unit |
|  *PNOZ mc7p* | **PNOZ mc7p/ PNOZ mc7p (coated version)** | Fieldbus module CC-Link | 24 VDC via base unit |
|  *PNOZ mc8p* | **PNOZ mc8p/ PNOZ mc8p (coated version)** | Fieldbus module Ethernet/IP, Modbus TCP | 24 VDC via base unit |
|  *PNOZ mc9p* | **PNOZ mc9p** | Fieldbus module PROFINET IO Device | 24 VDC via base unit |

| Dimensions (H x W x D) in mm | Features | Order number |
|---|---|---|
| 94 x 22.5 x 122 | ▸ Can be configured using the PNOZmulti Configurator<br>▸ Station addresses from 0 … 99, selected via rotary switch<br>▸ Status indicators via LEDs<br>▸ Subscriber (Slave) on CANopen<br>▸ Transmission rate selected via rotary switch<br>▸ Transmission rate: Max. 1 Mbit/s<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mc6p..... 773 724<br>▸ PNOZ mc6p (coated version) .... 773 727 |
| 94 x 22.5 x 122 | ▸ Can be configured using the PNOZmulti Configurator<br>▸ Station addresses from 1 … 63, selected via rotary switch<br>▸ Status indicators via LEDs<br>▸ Subscriber (Slave) on CC-Link<br>▸ Occupied stations: 2<br>▸ Transmission rate selected via rotary switch<br>▸ Transmission rate: Max. 10 Mbit/s<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mc7p..... 773 726<br>▸ PNOZ mc7p (coated version) .... 773 725 |
| 94 x 22.5 x 114 | ▸ Can be configured in the PNOZmulti Configurator<br>▸ Subscriber on Ethernet/IP (Adapter) or Modbus TCP (Slave)<br>▸ Transmission rate 10 Mbit/s<br>▸ Status indicators via LEDs<br>▸ IP address is set via DIP switches on the front of the unit<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | ▸ PNOZ mc8p..... 773 730<br>▸ PNOZ mc8p (coated version) .... 773 734 |
| 94 x 22.5 x 114 | ▸ Device name can be configured in the PNOZmulti Configurator<br>▸ Subscriber on PROFINET IO (PROFINET IO Device)<br>▸ Diagnostics and alarm functions are not supported<br>▸ Status indicators via LEDs<br>▸ Max. 1 fieldbus module can be connected to the base unit<br>▸ Connected to base unit using jumpers on the back of the unit | 773 731 |

★ *Type recommended by Pilz for the majority of your applications*

*Technical documentation on the configurable control system PNOZmulti:*

Webcode 0685

*Online information at www.pilz.com*



# Customised application and child's play to

**PNOZmulti Configurator – The original**

Your safety circuit is easy to configure on the PC using the PNOZmulti Configurator. The graphics-based user interface conforms to the Windows® standard; all elements are available either as icons or in selection menus. Online help with documentation is available during configuration.

**Configuration rather than wiring**

All inputs and outputs are freely configurable and can be linked using logic elements via a simple drag and drop function. All available function, logic and output elements are available to see at a glance. Rapid commissioning and the minimal wiring work involved will convince you. With intuitive operation, the PNOZmulti is absolute child's play!

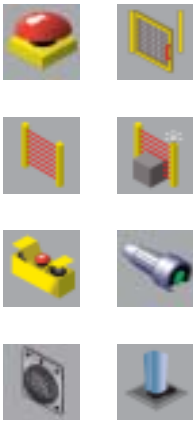
**Doubly safe**

Once the configuration is complete, the configuration tool checks the circuit for any errors. The completed configuration can also be certified, thereby protecting it from unwanted modifications. If the configuration has not been certified, it can be edited, modified and extended at any time by calling it up in the Configurator. The configuration can be printed out and used as documentation.

**Maintenance is simple with the PNOZmulti service licence**

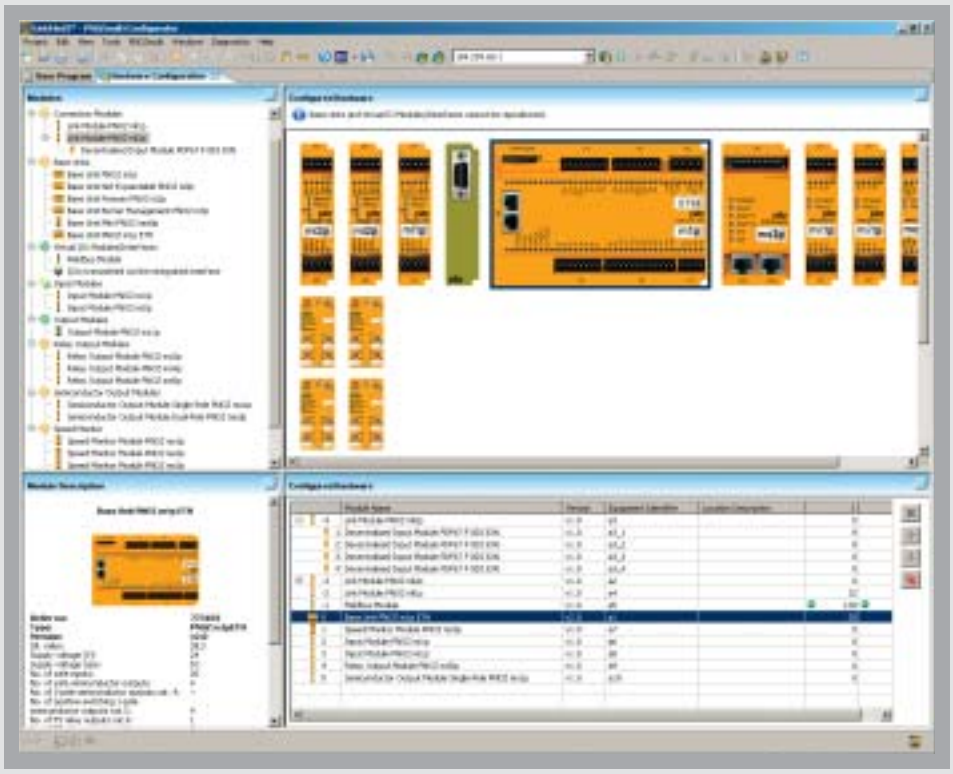
The PNOZmulti service tool is specifically used for trouble-shooting and diagnostics during service and maintenance, directly on the machine for example. The current status of the configuration is visible during operation (powerflow). Any options that can be used to modify a project are disabled.

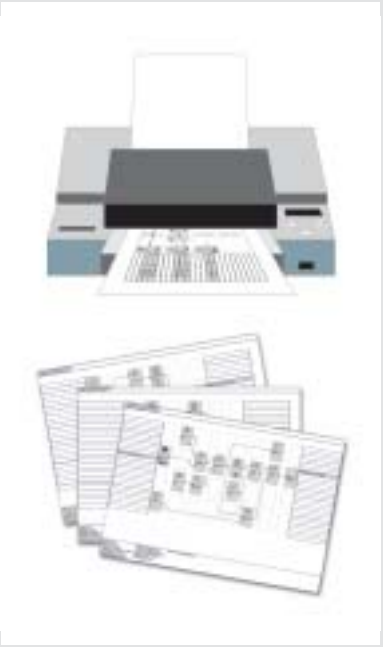
*Function elements*



*Logic elements*

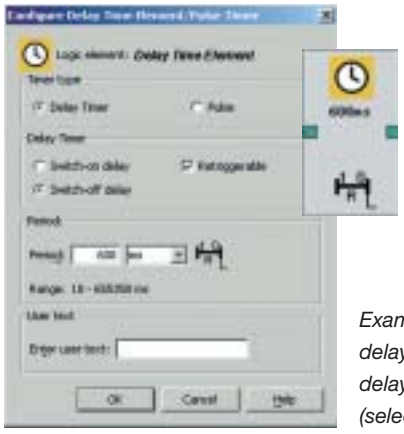

*Output elements*



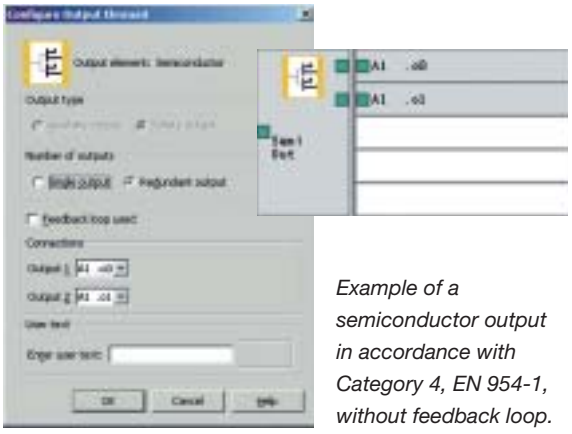


PVIS®

Based on Pilz Diagnostic Concept



*Example of a time delay element with a delay time of 600 ms (selectable).*



*Example of a semiconductor output in accordance with Category 4, EN 954-1, without feedback loop.*



# Technical details – PNOZmulti

## Software – PNOZmulti PASsystem

| Type | Features |
|---|---|
| **PNOZmulti Configurator** | ▸ Graphic tool for configuration and programming of the configurable control system PNOZmulti<br>▸ Project configuration, configuration generation, documentation, commissioning<br>▸ Data transfer via serial interface or chip card<br>▸ User interface in German, English, French, Italian, Spanish, Japanese, Chinese (selectable) |

## Accessories – PNOZmulti IS

| Type | Features |
|---|---|
| **PNOZmulti Tool Kit** | ▸ The Tool Kit contains the accessories you need to start working with PNOZmulti:<br>- Documentation folder with the PNOZmulti Configurator<br>- Chip card reader to write and save the configuration on to a chip card<br>- Chip card set consisting of 10 chip cards, including a chip card adapter for rewriting chips removed from the chip card<br>- Configuration cable for reading diagnostic data |

| System requirements | Order number |
|---|---|
| ▸ Operating system: Windows® 2000, XP or Vista<br>▸ Standard PC with min. 1 GHz processor<br>▸ RAM: Min. 1 024 MByte<br>▸ Hard drive: 20 GByte, min. 15 GByte of available disk space<br>▸ Supports Super VGA graphics<br>▸ CD-ROM drive | **CD-ROM and documentation folder** [1] ..... 773 000<br>**CD-ROM** [1] ..... 773 000D<br><br>**Full version for configuration**<br>▸ Single-user licence (Basic) ..... 773 010B<br>▸ Additional licence (User) ..... 773 010K<br>▸ Upgrade licence (Basic) ..... 773 010U<br>▸ Lite Licence ..... 773 010L<br>▸ Time restricted single-user licence (Basic), 2 months ..... 773 010S<br>▸ Time restricted single-user licence (Basic), 3 months ..... 773 010R<br>▸ Time restricted single-user licence (Basic), 4 months ..... 773 010Q<br><br>**Service version for diagnostics during service and maintenance**<br>▸ Single-user licence (Basic) ..... 773 011B<br>▸ Additional licence (User) ..... 773 011K<br>▸ Upgrade licence (Basic) ..... 773 011U |

*[1] Please order licence separately; this is required in order to activate the software; other licence types available on request*

**Order number**

| PNOZmulti Tool Kit | Chip card reader | Chip card set | Configuration cable | Documentation folder with PNOZmulti Configurator | Licence type |
|---|---|---|---|---|---|
| 779 000 | 779 230 [2] | ▸ 8 kByte..... 779 200 [2]<br>▸ 32 kByte.... 779 212 [2] | 310 300 [2] | 773 000<br><br>Please order licence separately | 773 010…<br><br>Compare PNOZmulti Configurator |

*[2] For use only with subsequent orders*

*Technical documentation on the configurable control system PNOZmulti:*

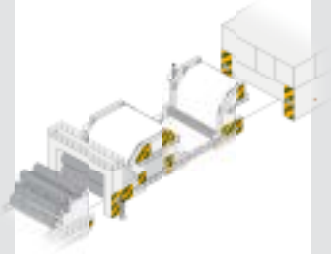
Webcode 0685

*Online information at www.pilz.com*



# The safe, complete solution

**Your requirements:**

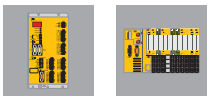


**Our example solutions:**

*Safety relays PNOZsigma and rope pull switches PSENrope*

*Safety relays PNOZmulti Mini and safety gate systems PSENslock*

*Control systems PNOZmulti and safety switches PSENmag*



*Programmable control systems PSS*


*Automation system PSS 4000*

**Easy project implementation with Pilz**

Pilz offers a comprehensive range of services to help integrate Pilz products into your application:

- Safety-related inspection
  - Plant Assessment
  - Risk Assessment
- Safety Concept in accordance with the current standards and directives
- Including Safety Design
  - Measurement of plant/machine's stopping time
  - Calculation of safety distances
- Including System Implementation
  - Preparation/adaptation of circuit diagrams
  - Wiring, assembly, installation
  - System configuration
  - Testing prior to initial commissioning
  - Commissioning
- Safety Validation
- CE Marking
- Training
- Repeat testing (ESPE Inspection)

# Safety in series

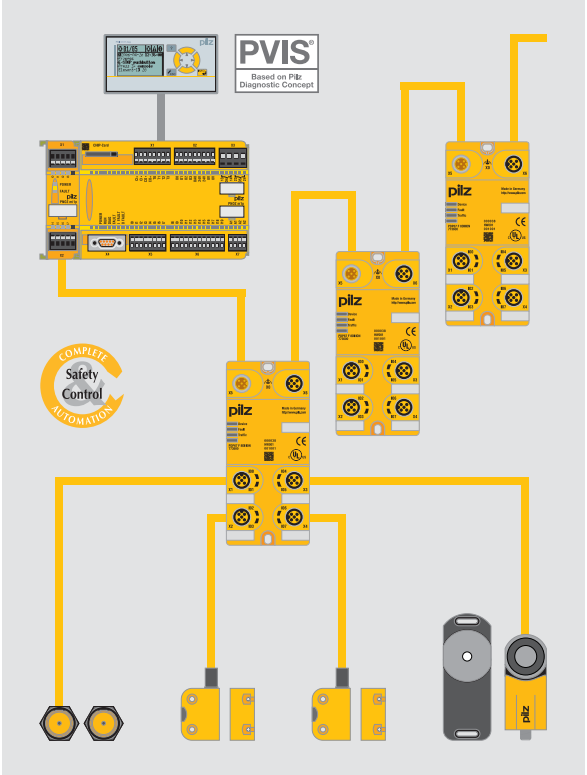
**Decentralised input module – PDP67 F 8DI ION**

The digital input module PDP67 F 8DI ION monitors safety functions decentrally in the field – and as such is the first safety-related IP67 module that can be connected to a variety of evaluation devices, such as PNOZmulti, PNOZmulti Mini and in future PSS 4000!

Direct on-site installation through a simple screw assembly minimises your planning, design and installation work – saving you time, money and space in the control cabinet! Communication with the configurable control system PNOZmulti is via a safe data link.

**Your benefits at a glance**

- Simpler than a fieldbus system (no bus terminating resistor, no separate address)
- Simple installation means less planning, design and installation work
- No control cabinet necessary
- Modular machine concept is possible
- One cable for communication and supply
- Configuration is simple with the proven PNOZmulti Configurator



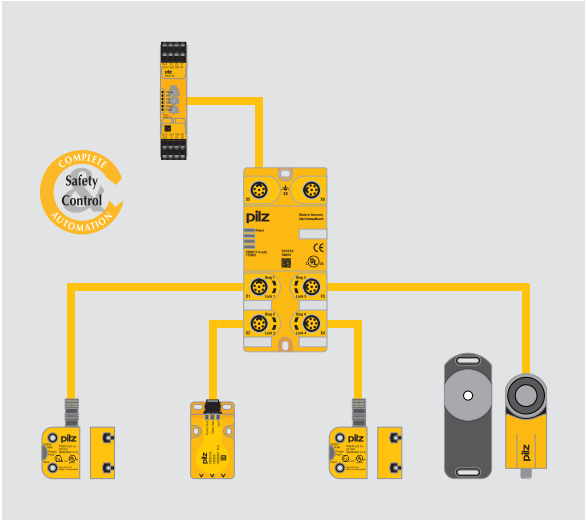

*Application example: PDP67 F 8DI ION in conjunction with PNOZmulti*

**Passive junction – PDP67 F 4 code**

Incorporated into ingenious IP67 housing, the passive junction PDP67 F 4 code optimises your installation and wiring effort by removing the need for additional, cost-intensive hardware, such as a control cabinet for example. Now you can connect up to four PSENcode to any evaluation device (PNOZ X, PNOZsigma, PNOZmulti etc.) via a single PDP67 F 4 code, using proven M12 connection technology.

**Your benefits at a glance**

- Simple installation means less planning, design and installation work
- No control cabinet necessary
- Modular machine concept is possible
- One cable for communication and supply
- Possible to connect to any evaluation device
- Can be cascaded using PSEN T junction and PSEN Y junction




*Application example: PDP67 F 4 code in conjunction with PNOZsigma*

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