




## Up to Category 2, EN 954-1 PNOZ X1P

مبتکران صنعت برنا  
جهت سفارش با شماره زیر تماس بگیرید  
0990 4040 832 msborna.com



Safety relay for monitoring E-STOP pushbuttons.

### Approvals

|   | PNOZ X1P |
|---|----------|
|   | ◆        |
|  | ◆        |
|  | ◆        |

### Unit features

- ▶ Positive-guided relay outputs:
  - 3 safety contacts (N/O), instantaneous
  - 1 auxiliary contact (N/C), instantaneous
- ▶ Connection options for:
  - E-STOP pushbutton
  - Reset button
- ▶ LED indicator for:
  - Switch status channel 1/2
  - Supply voltage
- ▶ Plug-in connection terminals (either cage clamp terminal or screw terminal)

### Safety features

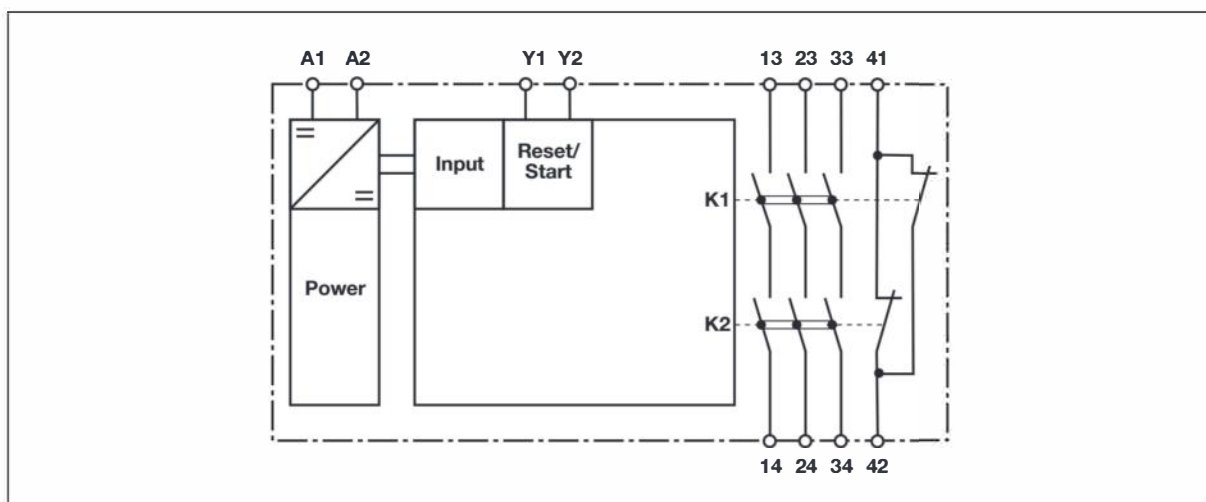
- The relay conforms to the following safety criteria:
- ▶ The circuit is redundant with built-in self-monitoring.
  - ▶ The safety function remains effective in the case of a component failure.
  - ▶ The correct opening and closing of the safety function relays is tested automatically in each on-off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

### Unit description

The safety relay is not suitable for non-contact barriers because

- ▶ a dynamic start is not possible
- The safety relay meets the requirements of EN 60204-1 and IEC 60204-1 and may be used in applications with
- ▶ E-STOP pushbuttons
  - ▶ Safety gates

### Block diagram



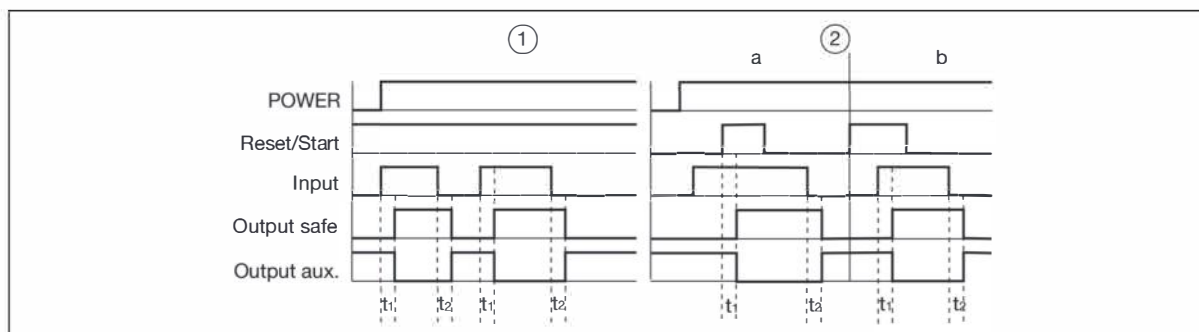
## Up to Category 2, EN 954-1 PNOZ X1P

مبتکران صنعت برنا  
جهت سفارش با شماره زیر تماس بگیرید  
0990 4040 832 msborna.com

### Function description

- ▶ Single-channel operation: no redundancy in the input circuit, earth faults in the reset circuit are detected.
- ▶ Automatic start: Unit is active once the input circuit has been closed.
- ▶ Manual reset: Unit is active once the input circuit is closed and then the reset circuit is closed.
- ▶ Increase in the number of available contacts by connecting contact expander modules or external contactors/relays.

### Timing diagram



### Key

- ▶ Power: Supply voltage
- ▶ Reset/start: Reset circuit Y1-Y2
- ▶ Input: Input circuits A1
- ▶ Output safe: Safety contacts 13-14, 23-24, 33-34
- ▶ Output aux: Auxiliary contacts 41-42
- ▶ ①: Automatic reset
- ▶ ②: Manual reset
- ▶ a: Input circuit closes before reset circuit
- ▶ b: Reset circuit closes before input circuit
- ▶ t<sub>1</sub>: Switch-on delay
- ▶ t<sub>2</sub>: Delay-on de-energisation

### Wiring

Please note:

- ▶ Information given in the "Technical details" must be followed.
- ▶ Outputs 13-14, 23-24, 33-34 are safety contacts, output 41-42 is an auxiliary contact (e.g. for display).
- ▶ To prevent contact welding, a fuse should be connected before the output contacts (see technical details).
- ▶ Calculation of the max. cable runs  $I_{max}$  in the input circuit:

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

$R_{lmax}$  = max. overall cable resistance (see technical details)

$R_l / km$  = cable resistance/km

- ▶ Use copper wire that can withstand 60/75 °C.
- ▶ Sufficient fuse protection must be provided on all output contacts with capacitive and inductive loads.

## Up to Category 2, EN 954-1 PNOZ X1P

مبتکران صنعت برنا  
جهت سفارش با شماره زیر تماس بگیرید  
0990 4040 832 msborna.com

### Preparing for operation

#### Supply voltage

| Supply voltage | AC | DC |
|----------------|----|----|
|                |    |    |

#### Input circuit

| Input circuit   | Single-channel | Dual-channel |
|---|----------------|--------------|
| E-STOP<br><b>without</b> detection of shorts across contacts      |                |              |
| Safety gate<br><b>without</b> detection of shorts across contacts |                |              |

#### Reset circuit

| Reset circuit   | E-STOP wiring (single-channel)<br>Safety gate (single-channel) | E-STOP wiring (dual-channel)<br>Safety gate (dual-channel) |
|-----------------|--|--|
| Automatic reset |  |  |
| Manual reset    |  |  |

#### Feedback loop

| Feedback loop                     | Automatic reset | Manual reset |
|-----------------------------------|-----------------|--------------|
| Contacts from external contactors |                 |              |

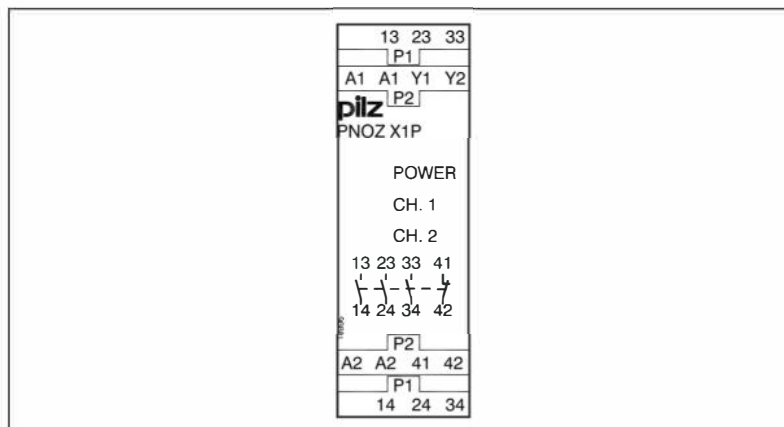
## Up to Category 2, EN 954-1 PNOZ X1P

مبتکران صنعت برنا  
جهت سفارش با شماره زیر تماس بگیرید  
0990 4040 832 msborna.com

### ▶ Key

|    |                   |
|----|-------------------|
| S1 | E-STOP pushbutton |
| S3 | Reset button      |
|    | Switch operated   |
|    | Gate open         |
|    | Gate closed       |

### Terminal configuration

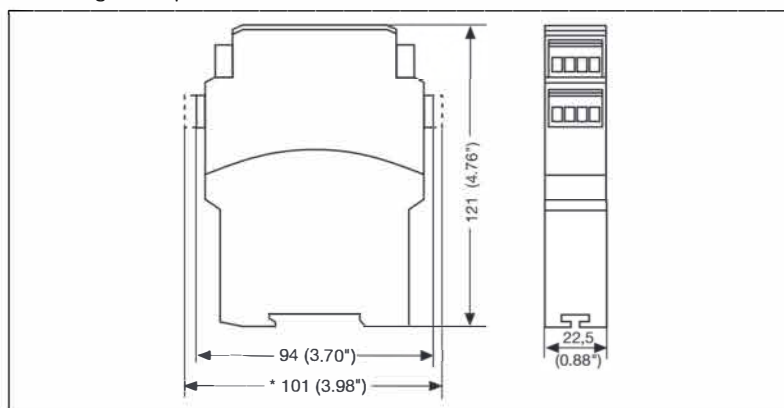


### Installation

- ▶ The safety relay should be installed in a control cabinet with a protection type of at least IP54.
- ▶ Use the notch on the rear of the unit to attach it to a DIN rail.
- ▶ Ensure the unit is mounted securely on a vertical DIN rail (35 mm) by using a fixing element (e.g. retaining bracket or an end angle).

### Dimensions

\* with cage clamp terminals



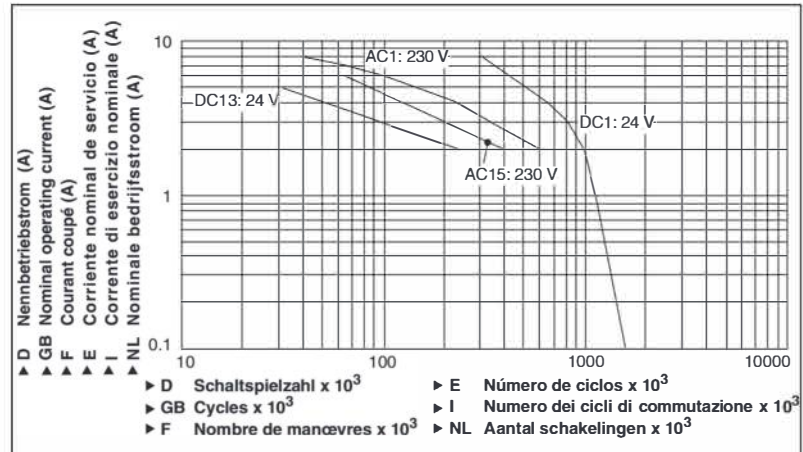
## Up to Category 2, EN 954-1 PNOZ X1P

مبتکران صنعت برنا  
جهت سفارش با شماره زیر تماس بگیرید  
0990 4040 832 msborna.com

### Notice

This data sheet is only intended for use during configuration. For installation and operation, please refer to the operating instructions supplied with the unit.

### Service life graph



### Technical details

#### Electrical data

|   |  |
|---|--|
| Supply voltage $U_B$ DC   | <b>24 V</b>  |
| Voltage tolerance   | <b>-15 % / +10 %</b>   |
| Power consumption at $U_B$ DC   | <b>1.5 W</b>   |
| Residual ripple DC  | <b>160 %</b>   |
| Voltage and current at<br>Input circuit: <b>24 VDC</b><br>Reset circuit: <b>24 VDC</b><br>Feedback loop: <b>24 VDC</b>        | <b>45 mA</b><br><b>45 mA</b><br><b>45 mA</b>                                       |
| Output contacts in accordance with <b>EN 954-1, Category 2</b>  | Safety contacts (N/O): <b>3</b><br>Auxiliary contacts (N/C): <b>1</b>              |
| Utilisation category in accordance with <b>EN 60947-4-1</b><br>AC1: <b>240 V</b>  | $I_{min}$ : <b>0.01 A</b> , $I_{max}$ : <b>6.0 A</b><br>$P_{max}$ : <b>1500 VA</b> |
| DC1: <b>24 V</b>  | $I_{min}$ : <b>0.01 A</b> , $I_{max}$ : <b>6.0 A</b><br>$P_{max}$ : <b>150 W</b>   |
| Utilisation category in accordance with <b>EN 60947-5-1</b><br>AC15: <b>230 V</b><br>DC13 (6 cycles/min): <b>24 V</b>         | $I_{max}$ : <b>5.0 A</b><br>$I_{max}$ : <b>4.0 A</b>                               |
| Contact material  | <b>AgSnO<sub>2</sub> + 0.2 µm Au</b>   |
| External contact fuse protection ( <b>EN 60947-5-1</b> )<br>Blow-out fuse, quick<br>Blow-out fuse, slow<br>Circuit breaker    | <b>6 A</b><br><b>4 A</b><br><b>4 A, 24 VAC/DC, characteristic B/C</b>              |
| Max. overall cable resistance $R_{lmax}$ input circuits,<br>reset circuits<br>Single-channel at $U_B$ DC                      | <b>30 Ohm</b>  |
| <b>Times</b>  |  |
| Switch-on delay<br>with automatic reset typ.<br>with automatic reset max.<br>with manual reset typ.<br>with manual reset max. | <b>60 ms</b><br><b>120 ms</b><br><b>50 ms</b><br><b>120 ms</b>                     |
| Delay-on de-energisation<br>with E-STOP typ.<br>with E-STOP max.<br>with power failure typ.<br>with power failure max.        | <b>55 ms</b><br><b>90 ms</b><br><b>55 ms</b><br><b>90 ms</b>                       |

## Up to Category 2, EN 954-1

### PNOZ X1P

مبتکران صنعت برنا  
 جهت سفارش با شماره زیر تماس بگیرید  
 0990 4040 832 msborna.com

| Times   |                               |
|---|-------------------------------|
| Recovery time at max. switching frequency 1/s after E-STOP          | 150 ms                        |
| after power failure   | 150 ms                        |
| Supply interruption before de-energisation                          | 20 ms                         |
| Environmental data  |                               |
| EMC   | EN 60947-5-1, EN 61000-6-2    |
| Vibration in accordance with EN 60068-2-6                           |                               |
| Frequency   | 10 - 55 Hz                    |
| Amplitude   | 0.35 mm                       |
| Climatic suitability  | EN 60068-2-78                 |
| Airgap creepage   | VDE 0110-1                    |
| Ambient temperature   | -10 - 55 °C                   |
| Storage temperature   | -40 - 85 °C                   |
| Protection type   |                               |
| Mounting (e.g. cabinet)   | IP54                          |
| Housing   | IP40                          |
| Terminals   | IP20                          |
| Mechanical data   |                               |
| Housing material  |                               |
| Housing   | PPO UL 94 V0                  |
| Front   | ABS UL 94 V0                  |
| Max. cross section of external conductors with screw terminals      |                               |
| 1 core flexible   | 0.25 - 2.50 mm <sup>2</sup>   |
| 2 core, same cross section, flexible:                               |                               |
| with crimp connectors, without insulating sleeve                    | 0.25 - 1.00 mm <sup>2</sup>   |
| without crimp connectors or with TWIN crimp connectors              | 0.20 - 1.50 mm <sup>2</sup>   |
| Torque setting with screw terminals                                 | 0.50 Nm                       |
| Max. cross section of external conductors with cage clamp terminals |                               |
| Flexible without crimp connectors                                   | 0.20 - 1.50 mm <sup>2</sup>   |
| Cage clamp terminals  |                               |
| Terminal points per connection                                      | 2                             |
| Stripping length  | 8 mm                          |
| Dimensions (H x W x D)  |                               |
| with screw terminals  | 94.0 mm x 22.5 mm x 121.0 mm  |
| with cage clamp terminals   | 101.0 mm x 22.5 mm x 121.0 mm |
| Weight  | 205 g                         |

The standards current on 05/03 apply.

| Max. continuous current |                           |
|-------------------------|---------------------------|
| Number of contacts      | $I_{max}$ (A) at $U_B$ DC |
| 1                       | 6.00 A                    |
| 2                       | 6.00                      |
| 3                       | 4.50                      |

| Order reference |          |                      |           |
|-----------------|----------|----------------------|-----------|
| Type            | Features | Terminals            | Order no. |
| PNOZ X1P C      | 24 VDC   | Cage clamp terminals | 787 100   |
| PNOZ X1P        | 24 VDC   | Screw terminals      | 777 100   |