Up to PL e of EN ISO 13849-1
PNOZ s7.2

Contact expansion module for increasing the number of available contacts

Approvals

	PNOZ s7.2
c(UL)us LISTED	◆
TÜV SÜD	◆
CCC	◆

Unit features

- Positive-guided relay outputs:
  – 4 safety contacts (N/O), instantaneous
  – 1 auxiliary contact (N/C), instantaneous
- Safe separation of safety contacts 13-14, 23-24, 33-34 from all other circuits
- Connection options for expansion modules
- LED for:
  – Input status, channel 1
  – Input status, channel 2
  – Switch status of the safety contacts
- Plug-in connection terminals (either spring-loaded terminals or screw terminals)

Unit description

The unit meets the requirements of EN 60947-5-1, EN 60204-1 and VDE 0113-1. The contact expander module is used to increase the number of instantaneous safety contacts available on a base unit. The category that can be achieved in accordance with EN 954-1 and EN ISO 13849-1 depends on the category of the base unit. The contact expander module may not exceed this.

Safety features

The unit meets the following safety requirements:

- The contact expansion module expands an existing circuit. As the output relays are monitored via the base unit's feedback loop, the safety functions on the existing circuit are transferred to the contact expansion module.
- The safety function remains effective in the case of a component failure.
- Earth fault in the feedback loop: Detected, depending on the base unit that is used.
- Earth fault in the input circuit: The output relays de-energise and the safety contacts open.

Block diagram
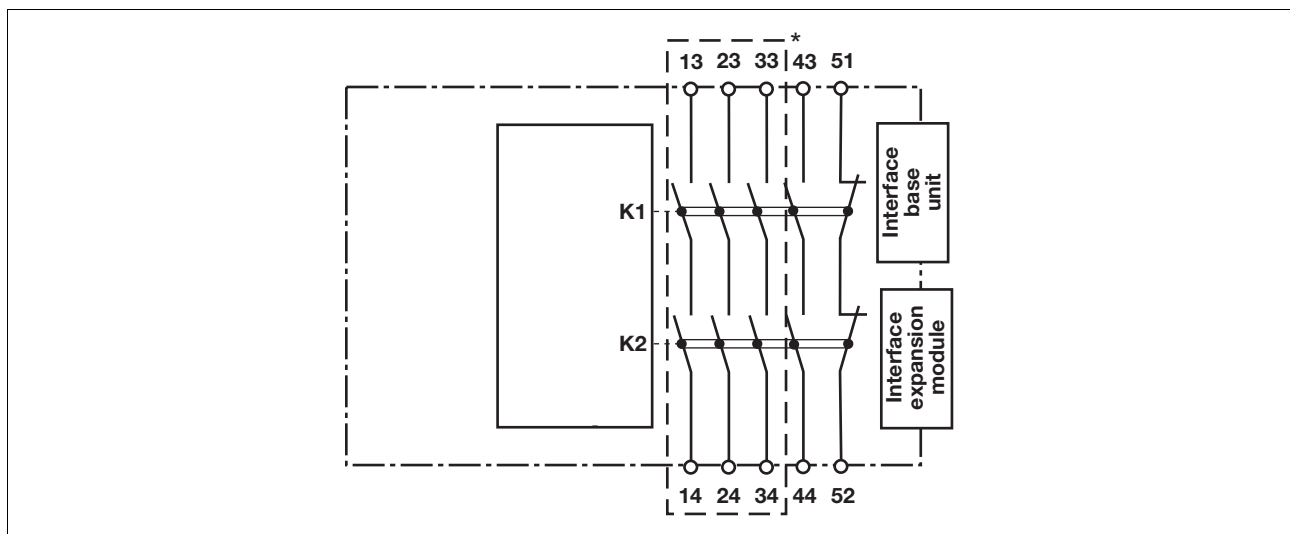
*Safe separation in accordance with EN 60947-1, 6 kV

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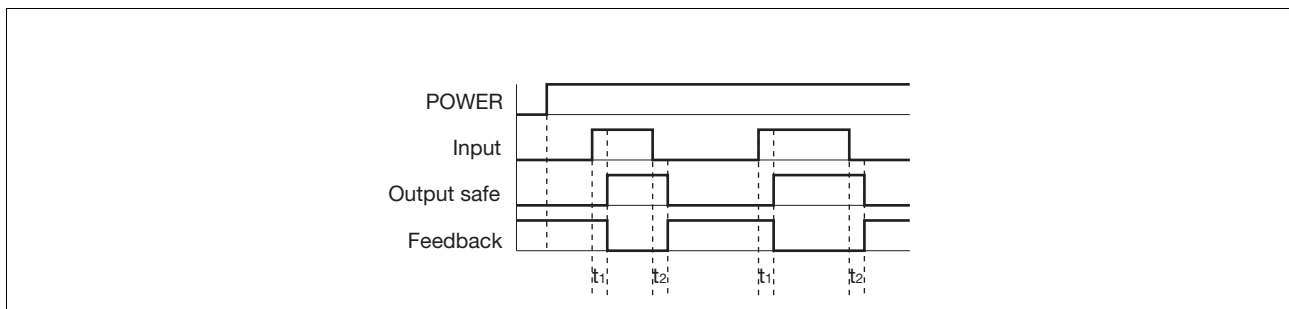## PNOZ s7.2

Function description

with PNOZsigma s7.1:
▸ Dual-channel operation and supply voltage via PNOZsigma connector

with PNOZsigma expander modules:
▸ Dual-channel operation and supply voltage via PNOZsigma connector

Timing diagram

POWER
Input
Output safe
Feedback

t_1 t_2 t_1 t_2

Key
▸ Power: Supply voltage
▸ Input: Input circuits

▸ Output safe: Safety contacts 13-14, 23-24, 33-34, 43-44
▸ Feedback: Feedback loop 51-52

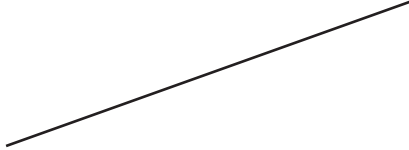▸ t_1: Switch-on delay
▸ t_2: Delay-on de-energisation

Wiring
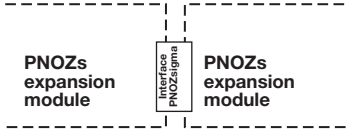
Please note:
▸ Information given in the "Technical details" must be followed.
▸ Outputs 13-14, 23-24, 33-34, 43-44 are safety contacts, output 51-52 is an auxiliary contact (e.g. for display).
▸ To prevent contact welding, a fuse should be connected before the output contacts (see technical details).
▸ Use copper wire that can withstand 60/75 °C.
▸ Sufficient fuse protection must be provided on all output contacts with capacitive and inductive loads.

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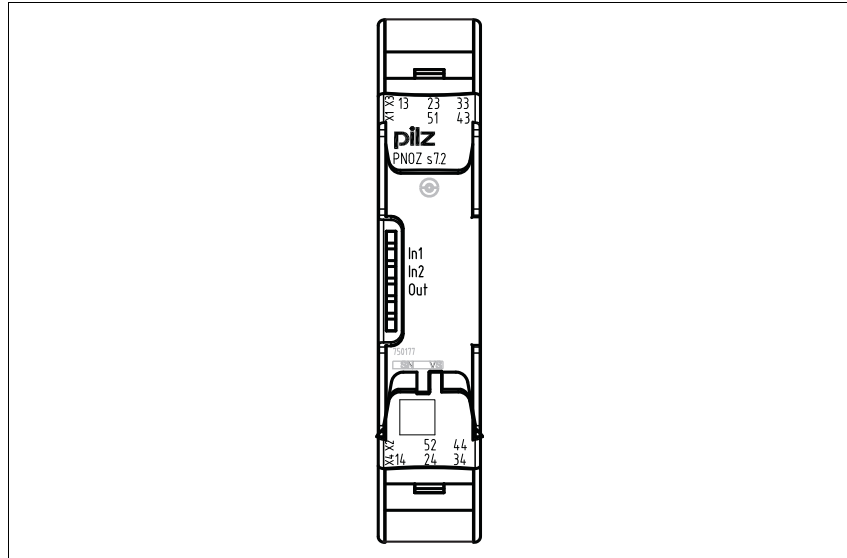### Preparing for operation

▸ Supply voltage/input circuit/feedback loop

Supply voltage/input circuit/feedback loop	AC	DC
Contact expansion module PNOZ s7.2		PNOZs expansion module — Interface PNOZsigma — PNOZs expansion module

pilz

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Terminal configuration

Installation

Connect contact expansion module PNOZ s7.2 to PNOZsigma contact expansion modules

▶ Connect the contact expansion modules using the connector supplied.

Control cabinet 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 us-

ing a fixing element (e.g. retaining bracket or an end angle).

Push the unit upwards or downwards before lifting it from the DIN rail.

| Expansion options	Please note the max. power consumption of the contact expansion modules (see Technical data PNOZ s7.1).
①: Base unit ②: Contact expansion module PNOZ s7.1 ③: Contact expansion module PNOZ s7.2 ④: Contact expansion module PNOZ s7.2 with terminator	

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①: Base unit ②: Contact expansion module PNOZ s7.1 ③: Contact expansion module PNOZ s7.2 ④: Contact expansion module PNOZ s7, s8, s9, s10, s11 as terminator	PNOZsigma base unit / PNOZsigma expansion module s7.1 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7/s8/s9/s10/s11 ① ② ③ ④
①: Contact expansion module PNOZ s7.1 with terminator ②: Contact expansion module PNOZ s7.2 ③: Contact expansion module PNOZ s7.2 with terminator	PNOZsigma expansion module s7.1 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7.2 ① ② ③
①: Contact expansion module PNOZ s7.1 with terminator ②: Contact expansion module PNOZ s7.2 ③: Contact expansion module PNOZ s7, s8, s9, s10, s11 as terminator	PNOZsigma expansion module s7.1 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7/s8/s9/s10/s11 ① ② ③
①: Base unit ②: Contact expansion module PNOZ s7.1 ③: Contact expansion module PNOZ s7.2 ④: Contact expansion module PNOZ s7.1 ⑤: Contact expansion module PNOZ s7.2 ⑥: Contact expansion module PNOZ s7.2 with terminator	PNOZsigma base unit / PNOZsigma expansion module s7.1 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7.1 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7.2 / PNOZsigma expansion module s7.2 ① ② ③ ④ ⑤ ⑥

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Dimensions

*with spring-loaded terminals

98 (3.86")
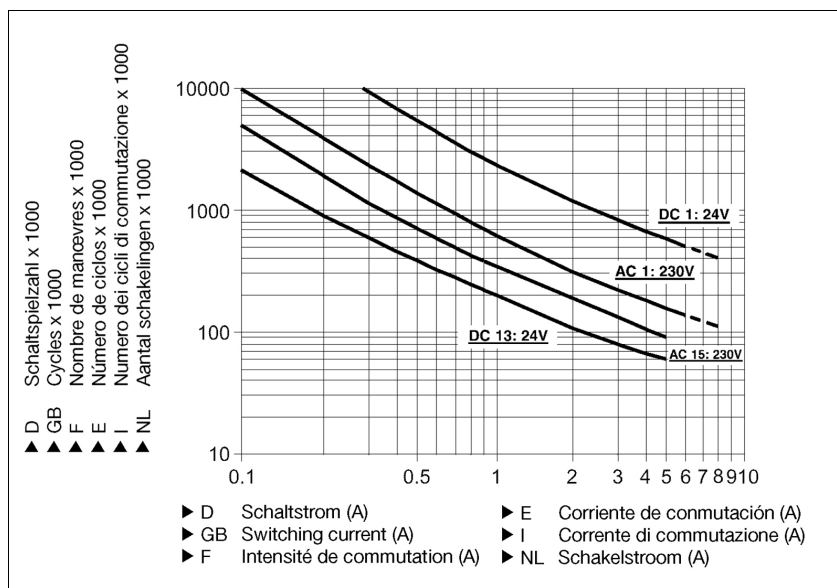* 100 (3,94")
120 (4.72")
17,5 (0.69")
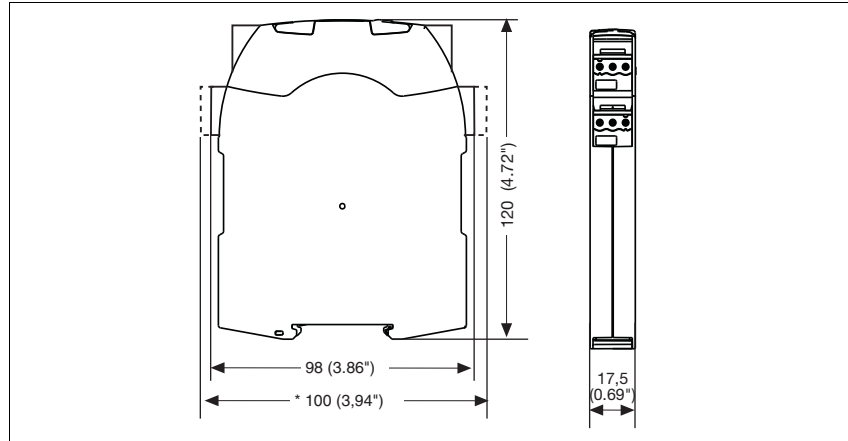
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NOTICE

This data sheet is only intended for use during configuration. Please refer to the operating manual for installation and operation.

Service life graph

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

D	Schaltstrom (A)	E	Corriente de conmutación (A)
GB	Switching current (A)	I	Corrente di commutazione (A)
F	Intensité de commutation (A)	NL	Schakelstroom (A)

Example
- Inductive load: 0,2 A
- Utilisation category: AC15
- Contact service life: 2,000,000 cycles

Provided the application requires fewer than 2,000,000 cycles, the PFH value (see technical details) can be used in the calculation.

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

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Technical details	
Electrical data	
Power consumption at U_B DC	**2.0 W**
Number of output contacts	
Safety contacts (S) instantaneous:	**4**
Auxiliary contacts (N/C):	**1**
Utilisation category in accordance with **EN 60947-4-1**	
Safety contacts: AC1 at **240 V**	I_{min}: **0.01 A** , I_{max}: **6.0 A**
	P_{max}: **1500 VA**
Safety contacts: DC1 at **24 V**	I_{min}: **0.01 A** , I_{max}: **6.0 A**
	P_{max}: **150 W**
Auxiliary contacts: AC1 at **240 V**	I_{min}: **0.01 A** , I_{max}: **2.0 A**
	P_{max}: **500 VA**
Auxiliary contacts: DC1 at **24 V**	I_{min}: **0.01 A** , I_{max}: **2.0 A**
	P_{max}: **50 W**
Utilisation category in accordance with **EN 60947-5-1**	
Safety contacts: AC15 at **230 V**	I_{max}: **5.0 A**
Safety contacts: DC13 at **24 V** (6 cycles/min)	I_{max}: **5.0 A**
Auxiliary contacts: AC15 at **230 V**	I_{max}: **2.0 A**
Auxiliary contacts: DC13 at **24 V** (6 cycles/min)	I_{max}: **2.0 A**
Contact material	**AgCuNi + 0.2 µm Au**
External contact fuse protection (I_K = 1 kA) to **EN 60947-5-1**	
Blow-out fuse, quick	
Safety contacts:	**10 A**
Auxiliary contacts:	**4 A**
Blow-out fuse, slow	
Safety contacts:	**6 A**
Auxiliary contacts:	**2 A**
Circuit breaker 24 VAC/DC, characteristic B/C	
Safety contacts:	**6 A**
Auxiliary contacts:	**2 A**
Max. overall cable resistance R_{lmax} input circuits, reset circuits	
single-channel at U_B DC	**30 Ohm**
Safety-related characteristic data	
PL in accordance with **EN ISO 13849-1: 2006**	**PL e (Cat. 4)**
Category in accordance with **EN 954-1**	**Cat. 4**
SIL CL in accordance with **EN IEC 62061**	**SIL CL 3**
PFH in accordance with **EN IEC 62061**	**2.31E-09**
SIL in accordance with **IEC 61511**	**SIL 3**
PFD in accordance with **IEC 61511**	**2.03E-06**
T_M [year] in accordance with **EN ISO 13849-1: 2006**	**20**
Times	
Switch-on delay	
with automatic reset after power on typ.	**30 ms**
with automatic reset after power on max.	**50 ms**
Delay-on de-energisation	
with E-STOP typ.	**18 ms**
with E-STOP max.	**30 ms**
with power failure typ.	**18 ms**
with power failure max.	**30 ms**
Environmental data	
EMC	**EN 60947-5-1, EN 61000-6-2, EN 61000-6-4**
Vibration to **EN 60068-2-6**	
Frequency	**10.0 - 55.0 Hz**
Amplitude	**0.35 mm**
Climatic suitability	**EN 60068-2-78**

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Environmental data	
Airgap creepage in accordance with **EN 60947-1**	
Pollution degree	**2**
Overvoltage category	**III**
Rated insulation voltage	**250 V**
Rated impulse withstand voltage	**6.00 kV**
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	**PC**
Front	**PC**
Cross section of external conductors with screw terminals	
1 core flexible	**0.25 - 2.50 mm² , 24 - 12 AWG** No. 750177
2 core, same cross section, flexible:	
with crimp connectors, without insulating sleeve	**0.25 - 1.00 mm² , 24 - 16 AWG** No. 750177
without crimp connectors or with TWIN crimp connectors	**0.20 - 1.50 mm² , 24 - 16 AWG** No. 750177
Torque setting with screw terminals	**0.50 Nm** No. 750177
Cross section of external conductors with spring-loaded terminals: Flexible with/without crimp connectors	**0.20 - 2.50 mm² , 24 - 12 AWG** No. 751177
Spring-loaded terminals: Terminal points per connection	**2** No. 751177
Stripping length	**9 mm** No. 751177
Dimensions	
Height	**100.0 mm** No. 751177
	98.0 mm No. 750177
Width	**17.5 mm**
Depth	**120.0 mm**
Weight	**170 g**

No. stands for order number.

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

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

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

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

The standards current on **2007-07** apply.

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Conventional thermal current while loading several contacts

Number of contacts	I_{th} per contact at U_B DC
1	**6.00 A**
2	**5.50 A**
3	**4.50 A**
4	**4.00 A**

Order reference

Type	Features		Terminals	Order no.
PNOZ s7.2 C	24 VDC		With spring-loaded terminals	751 177
PNOZ s7.2	24 VDC		With screw terminals	750 177