Up to PL e of EN ISO 13849-1
PNOZ s22

Contact expansion module for increasing the number of available contacts

Approvals

	PNOZ s22
TÜV SÜD	◆

Unit features

- Positive-guided relay outputs:
  - 6 safety contacts (N/O), instantaneous
  - 2 auxiliary contacts (N/C), instantaneous
- 3 safety contacts and 1 auxiliary contact each; these can be controlled separately
- Safety contacts are safely separated from all other circuits; safety contacts from Ext.1/O0 are safely separated from the safety contacts from Ext.2/O1
- Basic insulation between contacts
- LED indicator for:
  - Input state of channel Ext.1/O0
  - Input state of channel Ext.2/O1
- 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 expansion module is used to increase the number of instantaneous safety contacts available on a base unit. Base units are

- Speed monitor PNOZ s30
- PNOZmulti Mini base units PNOZ mm0.1p, PNOZ mm0.2p

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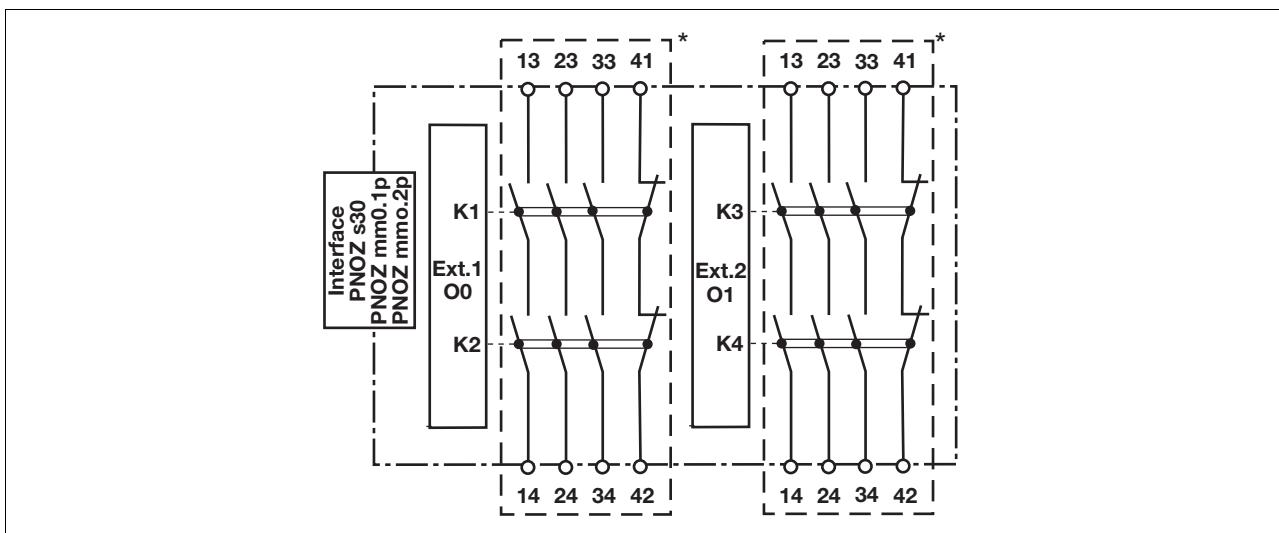
*Safe separation in accordance with EN 60947-1, 6 kV

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Function description

▶ Dual-channel operation and supply voltage via PNOZsigma connector

▶ 3 safety contacts and 1 auxiliary contact each; these can be controlled separately

Wiring

Please note:
▶ Information given in the "Technical details" must be followed.
▶ The wiring guidelines in the base units' operating instructions must be taken into account.

▶ Outputs 13 -14, 23 -24, 33 - 34 are safety contacts; outputs 41 - 42 are auxiliary contacts (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.

Preparing for operation

	AC	DC
Versorgungsspannung/Eingangskreis/ Rückführkreis		
Supply voltage/input circuit/feedback loop		PNOZ s30/ PNOZ mm0.1p PNOZ mm0.2p — Interface PNOZsigma — PNOZs22
Tension d'alimentation/circuit d'entrée/ boucle de retour		

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Terminal configuration
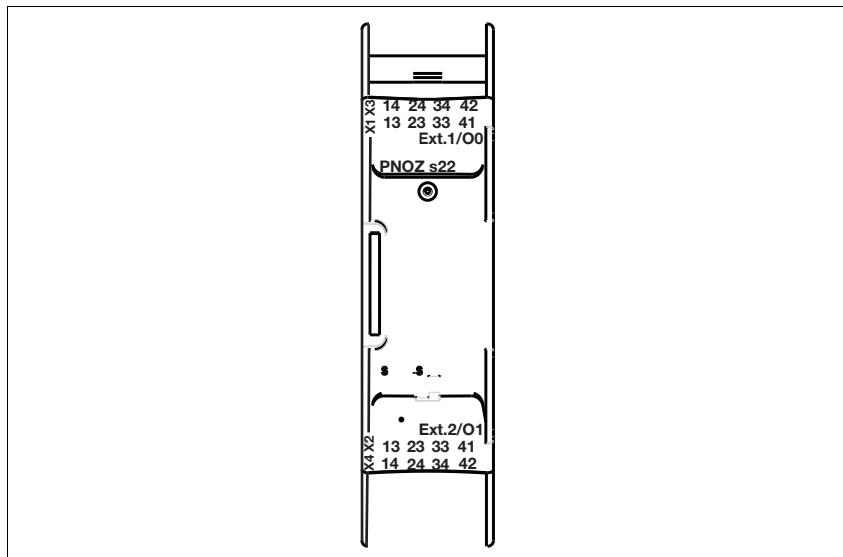
Installation

Connecting the contact expansion block to the PNOZ s30 or base unit PNOZmm0.1p/PNOZ mm0.2p

▸ Connect the contact expansion block 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 using a fixing element (e.g. retaining bracket or an end angle).

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

Dimensions

*with spring-loaded terminals
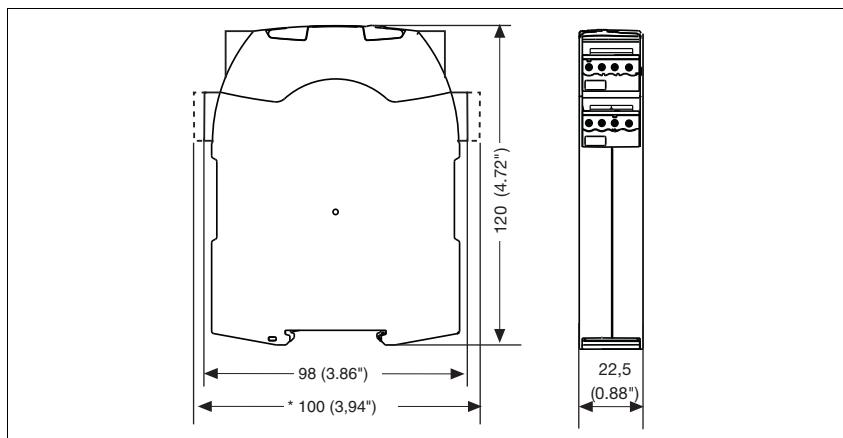
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NOTICE

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

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)	
▶ GB	Switching current (A)	
▶ F	Intensité de commutation (A)	
▶ E	Corriente de conmutación (A)	
▶ I	Corrente di commutazione (A)	
▶ NL	Schakelstroom (A)	
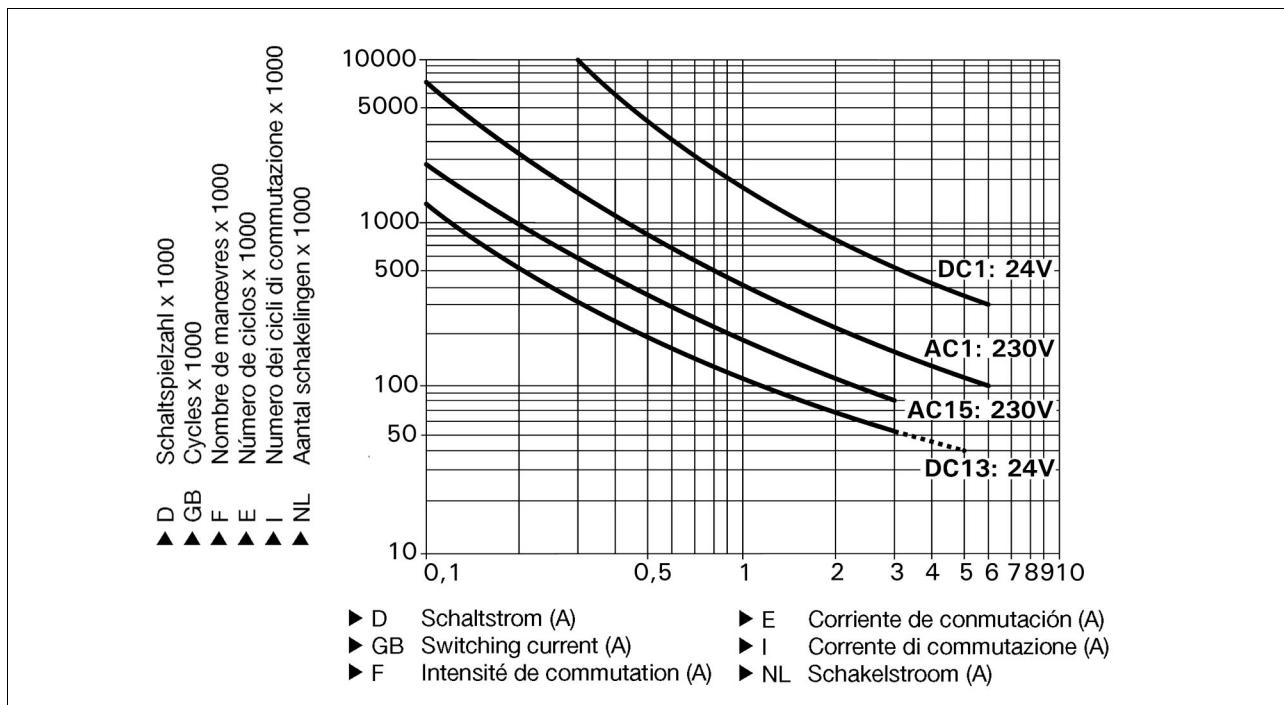
Example
- Inductive load: 0,2 A
- Utilisation category: AC15
- Contact service life: 1,000,000 cycles

Provided the application requires fewer than 1,000,000 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

Supply voltage	
Supply voltage U_B DC	**24 V**
Voltage tolerance	**-15 %/+20 %**
Power consumption at U_B DC	**1.5 W**
Number of output contacts	
Safety contacts (S) instantaneous:	**6**
Auxiliary contacts (N/C):	**2**
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}: **6.0 A** P_{max}: **1500 VA**
Auxiliary contacts: DC1 at **24 V**	I_{min}: **0.01 A** , I_{max}: **6.0 A** P_{max}: **150 W**
Utilisation category in accordance with **EN 60947-5-1**	
Safety contacts: AC15 at **230 V**	I_{max}: **3.0 A**
Safety contacts: DC13 at **24 V** (6 cycles/min)	I_{max}: **4.0 A**
Auxiliary contacts: AC15 at **230 V**	I_{max}: **4.0 A**
Auxiliary contacts: DC13 at **24 V** (6 cycles/min)	I_{max}: **4.0 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:	**6 A**
Auxiliary contacts:	**6 A**
Blow-out fuse, slow	
Safety contacts:	**4 A**
Auxiliary contacts:	**4 A**
Circuit breaker 24 VAC/DC, characteristic B/C	
Safety contacts:	**4 A**
Auxiliary contacts:	**4 A**

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**	**2.50E-09**
SIL in accordance with **IEC 61511**	**SIL 3**
PFD in accordance with **IEC 61511**	**2.13E-05**
T_M [year] in accordance with **EN ISO 13849-1: 2006**	**20**

Times

Switch-on delay	
with automatic reset typ.	**11 ms**
with automatic reset max.	**20 ms**
Delay-on de-energisation	
with E-STOP typ.	**12 ms**
with E-STOP max.	**20 ms**

Environmental data

EMC	**EN 60947-5-1, EN 61000-6-2, EN 61000-6-4**
Vibration to **EN 60068-2-6**	
Frequency	**10 - 55 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 - 80 °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. 750132
2 core, same cross section, flexible:	
with crimp connectors, without insulating sleeve	**0.25 - 1.00 mm² , 24 - 16 AWG** No. 750132
without crimp connectors or with TWIN crimp connectors	**0.20 - 1.50 mm² , 24 - 16 AWG** No. 750132
Torque setting with screw terminals	**0.50 Nm** No. 750132
Cross section of external conductors with spring-loaded terminals: Flexible with/without crimp connectors	**0.20 - 2.50 mm² , 24 - 12 AWG** No. 751132
Spring-loaded terminals: Terminal points per connection	**2** No. 751132
Stripping length	**9 mm** No. 751132
Dimensions	
Height	**96.0 mm**
Width	**22.5 mm**
Depth	**120.0 mm**
Weight	**265 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.

NOTICE

The safety-related characteristic data applies per channel of the contact expansion block. The safety-related characteristic data of the base unit and all other devices that are used must be taken into account when calculating the safety function. We recommend that you use the PAScal software tool to calculate the safety function's SIL/PL values.

The standards current on **2010-04** apply.

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Conventional thermal current

Conventional thermal current when the contacts from Ext.1/O0 **and** Ext.2/O1 are under load simultaneously.

Number of contacts used at a time	I_{th} [A] per contact
1	6.00 A
2	5.00 A
3	4.00 A

Conventional thermal current when either the contacts from Ext.1/O0 **or** the contacts from Ext.2/O1 are under load. They may **not** be under load simultaneously.

Number of contacts in total	I_{th} [A] per contact
2	6.00 A
3	5.00 A

Order reference

Type	Features	Terminals	Order no.
PNOZ s22	24 V DC	With screw terminals	750 132
PNOZ s22 C	24 V DC	With spring-loaded terminals	751 132