

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



Contact expansion module for increasing the number of available contacts

Approvals

	PNOZ s22
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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

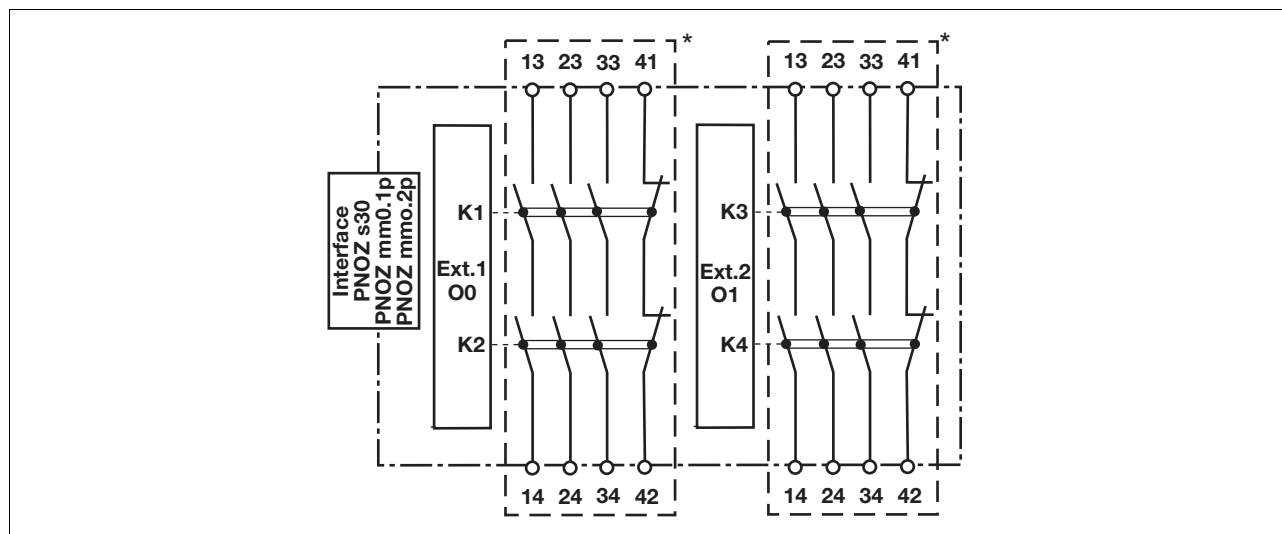
The category that can be achieved in accordance with EN 954-1 and EN ISO 13849-1 depends on the category of the base unit. The contact expansion module may not exceed this.

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

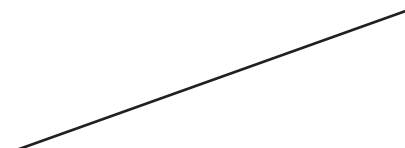
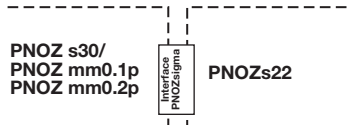
- ▶ Dual-channel operation and supply voltage via PNOZsigma connector
- ▶ 3 safety contacts and 1 auxiliary contact each; these can be controlled separately

Wiring

Please note:

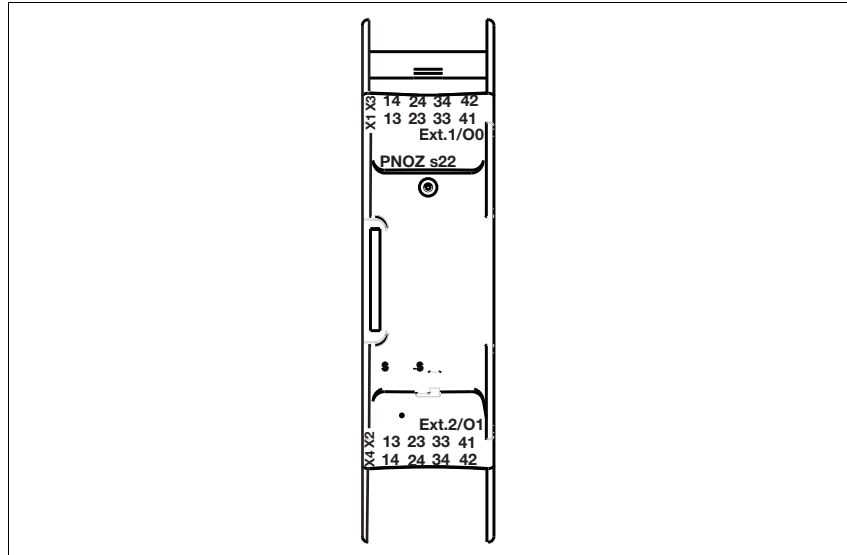
- ▶ Information given in the "Technical details" must be followed.
- ▶ The wiring guidelines in the base units' operating instructions must be taken into account.
- ▶ Outputs 13 -14, 23 -24, 33 - 34 are safety contacts; outputs 41 - 42 are auxiliary contacts (e.g. for display).
- ▶ To prevent contact 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		
Tension d'alimentation/circuit d'entrée/ boucle de retour		

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Terminal configuration



Installation

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

- ▶ Connect the contact expansion block using the connector supplied.

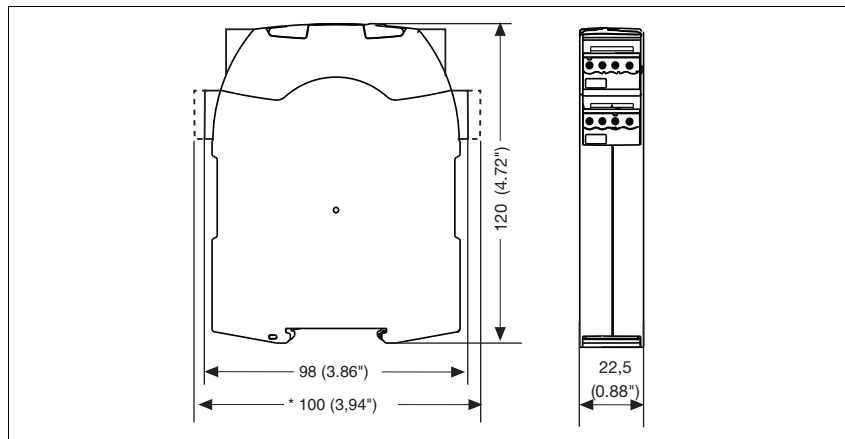
Control cabinet installation

- ▶ 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



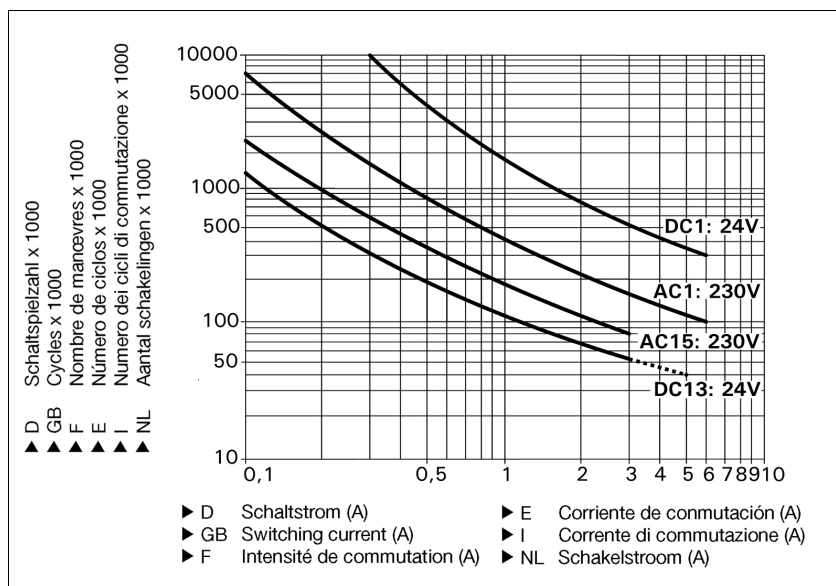
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NOTICE

This data sheet is only intended for use during configuration. 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.



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.

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

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Electrical data	
Utilisation category in accordance with EN 60947-4-1	
Safety contacts: AC1 at 240 V	$I_{min}: 0.01\text{ A}$, $I_{max}: 6.0\text{ A}$ $P_{max}: 1500\text{ VA}$
Safety contacts: DC1 at 24 V	$I_{min}: 0.01\text{ A}$, $I_{max}: 6.0\text{ A}$ $P_{max}: 150\text{ W}$
Auxiliary contacts: AC1 at 240 V	$I_{min}: 0.01\text{ A}$, $I_{max}: 6.0\text{ A}$ $P_{max}: 1500\text{ VA}$
Auxiliary contacts: DC1 at 24 V	$I_{min}: 0.01\text{ A}$, $I_{max}: 6.0\text{ A}$ $P_{max}: 150\text{ W}$
Utilisation category in accordance with EN 60947-5-1	
Safety contacts: AC15 at 230 V	$I_{max}: 3.0\text{ A}$
Safety contacts: DC13 at 24 V (6 cycles/min)	$I_{max}: 4.0\text{ A}$
Auxiliary contacts: AC15 at 230 V	$I_{max}: 4.0\text{ A}$
Auxiliary contacts: DC13 at 24 V (6 cycles/min)	$I_{max}: 4.0\text{ A}$
Contact material	AgCuNi + 0.2 µm Au
External contact fuse protection ($I_K = 1\text{ kA}$) 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	2.31E-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 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
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

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Mechanical data	
Housing material	
Housing	PC
Front	PC
Cross section of external conductors with screw terminals	
1 core flexible	0.25 - 2.50 mm ² , 24 - 12 AWG No. 750132
2 core, same cross section, flexible:	
with crimp connectors, without insulating sleeve	0.25 - 1.00 mm ² , 24 - 16 AWG No. 750132
without crimp connectors or with TWIN crimp connectors	0.20 - 1.50 mm ² , 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 mm ² , 24 - 12 AWG No. 751132
Spring-loaded terminals: Terminal points per connection	2 No. 751132
Stripping length	9 mm No. 751132
Dimensions	
Height	100.0 mm No. 751132 98.0 mm No. 750132
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 VDC		With screw terminal	750 132
PNOZ s22 C	24 VDC		With spring-loaded terminal	751 132