

2963802

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Safety relay for emergency stop and safety door up to SIL 1, Cat. 1, PL c, depending on the application up to SIL 3, Cat. 4, PL e, single-channel operation, 4 enabling current paths,  $U_S = 24\text{ V DC}$ , plug-in screw terminal blocks

Your advantages

- Up to Cat. 1/PL c in accordance with ISO 13849-1, SIL 1 in accordance with EN IEC 62061, SIL 1 in accordance with IEC 61508
- Depending on the application, up to Cat. 4/PL e in accordance with ISO 13849-1, SIL 3 in accordance with EN IEC 62061, SIL 3 in accordance with IEC 61508
- Basic insulation
- 1-channel control

Commercial data

Item number	2963802
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN01
Product key	DNA111
GTIN	4017918892661
Weight per piece (including packing)	200 g
Weight per piece (excluding packing)	179.2 g
Customs tariff number	85371098
Country of origin	DE

## Technical data

### Notes

#### Note on application

Note on application	Only for industrial use
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### Product properties

Product type	Safety relays
Product family	PSRclassic
Application	Emergency stop
	Safety door
Control	1-channel
Mechanical service life	10x 10 <sup>6</sup> cycles
Relay type	Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3

#### Insulation characteristics

Overvoltage category	III
Degree of pollution	2

#### Times

Typical response time	< 100 ms (For U <sub>s</sub> autostart)
	< 100 ms (with U <sub>s</sub> manual start)
Typ. starting time with U <sub>s</sub>	< 100 ms (with U <sub>s</sub> / when controlled via A1)
Typical release time	< 10 ms (At U <sub>s</sub> on demand via sensor circuit)
	< 100 ms (At U <sub>s</sub> /on demand via A1)
Restart time	< 1 s (Boot time)
Recovery time	< 1 s (following demand of the safety function)
Start pulse length	≥ 500 ms (manual start)

### Electrical properties

Maximum power dissipation for nominal condition	16 W (U <sub>S</sub> = 26.4 V, I <sub>L</sub> <sup>2</sup> = 72 A <sup>2</sup> , P <sub>Total max</sub> = 1.6 W + 14.4 W)
Nominal operating mode	100% operating factor
Rated insulation voltage	250 V AC
Rated surge voltage/insulation	Basic insulation 4 kV: between all current paths and housing Safe isolation, reinforced insulation 6 kV: between A1/A2 and 13/14, 23/24, 33/34, 43/44 between S11/S12/S33/S34 and 13/14, 23/24, 33/34, 43/44 between 51/52 and 13/14, 23/24, 33/34, 43/44

#### Supply

Rated control circuit supply voltage U <sub>S</sub>	24 V DC -15 % / +10 %
Rated control supply current I <sub>S</sub>	typ. 55 mA (at U <sub>S</sub> )
Power consumption at U <sub>S</sub>	typ. 1.32 W
Inrush current	< 3.5 A (typ. with U <sub>S</sub> , Δt = 2 ms)

Filter time	2 ms (in the event of voltage dips at $U_S$ )
Protective circuit	Serial protection against polarity reversal; Suppressor diode

## Input data

### Digital: Logic (S12)

Description of the input	safety-related
Number of inputs	1
Input voltage range "0" signal	0 V DC ... 5 V DC
Input voltage range "1" signal	20.4 V ... 26.4 V
Input current range "0" signal	0 mA ... 2 mA
Inrush current	80 mA (typ. with $U_S$ , $\Delta t = 150$ ms)
Filter time	No brightness test pulses / high test pulses permitted. 1 ms (Test pulse width of low test pulses) 1 s (Test pulse rate for low test pulse)
Max. permissible overall conductor resistance	50 $\Omega$
Protective circuit	Suppressor diode
Current consumption	typ. 50 mA (with $U_S$ at S11) typ. 52 mA (with $U_S$ supplied externally)

### Digital: Start circuit (S34)

Description of the input	non-safety-related
Number of inputs	1
Input voltage range "1" signal	20.4 V ... 26.4 V
Inrush current	< 6 mA (typ. with $U_S$ , $\Delta t = 65$ ms)
Filter time	No test pulses permitted
Max. permissible overall conductor resistance	50 $\Omega$
Protective circuit	Suppressor diode
Current consumption	0 mA (typ. with $U_S$ )

## Output data

### Relay: Enabling current paths (13/14, 23/24, 33/34, 43/44)

Output description	2 N/O contacts in series, safety-related, floating
Number of outputs	4
Contact switching type	4 enabling current paths
Contact material	AgSnO <sub>2</sub>
Switching voltage	min. 10 V max. 250 V AC/DC
Switching capacity	min. 100 mW
Inrush current	min. 10 mA max. 20 A ( $\Delta t = 100$ ms)
Limiting continuous current	6 A
Sq. Total current	72 A <sup>2</sup> (observe derating)
Switching frequency	max. 0.5 Hz

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Mechanical service life	10 <sup>7</sup> cycles
Output fuse	10 A gL/gG (High demand)
	4 A gL/gG (Low demand)

## Relay: Signaling current path (51/52)

Output description	2 N/C contacts parallel, non-safety-related, floating
Number of outputs	1
Contact switching type	1 signaling current path
Contact material	AgSnO <sub>2</sub>
Switching voltage	min. 5 V
	max. 250 V AC/DC
Switching capacity	min. 50 mW
Inrush current	min. 10 mA
	max. 6 A
Limiting continuous current	6 A
Sq. Total current	36 A <sup>2</sup> (observe derating)
Switching frequency	max. 0.5 Hz
Mechanical service life	10 <sup>7</sup> cycles
Output fuse	6 A gL/gG

## Connection data

### Connection technology

pluggable	yes
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### Conductor connection

Connection method	Screw connection
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 12
Stripping length	7 mm
Screw thread	M3
Tightening torque	0.5 Nm ... 0.6 Nm

## Signaling

Status display	2 x LED (green)
Operating voltage display	1 x LED (green)

## Dimensions

Width	22.5 mm
Height	99 mm
Depth	114.5 mm

## Material specifications

Color (Housing)	yellow (RAL 1018)
Housing material	PA

## Characteristics

### Safety data

Stop category	0
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### Safety data: EN ISO 13849

Category	4
Performance level (PL)	e (3 A DC13; 3 A AC15; 8760 switching cycles/year)
	e (5 A DC13; 3 A AC15; 4380 switching cycles/year)

### Safety data: IEC 61508 - High demand

Safety Integrity Level (SIL)	3
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### Safety data: IEC 61508 - Low demand

Safety Integrity Level (SIL)	3
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### Safety data: EN IEC 62061

Safety Integrity Level (SIL)	3
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## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Ambient temperature (operation)	-20 °C ... 65 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Maximum altitude	≤ 2000 m (Above sea level)
Max. permissible humidity (storage/transport)	75 % (on average, 85% infrequently, non-condensing)
Max. permissible relative humidity (operation)	75 % (on average, 85% infrequently, non-condensing)
Shock	15g
Vibration (operation)	10 Hz ... 150 Hz, 2g

## Approvals

### CE

Identification	CE-compliant
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## Mounting

Mounting type	DIN rail mounting
Assembly note	See derating curve
Mounting position	vertical or horizontal

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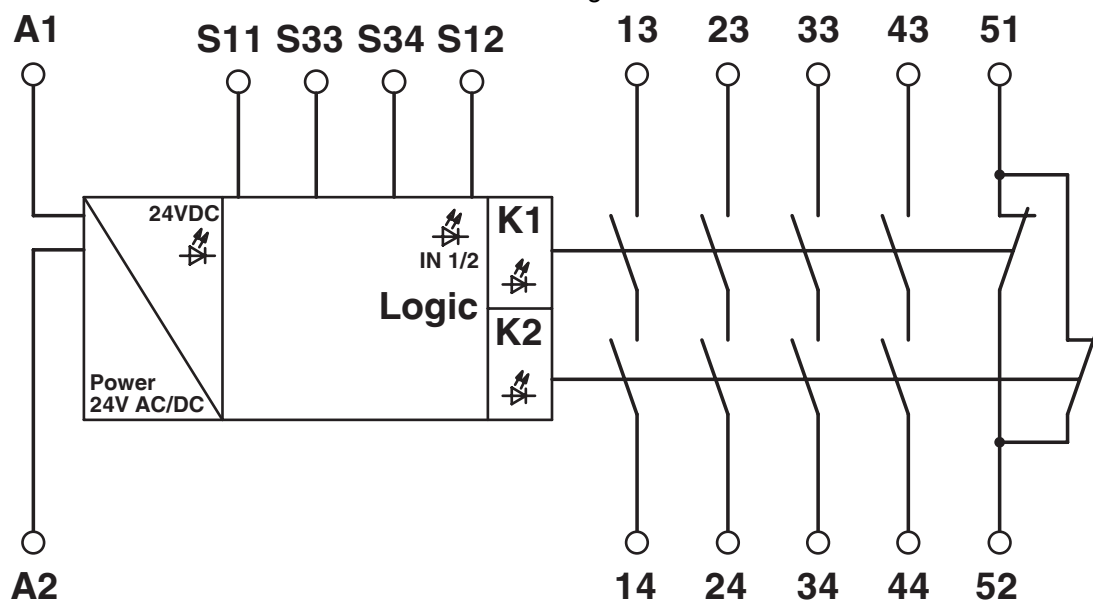


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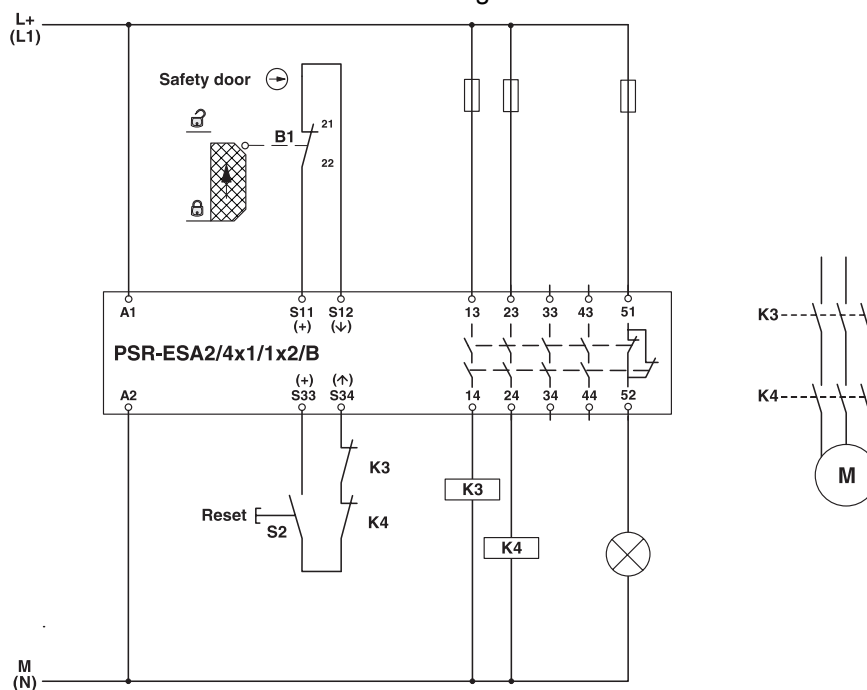
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## Drawings

Circuit diagram



Circuit diagram



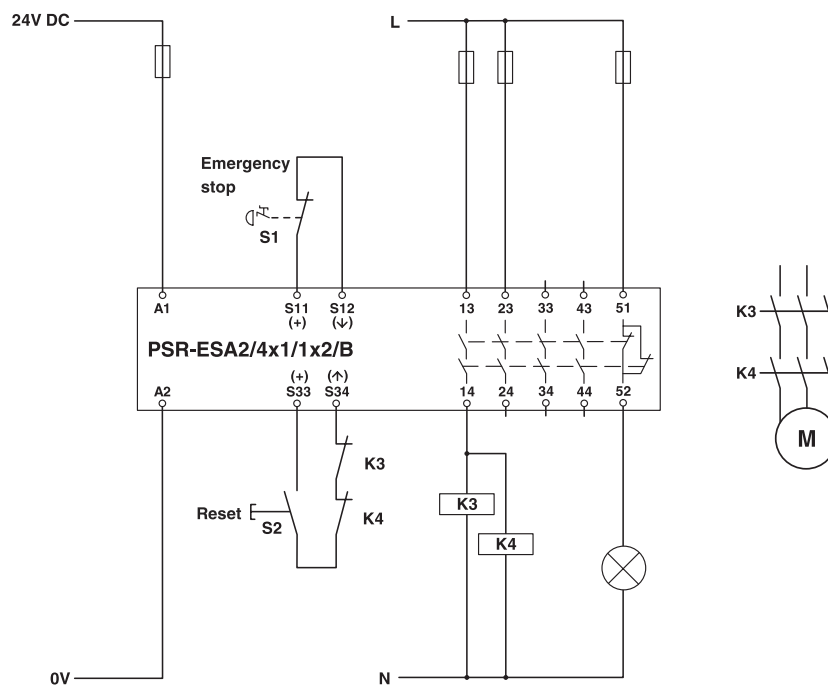
Single-channel safety door monitoring

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Circuit diagram



Single-channel emergency stop monitoring

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## Approvals

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**cULus Listed**

Approval ID: E140324



**cULus Listed**

Approval ID: E140324



**Functional Safety**

Approval ID: 01/205/0653.05/23



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## Classifications

### ECLASS

ECLASS-13.0	27371819
ECLASS-15.0	27371819
ECLASS-15.0 ASSET	27250101

### ETIM

ETIM 9.0	EC001449
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### UNSPSC

UNSPSC 21.0	39122200
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	0cde4f44-4521-4b22-8d20-64858a0ac0dc

### EF3.0 Climate Change

CO2e kg	3.611 kg CO2e
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