

# Safety relays - PSR-MS20-1NO-1DO-24DC-SC



2904950

<https://www.phoenixcontact.com/de/produkte/2904950>

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Safety relay for emergency stop and safety doors up to SIL 1, Cat. 1, PL c, depending on the application up to SIL 3, Cat. 4, PL e, 1-channel operation, automatic start, 1 enabling current path,  $U_S = 24 \text{ V DC}$ , fixed screw terminal block

## Your advantages

- Depending on the application, up to Cat. 4/PL e in accordance with ISO 13849-1, SIL CL 3 in accordance with IEC 62061
- Depending on the application, up to Cat. 4/PL e in accordance with ISO 13849-1, SIL CL 3 in accordance with IEC 62061
- Low housing width of just 6.8 mm
- 1-channel control
- 1 enabling current path, 1 digital signal output
- Automatic activation

## Commercial Data

Item number	2904950
Packing unit	1 pc
Minimum order quantity	1 pc
Sales Key	G1 - Relais
Product Key	DNA171
Catalog Page	Page 215 (C-6-2019)
GTIN	4046356904988
Weight per Piece (including packing)	87,7 g
Weight per Piece (excluding packing)	69 g
Customs tariff number	85371098
Country of origin	DE

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## Technical Data

### Product properties

Product type	Safety relays
Product family	PSRmini
Application	Emergency stop
	Safety door
	Solenoid switch
Relay type	Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3

### Times

Typical response time	< 175 ms
Typ. starting time with $U_S$	< 250 ms (when controlled via A1)
Typical release time	< 20 ms (when controlled via A1 or S12)
Recovery time	< 500 ms

### Electrical properties

Nominal operating mode	100% operating factor
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### Air clearances and creepage distances between the power circuits

Rated insulation voltage	250 V AC
	250 V AC
Rated surge voltage/insulation	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing

### Supply

Designation	A1/A2
Rated control circuit supply voltage $U_S$	20.4 V DC ... 26.4 V DC
Rated control circuit supply voltage $U_S$	24 V DC -15 % / +10 %
Rated control supply current $I_S$	typ. 42 mA
Power consumption at $U_S$	typ. 1 W
Inrush current	4.5 A ( $\Delta t < 120 \mu s$ at $U_S$ )
Filter time	1 ms (at A1 in the event of voltage dips at $U_S$ )
Protective circuit	Surge protection; Suppressor diode
	Protection against polarity reversal for rated control circuit supply voltage

### Input data

#### Digital: Sensor circuit (S11, S12)

Description of the input	safety-related sensor inputs
Input voltage range "0" signal	0 V DC ... 5 V DC (for safe Off; at S12)
Input current range "0" signal	0 mA ... 2 mA (for safe Off; at S12)
Inrush current	< 20 mA (with $U_S/I_x$ to S12)

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Filter time	max. 1.5 ms (at S12; test pulse width)
	min. 7.5 ms (at S12; test pulse rate)
	Test pulse rate = 5 x Test pulse width
Max. permissible overall conductor resistance	150 Ω
Current consumption	< 5 mA (with $U_s/I_x$ to S12)

## Digital: Start circuit (S35)

Description of the input	non-safety-related
Number of inputs	1
Input voltage range "1" signal	20.4 V DC ... 26.4 V DC
Inrush current	< 10 mA
Max. permissible overall conductor resistance	150 Ω
Protective circuit	Suppressor diode
Current consumption	< 10 mA

## Output data

### Relay: Enabling current path (13/14)

Output description	safety-related N/O contacts
Number of outputs	1 (undelayed)
Contact type	1 enabling current path
Contact material	AgSnO <sub>2</sub>
Switching voltage	min. 12 V AC/DC
	max. 250 V AC/DC (Observe the load curve)
Switching capacity	min. 60 mW
Inrush current	min. 3 mA
	max. 6 A
Limiting continuous current	6 A (observe derating)
Sq. Total current	36 A <sup>2</sup> (observe derating)
Switching frequency	max. 0.5 Hz
Mechanical service life	10x 10 <sup>6</sup> cycles
Output fuse	6 A gL/gG (N/O contact)
	4 A gL/gG (for low-demand applications)

### Signal: M1

Output description	non-safety-related
Number of outputs	1 (digital, PNP)
Voltage	22 V DC ( $U_s - 2$ V)
Current	max. 100 mA
Maximum inrush current	500 mA ( $\Delta t = 1$ ms at $U_s$ )
Short-circuit protection	no

## Connection data

### Connection technology

pluggable	no
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## Conductor connection

Connection method	Screw connection
Conductor cross section solid	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	12 mm
Screw thread	M3

## LED signaling

Status display	2 x green LEDs
Operating voltage display	1 x green LED

## Dimensions

Width	6.8 mm
Height	93.1 mm
Depth	102.5 mm

## Material specifications

Housing material	PBT
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## Characteristics

### Safety data

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

Category	1 (up to Cat. 4 depending on the application)
Performance level (PL)	c (up to PL e depending on the application)

### Safety data: IEC 61508 - High demand

Safety Integrity Level (SIL)	1 (up to SIL 3 depending on the application)
Probability of a hazardous failure per hour (PFH <sub>D</sub> )	1.5 x 10 <sup>-9</sup> (4 A DC13; 5 A AC15; 8760 switching cycles/year)
Proof test interval	240 Months
Duration of use	240 Months

### Safety data: IEC 61508 - Low demand

Safety Integrity Level (SIL)	1 (up to SIL 3 depending on the application)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	1.47 x 10 <sup>-4</sup>
Proof test interval	60 Months
Duration of use	240 Months

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Min. degree of protection of inst. location	IP54

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Ambient temperature (operation)	-40 °C ... 60 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °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

## Approval data

CE

Certificate	CE-compliant
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## Standards and regulations

Air clearances and creepage distances between the power circuits

Standards/regulations	EN 60947-1
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## Mounting

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

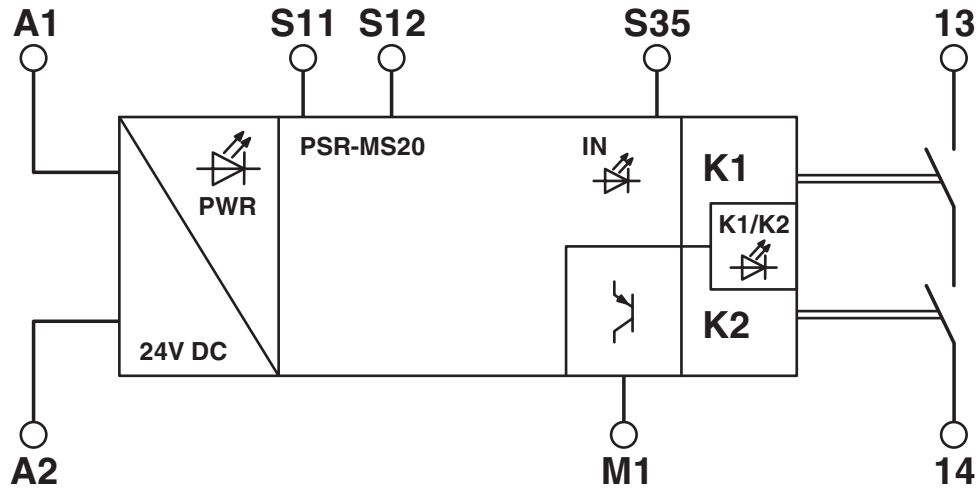
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## Drawings

Block diagram



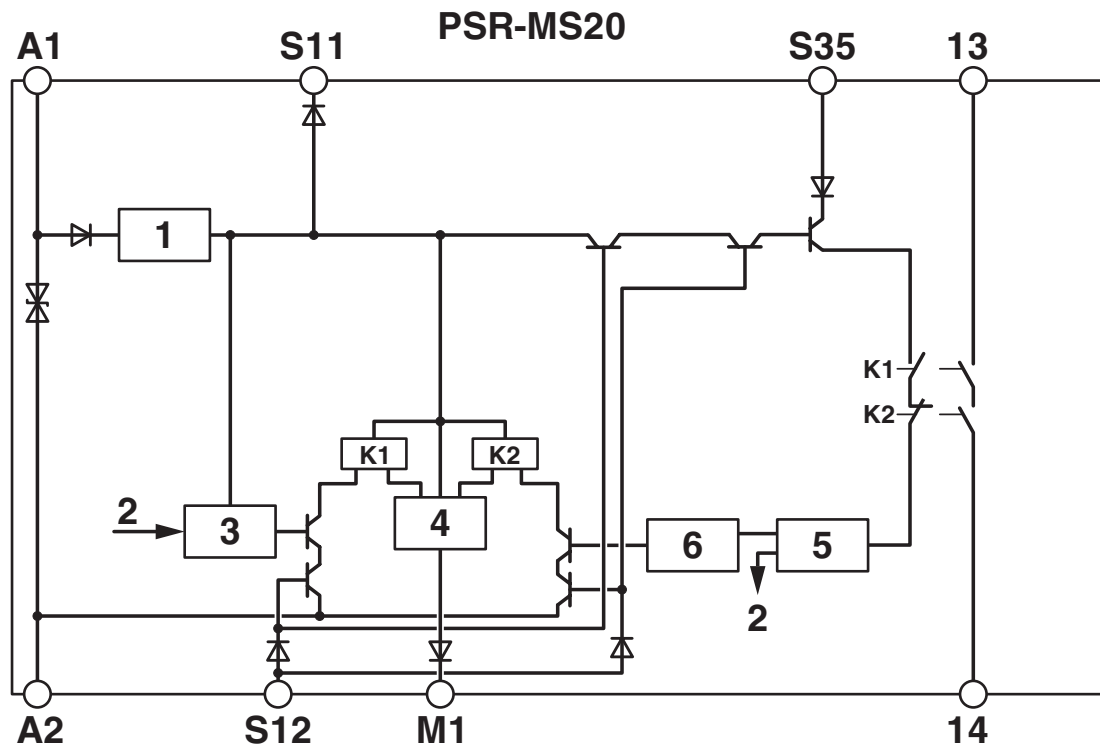
Block diagram

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2904950

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Block diagram



## Key:

- 1 = Voltage limitation
- 2 = Channel 1
- 3 = Control circuit channel 1
- 4 = Control circuit signal output
- 5 = Start channel 1 and 2
- 6 = Control circuit channel 2
- K1, K2 = Force-guided elementary relays

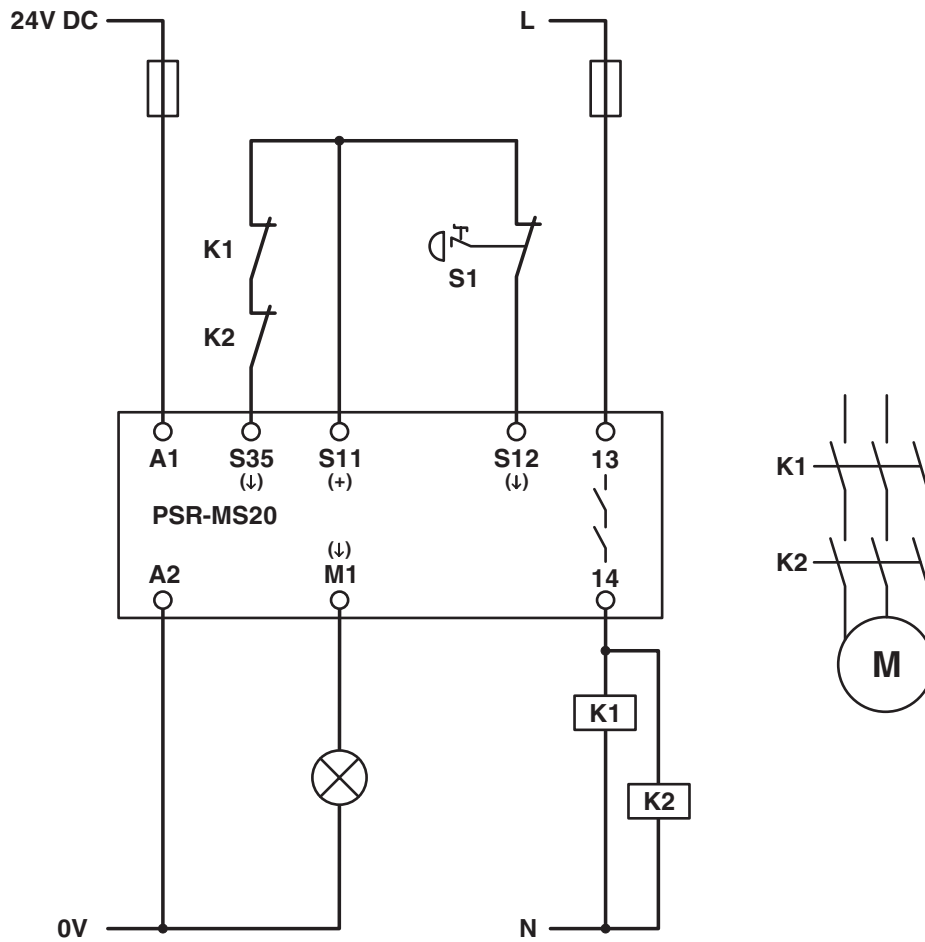
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Application drawing



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## Approvals



### EAC

Approval ID: RU C-DE.A\*30.B.01082



### UL Listed

Approval ID: FILE E 140324



### cUL Listed

Approval ID: FILE E 140324



### Functional Safety

Approval ID: 44-205-13755202



### Functional Safety

Approval ID: 44-780-13755207

cULus Listed

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## Classifications

### ECLASS

ECLASS-9.0	27371819
ECLASS-10.0.1	27371819
ECLASS-11.0	27371819

### ETIM

ETIM 8.0	EC001449
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### UNSPSC

UNSPSC 21.0	39122200
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## Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For information on hazardous substances, refer to the manufacturer's declaration available under "Downloads"

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## Accessories

### Zack Marker strip, flat

Zack Marker strip, flat - ZBF 6:UNBEDRUCKT - 0808710

<https://www.phoenixcontact.com/de/produkte/0808710>



Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: PLOTMARK, CMS-P1-PLOTTER, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 5.15 x 6.15 mm, Number of individual labels: 10

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