

PSR-MM20-2NO-1DO-24DC-SC - Safety relay module



2702374

<https://www.phoenixcontact.com/us/products/2702374>

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Safety relay module for speed or zero-speed monitoring up to SIL 3, Cat. 4, PL e, suitable for connecting two proximity switches, pluggable screw terminal block, width: 17.5 mm

Product description

The locally configurable safety relay module is used for monitoring the zero-speed and speed of moving parts in systems and machines. To monitor movement, the safety relay module evaluates the signals of proximity switches.

Your advantages

- Up to Cat. 4/PL e in accordance with EN ISO 13849-1, SIL 3 in accordance with EN IEC 62061, SIL 3 in accordance with IEC 61508
- Compatible with 3-wire proximity switches for motion monitoring
- Locally configurable
- Individually adjustable switching threshold in the range 0.5 Hz ... 315 Hz
- Low housing width of just 17.5 mm

Commercial data

Item number	2702374
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN01
Product key	DNA241
GTIN	4055626138145
Weight per piece (including packing)	170.81 g
Weight per piece (excluding packing)	140.88 g
Customs tariff number	85371098
Country of origin	DE

Technical data

Product properties

Product type	Safety device
Application	Zero-speed safety relay
	Over-speed safety relay
Control	2-channel
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	See Section "Maximum response time".
Response time	See Section "Maximum response time".
Typical release time	25 ms (When requested via A1; applicative deactivation via A1/A2 is not permitted)
Restart time	2.5 s (Boot time)
Start pulse length	min. 200 ms (manual start)
	max. 10 s (manual start)

Electrical properties

Maximum power dissipation for nominal condition	4 W ($U_B = 30\text{ V}$, $I_L = 6\text{ A}$)
Nominal operating mode	100% operating factor
Interfaces	Proximity switches
Rated insulation voltage	250 V
Rated surge voltage/insulation	See data sheet, section "Insulation coordination".

Supply

Designation	A1/A2
Rated control circuit supply voltage U_S	24 V DC -20 % / +25 %
Rated control supply current I_S	typ. 70 mA
Power consumption at U_S	typ. 1.7 W
Inrush current	< 6 A ($\Delta t = 1\text{ ms}$ at U_S)
Filter time	1 ms (in the event of voltage dips)
Protective circuit	Serial protection against polarity reversal; Suppressor diode
Protection	1 A (slow-blow, required externally)

Input data

Digital: Start circuit (S34)

Description of the input	Non-safety-related, current sinking
	IEC 61131-2 type 3
Number of inputs	1

PSR-MM20-2NO-1DO-24DC-SC - Safety relay module



2702374

<https://www.phoenixcontact.com/us/products/2702374>

Input voltage range "0" signal	0 V DC ... 5 V DC
Input voltage range "1" signal	11 V DC ... 30 V DC
Input current range "0" signal	0 mA ... 1.5 mA
Max. permissible overall conductor resistance	150 Ω
Protective circuit	Suppressor diode
Current consumption	typ. 3 mA (at U_S)

Measurement

Input name	Proximity switch inputs
	IN1, IN2
Description of the input	Safety-related, current sinking/current sourcing
Number of inputs	2
Input voltage range "0" signal	Open circuit
Input voltage range "1" signal	15 V ... 30 V (Current, inward)
	0 V ... 2 V (Current, outward)
Input current range "0" signal	Open circuit
Precision	$\pm 2\%$ (in reference to the parameterized limit value)
Limit frequency	max. 4 kHz (Minimum pulse duration: 45 μ s)
	min. 0.1 Hz (Minimum pulse duration: 45 μ s)
Duty factor	5 % ... 95 % (Push-pull operation, observe minimum pulse duration)
	55 % ... 95 % (PNP operation, observe minimum pulse duration)
Hysteresis	20 %
Pulse width	45 μ s (Minimum pulse duration)
Max. permissible overall conductor resistance	150 Ω
Protective circuit	Suppressor diode
Current consumption	5 mA (Current, inward)
	-7 mA (Current, outward)

Output data

Relay: Enabling current paths (13/14, 23/24)

Output description	1 N/O contact each, safety-related, floating
Number of outputs	2
Contact switching type	2 enabling current paths
Contact material	AgSnO ₂
Switching voltage	min. 12 V AC/DC
	max. 250 V AC/DC
Switching power	min. 36 mW
Inrush current	min. 3 mA
	max. 6 A
Switching capacity	4 A (24 V (DC13))
	2 A (250 V (AC15))
Limiting continuous current	6 A
Sq. Total current	72 A ² (observe derating)

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Switching frequency	0.1 Hz
Mechanical service life	10x 10 ⁶ cycles
Output fuse	6 A gL/gG

Signal: Digital signal output (MO)

Output description	non-safety-related
	PNP
Number of outputs	1
Voltage	approx. 22 V DC ($U_s - 2 \text{ V}$)
Current	max. 100 mA
Maximum inrush current	500 mA ($\Delta t = 100 \text{ ms}$ at U_s)
Ohmic load	min. 240 Ω
Switching frequency	0.1 Hz (Resistive load)
Protective circuit	Suppressor diode
Short-circuit protection	Yes
Discharging circuit	no

Signal: Analog signal output (AO+, AO-)

Output description	non-safety-related
	Analog
	Requirements on the connecting cables: 2-conductor, shielded, twisted pair
Number of outputs	1
Output voltage range	0 V ... 10.5 V $\pm 100 \text{ mV}$ (The tolerance may be greater under EMC influence)
Load/output load voltage output	$\geq 2 \text{ k}\Omega$
Protective circuit	Suppressor diode
Short-circuit protection	Yes
Signal rise time	1 ms ($R_L = 2 \text{ k}\Omega$, jump from 0 V to 10.5 V)
Control interval time	10 ms
Control time	max. 200 ms (For an accuracy of $\pm 500 \text{ mV}$)
	max. 400 ms (For an accuracy of $\pm 100 \text{ mV}$)
Max. permissible overall conductor resistance	6 Ω

Connection data

Connection technology

pluggable	yes
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Conductor connection

Connection method	Screw connection
Conductor cross-section rigid	0.2 mm ² ... 2.5 mm ²
Conductor cross-section flexible	0.2 mm ² ... 2.5 mm ²
Conductor cross-section AWG	24 ... 12
Stripping length	7 mm
Screw thread	M3

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2702374

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Tightening torque	0.5 Nm ... 0.6 Nm
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Signaling

Status display	6 x LED (green, red)
Operating voltage display	1 x LED (green, red)

Dimensions

Width	17.5 mm
Height	112.2 mm
Depth	114.5 mm

Material specifications

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

Characteristics

Safety data

Stop category (EN 60204-1)	0
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Safety data: EN ISO 13849

Performance level (PL)	e (4 A DC13, 1095 switching cycles/year or 2 A DC13, 2 A AC15, 8760 switching cycles/year)
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Safety data: IEC 61508 - High 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)	-25 °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

Approvals

CE

Certificate	CE-compliant
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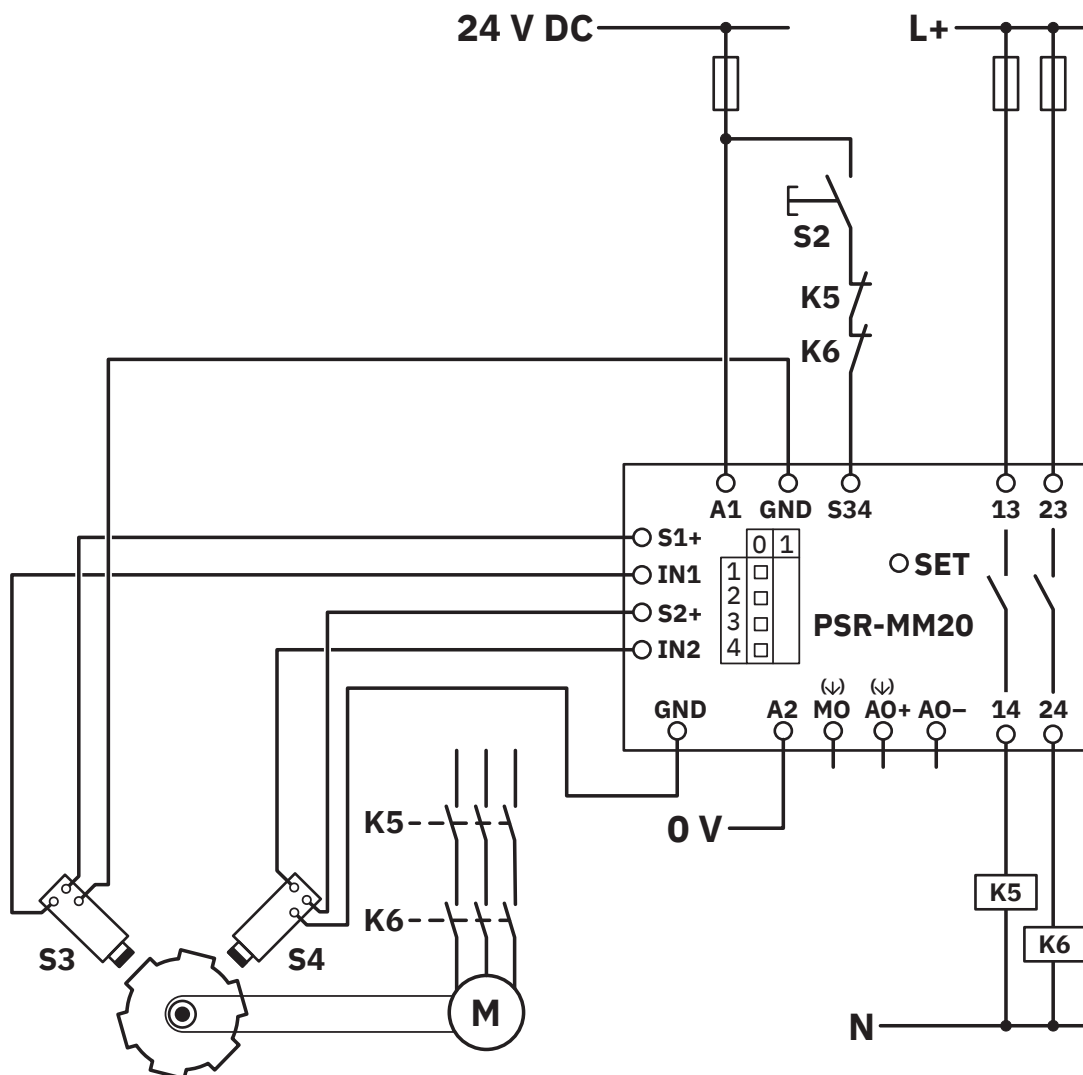
<https://www.phoenixcontact.com/us/products/2702374>

Mounting

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

Drawings

Circuit diagram



Example application

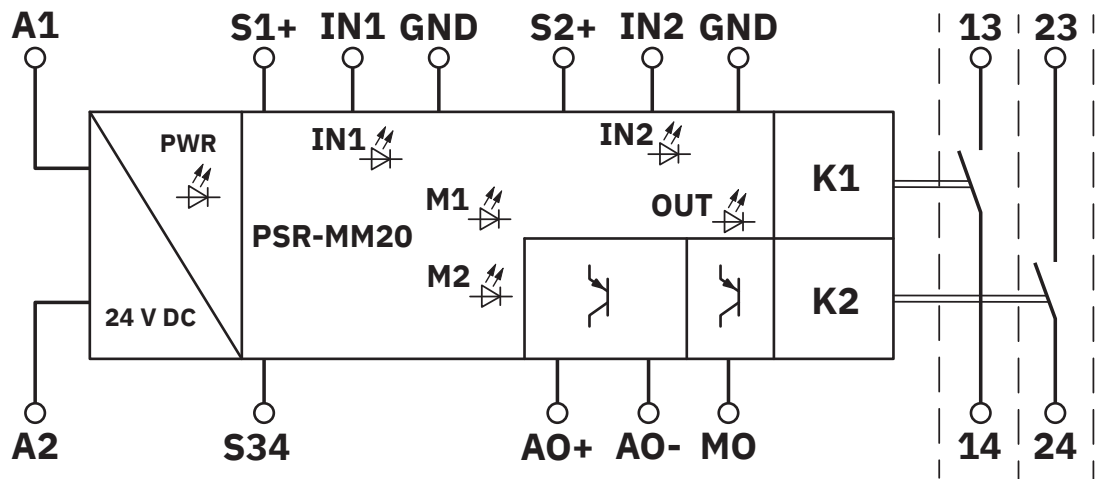
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Block diagram



Block diagram

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Approvals

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cULus Listed

Approval ID: E140324



Functional Safety

Approval ID: 4420515124322



Functional Safety

Approval ID: 4478015124323

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Classifications

ECLASS

ECLASS-13.0	27371811
ECLASS-15.0	27371811
ECLASS-15.0 ASSET	27250101

ETIM

ETIM 10.0	EC001448
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UNSPSC

UNSPSC 21.0	39122331
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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)
	2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol(CAS: 79-94-7)

EF3.1 Climate Change

CO2e kg	28.44 kg CO2e
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