

PSR-MS50-1NO-1DO-24DC-SC - Safety relays



2904956

<https://www.phoenixcontact.com/us/products/2904956>

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Safety relay for monitoring non-equivalent signal generators up to SIL 3, Cat. 4, PL e, 2-channel, non-equivalent operation, automatic start, 1 enabling current path, $U_S = 24 \text{ V DC}$, fixed screw terminal block

Your advantages

- Up to Cat. 4/PL e in accordance with EN ISO 13849-1, SIL 3 in accordance with EN IEC 62061
- Low housing width of just 6.8 mm
- Two-channel non-equivalent control
- 1 enabling current path, 1 digital signal output
- Automatic activation

Commercial data

Item number	2904956
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN01
Product key	DNA171
GTIN	4046356904063
Weight per piece (including packing)	78.3 g
Weight per piece (excluding packing)	69 g
Customs tariff number	85371098
Country of origin	DE

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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	PSRmini
Application	Antivalent signal generator Safety door Magnetic switch
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	< 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 and S13.)
Restart time	1 s (Boot time, after switching on the supply voltage)
Recovery time	< 500 ms

Electrical properties

Maximum power dissipation for nominal condition	3 W ($U_S = 26.4$ V, $I_L^2 = 36$ A ² , $P_{Total\ max} = 1.2$ W + 1.8 W)
Nominal operating mode	100% operating factor
Rated insulation voltage	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 ($\Delta t < 120$ μ 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 Serial protection against polarity reversal

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Input data

Digital: Sensor circuit (S12, S13)

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 voltage range "1" signal	20.4 V DC ... 26.4 V DC
Input current range "0" signal	0 mA ... 2 mA (for safe Off; at S12)
Inrush current	< 20 mA (typ. with U_S)
Filter time	max. 1.5 ms (Test pulse width of low test pulses)
	Test pulse rate = 5 x Test pulse width
Max. permissible overall conductor resistance	150 Ω
Protective circuit	Suppressor diode
Current consumption	< 5 mA (with U_S/I_x to S12)
	< 5 mA (with U_S/I_x to S13)

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 switching type	1 enabling current path
Contact material	AgSnO ₂
Switching voltage	min. 12 V AC/DC
	max. 250 V AC/DC
Switching power	min. 60 mW
Inrush current	min. 3 mA
	max. 6 A
Switching capacity	5 A (AC15)
	4 A (DC13)
Limiting continuous current	6 A
Sq. Total current	36 A ² (observe derating)
Switching frequency	max. 0.1 Hz
Mechanical service life	10x 10 ⁶ cycles
Output fuse	6 A gL/gG
	4 A gL/gG (for low-demand applications)

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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 ($\Delta t = 1 \text{ ms}$ at U_s)
Protective circuit	Suppressor diode

Connection data

Connection technology

pluggable	no
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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	26 ... 12
Stripping length	12 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	6.8 mm
Height	93.1 mm
Depth	102.5 mm

Material specifications

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

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; 5 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: IEC 61508 - Low demand

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

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Min. degree of protection of inst. location	IP54
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, amplitude 0.15 mm, 2g

Approvals

CE

Certificate	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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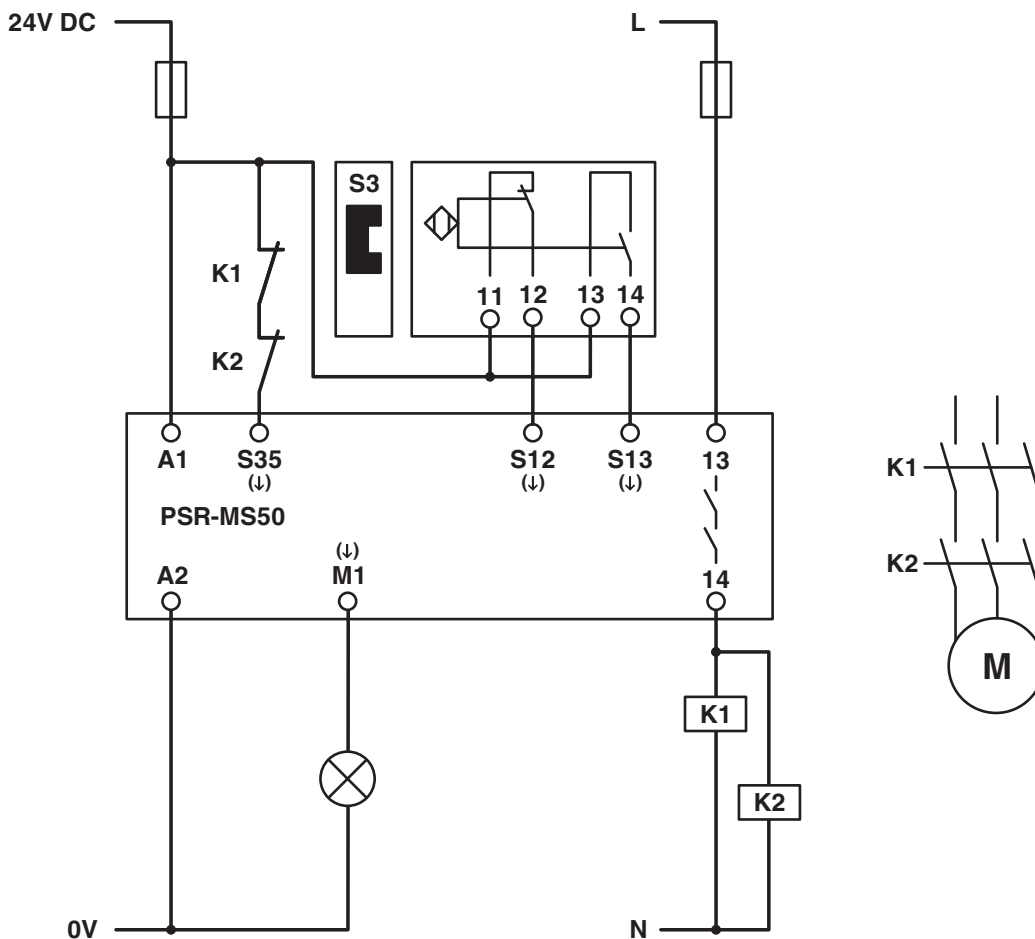


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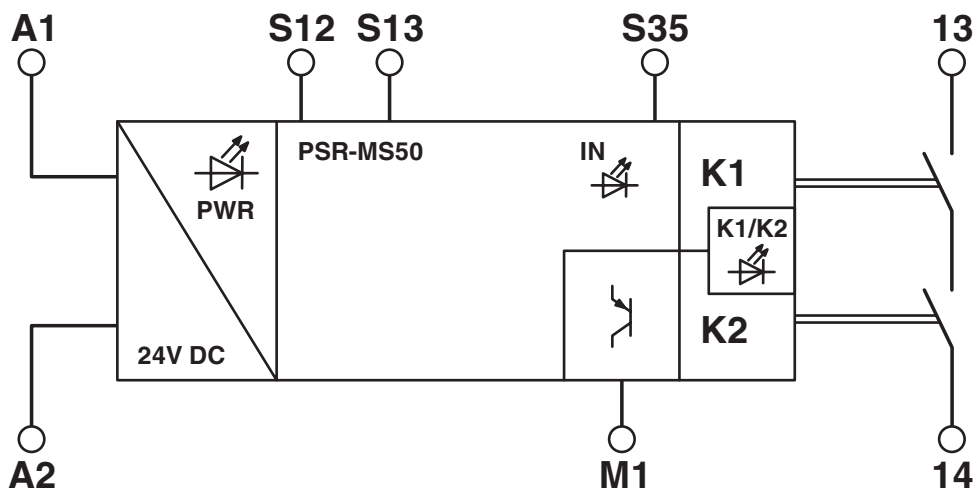
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Drawings

Circuit diagram

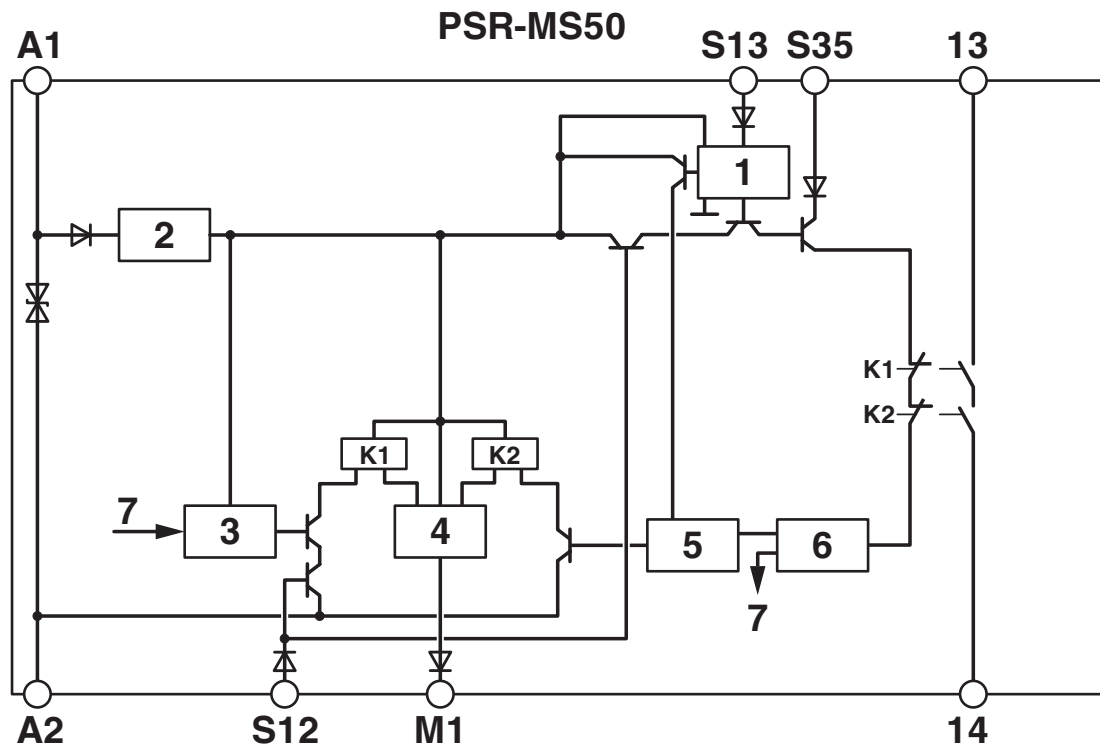


Block diagram



Block diagram

Block diagram



Key:

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

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Approvals

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Functional Safety

Approval ID: 44 205 13755202



cULus Listed

Approval ID: E140324



Functional Safety

Approval ID: 44 780 13755207

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Classifications

ECLASS

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

ETIM

ETIM 10.0	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	a233516c-6027-43fb-bf3a-16cc5cb48c5d

EF3.1 Climate Change

CO2e kg	11.859 kg CO2e
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