

# PSR-MC50-3NO-1DO-24DC-SC - Safety relays



2700553

<https://www.phoenixcontact.com/ae/products/2700553>

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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 or manual, monitored start, 3 enabling current paths,  $U_S = 24 \text{ V DC}$ , plug-in 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 12.5 mm
- Two-channel non-equivalent control
- 3 enabling current paths, 1 digital signal output
- Manually monitored and automatic activation in a single device

## Commercial data

Item number	2700553
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DNA
Product key	DNA181
Catalog page	Page 224 (C-6-2019)
GTIN	4046356912747
Weight per piece (including packing)	182 g
Weight per piece (excluding packing)	176.3 g
Customs tariff number	85371098
Country of origin	DE

## Technical data

### Product properties

Product type	Safety relays
Product family	PSRmini
Application	Antivalent signal generator
	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 (automatic start)
	< 175 ms (manual, monitored start)
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.)
Recovery time	< 500 ms

### Electrical properties

Maximum power dissipation for nominal condition	4.8 W ( $U_S = 26.4$ V, $I_L^2 = 48$ A <sup>2</sup> , $P_{Total\ max} = 2.4$ W + 2.4 W)
Nominal operating mode	100% operating factor

### 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 (13/14) and enabling current path (23/24) and enabling current path (33/34) 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. 80 mA
Power consumption at $U_S$	typ. 1.92 W
Inrush current	5 A ( $\Delta t = 200$ $\mu$ 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 (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)

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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)
	< 5 mA (with $U_s/I_x$ to S13)
Filter time	max. 1.5 ms (at S12, S13; test pulse width)
	min. 7.5 ms (at S12, S13; test pulse rate)
	Test pulse rate = 5 x Test pulse width
Max. permissible overall conductor resistance	150 $\Omega$
Current consumption	< 5 mA (with $U_s/I_x$ to S12)
	< 5 mA (with $U_s/I_x$ to S13)

## Digital: Start circuit (S34)

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	typ. 200 mA
Max. permissible overall conductor resistance	150 $\Omega$
Protective circuit	Suppressor diode
Current consumption	< 10 mA (at S34/24 V)
	> -5 mA (at S34/0 V)

## Output data

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

Output description	safety-related N/O contacts
Number of outputs	3 (undelayed)
Contact switching type	3 enabling current paths
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	48 A <sup>2</sup> (observe derating)
Switching frequency	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 $U_s$ )

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Short-circuit protection	no
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## 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

## Signaling

Status display	3 x green LED
Operating voltage display	1 x green LED

## Dimensions

Width	12.5 mm
Height	112.2 mm
Depth	114.5 mm

## Material specifications

Housing material	Polyamide
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## Characteristics

### Safety data

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

Category	4
Performance level (PL)	e (4 A DC13; 5 A AC15; 8760 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
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Min. degree of protection of inst. location	IP54
Ambient temperature (operation)	-40 °C ... 55 °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

Identification	CE-compliant
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## Standards and regulations

Air clearances and creepage distances between the power circuits

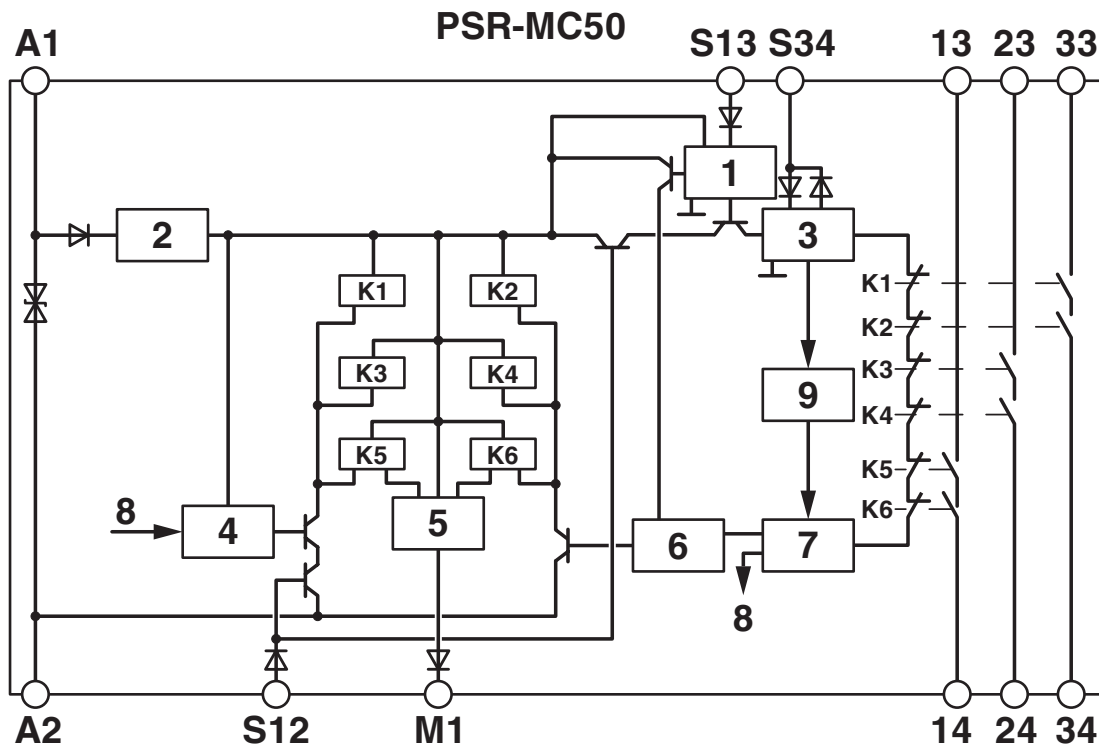
Standards/regulations	EN 60947-1
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## Mounting

Mounting type	DIN rail mounting
Assembly instructions	See derating curve
Mounting position	vertical or horizontal
Connection method	Screw connection

Drawings

Block diagram



Key:

- 1 = Input circuit
- 2 = Voltage limitation
- 3 = Start circuit
- 4 = Control circuit channel 1
- 5 = Control circuit signal output
- 6 = Control circuit channel 2
- 7 = Start channel 1 and 2
- 8 = Channel 1
- 9 = Diagnostics
- K1, K2 ... K6 = Force-guided elementary relays

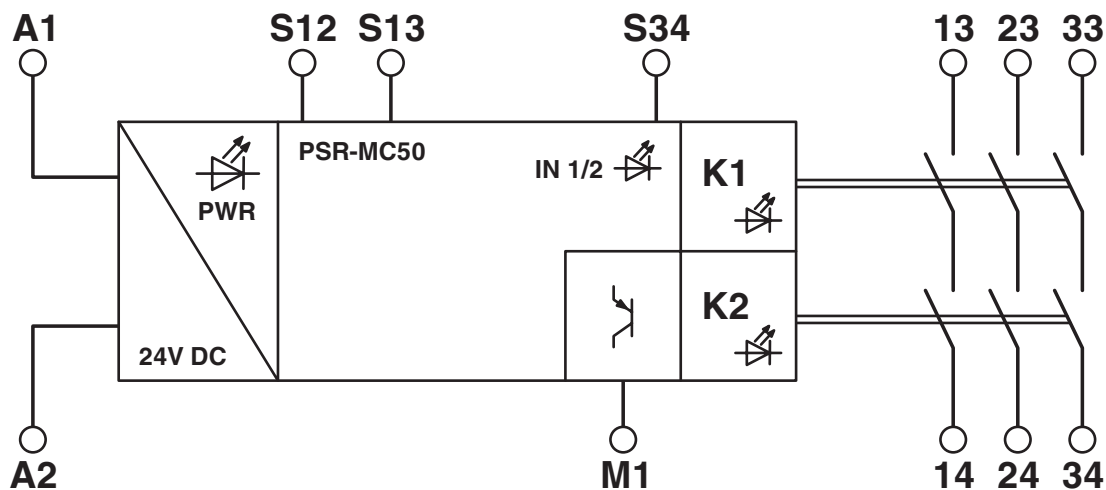
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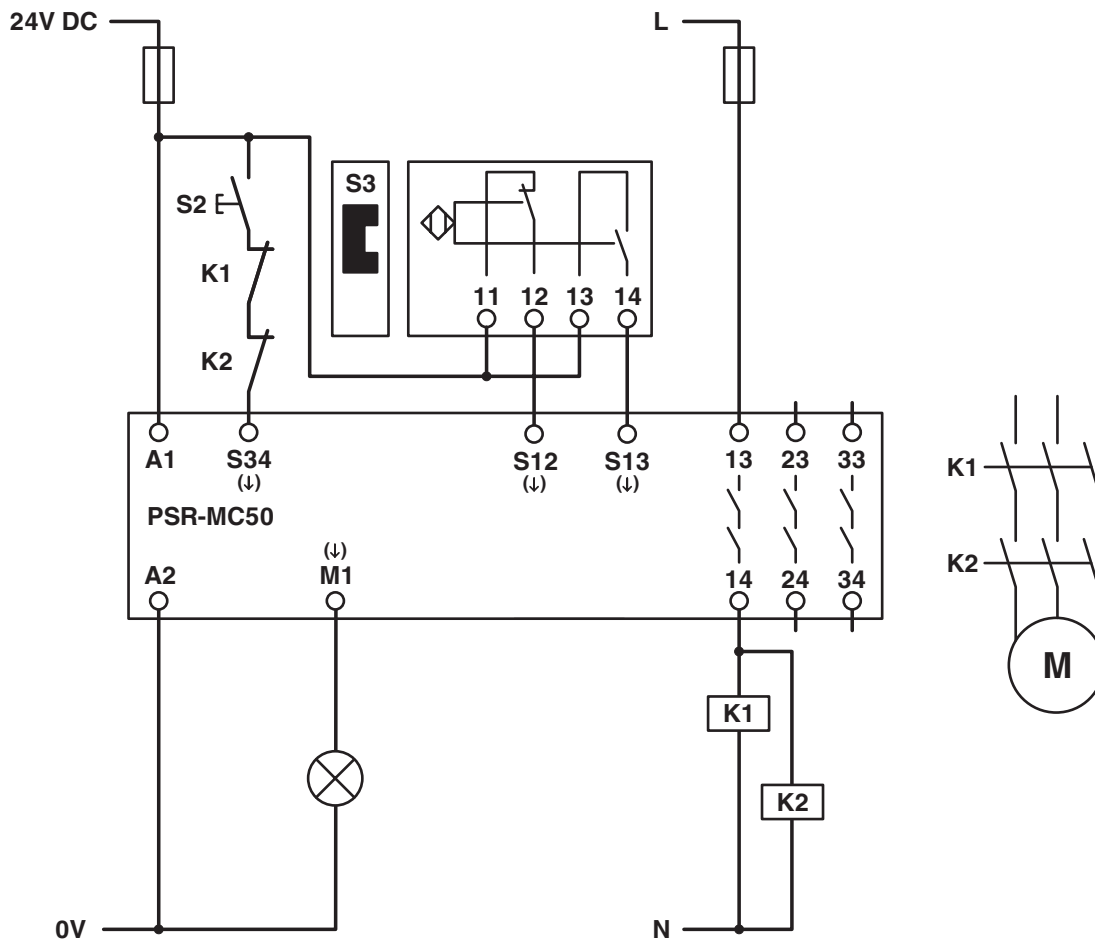
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Block diagram



Block diagram

Circuit diagram



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## Approvals

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### 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: 44-205-13755201



### Functional Safety

Approval ID: 44-780-13755201

### cULus Listed



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## Classifications

### ECLASS

ECLASS-11.0	27371819
ECLASS-13.0	27371819
ECLASS-12.0	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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