

## Safety relays - PSR-MC50-3NO-1DO-24DC-SP - 2700564

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Safety relay for monitoring non-equivalent signal generators up to SILCL 3, Cat. 4, PL e, 2-channel, non-equivalent operation, automatic or manual, monitored start, 3 enabling current paths,  $U_s = 24\text{ V DC}$ , pluggable Push-in terminal block


The figure shows a version with a screw connection

### Your advantages

- ✓ Up to Cat.4/PL e according to ISO 13849-1, SILCL 3 according to 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
- ✓ Time saving push-in connection, tools not required
- ✓ Potentials can be easily looped through – ideal for BUS applications
- ✓ Intuitive use through colour coded actuation lever
- ✓ Can be combined with the MSTB 2,5 range
- ✓ Quick and convenient testing using integrated test option



### Key Commercial Data

Packing unit	1 pc
GTIN	 4 046356 912679
GTIN	4046356912679
Weight per Piece (excluding packing)	170.800 g
Custom tariff number	85371098
Country of origin	Germany

### Technical data

Note

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## Technical data

### Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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### Dimensions

Width	12.5 mm
Height	116.6 mm
Depth	114.5 mm

### Ambient conditions

Ambient temperature (operation)	-40 °C ... 55 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Max. permissible relative humidity (operation)	75 % (on average, 85% infrequently, non-condensing)
Max. permissible humidity (storage/transport)	75 % (on average, 85% infrequently, non-condensing)
Maximum altitude	≤ 2000 m (Above sea level)

### Power supply

Designation	A1/A2
Rated control circuit supply voltage $U_s$	24 V DC -15 % / +10 %
	20.4 V DC ... 26.4 V DC
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

### Digital inputs

Input name	Sensor circuit
	S12, S13
Description of the input	safety-related sensor inputs
	NPN
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)
	< 5 mA (with $U_s/I_x$ to S13)
Current consumption	< 5 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 $\Omega$
Input name	Start circuit
	S34

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### Digital inputs

Description of the input	non-safety-related
	NPN/PNP
Number of inputs	1
Input voltage range "1" signal	20.4 V DC ... 26.4 V DC
Inrush current	typ. 200 mA
Current consumption	< 10 mA ()
	> -5 mA ()
Max. permissible overall conductor resistance	150 Ω
Protective circuit/component	Suppressor diode

### Relay outputs: enabling current path

Output name	Enabling current paths
	13/14, 23/24, 33/34
Output description	safety-related N/O contacts
Number of outputs	3 (undelayed)
Contact 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)
Limiting continuous current	6 A (observe derating)
Inrush current	min. 3 mA
	max. 6 A
Sq. Total current	48 A <sup>2</sup> (observe derating)
Switching capacity	min. 60 mW
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)

### Alarm outputs

Designation	M1
Output description	non-safety-related
Number of outputs	1 (digital, PNP)
Voltage	22 V DC (U <sub>s</sub> - 2 V)
Current	max. 100 mA
Maximum inrush current	500 mA (Δt = 1 ms at U <sub>s</sub> )
Short-circuit protection	no

### Times

Typical pickup time at US	< 250 ms (when controlled via A1)
Typical response time at US	< 175 ms (automatic start)
	< 175 ms (manual, monitored start)

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### Times

Typical release time at US	< 20 ms (when controlled via A1 or S12 and S13.)
Recovery time	< 500 ms

### General

Relay type	Electromechanical relay with forcibly guided contacts in accordance with IEC/EN 61810-3 (EN 50205)
Nominal operating mode	100% operating factor
Net weight	170.8 g
Mounting position	vertical or horizontal
Mounting type	DIN rail mounting
Assembly instructions	See derating curve
Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Housing material	PBT
Housing color	yellow
Operating voltage display	1 x green LED
Status display	3 x green LED

### Connection capacity

Connection method	Push-in spring connection
pluggable	Yes
Conductor cross section solid	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross section AWG / kcmil	24 ... 16
Conductor cross section flexible, with ferrule without plastic sleeve	0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> (only together with CRIMPFOX 6)
Conductor cross section, flexible, with ferrule, with plastic sleeve	0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> (only together with CRIMPFOX 6)
Stripping length	8 mm

### Safety-related characteristic data

Stop category	0
Designation	IEC 61508 - High demand
Safety Integrity Level (SIL)	3
Designation	IEC 61508 - Low demand
Safety Integrity Level (SIL)	3
Designation	EN ISO 13849
Performance level (PL)	e (4 A DC13; 5 A AC15; 8760 switching cycles/year)
Category	4
Designation	EN 62061
Safety Integrity Level Claim Limit (SIL CL)	3

### Standards and Regulations

Designation	Air clearances and creepage distances between the power circuits
Standards/regulations	DIN EN 50178

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## Technical data

### Standards and Regulations

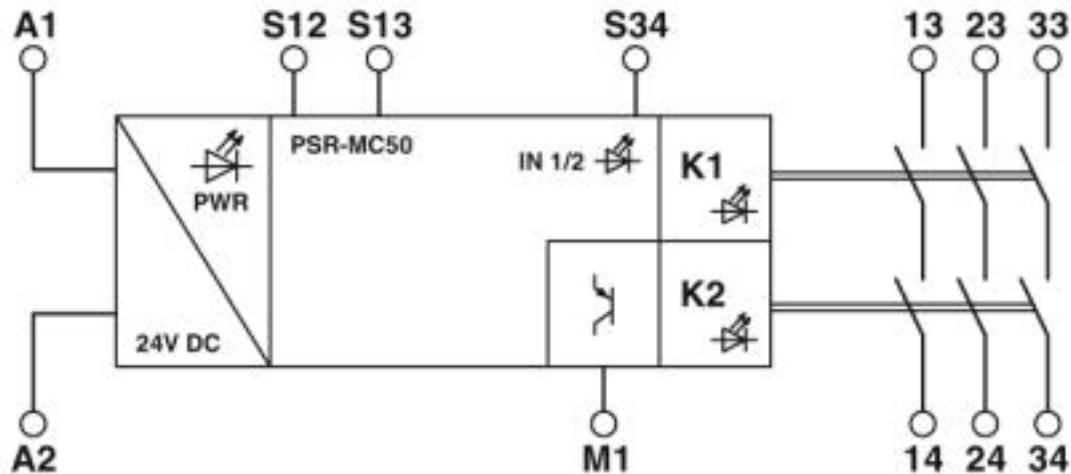
Rated insulation voltage	250 V AC
	250 V AC
Rated surge voltage/insulation	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path (13/14) and enabling current path (23/24) and enabling current path (33/34) Basic insulation 4 kV between all current paths and housing
Degree of pollution	2
Overvoltage category	III
Shock	15g
Vibration (operation)	10 Hz ... 150 Hz, 2g

### Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

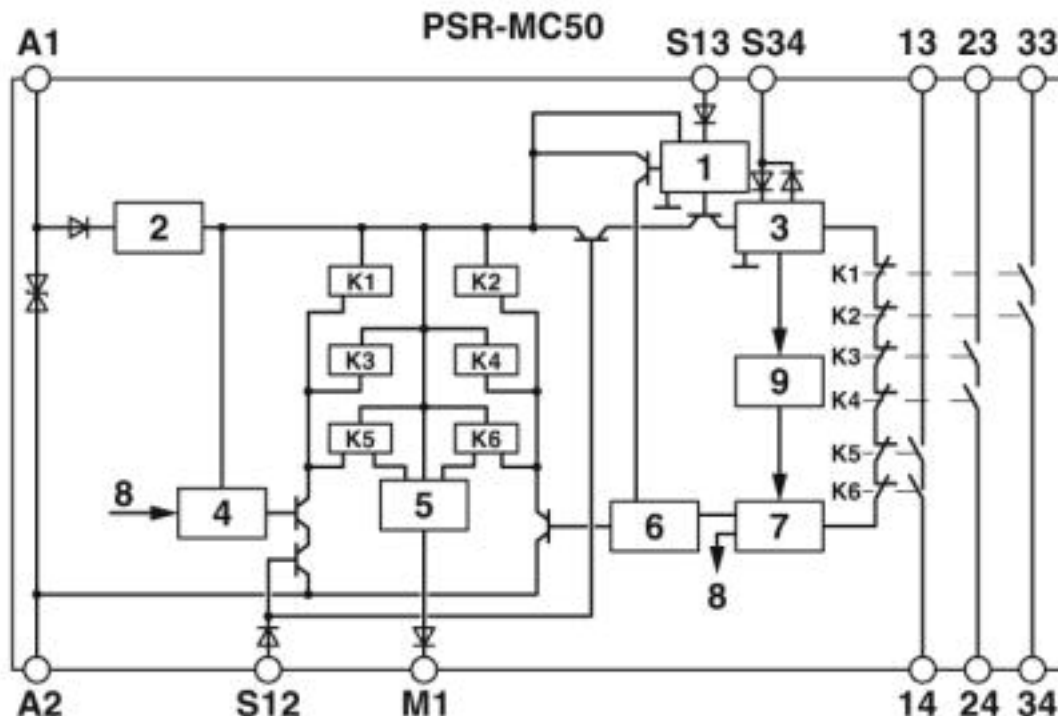
## Drawings

Block diagram



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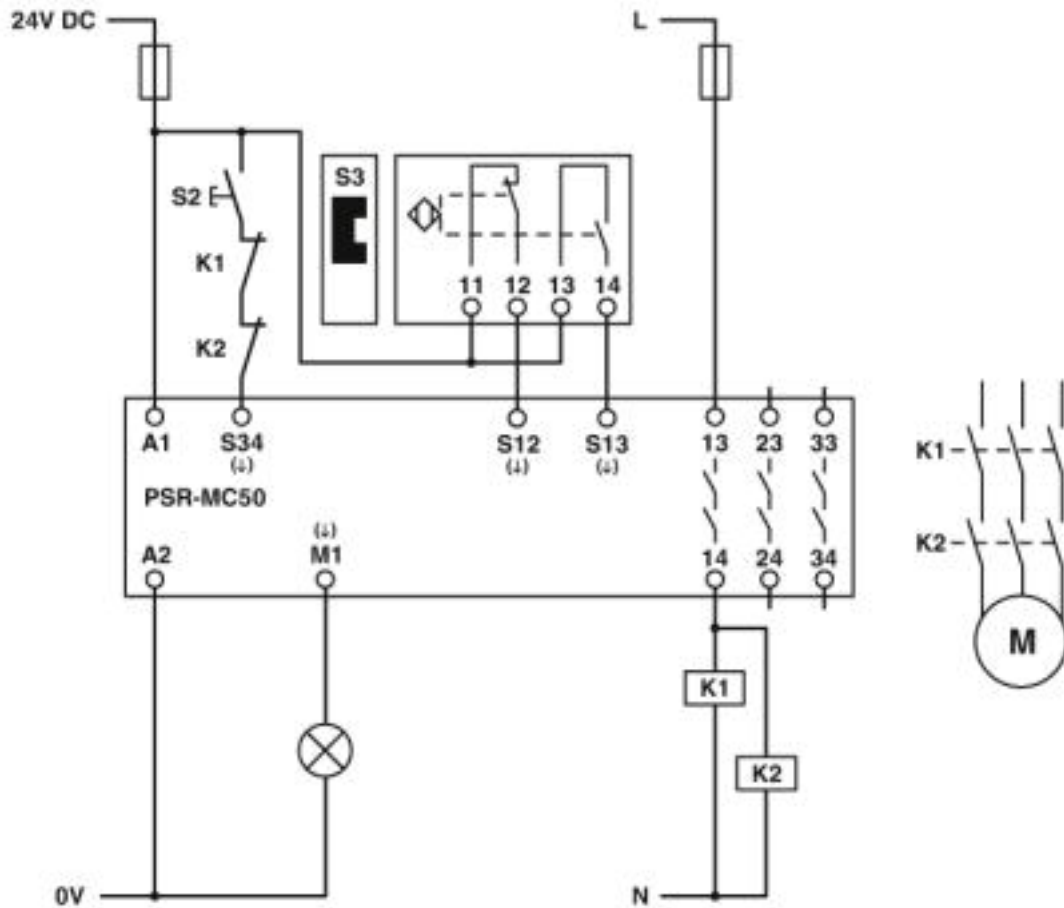
Block diagram



- 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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Circuit diagram



### Classifications

eCl@ss

eCl@ss 4.0	40020600
eCl@ss 4.1	40020600
eCl@ss 5.0	27371900
eCl@ss 5.1	27371900
eCl@ss 6.0	27371800
eCl@ss 7.0	27371819
eCl@ss 8.0	27371819
eCl@ss 9.0	27371819

ETIM

ETIM 5.0	EC001449
ETIM 6.0	EC001449
ETIM 7.0	EC001449

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## Classifications

### UNSPSC

UNSPSC 13.2	39121501
UNSPSC 18.0	39122205
UNSPSC 19.0	39122205
UNSPSC 20.0	39122205
UNSPSC 21.0	39122205

## Approvals

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#### Approvals

UL Listed / cUL Listed / Functional Safety / EAC / cULus Listed

#### Ex Approvals

### Approval details

UL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 140324
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cUL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 140324
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Functional Safety			44-205-13755201
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EAC			RU C- DE.A*30.B.01082
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cULus Listed			
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