

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



2700564

<https://www.phoenixcontact.com/us/products/2700564>

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The figure shows a version with a screw connection

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,  $U_S = 24 \text{ V DC}$ , pluggable Push-in 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                          | 2700564       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | DN01          |
| Product key                          | DNA181        |
| GTIN                                 | 4046356912679 |
| Weight per piece (including packing) | 170.8 g       |
| Weight per piece (excluding packing) | 163.8 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 |
|---------------------|-------------------------|

### Product properties

|                |  |
|----------------|--|
| Product type   | Safety relays  |
| Product family | PSRmini  |
| Application    | Antivalent signal generator<br>Safety door<br>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 (automatic start)<br>< 175 ms (manual, monitored start)         |
| Typ. starting time with $U_S$ | < 250 ms (when controlled via A1)  |
| Typical release time          | < 20 ms (on demand via the sensor circuit)<br>< 20 ms (on demand via A1) |
| Restart time                  | < 1 s (Boot time)  |
| Recovery time                 | < 500 ms   |
| Start pulse length            | $\geq$ 500 ms (manual start)   |

### 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   |
| Rated insulation voltage                        | 250 V AC  |
| Rated surge voltage/insulation                  | See data sheet, section "Insulation coordination".                                      |

### 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                  |

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|  |   |
|--|---|
|  | Serial protection against polarity reversal |
|--|---|

## 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 current range "0" signal                | 0 mA ... 2 mA (for safe Off; at S12)              |
| Inrush current                                | < 20 mA (typ. with $U_S$ at S12)                  |
|   | < 5 mA (typ. with $U_S$ at S13)                   |
| 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 $\Omega$                                      |
| Protective circuit                            | Suppressor diode                                  |
| Current consumption                           | < 5 mA (typ. with $U_S$ )                         |

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

## Output data

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

|                             |   |
|-----------------------------|---|
| Output description          | 2 N/O contacts each in series, safety-related, floating |
| 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  |
| 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           | 48 A <sup>2</sup> (observe derating)                    |
| Switching frequency         | 0.1 Hz  |
| Mechanical service life     | 10x 10 <sup>6</sup> 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 | yes |
|-----------|-----|

Conductor connection

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

## Signaling

|                           |                 |
|---------------------------|-----------------|
| Status display            | 3 x LED (green) |
| Operating voltage display | 1 x LED (green) |

## Dimensions

|        |          |
|--------|----------|
| Width  | 12.5 mm  |
| Height | 116.6 mm |
| Depth  | 114.5 mm |

## Material specifications

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

## Characteristics

Safety data

|                            |   |
|----------------------------|---|
| Stop category (EN 60204-1) | 0 |
|----------------------------|---|

Safety data: EN ISO 13849

|                        |  |
|------------------------|--|
| 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 |
|------------------------------|---|

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 ... 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, amplitude 0.15 mm, 2g             |

## Approvals

CE

|                |              |
|----------------|--------------|
| Identification | CE-compliant |
|----------------|--------------|

## Mounting

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

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

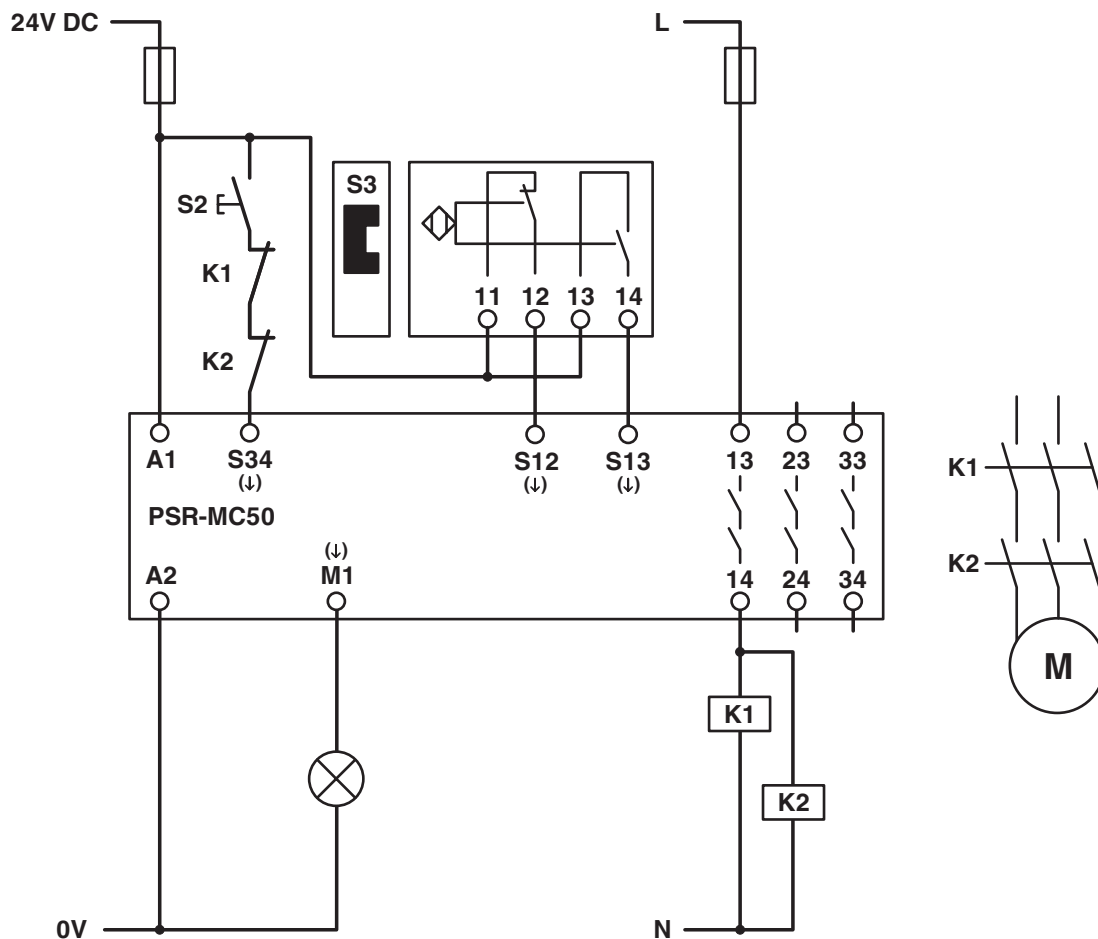


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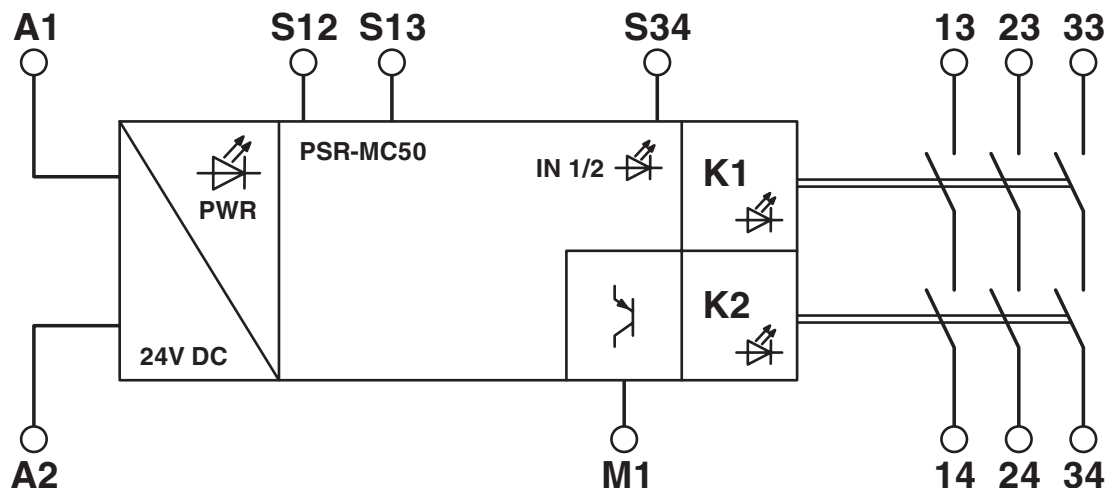
<https://www.phoenixcontact.com/us/products/2700564>

## Drawings

Circuit diagram



Block diagram



Block diagram

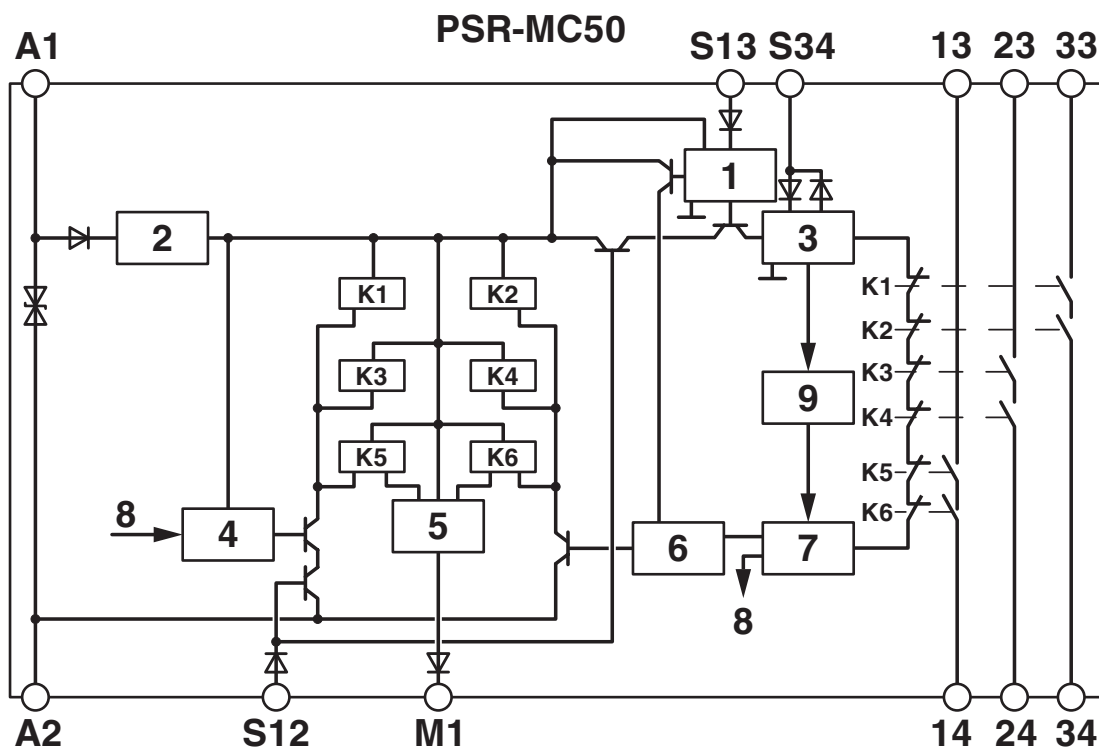
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Block diagram



**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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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2700564>



### Functional Safety

Approval ID: 44 205 13755201



### Functional Safety

Approval ID: 44 780 13755201



### cULus Listed

Approval ID: E140324

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## Classifications

### ECLASS

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

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC001449 |
|-----------|----------|

### 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                                | 31017bfe-161c-49d5-b8ed-22f9ee943fbb |

### EF3.1 Climate Change

|         |                |
|---------|----------------|
| CO2e kg | 31.115 kg CO2e |
|---------|----------------|

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