

## Safety relays - PSR-MS45-1NO-1DO-24DC-SC - 2904955

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Safety relay for emergency stop and safety doors up to SILCL 3, Cat. 4, PL e, 1 or 2-channel operation, manual, monitored start, 1 enabling current path,  $U_s = 24 \text{ V DC}$ , fixed screw terminal block

### Why buy this product

- ✓ Up to Cat.4/PL e according to ISO 13849-1, SILCL 3 according to IEC 62061
- ✓ Low housing width of just 6.8 mm
- ✓ Two-channel control
- ✓ 1 enabling current path, 1 digital signal output
- ✓ Manual and monitored activation



### Key Commercial Data

|                                      |          |
|--------------------------------------|----------|
| Packing unit                         | 1 STK    |
| Weight per Piece (excluding packing) | 80.000 g |
| Custom tariff number                 | 85371099 |
| Country of origin                    | Germany  |

### Technical data

#### Note

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

#### Dimensions

|        |          |
|--------|----------|
| Width  | 6.8 mm   |
| Height | 93.1 mm  |
| Depth  | 102.5 mm |

#### Ambient conditions

# Safety relays - PSR-MS45-1NO-1DO-24DC-SC - 2904955

## Technical data

### Ambient conditions

|  |   |
|--|---|
| Ambient temperature (operation)                | -40 °C ... 60 °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) |
| Shock  | 15g   |
| Vibration (operation)                          | 10 Hz ... 150 Hz, 2g                                |
| Maximum altitude                               | ≤ 2000 m (Above sea level)                          |

### Input data

|   |   |
|---|---|
| Rated control circuit supply voltage $U_s$    | 24 V DC -15 % / +10 %                               |
| Power consumption at $U_s$                    | typ. 1 W  |
| Rated control supply current $I_s$            | typ. 42 mA  |
| Inrush current                                | 4.5 A ( $\Delta t = 120 \mu s$ at $U_s$ )           |
| Current consumption                           | < 5 mA (with $U_s/I_x$ to S12)                      |
|   | < 5 mA (with $U_s/I_x$ to S22/ $U_s$ )              |
|   | < 10 mA (with $U_s/I_x$ at the start circuit)       |
|   | > -5 mA (with $U_s/I_x$ to S22/0V)                  |
| Voltage at input/start and feedback circuit   | 24 V DC -15 % / +10 %                               |
| Typical response time                         | < 175 ms  |
| Typical release time                          | < 20 ms (when controlled via A1 or S12 and S22.)    |
| Recovery time                                 | < 500 ms  |
| Status display                                | 2 x green LEDs                                      |
| Maximum switching frequency                   | 0.5 Hz  |
| Max. permissible overall conductor resistance | 150 $\Omega$  |
| Filter time                                   | 1 ms (at A1 in the event of voltage dips at $U_s$ ) |
|   | max. 1.5 ms (at S12, S22; test pulse width)         |
|   | min. 7.5 ms (at S12, S22; test pulse rate)          |
|   | Test pulse rate = 5 x Test pulse width              |

### Output data

|                             |                                      |
|-----------------------------|--------------------------------------|
| Contact type                | 1 enabling current path              |
| Contact material            | AgSnO <sub>2</sub>                   |
| Minimum switching voltage   | 12 V AC/DC                           |
| Maximum switching voltage   | 250 V AC/DC (Observe the load curve) |
| Limiting continuous current | 6 A (observe derating)               |
| Inrush current, minimum     | 3 mA                                 |
| Maximum inrush current      | 6 A                                  |
| Sq. Total current           | 36 A <sup>2</sup> (observe derating) |

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### Technical data

#### Output data

|                    |   |
|--------------------|---|
| Switching capacity | min. 60 mW                              |
| Output fuse        | 6 A gL/gG (N/O contact)                 |
|                    | 4 A gL/gG (for low-demand applications) |

#### Alarm outputs

|                          |   |
|--------------------------|---|
| 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 $U_s$ ) |
| Short-circuit protection | no  |

#### General

|   |  |
|---|--|
| Relay type                                  | Electromechanical relay with forcibly guided contacts in accordance with IEC/EN 61810-3 (EN 50205) |
| Mechanical service life                     | $10 \times 10^6$ cycles  |
| Nominal operating mode                      | 100% operating factor  |
| Net weight                                  | 69 g   |
| Mounting type                               | DIN rail mounting  |
| Mounting position                           | vertical or horizontal   |
| Degree of protection                        | IP20   |
| Min. degree of protection of inst. location | IP54   |
| Control                                     | one and two channel  |
| Housing material                            | PBT  |
| Housing color                               | yellow   |

#### Connection data

|                                       |                     |
|---------------------------------------|---------------------|
| Connection method                     | Screw connection    |
| pluggable                             | no                  |
| Conductor cross section solid min.    | 0.2 mm <sup>2</sup> |
| Conductor cross section solid max.    | 2.5 mm <sup>2</sup> |
| Conductor cross section flexible min. | 0.2 mm <sup>2</sup> |
| Conductor cross section flexible max. | 2.5 mm <sup>2</sup> |
| Conductor cross section AWG min.      | 26                  |
| Conductor cross section AWG max.      | 12                  |
| Stripping length                      | 12 mm               |
| Screw thread                          | M3                  |

#### Safety-related characteristic data

|               |                         |
|---------------|-------------------------|
| Stop category | 0                       |
| Designation   | IEC 61508 - High demand |

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## Technical data

### Safety-related characteristic data

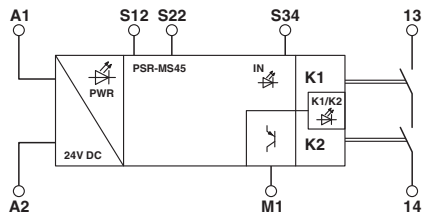
|   |  |
|---|--|
| Safety Integrity Level (SIL)                | 3  |
| Designation                                 | IEC 61508 - Low demand                             |
| Safety Integrity Level (SIL)                | 3  |
| Designation                                 | EN ISO 13849                                       |
| 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

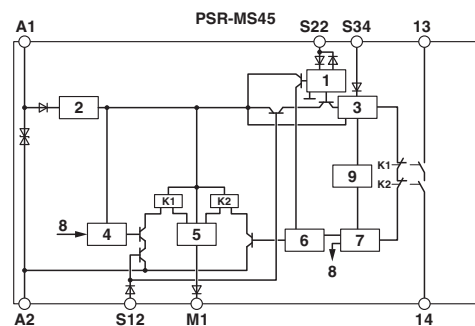
|                                |   |
|--------------------------------|---|
| Shock                          | 15g   |
| Designation                    | Air clearances and creepage distances between the power circuits  |
| Standards/regulations          | DIN EN 50178  |
| Rated insulation voltage       | 250 V AC  |
| Rated surge voltage/insulation | Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path<br>Basic insulation 4 kV between all current paths and housing |
| Degree of pollution            | 2   |
| Overvoltage category           | III   |
| Vibration (operation)          | 10 Hz ...150 Hz, 2g   |
| Conformance                    | CE-compliant  |

## Drawings

Block diagram



Block diagram

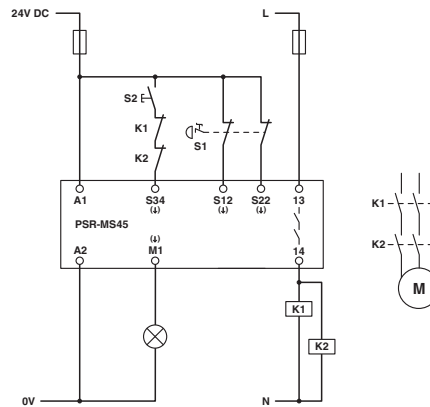


- Key:
- 1 = Input circuit
  - 2 = Voltage limitation
  - 3 = Start circuit
  - 4 = Control circuit channel 1
  - 5 = Control circuit signal output

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- 6 = Control circuit channel 2
- 7 = Start channel 1 and 2
- 8 = Channel 1
- 9 = Diagnostics
- K1, K2 = Force-guided elementary relays

Circuit diagram



## Classifications

eCl@ss

|            |          |
|------------|----------|
| eCl@ss 5.1 | 27371901 |
| eCl@ss 6.0 | 27371819 |
| eCl@ss 8.0 | 27371819 |
| eCl@ss 9.0 | 27371819 |

ETIM

|          |          |
|----------|----------|
| ETIM 5.0 | EC001449 |
|----------|----------|

## Approvals

Approvals

Approvals

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

Ex Approvals

Approval details

## Safety relays - PSR-MS45-1NO-1DO-24DC-SC - 2904955

### Approvals

UL Listed  <http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm> FILE E 140324

cUL Listed  <http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm> FILE E 140324

Functional Safety 44-205-13755202

EAC 7500651.22.01.00244

cULus Listed 