

# PSR-MC72-2NO-1DO-24DC-SC - Safety relays



2702096

<https://www.phoenixcontact.com/pc/products/2702096>

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Safety relay for emergency stop, safety doors, light grid up to SIL 3, Cat. 4, PL e, 1- or 2-channel operation, cross-circuit detection, can be retriggered, fall back/tightening delay 0.2 s ... 60 s, 2 enabling current paths,  $U_S = 24$  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
- 1- and 2-channel control
- 2 enabling current paths, 1 digital signal output
- Manually monitored and automatic activation in a single device

## Commercial data

|                                      |                     |
|--------------------------------------|---------------------|
| Item number                          | 2702096             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Product key                          | DNA181              |
| Catalog page                         | Page 226 (C-6-2019) |
| GTIN                                 | 4046356952484       |
| Weight per piece (including packing) | 165 g               |
| Weight per piece (excluding packing) | 108.98 g            |
| Customs tariff number                | 85371098            |
| Country of origin                    | DE                  |

## Technical data

### Notes

#### Utilization restriction

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

### Product properties

|                |  |
|----------------|--|
| Product type   | Safety relays  |
| Product family | PSRmini  |
| Application    | Emergency stop   |
|                | Safety door  |
|                | Light grid   |
| Relay type     | Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3 |

### Times

|                       |   |
|-----------------------|---|
| Typical response time | < 35 ms (automatic start)   |
|                       | < 30 ms (manual, monitored start)   |
| Typical release time  | < 25 ms (when controlled via S12 (only for undelayed contact 13/14))                  |
|                       | < 5 ms (when interrupted via A1; applicative deactivation via A1/A2 is not permitted) |
| Delay time range      | 0.2 s ... 60 s $\pm 5\%$ (can be set for 27/28)                                       |
| Restart time          | < 1 s (Boot time)   |

### Electrical properties

|   |  |
|---|--|
| Maximum power dissipation for nominal condition | 5.78 W (at $U_S = 30\text{ V}$ , $I_L^2 = 72\text{ A}^2$ ) |
| 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 | Basic insulation 4 kV: between all current paths and housing<br>Safe isolation, reinforced insulation 6 kV:<br>between (A1, A2, S11, S12, S21, S22, S34, M1) and enabling current path (13/14)<br>between (A1, A2, S11, S12, S21, S22, S34, M1) and enabling current path (27/28)<br>between enabling current paths |

### Supply

|  |                       |
|--|-----------------------|
| Designation                                | A1/A2                 |
| Rated control circuit supply voltage $U_S$ | 19.2 V DC ... 30 V DC |
| Rated control circuit supply voltage $U_S$ | 24 V DC -20 % / +25 % |
| Rated control supply current $I_S$         | typ. 60 mA            |
| Power consumption at $U_S$                 | typ. 1.44 W           |

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|                    |   |
|--------------------|---|
| Inrush current     | typ. 25 A ( $\Delta t = 10 \mu s$ at $U_S$ )                                  |
| Filter time        | 10 ms (For the logic. 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, S22)

|   |   |
|---|---|
| Description of the input                      | safety-related sensor inputs                    |
| Number of inputs                              | 2   |
| Input voltage range "0" signal                | 0 V DC ... 5 V DC                               |
| Input current range "0" signal                | 0 mA ... 2 mA                                   |
| Inrush current                                | < 11 mA (typically with $U_S$ )                 |
| Filter time                                   | max. 3 ms (Test pulse width of low test pulses) |
|   | min. 21 ms (Test pulse rate for low test pulse) |
|   | Test pulse rate = 7 x Test pulse width          |
| Concurrency                                   | $\infty$  |
| Limit frequency                               | min. 0 Hz                                       |
|   | max. 1 Hz                                       |
| Max. permissible overall conductor resistance | 150 $\Omega$                                    |
| Current consumption                           | < 4.1 mA (typically with $U_S$ )                |

Digital: Start circuit (S34)

|   |   |
|---|---|
| Description of the input                      | non-safety-related                              |
| Number of inputs                              | 1   |
| Inrush current                                | < 8.6 mA (typically with $U_S$ )                |
| Filter time                                   | max. 3 ms (Test pulse width of low test pulses) |
|   | min. 21 ms (Test pulse rate for low test pulse) |
|   | Test pulse rate = 7 x Test pulse width          |
| Max. permissible overall conductor resistance | 150 $\Omega$                                    |
| Voltage at input/start and feedback circuit   | 24 V DC -20 % / +25 %                           |
| Current consumption                           | < 3.2 mA (typically with $U_S$ )                |

## Output data

Relay: Enabling current paths (13/14, 27/28)

|                        |  |
|------------------------|--|
| Output description     | safety-related N/O contacts            |
| Number of outputs      | 1 (undelayed)                          |
|                        | 1 (delayed)                            |
| Contact switching type | 2 enabling current paths               |
| Contact material       | AgSnO <sub>2</sub>                     |
| Switching voltage      | min. 12 V AC/DC                        |
|                        | max. 250 V AC (Observe the load curve) |
| Switching capacity     | min. 60 mW                             |
| Inrush current         | min. 3 mA                              |

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|                             |  |
|-----------------------------|--|
|                             | max. 6 A   |
| Limiting continuous current | 6 A (observe derating)   |
| Sq. Total current           | 72 A <sup>2</sup> (observe derating)                               |
| Mechanical service life     | 10x 10 <sup>6</sup> cycles   |
| Output fuse                 | 6 A gL/gG (N/O contact)<br>4 A gL/gG (for low-demand applications) |

Signal: M1

|                          |  |
|--------------------------|--|
| Output description       | PNP<br>non-safety-related              |
| Number of outputs        | 1                                      |
| Voltage                  | approx. 23 V DC (U <sub>S</sub> - 1 V) |
| Current                  | max. 100 mA                            |
| Maximum inrush current   | 500 mA (Δt = 1 ms at U <sub>S</sub> )  |
| Short-circuit protection | Yes                                    |

## Connection data

Connection technology

|           |     |
|-----------|-----|
| pluggable | yes |
|-----------|-----|

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 | 5 x bi-color LED |
|----------------|------------------|

## Dimensions

|        |          |
|--------|----------|
| Width  | 12.5 mm  |
| Height | 112.2 mm |
| Depth  | 114.5 mm |

## Material specifications

|                  |           |
|------------------|-----------|
| Housing material | Polyamide |
|------------------|-----------|

## Characteristics

Safety data

|               |        |
|---------------|--------|
| Stop category | 0<br>1 |
|---------------|--------|

Safety data: EN ISO 13849

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|                        |   |
|------------------------|---|
| Category               | 4 |
| Performance level (PL) | e |

Safety data: IEC 61508 - High 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)                | -35 °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, 2g                                |

## Approvals

CE

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

## Standards and regulations

Air clearances and creepage distances between the power circuits

|                       |              |
|-----------------------|--------------|
| Standards/regulations | DIN EN 50178 |
|-----------------------|--------------|

## Mounting

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

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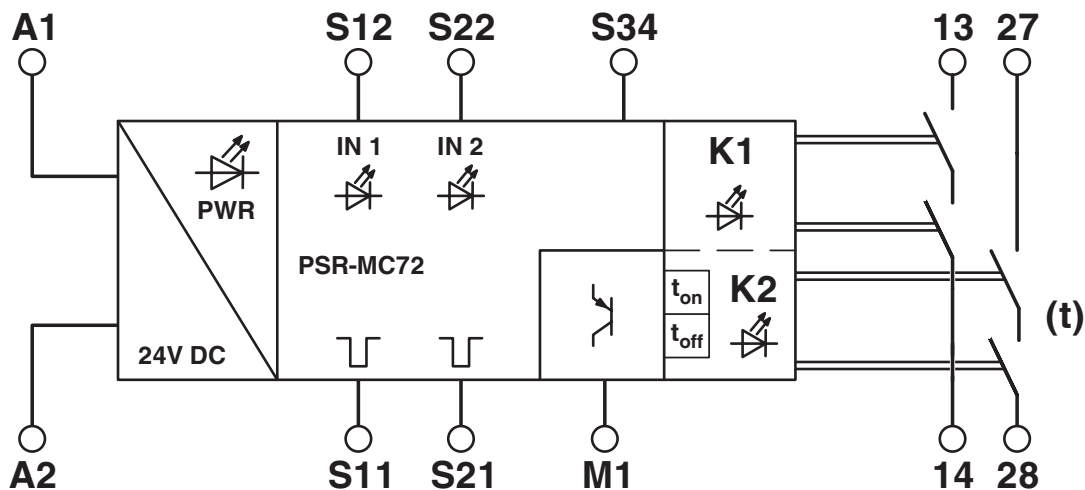


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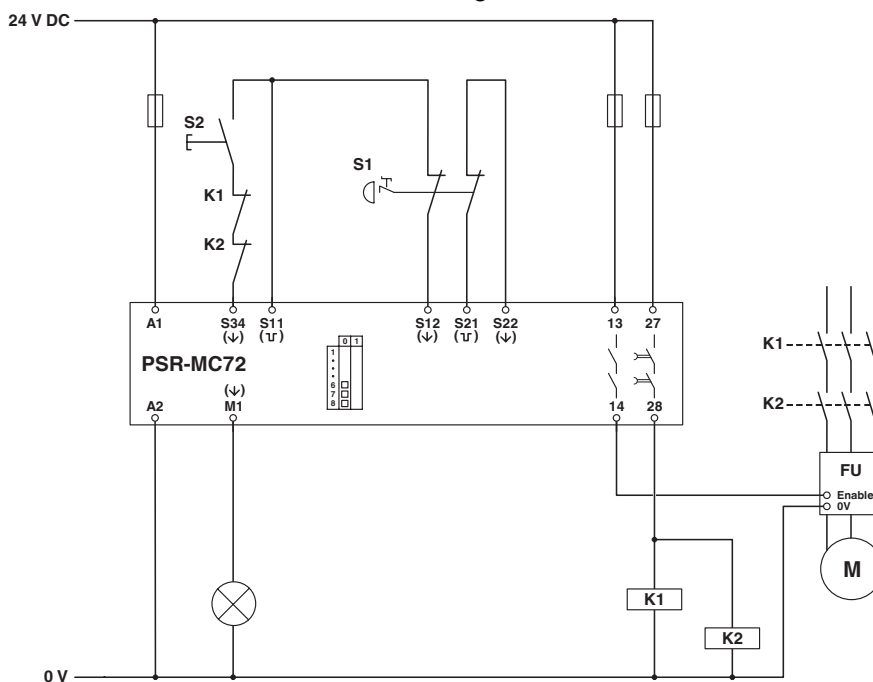
## Drawings

Block diagram



Block diagram

Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/pc/products/2702096>



### UL Listed

Approval ID: FILE E 140324



### cUL Listed

Approval ID: FILE E 140324



### Functional Safety

Approval ID: 01/205/5486.01/19

### 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 |
|----------|----------|

### 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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