

PSR-MC30-2NO-1DO-24DC-SP - Safety relays



2700499

<https://www.phoenixcontact.com/pc/products/2700499>

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Safety relay for emergency stop and safety doors up to SIL 3, Cat. 4, PL e, 1- or 2-channel operation, automatic or manual, monitored start, cross-circuit detection, 2 enabling current paths, $U_S = 24\text{ V DC}$, plug-in 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
- Cross-circuit detection
- Low housing width of just 12.5 mm
- Manually monitored and automatic activation in a single device
- 2 enabling current paths, 1 digital signal output
- 2 channel control

Commercial data

| | |
|--------------------------------------|---------------------|
| Item number | 2700499 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Product key | DNA181 |
| Catalog page | Page 221 (C-6-2019) |
| GTIN | 4046356912877 |
| Weight per piece (including packing) | 164.1 g |
| Weight per piece (excluding packing) | 155 g |
| Customs tariff number | 85371098 |
| Country of origin | DE |

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Technical data

Product properties

| | |
|-------------------------|--|
| Product type | Safety relays |
| Product family | PSRmini |
| Application | Emergency stop |
| | Safety door |
| | Solenoid switch |
| Mechanical service life | approx. 10^7 cycles |
| 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 (on demand via A1) |
| | < 20 ms (on demand via the sensor circuit) |
| Restart time | < 1 s (Boot time, after switching on the supply voltage) |
| Recovery time | < 500 ms (following demand of the safety function) |

Electrical properties

| | |
|---|---|
| Maximum power dissipation for nominal condition | 5.5 W ($U_S = 26.4$ V, $I_L^2 = 72$ A ² , $P_{\text{Total max}} = 1.9$ W + 3.6 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) 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. 65 mA (at U_S) |
| Power consumption at U_S | typ. 1.56 W |
| Inrush current | typ. 4 A ($\Delta t = 200$ μ s at U_S) |
| Filter time | 1 ms (at A1 in the event of voltage dips at U_S) |
| Protective circuit | Serial protection against polarity reversal; Suppressor diode |

Input data

Digital: Sensor circuit (S11, S12, S21, S22)

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| | |
|---|---|
| Description of the input | safety-related sensor inputs |
| Number of inputs | 4 |
| Input voltage range "0" signal | < 5 V (S12) Input S22 can interpret low-resistance outputs of a PLC as a continuous HIGH signal. |
| Input voltage range "1" signal | 20.4 V ... 26.4 V |
| Input current range "0" signal | < 2 mA (S12) 0 mA ... 2 mA (S22) |
| Inrush current | < 20 mA (Typically with U_S at S12) < 5 mA (typically with U_S at S22/24 V) > -15 mA (typically with U_S at S22/0 V) |
| Filter time | 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 |
| Concurrence | ∞ |
| Max. permissible overall conductor resistance | 150 Ω |
| Protective circuit | Suppressor diode |
| Current consumption | < 5 mA (Typically with U_S at S12) < 5 mA (typically with U_S at S22/24 V) > -5 mA (typically with U_S at S22/0 V) |

Digital: Start circuit (S34)

| | |
|---|---|
| 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 | max. 200 mA (typically with U_S) |
| Max. permissible overall conductor resistance | 150 Ω |
| 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)

| | |
|---|--|
| Output description | safety-related N/O contacts |
| Number of outputs | 2 (undelayed) |
| Contact switching type | 2 enabling current paths |
| Contact material | AgSnO ₂ |
| 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 |
| Switching capacity in accordance with IEC 60947-5-1 | 5 A (AC15) |

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| | |
|-----------------------------|--|
| | 4 A (DC13) |
| Limiting continuous current | 6 A (observe derating) |
| Sq. Total current | 72 A ² (observe derating) |
| Switching frequency | 0.5 Hz |
| Mechanical service life | 10x 10 ⁶ 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 ($\Delta t = 1 \text{ ms}$ at U_s) |
| Switching frequency | 0.5 Hz (Resistive, inductive, capacitive) |
| Protective circuit | Suppressor diode |
| Short-circuit protection | no |

Connection data

Connection technology

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

Conductor connection

| | |
|---|--|
| Connection method | Push-in connection |
| Conductor cross section rigid | 0.2 mm ² ... 1.5 mm ² |
| Conductor cross section flexible | 0.2 mm ² ... 1.5 mm ² |
| Conductor cross section, flexible, with ferrule, with plastic sleeve | 0.25 mm ² ... 1.5 mm ² (only together with CRIMPFOX 6) |
| Conductor cross section flexible, with ferrule without plastic sleeve | 0.25 mm ² ... 1.5 mm ² (only together with CRIMPFOX 6) |
| Conductor cross-section AWG | 24 ... 16 |
| Stripping length | 8 mm |

Signaling

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

Dimensions

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

Material specifications

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

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Characteristics

Safety data

| | |
|---------------|---|
| Stop category | 0 |
|---------------|---|

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

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, 2g |

Approvals

CE

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

Standards and regulations

Air clearances and creepage distances between the power circuits

| | |
|-----------------------|------------|
| Standards/regulations | EN 60664-1 |
|-----------------------|------------|

Mounting

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

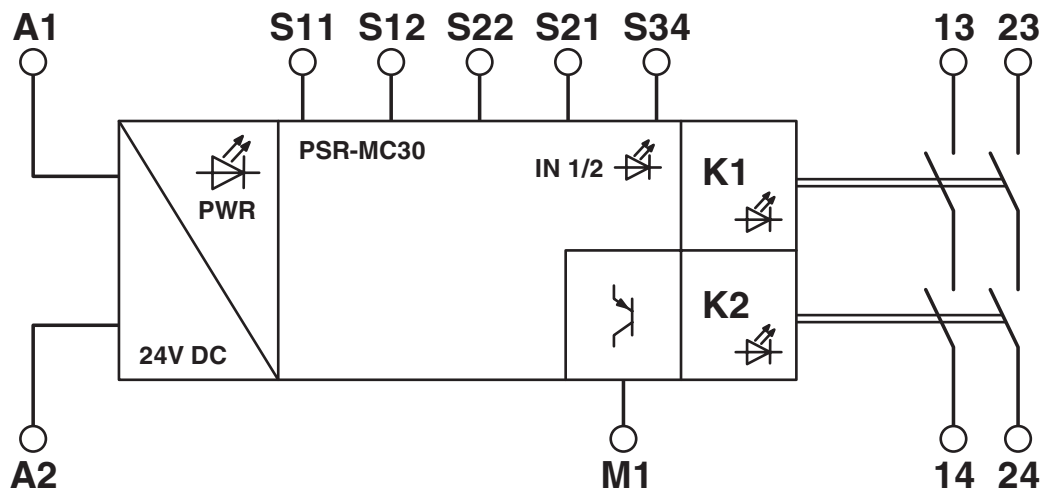
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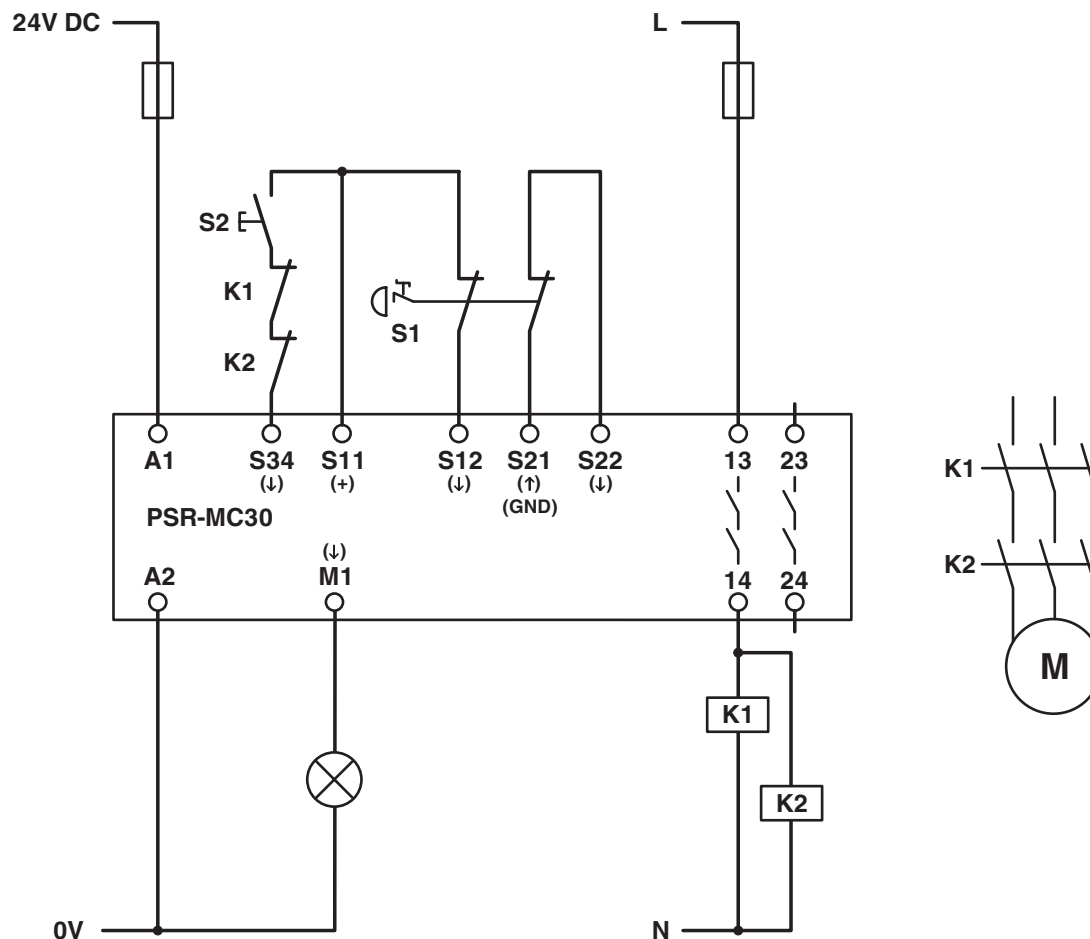
Drawings

Block diagram



Block diagram

Circuit diagram



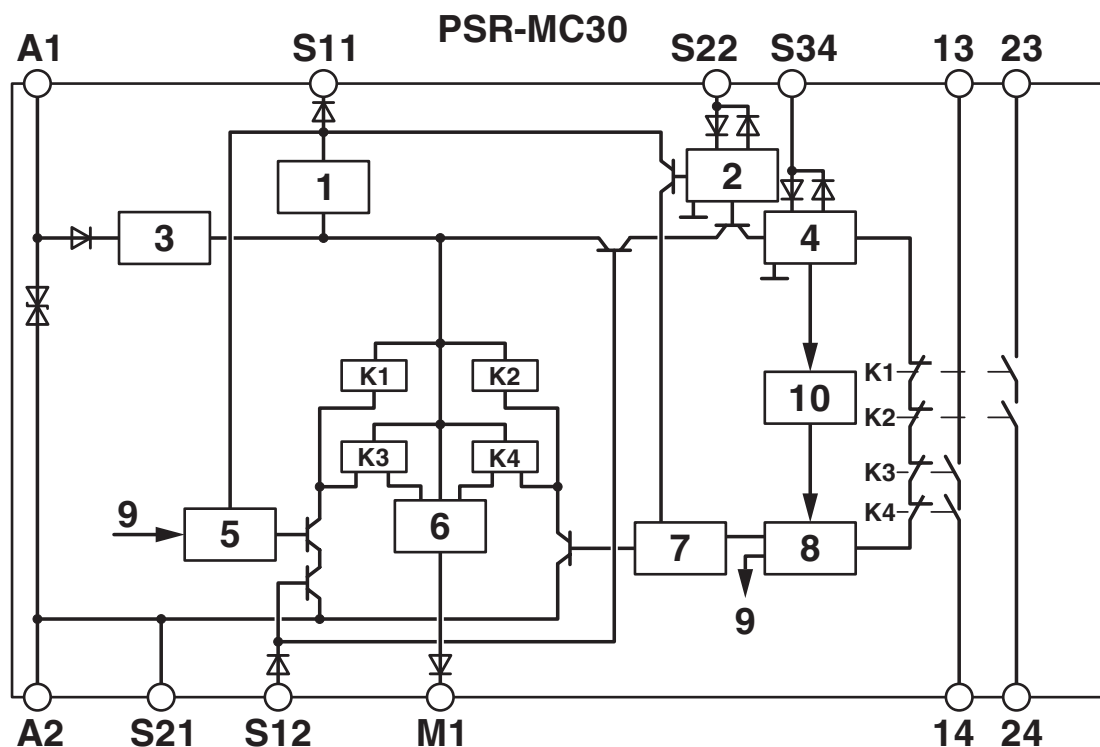
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Block diagram



Key:

- 1 = Current limitation
- 2 = Input circuit
- 3 = Voltage limitation
- 4 = Start circuit
- 5 = Control circuit channel 1
- 6 = Control circuit signal output
- 7 = Control circuit channel 2
- 8 = Start channel 1 and 2
- 9 = Channel 1
- 10 = Diagnostics
- K1, K2 ... K4 = Force-guided elementary relays

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Approvals

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EAC

Approval ID: RU C-DE.A*30.B.01082



DNV GL

Approval ID: TAA00002VZ



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

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| ETIM 9.0 | EC001449 |
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UNSPSC

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| UNSPSC 21.0 | 39122200 |
|-------------|----------|

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Environmental product compliance

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