

Safety relays - PSR-MC20-3NO-1DO-24DC-SP - 2700467

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Safety relay for emergency stop/safety doors up to SILCL 1, Cat. 1, PL c, depending on the application up to SILCL 3, Cat. 4, PL e, 1-channel operation, automatic/manual start, 3 enabling current paths, $U_s = 24\text{ V DC}$, plug-in spring-cage terminal block


The figure shows a version with a screw connection

Your advantages

- Up to Cat. 1/PL c according to ISO 13849-1, SILCL 1 according to IEC 62061
- Depending on the application, 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
- Single-channel control
- 3 enabling current paths, 1 digital signal output
- Manually monitored and automatic activation in a single device



Key Commercial Data

| | |
|--------------------------------------|---|
| Packing unit | 1 pc |
| GTIN |  4 046356 912754 |
| GTIN | 4046356912754 |
| Weight per Piece (excluding packing) | 140.400 g |
| Custom tariff number | 85371098 |
| Country of origin | Germany |

Technical data

Note

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

Dimensions

| | |
|--------|----------|
| Width | 12.5 mm |
| Height | 116.6 mm |

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Dimensions

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

| | |
|--|---|
| 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 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 | < 21 mA (with U_s/I_x to S12) |
| | < 200 mA (with U_s/I_x to S34) |
| Current consumption | < 5 mA (with U_s/I_x to S12) |
| | < 10 mA (with U_s/I_x to S34) |
| | > -5 mA (with U_s/I_x to S34) |
| Filter time | max. 1.5 ms (at S12; test pulse width) |
| | min. 7.5 ms (at S12; test pulse rate) |
| | Test pulse rate = 5 x Test pulse width |
| Voltage at input/start and feedback circuit | 24 V DC -15 % / +10 % |
| Max. permissible overall conductor resistance | 150 Ω |

Relay outputs: enabling current path

| | |
|-----------------------------|---|
| Output name | Enabling current path |
| Output description | safety-related N/O contacts |
| Number of outputs | 3 (undelayed) |
| Contact type | 3 enabling current paths |
| Contact material | AgSnO ₂ |
| Switching voltage | min. 12 V AC/DC |
| | max. 250 V AC/DC (Observe the load curve) |
| Limiting continuous current | 6 A (observe derating) |

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Relay outputs: enabling current path

| | |
|-------------------------|---|
| Inrush current | min. 3 mA |
| | max. 6 A |
| Sq. Total current | 48 A ² (observe derating) |
| Switching capacity | min. 60 mW |
| 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) |

Alarm outputs

| | |
|--------------------------|---------------------------------------|
| 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 (Δt = 1 ms at U _s) |
| 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) |
| Typical release time at US | < 20 ms (when controlled via A1 or S12) |
| 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 | 140.4 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 data

| | |
|------------------------------------|------------------------|
| Connection method | Spring-cage connection |
| pluggable | Yes |
| Conductor cross section solid min. | 0.2 mm ² |

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Connection data

| | |
|---------------------------------------|---------------------|
| Conductor cross section solid max. | 1.5 mm ² |
| Conductor cross section flexible min. | 0.2 mm ² |
| Conductor cross section flexible max. | 1.5 mm ² |
| Conductor cross section AWG min. | 24 |
| Conductor cross section AWG max. | 16 |
| Stripping length | 8 mm |

Safety-related characteristic data

| | |
|---|--|
| Stop category | 0 |
| Designation | IEC 61508 - High demand |
| Safety Integrity Level (SIL) | 1 (up to SIL 3 depending on the application) |
| Designation | IEC 61508 - Low demand |
| Safety Integrity Level (SIL) | 1 (up to SIL 3 depending on the application) |
| Designation | EN ISO 13849 |
| Performance level (PL) | c (up to PL e depending on the application) |
| Category | 1 (up to Cat. 4 depending on the application) |
| Designation | EN 62061 |
| Safety Integrity Level Claim Limit (SIL CL) | 1 (up to SILCL 3 depending on the application) |

Standards and Regulations

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

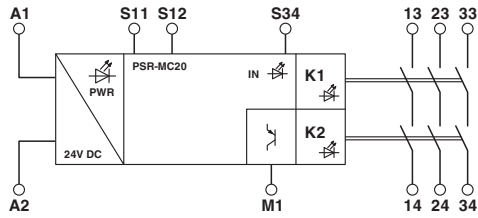
Environmental Product Compliance

| | |
|------------|---|
| China RoHS | Environmentally friendly use period: unlimited = EFUP-e |
| | No hazardous substances above threshold values |

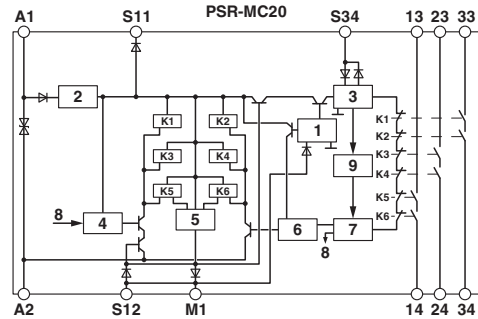
Drawings

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Block diagram



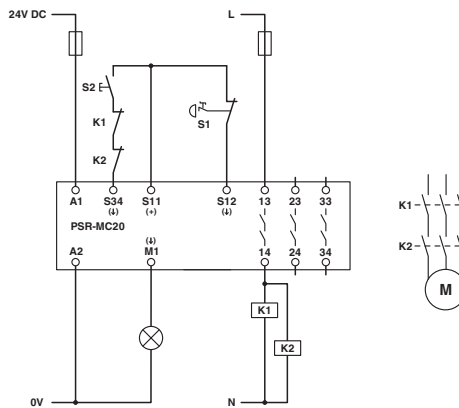
Block diagram



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

Circuit diagram



Classifications

eCl@ss

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

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Classifications

UNSPSC

| | |
|-------------|----------|
| UNSPSC 13.2 | 39121501 |
|-------------|----------|

Approvals

Approvals

Approvals

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

Ex Approvals

Approval details

| | | | |
|-----------|--|---|---------------|
| 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 | | | 44-205-13755201 |
|-------------------|--|--|-----------------|

| | | | |
|-----|--|--|--------------------------|
| EAC | | | RU C- DE.A*30.B.01082 |
|-----|--|--|--------------------------|

| | | | |
|--------------|--|--|--|
| cULus Listed | | | |
|--------------|--|--|--|