

Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

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Safety relay with IO-Link for emergency stop, safety doors, and light grids, up to SILCL 3, Cat. 4, PL e, 2 sensor circuits, automatic or manual, monitored start, 2 enabling current paths, 1 signal output, $U_s = 24 \text{ V DC}$, plug-in screw terminal block

Your advantages

- ✓ Up to Cat. 4/PL e according to ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508
- ✓ Single and two-channel control
- ✓ 2 sensor circuits
- ✓ 2 enabling current paths, 1 digital signal output
- ✓ Diagnostic data via IO-Link in combination with PSR-CT safety switches
- ✓ For emergency stop and safety door monitoring, plus evaluation of light grids
- ✓ Manually monitored and automatic activation



Key Commercial Data

| | |
|--------------|---------------|
| Packing unit | 1 pc |
| GTIN | |
| GTIN | 4055626458540 |

Technical data

Note

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

Dimensions

| | |
|--------|----------|
| Width | 17.5 mm |
| Height | 112.2 mm |
| Depth | 114.5 mm |

Ambient conditions

| | |
|---|-------------------------------------|
| Ambient temperature (operation) | -25 °C ... 60 °C (observe derating) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |

Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

Technical data

Ambient conditions

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

| | |
|--|--|
| Designation | A1/A2 |
| Rated control circuit supply voltage U_s | 24 V DC -20 % / +25 % (provide external protection) |
| Rated control supply current I_s | typ. 60 mA |
| Power consumption at U_s | typ. 1.44 W |
| Inrush current | typ. 2.5 A ($\Delta t = 500 \mu s$ 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 |

Supply of the IO-Link ports

| | |
|--------------------------------|--|
| Designation | L+/L- |
| Nominal voltage for I/O supply | 24 V DC -20 % / +25 % (is provided via the IO-Link interface of the IO-Link master.) |
| Current consumption | typ. 16 mA |
| Type of protection | Serial protection against polarity reversal |
| Protective circuit/component | Suppressor diode |

Digital inputs

| | |
|---|--|
| Input name | Sensor circuit S0 |
| | 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 (S12) |
| | For S22, see note in "Signal generator connection versions" section. |
| Input voltage range "1" signal | 11 V DC ... 30 V DC |
| Input current range "0" signal | 0 mA ... 2 mA (S12, S22) |
| Inrush current | < 5 mA (typ. with U_s at S12, $\Delta t = 150 ms$) |
| | < 5 mA (typically with U_s at S22/24 V, $\Delta t = 500 \mu s$) |
| | > -5 mA (typically with U_s at S22/0 V, $\Delta t = 500 \mu s$) |
| 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) |
| Filter time | 1.5 ms (Test pulse width of low test pulses) |
| | Test pulse rate = 5 x Test pulse width |
| | Deactivate the switch-on pulses for safety applications. |
| Max. permissible overall conductor resistance | 150 Ω |
| Concurrence input 1/2 | ∞ |
| Protective circuit/component | Suppressor diode |

Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

Technical data

Digital inputs

| | |
|---|--|
| Input name | Sensor circuit S1 |
| | S32, S42 |
| Description of the input | safety-related sensor inputs |
| Number of inputs | 2 |
| Input voltage range "0" signal | 0 V DC ... 5 V DC |
| Input voltage range "1" signal | 11 V DC ... 30 V DC |
| Input current range "0" signal | 0 mA ... 2 mA |
| Inrush current | < 20 mA (typically with U _S) |
| Current consumption | < 5 mA (typically with U _S) |
| Filter time | max. 1.5 ms (Test pulse width of low test pulses) |
| | Test pulse rate = 5 x Test pulse width |
| | Deactivate the switch-on pulses for safety applications. |
| Max. permissible overall conductor resistance | 150 Ω |
| Concurrence input 1/2 | ∞ |
| Protective circuit/component | Suppressor diode |
| Input name | Diagnostic input |
| | DGN |
| Description of the input | non-safety-related |
| Number of inputs | 1 |
| Input voltage range | 0 V DC ... 30 V DC |
| Current consumption | typ. 30 mA |
| Protective circuit/component | Suppressor diode |
| Input name | Start circuit |
| | S34 |
| Number of inputs | 1 |
| Input voltage range "1" signal | 19.2 V DC ... 30 V DC (manual start, autostart: 0 V) |
| Inrush current | < 10 mA (typically with U _S , Δt = 100 ms) |
| Current consumption | < 5 mA (typically with U _S at S34/24 V) |
| | > -5 mA (typically with U _S at S34/0 V) |
| Max. permissible overall conductor resistance | 150 Ω |
| Protective circuit/component | Suppressor diode |

IO-Link inputs

| | |
|------------------------|----------------------------|
| Designation | IO-Link |
| Specification | Version 1.1 |
| Transmission speed | 230 kbps (COM3) |
| Cycle Time | 5 ms |
| Process data update | 5 ms |
| Amount of process data | max. 31 Byte (Input data) |
| | max. 16 Byte (Output data) |
| Number of ports | 1 |

Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

Technical data

IO-Link inputs

| | |
|------------------------------|---|
| Connection method | Screw connection |
| Connection technology | 3-wire |
| Port type | Class A |
| Input name | C/Q |
| Description of the input | IO-Link switching and communication cable |
| Number of inputs | 1 |
| Protective circuit/component | Suppressor diode |

Relay outputs: enabling current path

| | |
|---|---|
| Output name | Enabling current path |
| | 13/14, 23/24 |
| Output description | safety-related N/O contacts |
| | 2 NO contacts each in series, without delay, floating |
| Number of outputs | 2 (undelayed) |
| Contact 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) |
| Limiting continuous current | 6 A |
| Inrush current | min. 3 mA |
| | max. 6 A |
| Sq. Total current | 72 A ² (observe derating) |
| Switching capacity | min. 60 mW |
| Switching frequency | 0.5 Hz |
| Mechanical service life | 10x 10 ⁶ cycles |
| Switching capacity according to IEC 60947-5-1 | 4 A (24 V (DC13)) |
| | 5 A (250 V (AC15)) |
| Output fuse | 6 A gL/gG |
| | 4 A gL/gG (for low-demand applications) |

Alarm outputs

| | |
|------------------------------|--|
| Designation | M1 |
| Output description | PNP |
| | non-safety-related |
| Number of outputs | 1 |
| Voltage | approx. 22 V DC (U _s - 2 V) |
| Current | max. 100 mA |
| Maximum inrush current | 500 mA (Δt = 1 ms at U _s) |
| Protective circuit/component | Suppressor diode |

Times

| | |
|---------------------------|-----------------------------------|
| Typical pickup time at US | < 250 ms (when controlled via A1) |
|---------------------------|-----------------------------------|

Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

Technical data

Times

| | |
|-----------------------------|--|
| Typical response time at US | < 220 ms (automatic start) |
| | < 175 ms (manual, monitored start) |
| Typical release time at US | < 20 ms (on demand via the sensor circuit) |
| | < 20 ms (on demand via A1) |
| Restart time | < 1 s (Boot time) |
| Recovery time | < 500 ms |

General

| | |
|---|--|
| Relay type | Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3 |
| Nominal operating mode | 100% operating factor |
| Net weight | 157.28 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, yellow, red LED |
| Status display | 5x LED green |

Connection data

| | |
|----------------------------------|---|
| Connection method | Screw connection |
| pluggable | Yes |
| Conductor cross section solid | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross section flexible | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross-section AWG | 24 ... 12 |
| Stripping length | 7 mm |
| Screw thread | M3 |

Safety-related characteristic data

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

Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

Technical data

Standards and Regulations

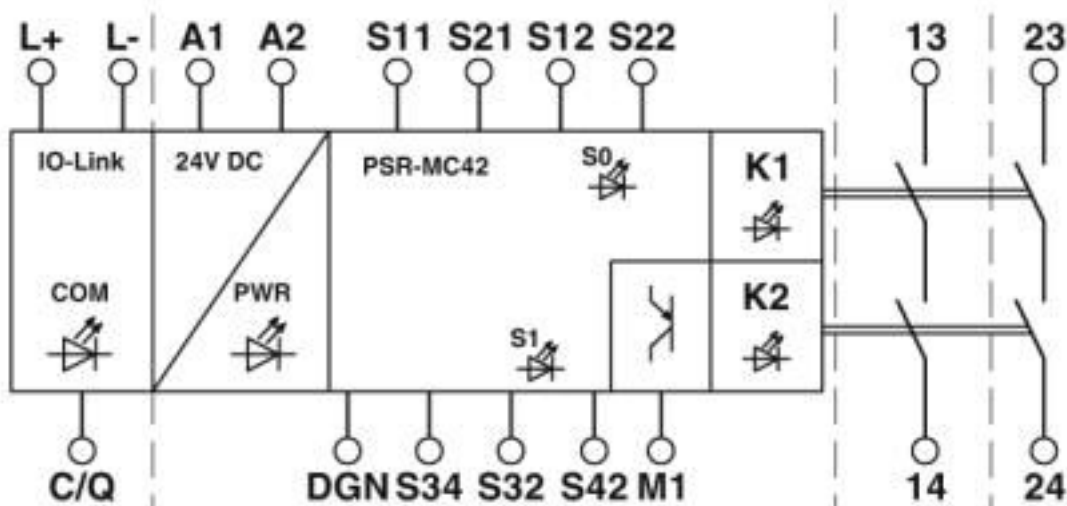
| | |
|--------------------------------|--|
| Designation | Air clearances and creepage distances between the power circuits |
| Standards/regulations | DIN EN 60947-1 |
| Rated insulation voltage | 320 V |
| | 320 V |
| Rated surge voltage/insulation | Basic insulation 4 kV between all current paths and housing |
| | Safe isolation, reinforced insulation 4 kV between input circuit and enabling current path (13/14) and enabling current path (23/24) |
| Degree of pollution | 2 |
| Overvoltage category | II |
| Shock | 15g |
| Vibration (operation) | 10 Hz ... 150 Hz, 2g |
| Conformance | CE-compliant |

Environmental Product Compliance

| | |
|------------|---|
| REACH SVHC | Lead 7439-92-1 |
| China RoHS | Environmentally Friendly Use Period = 50 years |
| | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

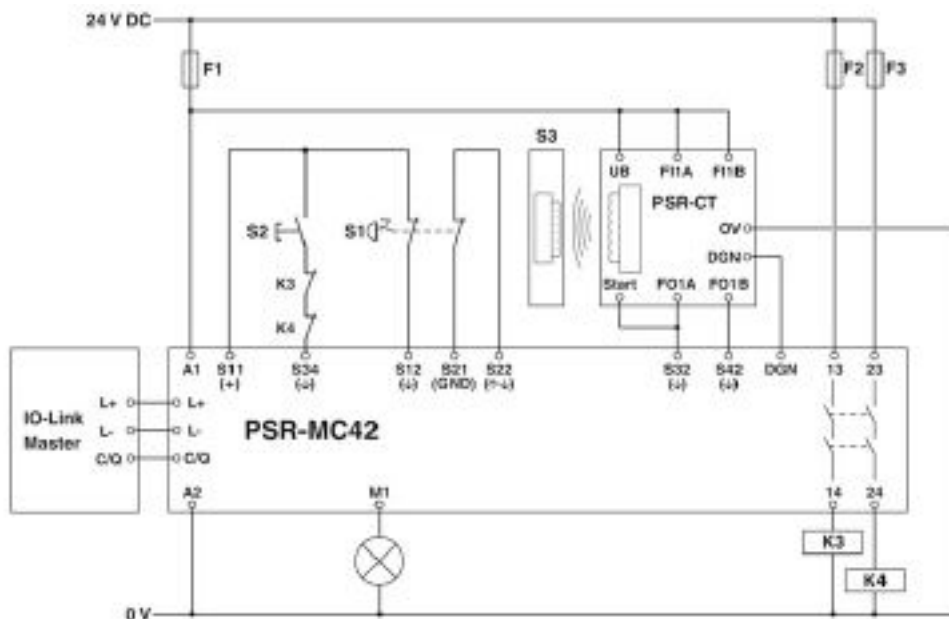
Drawings

Block diagram



Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

Circuit diagram



Classifications

eCl@ss

| | |
|---------------|----------|
| eCl@ss 10.0.1 | 27371819 |
| 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 |
| ETIM 6.0 | EC001449 |
| ETIM 7.0 | EC001449 |

Approvals

Approvals

Approvals

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

Ex Approvals

Approval details

Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

Approvals

| | | |
|-------------------|--|--------------------|
| Functional Safety | | 968/FSP 1718.00/19 |
|-------------------|--|--------------------|

| | | |
|-------------------|--|-------------------|
| Functional Safety | | 01/205/5677.00/19 |
|-------------------|--|-------------------|

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

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

Accessories

Accessories

Safety switches

Safety switch sensor - PSR-CT-C-SEN-1-8 - 2702972



Proximity safety circuit up to Cat. 4, PL e (EN ISO 13849), SIL 3 (IEC 61508), unicode sensor with RFID coding, model 4 (EN ISO 14119), automatic or manual start, integrated diagnostics, 24 V DC supply, IP69K, M12 connector

Safety switch sensor - PSR-CT-M-SEN-1-8 - 2702975



Proximity safety circuit up to Cat. 4, PL e (EN ISO 13849), SIL 3 (IEC 61508), multicode sensor with RFID coding, model 4 (EN ISO 14119), automatic or manual start, integrated diagnostics, 24 V DC supply, IP69K, M12 connector

Safety relays - PSR-MC42-2NO-1DO-24DC-SC - 2702901

Accessories

Safety switch sensor - PSR-CT-F-SEN-1-8 - 2702976



Proximity safety circuit up to Cat. 4, PL e (EN ISO 13849), SIL 3 (IEC 61508), fixcode sensor with RFID coding, model 4 (EN ISO 14119), automatic or manual start, integrated diagnostics, 24 V DC supply, IP69K, M12 connector

Safety switch actuator - PSR-CT-C-ACT - 2702973



Proximity safety circuit up to Cat. 4, PL e (EN ISO 13849), SIL 3 (IEC 61508), coded actuator, compatible with all sensor coding types, supplied inductively via the sensor, IP69K

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