

## Safety relays - PSR-MC42-2NO-1DO-24DC-SP - 2702902

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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 spring-cage 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	 4 055626 458564
GTIN	4055626458564
Weight per Piece (excluding packing)	181.800 g
Sales Key	DNA181

### Technical data

#### Note

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

Width	17.5 mm
Height	116.6 mm
Depth	114.5 mm

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## Technical data

### Ambient conditions

Ambient temperature (operation)	-25 °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)
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
	NPN (S12), NPN/PNP (S22)
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 switch-on pulses/light tests for safety applications.

# Safety relays - PSR-MC42-2NO-1DO-24DC-SP - 2702902

## Technical data

### Digital inputs

Max. permissible overall conductor resistance	150 Ω
Concurrence input 1/2	∞
Protective circuit/component	Suppressor diode
Input name	Sensor circuit S1
	S32, S42
Description of the input	safety-related sensor inputs
	NPN
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 <sub>S</sub> )
Current consumption	< 5 mA (typically with U <sub>S</sub> )
Filter time	max. 1.5 ms (Test pulse width of low test pulses)
	Test pulse rate = 5 x Test pulse width
	Deactivate switch-on pulses/light tests 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
Description of the input	NPN (manual start), PNP (autostart)
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 <sub>S</sub> , Δt = 100 ms)
Current consumption	< 5 mA (typically with U <sub>S</sub> at S34/24 V)
	> -5 mA (typically with U <sub>S</sub> 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)

## Safety relays - PSR-MC42-2NO-1DO-24DC-SP - 2702902

### Technical data

#### IO-Link inputs

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
Connection method	Spring-cage 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

#### 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 <sub>2</sub>
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 <sup>2</sup> (observe derating)
Switching capacity	min. 60 mW
Switching frequency	0.5 Hz
Mechanical service life	10x 10 <sup>6</sup> 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 <sub>s</sub> - 2 V)
Current	max. 100 mA

# Safety relays - PSR-MC42-2NO-1DO-24DC-SP - 2702902

## Technical data

### Alarm outputs

Maximum inrush current	500 mA ( $\Delta t = 1 \text{ ms}$ at $U_s$ )
Protective circuit/component	Suppressor diode

### Times

Typical pickup time at US	< 250 ms (when controlled via A1)
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 forcibly guided contacts in accordance with IEC/EN 61810-3 (EN 50205)
Nominal operating mode	100% operating factor
Net weight	181.8 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	5 green LEDs

### Connection data

Connection method	Spring-cage connection
pluggable	Yes
Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	1.5 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	1.5 mm <sup>2</sup>
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)	3
Designation	IEC 61508 - Low demand

# Safety relays - PSR-MC42-2NO-1DO-24DC-SP - 2702902

## Technical data

### Safety-related characteristic data

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

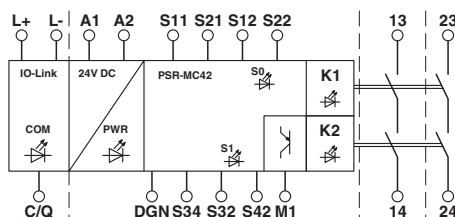
Designation	Air clearances and creepage distances between the power circuits
Standards/regulations	DIN EN 60947-1
Rated insulation voltage	320 V
	320 V
Rated surge voltage/insulation	Basic insulation 4 kV between all current paths and housing
	Safe isolation, reinforced insulation 4 kV between input 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: unlimited = EFUP-e
	No hazardous substances above threshold values

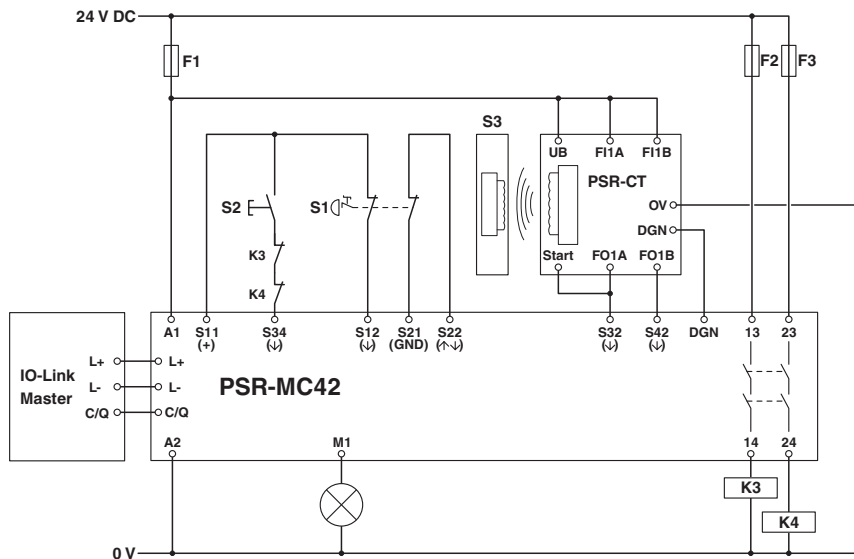
## Drawings

Block diagram



# Safety relays - PSR-MC42-2NO-1DO-24DC-SP - 2702902

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
ETIM 6.0	EC001449

## Approvals

Approvals

Approvals

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

Ex Approvals

Approval details

Functional Safety		968/FSP 1718.00/19
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# Safety relays - PSR-MC42-2NO-1DO-24DC-SP - 2702902

## Approvals

Functional Safety		01/205/5677.00/19
UL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> FILE E 140324
cUL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> 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 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 relays - PSR-MC42-2NO-1DO-24DC-SP - 2702902

### Accessories

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