

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



2702902

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

### Your advantages

- 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
- Automatic and manual activation
- 1- and 2-channel control
- 2 sensor circuits
- Up to Cat. 4/PL e in accordance with ISO 13849-1, SIL 3 in accordance with EN IEC 62061, SIL 3 in accordance with IEC 61508

### Commercial data

Item number	2702902
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN01
Product key	DNA181
Catalog page	Page 224 (C-6-2019)
GTIN	4055626458564
Weight per piece (including packing)	181.84 g
Weight per piece (excluding packing)	150.98 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
	Light grid
	Solenoid switch
	Transponder
Relay type	Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3

### Times

Typical response time	< 220 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 the sensor circuit)
	< 20 ms (on demand via A1)
Restart time	< 1 s (Boot time)
Recovery time	< 500 ms

### Electrical properties

Maximum power dissipation for nominal condition	6.45 W ( $U_S = 30$ V, $U_L = 30$ V, $I^2 = 72$ A <sup>2</sup> )
Nominal operating mode	100% operating factor

### Air clearances and creepage distances between the power circuits

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)

### Supply

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

### 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 % (provide external protection)
Rated control supply current $I_S$	typ. 60 mA

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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

## Input data

Digital: 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, $\Delta t = 500 \mu s$ )
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.
Concurrence	$\infty$
Max. permissible overall conductor resistance	150 $\Omega$
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: 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 $U_S$ )
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.
Concurrence	$\infty$
Max. permissible overall conductor resistance	150 $\Omega$
Protective circuit	Suppressor diode
Current consumption	< 5 mA (typically with $U_S$ )

Digital: Diagnostic input (DGN)

Description of the input	non-safety-related
Number of inputs	1

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Input voltage range	0 V DC ... 30 V DC
Protective circuit	Suppressor diode
Current consumption	typ. 30 mA

## Digital: 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 $U_S$ , $\Delta t = 100$ ms)
Max. permissible overall conductor resistance	150 $\Omega$
Protective circuit	Suppressor diode
Current consumption	< 5 mA (typically with $U_S$ at S34/24 V)
	> -5 mA (typically with $U_S$ at S34/0 V)

## IO-Link

Designation	IO-Link
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)
Description of the input	IO-Link switching and communication cable
Number of inputs	1
Connection method	Spring-cage connection
Connection technology	3-conductor
Number of ports	1
Port type	Class A

## Output data

### Relay: 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 switching 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)
Switching capacity	min. 60 mW
Inrush current	min. 3 mA
	max. 6 A
Switching capacity in accordance with IEC 60947-5-1	4 A (24 V (DC13))
	5 A (250 V (AC15))
Limiting continuous current	6 A
Sq. Total current	72 A <sup>2</sup> (observe derating)
Switching frequency	0.5 Hz

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Mechanical service life	10x 10 <sup>6</sup> cycles
Output fuse	6 A gL/gG
	4 A gL/gG (for low-demand applications)

Signal: 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
Maximum inrush current	500 mA ( $\Delta t = 1 \text{ ms}$ at U <sub>s</sub> )
Protective circuit	Suppressor diode

## Connection data

Connection technology

pluggable	yes
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Conductor connection

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

## Signaling

Status display	5x LED green
Operating voltage display	1 x green, yellow, red LED

## Dimensions

Width	17.5 mm
Height	116.6 mm
Depth	114.5 mm

## Material specifications

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

## Characteristics

Safety data

Stop category	0
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Safety data: EN ISO 13849

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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
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Safety data: IEC 61508 - Low demand

Safety Integrity Level (SIL)	3
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Safety data: EN IEC 62061

Safety Integrity Level (SIL)	3
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## Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Ambient temperature (operation)	-25 °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
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## Standards and regulations

Air clearances and creepage distances between the power circuits

Standards/regulations	DIN EN 60947-1
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## Mounting

Mounting type	DIN rail mounting
Assembly instructions	See derating curve
Mounting position	vertical or horizontal

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## Classifications

### ECLASS

ECLASS-11.0	27371819
ECLASS-13.0	27371819
ECLASS-12.0	27371819

### ETIM

ETIM 9.0	EC001449
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### 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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Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)