

## Coupling relay - PSR-PC20-1NO-1NC-24DC-SC - 2700577

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Coupling relay for SIL 3 high- and low-demand applications, couples digital output signals to the periphery, 1 enabling current path, 1 confirmation current path, 1 digital signal output, safe state off applications, test pulse filter, TBUS connection, plug-in screw terminal block

### Your advantages

- ✓ Up to SIL 3 according to IEC 61508
- ✓ Forcibly guided contacts according to EN 50205
- ✓ Easy proof test according to IEC 61508 thanks to integrated signal contact
- ✓ Approved for Class I, Zone 2 applications
- ✓ Low housing width of just 12.5 mm
- ✓ Enabling current path protected via internal fuse as an option
- ✓ Long service life thanks to filtering of controller test pulses
- ✓ 1 enabling current path, 1 digital signal output, 1 diagnostic current path
- ✓ Couples digital output signals from failsafe controllers to I/O devices (valves, etc.) for electrical isolation and power adaptation

RoHS



### Key Commercial Data

Packing unit	1 pc
GTIN	
GTIN	4046356916417

### Technical data

#### Note

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

Width	12.5 mm
Height	112.2 mm
Depth	114.5 mm

#### Ambient conditions

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## Technical data

### Ambient conditions

Ambient temperature (operation)	-40 °C ... 70 °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 % (A1/A2)
	20.4 V DC ... 26.4 V DC
Rated control supply current $I_s$	typ. 50 mA
Input voltage range "0" signal	0 V DC ... 5 V DC (for safe Off)
Input current range "0" signal	0 mA ... 2 mA (for safe Off)
Power consumption at $U_s$	typ. 1.2 W
Inrush current	typ. 400 mA ( $\Delta t < 10 \mu s$ at $U_s$ )
Filter time	max. 2 ms (at A1-A2; test pulse width)
	≥ 100 ms (at A1-A2; test pulse rate)
Diagnostic supply voltage $U_D$	24 V DC -15 % / +10 % (31/A2, TBUS)
Input current at $U_D$	6 mA (at 31-A2 for $U_D$ ; depending on load + 100 mA at M1 and 32)
Inrush current at $U_D$	typ. 2.5 A ( $\Delta t < 20 \mu s$ at $U_D$ )
Protective circuit	Serial protection against polarity reversal 33 V suppressor diode (A1/A2) 33 V suppressor diode (31/A2)

### Relay outputs: enabling current path

Output name	Enabling current path
Output description	2 N/O contacts in series, without delay, floating
Number of outputs	1 (safety-related N/O contacts: 13/14 (13F/14))
Contact type	1 enabling current path
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 (13/14 for high-demand)
	4 A (13F/14 with high/low demand, 13/14 with low demand)
Inrush current	min. 3 mA
	max. 6 A (N/O contact 13/14)
	4 A (N/O contact 13F/14)
Sq. Total current	36 A <sup>2</sup> (13/14, see to derating)
	16 A <sup>2</sup> (13F/14, see to derating)
Switching capacity	min. 60 mW
Switching frequency	max. 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); N/O contact 13/14)

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## Technical data

### Relay outputs: enabling current path

	5 A (250 V (AC15); N/O contact 13/14)
	4 A (250 V (AC15); N/O contact 13F/14)
Output fuse	6 A gL/gG (N/O contact 13/14)
	4 A gL/gG (for low-demand applications)

### Relay outputs: return current/signaling current path

Output name	Confirmation current path
Output description	2 N/C contacts in series, without delay, not floating (reference ground: A2)
Number of outputs	1 (safety-related N/C contacts: 31/32)
Contact type	1 confirmation current path
Contact material	AgCuNi, + Au
Switching voltage	min. 20.4 V DC
	max. 26.4 V DC
Limiting continuous current	100 mA
Inrush current	min. 1 mA
	max. 100 mA
Switching capacity	min. 20 mW
Switching frequency	max. 0.5 Hz
Mechanical service life	10x 10 <sup>6</sup> cycles
Output fuse	150 mA Fast-blow

### Alarm outputs

Designation	M1
Output description	PNP
Number of outputs	1 (non-safety-related)
Voltage	approx. 22 V DC (U <sub>D</sub> - 2 V)
Current	max. 100 mA
Maximum inrush current	500 mA (Δt = 1 ms at U <sub>s</sub> )
Short-circuit protection	no
Output fuse	150 mA fast blow

### Times

Typical pickup time at US	< 100 ms (with U <sub>s</sub> when controlled via A1)
Typical release time at US	< 35 ms (when controlled via A1)
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	189.1 g
Mounting position	vertical, horizontal, with front of module upward

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## Technical data

### General

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 yellow LED
Status display	1 x green LED
Indication	1 x red LED

### Connection data

Connection method	Screw connection
pluggable	Yes
Conductor cross section solid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 12
Stripping length	7 mm
Screw thread	M3
Torque	0.5 Nm ... 0.6 Nm

### 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 50156
Safety Integrity Level (SIL)	3

### Standards and Regulations

Designation	Air clearances and creepage distances between the power circuits
Standards/regulations	DIN EN 50178, EN 60079-15
Rated insulation voltage	250 V AC
Rated surge voltage/insulation	Safe isolation, 6 kV reinforced insulation from control circuit, start circuit, confirmation current path, signal output to the enabling current path; 4 kV/basic insulation between all current paths and housing
Degree of pollution	2
Overvoltage category	III
Shock	15g
Vibration (operation)	10 Hz ... 150 Hz, 2g
Conformance	CE-compliant
UL, USA/Canada	cULus
	Class I, Zone 2, AEx nA nC IIC T4 / Ex nA nC IIC Gc T4 X

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## Technical data

### Standards and Regulations

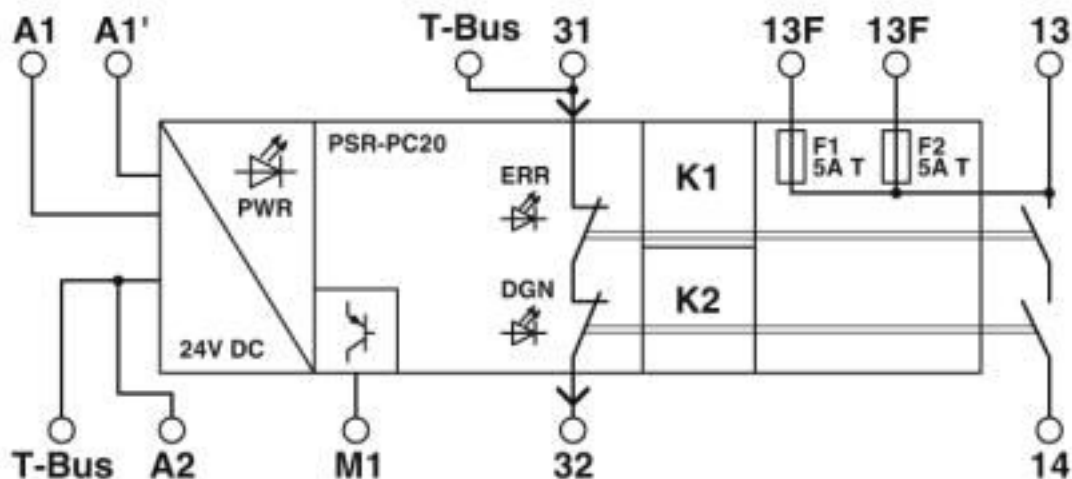
	Class I, Div. 2, Groups A, B, C, D, T4
GL	C, EMC2
Environmental simulation test	ISA-S71.04 (G3)

### 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"

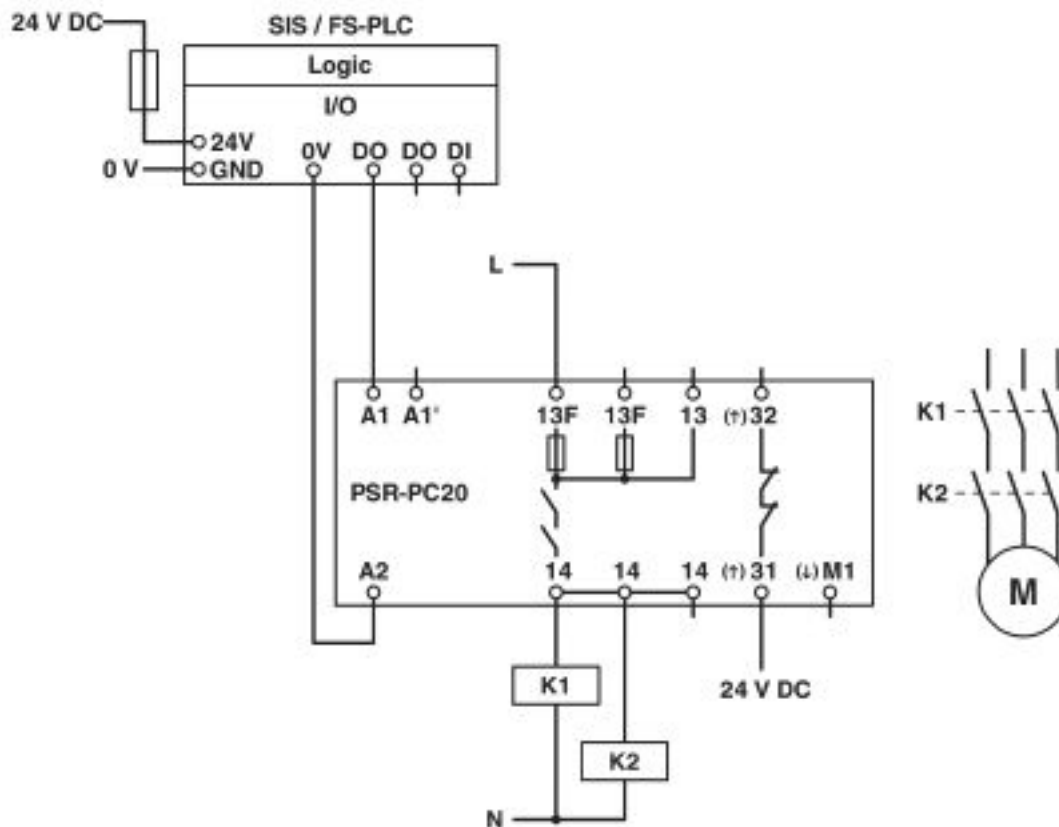
## Drawings

Block diagram



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Circuit diagram



## Classifications

eCl@ss

eCl@ss 10.0.1	27371819
eCl@ss 4.0	40020600
eCl@ss 4.1	40020600
eCl@ss 5.0	27371900
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
ETIM 7.0	EC001449

## Approvals

Approvals

# Coupling relay - PSR-PC20-1NO-1NC-24DC-SC - 2700577

## Approvals

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### Approvals

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

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### Ex Approvals

IECEX / ATEX / UL Listed / cUL Listed

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### Approval details

GL		<a href="https://approvalfinder.dnvgl.com/">https://approvalfinder.dnvgl.com/</a>	11253-14 HH
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
Functional Safety			44-780-13755202
EAC			RU C- DE.A*30.B.01082
cULus Listed			

## Accessories

### Accessories

DIN rail connector

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### Accessories

DIN rail bus connectors - ME 6,2 TBUS-2 1,5/5-ST-3,81 GN - 2869728



DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

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