

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



2700577

<https://www.phoenixcontact.com/us/products/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 in accordance with IEC 61508
- Force-guided contacts in accordance with 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
- Corrosion protection through protective coating on the PCB

## Commercial data

Item number	2700577
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN01
Product key	DNA182
GTIN	4046356916417
Weight per piece (including packing)	204 g
Weight per piece (excluding packing)	189.1 g
Customs tariff number	85364900
Country of origin	DE

## Technical data

### Notes

#### Note on application

Note on application	Only for industrial use
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### Product properties

Product type	Coupling relay
Product family	PSRmini
Application	Safe switch off
	High demand
	Low demand
	Ex
Control	1-channel
Relay type	Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3

#### Insulation characteristics

Overvoltage category	III
Degree of pollution	2

#### Times

Typ. starting time with $U_s$	< 100 ms (with $U_s$ when controlled via A1)
Typical release time	< 35 ms (when controlled via A1)
Recovery time	500 ms

### Electrical properties

Maximum power dissipation for nominal condition	3.43 W ( $I_L^2 = 36 \text{ A}^2$ )
Nominal operating mode	100% operating factor
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

#### Supply

Designation	A1/A2
Rated control circuit supply voltage $U_s$	20.4 V DC ... 26.4 V DC
Rated control circuit supply voltage $U_s$	24 V DC -15 % / +10 %
Rated control supply current $I_s$	typ. 50 mA
Power consumption at $U_s$	typ. 1.2 W
Inrush current	typ. 400 mA ( $\Delta t < 10 \mu\text{s}$ at $U_s$ )
Filter time	max. 2 ms (at A1-A2; test pulse width)
	$\geq 100$ ms (at A1-A2; test pulse rate)
Protective circuit	Serial protection against polarity reversal; Suppressor diode 33 V

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## Supply

Designation	31/A2, TBUS
Diagnostic supply voltage $U_D$	24 V DC -15 % / +10 %
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; Suppressor diode 33 V

## Output data

### Relay: Enabling current path (13/14 (13F/14))

Output description	2 N/O contacts in series, without delay, floating
Number of outputs	1 (safety-related)
Contact switching type	1 enabling current path
Contact material	AgSnO <sub>2</sub>
Switching voltage	min. 12 V AC/DC max. 250 V AC/DC
Switching power	min. 60 mW
Inrush current	min. 3 mA max. 6 A (N/O contact 13/14) 4 A (N/O contact 13F/14)
Switching capacity	4 A (24 V (DC13); N/O contact 13/14) 5 A (250 V (AC15); N/O contact 13/14) 4 A (250 V (AC15); N/O contact 13F/14)
Limiting continuous current	6 A (13/14 for high-demand) 4 A (13F/14 with high/low demand, 13/14 with low demand)
Sq. Total current	36 A <sup>2</sup> (13/14, see to derating) 16 A <sup>2</sup> (13F/14, see to derating)
Switching frequency	max. 0.1 Hz
Mechanical service life	10x 10 <sup>6</sup> cycles
Output fuse	6 A gL/gG (N/O contact 13/14) 4 A gL/gG (for low-demand applications)

### Relay: Confirmation current path (31/32)

Output description	2 N/C contacts in series, without delay, not floating (reference ground: A2)
Number of outputs	1 (safety-related)
Contact switching type	1 confirmation current path
Contact material	AgCuNi, + Au
Switching voltage	min. 20.4 V DC max. 26.4 V DC
Switching power	min. 20 mW
Inrush current	min. 1 mA max. 100 mA
Limiting continuous current	100 mA

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Switching frequency	max. 0.1 Hz
Mechanical service life	10x 10 <sup>6</sup> cycles
Output fuse	150 mA Fast-blow

Signal: 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 ( $\Delta t = 1$ ms at U <sub>s</sub> )
Short-circuit protection	no
Output fuse	150 mA fast blow

## Connection data

Connection technology

pluggable	yes
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Conductor connection

Connection method	Screw connection
Conductor cross-section rigid	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
Tightening torque	0.5 Nm ... 0.6 Nm

## Signaling

Status display	1 x LED (green)
Operating voltage display	1 x LED (yellow)
Error indication	1 x LED (red)

## Dimensions

Width	12.5 mm
Height	112.2 mm
Depth	114.5 mm

## Material specifications

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

## Characteristics

Safety data

Stop category	0
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Safety data: EN 50156

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Safety Integrity Level (SIL)	3
Safety data: IEC 61508 - High demand	
Safety Integrity Level (SIL)	3
Safety data: IEC 61508 - Low demand	
Safety Integrity Level (SIL)	3

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Ambient temperature (operation)	-40 °C ... 70 °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

### ATEX

Identification	⊕ II 3G Ex ec nC IIC T4 Gc
Certificate	UL 22 ATEX 2912X

### IECEX

Identification	Ex ec nC IIC T4 Gc
Certificate	IECEX UL 22.0037X

### UL, USA/Canada

Identification	cULus
Certificate	E140324

### UL Ex, USA / Canada

Identification	Class I, Zone 2, AEx ec nC IIC T4 / Ex ec nC IIC Gc T4 X
	Class I, Div. 2, Groups A, B, C, D, T4
Certificate	E360692

### CE

Identification	CE-compliant
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### Environmental simulation test

Identification	G3
Certificate	ISA-S71.04

### CCC / China-Ex

Identification	Ex ec nC IIC T4 Gc
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Certificate	2022122304115695
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## DNV

Identification	C, EMC2
Certificate	11253-14 HH

## Mounting

Mounting type	DIN rail mounting
Assembly note	See derating curve
Mounting position	vertical, horizontal, with front of module upward

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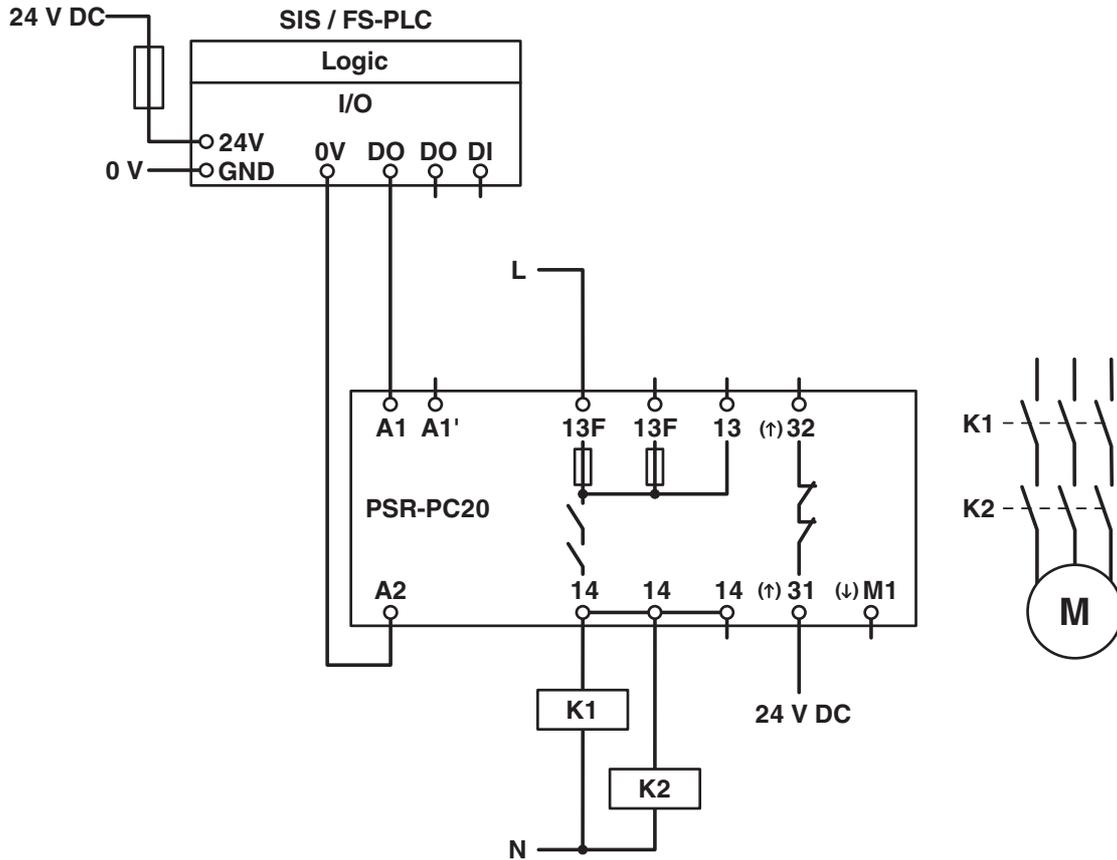


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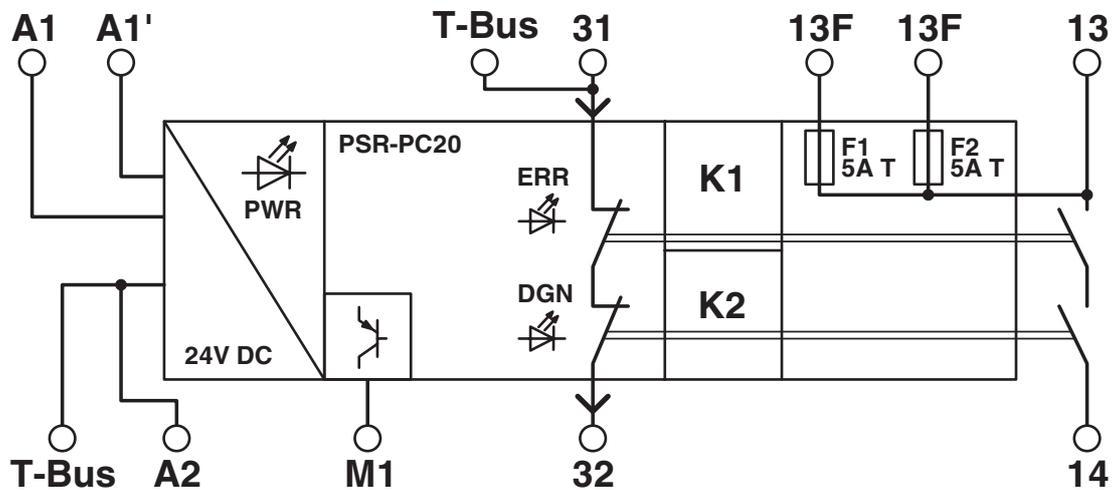
## Drawings

Circuit diagram



High-demand application with failsafe controller

Block diagram



Block diagram

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2700577>



### Functional Safety

Approval ID: 44-780-13755202



### Functional Safety

Approval ID: 44 205 13755204



### cULus Listed

Approval ID: E140324



### IECEx

Approval ID: IECEx ULD 22.0037X



### ATEX

Approval ID: UL 22 ATEX 2912X



### cULus Listed

Approval ID: E360692



### CCC

Approval ID: 2022122304115695

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## Classifications

### ECLASS

ECLASS-13.0	27371819
ECLASS-15.0	27371819

### ETIM

ETIM 9.0	EC001449
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### UNSPSC

UNSPSC 21.0	39122200
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	90723e1b-e622-44f1-8c0e-abf4aeabfb56

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