

PSR-PS20-1NO-1NC-24DC-SC - Coupling relay



2700356

<https://www.phoenixcontact.com/gb/products/2700356>

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Coupling relay for SIL 3 high and low-demand applications, couples digital output signals to the I/O, 1 enabling current path, 1 confirmation current path, 1 digital signal output, safe state off applications, test pulse filter, fixed 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 6.8 mm
- 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	2700356
Packing unit	1 pc
Minimum order quantity	1 pc
Sales Key	DNA172
Product Key	DNA172
Catalog Page	Page 249 (C-6-2019)
GTIN	4046356912891
Weight per Piece (including packing)	164 g
Weight per Piece (excluding packing)	69.773 g
Customs tariff number	85364900
Country of origin	DE

Technical Data

Notes

Utilization restriction

CCCex note	Use in potentially explosive areas is not permitted in China.
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Product properties

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

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	3.28 W ($I_L^2 = 36 A^2$)
Nominal operating mode	100% operating factor

Air clearances and creepage distances between the power circuits

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. 45 mA
Power consumption at U_S	typ. 1.08 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)
Protective circuit	Serial protection against polarity reversal; Suppressor diode 33 V

Supply

Designation	21/A2
Diagnostic supply voltage U_D	24 V DC -15 % / +10 % (21/A2)

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Input current at U_D	6 mA (at 21-A2 for U_D ; depending on load + 100 mA at M1 and 22)
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 38 V

Output data

Relay: 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)
Contact switching type	1 enabling current path
Contact material	AgSnO ₂
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 (High demand) 4 A (Low demand)
Sq. Total current	36 A ² (observe derating)
Switching frequency	max. 1 Hz
Mechanical service life	10x 10 ⁶ cycles
Output fuse	6 A gL/gG 4 A gL/gG (for low-demand applications)

Relay: 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: 21/22)
Contact switching type	1 confirmation current path
Contact material	AgCuNi, + Au
Switching voltage	min. 20.4 V DC max. 26.4 V DC
Switching capacity	min. 20 mW
Inrush current	min. 1 mA max. 100 mA
Limiting continuous current	100 mA
Switching frequency	max. 1 Hz
Mechanical service life	10x 10 ⁶ cycles
Output fuse	150 mA Fast-blow

Signal: M1

Output description	PNP
Number of outputs	1 (non-safety-related)

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Voltage	approx. 22 V DC ($U_D - 2 V$)
Current	max. 100 mA
Maximum inrush current	500 mA ($\Delta t = 1 \text{ ms at } U_S$)
Short-circuit protection	no
Output fuse	150 mA fast blow

Connection data

Connection technology

pluggable	no
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Conductor connection

Connection method	Screw connection
Conductor cross section rigid	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	12 mm
Screw thread	M3
Tightening torque	0.5 Nm ... 0.6 Nm

Signaling

Status display	2 x green LEDs
Operating voltage display	1 x yellow LED
Error indication	1 x red LED

Dimensions

Width	6.8 mm
Height	93.1 mm
Depth	102.5 mm

Material specifications

Housing material	PBT
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Characteristics

Safety data

Stop category	0
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Safety data: EN 50156

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

Designation	For use in high-demand applications, the diagnostics function must be implemented via the confirmation current path.
Equipment type	Type A
Safety Integrity Level (SIL)	3
Safe Failure Fraction (SFF)	99.98 %

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MTBF	80.63 Years
λ_{SU}	148.96 FIT
λ_{SD}	989.32 FIT
λ_{DU}	0.20 FIT
λ_{DD}	52.58 FIT
Probability of a hazardous failure per hour (PFH _D)	1.95×10^{-10} (4 A DC13; 5 A AC15; 8760 switching cycles/year)
Proof test interval	240 Months
Duration of use	240 Months

Safety data: IEC 61508 - Low demand

Equipment type	Type A
Safety Integrity Level (SIL)	3
Safe Failure Fraction (SFF)	99.66 %
MTBF	63 Years
λ_{SU}	1579 FIT
λ_{SD}	0 FIT
λ_{DU}	5.392 FIT
λ_{DD}	0 FIT
Probability of a hazardous failure on demand (PFD _{AVG})	1.27×10^{-4} 2.36×10^{-5} (for proof test interval = 1 year)
Proof test interval	72 Months
Duration of use	240 Months

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 3 G Ex nA nC IIC T4 Gc
Certificate	DEMKO 14 ATEX 1284X

IECEX

Identification	Ex nA nC IIC T4 Gc
Certificate	IECEX ULD 14.0003X

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UL, USA/Canada

Identification	cULus
Certificate	E140324

UL, USA/Canada

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

DNV

Identification	C, EMC2
Certificate	11253-14 HH

CE

Certificate	CE-compliant
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Environmental simulation test

Identification	ISA-S71.04
Note	G3

Standards and regulations

Air clearances and creepage distances between the power circuits

Standards/regulations	EN 60664-1, EN 60079-15
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Mounting

Mounting type	DIN rail mounting
Assembly instructions	See derating curve
Mounting position	vertical, horizontal, with front of module upward
Connection method	Screw connection

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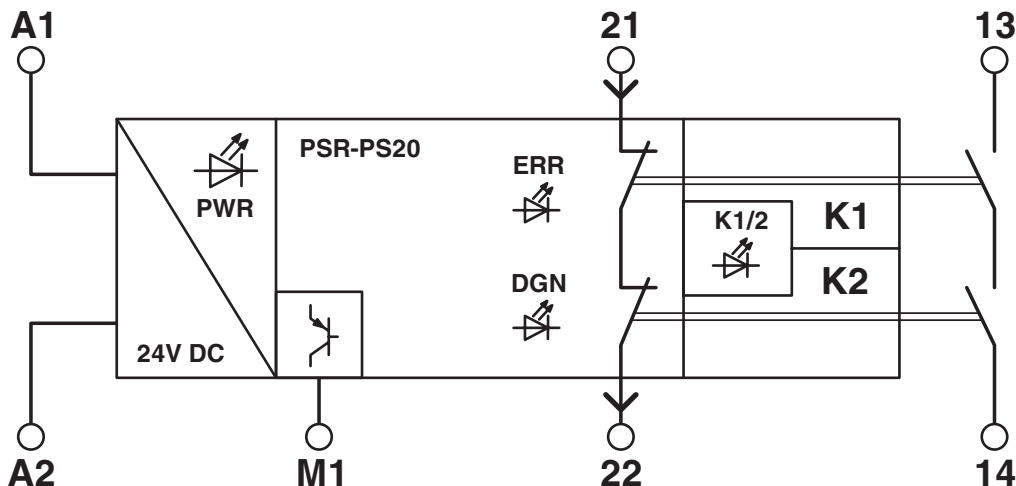


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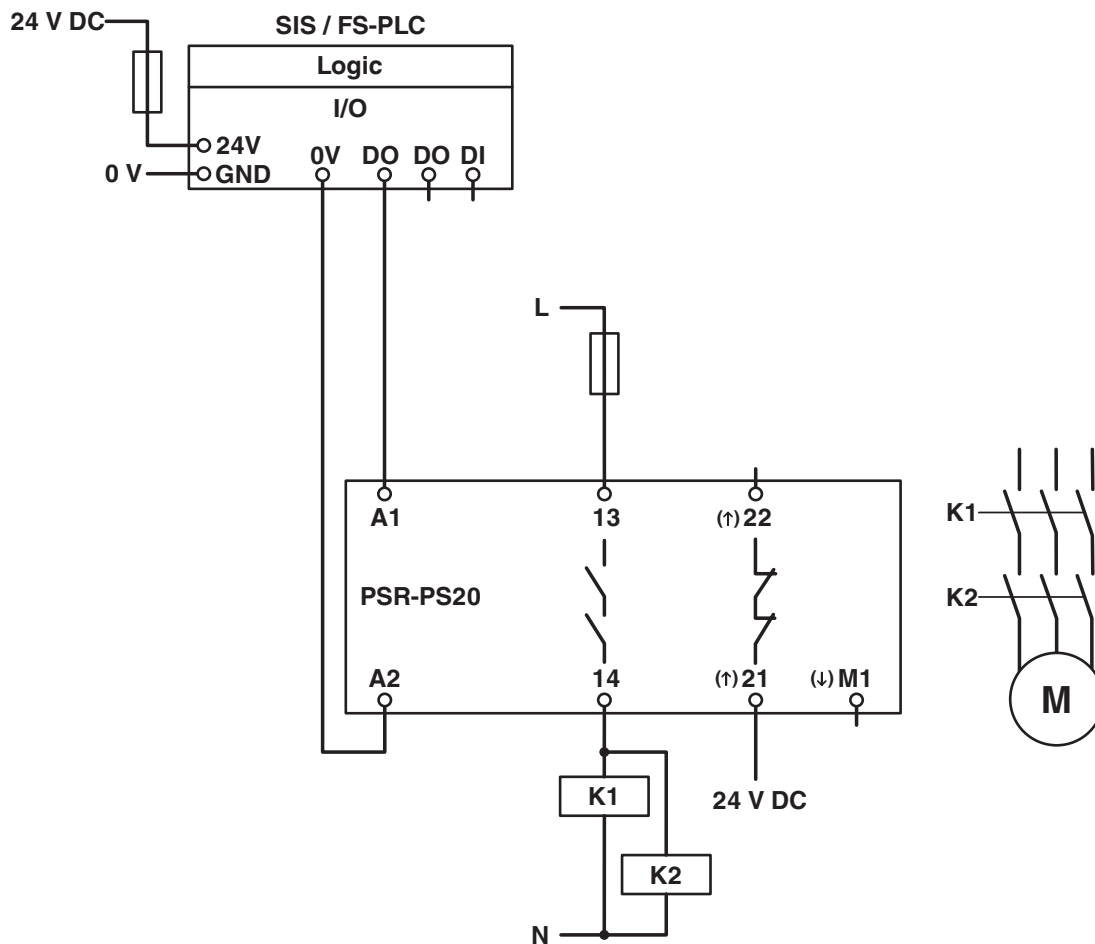
Drawings

Block diagram



Block diagram

Circuit diagram



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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/gb/products/2700356>



EAC

Approval ID: RU C-DE.A*30.B.01082



DNV GL

Approval ID: TAA00002VZ



UL Listed

Approval ID: FILE E 140324



cUL Listed

Approval ID: FILE E 140324



Functional Safety

Approval ID: 44-780-13755203



Functional Safety

Approval ID: 44-205-13755205



IECEx

Approval ID: IECEx ULD 14.0003 X



cUL Listed

Approval ID: File E 360692



UL Listed

Approval ID: File E 360692



ATEX

Approval ID: DEMKO 14 ATEX 1284 X

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Classifications

ECLASS

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

ETIM

ETIM 8.0	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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Accessories

ZBF 6:UNBEDRUCKT - Zack Marker strip, flat

0808710

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Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: PLOTMARK, CMS-P1-PLOTTER, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 5.15 x 6.15 mm, Number of individual labels: 10

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