

Forcibly guided coupling relay - PSR-PC40-2NO-1DO-24DC-SP - 2700589



<https://www.phoenixcontact.com/il/products/2700589>

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Coupling relay for SIL 3 high and low-demand applications, couples digital output signals to the I/O, 2 enabling current paths, 1 digital signal output, safe state off applications, test pulse filter, pluggable Push-in terminal block

Your advantages

- Low housing width of just 12.5 mm
- Corrosion protection due to conformal coating of the PCB
- 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
- Self-regulation with device-internal lock
- Manually monitored and automatic activation in a single device
- 2 enabling current paths, 1 digital signal output
- Couples digital output signals from failsafe controllers to I/O devices (valves, etc.) for electrical isolation and power adaptation
- Long service life thanks to filtering of controller test pulses

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Commercial Data

Order Key	2700589
Packing unit	1 pc
Minimum order quantity	1 pc
Catalog Page	Page 251 (C-6-2019)
GTIN	4046356916141
Weight per Piece (including packing)	205.0 GRM
Weight per Piece (excluding packing)	196.0 GRM
Customs tariff number	85364900
Country of origin	DE

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Technical Data

Environmental and real-life conditions

Ambient conditions

Shock	15g
Min. degree of protection of inst. location	IP54
Vibration (operation)	2g
Maximum altitude	≤ 2000 m (Above sea level)
Ambient temperature (operation)	-40 °C ... 70 °C (observe derating)
Max. permissible relative humidity (operation)	75 % (on average, 85% infrequently, non-condensing)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Degree of protection	IP20
Max. permissible humidity (storage/transport)	75 % (on average, 85% infrequently, non-condensing)

Output data

Signal: M1

Short-circuit protection	no
Maximum inrush current	500 mA ($\Delta t = 1 \text{ ms}$ at U_s)
Number of outputs	1 (non-safety-related)
Voltage	approx. 22 V DC ($U_s - 2 \text{ V}$)
Output fuse	150 mA fast blow
Output description	PNP
Current	max. 100 mA

Relay: Enabling current path

Contact material	AgSnO ₂
Contact type	2 enabling current paths
Output fuse	6 A gL/gG 4 A gL/gG (for low-demand applications)
Limiting continuous current	6 A (High demand) 4 A (Low demand)
Sq. Total current	60 A ² (observe derating)
Mechanical service life	10x 10 ⁶ cycles
Switching frequency	max. 0.5 Hz
Number of outputs	2 (safety-related N/O contacts: 13/14, 23/24)
Switching capacity according to IEC 60947-5-1	4 A (24 V (DC13)) 5 A (250 V (AC15))
Output description	2 NO contacts each in series, without delay, floating
Switching voltage	min. 12 V AC/DC max. 250 V AC/DC (Observe the load curve)
Inrush current	min. 3 mA max. 6 A

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Switching capacity	min. 60 mW
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Input data

Digital: Start circuit

Current consumption	< 5 mA
Voltage at input/start and feedback circuit	24 V DC -15 % / +10 %
Max. permissible overall conductor resistance	150 Ω
Number of inputs	2 (Non-safety-related start inputs: Y1/Y2)
Inrush current	< 10 mA

Notes

Utilization restriction

EMC note	EMC: class A product, see manufacturer's declaration in the download area
CCCex note	Use in potentially explosive areas is not permitted in China.

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"

Electrical properties

Rated insulation voltage	250 V AC
Nominal operating mode	100% operating factor
Maximum power dissipation for nominal condition	5.5 W ($I_L^2 = 60 \text{ A}^2$)
Rated surge voltage/insulation	Safe isolation, 6 kV reinforced insulation from control circuit, start circuit, signal output to the enabling current paths, 4 kV/basic insulation between the enabling current paths and between all current paths and housing

Supply

Rated control circuit supply voltage U_S	20.4 V DC ... 26.4 V DC
	24 V DC -15 % / +10 % (A1/A2)
Filter time	max. 2 ms (at A1-A2; test pulse width)
	≥ 100 ms (at A1-A2; test pulse rate)
Power consumption at U_S	typ. 1.8 W
Protective circuit	Serial protection against polarity reversal; 33 V suppressor diode
Inrush current	typ. 400 mA ($\Delta t < 100 \mu\text{s}$ at U_S)
Rated control supply current I_S	typ. 75 mA (depending on load M1 +100 mA)

Dimensions

Height	116.6 mm
Width	12.5 mm
Depth	114.5 mm

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LED signaling

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

Material specifications

Housing color	yellow
Housing material	PBT

Mounting

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

Characteristics

Safety data: IEC 61508 - High demand

Duration of use	240 Months
Proof test interval	240 Months
λ_{SD}	989.32 FIT
Safety Integrity Level (SIL)	3
Probability of a hazardous failure per hour (PFH _D)	1.04×10^{-10} (4 A DC13; 5 A AC15; 8760 switching cycles/year)
Equipment type	Type A
λ_{SU}	397.43 FIT
λ_{DU}	0.10 FIT
Safe Failure Fraction (SFF)	99.99 %
λ_{DD}	51.90 FIT
MTBF	64.98 Years

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 - Low demand

Duration of use	240 Months
Proof test interval	72 Months
Probability of a hazardous failure on demand (PFD _{AVG})	1.23×10^{-4} 2.29×10^{-5} (for proof test interval = 1 year)
λ_{SD}	0 FIT
Safety Integrity Level (SIL)	3
Equipment type	Type A
λ_{SU}	1798 FIT
λ_{DU}	5.236 FIT

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Safe Failure Fraction (SFF)	99.71 %
λ_{DD}	0 FIT
MTBF	54 Years

Approval data

Conformity/Approvals

UL certificate	E140324
	E360692
GL	C, EMC2
IECEX certificate	IECEX ULD 14.0003X
Environmental simulation test	ISA-S71.04 (G3)
EU-type examination certificate	DEMKO 14 ATEX 1284X
ATEX	□ II 3 G Ex nA nC IIC T4 Gc
Conformance	CE-compliant
Certificate of classification	11253-14 HH
UL, USA/Canada	cULus
	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
IECEX	Ex nA nC IIC T4 Gc

Connection data

Connection technology

pluggable	Yes
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Conductor connection

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

Standards and regulations

Air clearances and creepage distances between the power circuits

Standards/regulations	DIN EN 50178, EN 60079-15
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Product properties

Relay type	Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3
Application	Safe switch off
	High demand

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	Low demand
	Ex

Times

Typical release time	< 35 ms (when controlled via A1)
Recovery time	500 ms
Typ. starting time with U_s	< 200 ms (when controlled via A1, automatic start)

Insulation characteristics

Overvoltage category	III
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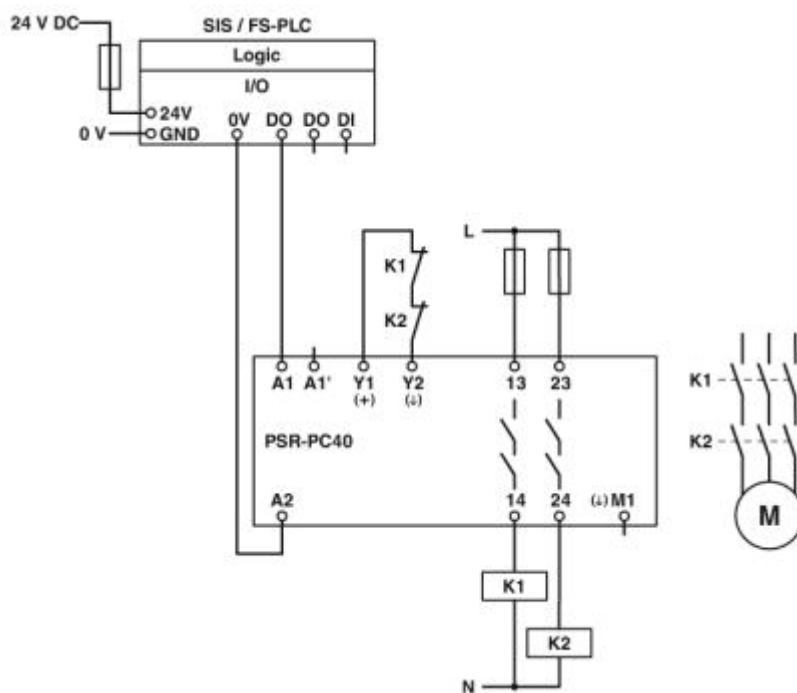
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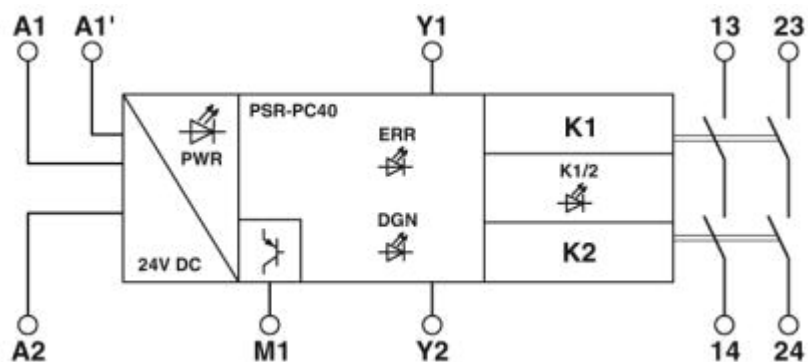
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Drawings

Circuit diagram



Block diagram



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Approvals

UL Listed 

cUL Listed 

Functional Safety 

EAC 

DNV GL 

Functional Safety 

cULus Listed

cULus Listed

IECEX 

UL Listed 

cUL Listed 

ATEX 

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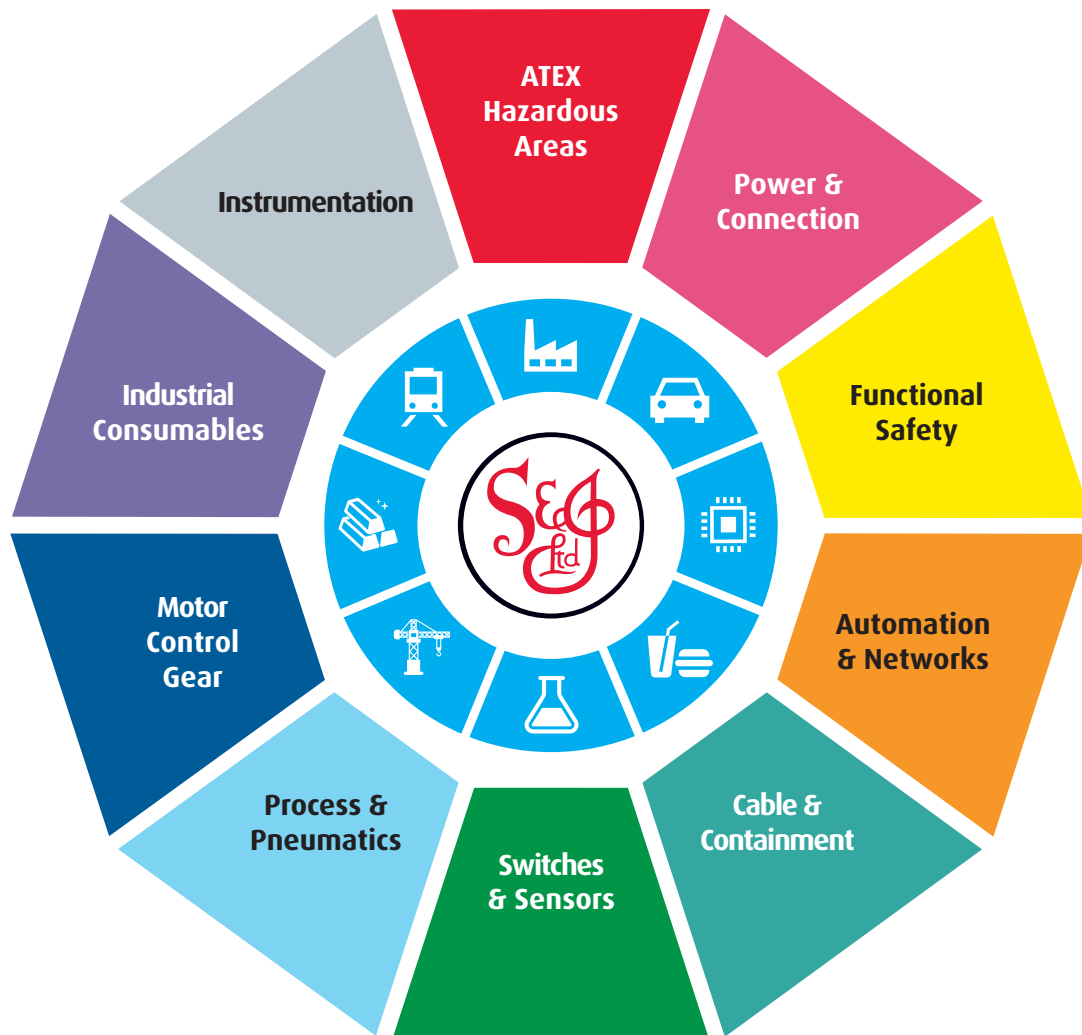
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