Coupling relay - PSR-SPP- 24DC/FSP/1X1/1X2

2981981

https://www.phoenixcontact.com/gb/products/2981981

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Safe coupling relay for SIL 3 high- and low-demand applications, couples digital output signals to the periphery, one enabling current path, one signal contact, module for safe state off applications, test pulse filter, fuse, plug-in Push-in connection, width: 17.5 mm

Your advantages

- Narrow 17.5 mm housing
- Up to SIL 3 in accordance with IEC 61508
- With built-in, replaceable fuse in the enabling current path
- Easy proof test according to IEC 61508 thanks to integrated signal contact
- Long service life thanks to filtering of controller test pulses
- Force-guided contacts in accordance with EN 50205
- 1 enabling current path
- Couples digital output signals from failsafe controllers to I/O devices (valves, etc.) for electrical isolation and power adaptation

Commercial Data

Item number	2981981
Packing unit	1 pc
Minimum order quantity	1 pc
Sales Key	DNA161
Product Key	DNA161
Catalog Page	Page 254 (C-6-2019)
GTIN	4046356448345
Weight per Piece (including packing)	159.6 g
Weight per Piece (excluding packing)	99.99 g
Customs tariff number	85364900
Country of origin	DE

Technical Data

Product properties

Product type	Coupling relay
Product family	PSRclassic
Application	Safe switch off
	High demand
	Low demand
Mechanical service life	10x 10^6 cycles
Relay type	Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3

Electrical properties

Maximum power dissipation for nominal condition	2.4 W
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, reinforced insulation 6 kV between the control circuits (A1/A2), (21/22), (13/14)

Input data

General

Rated control circuit supply voltage U_S	24 V DC -15 % / +10 %
Power consumption at U_S	typ. 1.32 W
Rated control supply current I_S	typ. 55 mA
Input voltage range	20.4 V DC ... 26.4 V DC
Inrush current	max. 100 mA
Filter time	max. 5 ms (at A1 in the event of voltage dips at U_s)
	max. 2 ms (Test pulse width; high test pulse at A1/A2)
	≥ 100 ms (Test pulse width; high test pulse at A1/A2)
	Test pulse rate = 80 x Test pulse width
	max. 5 ms (Test pulse width; low test pulse at A1/A2)
	≥ 50 ms (Test pulse rate; low test pulse at A1/A2)
	Test pulse rate = 15 x Test pulse width
Typ. starting time with U_s	50 ms
Typical release time	50 ms
Recovery time	1 s
Maximum switching frequency	0.5 Hz
Protective circuit	Surge protection; Suppressor diode, 33 V (A1 - A2)
Operating voltage display	1 x yellow LED

Output data

Contact type	1 enabling current path

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	1 confirmation current path
Contact material	AgCuNi, + 0.2 µm Au
Maximum switching voltage	250 V AC/DC (N/O contact / N/C contact, observe the load curve)
Minimum switching voltage	15 V AC/DC (N/O contact / N/C contact)
Limiting continuous current	5 A (N/O contact, pay attention to the derating)
	100 mA (N/C contact)
Maximum inrush current	5 A (N/O contact)
	100 mA (N/C contact)
Inrush current, minimum	5 mA (N/O contact / N/C contact)
Sq. Total current	25 A^2 (observe derating)
Interrupting rating (ohmic load) max.	120 W (24 V DC, τ = 0 ms, N/C contact: 2.4 W)
	192 W (48 V DC, τ = 0 ms, N/C contact: 4.8 W)
	162 W (60 V DC, τ = 0 ms, N/C contact: 6 W)
	66 W (110 V DC, τ = 0 ms, N/C contact: 11 W)
	60 W (220 V DC, τ = 0 ms, N/C contact: 22 W)
	1250 VA (250 V AC, τ = 0 ms, N/C contact: 25 VA)
Maximum interrupting rating (inductive load)	72 W (24 V DC, τ = 40 ms, N/C contact: 2.4 W)
	43 W (48 V DC, τ = 40 ms, N/C contact: 4.8 W)
	41 W (60 V DC, τ = 40 ms, N/C contact: 6 W)
	35 W (110 V DC, τ = 40 ms, N/C contact: 11 W)
	48 W (220 V DC, τ = 40 ms, N/C contact: 22 W)
Switching capacity	min. 75 mW
Switching capacity (3600/h cycles)	5 A (24 V (DC13))
	5 A (230 V (AC15))
Output fuse	5 A T fuse (N/O contact)
	150 mA Fast-blow (N/C contact)

Connection data

Connection technology

pluggable	yes

Conductor connection

Connection method	Push-in connection
Conductor cross section solid	0.2 mm² ... 1.5 mm²
Conductor cross section flexible	0.2 mm² ... 1.5 mm²
Conductor cross section, flexible, with ferrule, with plastic sleeve	0.25 mm² ... 1.5 mm² (only together with CRIMPFOX 6)
Conductor cross section flexible, with ferrule without plastic sleeve	0.25 mm² ... 1.5 mm² (only together with CRIMPFOX 6)
Conductor cross-section AWG	24 ... 16
Stripping length	8 mm

Dimensions

Width	17.5 mm
Height	112 mm

Depth	114.5 mm

Material specifications

Housing material	Polyamide

Characteristics

Safety data

Stop category	0

Safety data: EN ISO 13849

Category	4 (Diagnostic coverage (DC) of the control unit at A1/A2 must be ≥ 99%)
Performance level (PL)	e (Diagnostic coverage (DC) of the control unit at A1/A2 must be ≥ 99%)

Safety data: EN 50156

Safety Integrity Level (SIL)	3

Safety data: IEC 61508 - High demand

Equipment type	Type A
Safety Integrity Level (SIL)	3 (max. 10% of the entire SIL; diagnostic coverage (DC) of the control unit at A1/A2 must be ≥ 90%)
Safe Failure Fraction (SFF)	99.99 %
MTBF	319 Years (includes errors which are not part of the safety function; MTTR = 8 h)
λ_{SU}	62.7 FIT
λ_{SD}	198 FIT
λ_{DU}	0.02 FIT
λ_{DD}	3.66 FIT
Probability of a hazardous failure per hour (PFH_D)	2.02×10^{-11} (4 A DC13; 5 A AC15; 8760 switching cycles/year)
Diagnostic coverage (DC)	99 % (during evaluation of the confirmation current path)
Proof test interval	240 Months
Duration of use	240 Months

Safety data: IEC 61508 - Low demand

Designation	The safety characteristic data is calculated assuming an average ambient temperature of 40°C. At higher ambient temperatures, a safety factor of 1.8 should be applied to the characteristics.
Equipment type	Type A
Safety Integrity Level (SIL)	3 (max. 10% of the entire SIL; diagnostic coverage (DC) of the control unit at A1/A2 must be ≥ 90%)
Safe Failure Fraction (SFF)	99.77 %
MTBF	113 Years (includes errors which are not part of the safety function; MTTR = 8 h)
λ_{SU}	909.7 FIT
λ_{SD}	0 FIT
λ_{DU}	2.09 FIT
λ_{DD}	0 FIT

Probability of a hazardous failure on demand (PFD_{AVG})	9.87×10^{-5}
	9.15×10^{-6} (for proof test interval = 1 year)
Proof test interval	144 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)	-20 °C ... 55 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 70 °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

Approval data

CE

Certificate	CE-compliant

Standards and regulations

Air clearances and creepage distances between the power circuits

Standards/regulations	DIN EN 50178/VDE 0160

Mounting

Mounting type	DIN rail mounting
Mounting position	any

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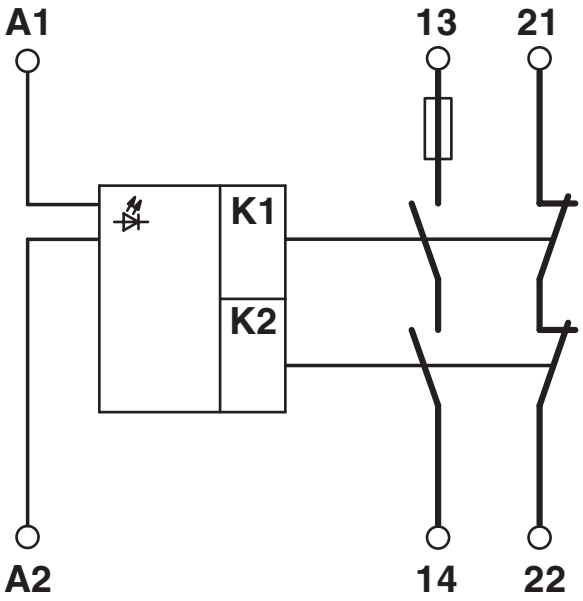
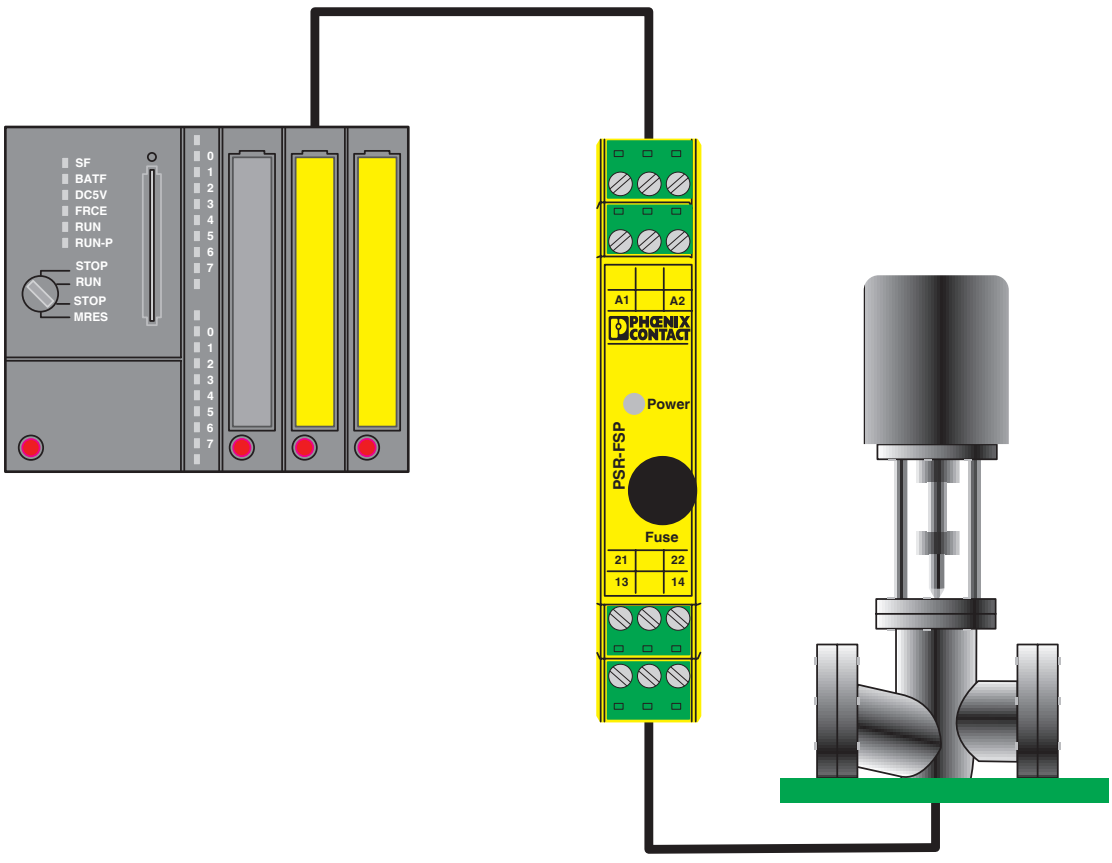
Drawings

Circuit diagram



Application drawing



Example of electrical isolation of a safety PLC output from the field.

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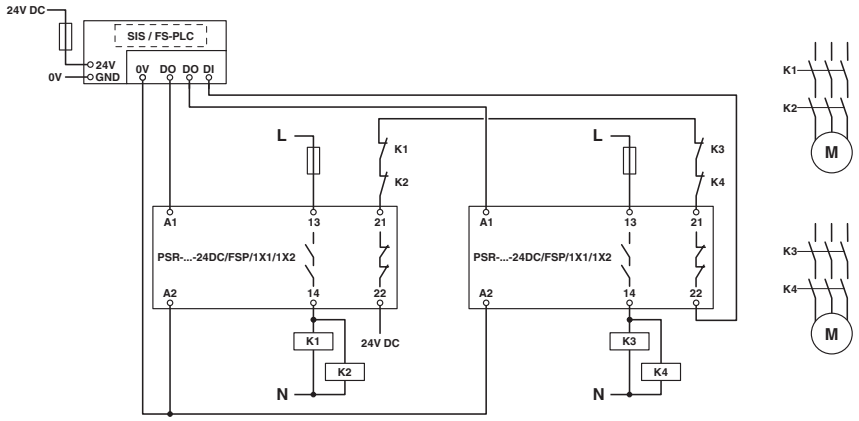
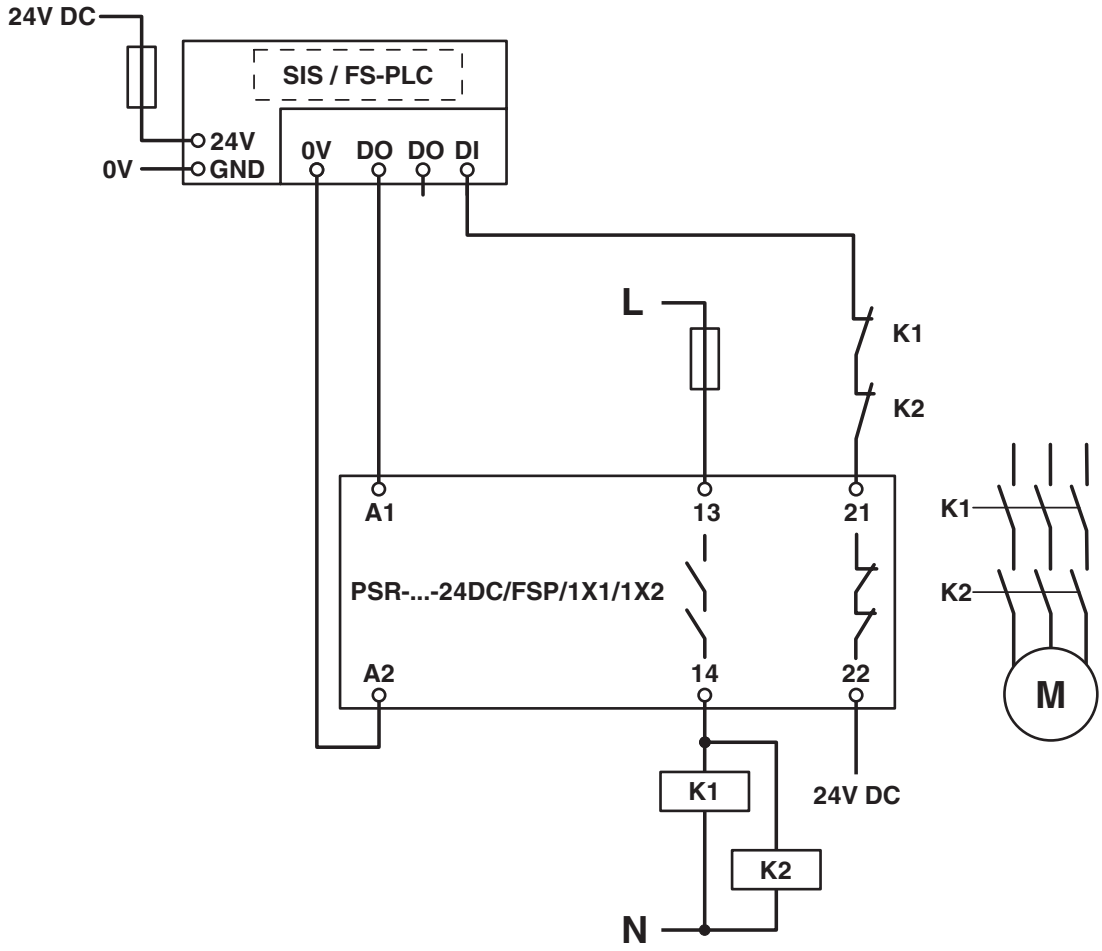
Circuit diagram



Circuit diagram



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Approvals

EAC
Approval ID: TR_TS_D_00573_c

DNV GL
Approval ID: TAA00002UC

	Nominal Voltage U_N	Nominal Current I_N	Cross Section AWG	Cross Section mm^2
Applied for			-	-

UL Listed
Approval ID: FILE E 140324

cUL Listed
Approval ID: FILE E 140324

Functional Safety
Approval ID: 968/EZ 365.10/22

cULus Listed

Classifications

ECLASS

ECLASS-9.0	27371819
ECLASS-10.0.1	27371819
ECLASS-11.0	27371819

ETIM

ETIM 8.0	EC001449

UNSPSC

UNSPSC 21.0	39122200

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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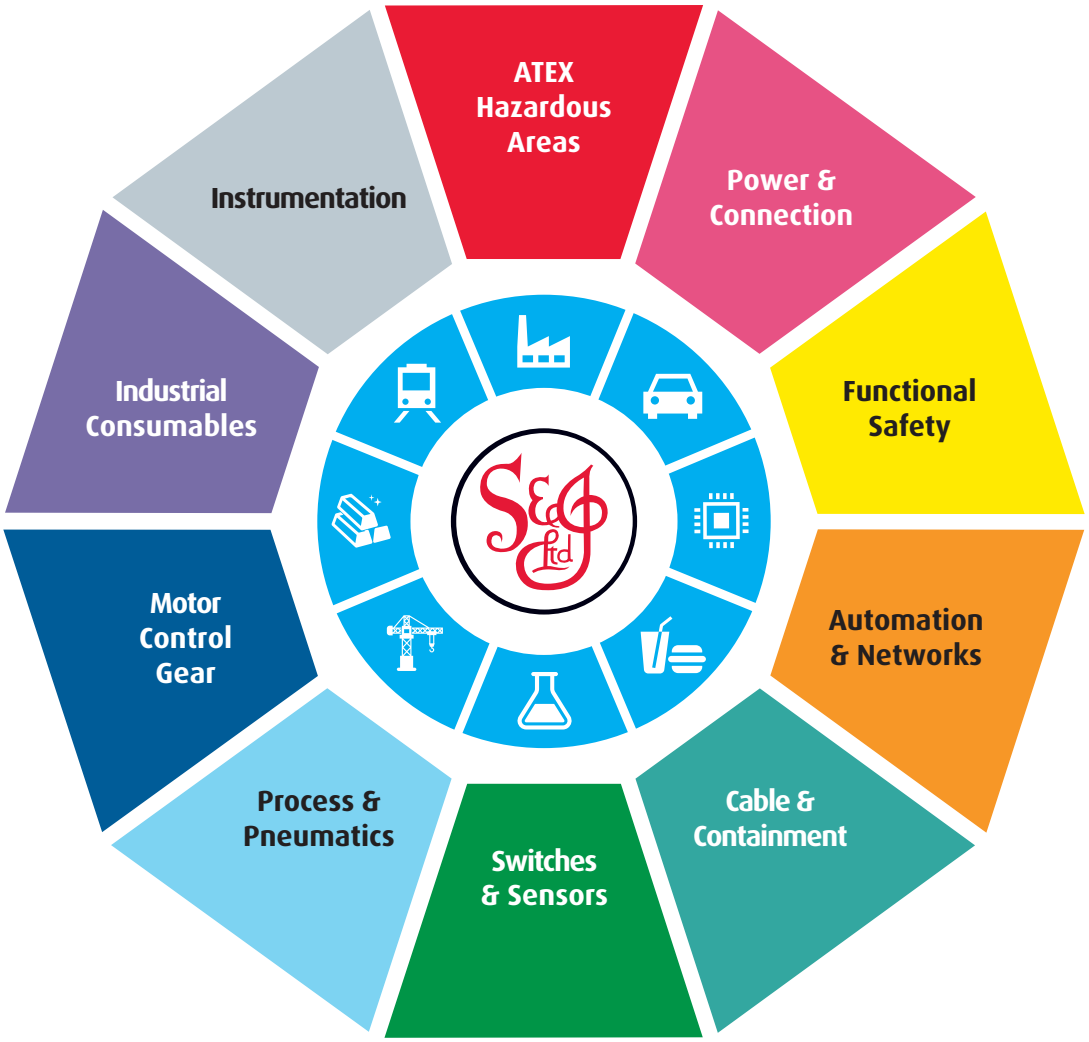

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