

PSR-PC51-1NO-1NC-24DC-SC - Coupling relay



2702522

<https://www.phoenixcontact.com/us/products/2702522>

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Coupling relay for electrical isolation and power adaptation for SIL 3 F&G applications, low demand, load diagnostics in the Off and On state for wire break and short circuit, 1 enabling current path, test pulse filter, plug-in screw terminal block, width: 17.5 mm

Your advantages

- Earth leakage monitoring
- Suitable for low-demand applications up to SIL 3 in accordance with IEC 61508, IEC 61511, and EN 50156
- Configurable Off and On state diagnostics
- Active error acknowledgment via A1 at DO
- Integrated DCS test pulse filter
- 1 enabling current path, 1 signaling current path

Commercial data

Item number	2702522
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN01
Product key	DNA182
Catalog page	Page 253 (C-6-2019)
GTIN	4055626283388
Weight per piece (including packing)	252.2 g
Weight per piece (excluding packing)	251.5 g
Customs tariff number	85364190
Country of origin	DE

Technical data

Notes

Utilization restriction

EMC note	EMC: class A product, see manufacturer's declaration in the download area
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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 on
	Low demand
	Ex
Relay type	Electromechanical relay

Times

Typ. starting time with U_S	typ. 100 ms (when controlled via A1-A2)
Typical release time	typ. 30 ms (when controlled via A1-A2)
Recovery time	1 s (when controlled via A1-A2)

Electrical properties

Maximum power dissipation for nominal condition	3.8 W (at $U_B = 26.4$ V DC, $U_{BD} = 26.4$ V DC, $I_L = 3$ A)
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	Basic insulation 4 kV between all current paths and housing
	Safe isolation, 6 kV reinforced insulation from (A1/A2, 24V/0V, 21/22, and TP1/TP2/TP3) to the enabling current path (L, L', LO, LO', NI, NI', N,N')

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. 75 mA
Power consumption at U_S	typ. 2 W (at U_S/U_D ; On state)
Inrush current	max. 100 mA
Filter time	2 ms (at A1-A2 in the event of voltage dips at U_S)
	max. 2 ms (at A1-A2; low test pulse width)
	≥ 100 ms (at A1-A2; low test pulse rate)
	max. 17 ms (at A1-A2; high test pulse width)
	≥ 800 ms (at A1-A2; high test pulse rate)

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Protective circuit	Surge protection; 36 V suppressor diode
	Reverse polarity protection
Supply	
Designation	24V/0V
Diagnostic supply voltage U_D	24 V DC -20 % / +25 %
Input current at U_D	35 mA (at $U_D = 24$ V)
	45 mA (at $U_D = 19$ V)
	25 mA (at $U_D = 30$ V)
Inrush current at U_D	1.5 A ($\Delta t < 10$ μ s)
Power consumption at U_D	typ. 0.9 W (at U_D ; Off state)
Protective circuit	Surge protection; 33 V suppressor diode
	Reverse polarity protection

Input data

Digital: Test points for proof test (T1, T2, T3)

Number of inputs	3
Inrush current	typ. 200 mA
Protective circuit	Surge protection; 36 V suppressor diode
Current consumption	typ. 20 mA (Input TP1)
	typ. 20 mA (Input TP2)
	typ. 30 mA (Input TP3)

Output data

Relay: Enabling current path (L-LO-NI-N / L'-LO'-NI'-N')

Output description	safety-related N/O contacts
Number of outputs	1 (undelayed)
Contact switching type	1 enabling current path
Contact material	AgNi, gold-flashed, Ag alloy
Switching voltage	min. 16 V AC/DC
	max. 250 V AC
	max. 125 V DC
Switching capacity	min. 1 W
Inrush current	min. 50 mA
	max. 5 A ($\Delta t \leq 1$ s)
Limiting continuous current	3 A (Observe derating, load type, and on-load voltage)
Sq. Total current	9 A ² (observe derating)
Switching frequency	max. 0.5 Hz
Diagnostic threshold	7 Ω ... 20 k Ω (configurable)
Mechanical service life	approx. 5x 10 ⁷ cycles

Relay: Signaling current path (21/22)

Output description	non-safety-related N/C contact
Number of outputs	1 (without delay, floating)

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Contact switching type	1 signaling current path
Switching current	max. 100 mA
Inrush current	≤ 800 mA ($\Delta t \leq 100$ ms)
Short-circuit protection	no

Connection data

Connection technology

pluggable	yes
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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	7 mm
Screw thread	M3

Signaling

Status display	1 x yellow LED, 1 x green LED, 1 x red LED
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Dimensions

Width	17.5 mm
Height	112.2 mm
Depth	114.5 mm

Material specifications

Housing material	Polyamide
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Characteristics

Safety data: EN 50156-2

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

Equipment type	Type A
Safety Integrity Level (SIL)	3
Safe Failure Fraction (SFF)	99.68 %
MTBF	66.98 Years
λ_{SU}	1831.13 FIT
λ_{SD}	0 FIT
λ_{DU}	5.72 FIT
λ_{DD}	3.66 FIT
Probability of a hazardous failure on demand (PFD _{AVG})	1.49 x 10 ⁻⁴ (< 15% of the overall SIL) 2.5 x 10 ⁻⁵ (for proof test interval = 1 year)
Proof test interval	72 Months
Duration of use	240 Months

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Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Ambient temperature (operation)	-25 °C ... 60 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 65 °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, 11 ms
Vibration (operation)	10 Hz ... 150 Hz, 2g
Air pressure (operation)	79 kPa ... 106 kPa
Air pressure (storage/transport)	79 kPa ... 106 kPa

Approvals

ATEX

Identification	Ⓜ II 3G Ex ec nC IIC T4 Gc
Certificate	DEMKO 19 ATEX 2240X

IECEX

Identification	Ex ec nC IIC T4 Gc
Certificate	IECEX ULD 19.0023X

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
Certificate	2022122304115696

Standards and regulations

Air clearances and creepage distances between the power circuits

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Standards/regulations	IEC 60664-1
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Mounting

Mounting type	DIN rail mounting
Assembly instructions	See derating curve
Mounting position	vertical or horizontal
Connection method	Screw connection

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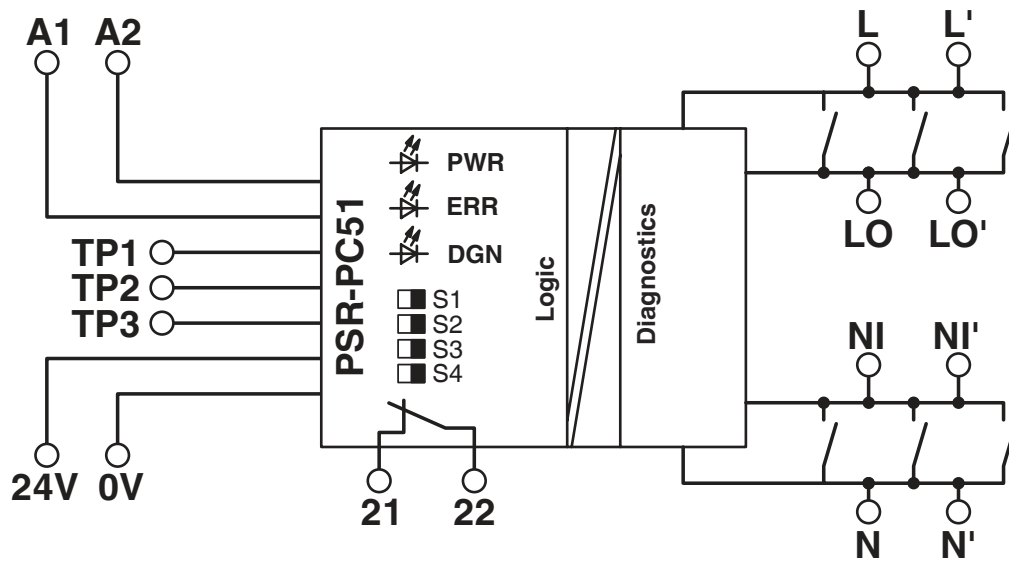


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Drawings

Block diagram



Block diagram

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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2702522>



UL Listed

Approval ID: FILE E 140324



cUL Listed

Approval ID: FILE E 140324



EAC

Approval ID: TR_TS_D_00573_c



EAC

Approval ID: RU*C-DE.*08.B.00010



Functional Safety

Approval ID: 968/FSP 1486.02/22



Functional Safety

Approval ID: 968/FSP 1486.02/22



IECEx

Approval ID: IECEx ULD 19.0023X



cUL Listed

Approval ID: File E 360692



UL Listed

Approval ID: File E 360692



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ATEX

Approval ID: DEMKO 19 ATEX 2240X

cULus Listed

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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

CP-MSTB - Coding profile

1734634

<https://www.phoenixcontact.com/us/products/1734634>

Coding profile, is inserted into the slot on the plug or inverted header, red insulating material



CR-MSTB - Coding section

1734401

<https://www.phoenixcontact.com/us/products/1734401>

Coding section, inserted into the recess in the header or the inverted plug, red insulating material



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CRIMPFOX 6 - Crimping pliers

1212034

<https://www.phoenixcontact.com/us/products/1212034>



Crimping pliers, for ferrules without insulating collar according to DIN 46228 Part 1 and ferrules with insulating collar according to DIN 46228 Part 4, 0.25 mm² ... 6.0 mm², lateral entry, trapezoidal crimp

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