

# PSR-SCP- 24DC/FSP/2X1/1X2 - Safety relays



2986960

<https://www.phoenixcontact.com/gb/products/2986960>

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

## Your advantages

- Narrow 17.5 mm housing
- Up to SIL 3 in accordance with IEC 61508
- 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
- 2 enabling current paths
- Couples digital output signals from failsafe controllers to I/O devices (valves, etc.) for electrical isolation and power adaptation

## Commercial data

|                                      |                     |
|--------------------------------------|---------------------|
| Item number                          | 2986960             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Sales key                            | DNA161              |
| Product key                          | DNA161              |
| Catalog page                         | Page 255 (C-6-2019) |
| GTIN                                 | 4046356520911       |
| Weight per piece (including packing) | 160.1 g             |
| Weight per piece (excluding packing) | 160.1 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 <sup>6</sup> 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  |
| Rated surge voltage/insulation | Safe isolation, reinforced insulation 6 kV between the control circuits (A1/A2), (31/32), (13/14, 23/24) |

### 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 switching type | 2 enabling current paths |
|------------------------|--------------------------|

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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                            | 50 A <sup>2</sup> (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                                  | 10 A gL/gG (N/O contact)  |
|  | 4 A gL/gG (for low-demand applications)                         |
|  | 150 mA Fast-blow (N/C contact)                                  |

## Connection data

### Connection technology

|           |     |
|-----------|-----|
| pluggable | yes |
|-----------|-----|

### 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  |

## Dimensions

|        |          |
|--------|----------|
| Width  | 17.5 mm  |
| Height | 99 mm    |
| Depth  | 114.5 mm |

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## Material specifications

|                  |                   |
|------------------|-------------------|
| Color (Housing)  | yellow (RAL 1018) |
| 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 $\geq 99\%$ ) |
| Performance level (PL) | e (Diagnostic coverage (DC) of the control unit at A1/A2 must be $\geq 99\%$ ) |

### Safety data: EN 50156

|                              |   |
|------------------------------|---|
| Safety Integrity Level (SIL) | 3 |
|------------------------------|---|

### Safety data: IEC 61508 - High demand

|                              |  |
|------------------------------|--|
| Safety Integrity Level (SIL) | 3 (max. 10% of the entire SIL; diagnostic coverage (DC) of the control unit at A1/A2 must be $\geq 90\%$ ) |
|------------------------------|--|

### Safety data: IEC 61508 - Low demand

|                              |  |
|------------------------------|--|
| Safety Integrity Level (SIL) | 3 (max. 10% of the entire SIL; diagnostic coverage (DC) of the control unit at A1/A2 must be $\geq 90\%$ ) |
|------------------------------|--|

### Safety data: EN IEC 62061

|                              |  |
|------------------------------|--|
| Safety Integrity Level (SIL) | 3 (max. 10% of the entire SIL; diagnostic coverage (DC) of the control unit at A1/A2 must be $\geq 90\%$ ) |
|------------------------------|--|

## 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                               | $\leq 2000$ 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

### CE

|             |              |
|-------------|--------------|
| Certificate | CE-compliant |
|-------------|--------------|

## Standards and regulations

# PSR-SCP- 24DC/FSP/2X1/1X2 - Safety relays



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## Air clearances and creepage distances between the power circuits

|                       |             |
|-----------------------|-------------|
| Standards/regulations | IEC 60664-1 |
|-----------------------|-------------|

## Mounting

|                   |                   |
|-------------------|-------------------|
| Mounting type     | DIN rail mounting |
| Mounting position | any               |

# PSR-SCP- 24DC/FSP/2X1/1X2 - Safety relays

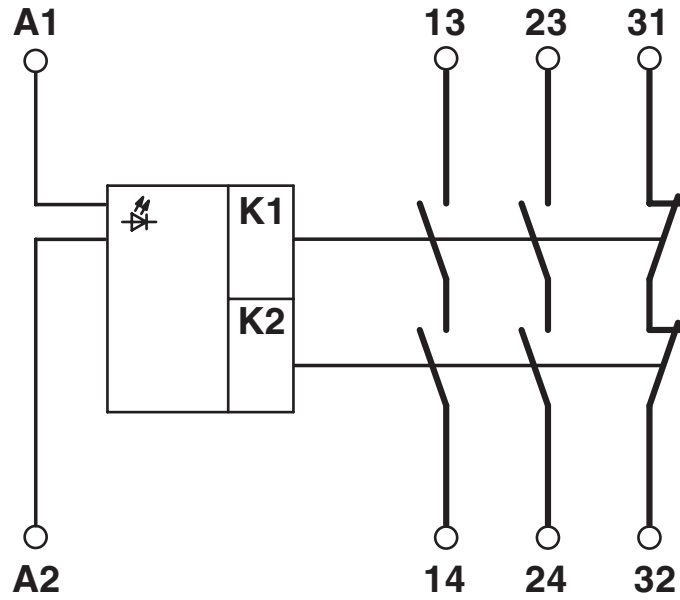


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## Drawings

Circuit diagram



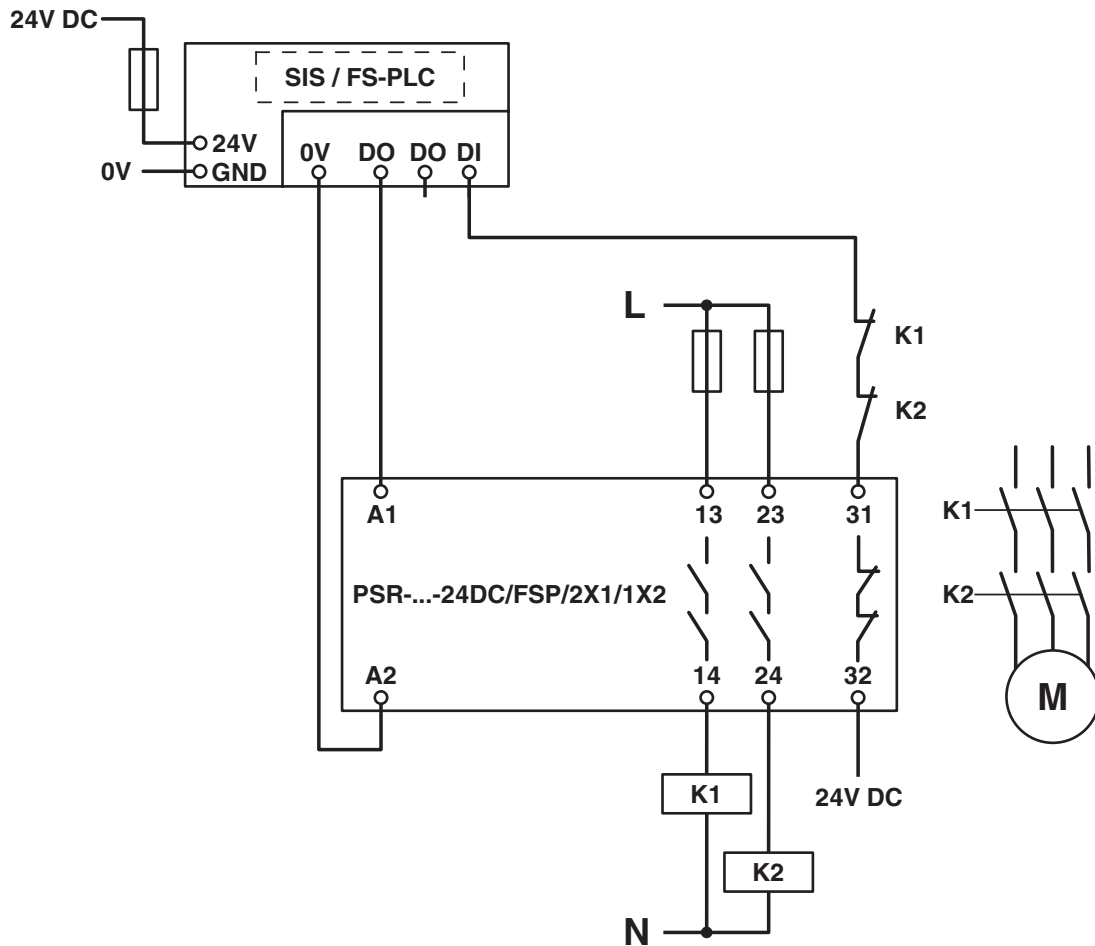
# PSR-SCP- 24DC/FSP/2X1/1X2 - Safety relays



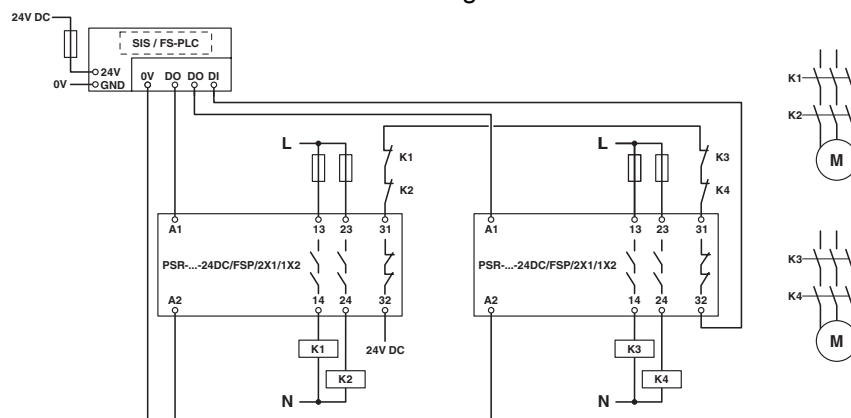
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Circuit diagram



Circuit diagram

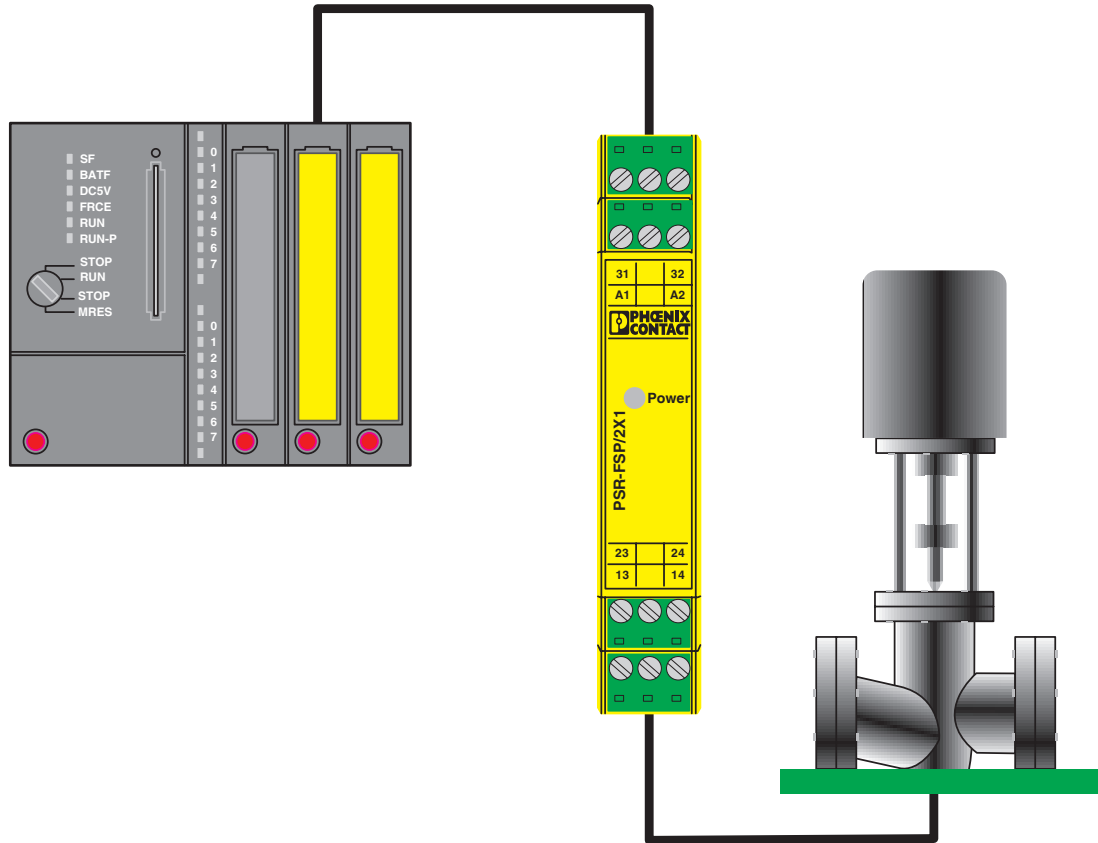


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Application drawing



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



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/gb/products/2986960>



**EAC**

Approval ID: TR\_TS\_D\_00573\_c



**DNV GL**

Approval ID: TAA00002UC



**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**

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## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC001449 |
|----------|----------|

### 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                                | c3451eea-28a9-426e-ab1b-3d9f48a31bb0 |

### EF3.0 Climate Change

|         |              |
|---------|--------------|
| CO2e kg | 3.06 kg CO2e |
|---------|--------------|

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## Accessories

### CRIMPFOX 6 - Crimping pliers

1212034

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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 mm<sup>2</sup> ... 6.0 mm<sup>2</sup>, lateral entry, trapezoidal crimp

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