

# PSR-SPP- 24UC/ESA4/2X1/1X2 - Safety relays



2963938

<https://www.phoenixcontact.com/us/products/2963938>

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Safety relay for emergency stop and safety door monitoring up to SIL 3 or Cat. 4, PL e in accordance with EN ISO 13849, 2-channel operation, 2 enabling current paths, nominal input voltage: 24 V DC, plug-in Push-in terminal block

## Your advantages

- Up to Cat. 4/PL e in accordance with EN ISO 13849-1, SIL 3 in accordance with EN IEC 62061, SIL 3 in accordance with IEC 61508
- 2 channel control
- 2 enabling current paths, 1 signaling current path
- Manually monitored and automatic activation in a single device

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2963938       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | DN01          |
| Product key                          | DNA113        |
| GTIN                                 | 4017918904777 |
| Weight per piece (including packing) | 181.3 g       |
| Weight per piece (excluding packing) | 193.9 g       |
| Customs tariff number                | 85371098      |
| Country of origin                    | DE            |

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## Technical data

### Notes

#### Note on application

|                     |                         |
|---------------------|-------------------------|
| Note on application | Only for industrial use |
|---------------------|-------------------------|

### Product properties

|                         |                                                                                      |
|-------------------------|--------------------------------------------------------------------------------------|
| Product type            | Safety relays                                                                        |
| Product family          | PSRclassic                                                                           |
| Application             | Emergency stop                                                                       |
|                         | Safety door                                                                          |
| Control                 | 2-channel                                                                            |
| Mechanical service life | approx. $10^7$ cycles                                                                |
| Relay type              | Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3 |

#### Insulation characteristics

|                      |     |
|----------------------|-----|
| Overvoltage category | III |
| Degree of pollution  | 2   |

### Electrical properties

|                                                 |                                                                                             |
|-------------------------------------------------|---------------------------------------------------------------------------------------------|
| Maximum power dissipation for nominal condition | 16.44 W ( $U_S = 26.4$ V, $I_L^2 = 72$ A <sup>2</sup> , $P_{Total\ max} = 2.04$ W + 14.4 W) |
| Nominal operating mode                          | 100% operating factor                                                                       |
| Rated insulation voltage                        | 250 V                                                                                       |
| Rated surge voltage/insulation                  | See data sheet, section "Insulation coordination".                                          |

### Input data

#### General

|                                             |                                                         |
|---------------------------------------------|---------------------------------------------------------|
| Rated control circuit supply voltage $U_S$  | 24 V DC -15 % / +10 %                                   |
| Power consumption at $U_S$                  | typ. 1.68 W (DC)                                        |
| Rated control supply current $I_S$          | typ. 70 mA                                              |
| Input voltage range in reference to $U_N$   | 0.85 ... 1.1                                            |
| Typical input current at $U_N$              | 70 mA DC                                                |
| Inrush current                              | < 3.5 A ( $\Delta t = 3$ ms at $U_S$ )                  |
|                                             | < 100 mA ( $\Delta t = 500$ ms, with $U_S/I_x$ at S12)  |
|                                             | > -100 mA ( $\Delta t = 300$ ms, with $U_S/I_x$ at S22) |
|                                             | < 6 mA (with $U_S/I_x$ to S34)                          |
| Current consumption                         | typ. 38 mA (S12)                                        |
|                                             | typ. -38 mA (S22)                                       |
|                                             | typ. 1 mA (with $U_S/I_x$ to S34)                       |
| Voltage at input/start and feedback circuit | approx. 24 V DC                                         |
| Filter time                                 | 5 ms (at A1 in the event of voltage dips at $U_S$ )     |
|                                             | No test pulses permitted                                |

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|                                               |                                                          |
|-----------------------------------------------|----------------------------------------------------------|
| Typical response time                         | 150 ms (automatic start)                                 |
| Typ. starting time with $U_s$                 | 250 ms (with $U_s$ when controlled via A1)               |
| Typical release time                          | 20 ms (on demand via the sensor circuit)                 |
|                                               | 45 ms (on demand via A1)                                 |
| Concurrence                                   | $\infty$                                                 |
| Recovery time                                 | 1 s (following demand of the safety function)            |
|                                               | < 1 s (Boot time)                                        |
| Protective circuit                            | Surge protection; Suppressor diode                       |
| Max. permissible overall conductor resistance | approx. 50 $\Omega$ (Input and start circuits at $U_s$ ) |
| Operating voltage display                     | Green LED                                                |
| Status display                                | LED (green)                                              |

## Output data

|                             |                                                  |
|-----------------------------|--------------------------------------------------|
| Contact switching type      | 2 enabling current paths                         |
|                             | 1 signaling current path                         |
| Contact material            | AgSnO <sub>2</sub> , + 0.2 $\mu$ m Au            |
| Maximum switching voltage   | 250 V AC/DC                                      |
| Minimum switching voltage   | 10 V AC/DC                                       |
| Limiting continuous current | 6 A (N/O contact)                                |
| Maximum inrush current      | 6 A                                              |
| Inrush current, minimum     | 10 mA                                            |
| Sq. Total current           | 72 A <sup>2</sup> (Enabling current paths)       |
|                             | 36 A <sup>2</sup> (Signaling current path 31/32) |
| Switching power min.        | 100 mW                                           |
| Output fuse                 | 10 A gL/gG (Enabling current paths)              |
|                             | 4 A gL/gG (Low-demand enabling current paths)    |
|                             | 6 A gL/gG (Signaling current path)               |

## Connection data

### Connection technology

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

### Conductor connection

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

## Dimensions

|       |         |
|-------|---------|
| Width | 22.5 mm |
|-------|---------|

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|        |          |
|--------|----------|
| Height | 112 mm   |
| Depth  | 114.5 mm |

## Material specifications

|                  |                   |
|------------------|-------------------|
| Color (Housing)  | yellow (RAL 1018) |
| Housing material | PA                |

## Characteristics

### Safety data

|               |   |
|---------------|---|
| Stop category | 0 |
|---------------|---|

### Safety data: EN ISO 13849

|                        |                                                    |
|------------------------|----------------------------------------------------|
| Category               | 4                                                  |
| Performance level (PL) | e (5 A DC13; 5 A AC15; 8760 switching cycles/year) |

### Safety data: IEC 61508 - High demand

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

### Safety data: IEC 61508 - Low demand

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

### Safety data: EN IEC 62061

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

## 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                                |

## Mounting

|                   |                        |
|-------------------|------------------------|
| Mounting type     | DIN rail mounting      |
| Assembly note     | See derating curve     |
| Mounting position | vertical or horizontal |

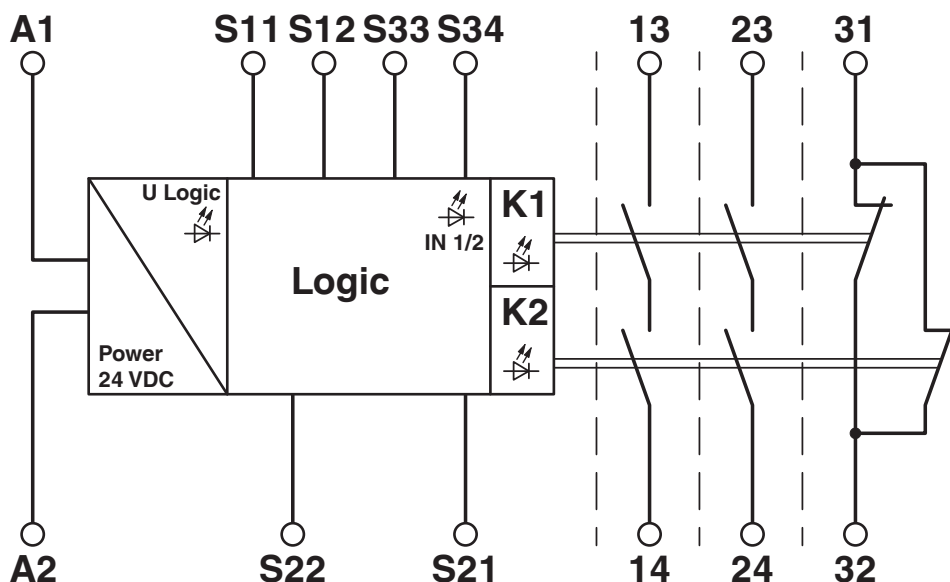
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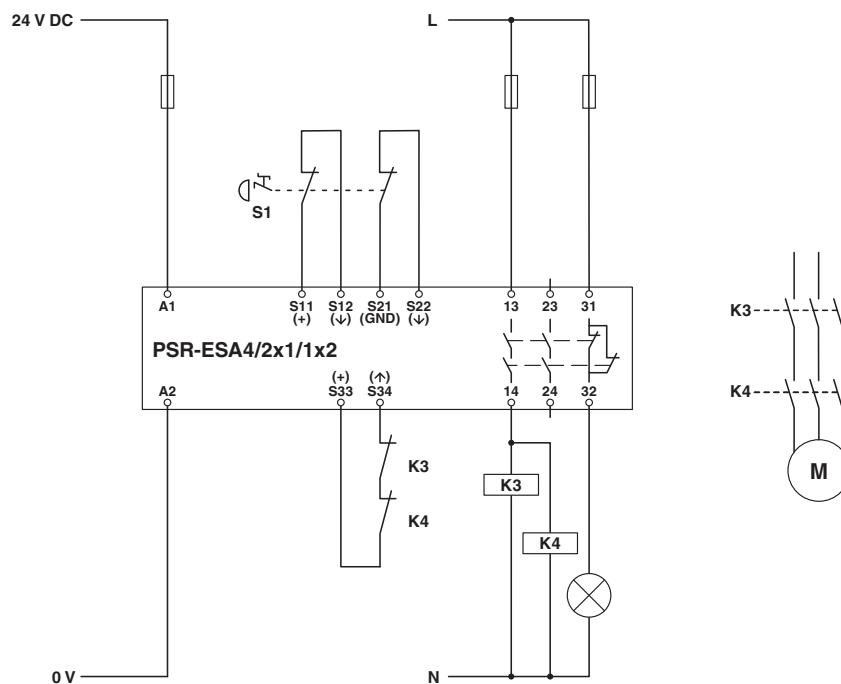
## Drawings

Circuit diagram



Block diagram

Circuit diagram



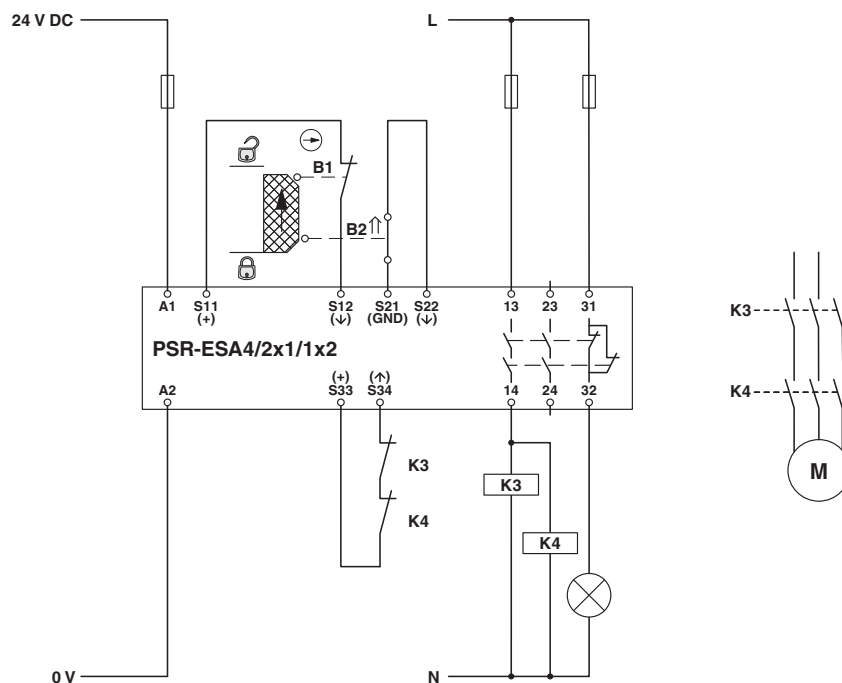
2-channel emergency stop monitoring

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Circuit diagram



Two-channel safety door monitoring

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## Approvals

 To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2963938>



**cULus Listed**

Approval ID: E140324



**Functional Safety**

Approval ID: 01/205/0652.05/22

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## Classifications

### ECLASS

|                   |          |
|-------------------|----------|
| ECLASS-13.0       | 27371819 |
| ECLASS-15.0       | 27371819 |
| ECLASS-15.0 ASSET | 27250101 |

### ETIM

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

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39122205 |
|-------------|----------|



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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                                | 25cda955-a831-4037-9eab-8a8e1e658c85 |

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