

# PSR-SCP- 24UC/ESL4/3X1/1X2/B - Safety relays



2981059

<https://www.phoenixcontact.com/us/products/2981059>

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Safety relay for emergency stop, safety doors, and light grids up to SIL 3, Cat. 4, PL e, 1 or 2-channel operation, automatic or manual, monitored start, 3 enabling current paths,  $U_S = 24 \text{ V DC}$ , plug-in screw terminal block

## Your advantages

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

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2981059       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | DN01          |
| Product key                          | DNA123        |
| GTIN                                 | 4017918927202 |
| Weight per piece (including packing) | 193 g         |
| Weight per piece (excluding packing) | 193 g         |
| Customs tariff number                | 85371098      |
| Country of origin                    | DE            |

## 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                                                                          |
|                         | Light grid                                                                           |
| Control                 | 1 and 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   |

#### Times

|                               |                                               |
|-------------------------------|-----------------------------------------------|
| Typical response time         | 125 ms (automatic start)                      |
|                               | 110 ms (manual, monitored start)              |
| Typ. starting time with $U_S$ | 125 ms (when controlled via A1)               |
| Typical release time          | 10 ms (on demand via the sensor circuit)      |
|                               | 45 ms (on demand via A1)                      |
| Restart time                  | < 1 s (Boot time)                             |
| Recovery time                 | 1 s (following demand of the safety function) |
| Start pulse length            | ≥ 500 ms (manual start)                       |

### Electrical properties

|                                                 |                                                                                               |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Maximum power dissipation for nominal condition | 16.44 W (at $U_S = 26.4$ 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".                                            |

#### Supply

|                                            |                                                                       |
|--------------------------------------------|-----------------------------------------------------------------------|
| Designation                                | A1/A2                                                                 |
| Rated control circuit supply voltage $U_S$ | 24 V DC -15 % / +10 %                                                 |
| Rated control supply current $I_S$         | typ. 70 mA (at $U_S$ )                                                |
| Power consumption at $U_S$                 | typ. 1.68 W                                                           |
| Inrush current                             | < 3.5 A (typ. with $U_S$ , $\Delta t = 3$ ms)                         |
| Filter time                                | 5 ms (in the event of voltage dips at $U_S$ , no test pulses allowed) |
| Protective circuit                         | Serial protection against polarity reversal; Suppressor diode         |

## Input data

### Digital: Logic (S12, S22)

|                                               |                                                                                                                                    |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Description of the input                      | safety-related                                                                                                                     |
| Number of inputs                              | 2                                                                                                                                  |
| Input voltage range "0" signal                | 0 V DC ... 5 V DC                                                                                                                  |
| Input voltage range "1" signal                | 20.4 V ... 26.4 V                                                                                                                  |
| Input current range "0" signal                | 0 mA ... 2 mA                                                                                                                      |
| Inrush current                                | max. 110 mA (typ. with $U_S$ , $\Delta t = 3$ ms)                                                                                  |
| Filter time                                   | max. 2 ms (Test pulse width low test pulses, at 100 ms test pulse rate)<br>No brightness test pulses / high test pulses permitted. |
| Concurrence                                   | $\infty$                                                                                                                           |
| Max. permissible overall conductor resistance | 50 $\Omega$                                                                                                                        |
| Protective circuit                            | Suppressor diode                                                                                                                   |
| Current consumption                           | 38 mA (typ. with $U_S$ )                                                                                                           |

### Digital: Start circuit (S34, S35)

|                                               |                                                                |
|-----------------------------------------------|----------------------------------------------------------------|
| Description of the input                      | non-safety-related                                             |
| Number of inputs                              | 2                                                              |
| Input voltage range "1" signal                | 20.4 V ... 26.4 V                                              |
| Inrush current                                | < 6 mA (typ. with $U_S$ at S34/S35, $\Delta t = 70$ ms)        |
| Filter time                                   | No test pulses permitted                                       |
| Max. permissible overall conductor resistance | 50 $\Omega$                                                    |
| Protective circuit                            | Suppressor diode                                               |
| Current consumption                           | 0 mA (typ. with $U_S$ at S34)<br>1 mA (typ. with $U_S$ at S35) |

## Output data

### Relay: Enabling current paths (13/14, 23/24, 33/34)

|                             |                                                         |
|-----------------------------|---------------------------------------------------------|
| Output description          | 2 N/O contacts each in series, safety-related, floating |
| Number of outputs           | 3                                                       |
| Contact switching type      | 3 enabling current paths                                |
| Contact material            | AgSnO <sub>2</sub>                                      |
| Switching voltage           | min. 10 V<br>max. 250 V AC/DC                           |
| Switching capacity          | min. 100 mW                                             |
| Inrush current              | min. 10 mA<br>max. 6 A                                  |
| Limiting continuous current | 6 A (Observe derating and load limit curve)             |
| Sq. Total current           | 72 A <sup>2</sup> (observe derating)                    |
| Switching frequency         | max. 0.5 Hz                                             |
| Mechanical service life     | 10x 10 <sup>6</sup> cycles                              |
| Output fuse                 | 10 A gL/gG                                              |

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|                                       |                                                       |
|---------------------------------------|-------------------------------------------------------|
|                                       | 4 A gL/gG (for low-demand applications)               |
| Relay: Signaling current path (41/42) |                                                       |
| Output description                    | 2 N/C contacts parallel, non-safety-related, floating |
| Number of outputs                     | 1                                                     |
| Contact switching type                | 1 signaling current path                              |
| Contact material                      | AgSnO <sub>2</sub>                                    |
| Switching voltage                     | min. 10 V AC/DC                                       |
|                                       | max. 250 V AC/DC                                      |
| Switching capacity                    | min. 100 mW                                           |
| Inrush current                        | min. 10 mA                                            |
|                                       | max. 6 A                                              |
| Limiting continuous current           | 6 A                                                   |
| Sq. Total current                     | 36 A <sup>2</sup> (observe derating)                  |
| Switching frequency                   | max. 0.5 Hz                                           |
| Mechanical service life               | 10x 10 <sup>6</sup> cycles                            |
| Output fuse                           | 6 A gL/gG                                             |

## 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                                          |
| Tightening torque                | 0.5 Nm ... 0.6 Nm                           |

## Signaling

|                           |                 |
|---------------------------|-----------------|
| Status display            | 2 x LED (green) |
| Operating voltage display | 1 x LED (green) |

## Dimensions

|        |          |
|--------|----------|
| Width  | 22.5 mm  |
| Height | 99 mm    |
| Depth  | 114.5 mm |

## Material specifications

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

## Characteristics

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## 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, amplitude 0.15 mm, 2g             |

## Approvals

### CE

|                |              |
|----------------|--------------|
| Identification | CE-compliant |
|----------------|--------------|

## Mounting

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

# PSR-SCP- 24UC/ESL4/3X1/1X2/B - Safety relays

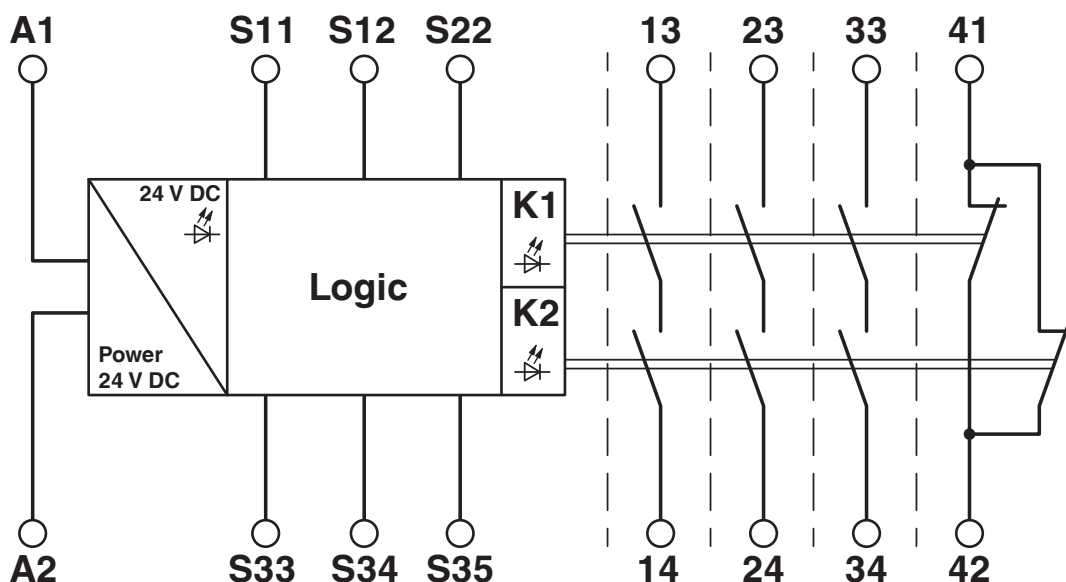


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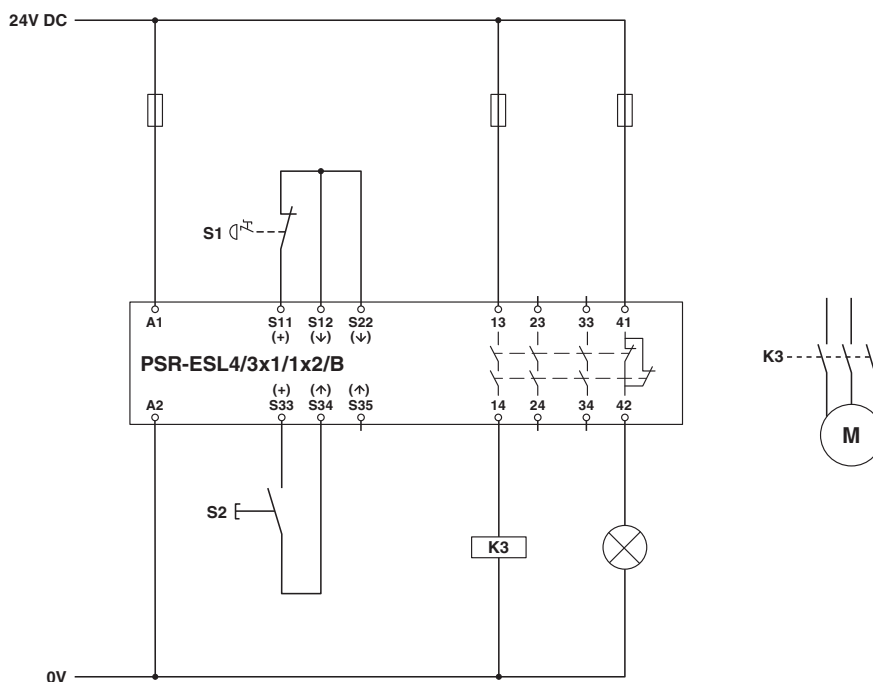
## Drawings

Circuit diagram



Block diagram

Circuit diagram



Single-channel safety door monitoring



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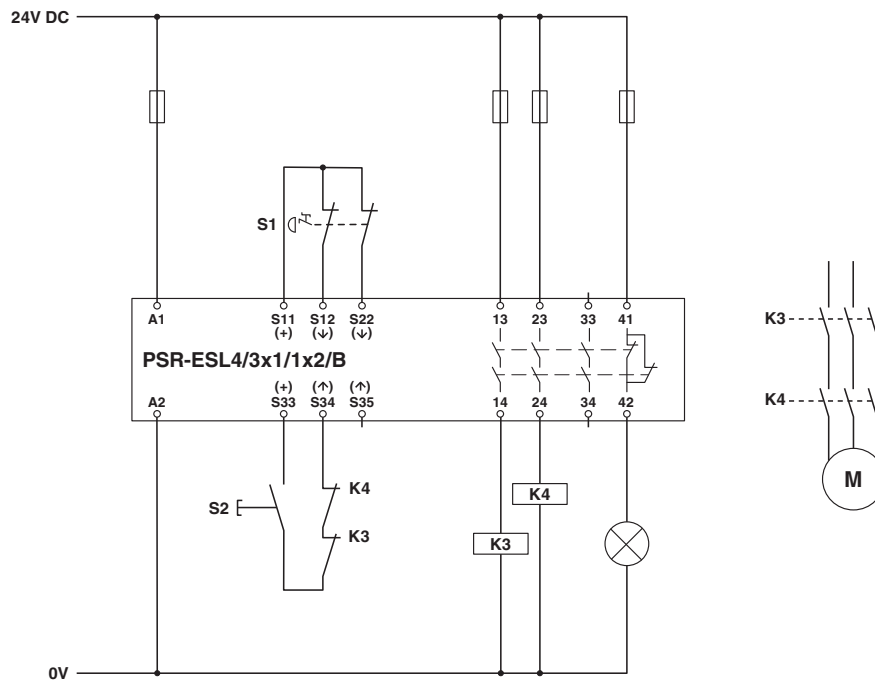
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Circuit diagram



2-channel emergency stop monitoring

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## Approvals

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### Functional Safety

Approval ID: 01/205/5265.04/23



### Functional Safety

Approval ID: 01/205/5265.04/23



### cULus Listed

Approval ID: E140324



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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27371819 |
|-------------|----------|

### ETIM

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

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39122200 |
|-------------|----------|

## 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                                | 8c3db85c-8969-449e-86af-0a14d7f5919c |

### EF3.0 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 7.133 kg CO2e |
|---------|---------------|