

PSR-SCP- 24DC/URD3/4X1/2X2/3 PSR-SPP- 24DC/URD3/4X1/2X2/3

Safety Relay as a Contact Extension Block With Off-Delay Contacts



INTERFACE

Data Sheet
102862_04_en

© PHOENIX CONTACT - 09/2007

Description

The **PSR-...- 24DC/URD3/4X1/2X2/3** safety relay can be used as a contact extension block in safety circuits according to DIN EN 60204-1/VDE 0113-1.

The device has an interface for the T-BUS DIN rail connector. This interface can be used for single-channel control and monitoring. Alternatively, the device can also be operated in single-channel mode via a contact on the basic device.

Depending on the external wiring, up to safety category 3 according to EN 954-1 can be achieved.

The relay has four enabling current paths, one signaling current path, and one confirmation path. Depending on the time set, the contacts drop with a 0.3 ... 3 second delay according to stop category 1 (DIN EN 60204-1/VDE 0113-1).

The extension unit can be used as a contact multiplier for emergency stop relays and two-hand controls.

Features

- Contact extension block
- Safety category 3 according to EN 954-1
- Plug-in screw or spring-cage connection terminal blocks
- Single-channel wiring
- Safe isolation
- Housing width 22.5 mm
- Four enable contacts, one alarm contact, and one confirmation contact



Observe the safety instructions on page 4.



Make sure you always use the latest documentation.
It can be downloaded at www.download.phoenixcontact.com.
A conversion table is available on the Internet at
www.download.phoenixcontact.com/general/7000_en_00.pdf.



This data sheet is valid for all products listed on the following page:

Ordering Data

Safety Relay

| Description | Type | Order No. | Pcs./Pck. |
|--|------------------------------|-----------|-----------|
| Safety relay as a contact extension block with off-delay contacts, with screw connection | PSR-SCP- 24DC/URD3/4X1/2X2/3 | 2981732 | 1 |
| Safety relay as a contact extension block with off-delay contacts, with spring-cage connection | PSR-SPP- 24DC/URD3/4X1/2X2/3 | 2981745 | 1 |

Accessories

| Description | Type | Order No. | Pcs./Pck. |
|--|-------------|-----------|-----------|
| DIN rail connector, yellow, for PSR applications | PSR-TBUS | 2890425 | 50 |
| Terminating connector | PSR-TBUS-TP | 2981716 | 50 |

Documentation

| Description | Type | Order No. | Pcs./Pck. |
|--|--------------------------------|-----------|-----------|
| Application manual for PSR safety relays | UM EN SAFETY RELAY APPLICATION | 2888712 | 1 |

Technical Data

Input Data

| | |
|--------------------------------------|------------------------|
| Nominal input voltage U_N | 24 V DC |
| Permissible range | 0.85 - 1.1 x U_N |
| Typical current consumption at U_N | 94 mA |
| Typical response time (K1, K2) | 20 ms |
| Release time (K1, K2) | 0.3 ... 3 seconds +50% |
| Recovery time | 1 s, approximately |
| Surge protection | Suppressor diode |
| Status indicators (K1, K2, Power) | Green LED |

Output Data

| | | |
|--|---|---------------------------------|
| Contact type: Positively driven contact assembly Class A according to EN 50205 | 4 enabling current paths, 1 signaling current path, 1 confirmation path | |
| Contact material | Silver tin oxide (AgSnO ₂) | |
| Maximum switching voltage | 250 V AC/DC | |
| Minimum switching voltage | 15 V AC/DC | |
| Limiting continuous current | | |
| N/O contact | 6 A | |
| N/C contact (65-66) | 3 A | |
| $I_{TH}^2 = I_1^2 + I_2^2 + \dots + I_N^2$ | 50 A ² | |
| Maximum inrush current | | |
| N/O contact | 6 A | |
| N/C contact (65-66) | 3 A | |
| Minimum switching current | 25 mA | |
| Maximum shutdown power | Ohmic load $\tau = 0$ ms Inductive load $\tau = 40$ ms | |
| | 24 V DC | 144 W (72 W) ¹ 48 W |
| | 48 V DC | 288 W (144 W) ¹ 40 W |
| | 110 V DC | 77 W 35 W |
| | 220 V DC | 88 W 33 W |
| | 250 V AC | 1500 VA (750 VA) ¹ |
| Minimum switching power | 0.4 W | |

Output Data (Continued)

| | | | | |
|---|---------------------------------------|----------|------|------|
| Mechanical service life | 10 ⁷ cycles, approximately | | | |
| Switching capacity according to DIN EN 60947-5-1/VDE 0660-200 | Cycles | | DC13 | AC15 |
| | 3600/h: | 24 V DC | 3 A | – |
| | | 230 V AC | – | 3 A |
| | 360/h: | 24 V/6 A | | |
| 230 V/5 A | | | | |

Short-circuit protection of the output circuits, external

Enabling current paths

NEOZED 10 A gL/gG

Signaling current path

NEOZED 4 A gL/gG

¹ The maximum values given in brackets apply to N/C contacts 65-66.**General Data**

| | |
|---|---|
| Permissible ambient operating temperature | -20°C ... +55°C |
| Nominal operating mode | 100% operating factor |
| Degree of protection according to VDE 0470-1 | |
| Housing | IP20 |
| Connection terminal blocks | IP20 |
| Installation location | IP54, minimum |
| Mounting position | Any |
| Air and creepage distances between the circuits | |
| Basic insulation ¹ | According to DIN EN 50178:1998-04 |
| Impulse voltage withstand level | 4 kV |
| Pollution degree | 2 |
| Surge voltage category | III |
| Dimensions (W x H x D) | |
| Screw connection | 22.5 mm x 114.5 mm x 99 mm |
| Spring-cage connection | 22.5 mm x 114.5 mm x 112 mm |
| Conductor cross-section | |
| Screw connection | 0.2 mm ² ... 2.5 mm ² |
| Spring-cage connection | 0.2 mm ² ... 1.5 mm ² |
| Stripping length | |
| Screw connection | 7 mm |
| Spring-cage connection | 8 mm |
| Housing material | Polyamide PA, not reinforced |

¹ Safe isolation, reinforced insulation, and 6 kV between the input circuit/N/C contacts and the enable contact current paths.**Tests/Approvals**

BG/TÜV



UL/CUL



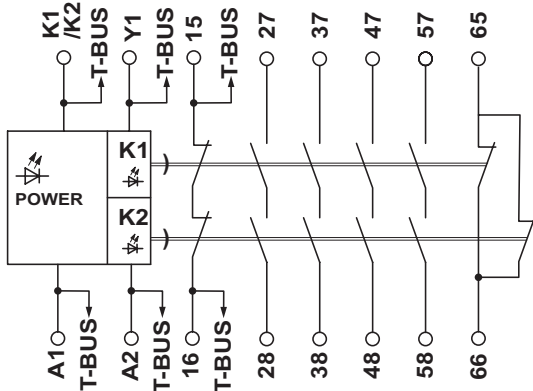
Block Diagram

Figure 1 Block diagram

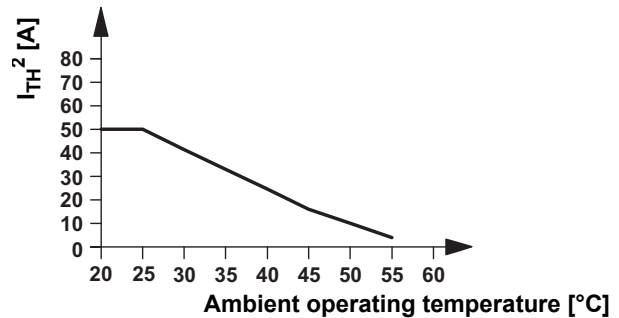
Derating Curve

Figure 2 Derating curve

Safety Instructions

- During operation, parts of electrical switching devices carry hazardous voltages.
- Before working on the device, disconnect the power.
- Please observe the safety regulations of electrical engineering and industrial safety and liability associations. Disregarding these safety regulations may result in death, serious personal injury or damage to equipment.
- Startup, assembly, modifications, and upgrades may only be carried out by a skilled electrical engineer.



- For emergency stop applications, the machine must be prevented from restarting automatically by a higher-level control system.
- Protective covers must not be removed when operating electrical switching devices.

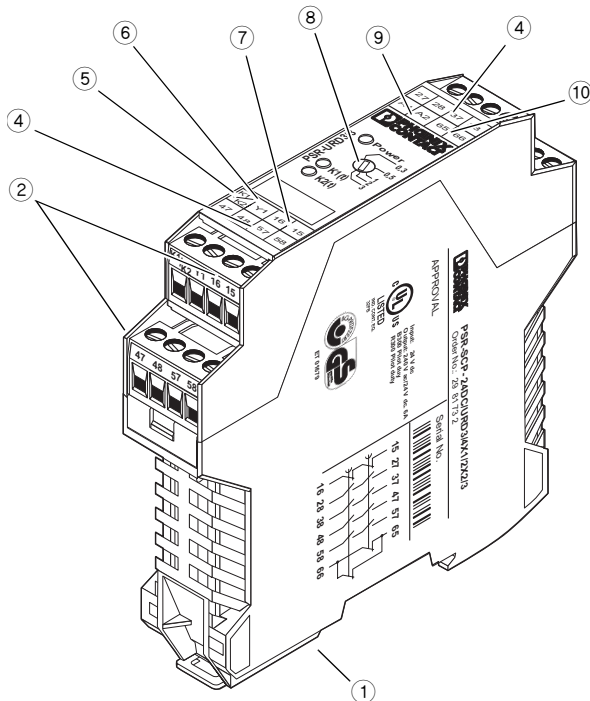


- In the event of an error, replace the device immediately.
- Repairs, especially if the housing must be opened, may only be carried out by the manufacturer or authorized persons. Otherwise the warranty is invalidated.

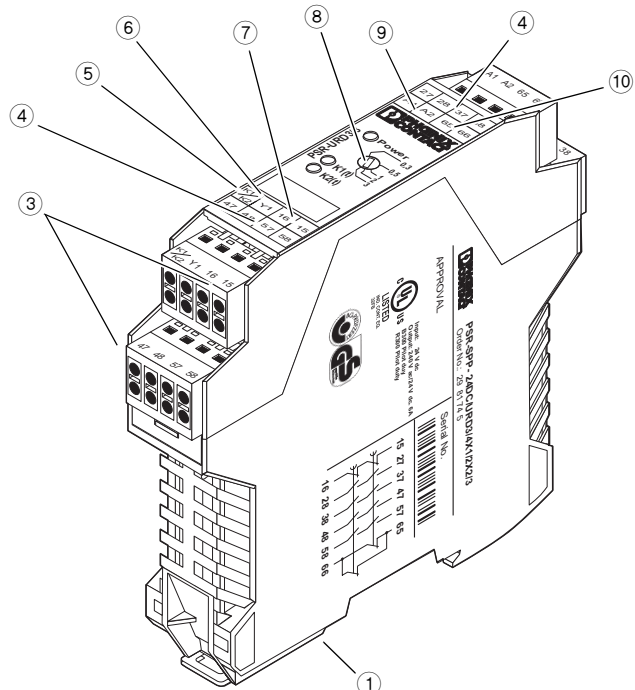


When operating relay modules, the operator must meet the requirements for noise emission for electrical and electronic equipment (EN 61000-6-4) on the contact side and, if required, take appropriate measures.

Structure



PSR-SCP- 24DC/URD3/4X1/2X2/3



PSR-SPP- 24DC/URD3/4X1/2X2/3

Figure 3 Structure

- 1 Metal lock for mounting on the DIN rail
- 2 COMBICON plug-in screw terminal blocks
- 3 COMBICON plug-in spring-cage terminal blocks
- 4 27-28, 37-38, 47-48, and 57-58: Enabling current paths
- 5 K1, K2: Input

- 6 Y1: Connection to the DIN rail connector
- 7 15-16: Confirmation contacts
- 8 Off delay setting
- 9 A1, A2: Supply voltage connection
- 10 65-66: Alarm contacts

Function

When the 24 V DC operating voltage is applied at terminal blocks A1-A2 or is led via the DIN rail connector, the "Power" LED lights up.

When a 24 V DC voltage is applied at input K1-K2 (or via the DIN rail connector), both relays are activated. The LEDs light up and the contacts for enabling current paths 27-28, 37-38, 47-48, and 57-58 close. Alarm contacts 15-16 and 65-66 open.

If the voltage is switched off at input K1-K2, the enable contacts open and the alarm contacts close after the set time has elapsed.

For additional connection examples, see page 7.

Connection Notes



- Before working on the device, disconnect the power.
- Check the set time following installation.
- For PSR applications, only yellow PSR-TBUS connectors (Order No. 2890425) may be used. Connection with another T-BUS is not permitted.
- Devices may only be mounted on/removed from the T-BUS when the power is switched off.
- A T-BUS unit can contain a basic device (PSR-...-SDC...) and a maximum of 10 extension units (PSR-...-UR...). Extension units must be mounted to the right of the basic device.
- The feedback circuit must be closed at the last extension unit (on the right): jumper at Y1 and 12 or PSR-TBUS-TP dummy plug (Order No. 2981716).
- The voltage supply can be provided at any PSR device or using a system power supply unit via the T-BUS.

When using T-BUS DIN rail connectors, connect together the required number of T-BUS connectors and push them onto the DIN rail. When attaching the safety relay to the DIN rail, ensure that it is aligned correctly with the T-BUS connector (see Figure 4).

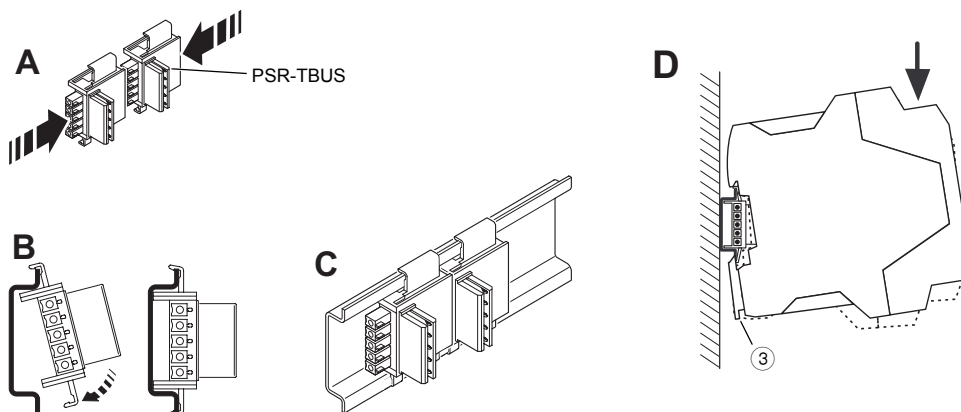


Figure 4 Using the T-BUS DIN rail connector

In order to comply with UL approval, use copper cables that are designed for operating temperatures > 75°C.

For reliable and safe-to-touch contacts, strip the cable ends as follows:

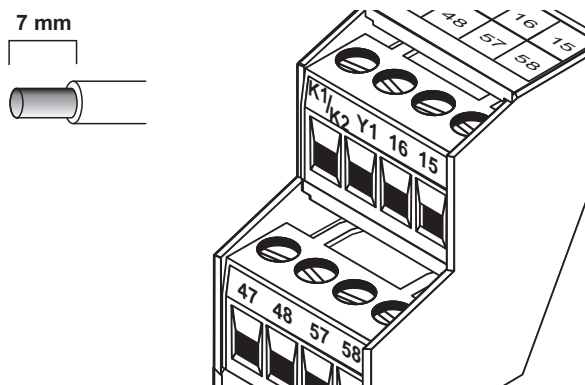


Figure 5 PSR-SCP- 24DC/URD3/4X1/2X2/3

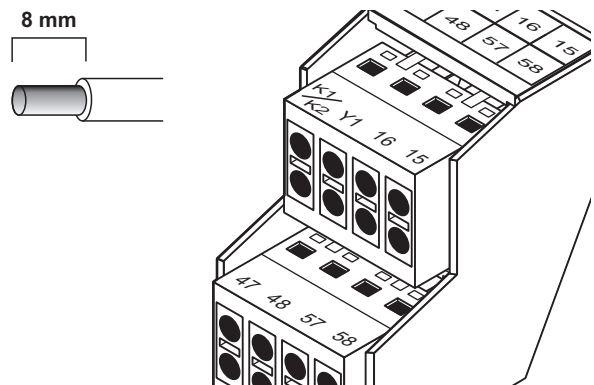


Figure 6 PSR-SPP- 24DC/URD3/4X1/2X2/3

Connection Example

Single-Channel Connection With Confirmation Path 15-16 Integrated in the Basic Device,
Suitable for up to Safety Category 3

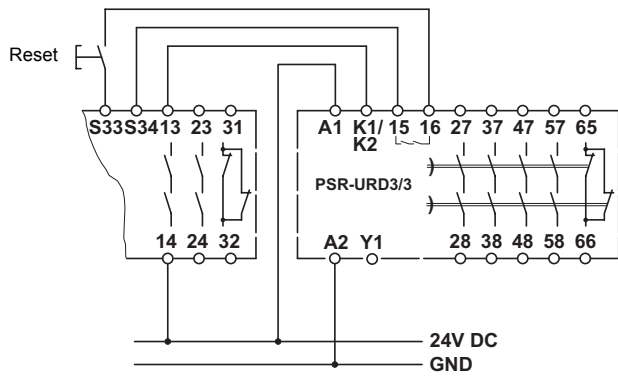


Figure 7 Wiring via connection terminal blocks

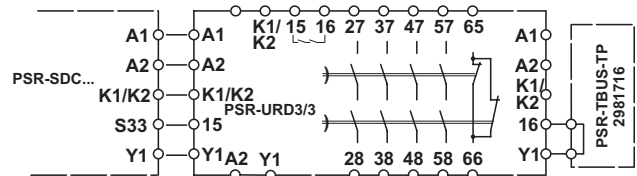


Figure 8 Wiring via T-BUS DIN rail connector

© PHOENIX CONTACT 09/2007