阅读申明

1. 本站收集的数据手册和产品资料都来自互联网，版权归原作者所有。如读者和版权方有任何异议请及时告之，我们将妥善解决。
2. 本站提供的中文数据手册是英文数据手册的中文翻译，其目的是协助用户阅读，该译文无法自动跟随原稿更新，同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
3. 本站提供的产品资料，来自厂商的技术支持或者使用者的心得体会等，其内容可能存在描叙上的差异，建议读者做出适当判断。
4. 如需与我们联系，请发邮件到marketing@iczoom.com，主题请标有"数据手册"字样。

Read Statement

1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.

2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader's learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.

3. All product information provided on the website refer to solutions from manufacturers' technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.

4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with "Datasheets".

PSR-SCP- 24DC/SSM/2X1
PSR-SPP- 24DC/SSM/2X1

Safety Relay With Downtime Monitoring

INTERFACE

Data Sheet

Description

The **PSR-...- 24DC/SSM/2X1** safety relay can be used in safety circuits according to DIN EN 60204-1/VDE 0113-1. Depending on the external wiring, up to safety category 4 according to EN 954-1 can be achieved. The relay meets the requirements of SIL 3 according to EN 61508. Control is implemented via two PNP or 2-wire proximity switches that switch with a 180° overlap (see "Connection Example" on page 6).

The requirements of the following standards are met once the safety equipment has been in use for the relevant period of time or a function test is carried out (experiment test).

Standard	Level	Period of Use
IEC 61508	SIL 3	48 months
EN 954-1	Cat. 4	12 months

The relay has two positively-driven N/O contacts that meet stop category 0 according to DIN EN 60204-1/VDE 0113-1.

⚠	**Observe the safety instructions on page 3.**
☞	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 Relays

Description	Type	Order No.	Pcs./Pkt.
Safety relay with downtime monitoring, with screw connection	PSR-SCP- 24DC/SSM/2X1	2981567	1
Safety relay with downtime monitoring, with spring-cage connection	PSR-SPP- 24DC/SSM/2X1	2981570	1

Documentation

Description	Type	Order No.	Pcs./Pkt.
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 (without proximity switch)	60 mA
Voltage at +S1, +S2	24 V DC
Typical response time (K1, K2) at U_N	12 ms
Typical release time (K1, K2) at U_N	8 ms
Surge protection	Suppressor diode
Status indicators (K1, K2)	Green LED
Switching range	
Downtime at	< 2 Hz
Operation at	> 2.5 Hz
Cut-off frequency	2 kHz

Output Data

Contact type	2 enable current paths, 2 signaling current paths	
Contact material	Silver nickel 15 (AgNi15), hard gold-plated (5 μm Au)	
Maximum switching voltage	250 V AC/DC	
Minimum switching voltage	10 V AC/DC	
Limiting continuous current	5 A	
Total current	On request	
Maximum inrush current	5 A	
Minimum inrush current	10 mA	
Maximum shutdown power	Ohmic load τ = 0 ms	Inductive load τ = 40 ms
24 V DC	192 W	48 W
48 V DC	144 W	24 W
110 V DC	88 W	33 W
220 V DC	66 W	22 W
250 V AC	2000 VA	
Minimum switching power	0.25 W	
Mechanical service life	50 x 10^6 cycles, approximately	

Switching capacity	Cycles		DC13	AC15
	360/h:	24 V:	2 A	–
		230 V:	–	3 A

Short-circuit protection of the output circuits, external	6 A gL (automatic device C8)

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	IP40
Connection terminal blocks	IP20
Installation location	IP54, minimum
Mounting position	Any
Air and creepage distances between circuits	According to EN 60664/VDE 0110
Basic insulation[1]	
Impulse voltage withstand level	4 kV[1]
Pollution degree	2
Surge voltage category	III
Dimensions (W x H x D):	
PSR-SCP- 24DC/SSM/2X1	22.5 mm x 99 mm x 114.5 mm
PSR-SPP- 24DC/SSM/2X1	22.5 mm x 112 mm x 114.5 mm
Conductor cross section	0.2 mm^2 ... 2.5 mm^2
Housing material	Polyamide PA, not reinforced

[1] Safe isolation, increased insulation, and 6 kV between input circuit and output contact current paths.

Tests/Approvals

TÜV (German Technical Inspectorate)	TÜV TÜV Rheinland / Berlin-Brandenburg
UL	applied for

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.**
☞	The device must be operated in a closed control cabinet (according to EN 61508-6:2001, Table 01).
☞	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
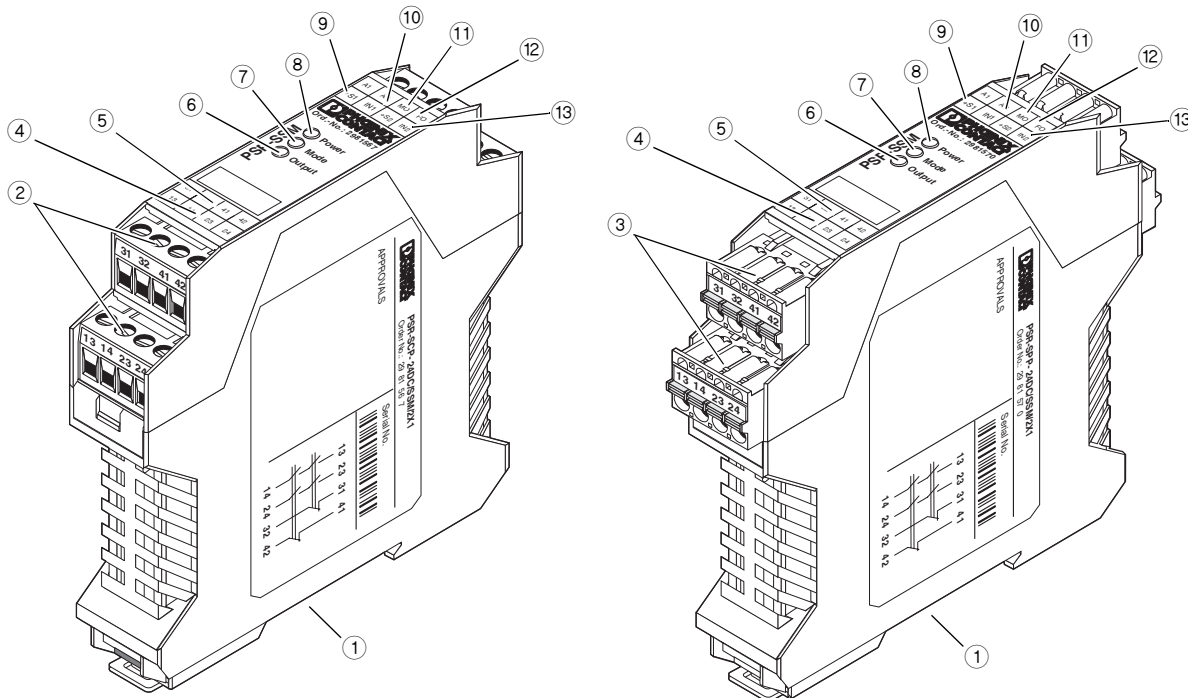
PSR-SCP- 24DC/SSM/2X1   PSR-SPP- 24DC/SSM/2X1

Figure 1   Structure

1   Metal lock for fixing on the DIN rail
2   COMBICON plug-in screw terminal blocks
3   COMBICON plug-in spring-cage terminal blocks
4   13-14, 23-24: N/O contact
5   31-32, 41-42: N/C contact
6   "Output" LED: Lights up in the event of a downtime,
       OFF in the event of movement,
       flashes in the event of a device error
7   "Mode" LED: Lights up when "Device OK",
       flashes in the event of a sensor error
8   "Power" LED: Lights up in the event of voltage at A1/A2
9   +S1, +S2: Supply voltage for proximity switches IN1,
       IN2
10 A1, A2: Supply voltage connection
11 MO: Downtime alarm output
12 FO: Error output (+24 V = device OK)
13 IN1, IN2: Proximity switch connection

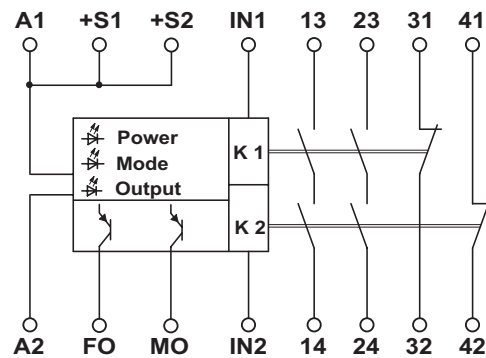**Block Diagram**

Figure 2   Block diagram

Function

If the 24 V DC operating voltage is applied at terminal blocks A1 and A2, the electronics checks (in the stop state) whether at least one of the proximity switches provides a signal at input IN1 or IN2.

The FO diagnostic output indicates the ready state with +24 V. The "Power" and "Mode" LEDs light up. If this is the case (one or both proximity switches provide a signal), the internal output relays switch to the operated condition. N/O contacts 13-14 and 23-24 are closed, N/C contacts 31-32 and 41-42 are open, and the "Output" lights up. Alarm output MO indicates +24 V.

The outputs remain active in their switch position as long as no signal change is generated at inputs IN1 and IN2 by a movement.

N/O contacts 13-14 and 23-24 open and N/C contacts 31-32 and 41-42 close if a signal change with a frequency > 2.5 Hz is detected at inputs IN1 and IN2. Alarm output MO is a high-resistance output.

If the input circuit frequency is less than 2 Hz (stop state entered or movement not hazardous), relays K1 and K2 switch. N/O contacts 13-14 and 23-24 are closed and N/C contacts 31-32 and 41-42 are open. Alarm output MO indicates +24 V.

In the event of an error (sensor error), the "Mode" LED flashes and FO is a high-resistance output.

For a connection example, please refer to page 6.

Assembly and Startup

Before working on the device, disconnect the power.

In order to comply with UL approval, use copper cables that are designed for operating temperatures > 75°C.
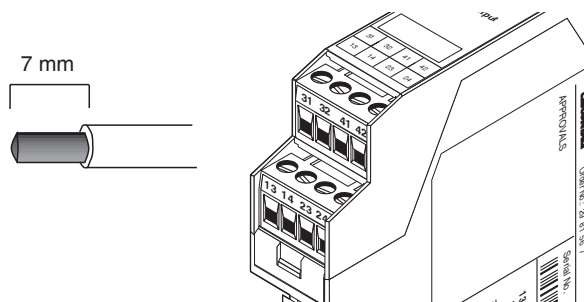For reliable and safe-to-touch contacts, strip the cable ends as follows:

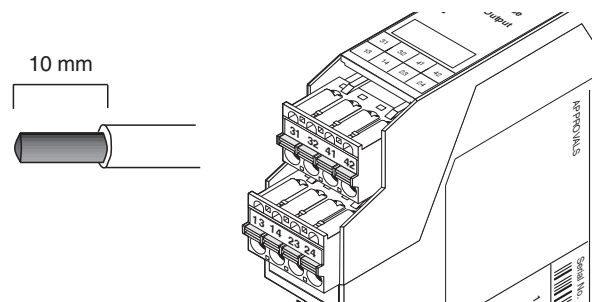Figure 3   PSR-SCP- 24DC/SSM/2X1

Figure 4   PSR-SPP- 24DC/SSM/2X1

Mounting the Proximity Switches

⚠️ **Prevent cross circuits between IN1 and IN2 by using a suitable cable installation.**

Requirements for a Gearwheel or Gear Rack:

The design of the gearwheel or gear rack is of particular importance for safe operation:

The surface of the gearwheel must always be greater than the gap between the teeth. This ensures that at least one proximity switch is actuated.

Arrangement of the Proximity Switches:

– Tooth > gap
– Tooth > switch diameter
– Depth of gap > switching interval of the switch
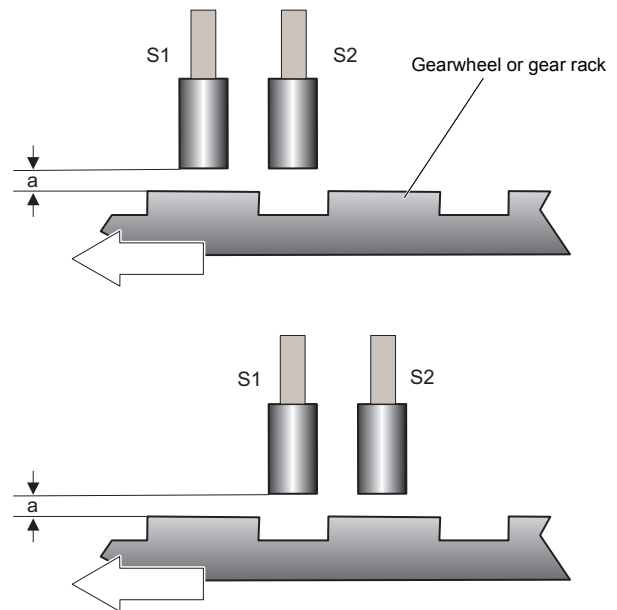– $a \leq$ (switching interval of the switch/2)

Connection Example

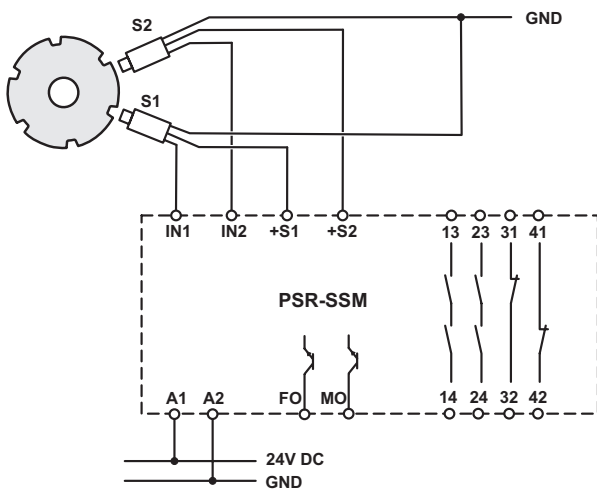

Figure 5   Two-channel downtime monitoring using two PNP or 2-wire proximity switches, suitable up to safety category 3[*], SIL 3

Figure 6   Mounting the proximity switches

© PHOENIX CONTACT 05/2006

---

*   Safety category 4 is possible if a test is performed within 24 hours of machine downtime to detect the internal sensor errors.