


# PSR – Phoenix Safety Relay

## PSR-ESAM4

- Emergency stop/safety door monitoring
- Safety Category 4, EN 954-1
- Plug-in screw-cage or spring-cage terminal blocks
- One or two-channel circuit
- Cross-circuit detection
- Safe isolation/basic insulation
- Housing width 45 mm (1.772 in.)
- Eight enable contacts
- One signaling contact
- Approvals:  (applied for)



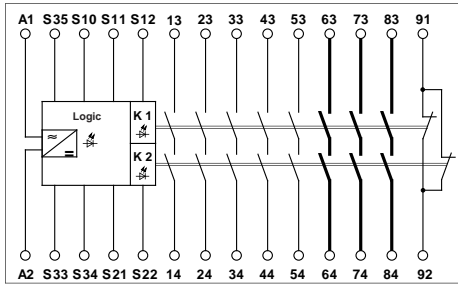
### 1. Short Description

The PSR-...-24UC/ESAM4/8x1/1x2 safety relay can be used in emergency stop devices according to EN 418 and in safety circuits according to DIN EN 60204-1/VDE 0113 Part 1. Depending on the external circuit, up to Safety Category 4 according to EN 954-1 can be achieved.


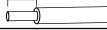
One or two-channel control is available with manual or automatic activation. The connected start button is monitored.

The relay has eight enable current paths and one signaling current path. The contacts drop without delay according to Stop Category 0 (DIN EN 60204-1/VDE 0113 Part 1).

## 2. Technical Data



**PSR-ESAM4**

 <b>M 3</b>	solid	flexible	AWG	 <b>7/10</b>
Connection data: 0.2 - 2.5    0.2 - 2.5    25 - 14				
Stripping length: Screw-cage version 7 mm (0.28 in.)				
Spring-cage version 10 mm (0.39 in.)				

Housing width 45 mm (1.772 in.)

Description	
<b>Safety relay</b> , Category 4, with or without start button monitoring	Screw-cage terminal block

Type	Order No.	Pcs. Pkt.
<b>PSR-SCP-24UC/ESAM4/8X1/1X2</b>	<b>29 63 91 2</b>	1
<b>PSR-SPP-24UC/ESAM4/8X1/1X2</b>	<b>29 63 99 6</b>	1

Technical Data	
<b>Input Data</b>	
Nominal input voltage $U_N$	
Permissible range	
Typical current consumption at $U_N$	
Voltage at input, start, and feedback circuit	
Maximum voltage drop for S11/S12 and S21/S22 (e.g., two Form B contacts of an emergency stop button)	
Typical response time at $U_N$	
- Monitored/manual start	
- Automatic start	
Typical release time (K1, K2) at $U_N$	
Simultaneity input S11/S12 and S21/S22	
Recovery time	

24 V AC/DC
$0.85 - 1.1 \times U_N$
210 mA AC, 120 mA DC
24 V DC, approximately
2 V DC, approximately (corresponds to 11 Ω)
(at $U_N = 24 \text{ V DC}$ and $T_{amb} = 25^\circ\text{C}$ [77°F])
60 ms
250 ms
20 ms
$\infty$
1 s, approximately

Output Data	
Contact version	
Contact material	
Maximum switching voltage	
Minimum switching voltage	
Limiting continuous current	
$I_{TH} = I_1^2 + I_2^2 + I_3^2$	
Maximum inrush current	
Minimum switching current	
Maximum shutdown power	
24 V DC	144 W
48 V DC	288 W
110 V DC	110 W
220 V DC	88 W
250 V AC	1500 VA
Minimum switching power	0.4 W
Mechanical life	$10^7$ cycles, approximately
Breaking capacity according to DIN EN 60947-5-1/VDE 0660 Part 20	24 V (DC13) 4 A; 230 V (AC15) 4 A
Short-circuit protection of the output circuits, external	24 V (DC13) 2.5 A; 230 V (AC15) 3 A
	6 A fast-blow

8 enable current paths	
1 signaling current path	
Silver stannic oxide, gold-flashed (AgSnO <sub>2</sub> 0.2 μm Au)	
250 V AC/DC	
15 V AC/DC	
6 A (Form A contact/Form B contact)	
On request	
6 A	
25 mA	
Ohmic load	Inductive load
$\tau = 0 \text{ ms}$	$\tau = 40 \text{ ms}$
144 W	42 W
288 W	42 W
110 W	42 W
88 W	42 W
1500 VA	
0.4 W	
$10^7$ cycles, approximately	
24 V (DC13) 4 A; 230 V (AC15) 4 A	
24 V (DC13) 2.5 A; 230 V (AC15) 3 A	
6 A fast-blow	

**General Data**

Permissible ambient operating temperature	-20°C to +55°C (-4°F to +131°F)
Nominal operating mode	100% ED
Degree of protection	According to VDE 0470 Part 1
- Housing	IP 40
- Connection terminal blocks	IP 20
- Mounting location	IP 54, minimum
Mounting position	Any
Mounting	Can be mounted without spacing
Air and creepance distances between circuits	According to DIN EN 50 178:1998-04, Basic insulation <sup>1)</sup>
Impulse voltage withstand level	4 kV <sup>1)</sup>
Degree of pollution	2
Surge Voltage Category	III
Dimensions (W x H x D)	45 mm x 99 mm (112 mm SPP) x 114.5 mm (1.772 x 3.898 4.409 SPP) x 4.508 in.)
Cable cross section	0.2 - 2.5 mm <sup>2</sup> (25 - 14 AWG)
Housing material	Polyamide PA, not reinforced

**Note:** When operating relay modules the operator must meet the requirements for emitted interference for electrical and electronic equipment (EN 50081-2) on the contact side and, if required, take appropriate measures.

<sup>1)</sup>Safe isolation, reinforced insulation, and 6 kV between the input circuit and the output contact paths (63/64, 73/74, 83/84) and between the various output contact paths (63/64, 73/74, 83/84).

### 3. Connection Notes and Safety Instructions

#### 3.1. Safety Instructions

- Please observe the safety regulations of electrical engineering and industrial safety and liability associations.
- Disregarding these safety regulations may result in death or serious damage to persons or property.
- Before working on the device, disconnect the power.
- Startup, mounting, modifications, and upgrades should only be carried out by a skilled electrical engineer.
- Protective covers must not be removed when operating electrical switching devices.
- During operation, parts of electrical switching devices carry hazardous voltages.
- Keep the instruction sheet in a safe place.
- In the event of an error, replace the device immediately.

#### 3.2. Connection Notes

To maintain the UL, use copper cables, which are designed for operating temperatures of 75°C (167°F). For reliable and safe contacts, strip the connector ends accordingly.

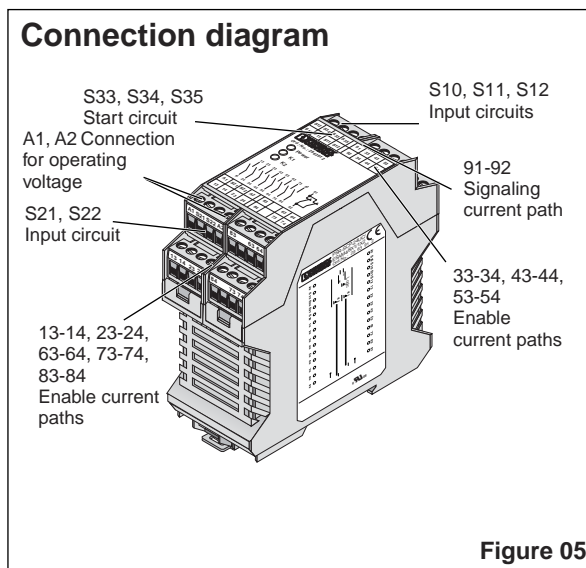
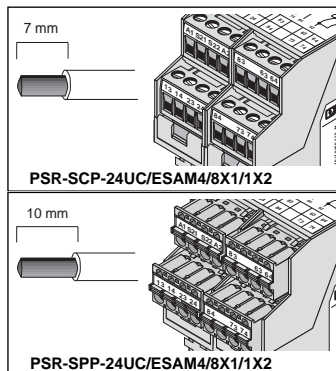


Figure 05



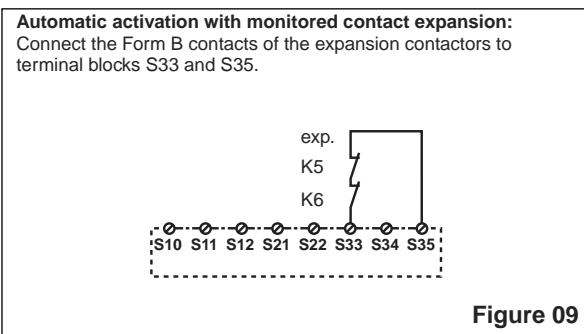
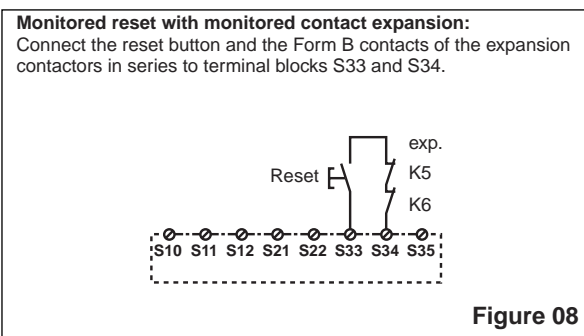
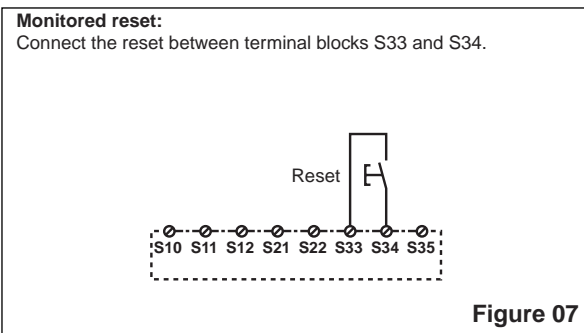
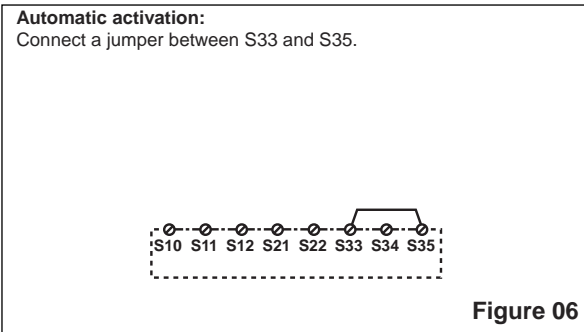
## 4. Mounting and Startup

For reliable operation, the emergency stop safety relay must be installed in a housing protected against dust and humidity with IP 54 protection.

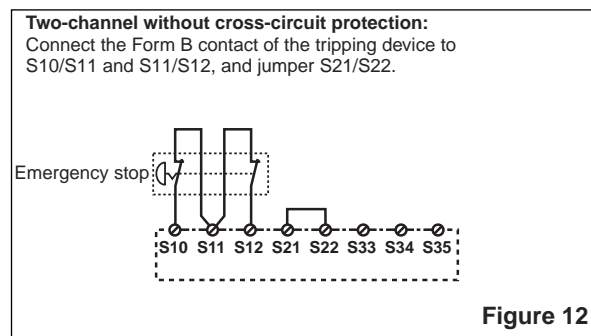
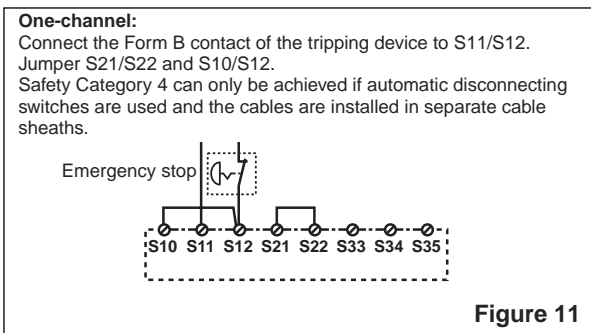
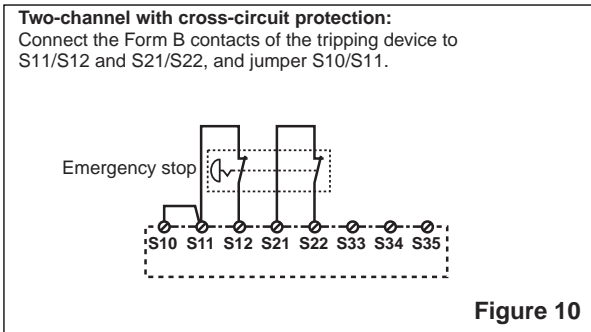
Ensure the wiring is appropriate to the field of application. Follow the application examples (page 5).

In general, the safety relay is wired according to the following specifications:

### 4.1. Closing the Activation Circuit and Feedback Circuit



### 4.2. Closing the Input Circuit (Emergency Shutdown)



## 5. Connection Examples

### 5.1. Two-Channel Emergency Stop Circuit with Cross-Circuit Detection and Monitored Reset Button

Suitable for up to Safety Category 4.

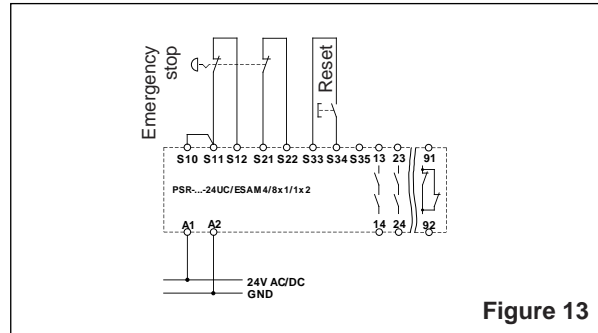


Figure 13

### 5.2. One-Channel Emergency Stop Circuit with Monitored Reset Button (Jumper S33/S35: Automatic Activation)

Suitable for up to Safety Category 4\*\*.

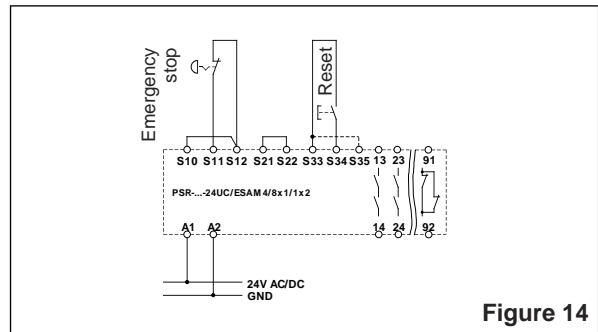


Figure 14

### 5.3. Two-Channel Limit Switch Monitoring with Solid-State Output and Monitored Reset Button (Jumper S33/S35: Automatic Activation)

Depending on the limit switch, suitable for up to Safety Category 4.

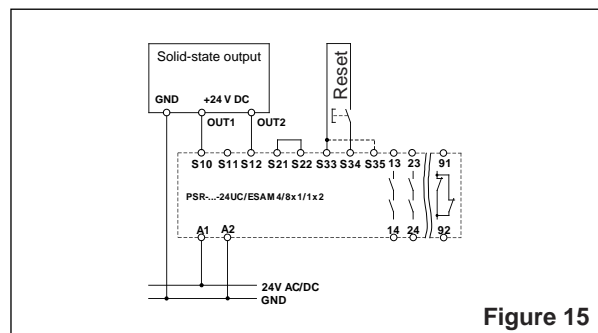


Figure 15

### 5.4. Two-Channel Safety Door Circuit with Cross-Circuit Detection and Monitored Reset Button (Jumper S33/S35: Automatic Activation)

Suitable for up to Safety Category 4.

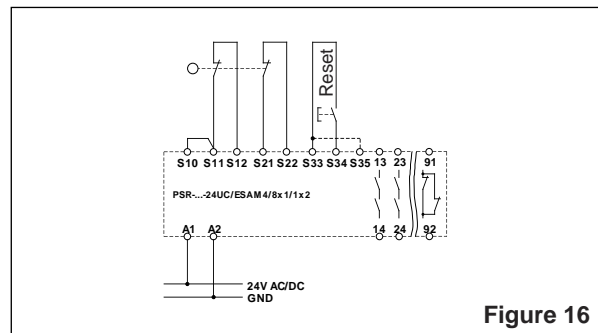


Figure 16

### 5.5. One-Channel Safety Door Circuit with Monitored Reset Button (Jumper S33/S35: Automatic Activation)

Suitable for up to Safety Category 4\*\*.

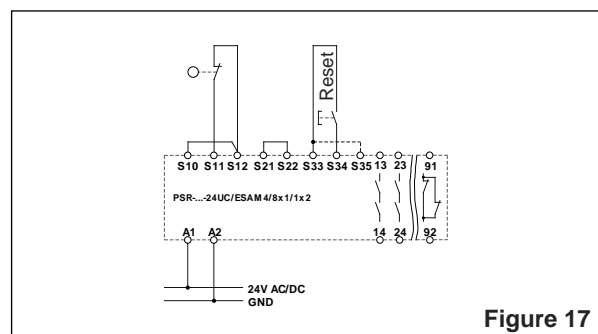


Figure 17

\*\* Safety Category 4 can only be achieved if automatic disconnecting switches are used and the cables are installed in separate cable sheaths.