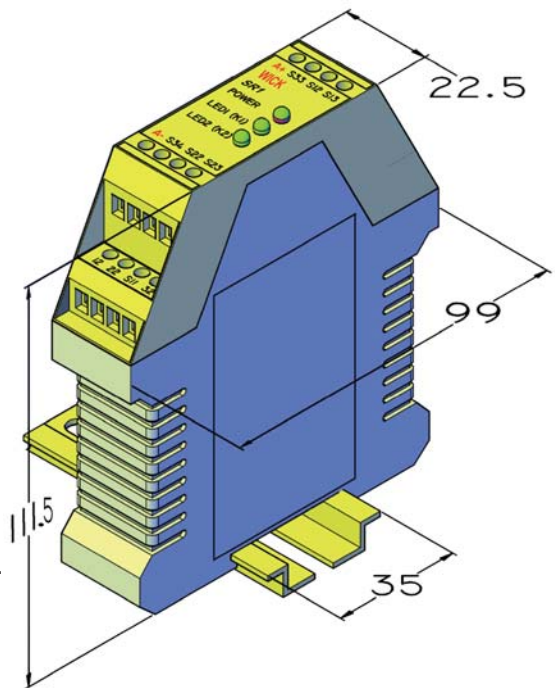


SAFETY RELAY (24VDC)

MSR-001 SAFETY RELAY

MAIN FEATURES

- For safety light curtains and access control barriers with symmetric or asymmetric outputs
- Work with NPN or PNP Light Curtain mode:
Under 2-channel operation mode
Safety Integrity Level (SIL) 3 according to IEC 61508 : 2010
Performance Level (PL) e according to EN/ISO 13849-1 : 2008
- Work with E-stop and Safety Door mode:
Under 1-channel / 2-channel operation mode
Safety Integrity Level (SIL) 3 according to IEC 61508 : 2010
Performance Level (PL) e and category 4 according to EN/ISO 13849-1 : 2008
- The boot itself detection for line fault
- Manual or automatic restart
- LED indicators: 1) To monitor whether the power works normal.
2) To monitor whether the K1/K2 relay works normal.
- 2 N.O. safety output (FSD1 and FSD2) /
1 N.C. auxiliary output (AUX)
- 22.5 mm wide, DIN-rail-mountable housing



APPLICATION AREA

This safety relay is a SIL 3, PL e, category 4 device, designed for the protection of people and machines. It can be used in applications:

Work together with: 1) NPN and PNP light curtainsz 2) E-stop of machine 3) Monitor safety door

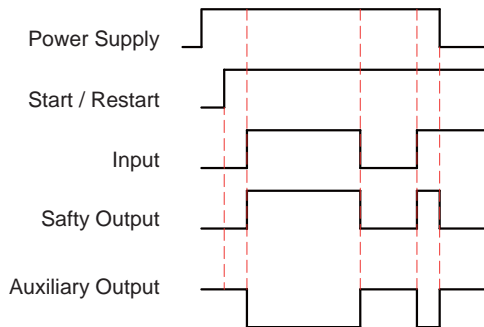
SPECIFICATIONS

Part Number	MSR-001
Operating Voltage	24VDC \pm 10%. Ripple < 10%
Power Consumption	\leq 3W
Short-circuit Protection	Internal PTC
Over Voltage Protection	Internal VDR
Load of FSD1 and FSD 2	250VAC/4A, 24VDC/5A(Resistive Load); 250VAC/2A, 24VDC/2.5A(Inductive Load);
Load of AUX	250VAC/4A, 24VDC/5A(Resistive Load); 250VAC/2A, 24VDC/2.5A(Inductive Load);
Electrical Contact Life	Contact to 5 A, 24VDC: $\geq 1.5 \times 10^5$ switching cycles
Permissible operating frequency	max. 360 operating cycles/h
Mechanical life	10×10^6 switching cycles
FSD1/FSD2/AUX Response time	25ms
Response time of Light Curtain input	25ms
Load Current of Light Curtain output	≥ 200 mA
Protection Category	Terminals: IP20 (IEC 60529); Housing: IP40 (IEC 60529)
Operating Temperature	-15 ... +55 ° C
Housing material	Hermoplastic
Housing dimensions (W x H x D)	22.5 x 99 x 111.5 mm
Mounting	on DIN rail IEC/EN 60715
Weight	About 200g

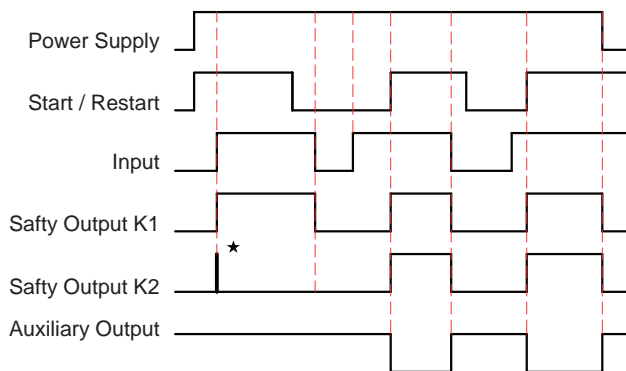
SAFETY RELAY (24VDC)

Function time-order Diagram

1. Automatic Restart Mode

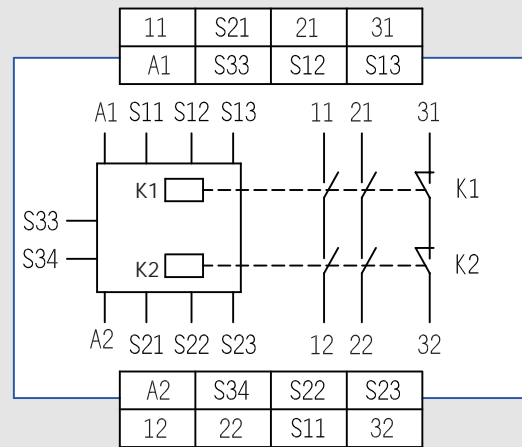


2. Manual Restart Mode



★ Push the Start / Restart switch, it will detect the line fault.

Wiring Diagram



3. Please Be Noted

- Under manual restart mode: push the Start/Restart switch, it will detect the line fault.
 - Under E-stop mode: When contacts S11- S12, S21-S22 are closed, push the Start/Restart switch, it will detect the line fault. If push the Start/Restart switch, and then make the contacts S11-S12, S21-S22 closed, the output contacts will not be closed.
 - The line fault is happened after the Relay works, it can push the Start/Restart switch to detect the line fault. Please ensure the output contacts is not closed.
- If the following situation happened, the line fault will not be detected,
- 1) Contact A1 is closed S11 or S12.
 - 2) Contact A2 is closed S21 or S22.

Panel of MSR-001

Indicators

POWER ● : Green LED lights up when power supply normal.
Red LED lights up when power supply abnormal or short circuit.
LED lights off when power off.

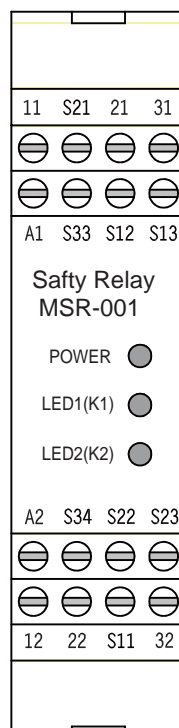
LED1(K1) ● : Green LED1 lights up when K1 relay works normal.

LED2(K2) ● : Green LED2 lights up when K2 relay works normal.
Green LED1 and LED2 lights off when the contact of K1 and K2 is closed or wired wrong.

Output Contacts

Contact Code	Output Function
11 ∨ 12	FSD1 (N.O.) contacts
21 ∨ 22	FSD2 (N.O.) contacts
31 ∨ 32	AUX (N.C.) contacts

Panel of MSR-001



Input Contacts

Contact Code	Input Function
A1	+24V
A2	0V
S33 ∨ S34	Automatic Restart
S12 ∨ S34	Manual Restart
S11 input1, S12 input2	PNP Light Curtain Input
S21 input1, S22 input2	NPN Light Curtain input
(S11+S12) ∨ S13	E-stop1 input (1-channel)★
(S21+S22) ∨ S23	E-stop2 input (1-channel)★
S11/S12/S13	E-stop1 input (2-channel)★
S21/S22/S23	E-stop2 input (2-channel)★

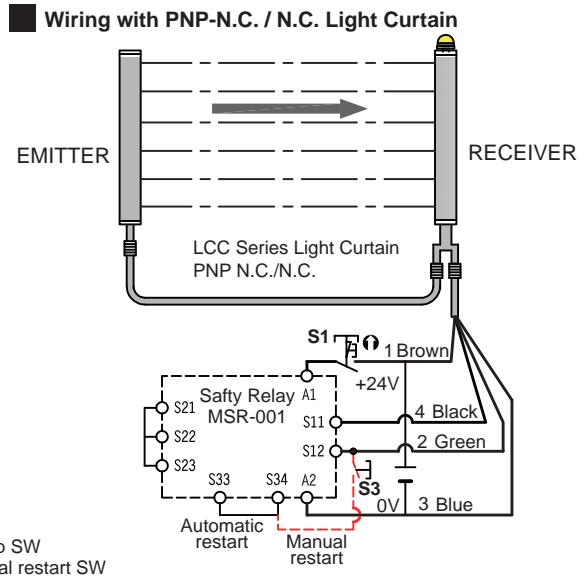
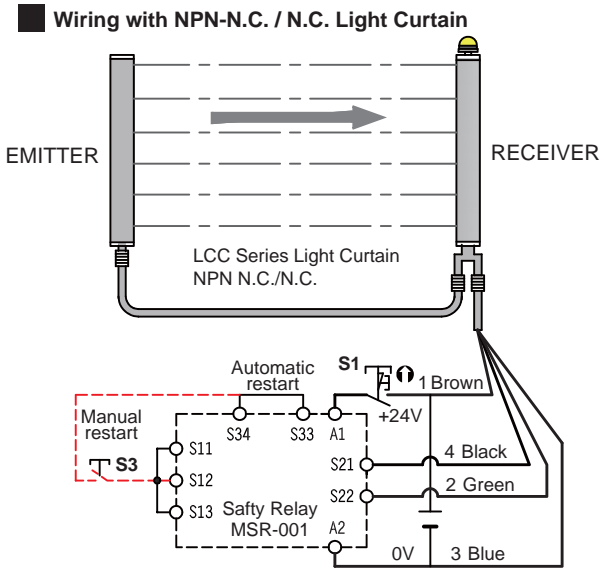
★ : Whether it is 1-channel or 2-channel mode, there is only one E-stop button will be used in practical application. That is to say, there is one E-stop button with two switches under 2-channel mode.

Warning: Two different switching signals are forbidden to contact to one safty relay, because there is no correlation between the two different switching signals. If do it, the safty relay MSR-001 will lose control function.

For the wiring diagram of E-stop and Safty door input circuit, please reference to Page 12.

SAFETY RELAY (24VDC)

Wiring Examples For Safty Relay MSR-001 and LCC Series Light Curtain



- 1) In this wiring example, the LCC light curtain is operating under 1-channel mode with E-stop SW input.
- 2) For the restart mode, it is available only for one mode: Automatic restart or Manual restart.
- 3) According to IEC/EN 60204-1, 9.2.5.4.2 and 10.7, it is prohibited to automatic restart after push E-stop. So, if the machine is Emergency Stop, it will not automatic restart.

Wiring Diagram For Input and Output of Safty Relay MSR-001

Operating Voltage	Automatic Restart Circuit	Manual Restart Circuit	AUX Output Circuit
<p>Input Circuit</p>	<p>1-channel</p>	<p>2-channel</p>	
<p>E-stop Not detect short circuit between the contacts</p>			
<p>E-stop To detect short circuit between the contacts</p>			
<p>Safety Door Not detect short circuit between the contacts</p>			
<p>Safety Door To detect short circuit between the contacts</p>			
<p>Output Circuit</p>	<p>Automatic Restart</p>	<p>Manual Restart</p>	

Note: 1) S1/S2: E-stop button / Safty Door Switch 2) S3: Restart button 3) → : Switch open or close 4) ☐ : Switch open or close