

ESR series safety relay

产品说明书

Product Instructions



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1. Matters need attention

- ◆ The safety relays can be only installed, check and maintained by professional engineers.
- ◆ The safety relay adopts standard 35mm DIN rail for installation.
- ◆ It's not safe if you open the shell or reconstruct circuit privately.
- ◆ Please avoid of wet and dust environment, in case of failure safety function, cause of plastic shell.
- ◆ Please give full protection for output contacts, especially capacitive and inductive loads.
- ◆ Please check the safety function at least 1 time in each month.

Warning

Safety relay can withstand high temperature above 55°C for a short time. But if work in such extreme ambient environment for a long time, the safety reliability may be reduced. Therefore, we strongly recommend to add appropriate cold cooling device to ensure that the safety relay works within the standard temperature range.

2. Description of product

ESR series safety relay module complies safety request of PLe in EN/ISO 13849-1 standard, suitable for monitoring various signals in industrial sites with high safety requirements -- Include emergency stop button, safety door switch, safety light curtain signal etc; It can provide 2 NO & 1 NC output, and have option of manual reset and automatic reset.

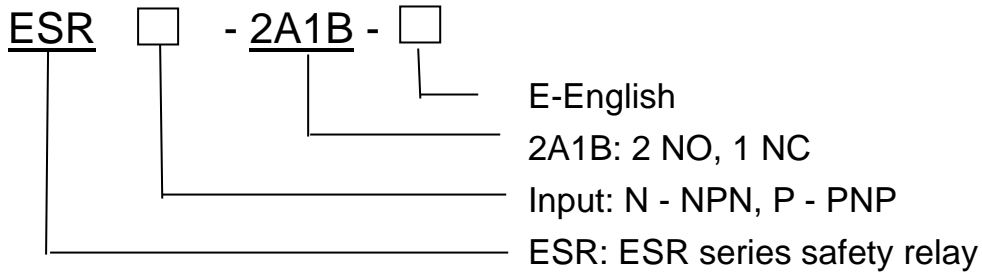
- ◆ Design according to ESN ISO 13849-1 (category 4, PLe).
- ◆ Relay output: 2 NO contacts, 1 NC auxiliary contact.
- ◆ Option: manual reset and automatic reset function.
- ◆ Internal circuit with cross-fault monitoring.
- ◆ Redundant circuit design and self-check function.
- ◆ Self-protection when input over voltage or over current.
- ◆ Power supply reverse connection protection.
- ◆ Indicator light is intuitive states, for easy operating diagnosis.
- ◆ Removable terminal block, easy to maintenance.
- ◆ Standard 35mm width rail for convenient installation.

3. Technical Parameters

Standard & level	
	EN 61496-1 EN 60204-1: 2018
	EN 61000-6-2 EN 61000-6-4

Standards	EN/ISO 12100: 2010 EN/ISO 13849-1: 2015
Safety level	EN/ISO 13849-1(Cat.4/PLe)
Electrical parameters	
Supply voltage	DC24V±10%
Power	<3W
Response time	<20ms
Buffer time	<50ms
Startup waiting time	<1s
Protective function	Overvoltage and overcurrent protection
	Reverse connection protection
Safety input	2 NPN normally close input Or 2 PNP normally close input
Input Synchronization	Unlimited
Safety Output	2 NO (normally open) , 1 NC (normally close)
Contact ratings	AC15: 5A/250V
	DC13: 6A/24V
Electrical life	≥ 100 thousand times
Mechanical life	≥ 10 million times
Environment	
Vibration Resistance	10 to 55Hz frequency range, 1 octave/min. sweep rate, 0.35mm ± 0.05 amplitude, 20 sweeps per axis.
Shock Resistance	10g, 16 ms duration, 1000 bumps for each axis (applies to all 3 axes)
Operating Temperature	-10 ~ +55℃
Storage Temperature	-40 ~ +85℃
Protection rating	Shell/Terminal: IP40/IP20
Installation/ Dimensions	
Installation	35mm DIN rail
Cable diameter	0.2~2.5mm ²
Dimension	117×100.6×22.5 (mm)

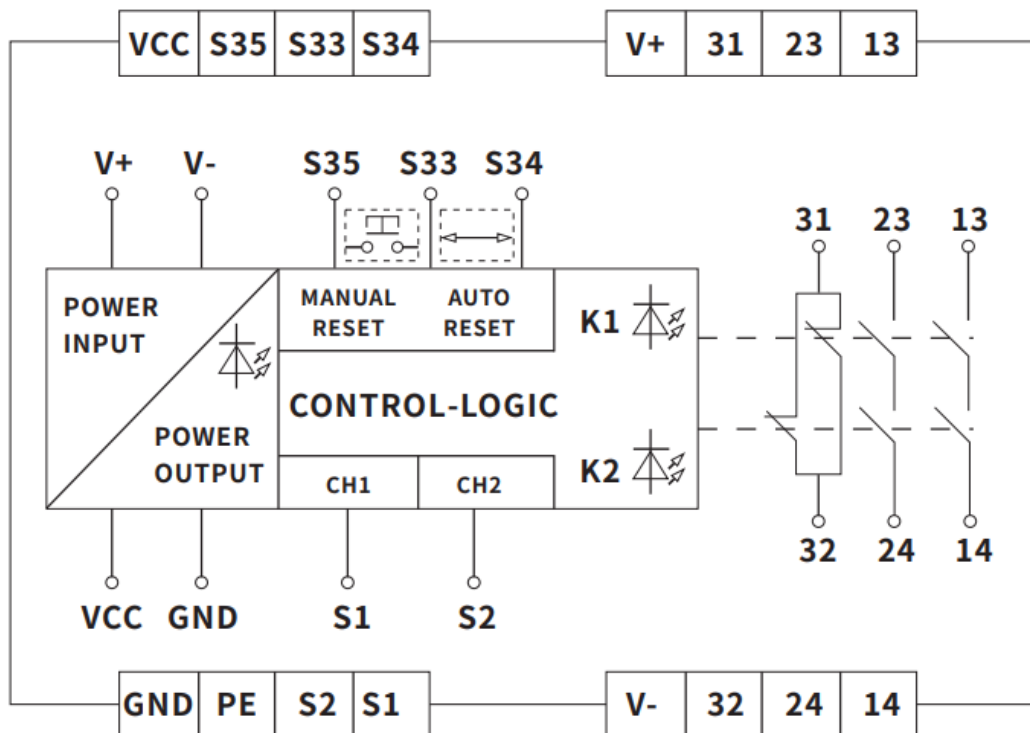
4.Model selection.



Note: ESRN-2A1B is suitable for safety light curtain with 2 NPN;
 ESRP-2A1B is suitable for safety light curtain with 2 PNP.

5. Application instruction

The safety relay ESRN/P-2A1B-E supply 2 safety contacts for output, and 1 auxiliary contacts. Connect the terminal V+/V- of safety relay with DC24V power supply, when input circuit S1 , S2 signal are correct, and reset circuit (manual reset or automatic reset) is effective, the safety relay can work normally.



◆ Automatic reset

Connect S33-S34, when both of input circuit S1 and S2 have signal, it works.

◆ Manual reset

Connect manual reset button with S33-S35 terminal, when both of S1 and S2 have signal, the contact works after click reset button and release it.

Advise: Choose button without self-lock, you can go ahead with next reset operation after click and release reset button.

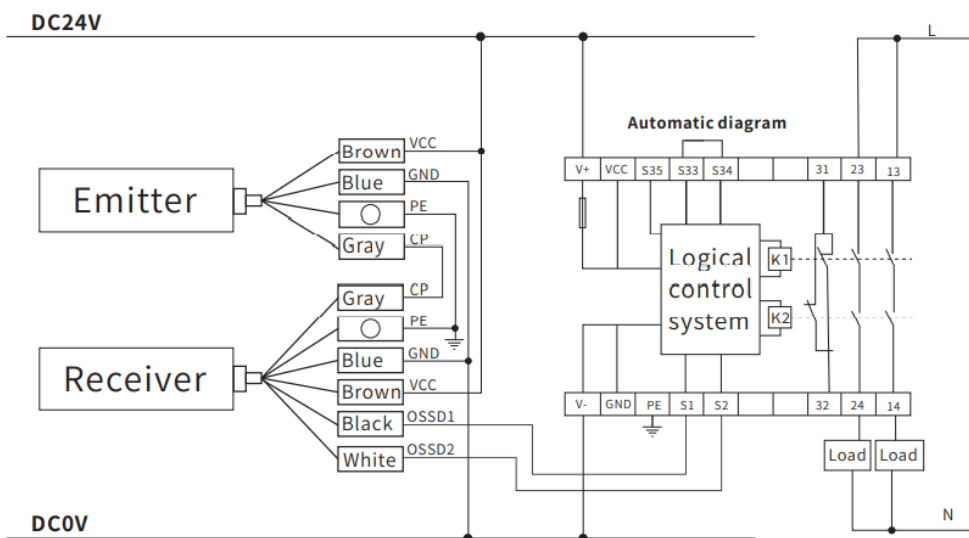
◆ Input circuit

Dual input circuit, respectively connect OSSD1 and OSSD2 of safety light curtain to the S1, S2 of relay.

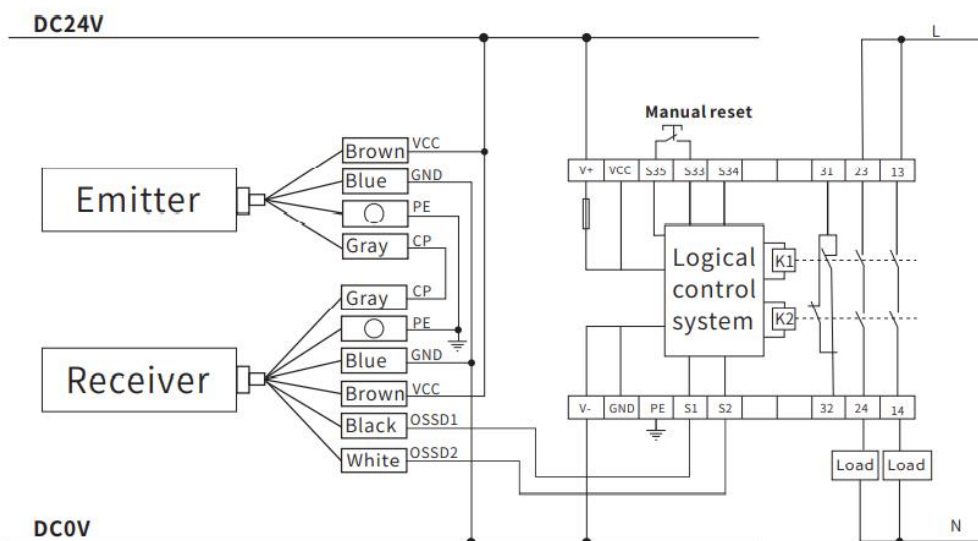
◆ The input circuit is close (The safety light curtain output signal to the safety relay), when reset power circuit take effect, the K1 and K2 of the relay are sucked and held together, and the CH1 and CH2 is light on, the safety contacts 13-14/ 23-24 are closed, and the auxiliary 31-32 are open.

◆ The input circuit is disconnected (the safety relay without signal from safety light curtain), when the reset power circuit take effect, the K1 and K2 of relay are disconnected, the CH1 and CH2 is light off, all contacts 13-14/23-24 are disconnected, and auxiliary contacts 31-32 are close.

Automatic diagram



Manual reset diagram



Warning

It's important to cut power supply when connect wire.
Automatic reset and manual reset is just as option, and cannot work at same time.

6. Description of outlook

Panel introduction.



Power light: it's light on after supplying power

CH1: Channel 1 indicates, it lights up when the relay 1 is pull in, and off when it's disconnected.

CH2: Channel 2 indicates, it lights up when the relay 2 is pull in, and off when it's disconnected.

V+/V-: Power input connection.

VCC/ GND: Power output connection (can supply power for safety light curtain)

PE: Ground protection connection.

S1: safety light curtain input signal 1

S2: safety light curtain input signal 2

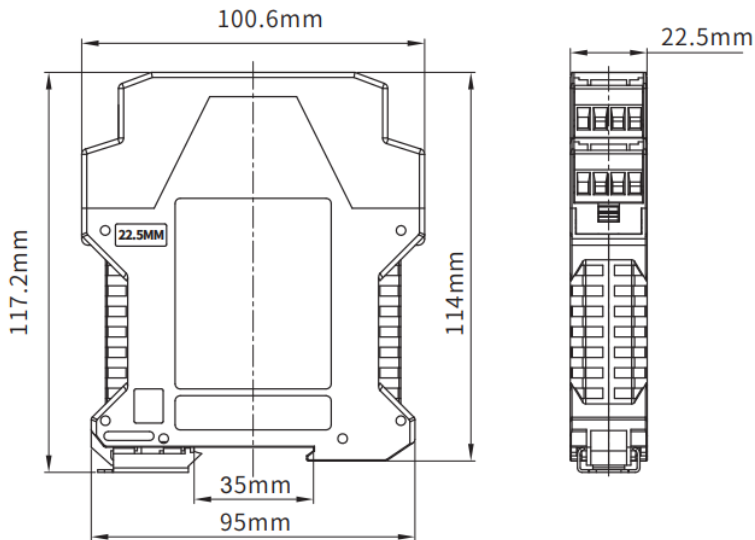
S33/S34: Connect S33, S34, When choose automatic reset

S33/S35: Connect S33, S35, when choose manual reset

13/14, 23/24; 2 Safety output (NO) connection

31/32: 1 auxiliary output (NC) connection

Product size

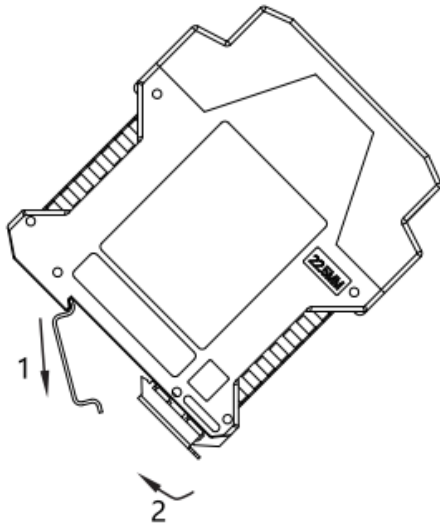


7. Product Installation

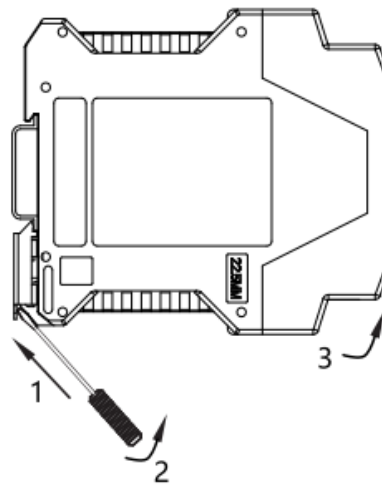
When install safety relay, you need to cut off power supply, and ensure no danger voltage, except for lighting and spare sockets;

You can directly fix safety relay on 35mm guide rail of the equipment. Please check if cable is connected correctly before power-on, and whether the products are fastened to the mounting rail.

When disassembling safety relay, you need to turn off power of the machine, and then loosen the locking screw or remove the terminal.



Installation



Disassembly