



Safety Relay Module

High safety level & Long service life

ESPE Introduction

Shenzhen ESPE Technology Co., Ltd. is a high-tech enterprise integrated with researching, production and sales of industrial safety product since 2008. As leading brand of safety industry, ESPE supply consult, risk evaluation, safety solution designing one-stop service.

“3+1+N” product strategy make sure ESPE have power to support over 11000 customers from wide industry: new energy (lithium battery & photovoltaic), aerospace, semiconductor, automotive, logistic, electronic production etc. Not only own 1/3 Chinese market, but also exported to over 60 countries.

Product range: safety light curtain, measuring light curtain, safety interlock switch, laser scanner, safety relay, safety controller module, LED signal tower light etc.

Established In

2008

Annual Amount (Curtain)

250000⁺ set

Annual Amount (Switch)

150000⁺ set

Partner Over

11000⁺



Honor & Certificates



Company certificates

- ★ National High-tech Enterprise.
- ★ Title of “Shenzhen Specialized, Refined and Innovative” Enterprise.
- ★ Title of Guangdong Province Credit-worthy Enterprise.
- ★ National Casting & Forging Machinery Supervision Product Certificates.
- ★ ISO9001:2015 Quality Management System Certification.
- ★ Co-draft of industry standard “JB/T14121-2021 Cylinder-driven Rapid Forging Hydraulic Press”.
- ★ Co-revise of national Standard “GB/T4584-2022 Technical Conditions of Photoelectric Protection Devices For Presses”.
- ★ Co-draft of National standard GBT/T19436 Mechanical Electrical Safety Electro-sensitive protection Equipment”.

Product Certificates

- ★ EU CE type 4.
- ★ TUV AUD/ TUV Austria.
- ★ CE-EMC, FCC safety certificates.
- ★ UKCA Type 4 certificates.
- ★ National CMA, CNAS.
- ★ EU RoHS certificates.

Patent

- ★ Technology patent 40+, software 30+.

Comprehensive Solution Provider In Field Of Industrial Safety Protection

Vision

Popularize industrial safety and lead the sensor technology;
Make machine more intelligent, production more convenient, and operators safer.

Value

Integrity and pragmatism, innovation, repay society.

Mission

Act as industry benchmark, aiming to be century enterprises.

Cooperative Partners





NSES Series
Safety Relay Module

P.06



NSESRH Series
Two Hand Button Control Module

P.13



NSESRE Series
Safety Relay Expansion Module

P.18



NSESRS Series
Safety Control Module

P.23

NSESR Series Safety Relay Module



Product Introduction

The NSESR series safety relay module meet PLe level of ISO 13849-1, is suitable for monitor of various signal (include emergency stop, safety door switch, safety light curtain and two hand button) in industrial sites with high requirements. Support 3NO+1NC output, can choose to monitor manual reset and automatic reset.

Product Feature

- Design according to ISO13849-1 (category 3, PLe).
- Relay output: 3NO and 1NC auxiliary contact.
- Optional manual reset and automatic reset.
- Internal circuit with cross-diagnose monitoring.
- Self-diagnose and redundant circuit design.
- Input overvoltage protection.
- Power supply reverse polarity protection.
- Visualized status indicator for easy diagnosis
- Detectable terminal for easy maintenance.
- Standard 35mm width guide mounting design.

Safety Relay Module

Product Parameter

Standard Level	
Reference Standard	ISO 13849-1 (Category 4/Ple)
Safety Level	Category 4/Ple
Electric Parameter	
Power Supply	DC24V±10%
Consumption	<3W
Response Time	<20ms
Suction Buffer Time	<100ms
Power-on Restart Time	<1s
Protective Circuit	Input power overvoltage protection, anti-reverse protection
Safety Input	Double NPN normally closed input (ESRN Type); Double PNP normally closed input (ESRP Type); Dual loop door or emergency stop button (ESRS Type);
Input Synchronization	Unlimited S1 is in the front of S2
Safety Output	3 normally open passive contacts, and 1 normally close passive contact;
B10 Data	Rated load: 400,000 times; Low load: 2,000,000 times;
Contact Capacity	AC15:5A/250V; DC13:6A/24V
Electric Lifetime	≥ 100,000 times (1NO: 5A250VAC, resistive load, 1s on 9s off)
Mechanical Lifetime	≥ 10 million times
Environment	
Vibration Resistance	Frequency 10Hz~55Hz, amplitude 0.35±0.05mm, X, Y and Z direction 20 times each
Impact Resistance	Acceleration 10g, pulse duration 16ms, X, Y and Z direction 1000 times each
Working Temperature	-25~+60°C
Storage Temperature	-40~+85°C
Protection Level	Shell/terminal protection: IP40/IP20
Installation/ Structure	
Mounting	35mm Rail
Wire Size	0.2~2.5mm ²
Hardware Size	117×100.6×22.5

Model Selection

Product Series

NSESR

Input Type



—

Output Method

3A1B

—

E

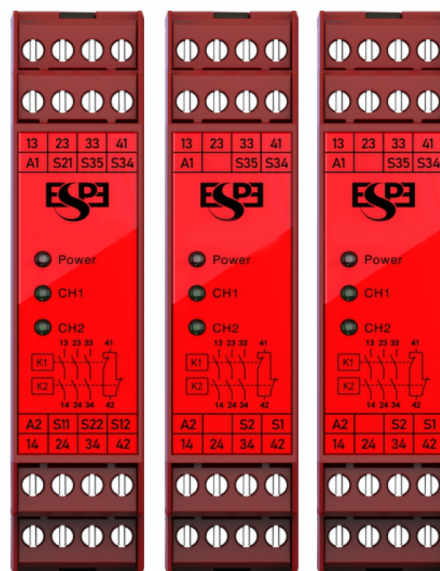
N: Dual channel NPN input
P: Dual channel PNP input
S: dual channel safety door switch, emergency stop

3A1B: 3NO+1NC

Panel Function

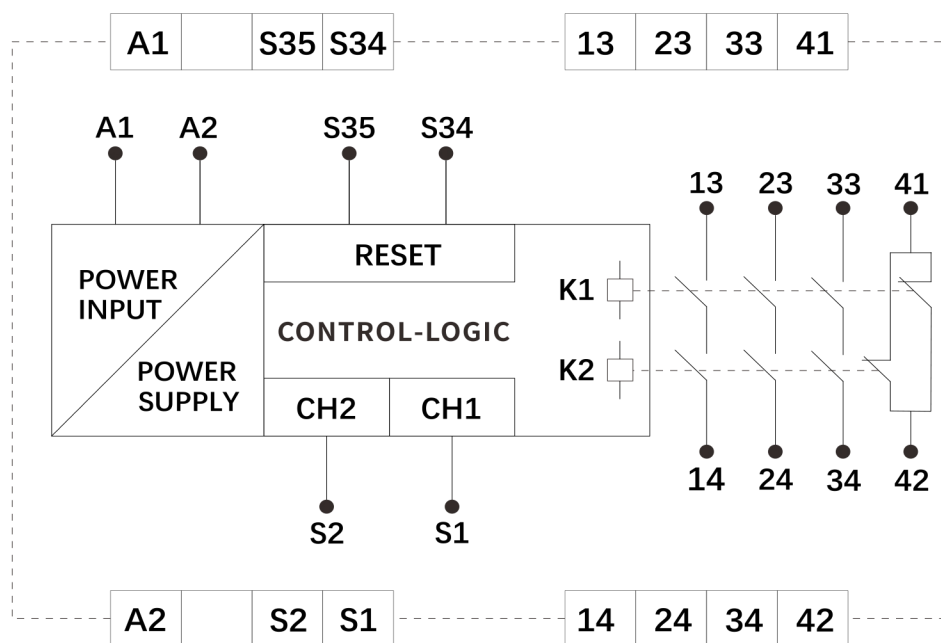
NSESR(P/N/S) - 3A1B - E

- Power: power indicator, ON when supply power.
- CH1: Channel 1 indicate that relay 1 is on when work, off when release.
- CH2: Channel 2 indicates that relay 2 is on when work, off when release.
- A1/A2: terminal for inputting power.
- S1: NPN/ PNP input 1 terminal.
- S2: NPN/ PNP input 2 terminal.
- S11/S12: door switch/emergency stop monitoring input signal 1 terminal.
- S11/S12: door switch/emergency stop monitoring input signal 2 terminal.
- S34/S35: optional automatic reset or monitored manual reset.
- 13/14, 23/24: 3 safety output (NO) terminal.
- 41/42: 1 auxiliary (NC) terminal.



Functional Diagram

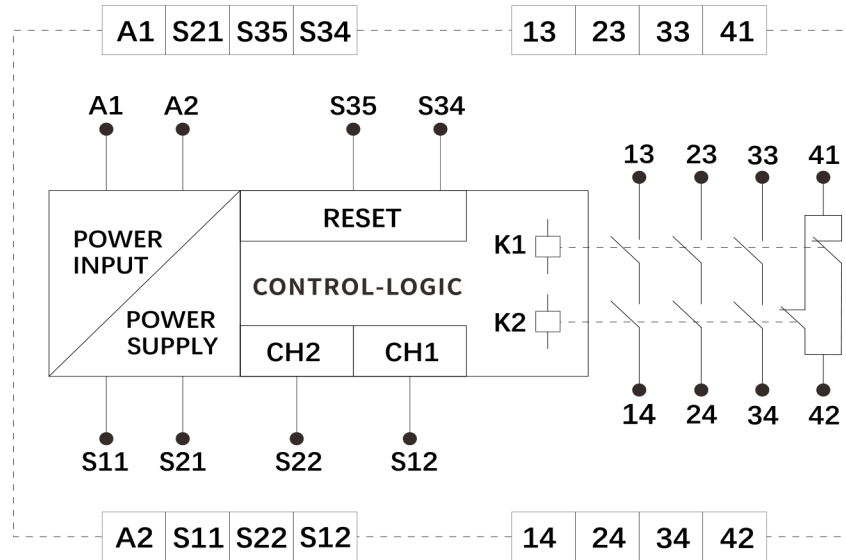
NSESR(N/P) - 3A1B - E



Safety Relay Module

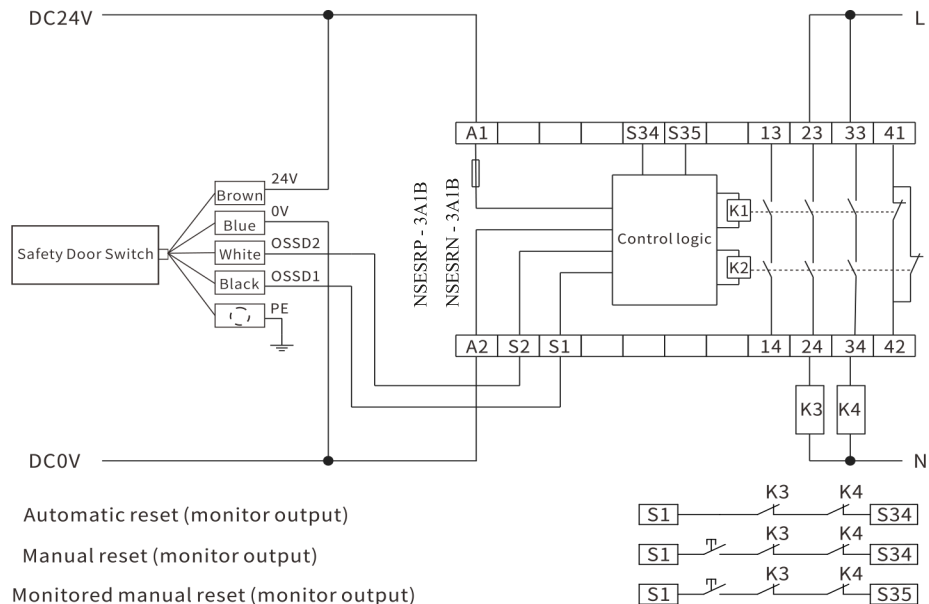
Functional Diagram

NSESRS - 3A1B - E



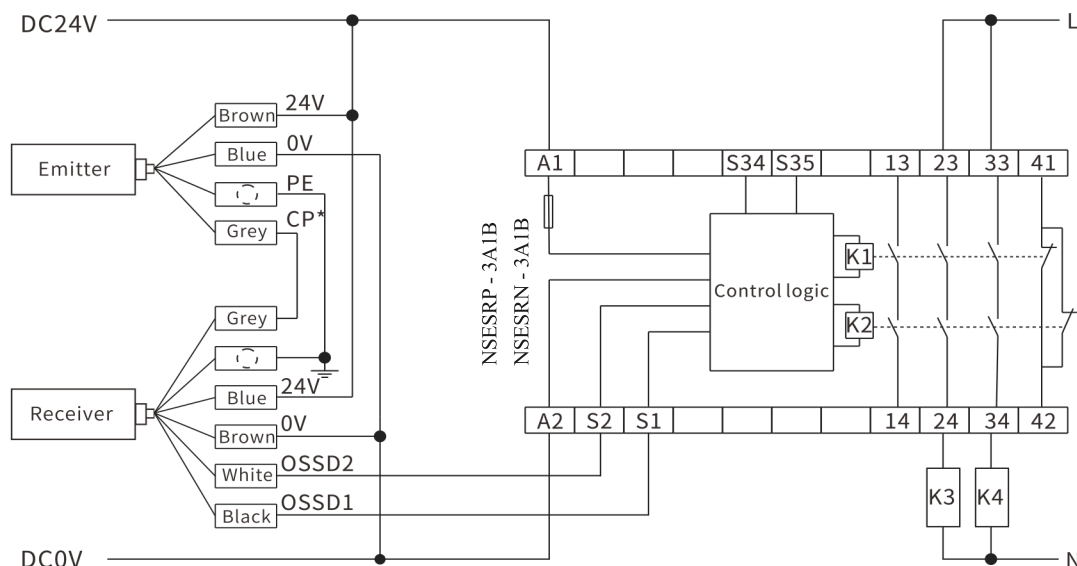
Wiring Diagram

NSES(R/N/P)-3A1B-E used for safety door switch (NPN/PNP output)



Wiring Diagram

Used for safety light curtain (NPN/PNP output)

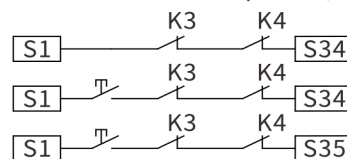


*For optical synchronization light curtain, NO CP wire (or CP wire connect with specific)

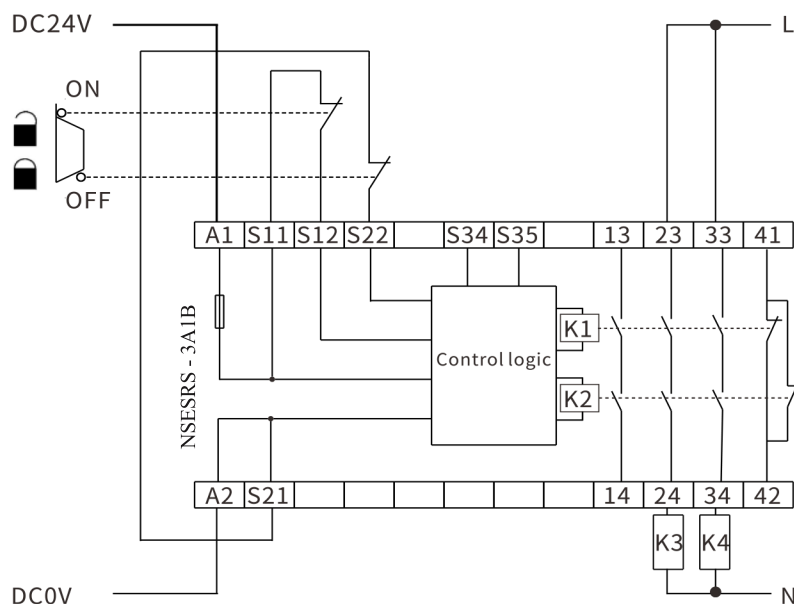
Automatic reset (monitor output)

Manual reset (monitor output)

Monitored manual reset (monitor output)



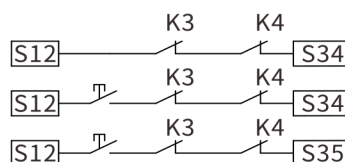
Used for dual channel safety door



Automatic reset (monitor output)

Manual reset (monitor output)

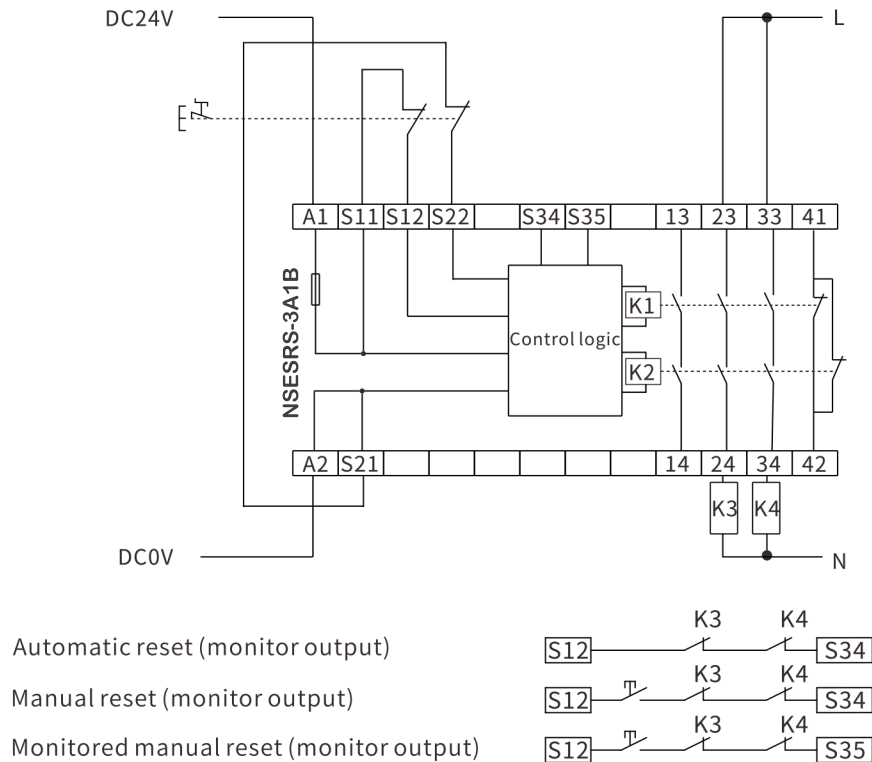
Monitored manual reset (monitor output)



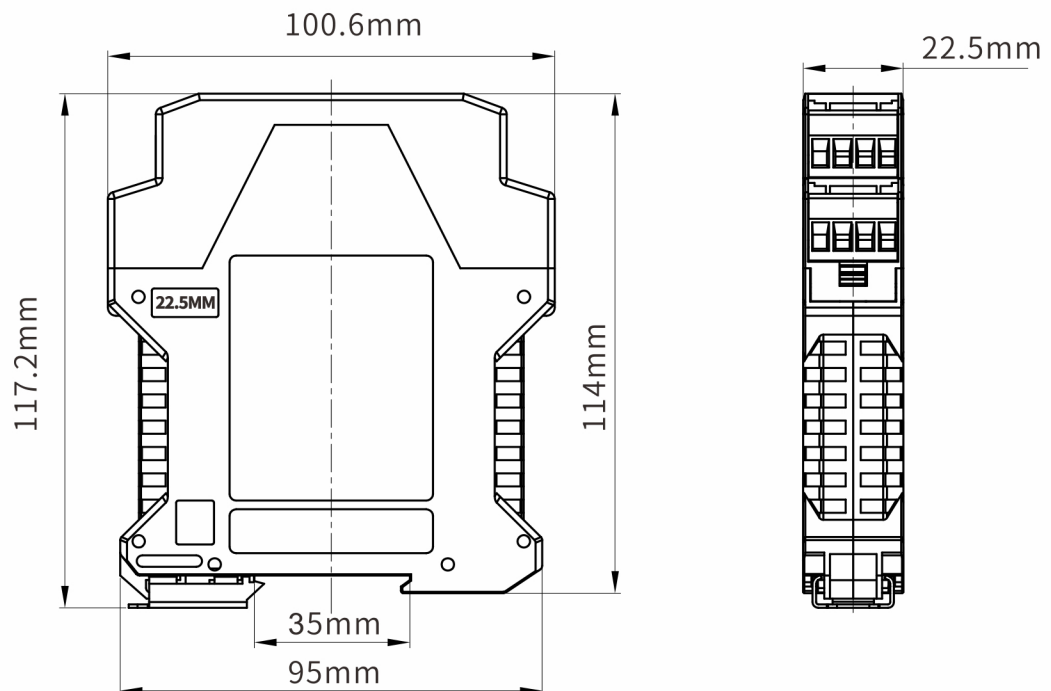
Safety Relay Module

Wiring Diagram

Used for emergency stop button



Product Size



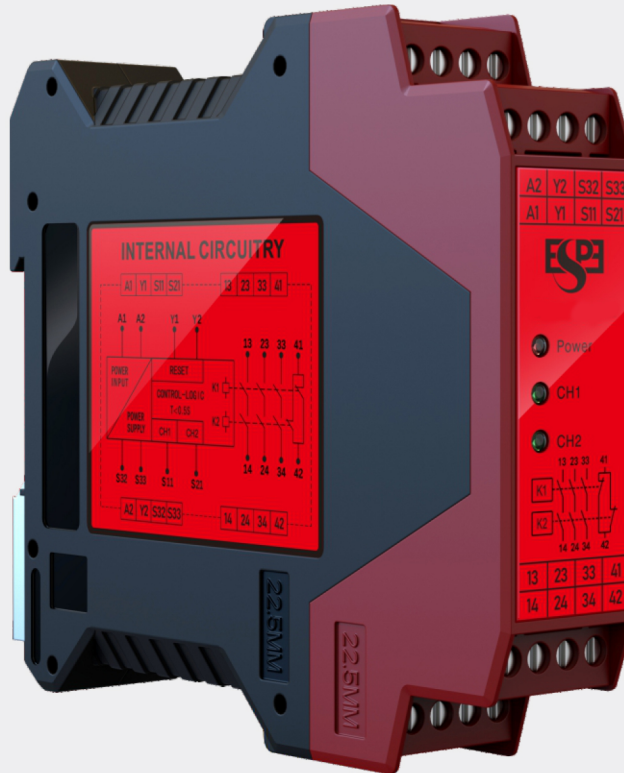
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Disassemble

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Two Hand Button Control Module



Product Introduction

NSESRH two hand button control module meet PLe safety requirement of ISO 13849-1, and is suitable for monitoring two hand button in industrial site with high safety requirements. It adopts dual-channel input mode, and has a detection ability with dual-channel synchronization time not exceeding 0.5s; it has a two-hand button control module with 3NO safety output contacts, and 1 NC auxiliary output contact.

Product Feature

- Design according to ISO13849-1 (Category 4 PLe).
- Relay output: 3NO and 1 NC auxiliary contacts.
- Inside circuit with cross-diagnose monitoring function.
- Input power overvoltage protection.
- Power supply reverse polarity protection.
- Visualized status indicator for easy diagnoses.
- Detectable terminal for easy maintenance.
- Standard 35mm width guide mounting design.

Two Hand Button Control Module

Product Parameter

Standard Level	
Reference Standard	ISO 13849-1
Safety Level	ISO 13849-1 Category 4/Pl e
Electric Parameter	
Power Supply	DC24V±10%
Consumption	<3W
Response Time	<20ms
Suction Buffer Time	<100ms
Power-on Restart Time	<1s
Protective Circuit	Overvoltage protection, reverse polarity protection
Safety Input	Two hand button signal
Input Synchronization	≤500ms (Typical data200ms)
Safety Output	3NO contacts, and 1 NC auxiliary contacts
B10 Data	Rated load: 400,000 times, low load: 2,000,000 times
Contact Capacity	AC15: 5A/250V; DC13: 6A/24V
Electric Lifetime	≥ 100, 000 times (1NO: 5A 250VAC, Resistive load)
Mechanical Lifetime	≥10,000,000 times
Environment	
Vibration Resistance	Frequency 10Hz-55Hz, amplitude 0.35±0.05mm, 20 times each in X,Y and Z direction
Impact Resistance	Acceleration 10g, pulse duration 16ms, 1000 times each in X, Y and Z direction
Working Temperature	-10~+55℃
Storage Temperature	-40~+85℃
Protection Level	Enclosure: IP40 Terminal: IP20
Installation/ Structure	
Mounting	35mm DIN navigation
Wire Size	0.2~2.5mm²
Hardware Size	117×100.6×22.5

Model Selection (eg: NSESR□-3A1B - E)

Product Series

NSESR

Input Type



H: two hand button

Output Method

3A1B

3A1B: 3NO+1NC

E

Panel Function

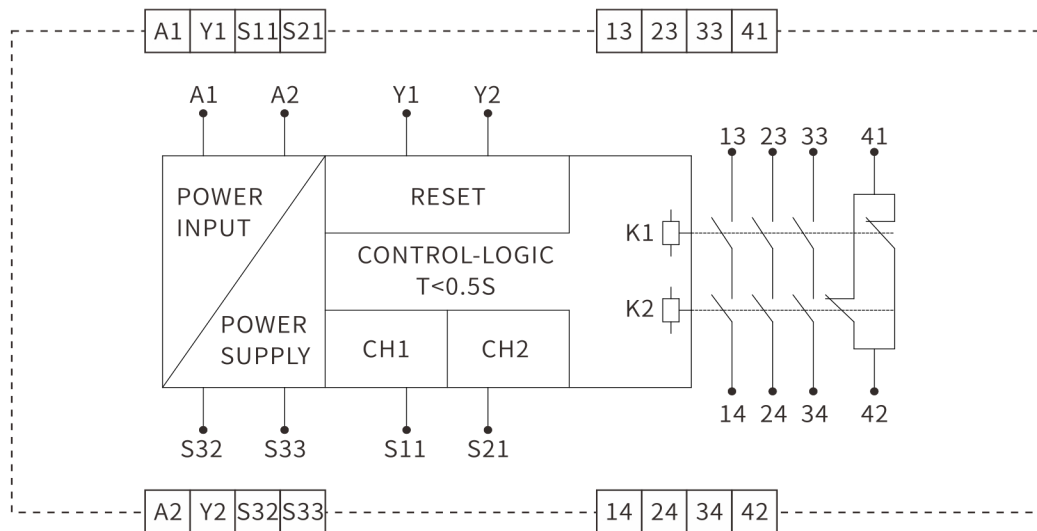
- Power: power indicator, ON after power on.
- CH1: channel 1 indicates that relay 1 is on when work and off when disconnect.
- CH2: channel 2 indicates that relay 2 is on when work and off when disconnect.
- A1/A2: DC24V power input/ output terminal.
- S11: two hand button input 1 terminal.
- S21: two hand button input 2 terminal.
- Y1-Y2: connect with Y1, Y2 to automatic reset.
- 13/14, 23/24, 33/34: 3 loop safety contacts output (NO) terminal.
- 41/42: 1 NC auxiliary contacts terminal.



Application Details

Two hand button control module NSESRH-3A1B supply 3 safety contacts output and 1 auxiliary contacts output in loop. Connect the A1 terminal to positive of DC24V power supply, A2 terminal to the negative of power supply, when the signal of input loop S11 S21 is correct and reset loop active, the two hand button control module works.

Functional diagram



Automatic reset

NSESRH-3A1B: connect Y1-Y2.

When input loop S11 and S21 input active signal, component start to work.

- When input loop input active signal to two hand button, reset loop active, the K1 K2 of relay keep disconnecting, indicator light CH1 CH2 light on, safety contacts 13-14/23-24/33-34 close, auxiliary 41-42 disconnected.

Input loop

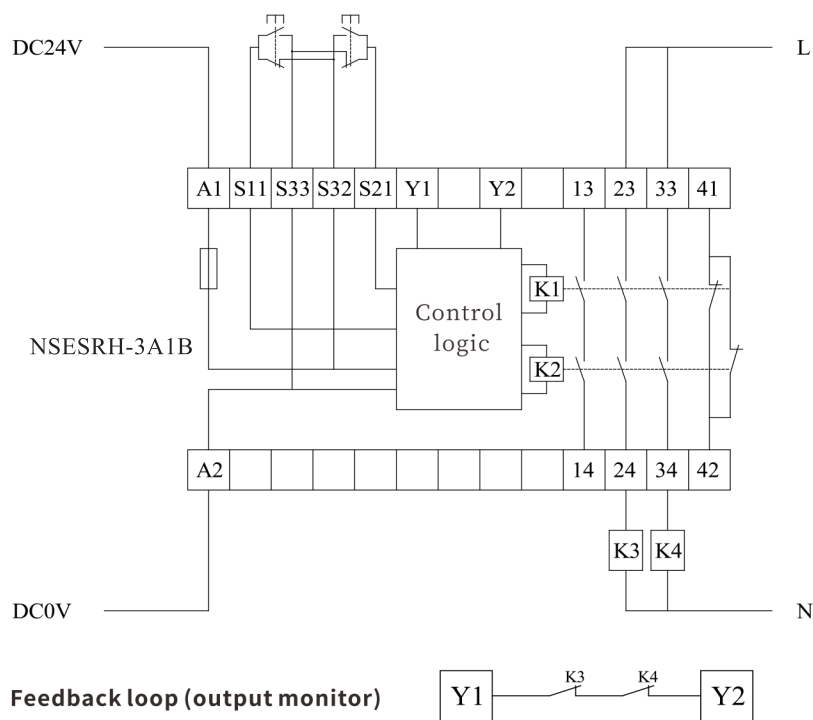
Dual-channel input, connect S11 & S21 of relay to two hand button respectively, at the mean time connect NO/NC of two hand button as diagram.

- Input loop disconnect (Input loop without active signal to NSESRH 3A1B), reset loop active, the K1 &K2 of relay get disconnected, indicator CH1, CH2 light off, safety contacts 13-14/23-24/33-34 get disconnected, auxiliary 41-42 close.

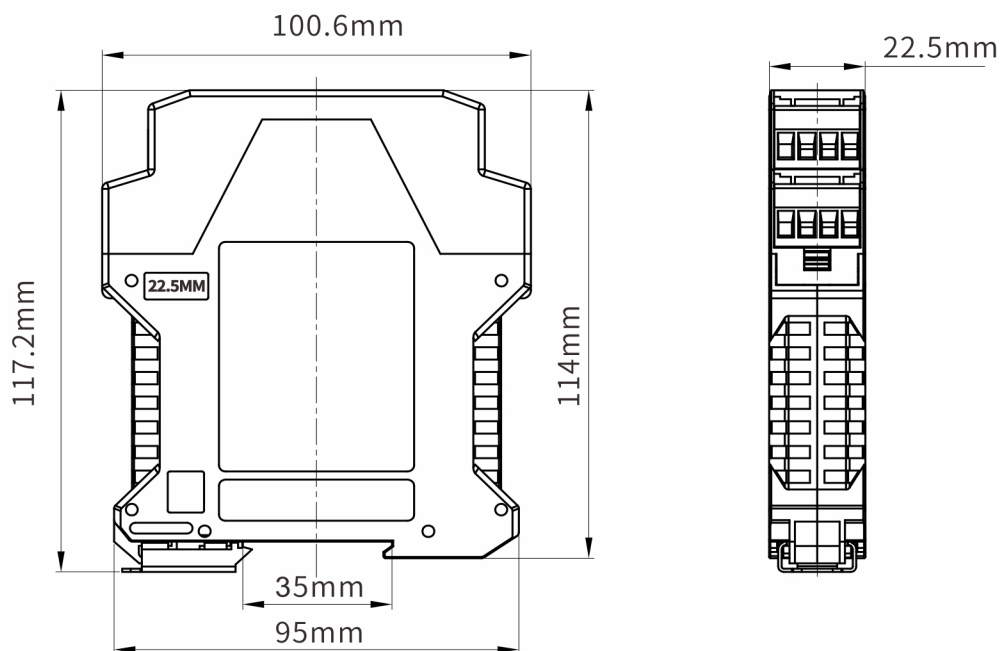
Two Hand Button Control Module

Wiring Diagram

NSESRH-3A1B-E



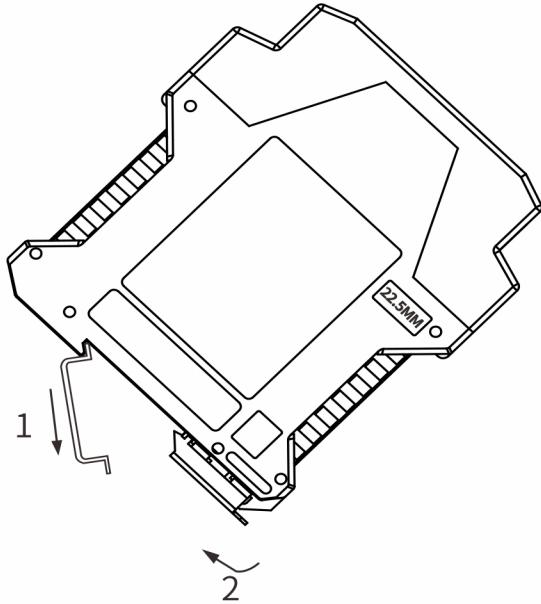
Product Size



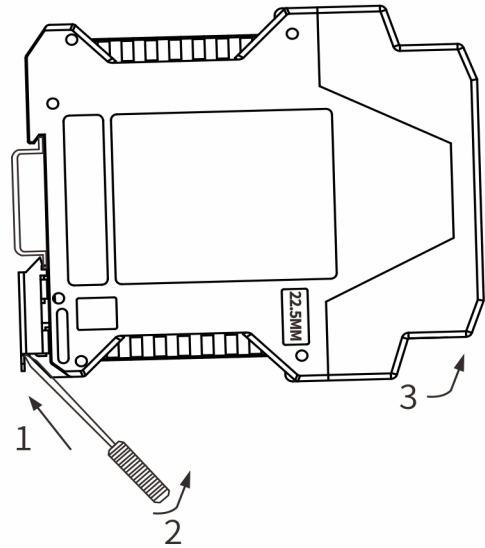


Product Installation

- Please cut off the power supply when mounting, and ensure no dangerous voltage of machine, except the lighting device and spare sockets; Clip the product directly onto 35mm rail inside the equipment cabinet. Before powering on, please check to ensure cable connection is correct and the product is fastened to the mounting rail. Before disassembling the product, you must cut off the power supply to the machine, then loosen the locking screws or remove terminals.



Installation diagram



Removal diagram



Carefully read the manual before installation, and ensure power supply is cut off when wiring. Wiring with power is prohibited.

Product Parameter

Standard Level	
Reference Standard	ISO 13849-1
Safety Level	ISO 13849-1 Category 4/Pl e
Electric Parameter	
Power Supply	DC24V±10%
Capacity	<3W
Response Time	<20ms
Suction Buffer Time	<50ms
Restart Time	<1s
Protective Circuit	Overvoltage protection, reverse polarity protection
Safety Input	Safety switch signal
Input Synchronization	No requirement
Safety Output	4NO contacts, and 2 NC auxiliary contacts
B10 Data	Rated load: 400,000 times, low load: 2,000,000 times
Contact Capacity	AC15: 5A/250V; DC13: 6A/24V
Electric Lifetime	≥ 100, 000 times (1NO: 5A 250VAC, Resistive load)
Mechanical Lifetime	≥10,000,000 times
Environment	
Vibration Resistance	Frequency 10Hz-55Hz, amplitude 0.35±0.05mm, 20 times each in X,Y and Z direction
Impact Resistance	Acceleration 10g, pulse duration 16ms, 1000 times each in X, Y and Z direction
Working Temperature	-10~+55℃
Storage Temperature	-40~+85℃
Protection Level	Enclosure: IP40 Terminal: IP20
Installation/ Structure	
Installation	35mm DIN navigation
Wire Size	0.2~2.5mm ²
Size	117×100.6×22.5

Model Selection (e.g:NSESR□-4A2B-E)

Product Series

NSESR

Input Type



E: safety expansion module

Output Method

4A2B

4A2B:4NO+2NC

E

Note: ESRE-4A2B-E is suitable for output expansion of safety relays

Panel Function

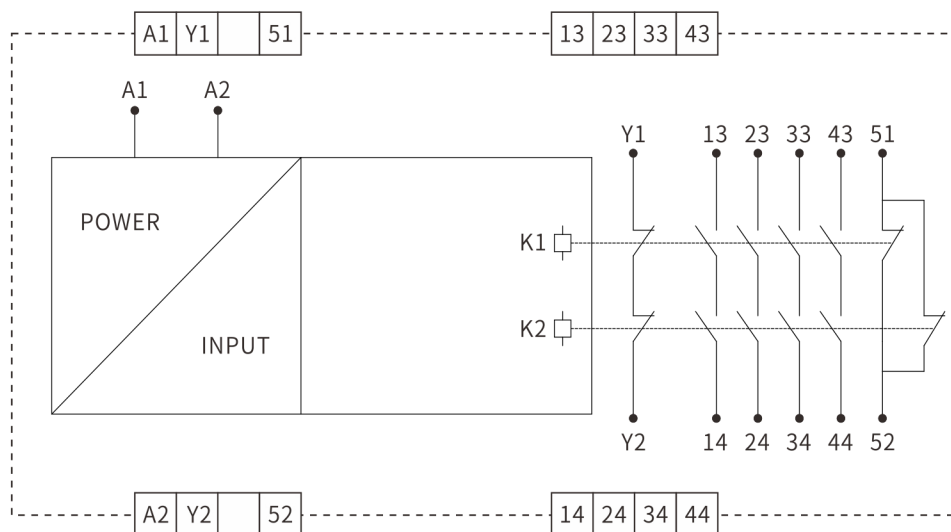
- Power: power indicator, light on when power on.
- CH1: channel 1 indicates that relay 1 is on when work and off when disconnect.
- CH2: channel 2 indicates that relay 2 is on when work and off when disconnect.
- A1/A2: previous switch signal input terminal.
- Y1-Y2: connect with Y1, Y2 to send back status.
- 12/14, 23/24, 33/34, 43/44: 4 safety output (NO) terminal.
- 51/52, Y1/Y2: 2 auxiliary output (NC) terminal.



Application Details

Safety relay expansion module NSESRE-4A2B-E supply 4 safety contacts output and 2 auxiliary output in safety circuit. Connect A1 of NSESRE-4A2B-E to output terminal of the previous device, A2 connected the pole of power supply, when previous device send right signal, the related contacts of expansion module has corresponding action.

Functional diagram



Automatic reset

NSESRE-4A2B Connect A1, A2 of NSESRE-4A2B as diagram, when previous device output active signal, the component works.

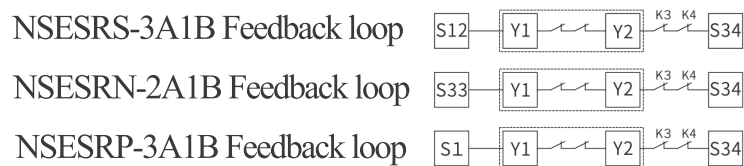
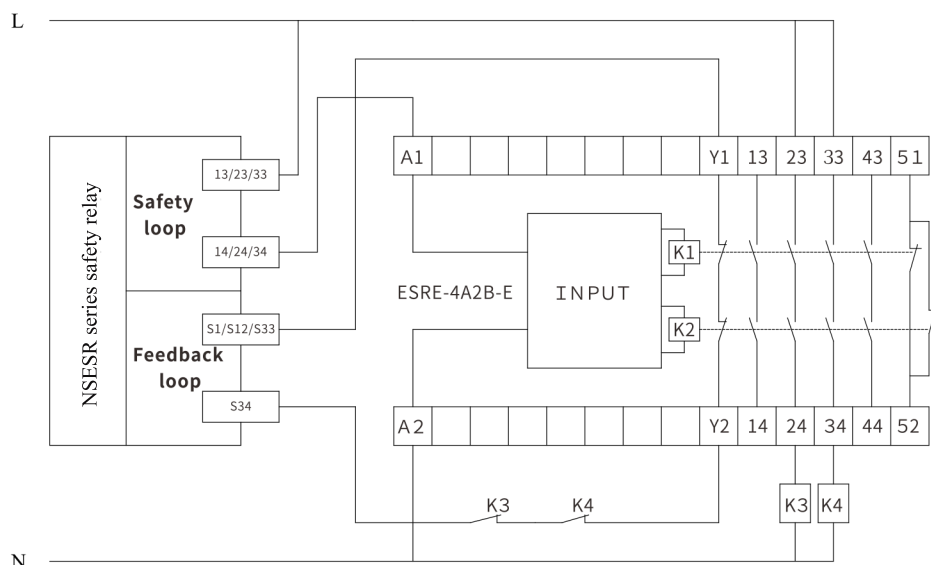
- Input circuit output active signal to NSESRE-4A2B, K1 & K2 of relay get energized and held, indicator CH1, CH2 light up, safety contacts 13-14/23-24/33-34/43-44 close, and auxiliary Y1-Y2/ 51-52 contacts open.

Safety feedback loop

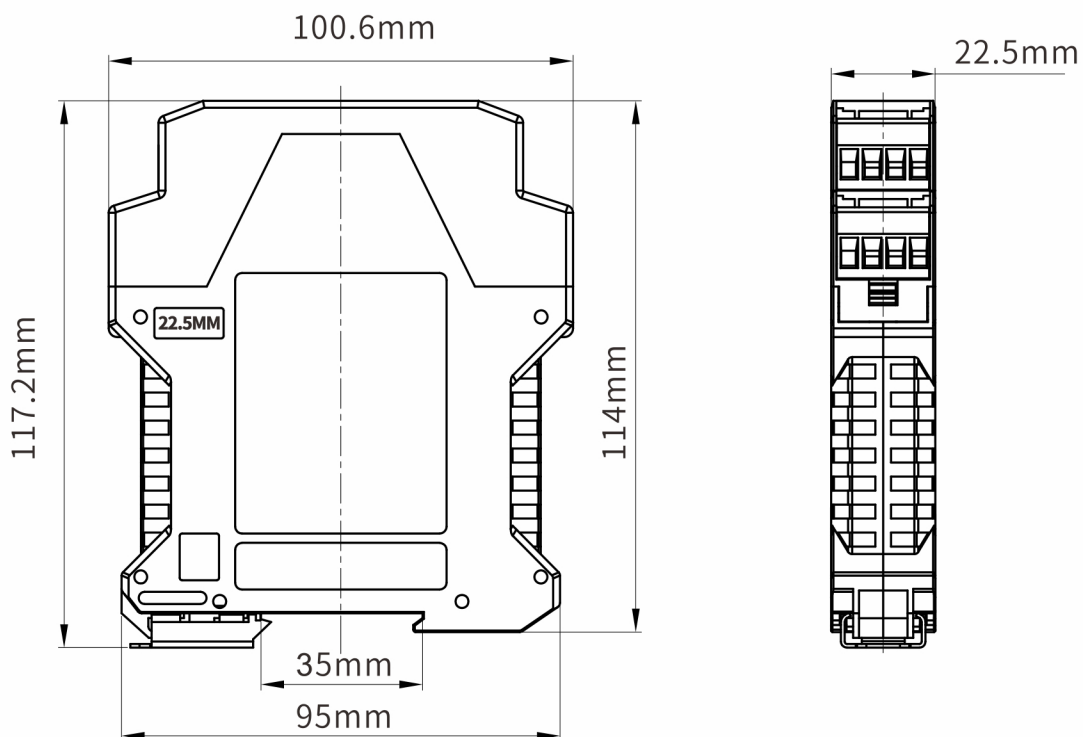
Connect YS, Y2 in series to feedback loop of previous device, when a related fault occurs, the safety relay expansion module will not perform the corresponding action.

- The input circuit is disconnected (The input circuit has no valid signal output to the safety relay expansion module), relay K1, K2 are disconnected, indicator light CH1, CH2 are off, safety contacts 13-14/23-24/33-34/43-44 are disconnected, and auxiliary contacts Y1-Y2/51-52 are closed.

Typical Application

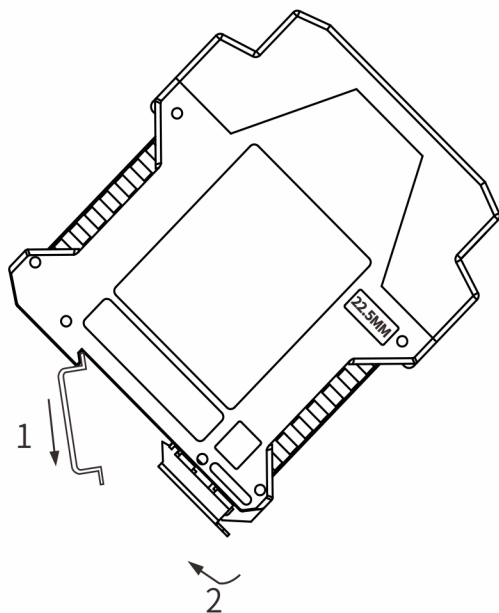


Size Diagram

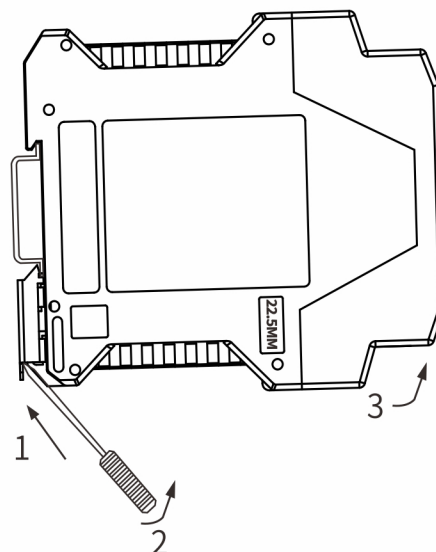


Product Installation

- Please cut off the power supply when mounting, and ensure no dangerous voltage of machine, except the lighting device and spare sockets; Clip the product directly onto 35mm rail inside the equipment cabinet. Before powering on, please check to ensure cable connection is correct and the product is fastened to the mounting rail. Before disassembling the product, you must cut off the power supply to the machine, then loosen the locking screws or remove terminals.



Installation diagram



Removal diagram



Carefully read the manual before installation, and ensure power supply is cut off when wiring. Wiring with power is prohibited.

NSESRS Series Safety Control Module



Performance Level: PL_e
Category: Cat.4

ESRS Safety Control Module

NSESRS is a configurable safety control module that supports input for a variety of switch type safety components (such as emergency button, safety door switch, safety light curtain, LiDAR, two-hand button, etc.). With a maximum of 6 safety components inputs, 2 relay safety outputs, and 4 semiconductor outputs. The configuration software of it can set the safety control logic to meet the needs of various field applications.

Product Feature

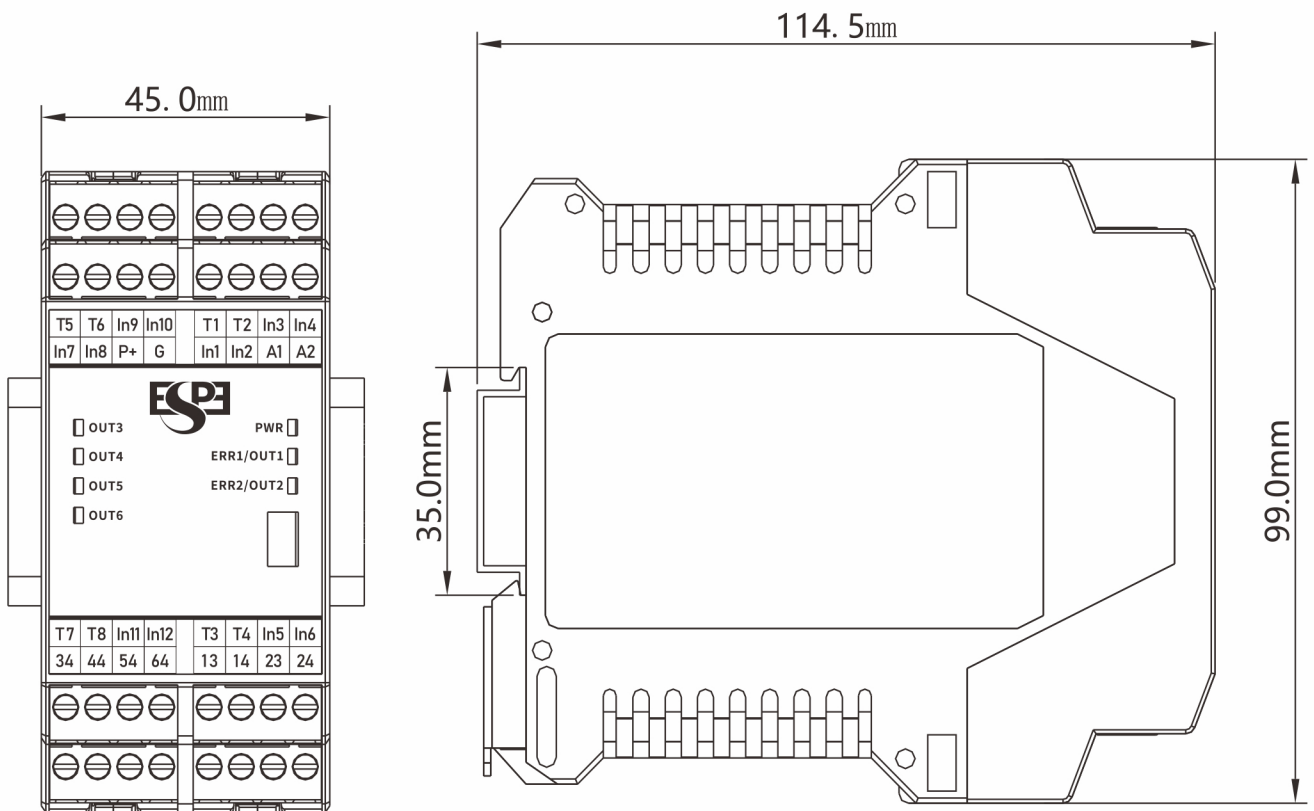
- Designed in accordance with ISO13849-1(Category4, PL_e).
- Relay output: 2 normally open contacts.
- Transistor output: 4 PNP signal output.
- Self-diagnose and redundant circuit design.
- Intuitive status indicator for easy operation status diagnosis.
- Detachable terminal for easy maintenance.
- Configurable control logic.
- Support a variety of safety input signals.



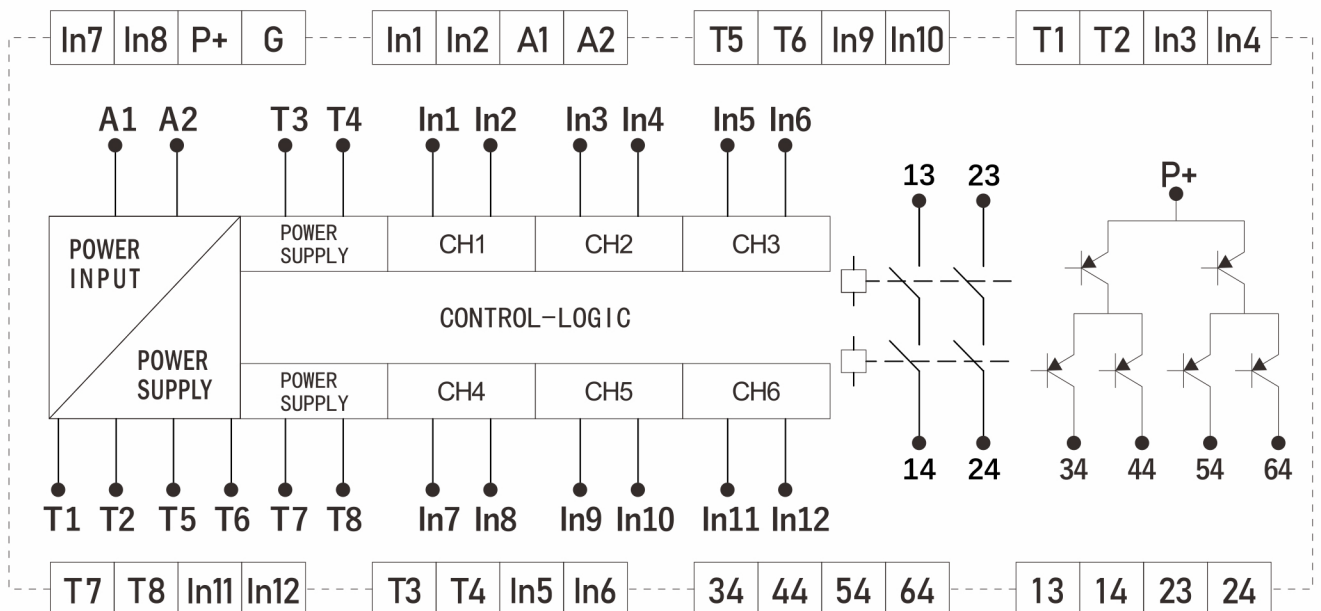
Product Parameter

Electrical Data	
Power Supply	20V~30VDC
Electricity Break	≤110mA(24VDC)
Input Feature	
Channel	6
Input Current	≤50mA(24VDC)
Wire Resistance	≤15Ω
Support Device	Emergency stop, safetygate, safety light curtain, safeyt mat, two hand button, interlock switch, reset button
Output Feature	
Contacts	2NO
Material of Contacts	AgSnO ₂
Fuse Protection	10A fast;6A slow
Switching Capacity	5A/250VAC;5A/24VDC
Semiconductor Feature	
Output	4PNP
Drive Power	2A(24VDC)
Time Feature	
Operation Time	≤100ms
Release Time	≤30ms
Restore Time	≤100ms
Power Break Time	20ms
Ambient Feature	
Electro Magnetic Compatibility	EN60947,EN61000-6-2,EN61000-6-4
Vibration	Frequency:10Hz~55Hz; Amplitude:0.35mm
Ambient Temperature	-20℃~+60℃
Storage Temperature	-40℃~+85℃
Relative Humidity	10%~90%
Insulating Feature	
Overvoltage Level	III
Pollution Level	2
Rated Insulating Voltage	250VAC
Rated Impact Voltage	6000V(1.2/50us)
Dielectric Strength	1500VAC,1min
Clearance & Creepage	EN60947-1
Certificates	
Safety Level	SIL3
Safety Level (SIL/PL)	Pl e
Safety Category	Cat.4

Size Diagram

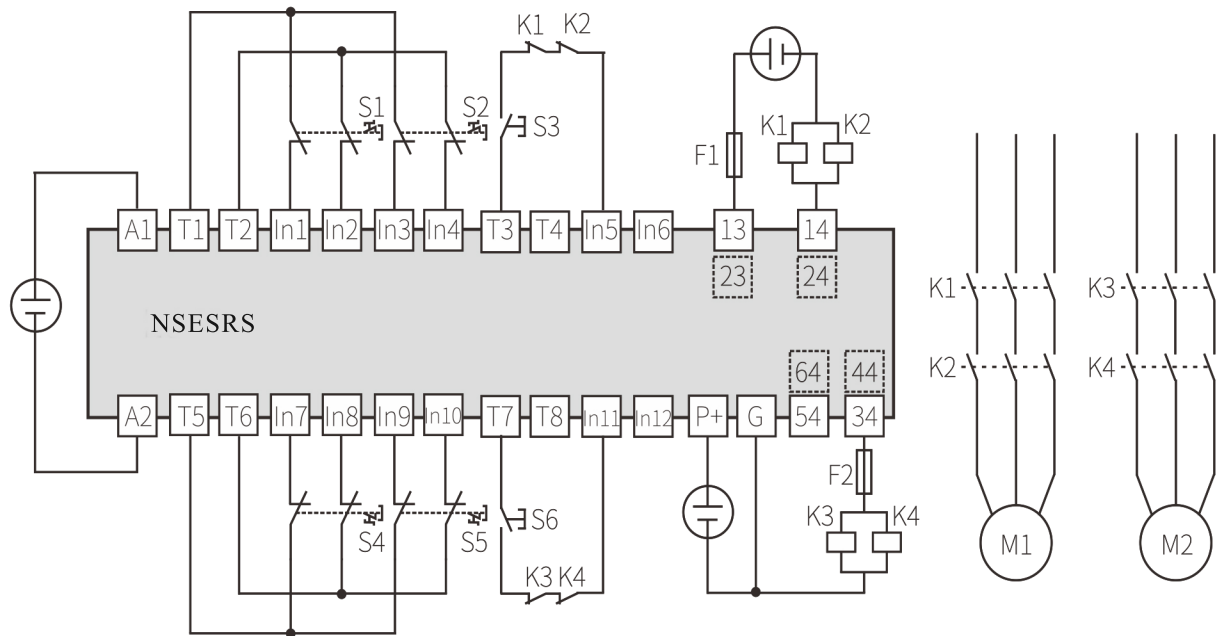


Panel Function

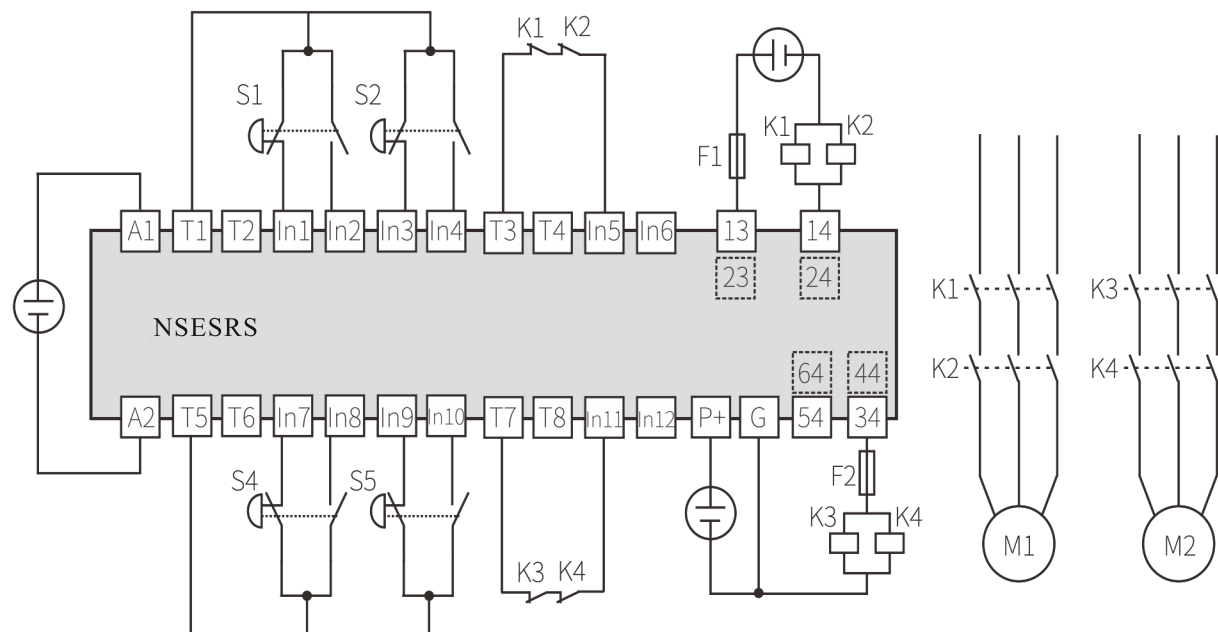


Connection Diagram

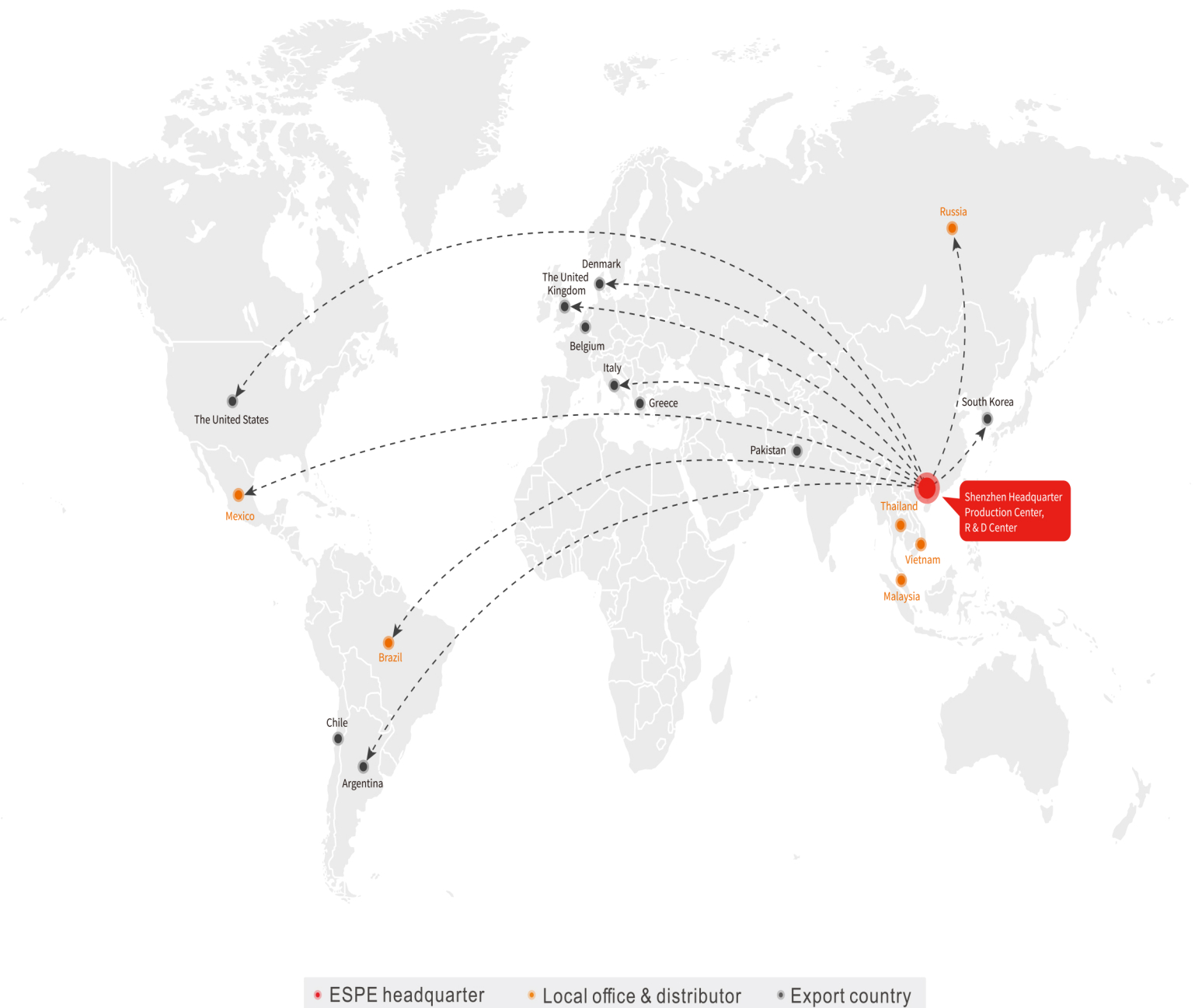
4 channel emergency button input



2 channel two-hand button input



Explore across ocean and continent



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