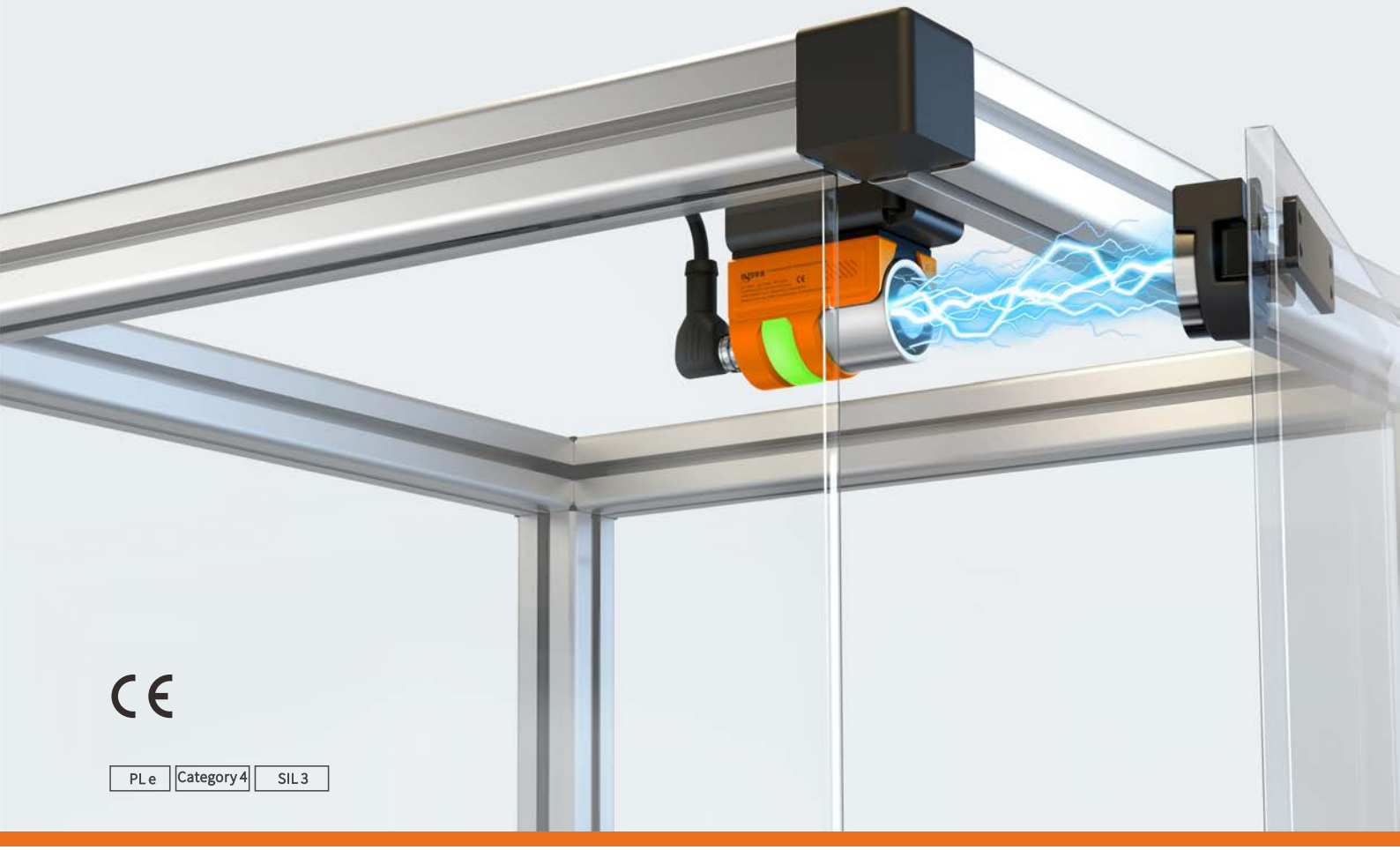
SLE21 Series

Miniature Safety Interlock Switch



CE

PL e | Category 4 | SIL 3

Product Introduction

SLE21 series is an electromagnetic locking safety interlock switch, the misalignment constructure and strong holding force ensure an optimized solution for movable guarding doors. The switch with advantage of electromagnetic and miniature size support new solution for small equipment with smaller inertia. Non-contact feature is available in high cleanliness and dust-free workshop like semiconductor, automobile manufacturing, beverage &food production etc.

Product Feature

- 500N electromagnetic force lock.
- Adopt "Electromagnetic" locking and keyless constructure.
- Easy to integrate (max. 20sets).
- Permanent magnet built-in actuator.
- Small size, easy to install.
- Full perspective indicator light.
- Non-contact without powder.
- IP65 /IP67 protection level.

Product Parameter

Safety Standard		EN ISO 13849-1:2023 (Category 4/PL e)、EN ISO 14119、EN 60947-5-3	
Type		Hinged door	
		Miniature size	
		Terminal Block	M12 connector
		Standard Mode	Standard mode; Advanced mode
Working Distance	Sao(Off-On)	1mm*1	
	Sar(On-Off)	6mm	
Response Time	Lock→Release	200ms	
	Release→Lock	200ms	
	Detect→Non-Detect	200ms+25ms* (Total quantity of cascaded lock -1)	
	Non-detect →Detect	200ms+50ms*(Total quantity of cascaded lock -1)	
Control Output	Output Method	Transistor output*2	
	Max. Load Current	150mA	
	Residual Voltage (During ON)	2.5V max. (5m cable) 3.5V (31m cable)	
	OFF Stage Voltage	2.0V max. (5m cable) 3V (31m cable)	
	Leakage Current	0.5mA max.	
	Max, Capacitive Load	2uF	
	Load Wiring Resistance	2.5Ω max.	
AUX Output (Not Safety Output)	Output	Transistor	
	Max. Load Current	50mA	
	Residual Voltage (When ON)	2.5V max. (5m cable) 3.5V (31m cable)	
External Input (Short Circuit Current)	Safety Input	Approx. 0.5mA * 2	
	Lock Control Input (OSSD Switching Input)	Approx. 0.5mA	
	Reset/EDM Input	Approx. 0.5mA (only for advanced function)	
	EDM Option Input	Approx. 0.5mA (only for advanced function)	
Power	Power Supply	24VDC±10% (ripple P-P 10% Class 2)	
	Power Consumption	<5W	
Circuit Protection		Reverse current protection, overcurrent protection, and surge protection for each output	
	Enclosure Rating	IP65/IP67	
Environmental Resistance	Ambient Temperature	-20~55℃(No freezing)	
	Storage Temperature	-20~55℃(No freezing)	
	Operating Relative Humidity	5% to 95%RH	
	Storage Relative Humidity	5% to 95%RH	
	Vibration Resistance	10 to 55Hz, double amplitude 2.0mm, 5 minutes in each of tine X, Y, and Z direction (IEC60947-5-3)	
	Shock Resistance	30G in X, Y, Z directions 6 times each axis (IEC60947-5-3)	

Remark: 1. The sensing distance is 0-6mm when open-close linked as function; The safety locking work normal when sensing distance between actuator and switch less than 1mm,

SLE21 Safety Interlock Switch

Model Selection (e.g.:SLE21-□□□□□)

Series	Locking Method	Configuration	Coding Method	Output Method	Lead Wire
SLE21	– □	□	□	□	□
	0: Power to lock	0: Standard mode 1: Advanced mode	0: Universal coding 1: Unique coding	N: NPN P: PNP	C: M12 connector T: Terminal Block

Note: The current terminal block version only supports NPN output mode.

Description for Standard & Advanced Mode							
	Safety output	AUX output	Safety input (linked)	Lock input	OSSD action switch	EDM	Reset
Terminal Block (Standard mode)	●	1*1	●	●	–	–	–
M12 Connector (Standard mode)	●	2*2	●	●	●	–	–
M12 Connector (Advanced mode)	●	2	●	●	●	●	●

*1 AUX single output (default AUX1); *2AUX dual OSSD (AUX1 and AUX2)

AUX Function Description

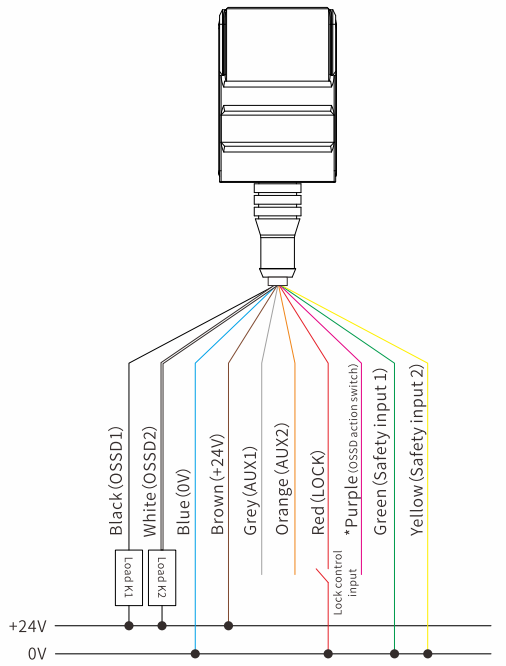
AUX 1 for Close-open Monitor, AUX 2 for Lock Monitor				
Door Status	OSSD1	OSSD2	AUX1	AUX2
Door Open	OFF	OFF	ON	ON
Close & Unlocked	OFF	OFF	OFF	ON
Close & Locked	ON	ON	OFF	OFF

SLE21 Selection Table

Locking Method	Configuration	Output Method	Coding Method	Model
Power to lock	Standard	NPN	Universal coding	SLE21-000NC
				SLE21-000NT
		NPN	Unique coding	SLE21-001NC
				SLE21-001NT
		PNP	Universal coding	SLE21-000PC
		PNP	Unique coding	SLE21-001PC
	Advanced	NPN	Universal coding	SLE21-010NC
		NPN	Unique coding	SLE21-011NC
		PNP	Universal coding	SLE21-010PC
		PNP	Unique coding	SLE21-011PC

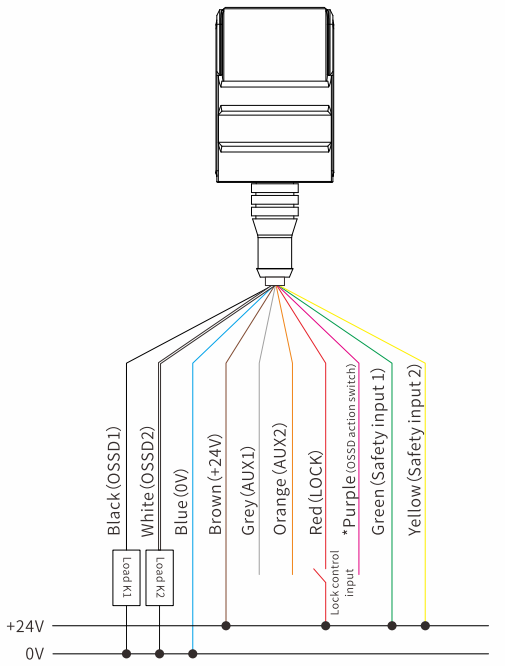
Wire Diagram

SLE21 Standard Mode (NPN, No Cascade)



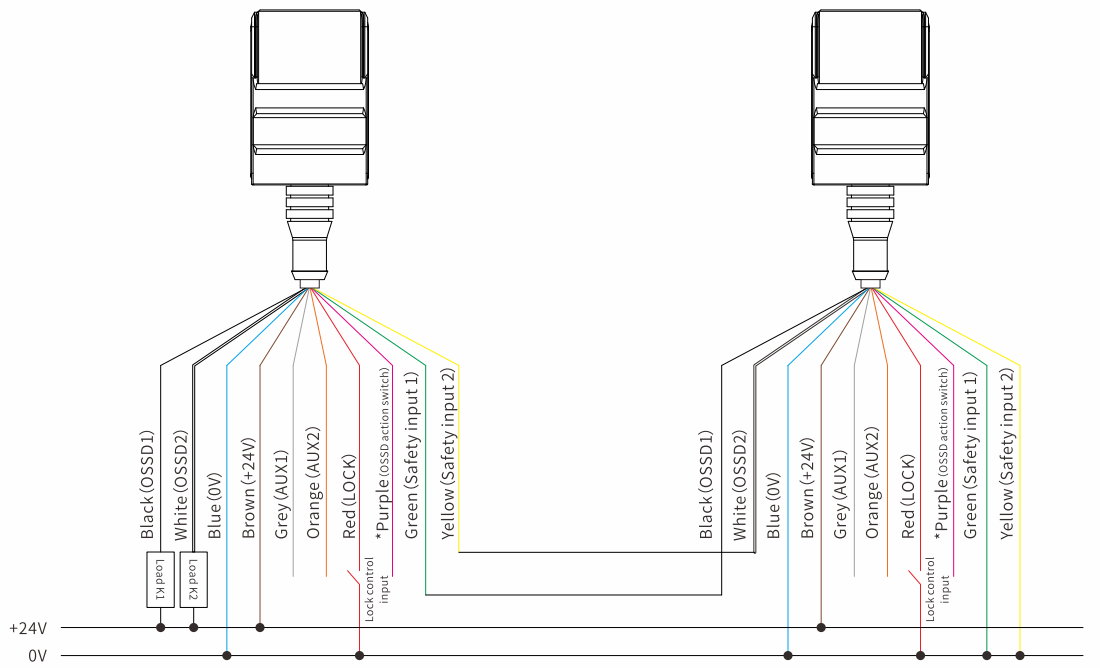
*Open/close link, purple is connected with 0V; Lock link, purple disconnected

SLE21 Standard Mode (PNP, No Cascade)



*Open/close link, purple is connected with +24V; Lock link, purple disconnected

SLE21 Standard Mode (NPN, Cascade)



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SLE21 Safety Interlock Switch

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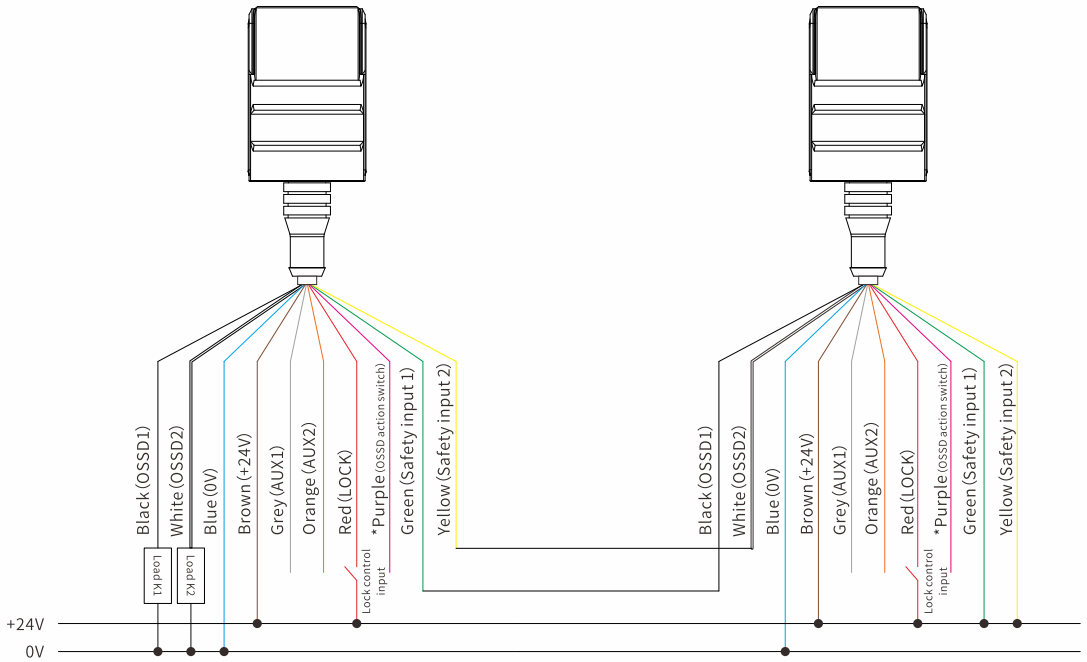

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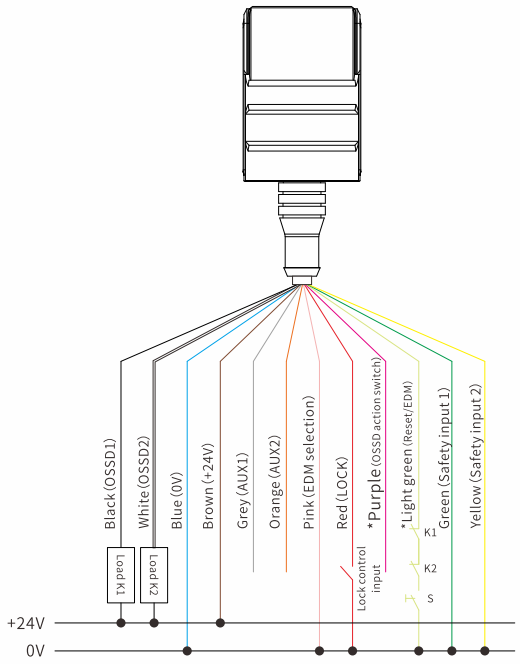
SLE21 Advanced Mode (NPN, No Cascade)



*Open/close link, purple is connected with 0V; Lock link, purple disconnected
*1. Use EDM and reset: wiring as picture
2. Do not use EDM reset: Keep EDM(pink wire), reset /EDM(light green wire) connect to +24V;
3. Use EDM no reset: disconnecting EDM pink wire.
K1, K2: external equipment (force guided relays, electromagnetic contactors, etc.)
5. S: Reset switch

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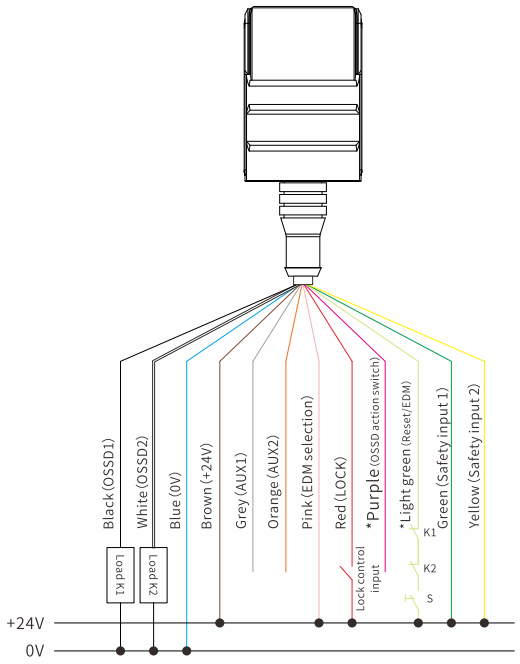

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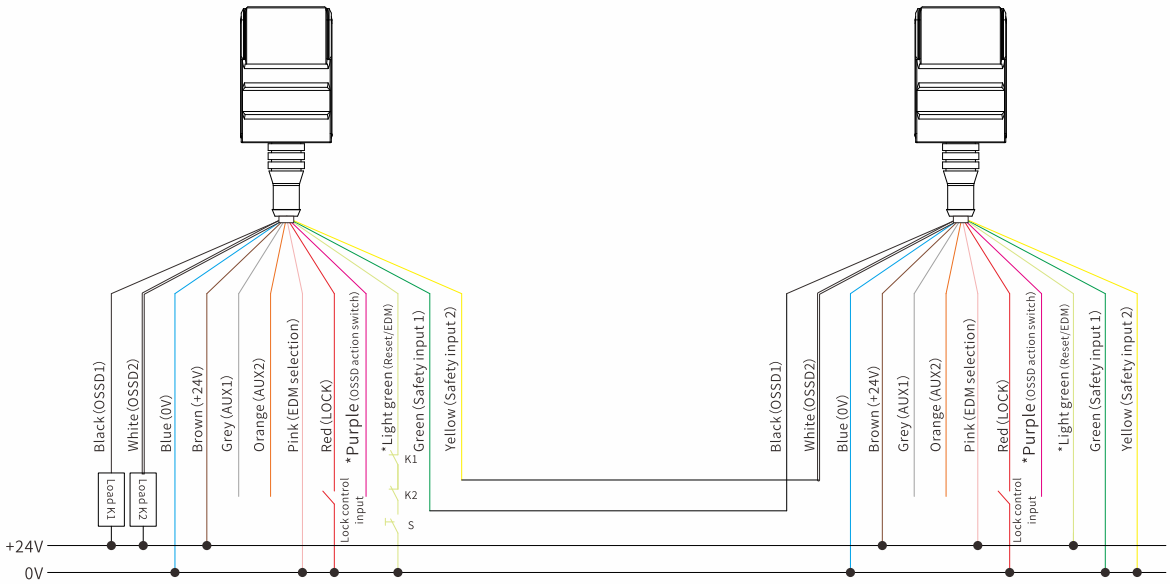

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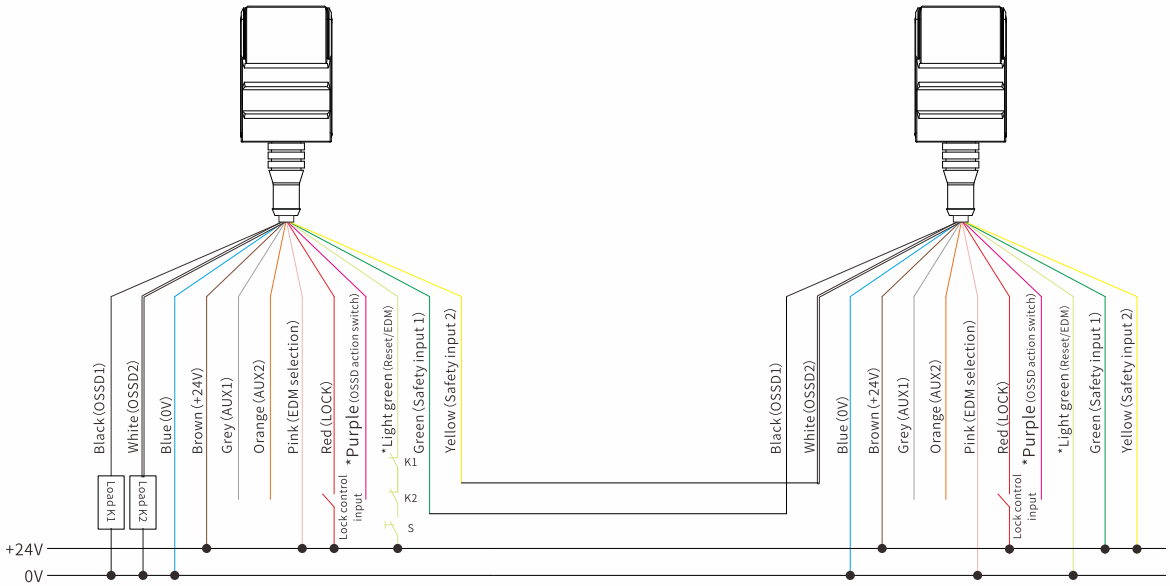

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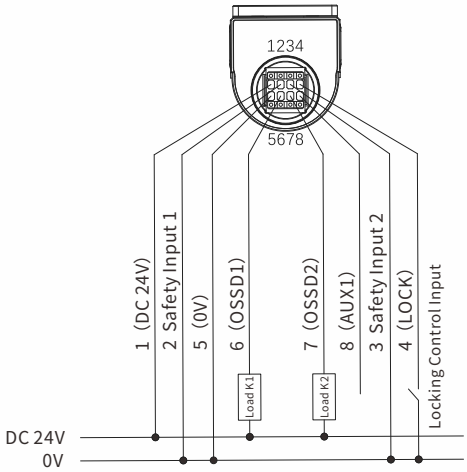
SLE21 Safety Interlock Switch

Wiring

SLE21 Terminal Block Standard Mode (NPN, no cascade)



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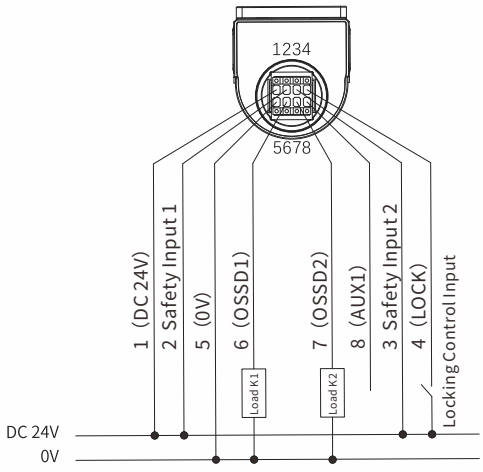
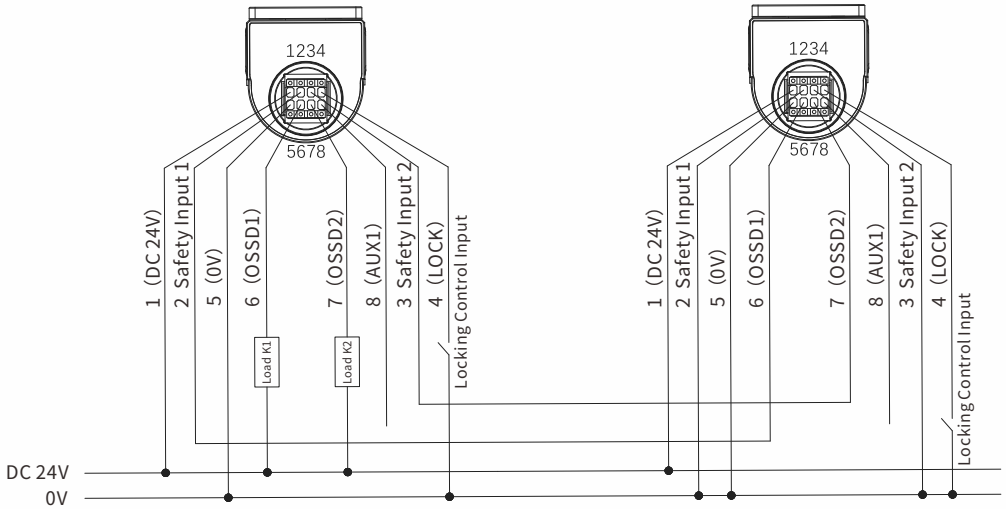


SLE21 Terminal Block Standard Mode (NPN, cascade)



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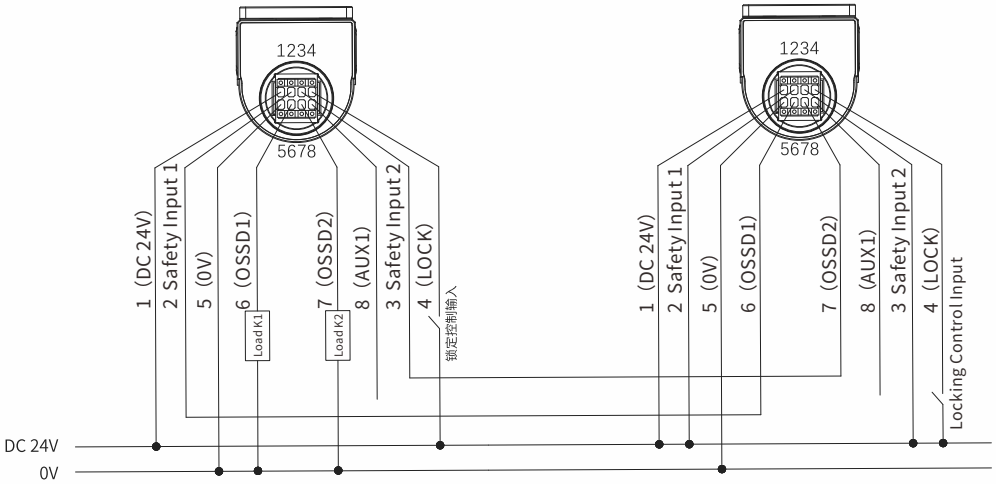
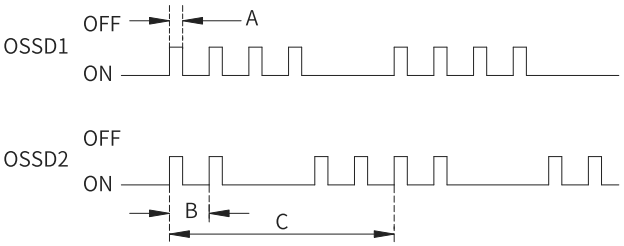
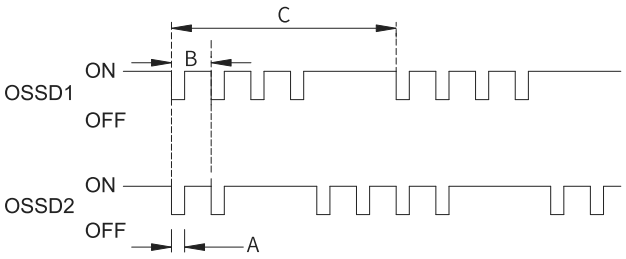


Sequence Chart



A:150-250us B:about 50ms C:about 300ms

NPN Output Cross Self-diagnosis Pulse



A:150-250us B:about 50ms C:about 300ms

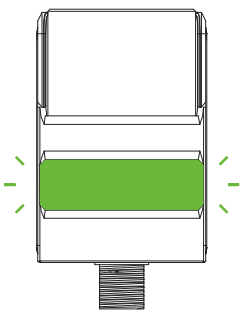
PNP Output Cross Self-Test Pulse

OSSD Action Switching Instructions

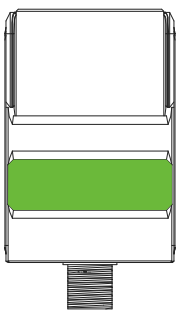
- Keep product switching between lock-linked and close-open linked. Lock-linked. As default setting.

	Lock-linked		Close-open linked	
Door Status	OSSD1	OSSD2	OSSD1	OSSD2
Door Open	OFF	OFF	OFF	OFF
Close & Unlocked	OFF	OFF	ON	ON
Close & Locked	ON	ON	ON	ON

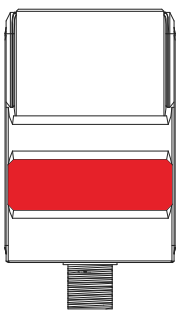
LED Indicator



Door Closed - green light flash



Door Closed & Locked - green steady



Door Open -red steady

LED Indicator

Lock-linked (OSSD action)

LED Indicator	Status			
	OSSD	Safety Input	LOCK	Actuator
Green steady ON	ON	ON	ON	Presence
Red steady ON	OFF	ON/OFF	ON/OFF	Absence
Green 1Hz blink	OFF	ON	OFF	Presence
Orange steady ON	OFF	OFF	ON	Presence
Orange 1Hz blink	OFF	OFF	OFF	Presence
Orange 2Hz blink	OFF	EDM error		
Red 1Hz blink stop 2 times	OFF	Safety input false		
Red 1Hz blink stop 3 times	OFF	OSSD false		
Red 4Hz blink	OFF	Abnormal power		
Alternating in red, green and orange	OFF	Unique coding and confirmed, waiting for restart		
1Hz alternating in red and green	OFF	Unique coding and un confirmed		
OFF	OFF	Power OFF		

If the reset function is configured as manual reset, the orange indicator light ON until reset/EDM get operated.

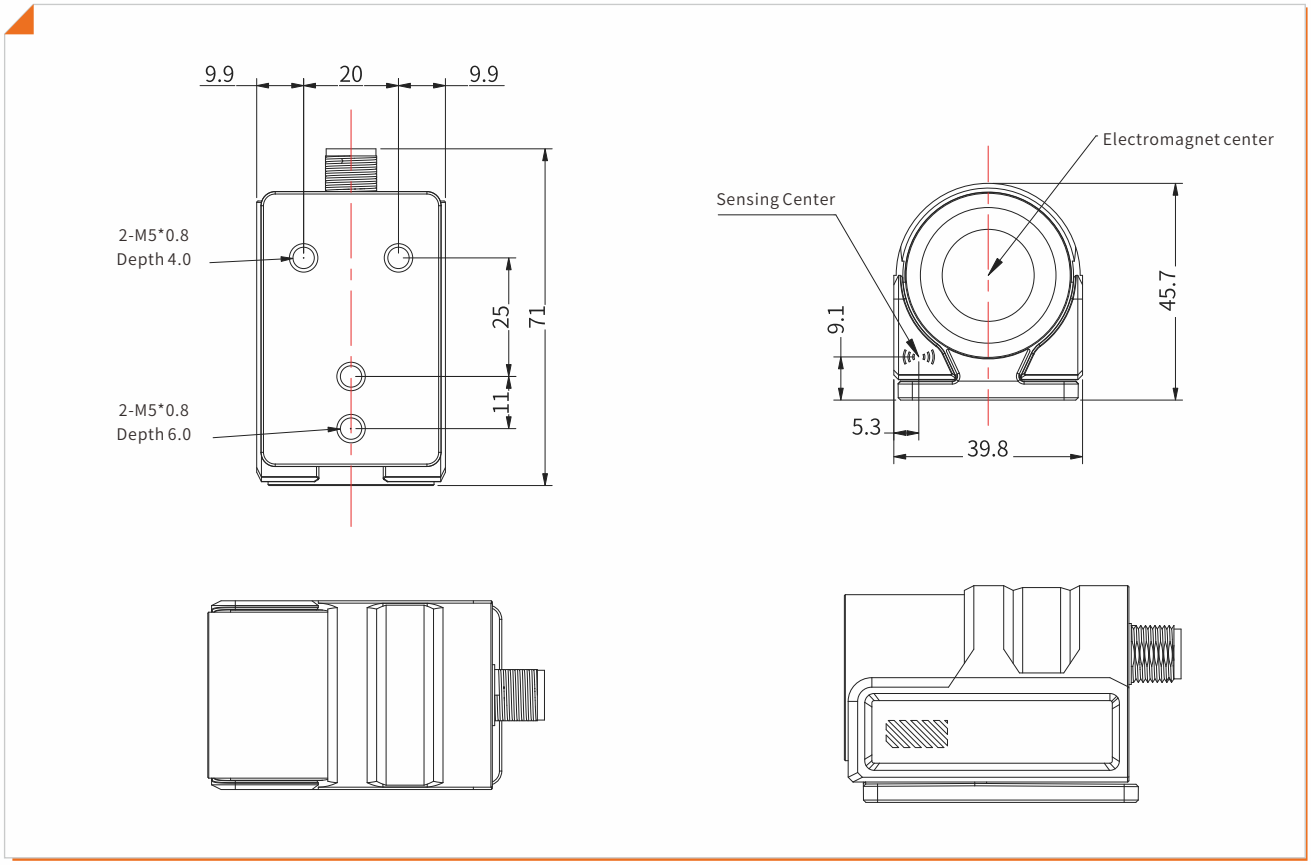
Close-open Linked (OSSD action)

LED Indicator	Status			
	OSSD	Safety Input	LOCK	Actuator
Green steady ON	ON	ON	ON/OFF	Presence
Red steady ON	OFF	ON/OFF	ON/OFF	Absence
Orange steady ON	OFF	OFF	ON/OFF	Presence
Orange 2Hz blink	OFF	EDM error		
Red 1Hz blink stop 2 times	OFF	Safety input false		
Red 1Hz blink stop 3 times	OFF	OSSD false		
Red 4Hz blink	OFF	Abnormal power		
Alternating in red, green and orange	OFF	Unique coding and confirmed, waiting for restart		
1Hz alternating in red and green	OFF	Unique coding and un confirmed		
OFF	OFF	Power OFF		

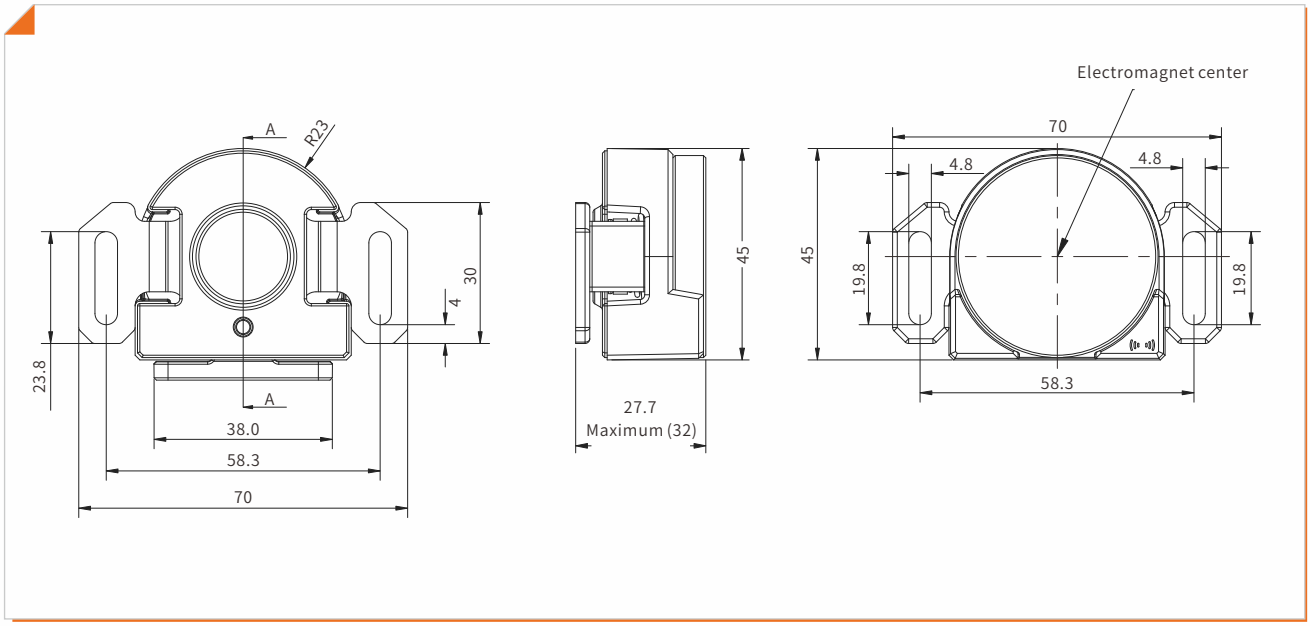
If the reset function is configured as manual reset, the orange indicator light ON until reset/EDM get operated.

Product Size

- M12 Connector Type



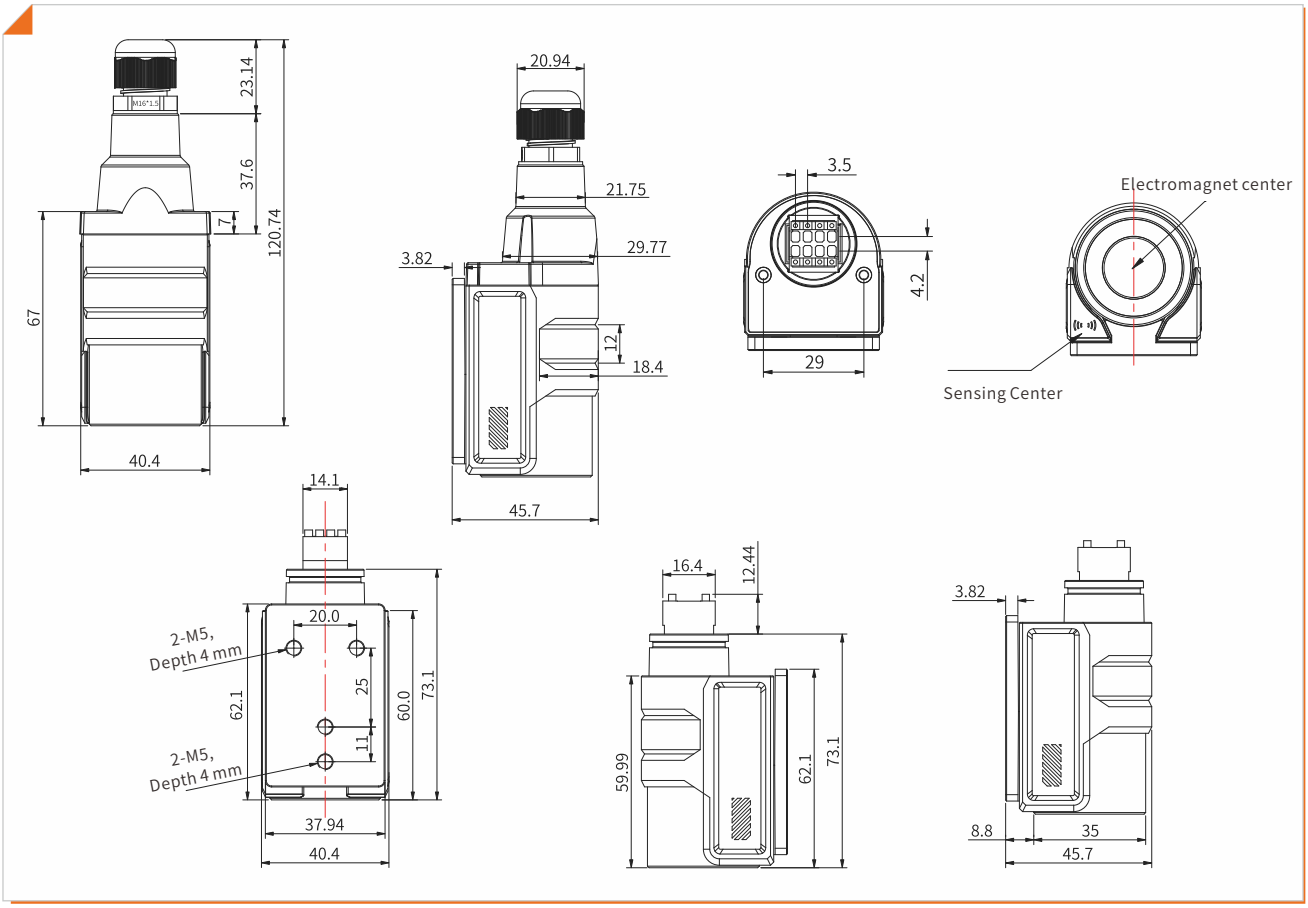
- Actuator



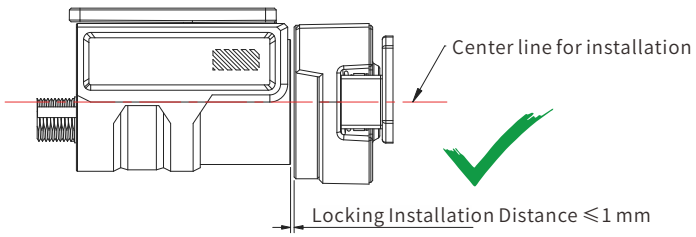
SLE21 Safety Interlock Switch

Product Size

- Terminal Block Type

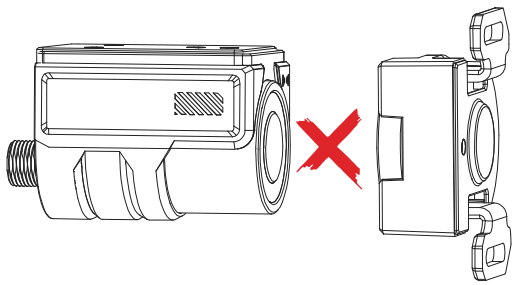


Installation



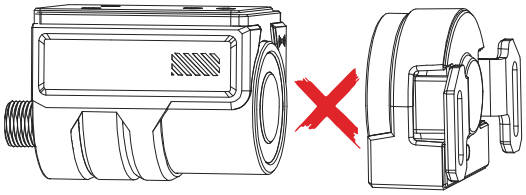
Gap ⩽1.0 mm
Inclination Angle ⩽4°
Both can be absorbed by the flexible structure of the actuator.

Correct installation, the sensing surface of main unit and actuator are facing.

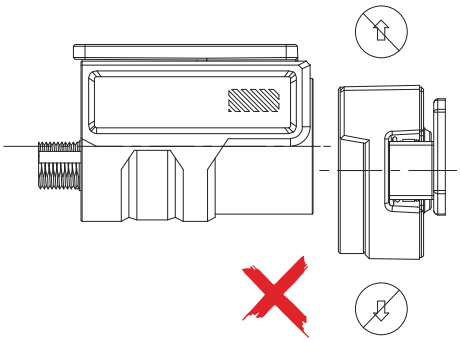


Wrong installation, the sensing surface of main unit and actuator are offset by 90°.

Installation



Wrong installation, the sensing surface of main unit and actuator are offset by 180°.



Wrong installation, the sensing surface of main unit and actuator are not at same horizontal plane.

Installation Mode

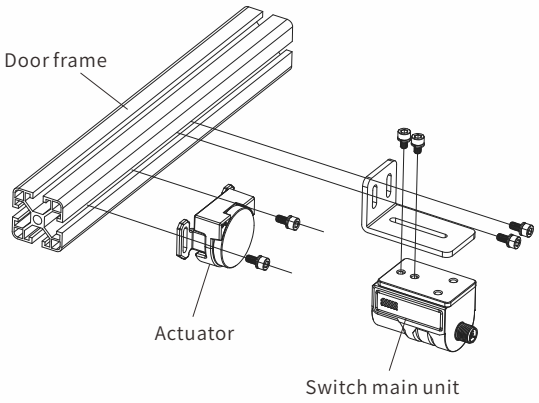


Diagram for actuator installation withou t bracket

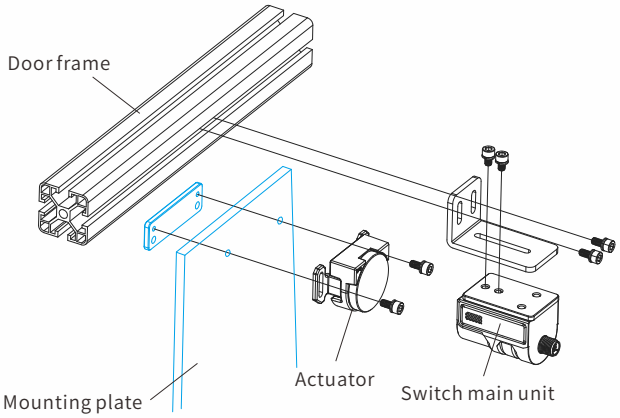
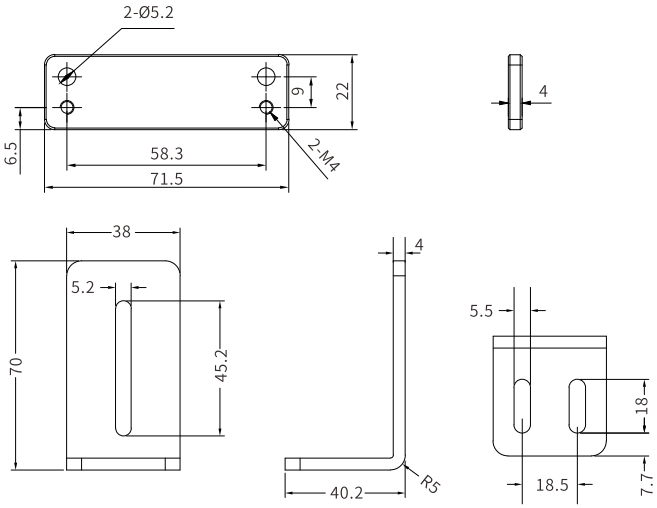


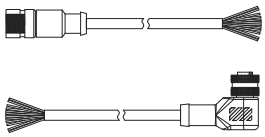
Diagram for actuator installation with bracket

Bracket

Picture	Name	Size
	SLE21-EL1	

SLE21 Safety interlock component

- M12 Connector Type

Step 1	Step 2	Step 3	Step 4
			
M12 switch main unit	Unique coding actuator: SLE21-M50 Universal coding actuator: SLE21-M51	SLE21-EL1 bracket (option)	Cable

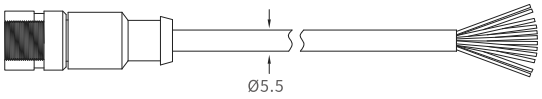
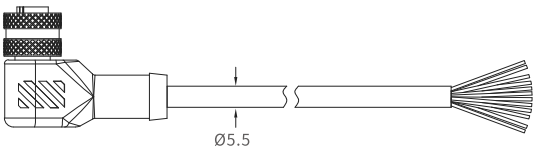
- Terminal Block Type

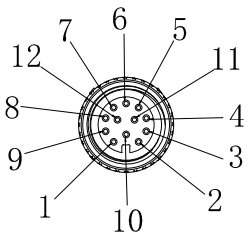
Step 1	Step 2	Step 3
		
Terminal block type main switch	Unique coding actuator: SLE21-M50 Universal coding actuator: SLE21-M51	SLE21-EL1 bracket (option)

Cable model selection (e.g: SLE-P12S1)

Product Series			Connector PIN	Cable	Length
SLE	–	P	□	□	□
			12	S: M12 straight female connector with terminated wire L: M12 L-shape female connector with terminated wire	1:1m 3:3m 5:5m 10:10m

Cable option

Standard Cable	Connector Type	Length	Model
	Straight connector	1m	SLE-P12S1
		3m	SLE-P12S3
		5m	SLE-P12S5
		10m	SLE-P12S10
	L type connector	1m	SLE-P12L1
		3m	SLE-P12L3
		5m	SLE-P12L5
		10m	SLE-P12L10

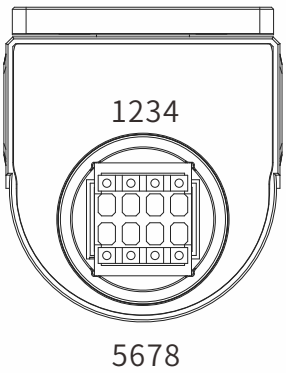


Wire sequence of M12 waterproof connector

M12-12 PIN wire:

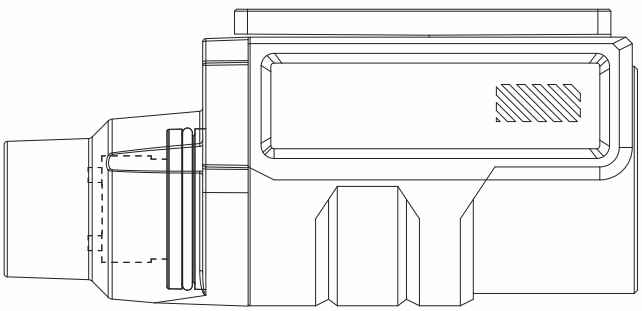
1. Brown-positive of power
2. Blue - negative of power
3. Grey - AUX output 1
4. Black-OSSD 1
5. White-OSSD 2
6. Green - safety input 1
7. Yellow - safety input 2
8. Red-lock control 1
9. Light green - EDM
10. Pink-EDM selection
11. Orange-AUX output 2
12. Purple-OSSD switch

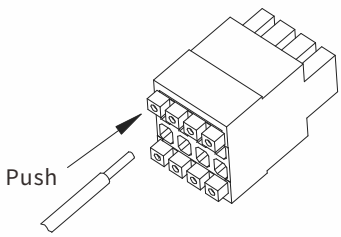
Terminal Block Wiring Specification



Terminal Block Type

NO.	Function
1	DC 24V
2	Safety Input 1
3	Safety Input 2
4	LOCK
5	0V
6	OSSD1
7	OSSD2
8	AUX Output





Gap 3.5mm

Warning

1.Please remove cap when wiring
2.Tightening torque for end cap screws: M3,1.5N · m, terminal block can be disassembled.
3.Wire type: AWG26-16
4.Please do not pull wire with excessive force, which may cause falling of terminal block.