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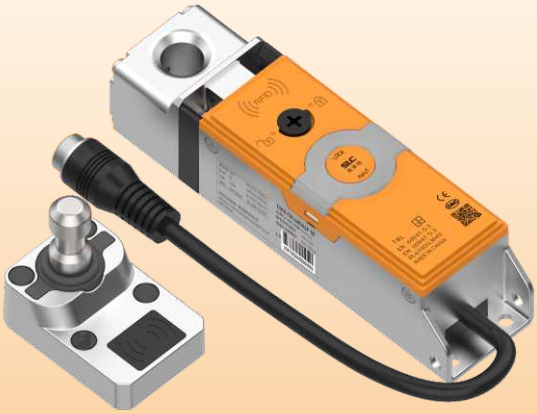
SHENZHEN TONGCHUANG MECHANTRONICS CO.,LTD.

TRL1 safety interlocking device series



Functional features

TRL1 safety interlocking device series is based on RFID radio frequency induction coding technology, using monitored stainless steel latch mechanism, used for personnel or machine safety protective door device. The secure dual-channel output technology can achieve safety level SIL3 or PLe, which can be used with the safety latch.

Technical parameter

Safety level	
Standard	IS0 13849-1 IEC/EN60947-5-3
Safety Classification	Cat. 4 /SIL3 dual channel interlock conforming to IS013849-1 is suitable for PLe/PLd.
Certification	CE / CQC / FCC

Protect

- ◇ Safety short circuit protection
- ◇ Current limit
- ◇ Overload protection
- ◇ Over voltage protection
- ◇ Overheat protection stops and restarts
- ◇ Reverse polarity protection
- ◇ Transient noise protection
- ◇ Failure pulse protection

Output	
Safety output	2-way redundant PNP or NPN output (with self-diagnostic test pulses)
Aux output	1 PNP or NPN output (door opening and closing/lock locking/auxiliary output/fault indicator).

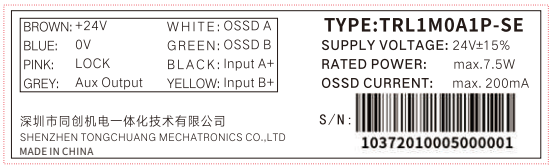
Technical parameters	
Latch insertion deviation	Max.:±2mm
Locking retainer Fmax (ISO14119)	9750N or 3000N
Locking retainer Fzh (ISO14119)	7500N or 2000N
Minimum radius of the revolving door	⩾220mm
Working voltage	DC 24V±15%
Rated power	4.6W(No load)※
Output current	Max.:200mA
Output conduction voltage drop	＜2.5V@200mA
Leakage current	＜100uA
Operating frequency	0.5Hz
Response time	100ms(Working independently)
Risk time	100ms
Start time	3.5s
Protection grade	Ip67
Operating temperature	0...+55°C
Relative humidity	5...95%
Material	Nylon/zinc alloy/stainless steel
PFHd	$<4.2x10^{-8}$
MTTFd	288年

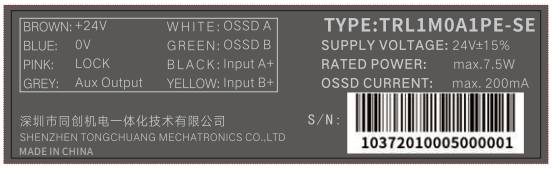
※The maximum power is 10W (no load) and the duration is 200ms

Model description

TRL 1 □ □ A 1 □ □ – □

- TRL: Guard lock switch
- 1: 1: Output monitored by door lock; 3: Output monitored by actuator
- □: M: Universal coding type; U: Unique coding type
- □: 0: Electromagnetic locking; 1: Mechanical locking
- A: Interface mode — A: Air plug (default); L: Direct line
- 1: ※Optional features, "※" means the "1" to the left of ※ is variable.
  - 0: The cascaded input gate is close (positive)
  - 1: Cascading input lock fixed (positive) (default)
  - 2: Cascaded input auxiliary output (reverse)
  - 3: Indicates the cascading input status (positive)
  - 4: No cascaded input gate close (positive)
  - 5: No cascade input door lock fixed (positive)
  - 6: No cascaded input auxiliary output (positive)
  - 7: Cascaded input system fault indication (positive)
  - 8: No cascaded input system fault indication (positive)
  - 9: Cascade input gate close (reverse)
  - A: Cascade input lock lock (reverse)
  - B: Cascaded input auxiliary output (positive)
  - C: Cascaded input status (reverse)
  - D: uncascaded input gate approach (reverse)
  - E: Uncascaded input door lock (reverse)
  - F: Uncascaded input auxiliary output (reverse)
  - G: Cascaded input system fault indication (reverse)
  - H: No cascaded input system fault indication (reverse)
- □: output mode — P: PNP output; N: NPN output
- □: Locking force (ISO14119) — None: Fzh=7500N; E: Fzh=2000N
- □: AC: Actuator; SE: Sensors; None: complete sets of products



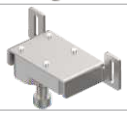


TRL1 safety interlocking device series selection Guide

Lock holding force	Type	lock type	PNP/NPN	Actuator	Sensors	Actuator + Sensor	Order No. (Actuator + Sensor)
Fzh:7500N	Universal coding type	Electromagnetic locking	PNP	TRL1M0P-AC	TRL1M0A1P-SE	TRL1M0A1*P	LOT136352299SCPE
			NPN	TRL1M0N-AC	TRL1M0A1N-SE	TRL1M0A1*N	LOT136352299SCNE
		Mechanical locking	PNP	TRL1M1P-AC	TRL1M1A1P-SE	TRL1M1A1*P	LOT136352299SCPO
			NPN	TRL1M1N-AC	TRL1M1A1N-SE	TRL1M1A1*N	LOT136352299SCNO
	Unique coding type	Electromagnetic locking	PNP	TRL1U0P-AC	TRL1U0A1P-SE	TRL1U0A1*P	LOT136352299UCPE
			NPN	TRL1U0N-AC	TRL1U0A1N-SE	TRL1U0A1*N	LOT136352299UCNE
		Mechanical locking	PNP	TRL1U1P-AC	TRL1U1A1P-SE	TRL1U1A1*P	LOT136352299UCPO
			NPN	TRL1U1N-AC	TRL1U1A1N-SE	TRL1U1A1*N	LOT136352299UCNO
Fzh:2000N	Universal coding type	Electromagnetic locking	PNP	TRL1M0P-AC	TRL1M0A1PE-SE	TRL1M0A1*PE	LOT1E36352299SCPE
			NPN	TRL1M0N-AC	TRL1M0A1NE-SE	TRL1M0A1*NE	LOT1E36352299SCNE
		Mechanical locking	PNP	TRL1M1P-AC	TRL1M1A1PE-SE	TRL1M1A1*PE	LOT1E36352299SCPO
			NPN	TRL1M1N-AC	TRL1M1A1NE-SE	TRL1M1A1*NE	LOT1E36352299SCNO
	Unique coding type	Electromagnetic locking	PNP	TRL1U0P-AC	TRL1U0A1PE-SE	TRL1U0A1*PE	LOT1E36352299UCPE
			NPN	TRL1U0N-AC	TRL1U0A1NE-SE	TRL1U0A1*NE	LOT1E36352299UCNE
		Mechanical locking	PNP	TRL1U1P-AC	TRL1U1A1PE-SE	TRL1U1A1*PE	LOT1E36352299UCPO
			NPN	TRL1U1N-AC	TRL1U1A1NE-SE	TRL1U1A1*NE	LOT1E36352299UCNO

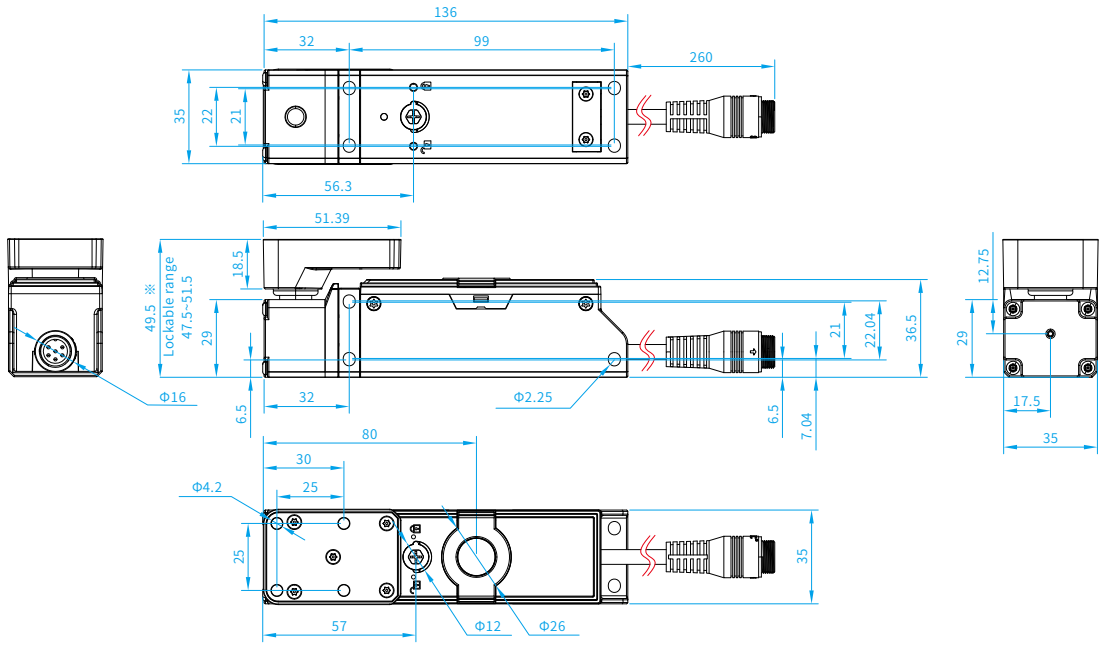
※Optional: Optional items, "※" means the "1" to the left of ※ is variable.
Lock holding force Fzh complies with ISO14119 test standards

Accessories Selection Table

Type	Application Diagram	Name	Model	Order no.
Mounting bracket		TRL1No.1 right mounting bracket	TRL1-ZJ01	LOTTRL1-ZJ01
		TRL1No.2 right mounting bracket	TRL1-ZJ02R	LOTTRL1-ZJ02R
		TRL1No.2 left mounting bracket	TRL1-ZJ02L	LOTTRL1-ZJ02L
		TRL1No.3 mounting bracket	TRL1-ZJ03	LOTTRL1-ZJ03
		TRL1No.4※ right mounting bracket	TRL1-ZJ04R	LOTTRL1-ZJ04R
		TRL1No.4※ left mounting bracket	TRL1-ZJ04L	LOTTRL1-ZJ04L
		Back release accessories	TRL1-H03	LOTTRL1H03
		Manual release key	TRL1-F03	LOTTRL1F03
Cable		Single head 3m cable	TRL1-LIN03	LOTTRL1-LIN03

※TRL1 4 (left and right) Mounting bracket: mainly used with revolving door
※TRL1 1 Mounting bracket: Used with TSL1/TSL2 safety latch. For details, see TSL1/TSL2 safety latch

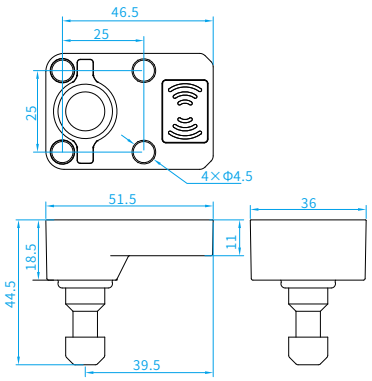
Installation dimension of inductor

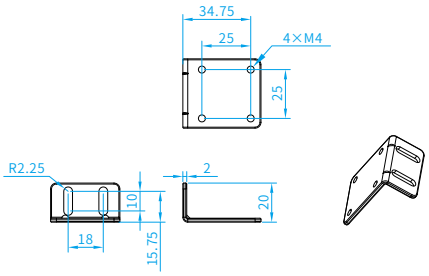


※The actual size and weight of the product may vary depending on the product configuration and manufacturing process.
※ 49.5 ※ Lockable range47.5~51.5 In this marking method, the size above the dimension line is the optimal installation size, and the range below the dimension line is the range that can be locked after installation according to the size above the dimension line.

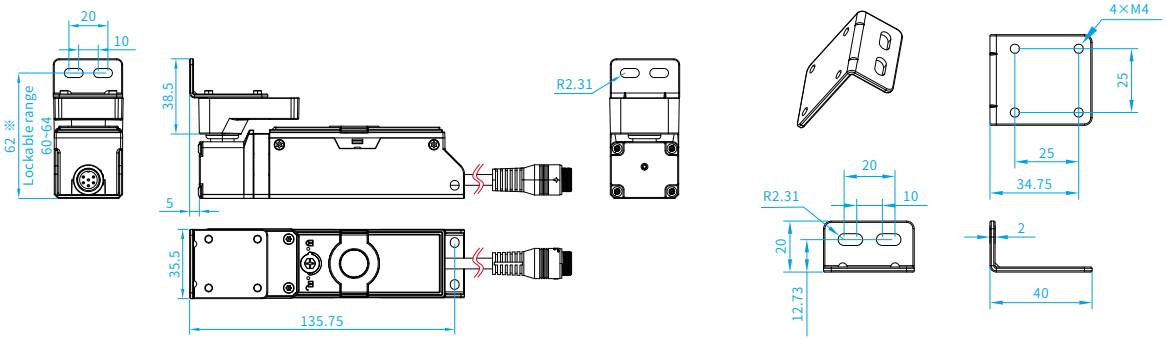
Overall dimensions of actuator and mounting bracket

Actuator	No. 3 mounting bracket TRL1-ZJ03



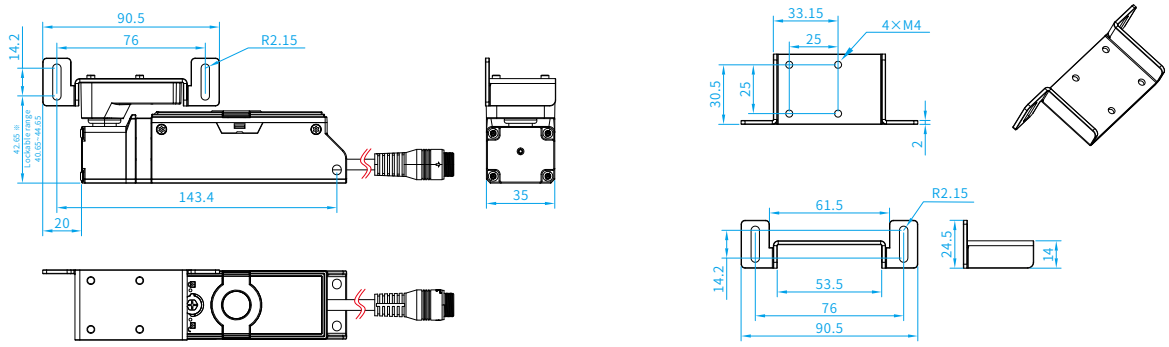


No. 1 mounting bracket
TRL1-ZJ01※



※The actual size and weight of the product may vary depending on the product configuration and manufacturing process.

No.2 right mounting bracket
TRL1-ZJ02R

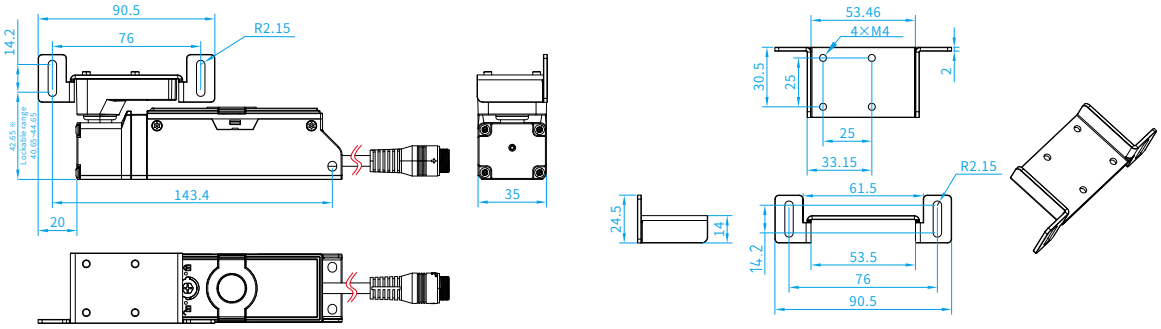


※The actual size and weight of the product may vary depending on the product configuration and manufacturing process.

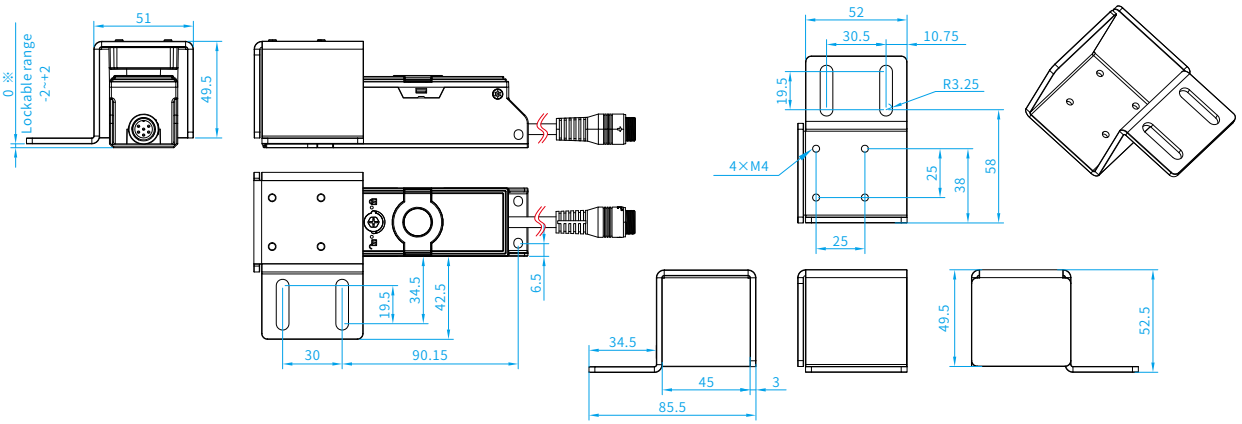
※TRL1 1 Mounting bracket: Used with TSL1/TSL2 safety latch. For details, see TSL1/TSL2 safety latch.

※ 49.5 ※ Lockable range47.5~51.5 In this marking method, the size above the dimension line is the optimal installation size, and the range below the dimension line is the range that can be locked after installation according to the size above the dimension line.

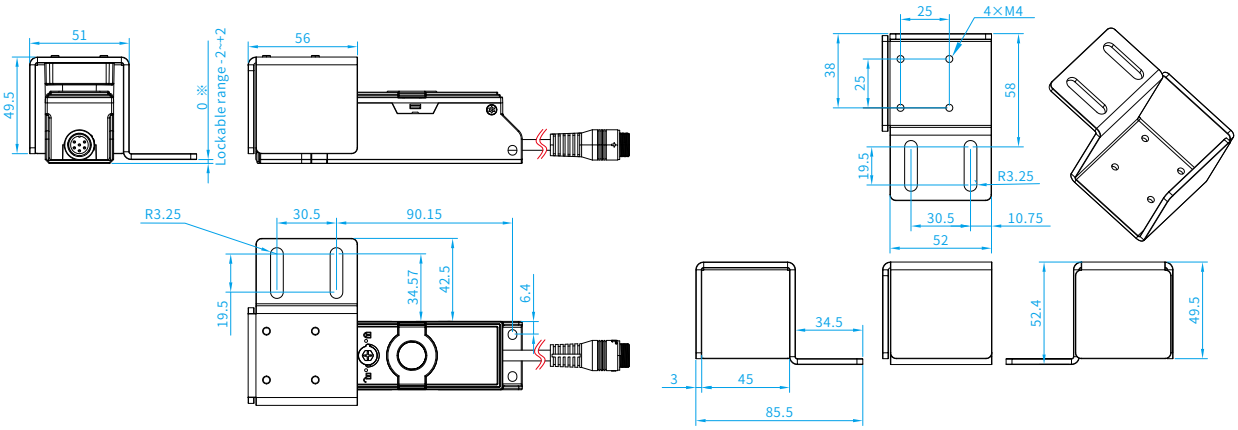
No.2 left mounting bracket
TRL1-ZJ02L



No.4 right mounting bracket
TRL1-ZJ04R



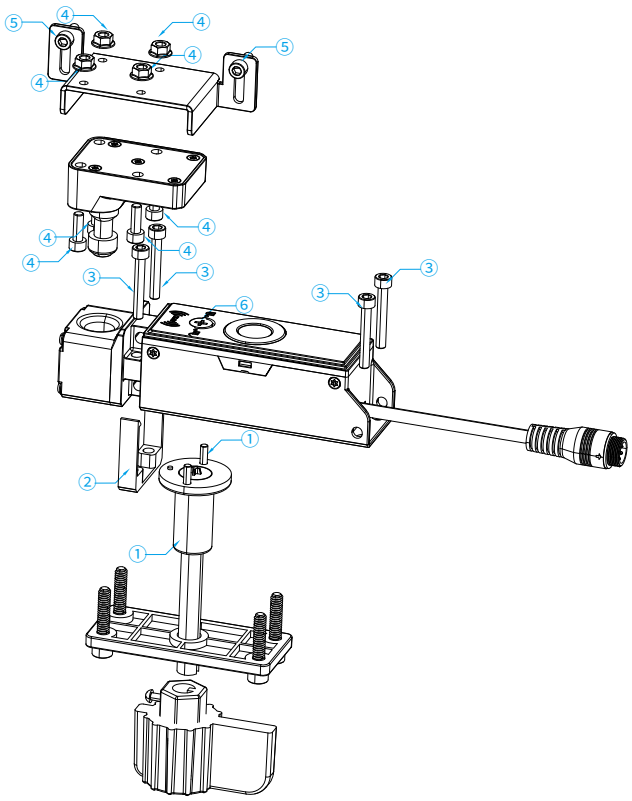
No.4 left mounting bracket
TRL1-ZJ04L



※The actual size and weight of the product may vary depending on the product configuration and manufacturing process.

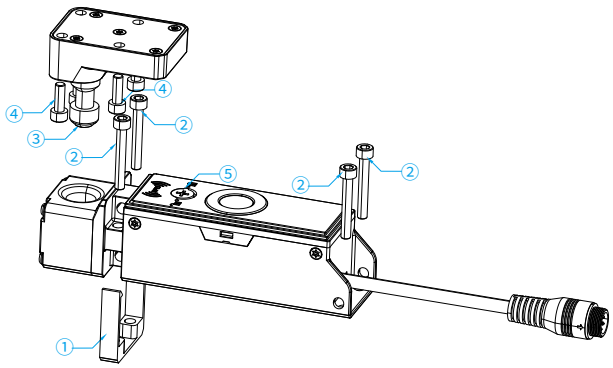
※ 49.5 ※ Lockable range47.5~51.5 In this marking method, the size above the dimension line is the optimal installation size, and the range below the dimension line is the range that can be locked after installation according to the size above the dimension line.

Installation steps with "mounting bracket"



①Calculate and measure the position of one side of the sensor installation, and punch holes in the position of the unlocking handle on the back;
②Rotate the sensor screw slider to the opposite side of the screw head to be fixed (each 90° rotation provides four installation directions);
③The actuator with four M4 screw fixed at the side of the door, pay attention to the need to to keep back the unlock knobs and handles mounting holes not obscured;
④Insert the actuator sensor jack, (mechanical lock setting need to unlock the knob to logo location) and adjust "mounting bracket installation direction" (for each installation rotate 90 ° direction, it provides three installation direction), with four M4 screw "mounting bracket and actuator lock, with sensors, both spacing shall not be greater than 3 mm;
⑤The assembly of the "mounting bracket" and the actuator is fixed on the other side of the safety door with 2 M4 screws;
⑥Turn the unlock knob to logo position, TRL1 safety lock can work normally;
⑦The four actuator installation hole anti-disassembly plug into the actuator installation hole.

Direct installation steps

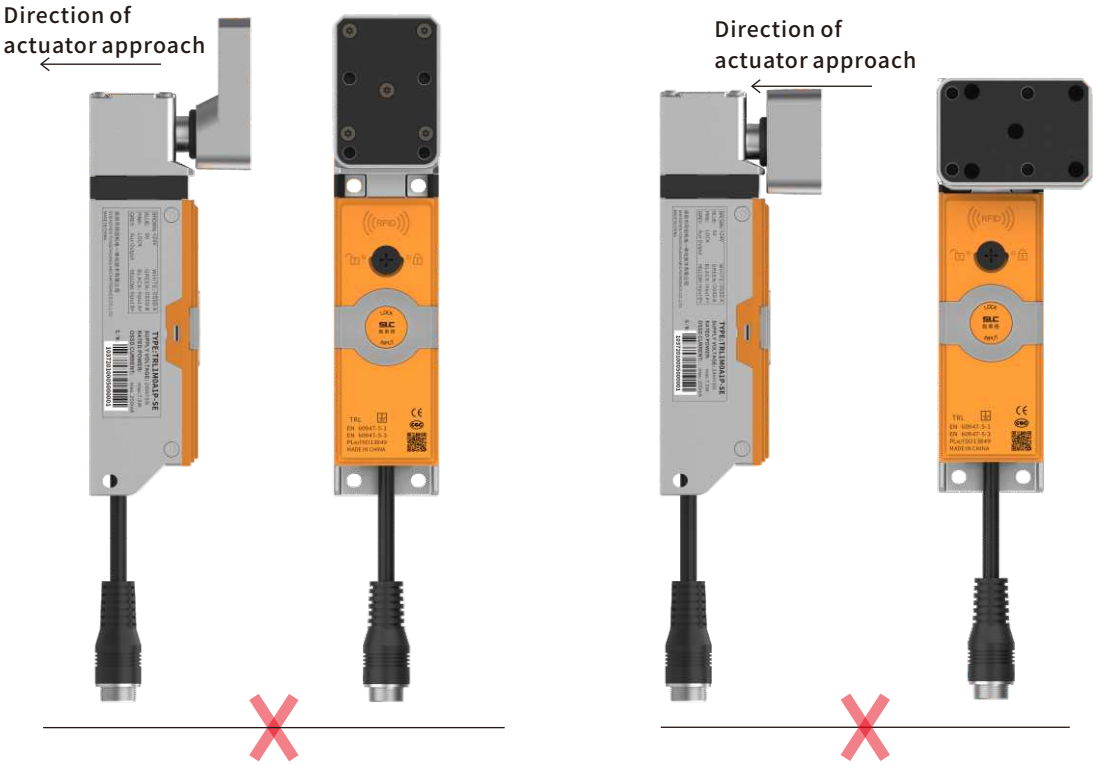


①Turn the sensor screw slider to the screw head alignment to be fixed (four mounting orientations are provided for each 90 ° rotation);
②Fix the actuator on one side of the safety door with four M4 screws, and ensure that the mounting holes of the unlocking knob and handle on the back are not blocked;
③Insert the actuator into the sensor jack (mechanical locking needs to rotate the unlocking knob to the position marked by), and measure the position of the actuator mounting hole. The actuator is close to the sensor, and the spacing between the two shall not be more than 3mm;
④Fix the sensor on the other side of the safety door with 4 M4 screws;
⑤To unlock the knob to logo position, TRL1 safety lock can work normally;
⑥Install the four actuator mounting hole anti-disassembly plugs into the actuator mounting hole.

TRL1 safety interlocking device series correct approach direction

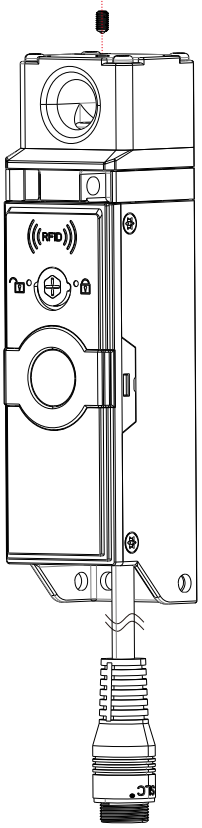
※Safety locks must be installed as shown above.
The actuator can only be approached from the front of the sensor.
In special cases, you may need to manually unlock the safety lock. After unlocking the safety lock, you must perform a function test.

TRL1 safety interlocking device series wrong approach direction



※The safety lock cannot be installed in the manner shown above.

Adjust the smoothness of opening and closing

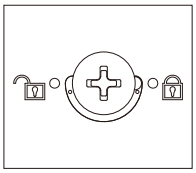


If the door does not open and close smoothly after installation, the locking machine meter screw (1.5mm on the opposite side) can also be removed and used again. Since the door is easy to open in this case, please prepare a door suction product as required.

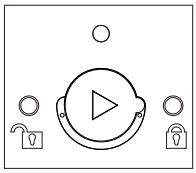
Danger	◆To reduce the probability of invalidation, install the TRL1 safety door lock in a location that is not easily accessible (e.g., out of reach, with physical shielding or railings, in a hidden location). Or it can be secured in a non-removable manner to prevent the TRL1 safety lock from being removed or moved. ◆For more information on minimizing the probability of invalidation, refer to ISO14119. ◆The actuator, inductor and other mounting brackets should be fixed according to the installation size requirements. ◆During installation, apply thread glue of medium strength to the screws to prevent the screws of the TRL1 safety door lock sensor and actuator mounting bracket from loosening. ◆If the special mounting bracket is not suitable for installation, please consult our product sales personnel.
Attention	◆When installing a revolving door, ensure that the revolving radius of the door is greater than 220mm. ◆When replacing the actuator or inductor, follow the same procedure. ◆Prepare additional screws (M4) for attaching the actuator, inductor, and mounting bracket to the device.

Instructions for unlocking

1.When manual release is required, please use a screwdriver or a manual knob accessory to turn the TRL1 sensor front release knob clockwise from 🔒 to 🔓. At this time, the TRL1 sensor will not be able to lock the TRL1 actuator. To restore the locking function, you need to turn the TRL1 sensor front release knob counterclockwise from 🔓 to 🔒 .
2.TRL1 safety lock can work normally only when the front release knob and the back release knob are at 🔒 position at the same time.



Cross release knob



Triangle release knob

Warning	◆For the electromagnetic locking model, it is prohibited to turn the manual release knob from 🔒 to 🔓 position when the product is locked, otherwise it will cause irreparable damage to TRL products; ◆For the electromagnetic locking model, when the door is opened, turn the manual release knob from 🔒 to 🔓 , and then give the door locking signal, which will not provide the locking force for the safety door. If the product needs to work normally again, you need to turn the manual release knob to 🔒 position.

Installation and Use Instructions for Rear Release Fitting TRL1-H03

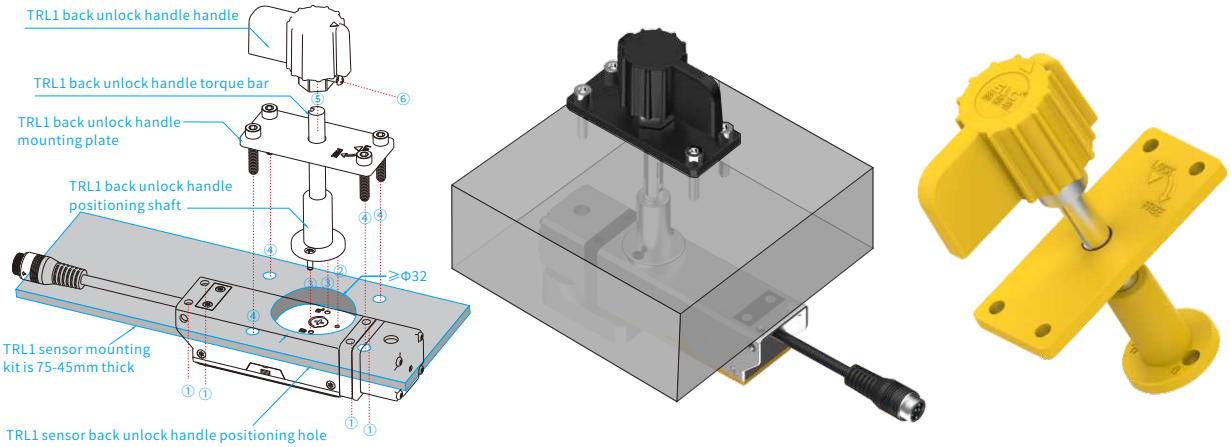
①Locate and punch the TRL1 sensor mounting piece (75~45mm thick) with a diameter ⩾ 32mm, which is used to install the rear release fitting TRL1-H03, and install and fix the TRL1 sensor with four M4 screws

Insert the TRL1-H03 torsion bar of the rear release fitting into the positioning shaft of the rear release fitting as shown in the figure, and align the convex point of the positioning shaft and the screw mounting hole with the positioning hole and screw hole of the TRL1 sensor respectively, so as to ensure that the cross bone position of the back release torsion bar is inserted into the cross slot of the TRL1 sensor, and rotate the back release torsion bar to unlock the TRL1 sensor

Fix the locating shaft of the back unlocking handle at the installation position of the TRL1 actuator with two M4 screws

Fix the mounting plate of the rear release fitting on the TRL1 sensor mounting plate with four M4 screws (note that the marking direction of the mounting plate needs to be consistent with the actual unlocking direction; the screw length needs to be determined according to the thickness of the mounting part, and the TRL1 sensor cannot be contacted)

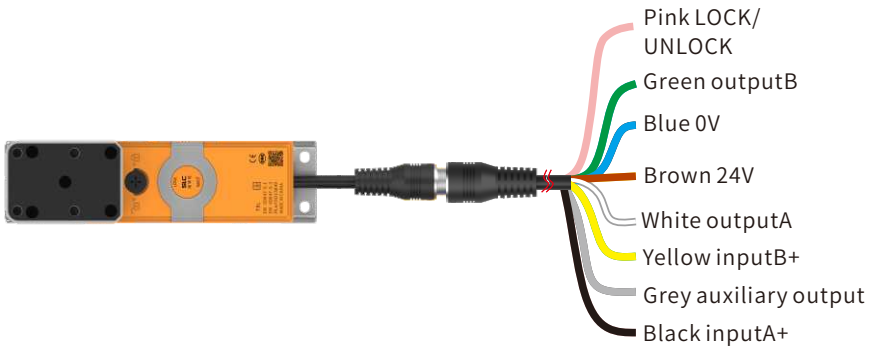
Install the TRL1 back release handle handle into the TRL1 back release handle torsion bar, and fix them with accessory screws as shown in ⑥.



Avoid mutual interference

When multiple TRL1 safety door locks are used, mutual interference may occur, which may lead to incorrect operation of TRL1 safety door locks. To prevent mutual interference, please install TRL1 safety door lock according to the following regulations.

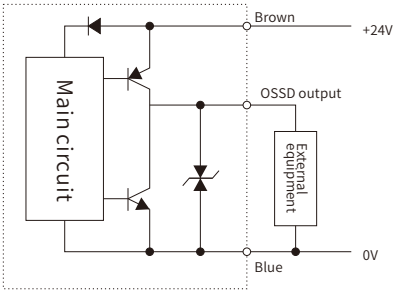
Interface signal definition



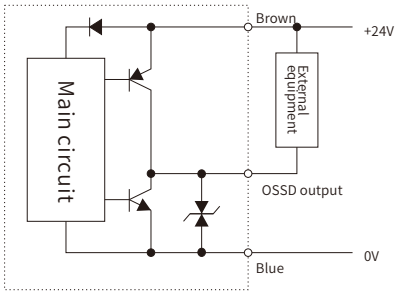
S/N	Signal definition	Colour	Explain
1	LOCK/UNLOCK	Pink	LOCK/UNLOCK
2	Safety outputB	Green	Safety output
3	0V	Blue	Power supply negative
4	24V	Brown	Power supply positive
5	Safety outputA	White	Safety output
6	Safety inputB+	Yellow	Cascade inputs (monitored)
7	Auxiliary output	Grey	Door status/lock status/output status
8	Safety inputA+	Black	Cascade inputs (monitored)

Input and output circuit diagram

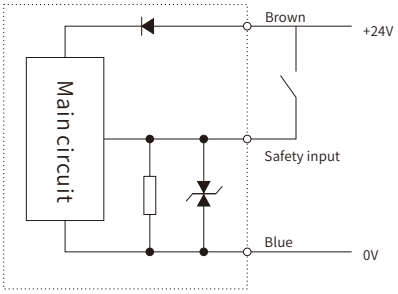
OSSD output circuit (PNP type)



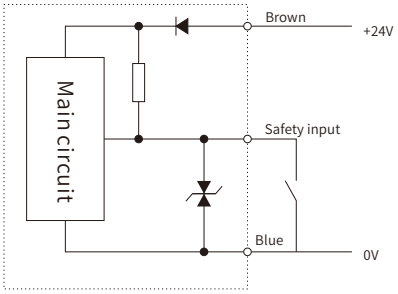
OSSD output circuit (NPN type)



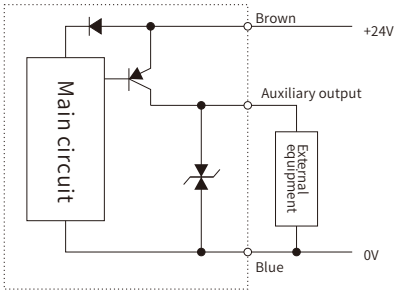
Safety input circuit (PNP type)



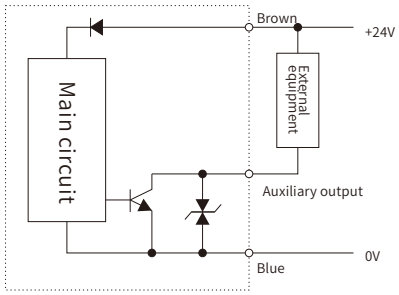
Safety input circuit (NPN type)



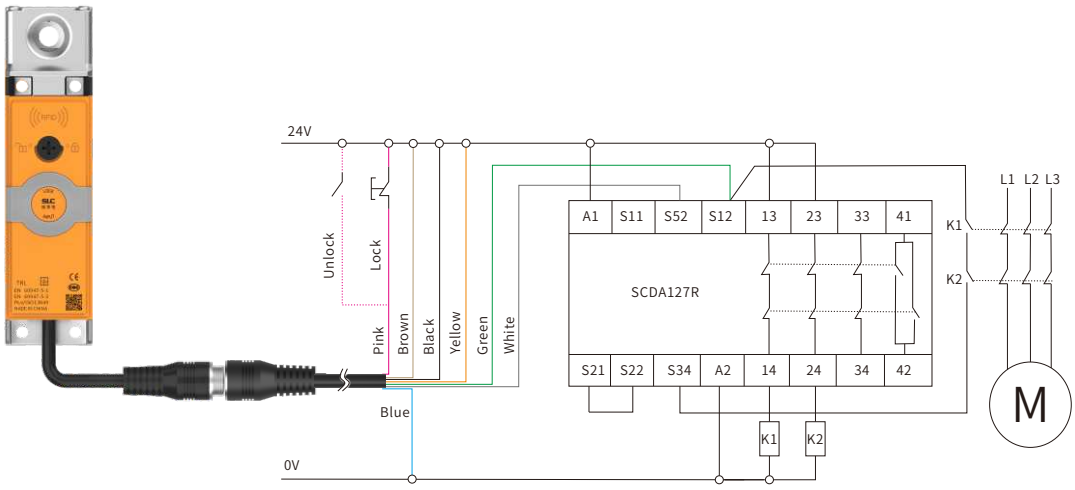
AUX output circuit diagram (PNP type)



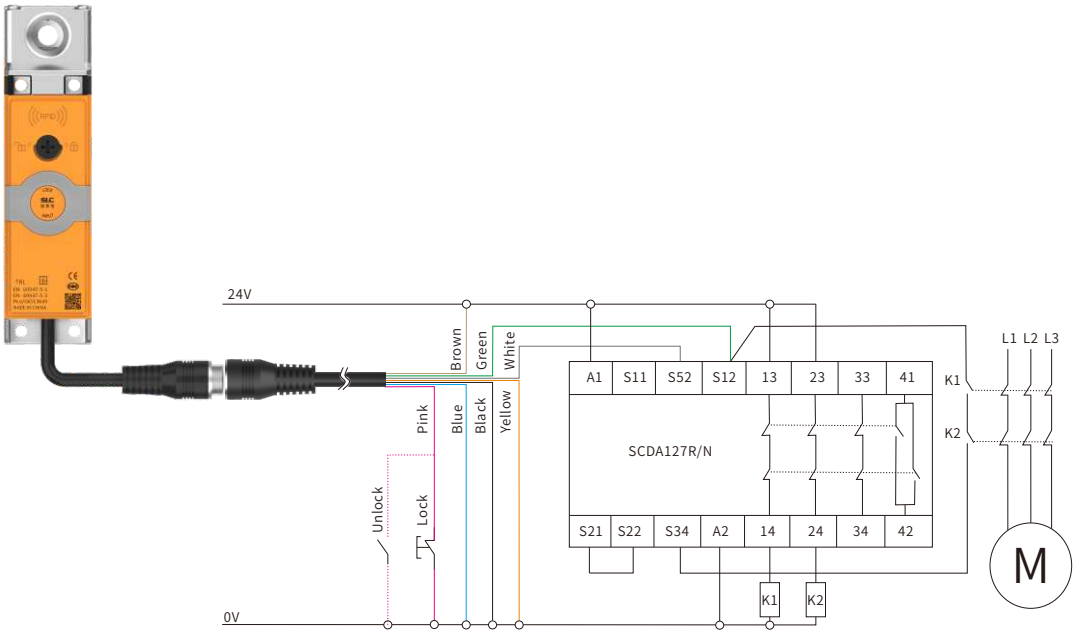
AUX output circuit diagram (NPN type)



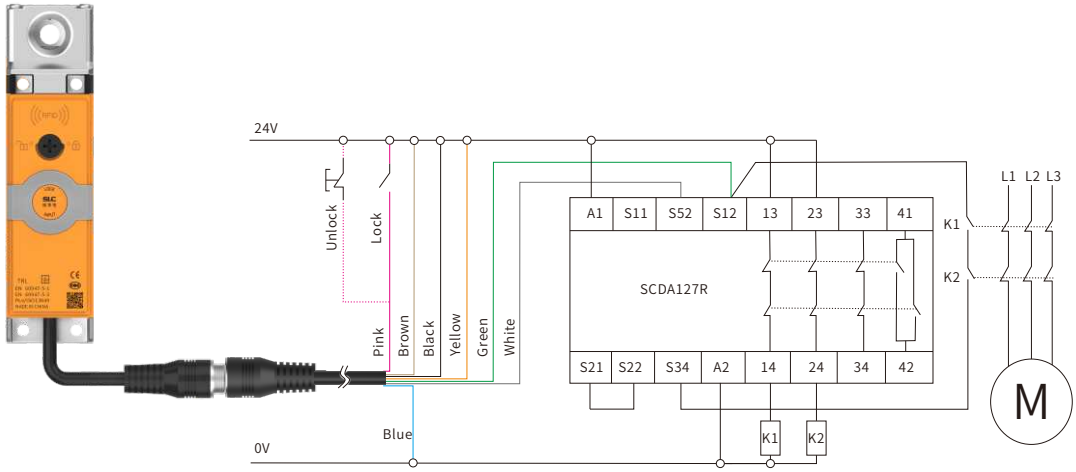
Application Wiring Example of PNP Type safety Door Lock with Electromagnetic Locking and SCDA127R



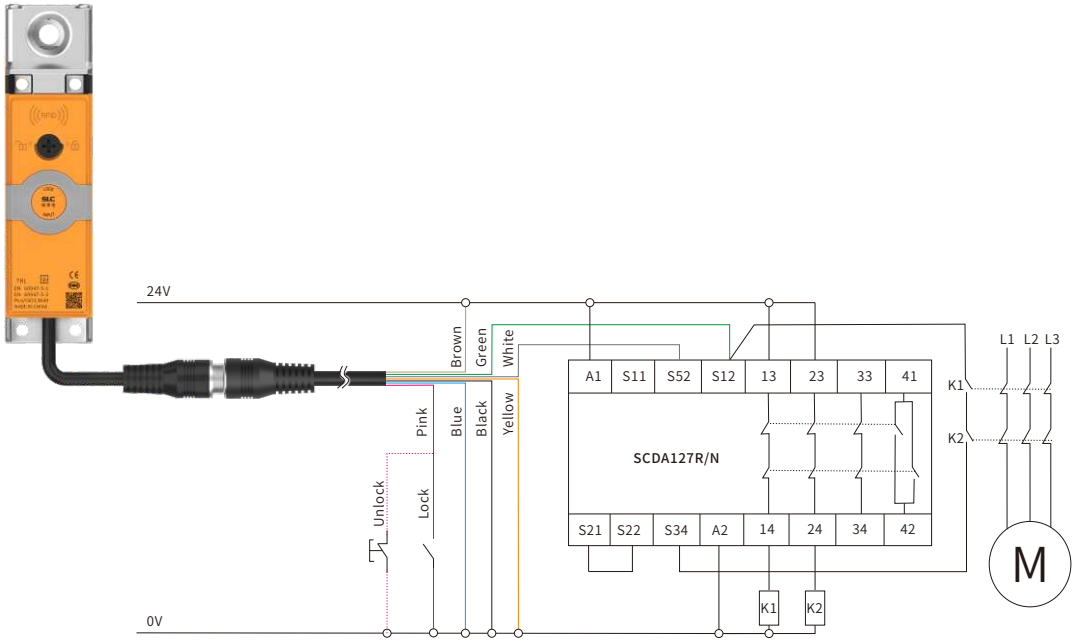
Wiring examples of electromagnetic locking NPN type safety door lock and SCDA127R/N application



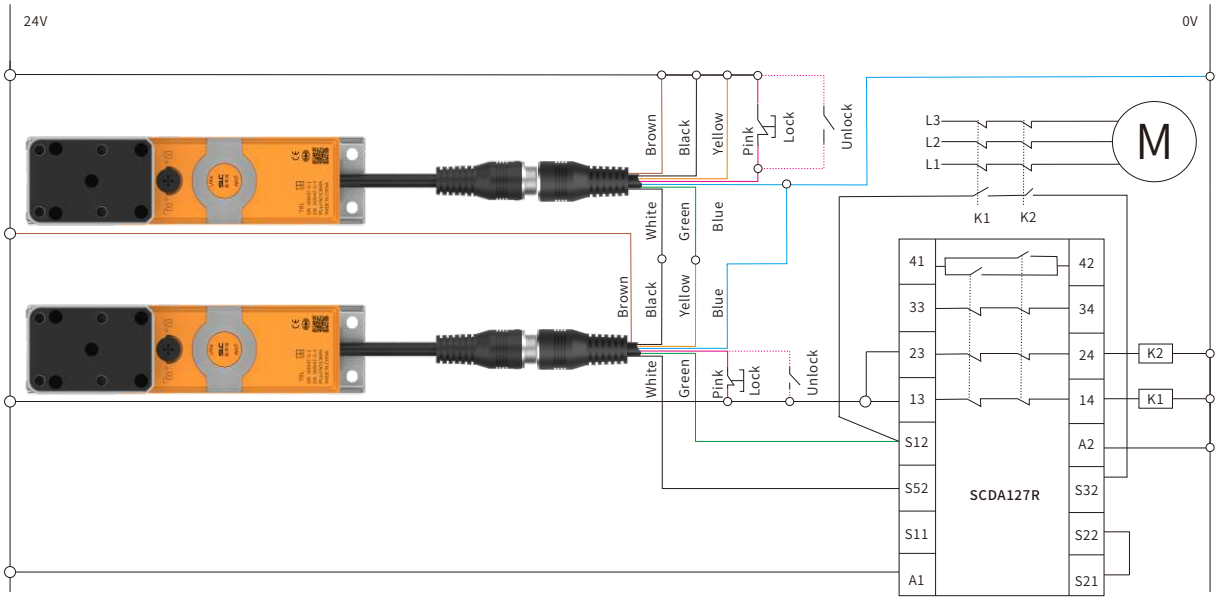
Example of mechanical locking PNP safety door lock and SCDA127R application wiring



Connection example of mechanical locking NPN type safety door lock and SCDA127R/N application



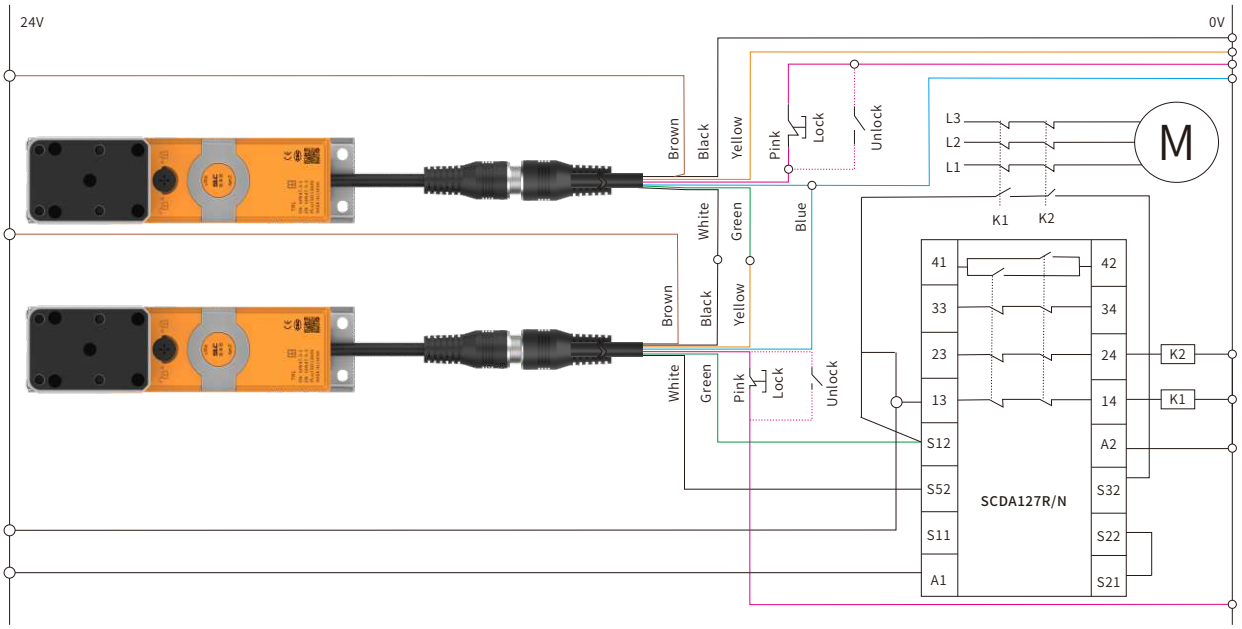
Wiring diagram of PNP type electromagnetic locking safety door lock multi lock cascade and SCDA127R



Warning

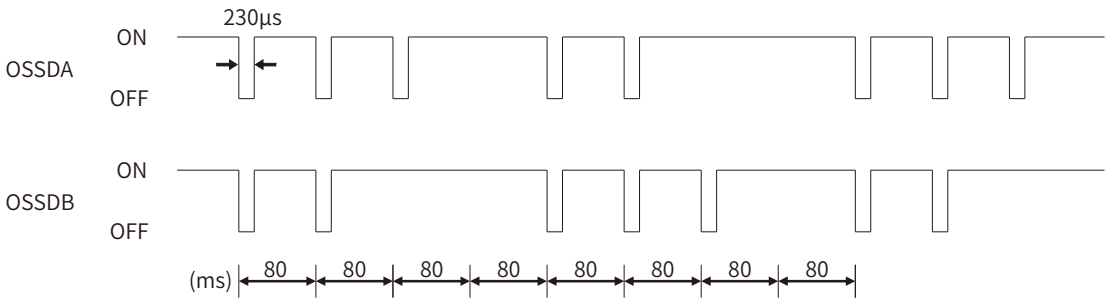
◆When multiple sets of products are used in cascaded or shared power supply, it is recommended to avoid collinear LOCK signals of multiple sets of products to avoid abnormal products or systems caused by excessive instantaneous power.

Wiring diagram of electromagnetic locking NPN type safety door lock multi lock cascade and SCDA127R/N



OSSD output self diagnosis timing

TRL1 safety lock has output self diagnosis function. During the TRL1 safety lock output continuity, the TRL1 safety lock internal control timing control unit periodically and actively turns off the OSSDA and OSSDB outputs in turn. During the brief shutdown of OSSDA or OSSDB, the TRL1 safety lock internal timing control unit detects whether OSSDA or OSSDB is indeed closed. If it is indeed closed, the corresponding OSSD switch is in normal working state. If OSSD is not detected to be closed, the corresponding OSSD fails, and the system will immediately shut down both OSSDs. At this time, the TRL1 safety lock red indicator flashes to ensure functional safety. Therefore, when the load connected to the safety lock is a PLC or a fast intelligent device with MCU control, it is necessary to filter the self-test pulse in the program. The following figure is the TRL1 safety lock self diagnosis output waveform sequence diagram.



※Devices connected to the OSSD, such as safety relays or contactors, should not react to these temporary, self diagnostic shutdown signals.

TRL1 safety interlocking device series function status indication

Electromagnetic locking (PNP)type

Actuator alignment status	Door lock control signal (Pink)	OSSD input (Black/Yellow)	Lock status	OSSD output (White/Green)	Auxiliary indication, 0~H optional function (gray line)																	LED indicator status
					0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	
Misalignment	Low level	Low level	Unlocked	0V	0V	0V	24V	0V	0V	0V	24V	24V (Faulty)	24V (Faulty)	24V	24V	0V	24V	24V	24V	0V	0V (Faulty)	0V (Faulty)	
	Low level	High level	Unlocked	0V	0V	0V	24V	24V	0V	0V	24V			24V	24V	0V	0V	24V	24V	0V			
	High level	Low level	Unlocked	0V	0V	0V	24V	0V	0V	0V	24V			24V	24V	0V	24V	24V	24V	0V			
	High level	High level	Unlocked	0V	0V	0V	24V	24V	0V	0V	24V			24V	24V	0V	0V	24V	24V	0V			
Alignment	Low level	Low level	Unlocked	0V	24V	0V	24V	0V	24V	0V	24V			0V	24V	0V	24V	0V	24V	0V			The red light is steady on, Lock the yellow light blinks at 1Hz, and all other lights are off.
	Low level	High level	Unlocked	0V	24V	0V	24V	24V	24V	0V	24V			0V	24V	0V	0V	0V	24V	0V			Green light flashing at 1Hz,steady yellow Lock,Input yellow light flashes at 1Hz,red light off
	High level	Low level	Lock	0V	24V	24V	24V	0V	24V	24V	24V			0V	0V	0V	24V	0V	0V	0V			Steady green, steady yellow Lock, steady yellow Input, steady red.
	High level	High level	Lock	24V	24V	24V	0V	24V	24V	24V	0V			0V	0V	24V	0V	0V	0V	24V			

Electromagnetic locking (NPN) type

Actuator alignment status	Door lock control signal (Pink)	OSSD input (Black/Yellow)	Lock status	OSSD output (White/Green)	Auxiliary indication, 0~H optional function (gray line)																	LED indicator status
					0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	
Misalignment	High level	Low level	Unlocked	24V	24V	24V	0V	0V	24V	24V	0V	0V (Faulty)	0V (Faulty)	0V	0V	24V	24V	0V	0V	24V	24V (Faulty)	24V (Faulty)	
	High level	High level	Unlocked	24V	24V	24V	0V	24V	24V	24V	0V			0V	0V	24V	0V	0V	0V	24V			
	Low level	Low level	Unlocked	24V	24V	24V	0V	0V	24V	24V	0V			0V	0V	24V	24V	0V	0V	24V			
	Low level	High level	Unlocked	24V	24V	24V	0V	24V	24V	24V	0V			0V	0V	24V	0V	0V	0V	24V			
Alignment	High level	Low level	Unlocked	24V	0V	24V	0V	0V	0V	24V	0V			24V	0V	24V	24V	24V	0V	24V			The red light is steady on, Lock the yellow light blinks at 1Hz, and all other lights are off.
	High level	High level	Unlocked	24V	0V	24V	0V	24V	0V	24V	0V			24V	0V	24V	0V	24V	0V	24V			Green light flashing at 1Hz,steady yellow Lock,Input yellow light flashes at 1Hz,red light off
	Low level	High level	Lock	24V	0V	0V	0V	24V	0V	0V	0V			24V	24V	24V	0V	24V	24V	24V			Steady green, steady yellow Lock, steady yellow Input, steady red.
	Low level	Low level	Lock	0V	0V	0V	24V	0V	0V	0V	24V			24V	24V	0V	24V	24V	24V	0V			

Mechanical locking（PNP）type

Actuator alignment status	Door lock control signal (Pink)	OSSD input (Black/Yellow)	Lock status	OSSD output (White/Green)	Auxiliary indication, 0~H optional function (gray line)																	LED indicator status
					0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	
Misalignment	Low level	Low level	Unlocked	0V	0V	0V	24V	0V	0V	0V	24V	24V (Faulty)	24V (Faulty)	24V	24V	0V	24V	24V	24V	0V	0V (Faulty)	0V (Faulty)	
	Low level	High level	Unlocked	0V	0V	0V	24V	24V	0V	0V	24V			24V	24V	0V	0V	24V	24V	0V			
	High level	Low level	Unlocked	0V	0V	0V	24V	0V	0V	0V	24V			24V	24V	0V	24V	24V	24V	0V			
	High level	High level	Unlocked	0V	0V	0V	24V	24V	0V	0V	24V			24V	24V	0V	0V	24V	24V	0V			
Alignment	High level	Low level	Unlocked	0V	24V	0V	24V	0V	24V	0V	24V			0V	24V	0V	24V	0V	24V	0V			The red light is steady on, Lock the yellow light blinks at 1Hz, and all other lights are off.
	High level	High level	Unlocked	0V	24V	0V	24V	24V	24V	0V	24V			0V	24V	0V	0V	0V	24V	0V			Green light flashing at 1Hz,steady yellow Lock,Input yellow light flashes at 1Hz,red light off
	Low level	Low level	Lock	0V	24V	24V	24V	0V	24V	24V	24V			0V	0V	0V	24V	0V	0V	0V			Steady green, steady yellow Lock, steady yellow Input, steady red.
	Low level	High level	Lock	24V	24V	24V	0V	24V	24V	24V	0V			0V	0V	24V	0V	0V	0V	24V			

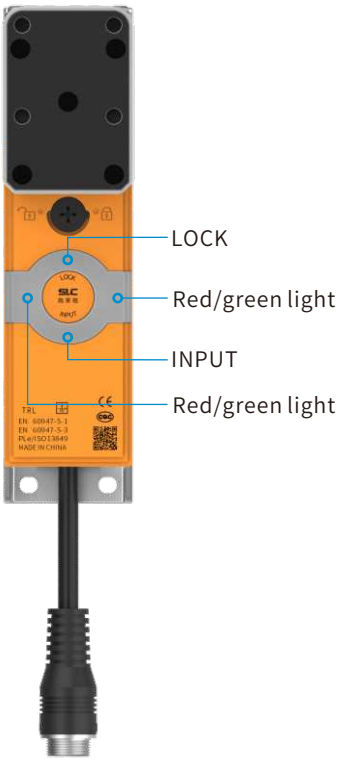
Mechanical locking（NPN）type

Actuator alignment status	Door lock control signal (Pink)	OSSD input (Black/Yellow)	Lock status	OSSD output (White/Green)	Auxiliary indication, 0~H optional function (gray line)																	LED indicator status
					0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	
Misalignment	High level	Low level	Unlocked	24V	24V	24V	0V	0V	24V	24V	0V	0V (Faulty)	0V (Faulty)	0V	0V	24V	24V	0V	0V	24V	24V (Faulty)	24V (Faulty)	
	High level	High level	Unlocked	24V	24V	24V	0V	24V	24V	24V	0V			0V	0V	24V	0V	0V	0V	24V			
	Low level	Low level	Unlocked	24V	24V	24V	0V	0V	24V	24V	0V			0V	0V	24V	24V	0V	0V	24V			
	Low level	High level	Unlocked	24V	24V	24V	0V	24V	24V	24V	0V			0V	0V	24V	0V	0V	0V	24V			
Alignment	Low level	Low level	Unlocked	24V	0V	24V	0V	0V	0V	24V	0V			24V	0V	24V	24V	24V	0V	24V			The red light is steady on, Lock the yellow light blinks at 1Hz, and all other lights are off.
	Low level	High level	Unlocked	24V	0V	24V	0V	24V	0V	24V	0V			24V	0V	24V	0V	24V	0V	24V			Green light flashing at 1Hz,steady yellow Lock,Input yellow light flashes at 1Hz,red light off
	High level	High level	Lock	24V	0V	0V	0V	24V	0V	0V	0V			24V	24V	24V	24V	24V	24V	24V			Steady green, steady yellow Lock, steady yellow Input, steady red.
	High level	Low level	Lock	0V	0V	0V	24V	0V	0V	0V	24V			24V	24V	0V	0V	24V	24V	0V			

TRL1 safety interlocking device series indicator status

LED status during normal operation				
Red light	Green light	INPUT Yellow Light	LOCK Yellow Light	Product status
Always on	Off	Off	Off	No RFID tag (common code)
Flashing light	Off	Off	Off	No RFID tag (unique code)
Always on	Off	Off	1Hz flash	RFID tag, no LOCK signal
Off	1Hz flash	1Hz flash	Always on	RFID tags, door lock, no input signals
Off	Always on	Always on	Always on	RFID tags, door lock, no input signals

LED status during fault				
Red light	Green light	INPUT Yellow Light	LOCK Yellow Light	Product status
1Hz flash	Off	Off	Off	OSSD output overload/AUX output overload/OSS output self diagnosis fault/OSS terminal voltage detection fault
1Hz flash	Off	1Hz flash	Off	Power supply voltage out of operating range
4Hz flash	Off	4Hz flash	Off	Input self diagnosis fault
4Hz flash	Off	Off	Off	Electromagnet fault/optocoupler self diagnosis fault
3 red and 1 green cyclic flashing		Off	1Hz flash	Opening timeout
3 green and 1 red cyclic flashing		Off	Always on	Door lock timeout
Red green alternating 1Hz flashing		Off	Off	Communication failure of main and auxiliary MCU
Red green alternating 4 Hz flashing		Off	Off	Unique code label and door lock code do not match



Unique encoding actuator uses matching

TRL1 safety locks are classified into generic and unique coding types.※

Unique Code Type The TRL1 safety door lock has no unique code before delivery. You need to match the code with the TRL1 actuator (door key) only when you use it for the first time.

After the green light flashes three times, the red light flashes for 1s, then flashes twice at 2Hz, and repeat. The other lights are off (unique code).

For sensors that have not completed coding matching, coding matching shall be performed as follows:

①Use the TRL1 actuator (door key) provided by our company to insert the unmatched TRL1 safety door lock;

②Power on the TRL1 safety lock. After the TRL1 safety lock that does not match the code is powered on and initialized successfully (the green light blinks three times), it enters the matching mode, and the traffic light blinks alternately and rapidly.

③TRL1 safety door lock will read the code of TRL1 actuator (door key);

④After 5 seconds, the TRL1 safety door lock matches the code successfully, and the traffic lights stop flashing alternately;

⑤Please power off and restart the TRL1 safety lock.

※Once the unique code type TRL1 safety door lock matches the code of a TRL1 actuator (door key) successfully, this TRL1 safety door lock can only identify the matched TRL1 actuator (door key), but not other TRL1 actuators (door key) during use.

Attention	◆The actuator must be matched for the first use. ◆In the process of actuator matching, do not power off or move the actuator, otherwise the matching will fail. ◆After matching the actuator and inductor, they can only be used in pairs, and the inductor can no longer identify other actuators.

FCC STATEMENT

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body