



# TCF series photoelectric sensor

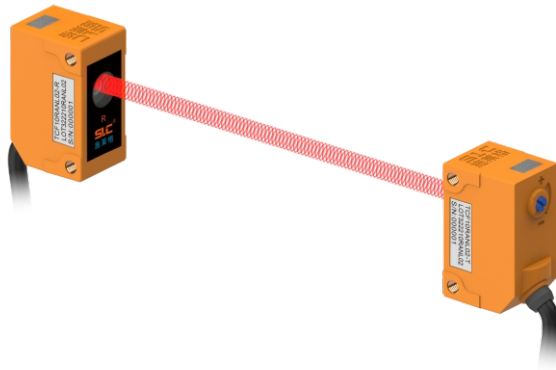


## TCF series photoelectric sensor features

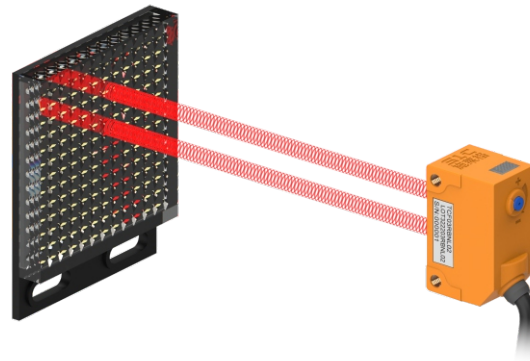
- ◆ Long distance detection
- ◆ Rapid response
- ◆ Compact in size
- ◆ Easy to install and use
- ◆ A variety of detection methods, such as counter reflection, regression reflection and diffuse reflection
- ◆ A variety of infrared and red light sources

## Use effect of photoelectric sensor

### Sensor (Thru-beam type)



### Sensor (Regressive reflex)



## Product model description

TCF	03		A	P	L	02	
Small square Photoelectric series	Detection distance 03: 3m 10: 10m	The light source None: infrared R: red light	Photoelectric Type A: Antithesis B:Regression reflex	Output way P: PNP output N: NPN output	Light output state L: Light on D: Dark on	02: 2 meters straight out M8: M8Air plug M12: M12Air plug	T: transmit R: receive

## Specifications and performance

Testing wa	Correlation				Regression reflection			
	NPN		PNP		NPN		PNP	
Infrared model	Light on	Dark on	Light on	Dark on	Light on	Dark on	Light on	Dark on
	TCF10ANL02	TCF10AND02	TCF10APL02	TCF10APD02	TCF03BNL02	TCF03BND02	TCF03BPL02	TCF03BPD02
Infrared order number	LOT322210NL02	LOT322210ND02	LOT322210PL02	LOT322210PD02	LOT322203NL02	LOT322203ND02	LOT322203PL02	LOT322203PD02
Red light models	TCF10RANL02	TCF10RAND02	TCF10RANP02	TCF10RAPD02	TCF03RBNL02	TCF03RBND02	TCF03RBPL02	TCF03RBDP02
Red light order number	LOT322210RNL02	LOT322210RND02	LOT322210RPL02	LOT322210RPD02	LOT322203RNL02	LOT322203RND02	LOT322203RPL02	LOT322203RPD02
Detection distance	10m				3m (With TD08 reflector)			
Light source	Infrared light (red light)							
Distance setting	Adjust 1 turn knob (230°C)							
Response time	1ms							
Power supply	DC 10~30V							
Current	T:15mA R:15mA				30mA			
Maximum load current	150mA							
Output residual voltage	2V							
Indicator light	Transmission: green light double flash (normal operation) Reception: green light is always on (best working condition for receiving light) Green light flashing (photoelectric light, but not the best working state, can be adjusted by adjusting the trans-ission knob to adjust it to the best working state) The red light is always on (the photoelectric light is not aligned) The red light is 1Hz flash (photoelectric light collection interference) The red light is 4Hz flash (output overload)				The green light is always on (to receive the light in the best working condition) The green light is flashing (photoelectric to the light, but not in the best working condition, can pass Adjust the transmitting knob to adjust it to the best working condition) The red light is always on (the photoelectric light is not matched) The red light is 1Hz flashing (photoelectric light receiving interference)			
Cable type	2 meters straight out							
Ambient light	20000Lux							
Working temperature	-20°C~55°C No freeze							
Relative humidity	30%~85% No condensation							
Enclosure protection	IP65							
Material quality	Plastic							

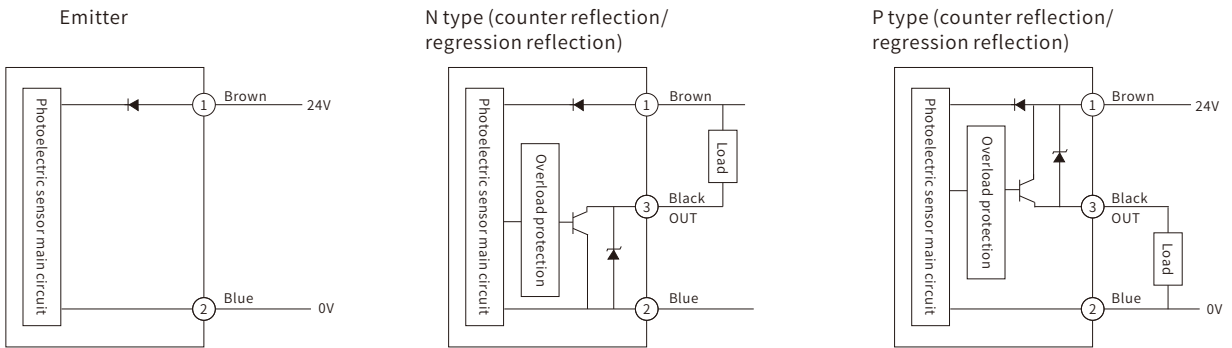
### ▶ Sensitivity regulation

The default position of the factory trimmer of the sensor is the "maximum" position, that is, the most luminous.

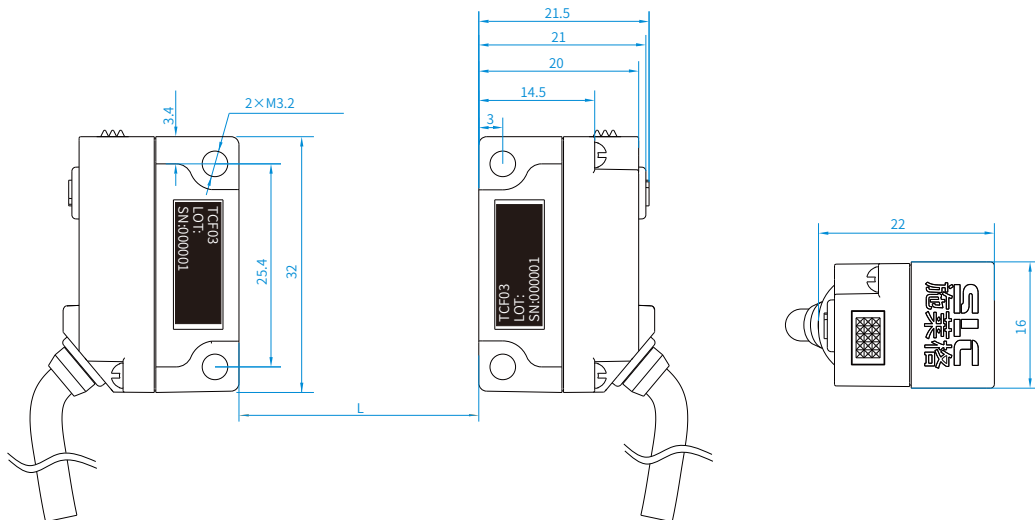
When the sensor is installed and energized, if the receiver shows a red or green light flashing (the transmitter trimmer is at the largest place), adjust the mounting bracket to align the center of the optical axis; If the receiver shows the green light stably, adjust the transmitter spinner clockwise to the green light flashing state of the receiver and then counterclockwise to make the receiver show the green light stably. At this time, the receiver is in the best state, with the maximum light gain margin and the strongest anti-interference.



### ▶ Photoelectric sensor wiring diagram

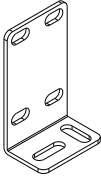
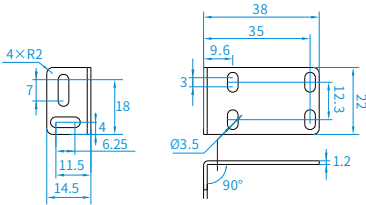

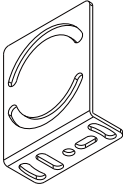
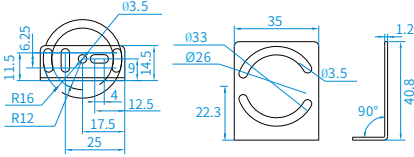

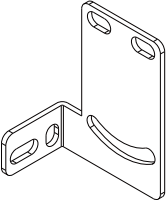
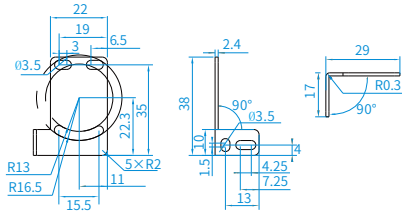

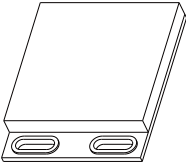
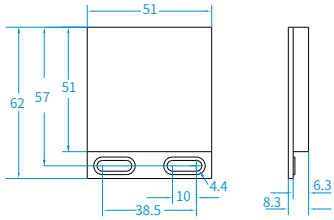
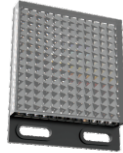
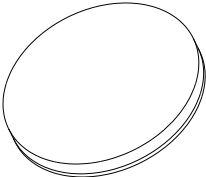
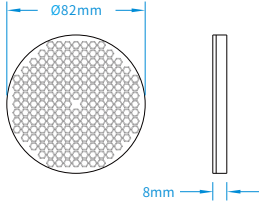
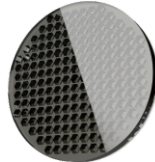
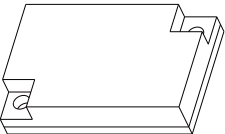
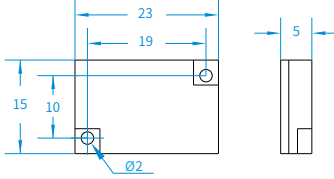
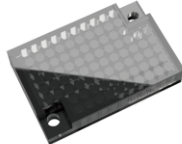
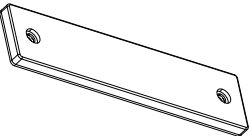
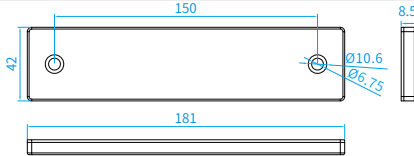



### ▶ Photoelectric sensor size specification




※ Due to the influence of product configuration and manufacturing process, the actual product size and weight may be different. Please refer to the actual product

## Mounting bracket and return reflector dimensions

Shape	Model	Size chart	Rendering
	TCF-ZJ01		
	TCF-ZJ02		
	TCF-ZJ03		
	TCF-TD08		
	TCF-TD05		
	TCF-TD02		
	TCF-TD03		

※Due to the influence of product configuration and manufacturing process, the actual product size and weight may be different. Please refer to the actual product

### Selection of reflector and mounting bracket

Model	Order number	Shape	Qty		Details
			Regression	Thru-beam	
TCF-TD08	LOTTTCF-TD08		1	0	Regression reflector plate
TCF-TD05	LOTTTCF-TD05		1	0	Regression reflector plate
TCF-TD02	LOTTTCF-TD02		1	2	Regression reflector plate
TCF-TD03	LOTTTCF-TD03		1	2	Regression reflector plate
TCF-ZJ01	LOTTTCF-ZJ01		1	2	Mounting bracket for direct outlet
TCF-ZJ02	LOTTTCF-ZJ02		1	2	Mounting bracket for direct outlet
TCF-ZJ03	LOTTTCF-ZJ03		1	2	Mounting bracket for direct outlet

#### PRECAUTIONS

- Please never use AC power.
- Do not disassemble, repair or modify the product.
- DC10-30V): The power supply voltage must be within the rated value (DC10-30V).
- Do not exceed the rated load when using.
- Do not use in the following places.
- Do not use in direct sunlight.
- Do not use in places with high humidity or easy con-densation.
- Do not use in places containing corrosive gas.
- Do not use the connection and installation where vibration and shock can be directly transmitted to the sensor.
- The maximum allowable voltage of the sensor is 30V, please confirm that the power supply voltage is less than the maximum allowable voltage before powering on.
- The sensor wire and power line or power line will be disturbed when installed in the same set of baskets. There may be malfunction or even damage. In principle, the sensor wire must be placed separately or shielded
- Extension wires must use wires with a cross-sectional area of more than 0.3mm<sup>2</sup> and a length of less than 100m.
- Do not subject the sensor to violent external forces when installing the sensor, use M3 bolts to fix it during installation.
- Use a commercially available switching power supply elbow, please ground FG.
- The time from turning on the power supply to the sensor can be detected normally is 3s, so please use it after 3s of energizing; the load and the sensor are connected to different power supply elbows, the power supply of the sensor must be turned on first.
- When the power is turned off, output pulses may appear, so we recommend turning off the power of the load or load line first;
- This sensor has a short-circuit protection function, please do not short-circuit the load. Please do not allow current higher than the rated current to pass through the load. When a load short-circuit occurs, the output turns off. Check the wiring and then turn on the power. The short circuit protection circuit will be reset. In addition, when the current passing through the loop is 1.5 times the load current, the load short-circuit protection will start;
- Although the waterproof level is IP65, please avoid using it in water, rain and outdoor



# TCF200 series position setting diffuse reflection photoelectric sensor

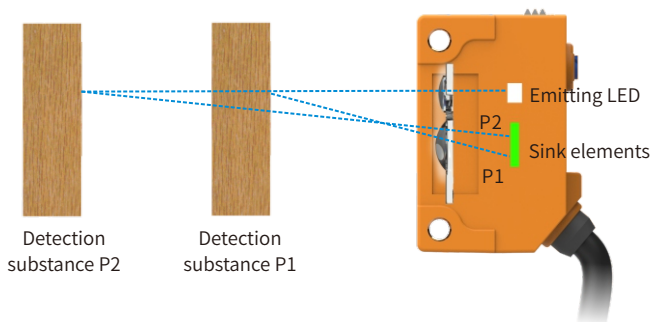


## Functional features

- ◆ With the principle of triangular distance measurement, the detection precision is high, and the small segment difference can be detected.
- ◆ Not affected by the background color, the glossy convex and concave work piece can also be easily detected.
- ◆ Can correspond to a variety of detection object/background combinations.
- ◆ With mounting thread, easy to use and install.

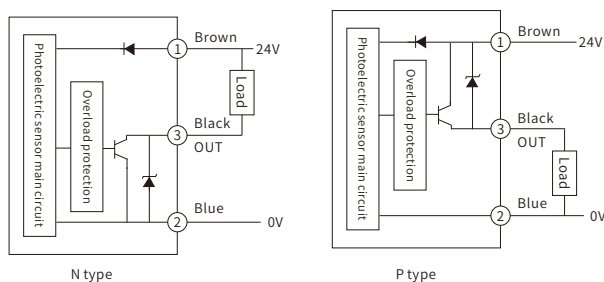
## Working principle

Linear light emitted by the photoelectric lens through the emitting lens. Receiving lens reflected back to the photoelectric by the object. According to the relative distance between the reflective object and the photoelectricity, the angle of the emitted light and the emission is also different. If the transmitting path is fixed, the position on the receiving photoreceptor is also different. According to the different positions on the photoreceptor, the distance from the measured object to the photoelectricity can be calculated according to the trigonometric function. This is the principle of trigonometric function ranging. In the close range, slight changes in the measured object and the photoelectric distance will cause a very obvious change in the position of the photosensitive point, so the triangular distance measurement can be very accurate in the close range.

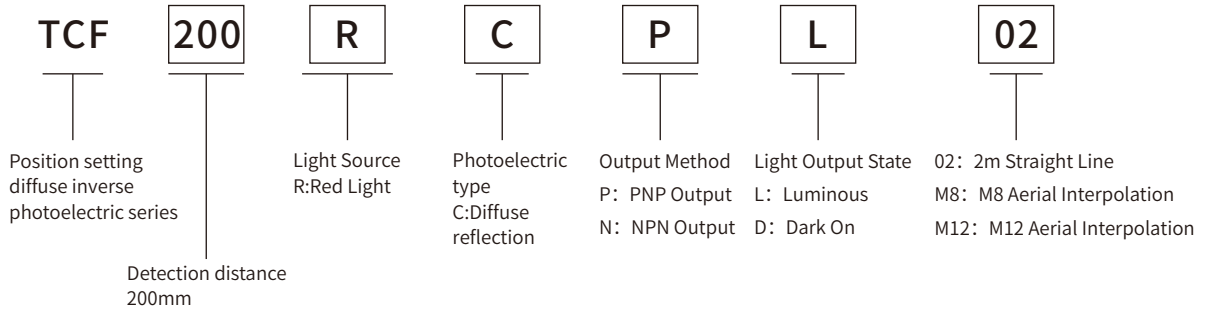


Triangulation diagram

## Wiring Diagrams



### Product model description



### Pump characteristic

Detection method	Position setting			
	NPN		PNP	
Type	Light on	Dark on	Light on	Dark on
	TCF200RCNL02	TCF200RCND02	TCF200RCPL02	TCF200RCPD02
Order No.	LOT32222CNL02	LOT32222CND02	LOT32222CPL02	LOT32222CPD02
Detection distance	5~200mm(100x100mm white board)			
Light source	Red light			
Distance setting	Automatically set by knob			
Response time	1ms			
Input power entry	DC 10~30V			
Current	26mA			
Maxcarry current	150mA			
Output residual voltage	2V			
LED	Solid green: There are objects in the detection range Flashing green: There are objects in the detection range, but weak signal Solid red: No objects in the detection range Flashing red: work error			
Cable type	2m straight line			
Anti-ambient lighting	20000Lux			
Operating temperature	-20°C~55°C no freezing			
RH	30%~85% no condensation			
IP	IP65			
IPS	Plastic			

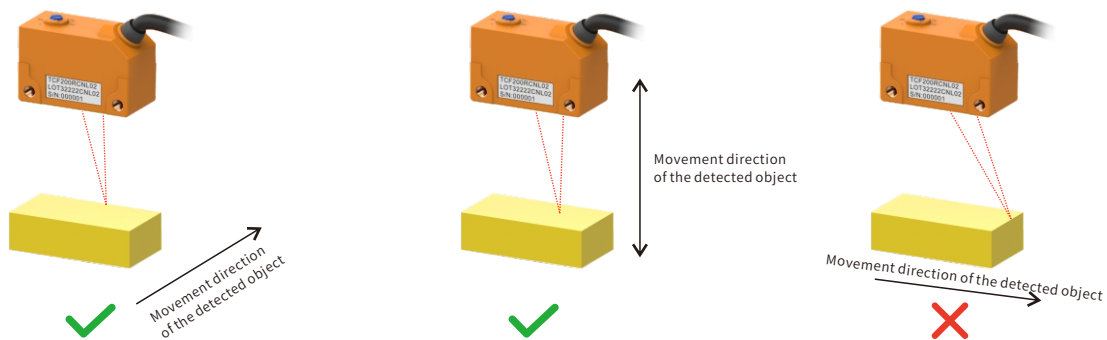
## Mounting bracket (need to be purchased separately)

Type	Order No.	Share	Orderable device	PCS	Details
TCF-ZJ01	LOTTCF-ZJ01			1	Mounting bracket for direct outlet (see the mounting bracket for further details)
TCF-ZJ02	LOTTCF-ZJ02			1	Mounting bracket for direct outlet (see the mounting bracket for further details)
TCF-ZJ03	LOTTCF-ZJ03			1	Mounting bracket for direct outlet (see the mounting bracket for further details)

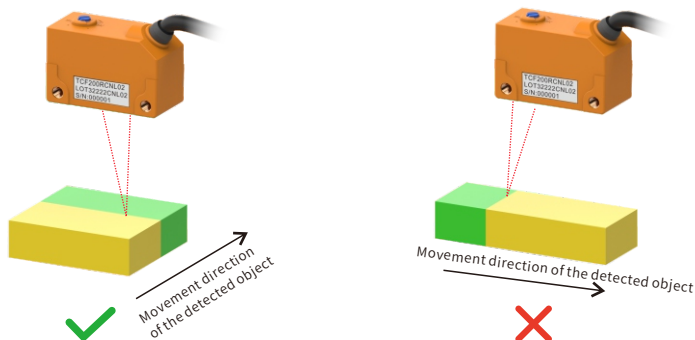
When the sensor is installed in the opposite direction, there may be mutual interference, so avoid installing the sensor with the optical axis in the opposite direction.

- ◆ Such as sun light, fluorescent lamp, incandescent lamp and other strong light must not shoot into the pointing angle of the photoelectric switch.
- ◆ When mounting the photoelectric switch, if it is knocked with a hammer, etc., it will cause damage to the water discharge function, so it must be prohibited.
- ◆ When mounting the photoelectric switch, please use M3 screws.

Regarding the installation direction of the photoelectric switch, pay attention to the moving direction of the detection object, and install it as shown below.

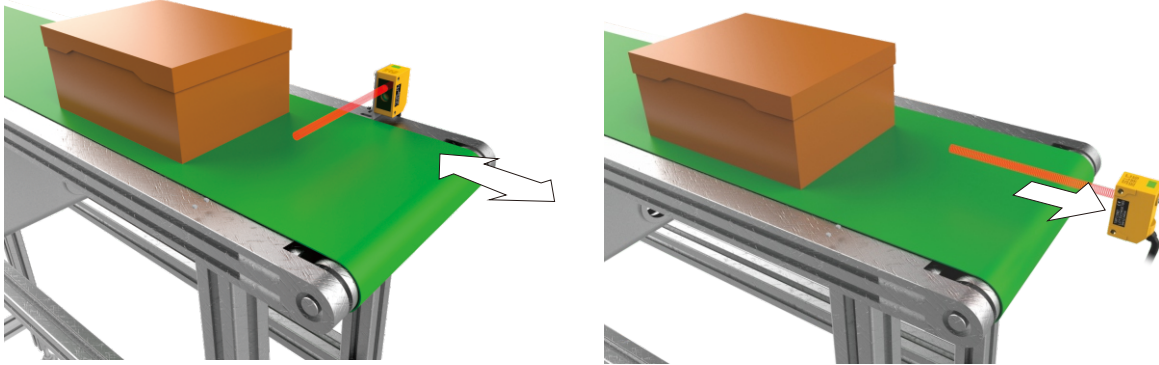


In addition, when the color and material of the detected object have extreme changes, install it as shown below.

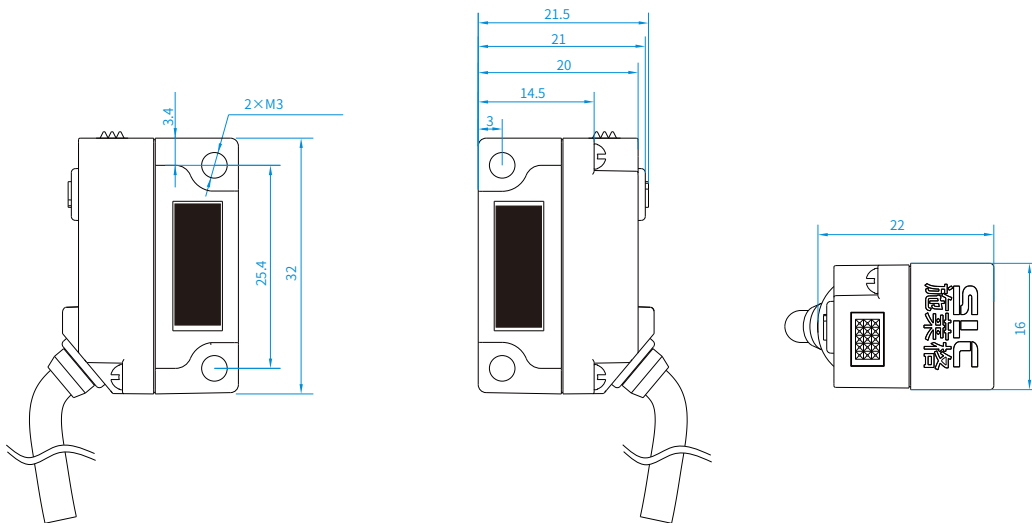




### Effect



### Mounting dimension



※Affected by product configuration and manufacturing process, the actual product size, weight may be different, please refer to the actual product.

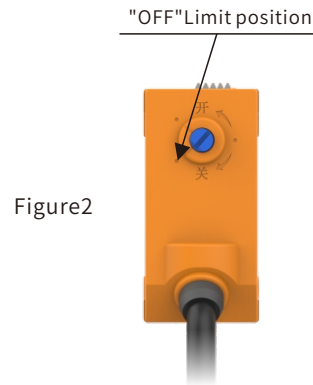
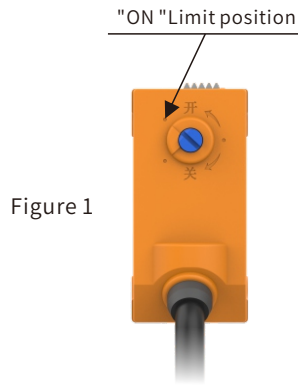
### Function set

The TCF200 series are photoelectric sensor which can be position setting, must be in the power state to enter the detection distance setting, the detection distance of re-energizing after each power-off defaults to the distance set before the last power-off, If you need to reset the detection distance, you need to install the TCF200 photoelectric sensor in the working condition where you need to set the detection distance, and then install the following steps to set: he TCF200 photoelectric sensor in the working condition where you need to set the detection distance, and then install the following steps to set:

1. First mounting the TCF200, and place the object to be detected (The object must be within the maximum detection range of the TCF200);
2. The TCF200 setting distance initial state, one end of the inclined surface of the knob slot should stay at the <"ON" limit position> for more than 3 seconds, as shown in Figure 1.
3. Turn the knob clockwise to the <"off" limit position>, at this time, the traffic lights flash alternately, and then do not twist the button.
- 4.1 After setting, The green light flashes to indicate that the detected object has been detected, at this time, within the flashing period of green light, turn the knob clockwise to the <"ON" limit position>, the database save is successful, setup complete, enter normal working state; within the flashing period of green, don't turn the knob clockwise to the <"ON" limit position >, It will automatically exit the setting without saving this data, and the detection distance will return to the detection distance before this setting.

4.2 After setting, the red indicator light flashes to indicate that the detected object is not detected, cannot save this setting data at this time, the detection distance will return to the detection distance before setting. To change the detection distance, repeat steps 1 to 4.1;

5. After the setting is successful, remove the detected object used to set the detection distance.



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