

Photoelectric sensor

PTE Series

Operation Instruction



NO or NC Optional

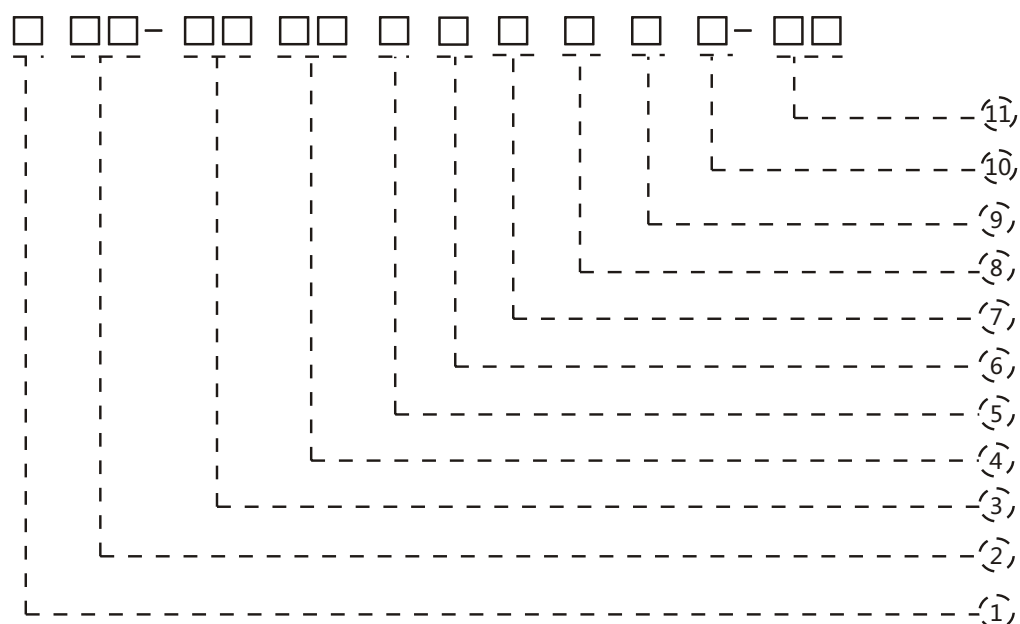
Adopt specialized IC, with stable performance

AC/DC Optional

Housing material: PC/ABS

Protection degree: IP67

Model description



1. Type code

P:Photoelectric

2. Shell code

TE:Square plastic shell
(50x41.3x18mm)

3. Mounting

T:Through beam
B:Diffuse reflection
P:Polarized reflection

4. Sensing distance

C30:30cm
C200:200cm
M5:5m
M60:60m

5. Operating voltage

D:10-30VDC
S:24-240VDC/AC

6. Output mode

F:NPN+PNP
K:Relay output

7. Output status

B:NO or NC

8. Light source

N/A: Infrared light

9. Delayed status

N/A: With no
delayed function

10. Cable length

N/A:2m
3M:3m

11.Connection

N/A: 2m cable
E2:M12 connector (4 pins)
E5: M12 connector (5 pins)

Specification parameter

Detection mode	Diffuse reflection			
Product model	PTE-BC...DFB/E2		PTE-BC...SK/E5	
Sensing distance	30cm(Adjustable)	200cm(Adjustable)	30cm(Adjustable)	200cm(Adjustable)
Attenuation rate	30cm product:38%(at 30cm); 200cmproduct:39.5%(at 200cm)			
Output	NPN+PNP NO/NC		Relay output NO+NC	
Supply voltage	10-30VDC		24-240V AC/DC	
Standard target	White card reflective rate 90%			
Hysteresis range	3-20%			
Non-detection zone	<4cm (Minimum distance 10cm)	<11cm (Minimum distance 30cm)	<4cm (Minimum distance 10cm)	<11cm (Minimum distance 30cm)
Repeated accuracy	<5%		<5%	
Load current	≤200mA DC		≤3A	
Voltage drop	<2.5V DC		/	
Consumption current	≤25mA DC		≤0.72 W	
Circuit protection	Reverse polarity protection, overload protection, short-circuit protection		/	
Indicator	Power indicator: Green LED; Action and stability indicator: Yellow LED			
Ambient temperature	-25...+55℃			
Ambient humidity	35%...95%RH			
Response time	Action and reset under 2ms		Action and reset under 10ms	
Light source	Infrared 850nm			
Spot size	/			
Protection degree	IP67			
Optical axis offset	within ±1°			
Housing material	PC/ABS			
Connection	2m PVC cable/4 pinsM12 connector		2m PVC cable/ 5 pinsM12 connector	

Specification parameter

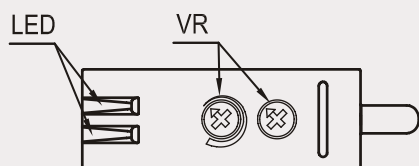
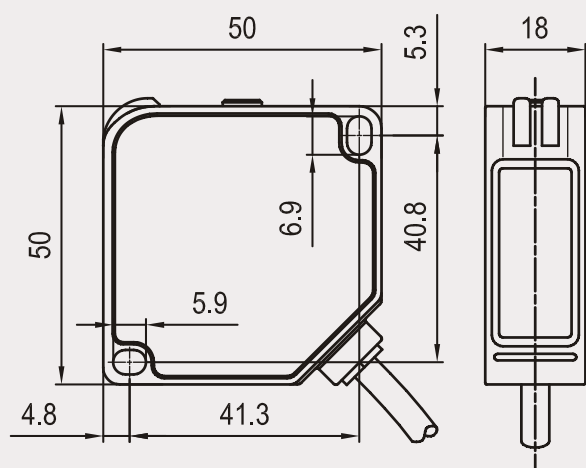
Detection mode	Polarized reflection	
Product model	PTE-PM5DFB/E2	PTE-PM5SK/E5
Sensing distance	5m(Adjustable)	
Attenuation rate	/	
Output	NPN+PNP NO/NC	Relay output NO+NC
Supply voltage	10-30VDC	24-240V AC/DC
Standard target	Reflector (TD-09)	
Hysteresis range	3-20%	
Non-detection zone	0	
Repeated accuracy	<5%	
Load current	≤200mA DC	≤3A
Voltage drop	<2.5V DC	/
Consumption current	≤25mA DC	≤0.72W
Circuit protection	Reverse polarity protection, overload protection, short-circuit protection	/
Indicator	Power indicator: Green LED; Action and stability indicator: Yellow LED	
Ambient temperature	-25...+55°C	
Ambient humidity	35%...95%RH	
Response time	Action and reset under 2ms	Action and reset under 10ms
Light source	Red 630nm	
Spot size	10*10cm(3m)	
Protection degree	IP67	
Optical axis offset	within ±1°	
Housing material	PC/ABS	
Connection	2m PVC cable/ 4 pinsM12 connector	

Specification parameter

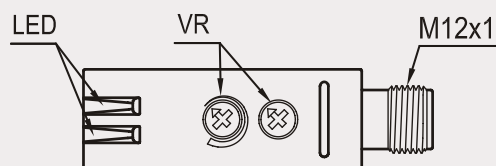
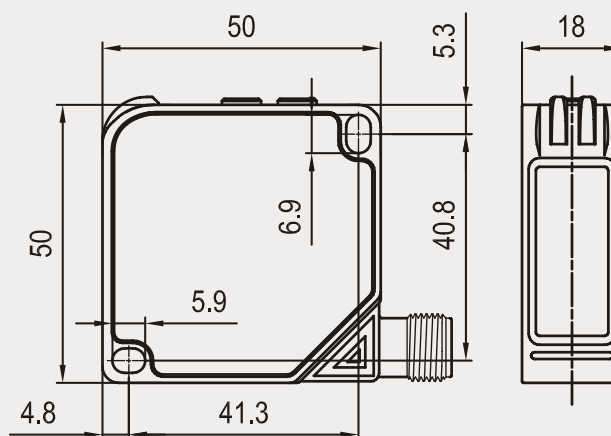
Detection mode	Through beam	
Product model	PTE-TM60D(FB)/E2	PTE-TM60S(K)/E5
Sensing distance	60m(Adjustable)	
Attenuation rate	/	
Output	NPN+PNP NO/NC	Relay output NO+NC
Supply voltage	10-30VDC	24-240V AC/DC
Standard target	Transparent objects above Ø15mm	
Hysteresis range	3-20%	
Non-detection zone	0	
Repeated accuracy	<5%	
Load current	≤200mA DC	≤3A
Voltage drop	<2.5V DC	/
Consumption current	Emitter: <30mA DC, Receiver <30mA DC	Emitter: <0.72W, Receiver <1.2W
Circuit protection	Reverse polarity protection, overload protection, short-circuit protection	/
Indicator	Power indicator: Green LED; Action and stability indicator: Yellow LED	
Ambient temperature	-25...+55°C	
Ambient humidity	35%...95%RH	
Response time	Action and reset under 2ms	Action and reset under 10ms
Light source	Infrared 850nm	
Spot size	/	
Protection degree	IP67	
Optical axis offset	<±1°	
Housing material	PC/ABS	
Connection	2m PVC cable/ 5 pinsM12 connector	

Product dimension

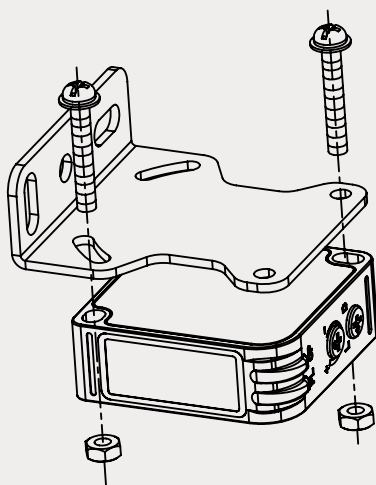
Cable



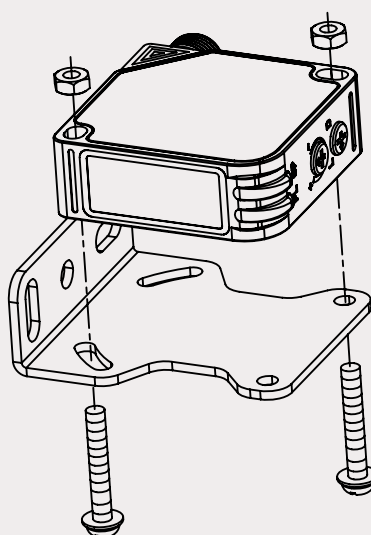
M12 Connector



Installation instruction(1)

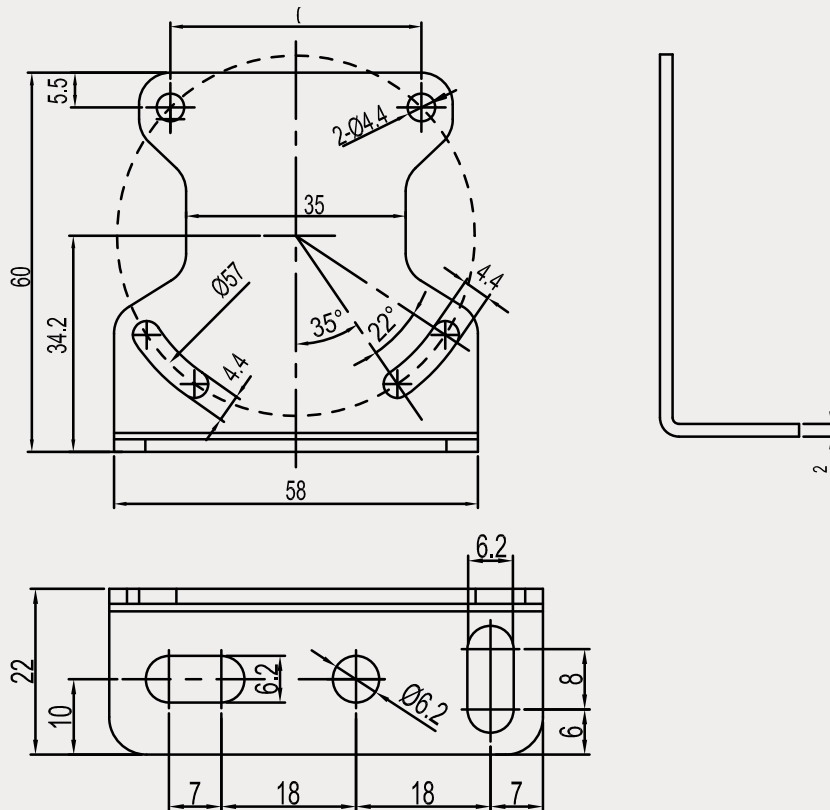


Installation instruction(2)



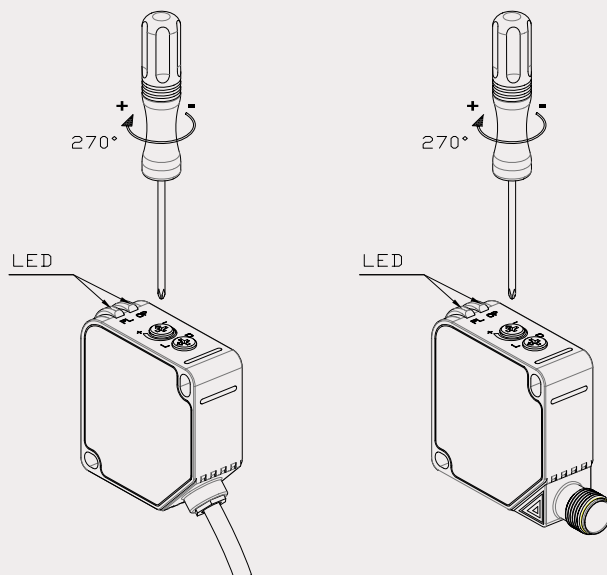
Mounting bracket

ZJP-5



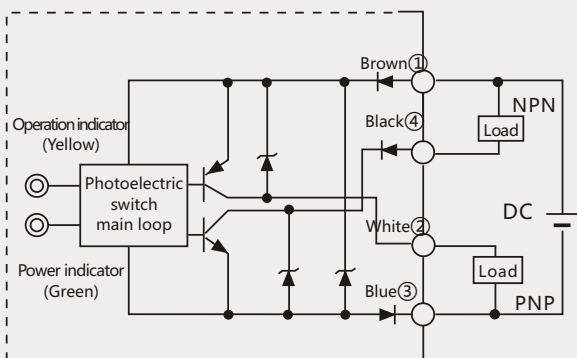
Potentiometer instruction

L/D knob potentiometer is used to adjust NO,NC (Single turn 270° adjustment); +/- knob potentiometer is used to adjust sensing distance (Single turn 270° adjustment)



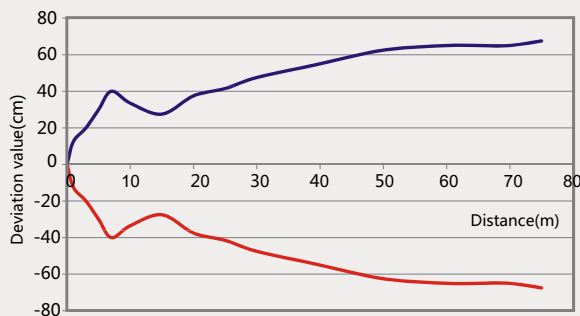
Output circuit diagram

NPN transistor valve output



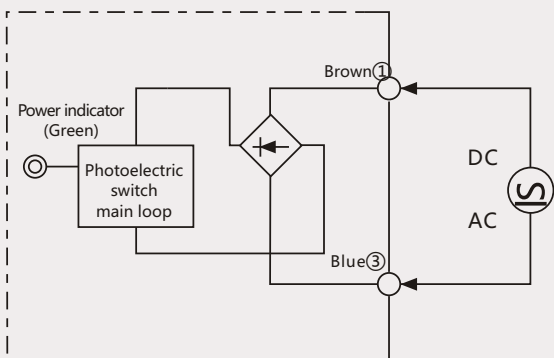
Detection description

Parallel move characteristics curve of through beam 60m

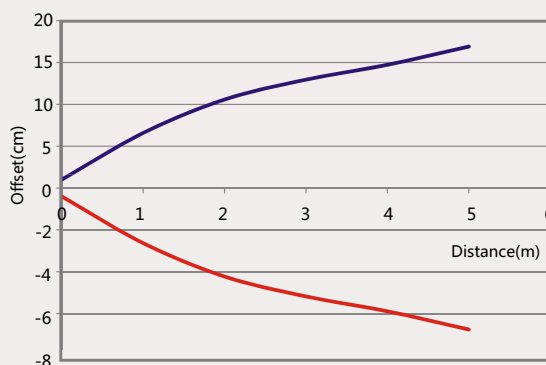


Measuring distance(m)	0	10	20	30	40	50	60	65	70	75
Left deviation value(cm)	0	34	38	48	55	63	65	65	65	68
Right deviation value(cm)	0	-34	-38	-48	-55	-63	-65	-65	-65	-68

Emitter of through beam sensor

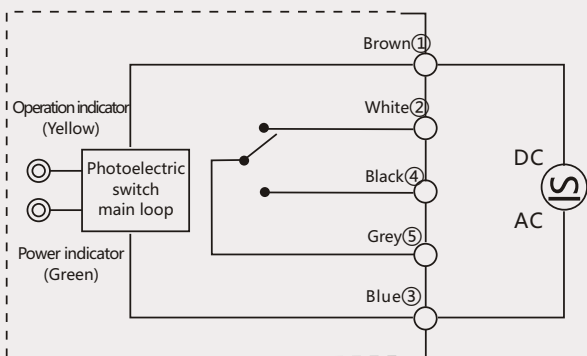


Polarized 5m parallel move characteristics curve

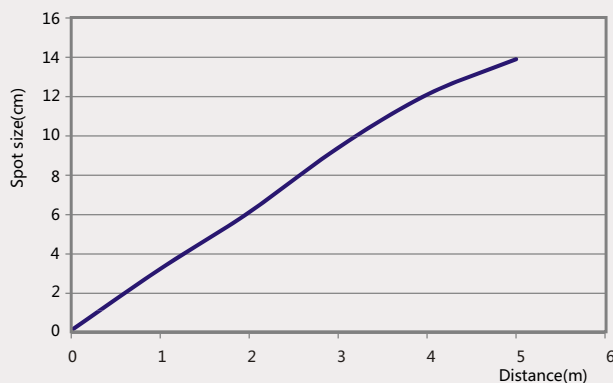


Measuring distance(m)	0	1	2	3	4	5
Positive offset(cm)	0.4	2.63	4.23	5.18	5.89	6.76
Negative offset(cm)	-0.4	-2.63	-4.23	-5.18	-5.89	-6.76

Relay output



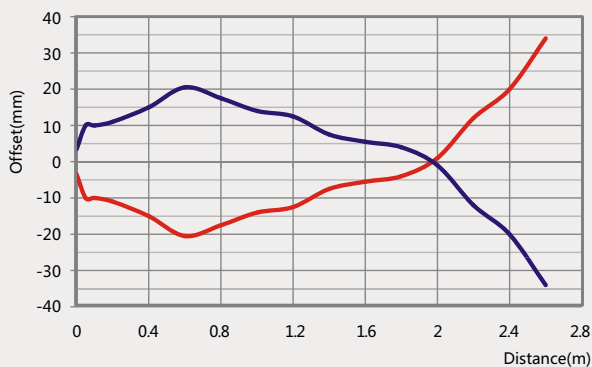
Polarized 5m spot size curve



Measuring distance(m)	0	1	2	3	4	5
Spot size(cm)	0.12	3.24	6.12	9.40	12.10	13.90

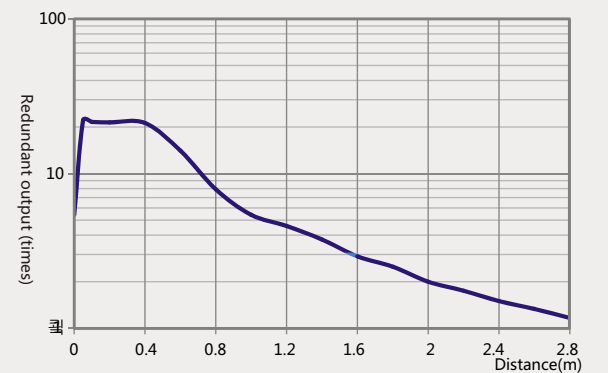
Detection description

Diffuse reflection PTE-BC200 action area characteristic curve



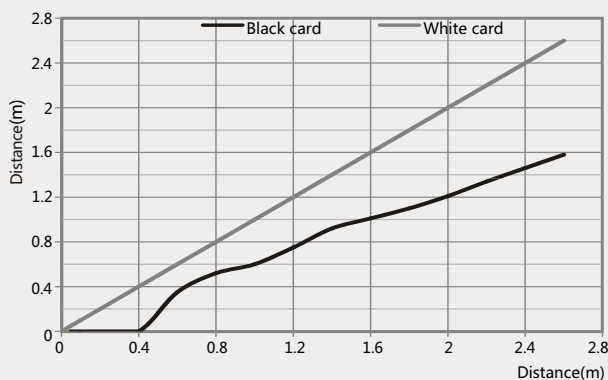
Distance (m)	0	0.1	0.4	0.6	1	1.4	1.8	2	2.2	2.4	2.6
Offset (mm)	3.5	10	15	20.5	14	7.5	4	-1	-12	-20	-34
Offset (mm)	-3.5	-10	-15	-20.5	-14	-7.5	-4	1	12	20	34

Diffuse reflection PTE-BC200 output characteristic curve



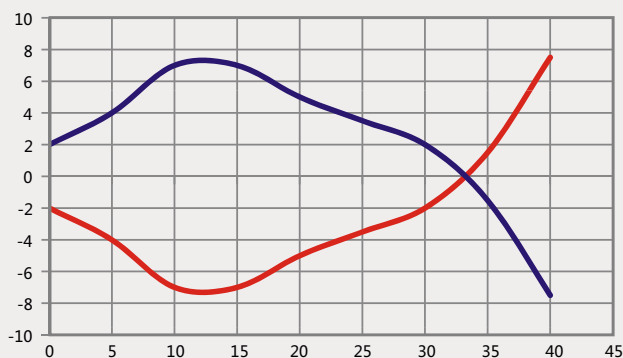
Distance (m)	0	0.40	0.80	1.20	1.60	2.00	2.40	2.80
Times	5.42	21.25	7.92	4.58	2.92	2.00	1.50	1.17

Diffuse reflection PTE-BC200 black-white card distance characteristic curve



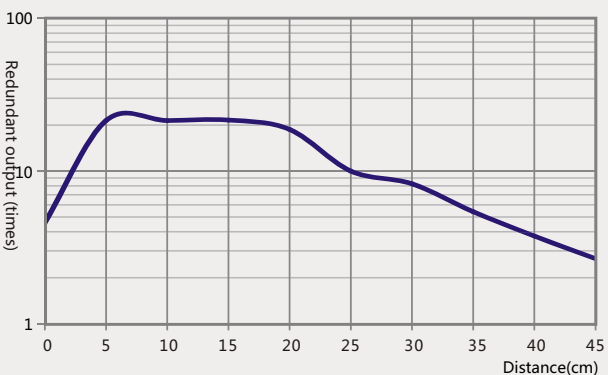
White card distance (m)	0	0.40	0.80	1.20	1.60	2.00	2.40
Black card distance (m)	0	0.00	0.52	0.75	1.01	1.21	1.46

Diffuse reflection PTE-BC30 output characteristic curve



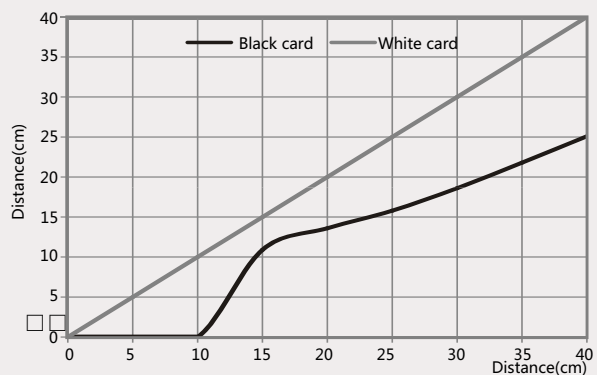
Distance (cm)	0	5	10	15	20	25	30	35	40
Offset (mm)	2	4	7	7	5	3.5	2	-1.5	-7.5
Offset (mm)	-2	-4	-7	-7	-5	-3.5	-2	1.5	7.5

Diffuse reflection PTE-BC30 output characteristic curve



Distance (m)	0	5	10	20	25	30	35	40	45
Times	4.58	21.42	21.42	18.75	10.00	8.25	5.42	3.75	2.67

Diffuse reflection PTE-BC30 black-white card distance characteristic curve



White card distance (m)	0	5	10	15	20	25	30	35	40
Black card distance (m)	0	0	0	10.90	13.6	15.80	18.60	21.8	25.10

Installation caution

Key points about security

Please be sure to follow the following points, which are very important in security.

- Don't use the product in flammable or explosive gas environment.
- Don't tear down, repair or transform this product.
- Supply voltage must be within rated value
(10...30VDC/24...240VAC 50...60Hz/24...240VDC).
- Please use load within rated value.

Application method

Proper usage

1. Don't use the product in the following environment:

- Place with direct sunlight.
- Place with high humidity and dew.
- Place with corrosive gas.
- Place with vibration and striking energy.

2. Connection and installation:

- Maximum allowable supply voltage of sensor is 10% of rated power, please make sure power supply voltage is lower than maximum value.
- It would be disturbed when sensor wire and power line are used in the same piping, causing wrong action or damage. In principle, sensor wire must be placed alone or conductively-closed.
- To lengthen the cable, section must be over 0.3mm^2 and wire be less than 100m.
- Don't pull the wire too hard.
- Avoid violent force onto sensors during installation as it may damage the performance of sensors. Please fix it with standard bolt when installing.

◎ M12 connector

- Connector can be used only when sensor power is cut off.
- Please hold the shell of sensor when inserting or pulling out connector.
- Please be sure to use hand as fixed tool, for pliers may damage products.
- Proper torque is $0.3\sim 0.4\text{N}\cdot\text{m}$, if torque is not enough, sensor would lose waterproof protection function, easy to loose when vibrating.

3. Cleaning

- Please avoid using diluents which may melt product appearance

4. Power supply

- Please connect FG (Frame Ground) to the ground when using switching rectifier..

5. Readjust the time of power

- Please use the sensor after 100ms 's energization, because the time from power on to normal sensing is 100ms. If load and sensor use different powers, then please power on sensor first .

6. Power off

- When power is turned off, it may appear output pulse; it is recommended closing the power of load or load wire first.

7. Load short-circuit protection

- Sensors have short-circuit protection function, so output will become OFF when load short circuit appears, please power on after amending circuit. Short-circuit protection circuit also can be readjusted. In addition, protection function starts when rated load current more than 1.8 times pass through circuit, so make sure the passing current less than 1.8 times the rated load current when connecting load.

Commitment

Attentions

- For security reason, please do not use this product for human body detection, when there is need to detect body, please select safety sensors published in our product summary.

- Please contact our customer service department and confirm the specification first to make sure safety or make risk to the lowest level in case of below special applications:

- ① Used in outdoors, potential chemical pollution environment, or the environment which have never recorded in product manual or operation instruction.

- ② Used in atomic energy control device, incineration equipment, railway, aviation, vehicle equipment, medical equipment, entertainment equipment, safety device or any other special defined manufacturing devices etc.

- ③ Used in system or device which may threat human life or property.

- ④ Used in gas, waterway or electric power supply system, or high-reliability device which runs 24 hours a day.

- ⑤ Used in application which needs high-security.