

Photo sensor

# PE series

## INSTRUCTION MANUAL

Thank you for purchasing HANYOUNG product.  
Please check whether the product is the exactly same as you ordered.  
Before using the product, please read this instruction manual carefully.  
Please keep this manual where you can view at any time

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## Safety information

Before using the product, please read the safety information thoroughly and use it properly.  
Alerts declared in the manual are classified to Danger, Warning and Caution by their criticality

	<b>DANGER</b>	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
	<b>WARNING</b>	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
	<b>CAUTION</b>	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury

### Danger

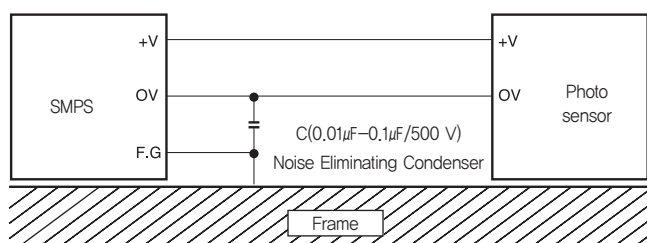
- Since this product is not designed for explosion-protective structure, do not use it at any place with flammable or explosive gas.
- Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.
- Do not touch or contact the input/output terminals because they may cause electric shock.
- Never disassemble, modify, or repair the product. There is a possibility of malfunction, electric shock, or a risk of fire.

### Warning

- If the user use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- If there is a possibility of an accident caused by errors or malfunctions of this product, install external protection circuit to prevent the accident.
- To prevent damage or failure of this product, please supply the rated power voltage.
- Remove this product while the power is off. Otherwise, it may cause malfunction or electric shock.
- When the sensor is exposed to water, the user must check the sensor to avoid the potential fire caused by a short circuit.

### Caution

- The contents of this manual may be changed without prior notification.
- Please do not turn ON and OFF the power continuously. It may shorten life span of the product and cause malfunction.
- Check the connection of the item before the power source on.
- Wiring length is 100 m max.
- Do not make high-tension wiring together with sensor product in the same pipe or duct to avoid malfunction caused by noise.
- Avoid the place where there is possible difficulty from induced electricity or is some magnetic noise.
- Please insulate the electrical wire which is out of use.
- Avoid the direct sunlight or the place accumulating radiant heat.
- Avoid the use of this item at the dusty places or the place where the item is exposed to the influence of frequent vibration and shock.
- Please note that the sensing distance depends on the target's size, color, material, or gloss.
- Please cover the sensor with visor in case that the sensor's view angle is exposed to too much rays (especially sun's rays)
- When installing more than two sensors, please leave the enough space between the sensors to prevent malfunction caused by mutual interference.
- Relay exchange is not available, but use servo relay. In case of prolonging life for relay, please set surge absorption component (Condenser and so on).
- When cleaning the lens of photo sensor, use dry cloth only. Do not use thinner or organic solvents.
- In case of using SMPS, please be sure to earth frame ground terminal (FG). Then install the noise preventing condenser between O V and FG.



## Characteristic

- Economical price
- Wide range of power supply voltage
- Relay output
- Flat lens type so less influence from the dust and etc
- Attached the indicator that can check the operation state.

## Specification

Model	PE-T5D	PE-M3D	PE-R05D
Detection method	through-beam type	retro-reflective type	diffuse-reflective type
Detection range	5 m	0.1 - 3 m	500 mm
Sensing object	Ø20 mm min (Opaque body)	Ø60 mm min (Opaque body)	200 × 200 mm (White non-glossy paper)
Power supply voltage	24 V d.c, 100 - 240 V d.c/a.c 50/60 Hz		
Power consumption	Emitter	1.6 W max	2 W max
	Receiver		
Control output	Relay output 1c, 250 V a.c, 2 A (Resistive load)		
Operation mode	Dark ON		Light ON
Response time	25 ms max		
Hysteresis	-		Less than 20 % of the detection range
Light source (Wave length)	Infrared LED (850 nm)		
Operation Lamp	Operation indicator : Red LED (Red LED of through beam type transmitter is the power indicator)		
Sensitivity adjustment	-	By the sensitivity adjusting volume	
Protective circuit	-		
Ambient illumination	Sunlight : 11,000 Lux max, Incandescent lamp : 3,000 Lux max		
Ambient temperature	operating : -20 ~ 60 °C, Storing : -25 ~ 70 °C (With no condensation)		
Ambient humidity	35 ~ 85 % R.H. (With no condensation)		
Protective structure	IP 54 (IEC)		
Insulation resistance	20 MΩ min (500 V d.c mega standard)		
Dielectric strength	1,500 V a.c, for 1 min		
Vibration resistance	10 - 55 Hz, Double amplitude : 1.5 mm, for 2 hours each X, Y and Z directions		
Shock resistance	500 %, 3 times each X, Y and Z directions		
Connection method	Cable extended type (Number of wire : 5P, Diameter Ø6 mm, Length : 2 m) ※ But transmitter is 2P		
Material	Case and lens : PC		
Weight	Transmitter and receiver each Approx. 120 g	Approx. 120 g	

(Note 1) The sensing distance can be varied depending on the size, surface condition, glossy, non-glossy of the sensing object.

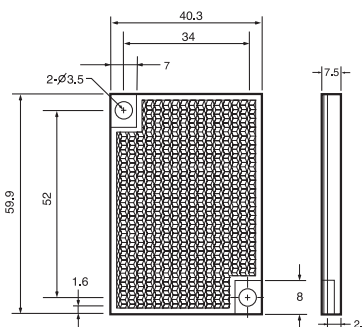
(Note 2) PE-TL5D is transmitter and PE-TR5D is receiver with the through beam type.

(Note 3) Sensing range of PE-M3D is the distance when HY-M5 (Mirror) is used.

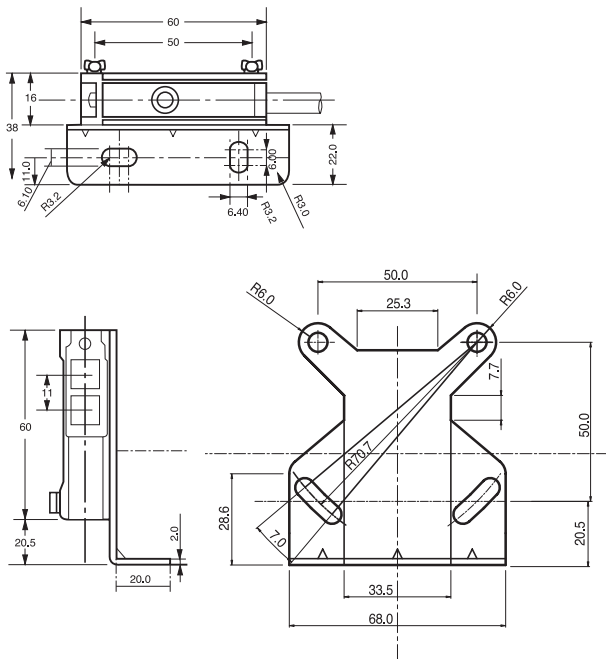
## Dimension

[Unit : mm]

### ■ Mirror (HY-M5)

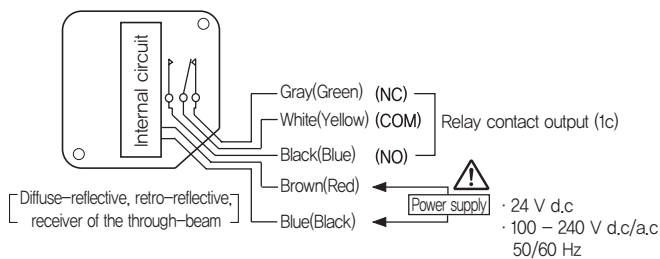


## ■ PE-R05D/PE-T5D



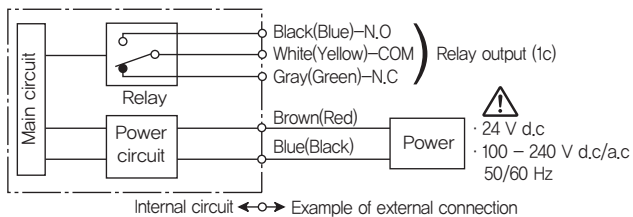
## Connection diagram

- Operating indicator becomes ON when sensing object is present within the optical axis.
- Com and NO become connected once the operating indicator (red LED) becomes ON.
- Color of the power input wire and polarity are not related to each other.
- Transmitter of the through-beam type is power input so the connection diagram is omitted.

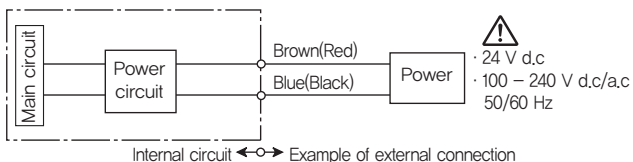


## Output circuit diagram

### ■ Diffuse-reflective, retro-reflective, receiver of the through-beam



### ■ Transmitter of the through-beam



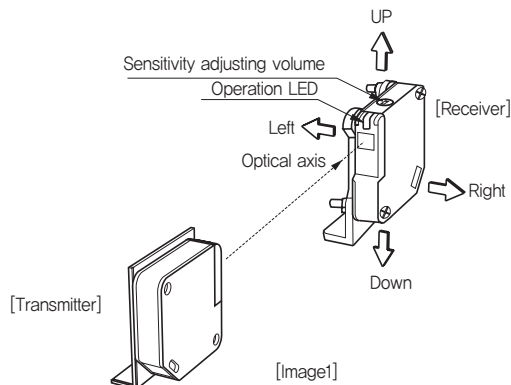
## Operation chart

Model	Sensing status	L-ON	D-ON
PE-R05D	Relay operation (a contact) and operation LED (Red LED)	ON	ON
		OFF	OFF
PE-M3D PE-T5D	Relay operation (a contact) and operation LED (Red LED)	ON	ON
		OFF	OFF

## Installation method

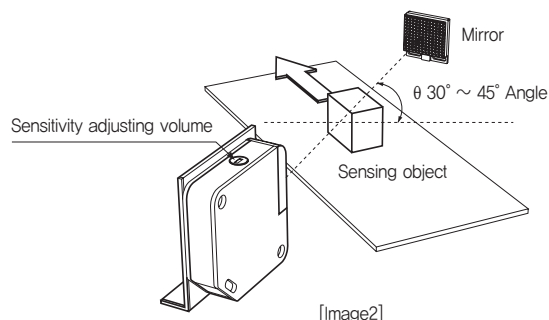
### ■ Through beam type (PE-T5D)

- Install the emitter (transmitter) and receiver to face each other in the straight line and check for the proper wiring. After finishing confirmation, supply in the power.
- Fix either the transmitter or receiver and check for the range where operation indicator of receiver becomes turned ON or turned OFF by controlling in the direction of up, down, left and right. After finishing the confirmation, place it in the middle and fix it.
- Place the sensing object within the optic axis range and confirm the condition of proper operation
- If the sensing objects are semitransparent or too small (less than 10 mm) then there is possibility that sensor will not detect any objects because they just pass through so please be cautious



### ■ Retro reflection type (PE-M3D)

- Install the sensor and mirror to face each other. After that, adjust the position of mirror to up, down, left and right direction and confirm the range where the operation indicator becomes turn OFF. Install it at the center of position where light became turned OFF.
- Adjust the sensitivity adjustment volume at the most suitable position according to the sensing range, sensing object and etc.
- When installing more than 1 sensor, please keep the distance (Gap) more than 30 cm due to the possibility of malfunction occurrence.
- When the sensing object is glossy or highly reflective, please install at an angle of 30° ~ 45° degree according to the moving direction of sensing object [Refer to the image 2 provided below]



### ■ Diffuse reflective type (PE-R05D)

- Generally it is used with the max sensitivity setting but it may be affected by the front side wall, pole and etc without sensing object so please be cautious when adjusting.
- Increasing the sensitivity too much may end up with malfunction, so please be cautious.
  - With the sensing object in the position, increase the volume gradually from the min sensitivity to the state when operation LED becomes ON and that position will be referred as point ①.
  - With the sensing object not in the position, decrease the volume gradually from the max to the state when operation LED becomes OFF and that position will be referred as point ②.
  - Set the volume halfway between point ① and ②

