

OUTLINE



This product is built-in amplifier photo sensor for long range detection equipped with NPN/PNP dual output. The through beam type can interrupt the emitting LED by an external signal for self check or interference protection. This sensor cannot be used for protecting human body.

SPECIFICATIONS

Model	Attached cable type	NE-T10RD-DC	NE-T10R-DC	NE-T30D-DC	NE-T30-DC	NE-M5RD-DC	NE-M5R-DC	NE-R10D-DC	NE-R10-DC
	Connector type	NE-T10RD-DC-J	—	NE-T30D-DC-J	—	NE-M5RD-DC-J	—	—	NE-R10-DC-J
Detection method	Through beam				Polarized retroreflective		Diffuse reflective		
Detecting distance	10m		30m		0.03~5m (With reflector model K-7)		1 m (200×200mm white drawing paper)		
Detection object	φ20mm or more Opaque				Mirror-like, opaque and translucent *1		Opaque, translucent and transparent *2		
Power supply	12 to 24V DC ±10% Ripple 10%								
Current consumption	Transmitter: 5mA or less Receiver: 20mA or less		Transmitter: 20mA or less Receiver: 20mA or less		22mA or less		26mA or less		
Output mode	Output mode NPN/PNP open collector dual output Rating: 100mA, (30VDC) or less (NPN: sink current; PNP: source current)								
Operation mode	Dark ON	Light ON	Dark ON	Light ON	Dark ON	Light ON	Dark ON	Light ON	
Light emission stop function	Provided (no-voltage input)								
Response time	1ms or less				0.5ms or less				
Hysteresis	—				—			10% or less	
Operating angle	3° (at receiver)		5° (at receiver)		30° (reflector)				—
Light source	Red LED (700nm)		Infrared LED (880nm)		Red LED (700nm)		Infrared LED (880nm)		
Indicator	Transmitter: — Receiver: Operation indicator (red LED) Stability indicator (green LED)		Transmitter: Power indicator (red LED) Receiver: Operation indicator (red LED) Stability indicator (green LED)		Operation indicator (red LED) Stability indicator (green LED)				
Volume	—				Sensitivity adjustment				
Material	Lens: Acrylic Case: heat-resistant ABS								
Connection	Attached cable type	Attached cable Transmitter: 0.3mm ² 3 cores 2m Receiver: 0.3mm ² 4 cores 2m				Attached cable Transmitter: 0.3mm ² 4 cores 2m			
	Connector type	M8 connector pigtail 0.2mm ² 4 cores 0.3m							
Weight	Approx. 130g (transmitter/receiver)				Approx. 130g				
Accessory	Operation manual				K-7 reflector, Operation manual		Operation manual		

ENVIRONMENTAL PERFORMANCE

- Ambient light**
10,000 lx max.
- Ambient temperature**
-25 to +55°C (non-freezing)
- Ambient humidity**
35 to 85%RH (non-condensing)
- Protective structure**
IP66
- Vibration**
10 to 55 Hz / 1.5 mm double amplitude / 2 hours each in X, Y, and Z directions
- Shock**
500m/s² / 3 times each in X, Y and Z directions
- Dielectric withstanding**
AC500 VAC for 1 minute
- Insulation resistance**
500 VDC mega, 20 MΩ or more

SENSITIVITY ADJUSTMENT VOLUME

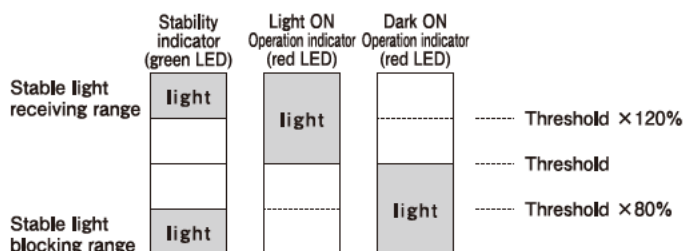
- When detecting a translucent object by the Through beam or Polarized retroreflective type, or there's a reflective background when using the Diffuse reflective type, turn the adjustment volume counterclockwise to reduce the sensitivity.
- See ADJUSTMENT for sensitivity setting.
- Use attached screwdriver. Do not rotate further than the end stops.



- The detecting distance and the detection object for polarized retroreflective type vary depending on reflector types combined with the sensor. The detecting distance is the range which you can set for the reflector. The sensor can detect an object even at an extremely short range.
- The detecting distance of the diffuse reflective type varies depending on the degree of transparency of the detection object. Be sure to check the detection in advance.
- Mounting brackets are sold separately.
 - *1 Glossy objects including mirror like objects wrapped in transparent film or laminated aluminum nameplates may cause unstable detection as these materials may scatter polarization lights.
 - *2 Detecting objects with a higher transparency may have shorter detection distance for diffuse reflective type sensors.

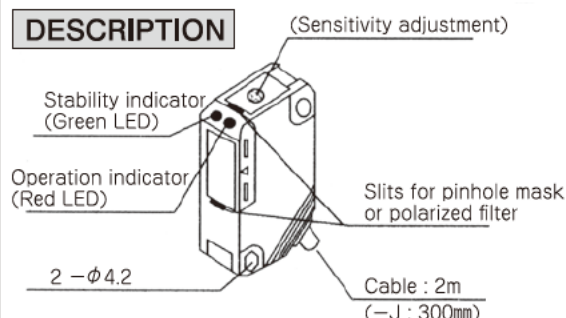
INDICATORS

- The operation indicator (red LED) and stability indicator (green LED) show the levels of received light intensity as described in the figure.
- NE-TL10R (transmitter) is not equipped with the operation indicator as the operation can be checked by the visible red light emitted from the sensor front.
- After aligning the optical axis and adjusting the sensitivity, use a detection object to block and unblock the light beam several times to make sure that the both activation and deactivation are occurred within the stable light receiving range and the stable light blocking range.
- Setting which allows activation and deactivation within the stable ranges achieves higher reliability against changes in the operating environment generated after installation.



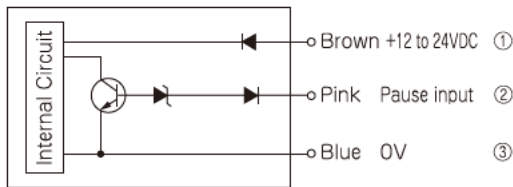
The red LED is the operation indicator. For the Light ON operation models, it turns on when the sensor receives light. For the Dark ON operation models, it turns on when the sensor receives no light.

DESCRIPTION

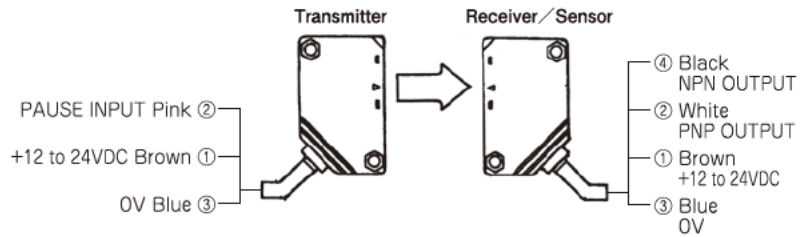
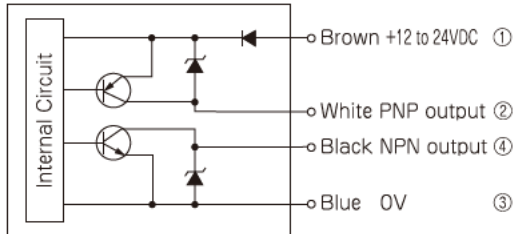


OUTPUT CIRCUIT AND WIRING

Transmitter



Receiver/Sensor



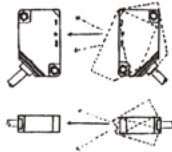
- The output transistor becomes OFF when it makes short circuit or overload.
- Make sure all connections are correct before turning the power on.
- ※ The numeral in ○ shows a pin number for connector type (- J).

INSTALLATION AND ADJUSTMENT

- Mounting brackets are optional (NE-B1, NE-B1C, NE-B2, NE-B2C). Refer to "DIMENSIONS" for installation. Tightening torque should be 0.8N·m or less when mounting by screws.
- Refer to "INDICATORS" regarding the indicators and operating modes.

◆ Through beam type

Install the transmitter and the receiver linearly. By swinging the transmitter vertically and horizontally, find the range where the stability indicator (green LED) turns on while the operation indicator (red LED) turns off in Dark ON mode (or the operation indicator turns on when in Light ON mode), then direct the sensor in the center of the range. Adjust the position of the receiver in the same way.



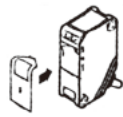
◎ Pinhole plate (option)

Pinhole plate reduces the size of activation area and detection objects.

Detection distance when the pinhole plates are put on both transmitter and receiver

Model : NE-T30D/NE-T30-DC

MODEL	NE-P3	NE-P5	NE-P5×1
Pinhole mask	φ3mm	φ5mm	5×1mm
Setting Distance	3m	7m	2m



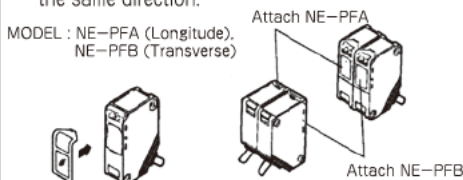
Model : NE-T10RD/NE-T10R-DC

MODEL	NE-P3	NE-P5	NE-P5×1
Pinhole mask	φ3mm	φ5mm	5×1mm
Setting Distance	1m	3m	0.7m

Bend the top and bottom tabs of the pinhole plate and insert the tabs into the slits on the sensor.

◎ Usage for Interference Protection Filter (Option)

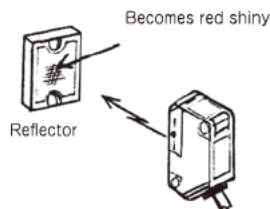
Interference immune filters (NE-PFA/NE-PFB) are available to prevent mutual interference in case that two NE-T10R(D)-(J) sensors are installed adjacently. NE-PFA and NE-PFB are filters with longitudinal and transverse polarization respectively. Use each set of the filter for respective pair of sensors. The detection distance when using the interference immune filter becomes 5m. Installed the two sensors in the same direction.



Note: Do not use the pinhole plate and the interference immune filter at the same time.

◆ Polarized retroreflective Type

- ① Arrange the sensor in line with the reflector. Face the sensor to the mirror and swing it vertically and horizontally. Install the sensor in the center of the area where the stability indicator (green LED) turns on while the operation indicator (red LED) turns off in Dark ON mode (or the operation indicator turns on when in Light ON mode). Taking advantage of the red light spot on the reflector seen from the behind the sensor allows easy setting.
- ② Set the sensitivity adjustment to MAX for detecting opaque objects.
- ③ Translucent objects may be detected by lowering the sensitivity.



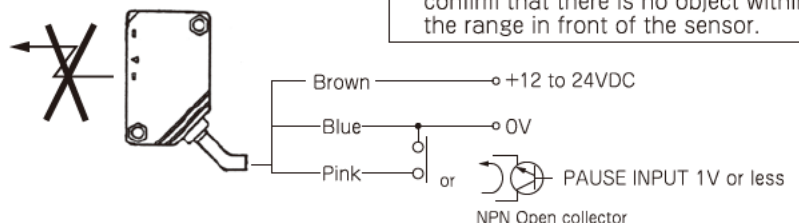
The range depends on reflector type. Non-polarization reflectors can't be used.

Reflector	K-7	K-71	S-510G
Range	0.03~5m	0.03~2m	0.1~3m
Notes	Accessory	Option	Option

PAUSE INPUT

Short circuit the PAUSE INPUT (pink) and 0V (blue) pauses the light emission.

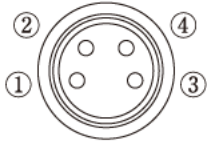
PAUSE INPUT : Connect to 0V (Short)



※ In case of using PAUSE INPUT, confirm that there is no object within the range in front of the sensor.

CONNECTOR TYPE (J)

Pin allocation (M8 pigtail)



Transmitter	Pin No	
	1	12 to 24VDC
	2	PAUSE INPUT
	3	0 V
	4	—

Receiver/Sensor	Pin No	
	1	12 to 24VDC
	2	PNP OUTPUT
	3	0 V
	4	NPN OUTPUT

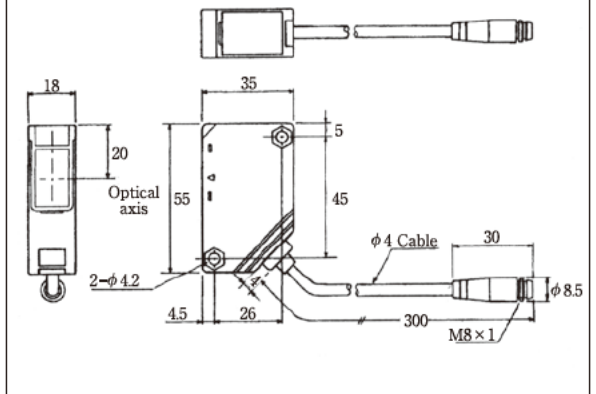
- Optical cable with connector is available.
Model : FBC-4R2S (Straight type)
FBC-4R2L (Angle type)

Transmitter		
Pin No	Cable Color	
1	Brown	12 to 24VDC
2	White	PAUSE INPUT
3	Blue	0 V
4	Black	—

Receiver / Sensor		
Pin No	Cable Color	
1	Brown	12 to 24VDC
2	White	PNP OUTPUT
3	Blue	0 V
4	Black	NPN OUTPUT

(in mm)

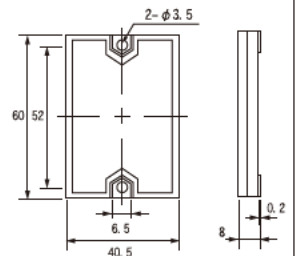
CONNECTOR type : M8 pigtail (J)



NOTES

- Use a power supply within the rated voltage and current in the specification.
- Limit the current of the power supply to 3A.
- Use UL class 2 power supply when using this product as UL approved equipment.
- Avoid turning the power on and off consecutively.
- The sensor starts operation after a warm-up period of 3 seconds. Always power on the sensor first.
- Mis-wiring may result in burnout or breakage. Check wiring before supplying the power.
- When using a DC power unit with an insulated transformer or a switching regulator, be sure to ground the frame ground (FG) terminals.
- Use a metal conduit to avoid malfunction or damage caused by induction when the wiring should be laid close to high-voltage cables or power lines.
- Though this sensor has IP 66 rated housing, do not use the sensor where water is splashing constantly or under the water.
- Clean the lens by a soft and dry cloth periodically. A stain or dirt stuck on the lens deteriorates the performance. Do not use organic solvent including alcohol and thinner.

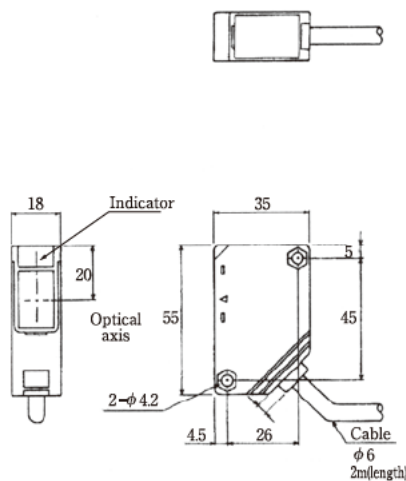
K-7 Reflector (attached)



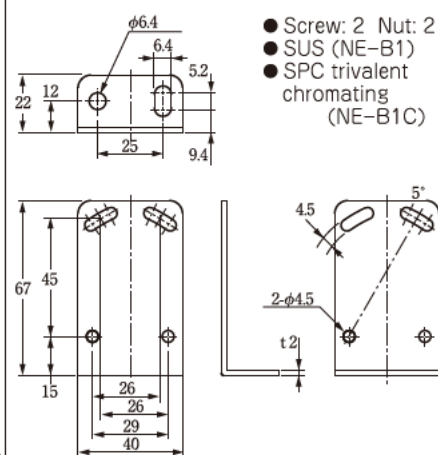
- Polarization reflector
- Effective area: 56×36mm
- Mount with M3 screws
- IP67 rated

DIMENSIONS (in mm)

Attached Cable Type

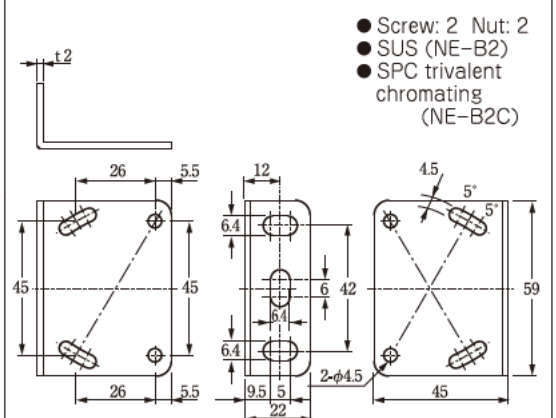


Mounting bracket (Optional) NE-B1 NE-B1C



- Screw: 2 Nut: 2
- SUS (NE-B1)
- SPC trivalent chromating (NE-B1C)

Mounting bracket (Optional) NE-B2 NE-B2C



- Screw: 2 Nut: 2
- SUS (NE-B2)
- SPC trivalent chromating (NE-B2C)

- The guarantee period of this product is one year after the delivery.
- If any defect is found during the guarantee period, Takenaka will repair or replace the defective product.
- This product is an industrial sensor which issues an output upon detecting an object. It does not have any function to prevent accidents, death or injuries.
- Takenaka will not held responsible for any damage or loss incurred due to accidents, faulty installation, abuse, misuse, improper maintenance or acts of God including lightning surge.