

NEF SERIES Instruction Manual

OUTLINE

This product is highly resistant to inverter noise emitted from inverter fluorescent lights.

SPECIFICATIONS

Model	NEF-T10RD	NEF-M5RD	NEF-R50
Detection method	Through beam	Polarized retroreflective	Diffuse reflective
Detecting distance	10m	0.03-5m (with K-7)	1m
Detection object	φ20mm (Min.) Opaque	Mirror-like / opaque	Opaque / translucent
Power supply	12-24V DC ±10% / Ripple 10%		
Current Consumption	Transmitter : 30mA or less Receiver : 25mA or less	40mA or less	
Output mode	NPN/PNPopen collector (Dual output)		
Control output	NPN : sink current 100mA (30VDC) or less	PNP : source current 100mA (30VDC) or less	
Operating mode	Dark ON		Light ON
Response time	5ms or less		
Hysteresis			10% or less
Operating angle	3° (at receiver)	30° (at reflector)	
Light source (Light wavelength)	Red LED (700nm)		Infrared Red LED (880nm)
Indicator	Transmitter : Power indicator (red LED) Receiver : Operation indicator (orange LED) Stability indicator (green LED)	Operation indicator (orange LED) Stability indicator (green LED)	
Volume (VR)	SENS : sensitivity adjustment (on receiver for through beam type)		
Short circuit protection	Provided		
Material	Case	Heat-resistant ABS	
	Lens	Acrylic	
Connection	Attached cable (outer dimension : dia. 6mm) Transmitter (through beam) : 0.3mm ² 2 cores 2m (gray) Receiver (through beam) : 0.2mm ² 4 cores 2m (black)		
Weight	Transmitter : Approx. 130 g Receiver : Approx. 150 g	Approx. 150 g	
Accessory	K-7 reflector Screwdriver for adjustment, mounting bracket, operation manual		

ENVIRONMENTAL SPECIFICATION

- Ambient light**
10,000 lx or less
- Ambient temperature**
-25 to +55°C (non-freezing)
- Ambient humidity**
35 to 85%RH (non-condensing)
- Protective structure**
I P66
- Vibration**
10-55Hz / 1.5mm double amplitude /
2 hours each in 3 directions
- Shock**
500 m/s² / 3 times each in 3 directions
- Dielectric withstanding**
1000 VAC for 1 minute
- Insulation resistance**
500 VDC, 20MΩ or higher

SENSITIVITY ADJUSTMENT

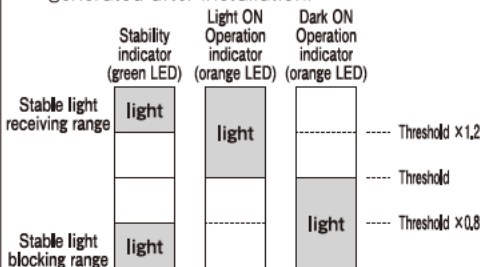
- Use the sensitivity adjustment (SENS) to reduce the sensitivity. The detection performance may be better for the following cases: when detecting a translucent object by the Through beam or Polarized retroreflective type, there's reflective background when using the Diffuse reflective type or using the Through beam type for short distance like 2m or less. 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 detection object of retroreflective types varies, 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 in extremely short range.
- The detecting distance of diffuse reflective type varies, depending on transmittance of the detection object. Please be sure to check the detection geborehand.

INDICATORS

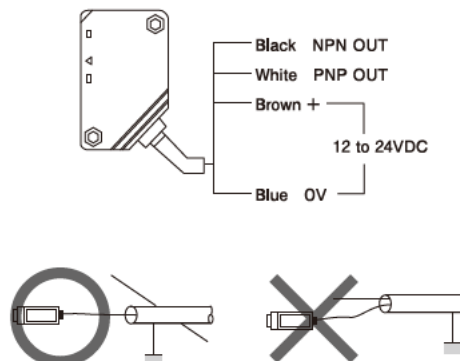
- The operation indicator (orange LED) and stability indicator (green LED) show the level of received light intensity as described in the figure.
- After aligning the optical axis and adjusting the sensitivity, use a detection object to block and unblock the light beam several times to make sure that 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.



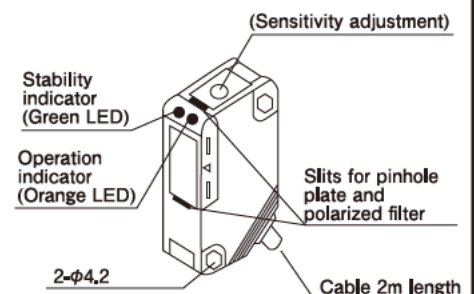
The orange LED is the operation indicator.
For the Light ON operation models,
it turns on when the sensor receives light.
For the Dark ON operation models,
it turns on when the sensor receives no light.

WIRING

- Do not use the sensor while turning on and off the power.
- Mis-wiring may result in burnout or breakage. Check wiring before supplying the power.
- 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.
- Limit the current of the power supply to 2A.
- Insulate the stability output cable when unused.



DESCRIPTION

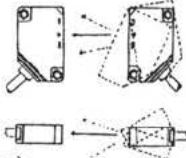


INSTALLATION

- Mounting bracket (NE-B1) is attached.
- Tightening torque is 0.8 N·m (8.2kgf·cm) or less when mounting the sensor by screws.
- Refer to INDICATORS regarding the indicator and the operating mode.

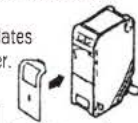
◆ Through beam type

Install the transmitter and the receiver linearly. By moving the transmitter vertically and horizontally, find the range where the stability indicator (green LED) turns on while the operation indicator (orange LED) turns off, 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 : NEF-T10RD

MODEL	NE-P3	NE-P5	NE-P5×1
Pinhole diameter	φ3	φ5	5×1mm
Detection distance	1m	3m	0.7m

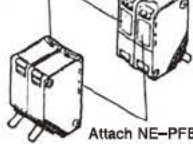
Bend the top and bottom tabs of the pinhole plate and insert the tabs into the slits on the sensor.

◎ Interference immune filter (option)

Interference immune filters (NE-PFA/NE-PFB) are available to prevent mutual interference in case that two through beam type 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.

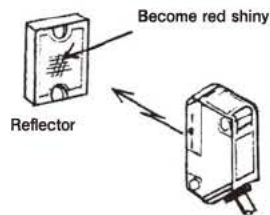
MODEL : NE-PFA (Polarizer)
NE-PFB (Analyzer)

Attach NE-PFA



◆ Polarized retroreflective type

- ① Arrange the sensor in line with the reflector. Face the sensor to the mirror and move 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 (orange LED) turns off. 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.



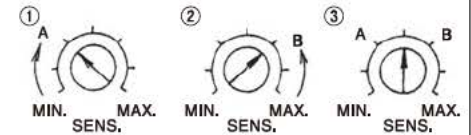
NOTE

- Use a power supply within the rated voltage and current in the specification.
- Avoid turning the power on and off consecutively.
- Though this sensor has IP 66 rated housing, do not use the sensor where water is splashing constantly or under the water.
- Do not use the sensor in an environment containing erosive gas, exposed to a splash of chemicals or oils, or a place exposed to vibration or shock may cause false operation or breakage of the sensor.
- 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.
- The pinhole plate and the interference immune filter can't be used together.
- When using a DC power unit with an insulated transformer or a switching regulator, be sure to ground the frame ground (G) terminal.

◆ Diffuse reflective type

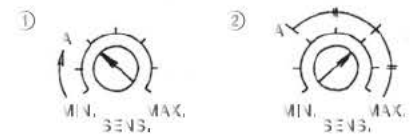
● When any light reflecting object is in the background

- ① Place a detection object at a given position and turn up the sensitivity adjustment volume from MIN until the operation indicator (orange LED) turns on (Point A).
- ② Remove the object and turn down the sensitivity adjustment volume from MAX until the operation indicator turns off (Point B). (MAX is regarded as Point B if the operation indicator doesn't turn on at MAX.)
- ③ Set the volume at the middle point between Points A and B.



● When no light reflecting object is in the background

- ① Place a detection object at a given position and turn up the sensitivity adjustment volume from MIN until the operation indicator (orange LED) turns on (Point A).
- ② Set the volume at the middle point between Point A and MAX.

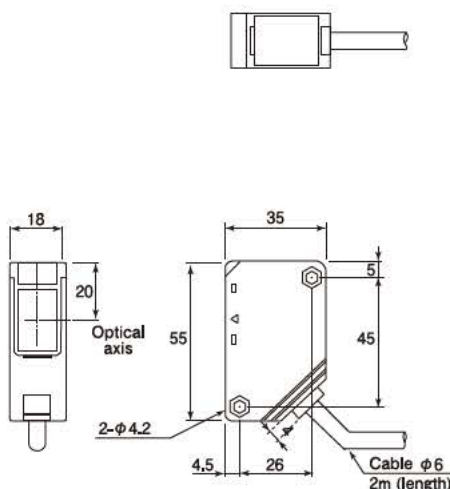


Make sure both the operation indicator and the stability indicator (green LED) turn on when the detection object is placed at the given position.

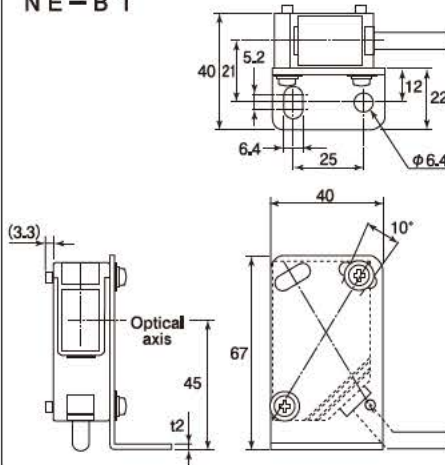
DIMENSIONS

(unit : mm)

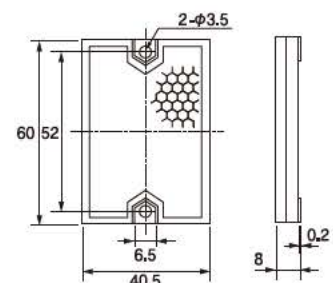
Basic Dimensions



Sensor with Bracket NE-B 1



Reflector : K-7



- 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.