

TAKEX PHOTOELECTRIC BEAM SENSOR

PR-11BE : OUTDOOR 1 to 11m(3.3 to 36ft.)
: INDOOR 1 to 15m(3.3 to 49ft.)

Instruction Manual

Thank you for purchasing our photoelectric beam sensor.

This sensor will provide long and dependable service when properly installed.

Please read this Instruction Manual carefully for correct and effective use.

Please note : This sensor is designed to detect intrusion and to initiate an alarm ; it is not a burglary-preventing device.

TAKEX is not responsible for damage, injury or losses caused by accident, theft, Acts of God (including inductive surge by lightning), abuse, misuse, abnormal usage, faulty installation or improper maintenance.

PRODUCT DESCRIPTION

This beam sensor contains a transmitter receiver and reflector.

As illustrated, an infrared beam, projected by the transmitter, is reflected back to the receiver.

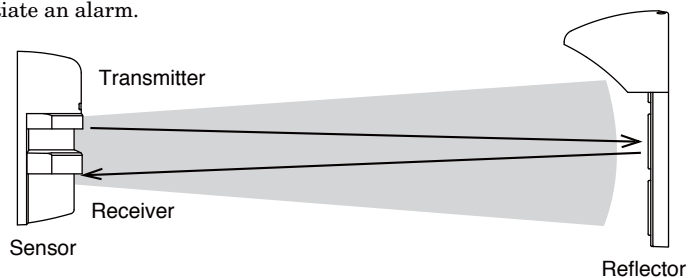
The protection loop is formed along the path from the transmitter to the reflector and back to the receiver.

When this protection loop is interrupted, the receiver will initiate an alarm.

* This beam sensor requires cable to the sensor unit end only, and reflects an infra-red light beam off a reflector unit (supplied). It is suitable for monitoring entrances, gateways, driveways etc where cabling to both ends is a problem.

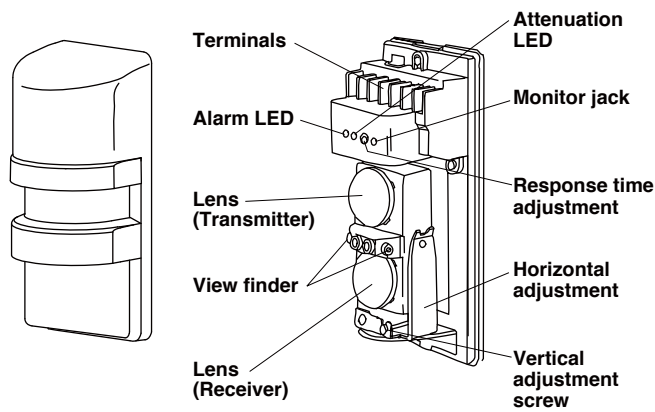
* This beam sensor can be used internally or externally, with a maximum range between the sensor unit and reflector of 15m internally, or 11m externally.

* Beam alignment can be adjusted at the sensor side only.



1 PARTS DESCRIPTION

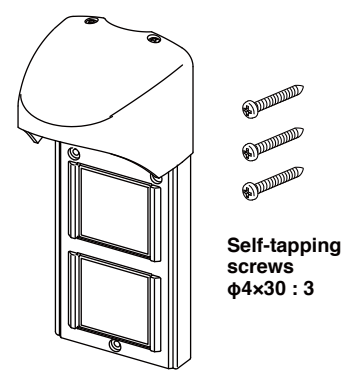
SENSOR



COVER

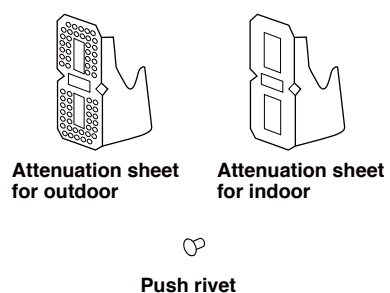
MOUNTING PLATE

REFLECTOR



Self-tapping screws φ4×30 : 3

ACCESSORY

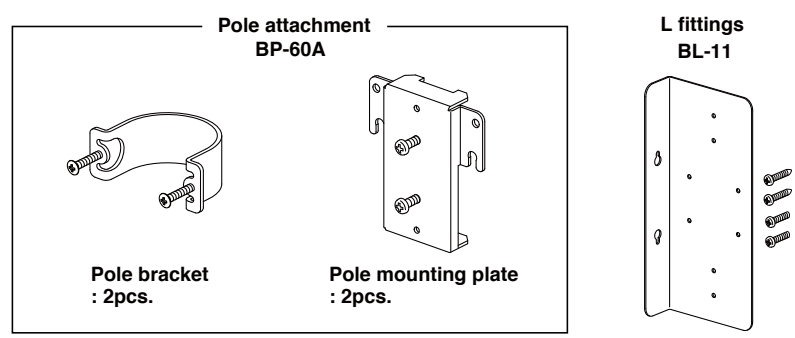


Attenuation sheet for outdoor

Attenuation sheet for indoor

Push rivet

OPTION PARTS



Pole attachment BP-60A

Pole bracket : 2pcs.

Pole mounting plate : 2pcs.

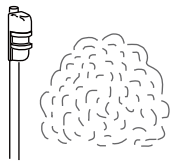
L fittings BL-11

2 CAUTIONS ON INSTALLATION

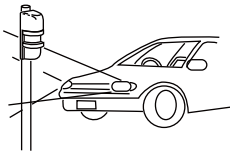
This beam sensor can be used for general monitoring, lighting control, and advising signalling (audible warnings, alarm 'chime' systems, or wired or wireless doorbells etc).

They are not recommended for 'graded' alarm systems, or perimeter or external detection in conjunction with security systems where 'nuisance' alarms are unacceptable.

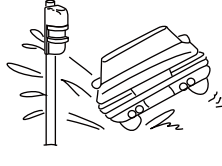
For intruder alarm / security applications we recommend Takex active infra-red beams due to their increased stability and resistance to nuisance alarms.



- Remove all obstructions (trees, clothes lines, etc.) between sensor and reflector.



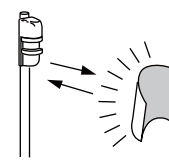
- Avoid strong light from the sun, automobile headlights etc. directly shining on sensor. When strong light stays in the optical axis for a long time, it does not cause malfunction but will affect the product life.



- Do not install the unit on places where it may be splashed by dirty water or direct sea spray.



- Do not install the unit on unsteady surfaces.



- Do not place highly reflective objects between the sensor and the reflector as they are likely to create a protection loop and prevent the sensor from making a detection.



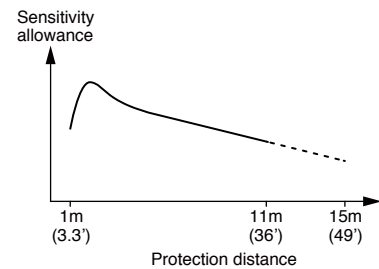
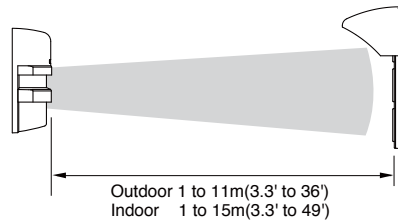
- Hazardous weather such as heavy rain or frost may cause false alarms. Sensitivity allowance of reflective type beam sensors is comparatively lower than that of standard type beams.

PROTECTION DISTANCE

* Protection distance (between sensor/reflector) should not exceed in the rated range.

The external range may be reduced due to the possible effect of mist and fog, or frost, rain, or condensation on the sensor unit cover and reflector unit, which can cause nuisance alarms.

* Sensitivity allowance will be greatly decreased when the protection distance deviates from the rated range. (See the sensitivity allowance-protection distance curve for PB-11BE)

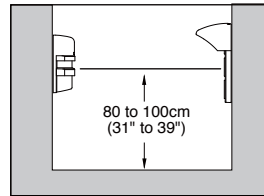


BEAM ALIGNMENT

- Fine tuning using a volt meter is required. (See section 5)

HEIGHT OF INSTALLATION

Install the sensor at a height of 80 to 100cm (31" to 39") to catch a human target. (Install vertically so that the center of the sensor lens and middle part of the reflector assembly are placed at the same height.)

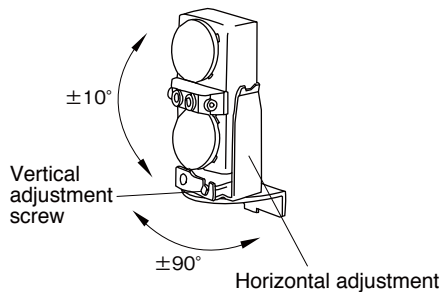


CAUTIONS ON INSTALLATION

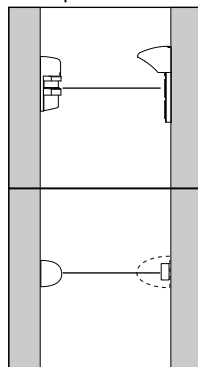
- Avoid overhead wiring.
- When installing indoors, wiring procedures similar to those for telephone or intercoms are acceptable. Outdoor wires should be placed inside conduit, or underground cable/metal shielded cable should be used.

POSITION OF INSTALLATION

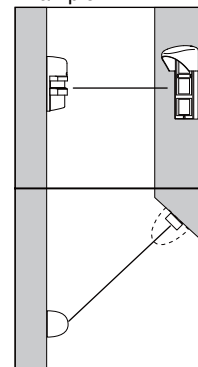
Using the adjustments, the lens can move horizontally (± 90 degrees) and vertically (± 10 degrees) allowing the unit to work in all directions. (example 1 to 3)



Example 1

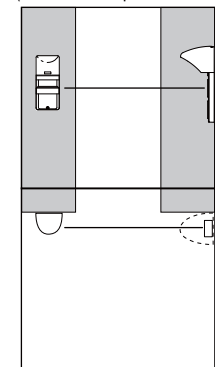


Example 2



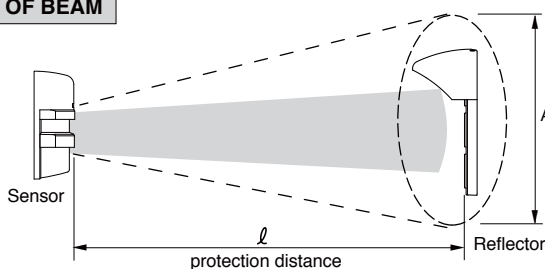
Example 3

(When BL-11 optional is used)



* The sensor and reflector units should be installed uprightly and vertically. Make sure that the reflector's front side faces the sensor as illustrated.

EXPANSION OF BEAM

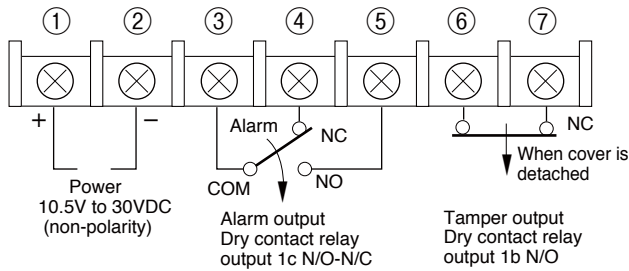


Expansion of beam can be calculated as follows.
 $A = 0.03 \times l$

| l | A |
|-------------|--------------|
| 5m (16.5') | 0.15m (5.9") |
| 11m (36.3') | 0.33m (13") |

3 WIRING

TERMINAL CONFIGURATION



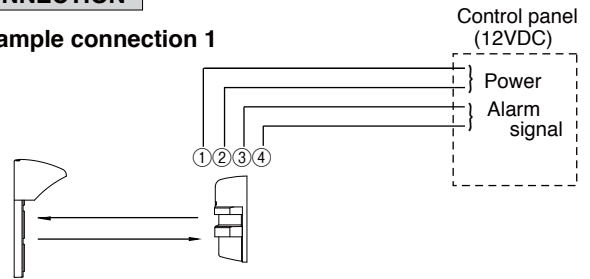
Wiring distance

| Wire size | Voltage | DC12V | DC24V |
|---------------------|---------|---------------|------------------|
| AWG 22 (Dia 0.65mm) | | 150m (500') | 1,700m (5,610') |
| AWG 20 (Dia 0.8mm) | | 300m (990') | 2,800m (9,240') |
| AWG 18 (Dia 1.0mm) | | 450m (1,490') | 4,200m (13,860') |
| AWG 17 (Dia 1.1mm) | | 550m (1,815') | 5,100m (16,830') |

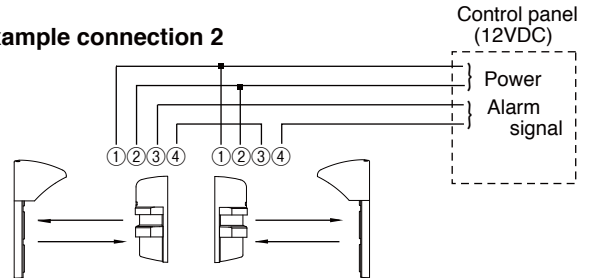
Note) Maximum wiring distance when two or more sets are connected is the value above divided by the number of sets.

CONNECTION

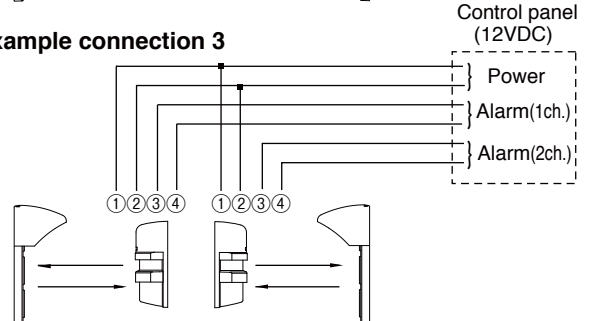
Example connection 1



Example connection 2



Example connection 3

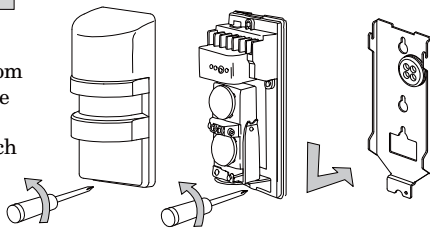


4 INSTALLATION

WALL MOUNT

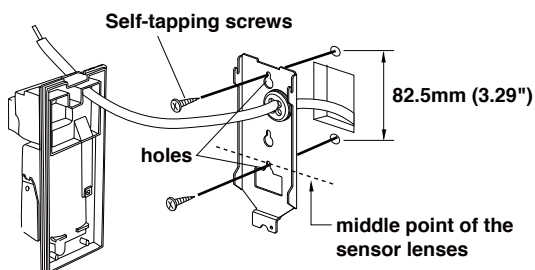
Sensor

① Remove cover from unit and slide the mounting plate upwards to detach it.



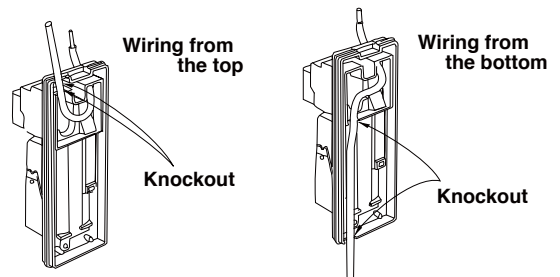
② Pull the wire through on the installation site.

③ Make one hole in the grommet on the mounting plate and pull the wire through it. Secure the plate with 2 x (φ 4x30mm) self-tapping screws.



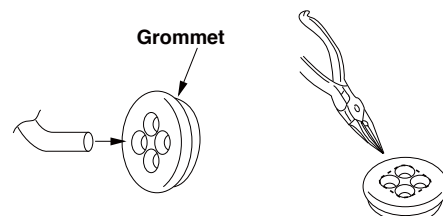
Pull the wire through the sensor body (back to front) and attach it to the terminals on the sensor.

④ When the wiring is exposed break knockouts (2 positions) on the rear of the unit, pull the wire through as in the figure and attach it to the terminals on the sensor.



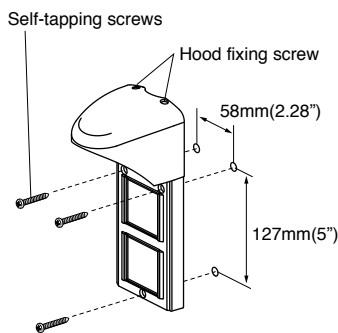
⑤ After wiring is completed, adjust alignment, attach cover and check operation. (Note : Sealing is not required around the unit due to rain-proof construction.)

※ The grommet is compatible with a wire of φ 3mm (φ 0.12") to φ 6mm (φ 0.24") outer dia. When a wire of more than φ 6mm (φ 0.24") outer dia. is used, cut off the dotted line portion on the below figure using pliers or the like. Then use caulking to prevent insects from entering into the unit.



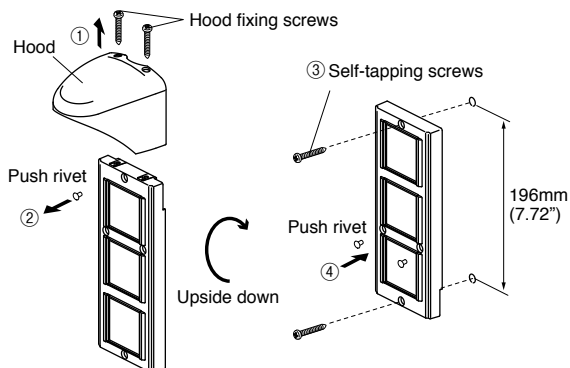
● Reflector

Fix the reflector into position facing the sensor with 3 x (Φ4x30mm) self-tapping screws



※In case of indoor installation, the hood can be removed if it is not required.

- ① Unscrew 2 x fixing screws on the top of reflector and remove the hood.
- ② Remove push rivet.
- ③ Invert the reflector with the hood fixing holes facing downwards and fix into position with 2 x (Φ4x30mm) self-tapping screws using the upper and lower holes.
- ④ Insert 2 x push rivets into the fixing screw holes to cover these holes.



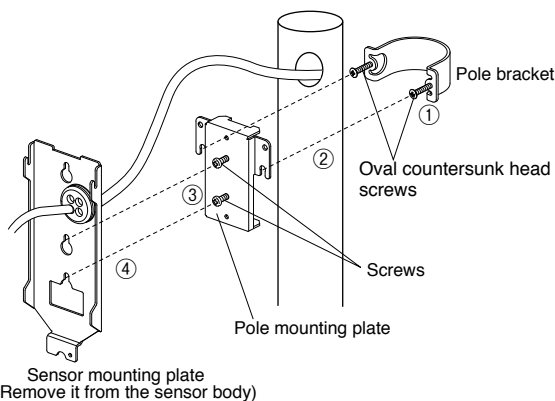
(note) In case of outdoor installation, please do not remove hood.

POLE MOUNT WITH BP-60A (Sold separately)

※Fit pole size : Outside dia.38mm(1.5") to 45mm(1.77").

● Sensor

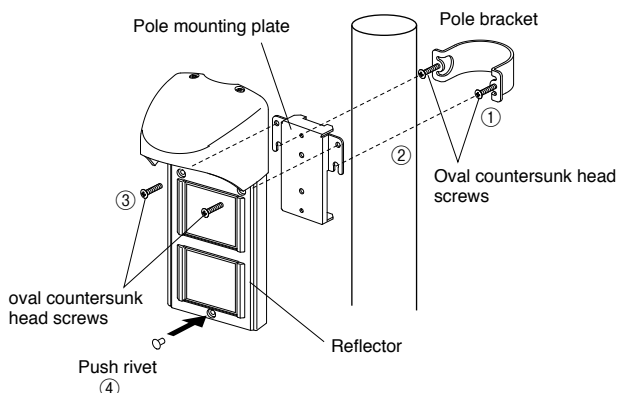
- ① Insert 2 x oval countersunk head screws (M4x20) into the pole bracket with a few turns.
- ② Hold a pole between the pole mounting plate and the pole bracket and tighten the screws.
- ③ Insert 2 x screws (M4x6) into the pole mounting plate with a few turns.
- ④ Fix the sensor mounting plate to the pole mounting plate.



- ⑤ Please follow the wall mount procedure after completing the above.

● Reflector

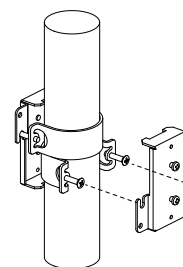
- ① Insert 2 x oval countersunk head screws (M4x20) into the pole bracket with a few turns.
- ② Hold a pole between the pole mounting plate and the pole bracket and tighten the screws.
- ③ Fix the reflector unit to the pole mounting plate by 2 x oval countersunk head screws (M4x20).
- ④ Insert the push rivet into the lower hole in order to seal it.



In case of back-to-back

(note) It's not possible to mount the reflector back to back.

- ① Mount the first pole mounting plate.
- ② Pass through the second pole bracket under the first pole mounting plate, and fix the second pole mounting plate upside down.

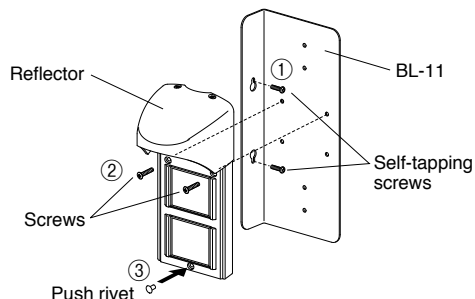


※Please follow the same procedure of wall mount after above.

Installation with BL-11 (Sold separately)

(note) It's not possible to mount the sensor on BL-11.

- ① Fix the BL-11 to the wall by 2 x self-tapping screws. (Φ4x20mm) (using keyhole)
- ② Fix the reflector to the BL-11 by 2 x oval countersunk head screws (M4x20).
- ③ Insert the push rivet into the lower hole in order to seal it.



5 ALIGNMENT AND OPERATION

BEAM ALIGNMENT

- ① With the cover detached, face the sensor lenses towards the reflector.
Adjust the angle of the sensor unit vertically and horizontally by looking through the view finder placed between the sensor lenses.
Adjust it until the center of the reflector can be seen in the middle of the view finder.
- ② Supply power to the sensor.
When the sensor and reflector are properly installed at the same height, alarm LED will remain OFF.
- ③ After confirming that the alarm LED is OFF, place the attenuation sheet on the optics of the sensor and check if the attenuation LED is OFF.
Please note that there are two types of attenuation sheets. (indoor use and outdoor use)
- ④ If the attenuation LED lights, make adjustment again until it turns OFF.
- ⑤ Fine tuning should be done by monitoring the output voltage using a volt meter.

(See the table below.) until obtaining the peak voltage.

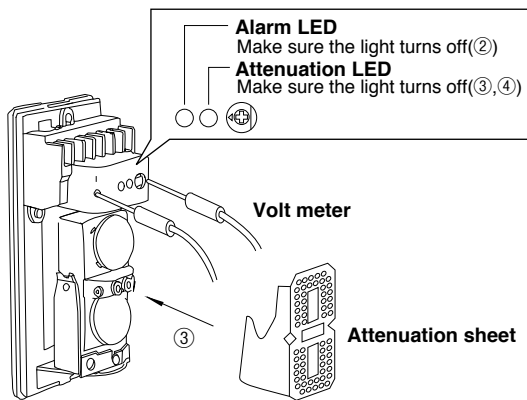
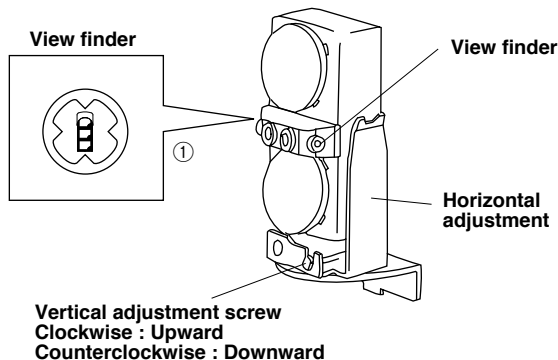
| Monitor output voltage | Beam level (outdoor, indoor) |
|------------------------|------------------------------|
| 2.6V or more | Best |
| 1.4 to 2.6V | Good |
| less than 1.4V | Re-adjustment |

Note : ● The above voltage shows the monitor output when the lenses are covered by the attenuation sheet.
● Using the attenuation sheet and a voltmeter ensures optimum performance of the sensor.

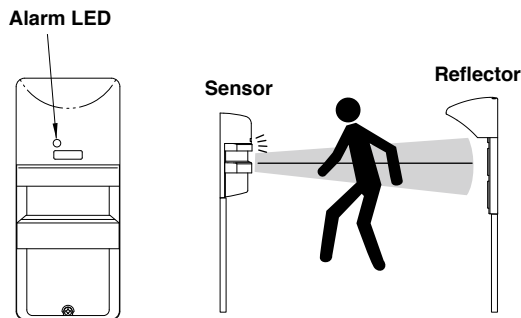
- ⑥ Remove the attenuation sheet after aligning the reflector beam (and retain for future use) before fitting the front cover.

OPERATION CHECK

- After installing the sensor and making the alignment adjustment, check the operation of the sensor, with its cover attached, by looking at the alarm LED on the sensor.
- ① Make sure that the alarm LED is OFF.
 - ② When the infrared beam is interrupted, the alarm LED lights.
It indicates that the operation is normal.
The relay operates during the interruption time for a minimum of 2 seconds.
 - ③ Walk through the infrared beam between the sensor and the reflector and make sure that the alarm LED lights up and then goes off.

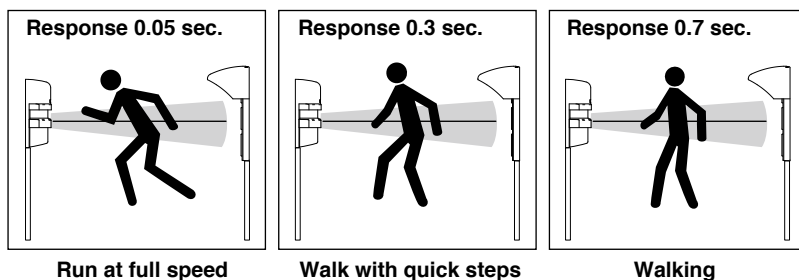
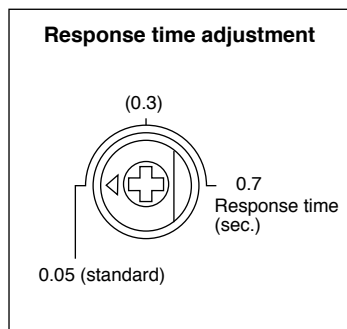


※After adjustment, remove the attenuation sheet.



6 RESPONSE TIME

Adjust response time as follows. The unit does not detect a passing object faster than the response time setting. If the response time is set longer, the unit does not detect human beings. Adjust to a little longer response time in a site where large objects such as birds, newspaper, or falling leaves may pass through the beam path.



Note : ●Unreasonably long response times may fail to detect a human being.

7 TROUBLESHOOTING

| Symptom | Possible cause | Remedy |
|---|---|---|
| Alarm LED does not light when the beam is broken. | 1) No power supply. 2) Bad wiring connection or broken wire, short. 3) Beam is reflected on another object and sent into the receiver. | 1) Turn on the power supply. 2) Check wiring. 3) Remove the reflecting object or change beam direction. |
| Alarm LED continues to light. | 1) Beam alignment is out. 2) Shading object between sensor and reflector. 3) Sensor cover or reflector are soiled. | 1) Check and adjust again. 2) Remove the shading object. 3) Clean the reflector with a soft cloth, or wash the cover with water. * Do not clean the cover with a cloth. |
| Intermittent alarm | 1) Bad wiring connection. 2) Change of supply voltage. 3) Shading object between sensor and reflector. 4) A large electric noise source, such as power machine, is located nearby sensor. 5) Unstable installation of sensor and reflector. 6) Sensor cover or reflector are soiled. 7) Improper alignment. 8) Small animals may pass through the beams. | 1) Check again. 2) Stabilize supply voltage. 3) Remove the shading object. 4) Change the place for installation. 5) Stabilize. 6) Clean the reflector with a soft cloth, or wash the cover with water. 7) Check and adjust again. 8) Set the response time longer. (Do not use this setting where an intruder can run at full speed through the beam.) |

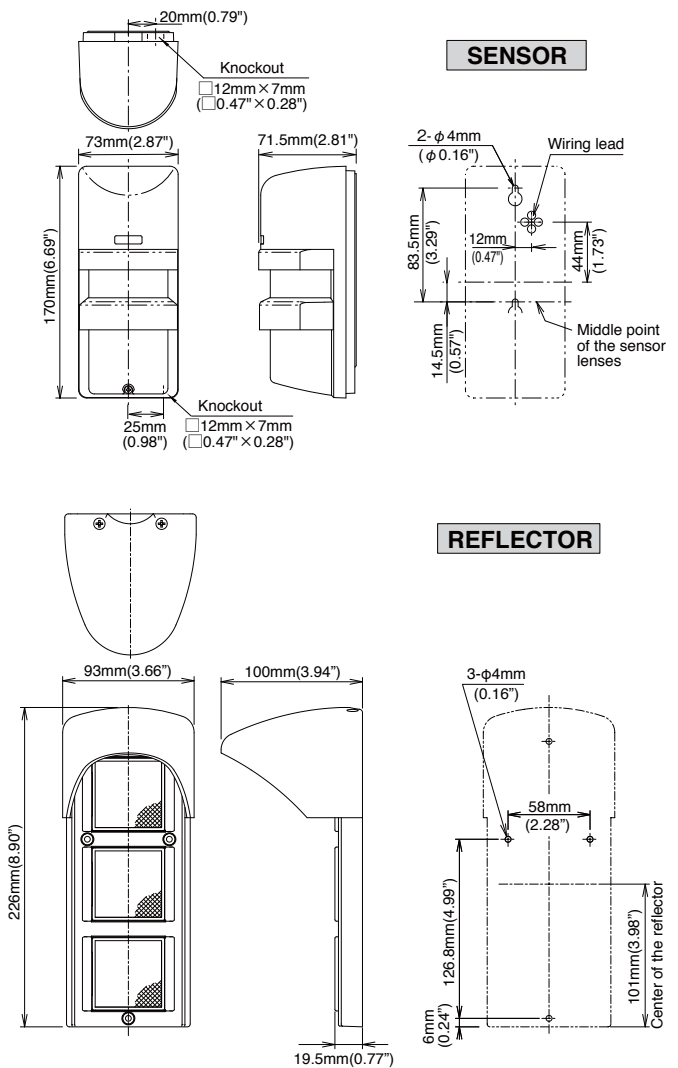
⟨Daily check⟩ Check the operation of the unit once a week.
If the cover becomes soiled, wash it with water.
Never clean it with a cloth otherwise it could damage the photocatalytic coating applied to the sensor cover.
The coating is designed to prevent attenuation of the infrared caused by waterdrops from torrential rain.

8 SPECIFICATIONS

| | |
|---------------------------|---|
| Model | PR-11BE |
| Detection system | Near infrared beam interruption system (reflective) |
| Protection distance | Outdoor 1 to 11m (3.3 to 36') Indoor 1 to 15m (3.3 to 49') |
| Supply voltage | 10.5V to 30V DC (Non-polarity) |
| Current consumption | 55mA or less |
| Alarm output | Dry contact relay from N/O-N/C Contact capacity : 30V (AC/DC) 0.5A or less Relay operation : Interruption time (minimum 2 secs) |
| Tamper output | Dry contact relay 1b (N/C) Action : Activated when cover is detached. Contact capacity : 30V (AC/DC) 0.5A or less |
| Response time | 0.05sec to 0.7sec. (Adjustable by potentiometer) |
| Alarm LED | Red LED ON : when an alarm is initiated |
| Attenuation LED | Red LED ON : when beam is attenuated |
| Functions | Monitor output |
| Ambient temperature range | -25°C to +60°C (-13°F to +140°F) |
| Mounting positions | Outdoor/Indoor |
| Wiring | Terminals |
| Weight | Sensor : 430g (15oz) Reflector : 190g (6.7oz) |
| Appearance | Sensor : Resin (wine red) Reflector : Resin (clear / black) |

●Specifications are subject to change without notice.

9 EXTERNAL DIMENSIONS



LIMITED WARRANTY

TAKEX products are warranted to be free from defects in material and workmanship for 12 months from original date of shipment. Our warranty does not cover damage or failure caused by natural disasters, abuse, misuse, abnormal usage, faulty installation, improper maintenance or any repairs other than those provided by TAKEX. All implied warranties with respect to TAKEX, including implied warranties for merchantability and implied warranties for fitness, are limited in duration to 12 months from original date of shipment. During the Warranty Period, TAKEX will repair or replace, at its sole option, free of charge, any defective parts returned prepaid. Please provide the model number of the products, original date of shipment and nature of difficulty being experienced. There will be charges rendered for product repairs made after our Warranty Period has expired.

