

# TAKEX PHOTOELECTRIC BEAM SENSOR

PB- 50F : OUTDOOR 165 ft. ( 50m)

PB-100F : OUTDOOR 330 ft. (100m)

PB-200F : OUTDOOR 660 ft. (200m)

## Instruction Manual

Thank you for purchasing our photoelectric beam sensor.

This unit will provide long term, dependable service when properly installed.

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

**Please note :** This sensor is designed to detect intrusion and 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.

### [FEATURE]

**\* High power infrared \***

This sensor adopt 4-stacked beam synchronized interruption system which avoids false alarm caused by small animals and the like.

The active infrared transmission is exceptionally strong with a maximum arrival distance ten times greater than the specified protection distance.

**\* Monitor output \***

You can adjust optics precisely by measuring voltage on monitor jack with tester.

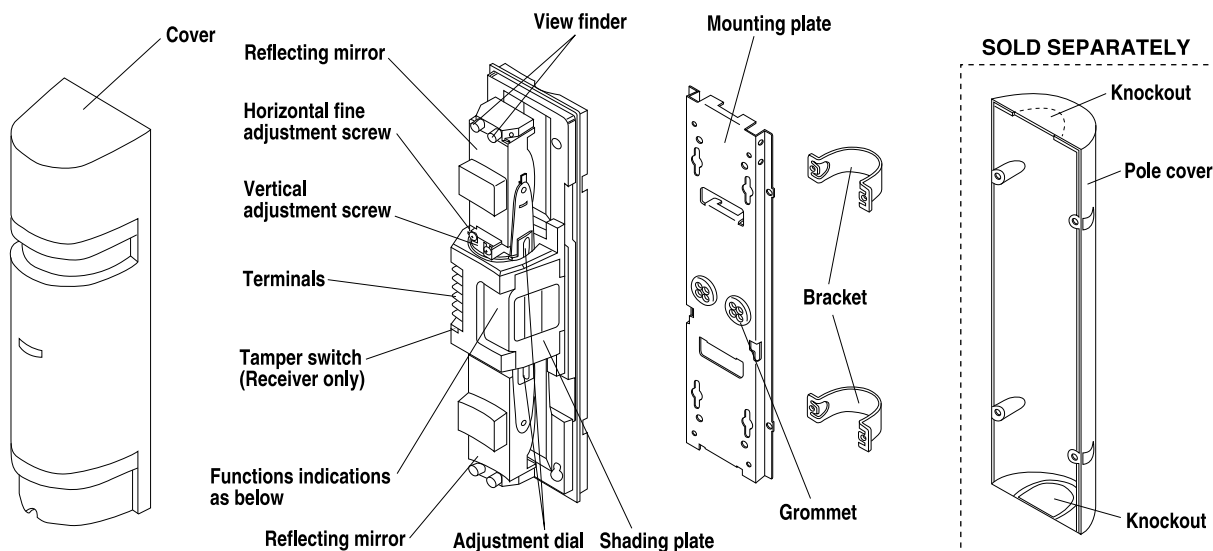
**\* Sound check switch \***

You can adjust optics easily by using sound check switch which indicates beam level with sounds.

**\* Other features \***

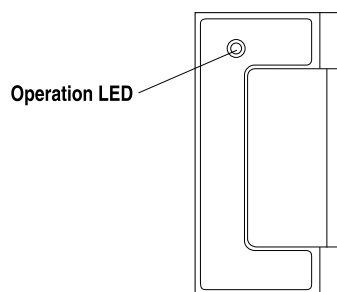
Sensitivity attenuation LED, response time adjustment volume, tamper output, AGC circuit.

## 1 PARTS DESCRIPTION

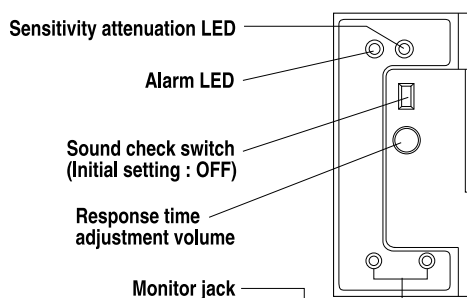


### Functions / Indications

#### [Transmitter]



#### [Receiver]

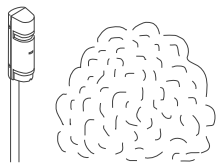


#### \* Accessories

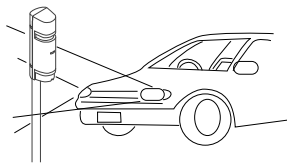
Tapping screw ( $\phi 4 \times 30$ )	8 pcs
Countersink screw (M4 $\times$ 20)	8 pcs
Pole cap	2 pcs

# 2 CAUTIONS ON INSTALLATION

## 1) DO'S AND DON'T'S



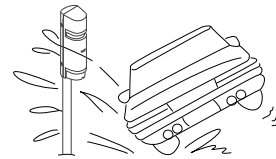
● Do not install the unit on places where it may be interrupted by obstacles such as trees.



● Avoid strong light from the sun, automobile headlights etc. directly shining on sensors.

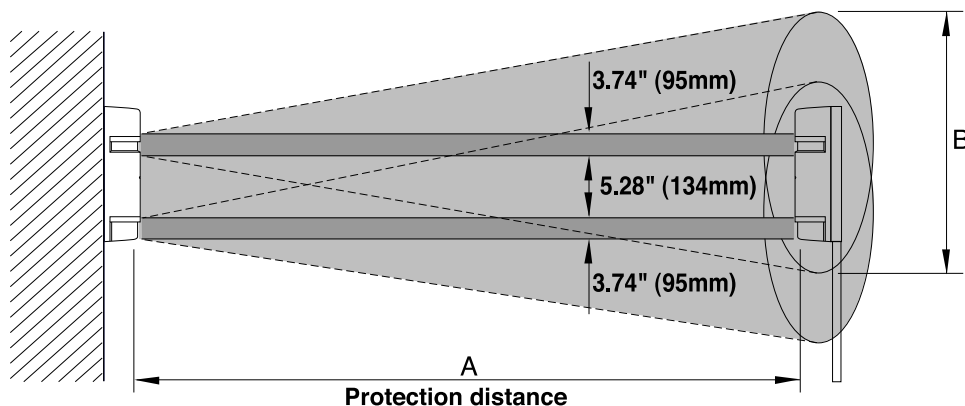


● Do not install the unit on unsteady surfaces.



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

## 2) Detection distance and installation height



\* Install the sensor at height of 27" to 35" (70cm - 90cm) to catch human pattern.

Model	A	B
PB- 50F	165' ( 50m) or less	4' (1.2m)
PB-100F	330' (100m) or less	8' (2.4m)
PB-200F	660' (200m) or less	16' (4.9m)

## 3) Wiring distance

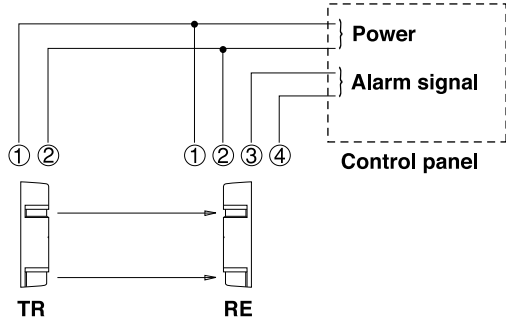
Size of wire used	power voltage	
	12V DC	24V DC
AWG 22 (Dia 0.65mm)	490' (150m)	4,000' (1,200m)
AWG 20 (Dia 0.8mm)	830' (250m)	6,600' (2,000m)
AWG 18 (Dia 1.0mm)	1,200' (366m)	10,000' (3,000m)
AWG 17 (Dia 1.1mm)	1,450' (442m)	11,500' (3,510m)
AWG 16 (Dia 1.25mm)	2,000' (600m)	15,500' (4,730m)
AWG 15 (Dia 1.4mm)	2,600' (793m)	21,000' (6,400m)

NOTE : 1) Max. wiring distance when two or more sets are connected is the above value divided by the number of sets.

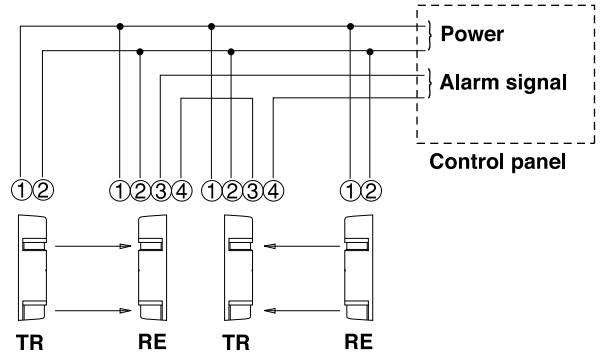
2) The signal line can be wired to distance of up to a 3,300' (1,000m) with AWG 22 (Dia. 0.65mm) telephone wire.

# 3 WIRING

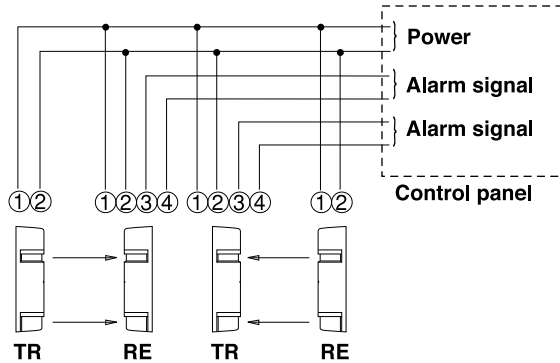
1) Basic connection



2) When two or more sets are connected to the same line.

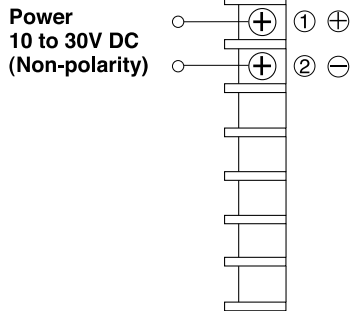


3) When two or more sets are connected to separate lines.

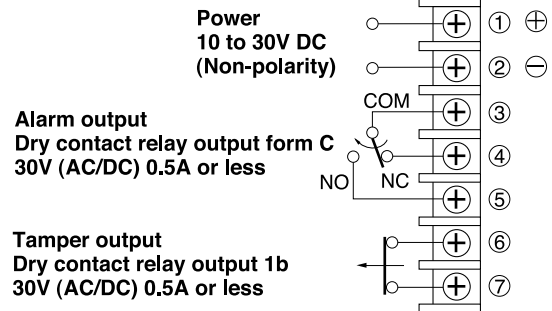


# 4 TERMINAL ARRANGEMENT

[Transmitter]

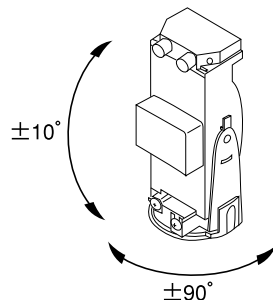


[Receiver]

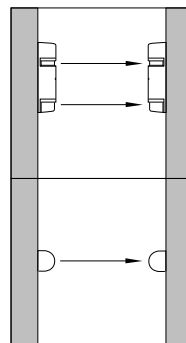


# 5 MOUNTING

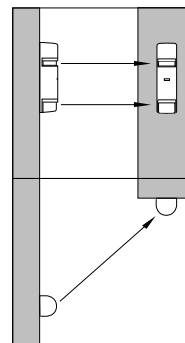
Using adjustment dial and adjustment screw, reflecting mirror parts can move horizontally ( $\pm 90$  degrees) and vertically ( $\pm 10$  degrees) allowing the unit to work in all directions.



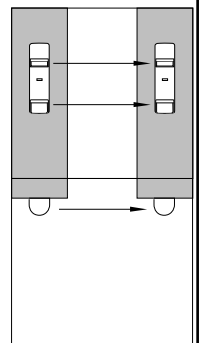
(Ex.1)



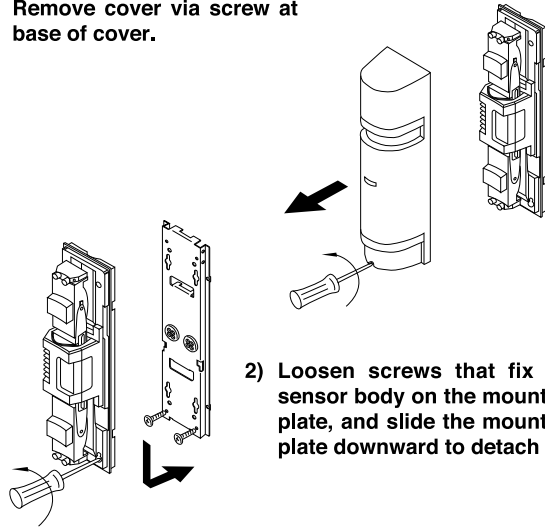
(Ex.2)



(Ex.3)



**1) Remove cover via screw at base of cover.**

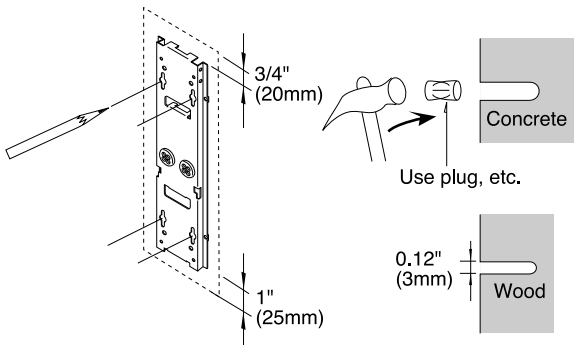


**2) Loosen screws that fix the sensor body on the mounting plate, and slide the mounting plate downward to detach it.**

**3) Wall mount**

(1) Make holes in wall.

●Place the mounting plate on wall as a template for drilling and mark the screw holes. (Allow a space 3/4" (20mm) above the plate and 1" (25mm) below the plate. This will provide easy detachment of the cover after installation.)



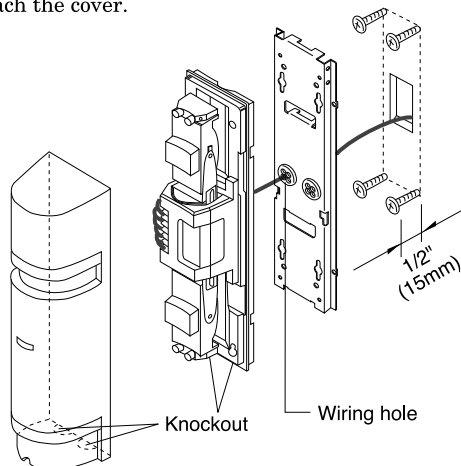
●Pre-drill on wall.

Concrete wall : Refer to specification of the securing plug used.

Wooden wall : 0.12" (3mm) dia.

(2) Install the sensor.

- Insert tapping screws leaving 1/2" (15mm) exposed.
- Install the mounting plate on exposed screws.
- Install the sensor body.
- Connect terminals.
- Attach the cover.

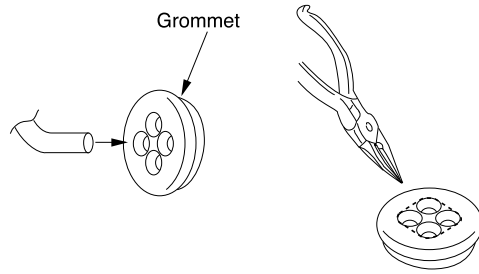


\* The unit can not be installed in an outlet box.  
But the outlet box can be used for wire-lead.

※The grommet is compatible with a wire of  $\phi$  0.12" ( $\phi$  3mm) to  $\phi$  0.24" ( $\phi$  6mm) outer dia.

When a wire of more than  $\phi$  0.24" ( $\phi$  6mm) 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.

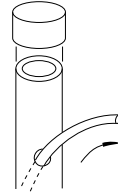


**4) Pole mounting**

(1) Make wiring hole in pole.

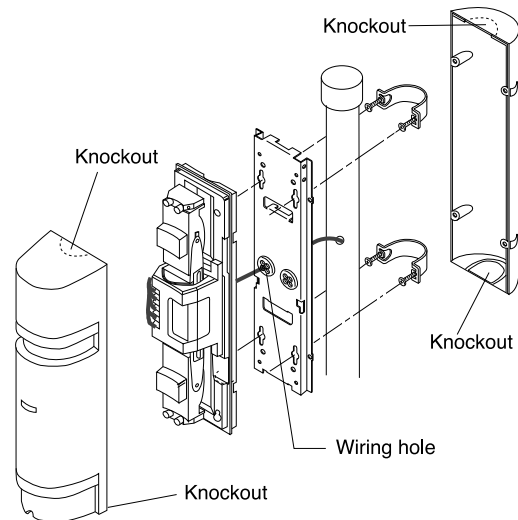
Pull through wire.

Place the pole cap on top of the pole.



(2) Install sensor on pole.

- Attach U brackets to pole and fix the mounting plate with screws.
- Attach sensor body.
- Connect terminals.
- Attach covers. (Break knockouts on cover and pole cover to adapt to pole diameter and configuration.)

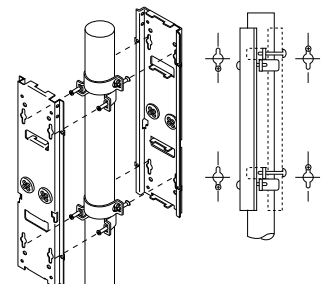


NOTE : \* When pole is short, it can be fixed with the lower bracket only.

\* The mounting plate must be attached on 0.28" (7mm) under the pole top. Do not allow the pole to protrude above the top cover.

(3) Pole mounting back to back

- Attach four U brackets to poles in two pairs, one on top of the other, facing opposite directions. (See illustration.)

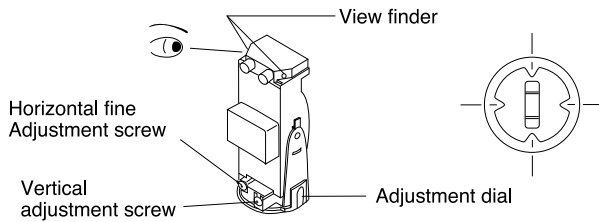


# 6 BEAM ALIGNMENT

1) Supply power with cover detached.

2) Adjust angle of reflecting mirror.

- Look through view finder on either side of transmitter optical unit and move until receiver unit is visible.
- Repeat the procedure for lower optical unit, and then repeat on receiver.



3) Fine tune.

- Attach shading plate to lower mirrors of both transmitter & receiver.
- Turn the sound check switch on receiver ON.

Sensitivity attenuation LED  
(Lights when beam reception is below minimal level.)

Sound check switch

Monitor jack

- Adjust angle of reflecting mirror with the adjustment screws until built-in speaker makes the highest tone.
- Repeat steps a), b), and c) for upper mirrors to test the lower beam.
- After adjustment, replace the shading plate and turn OFF the sound check switch.

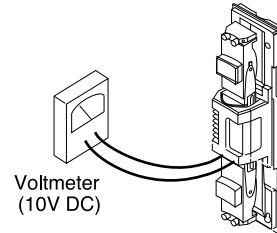
4) Attach cover.

● Beam alignment using voltmeter.

A precise alignment can be accomplished by using a voltmeter (10V DC).

Insert leads from voltmeter in monitor jacks of receiver.

Readings for alignment are as follows.



Alignment	Voltage reading
Best	2.0V or more
Good	1.8 to 2.0V
Poor, Re-adjust	1.8V or less

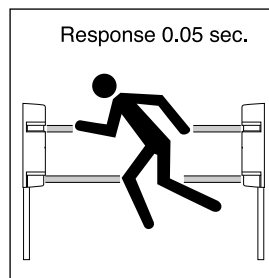
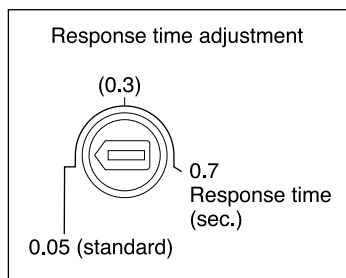
# 7 OPERATION CHECK

After installation, wiring and beam alignment are completed, check the operation by walking across the beam.

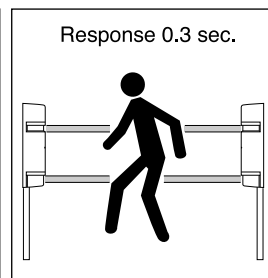
- Make sure that alarm LED on the receiver lights up.
- Make sure that connected equipments including controller work normally.

# 8 RESPONSE TIME

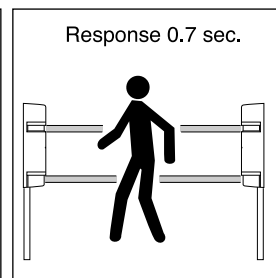
Adjust response time as follows. The unit does not detect the passing object faster than the response time set. If the response time is set longer, the unit does not detect human beings. Adjust to a little longer response time in a site where large passing objects, such as birds, newspaper or falling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



Run at full speed



Walk with quick steps



Walking

Note : ● Unreasonable longer response time may cause undetection of human being.

# 9 TROUBLESHOOTING

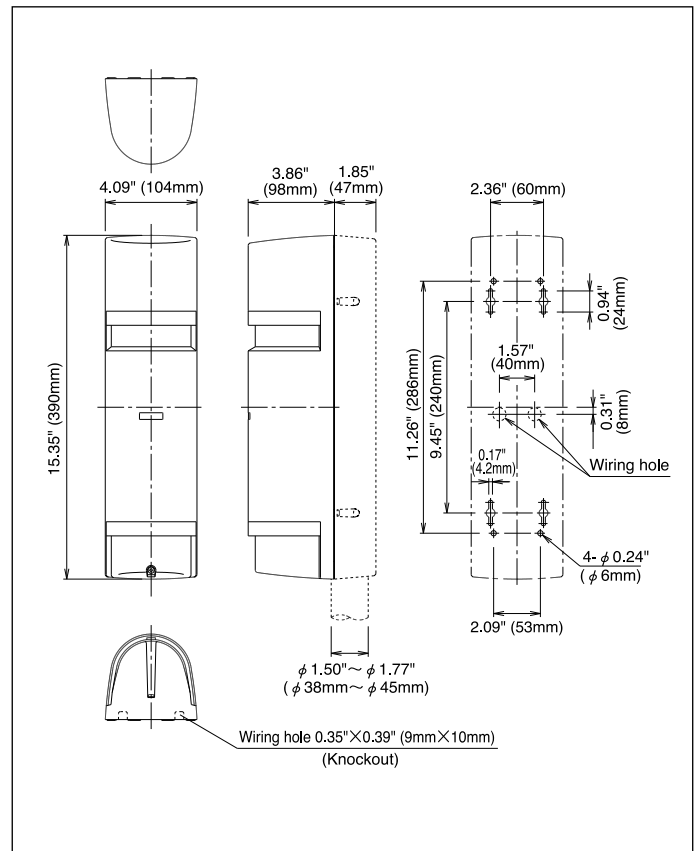
Solve possible problems according to the following table. If normal operations cannot be restored by this means, contact either the dealer from whom you bought the unit or TAKEX.

Symptom	Possible cause	Remedy
Transmitter LED does not light.	1. No power supply. 2. Bad wiring connection or broken wire, short.	1. Turn on the power. 2. Check wire.
Receiver 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. 4. 4 beams are not broken simultaneously. 5. Beam interruption time is shorter than response time.	1. Turn on the power. 2. Check wire. 3. Remove the reflecting object or change the place for installation. 4. Interrupt 4 beams simultaneously. 5. Adjust response time.
Receiver LED continues to light. (An alarm does not stop)	1. Alignment is off. 2. Shading object between transmitter and receiver. 3. Optics of units are soiled.	1. Check and adjust again. 2. Remove the shading object. 3. Clean the optics with a soft cloth.
Intermittent alarm.	1. Bad wiring connection. 2. Change of supply voltage. 3. Shading object between transmitter and receiver. 4. A large electric noise source such as power machine, is located nearby transmitter and receiver. 5. Unstable installation of transmitter and receiver. 6. Optics of units are soiled. 7. Improper alignment. 8. Small animals may pass through the 4 beams.	1. Check again. 2. Stabilize supply voltage. 3. Remove the shading object. 4. Change the place for installation. 5. Stabilize. 6. Clean the optics with soft cloth. 7. Check and readjust. 8. Change environments or the place for installation.

# 10 SPECIFICATIONS

Model	PB-50F	PB-100F	PB-200F
Detection system	Near infrared pulsed beam interruption system (TR-RE 4 beam simultaneous interruption)		
Infrared beam	Double modulation pulsed beam by LED		
Protection distance	Outdoor 165' (50m) or less	Outdoor 330' (100m) or less	Outdoor 660' (200m) or less
Max. arrival distance	1650' (500m)	3300' (1000m)	6600' (2000m)
Response time	50msec. to 700msec. (Variable at pot)		
Power supply	10V to 30VDC (Non-polarity)		
Current consumption	75mA or less		
Alarm output	Dry contact relay output form C Contact action : Interruption time + delay time (1sec.) Contact capacity : 30V AC/DC, 0.5A or less		
Tamper output	Dry contact relay N/C Action : Activated when receiver's cover is detached Contact capacity : 30V AC/DC, 0.5A or less		
Attenuation LED	Red LED (Receiver) ON : when beam is attenuated		
Alarm LED	Red LED (Receiver) ON : when an alarm is initiated		
Ambient temperature range	-13°F to +140°F (-25°C to +60°C)		
Beam adjustment	Horizontal : ±90°, Vertical : ±10°		
Functions	Sound check switch, Attenuation LED, Monitor jack output, AGC circuit, Frost proof cover		
Mounting positions	Outdoor		
Wiring	Terminals		
Weight	Transmitter : 42oz (1200g) Receiver : 45.5oz (1300g)		
Appearance	PC resin (wine red)		

# 11 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 Acts of God, 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.



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