

PHOTOELECTRIC BEAM SENSOR

(INTELLIGENT TWIN SERIES)

CE	PB-20TE	: Outdoor 66ft.(20m)/Indoor 135 ft.(40m)
	PB-40TE	: Outdoor 135ft.(40m)/Indoor 270ft.(80m)
	PB-60TE	: Outdoor 200ft.(60m)/Indoor 400ft.(120m)



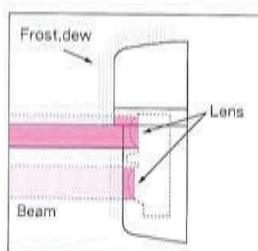
Utility model registered : 3
Trade mark registered : 1
Design pending : 1



Pole mount

PROTECTION AGAINST FROST/DEW

As a special hood is attached on sensor cover, beam protection continues without interruption even when the cover is screened by frost or dew.



The PULNiX intelligent "TWIN" photoelectric beam is designed to meet the highest standards of quality and reliability for photoelectric beam intrusion detection. Unique twin beams are synchronized to work together to reinforce the range and stability in severe weather conditions. The "intelligence" comes from having 4 different selectable frequencies which allow the stacking of beam sets to create a "Wall of Light". The system has a rotary optical system for easy installation and the special lens design aids in proper alignment.

SELECTABLE FREQUENCY

Includes 4 separate selectable frequencies which can stack up without crosstalk for high security applications.

HIGH RELIABILITY

Synchronized twin beams reduce false alarms caused by flying birds and falling leaves. The outdoor maximum arrival distance is 10 times longer than the operating distance, which allows for reliable operation in poor weather conditions.

EXTERNAL LIGHT PROTECTION

Trouble-free condition in 50,000 lux illumination fluctuation is assured by external light compensation circuit a filter, specially designed, that cuts visible rays effectively. Excellent tolerance against sun light, automobile head light, fluorescent light or mercury light.

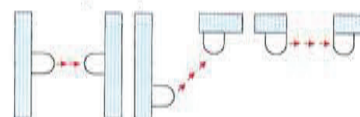
EASY BEAM ALIGNMENT

The special view finder allows for fast aiming and assures good alignment. Equipped with monitor jack to check sensitivity.

ROTARY OPTICAL SYSTEM

The optical system of both the transmitter and receiver can be rotated a full 180° which allows for side aiming.

Therefore the units do not have to be mounted face to face and the beam direction can not be discerned by simple observation.



INSECT PROTECTION

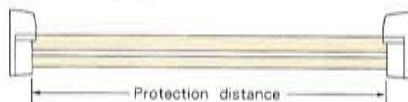
A sealed optical system prevents intrusion and interference by insects.

OTHER FEATURES

- * Automatic Gain Control circuit loaded
- * Wide adjustment (horizontally $\pm 90^\circ$, vertically $\pm 10^\circ$)
- * Pole mounting kit included

PHOTOELECTRIC BEAM SENSOR

■ COVERAGE



PB-20TE Outdoor	66' (20m)
Indoor	135' (40m)
PB-40TE Outdoor	135' (40m)
Indoor	270' (80m)
PB-60TE Outdoor	200' (60m)
Indoor	400' (120m)

■ OPTIONAL

● Pole

KP-100 (100cm, 2pcs./set)
KP-150 (150cm, 2pcs./set)



● Pole cover (2pcs./set) BP-60TE (pole cap, screw included)



● Housing case KH-120



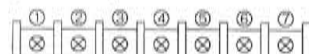
■ TERMINAL ARRANGEMENT

[Transmitter]



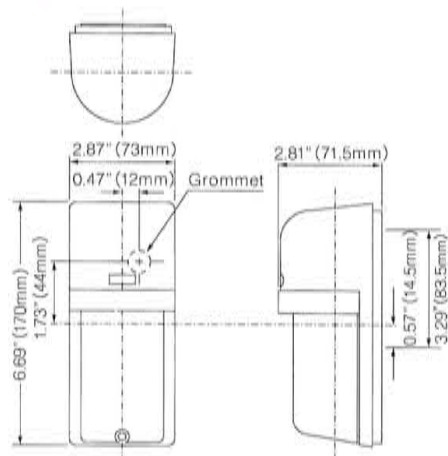
Power
12DC to 30VDC (non - polarity)

[Receiver]



Power
12V -
30VDC
(non -
polarity)
Alarm
output
Dry contact
output 1c,30V
(AC/DC),0.5A
COM
Alarm
output
Dry contact
output 1c,30V
(AC/DC),0.5A
TAMPER
output
Dry contact
output 1b,30V
(AC/DC),0.5A

■ EXTERNAL DIMENSIONS



■ SPECIFICATIONS

The specifications are subject to change without notice.

Model	PB-20TE	PB-40TE	PB-60TE
Detection system	Simultaneous breaking of 2 beams		
Infrared beam	LED pulsed beam, Double modulation		
Protection distance	Outdoor 66' (20m) or less Indoor 135' (40m) or less	Outdoor 135' (40m) or less Indoor 270' (80m) or less	Outdoor 200' (60m) or less Indoor 400' (120m) or less
Max. beam range	Outdoor 660' (200m) Indoor 660' (200m)	Outdoor 1350' (400m) Indoor 1350' (400m)	Outdoor 2000' (600m) Indoor 2000' (600m)
Response time	50msec. to 700msec. (Variable at pot)		
Supply voltage	12V to 30VDC (Non-polarity)		
Current consumption	55mA or less	75mA or less	80mA or less
Alarm output	Dry contact relay output form C Contact action : Interruption time + delay time (1 to 3sec.) Contact capacity : 30V (AC/DC) 0.5A or less		
Tamper output	Dry contact relay 1b (N/C) Action : Activated when cover is detached Contact capacity : 30V (AC/DC) 0.5A or less		
Alarm LED	Red LED (Receiver) ON : when an alarm is initiated.		
Attenuation LED	Red LED (Receiver) ON : when beam is attenuated.		
Functions	Beam frequency changeover (4ch.), Monitor jack output, AGC circuit, Frost proof cover		
Ambient temperature range	-13°F to +140°F (-25°C to +60°C)		
Mounting positions	Indoor/Outdoor		
Wiring	Terminals		
Weight	Transmitter: 13.3oz(380g) Receiver: 14.0oz(400g)		
Appearance	PC resin (wine red)		

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

LEAF 12-01R4-4

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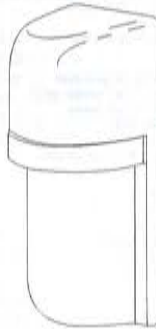
TAKEX

PHOTOELECTRIC BEAM SENSOR

Infrarotschranke
Barrière à infrarouge
Barriera a infrarosso
Barrera infrarroja
Infrarood barrière

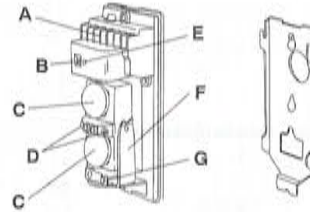
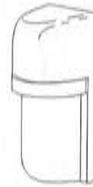
PB-20TE
PB-40TE
PB-60TE

Installation Manual
Montageanleitung
Manuel d'installation
Manuale di installazione
Manual de instalación
Installatiehandleiding

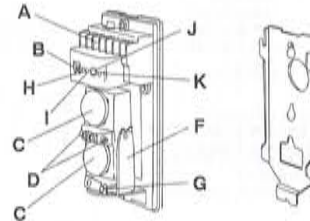


Parts identification Stückliste Nomenclature

Transmitter
Sender
Émetteur
Transmittore
Emisor
Zender



Receiver
Empfänger
Récepteur
Ricevitore
Receptor
Ontvanger



L

M

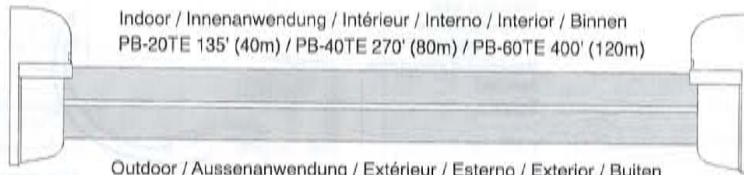
N

O

1

Operational Range Wirkbereich Portée

Raggio d'azione Alcance Bereik



Indoor / Innenanwendung / Intérieur / Interno / Interior / Binnen
PB-20TE 135' (40m) / PB-40TE 270' (80m) / PB-60TE 400' (120m)
Outdoor / Aussenanwendung / Extérieur / Esterno / Exterior / Buiten
PB-20TE 66' (20m) / PB-40TE 135' (40m) / PB-60TE 200' (60m)

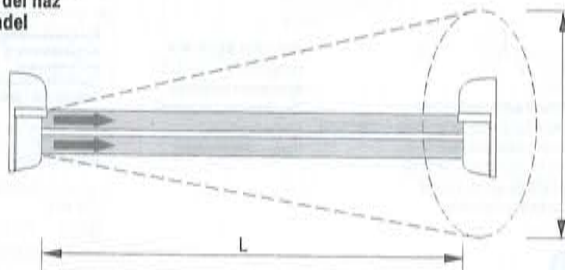
2

Beam dispersal Streuung des Strahls Diffusion du faisceau

Diffusione del raggio Dispersión del haz Diffusiebundel

	L	φ
PB-20TE	66' (20m)	2' (0.6m)
PB-40TE	135' (40m)	4' (1.2m)
PB-60TE	200' (60m)	6' (1.8m)

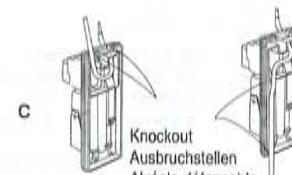
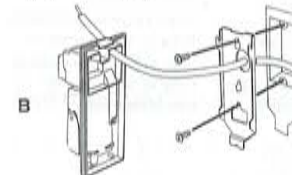
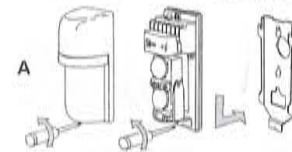
$$\phi = 0.03 \times L$$



3

Wall Mount Wandmontage Fixation murale

Montaggio a parete Montaje sobre pared Muurmontage

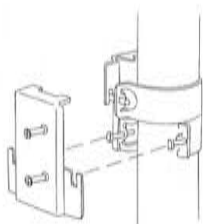
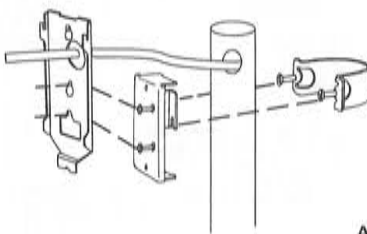


Knockout
Ausbruchstellen
Alvéole défonçable
Passacavo
Orificio pasacables
Uitbreken

4

Pole Mount Mastmontage Fixation sur mât

Montaggio su palo Montaje en mástil Montage op paal



A

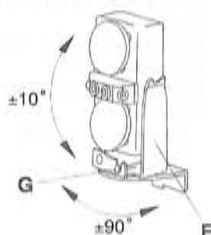
B

5

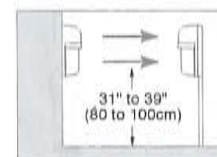
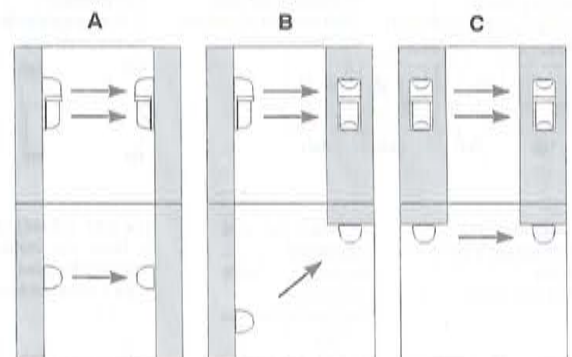
Installation position Positionierung der Melder Position d'installation

Posizione di installazione Posición de instalación Plaats installatie

Adjustment
Einstellung
Ajustement
Regolazione
Ajustes
Instellen



6

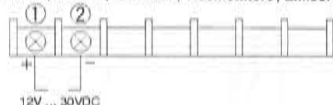


Installation Height
Montagehöhe
Hauteur d'installation
Altezza di installazione
Altura de instalación
Montagehoogte

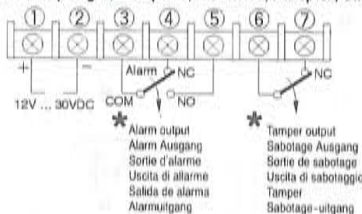
Terminal configuration
Klemmenkonfiguration
Configuration des bornes

Configurazione dei morsetti
Configuración de las clemas
Aansluitconfiguratie

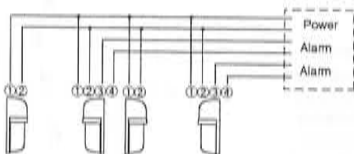
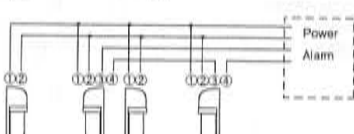
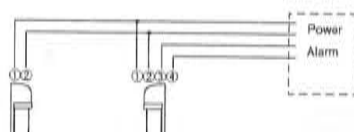
Transmitter / Sender / Émetteur / Trasmettitore / Emisor / Zender



Receiver / Empfänger / Récepteur / Ricevitore / Receptor / Ontvanger



*Relay shown in energised (non-alarm) condition
Relais in aufgezogenem Zustand (kein Alarm) gezeichnet
Le relais est représenté à l'état activé (pas d'alarme)
Il relé è rappresentato in stato eccitato (nessun allarme)
El relé se encuentra energizado en reposo
Relais in bekrachtigde toestand (geen alarm) getekend



7

Response Time
Ansprechzeit
Temps de réponse

Tempo di risposta
Tiempo de reacción
Reactietijd

Run at full speed
Mit höchster Geschwindigkeit rennen
Course à pied à vitesse maximale
Corrida a velocità elevata
Corriendo
Rennen op volle snelheid



0.05sec

Walking with quick steps
Mit schnellen Schritten gehen
Marche à pas rapides
Passo rapido
A paso rápido
Lopen met vlugge stappen

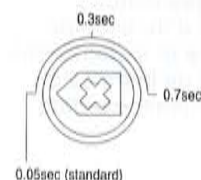


0.3sec

Walking
Gehen
Marche
Passo normale
Caminando
Wandelen



0.7sec



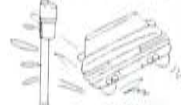
8

Do's and Don'ts
Wichtige Hinweise
Précautions d'installation

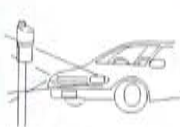
Avvertenze
Precauciones
Doen en laten



Remove all obstructions
Hindernisse entfernen
Retirer tous les obstacles
Rimuovere tutti gli ostacoli
Retirar cualquier obstrucción
Verwijder alle obstakels



Do not get it splashed
Vor Spritzwasser schützen
Ne pas asperger
Evitare gli schizzi
Evitar salpicaduras
Vermijd spatten



Avoid strong lights
Starke Lichtquellen vermeiden
Eviter les lumières intenses
Evitare l'illuminazione intensa
Evitar las luces intensas
Vermijd sterk licht



Install only on firm surfaces
Nur auf stabilem Untergrund installieren
Installer uniquement sur des surfaces régulières
Installare solo su superfici stabili
Instalar únicamente sobre superficies estables
Plaats alleen op een stevig oppervlak

9

Optical alignment
Ausrichten der Optik
Alignement de l'optique

Allineamento dell'ottica
Alineación de la óptica
Optiek richten

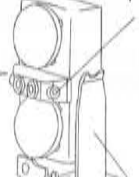
View finder
Sucher
Viseur
Mirino
Visor
Zoeker



Vertical adjustment screw
Einstellschraube für vertikale Ausrichtung
Vis d'ajustement vertical
Vite di regolazione verticale
Tornillo de ajuste vertical
Vertikale instelschroef

10

Attenuation sheet
Dämpfungsscheibe
Feuille d'atténuation
Mascherina di attenuazione
Atenuador
Demper



Horizontal adjustment
Horizontale Ausrichtung
Ajustement horizontal
Regolazione orizzontale
Ajuste horizontal
Horizontale afstelling

Tester VDC

Alarm LED
Attenuation LED

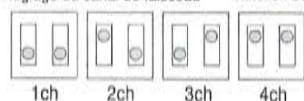
Attenuation sheet
Dämpfungsscheibe
Feuille d'atténuation
Mascherina di attenuazione
Atenuador
Demper

Monitor output voltage Ausgangsspannung bei Überwachung Tensión de control Tensione di uscita monitoraggio Tensión de salida de test	Alignment (outdoor) Ausrichtung (Außen) Alignement (à l'extérieur) Allineamento (esterno) Alineación (externa) Afstelling (buiten)	Alignment (indoor) Ausrichtung (Innen) Alignement (à l'intérieur) Allineamento (interno) Alineación (interna) Afstelling (binnen)
>700mV	✓	✓
250mV ... 700mV	✓	✓
60mV ... 250mV	no	no
<60mV	no	no

Beam frequency change
Ändern der Strahlenfrequenz
Changement de fréquence du faisceau

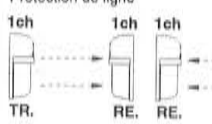
Modifica della frequenza del raggio
Cambio de frecuencia del haz
Veranderen van de bundelfrequentie

Set beam channel
Einstellung des Strahlenkanals
Réglage du canal de faisceau

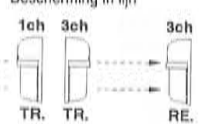


Impostazioni dei raggi
Selección del canal del haz
Instellen bundelkanaal

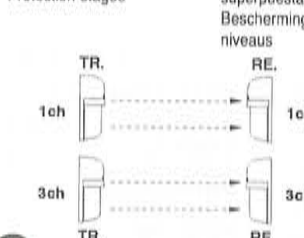
Line protection
In Reihe angeordneter Schutz
Protection de ligne



Protezione con unità in linea
Protección en línea
Bescherming in lijn

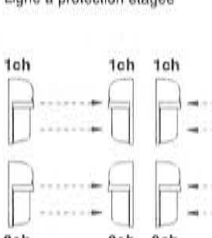


2-stacked protection
Übereinander angeordneter Schutz
Protection étagée

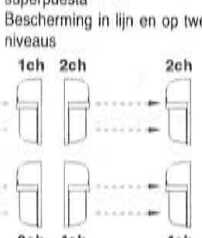


Protezione con unità sovrapposte
Protección doble superpuesta
Bescherming op twee niveaus

Line and 2-stacked protection
In Reihe und übereinander angeordneter Schutz
Ligne à protection étagée



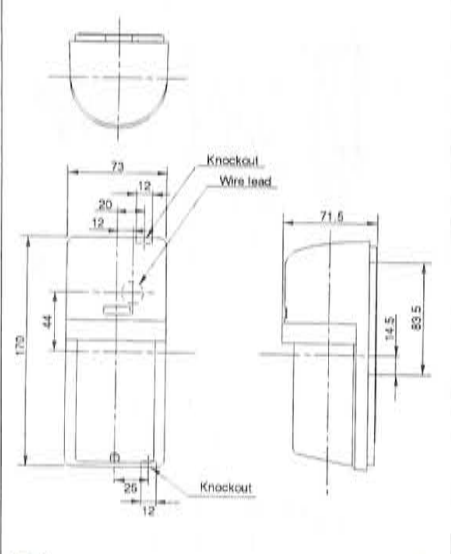
Protezione con unità in linea e sovrapposte
Protección en línea y doble superpuesta
Bescherming in lijn en op twee niveaus



11

Dimension
Vermessung
Dimensions

Dimensioni
Dimensiones
Afmetingen



12

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.

⚠ This sensor is designed to detect intrusion and to initiate an alarm; it's not a burglary-preventing device. TAKEEX 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

The TAKEEX photoelectric beam sensor (PB-20TE, PB-40TE and PB-60TE) consists of an infrared Transmitter and Receiver.

It's designed to be "AND" gated - an alarm is initiated only when two stacked beams are simultaneously interrupted. An alarm is not initiated when insects or falling leaves break one beam only.

In addition, four channels of beam frequency are available to prevent cross-talk when multiple units are stacked or multiple units are lined up.

Parts Description (fig. 1)

- A - Terminals
- B - Beam channel
- C - Lens
- D - View finder
- E - Operation LED
- F - Horizontal adjustment
- G - Vertical adjustment screw
- H - Alarm LED
- I - Attenuation LED
- J - Response time adjustment
- K - Monitor jack
- L - Tapping screw
- M - Pole mounting plate
- N - Pole bracket
- O - Attenuation sheet

Wall Mount (fig. 4)

- Remove cover from unit and slide the mounting plate to detach it (fig. 4A).
- Pull wire through on the installation side.
- Break grommet on mounting plate and pull wire through it. Secure the plate with 4mm screws (fig. 4B).

⚠ Fill the opening between grommet and wire with sealing compound.

- Remove knock outs on the rear of the unit and thread the cable through, see fig. 4C and attach to the mounting plate.

- After wiring is completed, adjust alignment, check operation and fit the cover.

⚠ Sealing is not required for unit surround due to rain-proof construction.

Pole Mount (fig. 5A)

- Use dia. 1.50" (38mm) to 1.77" (45mm) pole.
- Loosely fit 2 M4x20 countersunk head screws into the pole clamp bracket.
- Fix pole mounting plate to pole with pole bracket.
- Detach cover, and remove mounting plate from sensor body.
- Loosely insert 2 pcs. of M4x10 screws in pole mounting plate and fix sensor mounting plate on them.
- Break grommet on mounting plate and pull wire through it. Secure the plate with 4mm screws (figure 4B).

⚠ Fill the opening between grommet and wire with sealing compound.

- Remove knockouts on the rear of the unit and thread the cable through, see fig. 4C and attach to the mounting plate.

- After wiring is completed, adjust alignment, check operation and fit the cover.

⚠ Sealing is not required for unit surround due to rain-proof construction.

Back to Back Pole Mount and Right

Angle Pole Mount (fig. 5B)

- First, fix the pole mounting plate for the 1st unit.
- Fit the 2nd unit pole bracket under the 1st unit pole mounting bracket and fix the 2nd pole mounting plate up side down.

- Open grommet on mounting plate and pull wire through it. Secure the plate with 4mm screws (figure 4B).

⚠ Fill opening between grommet and wire with sealing materials.

- Remove knockouts on the rear if the unit and thread the cable through, see fig. 4C attach the mounting plate.

- After wiring is completed, adjust alignment, check operation and attach cover.

⚠ Sealing is not required for unit surround due to rain-proof construction.

Position of installations

Adjustment (fig. 6)

Using the adjustments, the lens can move horizontally (± 90 degrees) and vertically (± 10 degrees) allowing the unit to work in all directions (figure 6A / 6B / 6C).

Cautions on installation

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

Wiring Distance Between Sensor and Control Panel

PB-20TE	12V	24V
AWG22 ($\phi 0.65$ mm)	690' (210m)	6200' (1890m)
AWG20 ($\phi 0.8$ mm)	1150' (351m)	10500' (3200m)
AWG18 ($\phi 1.0$ mm)	1750' (534m)	16000' (4880m)
AWG17 ($\phi 1.1$ mm)	2100' (640m)	19000' (5790m)

PB-40TE	12V	24V
AWG22 ($\phi 0.65$ mm)	530' (160m)	4600' (1400m)
AWG20 ($\phi 0.8$ mm)	850' (259m)	7800' (2380m)
AWG18 ($\phi 1.0$ mm)	1350' (400m)	11500' (3510m)
AWG17 ($\phi 1.1$ mm)	1550' (473m)	14000' (4270m)

PB-60TE	12V	24V
AWG22 ($\phi 0.65$ mm)	490' (150m)	4200' (1280m)
AWG20 ($\phi 0.8$ mm)	830' (250m)	7200' (2200m)
AWG18 ($\phi 1.0$ mm)	1200' (366m)	10500' (3200m)
AWG17 ($\phi 1.1$ mm)	1450' (442m)	13500' (4000m)

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

⚠ The signal line can be wired to a distance of up to 3300ft (1000m) with AWG22 (dia 0.65mm) telephone wire.

Response Time (fig. 8)

Adjust response time as follows. The longer response times reduce the possibility of false alarms from birds and loose objects, but too longer time will reduce the detection of Human beings, so it is necessary to test the setting to achieve adequate detection in each installations environment.

⚠ Unreasonable longer response time may cause undetection of human being.

⚠ Turning the pot up to increase the response time voids the UL listing.

Alignment and Operation (fig. 10)

- Supply power with cover removed.
- Set the same beam channel on Transmitter and Receiver. (Channel 1 set at factory)
- Align Transmitter lens to Receiver lens. The view finder is located between the 2 lenses. Look through view finder on either side and line-up optics horizontally and vertically until the opposite unit is visible. (Move the metal part to change the horizontal angle.)
- Further, fine tune until receiver attenuation LED is OFF.
- When the unit is fitted outdoors, fine tune with attenuation sheet positioned on the receiver optics until the Receiver attenuation LED is OFF.
- When the unit is fitted outside, it is advisable to use a test meter to optimize the alignment adjustment. You can confirm the beam signal level by inserting a tester meter in monitor jack of Receiver.
- ⚠ The voltage on the reference shows attenuation sheet conditions.

Testing

Units should be tested on a regular monthly basis. To test, walk in front of Receiver and watch to see if the walk test LED lights as the beam is blocked. Relay functions should be confirmed by watching status light on control panel.

Maintenance

The PULNIX photoelectric beams are virtually maintenance free, with the exception of units that are located in dusty or dirty environments. Dirty units should be cleaned off with a damp cloth as necessary.

Change of Beam Frequency (fig. 11)

This function is used for the purpose of preventing cross-talk or bypass of beams which may occur with in line protection or stacked protection.

- When multi-stacked protection or inline protection is set up, it is advisable to adjust beam alignment with a test meter in order to optimize alignment, together with making use of beam frequency change function.
- When stacked protection is set up, both the upper and lower sensors should be the same model number types.
- Set Transmitter and Receiver at the same channel.
- Refer to the figures and set the beam channel when two or more units are installed in stacked protection or in line protection.

Troubleshooting

Operation LED does not light

1. No power supply.
 - Turn on the power.
2. Bad wiring connections or broken wire, short.
 - Check wiring.

Receiver Alarm LED does not light when the beam is broken.

1. No power supply.
 - Turn on the power supply.
2. Bad wiring connections or broken wire, short.
 - Check wiring.
3. Beam is reflected from another object and sent to the Receiver.
 - Remove the reflecting object or change beam direction.
4. Two beams are not broken simultaneously.
 - Break two beams simultaneously.
5. The beam interruption time is shorter than the set response time.
 - Set the response time shorter.

Receiver Alarm LED continues to light

1. Beam alignment is out.
 - Check and adjust again.
2. Shading object between Transmitter and Receiver.
 - Remove the shading object.
3. Optics of units are soiled.
 - Clean the optics with a soft cloth.
4. Frequency channel is not compatible between Transmitter and Receiver.
 - Readjust to the same channel.

Intermittent alarm

1. Bad wiring connection.
 - Check again.
2. Change of supply voltage.
 - Stabilize supply voltage.
3. Shading object between Transmitter and Receiver.
 - Remove the shading object.
4. A large electric noise source, such as a machine, is located nearby Transmitter and Receiver.
 - Change the position.
5. Unstable installation of Transmitter and Receiver.
 - Stabilize.
6. Soiled optics of Transmitter and Receiver.
 - Clean the optics with a soft cloth.
7. Improper alignment.
 - Check and adjust again.
8. Small animals may pass through the two beams.
 - Set the response time longer. (Impossible in a site where an intruder can run at full speed)

Approvals

CE conforme
National approval conditions relating to the use of the product must be followed.

Specifications

Detection system	Simultaneous breaking of two beams
Infrared beam	LED pulsed beam
Protection distance	
- PB-20TE outdoor	66' (20m)
indoor	135' (40m)
- PB-40TE outdoor	135' (40m)
indoor	270' (80m)
- PB-60TE outdoor	200' (60m)
indoor	400' (120m)
Max. beam range	
- PB-20TE	200m
- PB-40TE	400m
- PB-60TE	600m
Response time	50msec. to 700msec.
Supply voltage	12V to 30VDC (non-polarity)
Current consumption	
- PB-20TE	55mA
- PB-40TE	75mA
- PB-60TE	80mA
Alarm output	Dry contact relay output
	Contact action: Interruption time + delay time (1 to 3sec.)
	Contact: 30V (AC/DC), 0.5A
Tamper output	Dry contact relay output
	Action: Activated when cover is detached
	Contact: 30V (AC/DC), 0.5A
Alarm LED	Red LED (Receiver)
	ON: when an alarm is initiated
Attenuation LED	Red LED (Receiver)
	ON: when beam is attenuated
Functions	Beam frequency changeover (4ch.), Monitor jack output, AGC circuit, Frost proof cover
Ambient temperature range	-13°F to +140°F (-25°C to +60°C)
Mounting position	Indoor / Outdoor
Wiring	Terminals
Weight	
- Transmitter	13.3oz (380g)
- Receiver	14oz (400g)
Appearance	PC resin (wine red)

Details for ordering

PB-20TE Photoelectric beam sensor (20m)

PB-40TE Photoelectric beam sensor (40m)

PB-60TE Photoelectric beam sensor (60m)

BP-60TE Pole cover (2pcs./set)

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.