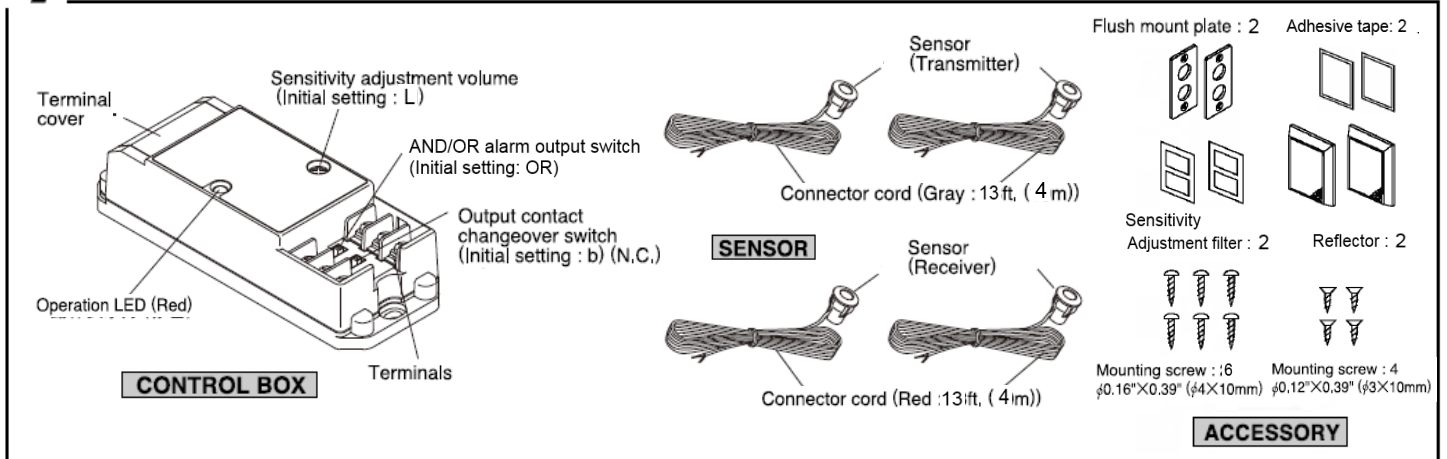# TAKEX PHOTOELECTRIC BEAM SENSOR
PB-4RTNS   Instruction Manual

Thank you for purchasing this TAKEX product. 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 to initiate an alarm : it is not a burglary-preventing device.
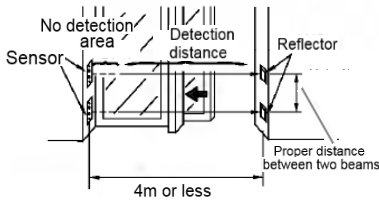TAKEX is not responsible for damage, injury or losses caused by accident, theft, Acts of God (including inductive surge by lightning), abuse, misuse, abnormal usage, faulty installation or improper maintenance.

1 PARTS DESCRIPTION

Terminal cover

Sensitivity adjustment volume (Initial setting : L)

AND/OR alarm output switch (Initial setting: OR)

Output contact changeover switch (Initial setting : b) (N.C.)

Operation LED (Red)

Terminals

CONTROL BOX

Sensor (Transmitter)

Connector cord (Gray : 13 ft, (4 m))

SENSOR

Sensor (Receiver)

Connector cord (Red :13 ft, (4 m))

Flush mount plate : 2   Adhesive tape: 2

Sensitivity Adjustment filter : 2   Reflector : 2

Mounting screw : 6 φ0.16"×0.39" (φ4×10mm)   Mounting screw : 4 φ0.12"×0.39" (φ3×10mm)
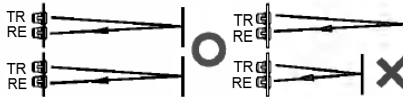
ACCESSORY

2 DO'S AND DON'T'S

1. Attach transmitter and receiver to flush mount plate. Set detection distance between sensor and reflector to 4m or less. There is no detection area near sensor heads. Set sensors so that objects to be detected pass area except no detection area.
When AND output switch is selected, set the distance between two beams properly so that objects don't fail to be detected.
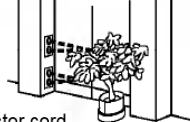

No detection area
Detection distance
Sensor
Reflector
Proper distance between two beams
4m or less

Note : No detection area depends on sensitivity setting.

Sensitivity Volume	No detection area (Object : white cloth, etc)
L	15cm or less
H	30cm or less

2. Use both two beams under the same distance.

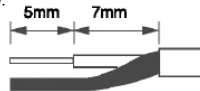
TR RE   TR RE   O

TR RE   TR RE   X

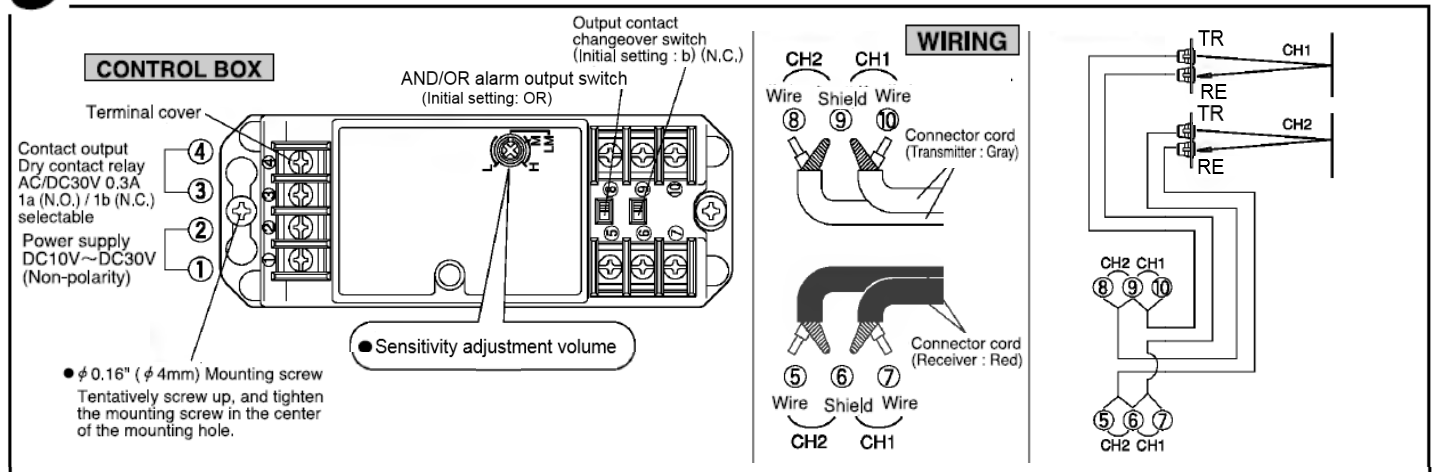3. Remove obstacles that may interrupt beams.

4. Do not extend connector cord. Extension of connector cord will cause deterioration of sensitivity.

5. Cut connection cords as the following figure, when necessary.

5mm   7mm

- Do not supply the power during engineering work of installation.
- Put terminal cover on terminals after the wiring.
- Do not use this product with outside of the supply voltage indicated. It may cause fire or electric shock.
- Contact output volume is ⟨30V (AC / DC) 0.3A⟩ or less. Make the connected device's volume within this capacity. Otherwise it may cause fire.
- Do not disassemble or modify the device. It may cause fire or electric shock.
- When AND output switch is selected, install the sensor with correct distance between two beams for secure detection of the object. (In case of incorrect installation with wrong distance may cause lost detection.)
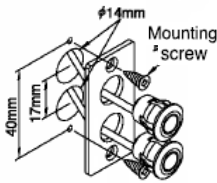
3 INSTALLATION AND WIRING

CONTROL BOX

Output contact changeover switch (Initial setting : b) (N.C.)

AND/OR alarm output switch (Initial setting: OR)

Terminal cover

Contact output Dry contact relay AC/DC30V 0.3A 1a (N.O.) / 1b (N.C.) selectable — ④ ③

Power supply DC10V~DC30V (Non-polarity) — ② ①

- φ 0.16" (φ 4mm) Mounting screw
Tentatively screw up, and tighten the mounting screw in the center of the mounting hole.

Sensitivity adjustment volume

WIRING

CH2   CH1
Wire   Shield   Wire
⑧   ⑨   ⑩
Connector cord (Transmitter : Gray)

⑤   ⑥   ⑦
Wire   Shield   Wire
CH2   CH1
Connector cord (Receiver : Red)

TR — CH1
RE
TR — CH2
RE

CH2 CH1
⑧ ⑨ ⑩

⑤ ⑥ ⑦
CH2 CH1

INSTALLATION

SENSOR

1. Make two holes (φ14mm) on mounting surface and clean away rough hole edge.
2. Attach sensor heads to flush mount plate and fix it to the hole with screws.

REFLECTOR

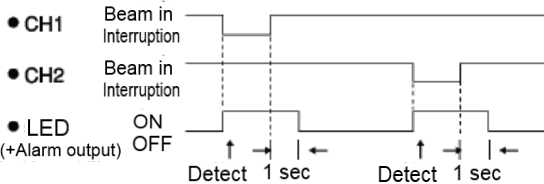1. Set "Sensitivity adjustment volume" on the control box at "M" and "AND/OR" alarm output switch" at "AND".

φ14mm Mounting screw
40mm / 17mm

2. Position where LED is on while moving reflector CH1. Attach reflector to that position with screws or adhesive tape.
3. Set alarm output switch at "OR".(Operation LED will go ON) Position where LED is on while moving reflector CH2. Attach reflector to that position with screws or adhesive tape.
4. Attach sensitivity adjustment filter on reflector CH1/CH2. (Alarm output is still at "OR".) Set sensitivity adjustment volume to the point where LED goes ON. (In case LED does not go ON, set it at "L".)
5. Remove sensitivity adjustment filter from reflectors. Set AND/OR alarm output switch according to installation condition.
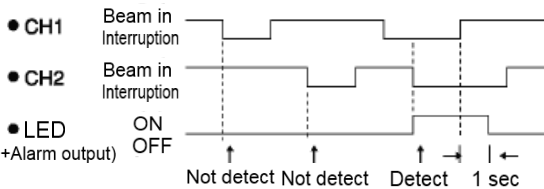
4 OPERATION CHECK

(1) Make installation and wiring of control box and sensors. [REF, 3. Installation and wiring]

(2) Supply the power, and make sure that operation LED on the control box goes off.
Operation LED lights up when beam is interrupted and goes out when beam is not interrupted.

(3) Select alarm output switch "OR".
Interrupt two beams individually to check if operation LED lights up for each interruption and connected devices work properly.
Select alarm output switch "AND".
First, interrupt two beams individually to check if LED remains off and connected devices have no change. Then, interrupt two beams simultaneouosly to check if operation LED lights up, and connected devices work properly.

(NOTE) In case operation LED goes off even though beam is interrupted, sensitivity may be too high.
Reduce sensitivity by turning sensitivity adjustment volume.

- **OR Detection :**
Alarm is initiated when one of two beam(or both) is interrupted.

CH1 Beam in Interruption
CH2 Beam in Interruption
LED (+Alarm output) ON OFF
Detect 1 sec   Detect 1 sec

- **AND Detection :**
Alarm is initiated when both of two beams are interrupted.

CH1 Beam in Interruption
CH2 Beam in Interruption
LED (+Alarm output) ON OFF
Not detect Not detect Detect 1 sec

5 TROUBLE SHOOTING

Symptom	Possible cause	Remedy
Inactive	Broken / improper wiring.	Check / correct wiring.
Malfunction	Detection distance does not match with sensitivity adjustment.	Adjust sensitivity.
	Some obstacles are interrupting the beam.	Remove interrupting obstacles.
	Protection distance is over 33ft. (10m).	Set the distance within 33ft. (10m).
	Lens surface is soiled or frozen.	Clear the lens surface.

6 SPECIFICATIONS

Model	PB-4RTNS
Detection system	Near infrared beam (reflection type)
Protection distance	13 ft. (4 m) or less
Supply voltage	DC10V to DC30V (Non-polarity)
Current consumption	55 mA or less
Alarm output	Dry contact relay : 30V (AC / DC) 0.3A 1a (N.O.) / 1b (N.C.) selectable Contact action : Interruption time + Delay time (approx. 1 sec.)
Response time	Detect 100msec. or more of beam interruption
Operation LED	Lights Red when detection (beam is interrupted)
Ambient temperature range	-13°F to +131°F (-25°C to +55°C) (without condensation or frozen)
Appearance	Sensor : PC resin (clear) Control box : ABS resin (white)
Weight	Sensor : 2.1oz (60 g) /pc Control box : 3.3oz (95g)
Accessory	φ 0.16"×0.39" (φ 4×10mm) mounting screw × 6 φ 0.12"×0.39"(φ 3×10mm) mounting screw × 4 (for flush mounting plate) Flush mounting plate × 2 Adhesive tape × 2 Reflector × 2 Sensitivity adjustment filter × 2

7 EXTERNAL DIMENSIONS

45   29   Reflector
12.5
69
16
120   83.5   54
Control box
Sensor (Transmitter and receiver)   Flush mount plate (Accessory)
14   2   φ15   24   2
50   40   17