TAKEX® DUAL ZONE OUTDOOR PIR

MS-12TE & MS-12FE

INSTRUCTION MANUAL

We appreciate your purchase of a TAKEX passive infrared 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.

1 PRODUCT DESCRIPTION

The dual zone outdoor PIR is an automatic switch which uses passive infrared sensor to detect infrared (body temperature) emitted from a human body. (Suitable for indoor/outdoor)
1) This sensor is equipped with an "AND" detection and pulse count system.
2) The AND detection system will issue an alarm signal only when detection occurs in both horizontal and downward zones simultaneously.
3) The sensor is equipped with many features such as
① Alarm output control depending on the illuminance of the surrounding area.
② Output time delay switch setting.
③ Combining the sensor with other devices such as a video monitoring system to display and record the presence of an intruder.
The sensor can be combined with an audible or visual warning device to annunciate the presence of visitors.
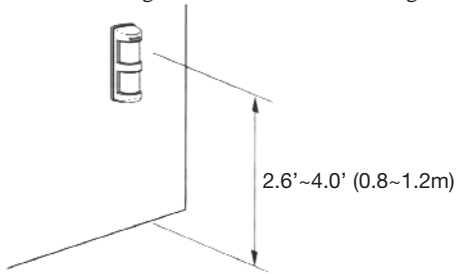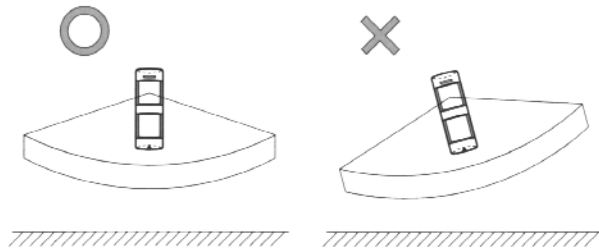
2 PARTS DESCRITION

[MS-12TE]　　　　[MS-12FE]
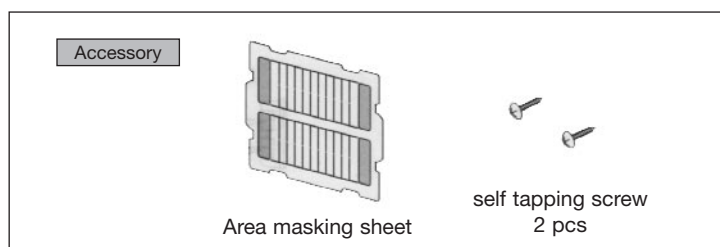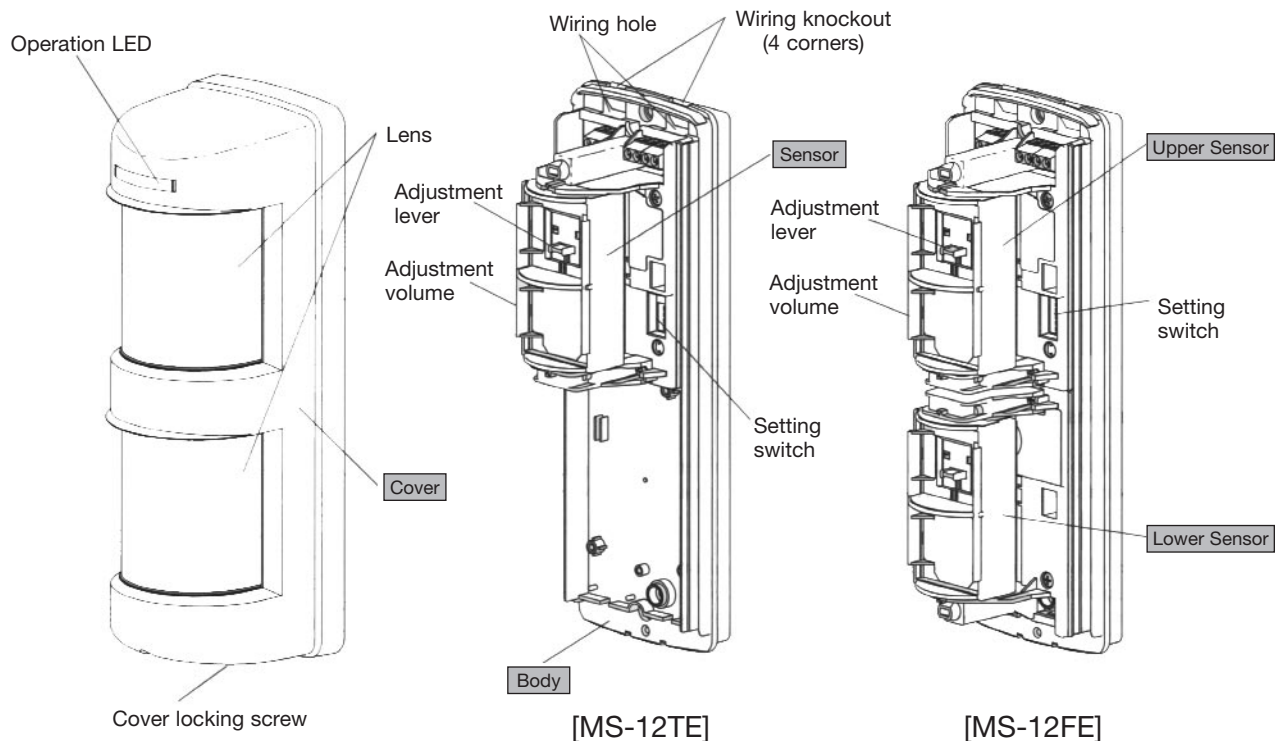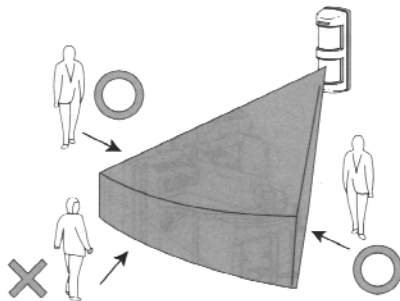
1. Precautions on Installation

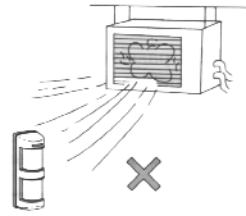● Install the unit at the height of 2.6' to 4.0' from the ground.

2.6'~4.0' (0.8~1.2m)

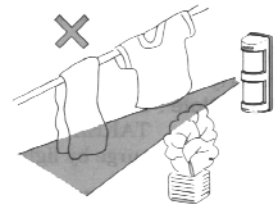● Install the unit horizontally so that its horizontal zone is parallel to the ground.

● Install the unit in such a direction that people are more likely to cross the detection zone.
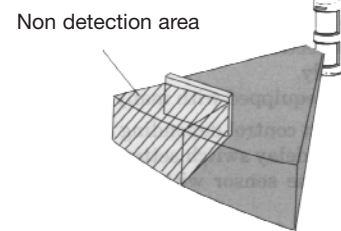
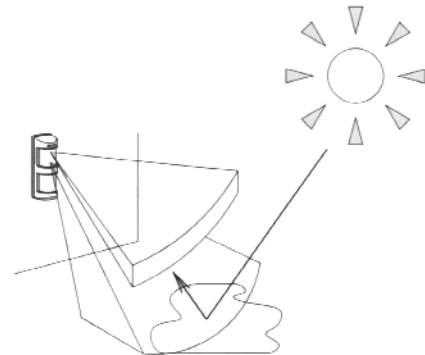● Do not install the unit by an air conditioning exhaust vent.

● Remove all obstructions (trees, clotheslines, etc.).

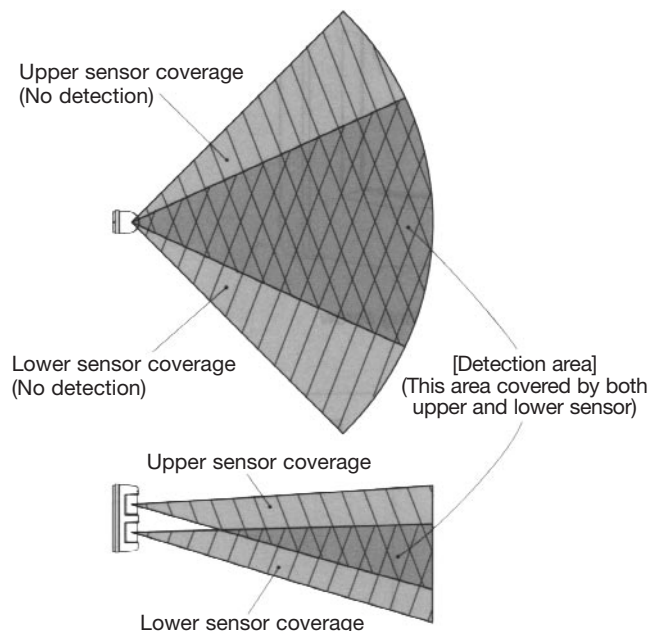● Remove all obstacles (including clear glass), which will create non detection zone.

Non detection area

● Make sure that downward zone will not be affected by sun light reflected by water on the road etc.

2. Other Precautions

● Operation LED blinks for about 1 min after turning on power. During this warm up period, the sensor doesn't make detection.

● Day light switch allows this unit to issue an alarm signal only when the surrounding area is darker than set illuminance. In other words, if surrounding area is brighter than set illuminance, this sensor doesn't output signal.

● This sensor operates during detecting time + delay time set by a potentiometer. It continues to issue alarm as long as it detects objects regardless of set delay time.

● Do not pour water on this unit with a hose as it is designed to be rainproof, not waterproof.

● When precaution mode is set at AND mode, this sensor outputs alarm signal only when both upper and lower sensor detect objects. In other words, it won't make detection in the area, which is not covered by both upper and lower sensor. [Only applicable to MS-12FE]

Upper sensor coverage (No detection)

Lower sensor coverage (No detection)

[Detection area] (This area covered by both upper and lower sensor)

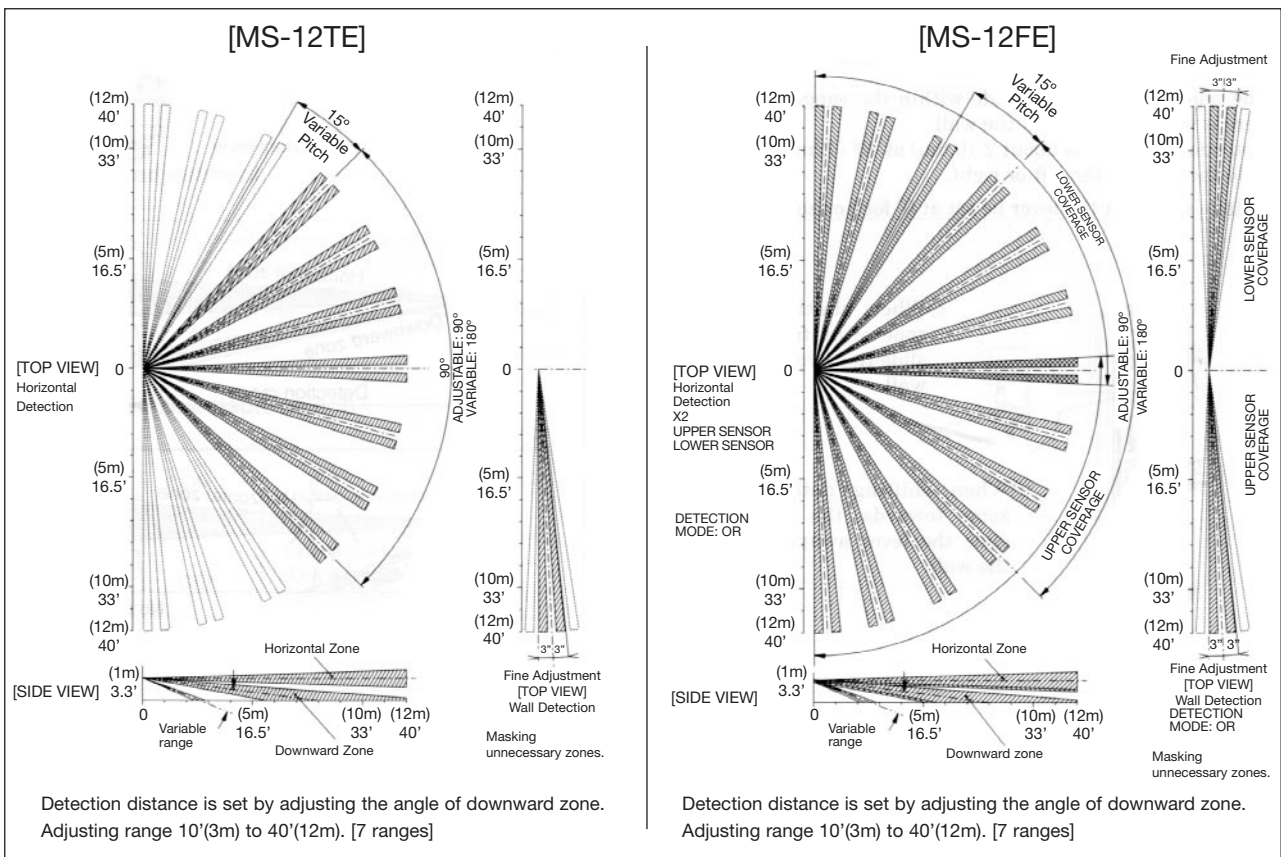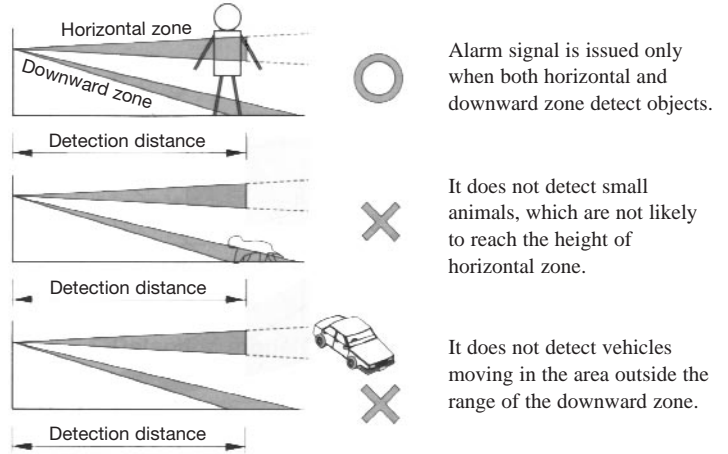Upper sensor coverage

Lower sensor coverage

4 DETECTION AREA

The detection zone of this unit consists of horizontal zone and downward zone.
Alarm signal is issued only when both detection zones detect objects.
Detection distance can be set by adjusting the angle of downward zone.

MS-12TE is equipped with 1 set of sensor on the upper side.

MS-12FE is equipped with 2 sets of sensor on the upper and lower side, making it possible to select AND mode or OR mode.

Horizontal zone
Downward zone
Detection distance

Alarm signal is issued only when both horizontal and downward zone detect objects.

It does not detect small animals, which are not likely to reach the height of horizontal zone.

It does not detect vehicles moving in the area outside the range of the downward zone.

[MS-12TE]

[TOP VIEW] Horizontal Detection

15° Variable Pitch

ADJUSTABLE: 90° VARIABLE: 180°

Fine Adjustment [TOP VIEW] Wall Detection

Masking unnecessary zones.

[SIDE VIEW]

Horizontal Zone

Variable range

Downward Zone

Detection distance is set by adjusting the angle of downward zone.
Adjusting range 10'(3m) to 40'(12m). [7 ranges]

[MS-12FE]

Fine Adjustment

[TOP VIEW] Horizontal Detection X2 UPPER SENSOR LOWER SENSOR

DETECTION MODE: OR

15° Variable Pitch

LOWER SENSOR COVERAGE

UPPER SENSOR COVERAGE

ADJUSTABLE: 90° VARIABLE: 180°

LOWER SENSOR COVERAGE

UPPER SENSOR COVERAGE

Fine Adjustment [TOP VIEW] Wall Detection DETECTION MODE: OR

Masking unnecessary zones.

[SIDE VIEW]

Horizontal Zone

Variable range

Downward zone

Detection distance is set by adjusting the angle of downward zone.
Adjusting range 10'(3m) to 40'(12m). [7 ranges]

Area adjustment

[Wide angle detection]

Sensor

±90°

±90°
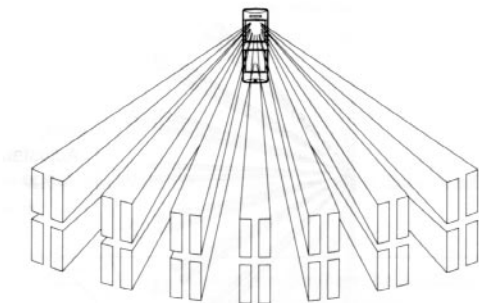
Centre

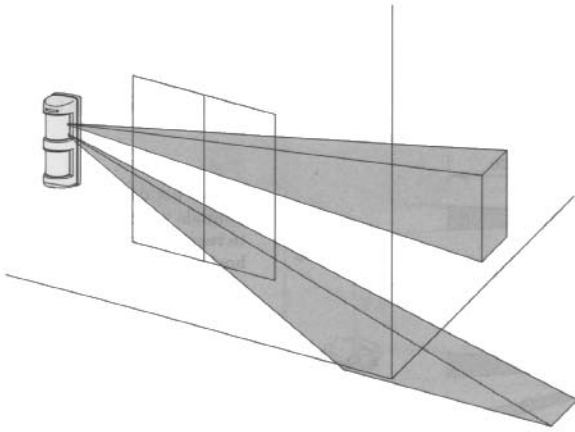(1) Point the sensor to the centre of the area to be detected.
By turning the sensor up to ±45°, it can detect all directions in front of it.
When the unit is turned more than ±45°, detection zone will be eliminated one by one from the end.
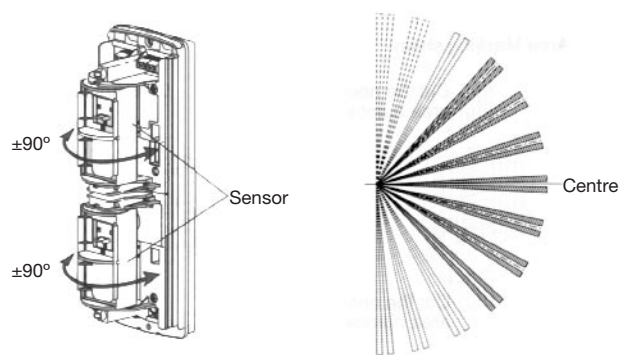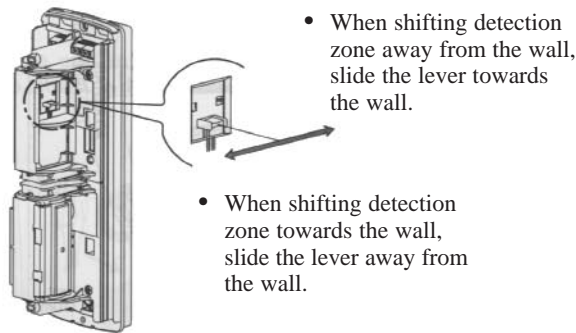
(2) It consists of seven detection zone (Wide angle : 90°).

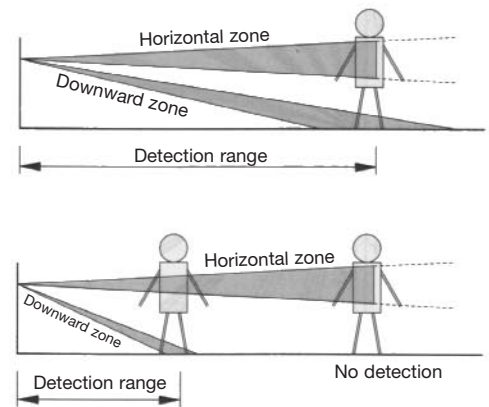(3) Utilize attached area masking sheet when eliminating detection zone.

[Wall detection]
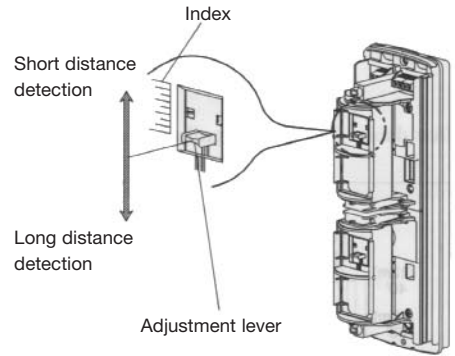
(1) Attach area masking sheet (accessory) to the lens holder of cover without cutting it out.
(2) Turn the sensor by 90º to the direction to be detected.
(3) Horizontal fine adjustment

Fine adjustment can be made within the range of ±3º, in case there are some obstacles on the wall.
(Detection zone shifts about 2'(0.6m) at 40'(12m) range.)
Slide the lever to the left or right.

∗Make sure that the lever is set at 0º for horizontal detection.

- When shifting detection zone away from the wall, slide the lever towards the wall.

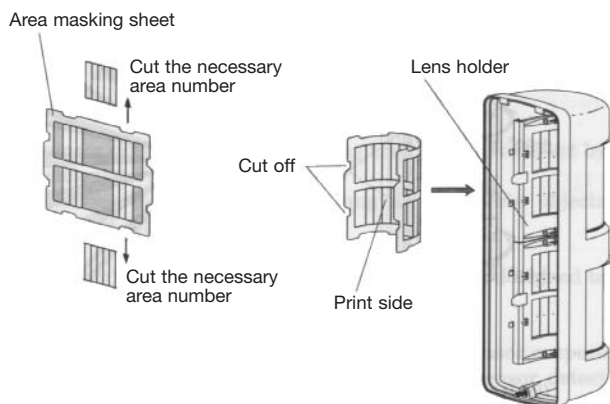- When shifting detection zone towards the wall, slide the lever away from the wall.

- Detection distance adjustment

Detection distance can be adjusted within a range from 10'(3m) to 40'(12m) by turning the angle of downward zone vertically.
Refer to the index and slide the adjustment lever up or down.
Slide it up and the detection distance becomes shorter, sliding it down, detection distance becomes longer.

> Detection distance depends on how the sensor is installed and how its sensitivity adjustment is set.

Index
Short distance detection
Long distance detection
Adjustment lever

Horizontal zone
Downward zone
Detection range

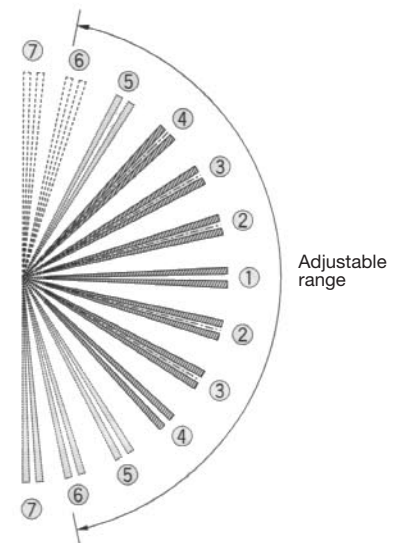Horizontal zone
Downward zone
Detection range
No detection

• Area masking sheet

(1) Cut the necessary area number on the area masking sheet. See below area masking picture for your reference and cut out the same place on both horizontal and downward zones.

(2) Attach the area masking sheet to the lens holder located inside cover.

Area masking sheet
Cut the necessary area number
Lens holder
Cut off
Cut the necessary area number
Print side

(3) Attach cover and check detection zone.

• Zone ⑦ cannot be masked by area masking sheet.

Adjustable range

Warm up period

Operation LED blinks for about 1 min after supplying power. The unit doesn't operate for this time as it is the sensor stabilising period.

Pulse count selectable

The number of counts can be selected according to the environmental conditions.

ON	ON	Less sensitive, prevents false alarms caused by temperature fluctuation.
OFF	OFF [Factory set]	More sensitive

* MS-12FE has two sets of above switches upper and lower sensor.

Sensitivity adjustment

L H	Sensitivity can be adjusted between 30% (L) and 170%(H). [Factory set:100%]

LED ON/OFF selectable switch

ON	ON [Factory set]	Lights at alarm
OFF	OFF	LED disabled. (During warm up period, light flickers.)
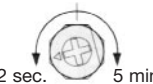
Day Light

Alarm is triggered only when surrounding environment is darker than the illuminance setting.

NIGHT	The unit operates during night time only.
DAY & NIGHT	The unit operates day and night. (Factory set)

Delay time

Operation time can be adjusted between 2sec. and to 5min. approx.

2 sec. 5 min.	Operation time can be adjusted between 2sec. and 5min. approx. [Factory set : 2sec]

Contact output selectable

ON	1a	a (N.O)
OFF	1b	b (N.C) [Factory set]

Detection mode [Only applicable to MS-12FE]

ON	AND	Alarm signal is issued only when both upper and lower sensors detect objects simultaneously.
OFF	OR [Factory set]	Alarm signal is issued when either upper or lower sensors detect objects.

6 *WIRING*

1. Terminal Configuration

| Power | Contact output | Tamper |
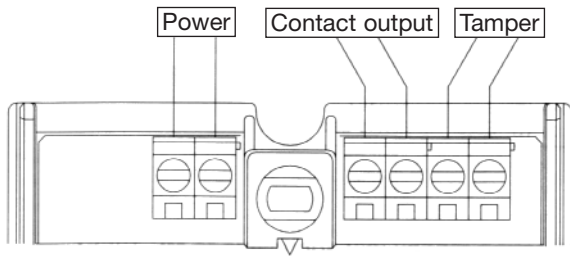
SUPPLY VOLTAGE

- 12V to 30VDC (Non Polarity)
- Power consumption
  35mA MAX (MS-12TE)
  40mA MAX (MS-12FE)

OUTPUT SIGNAL

Dry contact relay output form N.O/N.C selectable

CONTACT OPERATON

Detection time + off delay (2sec.-5min. approx.)

CONTACT CAPACITY

30V (AC/DC), 0.5A MAX. (resistive load)

DAY LIGHT

Output operates when daylight is below setting.

TAMPER

- Dry contact relay output N/C

CONTACT CAPACITY

30V (AC/DC), 0.5A MAX. (resistive load)

◎**WIRE SIZE**

AWG24 ~ AWG14 (0.2mm^2) ~ (2mm^2)

2. Wiring distance

Size of wire	Power voltage	
	DC12V	DC24V
0.3mm^2 (ø0.65mm)	820' (250m)	8,500' (2600m)
0.5mm^2 (ø0.8mm)	1,480' (450m)	14,100' (4300m)
0.8mm^2 (ø1.0mm)	2,300' (700m)	21,300' (6500m)
1.2mm^2 (ø1.25mm)	3,120' (950m)	29,500' (9000m)

Note: 1) Maximum wiring distance when two or more sets are
connected is the value above divided by number of sets.
2) The signal line can be wired to a distance of up to 3,000ft.
(1,000m) with AWG 22 (dia. 0.65mm) telephone wire.

3. Wire Insertion

Exposed wiring

- Break one outside knockout and its related inside knockout
  as necessary.
  Pull wire through the insertion holes and connect it to the
  terminals.

Mounted wiring

- Break inside knockout,
  pull wire through wiring
  hole and connect it to the
  terminals.
- * When installing the sensor
  to flush mount box, use
  wall mount bracket (BW-
  24) [sold separately].
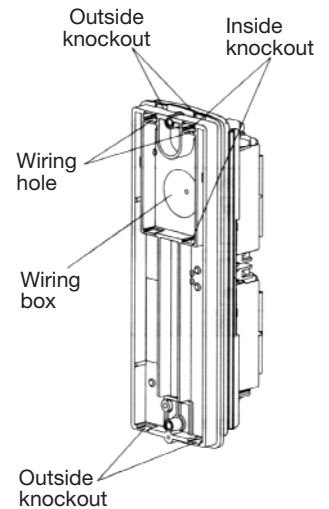
7 *INSTALLATION*

(1) Read PRECAUTIONS (3) before installation.
(2) Loosen cover locking screw and detach cover.
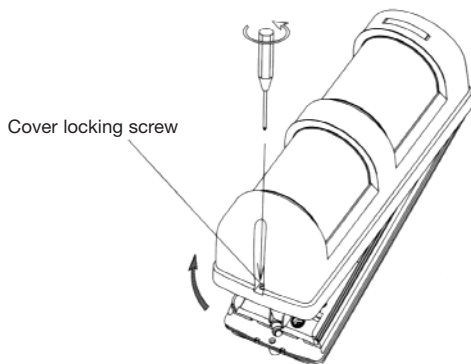
(3) Refer to WIRING (6) and connect wires to the terminal.
(4) Install the unit.

(5) Refer to DETECTION
AREA (4) and OPERATION
CHECK (8) and check
detection area and operation.
(6) Replace the cover.

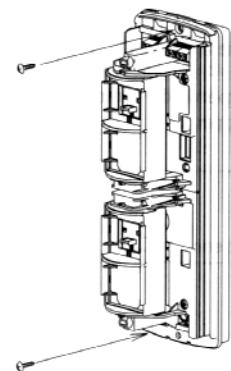# 8 OPERATION CHECK

1. Setting for operation check

• Operation LED : ON
• Day light : DAY & NIGHT
• Delay time : 2 sec.

(1) Determine the required area of detection and set the horizontal angle of the sensor and detection distance.

(2) Attach cover and fix it to the sensor with the locking screw.

(3) Turn the power ON and wait for 1 min. until the alarm LED stops blinking.

(4) After warm-up period, operate a walk test in the detection area to check, if the required area is covered.

(5) Readjust sensitivity, masking or count if necessary.

2. Operation check

(1) Make final setting according to the purpose.

(2) Attach cover and check if operation LED and connected devices operate properly.
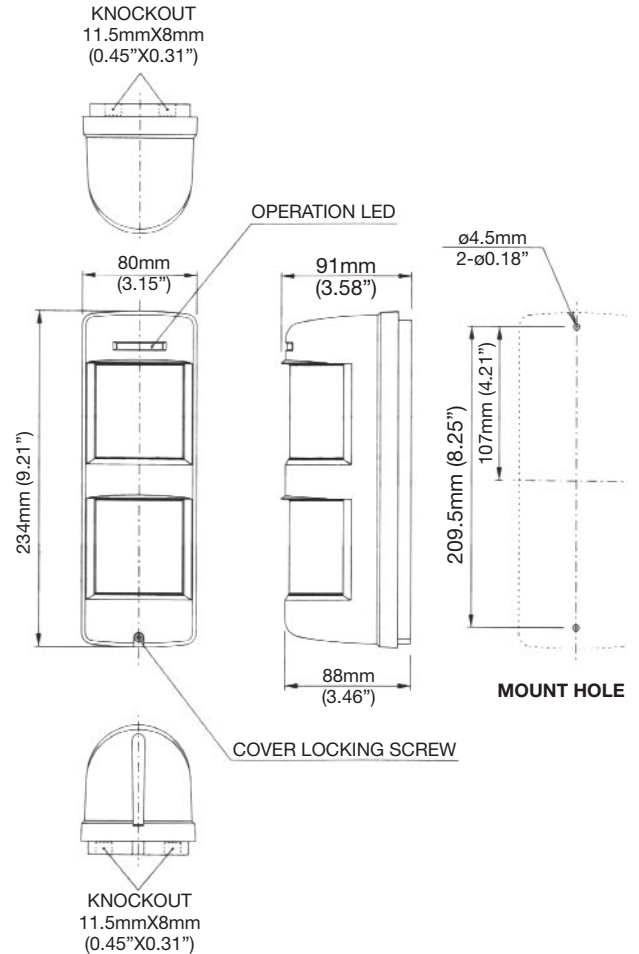
9 TROUBLESHOOTING

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.

Trouble	Check	Corrective Action
Completely Inactive	1. No power supply, broken wire or improper voltage.	1. Correct power supply or replace broken wire.
	2. Cover shielded by substances (including glass).	2. Remove the substances.
	3. Improper area adjustment.	3. Readjust the protection area setting.
	4. Improper operation mode setting.	4. Readjust operation mode setting.
	5. Not yet 1 minutes after power turned on. (Operation LED is flickering.)	5. Allow for warming up time (about 1 min.)
	6. No area covered by both upper and lower sensor when set at AND mode. [Only applicable to MS-12FE]	6. Readjust the sensor angle so that the area to be detected is covered by both upper and lower sensor.
Sometimes Inactive	1. Improper area adjustment.	1. Readjust the protection area setting.
	2. Improper operation mode setting.	2. Readjust operation mode setting.
	3. Cover face is soiled with dust or water drop.	3. Clean the cover with soft cloth.
	4. Area covered by both upper and lower sensor is too small to be detected when set at AND mode. (Only applicable to MS-12FE)	4. Readjust the sensor angle.
Activated when no person has passed	1. Unstable power voltage.	1. Stabilize the power voltage.
	2. Something moving in protected area or too rapid temperature variations.	2. Remove the cause.
	3. Large electrical noise source such as power machine nearby or its wiring close to that of sensor.	3. Relocate device.
	4. Intense reflection of sunlight or head light shining on the sensor.	4. Relocate device. Readjust the protection area setting.
	5. Reflecting lights such as sunlight or head light affect the downward zone.	5. Remove reflective objects. Readjust the protection area setting.
	6. Improper installation of the sensor.	6. Install the sensor parallel.
	7. Detection distance of the downward zone is too long.	7. Readjust detection distance.
The alarm LED lights, but connected device is inactive	1. Poor contact connection or broken wire or short circuit.	1. Check the wiring or connection.
	2. Contact output is not working.	2. Check the contact output terminal using a tester.
	3. Is the connected device operation normal?	3. Check the connected device.

10 SPECIFICATIONS

Model	MS-12TE	MS-12FE
Detection system	Passive infrared	
Coverage	When horizontal detection Angle: 90º Detection distance: 40' (12m) Horizontal zone: 7 zones Downward zone: 7 zones	2 sets of MS-12TE sensor (Full cover 180º)
Coverage adjustment	Horizontal : ±90º Detection distance : 10'~40' (3m~12m) [7 steps] (By adjusting vertical angle of downward curtain)	
Supply voltage	12 to 30V DC (Non polarity)	
Current consumption	35mA MAX	40mA MAX
Alarm output	Dry contact relay output N.C/N.O. selectable N.C/N.O *Contact capacity: 30V (AC/DC), 0.5A MAX (Resistive load) *Contact operation: Detection time+off delay (2sec.-5min.approx) *Day light : 10 lux (night) - (day & night)	
Tamper output	Dry contact relay output N/C *Contact capacity: 30V (AC/DC), 0.5A MAX (Resistive load)	
Operation LED	Red LED Blinking at Warming up Lighting at alarm (LED disabled)	
Counts selectable switch	Once/three times (with a switch)	
Sensitivity adjustment	*Approx. 30% (L) – Approx. 170% (H) (By volume)	
Detection mode		AND/OR selectable
Connection	Terminals	
Ambient temperature	-4ºF to 122ºF (-20ºC to 50ºC)	
Mounting position	Indoor/Outdoor (Height 0.8 – 1.2m)	
Weight	13.7oz (390g)	16.5oz (470g)
Appearance	Body: AES resin	Lens: PE resin
Accessory	Tapping screw: 2 Area masking sheet: 1	Tapping screw: 2 Area masking sheet: 2
Optional	Wall mount attachment (BW-24) Pole attachment (BP-22)	

11 EXTERNAL DIMENSIONS

KNOCKOUT 11.5mmX8mm (0.45"X0.31")

OPERATION LED

80mm (3.15")

234mm (9.21")

91mm (3.58")

88mm (3.46")

COVER LOCKING SCREW

KNOCKOUT 11.5mmX8mm (0.45"X0.31")

ø4.5mm 2-ø0.18"

209.5mm (8.25")

107mm (4.21")

MOUNT HOLE

TAKEX®

CE