

# MICROWAVE SENSOR

## MW-50



Application

*The TAKEX microwave sensor is especially designed for outdoor protection. K band microwave sensor achieve high stability in severe weather conditions.*

### HIGH RELIABILITY

24.1 GHz of microwave sensor reduces false alarms caused by severe weather conditions such as heavy fog, snowfall or rain.

### TWO FREQUENCIES (H) and (L) SELECTION

Two models are available with different frequencies, MW-50 (H) and MW-50 (L).

### ADJUSTMENT MODE SWITCH

With adjustment mode switch, monitor output voltage (beam reception level) can be checked speedily.

### LED

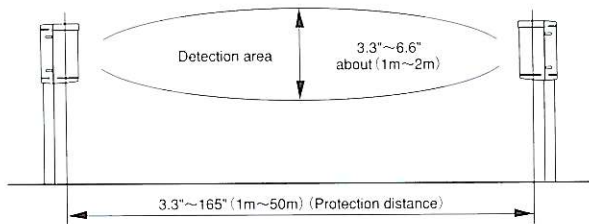
- \* Transmitter : Green LED ON when transmitting a signal
- \* Receiver : Red LED ON at alarm

### OTHER FEATURES

- \* Automatic Gain Control circuit
- \* Response time adjustment
- \* Antennae directional adjustment (horizontally  $\pm 90^\circ$ , vertically  $\pm 10^\circ$ )
- \* Monitor jack output
- \* Pole or wall mount

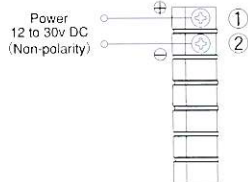
# MICROWAVE SENSOR

## ■ COVERAGE

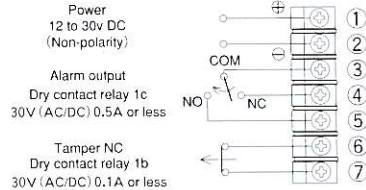


## ■ TERMINAL ARRANGEMENT

### <Transmitter>



### <Receiver>

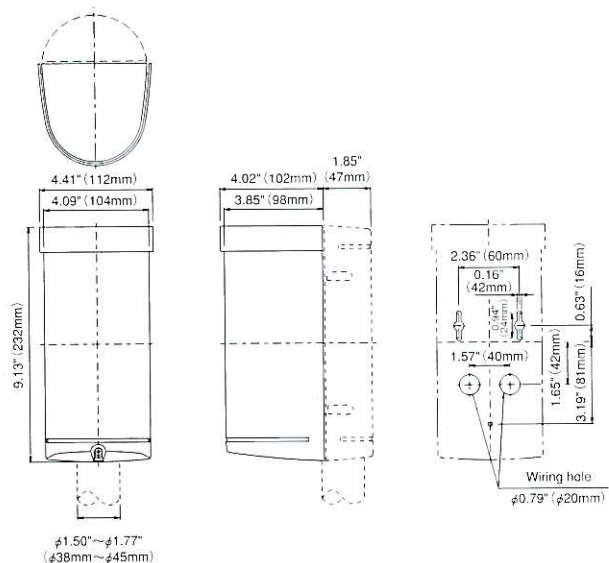


## ■ OPTIONAL

- Pole cover  
BP-50 MW



## ■ EXTERNAL DIMENSIONS (Unit : inch)



## ■ SPECIFICATIONS

Type	Microwave sensor	
Model	MW-50	
Protection distance	3.3ft. (1m) to 165ft. (50m)	
Max. arrival distance	Microwave : approx. 330ft. (100m)	
Microwave	(L) 24.11GHz	(H) 24.19GHz
Detection system	Microwave	
Response time	Microwave : 40msec. to 300msec. (Variable at pot)	
Alarm signal	Dry contact relay output 1C N/O and N/C Contact action : Interruption time output Contact capacity : 30V (AC/DC) 0.5A or less	
Supply voltage	12 to 30V DC	
Power consumption	100mA ● Transmitter : 50mA ● Receiver : 50mA	
Tamper signal	Dry contact output 1b (N/C) Contact capacity : 30V (AC/DC) 0.1A	
Alarm LED (Receiver)	Red LED Lighting at alarm	
Transmission LED (Transmitter)	Green LED Lighting at sending signal	
Functions	Monitor output, Adjustment mode switch	
Weight	Transmitter 710g Receiver 760g	
Appearance	Wine red PC resin	

※ The specifications are subject to change without notice.

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.

LEAF 02-05R27-1

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# TAKEX MICROWAVE SENSOR

MW-50

## Instruction Manual

We appreciate your purchase of a TAKEX microwave 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 or a crime 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.

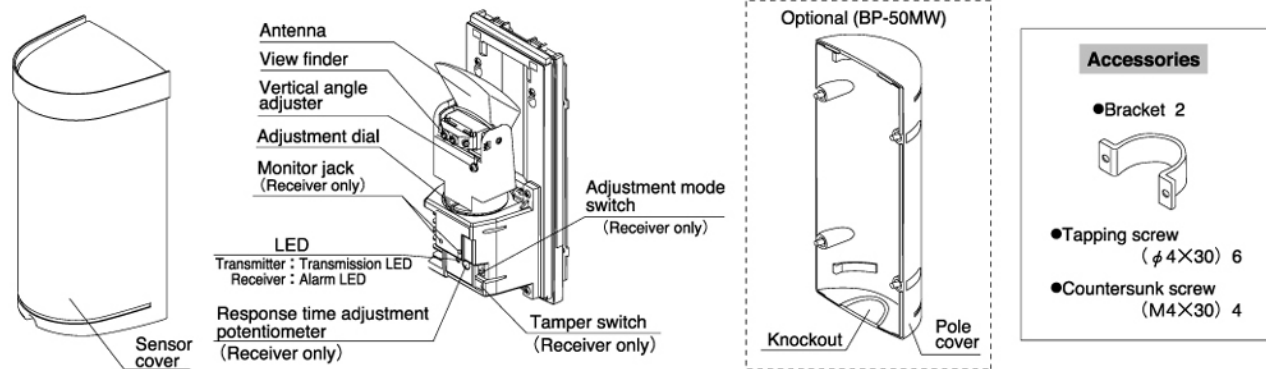
### PRODUCT DESCRIPTION

This Product consists of transmitter which sends 24.15GHz of microwave and receiver which receives the beam. It will initiate an alarm signal when receiver detects drop in the beam reception level because objects interrupt between transmitter and receiver.

Compared to photoelectric beam, microwave's wavelength is extremely long, which prevent the sensor from being affected by weather such as torrential rainfall, snowfall, fog or frost especially during the cold winter time. Stable detection performance is possible.

Two types of frequencies, MW-50 (H) and MW-50 (L) are available.

## 1 PARTS DESCRIPTION



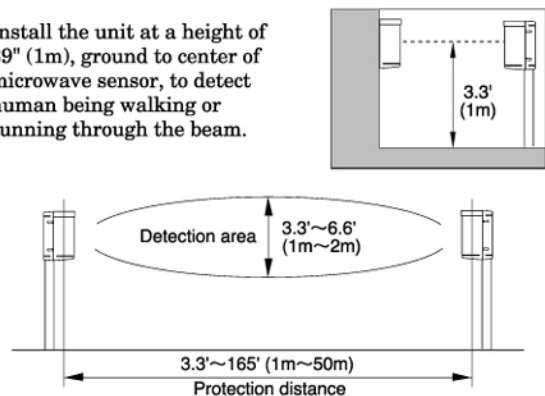
## 2 CAUTIONS ON INSTALLATION

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

- Do not install the unit at places where it may be interrupted by obstacles such as trees.
- Do not install the unit on unsteady surfaces.
- Do not install the unit on street side or in parking lots where many cars may pass by. Installation must be at 5ft. (1.5m) away from the automobile and traffic.
- When installing the unit along the side of a building or fence, installation must be at least 2ft. (60cm) away from the construction.

### 2) Height of installation

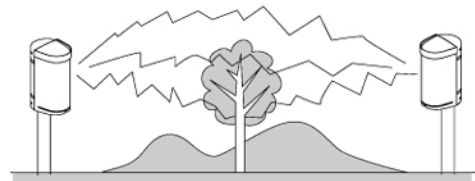
Install the unit at a height of 39" (1m), ground to center of microwave sensor, to detect human being walking or running through the beam.



The protection distance should be between 3.3ft. (1m) and 165ft. (50m).

### 3) Check the environment of the installation site

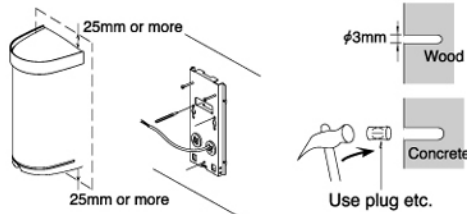
Microwave is affected by electric waves reflected from buildings, fences or the ground. Beam reception level of the microwave depends on how the unit is installed in the area. Install the sensor so that the microwave beam reception is not obstructed.



### 3) Wall mount

#### ① Make holes in wall.

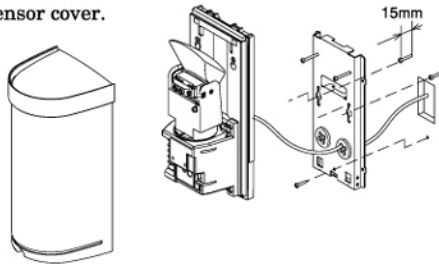
- Place the mounting plate on wall as a template for drilling and mark the screw holes. (Allow a space 1" (25mm) above and below the plate.. This will provide easy detachment of the cover after installation.)



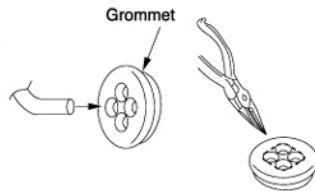
- Pre-drill on wall.  
Concrete wall : Refer to specification of the securing plug used.  
Wooden wall : 3mm dia.

#### ② Install the sensor.

- Insert tapping screws to 15mm under the screw head.
- Install mounting plate on the wall after pulling wire through it.
- Connect terminals.
- Attach sensor cover.

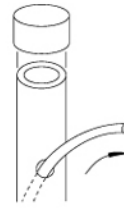


- \* The grommet is compatible with a wire of  $\phi 0.12"$  ( $\phi 3\text{mm}$ ) to  $\phi 0.24"$  ( $\phi 6\text{mm}$ ) outer dia.  
When a wire of more than  $\phi 0.24"$  ( $\phi 6\text{mm}$ ) outer dia. is used, cut off the dotted line portion as illustrated using pliers or the like. Then use caulking to prevent insects from entering into the unit.



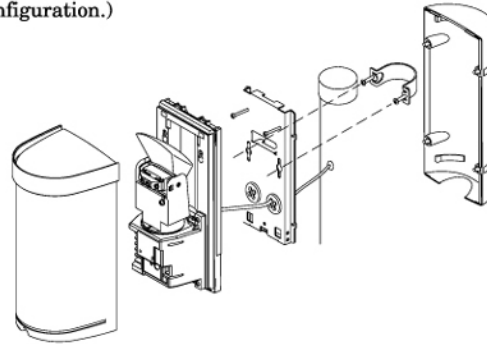
### 4) Pole mount

- #### ① Make wiring hole in pole. Pull through wire. Place the pole cap on top of the pole.



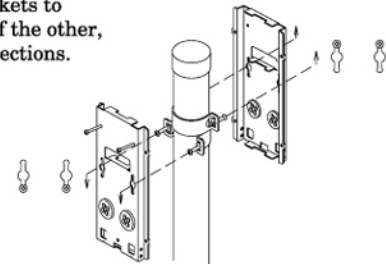
#### ② Install sensor on pole.

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



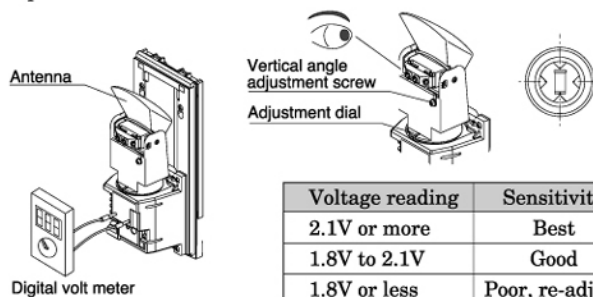
### 5) Pole mounting back to back.

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



## 3 SET-UP OF FUNCTIONS AND BEAM ALIGNMENT

- Supply power with covers off.
- Look through view finder on the transmitter unit and move until the receiver unit is visible.  
Repeat the procedure on the receiver unit.
- Set adjustment mode switch on the receiver at " adjustment mode". Connect digital volt meter to monitor jack and check the monitor output voltage (beam reception level).  
When output voltage is low, adjust the installation height of transmitter and receiver so that the output voltage will reach the highest level. (Make sure that the angle of the antenna does not change.)
- After adjustment, make sure that the adjustment switch is set at "Operation mode".

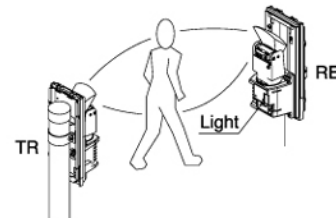


- #### ③ After adjustment, set adjustment mode switch at "Operation mode".

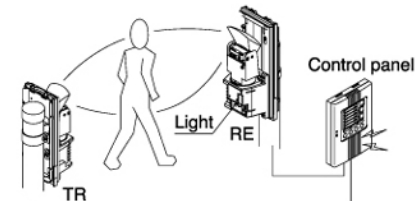
## 4 OPERATION CHECK

After installation and angle adjustment are finished, test operation by walk testing the beam. Two methods may be used.

#### 1) Check by alarm LED only.



#### 2) Check by alarm LED and control panel



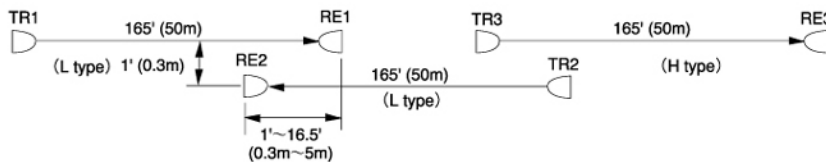


#### 4) Installation example

When two or more sets are used, two frequencies (L and H types) should be used in order to avoid cross talk or interference. Refer to the following example.

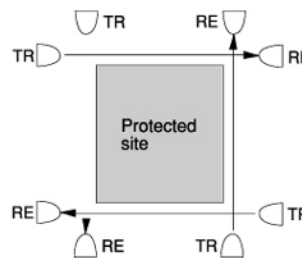
##### ● Linear protection

H type should be used for TR3 and RE3 when TR1 and RE1 are L type.



##### ● Perimeter protection

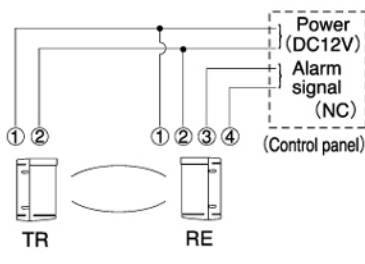
Do not install the transmitter and the receiver at a same corner. Microwave sensor with the same frequency can be used for this case.



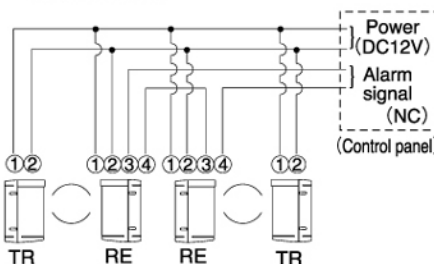
#### Wiring

The equipment must be powered from an LPS in accordance with EN60950-1 : 2001

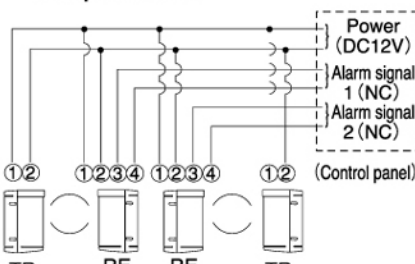
##### 1) Basic connection



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



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

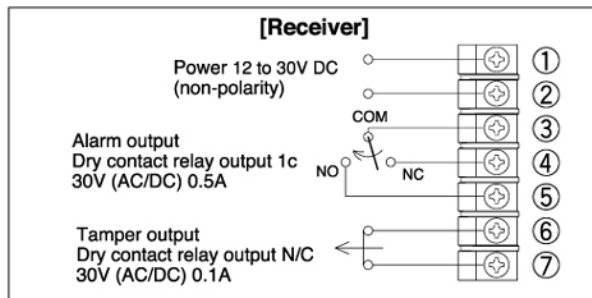
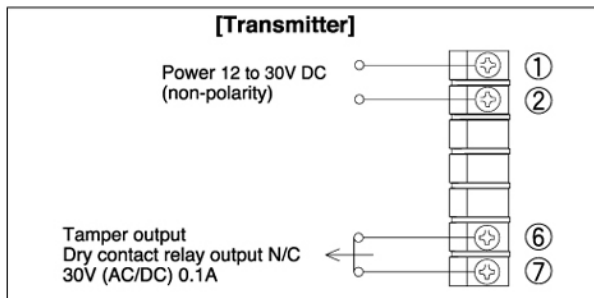


#### 4) Wiring distance

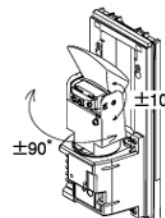
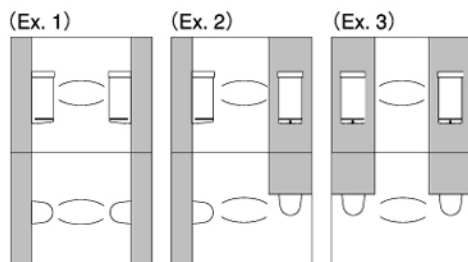
Size of wire used	Power voltage	
	12V DC	24V DC
AWG 20 (Dia. 0.8mm)	Up to 660ft. (200m)	Up to 5400ft. (1600m)
AWG 18 (Dia. 1.0mm)	Up to 1000ft. (300m)	Up to 8000ft. (2400m)
AWG 17 (Dia. 1.1mm)	Up to 1320ft. (400m)	Up to 9570ft. (2900m)
AWG 16 (Dia. 1.25mm)	Up to 1815ft. (550m)	Up to 12540ft. (3800m)
AWG 15 (Dia. 1.4mm)	Up to 2310ft. (700m)	Up to 16830ft. (5100m)
AWG 14 (Dia. 1.6mm)	Up to 2970ft. (900m)	Up to 21120ft. (6400m)

- 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 a distance of up to 6,000ft. (2,000m) with AWG 20 (dia.0.8mm) telephone wire.

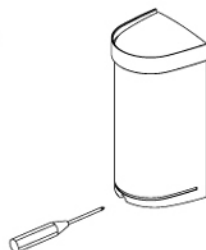
#### Terminal arrangement



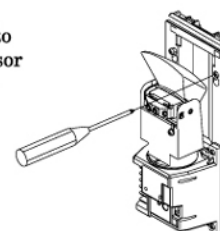
#### Mounting



- 1) Detach the sensor cover with a screw driver.



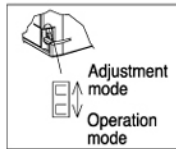
- 2) Detach the mounting plate to loosen 2 screws that fix sensor body to the mounting plate.



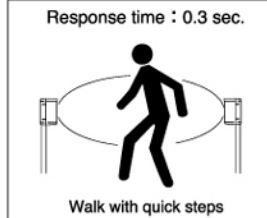
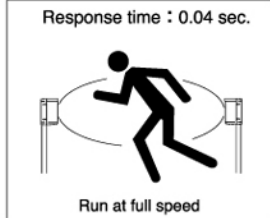
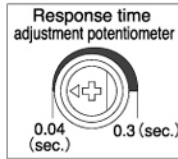
## 5 FUNCTIONS DESCRIPTION

### 1. Adjustment mode switch

With this switch, speedy check of beam reception level is possible. When making beam alignment, turn the switch to the "Adjustment mode".



### 2. Response time adjustment volume



## 6 TROUBLESHOOTING

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 3. Microwave is reflected on another object and sent into the receiver	1. Turn on the power 2. Check wire 3. Remove the reflecting object or change the place for installation
Receiver LED continues to light (An alarm does not stop)	1. No power supply on transmitter 2. Angle adjustment of transmitter and receiver is not appropriate. 3. Obstacles between transmitter and receiver	1. Turn on the power on transmitter 2. Re-adjust angle adjustment 3. Remove obstacles.
Intermittent alarm	1. Bad wiring connection 2. Change of supply voltage 3. Shading objects between transmitter and receiver 4. A large electric noise source such as power machine is located nearby transmitter and receiver 5. Installation height, installation site or angle adjustment is inappropriate	1. Check again 2. Stabilize supply voltage 3. Remove the shading object 4. Change the place of installation 5. Re-adjust

## 9 SPECIAL NOTES

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

—Reorient or relocate the receiving antenna. —Increase the separation between the equipment and receiver. —Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. —Consult the dealer or an experienced radio / TV technician for help.

**WARNING :** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

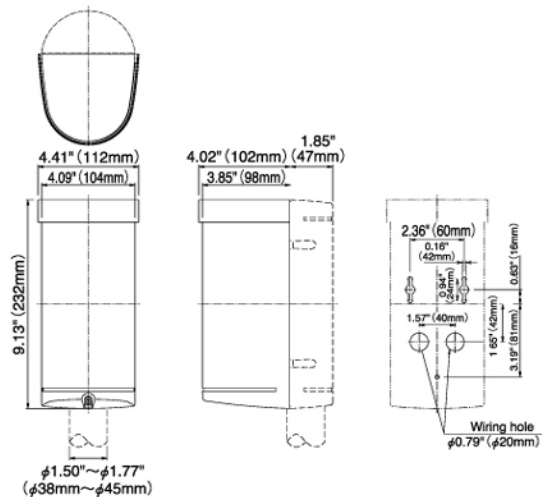
### Limited Warranty :

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 (including inductive surge by lightning), 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.

## 7 SPECIFICATION

Type	Microwave sensor	
Model	MW-50	
Protection distance	3.3ft.(1m) to 165ft.(50m)	
Max. arrival distance	Approx. 330ft. (100m)	
Microwave	(L) 24.11GHz	(H) 24.17GHz
Detection system	Microwave	
Response time	0.04sec. to 0.3sec. (Variable at pot)	
Alarm signal	Dry contact relay output 1C N/O and N/C Contact action : Interruption time output Contact capacity : 30V (AC/DC) 0.5A or less	
Supply voltage	12 to 30V DC	
Power consumption	100mA • Transmitter : 50mA • Receiver : 50mA	
Tamper signal	Dry contact output 1b (N/C) Contact capacity : 30V (AC/DC) 0.1A (Receiver only)	
Alarm LED (Receiver)	Red LED Lighting at alarm	
Transmission LED (Transmitter)	Green LED Lighting at sending signal	
Functions	Monitor output, Adjustment mode switch	
Weight	Transmitter 710g Receiver 760g	
Appearance	Wine red PC resin	

## 8 EXTERNAL DIMENSIONS



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