

TAKEX DUAL ZONE OUTDOOR PIR

MX-12FAMD

Instruction Manual

Thank you for your purchase of this TAKEX dual zone outdoor PIR.

This sensor will provide a 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 any damage, injury, or loss caused by accident, theft, Acts of God (including lightning), abuse, misuse, abnormal usage, faulty installation or improper maintenance.

PRODUCT DESCRIPTION:

MX-12FAMD is a dual-technology outdoor motion detection sensor which uses dual-zone PIR and microwave technologies to detect the movement of a human. Suitable for indoor/outdoor use, this sensor provides detection coverage of 12 m×180 degrees, with independent outputs for alarm and external devices per left/right side (90 degree), adjustable individually.

1 PRECAUTIONS

- ⊘ A prohibited action you must not do. Ⓢ An action you must do and information you should keep in mind.

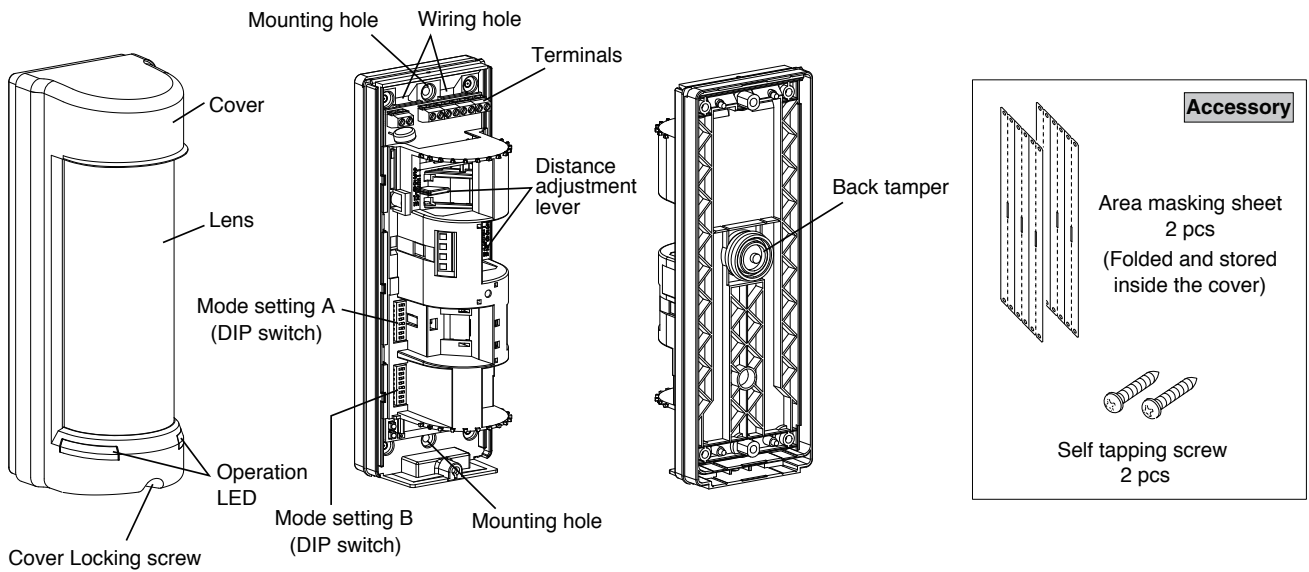
Warning This indicates the possibility of severe injury, and even death, if ignored or a user handles the unit incorrectly.

- | | |
|---|--|
| Ⓢ Do not disassemble or alter this product. | Ⓢ Mount the sensor securely in the optimal position. |
| Ⓢ Immediately stop power supply in the event of abnormal condition. | Ⓢ Immediately stop power supply in the event of water entry. |
| ⊘ Do not connect devices which exceed the capacitance of this sensor. | ⊘ Do not use the sensor in a location with high humidity. |
| Ⓢ Strictly observe the specified voltage (9 to 28V DC). | |

Caution This indicates the possibility of minor injury and/or damage to properties, or a possible notification delay in your system due to false operations and/or non-detection, if ignored or a user handles the unit incorrectly.

- | | | | |
|---|---|---|--|
| ⊘ Avoid electrical noise
 | ⊘ Avoid exhaust vent
 | ⊘ Remove all obstructions
 | ⊘ Avoid strong light and fluorescent lamp at a short distance
 |
| ⊘ Avoid spraying water with a hose
 | Ⓢ Ensure that people cross the detection area
 | Ⓢ Keep installation height 0.8 to 1.2m (2.6' to 4.0')
 | Ⓢ Remove obstructions, including glass
 |
| Ⓢ Install perpendicularly
 | Ⓢ Microwave may detect objects behind a wall.
 | ⊘ Avoid adjacent installation
 | Ⓢ Avoid detection of cars/motorcycles on the roadside. The detection zone extends to 12m ahead; there is a possibility of detecting vehicles with temperature differences.
 |
| Ⓢ Follow these mounting condition
Increase Decrease
 | | | |

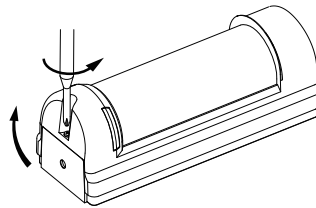
2 PARTS DESCRIPTION



3 INSTALLATION

3-1 Before mounting

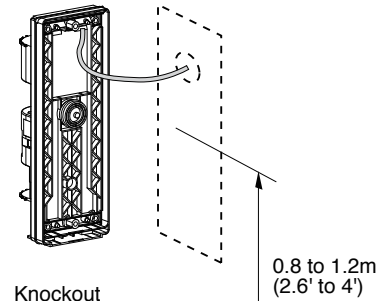
Loosen the cover locking screw and remove the cover.



3-2 Wall mount

[Embedded wiring]

- (1) Align the back of sensor with the wiring from the wall.
- (2) Feed the wiring through the wiring hole and connect it to the terminals.
- (3) Use sealant and caulk the gap around the wiring.

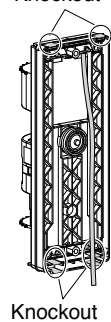


[External wiring]

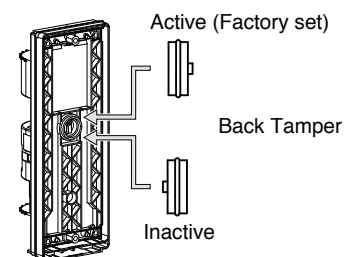
- (1) Break off the desired knockout before wiring.
- (2) Feed the wiring through the wiring hole and connect it to the terminals.
- (3) Use cable conduit and joint boxes to cover the wiring.
- (4) Use sealant to caulk the gap around the wiring.



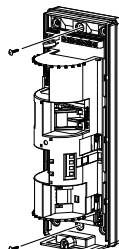
Make sure that sealant is used to caulk the wiring hole and gaps.



- (5) Select Active or Inactive back tamper by reversing the rubber switch cover.



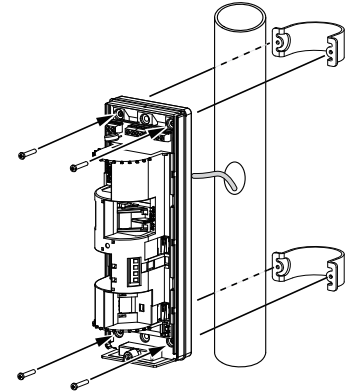
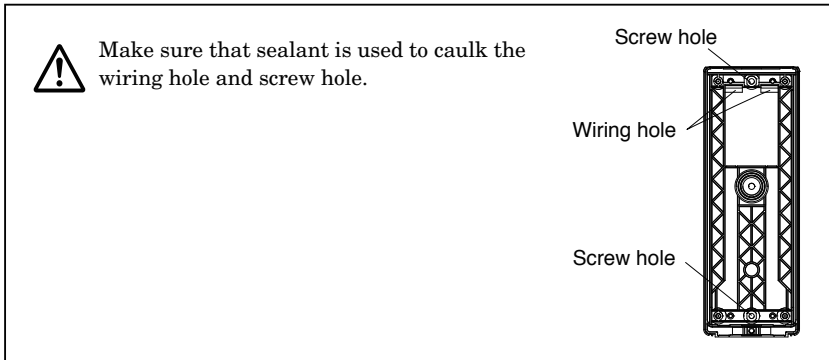
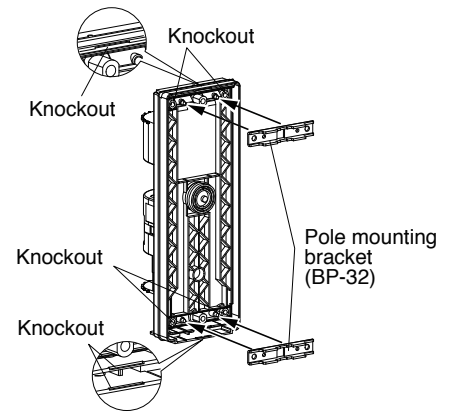
- (6) Fix the sensor using the supplied screws.



3-3 Pole mount

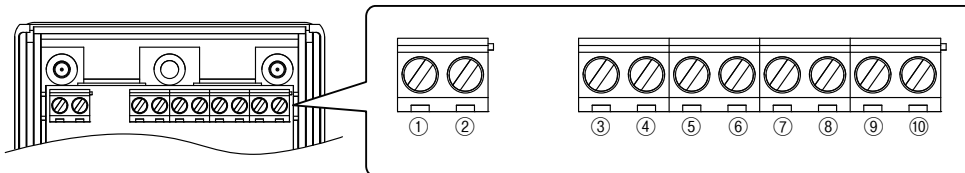
* Use the pole attachment BP-32 sold separately.
(for pole dia 38mm to 45mm (1.50" to 1.77"))

- (1) Break off the pole mounting knockouts.
- (2) Fit the pole mounting brackets to the sensor.
- (3) Select Active or Inactive Back Tamper by reversing the rubber switch cover.
- (4) Use sealant to caulk the screw hole and the gap around wiring entry.
- (5) Fit the pole fixing bracket around the pole and fix the sensor with screws.
- (6) Make sure that the sensor is not inclined when viewed in front or laterally.



4 WIRING

4-1 Terminal configuration



①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
POWER		ALARM(1)		ALARM(2)		TROUBLE		TAMPER	
		ALARM RIGHT + LEFT		EXTERNAL OUTPUT					
		Mode setting "A-2" ON							
		ALARM RIGHT		ALARM LEFT					
		Mode setting "A-2" OFF							

- POWER : 9 to 28V DC (non-polarity) Current consumption 30mA max.
- ALARM OUTPUT (1) : N.C./N.O. selectable, 30V (AC/DC) 0.2A max. (Resistive load)
- ALARM OUTPUT (2) : N.C./N.O. selectable, 30V (AC/DC) 0.2A max. (Resistive load)
(For EXTERNAL OUTPUT : N.O. only)
- TROUBLE OUTPUT : N.C. 30V (AC/DC) 0.2A max. (Resistive load)
- TAMPER OUTPUT : N.C. 30V (AC/DC) 0.1A max. (Resistive load)

4-2 Wiring distance

Size of wire used	Power voltage	
	12V DC	24V DC
AWG22 0.3mm ² (φ 0.65mm)	350m (1100')	1700m (5600')
AWG20 0.5mm ² (φ 0.8mm)	550m (1800')	2800m (9200')
AWG18 0.8mm ² (φ 1.0mm)	850m (2800')	4400m (14500')
AWG16 1.3mm ² (φ 1.3mm)	1400m (4600')	7100m (23000')

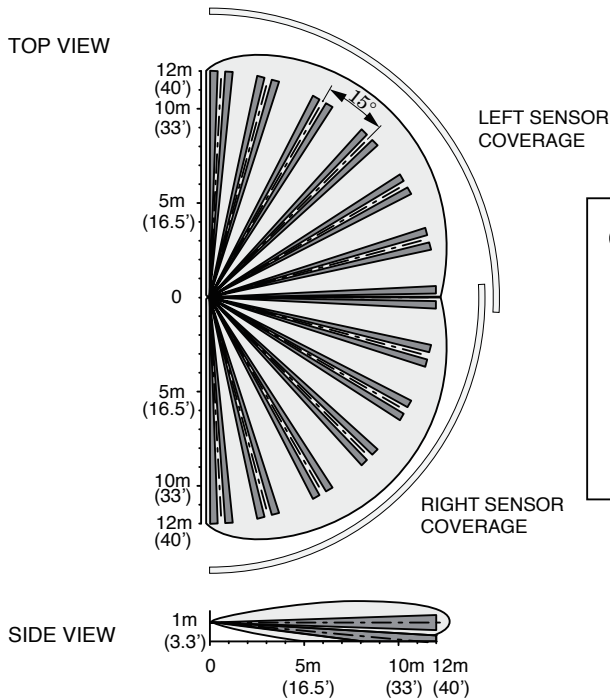
Wire size: AWG24 ~ AWG16 (0.2mm² ~ 1.3mm²)

- NOTE: 1) Maximum wiring distance
= Value of Power voltage / Number of sets
- 2) Max. signal line distance: 1,000m (3,000ft.)
(with AWG 22 (dia. 0.65mm) telephone wire)

5 SETTING

5-1 Detection area

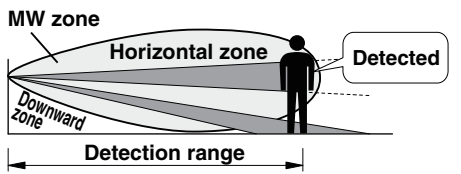
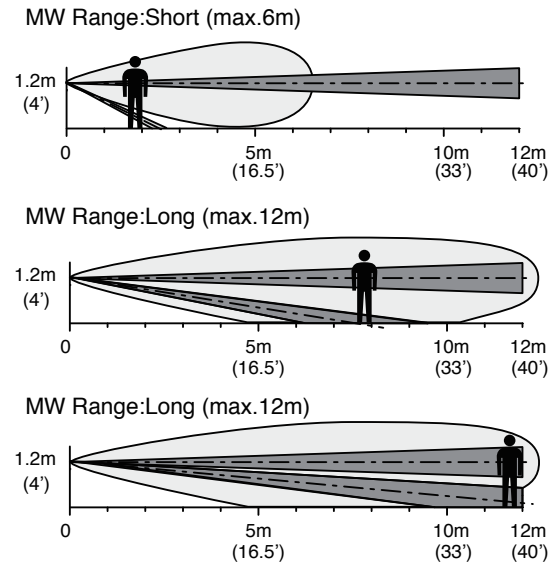
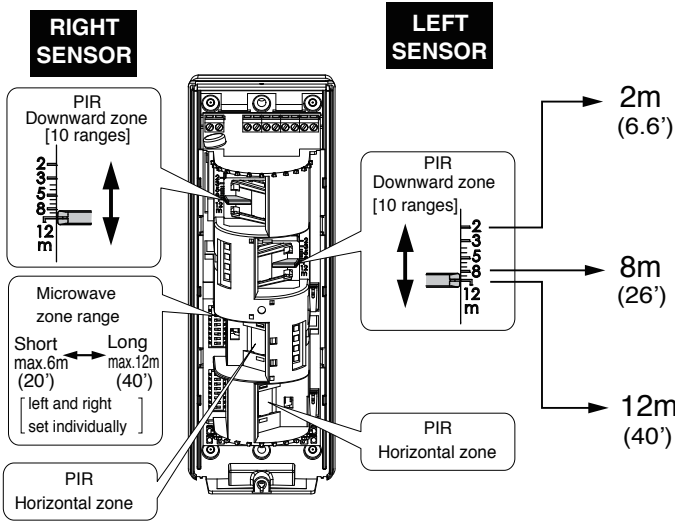
[Wide angle detection]



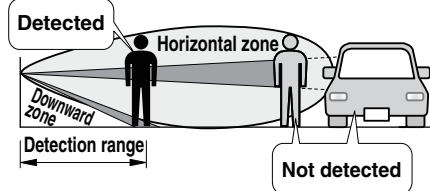
! IMPORTANT NOTES

Detection range/sensitivity may change depending on the following factors:

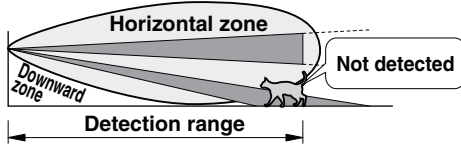
- Small difference of temperature between object and surroundings.
- Movement direction of the object.
- Mounting height.
- Mounting orientation.
- Slope in detection area.



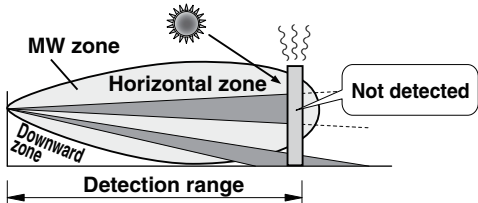
Alarm signal is issued only when both horizontal and downward PIR zones and Microwave zone detect objects.



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



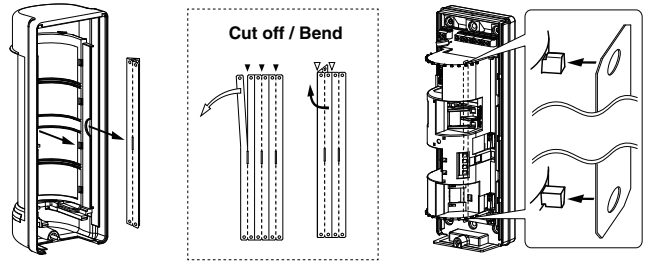
Small animals which are not likely to reach the height of horizontal PIR zone will not be detected.



As microwave is not affected by temperature variation of the object, the sensor makes stable detection performance.

5-2 PIR area masking

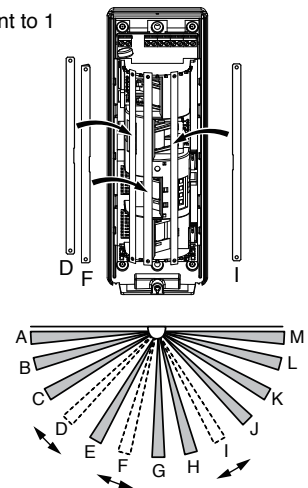
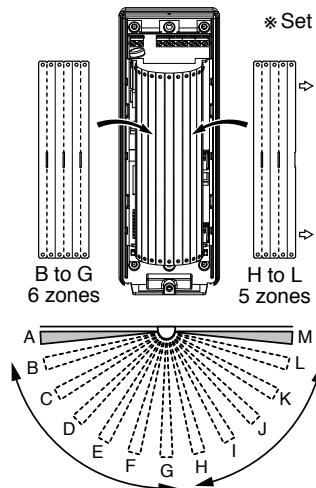
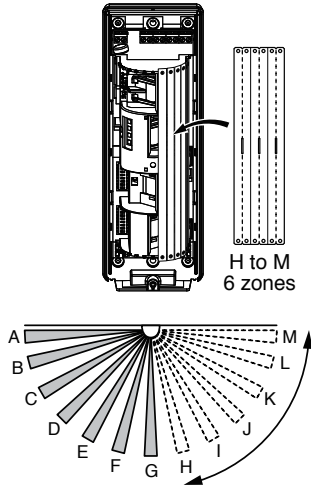
- (1) Pull out the area masking sheet from the cover.
- (2) Bend or cut off the sheet to adjust it to the masking area.
- (3) Clip the mask to the protruding hooks around the optical unit.
 - In case of wall detection, set the pulse count to 1.
 - Carry out a walk test and check the detection area.



Protection 90 degrees

Wall / window protection

Partial masking

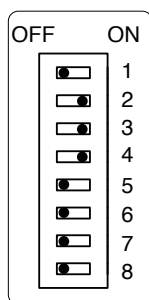


5-3 Switch setting

MODE SETTING A

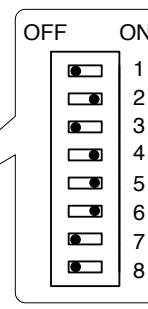
1	ALARM OUTPUT	<input type="checkbox"/> N.C.	<input type="checkbox"/> N.O.
2	ALARM FUNCTION	<input type="checkbox"/> OFF	<input type="checkbox"/> ON
3	MICROWAVE RANGE RIGHT SIDE	<input type="checkbox"/> Short	<input type="checkbox"/> Long
4	MICROWAVE RANGE LEFT SIDE	<input type="checkbox"/> Short	<input type="checkbox"/> Long
5	MICROWAVE ENV. RIGHT SIDE	<input type="checkbox"/> OFF	<input type="checkbox"/> ON
6	MICROWAVE ENV. LEFT SIDE	<input type="checkbox"/> OFF	<input type="checkbox"/> ON
7	VACANT	<input type="checkbox"/> OFF	

MODE SETTING A



[Factory set]

MODE SETTING B



[Factory set]

MODE SETTING B

1,2	PIR SENSITIVITY RIGHT SIDE	<input type="checkbox"/> 60	<input type="checkbox"/> 80
		<input type="checkbox"/> 100	<input type="checkbox"/> 120
3,4	PIR SENSITIVITY LEFT SIDE	<input type="checkbox"/> 60	<input type="checkbox"/> 80
		<input type="checkbox"/> 100	<input type="checkbox"/> 120
5	PULSE COUNT	<input type="checkbox"/> 1	<input type="checkbox"/> 3
6	ANTI-MASKING	<input type="checkbox"/> OFF	<input type="checkbox"/> ON
7,8	ANTI-MASKING ENVIRONMENTAL LEVEL	<input type="checkbox"/> Lv.0	<input type="checkbox"/> Lv.1
		<input type="checkbox"/> Lv.2	<input type="checkbox"/> Lv.3

MODE SETTING A

1	ALARM OUTPUT	OFF <input type="checkbox"/> 1	N.C. [Factory set]	
		ON <input type="checkbox"/> 1	N.O.	
2	ALARM FUNCTION	ON <input type="checkbox"/> 2 [Factory set]	ALARM(1) Right + Left	ALARM(2) N.O. only External output to Camera or ancillary device
		OFF <input type="checkbox"/> 2	ALARM(1) Right	ALARM(2) Left
3,4	MICROWAVE RANGE [RIGHT SIDE] [LEFT SIDE]	OFF <input type="checkbox"/> 3	SHORT	Right Short
		ON <input type="checkbox"/> 3	LONG [Factory set]	Long
		OFF <input type="checkbox"/> 4	SHORT	Short Left
		ON <input type="checkbox"/> 4	LONG [Factory set]	Long
5,6	MICROWAVE ENVIRONMENT [RIGHT SIDE] [LEFT SIDE] *	OFF <input type="checkbox"/> 3	OFF [Factory set]	Right
		ON <input type="checkbox"/> 3	ON	
		OFF <input type="checkbox"/> 4	OFF [Factory set]	Left
		ON <input type="checkbox"/> 4	ON	

MODE SETTING B

1,2	PIR SENSITIVITY [RIGHT SIDE]	OFF <input type="checkbox"/> 1	60%	OFF <input type="checkbox"/> 1	80%
		ON <input type="checkbox"/> 2		ON <input type="checkbox"/> 2	
3,4	PIR SENSITIVITY [LEFT SIDE]	OFF <input type="checkbox"/> 3	60%	OFF <input type="checkbox"/> 3	80%
		ON <input type="checkbox"/> 4		ON <input type="checkbox"/> 4	
5	PULSE COUNT	ON <input type="checkbox"/> 5	3 [Factory set]		
		OFF <input type="checkbox"/> 5		1	
6	ANTI-MASKING	ON <input type="checkbox"/> 6		ON [Factory set]	
		OFF <input type="checkbox"/> 6		OFF	
7,8	ANTI-MASKING ENVIRONMENTAL LEVEL*	OFF <input type="checkbox"/> 7	Lv.0 [Factory set]	OFF <input type="checkbox"/> 7	Lv.1
		ON <input type="checkbox"/> 8		ON <input type="checkbox"/> 8	
		OFF <input type="checkbox"/> 7	Lv.2	ON <input type="checkbox"/> 7	Lv.3
		ON <input type="checkbox"/> 8		ON <input type="checkbox"/> 8	

* If the anti-masking function does not work properly depending on the environment, change the setting appropriately.

Lv.0 ⇒ Lv.3
(normal) (high)

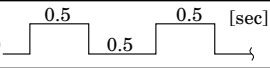
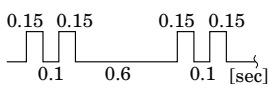
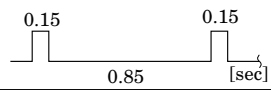
* In the environment where the microwave sensor is easily affected, set the DIP switch setting ON.

6 CHECKING

6-1 Operation check

- (1) Replace the cover to automatically start the operation check and walk test function (for 5 min) after approx. 1 min of LED blinking.
- (2) Check that the LED lights on both detection sides (left and right) within the set detection area.
- (3) Readjust the detection area if necessary.
- (4) Anti-masking performs learning function for 3 min after the cover is replaced. For this to be successful, do not have any object within 10cm of the lens during this period.
- (5) Check also operation of connected devices, when applicable.

6-2 LED indication

Status	LED operation	Recovery
Warm-up	Red Blinking (approx. 1min) 	
Alarm detection	Walk test Red Lights (approx. 2sec) Mode setting "A-2" ON: Left and Right / OFF : Left or Right (LED's corresponding to left/right zones)	
	Operation No	
MW detection	Walk test Green Lights (2sec max., Priority : Alarm (Red)) Mode setting "A-2" ON: Left and Right / OFF : Left or Right (LED's corresponding to left/right zones)	
	Operation No	
Masking detection	Red Blinking rapidly 	After resolving the cause, either open/close the cover, or allow the unit 15 seconds reset time without motion and then activate twice
Self diagnosis error*	Red Lights continuously	Return to the normal status by power supply reset
Low supply voltage**	Red Blinking slowly 	Return to the normal voltage by power supply reset

*Detection and notification of the problems caused by broken wiring inside the sensor, malfunction, etc.

**Monitoring and notification in case input power supply voltage to the sensor is reduced.

6-3 Output

Status	Output	Status	Output
Alarm detection	Alarm output(1)(2)	Self diagnosis error Low supply voltage	Trouble output
Masking detection	Alarm output(1)(2) Trouble output	Cover tamper detection Back tamper detection	Tamper output

7 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
The sensor does not detect anything	<ol style="list-style-type: none"> (1) No power supply (including broken wiring), or the power supply voltage is low. (2) The detection area is blocked by an object (which may include glass). (3) Unsuitable detection area settings (including detection distance). (4) Approximately 1 minute has not passed since turning the power ON. 	<ol style="list-style-type: none"> (1) Check the power wiring, and power supply voltage. → [4 WIRING] (2) Remove obstacles. (3) Readjust detection area. → [5 SETTING] (4) Wait approximately 1 minute.
The sensor sometimes does not detect anything	<ol style="list-style-type: none"> (1) Unsuitable detection area settings (including detection distance). (2) The detection lens is covered with dust or water droplets. (3) Unsuitable detection or pulse count settings. 	<ol style="list-style-type: none"> (1) Readjust detection area. → [5 SETTING] (2) Clean the lens with a damp soft cloth, and wipe off water droplets. (3) Readjust the settings. → [5 SETTING]
The sensor generates an alarm, although there are no people within detection area	<ol style="list-style-type: none"> (1) Unstable power supply voltage. (2) Something is moving within the detection area, or there are sudden changes in temperature. (3) A source of electrical noise (broadcasting station, amateur radio station, etc.) is nearby. (4) Direct or reflected light such as sunlight or headlights sometimes shines onto the sensor itself or into the detection area. (5) The sensor is mounted on an angle (the horizontal zone is tilted). (6) Cars or motorcycles are sometimes detected at the edge of the detection area. 	<ol style="list-style-type: none"> (1) Ensure appropriate power supply voltage. (2) Identify the problem object, and remove it. (3) Change the mounting location or remove the noise source. → [1 PRECAUTIONS] (4) Change the mounting location, or location of the reflective item. Readjust detection area. Use the area masking sheet to hide zones for which detection is not required. → [5 SETTING] (5) Change the mounting location. → [5 SETTING] (6) Reduce the set distance. Readjust detection area. → [5 SETTING]
The operation LED is on, but connected devices are not operating.	<ol style="list-style-type: none"> (1) Wiring failure, broken wire, or short-circuit. (2) Check that connected devices are operating correctly. 	<ol style="list-style-type: none"> (1) Connect wiring correctly. (2) Investigate with reference to the instruction manuals of the connected devices.

MAINTENANCE

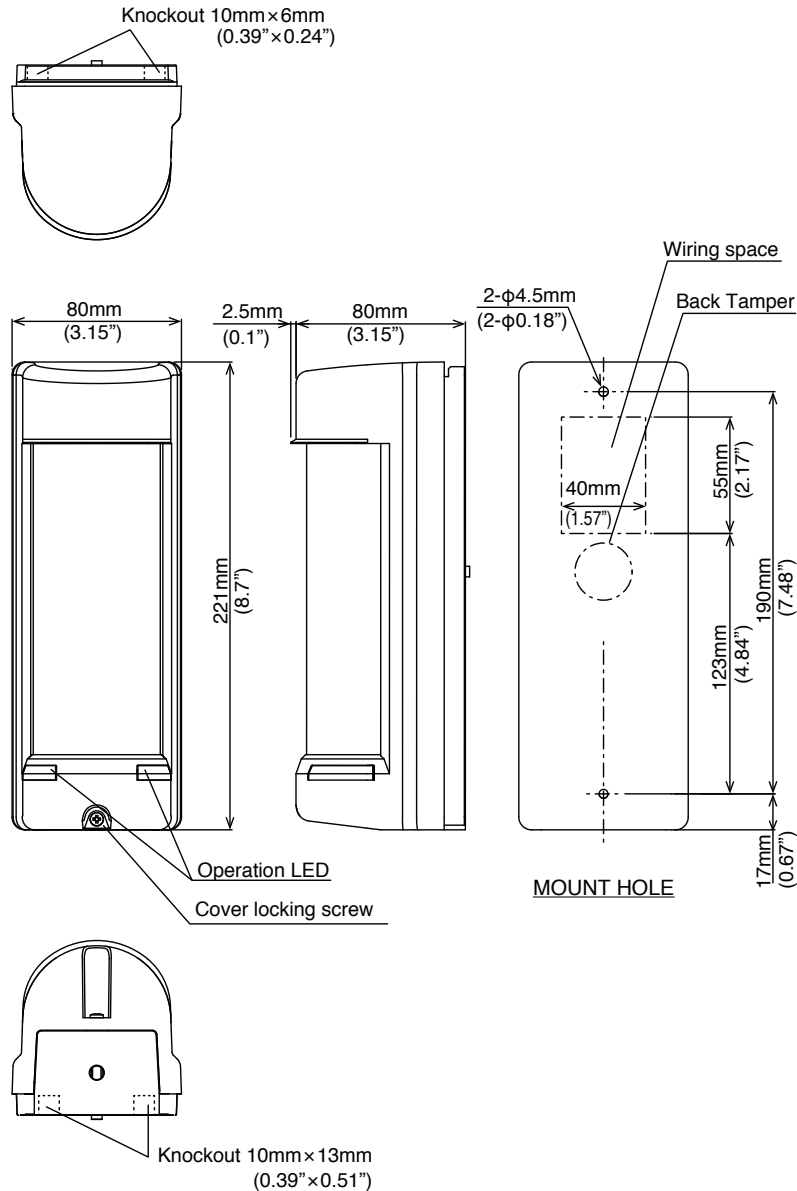
- Clean the device with a soft, damp cloth and wipe off water drops. Use water with weak neutral detergent to clean stubborn dirt. (except lens)
Do not use substances such as thinner or benzene.
- Perform operation check on a regular basis.

8 SPECIFICATIONS

Model	MX-12FAMD	
Detection system	Passive infrared and Microwave	
Microwave transmit frequency and power	24.150 to 24.250GHz 12.7dBm e.i.r.p	
Detection area	Horizontal detection Angle : 180°, Detection distance : 12m(40') Horizontal zone : 14 zones Downward zone : 14 zones	
PIR Area adjustment	Detection distance : 2 to 12m(10' to 40') [10 ranges] (by adjusting vertical angle of downward curtain) left and right adjustment individually possible	
Supply voltage	9 to 28V DC (non-polarity)	
Current consumption	40mA max.	
Alarm output (1)	ALARM RIGHT+LEFT	Dry contact relay output N.C./N.O. selectable · Contact capacity : 30V (AC/DC) 0.2A max. (Resistive load) · Contact operation : Detection time (+2sec.)
	ALARM RIGHT	
Alarm output (2)	ALARM LEFT	Dry contact relay output N.C./N.O. selectable · Contact capacity : 30V (AC/DC) 0.2A max. (Resistive load) · Contact operation : Detection time (+2sec.)
	EXTERNAL OUTPUT	
Trouble output	Dry contact relay output N.C. Contact capacity : 30V (AC/DC) 0.2A max.(Resistive load) (Masking detection / Low supply voltage / Self diagnosis error)	
Tamper output	Dry contact relay output N.C. Contact capacity : 30V (AC/DC) 0.1A max.(Resistive load) (Cover tamper / Back tamper (when enabled))	
Operation LED	Red LED · Warm-up (Blinking) · Alarm detection (Lights approx.2sec only for Walk test) · Low supply voltage (Blinking slowly) · Masking detection (Blinking rapidly) · Self diagnosis error (Lights continuously) Green LED · Microwave alarm detection (Lights max.2sec only for Walk test)	
Pulse count	1 / 3 times (selectable with DIP switch)	
PIR sensitivity adjustment	60% / 80% / 100% / 120% (selectable with DIP switch, left and right sensors individually)	
Microwave range adjustment	Short / Long (selectable with DIP switch, left and right sensors individually)	
Functions	Anti-masking, Microwave environment, Back tamper, Trouble alarm, Low voltage monitoring Anti-masking Environmental level	
Connection	Terminals	
Ambient temperature	-25°C to + 60°C (-13°F to + 140°F)	
Mounting position	Indoor / Outdoor	
Ingress protection	IP55 (Wall mount)	
Weight	400g (14.2oz)	
Appearance	Body : resin (white) / Lens : resin (white)	
Optional	Pole attachment : BP-32	

※ Specifications and design are subject to change without prior notice.

9 EXTERNAL DIMENSIONS



10 SPECIAL NOTES

TAKEX hereby declares that the radio equipment type MX-12FAMD is in compliance with RE Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address ; www.takex.com

This equipment complies with EU radiation exposure limits set forth for an uncontrolled environment.

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.



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