

REDWAVE

PASSIVE INFRARED AND MICROWAVE COMBINATION DETECTOR

OPM-3020, OPM-303



FEATURES

OPM-3020 and OPM-303 are highly-reliable combination detectors equipped with the "Adjustable Microwave Range Limiter Technology" and the "Dual Quad Zone Logic PIR" to detect motion outdoors.

Advanced Microwave and dual PIR technologies have been integrated to provide a highly reliable outdoor motion sensor.

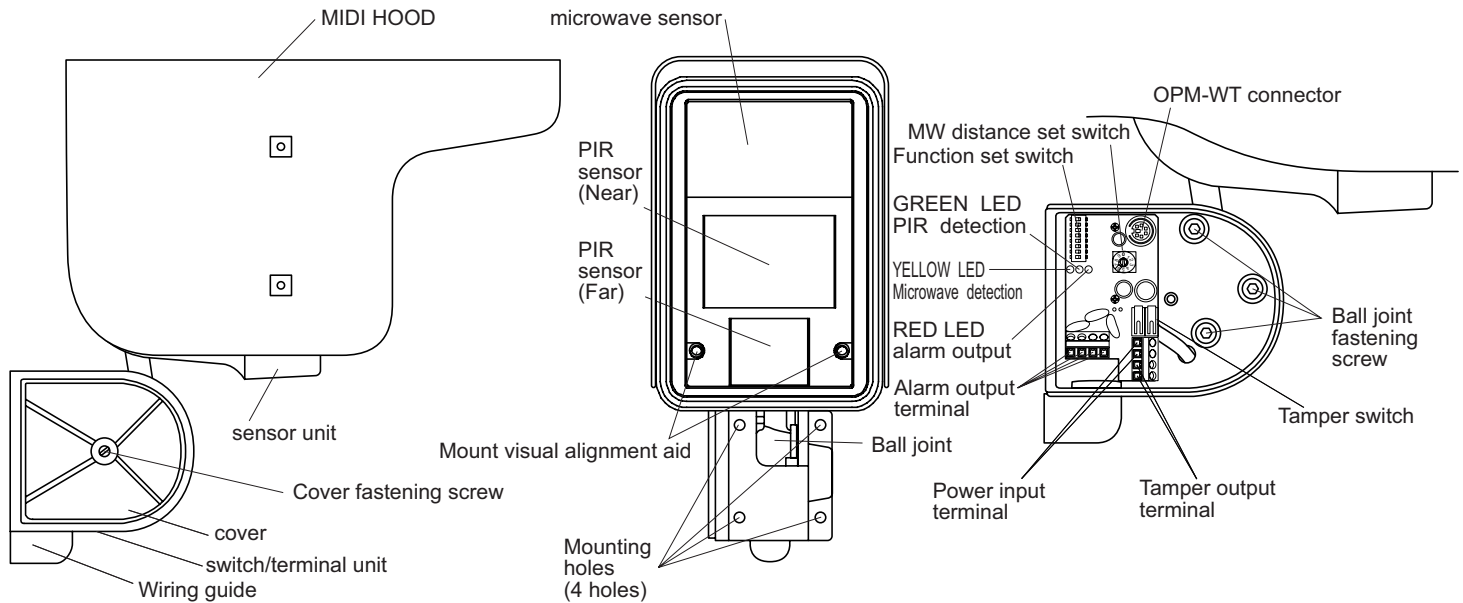
- Adjustable Microwave Range Limiter Technology (A.M.R.L. Technology)
The distance of the microwave can be adjusted so that it is only operational within the required detection area, this eliminates false alarms which may be caused by hazards outside the desired area.
- Dual Quad Zone Logic PIR
Two PIR detectors are configured vertically. Each PIR detector has a high density detection pattern which splits the detection area vertically. Signal processing reduces false alarms from both PIR's simultaneously.
- Double Conductive shielding of the pyroelectric element
-Extremely High Light and RFI Immunity(Patent listed) (For PIR)
- Temperature Compensation (For PIR)
- IP55
- 30m x 20m Wide Angle (OPM-3020)
- 30m x 3m Narrow Angle (OPM-303)
- 3 LED Indication
-Yellow : Microwave , Green : PIR , Red : Alarm

- Microwave "small animal immunity function" selector
This function cancels motions of small animals such as cats and rats.
- Microwave "Repetitive Movement Discrimination function" selector
This function cancels motions of trees swayed by wind.
- PIR "detection mode" selector
This function allows you to select the most suitable mode for places with many obstacles, where it is difficult to detect a human body.
- PIR "sensitivity" adjustment
With the detection area divided into 2 sections, "Far Area" and "Near Area", for which individual sensor switches installed, this function allows you to make sensitivity adjustments in various combinations.
- PIR "pulse count" selector (OPM-3020 only)
- VISUAL ALIGNMENT AID
Use this function to make a visual adjustment for the PIR detection area.
- MIDI HOOD

OPTION

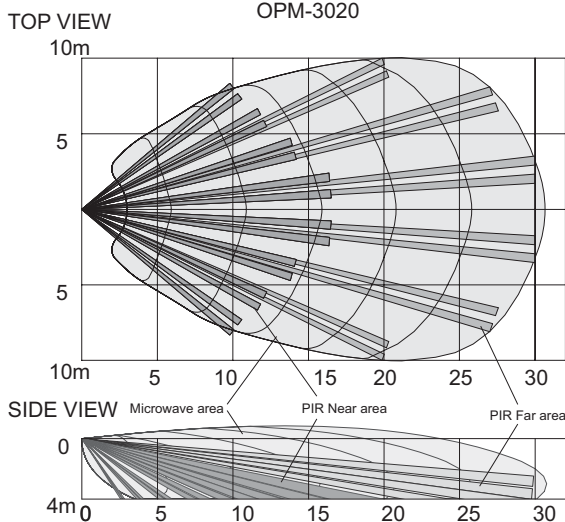
- OPM-WT (Walk tester)
A buzzer goes upon detection in microwave and PIR detection areas.

1. DESCRIPTION AND OPERATION

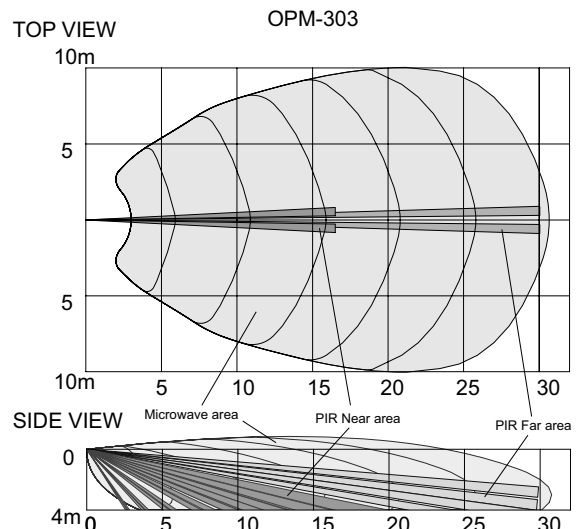


2. DETECTION AREA

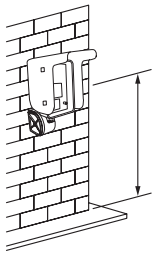
WIDE ANGLE



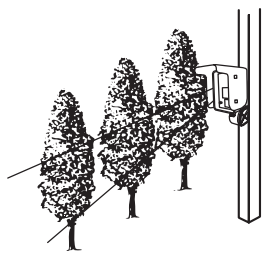
NARROW ANGLE



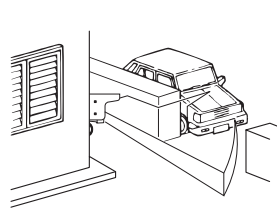
3.INSTALLATION HINTS



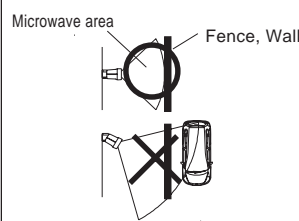
Mounting height is 2.4 - 4.0m.



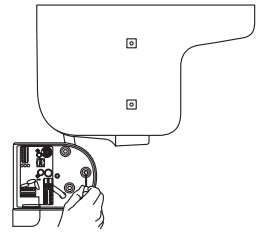
Avoid moving objects in the detection area (i.e. swaying trees, bushes, etc.).



Aim the detector at wall or the ground, to avoid unwanted detection

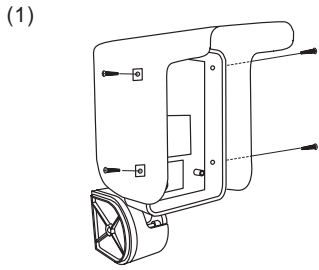


Set the microwave distance properly to prevent any object outside a fence or a wall from being detected (The microwave may detect any object beyond obstacles).

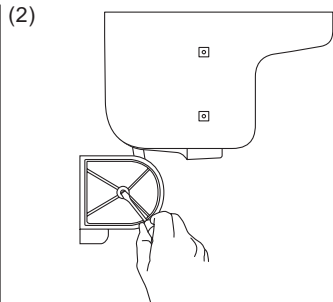


After adjusting the PIR area, firmly fix the sensor unit ball joint.

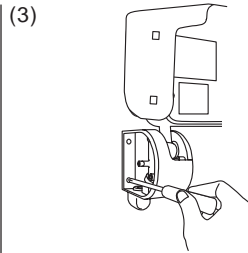
4.INSTALLATION



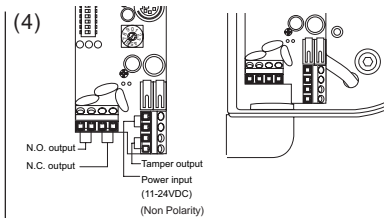
Use the MIDEHOOD to Sensor Unit with attached screws to avoid mis-operation.



Loosen the cover fastening screw and remove the cover.

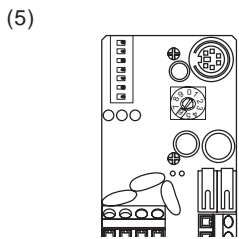


Firmly fix the sensor onto the mount surface with the accessory screws. Do not install onto the mount surface of low strength or in an unstable place. The sensor may drop.

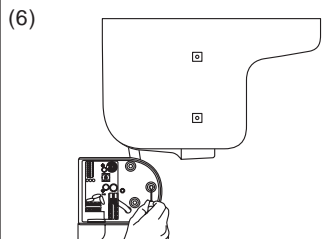


WIRE SIZE	12V	24V
AWG22(0.33mm ²)	130m	380m
AWG20(0.52mm ²)	200m	600m
AWG18(0.83mm ²)	320m	970m

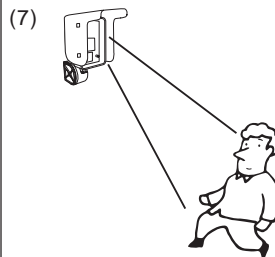
Wire to the P.C.B. unit terminal block through the wiring guide.



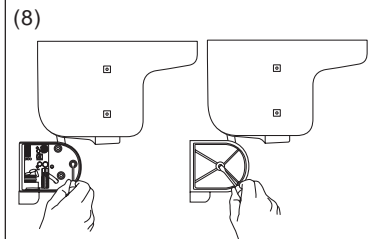
Set each switch according to installation environment. (See Section 5 and Section 6.)



Loosen three ball joint fastening screws and next move the sensor unit to set the PIR area.



Make a walk test to check the microwave and PIR areas. (See Section 5, Section 6 and Section 7.)



Tighten the ball joint fastening screws, close the cover, and tighten the cover fastening screws.

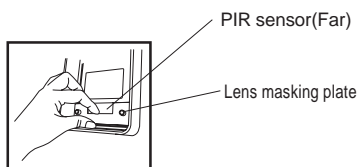
5.Area setting

Set the area of PIR and the microwave. On completion of respective area settings, conduct a walk test (See Section 7) to make sure that a human body is actually detected.

5-1 Setting the PIR area

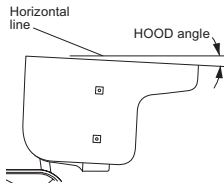
Set the PIR area in the following manner.

(1) Lens masking



To check the edge of the detecting area, install the provided lens masking plate to the "PIR sensor (Far)".

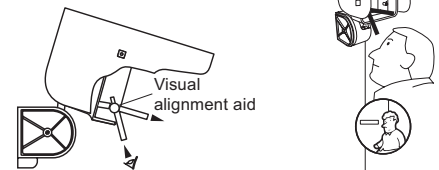
(2) Setting area with Fin on the sensor unit



Mounting height	Area maximum distance	Hood angle
2.4m	30m	-4.5°
	20m	-6.0°
3.0m	30m	-5.5°
	20m	-7.5°
4.0m	30m	-7.5°
	20m	-10.5°

To set a desired maximum detection range, adjust the Fin angle of the sensor unit based on the table.

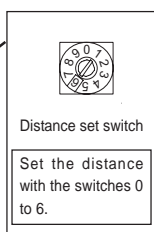
(3) Setting area with VISUAL ALIGNMENT AID



Mount the Visual alignment aid to the sensor unit. Check the far position sighted through the sight hole, where coincides with the PIR maximum area. Then, conduct a walk test. (See section 7.)

5-2 Setting the microwave sensor detection area

Set the area with the switch on the P.C.B. unit.



Position this window to a desired number.

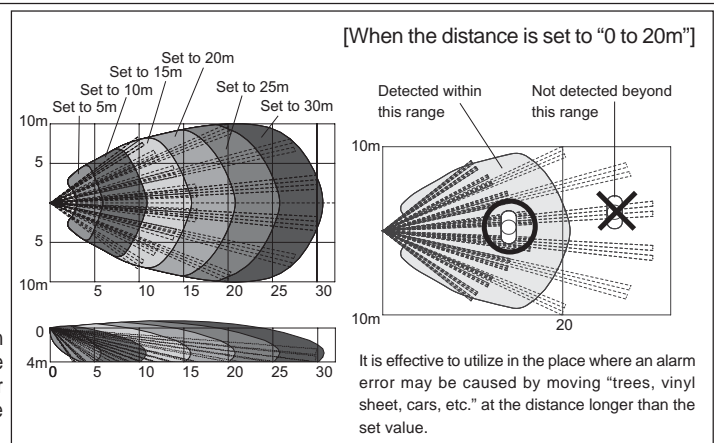


<It is set to "6: 0 to 30m" when the unit leaves the factory.>
Set to "0: Unlimited", and the sensor may detect at the distance of over 30m.

Switch No.	Set distance
0	Unlimited
1	0 ~ 5m
2	0 ~ 10m
3	0 ~ 15m
4	0 ~ 20m
5	0 ~ 25m
6	0 ~ 30m

This function does not work under -25C degree (rated operation temperature).

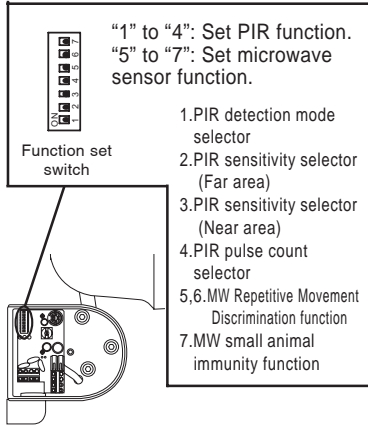
The microwave distance switch adjusts the detectable distance. An object at a distance shorter than the set value is detected and an object at a distance longer than the set value is cancelled. Due to environmental conditions at the installation site, the detectable distance can be longer and/or shorter than the set position. After the distance is set by the dial, conduct walk-test to confirm the detection distance. And, if necessary, switch position should be re-adjusted.



HINT: For easy adjustment, set the detection range slightly narrower than a targeted range first, and then expand it gradually during the walk test.

6. Function setting

Set the following functions with the function set switch on the P.C.B. unit.

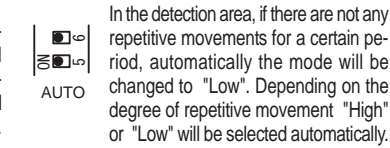
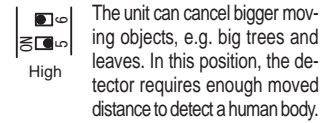
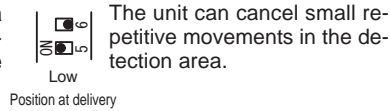
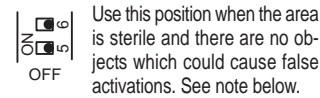


*OPM-303 is not equipped with Switch 4: Pulse count selector.

6-1 Setting the microwave sensor function

6-1-1 Repetitive Movement Discrimination function

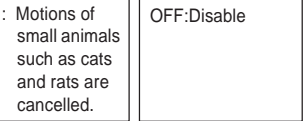
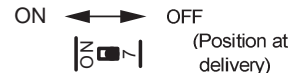
Use Switch 5 and Switch 6.



If there are objects that can be blown and moved, e.g. vegetation, vinyl sheets, etc., it can be the cause of false alarms. When the unit would be installed at these places, "Low" or "High" position should be selected. When "OFF" is selected, the microwave sensor might detect a little shock or vibration from installation surface (pole and/or wall). If this occurs "Low" or "High" position is recommended.

6-1-2 Small animal immunity function

Use Switch 7.

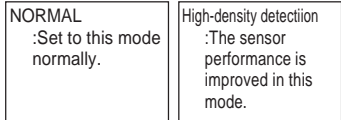


Use this function when there is a possibility of an alarm error due to the small animals moving within the microwave detection area. When this function is used, the microwave sensitivity may be lowered slightly. Conduct walk test after SW setting.

6-2 Setting the PIR sensor function

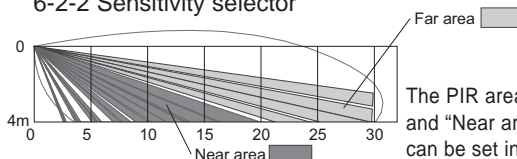
6-2-1 PIR detection mode selector

Use Switch 1.



Use the high-density detection mode when the unit is installed in the place where it is difficult to detect a human body due to obstacles in the PIR detection area. If this mode is selected, small animals such as cats and rats can also be detected easily.

6-2-2 Sensitivity selector



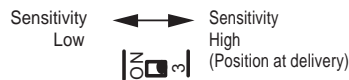
<Far area sensitivity selector>

Use Switch 2.



<Near area sensitivity selector>

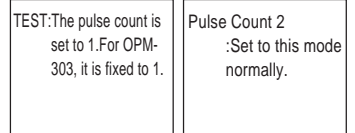
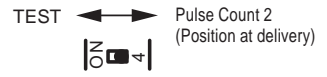
Use Switch 3.



The PIR area consists of "Far area" and "Near area". Each sensitivity can be set individually. When a set detection range is narrow, the sensitivity becomes too high especially on the ground within the Far area, which may allow easier detection of small animals. In such a case, switch the sensitivity of only Far Area to the Low position. In contrast, when a malfunction occurs frequently in the Near Area, switch the sensitivity of only Near Area to the Low position.

6-2-3 Pulse count selector (OPM-3020 only)

Use Switch 4.



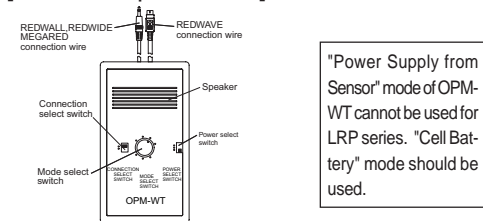
It is recommended to set to "TEST" when a Walk Test is carried out. To reduce the alarm error, set to Pulse Count 2 normally.

7. Walk Test to check the area setting

After completing each setting according to Section 5 and Section 6, carry out a walk test finally to check if the microwave sensor and the PIR sensor detect a human body within the set ranges. It is recommended to carry out the walk test with the optional OPM-WT.

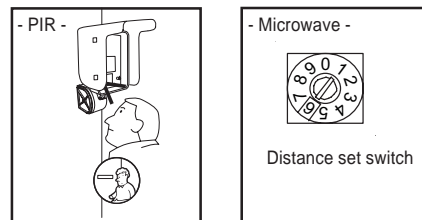
LRP-1020 is not applicable to REDWAVE.

[Walk Test procedure]



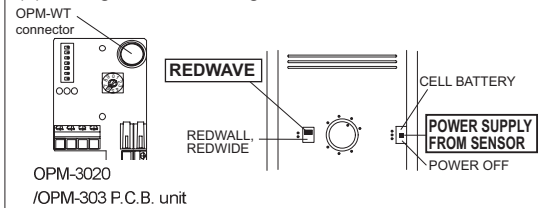
OPM-WT is optional walk-tester which can confirm the detection area of microwave and PIR by sound. It should be noted that it is impossible to accurately set the correct detection area without the OPM-WT. The Power for the OPM-WT can be selected from "OPM-WT Connector" on OPM-3020/303 or battery.

(1) Area setting



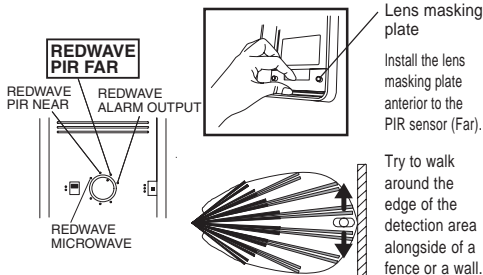
Set the PIR area and the microwave detection area (detection range) according to "Section 5-1" and "Section 5-2".

(2) Wiring, Switch setting



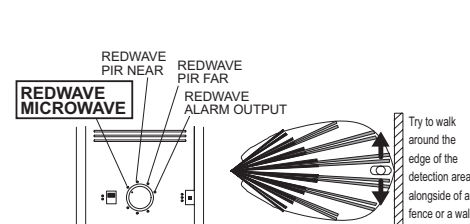
Insert the "REDWAVE connection cable" into the OPM-3020/303 "OPM-WT connector". At the same time, set the Power select switch to "Power supply from sensor", and the Connection select switch to "REDWAVE series". In condition of "Power Supply form Sensor" mode: When REDWAVE cannot work properly due to lack of current by power consumption of OPM-WT, use battery to operate OPM-WT.

(3) Checking the edge of PIR detection area



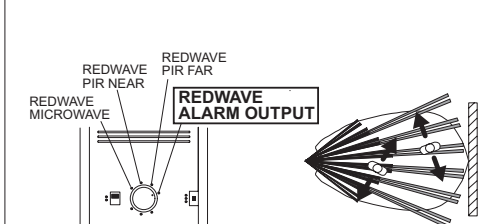
Set the Mode select switch to "PIR FAR". Walk around the edge of the set area to make sure that a human body is detected. While OPM-WT emits 2 different sounds, "Low pitch sound" and "High pitch sound", set the area to a position where the high pitch sound is available. When only "Low pitch sound" is available in whatever set position, switch the position of PIR DETECTION MODE SELECTOR to "High-density-detection". (See section 6-2-1)

(4) Checking the edge of the microwave detection area



Set the Mode select switch to "microwave". Walk around the edge of the detection area to make sure that a human body is detected. When detecting a human body, OPT-WT emits a detection sound. When no human body is detected, the "Distance set switch (See Section 5-2)" may be placed in a wrong position; try to check whether the switch is set properly.

(5) Final area check



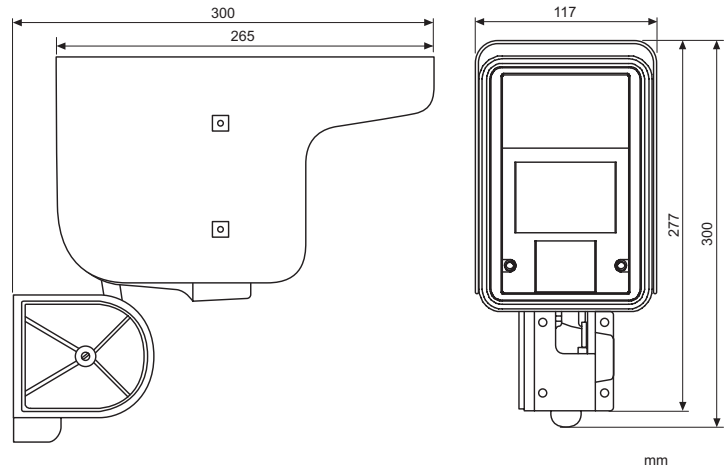
Set the Mode select switch to "alarm output". At this switch position, as the sound comes in conjunction with the output of "Alarm output terminal", it is possible to check the AND detection of PIR and the microwave. Finally, try to walk around the entire area randomly to make sure that a human body is detected.

8.TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
No operation	Power is not supplied.	Supply Power.
	Incorrect wiring.	Correct wiring.
	Low power supply.	Supply power between 11-24VDC.
Yellow LED does not light. No MW beep tones.(OPM-WT) (MW does not operates)	A person is moving beyond the microwave set area.	Check the microwave set area is correct. (See Section 5.)
	Strong RFI nearby. Moving fan or motor of air-conditioning vents etc.	Switch electrical equipment off.
	Objects beyond walls and buildings are detected.	Change the microwave distance set value to shorten.
	Weeds/trees and vinyl sheets are swaying in the detection area.	Minimize motions in the detection area. Select the microwave Repetitive Movement Discrimination function. (See Section 6.)
	Detecting somebody near the sensor.	The microwave may detect a human body (moving object) outside the area. Make sure that nobody near the sensor moves even if outside the area.
Green LED does not light. No PIR beep tones.(OPM-WT) (PIR does not operates)	A small animal is moving.	Select the microwave small animal immunity function switch to ON.(See Section 6.)
	Installed in a location subjected to a lot of snow and rain.	It is recommended to attach the optional hood. Set the PIR area appropriately.
Green LED lights even if no person in detection area.	Rapid temperature changes in detection area (heating,air conditioning, Ineandescent lamp etc.)	Remove such objects from detection area.
	Moving animals etc.	Select the sensitivity to "LOW". (See Section 6.)
	Persons and cars outside the area are detected.	Check the PIR area.
	The detector is in sunlight or car headlight.	Adjust the area to avoid direct sunlight or car headlight. If it is difficult to adjust the area, attach the optional hood.
Red LED does not light.	Only one of the two, MW or PIR, detects.	Unless both of MW and PIR detect, the red LED is not lit. Recheck the MW distance setting and the PIR area setting.

9.SPECIFICATIONS

Model	OPM-3020	OPM-303
Detection method	Passive infrared and Microwave	
Coverage	30m x 20m wide	30m x 3m narrow
Mounting height	2.4 - 4.0 m	
LED indicator	GREEN : PIR detection	
	YELLOW : MW detection	
	RED : PIR and MW detection	
Alarm period	Approx. 2 sec	
Alarm output	N.C. 28VDC 0.2A max	
	N.O. 28VDC 0.2A max	
Tamper switch	N.C.	
	28VDC 0.1A max	
Warm up period	Approx. 60 sec	
Power input	11 - 24 VDC	
Current draw	45mA max. (at 12VDC)	
	250mA max.(at 12VDC, OPM-WT USED)	
Weight	1.5kg	
Operating temperature	-25 - +60°C	
Environmental humidity	95% max.	
Microwave frequency	10.587GHz [(E)Version]	
	9.900GHz [(F)Version]	
IP rating	IP55	



NOTE

This unit is designed to detect movement of an intruder and activate an alarm control panel. Being only a part of a complete system, we cannot accept responsibility for any damages or other consequences resulting from an intrusion. The following statement will be provided with the equipment as required by Article 6.3 of the R&TTE Directive, 1999/5/EC.

The Optex OPM-3020 and OPM-303 are in conformity with all essential requirements of the R&TTE Directive (1999/5/EC). This equipment has been assessed to the following standards:

EN300 440-1 V1.3.1: 2001-09 EN300 440-2 V1.1.1: 2001-09 EN301 489-1 V1.4.1: 2002
EN301 489-3 V1.4.1: 2002 EN60950-1: 2001

This product is marked with **CE** which signifies conformity with Class II product requirements specified in the R&TTE Directive.

The following table indicates the areas of intended use of the equipment and any known restrictions. For countries not included in this list, please consult the responsible Spectrum Management Agency.

These products conform to the EMC directive, 89/336/EEC, 92/31/EEC and 93/68/EEC. This equipment has been assessed to the following standards:

EN55022: 1998 +A1: 2000 +A2: 2003 Class B EN55024: 1998 +A1: 2001 +A2: 2003
EN50130-4: 1995 +A1: 1998 +A2: 2003

Country of intended use	Restrictions
United Kingdom	10.587GHz
France	9.900GHz



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