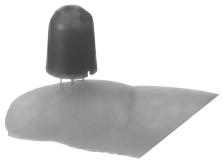
Order code	Manufacturer code	Description
61-1500	AMN11111	PIR SENSOR 5M STANDARD - BLACK (RC)
61-1502	AMN11112	PIR SENSOR 5M STANDARD - WHITE (RC)
61-1506	AMN12112	PIR SENSOR 2.5M HI SENSE - WHITE (RC)
61-1508	n/a	PIR SENSOR 5M SPOT-BLACK (RC)
61-1510	n/a	PIR SENSOR 5M SPOT - WHITE (RC)
61-1512	n/a	PIR SENSOR 10M LONG RANGE - BLACK (RC)
61-1514	n/a	PIR SENSOR 10M LONG RANGE - WHITE (RC)

Sales: 01206 751166
Sales@rapidelec.co.uk
Technical: 01206 835555
Tech@rapidelec.co.uk
Fax: 01206 751188
www.rapidonline.com

NAiS

MOTION SENSOR (PASSIVE INFRARED TYPE)

MP MOTION SENSOR 'NaPiOn'



Standard type

Slight motion detection type

Spot type
(Scheduled for launch in July 1999)

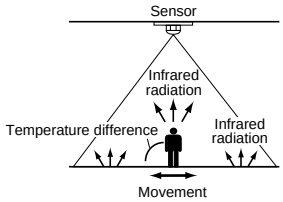
10 m detection type
(Scheduled for launch in July 1999)

What is passive infrared type?

This sensor detects changes in infrared radiation which occur when there is movement by a person (or object) which is different in temperature from the surroundings.

① As this sensor detects temperature differences, it is well suited to detecting the motion of people by their body temperature.

② Wide sensing area.

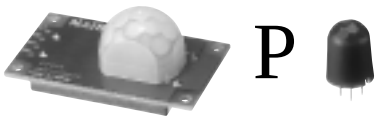


FEATURES

1. The world's smallest with a built-in amplifier (as of March 1998)

Ultrasmall design—About 1/10 the volume and 1/5 the lens surface area of conventional motion detecting sensors. It can be installed in the smallest devices.

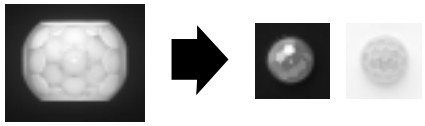
Conventional type **MP Motion sensor**



2. Dual lens colors (white and black) are provided

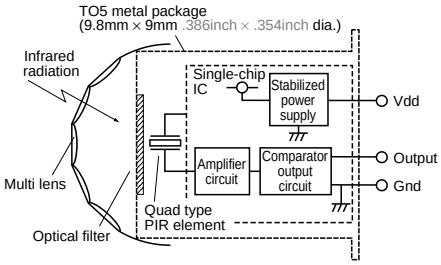
With an ultrasmall design and dual lens colors (white and black), it is inconspicuous, allowing the user to select either white or black to match the equipment color. This provides greater flexibility in equipment design.

Conventional type **MP Motion sensor**



3. Built-in amplifier for easy use

This sensor contains an amplifier circuit and a comparator circuit, and output through on/off switching. This enables connection directly to microcomputers.



4. Detects even slight motion of a person

With our sensor, even slight motions made by people will be detected easily.

- **Fine motion detection capability within approximately 2 meters of sensor.**

  Standard type:
  Detects movement of approximately 30cm 11.811inch.

  Slight motion detection type:
  Detects movement of approximately 20cm 7.874inch.

5. Noise withstanding capability

Circuitry is contained in a TO5 metal package, providing at least twice the noise withstanding capability as conventional type.

- **Comparison example of noise withstanding capability**

	Distance at which motion sensor is not affected by cellular phone noise
Conventional type	Min. 1 to 2m 3.281 to 6.562ft
MP Motion Sensor	Min. 1 to 2cm .394 to .787inch

APPLICATIONS

1. Home appliances
Useful for saving energy in air conditioner, television, personal computer, or ventilator and air purifier

2. Amusement machine market
Useful for saving energy and for automated guidance in theme parks and large video games

3. Equipment in service market
Useful for automated guidance, automated announcements and energy saving in vending machines, ATMs, etc.

4. Lighting market
Automated on/off controls, etc. for lamps, desk lamps, indoor lights, halls, stairway lights, etc.

ORDERING INFORMATION

AMN 1 □ □ □ □

AMN1: MP Motion Sensor

Detection performance
1: Standard type
2: Slight motion detection type
3: Spot type (Scheduled for launch in July 1999)
4: 10m detection type (Scheduled for launch in July 1999)

Feature
1: PC board mounting type

Operating voltage
1: 5V DC

Lens color
1: Black
2: White

PRODUCT TYPES

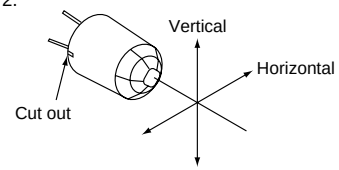
Rated operating voltage	Detection performance	Ambient temperature	Lens color	Part No.	Packing quantity	
					Inner	Outer
3 to 6DC V	Standard type	–20 to +60°C –4 to +140°F (general use)	Black	AMN11111	50 pcs.	1,000 pcs.
			White	AMN11112		
	Slight motion detection type	–20 to +60°C –4 to +140°F	Black	AMN12111		
			White	AMN12112		
	Spot type	–20 to +60°C –4 to +140°F	Black	AMN13111		
			White	AMN13112		
	10m detection type	–20 to +60°C –4 to +140°F	Black	AMN14111		
			White	AMN14112		

PERFORMANCE

1. Detection performance

Items		Standard type	Slight motion detection type	Spot type	10m detection type	Conditions of objects to be detected
Rated detection distance*Remark 1		5m 16.404ft (Max.)	2m 6.562ft (Max.)	5m 16.404ft (Max.)	10m 32.808ft (Max.)	1. Detectable difference in temperature between the target and background for the spot type is more than 3±1°C 37.4±33.8°F, and more than 5±1°C 41±33.8°F for the 10m detection type 2. Movement speed • Standard type/Spot type: 0.3 to 2.0 m/s • Slight motion detection type/10m detection type: 0.3 to 1.0 m/s 3. Detection object = human body
Detection range	Horizontal*Remark 2	100°	91°	38°	110°	
	Vertical*Remark 2	82°	91°	22°	93°	
	Detection zone*Remark 3	64 zones	104 zones	24 zones	80 zones	

2.



*Remarks1. Depending on the difference in temperature between the background and detection target and the speed at which the target moves, these sensors may be capable of detection beyond the detection distances stated above. Nevertheless, they should be used within the prescribed detection distances. For further details, refer to the detection range diagram on the following page.

3. Regarding of detection zone, please refer to “DETECTION PERFORMANCE” on the next page.

2. Rating (Measuring condition: ambient temp. = 25°C 77°F) (Common to All types)

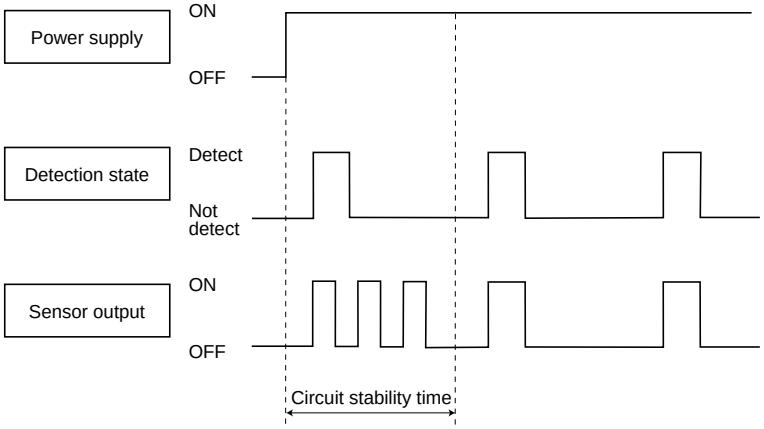
Items	Specified value	Remarks
Power supply voltage	–0.3 to 7V DC	
Usable ambient temperature	–20 to 60°C –4 to +140°F	No freezing and condensing at low temperature.
Storage temperature	–20 to 70°C –4 to +158°F	

3. Electrical characteristics (Measuring condition: ambient temp. = 25°C 77°F; operating voltage = 5V) (Common to All types)

Items			Symbol	Specified value	Measured conditions
Reted operating voltage		Minimum Typical Maximum	Vdd	3.0V DC — 6.0V DC	
Reted consumption current (Standby) *Remark		Typical Maximum	Iw	170µA 300µA	Iout = 0
Output	Current	Maximum	Iout	100µA	Vout ≧ Vdd–0.5
	Voltage	Maximum	Vout	Vdd (Same as operating voltage)	
Circuit stability time		Typical Maximum	Twu	7s 30s	

Remark: The current which is consumed during detection consists of the standby consumed current plus the output current.

[Timing chart]

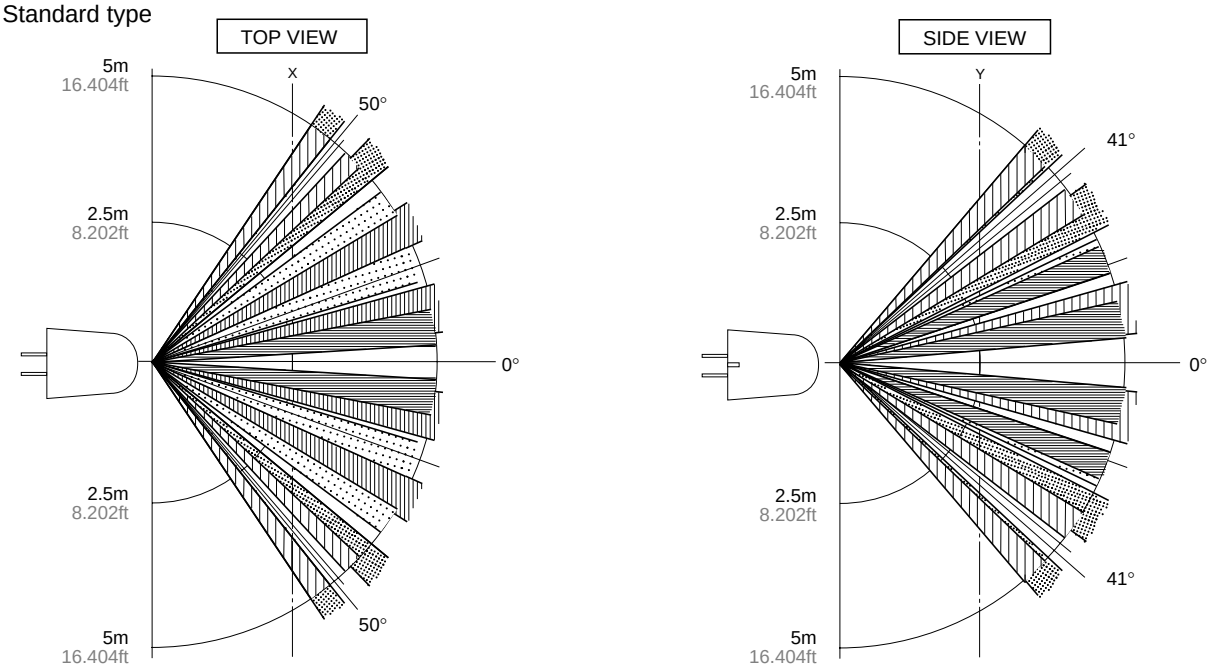


Remark: Circuit stability time: Max. 30s
While the circuitry is stabilizing after the power is turned on, the sensor output is not fixed in the “on” state or “off” state. This is true regardless of whether or not the sensor has detected anything.

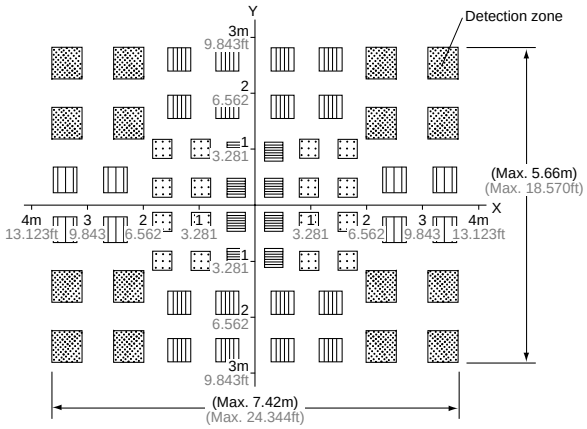
Note: The spot and 10m detection types are subject to change without notice due to improvements in product performance, characteristics and dimensions. Please contact us with any inquiries you may have.

DETECTION PERFORMANCE

1. Standard type

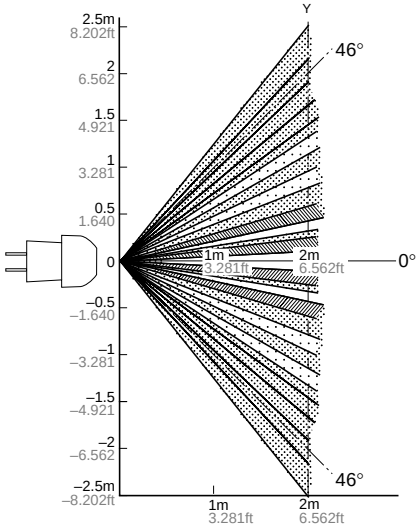


X-Y cross section

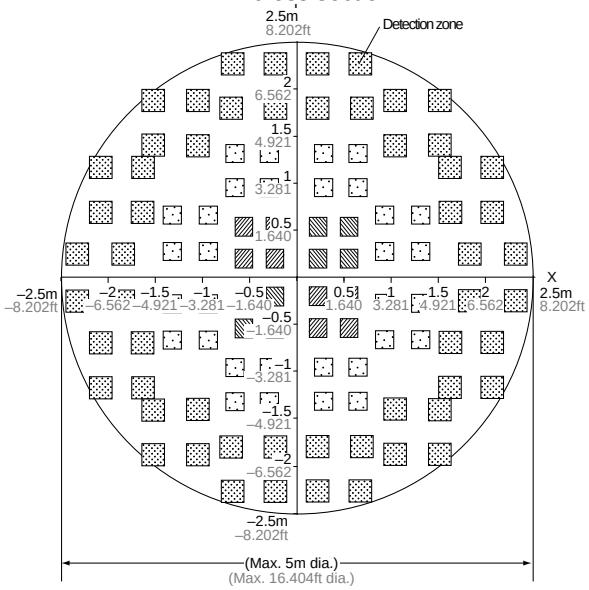


Remarks: 1. The X-Y cross-sectional diagram shows the detection area.
2. The differences in the detection zone patterns are indicative of the projections of the 16 lenses with single focal point and with five optical axes. An object whose temperature differs from the background temperature and which crosses inside the detection zone will be detected.

2. Slight motion detection type



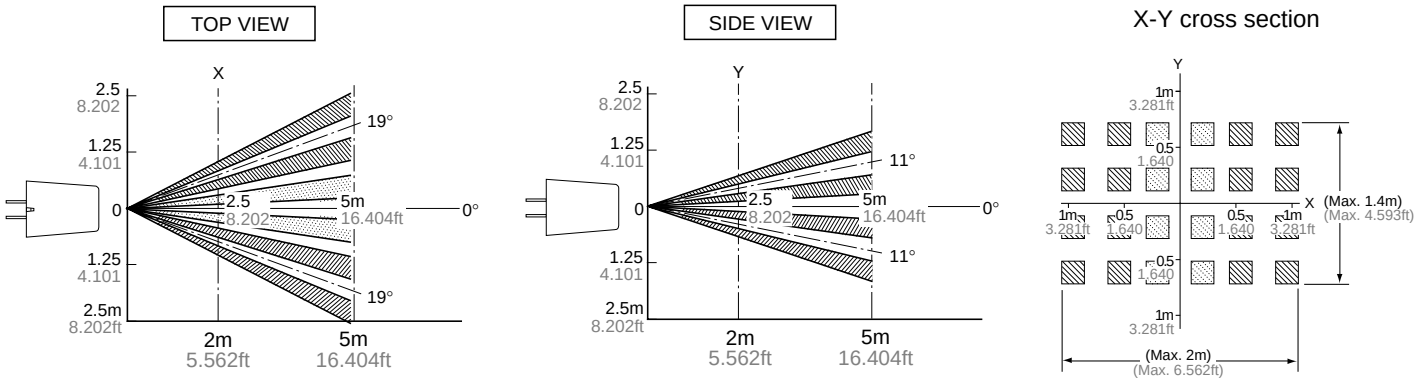
X-Y cross section



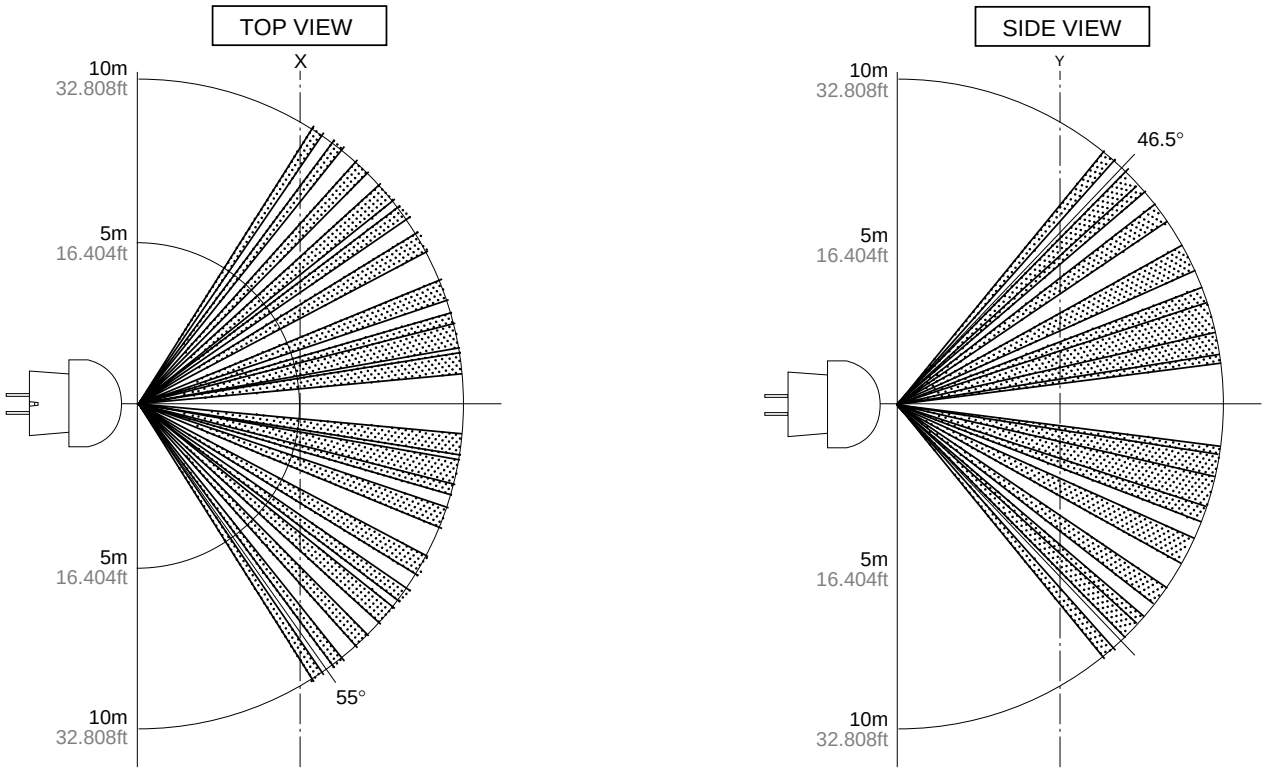
Remarks: 1. The X-Y cross-sectional diagram shows the detection area.
2. The differences in the detection zone patterns are indicative of the projections of the 26 lenses with single focal point and with five optical axes. An object whose temperature differs from the background temperature and which crosses inside the detection zone will be detected.

Note: The spot and 10m detection types are subject to change without notice due to improvements in product performance, characteristics and dimensions. Please contact us with any inquiries you may have.

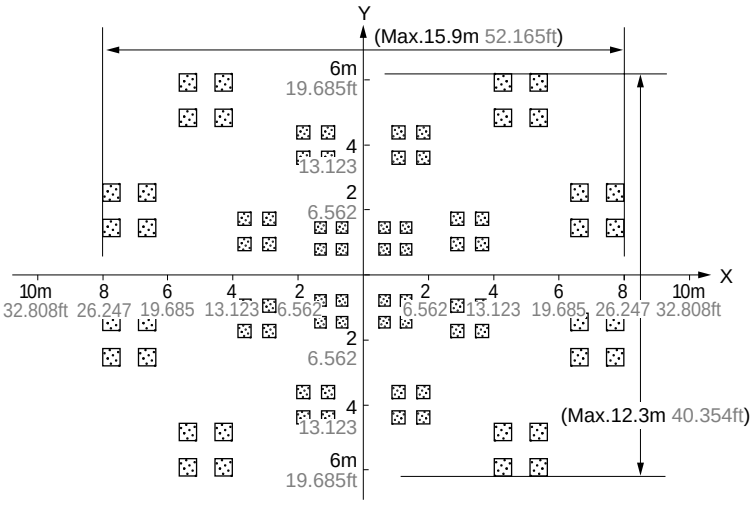
3. Spot type



4. 10m detection type



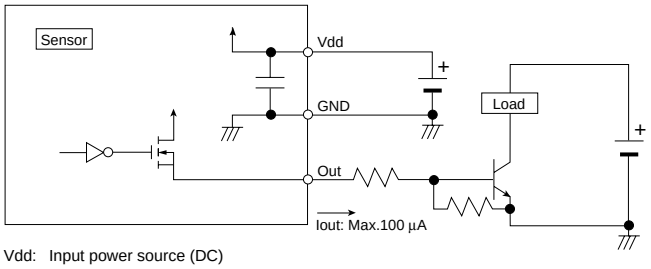
X-Y cross section



Note: The spot and 10m detection types are subject to change without notice due to improvements in product performance, characteristics and dimensions. Please contact us with any inquiries you may have.

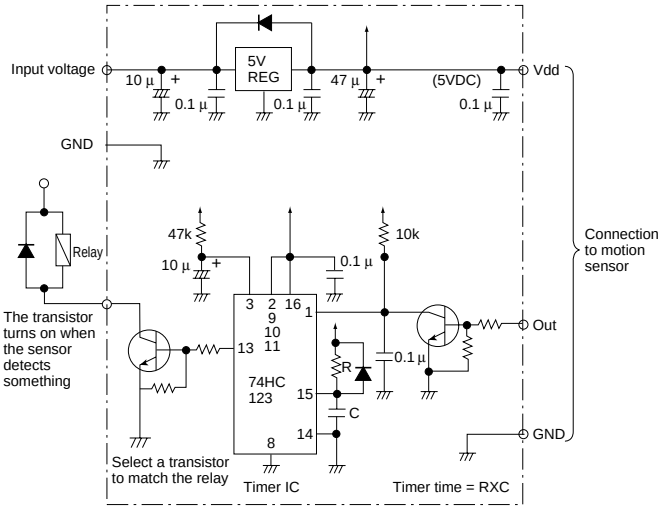
HOW TO USE

1. Wiring diagram



Vdd: Input power source (DC)
GND: GND
Out: Output (Comparator)

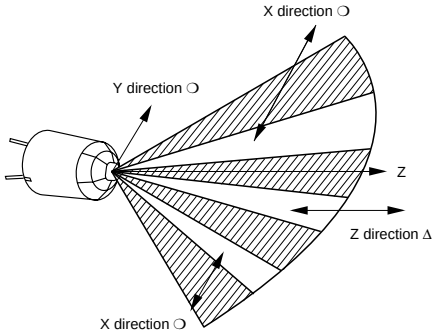
2. Timer circuit example



Note: This is the reference circuit which drives the MP motion sensor. Install a noise filter for applications requiring enhanced detection reliability and noise withstanding capability.
Differences in the specifications of electronic components to which the units are connected sometimes affect their correct operation; please check the units' performance and reliability for each application.

3. Installation

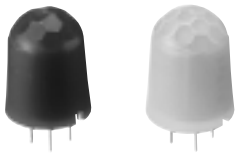
Install the sensor so that people will be entering from the X or Y direction shown below. If persons approch the sensor from the Z direction, detection distance will be shortened.

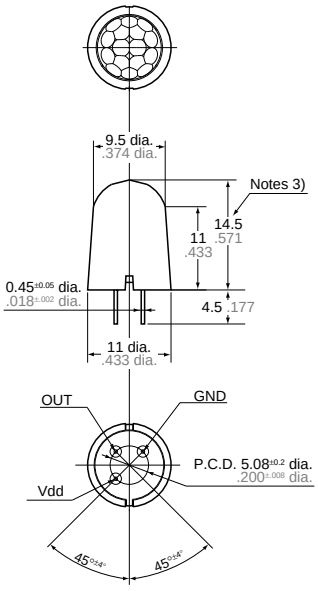


DIMENSIONS

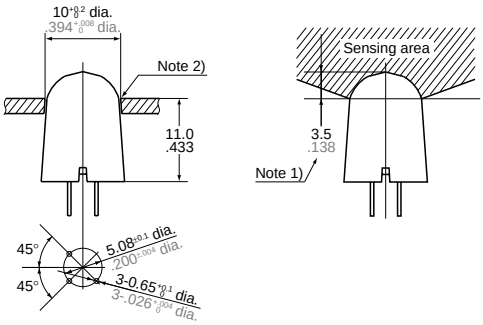
mm inch General tolerance ±0.5 ±.020

1. Standard type





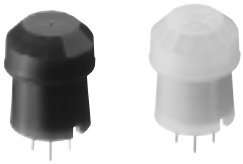
Recommended PC board pattern (BOTTOM VIEW)

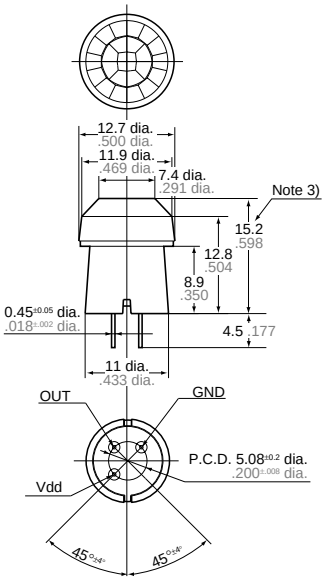


Notes: 1. In order to ensure proper detection, install it with the lens exposed at least 3.5mm .138inch.
2. As for panel mounting hole, tapering or making a large size hole should be done.
3. The height dimension does not include the remaining molding gate.

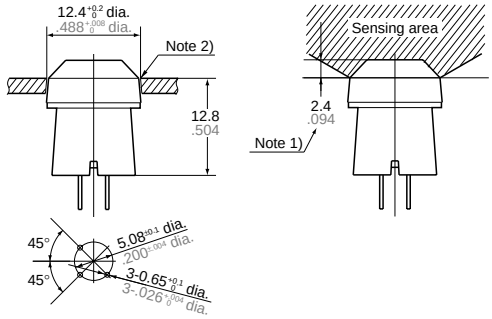
2. Slight motion detection type

mm inch General tolerance ±0.5 ±.020



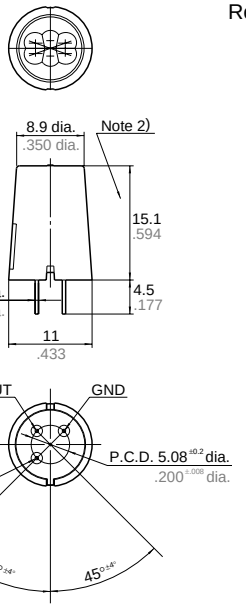


Recommended PC board pattern (BOTTOM VIEW)

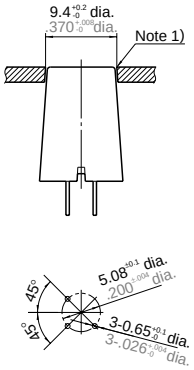


Notes: 1. In order to ensure proper detection, install it with the lens exposed at least 2.4mm .094inch.
2. As for panel mounting hole, tapering or making a large size hole should be done.
3. The height dimension does not include the remaining molding gate.

3. Spot type

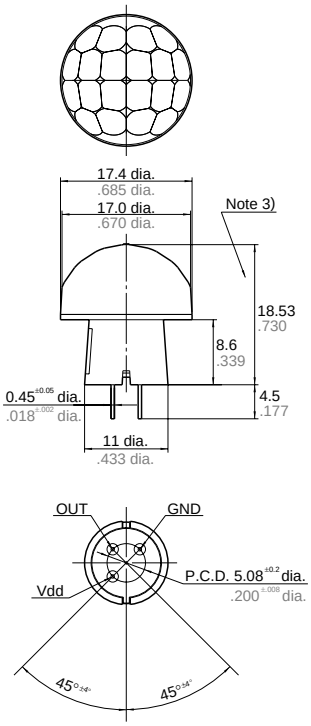


Recommended PC board pattern (BOTTOM VIEW)

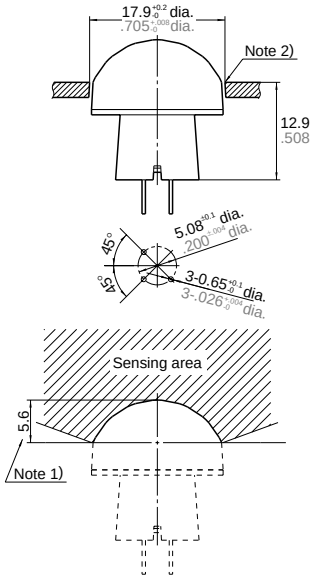


Notes: 1. As for panel mounting hole, tapering or making a large size hole should be done.
2. The height dimension does not include the remaining molding gate.
3. This type are subject to change without notice due to improvements in product performance, characteristics and dimensions.

4. 10m detection type



Recommended PC board pattern (BOTTOM VIEW)



Notes:
1. In order to ensure proper detection, install it with the lens exposed at least 5.6mm .220inch.
2. As for panel mounting hole, tapering or making a large size hole should be done.
3. The height dimension does not include the remaining molding gate.
4. This type are subject to change without notice due to improvements in product performance, characteristics and

NOTES

1. Checkpoints relating to principle of operation

MP motion sensors are passive infrared sensors which detect changes in the infrared rays. They may fail to detect successfully if a heat source other than a human being is detected or if there are no temperature changes in or movement of a heat source. Care must generally be taken in the following cases. The performance and reliability of the sensors must be checked out under conditions of actual use.

<1> Cases where a heat source other than a human being is detected.

1) When a small animal enters the detection range.

2) When the sensor is directly exposed to sunlight, a vehicle's headlights, an incandescent light or some other source of far infrared rays.

3) When the temperature inside the detection range has changed suddenly due to the entry of cold or warm air from an air-conditioning or heating unit, water vapor from a humidifier, etc.

<2> Cases where it is difficult to detect the heat source

1) When an object made of glass, acrylic or other subject which far infrared rays have difficult passing through is located between the sensor and what is to be detected.

2) When the heat source inside the detection range hardly moves or when it moves at high speed; for details on the movement speed, refer to the section on the performance ratings.

2. Other handling cautions

1) Be careful not to allow dust or dirt to accumulate on the lens as this will adversely affect the detection sensitivity.

2) The lens is made of a soft material (polyethylene).
Avoid applying a load or impact since this will deform or scratch the lens, making proper operation impossible and causing a deterioration in its performance.

3) The sensor may be damaged if it is exposed to static with a voltage exceeding ±200V. Therefore, do not touch its terminals directly, and exercise adequate care in the handling of the sensor.

4) When the leads are to be soldered, solder them by hand for less than 3 seconds at a temperature of less than 350°C 662°F at the tip of the soldering iron. Avoid using a solder bath since this will causing a deterioration in the sensor's performance.

5) Do not attempt to clean the sensor. Cleaning fluid may enter inside the lens area causing a deterioration in performance.

6) When using the sensors with cables, it is recommended that cables which are shielded and as short as possible be used in order to safeguard against the effects of noise.