Panasonic

((PaPIRs))

FAQ's

PIR MOTION SENSORS

Special designs from Panasonic that provide high sensitivity and reliability

Contents

Operating principle, usage related

Electrical connection, output signal related

Contents

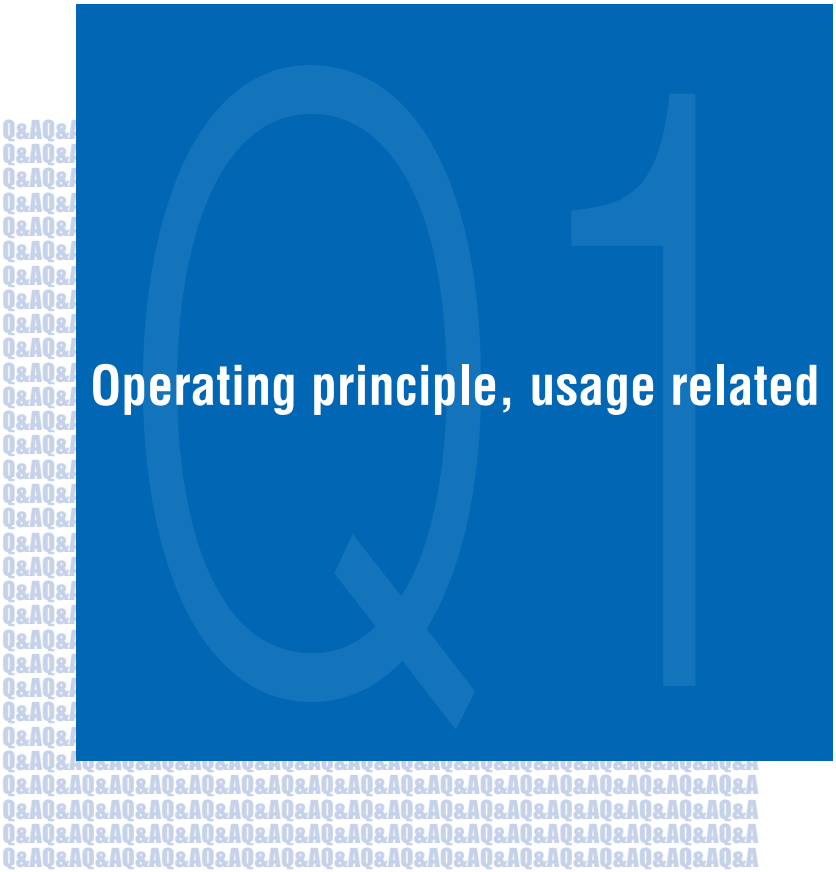
Related to product specifications, etc.

■ Source

The information contained in this document is based on the information as of March 2020.
The information provided in this document is subject to change without notice.

■ Caution for use of FAQ’s

This FAQ’s should be for referential purposes only.
When adopting our products, please make sure that you evaluate our products with your actual equipment after carefully reviewing the latest information in the specification sheets or catalogs and decide the availability on your own responsibility.
Please note that this FAQ’s is based on our estimated of compatibility with other manufacturer’s products, based on the information provided by those manufacturers, at the time the data was published.
We are not responsible for any incorrect or incomplete information in this FAQ’s.
The information is subject to change at any time without notice.


Q1
Operating principle, usage related

Q1-1 Can a single Panasonic Passive Infrared sensor detect the specific position of where person is located in an area?

No, specific position detection of a person is not possible.
Panasonic passive infrared sensors have a QUAD sensing element, meaning only one sensor component with four pyroelectric, heat receiving elements which are all interconnected. The lens determines the size and shape of the detection area, as well as the distribution and number of the switching zones.
Therefore, because there is only one sensor component, it cannot identify where the infrared source is coming from within the detection area.
On the other hand, if you use multiple Panasonic passive infrared sensors, it maybe possible to identify the approximate position of person.

Q1-2 Can Panasonic Passive infrared sensors detect even if human body temperature is lower than ambient temperature?

Yes, detection is possible.
Panasonic Passive infrared sensors are able to detect movement through the interpretation of temperature differentials. A human body can be detected whether it is higher or lower than the ambient temperature. However, since the surface of the human body is affected by the ambient temperature to a certain extent, the sensitivity of the sensor may deteriorate if the body and ambient temperatures equalize.

Q1-3 Do Panasonic Passive infrared sensors detect animals or other objects aside from humans?

Yes, detection is possible.
Pyroelectric sensors react to a change in intensity of infrared radiation within the specified detection criteria. All objects on earth emit infrared radiation and are therefore detected if they are moving and the if change in intensity is large enough to be detected (animals, insects, cleaning robots, curtains, flying objects, rain, etc.).

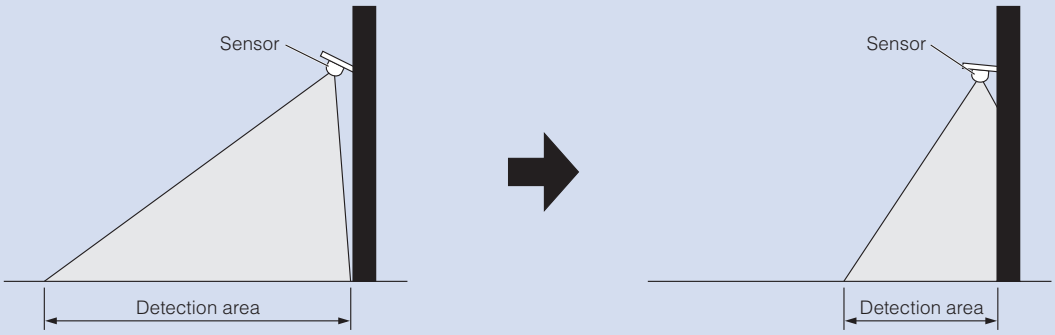
Q1-4 Is light for motion detection constantly emitted from the lens?

No, light is never emitted from the sensor.
PaPIRs are passive infrared sensors, which means that they do NOT emit infrared radiation to detect motion. Instead, the sensor operates by receiving infrared radiation emitted from a moving object. Therefore it is called a “Passive type” sensor.

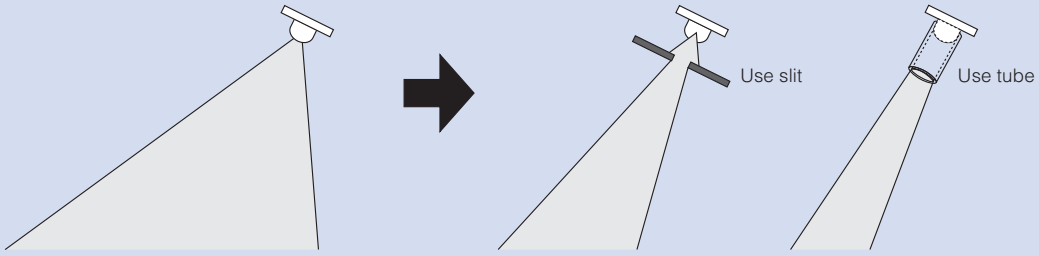
Q1-5 Although the detection range of standard lens type is 5m, is it possible for detection distance to be shorter?

Yes, although the sensor itself can not adjust detection distance on its own due to the principal of its operation. In order to set the limitation of detection range, the sensor should be pointed toward an obstacle such as ground, wall, or ceiling.
Additionally, it is also effective to limit the detection range by blocking the incoming infrared light by using a transmittance reducing material in front of the lens like Polyethylene.
Another possibility would be to use the analog sensor with amplifier output. With this sensor you can adjust the sensitivity to a certain degree by adjusting the switching thresholds within a software or with the help of a window comparator.

● Setting the sensor so it will not detect people who are far away



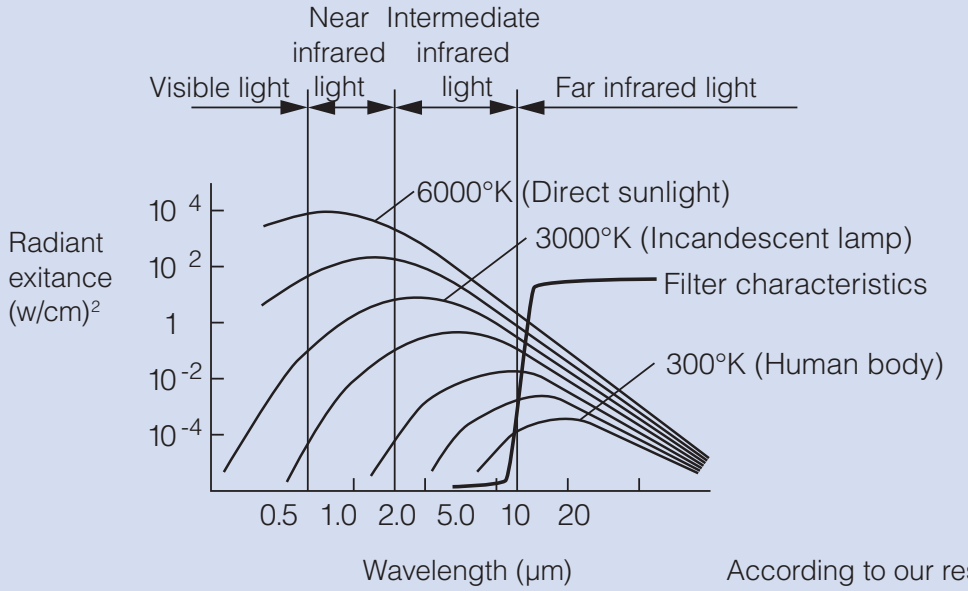
● For detection in only a limited area



Q1-6 How long is the detectable infrared wavelength?

As indicated below, the sensor uses an optical filter with light transmission characteristics of approximately 5µm or longer.
It is defined as a long wavelength (far infrared) which is from approximately 5 - 15µm.

■ Wavelength characteristics



According to our research

Q1-7 What are "pyroelectric elements"?

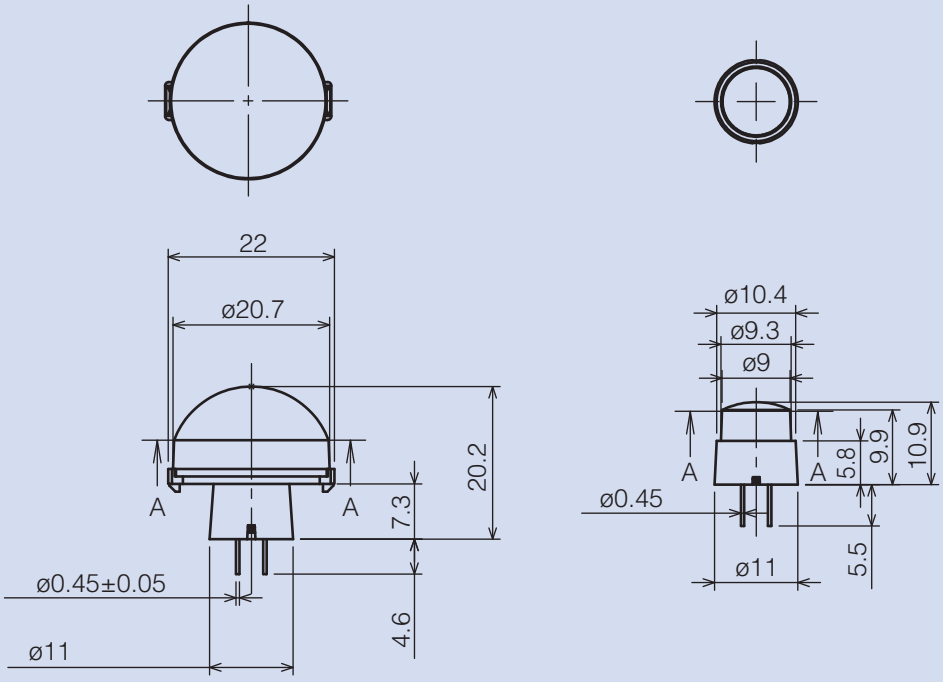
Pyroelectric elements are pyroelectric crystals provided with electrodes. With the help of an optical system, incident infrared radiation emitted by a moving person, for example, is focused on these pyroelectric elements by means of a lens, causing the crystals to change temperature. This temperature change leads to a charge shift at the electrodes. This charge shift generates a measurable voltage which is used to detect moving objects within the specified detection area.
PaPIRs are quad sensors, which means that four pyroelectric crystals are connected together on a carrier substrate. In contrast to sensors with one or only two pyroelectric elements, the probability of a triggering error is reduced with a quad sensor. False triggers can usually be caused by thermal interference sources in the environment, for example, by spontaneous shading of an object heated by the sun or quickly adjustable heat sources.

Q1-8 Is it possible to use PaPIRs in outdoor applications?

Only with certain precautions.
Panasonic passive infrared sensors are designed for indoor use with common indoor electronic devices.
If you need to use a sensor outdoors please take measures to waterproof the sensor and protect it from dust, condensation, and freezing.
There are many causes of temperature changes outdoors and because of that detection errors may result.

Q1-9 How should the sensor be waterproofed?

The sensor itself is not water-proof.
It is necessary to take water-proof measures by using O-rings or gaskets for example or HDPE suitable potting material (please contact potting material experts for HDPE suitable potting materials).
The high-density, long-distance, and low-profile lenses have a step for which O-rings or gasket seals can be placed (maybe CAD based pictures are a little bit more representative here).

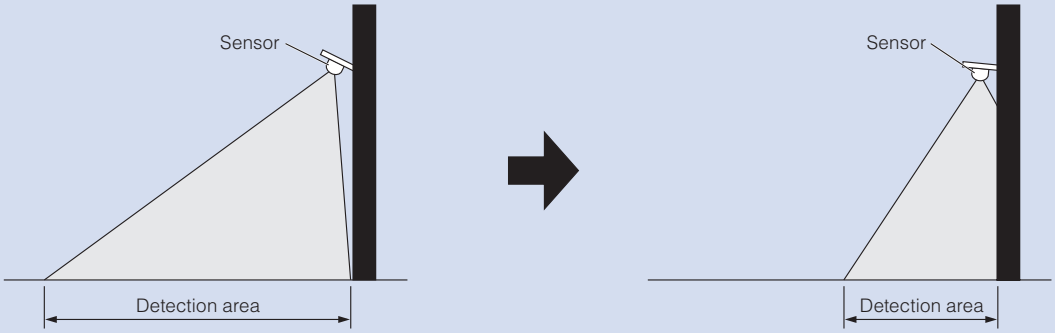


[ø20.45mm (High density & Long-distance)] [ø9.3mm (Low-profile)]

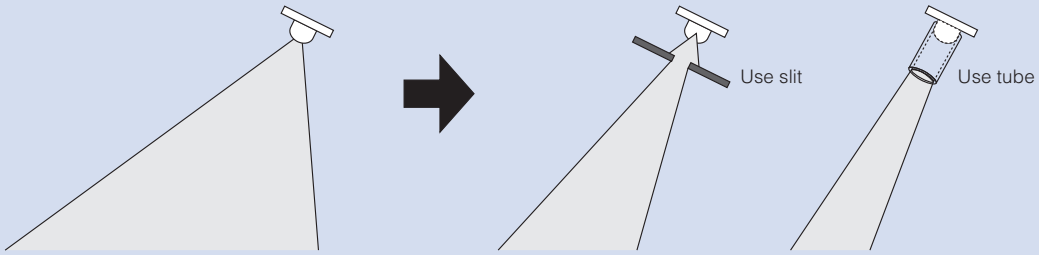
Q1-10 Can I change the detection area?

Yes, you can depending on the setting.
The detection area can be changed by changing the angle of the mounting of the sensor and by placing a cover with a slit or a mask in front of the sensor that limits the area detected by reducing the F.O.V. (Field of View).
If you find it difficult to calculate the desired detection area, please ask us. We can possibly create a field of view simulation upon request.

● Setting the sensor so it will not detect people who are far away



● For detection in only a limited area



Q1-11 Can the sensor be installed on a moving body?

No, the sensor is not suitable for mounting on moving objects.
PaPIRs are normally installed in a stationary devices. When an object enters the detection area, the sensor detects a change in the amount of infrared radiation in the detection area. If the sensor were to move, it would mistake changes in wall and floor temperature for a moving object, which would incorrectly lead to detection.
Strong shocks and vibrations can cause false alarms too, and in the worst case damage the sensor.

Q1-12 Is detection possible when the distance between the person and the sensor is almost zero?

Yes.
Panasonic Passive infrared sensors detect when a human enters or exits the specified detection area.
However, if the person is too close to the sensor, the entire detection area is covered by the upper body, for example. As a result, temperature changes are less likely to occur with small movements in the detection area.
In addition, detection can be difficult if a person moves through the detection area at an extremely short distance, very quickly. In this case, the temperature change could be too fast for the sensor.

Q1-13 Can Panasonic Passive infrared sensors detect through a transparent plate such as glass or acrylic?

No, it cannot a person through these materials.
The wavelength which can be detected by this sensor is over 5μm.
Ordinary, light wavelengths passing through glass are limited to 2μm. Since the sensor can only detect infrared wavelengths greater than 5μm, glass would render the sensor unable to detect a person on the other side.
As an alternative we suggest using a polyethylene sheet which allows for infrared light to pass through. However, if a sensor is placed opposite or close to a window, etc., it may react if the ambient temperature changes quickly enough, for example if the sun is shaded by clouds, etc.

Q1-14 Does the detection sensitivity change due to the ambient temperature?

Yes, it does.
During summer, when the difference between surface temperature of a human body and the background temperature is small, the sensitivity decreases. Conversely, during the winter, the sensitivity can increase all depending on amount of temperature differential between the object and background ambient.

Q1-15 Is there any impact by sunlight?

Yes, there is.
When sunlight suddenly illuminates or shades the sensor, a change in temperature occurs.
The sensor may detect this change, and there is a possibility to trigger a false detection.
Therefore, we recommend that the sensor should be installed at a place where it is not in direct sunlight.

Q1-16 Does detection performance change depending on clothes?

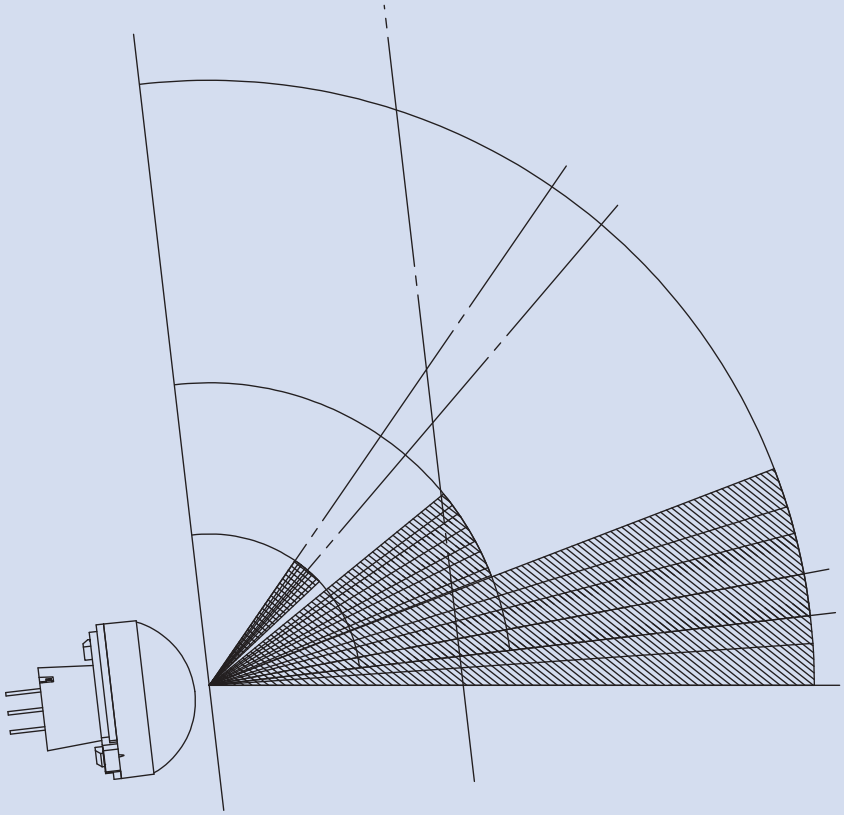
Yes, it does.
Since Panasonic Passive infrared sensors detect the difference between the ambient temperature and the human body, the detection performance changes depending on the state of the target object and the ambient temperature.
Regarding the change due to clothes, this depends on how much skin is exposed. The human body emits more infrared light when more skin is exposed. The more energy radiated from the human body, the easier it is for the sensor to recognize infrared energy.
Although people tend to cover up more with clothing during colder environments and winter seasons, the actual detection performance is actually still better in these climates.
This is because the ambient temperature is lower in winter and the effect of lowering ambient temperature has a greater effect than the change of infrared emitted by the person due to clothing.
Generally, it is necessary to pay attention to changes in the ambient temperature more than the affects of clothing.

Q1-17 What is an effective method for pet immunity?

There is no true “Pet Immunity” type PIR sensor from Panasonic.

You can install the “wall installation detection” lens type upside down and tilt the lens so that the detection area does not cover near the ground.

However, this is only possible with smaller animals. Larger dogs for example could be detected. But also cats or dogs that move into the detection area trigger the sensor, for example when they jump or climb on an elevation (create a 3D CAD picture).



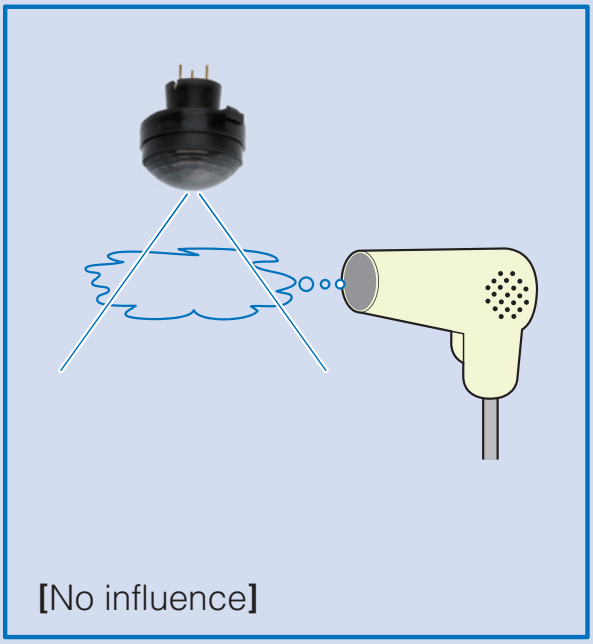
Q1-18 Does airflow around the sensor have any influence on detection performance?

No, unless the airflow is blown directly across the lens or directly at the sensor.
The principle of operation of the sensor is to detect changes in the amount of infrared energy.

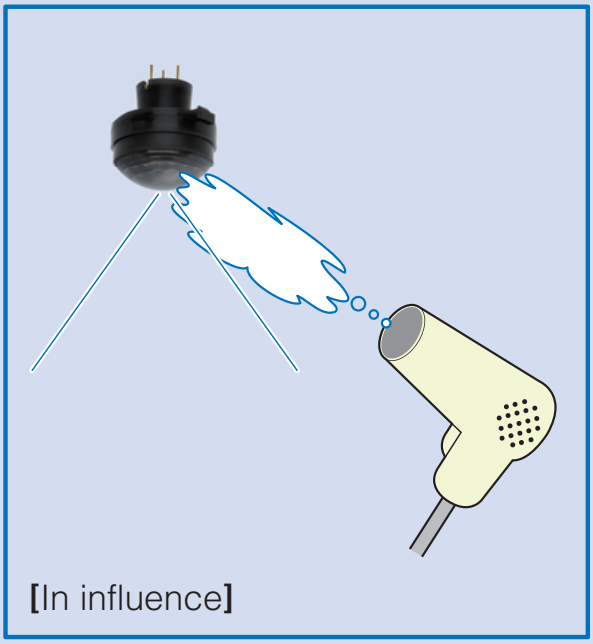
Infrared energy = Temperature x Emissivity of the object

Therefore, because air is 0% emissivity, the sensor does not respond no matter how much the temperature changes.

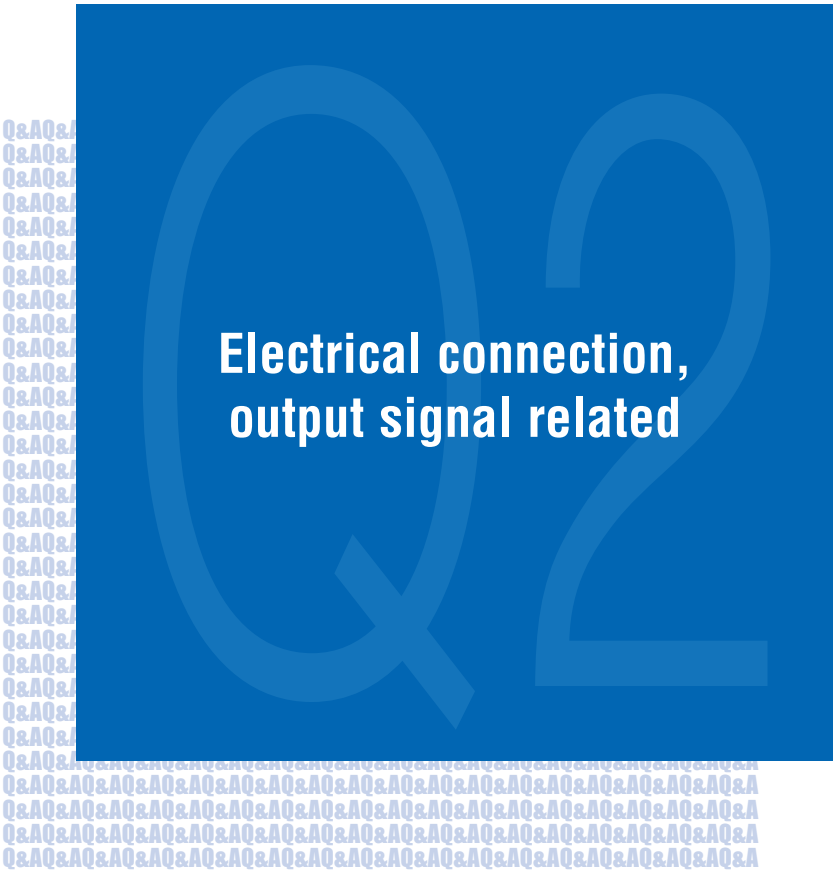
However, when the airflow blows directly toward the sensor's lens causing the temperature of the lens itself to change, there is the possibility of a false trigger.
In addition, if the airflow changes the background temperature rapidly, the sensor may be sensitive enough to interpret this as warm body movement.



[No influence]



[In influence]


Q2
Electrical connection,
output signal related

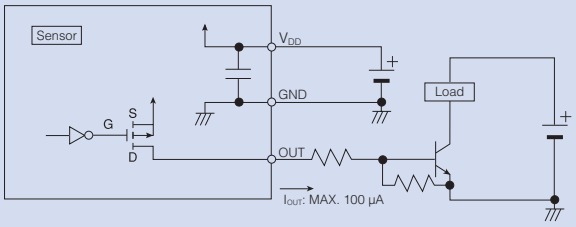
Q2-1 How should the sensor be wired?

1. Below are the functional pin assignments:
   Vdd power source (+)
   GND power source (–)
   Out output terminal

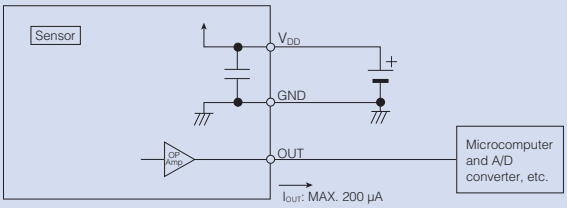
2. Connect the pins as follows:
   - Connect the (+) terminal of the power source to Vdd.
   - Connect the (–) terminal of the power source to GND.

3. Select an output resistor in accordance with Vout.

1) Digital output type

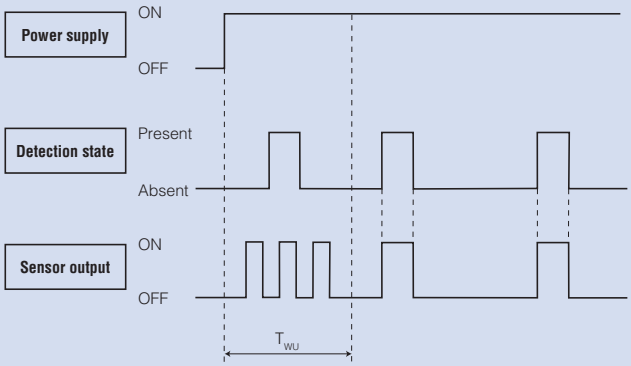


2) Analog output type



Q2-2 Can the circuit stabilization time (wait time) be shortened?

No, it cannot.
The circuit stabilization time is the time required for the internal circuit to stabilize after the power is turned on.
During this time accurate detection cannot take place as the output is unstable.



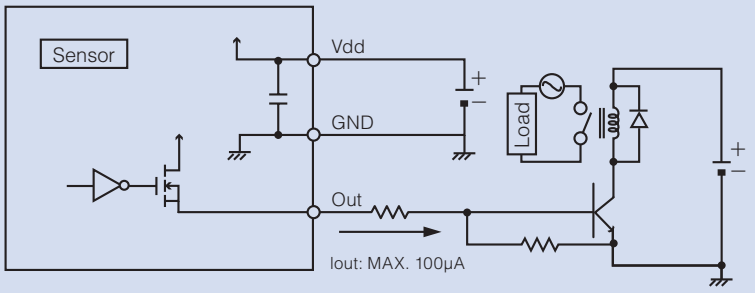
Q2-3 Can the AC load be turned on and off directly?

No, it cannot.
A mechanical relay or solid state relay should be connected to the output of the infrared sensor to turn the AC load on or off.
If a timer is needed, please refer to Q2-6 for an example of a timer circuit.

Circuit example

Circuit example as bellows.

1. For mechanical relay drive

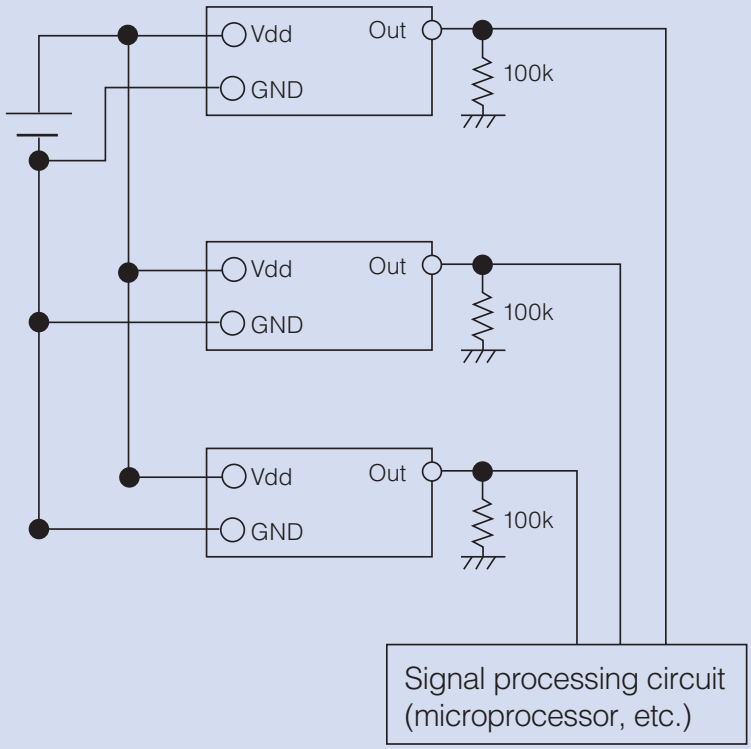


Q2-4 Are there any sensors with an operating voltage of 12V DC or 24V DC?

No, there are not.
A regulator or other circuitry should be used to transform the voltage to 5V DC.

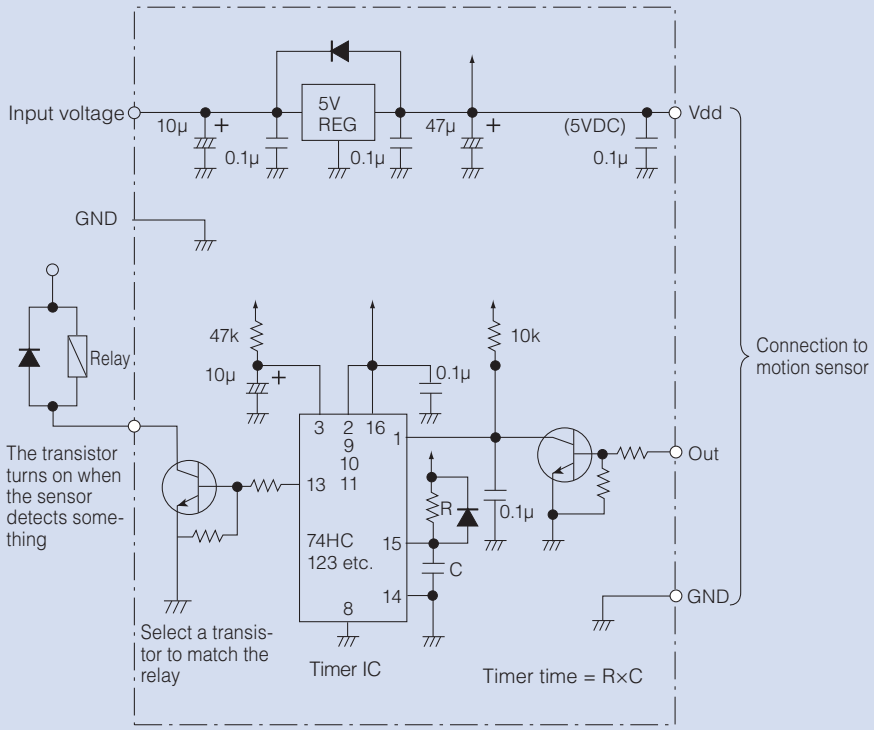
Q2-5 Is it possible to design a common circuit for multiple sensors?

Yes, it is.
A design using parallel connections such as in the example below can be used.



Q2-6 How do I set a timer for the output?

You can set the microprocessor's timer function.
If the device does not have such a function, refer to the following circuit image below to create a timer as an example.



Note 1) Each timer IC manufacturer required different values for the resistance (R) and capacitance (C) used for the time setting. Please confirm with the manufacturer for these values before you design the circuit.

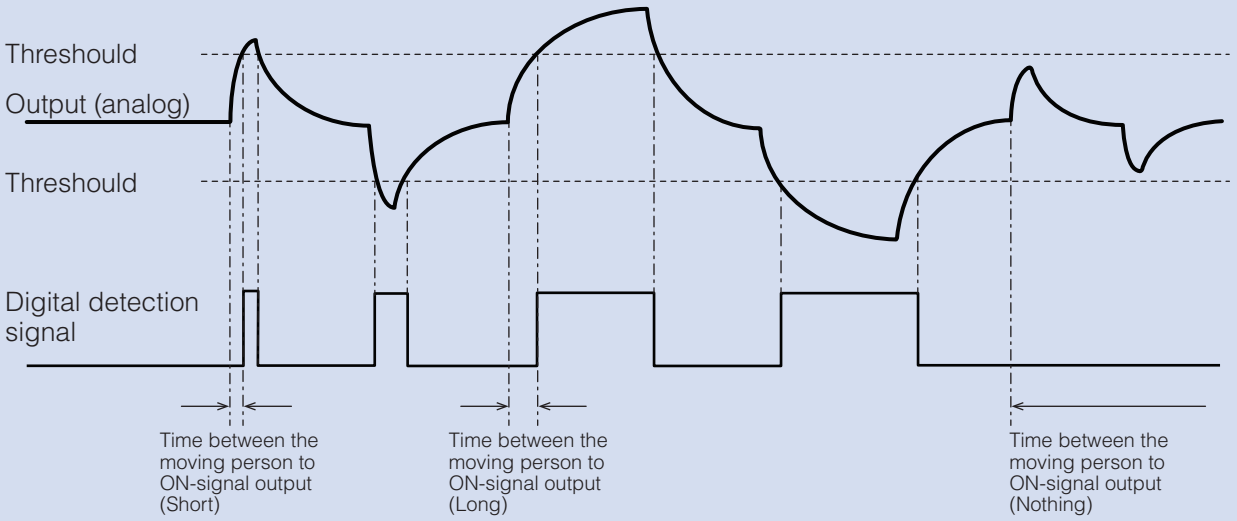
Note 2) This is the reference circuit which drives the motion sensor.
Please note that Panasonic bears no responsibility for any damages or loss arising from the use of this circuit. A noise filter should be installed for applications requiring enhanced detection reliability and noise withstanding capability.

Q2-7 Does the performance change depending on the operating voltage?

The detection performance does not change.

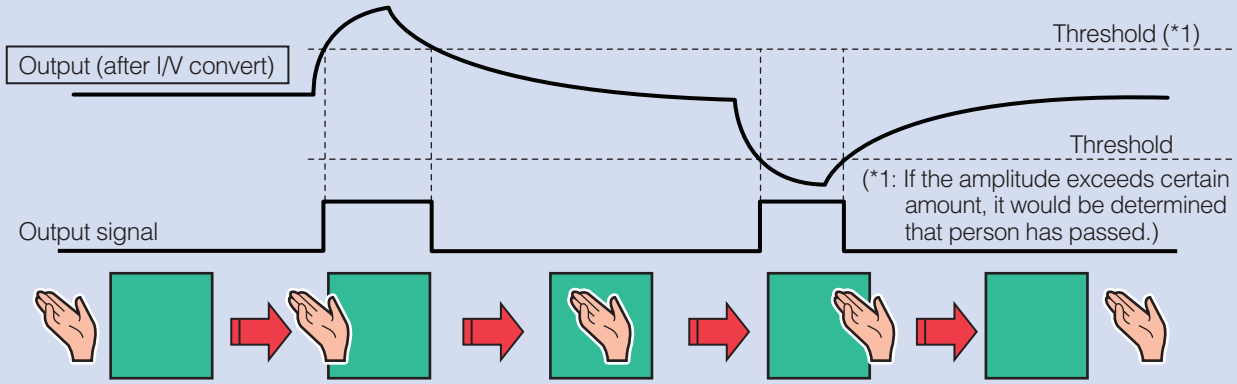
Q2-8 What is the duration for the digital output signal during a detection?

It is depends on certain conditions.
Therefore, it cannot be specified.
Detection occurs when the sensor generates an analog signal that extends beyond its threshold values. The slope of this analog signal can ramp drastically or minimally due to the detected change in temperature or movement speed of the object.



Q2-9 If a person keeps moving in the detection area, what kind of output appears from the digital output type sensor?

The output would be a repetition of ON/OFF.
When the detection state persists, the pyroelectric elements output an analog signal waveform continuously. The output analog signal is amplified by an amplifier circuit and when it exceeds the preset voltage level threshold, the sensor interprets this as motion by converting the signal to a digital ON output.
As the analog signal drops below the voltage threshold, the digital signal goes back to an OFF signal as the output.



Q2-10 What is the duration of the digital output signal from the sensor after a detection?

More than 1ms.
The pyroelectric elements' output differs depending on the temperature difference between the object and its surroundings as well as well as the moving object's speed. The output is amplified by an amplifier, and if the amplified output exceeds the reference voltage, the sensor interprets this as a detection by converting the analog signal to a digital ON output signal.
Although the output time is not always the same, the signal is more than 1ms due to the circuit characteristics.

Q2-11 How much time elapses after the person stops moving within the detection area and before the signal becomes a "definite" OFF?

It cannot be specified because it depends on too many parameters.
It may take some time to turn off depending on the conditions.

Q2-12 Why doesn't the sensor have a timer circuit for setting the output time?

It has become common practice to use the timer function of a microprocessor on the main board, so Panasonic infrared sensors do not implement it.
If you wish to see an example of a timer circuit, refer to Q2-6.

Q2-13 Can the sensor handle external surges and electrical noise?

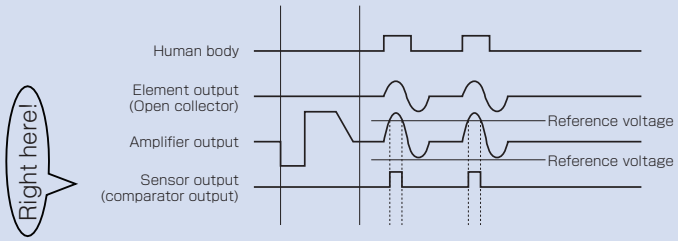
Yes it can handle external surges to a certain extent. It depends on the quality of the power supply and the noise conditions of the surrounding environment such as noise amplitude, noise frequency and cable routing.
In principle, the sensor should be used in a low noise environment.

Reference: The sensor is not affected by mobile phone noise with a minimum distance of 5 centimeters.

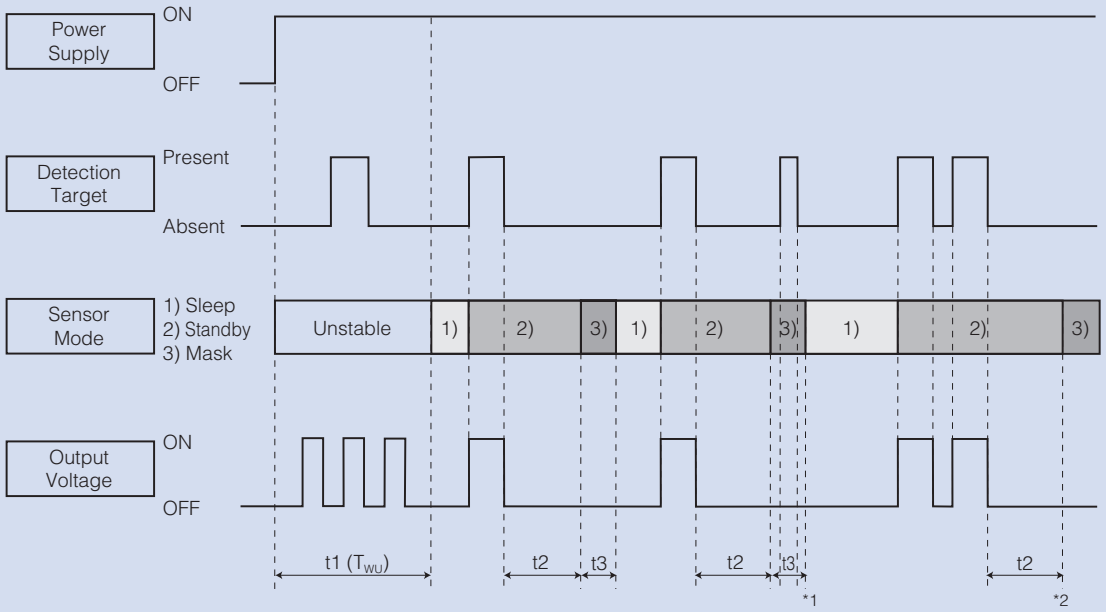
Q2-14 What is a comparator?

The amount of infrared radiation emitted from the human body is very small and the signal cannot be processed by the circuit as is.
For this reason, the signal is amplified by an internal amplifier circuit. The amplified signal must be compared to a preset reference level.
If the amplified circuit is greater than the reference level, a person is considered to have entered the detection area and a digital ON signal is outputted.
The circuit that makes this comparison is called a comparator.

<Timing chart> ● Standard type



Q2-15 What are sleep mode, standby mode, and mask mode?



[Modes]

1) Sleep Mode: When the output is OFF. The electrical current consumption during sleep mode is around 1μA.

2) Standby Mode: After the sensor's output reaches ON status, the sensor switches to standby mode. The electrical current consumption gets close to 1.9μA . When the sensor's output returns to its OFF value after expiration of the "hold time", the sensor switches again to sleep mode.

3) Mask Mode: Time during which the output is forced to OFF after the end of the standby mode. (No detection is possible during this period.)

[Durations]

t1(Twu): Circuit Stability Time About 25s. (typ.)
During this stage, the output's status is undefined (ON/OFF) and detection is therefore not guaranteed.

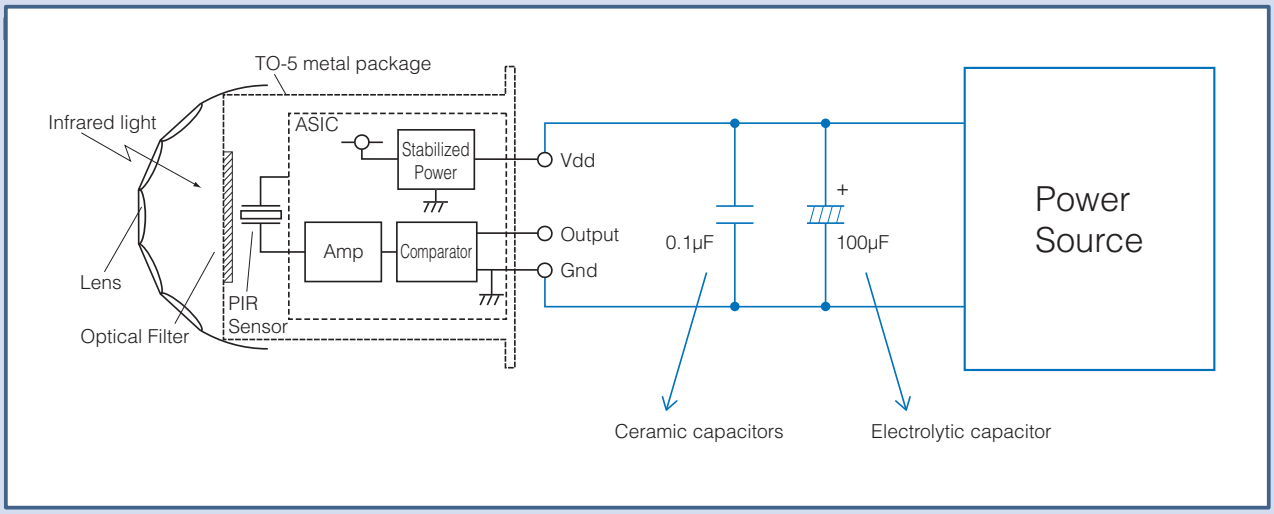
t2: Standby Hold Time About 2.6s (typ.)
Depending on the number of output happening during standby mode, the hold time can differ. (*1)

t3: Mask Time About 1.3s (typ.)
During this stage, even if the sensor detects something, output will not switch to ON (*2)

According to our research

Q2-16 How to reinforce power source noise?

A capacitor can be added as seen in the example below.

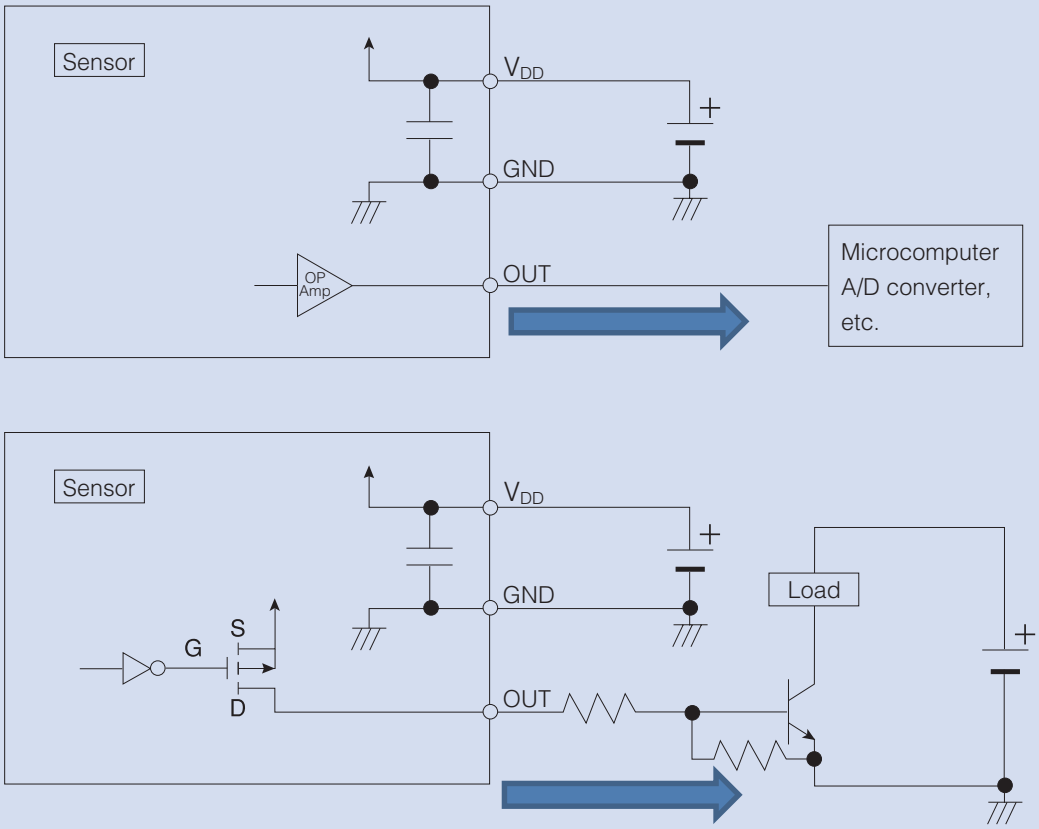


Q2-17 What is the operating process for output current?

PaPIRs have a voltage output (Out) which can only drive a certain current. The digital sensors can drive a maximum of 100μA, whereas the analog sensors (EKMC26-series) can drive up to 200μA.
The user must consider & design the circuit connected to the voltage output so that the specified maximum output current is not exceeded.

Otherwise the sensor shows unstable behavior and in the worst case can be damaged if this value is exceeded.

Panasonic infrared sensors do not work if more than 100μA is output.




Q3
Related to product
specifications, etc.

Q3-1 Will the sensor detect anything beyond the “maximum distance” specified in the catalog?

There is a possibility of detection.
This sensor is specified to detect an object based on defined conditions.
The catalogue is written as “Standard detection type 5m” and “Slight motion detection type 2m”, which is our “guaranteed detection distance”.

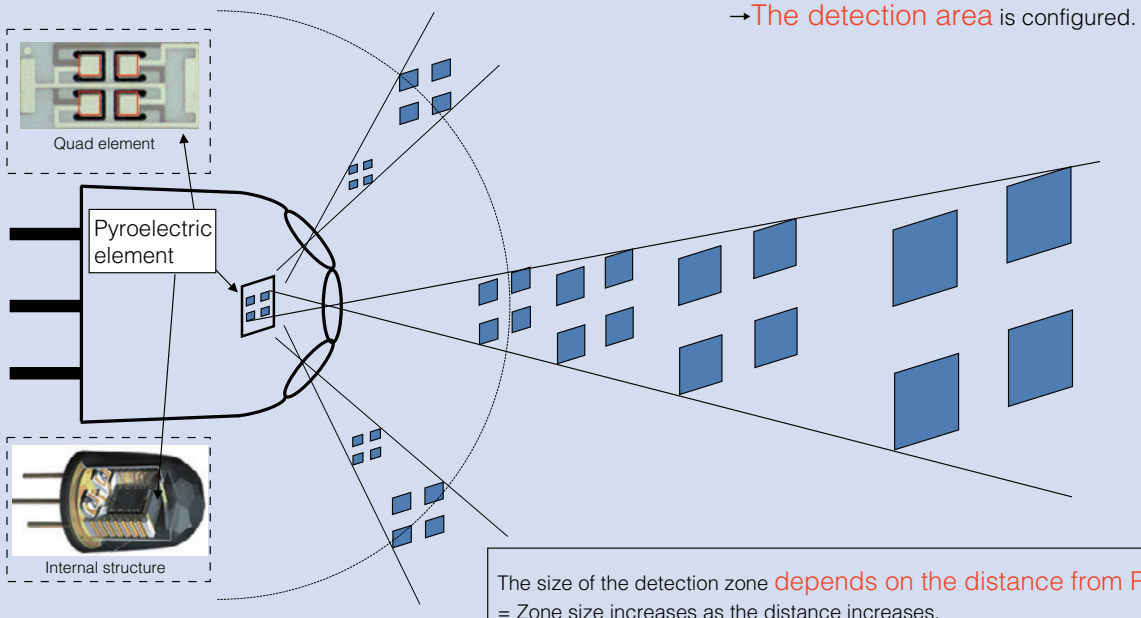
In reality, the detection cases may differs depending on the following factors.
- Temperature difference between target object and surroundings.
- Size of target object and how it overlaps with the detection zones.
- Moving speed of target object.

Therefore, there is the possibility that the sensor detects something beyond the specified “maximum distance”.
In addition, depending on the conditions, there is even the possibility that the sensor may not detect even within the specified detection distance.

Q3-2 How is the detection area of Panasonic infrared sensors determined?

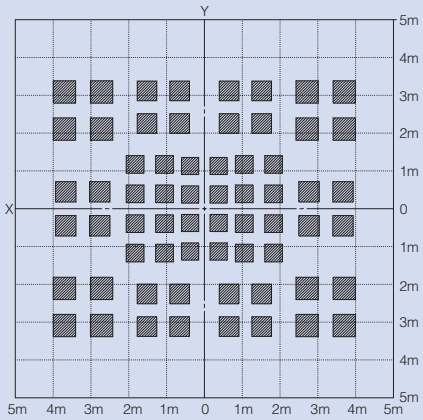
• Detection zone
This is the area where people are detected. There are 4 heat receiving elements inside the sensor, and those elements are projected to the lens creating 4 detection zones per each facet of the lens.
• Detection area
Detection area is where the 4 detection zones are as one group. This is a set of detection zones projected by a single facet on the lens.
• Detection range/distance
If ceiling mounted - Detection range / distance is the installation height that the sensor will detect reliably as per specification.
If wall mounted - Detection range / distance that the sensor will detect reliably.

One pyroelectric element inside PaPIRs is projected in various directions by a lens.
→The detection area is configured.



The size of the detection zone depends on the distance from PaPIRs
= Zone size increases as the distance increases.

X-Y sectional view (3m)



Detection area

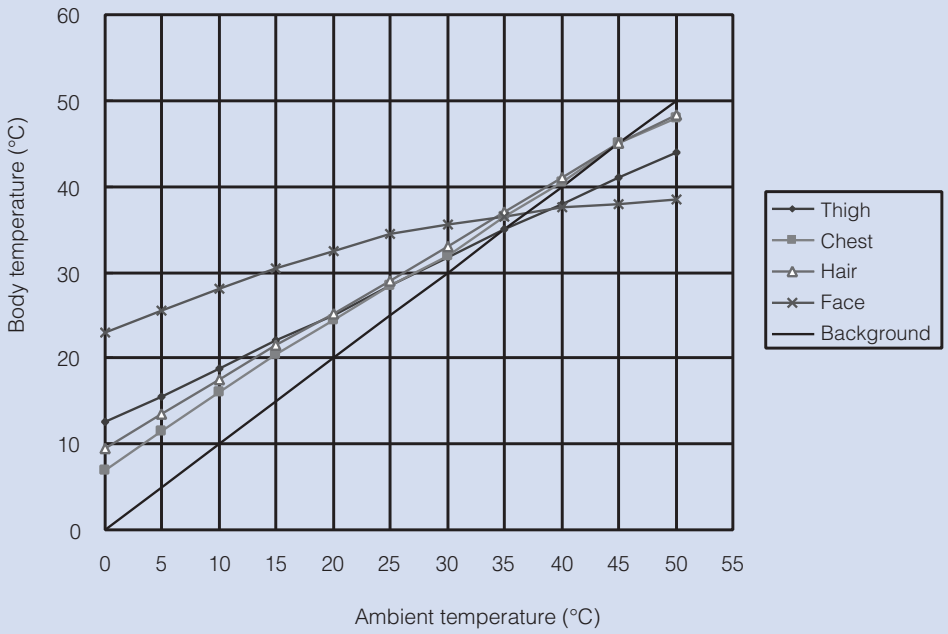
The standard type of PaRIRs (EKMC160111*) consists of 16 lens facets of 5 different shapes. The sensor is composed of 64 detection zones (4 detection zones x 16 lenses).

*Color of lens

Q3-3 What does “temperature difference of 4°C or more against background” mean?

PaPIRs are able to function based on a temperature difference of 4°C between a heat source such as a person and the background such as a floor or wall.
The background is the environmental temperature such as the area around the ground, walls and ceiling. When the person enters detection range of the sensor, the temperature difference between the ambient temperature and object will be detected due to the sensing of change in infrared light.

(Reference date) Wearing long-sleeve work clothes



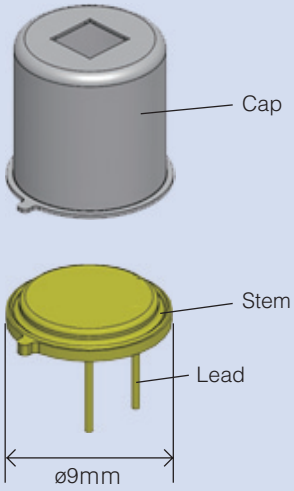
According to our research

Q3-4 How is product life cycle calculated?

Product life is estimated by an accelerated reliability test based on a THB (Temperature, Humidity and Bias) test.
Using this evaluation method, we established that there is no problem storing the sensor indoors at normal temperatures and humidity for 5 years.
The quality guarantee period is one year.

Q3-5 What is the TO-5 metal package?

TO-5 is a standard for package size for semiconductors.
As seen in this image, a TO-5 package consists of a metal semiconductor chip mounting 9mm in a diameter, a dish-shaped component called “stem” that holds the external leads, and metal cap that covers the semiconductor chip.



Q3-6 Is it possible to use reflow soldering?

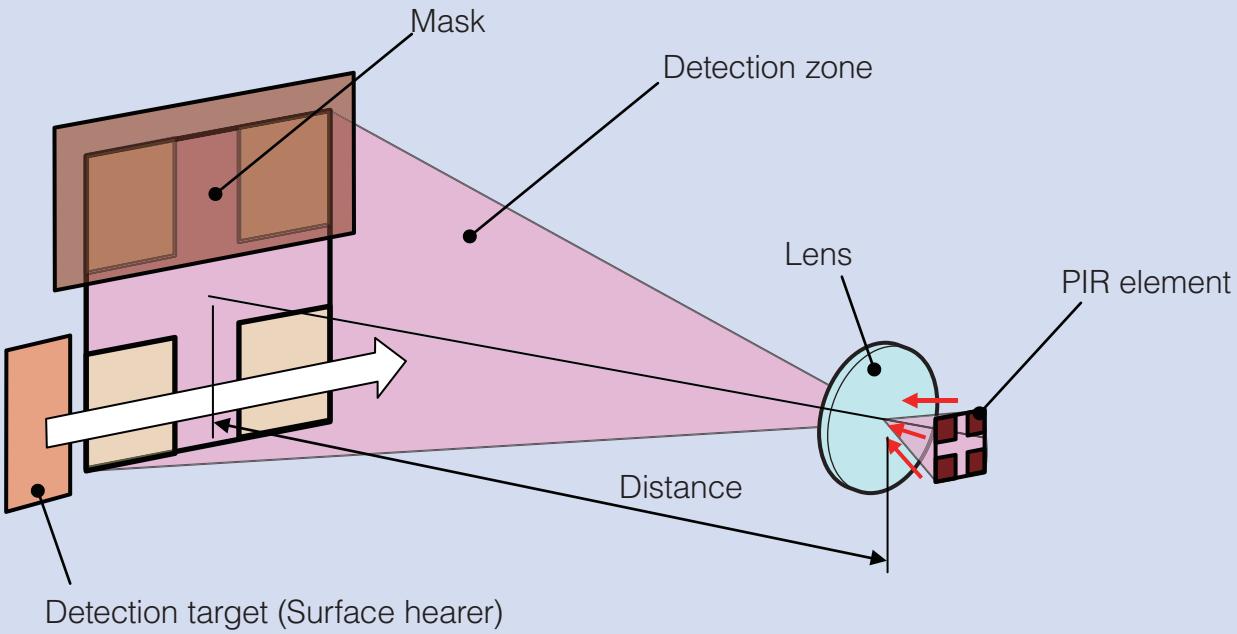
No, it is impossible.

Q3-7 How can we confirm detection performance based on the specification?

The design concept requires that the target object to be detected completely passes through the detection zone.

The conditions are as follows.

- Size of detection target.
- Movement speed of detection target.
- Temperature of detection target. (temperature difference from surroundings)
- Distance between the target and the sensor

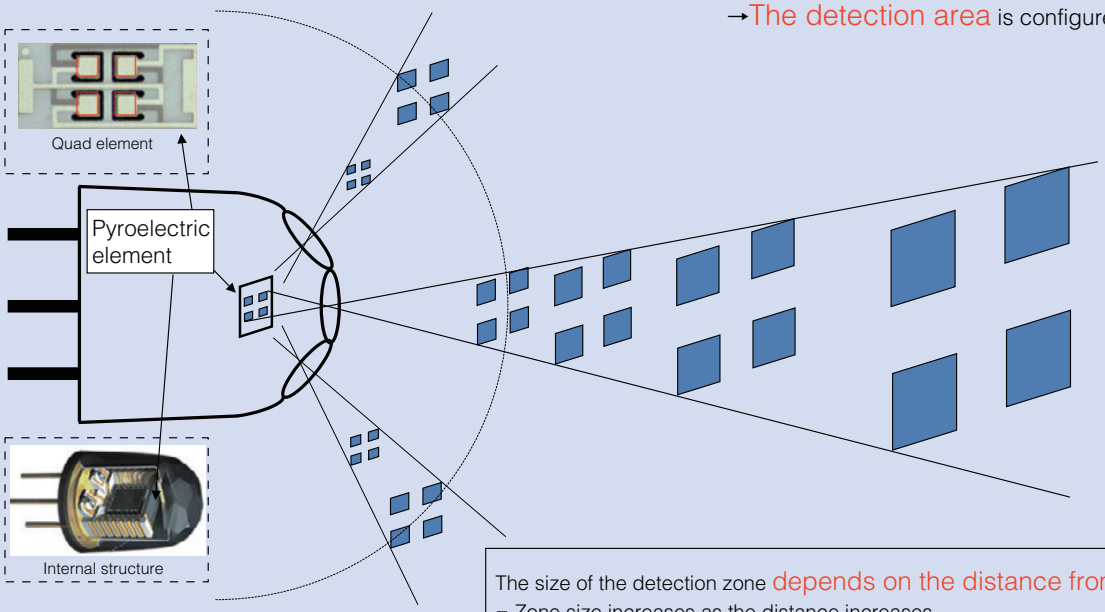


Q3-8 Is there any correlation between sensitivity and distance?

Yes, there is.
Sensitivity is inversely proportional to the size of the detection zone.
(The larger the detection zone, the more difficult it is to detect the object.)

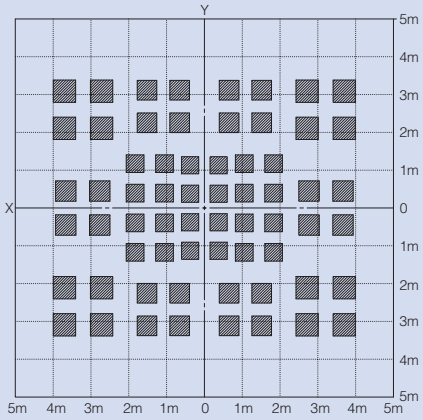
The sensitivity is roughly inversely proportional to the square of the distance as defined by the Inverse Square Law.
The greater the distance, the larger the individual detection zones become. Larger detection zones reduce the sensitivity against small objects or small movements.

One pyroelectric element inside PaPIRs is projected in various directions by a lens.
→The detection area is configured.



The size of the detection zone depends on the distance from PaPIRs
= Zone size increases as the distance increases.

X-Y sectional view (3m)



Detection area

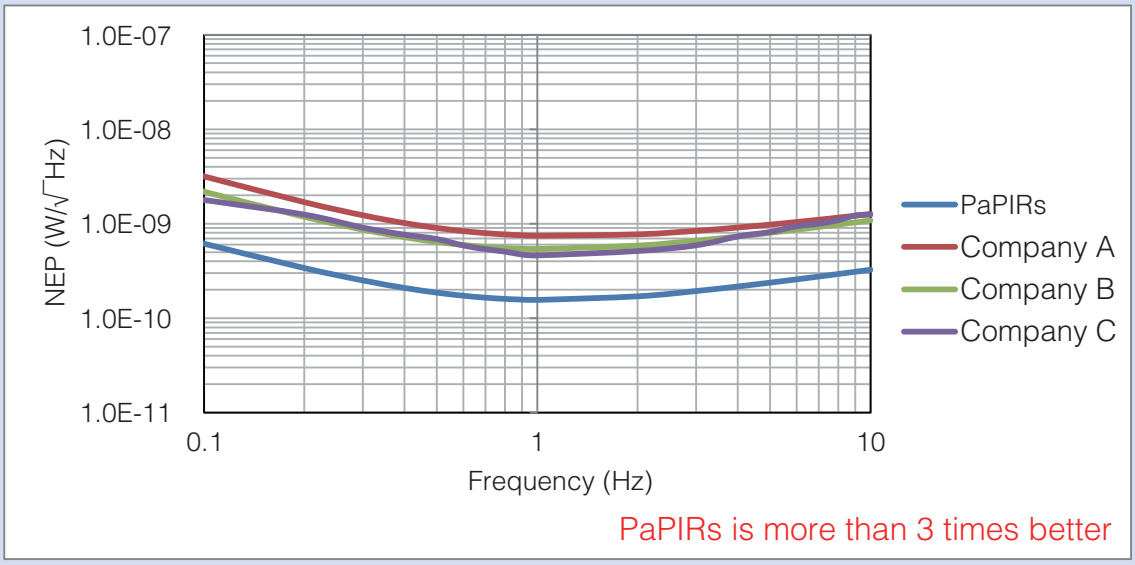
The standard type of PaRIRs (EKMC160111*) consists of 16 lens facets of 5 different shapes. The sensor is composed of 64 detection zones (4 detection zones x 16 lenses).

*Color of lens

Q3-9 What is NEP (Noise Equivalent Power)?

This amount indicates the incident energy intensity when the noise and signal output are equal.
The smaller this value is, the higher the detection capability which means that the noise level is reached with less light incident.

NEP = Noise Equivalent Power



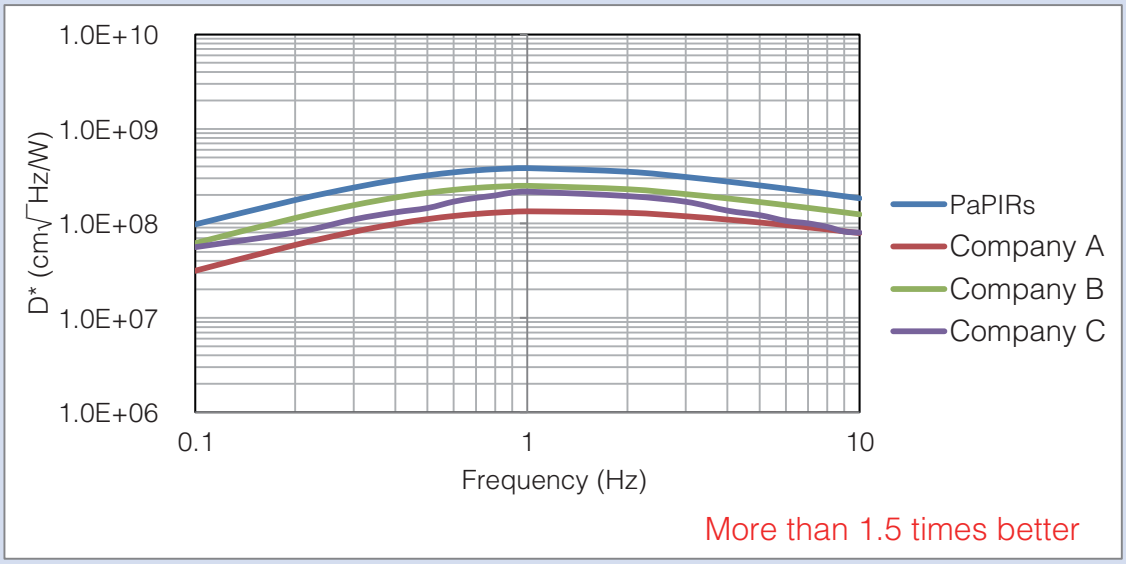
PaPIRs is more than 3 times better

According to our research

Q3-10 What is D* (ratio of detection performance)?

D* This is an index that component of the light receiving area is reflected in NEP.
It indicates the sensor detection performance as actual product.

D*= Detection capability



According to our research

Panasonic has better detection performance even though the sensor has a smaller element compared to other solutions.

Element	PaPIRs	Company A	Company B	Company C
Size (mm)	0.6 × 0.6	2.6 × 0.7	1.0 × 1.0	1.0 × 1.0

Cautions for use

Basic principles

PaPIRs are pyroelectric infrared sensors that detect variations in infrared rays.
However, detection may not be successful in the following cases: lack of movement or no temperature change in the heat source. They could also detect the presence of heat sources other than a human body. Efficiency and reliability of the system may vary depending on the actual operating conditions:

1) Detecting heat sources other than the human body, such as:
   a) small animals entering the detection area
   b) When a heat source, for example sun light, incandescent lamp, car headlights etc., or strong light beam hit the sensor regardless whether the detection area is inside or outside.
   c) Sudden temperature change inside or around the detection area caused by hot or cold wind from HVAC, or vapor from a humidifier, etc.
2) Difficulty in sensing the heat source
   a) Glass, acrylic or similar materials standing between the target and the sensor may not allow a correct transmission of infrared rays.
   b) Non-movement or quick movements of the heat source inside the detection area. (Please refer to the table on page 8 or 11 for details about movement speed.)
3) Expansion of the detection area
   In case of a considerable difference in the ambient temperature and the human body temperature, the detection area may be larger than the configured detection area.
4) Malfunction / Detection error
   On rare occasions, an erroneous detection signal may be output due to the nature of pyroelectric element. When the application cannot tolerate erroneous detection signals, take countermeasures by introducing a pulse-count circuit, etc.
5) Detection distance
   Panasonic's PIR Motion sensors state the detection distance in the specifications because they are usually provided with the lens (please refer to item 6 for lensless types). The PIR Motion sensor could detect variations in infrared rays however such variations are decided by following three factors.
   - The temperature difference between the target and the surroundings:
     The larger the temperature difference, the easier it is to detect targets.
   - Movement speed: If the target is moving at a slower or faster speed than specified in the tables, the detection ability may be lower.
   - Target size: The human body is the standard. If the target is smaller or larger than specified in the table, the detection ability may be lower.
     The detection distance explained in our data sheet is defined by the three factors mentioned above. Panasonic's standard for the temperature difference between the target and the surrounding is defined as 4°C. The larger the temperature difference, the longer the detection distance. If the temperature difference is 8°C, which is twice as much as the standard, the detection distance will be approx. 1.4 times longer than the distance at 4°C. For example, if targets at a distance of 5m can be detected at 4°C, then the sensor can detect targets at a distance of 7m at 8°C. (This is based on the theory that the detection sensitivity will vary inversely with the square of the distance.)
6) Lensless Type
   The lensless type cannot detect any targets because it is not possible to focus infrared variations into the sensor chip. It is not possible to determine the detection distance and the field of view without a lens. Please provide your own lens based on your lens design concept.
7) Lens material and the plate setting in front of the lens
   Typically, the only material that can be passed by infrared rays is Polyethylene.
   (The lens material of Panasonic's PIR Motion sensors is "High density polyethylene, HDPE".) When you need to set a plate in front of the lens, please choose one made from the Polyethylene. Please note the thickness or color of the plate will affect the detection ability, e.g. it may make the detection distance shorter. Therefore, please confirm by testing the sensor with the plate under realistic conditions.

Cautions

1) Refer to the newest specification regarding optimal operating environment conditions.
2) Do not solder with a soldering iron above 350°C (662°F) or for more than 3 seconds.
   This sensor should be hand-soldered.
3) To maintain stability of the product, always mount it on a printed circuit board.
4) Do not use liquids to wash the sensor. If washing fluid gets into the lens, it can reduce the performance.
5) Do not use a sensor after it has fallen on the ground.
6) The sensor may be damaged by ±200 volts of static electricity.
   Avoid direct hand contact with the pins and be very careful when operating the product.
7) When wiring the product, always use shielded cables and minimize the wiring length to prevent noise disturbances.
8) The inner circuit board can be destroyed by a voltage surge.
   The use of surge absorption elements is highly recommended.
   Surge resistance: below the power supply voltage value indicated in the section on maximum rated values.
9) Please use a stabilized power supply. Noise from the power supply can cause operating errors.
   Noise resistance: max. ±20V (square waves with a width of 50ns or 1µs)
   To reduce the effect of noise from the power supply , install a capacitor on the sensor's power supply pin.
10) Operation errors can be caused by noise from static electricity, lightnings, cell phones, amateur radio, broadcasting offices, etc
11) The detection performance can be reduced by dirt on the lens, please be careful.
12) The lens is made of soft materials (Polyethylene).
    Please avoid adding weight or impacts that may change its shape, causing operation errors or reduced performance.
13) The specified temperature and humidity levels are suggested to prolong usage. However, they do not guarantee durability or environmental resistance.
    Generally, high temperatures or high humidity levels will accelerate the deterioration of electrical components. Please consider both the planned usage and environment to determine the expected reliability and length of life of the product.
14) Do not attempt to clean this product with detergents or solvents such as benzene or alcohol, as these can cause shape or color alterations.
15) Avoid storage in high, low temperature or liquid environments.
    Also, avoid storage in environments containing corrosive gas, dust, salty air etc.
    Adverse conditions may cause performance deterioration and the sensor's main part or the metallic connectors could be damaged.
16) Storage conditions
    Temperature: +5 to +40°C, humidity: 30 to 75%
    Please use within 1 year after delivery.

Safety precautions

Obey the following precautions to prevent injury or accidents.

1) Do not use these sensors under any circumstance in which the range of their ratings, environment conditions or other specifications are exceeded. Using the sensors in any way which causes their specifications to be exceeded may generate abnormally high levels of heat, emit smoke, etc., resulting in damage to the circuitry and possibly causing an accident.
2) Our company is committed to making products of the highest quality and reliability. Nevertheless, all electrical components are subject to natural deterioration, and durability of a product will depend on the operating environment and conditions of use. Continued use after such deterioration could lead to overheating, smoke or fire. Always use the product in conjunction with proper fire-prevention, safety and maintenance measures to avoid accidents, reduction in product life expectancy or break-down.
3) Before connecting, check the pin layout by referring to the connector wiring diagram, specifications diagram, etc., to verify that the connector is connected properly. Mistakes made in connection may cause unforeseen problems in operation, generate abnormally high levels of heat, emit smoke, etc., resulting in damage to the circuitry.
4) Do not use any motion sensor which has been disassembled or remodeled.
5) Failure modes of sensors include short-circuiting, open-circuiting and temperature rises. If this sensor is to be used in equipment where safety is a prime consideration, examine the possible effects of these failures on the equipment concerned, and ensure safety by providing protection circuits or protection devices.
   Example : Safety equipment and devices, traffic signals, burglar and disaster prevention devices, controlling and safety device for trains and motor vehicles

MEMO

MEMO

Global Network

Europe

Germany (European Headquarters) :	Panasonic Electric Works Europe AG
Austria :	Panasonic Electric Works Austria GmbH
	Panasonic Industrial Devices Materials Europe GmbH
Benelux :	Panasonic Electric Works Sales Western Europe B.V.
Czech Republic :	Panasonic Electric Works Europe AG, organizační složka
France :	Panasonic Electric Works Sales Western Europe B.V.
Hungary :	Panasonic Electric Works Europe AG
Ireland :	Panasonic Electric Works UK Ltd.
Italy :	Panasonic Electric Works Italia srl
Nordic Countries :	Panasonic Electric Works Europe AG
	Panasonic Fire & Security Europe AB
Poland :	Panasonic Electric Works Polska sp. z o.o.
Spain :	Panasonic Electric Works España S.A.
Switzerland :	Panasonic Electric Works Schweiz AG
United Kingdom :	Panasonic Electric Works UK Ltd.

The Americas

United States (Headquarters in NJ) :	Panasonic Industrial Devices Sales Company of America
Canada :	Panasonic Canada Inc
Brazil :	Panasonic Do Brasil Limitada

East Asia

China :	Panasonic Industrial Device Sales (China) Co., Ltd.
Hong Kong :	Panasonic Industrial Devices Sales (Hong Kong) Co., Ltd.
Taiwan :	Panasonic Industrial Devices Sales Taiwan Co., Ltd.
Korea :	Panasonic Industrial Devices Sales Korea Co., Ltd.
Japan :	Panasonic Industrial Devices Sales Japan Co., Ltd.

Asia-Pacific

SINGAPORE / INDONESIA :	Panasonic Industrial Devices Automation Controls Sales Asia Pacific
THAILAND :	Panasonic Life Solutions Sales (Thailand)Co.,Ltd.
MALAYSIA :	Panasonic Industrial Devices Sales (M) Sdn. Bhd.
PHILIPPINES :	Panasonic Philippines (Sales Division of PMPC)
INDIA :	Panasonic India Pvt. Ltd. / Industrial Division
VIETNAM :	Panasonic Vietnam Co., Ltd. / Panasonic Sales Vietnam
TURKEY :	Panasonic Elektronik Satis A.S. PTR.

Panasonic Corporation

Life Solutions Company

System Components Business Unit

- Address: 1048, Kadoma, Kadoma-shi
  Osaka 571-8686, Japan
- Telephone: +81-6-6900-2773
  (Sensors & Devices Promotion Department)
- Web: http://www3.panasonic.biz/ac/e/control/sensor/human/
  (PIR Motion Sensor PaPIRs)

Panasonic®