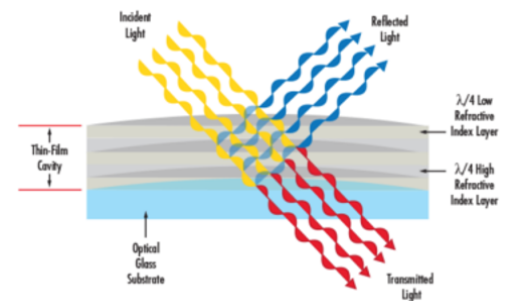
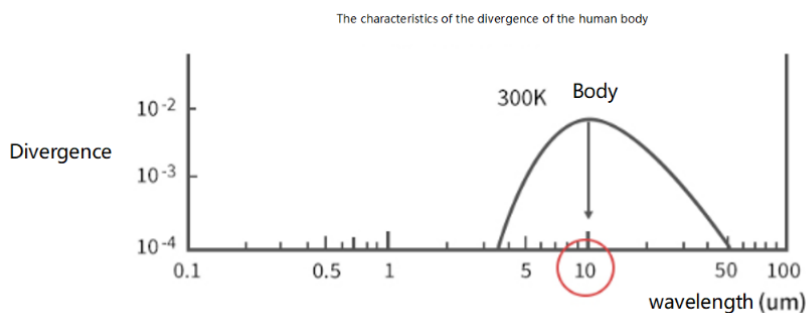


Deployment Method

PIR Technology Principle

RoomSensor is a temperature-sensitive sensor that uses PIR pyroelectric infrared technology to process data. Any object above the natural world's absolute temperature (-273°C) will produce an infrared spectrum. The human body has a constant body temperature, generally about 37°C , and will emit a specific wave of infrared light of about $10\mu\text{m}$. Infrared rays are enhanced by the Fresnel lens (selectively passing through effective human infrared bands to minimize the interference of other infrared bands) and then concentrated in pyroelectric elements. This element will lose charge balance when receiving the change of human infrared radiation temperature and release charge outward. Subsequent circuits can generate alarm signals after detection and processing. Therefore, when nobody moves, the sensor only senses the ambient temperature; When a human body moves, the sensor senses the difference between the body temperature and the ambient temperature, generating an alarm signal. When the human body does not move after entering the detection area, the body temperature will be regarded as the ambient temperature and judged that the temperature is unchanged so that the PIR sensor can detect the human body's or animals' activities.

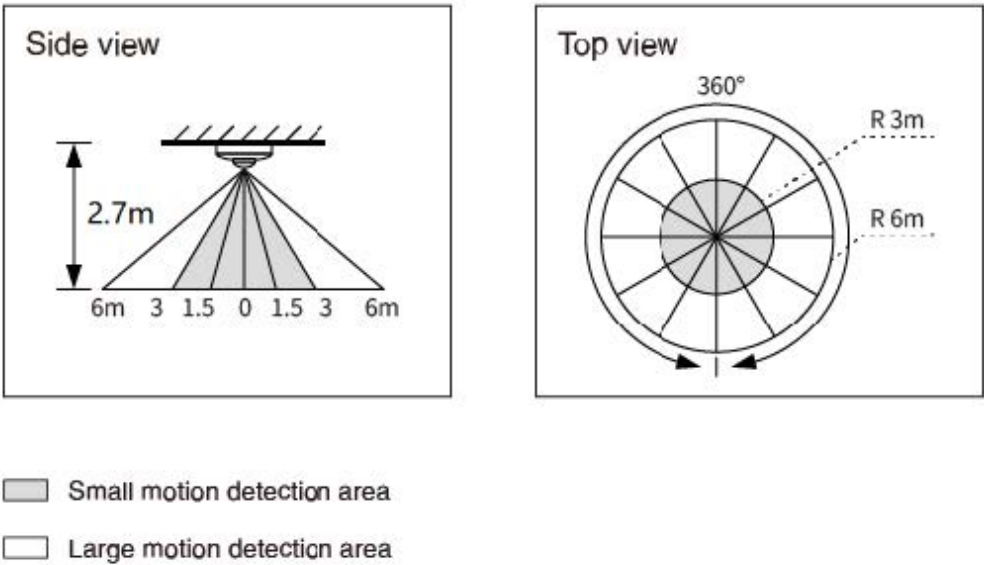


RoomSensor Detection Range

The specific detection range of the ceiling and wall installation is as follows.

Mount on the Ceiling: at an installation height of 2.7 meters, the coverage area is:

- Large motion: a circle with a radius of 6 meters
- Small motion: a circle with a radius of 3 meters

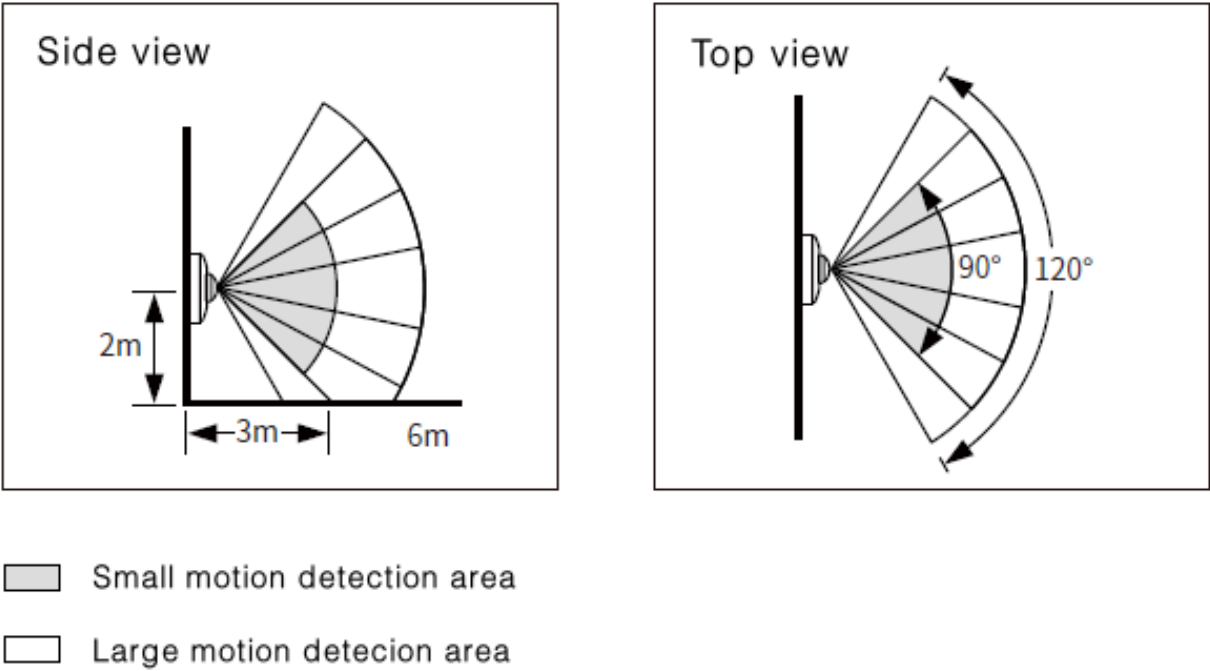


Large motion detection and **small motion detection** coverage are defined as follows.

Methods	Sensitivity	Small Motion			Large Motion		
	The distance between the person and the vertical center of the sensor	Type on the keyboard	Flip book	Drink water	Rotation	Stand up	Walk
Mount on the Ceiling	1 m	√	√	√	√	√	√
	2 m		√	√	√	√	√
	3 m			√	√	√	√
	4 m				√	√	√
	5 m					√	√
	6 m					√	√

Mount on the Wall: at the installation height of 2 meters, the coverage area is:

- Large motion: 120 degrees, 6-meter distance
- Small motion: 90 degrees, 3-meter distance



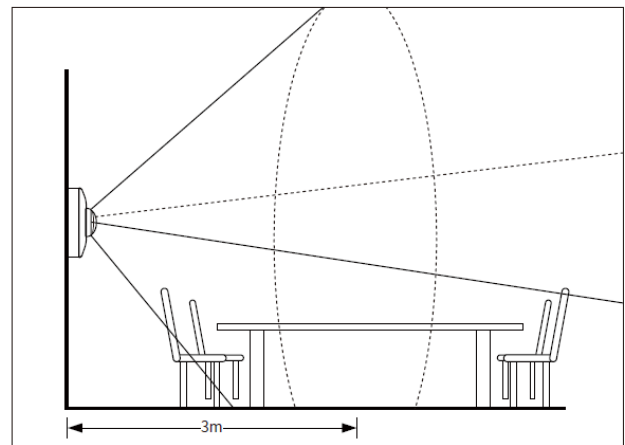
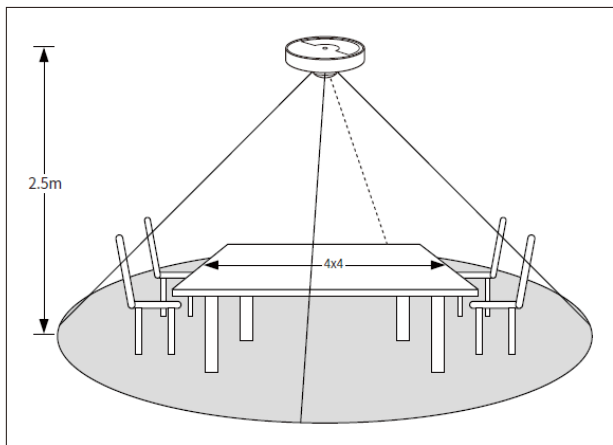
Large motion detection and **small motion detection** coverage are defined as follows:

Deployment Method	Sensitivity	Small Motion			Large Motion		
	The distance between the person and the vertical center of the sensor	Type on the keyboard	Flip book	Drink water	Rotation	Stand up	Walk
Mount on the Wall	1 m	✓	✓	✓	✓	✓	✓
	2 m		✓	✓	✓	✓	✓
	3 m		✓	✓	✓	✓	✓
	4 m				✓	✓	✓
	5 m				✓	✓	✓
	6 m				✓	✓	✓

Recommended Installation

Mount on the Ceiling: 4 m × 4 m conference table (installed in the center of the ceiling at the height of 2.5 m from the ground).

Mount on the Wall: in front of a conference table at a distance of 3 m (installed at a height of 2 m from the ground).

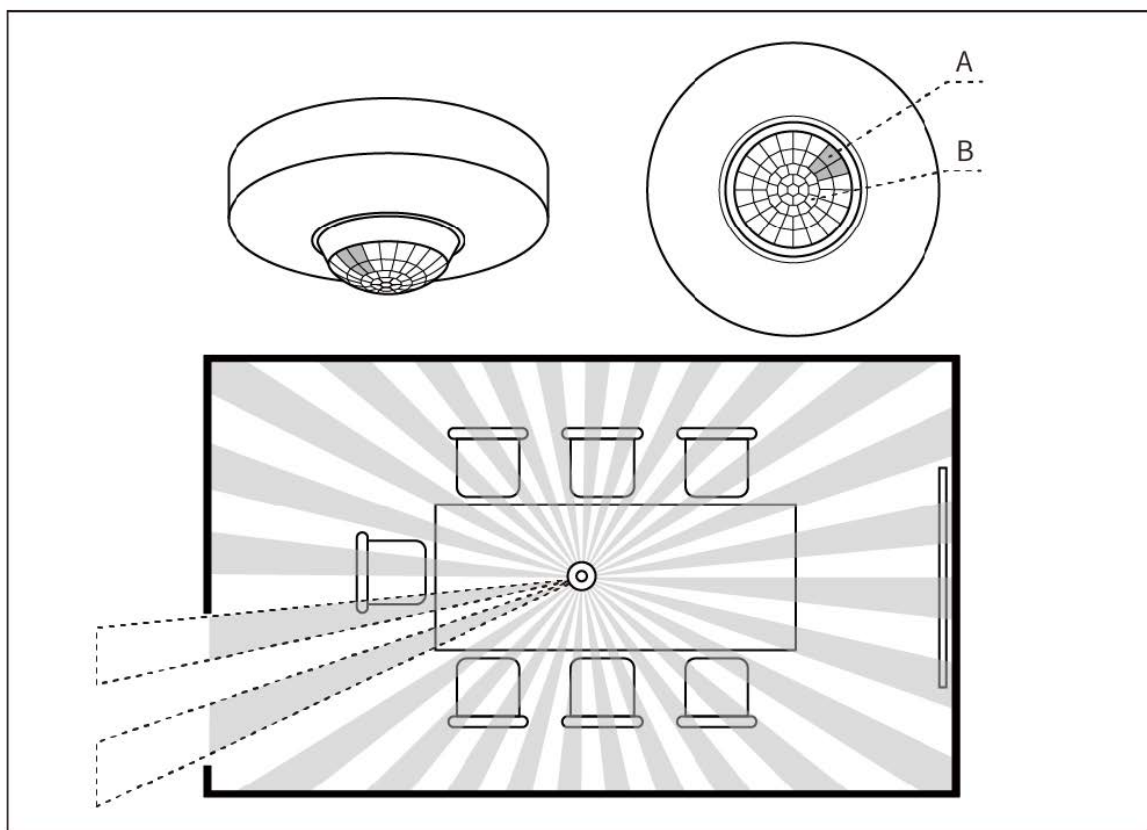


PIR Blocking Sticker

To prevent accidental detection of people in the corridor outside the door, you need to paste PIR blocking stickers for range shielding, and each sticker can cover about 30° range. Note that the stickers should only cover the top half of the lens (to prevent the entire sticker from affecting the detection of the entrance area of the conference room), and it can be adjusted according to the on-site situation.

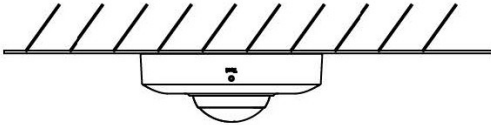
A: Paste area

B: No need to paste area

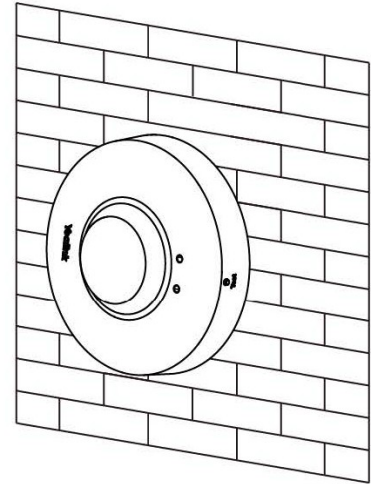


Deployment Methods

RoomSensor supports two deployment methods: **Mount on the Ceiling** and **Mount on the Wall**.



Mount on the ceiling



Mount on the wall

Advantages of ceiling mouting:

1. The conference room has a wider detection coverage area, and it is not easy to be blocked by obstacles in the space that causes detection blind spots.
2. Concealed installation returns you to a clean and tidy environment.

Advantages of wall mounting:

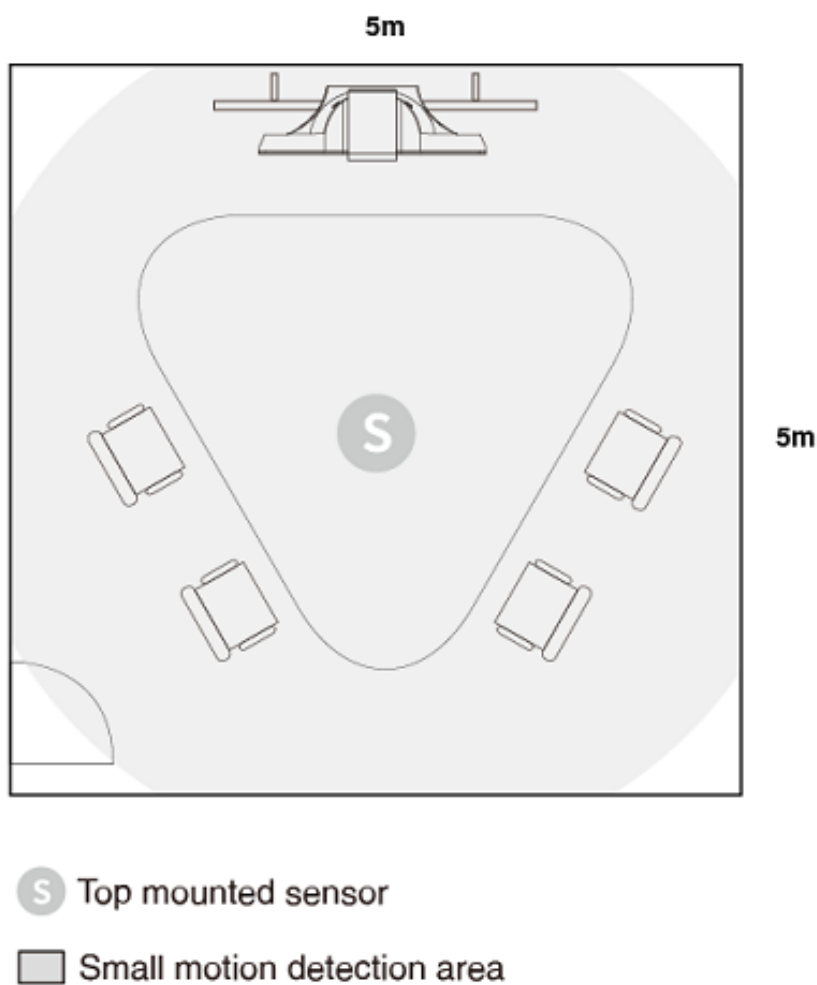
1. The deployment is more directional. It will not detect the area outside the target space, and the coverage is more accurate.
2. Wall mounting is more suitable when the ceiling is covered by projectors and chandeliers.
3. There is no blind spot under the wall mounting.

We recommend using the top-mounted method. The top-mounted method covers a broader area but has a lower missed detection rate than the side-mounted one. For more information about deployment operations, please refer to [RoomSensor Deployment Video](#).

Small Conference Room

Example 1

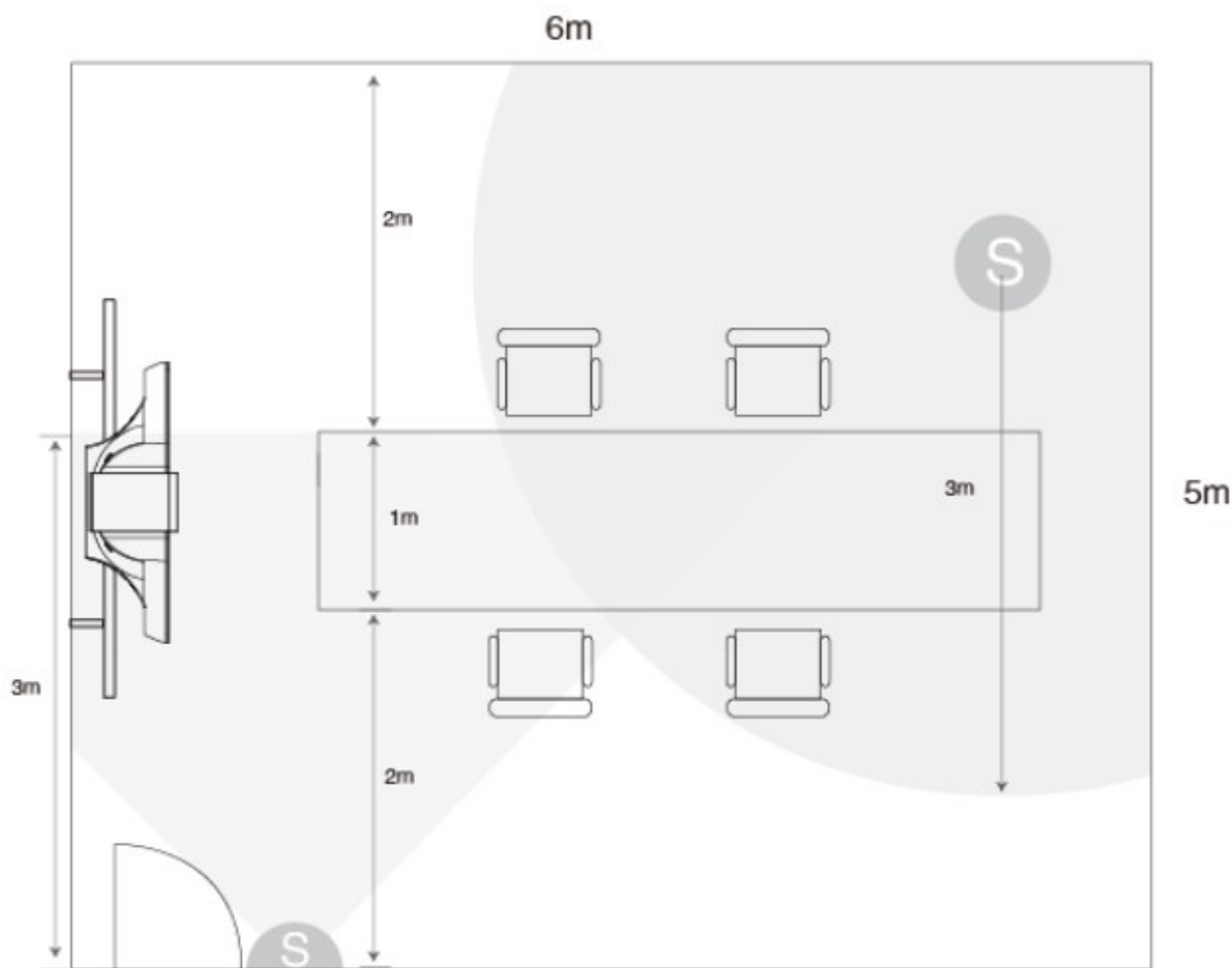
Conference room size: 5 m X 5 m



This example is for a small conference room, where a sensor can be deployed at the top center of the ceiling. A PIR blocking sticker can be attached to where the sensor faces the conference room door to prevent false detection of people passing in the corridor.

Example 2

Conference room size: 6 m X 5 m



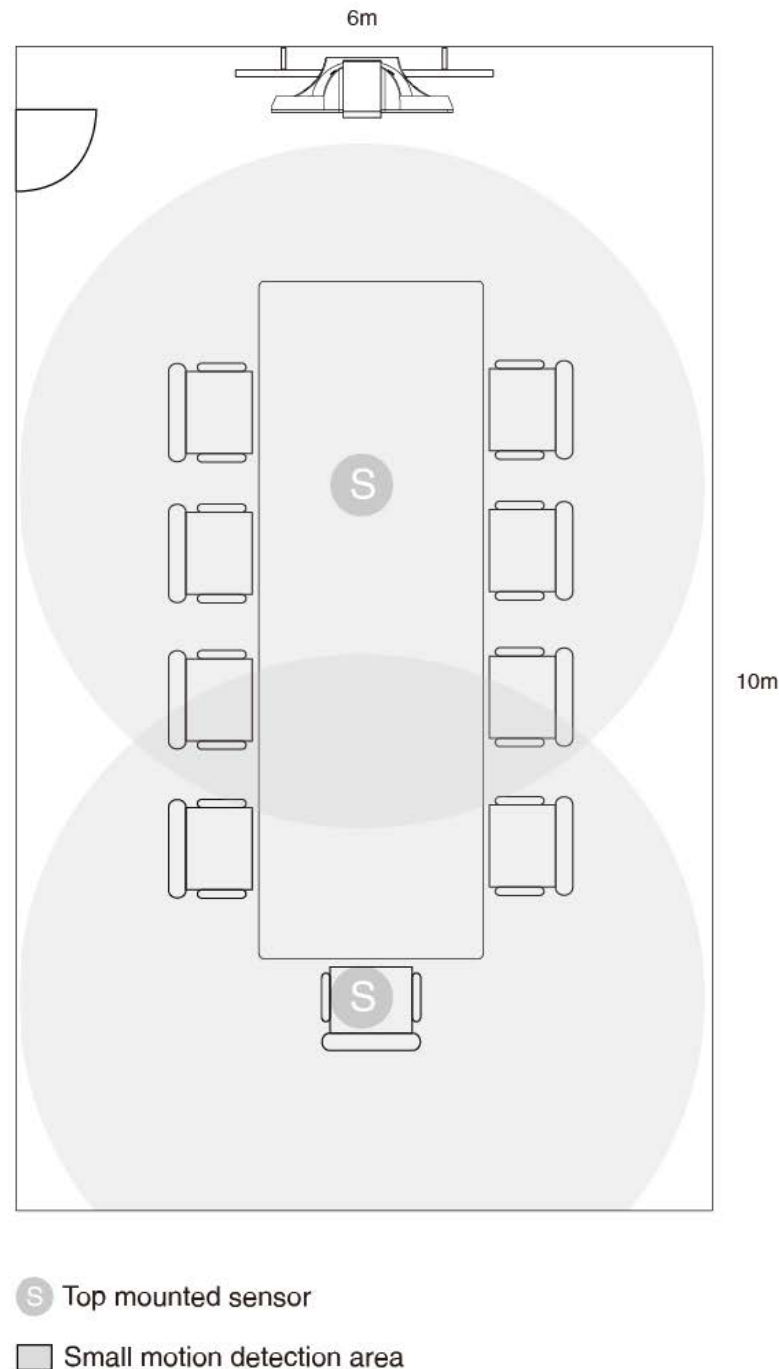
-  Side mounted sensor
-  Top mounted sensor
-  Small motion detection area

This example is suitable for a small conference room. The sensor is installed on the wall where the door is located (2 meters height is recommended). It will not mistakenly detect the staff in the corridor and can quickly detect them when they enter the room. This wall mounting sensor can cover the entrance, the front part of the table, and the display area in front of the conference room (front obstruction might block the detection as the PIR sensor is linear detection). You also need to install a sensor on the top corner to cover the back half of the table. Therefore, the two sensors can cover all the activity areas in the room.

Middle Conference Room

Example 1

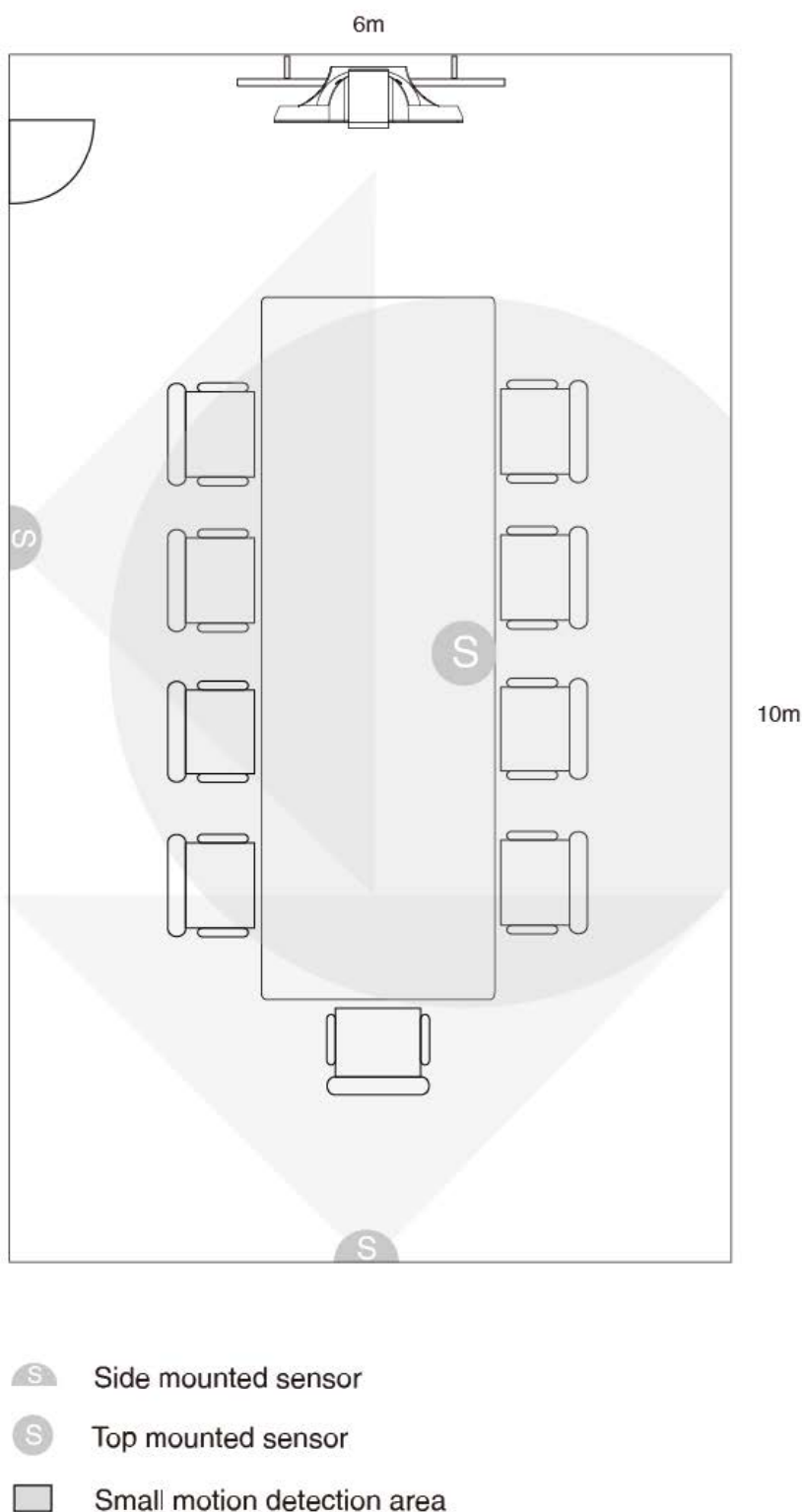
Conference room size: 6 m X 10 m



This example suits a middle conference room where a projector (or other equipment) does not obstruct the ceiling. Two sensors can be installed on the room ceiling to detect the entire conference table. A PIR blocking sticker can be pasted on the sensor towards the conference room entrance to prevent false detection of people passing in the corridor.

Example 2

Conference room size: 6 m X 10 m

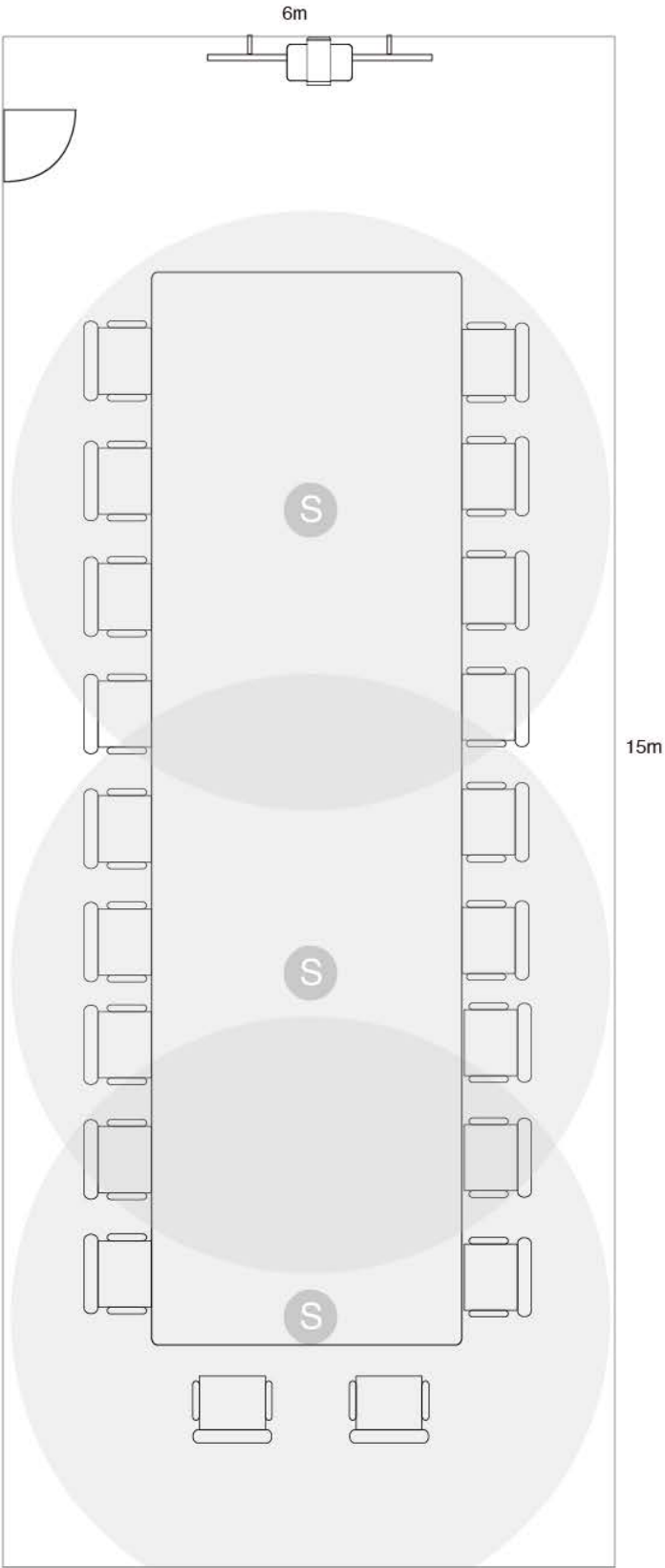


This example suits a middle conference room with ceiling lights, projectors or other obstructions. It is deployed using a mix of wall mounting and ceiling mounting methods (the PIR sensor is a linear sensor, and detection is cut off when there is an obstruction in front of it). It is necessary to ensure that the sensor's detection can cover the entire activity area of the conference table.

Large Conference Room

Example 1

Conference room size: 6 m X 15 m

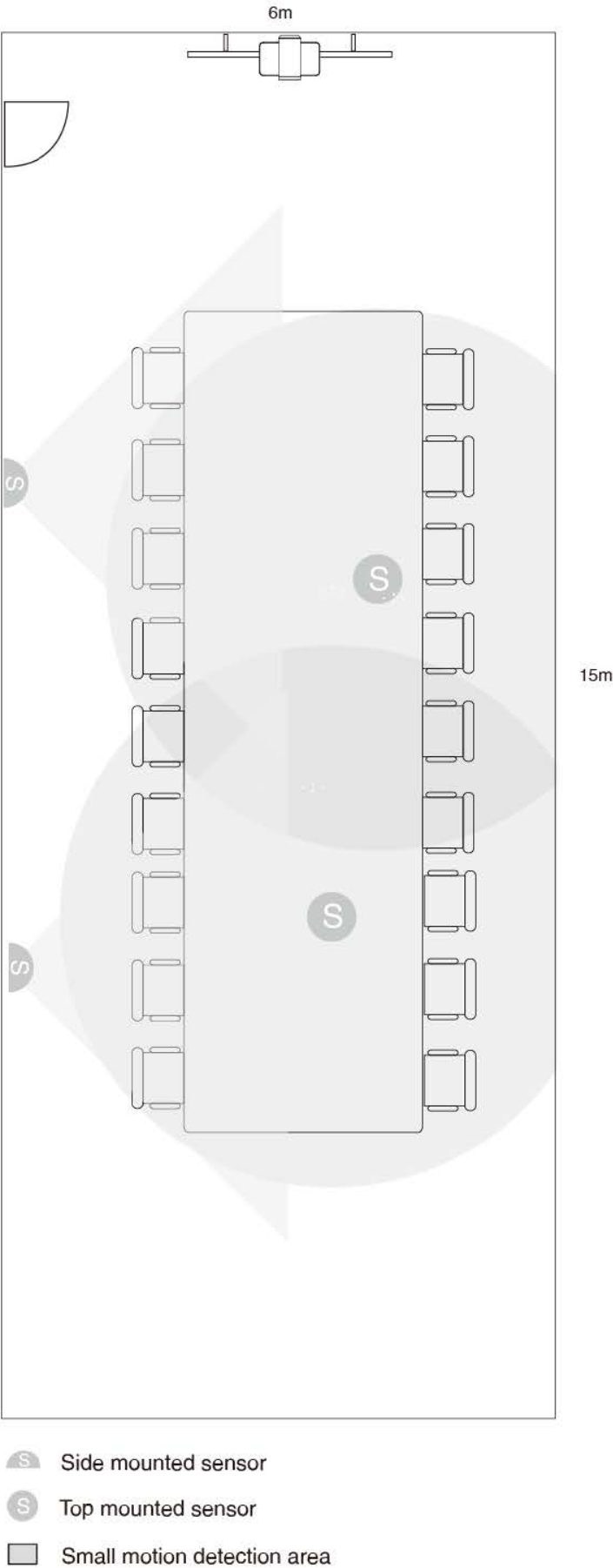


-  Top mounted sensor
-  Small motion detection area

This example is suitable for a large conference room. Three sensors are deployed on the top of the conference room to detect the entire conference table. To prevent mistakenly detecting the people in the corridor, PIR blocking stickers can be pasted on the sensor (which can detect the corridor outside the door) towards the conference room entrance.

Example 2

Conference room size: 6 m X 10 m



This example is suitable for a large conference room. The two sensors on the left are mounted on top of the wall (the PIR sensor is a linear detector, and detection is cut off when there is an obstruction in front of it) to prevent false detections and ensure coverage of the active entrance area of the table.

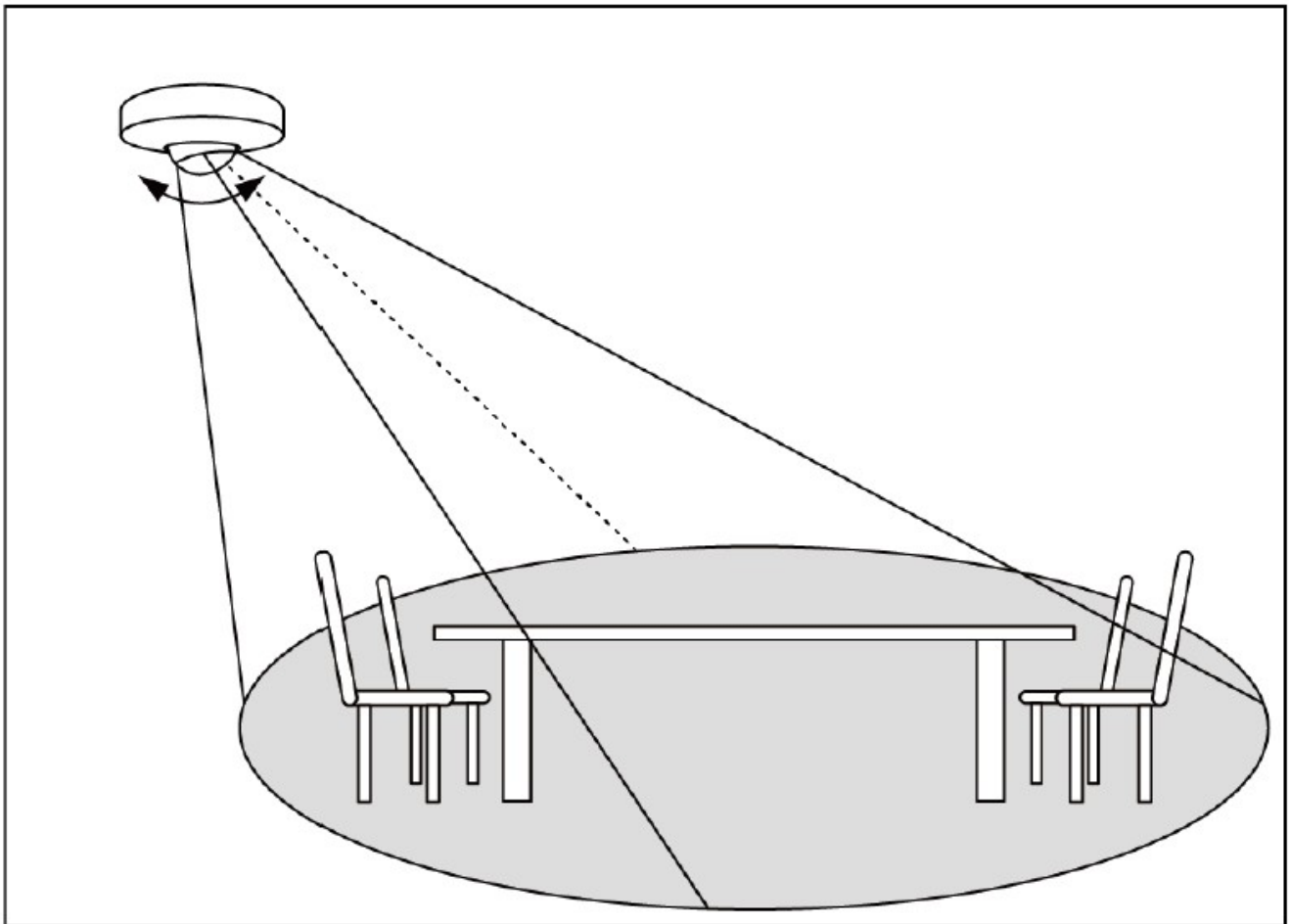
Precautions

Mounting Position

- When deploying multiple sensors in a conference room, the distance between each sensor should be at least 1 meter to avoid interference between the sensors and signal instability.
- The distance between the sensor and the RoomPanel of the conference room should not exceed 14 meters through the wall (due to different wall materials with varying capabilities of shielding for Bluetooth signals, the deployment distance may be different).
- Do not install the sensor near a vent, as vibrations and draughts can affect the sensor's detection.
- Do not install the sensor on radiators, lights and other objects whose temperature may be close to the human body, which may easily cause false alarms.
- When other equipment is deployed on the conference room's ceiling, such as projectors, hanging microphones, etc., they may block the sensor. You can choose Mount on the Wall method, to bypass these devices for deployment or deploy multiple sensors.
- When you mount the RoomSensor on the wall, the height should be 1.5 m to 2.5 m. If it is lower than 1.5 m, the detection range in the horizontal direction will be reduced. If it is higher than 2.5 m, the blind area under the sensor will be too large.
- Avoid the sensor towards the door so as not to detect people passing by outside the door.
- To detect small motions, we recommend that place the sensor as close as possible to the detected human body or increasing the sensitivity to improve the recognition accuracy.

Lens Adjustment

The installation requires attention to enhance the RoomSensor's accuracy in detecting the state of the room space by adjusting the PIR lens to focus on hot areas of activity, such as conference tables.



After the installation is complete, you can debug the RoomSensor. Please refer to: [Test RoomSensor](#).

FAQ

PIR sensors are only used to identify moving objects, and many small motions are often not recognized. Is it reliable for conference room occupancy detection?

RoomSensor can only recognize moving objects because of PIR pyro-infrared technology. Still, PIR can recognize motion and small motions and can support sensitivity adjustment, reducing missed detections in small motion scenes. In addition, use the idle timeout to carry out the conference room strategy. For example, set the idle timeout to 15 minutes. If no moving objects are detected within 15 minutes, it will be reported that no one is in the conference room. It can ensure that there will be no missed detection as much as possible (generally normal situations). There will be no conference room scene where no motion is detected for continuous 15 minutes).

If the sensor is installed on the ceiling with a projector, will it affect the detection?

Infrared penetration is relatively poor. When projectors or other objects block people's moving line of sight, it is not easy for the sensor to receive infrared rays, and there may be situations where they cannot be sensed. We recommend that avoid objects in the detection area as much as possible (such as chandeliers and projectors), which may block the detection line of sight.

Can the RoomSensor be installed next to the ceiling air conditioning vent or ventilation window?

Objects with temperature and moving airflow will affect the sensor's accuracy, which is likely to cause false alarms. We recommend that install the sensor 1.8 meters or more away from hot objects or moving airflow.

Does higher sensitivity mean more accurate detection?

No. Although high sensitivity increases sensitivity to small motions, external factors unrelated to the human body can easily be mixed in, such as the temperature of the surrounding lighting and thermal airflow disturbances outside the window, leading to false alarms where no one is in the actual meeting room. Choosing the right sensitivity according to the meeting room scenario and actual commissioning is advisable.

When adding a sensor to a RoomPanel, how do I distinguish multiple sensors with Bluetooth signals when searching for them nearby?

Open the RoomSensor bottom case. Inside is information about the Bluetooth name label for that device, which corresponds to it in the searchable Bluetooth list.

What is the RoomSensor powered by?

Dry battery powered, model CR-123A. Compared to the wired power supply method, the dry battery-powered method is more flexible in deployment and eliminates the need for wiring. After paired with the RoomPanel, go to  > **Device settings** > **Sensor** (default admin password: 0000) > **Details** to check the battery. The normal battery life is five years; if high sensitivity detection is used for a long time, it will somewhat reduce the battery life.

How many RoomSensors can be paired with one RoomPanel?

Four. In a real scenario, we need to turn on the test mode and determine the number of sensors to be deployed based on the actual size of the room and the layout of the room (e.g., whether there are devices like projectors or spotlights on the ceiling to block the sensor detection angle).

Is it always possible to detect small motions within the detection coverage?

The coverage of identifying small motions is within a radius of 3 meters. However, there is still the possibility of missed detection due to differences in the movement range of small motions. Therefore, the closer the detected human body is to the sensor, the easier it is to be identified. You can also use multiple sensors to help improve identification accuracy.