GENERAL GUIDE NOTES FOR PLACEMENT OF PRODUCTS CONTAINING MICROWAVE SENSORS

How do microwave sensors work?

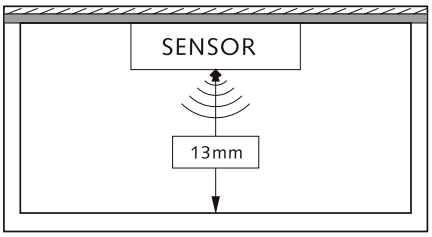
The way a microwave motion sensor works is typically based on the Doppler effect principle.

Microwaves are able to travel through solid objects like wood, plasterboard, brick and thin concrete. This can cause unwanted activation dependent on installation or application. The will not travel through lead or very thick concrete.

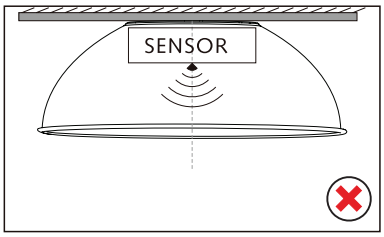
What is the Doppler effect?

Doppler effect in physics is defined as the increase (or decrease) in the frequency of sound, light, or other waves as the source(sensor) and person or object move towards (or away from) each other. Waves are emitted by a source (or sensor) that travel towards a person or object get compressed when the person or object moves.

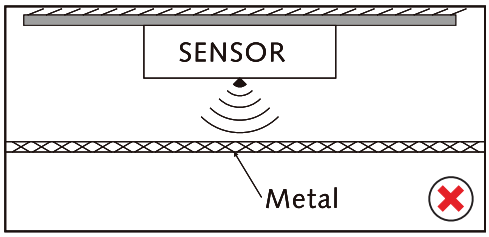
The wavelength of microwave radiation changes due to the relative motion of the wave source and the detected object. The faster the motion, the greater the frequency. The frequency difference between transmitting and receiving which is caused by the Doppler effect and is called Doppler Shifts. The microwave motion sensors control the lamp ON-OFF or dimming by measuring the changes in the Doppler Shifts.



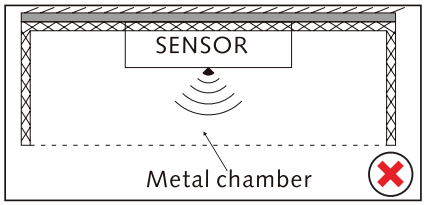
The sensor, when placed inside a dielectric (glass or plastic) material should be no less than 13mm, otherwise the sensor will not operate correctly.



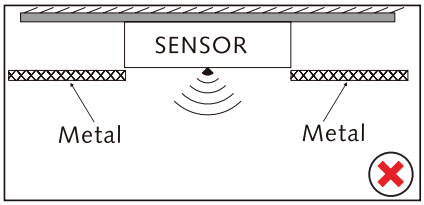
Microwave sensor cannot be placed inside a curved lampshade or shroud.



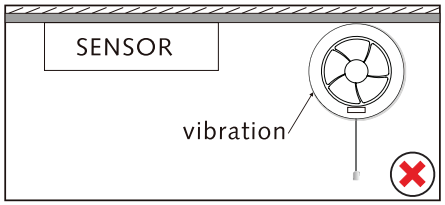
The microwave sensor cannot be covered by any metal materials, including plastic wrapping or labels which contain metal elements.



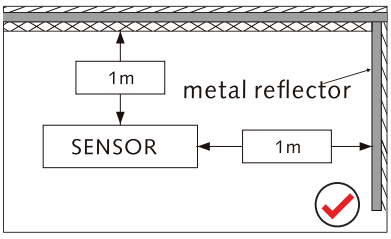
The sensor must not be placed inside any metal ensclosures. This can cause false triggering and causing incorrect operation.



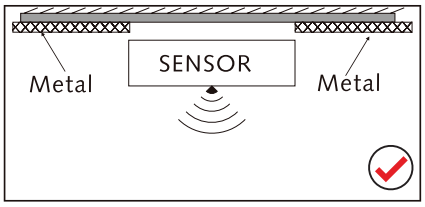
The sensor must not be placed in a confined space with metal object in close proximity or in front of the sensor . This can cause false triggering and causing incorrect operation.



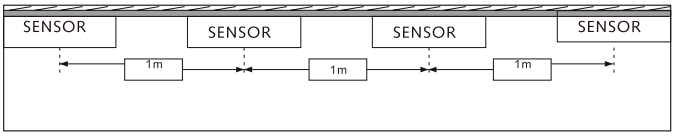
The sensor must not be placed close to areas where there is high acoustic vibrations. i.e plant rooms, extractor fans or Elevators. This can cause false triggering and causing incorrect operation.



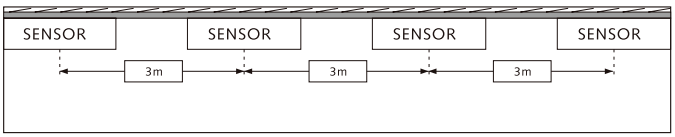
Always ensure that a minimum of 1m distance is given when mounting the sensor, where there are metalic or reflective (i.e glass) surfaces. These reflective surfaces may still cause false triggering. The detection area may need to be reduced if this occurs.



The sensor must only be placed with metal object behind the sensor. This will ensure that any metal objects(i.e. mounting surface)will not effect the sensor operation.



When multiple sensors are installed adjacent to each other, always ensure that there is a minimum of 1m distance between each sensor. This will ensure that the microwaves emitted from each sensor do not effect each other.



When installing multiple sensors in a warehouse application and are installed adjacent to each other, always ensure that there is a minimum of 3m distance between each sensor. This will ensure that the microwaves emitted from each sensor do not effect one another.