

PIR Sensors – Precautions for Product Installation and Operation

PIR motion sensor is based on the principle of which the detection of heat movement across 'windows' or 'planes' created by the optic in front of the passive infrared detector. The optic design is fundamental to the detection area and can be controlled by the use of 'blind', usually in the form of a plastic attachment or stickers to cover the segments of the optic.

1) When using PIR motion sensors, there are a few aspects that should be taken into consideration in order to ensure stable PIR performance. Before installation, it is a must to carry out a performance evaluation test under representative conditions as the sensitivity of PIR motion sensors is influenced by environmental conditions:

a) PIR motion sensor requires line-of-sight. When building the sensor into a luminaire, please make sure that the PIR must be visible with the optic directed towards the flow of traffic; it will not work behind any diffuser or lens. The PIR optic needs to be exposed.

b) The PIR motion sensor must be kept away from strong sources of heat, such as LED lamps, heatsinks and any control gears such as LED driver. Particularly, when the ambient temperature is close to that of the human body, the PIR would be not able to work properly and react rather slowly, such as during summer season. Vice versa, during winter season, the PIR sensor works better and picks up movements more swiftly. So, please kindly pay attention to the thermal management of the luminaire and ambient temperature of the environment.

c) On the other hand, the cool air from the air conditioner could also cause false triggering, especially when turning on the air conditioner under a warm environment which causes sudden change in ambient temperature. Vice versa, when turning on the heater under a cool environment, this could likewise cause false triggering due to the sudden change in ambient temperature.

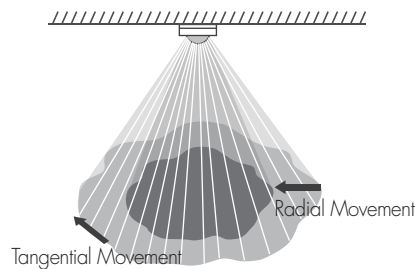
d) When the optic of PIR motion sensor is exposed to dust or other kinds of contamination, the PIR performance can degrade.

2) Due to the nature property of PIR, please kindly take note that the actual detection range/distance of PIR motion sensor can vary depending on the following factors:

a) Walking towards or walking across the edge of the detection area:

- PIR motion sensor is sensitive to tangential and radial movements.

- PIR tends to feel to be slow to react, especially in traffic approaching the sensor (radial), rather than crossing it (tangential). An indication regarding tangential and radial movement is as follows:



3) In some applications, low bay PIR sensors are intended to work at higher ceiling. In this case, the installer has to pay attention to:

a) When installed at higher ceiling (higher than the max. installation height mentioned on data sheet), the detection range may remain unchanged. E.g. The max. detection area of HBHC25 is 10m x 3m (diameter x height). When HBHC25 is installed at height of 4m or 5m, the detection diameter still remains at around 10m.

b) Although there is no much change in detection range, the PIR triggering points will yet become lesser at 4m or 5m as compared to those at 3m. This means that the detection becomes less sensitive when a low bay PIR motion sensor is installed at higher ceiling.

c) Please kindly take note that this is only applicable to the following products:

- HBHC25 - HBIR29 - HBIR32 - HBIR36 - HBIR30/CA
- HBIR29/SV - HIR27 - HIR28 - HIR29

4) Remote control:

For some PIR motion sensors, they have to be commissioned via a remote control. There are a few aspects to be aware of when commissioning with a remote control:

a) Make sure that the remote control is loaded with two AAA batteries. Under normal use, batteries last about a year. However, replace them whenever the LED indicator of the remote control and the PIR sensor appears to not respond to commands.

b) To commission the sensor with the remote control (especially for high bay PIR sensors), direct the transmitting part of the remote control to the sensor within vertical angle of $\pm 15^\circ$ and at installation height of 10m to 15m. The flashing of LED indicator from the remote control and lights controlled by the sensor flashing indicate that the transmission is properly done.

c) It is possible that signals from the remote control will not be received in spaces that have fluorescent lighting, incandescent lighting and other light sources which contain high level of infrared light around or near the sensor, or when the sensor is installed outdoor whereby there are sunlights.

5) Inrush current:

When an LED driver is turned on, instant high current flows into the circuit of a PIR motion sensor, of which it can be as high as 50 times of the steady state currents. In order to protect high inrush current from damaging the PIR sensor, please kindly make sure that the total inrush current from the LED driver is less than the limit a sensor can withstand.

a) For example, to enable synchronization control of a group of PIR sensors, an installer can connect the L' terminal in parallel. In this way, whichever sensor is triggered, the whole group of PIR sensors will turn on. There are two limitations that have to be taken into consideration:

i) The inrush current from the LED driver has to be less than the limit a PIR sensor can withstand;

ii) The total loading of the whole group of PIR sensors connected together in parallel should not exceed the rated loading of a single sensor. E.g. with luminaire of 30W, an installer can connect 13 pieces of HIR28 together via L' terminals in parallel because the rated loading of a single HIR28 is 400VA (capacitive), i.e. $30W \times 13 \text{ pieces} = 390VA < 400VA$.

b) Please kindly note that if the inrush current from the LED driver exceeds the limit a PIR sensor can withstand, the sensor can still work; however, the lifetime of the sensor will be reduced. For such case, Hytronik standard guarantee is not applicable as the product is not used according to the specifications.