

Microwave motion sensor

Principle:

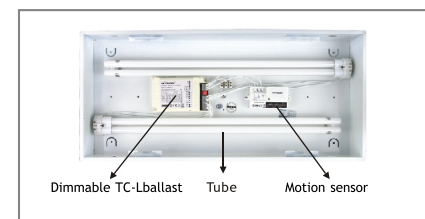
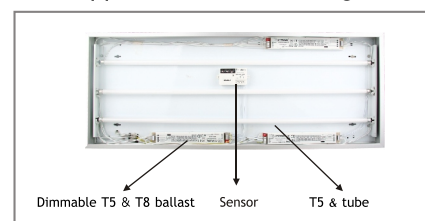
This motion sensor utilizes Doppler principle and RADAR technology, to detect the motion of object at certain speed & reflection surface, and gives output signals to the application unit, bells and lamps, for instance, to achieve desired function.

Product benefits:

- *Tailor-made for automatic lighting intelligent application. Extremely low Power consumption.(standby, 0.6w, operating 1.2w)
- *Directional, customized detection angle.
- *Working temperature: -20°C--+70°C. Suitable for outdoor application.
- *Adjustable light sensor to set up desired surrounding brightness to activate the lamp.
- *Adjustable sensibility makes it possible to choose the most suitable detection angle and distance to fit for each specific application.
- *Adjustable time delay, 5 seconds to 25 minutes.
- *Totally enclosed in fixture, compact to build in small lighting fixtures. There is no need to keep the sensor sticking out of the fixture thanks to wireless microwave operation which can penetrate any non-metal objects.



Application on office lights



Typical lighting applications

This sensor can be built in totally enclosed lighting fixture thanks to the microwave technology. The combination of this sensor and the special HYTRONIK dimmable ballast is an ideal and economical alternative to the 1-10v dimmable fluorescent ballast.

The sensor system is very much a simplified DALI system, perfect to apply on public area like corridors, side walk, garden path, parking garage, warehouses, as well as big office areas to save every possible watt.

Why microwave instead of infrared?

Microwave motion sensor has outstanding benefits in comparison with the traditional infra-red sensor...

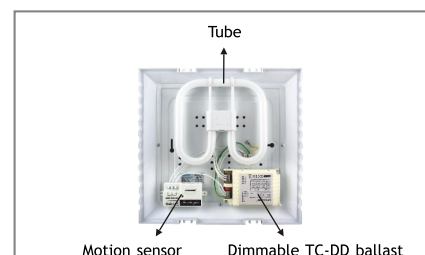
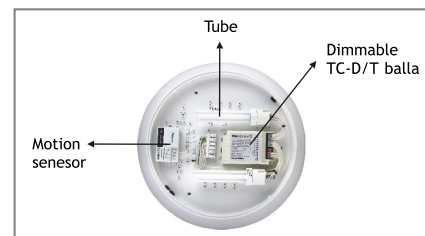
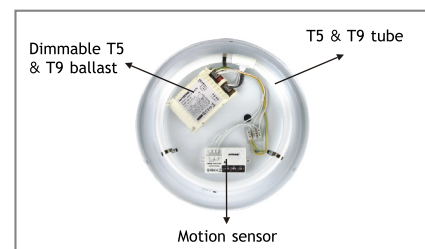
Infrared motion sensor

- *Activate by infrared, ie, heat and light.
- *No function when background temp. exceeds human body temp.
- *Vulnerable to dust and blocking objects
- *Lens gets aging, and reduce sensitivity
- *Short life time, 20,000 hours
- *Indoors only

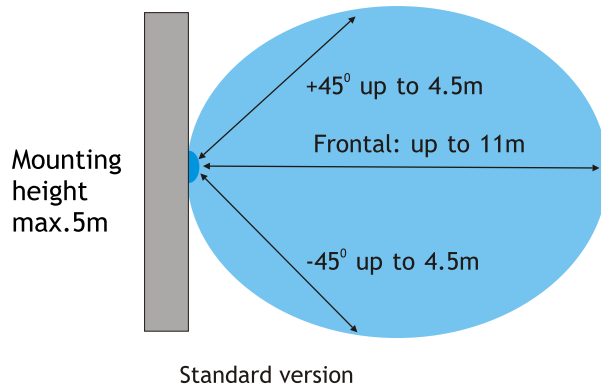
Microwave motion sensor

- *Activate by motion, ie, speed and size.
- *Built-in, dust free, and penetrates non-metal object.
- *Stable and reliable
- *Long life span, 100,000 hours
- *Outdoor and indoor use

Application on ceiling/wall fixtures

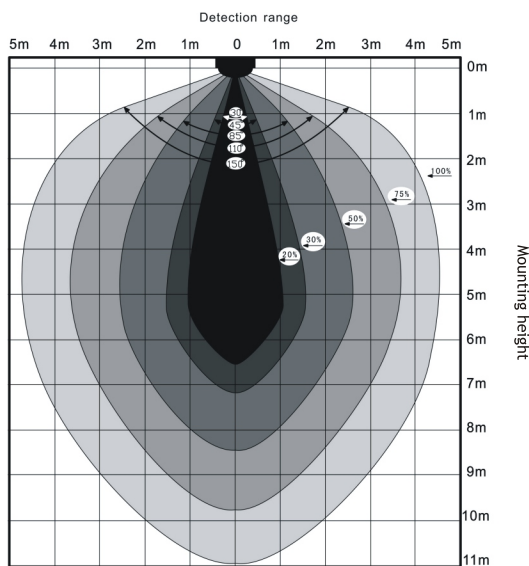
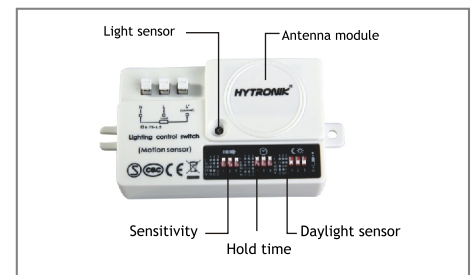


Detection range

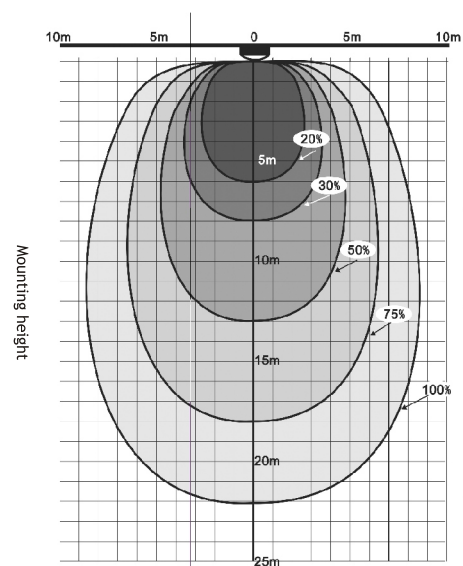


Note

1. By increasing the transmission power to 2 mw, we can achieve up to 20 meters detection distance on the reinforced version.
2. By reducing the sensitivity, the detection angle will also be reduced, please refer to the below drawing for details.



Detection field & angle at different sensitivities
Standard version



Detection field & angle at different sensitivities
Reinforced version

Setup

The sensor has three tiny switches to make different combination to set up the following functions:

The set up of sensitivity--

Daylight sensor

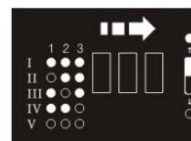
The sensor contains a daylight sensor in order to allow a function only below a defined brightness threshold. To set up "brightness threshold"--

"daylight": The lamp works always, even during daylight.

"twilight": The lamp works only in twilight and in darkness.

"darkness": The lamp works only in darkness.

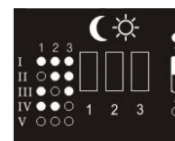
●:ON ○:OFF



Recommendation

| | 1 | 2 | 3 | |
|-----|---|---|---|------|
| I | ● | ● | ● | 100% |
| II | ○ | ● | ● | 75% |
| III | ● | ○ | ● | 50% |
| IV | ● | ● | ○ | 30% |
| V | ○ | ○ | ○ | 20% |

●:ON ○:OFF



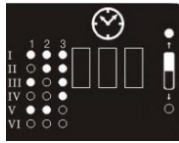
Recommendation

| | 1 | 2 | 3 | | |
|-----|---|---|---|----------|----------|
| I | ● | ● | ● | 2Lux | Darkness |
| II | ○ | ● | ● | 5Lux | |
| III | ● | ○ | ● | 20Lux | Twilight |
| IV | ● | ● | ○ | 50Lux | |
| V | ○ | ○ | ○ | Disabled | Daylight |

Disabled means the light is always on, even in bright daylight.

Likewise, the hold time can be specified as below

●:ON ○:OFF



Recommendation

| | 1 | 2 | 3 | |
|-----|---|---|---|-------|
| I | ● | ● | ● | 5s |
| II | ○ | ● | ● | 30s |
| III | ● | ○ | ● | 3min. |
| IV | ○ | ○ | ● | 5min. |
| V | ● | ● | ○ | 15min |
| VI | ○ | ○ | ○ | 25min |

Wiring diagram

The maximum switchable load is 1000w (incandescent bulbs) or 400w (fluorescent lamps). This load could be bulbs inside the lamp and also additional / external lamps. However, when the sensor is loaded with HYTRONIK particularly designed dimmable ballast, the load is unlimited.

When the sensor is supposed to control several external lamps to achieve on/off function with incandescent lamp and non-dimmable fluorescent ballast, The wiring should follow the schematic drawing 1:

When the sensor is used to control several Hytronik dimmable ballast (HB0135-1, for example) to achieve dimmer function, the wiring should follow the schematic drawing 2:

Installation

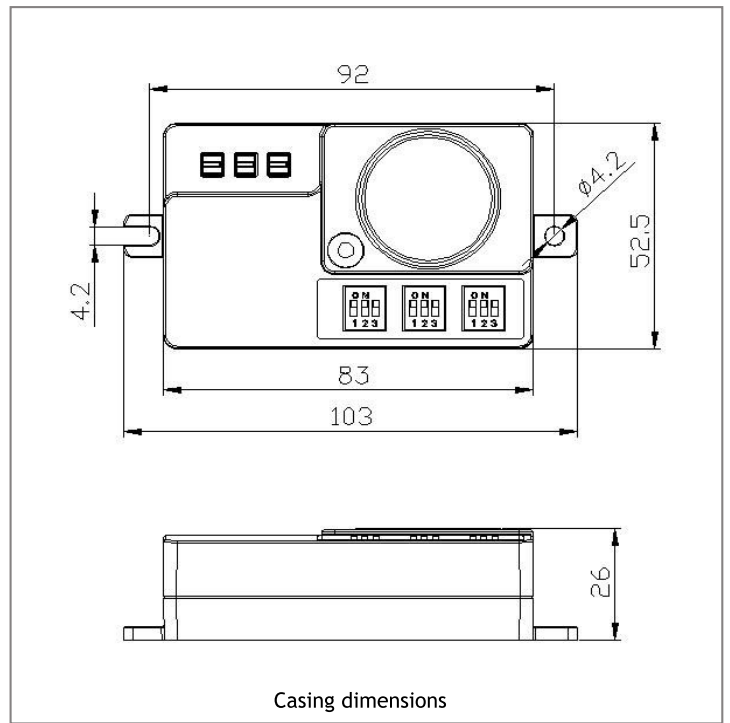
Ballast and lamp filament affect the detection range. For the better performance, we recommend to keep the sensor antenna module away from the ballast and lamp filament by at least 80mm. Please see following drawing 3 and 4.

Enclosed in our special designed IP54 housing, the sensor is completely protected against any harmful deposits of dust and water splashing from any direction. which makes it possible for outdoor use.

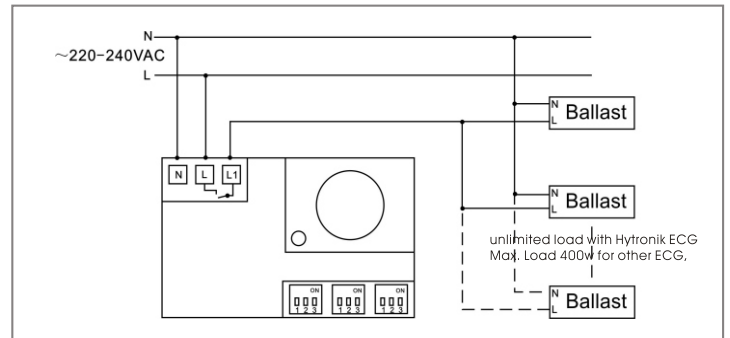
(Note: snow, storm and falling leaves does not activate the sensor.)



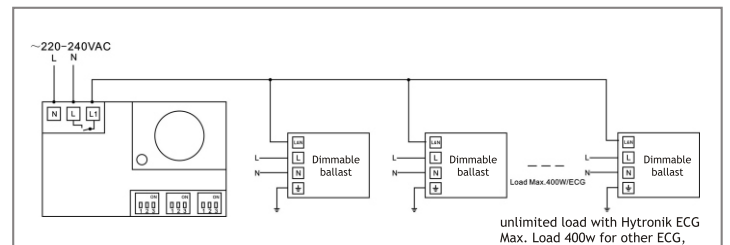
IP 54 box



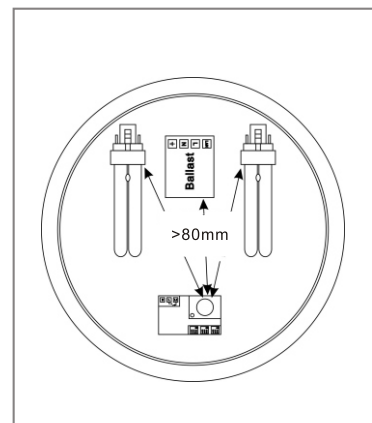
Casing dimensions



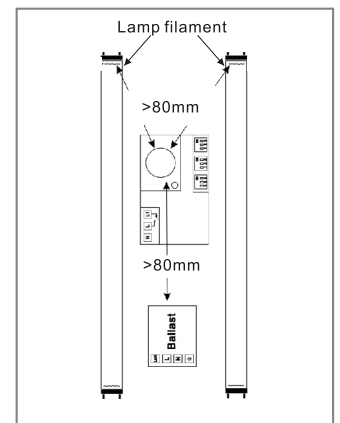
Drawing 1



Drawing 2



Drawing 3: Sensor antenna module away from ballast and lamp filament(=80mm)



Drawing 4: Sensor antenna module away from ballast and lamp filament(=80mm)

5 Technical Data

| | |
|------------------------|--|
| Power: | |
| Operating voltage: | 220-240V \pm 10%, 50/60Hz, 100-127V \pm 10% on request |
| Switched power: | 1000w (light bulbs), 400w (fluorescent lamps) |
| Standby power: | 0.6w (standby), 1.2w (operation) |
| Interface: | 3 pole push-in terminal block (N, L, L') for 0.75-1.5 mm ² cable |
| Sensor: | |
| Sensor principle | microwave motion detector |
| Microwave frequency | 5.8 GHz \pm 75 MHz |
| Microwave power | Standard version:<1 mw; reinforced version: <2 mw |
| Detection field: | Refer to page 4 diagram |
| Detection range | Standard version: 11m; reinforced version 22m (at max. sensitivity) |
| Detection angle | 30--150° (depending on sensitivity and height, see page 4) |
| Motion detection | 1-20km/h(<3m mounting height); 1-200km/h(>5m mounting height) |
| Adjustable functions: | |
| Sensitivity | 20 / 30 / 50 / 75 / 100% , can be customized |
| Hold time | 5s/30s/180s/300s/15min/25min, can be customized |
| Daylight sensor | daylight / twilight / darkness , can be customized |
| Operating conditions: | |
| Mounting height: | Standard version: max. 5m (wall mounting), max. 11 m (ceiling mounting) reinforced version: max. 8m (wall mounting), max. 22 m (ceiling mounting) |
| Operating temperature: | -20°C ~ +70°C |
| IP rating: | IP 20 (mounting inside a lamp); IP 54 (mounting in Hytronik special box) |

6 Compliance and Marking

This sensor is compliant to the following European directives and standards:




| | |
|----------------|--|
| EU directives: | |
| Nr. 1999/5/EC | EU Directive on radio equipment and telecommunications |
| Nr. 89/336/EEC | EU Directive on Electromagnetic Compatibility |
| Nr. 73/23/EEC | EU Low-Voltage Equipment Directive |
| Nr. 2002/95/EC | EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) |

Harmonized standards:

| | |
|---------------|--------------|
| IEC61000-4-2 | IEC61000-3-2 |
| IEC61000-4-3 | IEC61000-3-3 |
| IEC61000-4-4 | EN60669-2-1 |
| IEC61000-4-5 | EN60669-1 |
| IEC61000-4-6 | CISPR 14 |
| IEC61000-4-8 | CISPR 15 |
| IEC61000-4-11 | |

Marking

This sensor is marked with the following conformity marks:

| | |
|---|---|
|  | CE compliance, declares the compliance to the above mentioned standards |
|  | Semko certificate |
|  | Chinese safety standard |