# SensorDIM™ - Integrated HF Sensor and LED Driver

## HEC9028

Tri-level Control with Photocell Advance™

HYTRONIK®

CB CE SELV RED UK CA

## Applications

Occupancy sensor and constant current LED driver, 2-in-1.
Suitable for building into the fixture for:

- Office / Commercial Lighting
- Classroom
- Meeting Room

Use for retrofit and new luminaire designs/installations

## Features

- Photocell advance™
- Tri-level dimming control based upon occupancy (also known as corridor function)
- Easy-on-the-eye operation which makes the light turning on/off less uncomfortable
- Stand-by Power < 0.5W
- Analogue Flicker-free Dimming
- Short-circuit Protection
- Open-circuit Protection
- Overload Protection
- 5-year warranty

Suitable for protection class II luminaire.
Note: If working with protection class I luminaire, it may cause residual LED glow on standby.

## Technical Data

Input Characteristics

| | |
|---|---|
| Mains voltage | 220~240VAC 50/60Hz |
| Input current | 0.14 - 0.12A / 0.11-0.09A |
| Input power | 32W (Max.) / 22W |
| Warming-up | 20s |

Sensor Data

| | |
|---|---|
| Sensor principle | High Frequency (microwave) |
| Operation frequency | 5.8GHz +/- 75MHz |
| Transmission power | <0.2mW |
| Detection range(Max.)* | Installation Height : 5m<br>Detection Range(Ø) :8m@3m height |
| Detection angle | 30° ~ 150° |
| Setting adjustments: | |
| Sensitivity | 50% / 100% |
| Hold time | 5s / 30s / 3min / 10min |
| Daylight threshold | Disable / 50lux / 10lux / 2lux |
| Stand-by period | 0s / 30s / 10min / +∞ |
| Stand-by dimming level | 10% / 30% |

Driver Data

| | |
|---|---|
| Off load voltage | 60V |
| Output LED current | 685mA / 450mA |
| Output LED voltage | 24~40VDC |
| Output LED power | 16~27.5W / 11-18W |
| Power factor | ≥0.9 |
| Efficiency | 85% (Max.) |

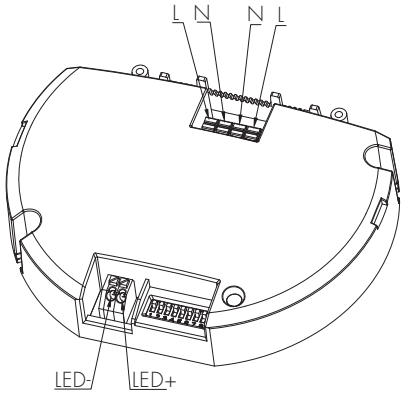
Safety and EMC

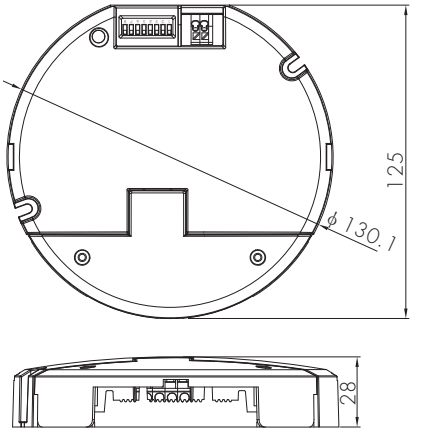
| | |
|---|---|
| EMC standard (EMC) | EN55015, EN61547, EN61000-3-3/-3-2 |
| Safety standard (LVD) | EN61347-1, EN61347-2-13 |
| Radio Equipment(RED) | EN300440, EN301489-1, EN301489-3 |
| Dielectric strength | Input→output: 3000VAC / 5mA / 1min |
| Abnormal protection | Short-circuit protection, Open-circuit Protection Overload Protection |
| Certification | CB, CE , EMC, RED, RCM |

Environment

| | |
|---|---|
| Operation temperature | Ta: -20°C ~ +50°C |
| Case temperature (Max.) | Tc: +75°C |
| IP rating | IP20 |

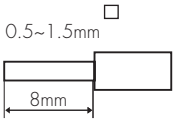
## Mechanical Structure & Dimensions



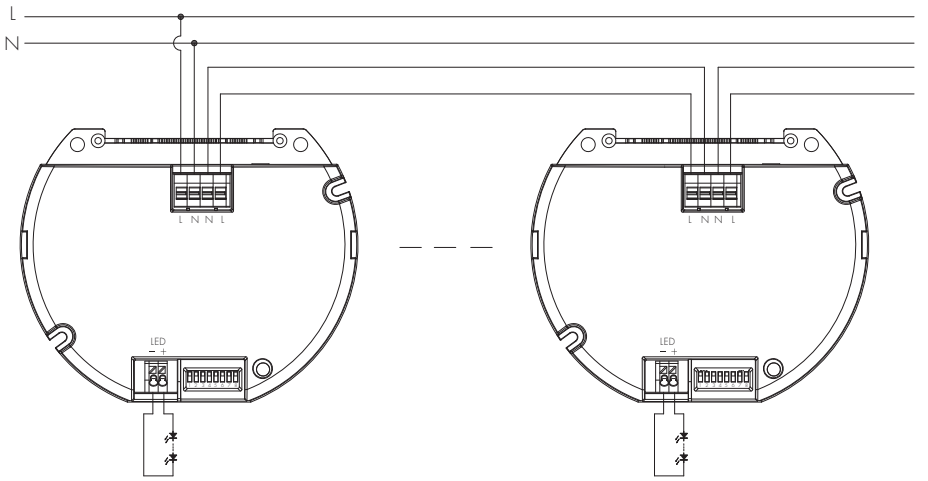

Note: We recommend the mounting distance between sensor to sensor should be more than 2m to prevent sensors from false-triggering.

## Wire Preparation




To make or release the wire from the terminal, use a screwdriver to push down the button.

## Wiring Diagram




## Assembly

The sensor features the DIP switches and protrudes the LED panel. This feature enables the end user to access the sensor settings without removing the gear tray / LED board.

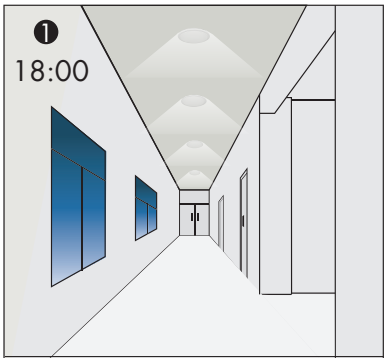
## Functions and Features

### 1 Photocell Advance™ Function

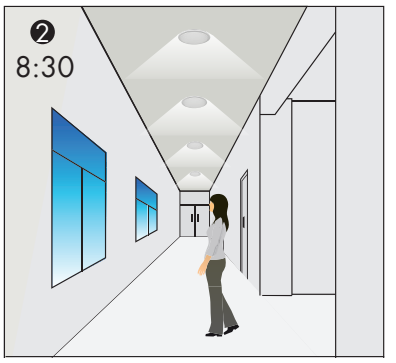
It's well known that LED lights have a totally different spectrum to natural light. Hytronik uses this principle and comes up with special photocell and sophisticated software algorithm to measure and differentiate natural light from LED light from behind the fixture cover, so that this photocell can ignore internal LED light and only respond to the natural light outside.
Our technology has no infringement to the existing patents in the market.

*Settings on this demonstration:*

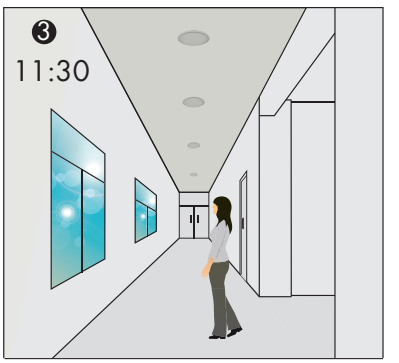
Hold-time: 10min  Daylight threshold: 50lux  Stand-by dimming level: 10%  Stand-by period: +∞




The light automatically turns on at dim level when natural light lux level drops below pre-set daylight threshold.



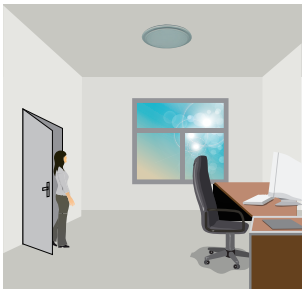

With insufficient natural light, the light switches on at 100% when there is motion detected.



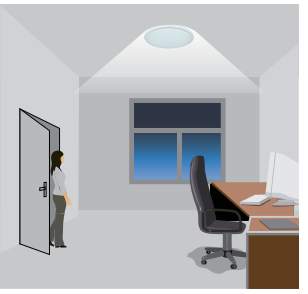

The light turns off completely whenever natural light reaches above pre-set daylight threshold, even with presence.

### 2 Tri-level Control (Corridor Function)

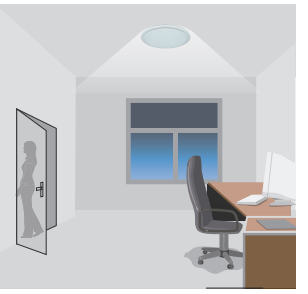
Hytronik builds this function inside the motion sensor to achieve tri-level control, for some areas which require a light change notice before switch-off. The sensor offers 3 levels of light: 100%-->dimmed light -->off; and 2 periods of selectable waiting time: motion hold-time and stand-by period; Selectable daylight threshold and freedom of detection area.



With sufficient natural light, the light does not switch on when presence is detected.



With insufficient natural light, the sensor switches on the light automatically when presence is detected.



After hold-time, the light dims to stand-by level preset.

Light switches off automatically after the stand-by period elapses.

## Loading and In-rush Current

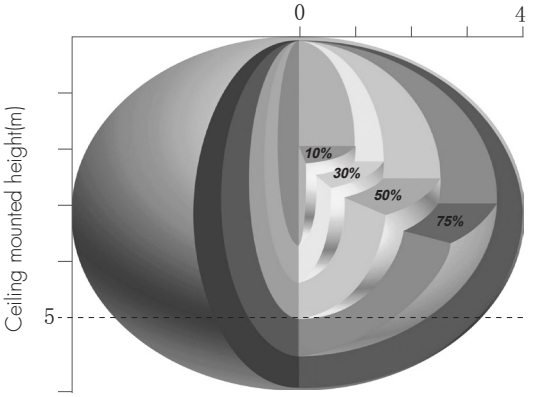
| Model | HEC9028 |
|---|---|
| In-rush Current (Imax.) | 44A |
| Pulse Time | 53 μs |

## Circuit Breaker Information

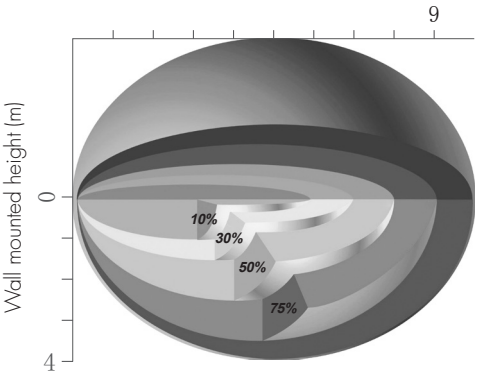
| Automatic circuit breaker type | B16A | B10A | B13A | B20A | B25A |
|---|---|---|---|---|---|
| HEC9028 (22W) | 100 | 62 | 81 | 125 | 156 |
| HEC9028 (32W) | 69 | 43 | 56 | 86 | 107 |

The data above is calculated according to the formula: Maximum Amount = 16/(Pn/230). In order to provide a more reliable reference in real application, the data have been revised to take 60% of the number calculated, i.e. 16/(Pn/230) x 60%. Please kindly take note that the calculation is based on ABB circuit breaker series S200. Actual values may differ due to different types of circuit breaker used and installation environment.

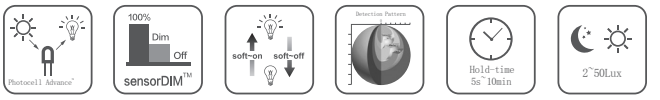
## Detection Pattern



Ceiling mounted detection pattern (m)



Wall mounted detection pattern (m)




2 in 1 and cost effective! This is a smart integration of microwave motion sensor and LED driver, which gives constant current to drive the LEDs to work based upon movement detection.

## DIP Switch Settings

### 1 Detection Range

Sensor sensitivity can be adjusted by selecting the combination on the DIP switches to fit precisely for each specific application.

| | 1 | |
|---|---|---|
| I | ● | 100% |
| II | ○ | 50% |

I – 100%
II – 50%

### 2 Hold Time

Select the DIP switch configuration for the light on-time after presence detection. This function is disabled when natural light is sufficient.

| | 2 | 3 | |
|---|---|---|---|
| I | ● | ● | 5s |
| II | ● | ○ | 30s |
| III | ○ | ● | 3min |
| IV | ○ | ○ | 10min |

I – 5s
II – 30s
III – 3min
IV – 10min

### 3 Daylight Threshold

Set the level according to the fixture and environment. The light will not turn on if ambient lux level exceeds the daylight threshold preset.
*Please note that the ambient lux level refers to internal light reaching the sensor.*

Disabling the daylight sensor will put the sensor into occupancy detection only mode.

| | 4 | 5 | |
|---|---|---|---|
| I | ● | ● | Disable |
| II | ● | ○ | 50Lux |
| III | ○ | ● | 10Lux |
| IV | ○ | ○ | 2Lux |

I – Disable
II – 50Lux
III – 10Lux
IV – 2Lux

### 4 Stand-by period (corridor function)

This is the time period you would like to keep at the low light output level before it is completely switched off in the long absence of people.

*Note: "0s" means on/off control; "+∞"means the stand-by period is infinite and the light is effectively controlled by the daylight sensor, off when natural light is sufficient and automatically on at dimming level when insufficient.*

| | 6 | 7 | |
|---|---|---|---|
| I | ● | ● | 0s |
| II | ● | ○ | 30s |
| III | ○ | ● | 10min |
| IV | ○ | ○ | +∞ |

I – 0s
II – 30s
III – 10min
IV – +∞

### 5 Stand-by dimming level

The setting is used to select the desired dimmed light level used in periods of absence for enhanced comfort and safety.

| | 8 | |
|---|---|---|
| I | ● | 10% |
| II | ○ | 30% |

I – 10%
II – 30%

## Additional Information / Documents

1. For full explanation of Hytronik Photocell Advance™ technology, please kindly refer to www.hytronik.com/download ->knowledge ->Introduction of Photocell Advance

2. Regarding precautions for microwave sensor installation and operation, please kindly refer to www.hytronik.com/download ->knowledge ->Microwave Sensors - Precautions for Product Installation and Operation

3. Regarding precautions for LED driver installation and operation, please kindly refer to www.hytronik.com/download ->knowledge ->LED Drivers - Precautions for Product Installation and Operation

4. Data sheet is subject to change without notice. Please always refer to the most recent release on www.hytronik.com/products/LED Driver ->Integrated sensorDIM

5. Regarding Hytronik standard guarantee policy, please refer to www.hytronik.com/download ->knowledge ->Hytronik Standard Guarantee Policy