

SensorDIM™ - Integrated HF Sensor and LED Driver

HEC9025 HEC9025/I

Detached Version with Tri-level Control / Photocell Advance™



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

- Special photocell to measure and differentiate natural light from LED light from behind the fixture cover (HEC9025/I)
- Tri-level dimming control based upon occupancy (also known as corridor function)
- DIP switch offers multiple current selections for different luminaire requirements
- Easy-on-the-eye operation which makes the light turning on/off less uncomfortable
- 5-Year Warranty

Technical Data

Input Characteristics

Model No.	HEC9025 HEC9025/I
Mains voltage	220~240VAC 50/60Hz
Input current	0.15
Input power	31W (Max.)
Warming-up	20s
Stand-by power:	
HEC9025 with SAM4	0.56W
HEC9025 without SAM4	0.4W
HEC9025/I with SAM5/I	0.8W
HEC9025/I without SAM5/I	0.6W
No load power:	
HEC9025 with SAM4	0.56W
HEC9025 without SAM4	0.4W
HEC9025/I with SAM5/I	0.85W
HEC9025/I without SAM5/I	0.7W

Safety and EMC

EMC standard (EMC)	EN55015, EN61547, EN6100-2/3
Safety standard (LVD)	EN61347-1, EN61347-2-13
Dielectric strength	Input→output: 3750VAC / 5mA / 1min
Abnormal protection	Output short-circuit protection
Certification	Semko, CB, CE, EMC, RED, RCM, SELV

Sensor Data

Model No.	HEC9025 HEC9025/I
Sensor principle	High Frequency (microwave)
Operation frequency	5.8GHz +/- 75MHz
Transmission power	<0.2mW
Detection range	Max. (Ø x H) 12m x 6m
Detection angle	30° ~ 150°
Setting adjustments:	
Sensitivity	Sensor OFF / 50% / 75% / 100%
Hold time	5s ~ 30min (selectable)
Daylight threshold	2 ~ 50 lux, disabled
Stand-by period	0s ~ 1h, +∞ (selectable)
Stand-by dimming level	10% / 20% / 30% / 50%

Driver Data

Off load voltage	55V
Power factor	≥0.9
Efficiency	85% (Max.)
Output current	350/500/550/700/750/900mA

Environment

Operation temperature	Ta: -20°C ~ +50°C
Case temperature (Max.)	Tc: +80°C
IP rating	IP20

Loading and In-rush Current

Model	HEC9025	HEC9025/1
In-rush Current (I _{max.})	48A	48A
Pulse Time	40μs	40μs

Number of Drivers Based upon 16A Circuit Breaker

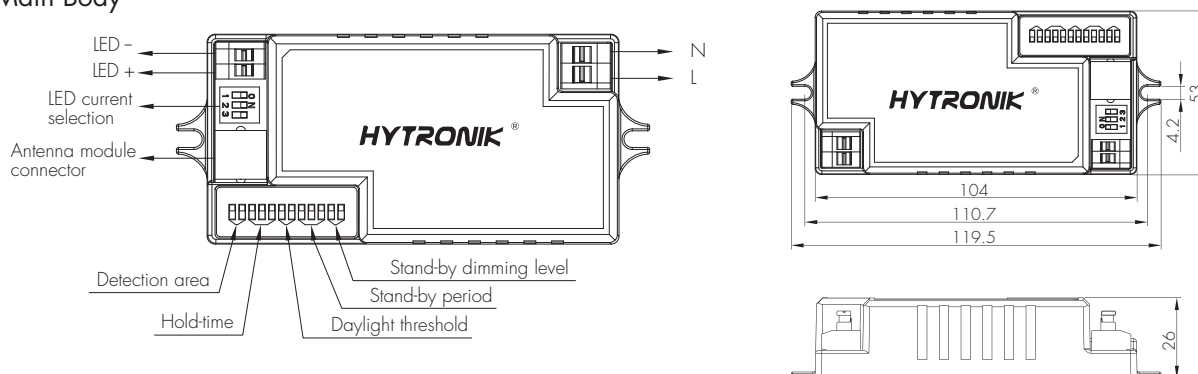
Cct Breaker Type	HEC9025	HEC9025/1
Type B	42	42

Conversion table for max. quantities of drivers on other types of Miniature Circuit Breaker

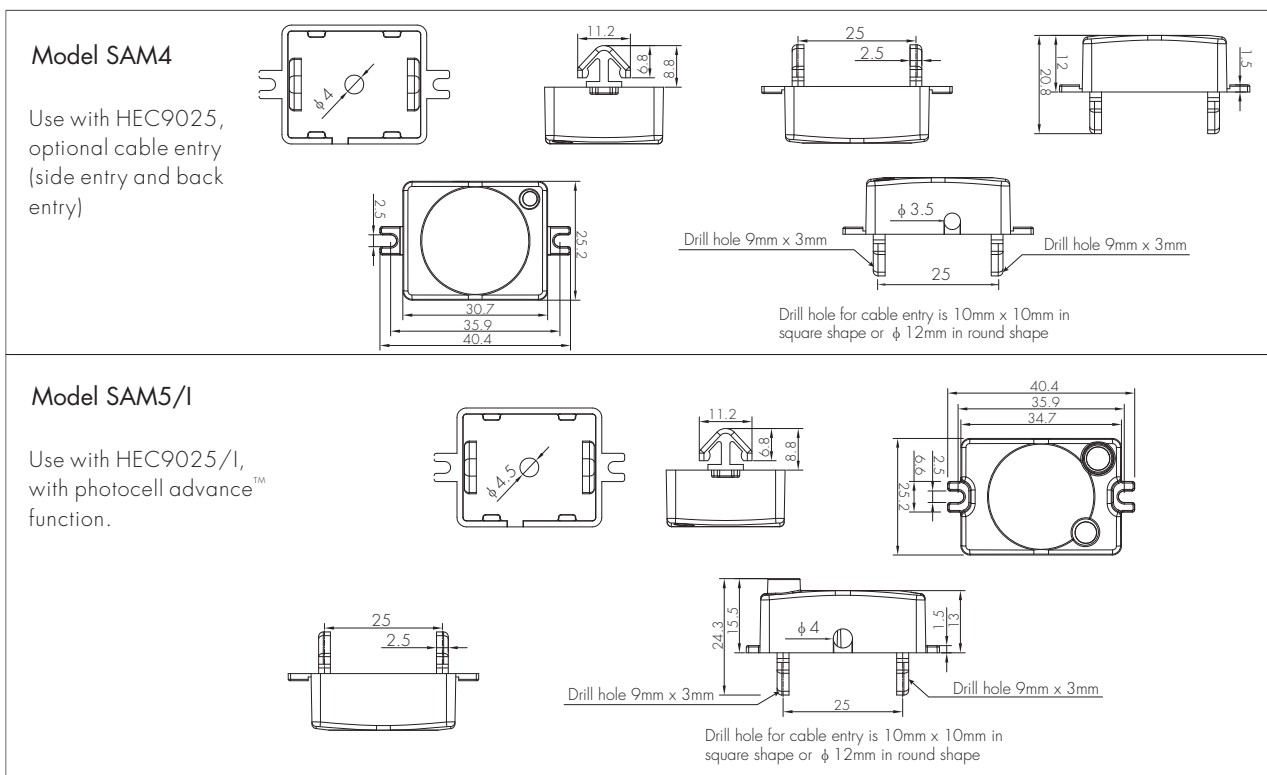
MCB Type	Rating	Relative number of drivers	MCB Type	Rating	Relative number of drivers
B	16A	100% (see table above)	C	10A	104%
B	10A	63%	C	13A	135%
B	13A	81%	C	16A	170%
B	20A	125%	C	20A	208%
B	25A	156%	C	25A	260%

* Environmental factors (such as temperature) will also influence the maximum number of the drivers. Please refer to the MCB manufactures datasheet for loading and derating factors.

Main Body



With the **detached sensor antenna**, it requires very little space on the LED panel. Only the antenna is installed on the PCB surface, while the main body can be hidden behind the panel. Completely shadow free.





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

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

Functions and Features

1 Photocell Advance™ Function (for HEC9025/I)

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

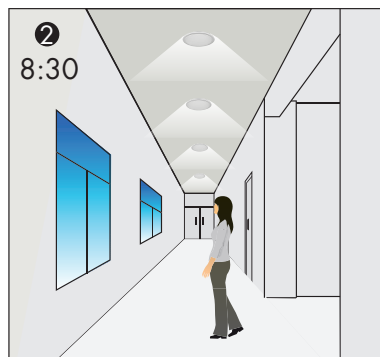
Daylight threshold: 50lux

Stand-by dimming level: 10%

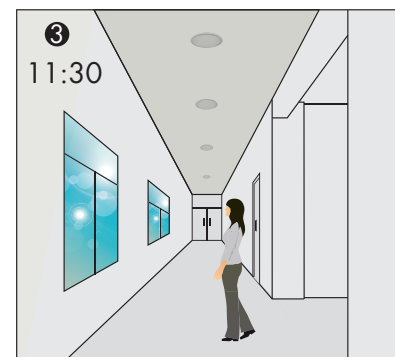
Stand-by period: +∞



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



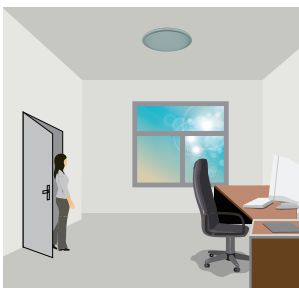
With insufficient natural light, the light switches on at 100% when there is motion detected.



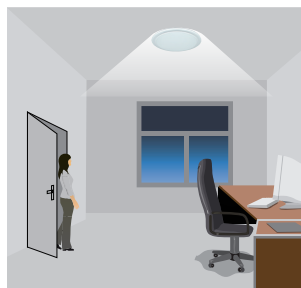
The light turns off completely whenever natural light reaches above pre-set daylight threshold, even with presence.

2 Tri-level Control (Corridor Function)

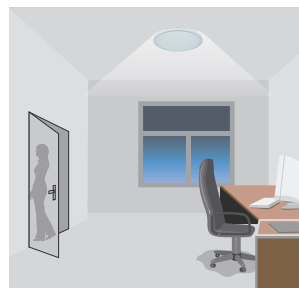
Hytronik builds this function inside the motion sensor to achieve tri-level control, for some areas which require a light change notice before switch-off. The sensor offers 3 levels of light: 100% -> dimmed light -> off; and 2 periods of selectable waiting time: motion hold-time and stand-by period;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

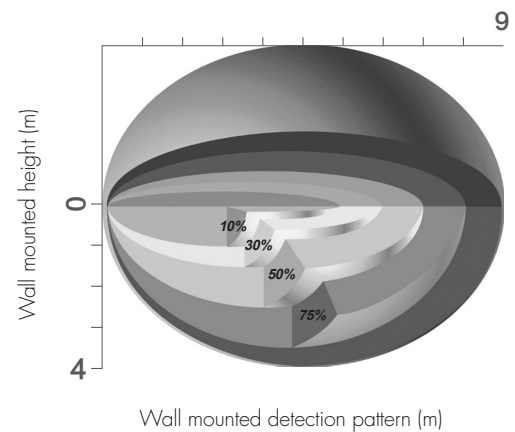
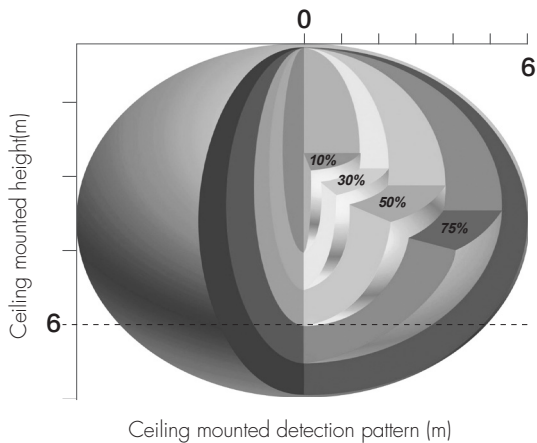


After hold-time, the light dims to stand-by level preset.



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

Detection Pattern



Settings (Remote Control HRC-11, for HEC9025/I)



Permanent ON/OFF function

Press button "ON/OFF" to select permanent ON or permanent OFF mode.
 * Press button "AUTO", "RESET" or "Ambient" to quit this mode.
 The mode will change to AUTO Mode after power failure.



Reset Settings

Press button "RESET", all settings go back to DIP switch settings.



AUTO mode

Press button "AUTO" to initiate automatic mode. The sensor starts working and all settings remain as before the light is switched ON/OFF.

Note: the function of SEMI-AUTO is disabled.



Shift Button

Press button "Shift", the LED on the top left corner is on to indicate mode selection.
 All values / settings in RED are valid for 20 seconds.



Sensor off function

1. Press button "Shift", the red LED is on for indication.
2. Press button "Sensor off", the function of movement detection and daylight sensor both are disabled.



Twilight mode

1. Press button "Shift", the red LED is on for indication.
2. Press button "Twilight", the function of movement detection is disabled. This unit is now a LED driver plus daylight sensor with daylight harvest function.



Power output

Press the buttons to select light output at 80% (at initial 10,000 hours) or 100%.



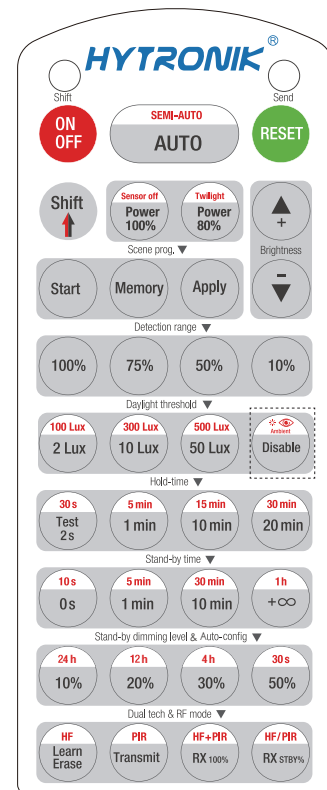
Brightness +/-

Press the buttons under below modes:

AUTO mode: to adjust hold-time light brightness.

Sensor off mode: to adjust light brightness.

Twilight mode: to adjust light brightness and reset the output lux value in line with natural light for daylight harvest function. The higher natural lux level, the lower output brightness, and vice-versa.



HRC-11

Load Indication:

The light will flash ONCE rapidly after receiving the command from the remote control successfully.



Scene program - 1-key commissioning

1. Press button "Start" to program.
2. Select the buttons in "Detection range", "Daylight threshold", "Hold-time", "Stand-by time", "Stand-by dimming level" to set all parameters.
3. Press button "Memory" to save all the settings programmed in the remote control.
4. Press button "Apply" to set the settings to each sensor unit(s).

For example, to set detection range 100%, daylight threshold Disable, hold-time 5min, stand-by time +∞, stand-by dimming level 30%, the steps should be: Press button "Start", button "100%", "Disable", "Shift", "5min", "Shift", "+∞", "30%", "Memory". By pointing to the sensor unit(s) and pressing "Apply", all settings are passed on the sensor(s).

Ambient daylight threshold

1. Press button "Shift", the red LED is on for indication.
2. Press button "Ambient", the surrounding lux level is sampled and set as the new daylight threshold.

Detection range

Press buttons in zone "Detection range" to set detection range at 100% / 75% / 50% / 10%.

Daylight threshold

Press buttons in zone "Daylight threshold" to set daylight sensor at 2Lux/ 10Lux / 50Lux / 100Lux / 300Lux / 500Lux / Disable.

Note: To set daylight sensor at 100Lux / 300Lux / 500Lux, press "Shift" button first.

Ambient daylight threshold

1. Press button "Shift", the red LED starts to flash.
2. Press button "Ambient", the surrounding lux level is sampled and set as the new daylight threshold.

Hold-time

Press buttons in zone "hold-time" to set the hold-time at 2s / 30s / 1min / 5min / 10min / 15min / 20min / 30min.

Note: 1. To set hold-time at 30s / 5min / 15min / 30min, press "Shift" button first.

2. 2s is for testing purpose only, stand-by period and daylight sensor settings are disabled in this mode.

**To exit from Test mode, press button "RESET" or any button in "Hold-time".*

Stand-by time (corridor function)

Press buttons in zone "stand-by time" to set the stand-by period at 0s / 10s / 1min / 5min / 10min / 30min / 1h / +∞.

Note: "0s" means on/off control; "+∞" means the stand-by time 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.

Stand-by dimming level

Press the button in zone "stand-by dimming level" to set the stand-by dimming level at 10% / 20% / 30% / 50%.

Auto-configuration function

All buttons in this zone are disabled.

Dual tech & RF mode

All buttons in this zone are disabled.

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.

Note: by choosing "Sensor OFF", it becomes an ordinary driver without both occupancy detection and daylight sensor.

	1	2	
I	●	●	100%
II	●	○	75%
III	○	●	50%
IV	○	○	Sensor OFF



I – 100%

II – 75%

III – 50%

IV – Sensor OFF

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.

	1	2	3	
I	●	●	●	5s
II	●	●	○	30s
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	20min
VII	○	○	○	30min

I – 5s
 II – 30s
 III – 1min
 IV – 5min
 V – 10min
 VI – 20min
 VII – 30min

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.

	1	2	
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 never switches off but stays at dimming level (HEC9025); For HEC9025/I, "+∞" 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.

	1	2	3	
I	●	●	●	0s
II	●	●	○	10s
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	30min
VII	○	○	●	1H
VIII	○	○	○	+∞

I – 0s
 II – 10s
 III – 1min
 IV – 5min
 V – 10min
 VI – 30min
 VII – 1H
 VIII – +∞

5 Stand-by dimming level

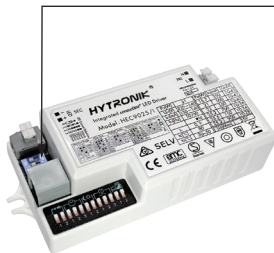
The setting is used to select the desired dimmed light level used in periods of absence for enhanced comfort and safety.

	1	2	
I	●	●	10%
II	●	○	20%
III	○	●	30%
IV	○	○	50%

I – 10%
 II – 20%
 III – 30%
 IV – 50%

LED Driver Specification

1 LED Current Selections



I	●	●	●	900mA
II	○	●	●	750mA
III	○	●	○	700mA
IV	○	●	○	550mA
V	●	○	○	500mA
VI	○	○	○	350mA
	1	2	3	Current

The current can be easily configured by choosing the correct combination of the DIP switches (see table on the left).

2 LED Maximum Load and Voltage

This multiple current LED driver has a wide range of loading capacity:

Maximum load @ different currents:	3.5~15W (350mA)	5~21W (500mA)	5.5~22W (550mA)
	7~25W (700mA)	7~25W (750mA)	9~25W (900mA)

Maximum voltage @ different currents:	10~43V (350mA)	10~42V (500mA)	10~40V (550mA)
	10~36V (700mA)	10~34V (750mA)	10~28V (900mA)

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](http://www.hytronik.com/download->knowledge->Introduction%20of%20Photocell%20Advance)
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](http://www.hytronik.com/download->knowledge->Microwave%20Sensors%20-%20Precautions%20for%20Product%20Installation%20and%20Operation)
3. Regarding Hytronik standard guarantee policy, please refer to [www.hytronik.com/download ->knowledge ->Hytronik Standard Guarantee Policy](http://www.hytronik.com/download->knowledge->Hytronik%20Standard%20Guarantee%20Policy)