

HBEM06

Constant Current, Self-Test, Dimming

**Product Description**

HBEM06 is a low-power, dimmable multifunctional emergency power module specifically designed for exit sign luminaires. Both mains and emergency outputs can be set to 1W, 2W, or 4W via DIP switch. With an RJ11 interface, it supports external sensor head connection. An SL terminal is provided for mains lighting compatibility (by connecting SL to L). Powered by a 6.4V LiFePO4 battery for safe and reliable emergency operation. Meanwhile, simple device setup and commissioning can be done via **Koolmesh**® app.

**Properties**

- Self - contained Emergency & LED drivers combination
- Non-maintained and maintained operations
- Mains & Emergency output (1W/2W/4W) selection via DIP switch
- It is dimmable via switch - dim or Koolmesh app in maintaining mode
- Plug-and-Play sensor with Photocell Advance™ technology for daylight & motion detection
- Abnormal protection for short-circuit, overload and open-circuit
- SELV classified (indicator LED, battery pack, test switch)
- Customized manual test switch (single press, long press)
- Battery Life Prediction and abnormal protection
- Wireless scheduling of monthly and annual EM tests via Koolmesh app
- Compact design suitable for Emergency Exit Sign light
- 5 years guarantee

Emergency Features

- Emergency working mode:
 - Normal emergency mode
 - Rest mode
 - Inhibit mode
 - Extended emergency mode
- Monthly/Annually Automatic Testing with report generation
- Battery status check via Koolmesh app
- Automatic email notification when fault is detected
- Retrievable usage data and report history

Batteries

- LiFePO4 batteries (BPC83/BPC84)
- Battery safeguarded from overcharge, deep discharge, and overheating
- 5 year design life for battery (up to 30 °C ambient temperature)
- 2 years guarantee (For battery compatibility refer to the Battery specifications)
 - <https://hytronik.com/emergency-led-drivers-inverters/bpc83>
 - *<https://hytronik.com/emergency-led-drivers-inverters/bpc84>

App Features

-  Emergency report generation and diagnosis
-  Quick setup mode & advanced setup mode
-  Web platform for project deployment & data analysis
-  Koolmesh Pro iPad for on-site configuration
-  Floorplan feature to simplify project planning
-  One-key device replacement
-  Device social relations check
-  Staircase function for quick setup
-  Remote control via Hytronik gateway
& touch screen HPAD-TSJASE I
-  Heat map
-  Grouping luminaires via mesh network
-  Scenes
-  Schedule
-  Astro timer (sunrise and sunset)
-  Power-on status (memory against power loss)
-  Offline commissioning
-  Bulk commissioning (copy and paste settings)
-  Different permission levels via authority management
-  Network sharing via QR code or keycode
-  Interoperability with Hytronik Bluetooth product portfolio
-  Internet-of-Things (IoT) featured
-  Device firmware update over-the-air (OTA)
-  Alert for excess lux / temperature
/ humidity via multi-meter HBLM01
-  Seamless integration with BMS via Hytronik BMS gateway
-  Test mesh network connection quality
-  Compatible with Shelly emergency metering
-  Continuous development in progress...

APP Functions with Sensor Head

-  Dusk/Dawn photocell (Twilight function)
-  Detailed motion sensor settings
-  Tri-level control
-  Daylight harvest
-  Circadian rhythm (Human centric lighting)
-  Motion sensor trigger diagnosis
-  Motion sensor range test
-  Adjustable motion & static sensitivity & Adjustable sensing distance

Koolmesh® - Operating Guide

Bluetooth® 5.0 SIG mesh



Smartphone (ios)



Smartphone (Android)



iPad



Web

*For additional information, including project and network, device, and scenes, please refer to: <http://faq.koolmesh.com/faq/en/index.html>

Bluetooth® Kinetic Switch



HBKS01

HBKS02

HBKS03

HBKS01D

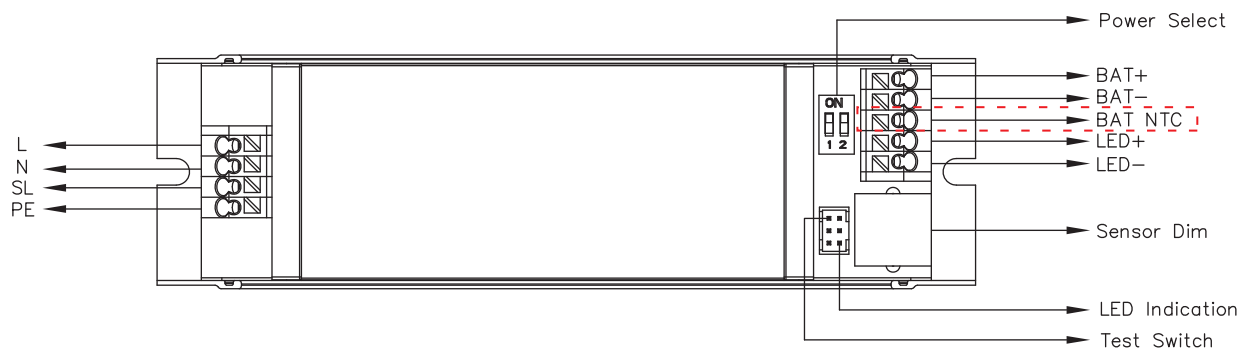
HBKS02D



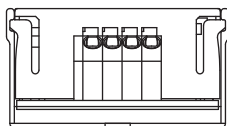
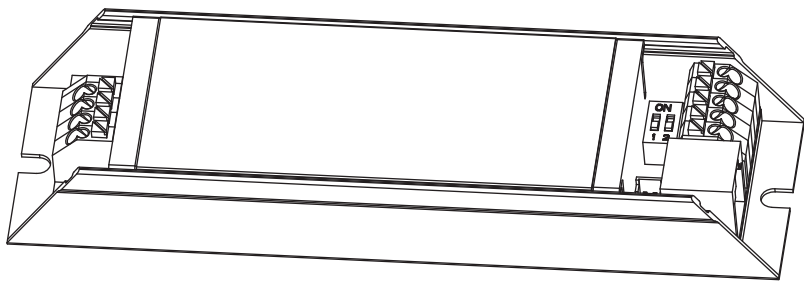
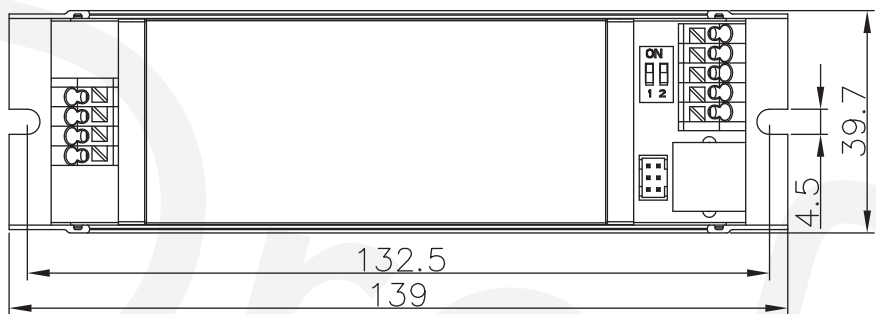
Fully support EnOcean self-powered switch module
PTM215B (HBES01/W & HBES01/B)

EnOcean
Self-powered IoT

Mechanical Structure & Dimensions



*Note: BAT NTC terminal is reserved for enhanced battery monitoring in the upgraded version.
Current version does not support this function.



Technical Specifications

Input & Output Characteristics	
Operating voltage	220~240VAC 50/60Hz
Input Current	Max. 50mA
Max. Output Power	4W
Uout Max.	15V
Power factor	>0.6
Mains & Emergency outputs (Wattage/Current/Voltage)	1W / 330-125mA / 3-8V 2W / 650-250mA / 3-8V 4W / 1300-500mA / 3-8V
In-rush Current (Imax.)	10A
Pulse Time	80 μs

Safety & EMC	
EMC standard (EMC)	EN55015, EN61547, EN61000-3-2, EN61000-3-3, EN300328, EN301489-17
Safety standard (LVD)	EN61347-1, EN62493, EN61347-2-7, EN62034, IEC62133
Certification	CE, UKCA, RCM, ROHS

Bluetooth Transceiver	
Operation frequency	2.4 GHz - 2.483 GHz
Transmission power	4 dBm
Range (Typical indoor)	10~30m
Protocol	Bluetooth® 5.0 SIG Mesh

Environment	
Operation temperature	Tc: 0~+50°C
Storage temperature	Tc: -40~+70°C
Case temperature (Max.)	Tc: +80°C
IP rating	IP20

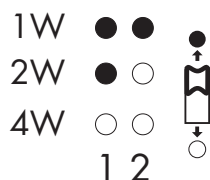
Circuit Breaker Information

Circuit breaker type	B10A	B13A	B16A	B20A	B25A
HBEM06	80 pcs	100 pcs	125 pcs	150 pcs	180 pcs

*Calculation uses typical values from ABB series S200 as a reference. E.g. Maximum amount = $16 / (P_n / 230)$. We recommend to use no more than 60% of the data as the actual max. number of drivers in real application. Actual values may differ due to used circuit breaker types and installation environment.

DIP Switch

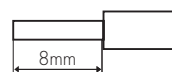
Emergency power Selection



Wire Preparation



0.5-1.5mm²



Solid or Stranded wire type 0.5 - 1.5mm²

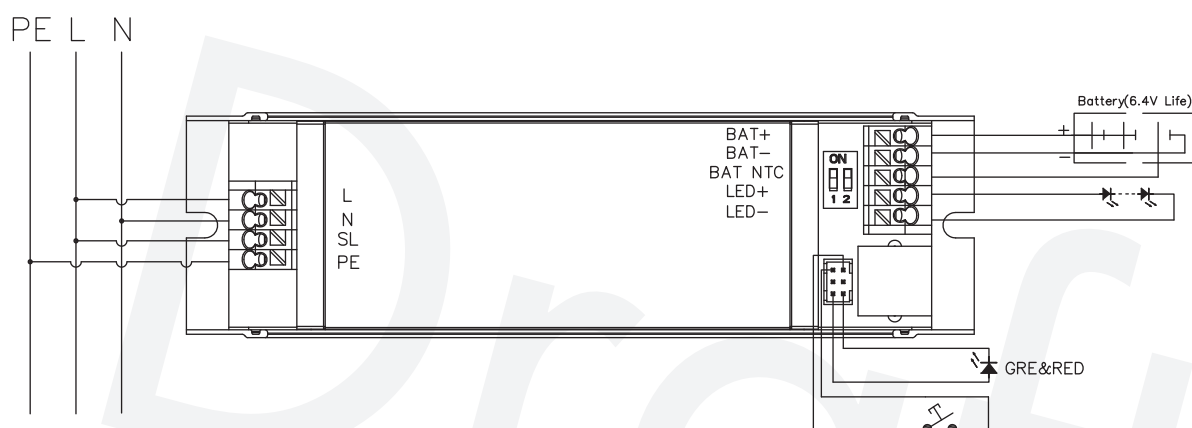
To make or release the wire from the terminal, use a screwdriver to push down the button.

Wiring Diagram

HBEM06: 1W/2W/4W EM output in EM mode (battery powered). Supports maintained and non-maintained mode selection via the SL wiring.

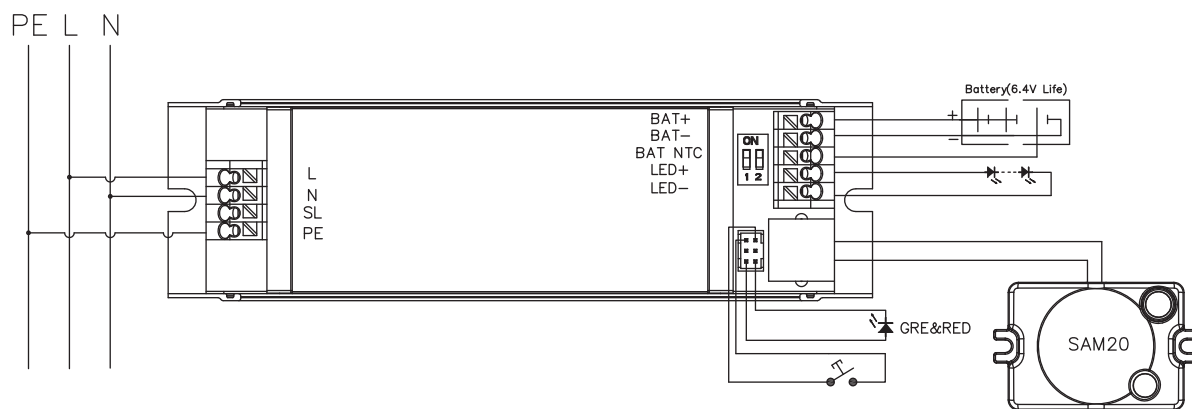
SL Connection – Maintained model

*When the SL wire is connected (maintained mode), the unit illuminates with fixed output under mains power(the fixed output is the same selection you made with dip switch). Sensors do not function in this mode (whether mains-powered or battery-powered). For example, when you select the 2W output through the dip switch, then when main power is connected, the LED will be with max 2W output, when it's in EM mode, the LED will be 2W as well. The exchange from main modes to EM mode will be about 0.3s, the LED will be flashing one time, only difference is when in main power mode, the status LED will be green constantly, but in EM mode, unless any faults occurs, the status LED will not turn on.



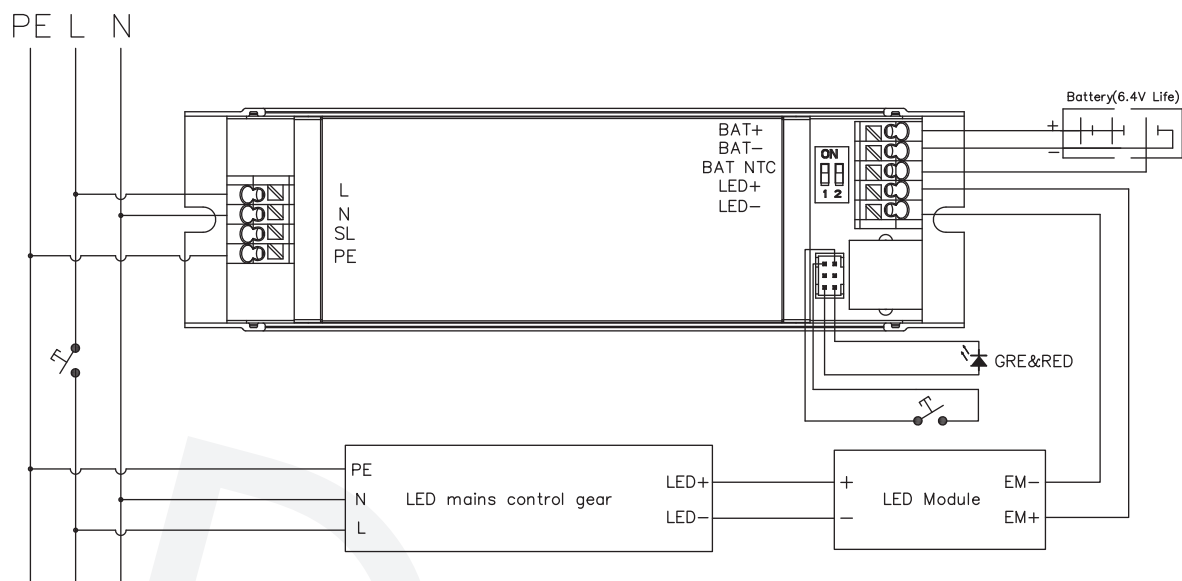
No SL Connection – Non-maintained model

*When the SL wire is not connected (non-maintained mode), sensors provide on/off and dimming control of the main driver when mains power is connected. Sensors do not function in EM mode (battery powered).

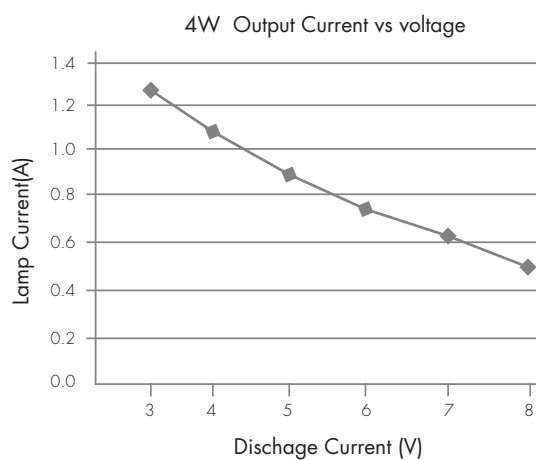
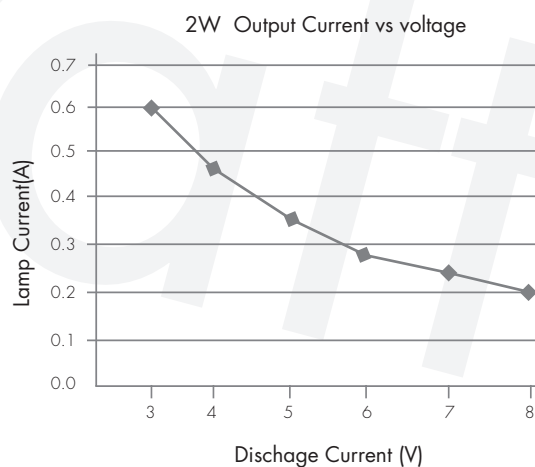
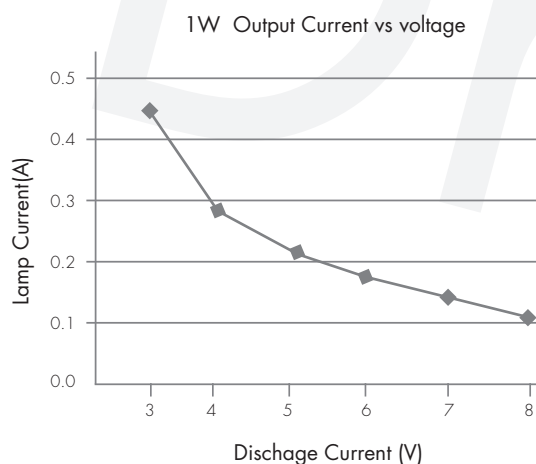


Combined Mains and Emergency Lighting

Since independent circuits are used, it is essential to switch off both the mains LED driver supply and the permanent emergency supply before testing. Otherwise, the operation of the emergency LEDs may not be visible. A circuit similar to the one shown should be used.



Performance Characteristics



Operating Modes & Self-Test Functions

Normal Mode

It is the mode in which mains supply is available, with the battery charged or charging. In this mode, HBEM06 is a combined Bluetooth LED driver, with ability to create scenes and controllable by motion sensor, Push switch and app.

Emergency Mode

It is the mode in which mains supply has failed and whilst the control gear is powered by the battery until deep discharge point. In this mode, HBEM06 is unable to be controlled by motion sensor, Push switch and app. However, some emergency parameters can still be configured via the app, such as time scheduled for self-test, duration for extended emergency mode etc.

Rest Mode

It is the mode in which the luminaire is intentionally off whilst the control gear is powered by the battery. To enter this mode, the prerequisite is that there is no mains supply. In this mode, the luminaire will be turned off automatically and HBEM06 is powered by the battery. If the luminaire is forced to turn on in this mode, HBEM06 will then be adjusted to emergency mode. When mains supply is recovered, HBEM06 will return to normal mode.

Inhibit Mode

It is the mode in which HBEM06 is powered from the mains but prevented from going into emergency mode in the event of mains failure. Please enter this mode only in special applications whereby emergency function is not needed, such as when electrician needs to cut off power supply when doing examination and maintenance work for HBEM06.

Extended Emergency Mode

It is the mode in which the control gear continues to operate the lamp in the same way as in emergency mode for the programmed prolong time after the restoration of the mains supply. When this mode is enabled, HBEM06 will remain in emergency mode even when mains supply is recovered. In this mode, the user has to set the time extended for emergency mode; when the time extended elapses, HBEM06 will then return to normal mode.

Self test (Monthly)

HBEM06 carries out routine test on emergency lighting based on pre-programmed time via the app or after receiving manual commands from the app. During the self test process, tests for load connections (such as open circuit, short-circuit) and battery connections (such as open circuit, short-circuit, polarity reversal etc.) will be carried out.

Self test (Annually)

The test is carried out mainly to check the battery level. The user has to make sure that the battery for HBEM06 is fully charged before HBEM06 carries out annual test. Also, the battery lifetime statistics will be analysed and displayed on a chart basis.

Battery Installation and Protection

Battery Pack Options

Picture		
LED indicator & Test switch		
Battery pack	BPC83	BPC84
Battery Type	LiFePO4	LiFePO4
Discharge current	6.4V, 3.6AH	6.4V, 3.6AH
Size (mm)	105*53*27.5	174.8*26.5*29
Battery charge current	0 - 500mA	0 - 500mA
Max. load/ Discharge hour	0.2A, 1W@3 - 8V / 3H 0.4A, 2W@3 - 8V / 3H 0.85A, 4W@3 - 8V / 3H	0.2A, 1W@3 - 8V / 3H 0.4A, 2W@3 - 8V / 3H 0.85A, 4W@3 - 8V / 3H
Recharge Time	24H	24H

- Please kindly charge battery for 24 hours before using.
- Do not short-circuit the battery pack.
- Over-discharge can damage the battery. Please avoid deep discharge and recharge promptly after emergency use.
- Do not connect the battery before installing the product. Once the battery is connected, ensure the HBEM06 product powers on and operates normally within 24 hours.
- For more details on battery precautions and usage, please visit the following link:
<https://hytronik.com/service/downloads> (LiFePO4 Battery Precautions and Usage).

Battery-Powered Bluetooth Standby

(Only applicable to Bluetooth Emergency Drivers)

To support emergency system logging and monitoring, Bluetooth-enabled emergency drivers are designed to allow the battery to directly power the Bluetooth module when mains power is not present.

During this state, the Bluetooth module typically draws ~20mA from the battery.

Please take this standby consumption into account when assessing battery life in long-term mains-disconnected scenarios.

Installation Warning for Unstable Mains Supply

(Important for on-site building installations)

During building installations, mains supply may not be available on a continuous 24-hour basis. If the battery is connected under such conditions, it may lead to uncontrolled and excessive charge/discharge cycles, which significantly shorten the design life of the battery.

To prevent premature battery wear, ensure the battery remains disconnected until a stable 24-hour mains power supply is available. Please refer to the corresponding emergency driver datasheets for behavior under intermittent power supply.

This warning must be clearly communicated to the installation staff and electricians to ensure proper commissioning practices on-site.

LED Diagnostics

Indicator Colour	Status	Meaning
GREEN SOLID	Device OK	All OK, AC power is present. Battery is connected & charging
GREEN FAST FLASH (0.1s ON, 0.1s OFF)	Monthly test/Functionality test	AC power is present. Monthly test in progress
GREEN VERY SLOW FLASH (1s ON, 1s OFF)	Annual test/Duration test	Annual test are being carried out
RED SOLID	Emergency LED fault	Emergency LED is open circuit, short circuit or has otherwise failed in some way,. Fault can indicate the live status or the result of a test
RED SLOW FLASH (1s ON, 1s OFF)	Battery fault	Battery failure (Battery failed the duration or functional test, battery appears to be defective, battery has incorrect voltage).
RED /GREEN OFF	No power available	AC power is lost, unit in emergency mode

*If you want to see the diagnostic report, please go to the APP or web platform to see the full report and analysis

Note: Before powering on, please plug in the sensor head and then plug in the battery, otherwise the sensor is disabled.

Remedy: Only after the APP is reset and re-connected to the network can the sensor head be re-identified.

Technical Specifications for Sensor Heads

PIR Sensor Properties		
Sensor principle	PIR detection	
Operating voltage	5VDC	
Detection range *	HIRO5 & HIRO5/FM HIRO5/AA & HIRO7	Max installation height: 3m; Max detection range: 6m (diameter)
	HIR11	Max installation height: 15m (forklift); 12m (single person); Max detection range: 24m (diameter)
	HIR12	Max installation height: 15m (forklift); 12m (single person); Max detection range: 18m*6m (L*W)
	HIR63	Max installation height: 3m; Max detection range: 12m (diameter)
	HIR63/R	Max installation height: 12m (forklift); 8m (single person); Max detection range: 14m (diameter)

HF Sensor Properties		
Sensor principle	High Frequency (microwave)	
Operating voltage	5VDC	
Operation frequency	5.8GHz +/- 75MHz	
Transmission power	<0.2mW	
Detection range *	SAM20 & SAM21 SAM22 & SAM22/AA	Max installation height: 3m; Max detection range: 12m (diameter)
	SAM23	Max installation height: 15m (forklift); 12m (single person); Max detection range: 20m (diameter)

* The detection range is heavily influenced by sensor placement (angle) and different walking paces. It may be reduced under certain conditions.

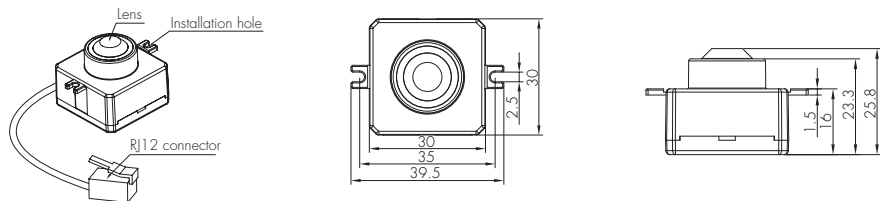
PIR & microwave sensor heads

The range of PIR and microwave sensor heads below offers powerful number of Plug'n'Play feature options to expand the flexibility of luminaire design. This approach to luminaire design reduces space requirements and component costs whilst simplifying production.

A. HIR05

PIR sensor head

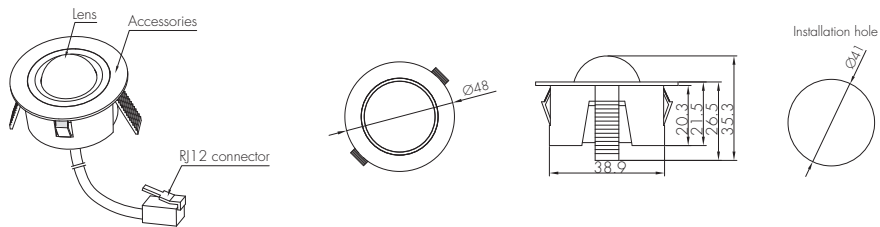
The cable length is around 65cm.



B. HIR05/FM

PIR sensor head

The cable length is around 65cm.

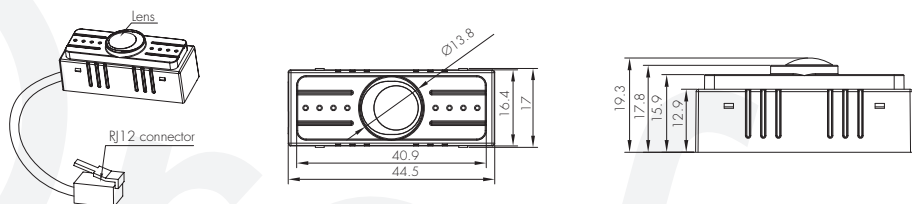


C. HIR07

PIR sensor head

Photocell Advance™

The cable length is around 30cm.



D. HIR11/S

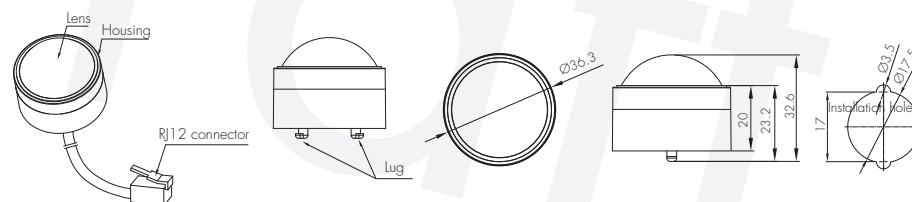
PIR sensor head

Surface mounting

For highbay application

IP65 (facia / lens part)

The cable length is around 65cm.



E. HIR11/F

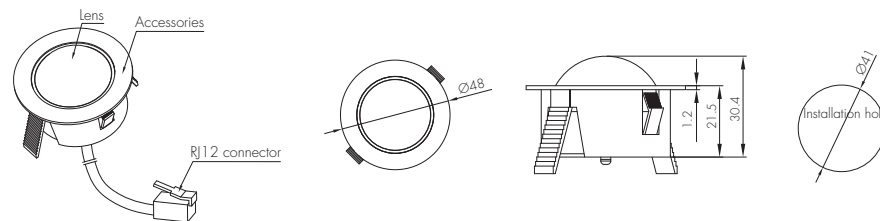
PIR sensor head

Flush mounting

For highbay application

IP65 (facia / lens part)

The cable length is around 65cm.



F. HIR11/C

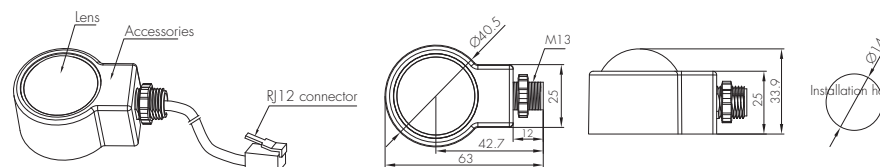
PIR sensor head

Screw to the luminaire by conduit

For highbay application

IP65 (facia / lens part)

The cable length is around 65cm.



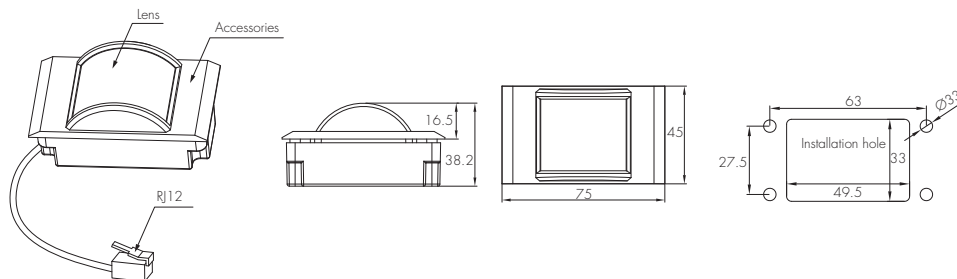
G. HIR12

PIR sensor head

For highbay application

IP65 (facia / lens part)

The cable length is around 65cm.



Installation for HIR12

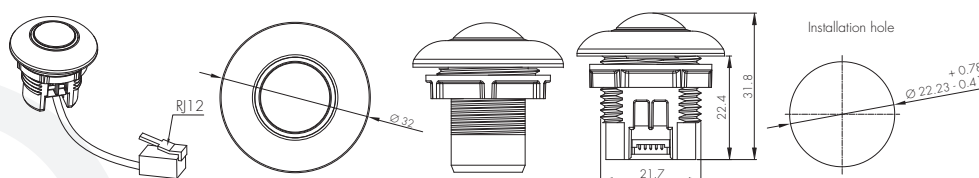


We suggest that the metal plate thickness to be 0.8mm – 1.6mm to ensure perfect focal length for the PIR lens.

H. HIR63

PIR sensor head

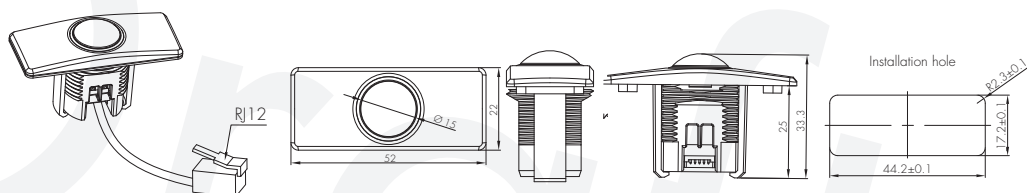
The cable length is around 65cm.



I. HIR63 with HA04

PIR sensor head

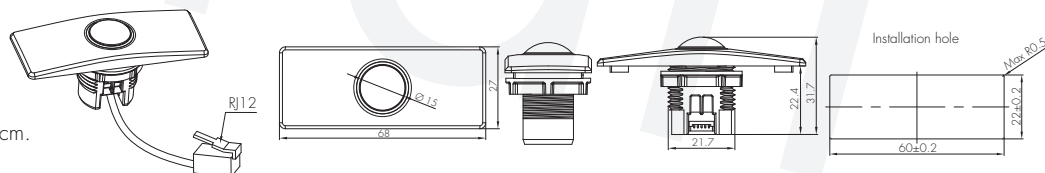
The cable length is around 65cm.



J. HIR63 with HA05

PIR sensor head

The cable length is around 65cm.

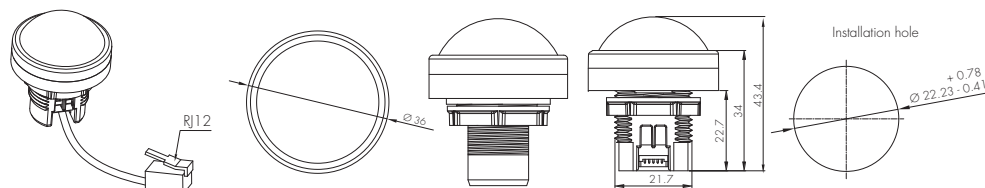


K. HIR63/R

PIR sensor head

IP65 (facia / lens part)

The cable length is around 65cm.

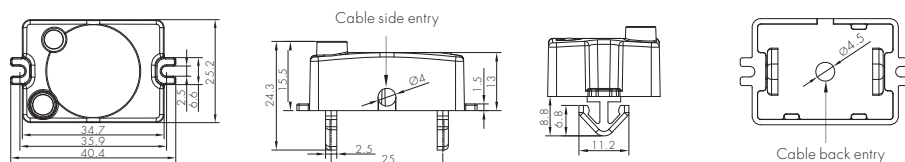


L. SAM20

HF sensor head

Photocell Advance™

The cable length is around 30cm.

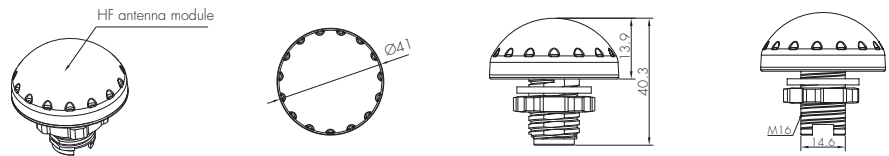


M. SAM21

HF sensor head

IP65

The cable length is around 65cm.

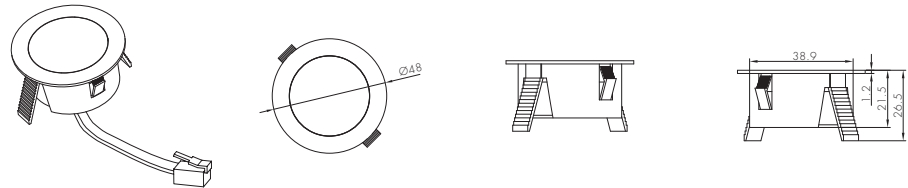


N. SAM22

HF sensor head

Flush mount

The cable length is around 65cm.

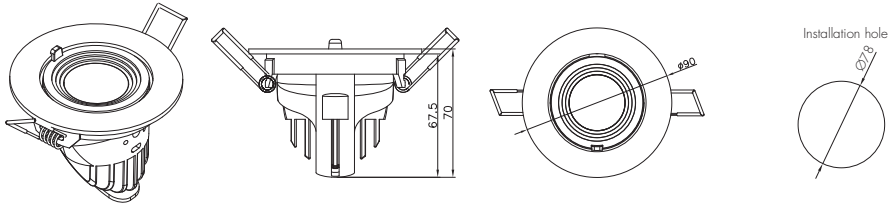


O. SAM22/AA

HF sensor head

Adjustable angle

The cable length is around 65cm.



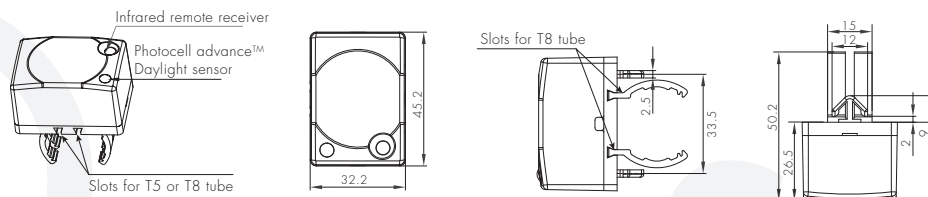
P. SAM23

HF sensor head

Photocell advance™

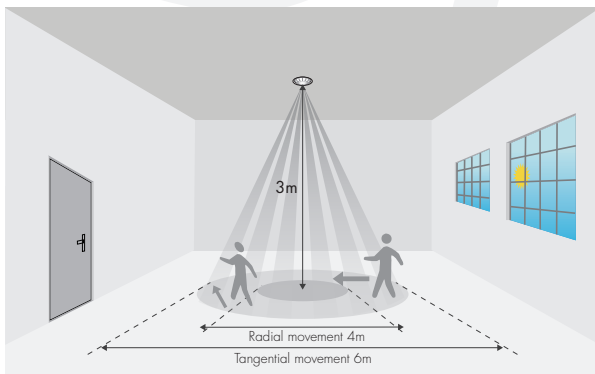
For highbay application

The cable length is around 30cm.

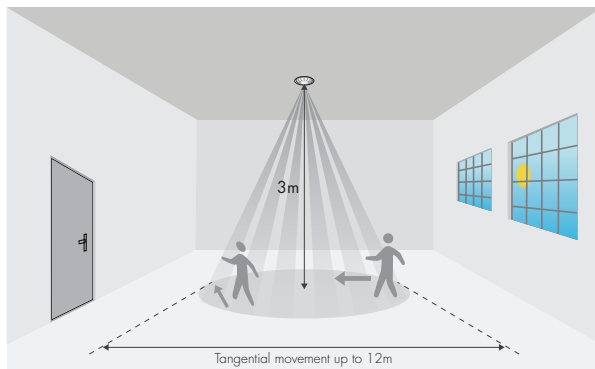


Detection Diagram

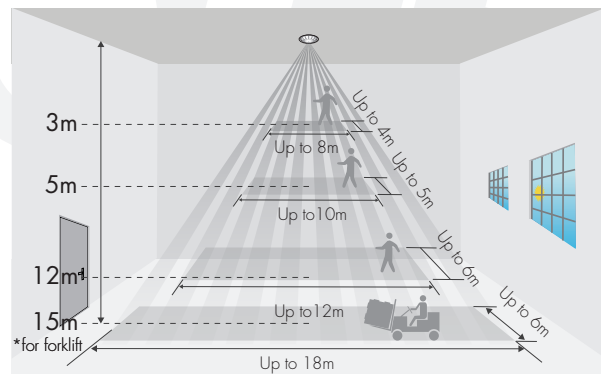
HIRO5 & HIRO5/FM & HIRO5/AA & HIRO7



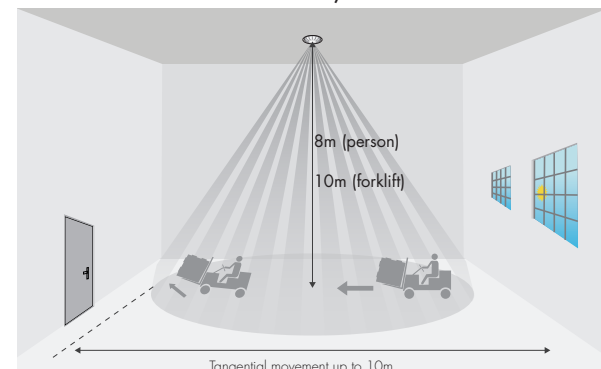
HIR63



HIR12



HIR63/R



*The detection patterns are based upon 5km/h movement speed.

HIR11 Series (High-bay)



HIR11 series: High-bay lens detection pattern for **forklift** @ $T_a = 20^\circ\text{C}$
(Recommended installation height **10m-15m**)

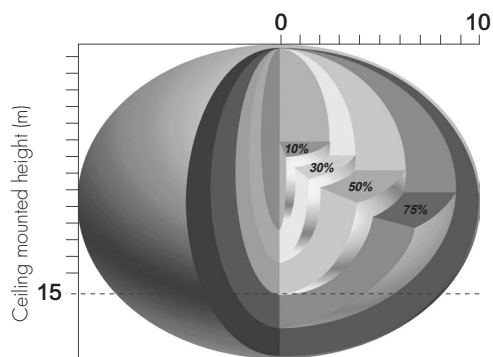
A: Tangential movement	B: Radial movement	Mount height	Tangential (A)	Radial (B)
		10m	max 380m ² (Ø = 22m)	max 201m ² (Ø = 16m)
		11m	max 452m ² (Ø = 24m)	max 201m ² (Ø = 16m)
		12m	max 452m ² (Ø = 24m)	max 201m ² (Ø = 16m)
		13m	max 452m ² (Ø = 24m)	max 177m ² (Ø = 15m)
		14m	max 452m ² (Ø = 24m)	max 133m ² (Ø = 13m)
		15m	max 452m ² (Ø = 24m)	max 113m ² (Ø = 12m)



HIR11 series: High-bay lens detection pattern for **single person** @ $T_a = 20^\circ\text{C}$
(Recommended installation height **2.5m-12m**)

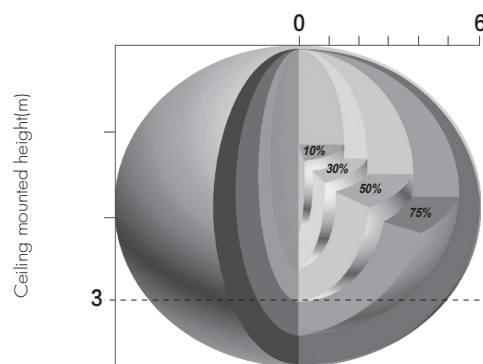
A: Tangential movement	B: Radial movement	Mount height	Tangential (A)	Radial (B)
		2.5m	max 50m ² (Ø = 8m)	max 7m ² (Ø = 3m)
		6m	max 104m ² (Ø = 11.5m)	max 7m ² (Ø = 3m)
		8m	max 154m ² (Ø = 14m)	max 7m ² (Ø = 3m)
		10m	max 227m ² (Ø = 17m)	max 7m ² (Ø = 3m)
		11m	max 269m ² (Ø = 18.5m)	max 7m ² (Ø = 3m)
		12m	max 314m ² (Ø = 20m)	max 7m ² (Ø = 3m)

SAM23



Ceiling mounted detection pattern (m)

SAM20 & SAM21 & SAM22 & SAM22/AA



Ceiling mounted detection pattern (m)

Additional Information / Documents

1. To learn more about detailed product features/functions, please kindly refer to
<https://hytronik.com/product/hbem06>
2. Regarding precautions for Bluetooth product installation and operation, please kindly refer to
<https://hytronik.com/service/downloads> (Bluetooth Products Precautions for Product Installation and Operation)
3. Regarding precautions for Emergency LifePO4 Batteries, please kindly refer to
<https://hytronik.com/service/downloads> (LiFePO4 Battery Precautions and Usage)
4. Data sheet is subject to change without notice. Please always refer to the most recent release on
<https://hytronik.com/products/emergency-led-drivers-inverters>
5. Regarding Hytronik standard guarantee policy, please kindly refer to
<https://hytronik.com/service/downloads> (Guarantee Conditions document)

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