Detached Emergency Converters

HBEM06 ECO

Constant Current, Self-Test, Dimming

Product Description

HBEM06 ECO 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.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
- Abnormal pro-tection 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 batterry (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-TSJASE1
- 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 energency metering
- Continuous development in progress…

Koolmesh® - Operating Guide

Bluetooth® 5.0 SIG mesh

Smartphone (ios) | Smartphone (Android) | iPad | Web

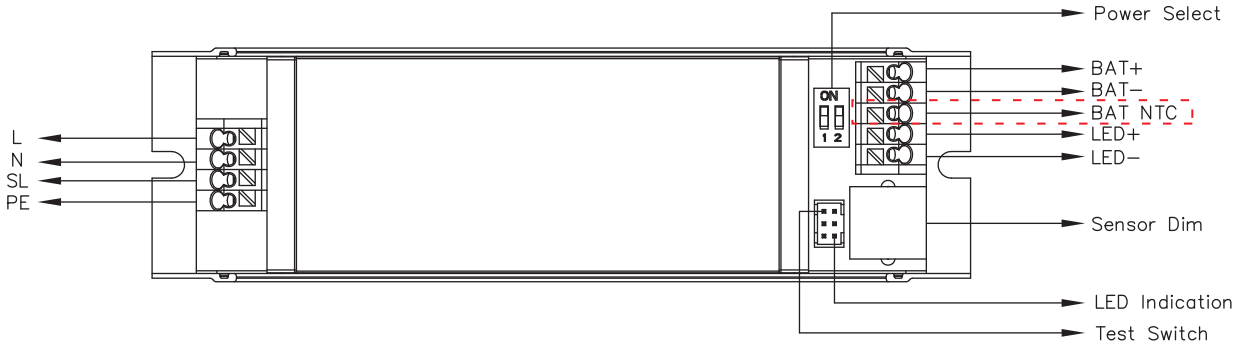
*For additional information, including project and network, device, and scenes, please refer to: http://faq.koolmesh.com/faq/en/index.html

Bluetooth® Kinetic Switch

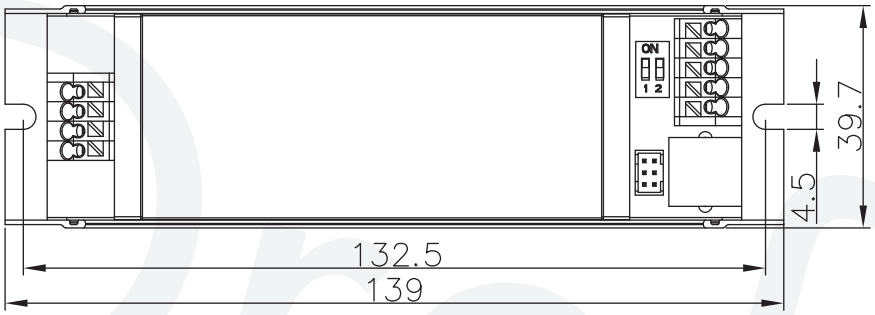
HBKS01 HBKS02 HBKS03 HBKS01D HBKS02D

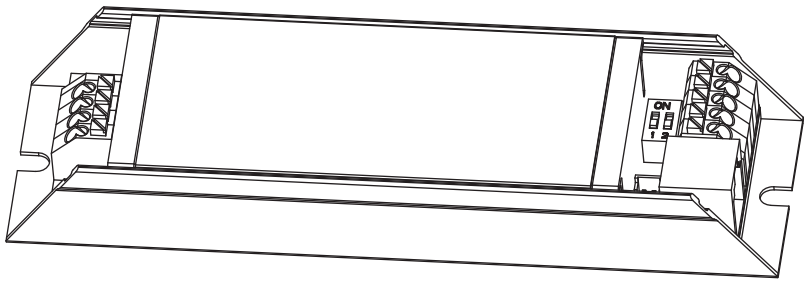
Fully support EnOcean self-powered switch module PTM215B（HBES01/W & HBES01/B）

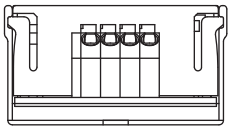
Mechanical Structure & Dimensions



*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

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

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

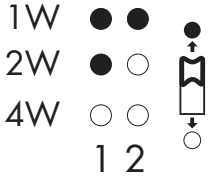
Circuit Breaker Information

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

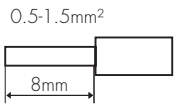
*Calculation uses typical values from ABB series S200 as a reference. E.g. Maximum amount =16/(Pn/230). We recommend to use no more than 60% of the data as the actual max. number of drivers in real application. Actual values may differ due to used circuit breaker types and installation environment.

DIP Switch

Emergency power Selection



Wire Preparation

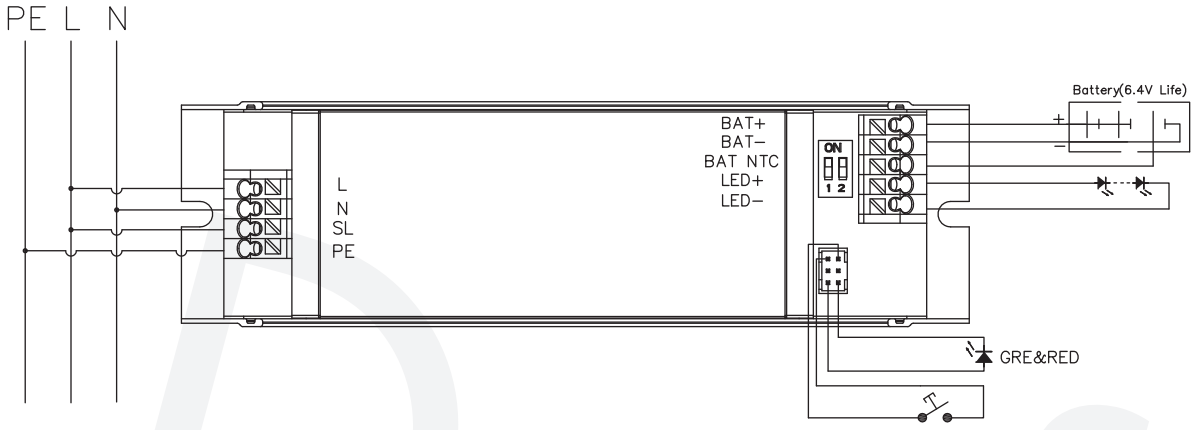


Solid or Stranded wire type 0.5 - 1.5mm²
To make or release the wire from the terminal, use a screwdriver to push down the button.

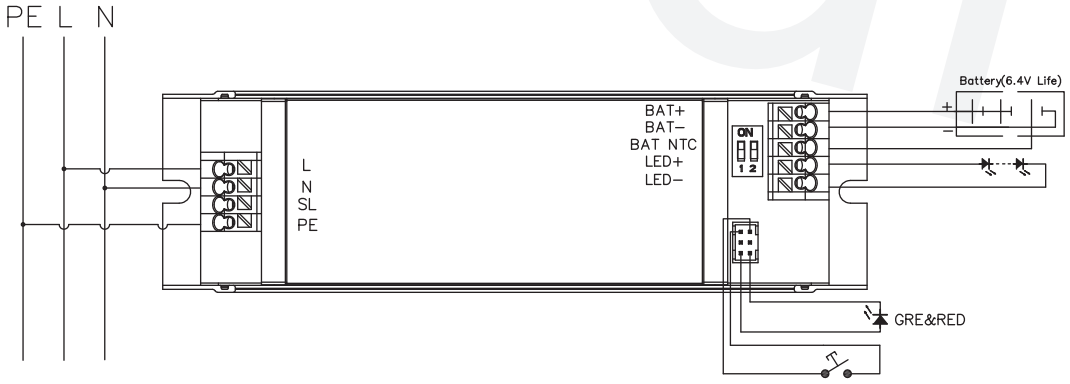
Wiring Diagram

The wiring diagrams illustrate the flexibility of the system for different applications. With SL connection, the module can operate in both normal and emergency lighting modes, and can be extended with sensor control for presence or daylight detection. Where no SL is connected, the unit functions as an emergency-only driver, also supporting sensor input if required.

SL Connection – Mains and Emergency Lighting

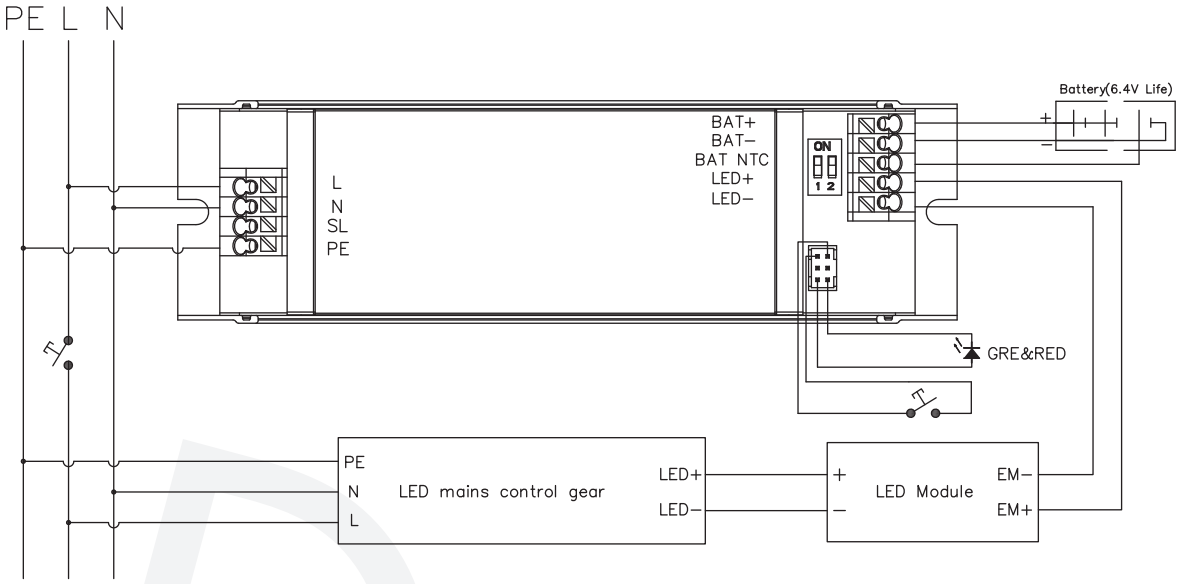


No SL Connection – Emergency-Only Operation



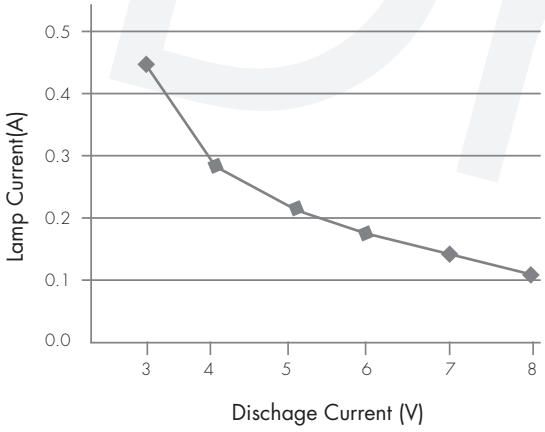
Combined Mains and Emergency Lighting

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.

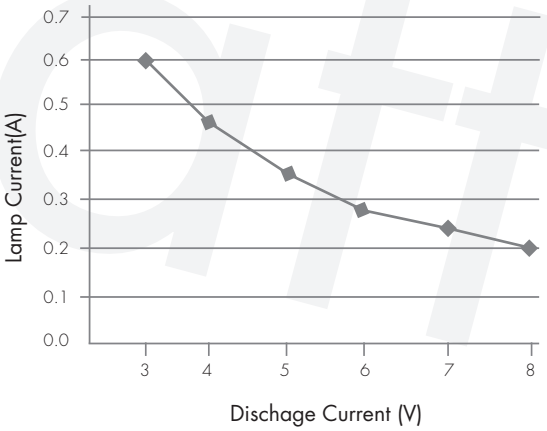


Performance Characteristics

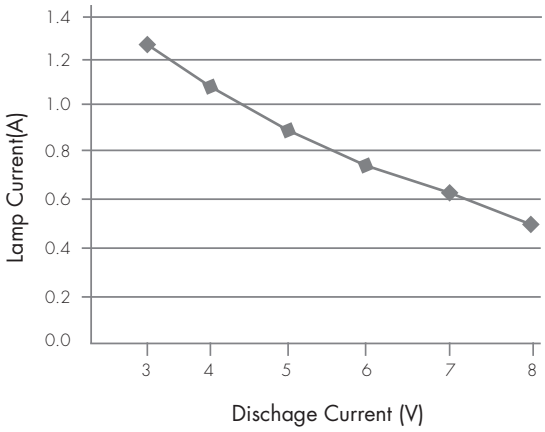
1W Output Current vs voltage



2W Output Current vs voltage



4W Output Current vs voltage



Operating Modes & Self-Test Functions

Normal Mode

It is the mode in which mains supply is available, with the battery either charged or charging. In this mode, the device operates as a combined Bluetooth LED driver, capable of creating scenes and being controlled by motion sensors, Push switches, and the mobile app.

Emergency Mode

It is the mode in which mains supply has failed and the control gear is powered by the battery until deep-discharge protection is reached. In this mode, the device cannot be controlled by motion sensors, Push switches, or the app. However, certain emergency parameters can still be configured via the app, such as scheduled self-test time, extended emergency duration, etc.

Rest Mode

It is the mode in which the luminaire is intentionally turned off while the control gear is powered by the battery. To enter this mode, mains supply must not be present. In this mode, the luminaire turns off automatically while the device continues to draw power from the battery. If the luminaire is forced on, the device will switch to emergency mode. When mains supply is restored, the device will return to normal mode.

Inhibit Mode

It is the mode in which the device is powered from the mains but prevented from entering emergency mode in the event of a mains failure. This mode is intended only for special applications where emergency functionality is not required, such as when electricians need to temporarily disable emergency operation during inspection or maintenance work.

Extended Emergency Mode

It is the mode in which the device continues operating the luminaire in the same manner as emergency mode for a programmed extended duration after mains power is restored. When enabled, the device remains in emergency mode even when mains supply returns. Once the programmed extended time expires, the device will switch back to normal mode.

Self-test (Monthly)

The device performs routine tests on emergency lighting based on pre-programmed schedules via the app or upon receiving manual commands. During the monthly self-test, load connections (e.g., open-circuit, short-circuit) and battery connections (e.g., open-circuit, short-circuit, polarity reversal) are inspected.

After the device reports a functional fault, a new monthly functional test shall be carried out after corrective actions to verify that the fault has been eliminated.

Self-test (Annually)

The annual test is mainly used to evaluate battery capacity and condition. The user must ensure that the battery is fully charged before the test begins. Battery lifetime statistics will be analysed and presented graphically.

When the device reports insufficient battery capacity and the battery is replaced, an annual test shall be performed to ensure that the new battery meets the required performance criteria.

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 ECO 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.

Additional Information / Documents

1. To learn more about detailed product features/functions, please kindly refer to https://hytronik.com/product/HBEM06 ECO
2. Regarding precautions for Bluetooth product installation and operation, please kindly refer to https://hytronik.com/service/downloads (Bluetooth Products Precautions for Product linstallation 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)