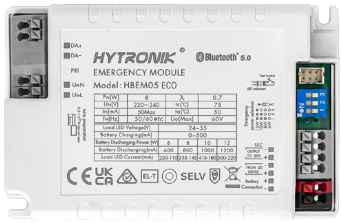
Bluetooth Emergency Inverter

HBEM05 ECO

Inverter, Self-Test

Product Description

HBEM05 ECO is a compact emergency inverter with integrated self-test, intelligent emergency lighting management.



Properties

- Designed for DALI Dimmable Drivers
- Self -contained Emergency with self -test functiond
- EM power selection via DIP switch (6W/8W/10W/12W)
- 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
- Add an emergency function to the main lighting fixtures
- 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 (BPC85)
- 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/bpc85

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…

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

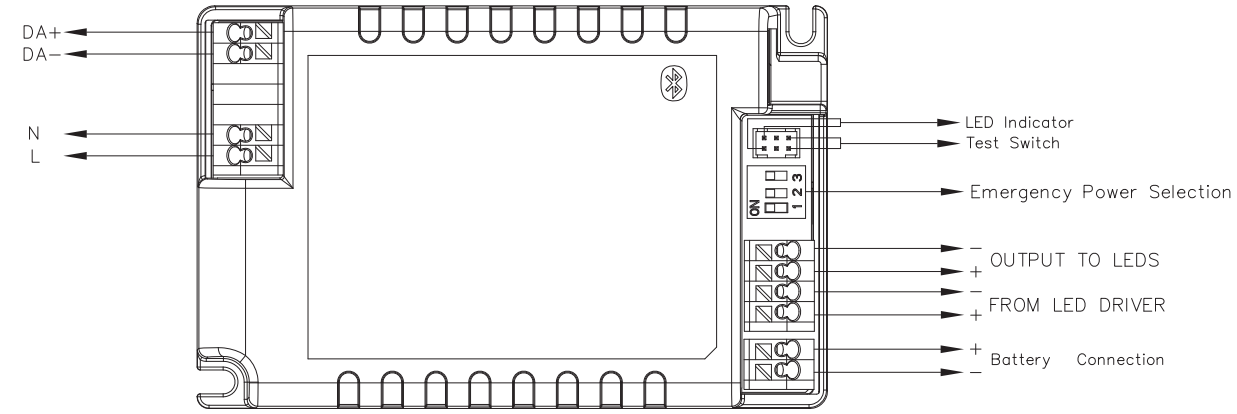
*For additional information, including project and network, device, and scenes, please refer to: http://faq.koolmesh.com/faq/en/index.html

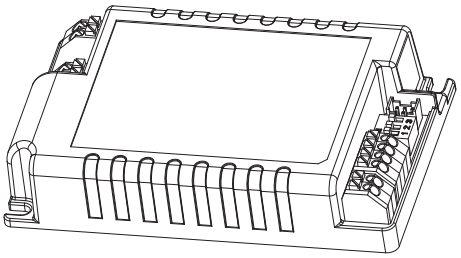
Bluetooth® Kinetic Switch

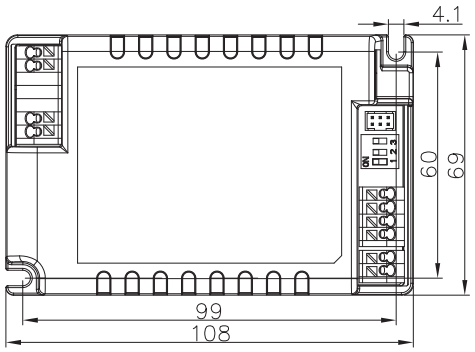
HBKS01 HBKS02 HBKS03 HBKS01D HBKS02D

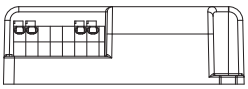
Fully support EnOcean self-powered switch module PTM215B（HBES01/W & HBES01/B）

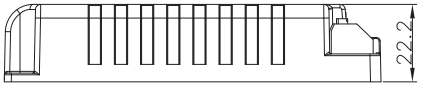
Mechanical Structure & Dimensions



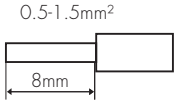








Wire Preparation



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.

Technical Specifications

Model No.		HBEM05 ECO
Input	Mains voltage	220~240VAC 50/60Hz
	Mains current	50mA (MAX)
	Max. loading	10W
	Efficiency	max. 85%
Output	Max. emergency output power	12W max.
	Output voltage(U-out Max.)	Load LED voltage 60V
	Power factor	>0.7
Battery	Battery charge current	0 - 500mA
	Battery pack	BPC85
	Battery Type (LiFePO4) / Discharge current / Max. load / Discharge hour	12.8V,3.6AH/0.6A,6W@24-55V/180min 12.8V,3.6AH/0.8A,8W@24-55V/180min 12.8V,3.6AH/1A,10W@24-55V/180min 12.8V,3.6AH/1.2A,12W@24-55V/180min
	Battery abnormal protection	Short circuit protection
		Reverse connection protection
	Charge period	24h
Safety and EMC	EMC standard	EN55015, EN61547, EN61000-3-2, EN61000-3-3, EN300328; EN301489-17
	Safety standard	EN61347-1, EN62493, EN61347-2-7, EN62034, IEC62133
	Certifications	CE, UKCA, RCM, ROHS
	Abnormal protection	Output short-circuit protection, Overload Protection, Open-circuit Protection
Environment	Operation temperature	0~+50℃
	Storage temperature	-40~+35℃
	Relative humidity	20~90%
	Max. case temp.	80℃
	IP grade	IP20

Loading and In-rush Current

Model	HBEM05 ECO
In-rush Current (Imax.)	25A
Pulse Time	80 μs

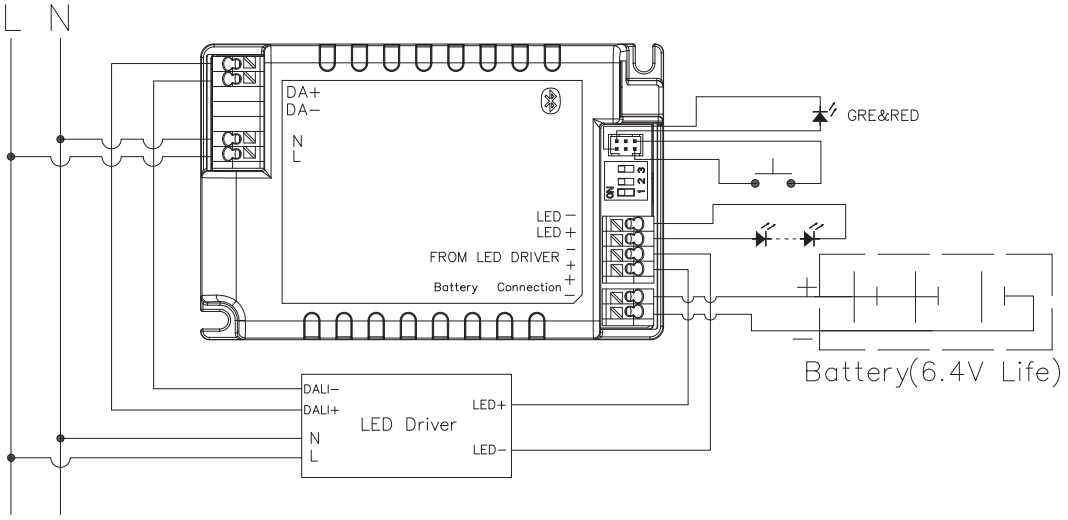
Circuit Breaker Information

Automatic circuit breaker type	B16A	B10A	B13A	B20A
HBEM05 ECO	114	72	92	142

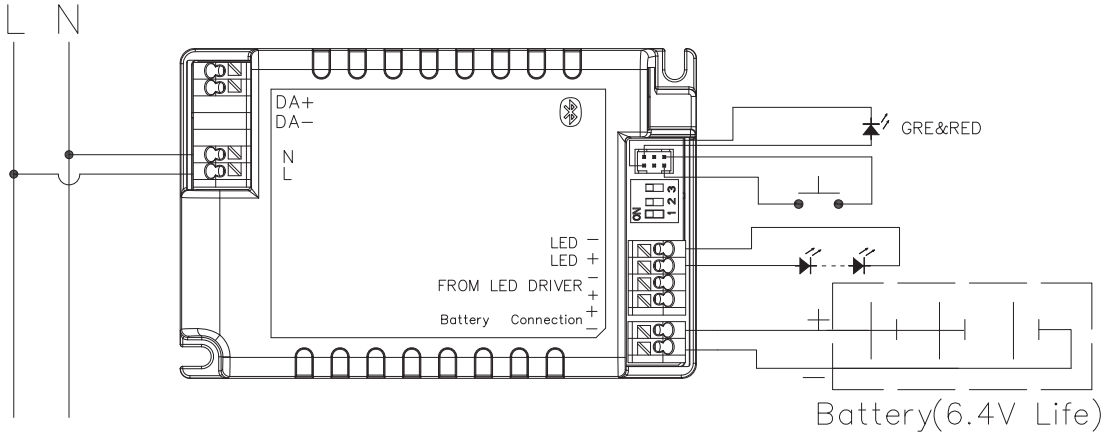
Calculation uses typical values from ABB series S200 as a reference. E.g. Maximum amount =16/(Pn/230). We recommend to use no more than 60% of the data as the actual max. number of drivers in real application.
Actual values may differ due to used circuit breaker types and installation environment.

Wiring Diagram

Without sensor head

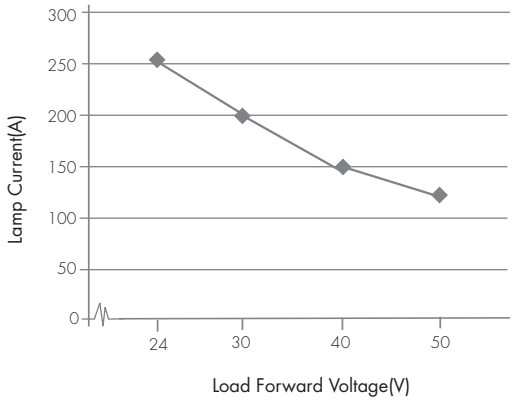


Non-maintained

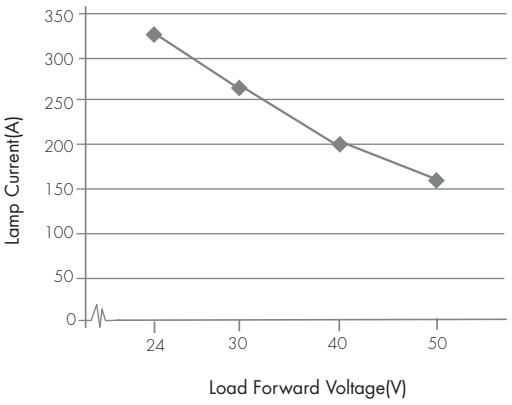


Performance Characteristics

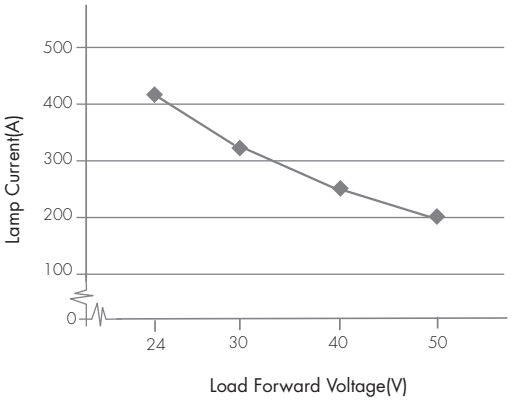
6W Output Current VS Forward Voltage



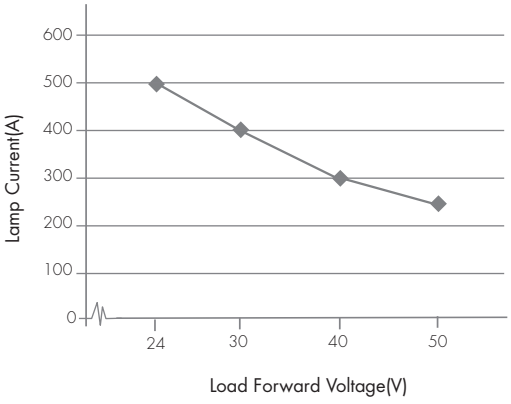
8W Output Current VS Forward Voltage



10W Output Current VS Forward Voltage



12W Output Current VS Forward 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	BPC85
Battery Type	LiFePO4
Discharge current	12.8V , 3.6AH
Size (mm)	74*56.5*66.5
Battery charge current	0 - 500mA
Max. load/ Discharge hour	0.6A, 6W@24 - 55V / 3H 0.8A, 8W@24 - 55V / 3H 1A, 10W@24 - 55V /3H 1.2A, 12W@24 - 55V /3H
Recharge Time	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 HBEM05 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/hbem05-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)