Different from other complex lighting systems, Hytronik circadian rhythm system offers a simple de-centralized human centric lighting solution for offices, schools and hospitals with the tunable white feature. Comprised of just one master sensor HBHC25 and optional occupancy sensor HBIR29, the system allows great flexibility and high specification in an easy installation and commission package. Thanks to the bluetooth module, now the system can be easily set and commissioned on our App. What's more, the user can adjust brightness and colour temperature, as well as select different scenes on our specially designed bluetooth touch panel for human centric lighting .

Concept

Slave Sensor
HBIR29

Free APP
Sensor

Wall Panel
HBP01

Colour and
Human Centric
Control

DALI
Channel 2
Control

DALI
Channel 1
Control

2 - Channel
DALI Output

Self-powered DALI
Up to 15 LED drivers
(Wired)

3 - Channel
Push Switch
Input (wired)

PIR Master Sensor
HBHC25

Self- powered DALI
Up to 25 LED drivers (Wired)

Hytronik Tunable White
LED Driver HHC2045

Hytronik Tunable White
LED Driver HHC2050L

DALI DT8
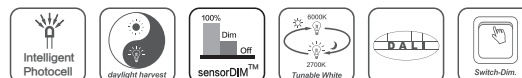Tunable White
LED Driver (3rd party)

Note:

This datasheet is intended for information related to the hardware only. For detailed set-up of features available in the App, please refer to the App user guide available from our website.

65mm

62
70.5
75.2

Ø78
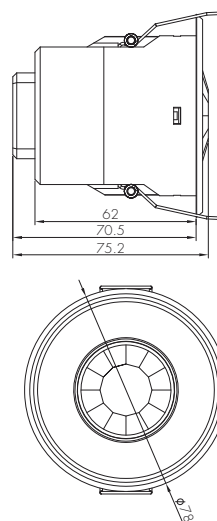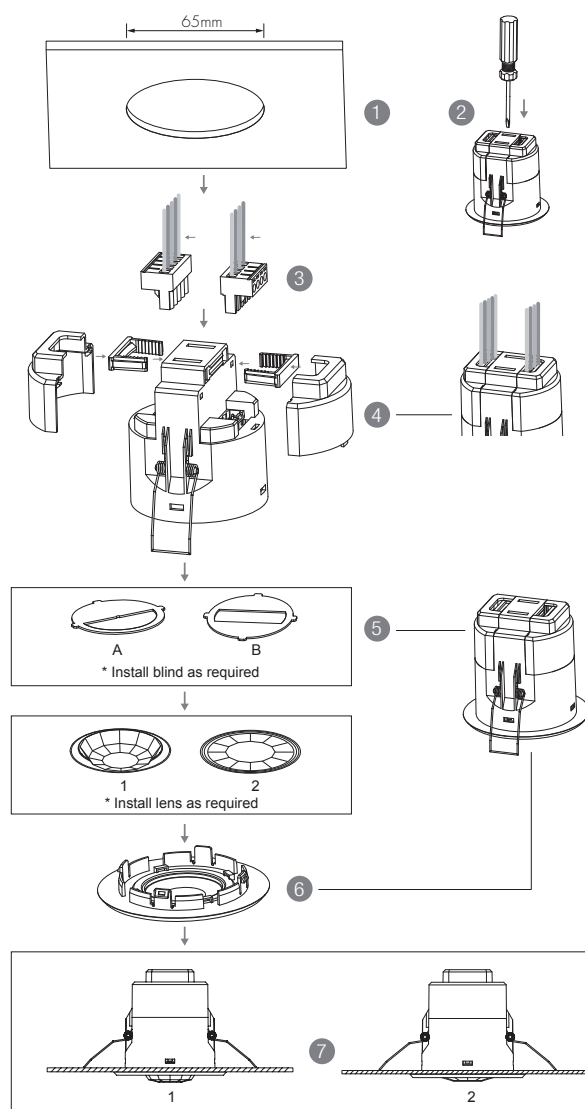
1. Ceiling (drill hole 65mm)
2. Carefully prise off the cable clamps.
3. Make connections to the pluggable terminal blocks.
4. Insert plug connectors and secure using the provided cable clamps, then clip terminal covers to the base.
5. Fit detection blind (if required) and desired lens.
6. Clip fascia to body.
7. Bend back springs and insert into ceiling.

A   B
* Install blind as required

1   2
* Install lens as required

Bluetooth®

Intelligent Photocell | daylight harvest | sensorDIM™ | Tunable White 2700K-6000K | DALI | Switch-Dim.

Technical Data for HBHC25

Input Characteristics	
Operating voltage	220~240VAC 50/60Hz
Stand-by power	<1W

Output Characteristics	
DALI Channel 1	50mA, Max. 25 LED drivers
DALI Channel 2	30mA, Max. 15 LED drivers

Suitable for DALI DT8 LED drivers

Safety and EMC	
EMC standard (EMC)	EN55015, EN61000
Safety standard (LVD)	EN60669, AS/NZS60669
RED	EN300328, EN301489
Certification	Semko, CB, CE , EMC, RED, RCM

PIR Sensor Data	
Warm-up Period	20s
Detection range	(Ø x H) 10m x 3m
Detection angle	360°
Mounting height	5m (maximum)

Environment	
Operation temperature	Ta: -20°C ~ +50°C
IP rating	IP20

Bluetooth Transceiver	
Operation frequency	2.4 GHz - 2.483 GHz
Transmission power	Max.7 dBm
Range (Typical) *	15~30m

CE emc RED Interlek RCM CB IP20

Part 2: Slave Sensor HBIR29

One or more slave sensors may be incorporated into the group using the App to extend the detection zone. Any movement detected by the sensor will be sent to the master unit HBHC25 via Bluetooth® transmission and turn all the lights in the group on. A daylight photocell is also built in the sensor to prevent the lights from switching on when there is sufficient natural light.
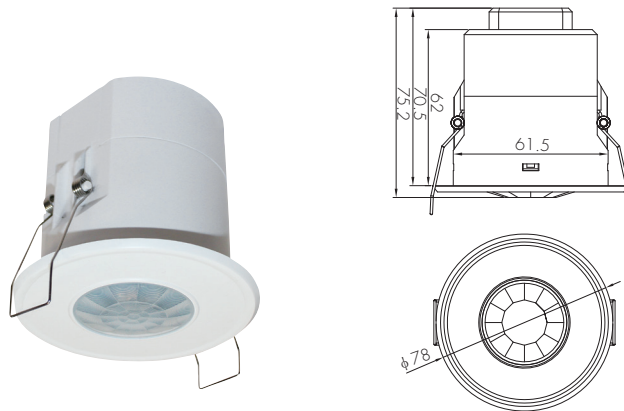

Part 3: Bluetooth Touch Panel HBP01

With the bluetooth module built in, the touch panel can be grouped with the master sensor HBHC25 and slave sensor HBIR29.

The end-user can:
1. Turn off/on the lights for a certain time
2. Select the circadiam rhythm profiles (office/classroom or healthcare)
3. Temporarily dim up or down the light brightness
4. Temporarily adjust the colour temperature of the lights
5. Select suitable scene programmed on the App for different applications
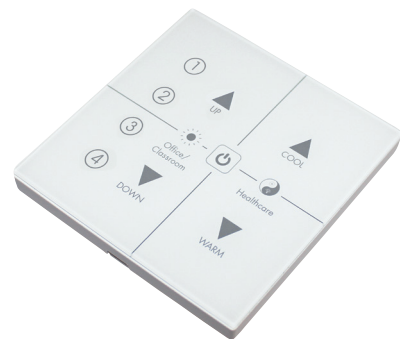
Please note that these over-ride functions are available under occupancy conditions. When the sensor times out, the automatic circadian rhythm profile will be resumed. 4 Scenes may be set up for 1-touch recall of comfort or activity settings.
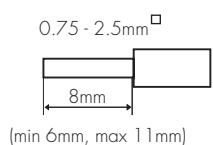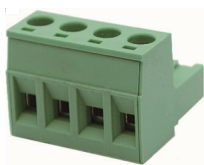

 Bluetooth®

Wiring Diagram
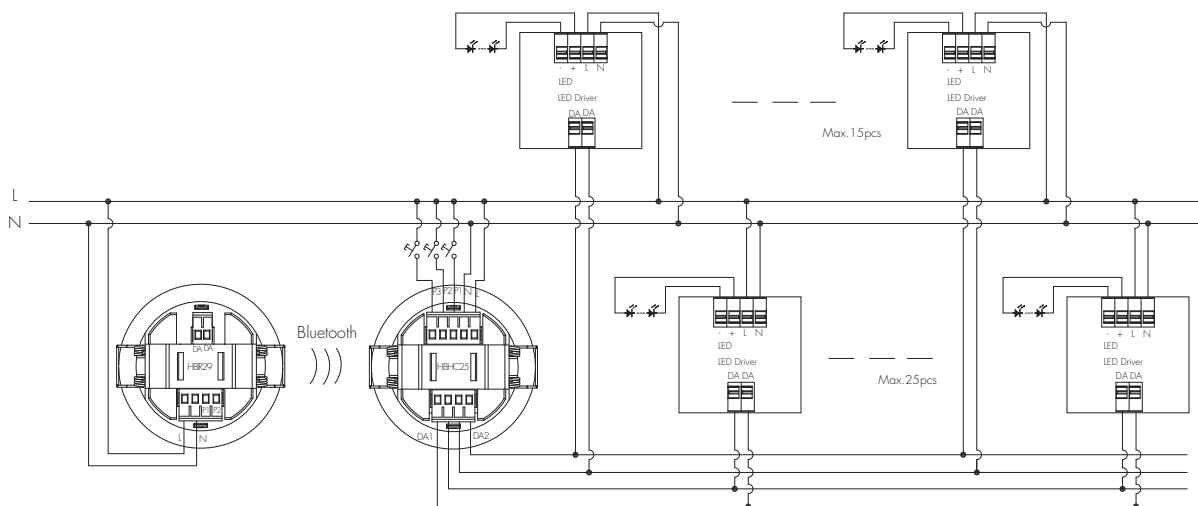
Note: DALI output & terminal P1 / P2 of HBIR29 are disabled in HCL system.
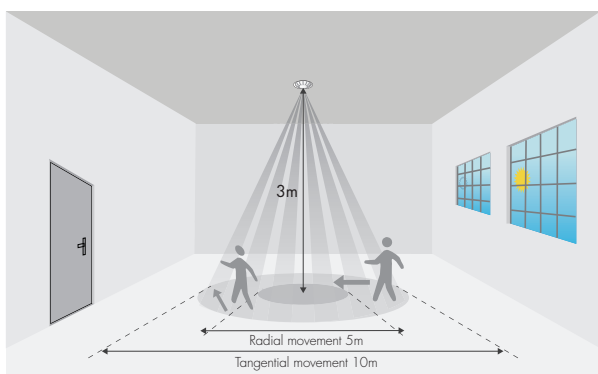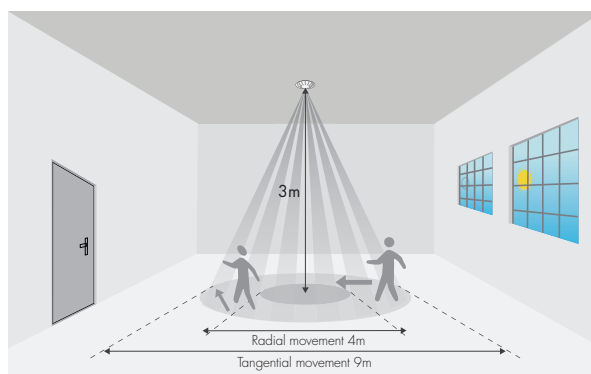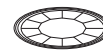
Wire Preparation

0.75 - 2.5mm$^\square$

8mm

(min 6mm, max 11mm)

Pluggable screw terminal. It is recommended to make connections to the terminal before fitting to the sensor.
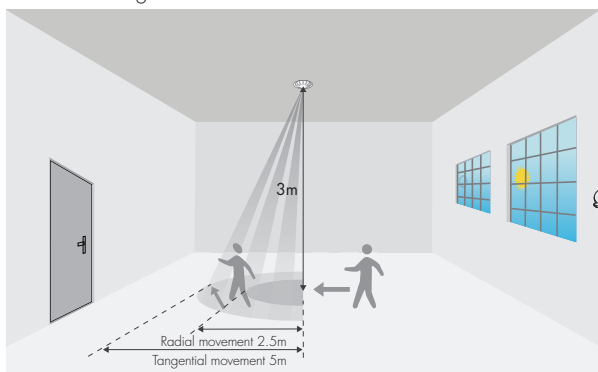
Occupancy Detection
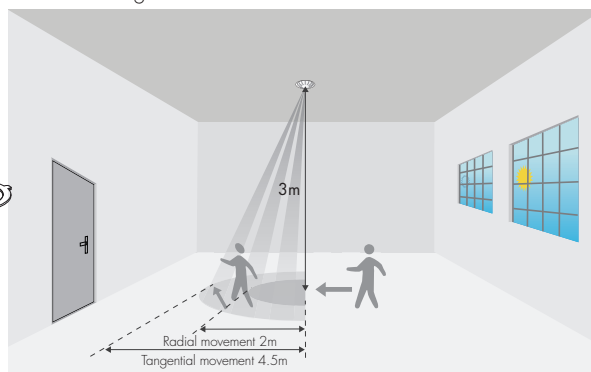
Detection range with convex lens
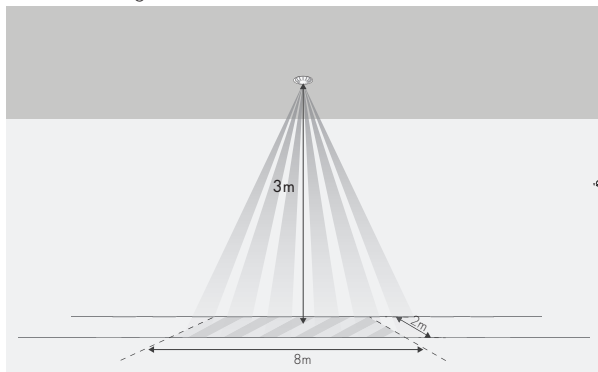
Detection range with flat lens

3m

Radial movement 5m
Tangential movement 10m

3m

Radial movement 4m
Tangential movement 9m

Detection range with convex lens and 50% Blind A

Detection range with flat lens and 50% Blind A

3m

A

Radial movement 2.5m
Tangential movement 5m

3m

Radial movement 2m
Tangential movement 4.5m

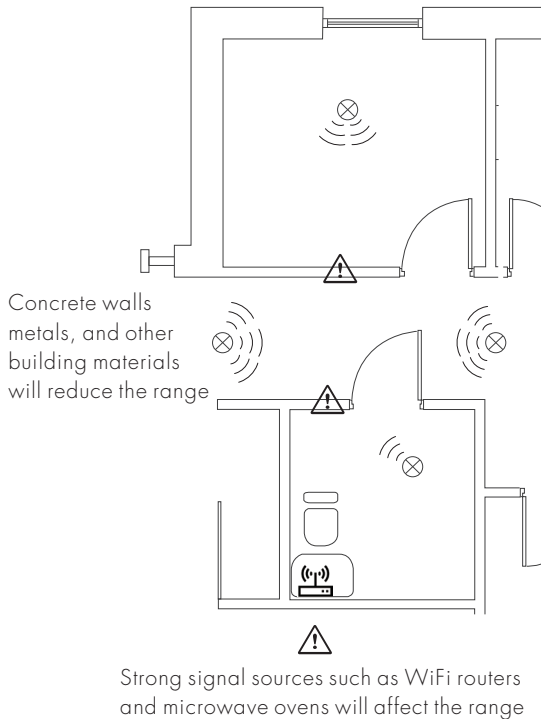Detection range with convex lens and corridor blind B

Detection range with flat lens and corridor blind B

3m

B

2m

8m

3m

2m

7m
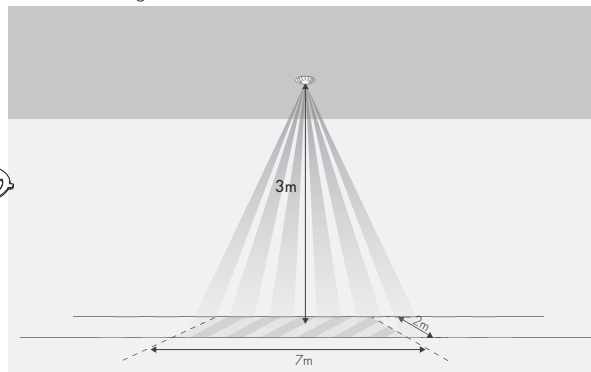
To maximise the bluetooth transmission range in every direction, the following considerations should be taken into account when situating the control base in the luminaire:

Device to Device Placement

Concrete walls metals, and other building materials will reduce the range

Strong signal sources such as WiFi routers and microwave ovens will affect the range

Device placement may offer up to 30m communication distance. However, we recommend for indoor applications that device placements should be no further apart than 15m.

Smart Phone to Device Range


6-10m   > 10m
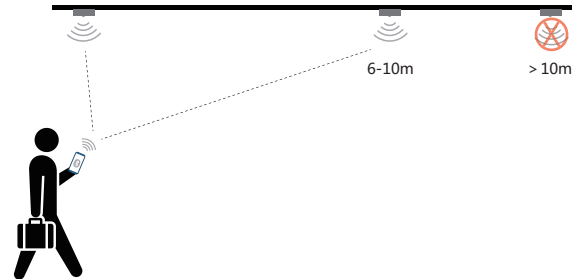
Notes:

The range for which a smart phone can communicate with the lighting points will vary from model to model and is dependant on its Bluetooth® capability.

Placement of the antenna within the luminaire will also effect the smart phone communication range and may appear different for each luminaire variant.

Finally, other environmental factors (as per opposite) will influence the ultimate achievable range of communication between smart phone and luminaire device.

Optional accessory: reinforced bluetooth antenna

For some special applications, customers may need a larger bluetooth transmission for both smart phone to device and device to device. Thanks to the reinforced bluetooth antenna, with it adding to the sensor, the transmission distance (smart phone to device) enlarges to 20m, the distance of device to device is around 50m.

Installation hole 6.5mm

Bluetooth antenna

9.5   31.2   48.7

12.7
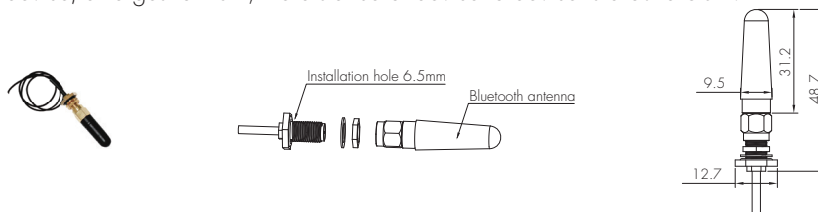
1   Circadian Rhythm Lighting

Controlled light output brightness colour appearance can enhance a user's day-to-day mood, wellbeing, productivity and attention levels. The user can select and customize the biodynamic lighting curve with pre-programmed colour (CCT) and brightness (LUX) control which automatically changes according to the time of the day.
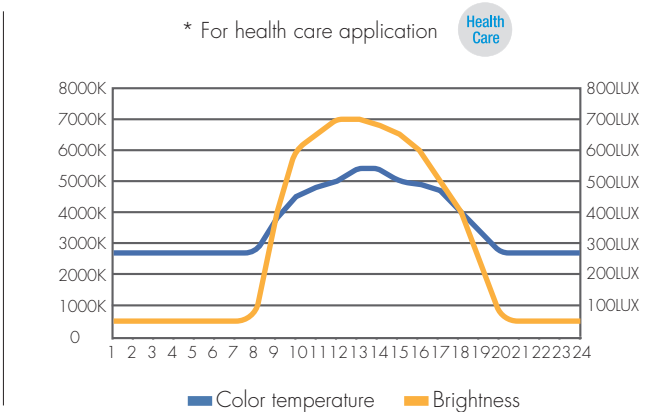
Circadian Rhythm Profiles:
A total of 2 profiles are available for selection; 1 for office application and 1 for health care purposes.

* Default profile controls for Color Control (CCT) and brightness (LUX) Control

* For office application   **Office**

Color temperature   Brightness
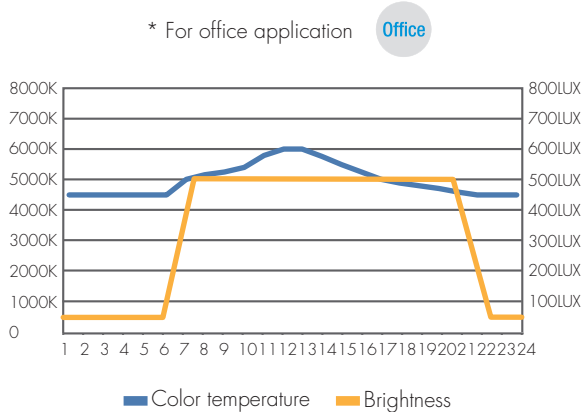
A fixed and customisable 'office' profile may be defined and selected to provide consistent lighting patterns throughout the year.

* For health care application   **Health Care**

Color temperature   Brightness

With automatic tracking of sunrise and sunset times, effective geographical adjustments are made to the healthcare mode.
* The accurate location is obtained from the Hytronik APP.

Time sustainability: Each Hytronik circadian rhythm sensor or touch panel can keep the time runing for up to 2 weeks (sensor) or 1 month (panel) during power failure.

2   Daylight Harvest and Lux Off Function

The built-in photocell performs the function of reading the natural daylight, and maintaining the lux level by calculating how much artificial light is needed according to the target lux level required by the profile preset.
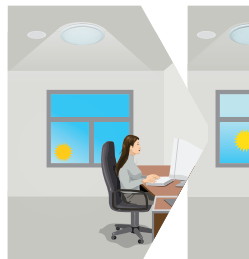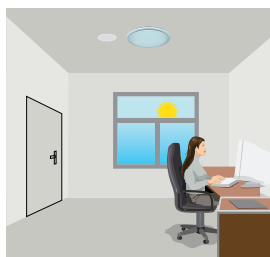
Office Application
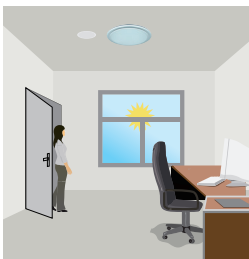
Light will not switch on when natural light is sufficient, even there is motion detected.
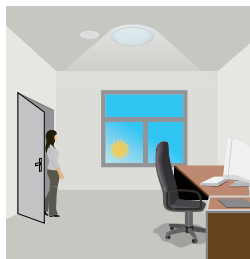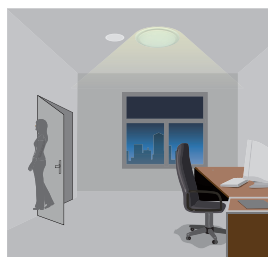
The light switches on automatically with presence when natural light is insufficient.

The light turns on at full or dims to maintain the lux level. The light output regulates accroding to the level of natural light available.

The light dims down and eventually turns off when the ambient natural light is sufficient.

The light goes to stand-by time after hold-time and stays on dimming level.

The light switches off completely after hold-time.
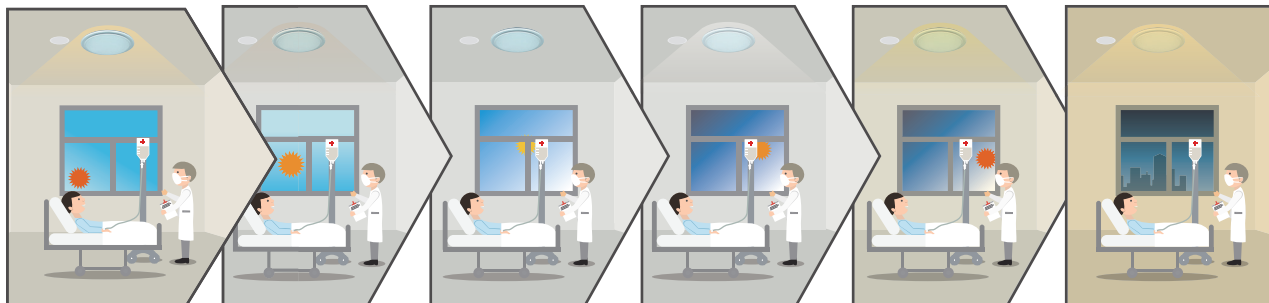
Health Care Application

08:00 10:00 12:00 Bright out 14:00 16:00 18:00

3 | 🅑 Bluetooth® Transceiver Nodes

Communication between the master sensor HBHC25, extender sensor HBIR29 and wall panel HBP01is performed wirelessly. This not only reduces system wiring complexity and costs, it is also beneficial in that the DALI power supply resources can be dedicated to the DALI DT8 LED drivers, such Hytronik HHC2045 and HHC2050L. Commissioning and programming of the system is via the Hytronik APP using a 🅑 Bluetooth® enabled smart device using Android or iOS operating systems.
Please refer to our App user guide for more details.

4 | Dual DALI Output Control

Two channels of self-powered DALI output are available on HBHC25 for connection of two groups of LED drivers. Each group can be set to support different circadian rhythm profiles on the App. Please note that both channels share the same control settings sent from the occupancy sensor and photocell.

System Capacity	DALI channel	DT8 Driver = 2mA
HBHC25 includes 2 channels total 80mA max. DALI PSU	DALI PSU Channel 1 (max 50mA)	25
	DALI PSU Channel 2 (max 30mA)	15

5 | Manual Override (Push Function)

Three push terminals (P1, P2, P3) are available on the HBHC25 master sensor for end-users to switch on/off or change the light brightness and colour temperature of the two DALI channels temporarily. The settings will revert to the automatic timing profile (circadian rhythm mode) after sensor time-out.

* Long push on P1: adjust the hold-time light brightness of DALI channel 1;
  Short push (<1s) on P1: on/off function
* Long push on P2: adjust the hold-time light brightness of DALI channel 2;
  Short push (<1s) on P2: on/off function
* Long push on P3: cycles through colour tuning on both channels.
 Short push (<1s) on P3: resume automatic circadiam rhythm mode .

*Note:

The push inputs are fixed by hardware and are not configurable in the app.

App information

HBHC25 Device Settings

The HBHC 25 has unique settings which are configurable per device. The screen below is accessed via the device settings option and selecting the HBHC25. The titled settings are compressed and expanded as such:

Compressed settings menu

1. Expanded device base settings

2. Sensor base settings

3.Profile base settings
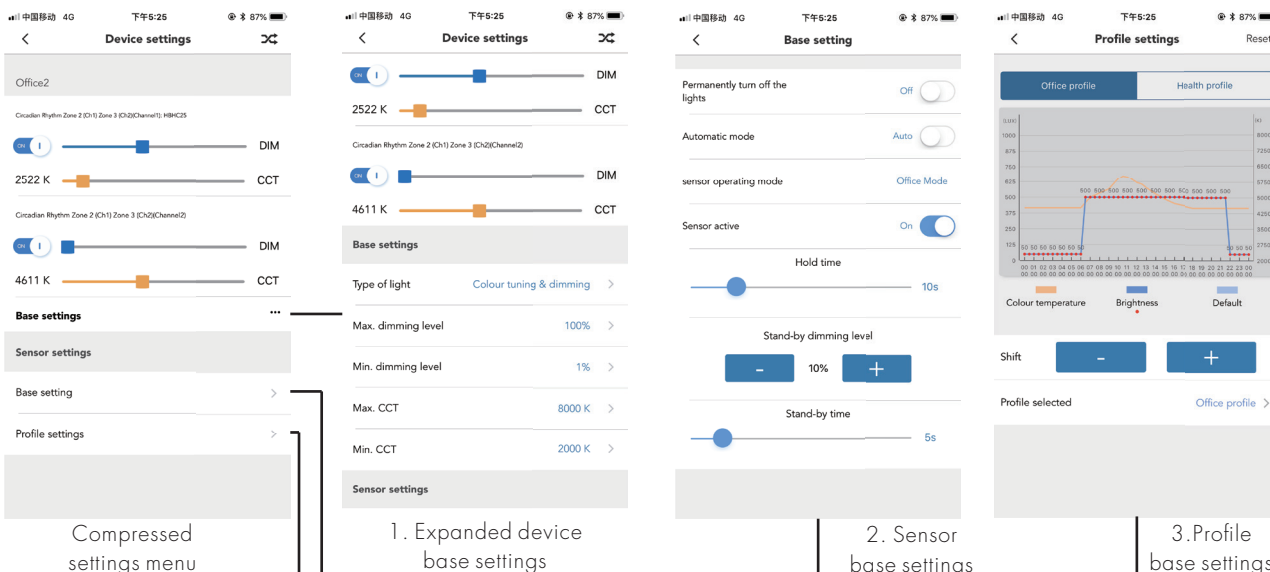
1. Device base settings

These settings are fully covered in the sensor app user guide. A dimming & CCT slider and on/off control is provided for each channel

2. Sensor base settings
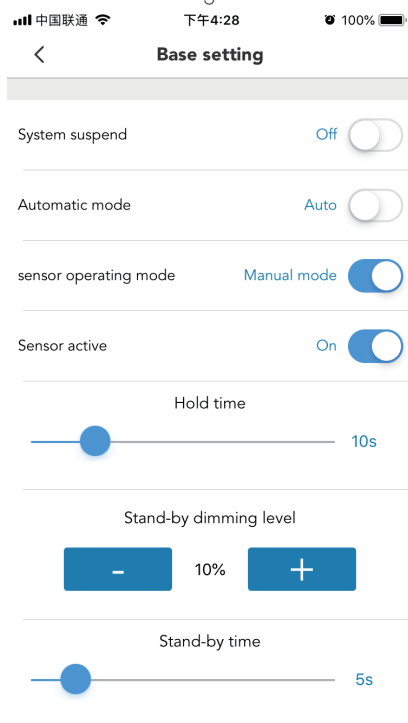
If this option is enabled, both occupancy and daylight sensors are disabled and the lights will remain off until a manual input from switches P1-P3, the HBP01or the app. After the lights are re-started, the system resumes fully automatic mode. The function may be used if the installation is unoccupied during a holiday period, for example.

Auto/semi-auto mode. Also known as 'abscence detection', this function is similar to the above, but the system will always require a manual re-start after the sensor times out (i.e. when the lights turn off, only a manual input can re-start the lights).

Select between office and healthcare pre-dined default profiles.

In office mode, any manual adjustment will be cleared after sensor time out and the automatic profile restored.

In healthcare mode, any manual adjustments will be cleared and restored with the profile setting at midnight

Enable or disable the occupancy sensor. The daylight sensor remains active and the automatic profile is still followed.

Set the time to keep the lights on after the last person leaves the detector area.

After the hold time expires, the light can be programmed to remain on at a fixed dimming level, here called the stand-by mode. Choose the dimming level and the period of time desired to keep the lights in the stand-by mode. If infinity is selected the lights will remain in the stand-by mode until the occupancy sensor is operated again.

*Notes :

HBHC25 will only connect to HBP01 & HBIR29 devices in the mesh network.

It is not possible to 'sensor link' HBHC25 with other HBHC25.

The push inputs P1-P3 are fixed by hardware and are not configurable in the app.
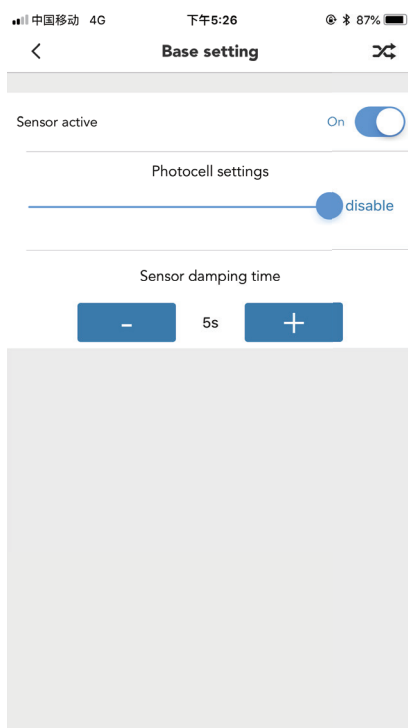
Other schedule timers are not selsectable for use with HBHC25

3. Profile settings

These settings are fully covered in the sensor app user guide.

HBIR29 Device Settings

Enable or disable the occupancy sensor. The daylight sensor remains active and the automatic profile is still followed.

Enable or disable the daylight sensor. The daylight sensor has priority over the occupancy sensor and can prevent unwanted switching if the occupied area has sufficient natural daylight.

After occupancy detection, the sensor can be delayed from operating again for a short time period to reduce communication congestion on the mesh network and also reduces the possibilities of mis-communication if 2 system sensors are triggered simultaneously.

HHC2045 and HHC2050L are specially designed to work with the Hytronik Human Centric sensors. Dual channel tunable white LED driver for accurate white balance and intensity control.

Features

Can be commissioned by standard DT8 broadcast command to adjust light brightness and colour temperature (HHC2050L)

Tunable White

Linear Dimming

Configurable Constant Current (CC) Output via Dip-Switch

Stand-by power < 0.5W

Active PFC Design

Thermal Cut-out Protection

Short Circuit Protection   } All with Auto-restart

Over-load Protection
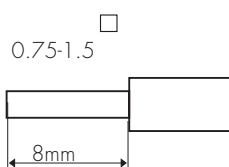
5 Year, 50,000hr Warranty
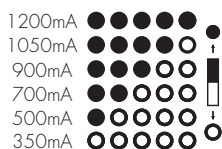
HHC2045

HHC2050L

Wire Preparation

0.75-1.5

8mm

Solid or Stranded wire type 0.75 - 1.5mm². To make or release the wire from the terminal, use a screwdriver to push down the button.

LED Current Selection (HHC2045)

1200mA
1050mA
900mA
700mA
500mA
350mA

Warning: Please make sure the correct current is selected before starting the driver!

Loading and In-rush Current
HHC2045 & HHC2050L

Inrush Current (Imax.)	53A
Pulse Time	36 µs

LED Current (HHC2050L)

Single current 1.05A, can be customized.

Number of Drivers
16A Circuit Breaker HHC2045 & HHC2050L

Type B	37

Conversion table for max. quantites 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.
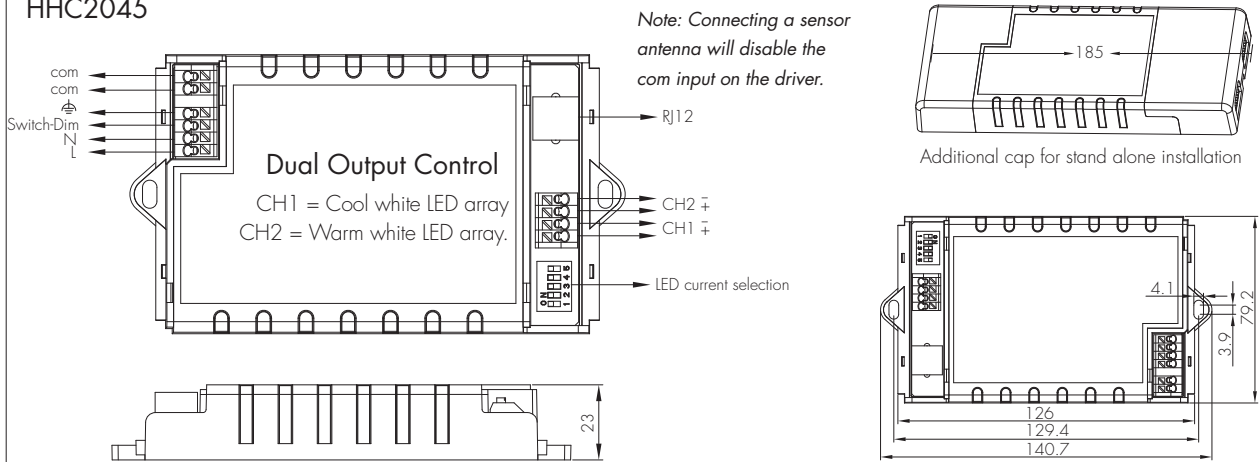
Load distribution

Each channel can supply the maximum load and white balance can be controlled as such:

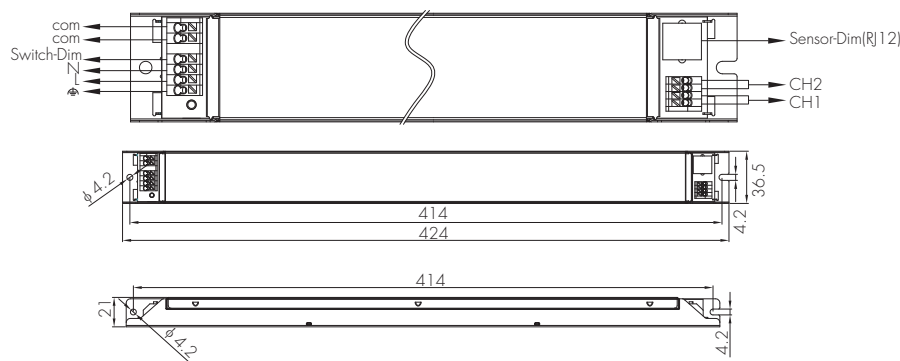| Colour Temperature	Cool White	Neutral White	Warm White
HHC2045 Power Distribution	CH1=45W, CH2=0W	CH1=22.5W, CH2=22.5W	CH1=0W, CH2=45W
HHC2050L Power Distribution	CH1=50W, CH2=0W	CH1=25W , CH2=25W	CH1=0W, CH2=50W

Dimensions and Terminals

HHC2045

com
com
Switch-Dim
N
L

Dual Output Control
CH1 = Cool white LED array
CH2 = Warm white LED array.

Note: Connecting a sensor antenna will disable the com input on the driver.

RJ12

CH2 ∓
CH1 ∓

LED current selection

185

Additional cap for stand alone installation

126
129.4
140.7

79.2
4.1
3.9

23

HHC2050L

com
com
Switch-Dim
N
L

Note: Connecting a sensor antenna will disable the com input on the driver.

Sensor-Dim(RJ12)

CH2
CH1

Dual Output Control
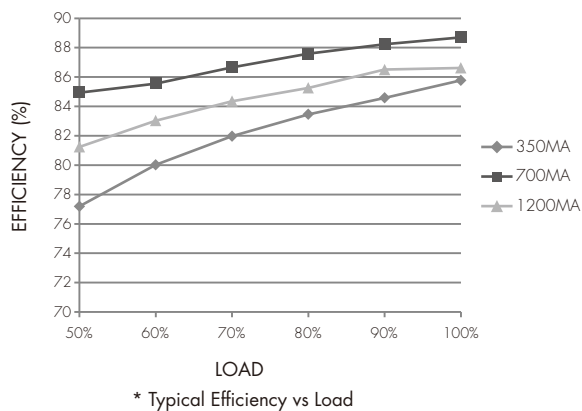CH1 = Cool white LED array
CH2 = Warm white LED array.

ø4.2
414
424
36.5
4.2

414
21
ø4.2
4.2

Technical Data

Input	Mains Voltage	220~240VAC 50/60Hz
	Mains Current	0.22~0.2A(HHC2045); 0.3-0.25A(HHC2050L)
	Power Factor	0.95
	Max. Efficiency	85%
	Dielectric Strength	Input→Output : 3000VAC
	Leakage Current	< 0.25mA
Output	Power/Current/ Voltage Range (HHC2045)	20W/350mA/10~56V 28W/500mA/10~56V 40W/700mA/10~56V 45W/900mA/10~50V 42W/1050mA/10~40V 40W/1200mA/10~34V
	Power/Current/ Voltage	50W/1.05A/12-48V (HHC2050L, can be customized)
	Output power handling	Channel 1 (CH1) + Channel 2 (CH2) = 45W (HHC2045)/50W (HHC2050L) max.
	Output channel function	CH1 = Cool white CH2 = Warm White
	Ripple Current	<3%
	Uout Max.	75V(HHC2045); 70V(HHC2050L)
	Turn-on Time	< 0.5s
Environment	Operation Temp.	Ta: -20~+50℃
	Case Temp. (Max.)	80℃
	IP Rating	IP20
Safety and EMC	EMC standard	EN55015, EN61547, EN61000-3-2, EN61000-3-3
	RED standard	EN300328, EN301489-1, EN301489-17
	Safety standard	EN61347-1,EN62493,EN61347-2-13
	Certifications	CB, CE , EMC, RCM

Linear Colour Tuning Profile

Warm White (Min. 2700K)

Neutral (4000K)

Cool White (Max. 6500K)

Recommended CCT range

Inner ring
cool white (CH1)

Outer ring,
warm white (CH2)
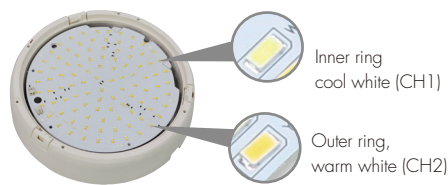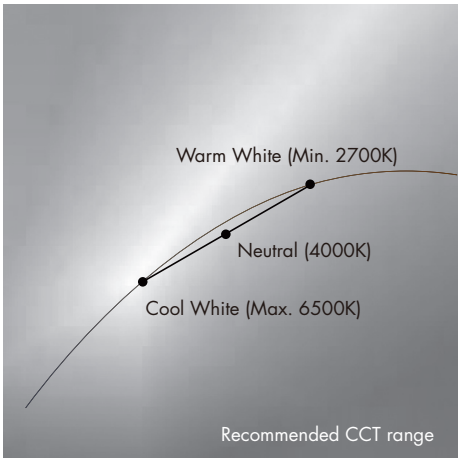
Performance Characteristics

EFFICIENCY (%)

LOAD

- 350MA
- 700MA
- 1200MA

* Typical Efficiency vs Load

PF

LOAD

- 240V
- 230V
- 220V

* Typical Power Factor vs Load
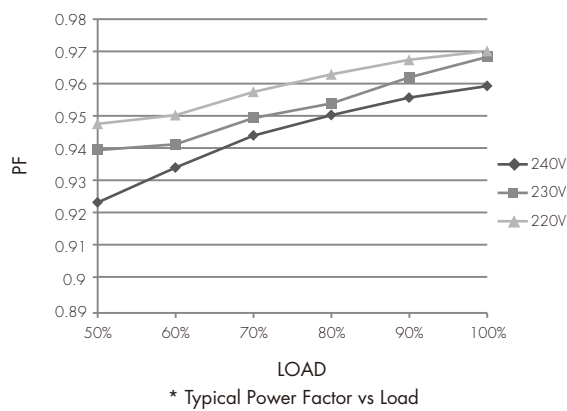
Dimming Characteristics

Light output [%]

Digital light value

Com Dimming Curve