

HIR13x and HIR16 PIR Sensor Head



## Applications

These PIR sensor heads are specially designed for highbay and lowbay luminaire designs and are supported by the circadian rhythm profiling accessed from the Hytronik sensor app. Offering IP64 and IP65 miniaturised designs, they allow the luminaire designer freedom of placement for high performance lighting controls with aesthetically pleasing results. They work with HCD038 DALI base units connected to DALI DT8 LED drivers, or for further space and cost savings, connect directly with our HHC range of tunable white LED drivers. They are easily set-up and commissioned using the Hytronik sensor app.

### HIR13/S

IP64 surface mounting PIR unit (fascia only) with daylight harvest photocell. Up to 12m mounting height for highbay applications.



### HIR13/F

IP64 PIR unit (fascia only) with daylight harvest photocell and flush mount fixing ring. Up to 12m mounting height for highbay applications.



### HIR13/C

IP64 PIR unit (fascia only) with daylight harvest photocell. Features moulded threaded bolt for screw fixing to the luminaire. Up to 12m mounting height for highbay applications.



### HIR16

IP65(lens part) PIR sensor heads with daylight harvest photocell. Flush mount fixing and low profile design. HIR16 designed or up to 15m highbay luminaire designs.



## Technical Data For Sensor Heads

PIR Sensor Properties	
Sensor principle	PIR detection
Operation voltage	5VDC
Detection range *	HIR13x (Ø x H) 16m x 12m HIR16 (Ø x H) 18m x 6m x 15m
Detection angle	360°

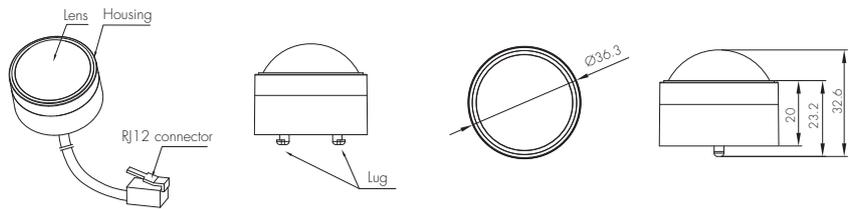
\* The detection range is heavily influenced by antenna placement (angle of approach) and different walking paces. It may be reduced under certain conditions.

## Dimensions

### PIR sensor heads

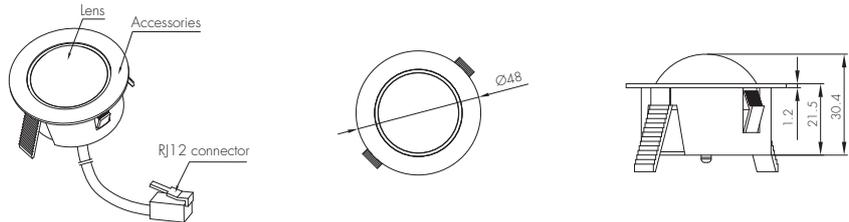
#### A. HIR13/S

Surface mounting  
Daylight harvest  
For highbay application  
IP64(lens part)  
The cable length is around 30cm.



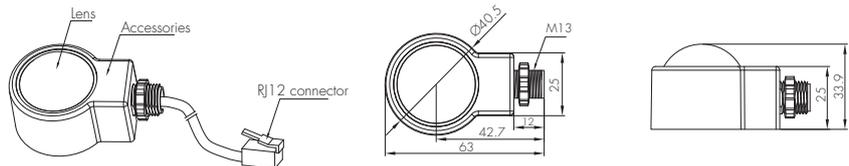
#### B. HIR13/F

Flush mounting  
Daylight harvest  
For highbay application  
IP64(lens part)  
The cable length is around 30cm.



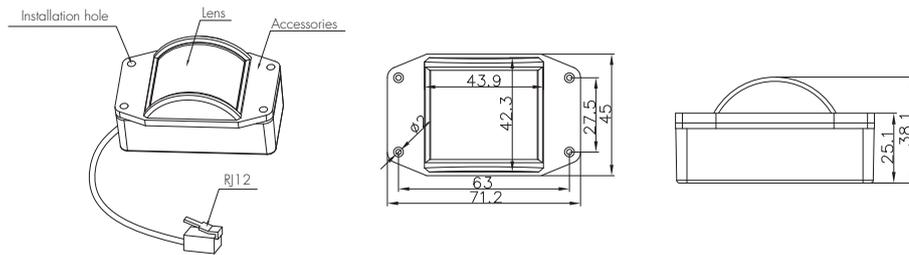
#### C. HIR13/C

Screw to the luminaire by conduit  
Daylight harvest  
For highbay application  
IP64(lens part)  
The cable length is around 30cm.



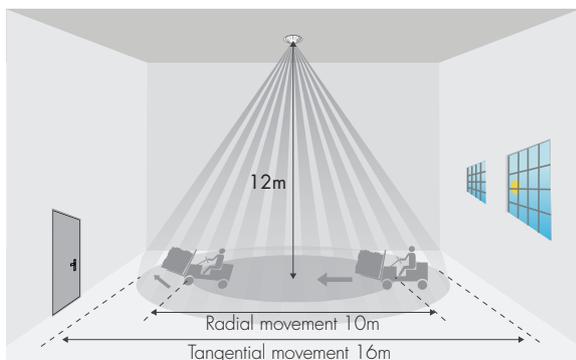
#### D. HIR16

PIR sensor head  
Daylight harvest  
For highbay application  
IP65(lens part)  
The cable length is around 30cm.

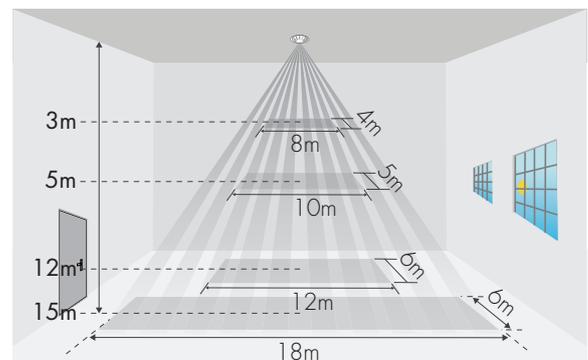


## Occupancy Detection

### HIR13x



### HIR16



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

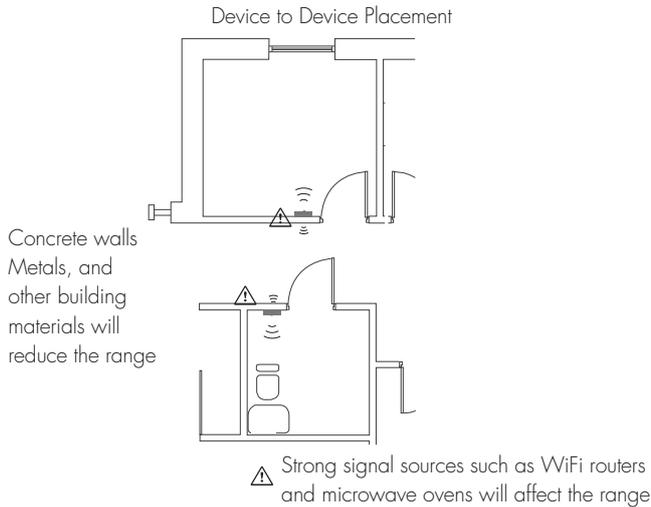
## Placement Guide and Typical Range

### Network Considerations:

The recommended maximum distance between sensor is 20m.

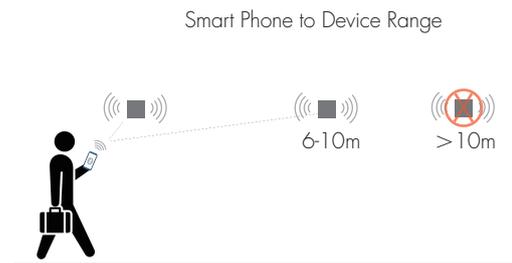
Please be aware that building materials such as concrete and sheet steel will effect the range achievable when installed.

Other forms of interference which may affect the range include WiFi routers, microwave ovens and other such sources which emit strong signals should be taken into consideration when installing.



The smart device with the App installed will have a typical range of 10m, but varies from device to device. During commissioning, the installer will need to be in range of the devices when searching for devices to add to the network.

Once the devices have been added to the network via the App, the devices will start communicating within the wireless mesh. This means that once the network is complete, all devices are accessible from the smart device when in a 20m range of a single point.



### 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 head, the transmission distance (smart phone to device) enlarges to 20m, the distance of device to device is around 50m.



### 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.

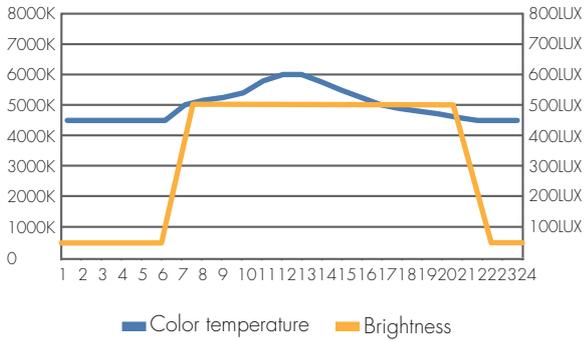
#### Circadian Rhythm Profiles:

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

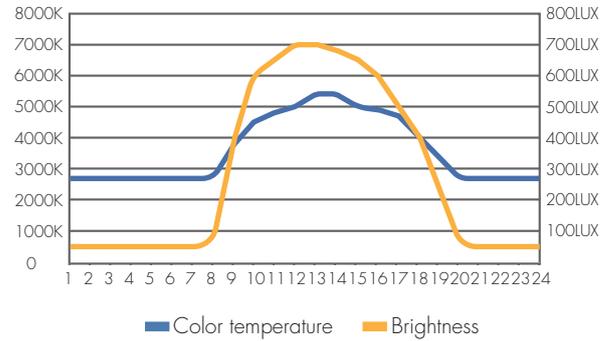
Office



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



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: The circadian rhythm sensor (HIR16) and touch panel can keep the time running for up to 1 month 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.



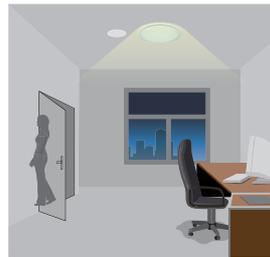
The light switches on automatically with presence when natural light is insufficient.



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



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

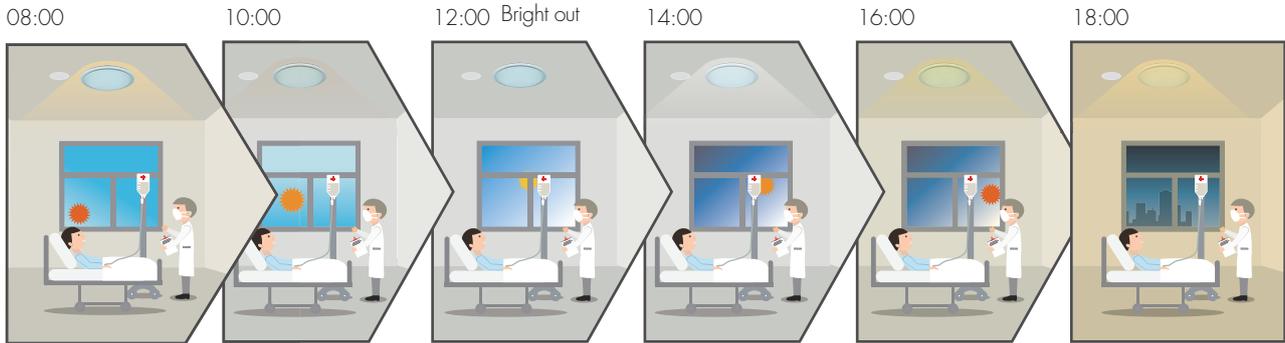


The light goes to stand-by time after hold-time and stays on dimming level.



The light switches off completely after hold-time.

## Health Care Application



### 3 Bluetooth® Transceiver Nodes

Communication between the sensor head HIR13x, HIR16 and wall panel HBPO1 is 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 as 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.

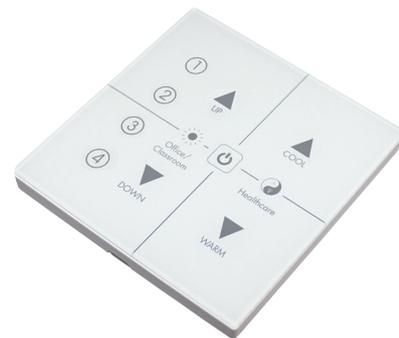
## Bluetooth Touch Panel HBPO1

With the bluetooth module built in, the touch panel can be grouped with the sensor head HIR13x and HIR16.

The end-user can:

1. Turn off/on the lights for a certain time
2. Select the circadian 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.



## Using HIR13x and HIR16 with HCD038 / HCD038/P

### HCD038 / HCD038/P DALI Control Base

A Bluetooth transceiver node with DALI output, the linear shape control base HCD038 / HCD038/P can be built behind the PCB board. It is also perfect for applications where space is restricted for cables and externally mounted lighting controls. Features manual switch input and port for a range of miniature antennas.



Bluetooth® 5.0 SIG mesh wireless lighting control with DALI output

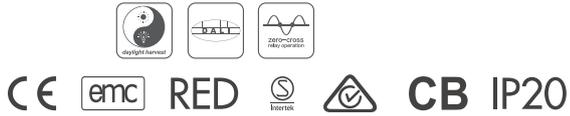
### Features

- 30mA broadcast DALI output for up to 15 LED drivers per node (HCD038)  
80mA broadcast DALI output for up to 40 LED drivers per node (HCD038/P)
- Daylight harvest function to regulate light output for maintaining required lux level
- Tri-level dimming control based upon occupancy (also known as corridor function)
- Switch-Dim with synchronization for simple manual over-ride
- Permanent settings memory, protected against loss of power
- 5 Year, 50,000hr warranty

## Technical Data For Control Base

Input Characteristics	
Mains voltage	220~240VAC 50/60Hz
Stand-by power	<0.5W
Load ratings:	30mA (max. 15 devices) - HCD038 80mA (max. 40 devices) - HCD038/P
Warming-up	20s

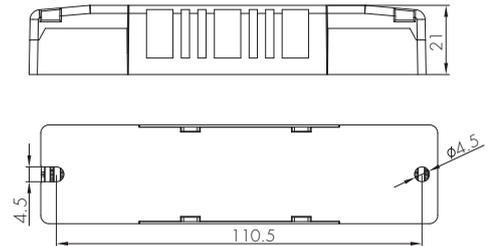
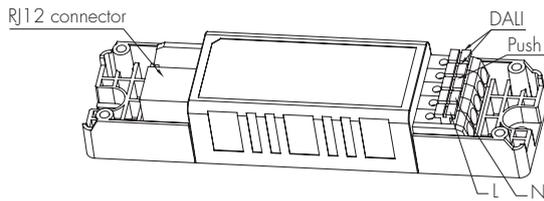
Safety and EMC (Common Data)	
EMC standard (EMC)	EN55015, EN61000, EN61547
Safety standard (LVD)	EN60669, AS/NZS60669
Radio Equipment (RED)	EN300440, EN301489 EN62479, EN300328
Certification	Semko, CB, CE, EMC, RED, RCM



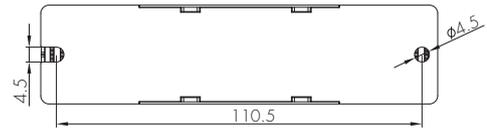
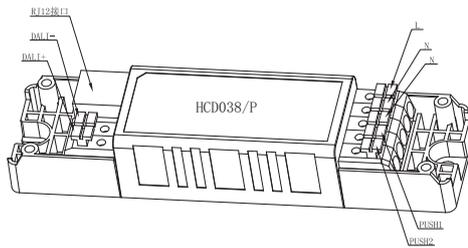
Environment	
Operation temperature	Ta: -20°C ~ +55°C
Case temperature (Max.)	Tc: +80°C
IP rating	IP20

## Dimensions and Terminals

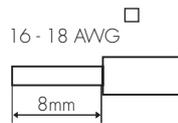
### HCD038



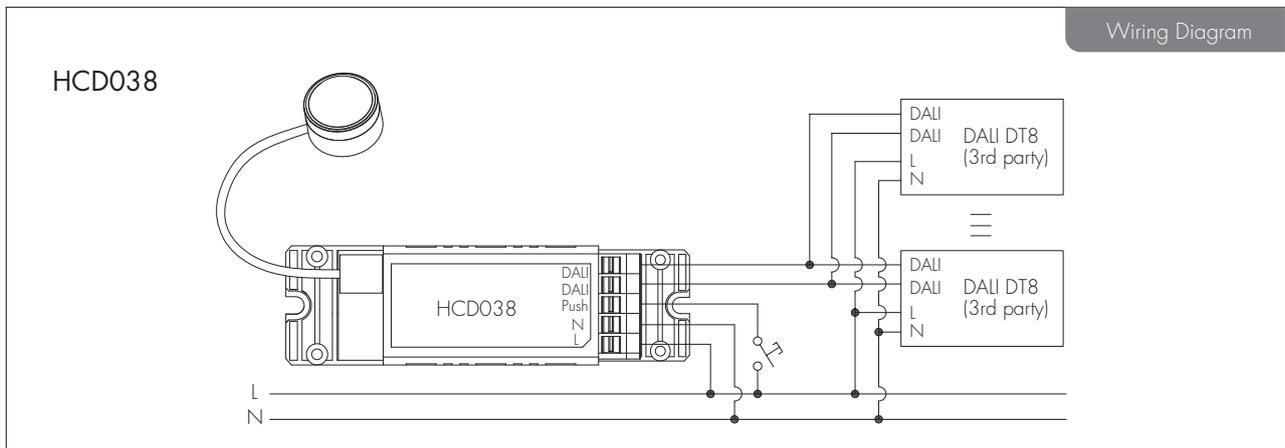
### HCD038/P

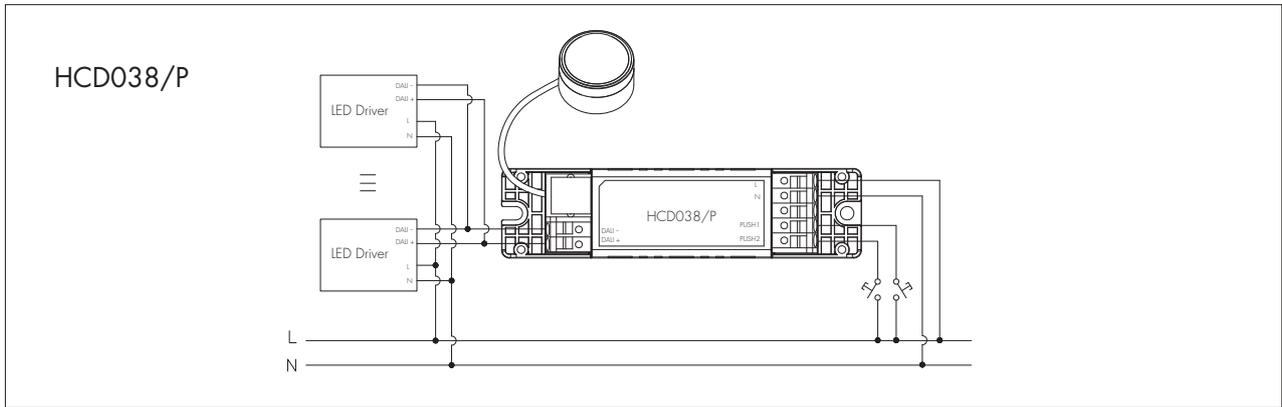


### Wire Preparation



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





### Manual Override ('Push' Terminal)

The 'push' terminal reserves the access of manual override function for the end-user to switch on/off, or adjust the brightness and CCT levels by retractive push-switch. Furthermore, entire groups of fixtures may be wirelessly controlled by a single switch. Please refer to the App user guide for further information.

- \* Short Push (<1s): In app defined as 'single click' - Permanent on/off function; can also be configured to recall a scene selection.
- \* Short double Push (<1s - <1s) - In app defined as double click' - configurable as scene recall or resume selected circadian rhythm mode.
- \* Long Push (>1s): In app defined by the 'Input type' - Brightness level adjustment or color tuning.

Notes:

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- 2) The switch functions are configured in the App.
- 3) The push terminal may be left unconnected if no manual control is required.

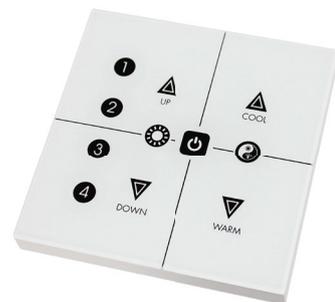
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Bluetooth®

### Hytronik Tunable White LED Drivers for Human Centric Lighting System

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



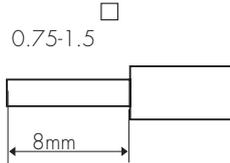
HHC2045

-  Thermal Cut-out Protection
  -  Short Circuit Protection
  -  Over-load Protection
  -  5 Year, 50,000hr Warranty
- } All with Auto-restart



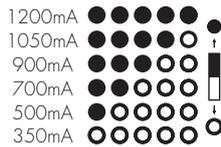
HHC2050L

### Wire Preparation



Solid or Stranded wire type 0.75 - 1.5mm<sup>2</sup>.  
To make or release the wire from the terminal, use a screwdriver to push down the button.

### LED Current Selection (HHC2045)



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

### LED Current (HHC2050L)

Single current 1.05A, can be customized.

### Loading and In-rush Current

HHC2045 & HHC2050L

Inrush Current (I <sub>max.</sub> )	53A
Pulse Time	36 μs

### Number of Drivers

16A Circuit Breaker HHC2045 & HHC2050L

Type B	22
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### 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.

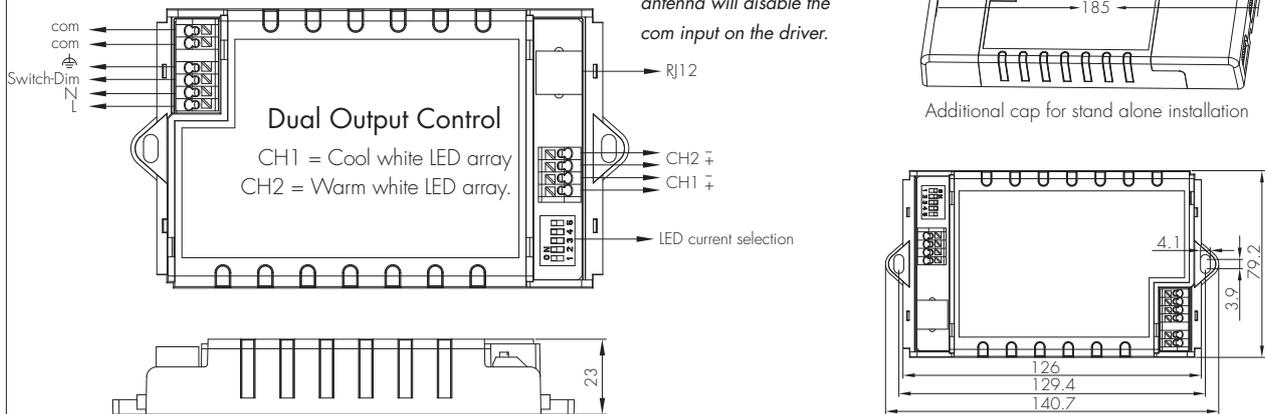
### Load distribution

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

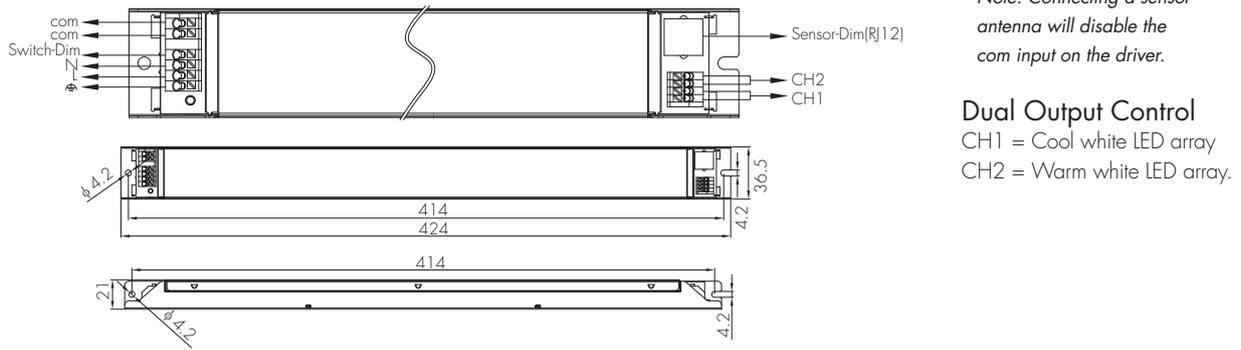
	Colour Temperature	Cool White	Neutral White	Warm White
HHC2045	Power Distribution	CH1=45W, CH2=0W	CH1=22.5W, CH2=22.5W	CH1=0W, CH2=45W
HHC2050L	Power Distribution	CH1=50W, CH2=0W	CH1=25W, CH2=25W	CH1=0W, CH2=50W

## Dimensions and Terminals

### HHC2045



### HHC2050L



## 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)
Environment	Operation Temp.	Ta: -20~+50°C
	Case Temp. (Max.)	80°C
	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

## Manual Override ('Push' Terminal)

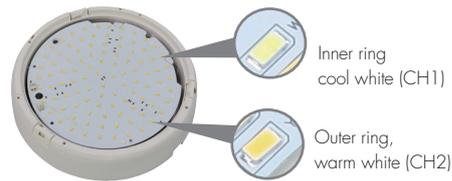
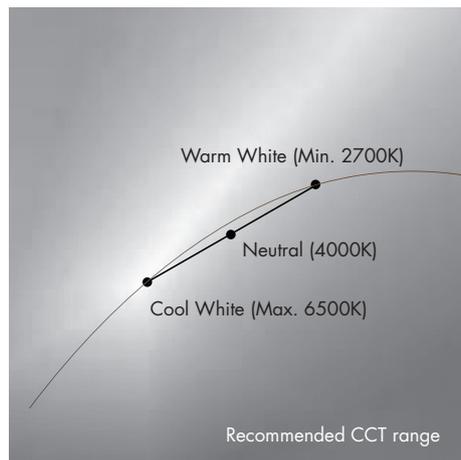
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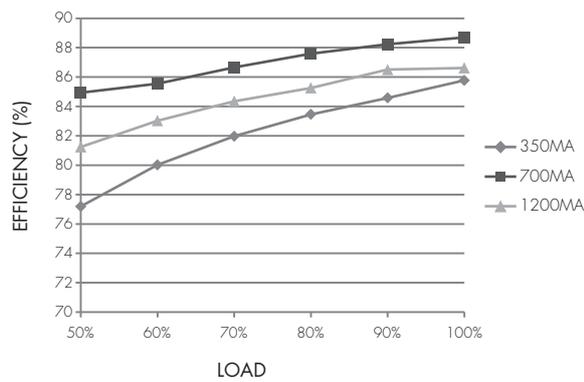
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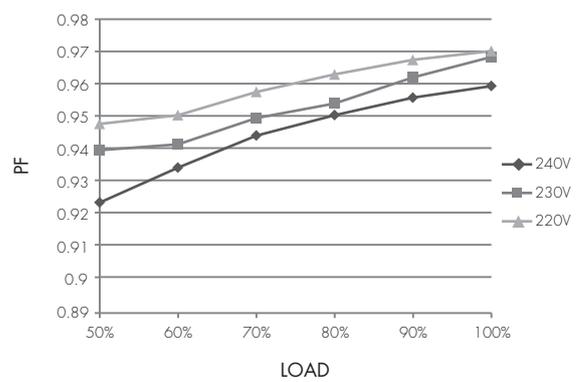
## Linear Colour Tuning Profile



## Performance Characteristics

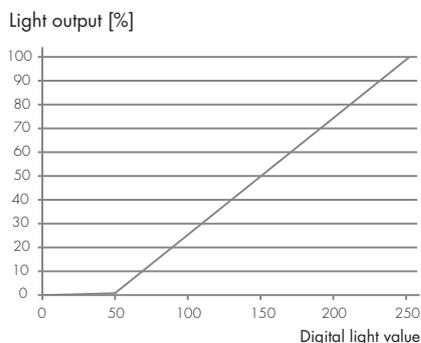


\* Typical Efficiency vs Load



\* Typical Power Factor vs Load

## Dimming Characteristics



Com Dimming Curve