

PIR Standalone Motion Sensor with Bluetooth® 5.0 SIG Mesh

HBIR29
Low-bay

HBIR29/R
Reinforced Low-bay

HBIR29/W
Wide range Low-bay

HBIR29/H
High-bay

HBIR29/RH
Reinforced High-bay

HBIR29/UH
Ultra high-bay

HYTRONIK®



Product Description

HBIR29 series are Bluetooth PIR standalone motion sensors with one DALI channel output (80mA DALI power supply built in). It is ideal for typical indoor applications such as office, classroom, healthcare and other commercial areas. With Bluetooth wireless mesh networking, it makes communication between luminaires much easier without time-consuming hardwiring, which eventually saves costs for projects (especially for retrofit upgrade projects!). Meanwhile, simple device setup and commissioning can be done via **Koolmesh®** app.

App Features

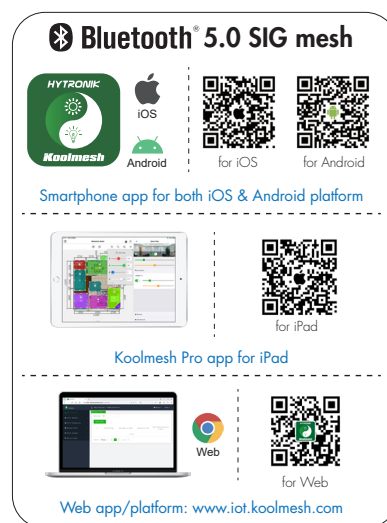
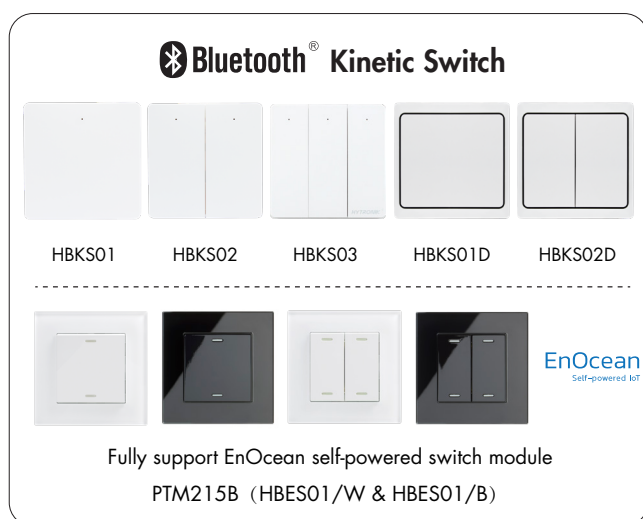
- Quick setup mode & advanced setup mode
- Web app/platform for project deployment & data analysis
- Koolmesh Pro app on iPad for on-site configuration
- Floorplan feature to simplify project planning
- coming soon
- One-key device replacement
- Device social relations check
- Staircase function (primary & secondary)
- Remote control via gateway support HBGW01
- Heat map
- Dynamic daylight harvest auto-adaptation
- Grouping luminaires via mesh network
- Scenes
- Dusk/Dawn photocell (Twilight function)
- Tri-level control
- Daylight harvest
- Circadian rhythm (Human centric lighting)
- Push switch configuration
- Detailed motion sensor settings
- 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
- Compatible with EnOcean BLE switches



- Internet-of-Things (IoT) featured
- Device firmware update over-the-air (OTA)
- Continuous development in progress...

Hardware Features

- 80mA DALI broadcast output
- Support to control DT8 LED drivers
- Support D4i driver and collect energy, fault & diagnostics data
- RTC retains timekeeping for about 10 days during power loss
(For optimal performance, install the device facing down and at around 25°C. Prolonged exposure to direct outdoor sunlight may reduce RTC time to 2 days.)
- 2 Push inputs for flexible manual control
- Black & White & Gray metal surface mount box options
- Two types of blind inserts / blanking plates
- User-friendly design for installation
- High bay version available (up to 21m in height)
- 5-year warranty



Technical Specifications

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

Input & Output Characteristics	
Operating voltage	220~240VAC 50/60Hz
Stand-by power	<1W
Switched power	Max.80mA
Warming-up	20s

Sensor Data	
Sensor Model	PIR detection
HBIR29	Installation Height : 6m Detection Range(Ø) : 9m
HBIR29/R	Installation Height : 6m Detection Range(Ø) : 10m
HBIR29/W	Installation Height : 6m Detection Range(Ø) : 18m
HBIR29/H	Installation height: 1.5m (forklift) 12m (person) Detection range (Ø): 24m
HBIR29/RH	Installation height: 20m (forklift) 12m (person) Detection range (Ø): 40m
HBIR29/UH	Installation height: 21m Detection range (Ø): 28m
Sensitivity	10% 30% 50% 75% 100%
Detection angle	360°

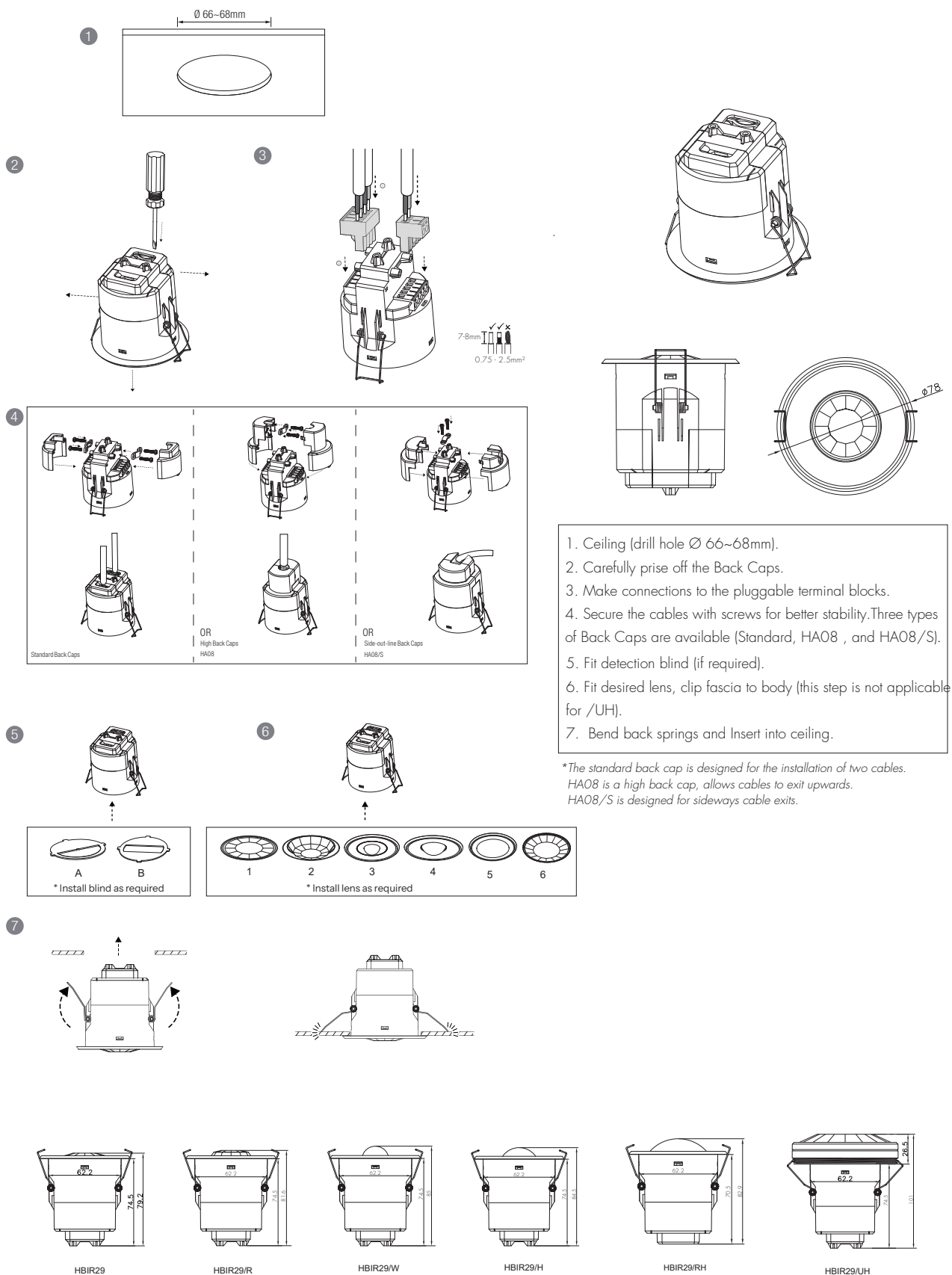
Safety & EMC	
EMC standard (EMC)	EN55015, EN61000, EN61547
Safety standard (LVD)	EN60669-1, EN60669-2-1 AS/NZS60669-1/-2-1
RED	EN300328, EN301489-1/-17
Certification	CB, CE, EMC, RED, RCM

Environment	
Operation temperature	Ta: -20°C ~ +50°C
IP rating	IP20
IP rating (facial part)	IP54

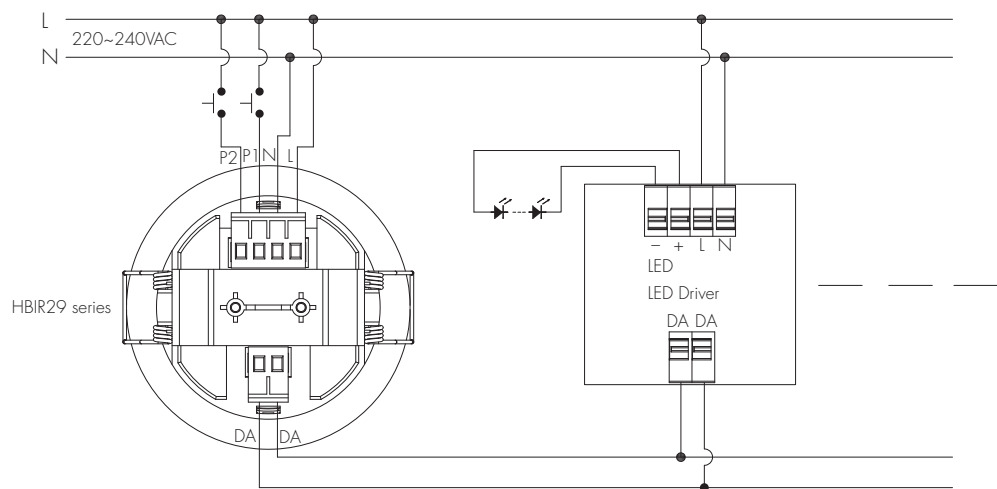
* IP54 (facial part) only for lens of standard, /R, /H, /UH

* For more details of detection range, please refer to "detection pattern" section.

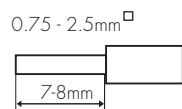
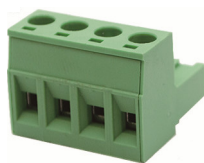
Mechanical Structure



Wiring Diagram



Wire Preparation



Pluggable screw terminal. It is recommended to make connections to the terminal before fitting to the sensor.

- 1. 200 metres (total) max. for 1 mm² CSA (Ta = 50°C)
- 2. 300 metres (total) max. for 1.5 mm² CSA (Ta = 50°C)

Detection Pattern & Optional Accessories

Placement Guide and Typical Range

Smart Phone to Device Range



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.

1. HBIR29 (Low-bay)

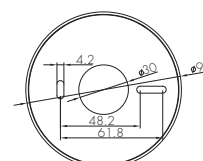
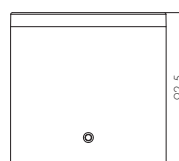


HBIR29: Low-bay flat lens detection pattern for **single person** @ $T_a = 20^\circ\text{C}$

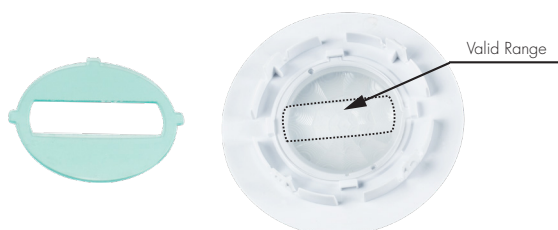
(Recommended ceiling mount installation height **2.5m-6m**)

A: Tangential movement	B: Radial movement	Mount height	Tangential (A)	Radial (B)
		2.5m	max 50m ² (Ø = 8m)	max 13m ² (Ø = 4m)
		3m	max 64m ² (Ø = 9m)	max 13m ² (Ø = 4m)
		4m	max 38m ² (Ø = 7m)	max 13m ² (Ø = 4m)
		5m	max 38m ² (Ø = 7m)	max 13m ² (Ø = 4m)
		6m	max 38m ² (Ø = 7m)	max 13m ² (Ø = 4m)

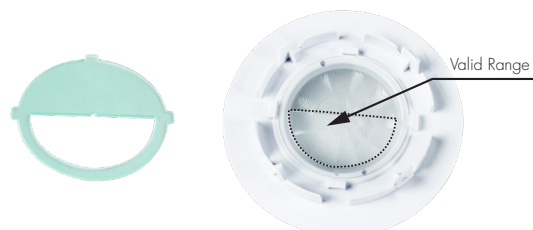
Optional Accessory --- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



Optional Accessory --- Blind Insert for Blocking Certain Detection Angles



Blind Option 1 --- Aisle Detection



Blind Option 2 --- 180° Detection

2. HBIR29/R (Reinforced Low-bay)

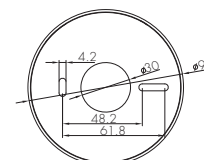
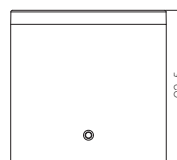
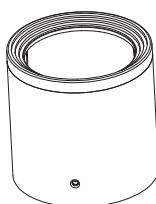


HBIR29/R: Low-bay convex lens detection pattern for **single person** @ $T_a = 20^\circ\text{C}$

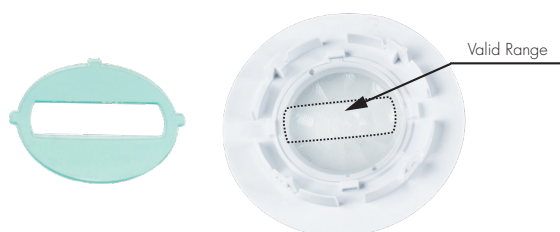
(Recommended ceiling mount installation height **2.5m-6m**)

A: Tangential movement	B: Radial movement	Mount height	Tangential (A)	Radial (B)
		2.5m	max 79m ² (Ø = 10m)	max 20m ² (Ø = 5m)
		3m	max 79m ² (Ø = 10m)	max 20m ² (Ø = 5m)
		4m	max 64m ² (Ø = 9m)	max 20m ² (Ø = 5m)
		5m	max 50m ² (Ø = 8m)	max 20m ² (Ø = 5m)
		6m	max 50m ² (Ø = 8m)	max 20m ² (Ø = 5m)

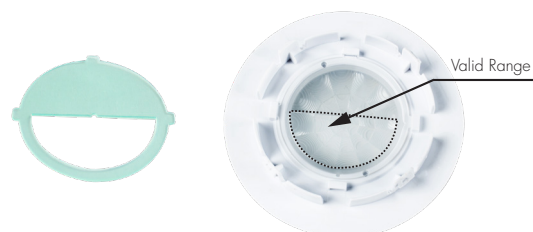
Optional Accessory --- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



Optional Accessory --- Blind Insert for Blocking Certain Detection Angles



Blind Option 1 --- Aisle Detection



Blind Option 2 --- 180° Detection

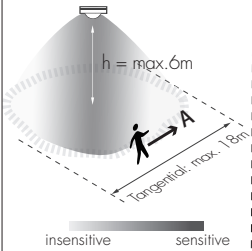
3. HBIR29/W (Wide range Low-bay)



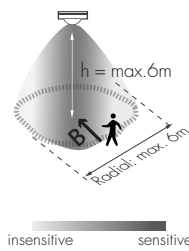
HBIR29/W: Low-bay convex lens detection pattern for **single person** @ $T_a = 20^{\circ}\text{C}$

(Recommended ceiling mount installation height **2.5m-6m**)

A: Tangential movement



B: Radial movement



Mount height

Tangential (A)

Radial (B)

2.5m

max 254m² (Ø = 18m)

max 28m² (Ø = 6m)

3m

max 254m² (Ø = 18m)

max 28m² (Ø = 6m)

4m

max 154m² (Ø = 14m)

max 28m² (Ø = 6m)

5m

max 113m² (Ø = 12m)

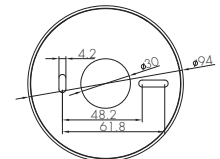
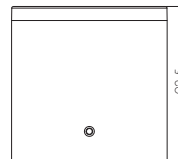
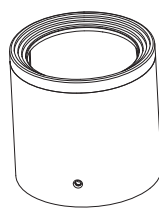
max 28m² (Ø = 6m)

6m

max 79m² (Ø = 10m)

max 13m² (Ø = 4m)

Optional Accessory --- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



4. HBIR29/H (High-bay)



HBIR29/H: High-bay lens detection pattern for forklift @ Ta = 20°C

(Recommended ceiling mount installation height **10m-15m**)

A: Tangential movement	B: Radial movement	Mount height	Tangential (A)	Radial (B)
		10m	max 380m² (Ø = 22m)	max 201m² (Ø = 16m)
		11m	max 452m² (Ø = 24m)	max 201m² (Ø = 16m)
		12m	max 452m² (Ø = 24m)	max 201m² (Ø = 16m)
		13m	max 452m² (Ø = 24m)	max 177m² (Ø = 15m)
		14m	max 452m² (Ø = 24m)	max 133m² (Ø = 13m)
		15m	max 452m² (Ø = 24m)	max 113m² (Ø = 12m)

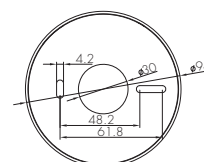
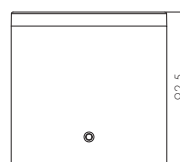
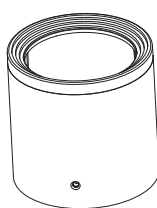


HBIR29/H: High-bay lens detection pattern for single person @ Ta = 20°C

(Recommended ceiling mount installation height **2.5m-12m**)

A: Tangential movement	B: Radial movement	Mount height	Tangential (A)	Radial (B)
		2.5m	max 50m² (Ø = 8m)	max 7m² (Ø = 3m)
		6m	max 104m² (Ø = 11.5m)	max 7m² (Ø = 3m)
		8m	max 154m² (Ø = 14m)	max 7m² (Ø = 3m)
		10m	max 227m² (Ø = 17m)	max 7m² (Ø = 3m)
		11m	max 269m² (Ø = 18.5m)	max 7m² (Ø = 3m)
		12m	max 314m² (Ø = 20m)	max 7m² (Ø = 3m)

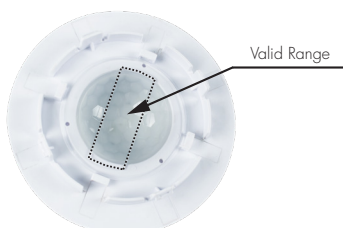
Optional Accessory -- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



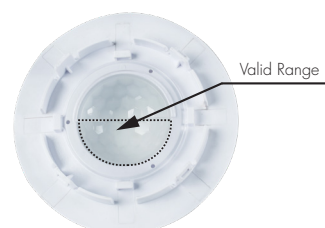
Optional Accessory -- Blind Insert for Blocking Certain Detection Angles



Blind Option 1 --- Aisle Detection



Blind Option 2 --- 180° Detection



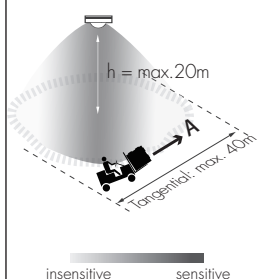
HBIR29/RH (Reinforced High-bay with 3-Pyro)



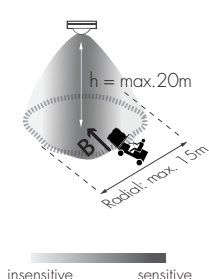
HBIR29/RH: Reinforced high-bay lens detection pattern for forklift @ Ta = 20°C

(Recommended ceiling mount installation height **10m-15m**)

A: Tangential movement



B: Radial movement



Mount height

Tangential (A)

Radial (B)

10m

max 346m² (Ø = 21m)

max 177m² (Ø = 15m)

11m

max 660m² (Ø = 29m)

max 177m² (Ø = 15m)

12m

max 907m² (Ø = 34m)

max 154m² (Ø = 14m)

13m

max 962m² (Ø = 35m)

max 154m² (Ø = 14m)

14m

max 1075m² (Ø = 37m)

max 113m² (Ø = 12m)

15m

max 1256m² (Ø = 40m)

max 113m² (Ø = 12m)

20m

max 707m² (Ø = 30m)

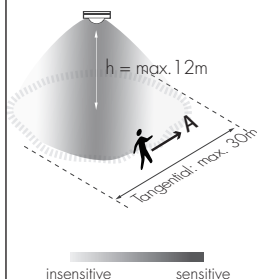
max 113m² (Ø = 12m)



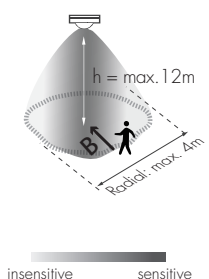
HBIR29/RH: Reinforced high-bay lens detection pattern for single person @ Ta = 20°C

(Recommended ceiling mount installation height **2.5m-12m**)

A: Tangential movement



B: Radial movement



Mount height

Tangential (A)

Radial (B)

2.5m

max 38m² (Ø = 7m)

max 7m² (Ø = 3m)

6m

max 154m² (Ø = 14m)

max 7m² (Ø = 3m)

8m

max 314m² (Ø = 20m)

max 7m² (Ø = 3m)

10m

max 531m² (Ø = 26m)

max 13m² (Ø = 4m)

11m

max 615m² (Ø = 28m)

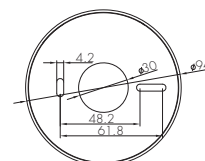
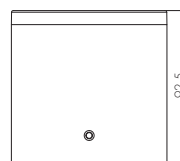
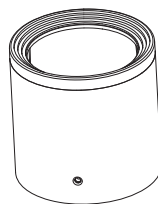
max 13m² (Ø = 4m)

12m

max 707m² (Ø = 30m)

max 13m² (Ø = 4m)

Optional Accessory --- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



5. HBIR29/UH (Ultra High-bay)

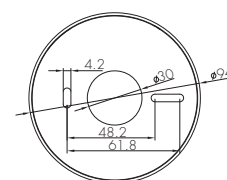
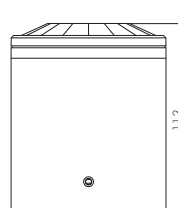
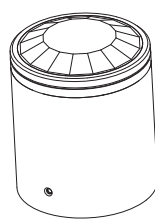


HBIR29/UH: Ultra High-bay convex lens detection pattern for **single person** @ $T_a = 20^\circ\text{C}$
(Recommended ceiling mount installation height **3m-21m**)

Noted: The different humidity levels in the environment can affect the sensor detection range.

Mount height	Tangential (A)	Radial (B)
3m	max12.5m ² (Ø = 4m)	max12.5m ² (Ø = 4m)
6m	max50m ² (Ø = 8m)	max28m ² (Ø = 6m)
9m	max113m ² (Ø = 12m)	max50m ² (Ø = 8m)
12m	max201m ² (Ø = 16m)	max79m ² (Ø = 10m)
15m	max314m ² (Ø = 20m)	max113m ² (Ø = 12m)
18m	max452m ² (Ø = 24m)	max113m ² (Ø = 12m)
21m	max615m ² (Ø = 28m)	max113m ² (Ø = 12m)

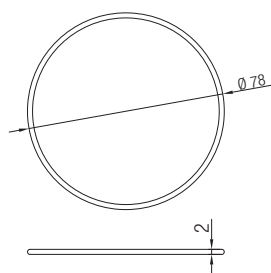
Optional Accessory --- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



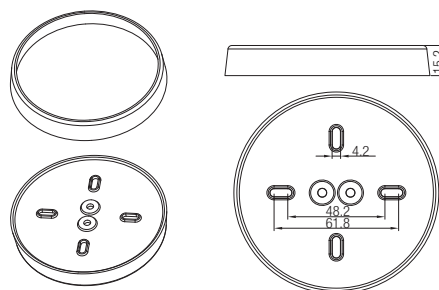
Optional Accessories For Water-Proof

Big and small silicon gasket used to make IP54 degree protection (mounted into HA09 housing for ceiling mount)

Small silicon water-proof gasket dimension(size:mm)

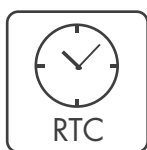


Big silicon water-proof gasket dimension(size:mm)



Note: The small silicon water-proof gasket is not suitable for HBIR29/W and HBIR29/UH
The Big silicon water-proof gasket is not suitable for HBIR29/W

Functions and Features



The RealTime Clock (RTC) is a critical component in many of our BLE (Bluetooth Low Energy) products, particularly those designed to support circadian rhythm systems. The primary function of the RTC is to maintain accurate time and date information, even when the device is powered off or experiences a power failure. This is crucial for ensuring that the device can resume its correct operation and provide timely data or functionality once power is restored.

Dimming Interface Operation Notes

Switch-Dim

The provided Switch-Dim interface allows for a simple dimming method using commercially available non-latching (momentary) wall switches. Detailed Push switch configurations can be set on the Koolmesh app.

Switch Function	Action	Descriptions
Push switch	Short press (< 1 second) * Short press has to be longer than 0.1s, or it will be invalid.	- Turn on/off - Turn on only - Turn off only - Recall a scene - Quit manual mode - Do nothing
	Double push	- Turn on only - Turn off only - Recall a scene - Quit manual mode - Do nothing
	Long press (≥ 1 second)	- Dimming - Colour tuning - Do nothing
Sensor-link	/	- Upgrade a normal on/off motion sensor to a Bluetooth controlled motion sensor
Emergency Self-Test Function	Short press (< 1 second) * Short press has to be longer than 0.1s, or it will be invalid.	- Start Self test (Monthly) - Stop Self test - Start Self test (Annually) - Invalid
	Long press (≥ 1 second)	- Start Self test (Monthly) - Stop Self test - Start Self test (Annually) - Invalid
Fire Alarm (VFC signal only)	Refer to Koolmesh ® App User Manual V2.1	- Able to connect the Fire Alarm system - Once the fire alarm system is triggered, all the luminaires controlled by the Push Switch will enter the preset scene (normally it's full on), after the fire alarm system gives the ending signal, all the luminaires controlled by this Push Switch will revert back to normal status.

Additional Information / Documents

1. To learn more about detailed product features/functions, please kindly refer to <https://hytronik.com/product/hbir29>
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 PIR Sensors installation and operation, please kindly refer to <https://hytronik.com/service/downloads> (PIR Sensors Precautions for Product Installation and Operation)
4. Data sheet is subject to change without notice. Please always refer to the most recent release on <https://hytronik.com/products/motion-daylight-sensors>
5. Regarding Hytronik standard guarantee policy, please kindly refer to <https://hytronik.com/service/downloads> (Guarantee Conditions document)