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®

🅱® ⬭DALI⬭ **CB** ⚠ CE RED emc UK CA

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.

HBIR29   HBIR29/R   HBIR29/W

HBIR29/H   HBIR29/RH (3-pyro)   HBIR29/UH
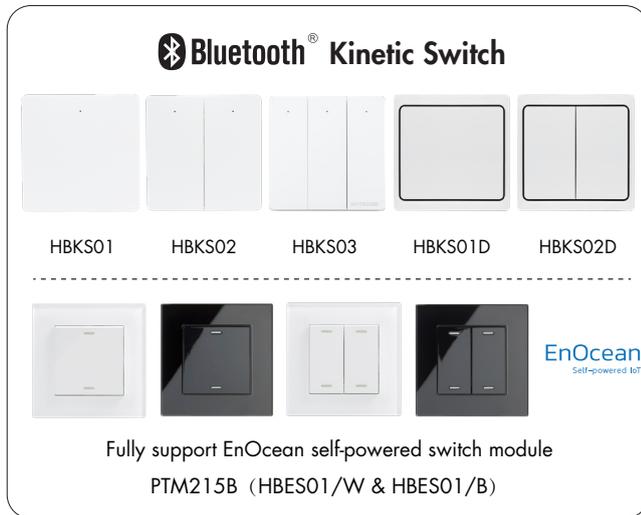
App Features

- 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
- ⬭DALI⬭ 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

❈ Bluetooth® Kinetic Switch

| HBKS01 | HBKS02 | HBKS03 | HBKS01D | HBKS02D |

EnOcean
Self-powered IoT

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

❈ Bluetooth® 5.0 SIG mesh

HYTRONIK
Koolmesh

iOS
Android

for iOS   for Android

Smartphone app for both iOS & Android platform

for iPad

Koolmesh Pro app for iPad

Web

for Web

Web app/platform: www.iot.koolmesh.com

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

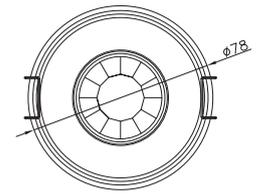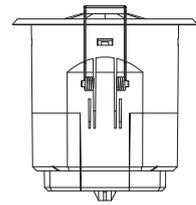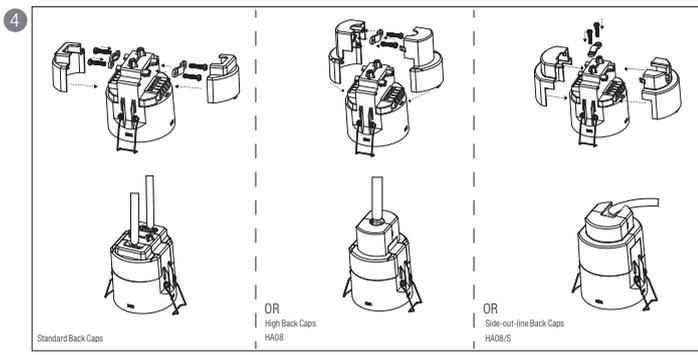| Sensor Data	
Sensor Model	PIR detection
HBIR29	Installation Height : 6m Detection Range(Ø) :9m
HBIR29/R	Installation Height : 6m Detection Range(Ø) :10m
HBIR29/W	Installation Height : 6m Detection Range(Ø) :18m
HBIR29/H	Installation height：15m (forklift) 12m (person) Detection range (Ø)：24m
HBIR29/RH	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°

* For more details of detection range, please refer to "detection pattern" section.
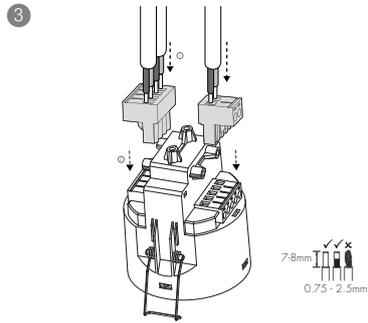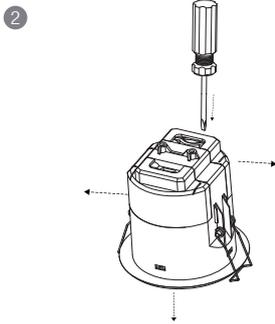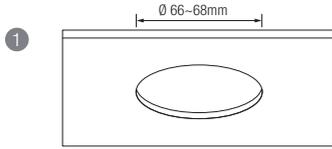
Safety & EMC	
EMC standard (EMC)	EN55015, EN61000, EN61547
Safety standard (LVD)	EN60669-1, EN60669-2-1 AS/NZS60669-1/-2-1
RED	EN300328, EN301489-1/-17
Certification	CB, CE , EMC, RED, RCM

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

Mechanical Structure

① Ø 66~68mm

②

③ 7-8mm
0.75 - 2.5mm²

④

Standard Back Caps
OR High Back Caps HA08
OR Side-out-line Back Caps HA08/S

⑤
A B
* Install blind as required

⑥
1 2 3 4 5 6
* Install lens as required

⑦

Ø78

1. Ceiling (drill hole Ø 66~68mm).
2. Carefully prise off the Back Caps.
3. Make connections to the pluggable terminal blocks.
4. Secure the cables with screws for better stability. Three types of Back Caps are available (Standard, HA08 , and HA08/S).
5. Fit detection blind (if required).
6. Fit desired lens, clip fascia to body (this step is not applicable for /UH).
7. Bend back springs and Insert into ceiling.

*The standard back cap is designed for the installation of two cables.
 HA08 is a high back cap, allows cables to exit upwards.
 HA08/S is designed for sideways cable exits.

HBIR29
HBIR29/R
HBIR29/W
HBIR29/H
HBIR29/RH
HBIR29/UH
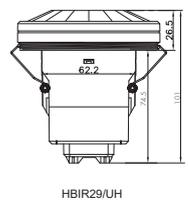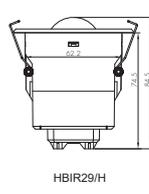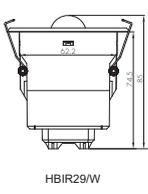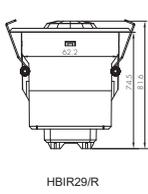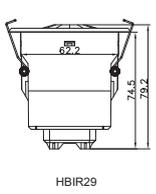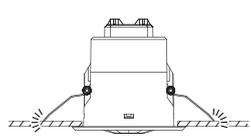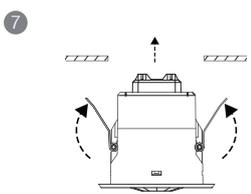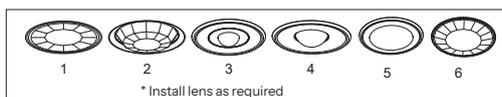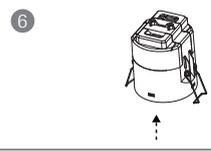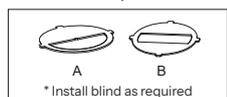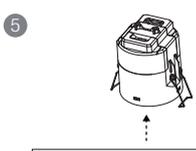
Wiring Diagram

Wire Preparation

0.75 - 2.5mm²

7-8mm
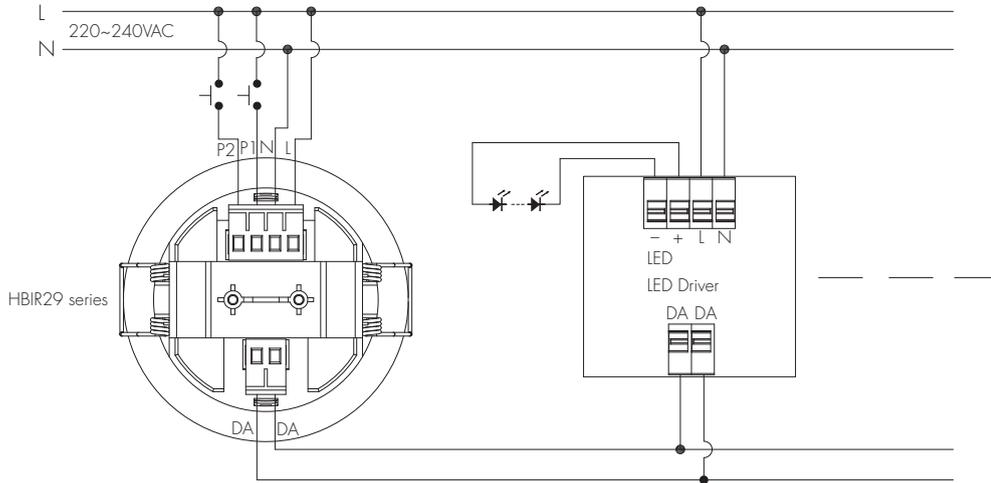
Pluggable screw terminal. It is recommended to make connections to the terminal before fitting to the sensor.

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

Placement Guide and Typical Range

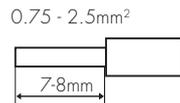Smart Phone to Device Range

6-10m   >10m

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** @ Ta = 20°C

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

A: Tangential movement	B: Radial movement	Mount height	Tangential (A)	Radial (B)
		2.5m	max 50m² (Ø = 8m)	max 13m² (Ø = 4m)
		3m	max 64m² (Ø = 9m)	max 13m² (Ø = 4m)
		4m	max 38m² (Ø = 7m)	max 13m² (Ø = 4m)
		5m	max 38m² (Ø = 7m)	max 13m² (Ø = 4m)
		6m	max 38m² (Ø = 7m)	max 13m² (Ø = 4m)

h = max.6m

Tangential: max. 9m

Radial: max. 4m

insensitive   sensitive

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

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

Valid Range

Valid Range

Blind Option 1 --- Aisle Detection

Blind Option 2 --- 180° Detection

2. HBIR29/R (Reinforced Low-bay)

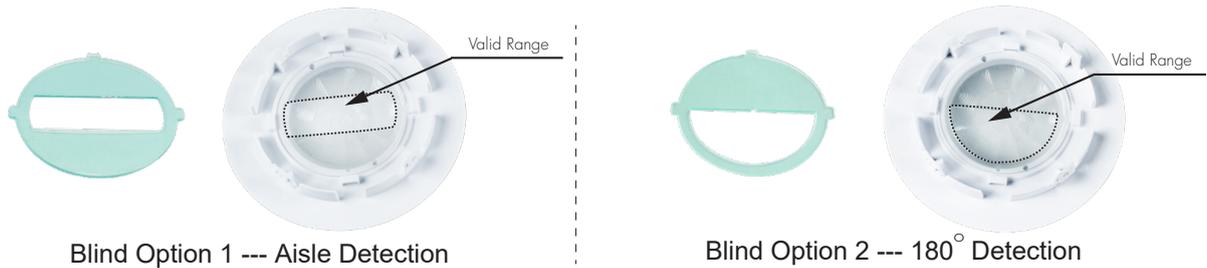**HBIR29/R**: Low-bay convex lens detection pattern for **single person** @ Ta = 20°C

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

A: Tangential movement	B: Radial movement	Mount height	Tangential (A)	Radial (B)
		2.5m	max 79m² (Ø = 10m)	max 20m² (Ø = 5m)
		3m	max 79m² (Ø = 10m)	max 20m² (Ø = 5m)
		4m	max 64m² (Ø = 9m)	max 20m² (Ø = 5m)
		5m	max 50m² (Ø = 8m)	max 20m² (Ø = 5m)
		6m	max 50m² (Ø = 8m)	max 20m² (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

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

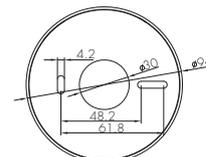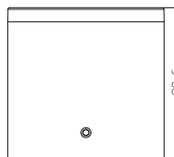**HBIR29/W**: Low-bay convex lens detection pattern for **single person** @ Ta = 20°C

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

Mount height	Tangential (A)	Radial (B)
A: Tangential movement / B: Radial movement		
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)

A: Tangential movement

h = max.6m

Tangential: max. 18m

insensitive — sensitive

B: Radial movement

h = max.6m

Radial: max. 6m

insensitive — sensitive

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

92.5

4.2 Ø30 Ø94
48.2
61.8

4. HBIR29/H (High-bay)

HBIR29/H: High-bay lens detection pattern for **forklift** @ Ta = 20°C
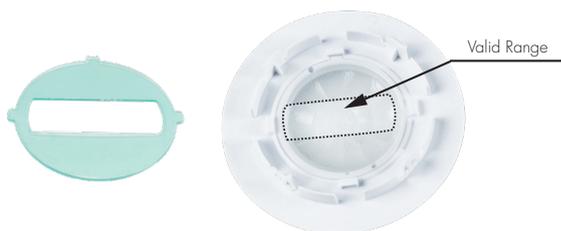### (Recommended ceiling mount installation height **10m-15m**)

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)

h = max.15m   Tangential: max. 24m
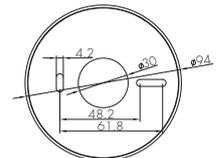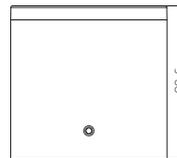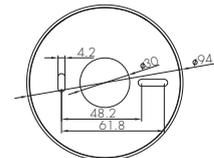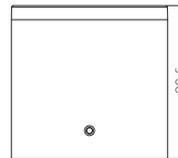
h = max.15m   Radial: max. 16m

insensitive — sensitive

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)

h = max.12m   Tangential: max. 20m

h = max.12m   Radial: max. 3m

insensitive — sensitive

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

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

Valid Range

Valid Range
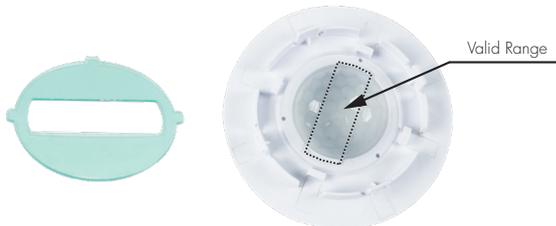
Blind Option 1 --- Aisle Detection

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

h = max.20m

Tangential: max. 40m

h = max.20m

Radial: max. 15m

insensitive — sensitive

insensitive — sensitive

| 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

h = max.12m

Tangential: max. 30m

h = max.12m

Radial: max. 4m

insensitive — sensitive

insensitive — sensitive

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
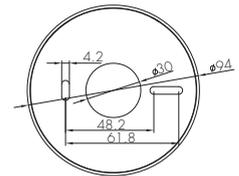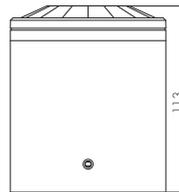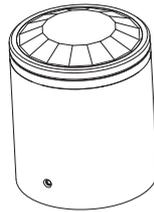
92.5

4.2   Ø30   Ø94

48.2
61.8
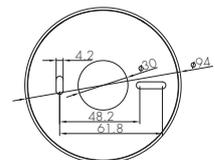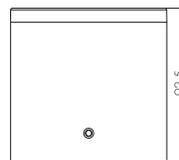
5. HBIR29/UH (Ultra High-bay)

HBIR29/UH: Ultra High-bay convex lens detection pattern for **single person** @ Ta = 20°C

(Recommended ceiling mount installation height **3m-21m)**

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

A: Tangential movement   B: Radial movement

h = max.21m

Tangential: max. 28h

h = max.21m

Radial: max. 12m

insensitive   sensitive   insensitive   sensitive

Mount height	Tangential (A)	Radial (B)
3m	max12.5m² (∅ = 4m)	max12.5m² (∅ = 4m)
6m	max50m² (∅ = 8m)	max28m² (∅ = 6m)
9m	max113m² (∅ = 12m)	max50m² (∅ = 8m)
12m	max201m² (∅ = 16m)	max79m² (∅ = 10m)
15m	max314m² (∅ = 20m)	max113m² (∅ = 12m)
18m	max452m² (∅ = 24m)	max113m² (∅ = 12m)
21m	max615m² (∅ = 28m)	max113m² (∅ = 12m)

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

113

4.2   ∅30   ∅94

48.2
61.8

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)

∅78

2

15.2

4.2

48.2
61.8
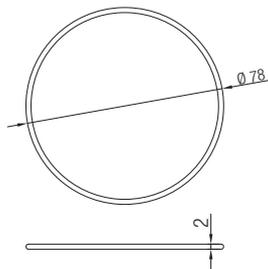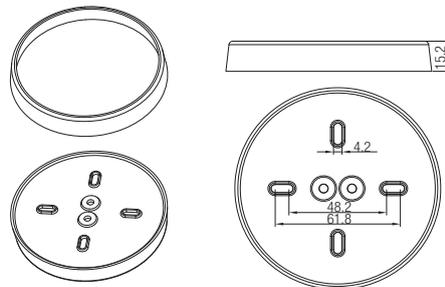
Note: The small silicon water-proof gasket is not suitable for HBIR29/W and HBIR29/UH
The Big silicon water-proof gasket is not suitable for HBIR29/W

Functions and Features

The Real-Time 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 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 - Recall a scene - Turn on only - Quit manual mode - Turn off only - Do nothing
	Double push	- Turn on only - Quit manual mode - Turn off only - Do nothing - Recall a scene
	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) - Start Self test (Annually) - Stop Self test - Invalid
	Long press (≥1 second)	- Start Self test (Monthly) - Start Self test (Annually) - Stop Self test - Invalid
Fire Alarm (VFC signal only)	Refer to http://faq.koolmesh.com/docu/en/	- Able to connect the Fire Alarm system - Once the fire alarm system is triggered, all the luminaries 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 luminaries 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 linstallation 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)