PIR Standalone Motion Sensor with ✴ Bluetooth® 5.0 SIG Mesh

HBIR28/2CH
Low-bay

HBIR28/2CH/R
Reinforced Low-bay

HBIR28/2CH/W
Wide range Low-bay

HBIR28/2CH/H
High-bay

HBIR28/2CH/RH
Reinforced High-bay

HYTRONIK ®

✴ ⚠ CE RED UKCA

Product Description

HBIR28/2CH is a Bluetooth PIR standalone motion sensor, On/Off control with two independent relay channel outputs. It has two relays built-in: one is voltage-free contact, which is NO (normally open contact) and NC (normally closed contact) 2-in-1, the other is normally closed relay output. 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.

HBIR28/2CH   HBIR28/2CH/R   HBIR28/2CH/W

HBIR28/2CH/H   HBIR28/2CH/RH
(3-pyro)

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
- One-key device replacement
- Device social relations check
- Staircase function (primary & secondary)
- Remote control via gateway support HBGW01
- Heat map
- Grouping luminaires via mesh network
- Scenes
- Dusk/Dawn photocell (Twilight function)
- 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

- On/Off control with ralay output
- Freely select NO or NC contact

  VFC: Volt-free Contact/Dry Contact
  – 24VDC@2A
  – 250VDC@2A

- Two relays built-in
- Zero crossing detection to reduce in-rush current and maximise relay life
- Max withstandable in-rush current: 80A@160μs
- 2 Push inputs for flexible manual control
- Black & White & Gray metal surface mount box option
- Various PIR lens and blind inserts options
- User-friendly design for installation
- High bay version available (up to 15m in height)
- 5-year warranty

EnOcean
Self-powered IoT

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

Bluetooth 5.0 SIG mesh

Smartphone app for both iOS & Android platform

for iOS — for Android

Koolmesh Pro app for iPad

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

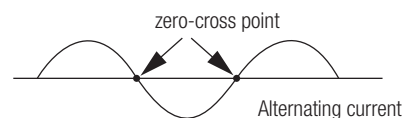| Input & Output Characteristics	
Operating voltage	220~240VAC 50/60Hz
Load ratings	Channel 1: 400VA Channel 2: 24VDC@2A, 250VAC@2A
Max withstandable in-rush current	80A@160µs
Warming-up	20s

Sensor Data	
Sensor Model	PIR detection
HBIR28/2CH	Installation Height : 6m Detection Range(Ø) :9m
HBIR28/2CH/R	Installation Height : 6m Detection Range(Ø) :10m
HBIR28/2CH/W	Installation Height : 6m Detection Range(Ø) :18m
HBIR28/2CH/H	Installation height：15m (forklift) 12m (person) Detection range (Ø)：24m
HBIR28/2CH/RH	Installation height：20m (forklift) 12m (person) Detection range (Ø)：40m
Detection angle	360°

Safety & EMC	
EMC standard (EMC)	EN55015, EN61000-3-2/-3-3, EN61547
Safety standard (LVD)	EN60669-1, EN60669-2-1 AS/NZS60669-1/-2-1
RED	EN300328, EN301489-1/-17
Certification	CE, RED, RCM, UKCA

Environment	
Operation temperature	Ta: -20°C ~ +50°C
IP rating	IP20/IP54

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

Zero-cross Relay Operation

The sensor switches on/off the load right at the zero-cross point, to ensure that the in-rush current is minimised, enabling the maximum lifetime of the relay.
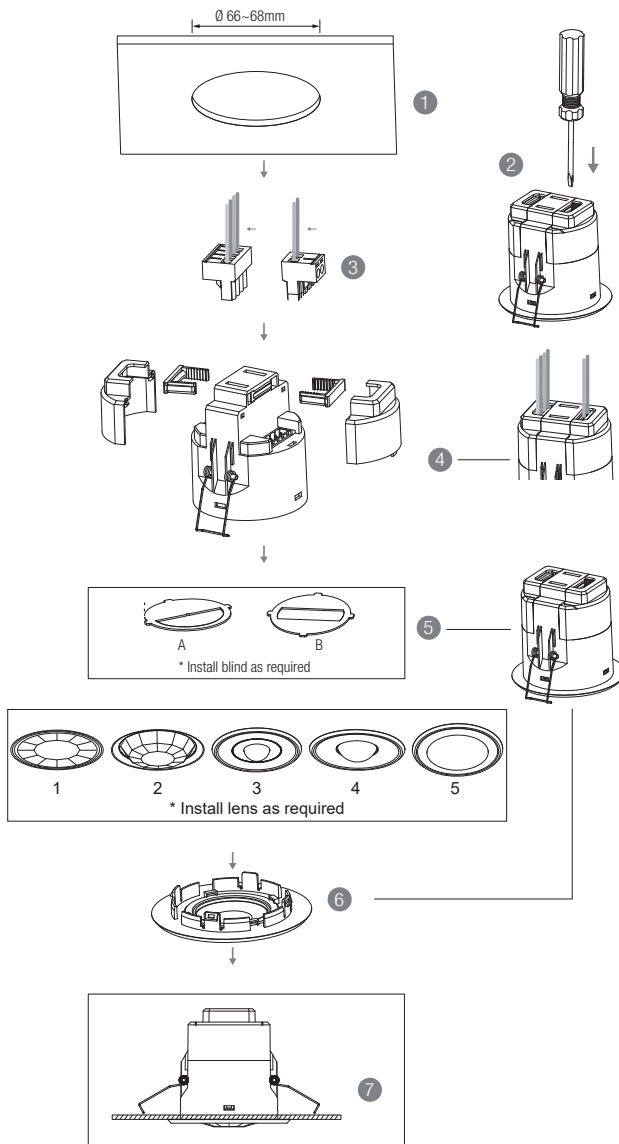

zero-cross point

Alternating current

Mechanical Structure & Dimensions

Ø 66~68mm

①

②

③

④

⑤

A B
* Install blind as required

1   2   3   4   5
* Install lens as required

⑥

⑦

1. Ceiling (drill hole Ø 66~68mm)
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.

Ø78

| HBIR28/2CH | HBIR28/2CH/R | HBIR28/2CH/W | HBIR28/2CH/H | HBIR28/2CH/RH |

62.2 70.5 75.2
62.2 70.5 77.6
62.2 70.5 81
62.2 70.5 80.5
62.2 70.5 82.9
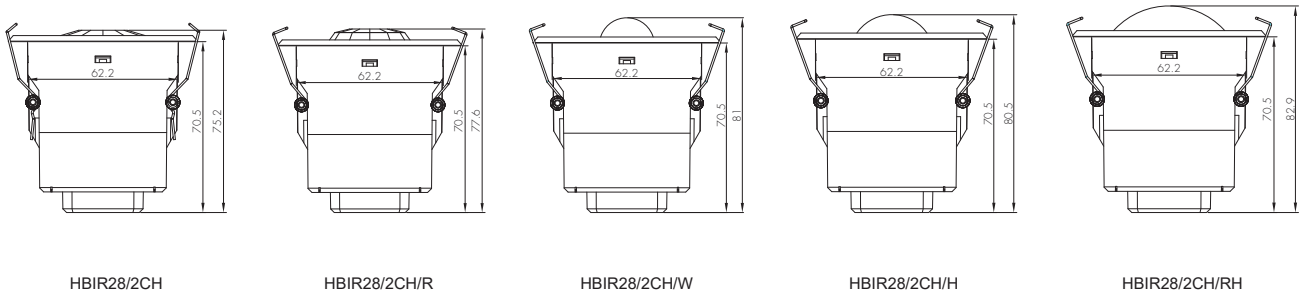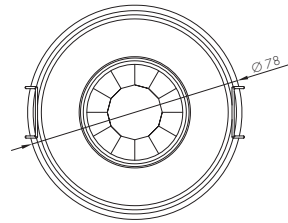
Wiring Diagram
Original status (stand-by)

*By connecting L and COM, the VFC (voltage-free contact) channel can also be turned into a common Switch L output to achieve separate control of the two Switch L channels.

Wire Preparation

0.75 - 2.5mm²

7-8mm

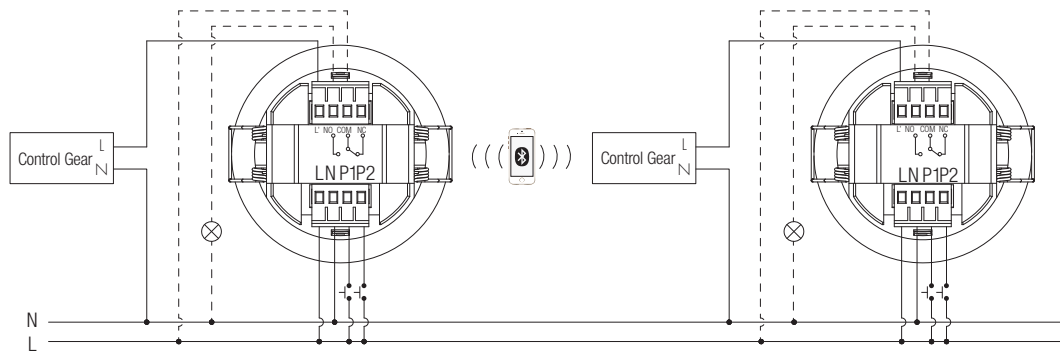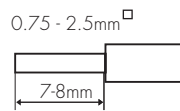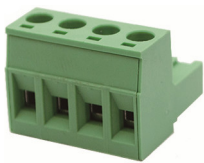Pluggable screw terminal. It is recommended to make connections to the terminal before fitting to the sensor.

Detection Pattern & Optional Accessories

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)

Ø78

2
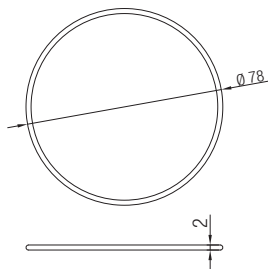
Big silicon water-proof gasket dimension(size:mm)

15.2

4.2

48.2
61.8
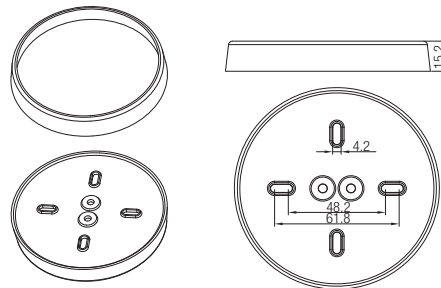
Placement Guide and Typical Range

Smart Phone to Device Range

6-10m   >10m
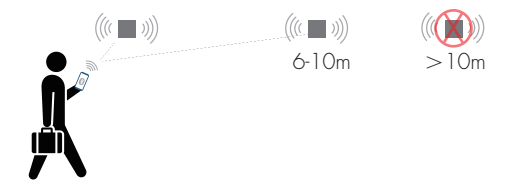
The smart device with the App installed will have a typical range of 10m, but varies from device to device. During commissioning, the installer will need to be in range of the devices when searching for devices to add to the network.

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. HBIR28/2CH (Low-bay)

HBIR28/2CH: Low-bay flat lens detection pattern for **single person** @ Ta = 20°C

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

A: Tangential movement

h = max.6m

Tangential: max. 9m

insensitive — sensitive

B: Radial movement

h = max.6m

Radial: max. 4m

insensitive — sensitive

Mount height	Tangential (A)	Radial (B)
2.5m	max 50m² (∅ = 9m)	max 13m² (∅ = 4m)
3m	max 64m² (∅ = 10m)	max 13m² (∅ = 4m)
4m	max 38m² (∅ = 8m)	max 13m² (∅ = 4m)
5m	max 38m² (∅ = 8m)	max 13m² (∅ = 4m)
6m	max 38m² (∅ = 8m)	max 13m² (∅ = 4m)

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

∅2.5

4.2
∅0
∅24
48.2
61.8

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

Valid Range

Blind Option 1 --- Aisle Detection

Valid Range

Blind Option 2 --- 180° Detection

2. HBIR28/2CH/R (Reinforced Low-bay)

HBIR28/2CH/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 (∅ = 10m)	max 20m² (∅ = 5m)
		3m	max 79m² (∅ = 10m)	max 20m² (∅ = 5m)
		4m	max 64m² (∅ = 9m)	max 20m² (∅ = 5m)
		5m	max 50m² (∅ = 8m)	max 20m² (∅ = 5m)
		6m	max 50m² (∅ = 8m)	max 20m² (∅ = 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
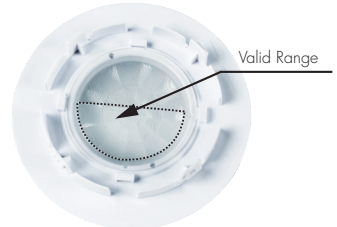
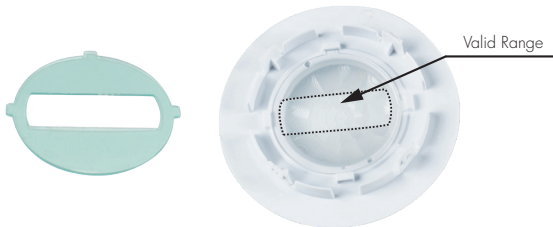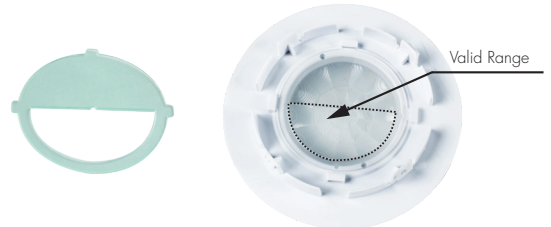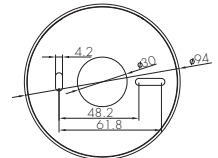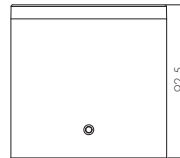Blind Option 2 --- 180° Detection

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3. HBIR28/2CH/W (Wide range Low-bay)

HBIR28/2CH/W: 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 254m² (∅ = 18m)	max 28m² (∅ = 6m)
		3m	max 254m² (∅ = 18m)	max 28m² (∅ = 6m)
		4m	max 154m² (∅ = 14m)	max 28m² (∅ = 6m)
		5m	max 113m² (∅ = 12m)	max 28m² (∅ = 6m)
		6m	max 79m² (∅ = 10m)	max 13m² (∅ = 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 ∅30 ∅94 48.2 61.8

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4. HBIR28/2CH/H (High-bay)

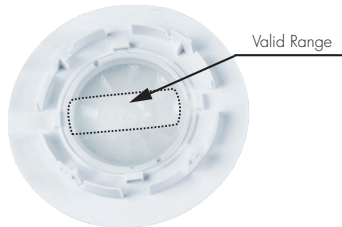**HBIR28/2CH/H**: High-bay lens detection pattern for **forklift** @ Ta = 20°C

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

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

A: Tangential movement — h = max.15m — Tangential: max. 24m

B: Radial movement — h = max.15m — Radial: max. 16m

insensitive — sensitive | insensitive — sensitive

HBIR28/2CH/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 (∅ = 8m)	max 7m² (∅ = 3m)
	6m	max 104m² (∅ = 11.5m)	max 7m² (∅ = 3m)
	8m	max 154m² (∅ = 14m)	max 7m² (∅ = 3m)
	10m	max 227m² (∅ = 17m)	max 7m² (∅ = 3m)
	11m	max 269m² (∅ = 18.5m)	max 7m² (∅ = 3m)
	12m	max 314m² (∅ = 20m)	max 7m² (∅ = 3m)

A: Tangential movement — h = max.12m — Tangential: max. 20m

B: Radial movement — h = max.12m — Radial: max. 3m

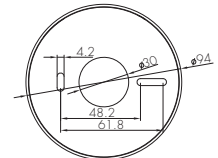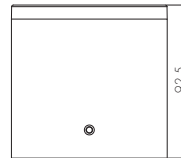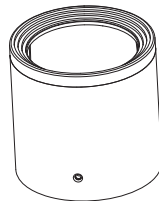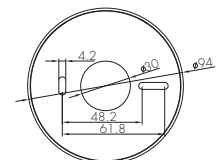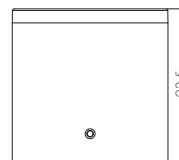insensitive — sensitive | insensitive — sensitive

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

92.5

4.2   ∅10   ∅94
48.2
61.8

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

Valid Range

Valid Range

Blind Option 1 --- Aisle Detection

Blind Option 2 --- 180° Detection

5. HBIR28/2CH/RH (Reinforced High-bay with 3-Pyro)

HBIR28/2CH/RH: Reinforced high-bay lens detection pattern for **forklift** @ Ta = 20°C

(Recommended ceiling mount installation height **10m-20m**)

A: Tangential movement   B: Radial movement

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)

HBIR28/2CH/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

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
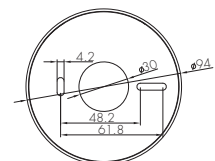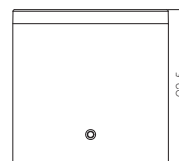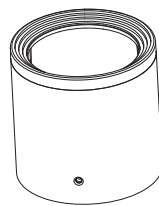
Dimming Interface Operation Notes

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 **Koolmesh**™ App User Manual V2.1	- 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/funcvtions, please refer to
   www.hytronik.com/download ->knowledge ->Introduction of App Scenes and Product Functions

2. Regarding precautions for Bluetooth product installation and operation, please kindly refer to
   www.hytronik.com/download ->knowledge ->Bluetooth Products - Precautions for Product Installation and Operation

3. Regarding precautions for PIR Sensors installation and operation, please kindly refer to
   www.hytronik.com/download ->knowledge ->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
   www.hytronik.com/products/bluetooth technology ->Bluetooth Sensors

5. Regarding Hytronik standard guarantee policy, please refer to
   www.hytronik.com/download ->knowledge ->Hytronik Standard Guarantee Policy