

HBIR29/2CH

Bluetooth Dual-Channel PIR Lowbay | DALI and VFC Output | Ceiling mounting

HYTRONIK[®]
SENSORS & LIGHTING CONTROL



Benefits

Adaptable: Options of blind inserts and metal surface mount boxes

Flexible: Integrated DALI PSU and VFC output for extended device control

Simple: Wireless setup and commissioning via Koolmesh App

Applications

Ceiling or surface mounting (with accessory)

Offices & Classrooms

Corridors & Staircases

Check Out the Complete System Solution on the Website:

<https://www.hytronik.com/product/HBIR29-2CH>



RED

UK
CA

Product Description

HBIR29/2CH is a Bluetooth PIR dual-channel standalone motion sensor designed for indoor lighting applications, providing flexible control through two independent output channels. Channel 1 provides DALI control with a built-in 50mA DALI power supply, eliminating the need for additional power components when connecting DALI luminaires; Channel 2 offers a voltage-free contact (VFC) normally open (NO) output for controlling additional devices. Bluetooth Mesh networking enables wireless communication between devices without additional control wiring, reducing installation complexity and costs, especially for retrofit projects. All configuration and commissioning can be completed easily via the Koolmesh App.

Functions and Features

See additional details at the end of datasheet



Built-in DALI PSU



DALI Driver
Compatibility



DALI Broadcast
Output



Daylight Harvest



Human Centric
Lighting (HCL)



Koolmesh - See
bluetooth control
below



Live Energy &
Diagnostic Data
Part 252 / 253



Luminaire Asset
Data Part 251



NO Contact



Power-Loss Time
keeping (RTC)



Push-Button
Input



Tri-level Dimming

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Specifications

Main Capabilities

Dimming (Output) Interface	DALI, Volt-free Contact (VFC)
Push Button Input	2

Sensor Data

Detection angle	360°
Max. Detection range (Diameter)	9.0 m
Maximum Mounting Height	6.0 m
Detection area	64 m ²
Sensitivity	10%/ 30% /50% /75%/ 100%
Detection Methods	Passive Infrared (PIR)

Electrical Data

Bluetooth Platform	Nordic nRF52832
Bluetooth frequency	2.4 GHz - 2.483 GHz
Bluetooth range (Phone to Device)	10-30m
Bluetooth transmit power	4 dBm
Bluetooth system	Koolmesh
Operating voltage range	220-240 VAC 50/60 Hz
Stand-by power (Psb)	<1W
Warming-up	20 s
DALI bus nominal current (I guaranteed)	50 mA
Max withstandable in-rush current	80A@160µs
VFC Output(Volt-free Contact / Dry Contact)	2A@24VDC , 2A@250VAC

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Specifications

Technical	
Product weight	86.0 g
Product height	79.2 mm
Product length	78.0 mm
Product width	78.0 mm
Mounting hole	66.0 mm
Ambient temperature	-20 ~ +50 °C
Storage temperature	-50 ~ +70 °C
Humidity max	10 ~ 90%
IP Rate	IP20
IP Rate (facial part)	IP54

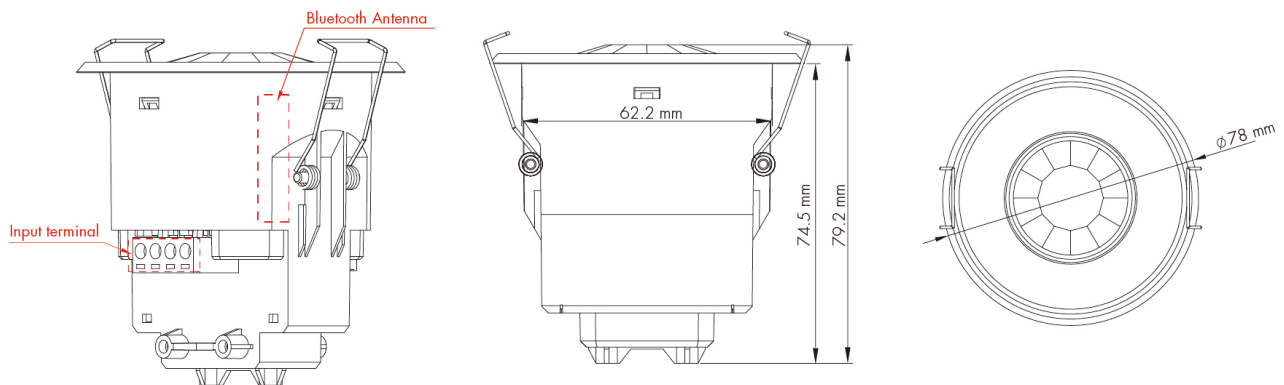
Standard	
EMC	EN 55015, EN 61000, EN 61547
LVD	AS/NZS 60669-1/-2-1, EN 60669-1, EN 60669-2-1
RED	EN 300328, EN 301489-1/-17

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Technical Drawing



The Bluetooth antenna is located at the marked end of the device.

- Keep the antenna area clear of metal or conductive materials.
- Maintain at least 10 mm clearance around the antenna whenever possible for optimal wireless performance.
- Avoid installing the antenna section inside a metal enclosure or behind large metal structures.

Application Example



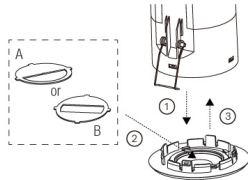
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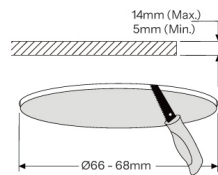
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Installation Process

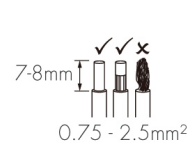
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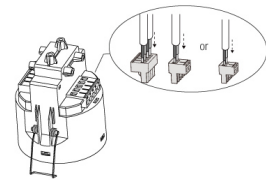
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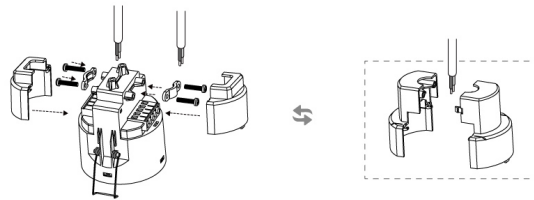
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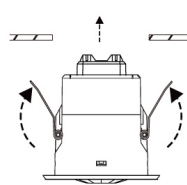
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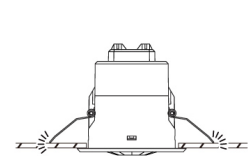
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6



7



Detailed Installation Instructions

1. Optional: If a detection blind is required, detach the lens cover, select the suitable detection blind and place it above the lens, then refit the lens cover onto the sensor body.
2. Ceiling cut-out (hole Ø 66~68mm).
3. Prepare the cables correctly.
4. Connect the cables to the pluggable terminal blocks according to the wiring diagram.
5. Secure the cables with screws and cable clips for better stability. Install the standard back caps (or replace with the high back cap HA08 for larger wire diameter if necessary).
6. Bend the spring clips upwards and fit the sensor into the ceiling cut-out.
7. Spring clips will release and secure the sensor in the ceiling.

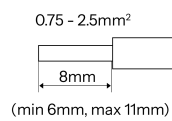
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⚠ Wiring Guidelines

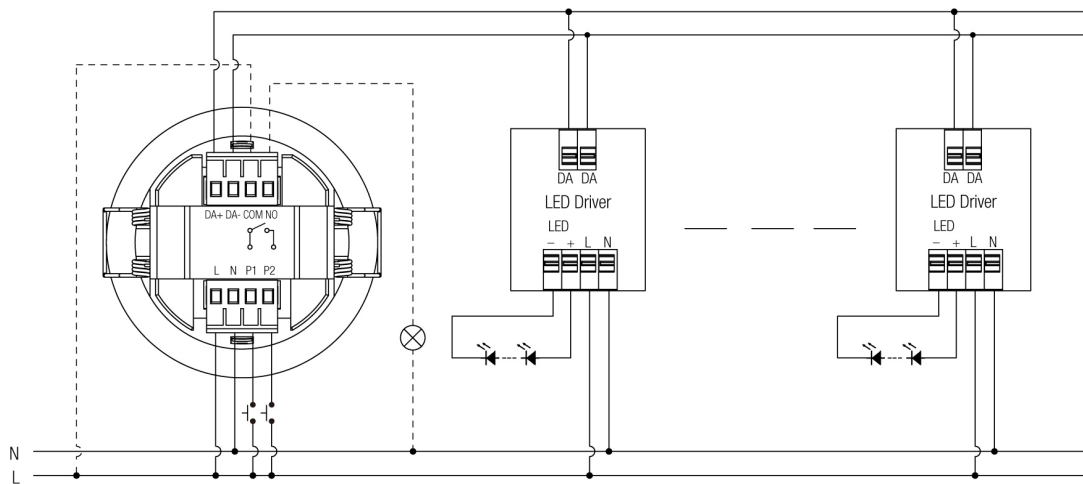
1. Installation by a qualified electrician only and in accordance with local electrical regulations.
2. Disconnect mains power before installation, wiring, maintenance or replacement.
3. Failure to follow the wiring diagram may result in product damage and malfunction.
4. Refer to the Wire Preparation section for recommended wire diameter and strip length.
5. Push inputs are mains-voltage inputs and must only be connected to mains-rated switches.
6. Do not connect mains voltage (L/N) to the DALI terminals.
7. For polarity-marked DALI terminals (DA+/DA-), observe correct DALI polarity.
8. For non-polarity-marked DALI terminals (DA/DAL), DALI wiring is polarity-free.

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

Wiring Diagram

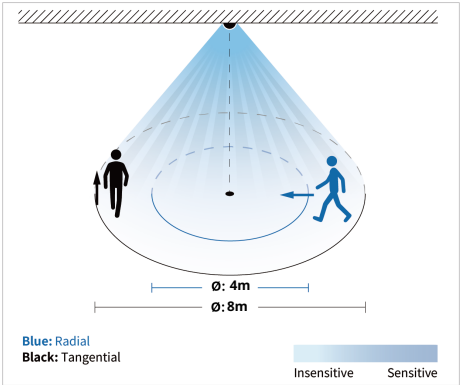


Detection Range

Single Person Walk (Ceiling mount)

- The data is tested under following conditions:
- Single person walking
 - Sensor not connected to any driver that may have soft-on period
 - Testing temperature Ta = 20°C
 - The testing is conducted in an open and spacious indoor field, without noticeable obstacles or influences that may affect PIR performances.

Detection example 2.5m mounting height:



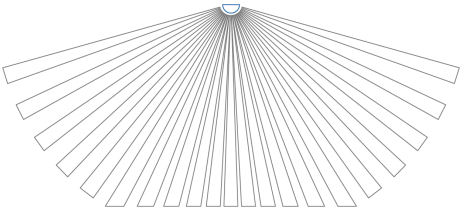
Tangential movement

H[m]	2.5	3	4	5	6
Ø[m]	8	9	7	7	7

Radial movement

H[m]	2.5	3	4	5	6
Ø[m]	4	4	4	4	4

Detection schematic diagram



Commissioning Instructions and Precautions

A. Push Notes

1. This product has two independent PUSH inputs: Push1 controls Channel 1, Push2 controls Channel 2.

B. DALI Bus Current Notes

1. Typical DALI bus current consumption per driver is approximately 2 mA. Before installation, calculate the total bus current consumption of all devices connected to the same DALI bus. Ensure that the total current consumption does not exceed the guaranteed supply current of the DALI bus power supply, and allow sufficient system margin.

C. RTC Notes

1. The RTC (Real-Time Clock) retains timekeeping for up to 10 days during power loss. For optimal performance, it is recommended to install the device facing down and in an environment around 25°C. Prolonged exposure to direct outdoor sunlight may reduce RTC time retention to 2 days.

D. VFC Notes (Channel 2)

1. This product may be supplied with different output version. Confirm the product version with Hytronik before commissioning, replacement or project extension, especially where a specific output logic is required.

- Version A (COM + NC output): allows the light to remain ON during the device loses power or fails (called “fail-safe light-on behaviour” below).
Max. inrush current: 50A @ 160µs.

- Version B (COM + NO output): default version, for standard switch control only and does not support the fail-safe light-on behaviour. (Max. inrush current: 80A @ 160µs.)

Version B is the current standard version, while Version A is no longer available as a standard option. For previous projects using Version A, please note that the output logic of Version B is different. Do not mix Version A and Version B in the same control application unless the wiring logic has been confirmed.

E. Factory settings Notes

1. Sensor setting: Control object: Zone, Sensor status: Sensor ON, Detection range: 100%, Hold time: 20min, Hold time scene: ALL ON, Stand-by time: 5s, Stand-by time scene1: 10%, Sensor mode: Auto, Mode in priority: Manual prior to sensor.
2. Push switch setting: Push switch function: Normal PUSH (Retractive switch), Control object: Zone, Single press: ON/OFF, Double press: disable, Press and hold: Brightness dimming.

Warning: For additional important documents, including installation precautions, product guidelines, and guarantee conditions, please refer to the official downloads.

<https://hytronik.com/service/downloads>

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Switch Input Function Configuration

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.

Note: Single press, double press, and press-and-hold actions can each be independently assigned to one function via the app. Once configured, each action triggers only its assigned function. Multiple functions cannot be activated by a single press action.

Switch function	Action	Descriptions
Fire Alarm Function	Refer to https://support.koolmesh.com/	• 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.
ON OFF Switch (Latching Switch)	/	• Upgrade a standard on/off control to Bluetooth control, enabling one latching switch to control multiple luminaires or zones, reducing wiring and switch count.
Normal PUSH (Retractive Switch)	Single press (> 0.1s) Double press Press and hold (>= 1s)	• ON/OFF • OFF only • Recall this scene • Sensor take over • Not in use
Sensor-Link	/	• Hold time/scene • Stand-by time/scene • Upgrade a normal on/off motion sensor to a Bluetooth-controlled motion sensor

Options

Included Accessories



High Back Caps HA08 and HA08/S



Blind Insert Option 1 and Option 2

Accessories



Plastic Mount Box | Surface Mounting | white color HA03 www.hytronik.com/product/HA03



Plastic Mount Box | Surface Mounting | IP54 Waterproof Gasket HA03/IP54 www.hytronik.com/product/HA03-IP54



Metal Mount Box | Surface Mounting | Grey Color HA09/G www.hytronik.com/product/HA09-G



Metal Mount Box | Surface Mounting | Black Color HA09/B www.hytronik.com/product/HA09-B



Metal Mount Box | Surface Mounting | White Color HA09/W www.hytronik.com/product/HA09-W

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Koolmesh - Operating guide

Bluetooth



Smartphone(ios)



Smartphone (Android)



iPad



Web

For additional information, including project and network, device, and scenes, please refer to: <http://faq.koolmesh.com/>

Shared Koolmesh App Features

- | | |
|--|---|
|  Alert for excess lux / temperature / humidity via multi-meter HBLM01 |  Koolmesh Pro iPad for on-site configuration |
|  Astro timer (sunrise and sunset) |  Network sharing via QR code or keycode |
|  Bulk commissioning (copy and paste settings) |  Offline commissioning |
|  Compatible with Shelly energy metering |  One-key device replacement |
|  Continuous development in progress... |  Quick setup mode & advanced setup mode |
|  Device firmware update over-the-air (OTA) |  Remote control via Hytronik gateway & touch screen HPAD-TSJASE1 |
|  Device social relations check |  Scenes |
|  Different permission levels via authority management |  Schedule |
|  Floorplan feature to simplify project planning |  Staircase function for quick setup |
|  Grouping luminaires via mesh network |  Test mesh network connection quality |
|  Internet-of-Things (IoT) featured |  Web platform for project deployment & data analysis |

Device-specific Koolmesh App features

- | | |
|--|---|
|  Adjustable motion & static sensitivity & adjustable sensing distance |  Dynamic daylight harvest auto-configuration |
|  Compatible with EnOcean kinetic switches |  Motion sensor range test |
|  Detailed motion sensor settings |  Motion sensor trigger diagnosis |
|  Dusk/Dawn photocell (twilight function) |  Push switch configuration |

Bluetooth Mesh Network Installation & Device Access Range

1. Phone/Pad to Device Range (Bluetooth Connection)

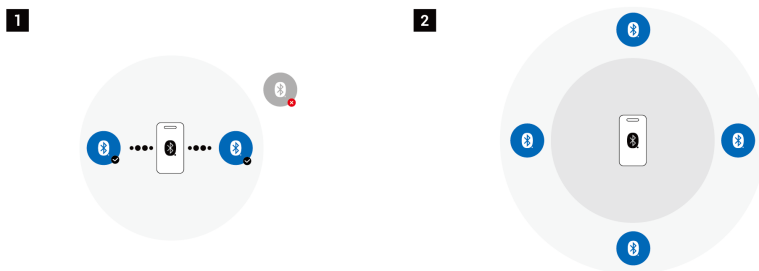
During commissioning, the installer must remain within Bluetooth range of the target device when adding it via the App.

2. Device to Device Range (Mesh Network Communication)

Once commissioned, devices communicate through the wireless mesh network. Users can access and control all devices within the network when connected to any active mesh node.

Note:

- Bluetooth range varies by product. Refer to the Specification section for details.
- Actual communication range may vary depending on product type, obstacles, environmental conditions, and luminaire construction.



Bluetooth Network Components



HBGW02

Bluetooth Mesh Gateway | Ethernet or Wi-Fi 2.4GHz | wall/flat surface mounting
www.hytronik.com/product/HBGW02



HBGW02/D

Bluetooth Mesh Gateway | Dual-band Wi-Fi | wall/flat surface mounting
www.hytronik.com/product/HBGW02-D



HBGW03/R

BACnet Gateway | Dual-band Wi-Fi or Ethernet | DIN rail/wall/flat surface mounting
www.hytronik.com/product/HBGW03-R



HBKS01/W

Bluetooth Kinetic Switch | One-gang | Wireless Control
www.hytronik.com/product/HBKS01-W



HBKS01D/W

Bluetooth Kinetic Switch | Single Rocker | White Color
www.hytronik.com/product/HBKS01D-W



HBKS02/W

Bluetooth Kinetic Switch | Two-gang | White Color
www.hytronik.com/product/HBKS02-W



HBKS02D/W

Bluetooth Kinetic Switch | Double Rocker | White Color
www.hytronik.com/product/HBKS02D-W



HBKS03/W

Bluetooth Kinetic Switch | Three-gang | White Color
www.hytronik.com/product/HBKS03-W



HBLM01

Multi-meter | Bluetooth & NFC | Lux Measurements
www.hytronik.com/product/HBLM01



HPAD-TSJASE1

Bluetooth Touch Tablet | Gateway Integrated | Switch Boxes
www.hytronik.com/product/HPAD-TSJASE1

Functions and Features



Built-in DALI PSU

Built-in DALI PSU means the DALI bus power supply is integrated into the product, eliminating the need for an external DALI power unit.

This reduces wiring complexity, saves installation space, and simplifies commissioning, making the system more compact and efficient.



D4i Driver Compatibility

Designed to operate with D4i-certified drivers within D4i luminaires, supporting standard DT6 / DT8 control behaviour in D4i systems.



DALI Broadcast Output

This product supports DALI broadcast output, allowing control commands to be sent simultaneously to all devices on the DALI bus without individual addressing.

This enables simple group control, synchronized operation, and fast commissioning within a DALI lighting system.



Daylight Harvest

Right time, right place and the right amount of light! Daylight harvest (Also known as daylight regulating or daylight interaction) is a must in the future lighting norms. It automatically measures available natural light and adjusts artificial lighting output to maintain the target illuminance level. Using daylight sensor feedback, control signals are transmitted to the LED drivers via DALI or 0–10V interfaces, ensuring the required light output is delivered only when needed, improving visual comfort and reducing energy consumption.



Human Centric Lighting (HCL)

Human Centric Lighting (HCL) helps reduce energy consumption while supporting human wellbeing and productivity in artificially lit environments. Through Hytronik's decentralised tunable white control with integrated time-based operation, HCL enables cost-effective circadian rhythm lighting without the complexity of centralised lighting systems. Designed as a simple and flexible solution, it is ideal for offices, schools, and healthcare applications requiring dynamic white light adjustment throughout the day.



Live Energy & Diagnostic Data Part 252 / 253

Koolmesh can wirelessly read live operating data from D4i drivers, or compatible DALI drivers with Part 252 / 253 implemented.

Readable data may include real-time power (W), energy consumption (kWh), voltage (V), current (mA), power factor, operating hours (burn hours), driver temperature, start counters and LED failure flags (open/short circuit).

For standard DALI-2 DT6/DT8 drivers, Koolmesh can read the data points made available by the driver, with the actual retrievable data depending on the driver's supported functions.



Luminaire Asset Data Part 251

Koolmesh can read Part 251 luminaire asset data where available, such as GTIN, serial number, manufacturing date, luminous flux, colour temperature and manufacturer ID. The information must be pre-written into Memory Bank 1 by the luminaire OEM or driver manufacturer. If left unconfigured, related fields may be blank or unavailable.



NO Contact

This product provides a single switched live output (L'), corresponding to NO (Normally Open) logic. When the product is not powered, the load remains off.

In standby condition, the output is off; when triggered, the output switches on to power the load, achieving "light on when occupied".

This follows the standard definition: NO: open when idle, closed when triggered; NC: closed when idle, open when triggered.

This configuration is widely used for general switching and control applications requiring activation upon detection.

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Functions and Features



Power-Loss Time keeping (RTC)

The Real-Time Clock (RTC) is an essential component in Hytronik BLE devices, particularly those used in circadian-rhythm lighting systems. It preserves accurate time and date information during power interruptions, ensuring schedules, astro timer, circadian rhythm profiles, time-triggered scenes and other time-based functions continue to operate correctly and automatically recover when power is restored. This helps maintain uninterrupted operation and overall system reliability. RTC retention duration varies by product and installation conditions; prolonged exposure to high ambient temperatures or direct sunlight may reduce the available backup time.



Push Button Input

This product integrates push-button (momentary switch) inputs, allowing external potential-free switches to trigger basic lighting control functions. Each input can be configured for actions such as on/off switching, dimming or scene recall, providing flexible manual control and user interaction within the lighting system. The push-button inputs operate independently of the sensor's automatic functions, enabling seamless coexistence of manual and sensor-based lighting control.



Tri-level Dimming

Hytronik's tri-level dimming products offer 3 levels of light control: 100% dimmed light off, with settable time periods between each phase, as well dimming level and daylight threshold.

*All Hytronik's tri-level dimming products can also be configured as bi-level control (by setting the stand-by period to infinity), so that the light always remains in the dimmed mode in absence for areas where there are safety, security or enhanced comfort requirements.

Check out for further explanation of features

<https://hytronik.com/solutions/lighting-control-features>

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Additional Notes

Detection Blind Insert Options and Detection Range Reference

Two fixed blind inserts are supplied to reduce or limit the detection area. The blind insert can be fitted directly into the lens cover. Select the suitable blind insert according to the required detection area and installation application.

Option 1 provides a rectangular detection area. Option 2 provides a half-circle detection area, suitable for applications where detection from one side needs to be limited.

For reference, the next page includes detection pattern and dimensional drawings to support actual installation and application. The detection diagram is based on the following test conditions:

Detection Range Test Conditions:

Single person walking or forklift driving at 5 km/h

Sensor not connected to a driver with soft-on period

Ambient temperature (Ta): 20 °C

Test conducted in a large open indoor area without obstacles affecting PIR performance

Note: Detection range may vary depending on installation angle, temperature, and humidity conditions.

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Additional Diagram

