Flush Mount PIR Motion Sensor

HIR28/2CH Low-bay

HIR28/2CH/R Reinforced Low-bay

HIR28/2CH/H High-bay

HIR28/2CH/UH Ultra High-bay

HYTRONIK®

CE emc CB IP20

Product Description

HIR28/2CH is a flush mount PIR 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.

HIR28/2CH

HIR28/2CH/R

HIR28/2CH/H

HIR28/2CH/UH

With on/off relay control

Designed with a low profile for aesthetically demanding architectural projects providing a high quality sensor for simple on/off occupancy control or providing semi-automatic (absence detection) control.

An intelligent photocell is also included to prevent switching of the lights when natural daylight is availible

Set-up of the sensor is carried out using a remote control handset with program memory allowing one-key commissioning where common settings are used for multiple devices.

Features

- Store settings in the remote for easy commissioning when programming multiple sensors
- On/Off control with relay 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: 120A@160μs
- 2 Push inputs for flexible manual control
- Black & White & Gray metal surface mount box options
- Various PIR lens and blind inserts options
- User-friendly design for installation
- High bay version available (up to 21m in height)
- 5-year warranty

Technical Data

Input Characteristics	
Mains voltage	220~240VAC 50/60Hz
Stand-by power	<1W
Load ratings:	Channel 1: 400VA Channel 2: 24VDC@2A, 250VAC@2A
Max withstandable in-rush current	120A@160μs
Warming-up	20s

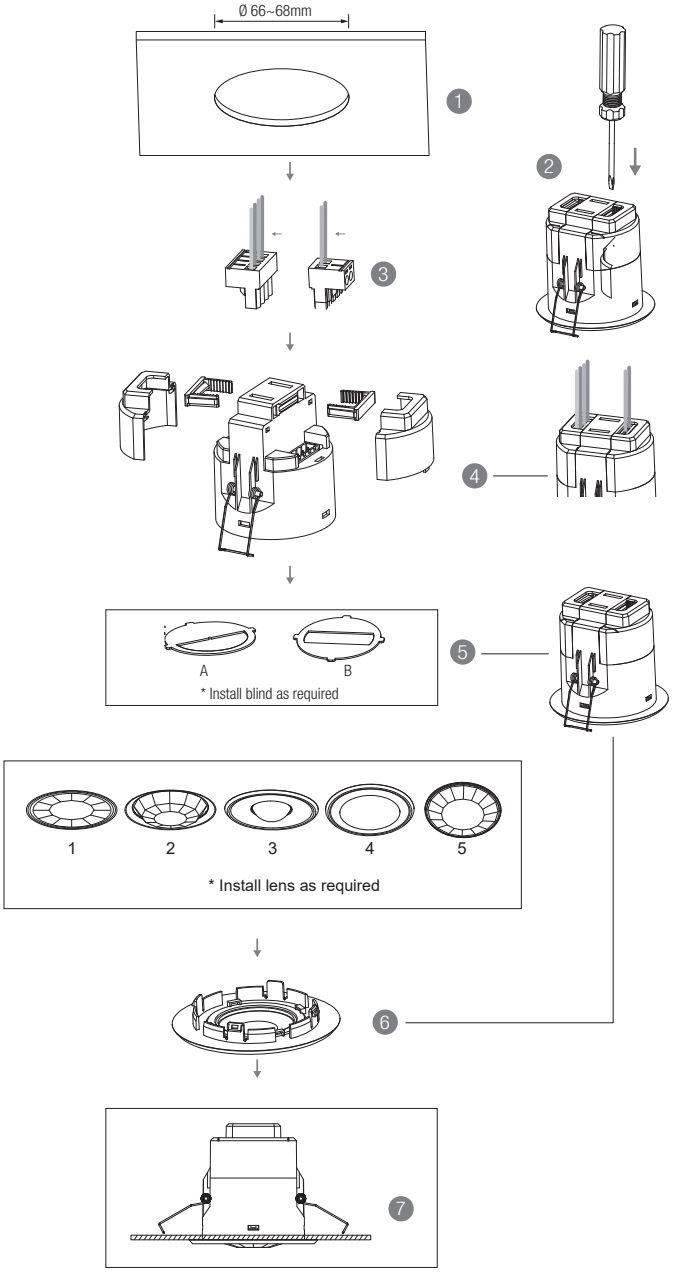
Safety and EMC	
EMC standard (EMC)	EN55015, EN61000
Safety standard (LVD)	EN60669-1, EN60669-2-1
Certification	CB, CE , EMC, LVD, RCM

Sensor Data	
Sensor Model	PIR detection
Detection range (Max.)* HIR28/2CH	Installation Height : 6m Detection Range(Ø) :9m
Detection range (Max.)* HIR28/2CH/R	Installation Height : 6m Detection Range(Ø) :10m
Detection range (Max.)* HIR28/2CH/H	Installation height: 15m (forklift) 12m (person) Detection range (Ø): 24m
Detection range (Max.)* HIR28/2CH/UH	Installation height: 21m Detection range (Ø): 28m
Detection angle	360°

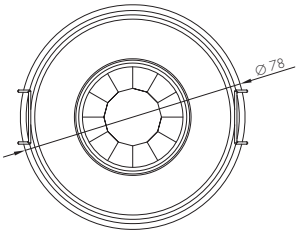
* For more details of detection range, please refer to "detection pattern" section.

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

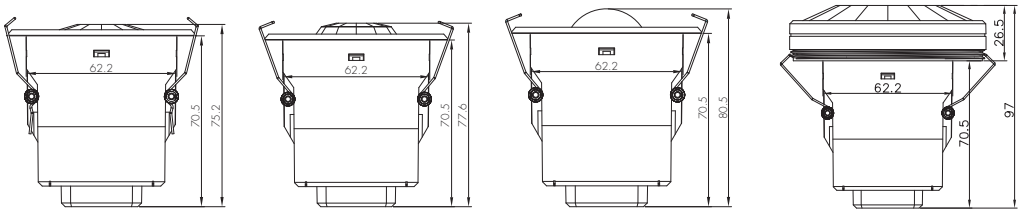
Mechanical Structure



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 (this step is not applicable for /UH).
7. Bend back springs and insert into ceiling.

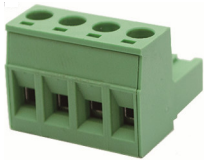


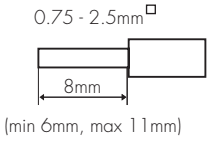
Note:We recommend the mounting distance between sensor to sensor should be more than 2m to prevent sensors from false-triggering.



HIR28 HIR28/R HIR28/H HIR28/UH

Wire Preparation

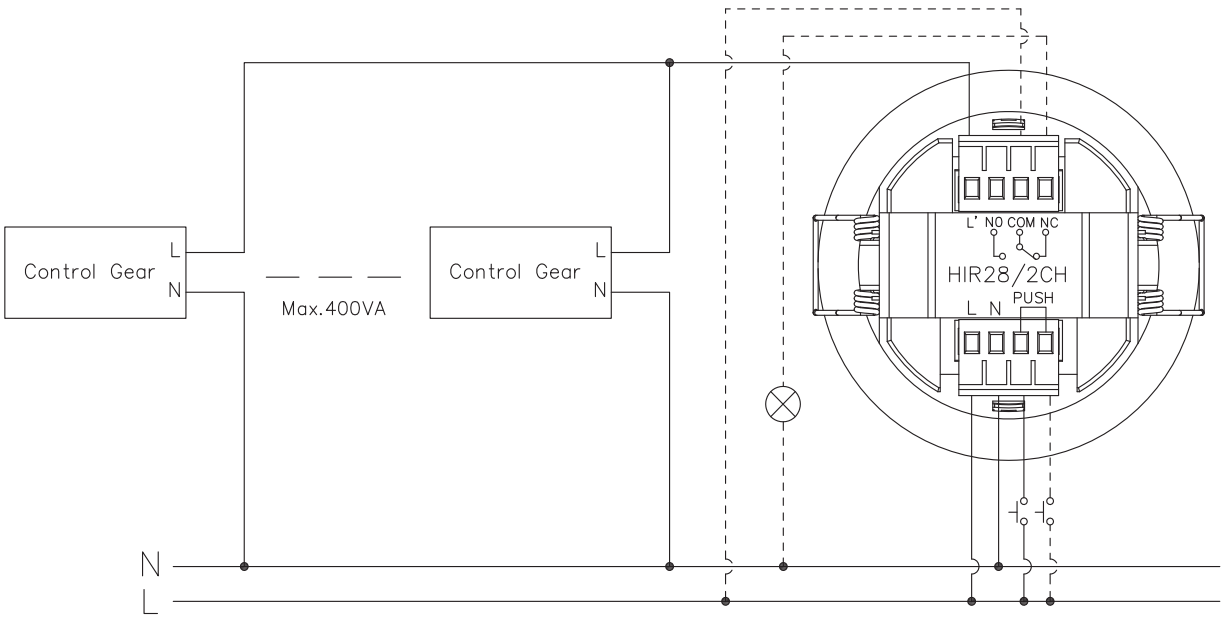




Pluggable screw terminal. It is recommended to make connections to the terminal before fitting to the sensor.

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.

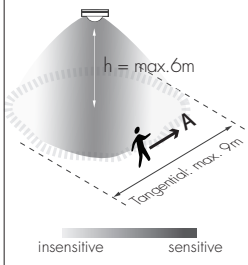
Detection Pattern & Optional Accessories

1. HIR28/2CH (Low-bay)

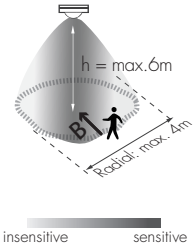
HIR28/2CH: Low-bay flat lens detection pattern for **single person** @ Ta = 20°C

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

A: Tangential movement

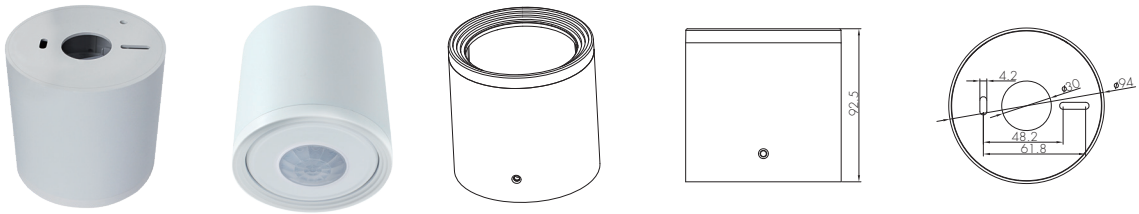


B: Radial movement

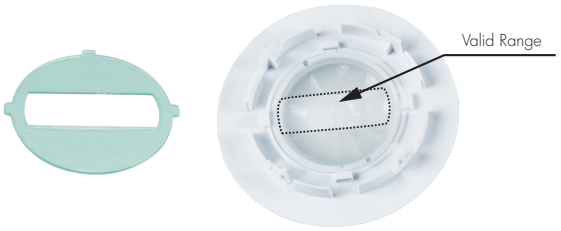


Mount height	Tangential (A)	Radial (B)
2.5m	max 50m² (Ø = 8m)	max 13m² (Ø = 4m)
3m	max 64m² (Ø = 9m)	max 13m² (Ø = 4m)
4m	max 38m² (Ø = 7m)	max 13m² (Ø = 4m)
5m	max 38m² (Ø = 7m)	max 13m² (Ø = 4m)
6m	max 38m² (Ø = 7m)	max 13m² (Ø = 4m)

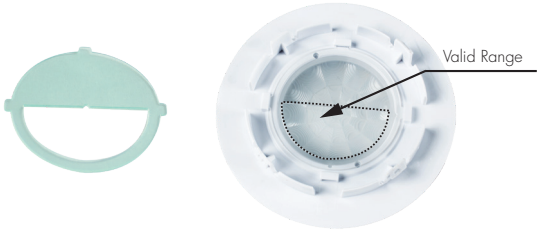
Optional Accessory --- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



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



Blind Option 1 --- Aisle Detection



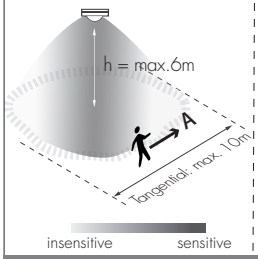
Blind Option 2 --- 180° Detection

2. HIR28/2CH/R (Reinforced Low-bay)

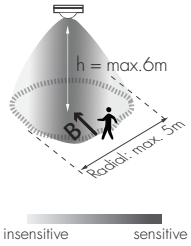
HIR28/2CH/R: Low-bay convex lens detection pattern for **single person** @ Ta = 20°C

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

A: Tangential movement

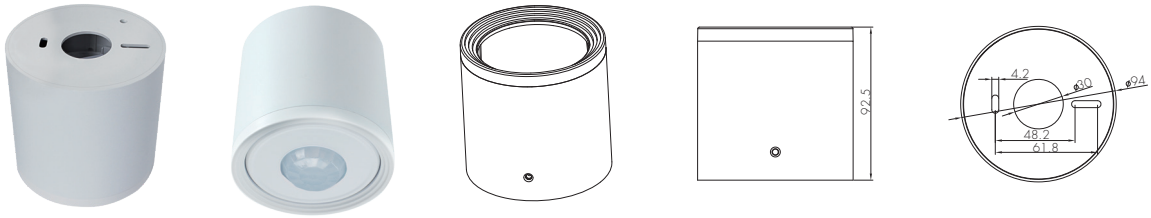


B: Radial movement

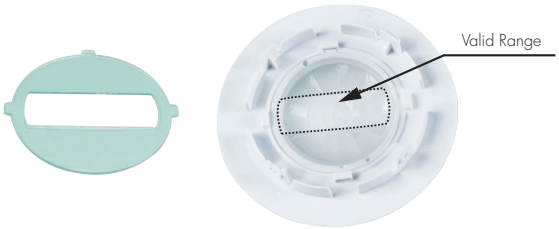


Mount height	Tangential (A)	Radial (B)
2.5m	max 79m² (Ø = 10m)	max 20m² (Ø = 5m)
3m	max 79m² (Ø = 10m)	max 20m² (Ø = 5m)
4m	max 64m² (Ø = 9m)	max 20m² (Ø = 5m)
5m	max 50m² (Ø = 8m)	max 20m² (Ø = 5m)
6m	max 50m² (Ø = 8m)	max 20m² (Ø = 5m)

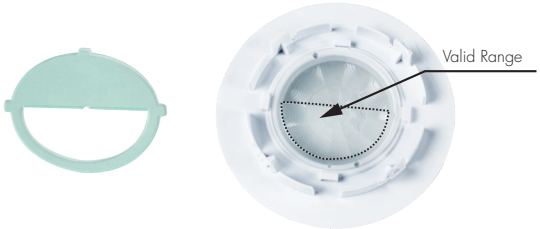
Optional Accessory --- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



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



Blind Option 1 --- Aisle Detection



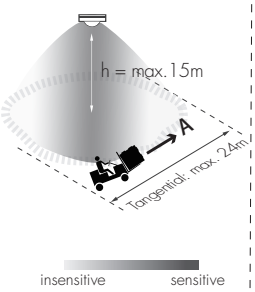
Blind Option 2 --- 180° Detection

3. HIR28/2CH/H (High-bay)

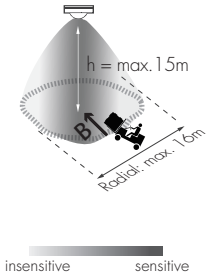
HIR28/2CH/H: High-bay lens detection pattern for **forklift** @ Ta = 20°C

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

A: Tangential movement



B: Radial movement

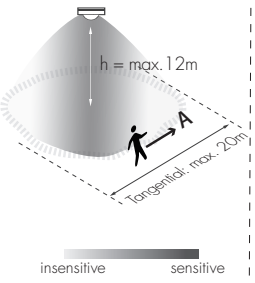


Mount height	Tangential (A)	Radial (B)
10m	max 380m² (Ø = 22m)	max 201m² (Ø = 16m)
11m	max 452m² (Ø = 24m)	max 201m² (Ø = 16m)
12m	max 452m² (Ø = 24m)	max 201m² (Ø = 16m)
13m	max 452m² (Ø = 24m)	max 177m² (Ø = 15m)
14m	max 452m² (Ø = 24m)	max 133m² (Ø = 13m)
15m	max 452m² (Ø = 24m)	max 113m² (Ø = 12m)

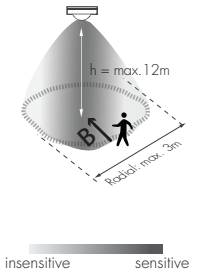
HIR28/2CH/H: High-bay lens detection pattern for **single person** @ Ta = 20°C

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

A: Tangential movement

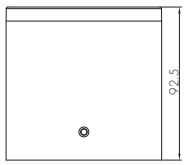


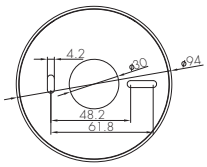
B: Radial movement



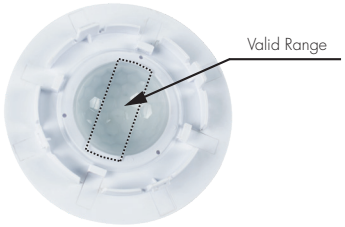
Mount height	Tangential (A)	Radial (B)
2.5m	max 50m² (Ø = 8m)	max 7m² (Ø = 3m)
6m	max 104m² (Ø = 11.5m)	max 7m² (Ø = 3m)
8m	max 154m² (Ø = 14m)	max 7m² (Ø = 3m)
10m	max 227m² (Ø = 17m)	max 7m² (Ø = 3m)
11m	max 269m² (Ø = 18.5m)	max 7m² (Ø = 3m)
12m	max 314m² (Ø = 20m)	max 7m² (Ø = 3m)

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

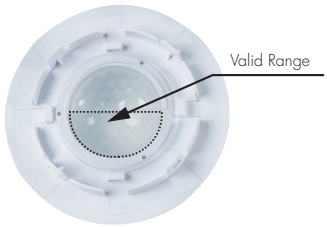




Optional Accessory --- Blind Insert for Blocking Certain Detection Angles



Blind Option 1 --- Aisle Detection



Blind Option 2 --- 180° Detection

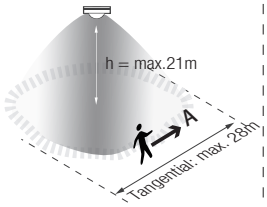
4. HIR28/2CH/UH (Ultra High-bay)

HIR28/2CH/UH: Ultra High-bay convex lens detection pattern for single person @ Ta = 20°C

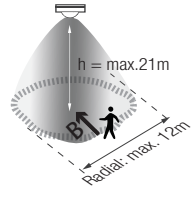
(Recommended ceiling mount installation height 3m-21m)

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

A: Tangential movement

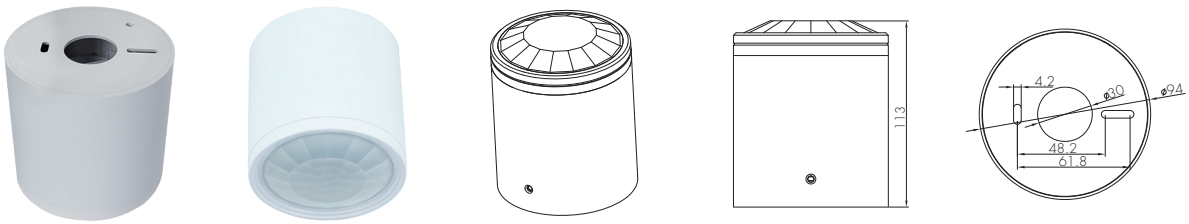


B: Radial movement



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

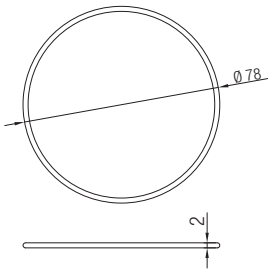
Optional Accessory --- Ceiling/Surface Metal Mount Box: HA09/W, HA09/B, HA09/G



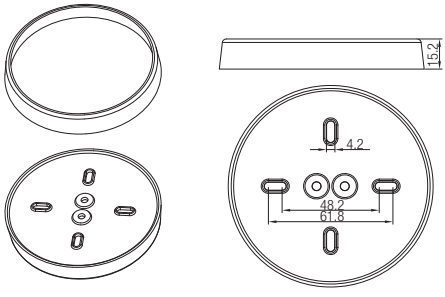
Optional Accessories For Water-Proof

*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)



Noted: HIR28/2CH/UH is only suitable for small silicon water-proof gasket

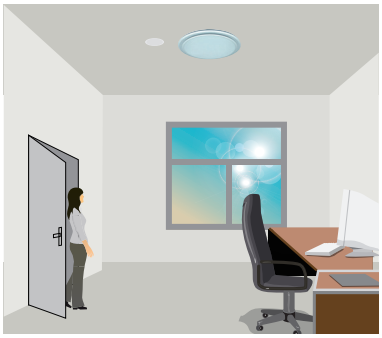
Functions and Features

1 On/ off Control

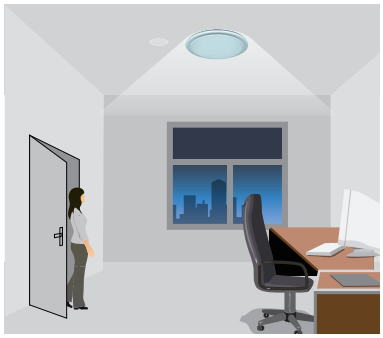
This sensor is a motion switch, which turns on the light upon detection of motion, and turns off after a pre-selected hold-time when there is no movement. A daylight sensor is also built in to prevent the light from switching on when there is sufficient natural light.

2 Intelligent Photocell (daylight detection prior to motion detection)

The built-in photocell will also automatically turn off the light when the ambient natural light exceeds the programmed lux level for more than 5min, regardless of whether motion is detected or not.



With sufficient natural light, the light does not switch on when presence is detected.



With insufficient natural light, the sensor switches on the light automatically when presence is detected.

The sensor switches off the light when natural light is sufficient, even with presence.

3 Manual Override

With the help of push-switch, this sensor can be over-ridden by the end-user to manually switch on/off the light, which makes the product more user-friendly and offers more options to fit some extra-ordinary demands:

* Short Push (<1s): on/off function;
  On → Off: the light turns off immediately and cannot be triggered ON by motion until the expiration of pre-set hold-time. After this period, the sensor goes back to normal sensor mode.
  Off → On: the light turns on and goes to sensor mode, no matter if ambient Lux level exceeds the daylight threshold or not.

Note: if end-user do not want this manual override function, just leave the "push" terminal unconnected to any wire.

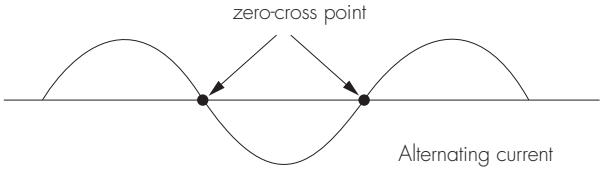
4 Semi-auto Mode (Absence Detection)

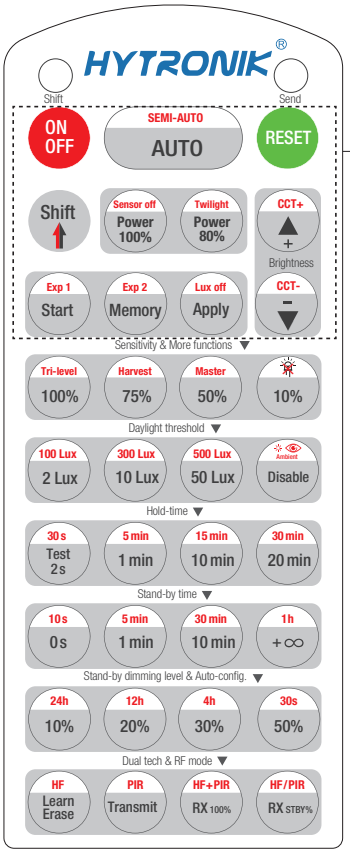
It is easy to forget to switch off the light, in office, corridor, even at home. And in many other cases, people do not want to have a sensor to switch on the light automatically, for example, when people just quickly pass-by, there is no need to have the light on. The solution is to apply this "absence detector": motion sensor is employed, but only activated on the manual press of the push-switch, the light keeps being ON in the presence, and switches off in the long absence.

Note: end-user can choose either function 3 or function 4 for application. Default function is manual override.

5 Zero-cross Relay Operation

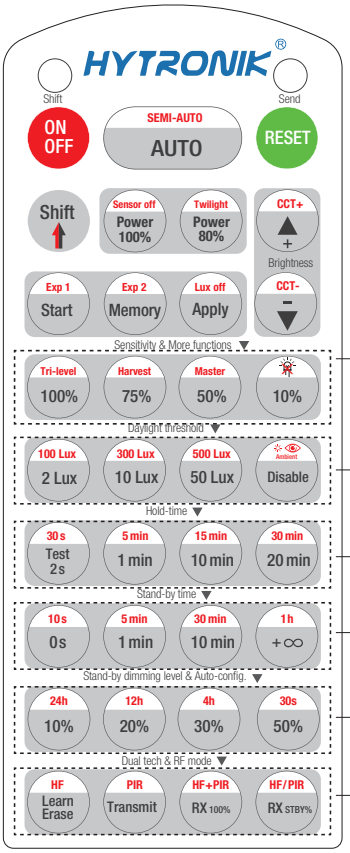
Designed in the software, sensor switches on/off the load right at the zero-cross point, to ensure that the in-rush current is minimised, enabling the maximum lifetime of the relay.





HRC-11

ON OFF	Press button "ON/OFF" to select permanent ON or permanent OFF mode. * Press button "AUTO"/ "RESET" to exit this mode.
RESET	Press button "RESET", all settings go back to default. The default settings are: Auton mode; Detection range 100%; Hold-time 5min; Daylight threshold disable; Lux off activated;
Shift	Press button "Shift", the LED on the top left corner is on to indicate mode selection. All values / settings in RED are valid for 20 seconds.
AUTO	Press button "AUTO" to initiate automatic mode. The sensor starts working and all settings remain as before the light is switched ON/OFF;
SEMI-AUTO	1. Press button "Shift" ,the red LED on. 2. Press button "SEMI-AUTO" to initiate Semi-auto mode. The sensor is only activated with the manual press of push switch. To exit this mode, simply press button "AUTO". *For Sensor LED indicator references: Remains on 2s, initiate "Semi-auto" mode from "Auto" mode.*
Power 100% 80%	This key is not appliable on this product.
Sensor off Twilight	This key is not appliable on this product.
	This key is not appliable on this product.
CCT+ CCT-	This key is not appliable on this product.
Start Memory Apply	1. Press button "Start" to program. 2. Select the buttons in "Detection range", "Daylight threshold", "Hold-time", "Stand-by time", to set all parameters. 3. Press button "Memory" to save all the settings programmed in the remote control. 4. Press button "Apply" to set the settings to each sensor unit(s). *For example, to set detection range 100%, daylight threshold Disable, hold-time 5min, stand-by time +∞, the steps should be:* *Press button "Start", button "100%", "Disable", "Shift", "5min", "Shift", "+∞", "Memory". By pointing to the sensor unit(s) and pressing "Apply", all settings are passed on the sensor(s).*
Lux off	The "Lux off" function is activated as default. When the ambient lux level exceeds the target level continuously for more than 5 minutes, the lights will be turned off. In AUTO /SEMI-AUTO/Twilight modes, to disable "Lux off": 1. Press "Shift" button first, the red LED on. 2. Press "Lux off" button, the "Lux Off" function will be deactivated. The lights will not turn off even when the ambient lux level exceeds the target lux level but will dim down the brightness to the stand-by time level. *For Sensor LED indicator references: 1.Fast flash 1s, "Lux off" function activated.* *2.Remains on 2s, "Lux off" function deactivated.*
Exp 1 Exp 2	"Exp" refer to Expansion, these two buttons are reserved functions and pending future development.



HRC-11

Sensitivity & More functions	
100% 75% 50% 10%	In AUTO /SEMI-AUTO modes, press buttons in zone "Detection range" to set detection range at 100%/75%/50%/10%.
Tri-level Harvest	This key is not appliable on this product.
Master	This key is not appliable on this product.
Daylight threshold	
2 Lux 100 Lux 10 Lux 300 Lux 50 Lux 500 Lux Disable	Press buttons in zone "Daylight threshold" to set daylight sensor at 2Lux/ 10Lux / 50Lux / 100Lux / 300Lux/500Lux / Disable. *Note: To set daylight sensor at 100Lux / 300Lux/500Lux , press "Shift" button first.*
Ambient	1. Press button "Shift", the red LED on. 2. Press button "Ambient", the surrounding lux level is sampled and set as daylight threshold / target Lux level.
Hold-time mode	
Test 2s 30 s 1 min 5 min 10 min 15 min 20 min 30 min	In AUTO /SEMI-AUTO modes, press buttons in zone "hold-time" to set the hold-time at 2s / 30s / 1min / 5min / 10min / 15min / 20min / 30min. *Note: 1. To set hold-time at 30s / 5min / 15min / 30min, press "Shift" button first.* *2. 2s is for testing purpose only, stand-by period and daylight sensor settings are disabled in this mode.* *To exit from Test mode, press button "RESET" or any button in "Hold-time".
Stand-by time mode	
0s 10 s 1 min 5 min 10 min 30 min +∞ 1h	Press buttons in zone "stand-by time", the stand-by period time can be extended by overlaying the time in the "hold-time" zone with the time in"stand-by time" zone. For example, press button "5 min" in "hold-time" zone + button "30 min" in "stand-by time" zone, the stand-by period time is total of 35 minutes. *Note: 1. To set stand-by time at 10s/ 5min / 30min / 1h, press "Shift" button first.* *2. When "Lux off" is activated as default, press button"+∞", the product is a daylight sensor and will be turned off when the ambient lux level exceeds the target lux level, no longer motion detected. When "Lux off" function be deactivated, "+∞" means the fixture will remains on.*
Stand-by dimming level & Auto-config.	
10% 20% 30% 50%	This key is not appliable on this product.
24h 12h 4h 30s	This key is not appliable on this product.
Dual tech & RF mode	
Learn Erase	This key is not appliable on this product.
Transmit	This key is not appliable on this product.
HF PIR HF+PIR HF/PIR	This key is not appliable on this product.

Additional Information / Documents

1. Regarding precautions for PIR sensor installation and operation, please kindly refer to www.hytronik.com/download ->knowledge ->PIR Sensors - Precautions for Product Installation and Operation

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