Daylight Harvest HF Sensor

HC019V/DH

Fixture Built-in Sensor with Photocell Advance™ and Remote Control

HYTRONIK®

Applications

Occupancy detector with daylight harvest suitable for building into the fixture:

- Office / Commercial Lighting
- Classroom

Use for new luminaire designs and installations

Features

- Daylight harvest function to regulate light output for maintaining required lux level
- Special photocell to measure and differentiate natural light from LED light from behind the fixture cover
- Tri-level dimming control based upon occupancy (also known as corridor function)
- One-key commissioning via programmable remote control
- 1-10V dimming control method
- Synchronised dimming with multiple sensor circuits
- Zero crossing detection circuit reduces in-rush current and prolongs relay life
- Loop-in and loop-out terminal for efficient installation
- 5-Year Warranty

Technical Data

Input Characteristics

Model No.	HC019V/DH
Mains voltage	220~240VAC 50/60Hz
Stand-by power	<0.8W
Load ratings:	
Capacitive	800VA
Resistive	1200W
Warming-up	20s

Safety and EMC

EMC standard (EMC)	EN55015, EN61000
Safety standard (LVD)	EN60669
Radio Equipment (RED)	EN300440, EN301489, EN62479
Certification	Semko, CB, CE , EMC, RED, RCM

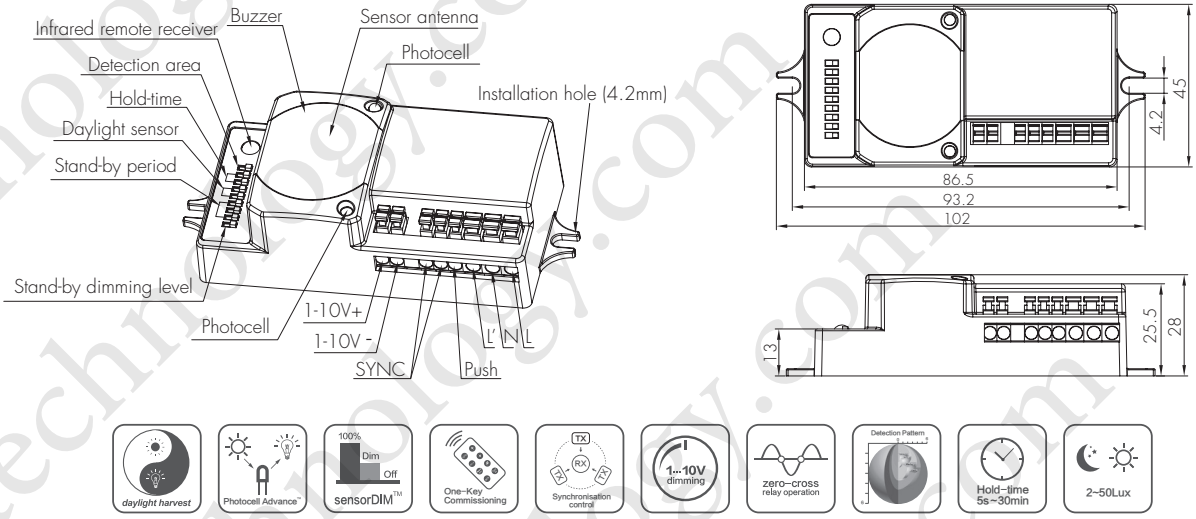
CE emc RED CB IP20

Sensor Data

Model No.	HC019V/DH
Sensor principle	High Frequency (microwave)
Operation frequency	5.8GHz +/- 75MHz
Transmission power	<0.2mW
Detection range	Max. (Ø x H) 12m x 6m
Detection angle	30° ~ 150°
DIP Switch Settings:	
Sensitivity	50% / 100%
Hold-time	5s ~ 30min (selectable)
Daylight threshold	2 ~ 50 lux, disabled
Stand-by period	0s ~ 1h, +∞ (selectable)
Stand-by dimming level	10% /30%

Environment

Operation temperature	Ta: -20°C ~ +60°C
Case temperature (Max.)	Tc: +80°C
IP rating	IP20



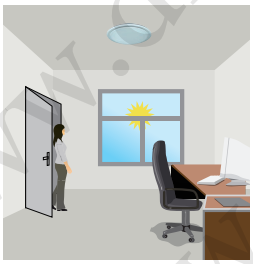
Note: We recommend the mounting distance between sensor to sensor should be more than 2m to prevent sensors from false-triggering.

Functions and Features

1 Photocell Advance™ Function

It's well known that LED lights have a totally different spectrum to natural light. Hytronik uses this principle and comes up with special photocell and sophisticated software algorithm to measure and differentiate natural light from LED light from behind the fixture cover, so that this photocell can ignore internal LED light and only respond to the natural light outside.
Our technology has no infringement to the existing patents in the market.

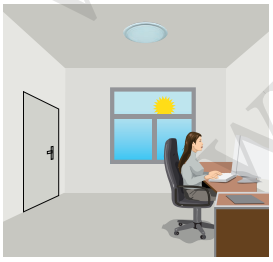
2 Daylight Harvest



Light will not switch on when natural light is sufficient, even there is motion detected.

The light switches on automatically with presence when natural light is insufficient.

The light turns on at full or dims to maintain the lux level. The light output regulates according to the level of natural light available.



The light switches off when the ambient natural light is sufficient.

The light dims to stand-by period after hold-time and stays on selected minimum dimming level.

The light switches off completely after the stand-by period.

Note:
1. The light automatically turns on at target dim level or turns off based upon ambient natural light lux level during stand-by period if it is preset to '+∞'.

2. The target lux level can be adjusted by RC or a long press on the push switch.

3 Synchronisation Function

By connecting the "SYNC" terminals in parallel (maximum 10pcs, see wiring diagram), no matter which sensor detects motion, all HC019V/DH in the group will turn on the lights (ambient natural light is below daylight threshold). The detection area is widely enlarged in this way while other settings such as hold-time, stand-by period, stand-by dimming level and daylight threshold on each individual unit stay the same.

4 Manual Override

This sensor reserves the access of manual override function for end-user to switch on/off, or adjust the target lux level by push-switch, 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.
* Long Push (>1s): adjust the target lux level by turning the light up or down. Both the adjustment on RC and push switch can overwrite each other, the last adjustment remains in memory.

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

5 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 maunal press of the push switch, the light keeps being ON in the presence, and dims down in the absence, and eventually switches off in the long absence.

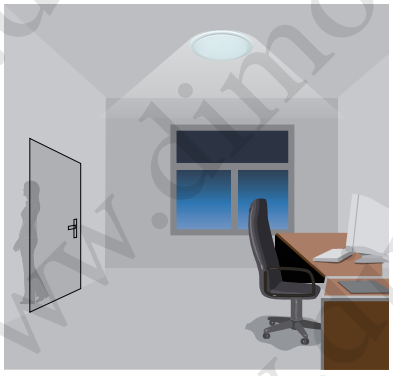
This is a good combination of sensor automation and maunal override control, to have the maximum energy saving, and at the same time, to keep efficient and comfortable lighting.

The light does not switch on when there is presence being detected.

Short push to activate the sensor and switch on the light

The light turns on full, and the sensor stays in sensor mode.

The light keeps being ON during the presence.



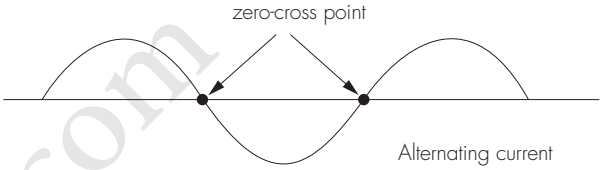
People left, the light dims to stand-by level after the hold-time.

The light switches off automatically after the stand-by period elapses.

Note: end-user can choose either function 4 or function 5 for application. Default function is manual override.

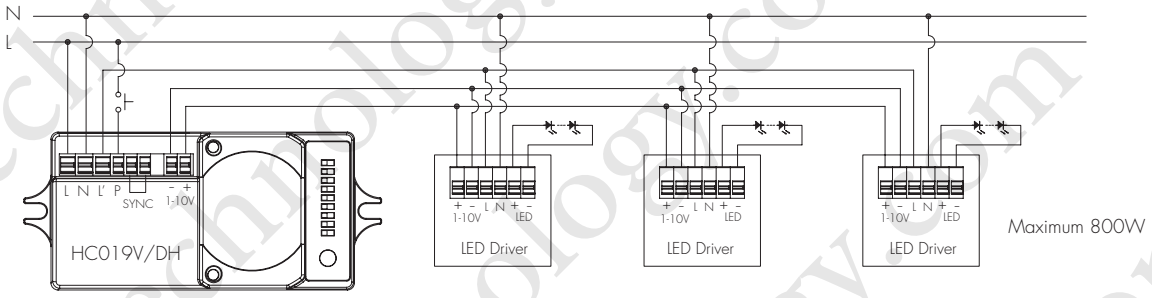
6 Zero-cross Relay Operation

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.

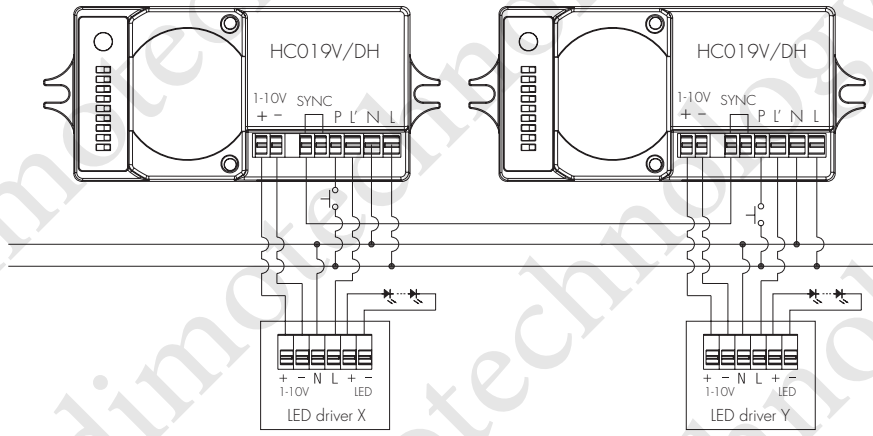


Wiring Diagram

1 sensor controls a group of ballast /LED driver

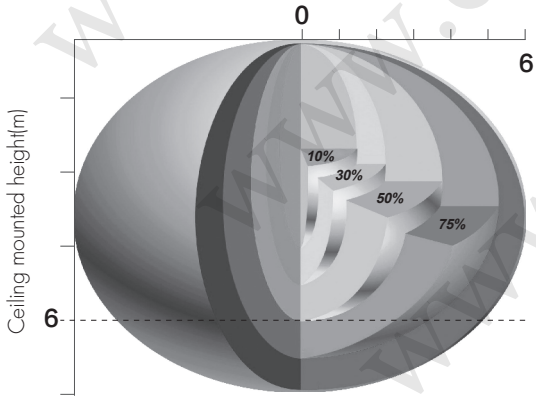


Multiple sensors control the same group of ballast /driver

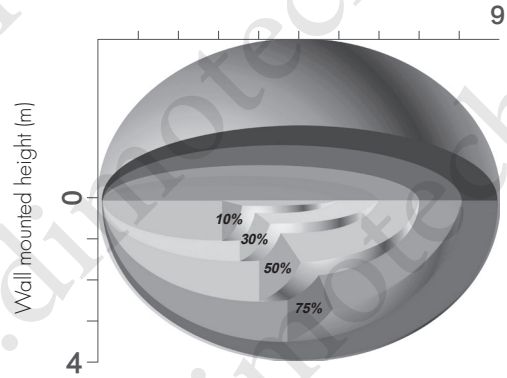


Note: this 1-10V output is isolated, SELV output. Do not connect the 1-10V terminals on driver X to Driver Y.

Detection Pattern



Ceiling mounted detection pattern (m)



Wall mounted detection pattern (m)

Settings (Remote Control HRC-11)

Permanent ON/OFF function

Press button "ON/OFF" to select permanent ON or permanent OFF mode.
* Press button "AUTO", "RESET" or "Ambient" to quit this mode.
The mode will change to AUTO Mode after power failure.

Reset Settings

Press button "RESET", all settings go back to DIP switch settings.

Shift Button

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 mode

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 mode

1. Press button "Shift", the red LED flashes for indication.
2. Press button "SEMI-AUTO/AUTO" to initiate semi-auto mode. The fixture is manually turned on by pressing the push-switch, and goes off automatically after stand-by time. (Absence detection mode)

Power output

Press the buttons to select light output at 80% (at initial 10,000 hours) or 100%.
Note: "Sensor off" and "Twilight" functions are disabled.

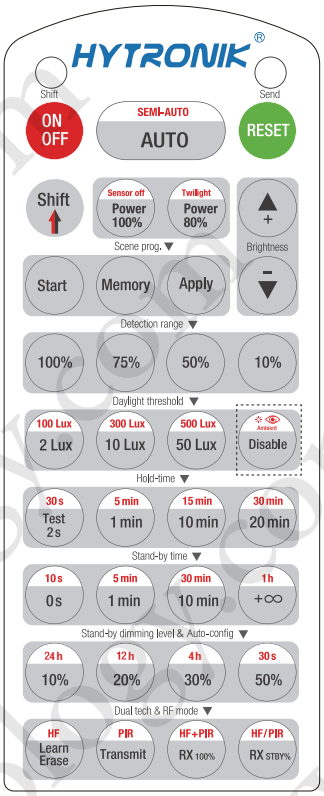
Brightness +/-

Press these two buttons to adjust the light output brightness and set a new target lux level. The built-in daylight sensor can measure ambient daylight level from behind the diffuser and calculates how much artificial light is needed to maintain the target lux level.

Scene program - *1-key commissioning*

1. Press button "Start" to program.
2. Select the buttons in "Detection range", "Daylight threshold", "Hold-time", "Stand-by time", "Stand-by dimming level" 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 +∞, stand-by dimming level 30%, the steps should be: Press button "Start", button "100%", "Disable", "Shift", "5min", "Shift", "+∞", "30%", "Memory". By pointing to the sensor unit(s) and pressing "Apply", all settings are passed on the sensor(s).



HRC-11

Detection range

Press buttons in zone "Detection range" to set detection range at 100% / 75% / 50% / 10%.

Daylight threshold

Press buttons in zone " Daylight threshold" to set daylight sensor at 2Lux/ 10Lux / 50Lux / 100Lux / 300Lux / 500Lux / Disable.
The light will not turn on upon movement if ambient lux level exceeds the daylight threshold preset.
Note: To set daylight sensor at 100Lux / 300Lux / 500Lux, press "Shift" button first.

Ambient daylight threshold

1. Press button "Shift", the red LED starts to flash.
2. Press button "Ambient", the surrounding lux level is sampled and set as the new daylight threshold.

Hold-time

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 (corridor function)

Press buttons in zone "stand-by time" to set the stand-by period at 0s / 10s / 1min / 5min / 10min / 30min / 1h / +∞.
Note: "0s" means on/off control; "+∞" means the stand-by time is infinite and the light is effectively controlled by the daylight sensor, off when natural light is sufficient and automatically on at dimming level when insufficient.

Stand-by dimming level

Press the button in zone "stand-by dimming level" to set the stand-by dimming level at 10% / 20% / 30% / 50%.
Note:The function of 24h / 12h / 4h / 30s are disabled.

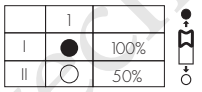
Dual tech & RF mode

All buttons in this zone are disabled.

DIP Switch Settings

1 Detection Range

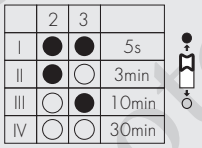
Sensor sensitivity can be adjusted by selecting the combination on the DIP switches to fit precisely for each specific application.



I – 100%
II – 50%

2 Hold Time

Select the DIP switch configuration for the light on-time after presence detection.
This function is disabled when natural light is sufficient.

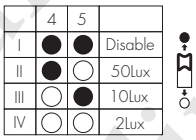


I – 5s
II – 3min
III – 10min
IV – 30min

3 Daylight Threshold

Set the level according to the fixture and environment. The light will not turn on if ambient lux level exceeds the daylight threshold preset.
Please note that the ambient lux level refers to internal light reaching the sensor.

Disabling the daylight sensor will put the sensor into occupancy detection only mode.

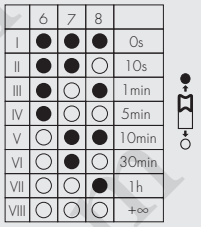


I – Disable
II – 50Lux
III – 10Lux
IV – 2Lux

4 Stand-by period (corridor function)

This is the time period you would like to keep at the low light output level before it is completely switched off in the long absence of people.

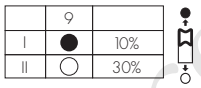
Note: "0s" means on/off control;
"+∞"means the stand-by period is infinite and the light is effectively controlled by the daylight sensor, off when natural light is sufficient and automatically on at dimming level when insufficient.



I – 0s
II – 10s
III – 1min
IV – 5min
V – 10min
VI – 30min
VII – 1h
VIII – +∞

5 Stand-by dimming level

The setting is used to select the desired dimmed light level used in periods of absence for enhanced comfort and safety.



I – 10%
II – 30%

Additional Information / Documents

1. For full explanation of Hytronik Photocell Advance™ technology, please kindly refer to www.hytronik.com/download ->knowledge ->Introduction of Photocell Advance
2. Regarding precautions for microwave sensor installation and operation, please kindly refer to www.hytronik.com/download ->knowledge ->Microwave Sensors - Precautions for Product Installation and Operation
3. Regarding Hytronik standard guarantee policy, please refer to www.hytronik.com/download ->knowledge ->Hytronik Standard Guarantee Policy

Test Verification of Conformity

Verification Number: 190925152GZU-VOC001

On the basis of the referenced test report(s), sample(s) tested of the below product have been found to comply with the standards harmonized with the directives listed on this verification at the time the tests were carried out. Other standards and Directives may be relevant to the product. This verification is part of the full test report(s) and should be read in conjunction with it <them>. This verification replaces previous verification dated: 16-08-2018: 140625045GZU-001

Once compliance with all product relevant CE mark directives are verified, including any relevant e.g. risk assessment and production control, the manufacturer may indicate compliance by signing a Declaration of Conformity themselves and applying the mark to products identical to the tested sample(s).

Applicant Name & Address:	Hytronik Electronics Co., Ltd. 3rd Floor, block C, Complex building 155#, Bai'gang Road South Bai'gang Village, Xiao Jin Kou Town Huicheng District, Huizhou, Guangdong, China
Product Description:	Lighting control switch (Motion sensor)
Ratings & Principle Characteristics:	See appendix
Models/Type References:	See appendix
Brand Name:	HYTRONIK
Relevant Standards:	EN 60669-2-1: 2004 +A1: 2009+ A12: 2010; EN 60669-1: 2018; EN 62493: 2015
Verification Issuing Office Name & Address:	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
Date of Tests:	25 September 2019 to 31 October 2019
Test Report Number(s):	190925152GZU-001

Additional information in Appendix.

Signature Shelley Ying

Name: Shelley Ying
Position: Technical Manager
Date: 19 November 2019

APPENDIX: Test Verification of Conformity

This is an Appendix to Test Verification of Conformity Number: 190925152GZU-VOC001

Manufacturer:	Hytronik Electronics Co., Ltd. 3rd Floor, block C, Complex building, 155#, Bai'gang road south, Bai'gang village, Xiao Jin Kou town, Huicheng district, Huizhou, Guangdong, China
Ratings & Principle Characteristics:	220-240 VAC; 50/60 Hz; Micro-gap; IP20; Integral type; HC005S; DS05; HC005S/I: Max. 800 W for incandescent Lamp and Max. 400 W for fluorescent Lamp; HC017V; HC018V; HC019V; HC019V/I; HC019V/DH: Max. 800 W for fluorescent Lamp; HC018V /RF; HC023RF; HC024RF: Max. 1200 W for incandescent Lamp and Max. 400 W for fluorescent Lamp
Models/Type References:	HC005S; DS05; HC017V; HC018V; HC019V; HC018V /RF; HC023RF; HC024RF; HC005S/I; HC019V/I; HC019V/DH (total 11 models)

Signature

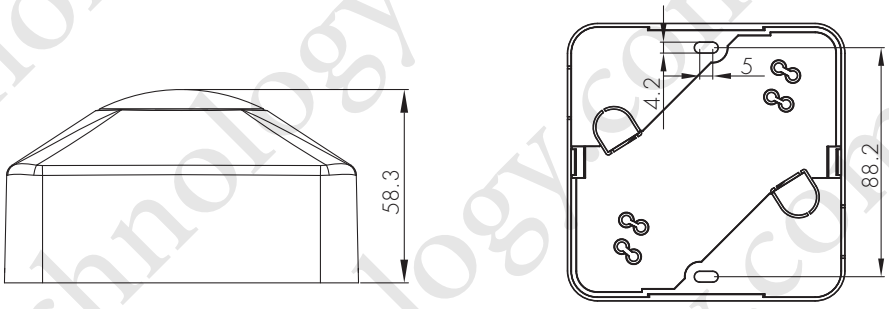
Name: Shelley Ying
Position: Technical Manager
Date: 19 November 2019

IP20 Housing for HF Motion Sensor

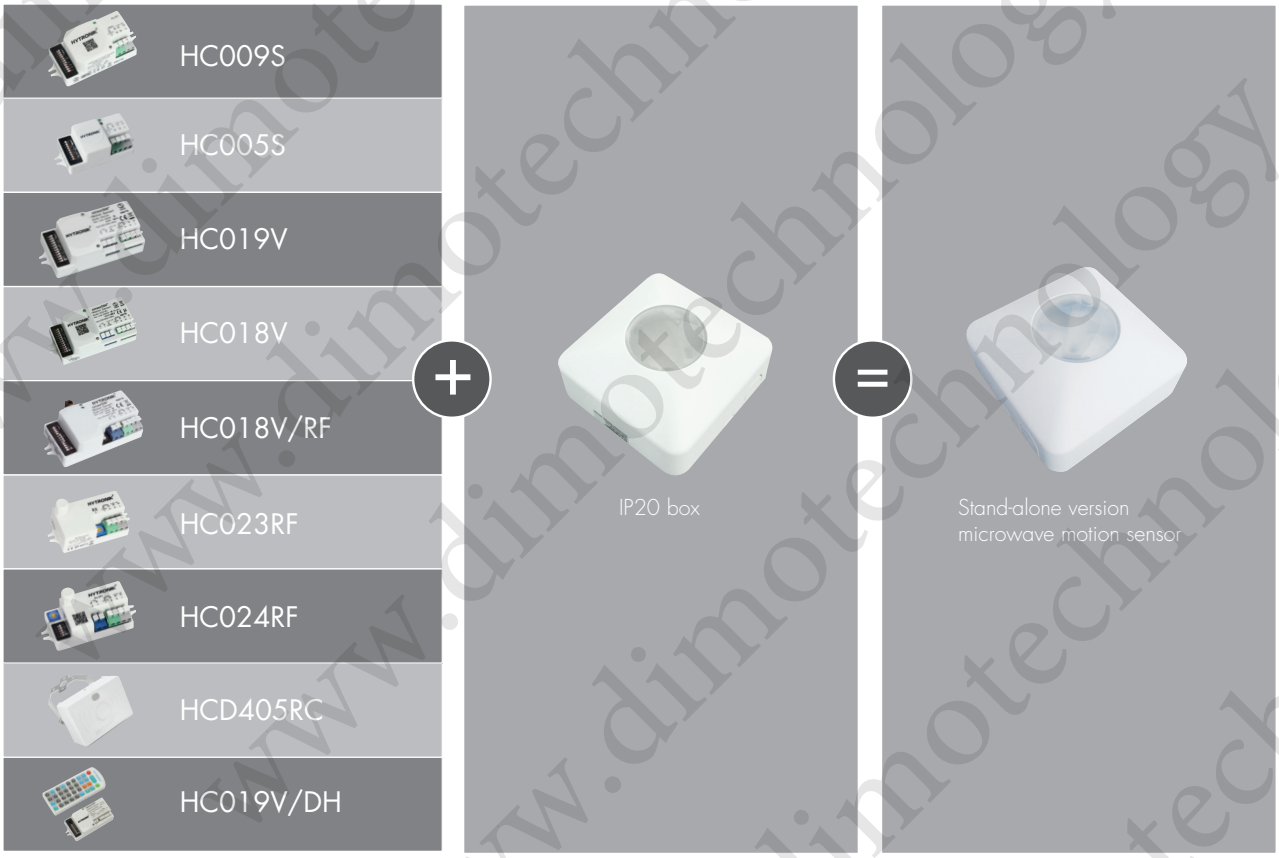
HC-IP20

HYTRONIK®

Mechanical structure



Below sensors can be mounted inside the IP20 box, for stand alone independent electrical installation.
(the milky lens allows natural light come through)



Installation Instructions

step1

Choose your wiring

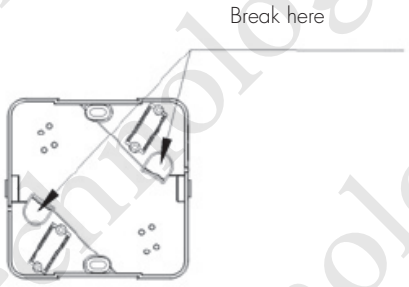


Fig. 1

Option 1: For cables buried in the walls

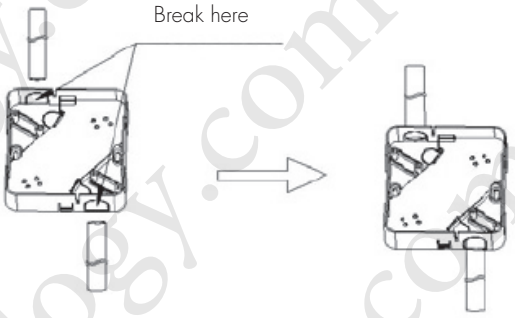
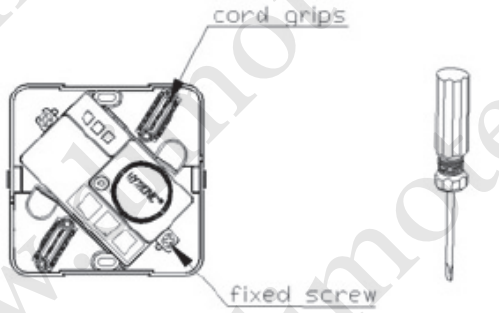


Fig. 2

Option 2: For cables go from cable pipe

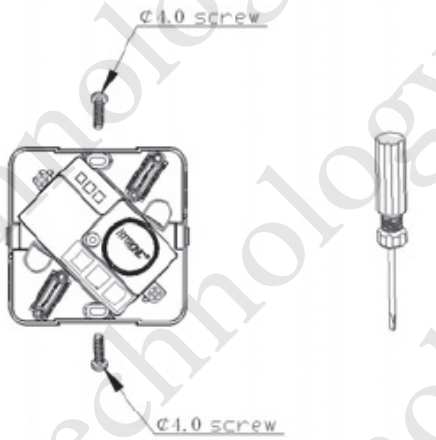
step2

Install the sensor on the box base



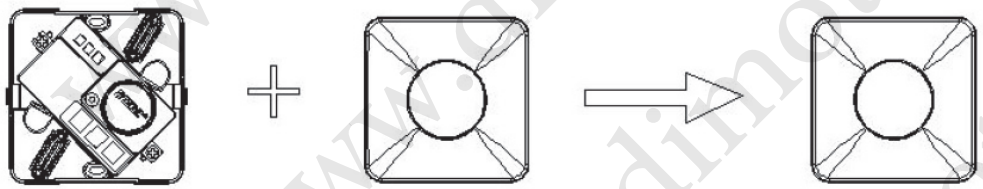
step3

Fixing the base to the ceiling or flat surface with screws



step4

Mount the cover to the base

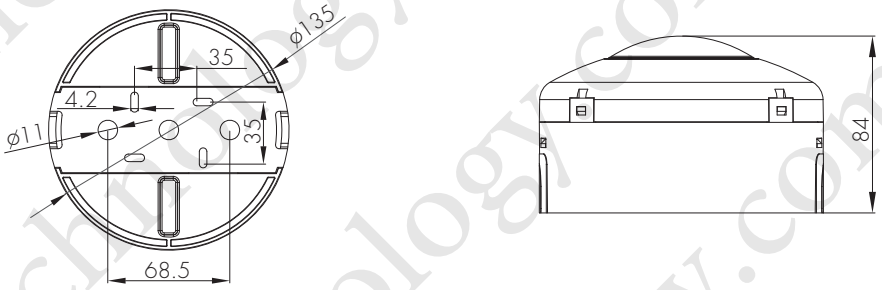


IP65 Housing for HF Motion Sensor

HC-IP65

HYTRONIK®

Mechanical structure



Putting the sensors inside the IP65 box, they are then safe and ready for independent installation.
They are 2 colors of the box: transparent PC for daylight, and white PC when the daylight sensor is not intended to use.

Installation Instructions

step1

Put motion sensor into the IP housing and click the cover on

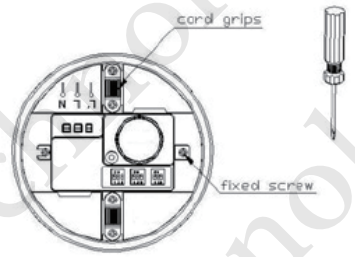


Fig 1.1

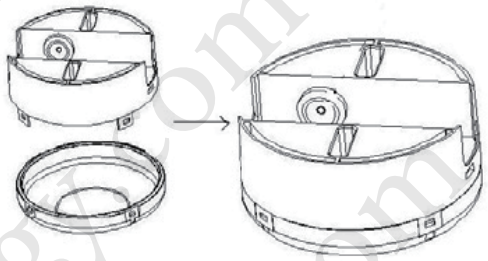


Fig 1.2

step2

Mounting bracket (three options):

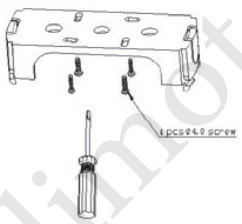


Fig 2.1

Option 1: Mount bracket to flat surface with screws

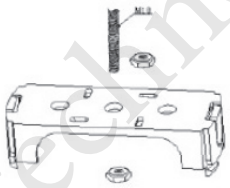


Fig 2.2

Option 2: Mount bracket to ceiling pole with nut

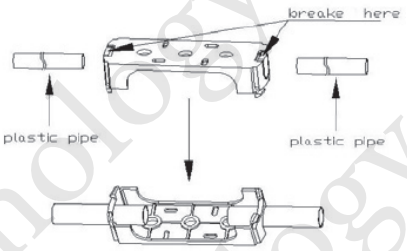


Fig 2.3

Option 3: Put pipe through the bracket hole

step3

Mount the bracket to the cover

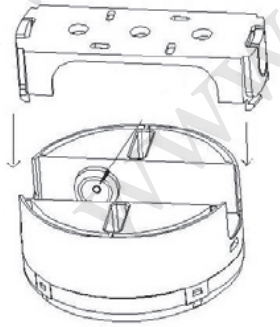


Fig 3.1

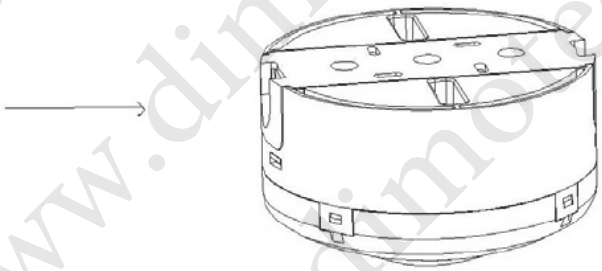


Fig 3.2