

Tri-level Control HF Sensor

HC018V
Standard Version

HYTRONIK®

Applications

Occupancy detector with tri-level control suitable for indoor use.

Suitable for building into the fixture:

- Office / Commercial Lighting

Use for new luminaire designs and installations



Features

- Tri-level dimming control based upon occupancy (also known as corridor function)
- 1-10V dimming control method
- 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.	HC018V
Mains voltage	220~240VAC 50/60Hz
Stand-by power	<0.5W
Load ratings:	
Capacitive	800VA
Resistive	2000W
Warming-up	20s

Safety and EMC

EMC standard (EMC)	EN55015, EN61000
Safety standard (LVD)	EN60669, AS/NZS60669
Radio Equipment (RED)	EN300440, EN301489, EN62479
Certification	Semko, CB, CE, EMC, RED, RCM

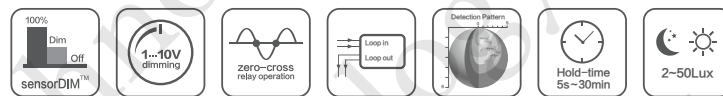
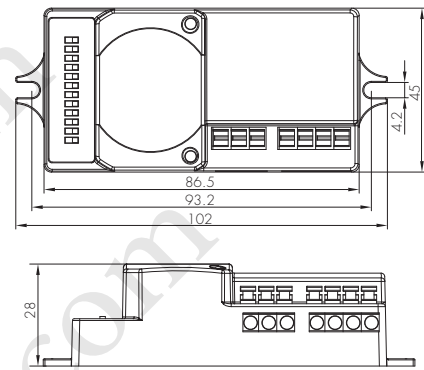
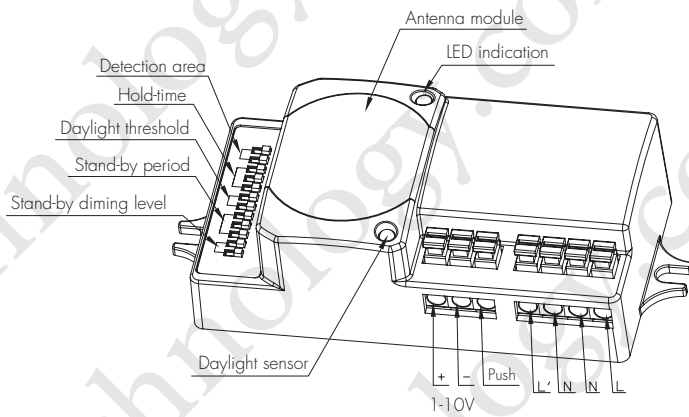
CE emc RED   CB IP20

Sensor Data

Model No.	HC018V
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°
Setting adjustments:	
Sensitivity	10% / 50% / 75% / 100%
Hold-time	5s ~ 30min (selectable)
Daylight threshold	2 ~ 50 lux, disabled
Stand-by period	0s ~ 1h, +∞ (selectable)
Stand-by dimming level	10% / 20% / 30% / 50%

Environment

Operation temperature	Ta: -35°C ~ +70°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 Tri-level Control (Corridor Function)

Hytronik builds this function inside the motion sensor to achieve tri-level control, for some areas which require a light change notice before switch-off. The sensor offers 3 levels of light: 100% → dimmed light → off; and 2 periods of selectable waiting time: motion hold-time and stand-by period; Selectable daylight threshold and freedom of detection area.



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.



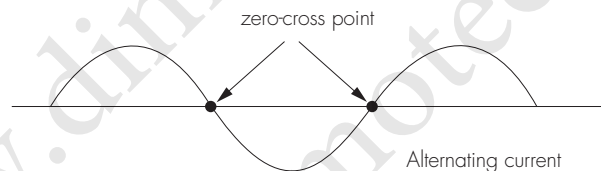
After hold-time, the light dims to stand-by level or switch off if the stand-by period is pre-set to 0s.



Light switches off automatically after the stand-by period elapses.

2 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.



3 Loop-in and Loop-out Terminal

Double LN terminal makes it easy for wire loop-in and loop-out, and saves the cost of terminal block and assembly time.

4 Manual Override

This sensor reserves the access of manual override function for end-user to switch on/off, or adjust the brightness by push-switch, which makes the product more user-friendly and offers more options to fit some extra-ordinary demands:

* Short Push (< 1 s): 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 (> 1 s): adjust the hold-time brightness level between 10% and 100%.

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 manual 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 manual 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.



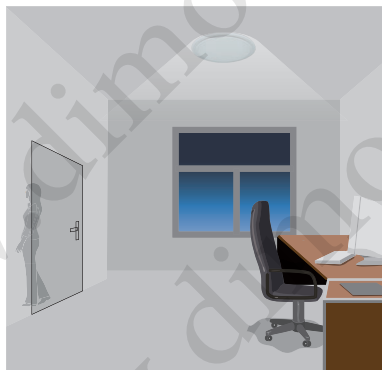
Short push to activate the sensor and switch on the light



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



The light keeps being ON during the presence.

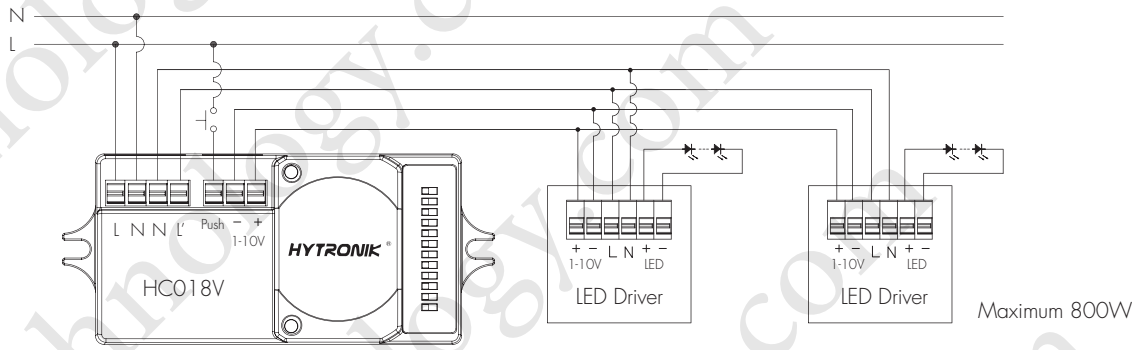


People left, the light dims to stand-by level after the hold-time.



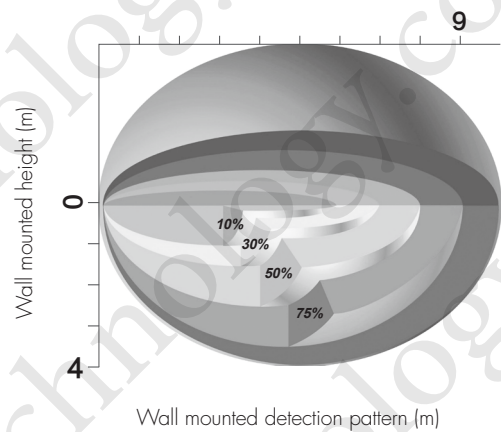
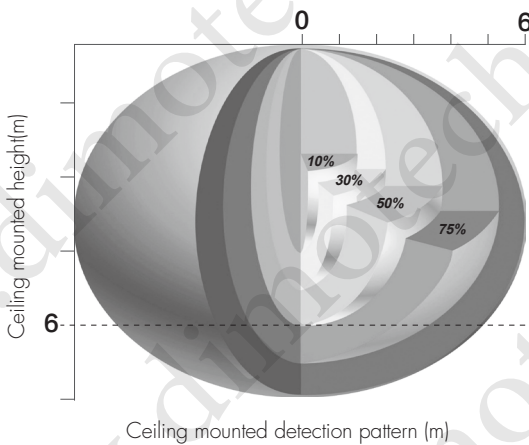
The light switches off automatically after the stand-by period elapses.

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



Note: this 1-10V output is non-isolated, please make sure the fixture is constructed according to relevant safety standard.

Detection Pattern



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.

	1	2	
I	●	●	100%
II	●	○	75%
III	○	●	50%
IV	○	○	10%

- I – 100%
- II – 75%
- III – 50%
- IV – 10%

2 Hold Time

Select the dip switch configuration for the full brightness on-time after presense detection.

Please note that this function is disabled when the natural daylight exceeds the daylight threshold setting for more than 5 minutes.

	1	2	3	
I	●	●	●	5s
II	●	●	○	30s
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	20min
VII	○	○	○	30min

- I – 5s
- II – 30s
- III – 1min
- IV – 5min
- V – 10min
- VI – 20min
- VII – 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.

	1	2	
I	●	●	Disable
II	●	○	50Lux
III	○	●	10Lux
IV	○	○	2Lux



 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 time is infinite and the fixture never switches off.

	1	2	3	
I	●	●	●	0s
II	●	●	○	10s
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	30min
VII	○	○	●	1H
VIII	○	○	○	+∞




 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.

Note: end-user can also scan the QR code on the housing for DIP switch settings.

	1	2	
I	●	●	10%
II	●	○	20%
III	○	●	30%
IV	○	○	50%



 I – 10%
 II – 20%
 III – 30%
 IV – 50%

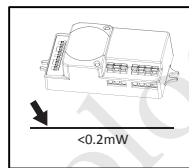
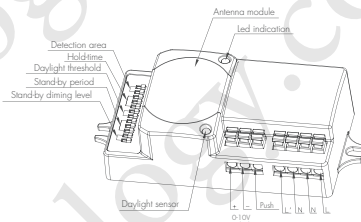
Additional Information / Documents

- 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](http://www.hytronik.com/download->knowledge->Microwave%20Sensors%20-%20Precautions%20for%20Product%20Installation%20and%20Operation)
- Regarding Hytronik standard guarantee policy, please refer to [www.hytronik.com/download ->knowledge ->Hytronik Standard Guarantee Policy](http://www.hytronik.com/download->knowledge->Hytronik%20Standard%20Guarantee%20Policy)

User Manual of Microwave Motion Sensor New advanced version Model.:HC018V

Technical Specifications

PRODUCT TYPE:	Microwave Motion Sensor
OPERATING VOLTAGE:	220-240VAC 50Hz/60Hz
HF SYSTEM:	5.8GHz CW radar
TRANSMISSION POWER:	<0.2mW
RATED LOAD:	800W(capacitive Load)
DETECTION ANGLE:	30~150°
POWER CONSUMPTION:	Approx. 0.5W
DETECTION RANGE:	Max. 12 x 6m (DxH)
TIME SETTING:	5s ~ 30 min.
DAYLIGHT SENSOR:	2~50Lux, disable
STAND-BY PERIOD:	0s, 10s ~ 1h, +∞
STAND-BY DIMMING LEVEL :	10% ~ 50%
MOUNTING:	Indoors, ceiling & walling mounted
Working temperature:	-20 ~ +60°C



The sensor is an active motion detector; it emits a high-frequency electromagnetic wave 5.8GHz and receives its echo. The sensor detects the change in echo from movement in its detection zone. A microprocessor then triggers the switch light ON command. Detection is possible through doors, panels of glasses thin walls.

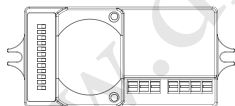
NOTE:the high-frequency output of this sensor is <math><0.2\text{mW}</math>;approximately just 1% of the transmission power of a mobile telephone.

IMPORTANT

PLEASE READ THESE INSTRUCTIONS CAREFULLY PRIOR TO INSTALLATION AND RETAIN THIS LEAFLET IN A KNOWN AND SAFE PLACE FOR FUTURE REFERENCE.

SECTION 1 INSTALLATION & WIRING

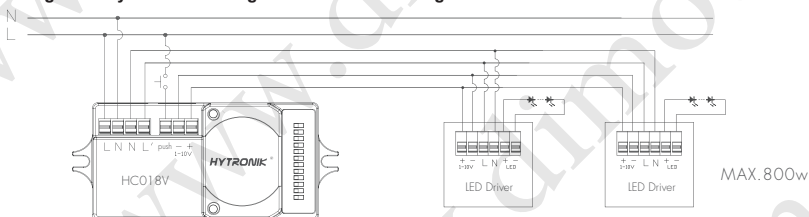
1.1 ENSURE THAT THE ELECTRICITY SUPPLY IS SWITCHED OFF COMPLETELY BEFORE INSTALLING OR SERVICING THIS PRODUCT



The sensor works with a main voltage of 220-240VAC 50/60 Hz.
The sensor has a 7-wire electrical interface:

Nx2(neutral / 220-240VAC)	Push(push switch interface)
L (phase / 220-240VAC)	- (1-10v "-" interface)
L' (switched phase / output)	+ (1-10v "+" interface)

Wring with any 1-10V control gear to achieve dimming function.



SECTION 2 SETTINGS


Detection Area:

This determines the effective range of the motion detector and is set by DIP switches at the sensor itself, refer to figure. Note that reducing the sensitivity will also narrow the detection range.

The following settings are available:

- I – 100%
- II – 75%
- III – 50%
- IV – 10%

	1	2	
I	●	●	100%
II	●	○	75%
III	○	●	50%
IV	○	○	10%



Hold time:

This determines the time the fitting remains at 100% level on motion detection and is set with DIP switches at the sensor itself, refer to figure. The walk test setting is useful when installing the fitting to establish correct operation and range.

The following settings are available:

- I – 5S
- II – 30S
- III – 1min
- IV – 5min
- V – 10min
- VI – 20min
- VII – 30min

	1	2	3	
I	●	●	●	5s
II	●	●	○	30s
III	●	○	○	1min
IV	○	○	○	5min
V	○	●	○	10min
VI	○	●	●	20min
VII	○	○	○	30min




Daylight sensor:

This setting holds off the 100% light output should there sufficient daylight and is set using DIP switches at the sensor, refer to figure. The following settings are available:

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

	1	2	
I	●	●	Disable
II	●	○	50Lux
III	○	●	10Lux
IV	○	○	2Lux




*In disable mode the lamp(s) will always be on with motion detected and operate at 100% light output, even in bright daylight.

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.

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

	1	2	3	
I	●	●	●	0s
II	●	○	○	10s
III	○	○	●	1min
IV	○	○	○	5min
V	○	●	○	10min
VI	○	●	●	30min
VII	○	○	○	1h
VIII	○	○	○	+∞




Note: 0 means on/off control; +∞ means 2 steps of dimming control, fixture never switch off.

Stand-by dimming level

This is the dimmed low light output level you would like to have after the hold-time in the absence of people.

- I – 10%
- II – 20%
- III – 30%
- IV – 50%

	1	2	
I	●	●	10%
II	●	○	20%
III	○	●	30%
IV	○	○	50%



SECTION 3 FUNCTIONS

3.1 Zero-cross relay operation

Designed in the software, the sensor switches on/off the load right on the zero-cross point, to ensure the min. current passing through the relay contact point, and enable the max. load and life-time of the relay.

3.2 Loop-in and loop-out

Double "L" and "N" terminal makes it easy for wire loop-in and loop-out, saves the cost of terminal block and assembly time.

3.3 Manual override

This sensor reserved the access of manual override function for end-users to switch on/ off, or adjust the stand-by dimming level with the push-switch, which makes the product more user-friendly and more options to fit for some extra-ordinary demands.

* short push (<1s): on/off;

ON → OFF: the light turns off immediately and can not be lighten for a certain time (equals to hold time preset) even movement is detected. After this period, the sensor goes to auto sensor mode.

OFF → ON: the light turns on 100% and goes to hold time period directly even movement is detected. As soon as the sensor goes to stand-by period, it can detect movement and turn on the light(100%) again (auto sensor mode).

* long push (>1s): dim up/down the hold-time brightness between 10% to 100%. Both the settings on DIP switch and manual override can overwrite each other, the latest action controls.

* if customers do not want to have this manual override function, we can just leave this "push" terminal alone , not connected to any wire.

Note: this 1-10V output is non-isolated, it can be connected to isolated 1-10V LED driver only.

SECTION 4 TROUBLE SHOOTING

MALFUNCTION CAUSE REMEDY	CAUSE	REMEDY
The load will not work	Incorrect light-control setting selected	Adjust setting
	Load faulty	Replace load
	Mains switch OFF	Switch ON
The load is always on	Continuous movement in the detection zone	Check zone setting
	The sensor is not mounted for reliably detecting movement	Securely mount enclosure
The load is on without any identifiable movement	Movement occurred, but not identified by the sensor (movement behind wall, movement of small object in immediate lamp vicinity etc.)	Check zone setting
	Rapid movements are being suppressed to minimize malfunctioning or the detection radius is too small	Check zone setting

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 

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

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

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

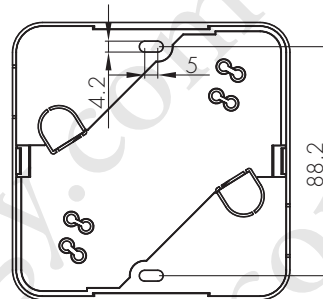
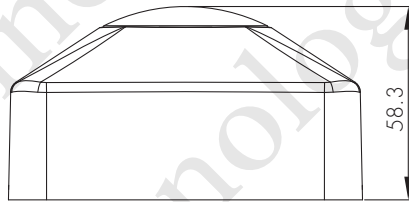
This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

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)

- HC009S
- HC005S
- HC019V
- HC018V
- HC018V/RF
- HC023RF
- HC024RF
- HCD405RC
- HC019V/DH

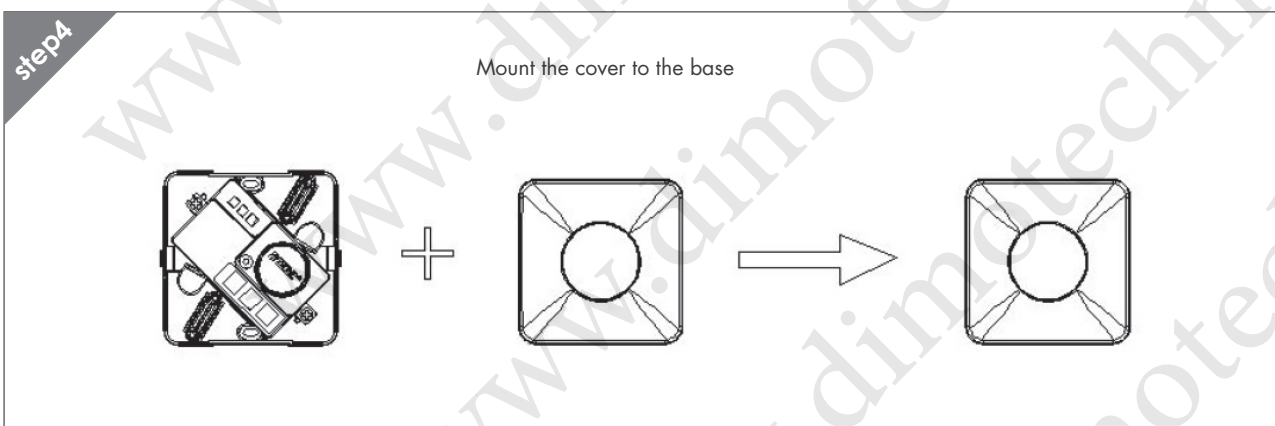
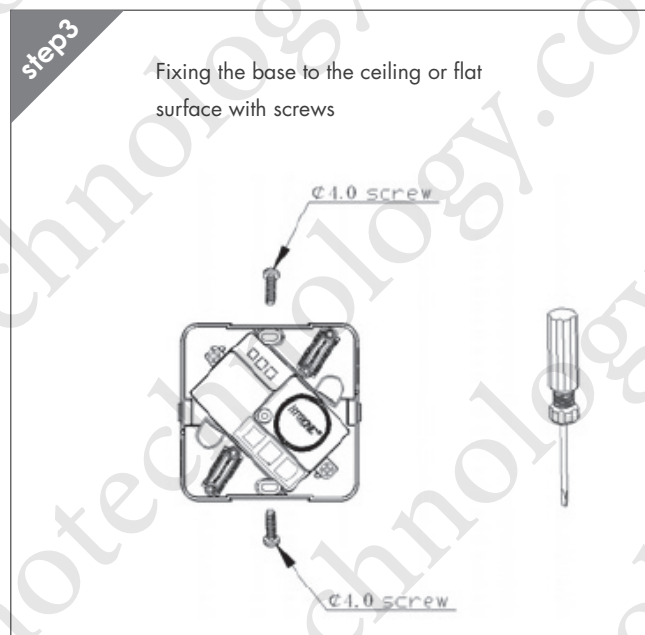
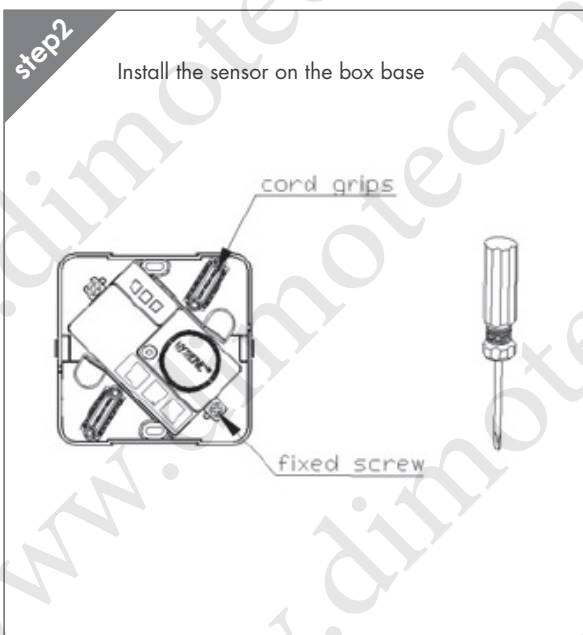
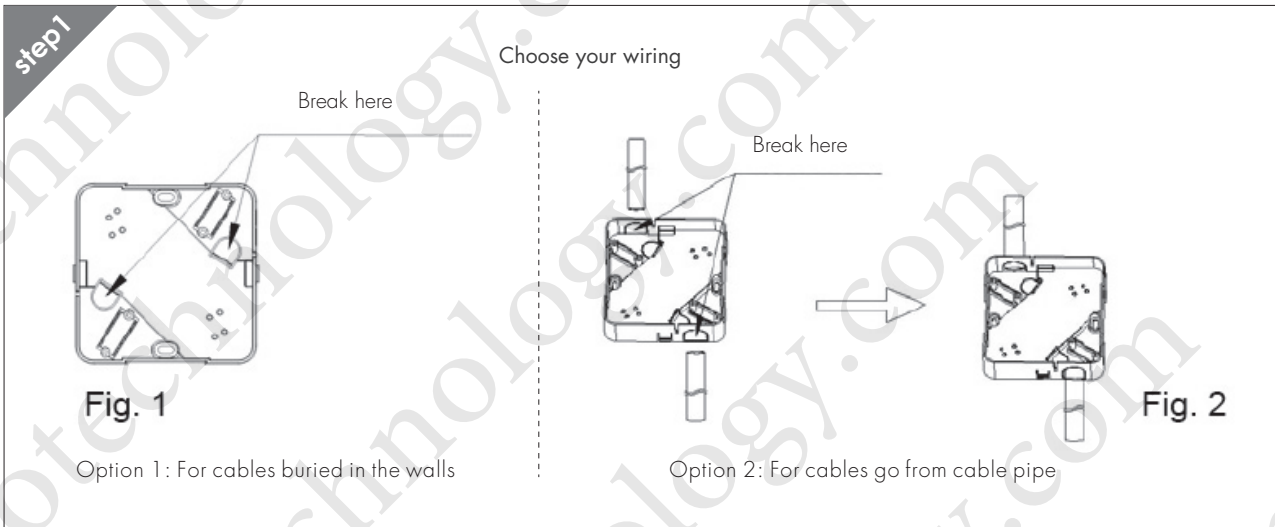


IP20 box



Stand-alone version
microwave motion sensor

...

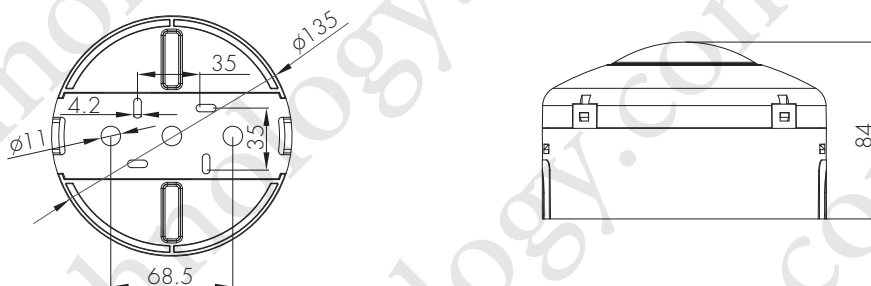


IP65 Housing for HF Motion Sensor


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.

-  HC009S
-  HC005S
-  HC019V/I
-  HC018V
-  HC018V/RF
-  HC023RF
-  HC024RF
-  HCD405RC
-  HC019V/DH

...



IP65 box



Stand-alone version
microwave motion sensor

Installation Instructions

step1

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

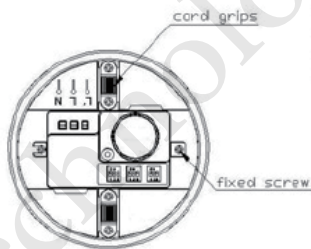


Fig 1.1

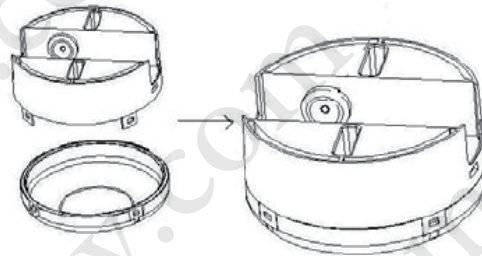


Fig 1.2

step2

Mounting bracket (three options):



Fig 2.1

Option 1: Mount bracket to flat surface with screws

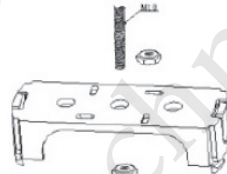


Fig 2.2

Option 2: Mount bracket to ceiling pole with nut

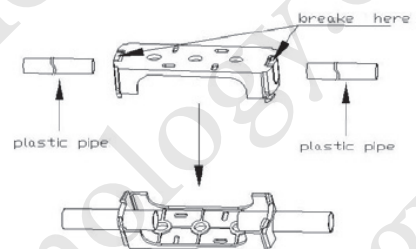


Fig 2.3

Option 3: Put pipe through the bracket hole

step3

Mount the bracket to the cover

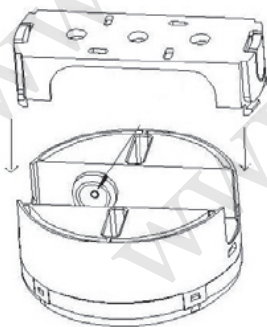


Fig 3.1

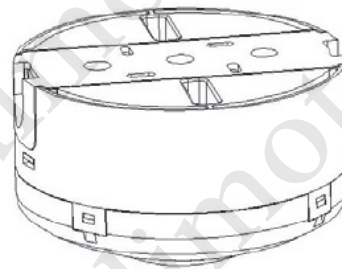


Fig 3.2