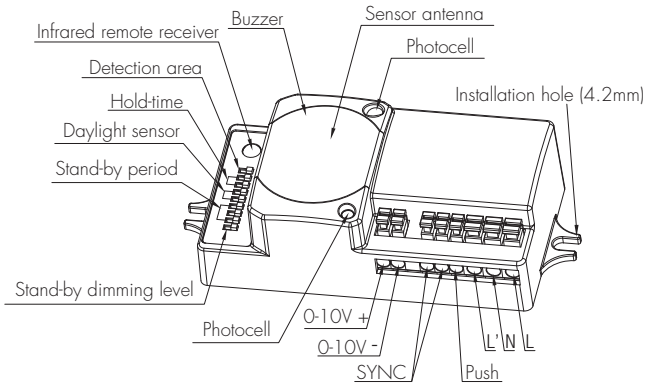
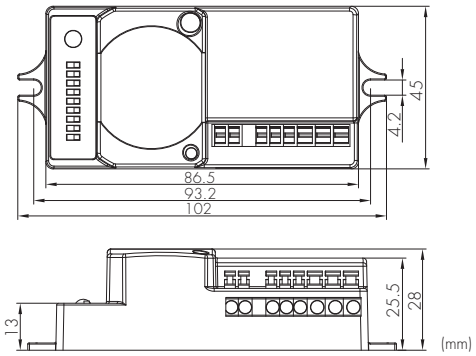
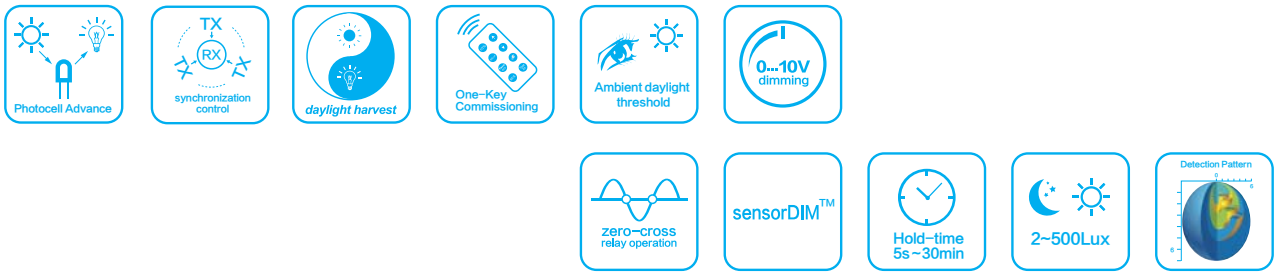
Fixture Built-in Sensor
Daylight Harvest Version

Model: HC419VRC /DH







Functions and Features

This product allows luminaire design to be simplified as the luminaire body no longer needs to be drilled to accept a photocell for assessing the daylight condition. It will measure the ambient natural light behind the cover then calculate how much artificial light is needed to reach the target lux level. The required dimming level control is passed to the driver by the 0-10V signal for delivering the right amount of light.

The light will be dimmed to minimum level and switched off eventually if ambient daylight is sufficient, regardless of hold-time or stand-by time, with or without motion.

1 Photocell Advance (Lux off Function)

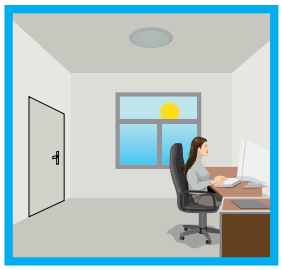
The built-in sensor can measure ambient natural light from behind the cover, dim and eventually switch off the fixture when artificial light is not required. What's more, if the stand-by time is pre-set at "+∞", the fixture can automatically turn on at dim level when natural light is insufficient.

2 Daylight Harvest (Daylight Regulating)

The light remains off when natural light level exceeds daylight threshold preset, even if motion detected.

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

The light output regulates from full brightness to minimum dim level according to the change of daylight brightness, so as to maintain the target lux level.



The light eventually switches off whenever ambient daylight is sufficient, even with presence.

The light dims to target stand-by brightness after hold-time.

The light switches off after the stand-by period.

Note:

1. The light will automatically turn on at target dim level or turn 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 remote control or long press on the push switch.

3 Synchronization Control Function

By connecting the "SYNC" terminals in parallel (maximum 10pcs, see wiring diagram next page), no matter which sensor detects motion, all HC419VRC/DH connected will turn on the lights when surrounding natural light is below the daylight threshold which can be set by either DIP switch on the sensor unit or remote control HRC-11. The sensor antennas are effectively 'shared' and the detection area is widely enlarged in this way.

Note: To avoid fixtures turning on unnecessarily, daylight sensing takes priority on a point-by-point basis. Occupancy sensing (SYNC) is disabled on those units in which the ambient light exceeds the daylight threshold.

4 Zero-cross relay operation

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

5 Manual Override (Push Function)

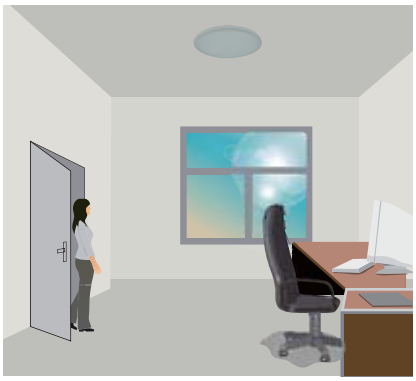
By using a momentary push-to-make switch, this sensor maybe over-ridden by the end-users to switch on/off the lights manually, or adjust the light brightness during motion hold-time. This makes the product more user-friendly and offers more options to fit for extra-ordinary demands.

* Short push (<1s): on/off function;
  On → off: the light turns off immediately and cannot be lighten for a certain time (equals to hold-time preset) even movement is detected. After this period, the sensor goes to sensor mode.
  Off → on: the light turns on 100% and goes to auto sensor mode, even when ambient Lux level exceeds the daylight threshold.
* Long push (>1s): adjust the target lux level by turning the light up or down. Both the adjustment on remote control and push switch can overwrite each other, the last adjustment remains in memory.

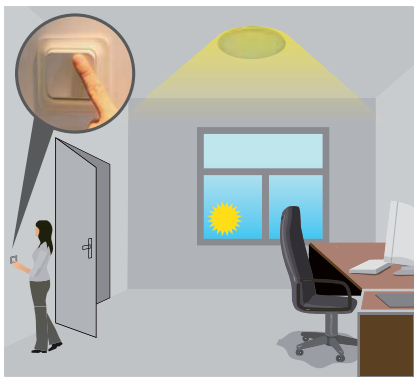
Note: if no end-user adjustment is desired, simply leave the "push" terminal disconnected.

6 Semi-auto Function (absence detection)

It is easy to forget to switch off the light, in offices, corridors, or even at home. In many other cases, people do not want to have a sensor to automatically switch on the light, 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. With presence, the light remains on and can interact with ambient natural light, then dims down in absence, eventually switching off automatically after the stand-by time has expired.

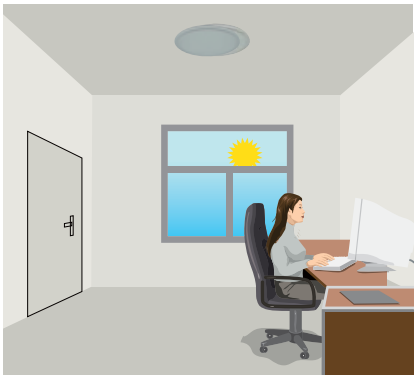


Light does not switch on when there is motion detected.

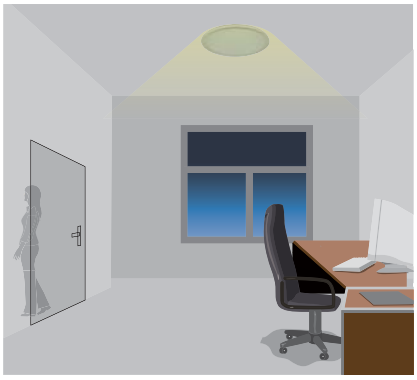


Short press on the push switch to activate the sensor and turn on the light.

The light turns up or down according to the change of daylight brightness.



The light turns off completely when artificial light is not required, even with presence.



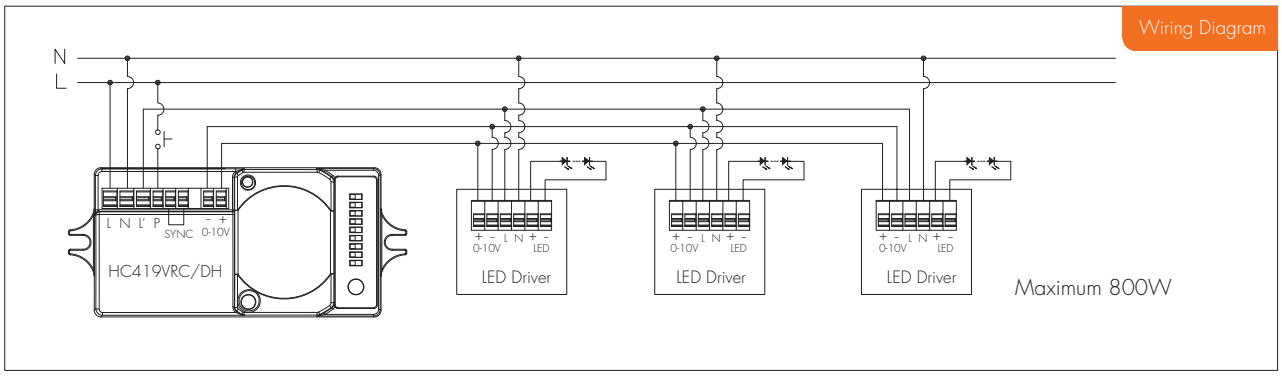
The light automatically dims to stand-by brightness after hold-time.

The light turns off eventually after the stand-by time has expired.

Note: The end-user may choose either function 5 or function 6 for application. Default function is manual override (push function).
Note2: The end-suer may also switch off the light manually with a short press of the push switch

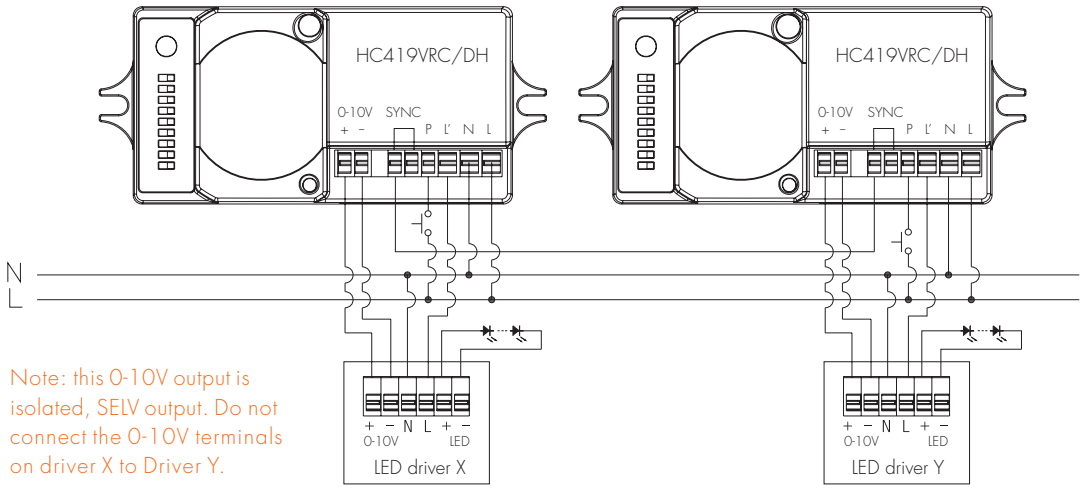
Wiring diagram

1 sensor controls a group of ballast /driver



Multiple sensors control the same group of ballast /driver

Wiring Diagram



Settings (Remote Control HRC-11)

ON OFF Permanent ON/OFF function

Press "ON/OFF" button, the light goes to permanent ON or permanent OFF mode.
* Press button "SEMI-AUTO/AUTO" or button "RESET" to resume automatic operation.

RESET Reset function

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

Shift Shift

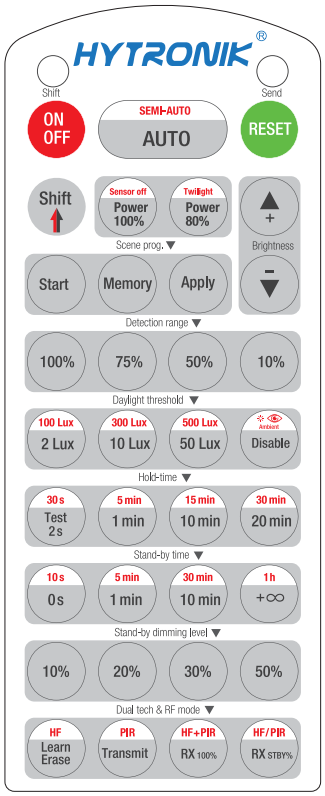
Press button "Shift" , the LED on the top left corner flashes to indicate mode selection. All values / settings in RED are valid for 20 seconds.

SEMI-AUTO AUTO Automatic mode

Press "SEMI-AUTO/AUTO" to initiate automatic mode. The sensor starts working and all settings remain as before the light was switched ON/OFF.

SEMI-AUTO AUTO 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)



Sensor off Power 100% / Twilight Power 80% Power output

By pressing these two buttons, the light output shifts between 80% and 100%.
Note: the function of "Sensor off" and "Twilight" 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 pre-set detection range 100%, daylight threshold Disable, hold time 5min, stand-by time +∞, stand-by dimming level 30%, steps should be:
   Press button "Start", "100% ", "Disable", "Shift", "5min", "Shift", "+∞", "30%", "Memory". By pointing to the sensor unit(s) and pressing "Apply", all settings are passed onto the sensor(s).

Detection range

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

Daylight threshold

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

Ambient daylight threshold

1. Press button "Shift", the red LED flashes for indication.
2. Press button "Ambient/Disable", the ambient lux level is sampled and set as the new daylight threshold.

Hold time

Press buttons of "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 the 'shift' button first.
2. "2s" is for test 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 zone "Hold-time".

Stand-by time

Press buttons of "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.

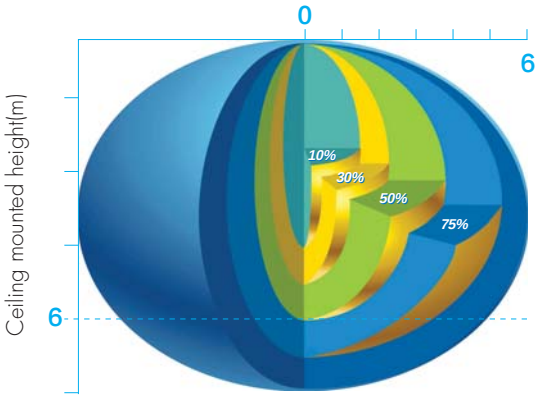
Stand-by dimming level

Press buttons of " Stand-by dimming level" to set the stand-by dimming level at 10% / 20% / 30% / 50%.

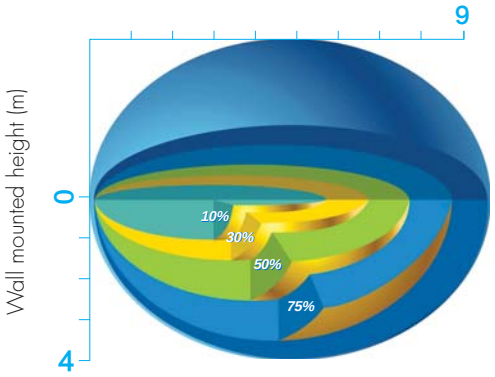
Dual tech & RF mode

All buttons of " Dual tech & RF mode" are disabled.

Detection Pattern



Ceiling mounted detection pattern (m)



Wall mounted detection pattern (m)

Settings

1 Detection area

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

	1	
I	●	100%
II	○	50%

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.

	2	3	
I	●	●	5s
II	●	○	3min
III	○	●	10min
IV	○	○	30min

I – 5s
II – 3min
IV – 10min
V – 30min

3 Daylight sensor

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 the ambient lux level refers to internal light reaching the sensor.

	4	5	
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 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.

	6	7	8	
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.

	9	
I	●	10%
II	○	30%

I – 10%
II – 30%

Technical Data

Operating voltage	120-277VAC
Switched power	Max. 400VA @120VAC, 1000VA @ 277VAC (capacitive) Max. 700W @120VAC, 1600W @ 277VAC (resistive)
Stand-by power	<0.8W
Warm time	20s
Detection area	50% /100% (10% /50% /75% /100% on RC)
Hold-time	5s /3min /10min/30min (TEST 2s /30s /1min /5min /10min /15min /20min/30min on RC)
Stand-by time	0s/10s/1min/5min/10min/30min/1h/+∞
Stand-by dimming level	10% /30% (10% /20% /30% /50% on RC)
Daylight threshold	2~500Lux, disable, can be customized
Sensor principle	Microwave motion detector
Microwave frequency	5.8GHz+/-75MHz
Microwave power	<0.2mW
Detection range	Maximum (ØxH): 12m x 6m
Detection angle	30°~150°
Mounting height	Maximum 6m
Operating temp.	-20°C ~ +60°C
Max. case temperature (Tc)	80°C
IP rating	IP20