

Specification

Product Name: 24GHz radar presence sensor (ON/OFF version)

Product Model: MSA246S 99

Product Version: V1.0

Versions	Release Date	Record	Publishing
V1.0	2026.4.30	Initial version	Jacky

【Product Description】

MSA246S 99 is a 24GHz radar sensor based on Merrytek patented orthogonal antenna. Its antenna has high gain and wide detection range. Combined with Merrytek's unique software algorithm and FMCW modulation, it can accurately detect micro movements brought by human in almost all indoor spaces to automatically turn on or turn off lighting etc electrical appliance.

【Product Feature】

- Exclusive Merrytek Lifebeing Presence Detection
- FMCW modulation technology applied to detect micro movement brought by breathing
- Accurate Presence/Absence detection
- Daylight sensor available
- Daylight threshold/daylight priority/Pure daylight mode available
- 24Ghz ISM Band Millimeter Wave Radar technology
- Max loading capacity :1200w resistive loading and 600w inductive loading
- Major/Minor/Micro Motion detection diameter: 6-8m Max
- Sensor parameter adjustable by knob switch or MH10/MH18 remote
- Sensing function based on millimeter wave radar technology
- Low RF power output. No harm to human health
- Not affected by temperature, humidity, noise, airflow, dust, light and other environments
- Flush mounting and surface mounting(extra surface mounting kit needed) installation available
- 5 years warranty

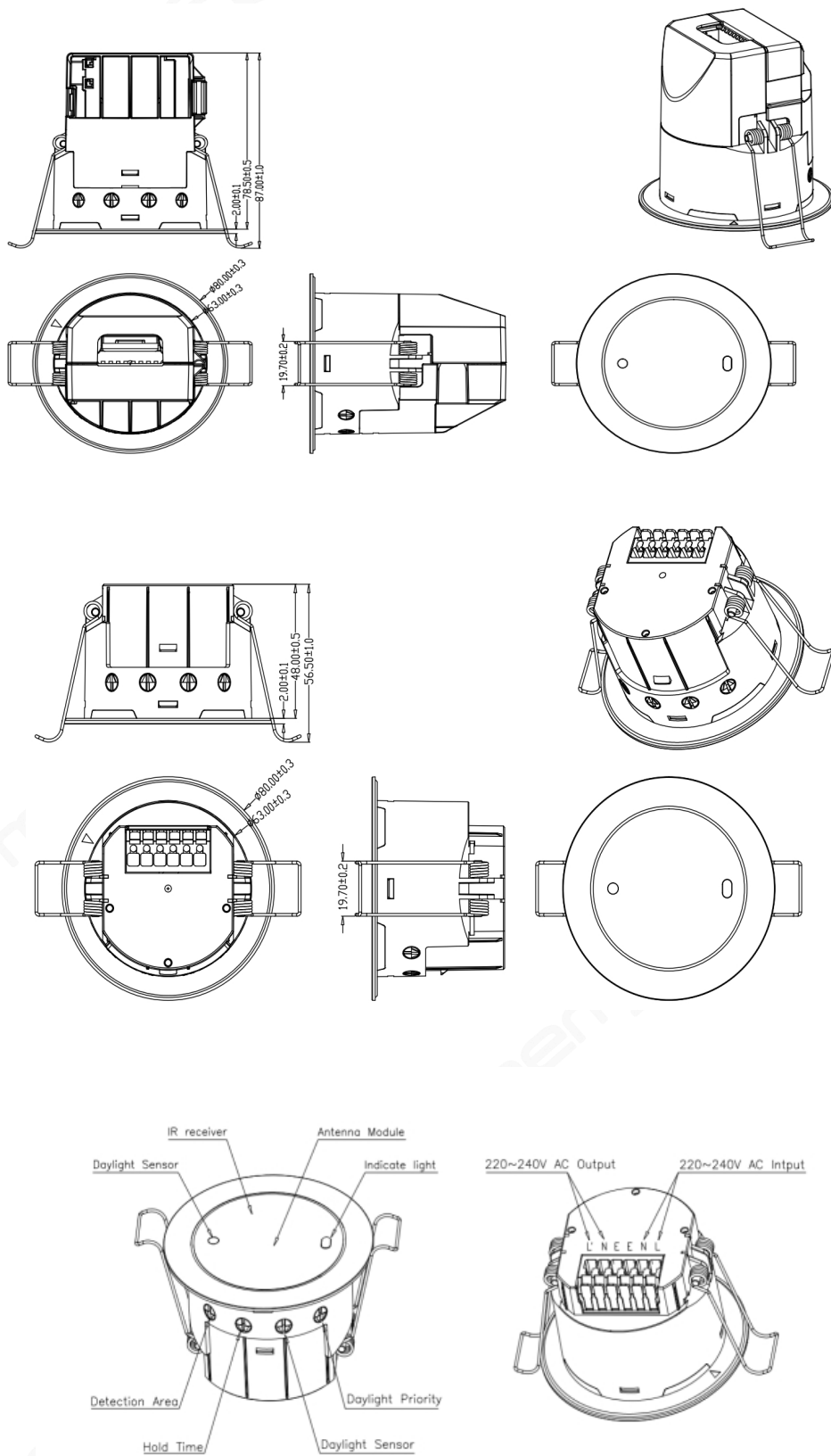
【Product dimension】

- Dimension: $\phi 63$ (Internal diameter)x80.5mm/ $\phi 80$ (external diameter)x80.5mm
- Connection: 6-pin terminal

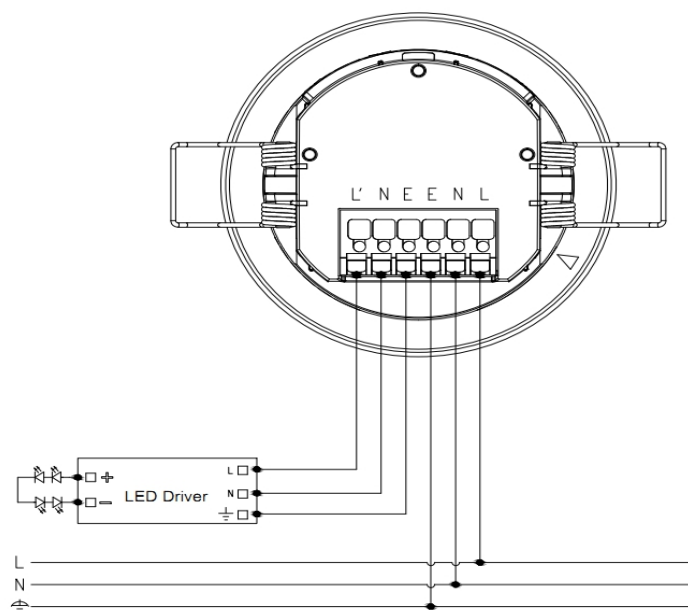
【Parameter】

Input/Output	Input voltage	220-240V AC 50/60Hz
	Rated voltage	230V AC
	Consumption	≤2W @230V AC
	Output signal	16A relay ON/OFF
	Max surge voltage	2KV(L/N,EN61000-4-5)
	Max surge capacity	30A(50% Ipeak, twidth =500uS, 230Vac full load, cold start)
	Max loading	Max 1200w resistive loading and 600w inductive loading
Sensor Parameter	Sensor technology	24GHz radar sensor+daylight sensor
	Detection Area	Knob switch or MH10/MH18 remote setting: 0.5m-4m
	Hold Time	Knob switch or MH10/MH18 remote setting: 10s/30s/1min/3min/5min/10min/20min/30min
	Daylight Sensor Threshold	Rotation switch or MH10/MH18 remote setting: 30Lux/50Lux/100Lux/150Lux/Disable
	Pure daylight threshold mode	When sensor enter pure daylight threshold mode,sensing function is override,sensor will only turn on or turn off light based on below daylight threshold: 30lux light on,100lux light off 50lux light on,200lux light off 100lux light on,300lux light off 150lux light on,400lux light off
	Daylight priority mode	30lux light on,100lux light off 50lux light on,200lux light off 100lux light on,300lux light off 150lux light on,400lux light off
	QS1+100% detection range radius	major/minor/micro movement (3m height installation) : 3.5±0.5m (based on 41m ² open area test and might change due to different space)
	Remote control	Available(MH10/MH18)
	Mounting height	2.5-4.0m typical value:3m
Application Environment	Drill hole	Φ65mm
	Working Temperature	0℃...+50℃
	Storage Temperature	-25℃~+50℃, Humidity ≤60%(non-condensation)
	Warranty	5 years(only for product quality problem)
Certificate Standard	Certificate	CE ROHS
	Environmental Requirement	Compliant to RoHS
	IP Rating	IP20
Note: "N/A" means not available.		

【Dimension and Function diagram】



【Wiring instruction】



Wiring layout suggestion:

1. LN terminal stands for AC input, L'N' stands for AC output, please wiring correctly
2. One sensor's max loading capacity is 1200w resistive loading and 600w inductive loading for one single load. if you want connect more load in one loop, we recommend to add an AC contactor in our output LN terminal to avoid momentary surge overload.

【Initialization】

When powered on, sensor indicator will turn off after flashing for 10S and will enter a 10S detection cycle, if there's presence detected, then sensor will report presence and enter hold time calculating, if absence detected, then sensor will report absence. During initialization, sensor will not detect moving signal and you can use our MH10/MH18 remote or rotation switch to adjust detection area, hold time and daylight sensor etc parameter.

【Factory setting】

Detection Area: 4M

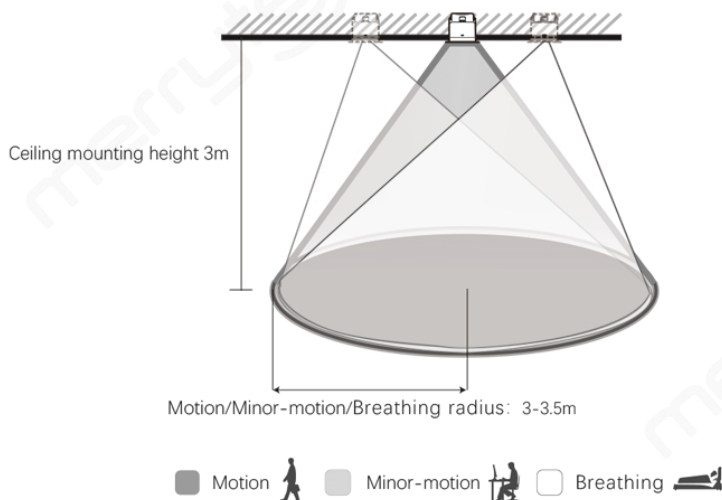
Hold Time: 30S

Indicator light :Open

Daylight sensor :Disable

【Detection radiation】

MSA246S 99 is highly recommended ceiling flush mounting and its detection radiation is as below shows:



【Detection Signal】

The product detects human moving, minor moving, and presence signals, and realizes the detection of human-existing/no-human in non-sleep state. The following is a description of the moving, minor moving and presence signals:

- **Major movement:** detect the human significant moving (walking) in the detection area.
- **Minor movement:** detect the human slight moving in the detection area, such as leaning forward, leaning forwarder and back, swinging limbs, shaking head, typing, playing with mobile phones and so on.
- **Micro movement:** detect human abdominal and thoracic expansion behaviors caused by breathing, but not detect moving signal and minor moving signal.



Major motion



Minor motion



Micro motion

【Rotation switch setting】

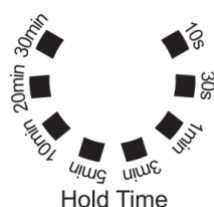
Detection Area

Gear	Radius range
1	0.5m
2	1m
3	1.5m
4	2m
5	2.5m
6	3m
7	3.5m
8	4m



Hold Time

Gear	Hold time
1	10s
2	30s
3	1min
4	3min
5	5min
6	10min
7	20min
8	30min



Daylight Sensor Mode

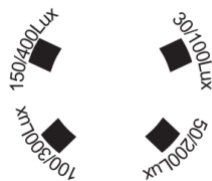
Gear	Daylight mode
1	Light control
2	Priority
3	Bright and dark
4	Disable



*When setting disable, our sensor will turn on light when motion detected regardless of environment daylight

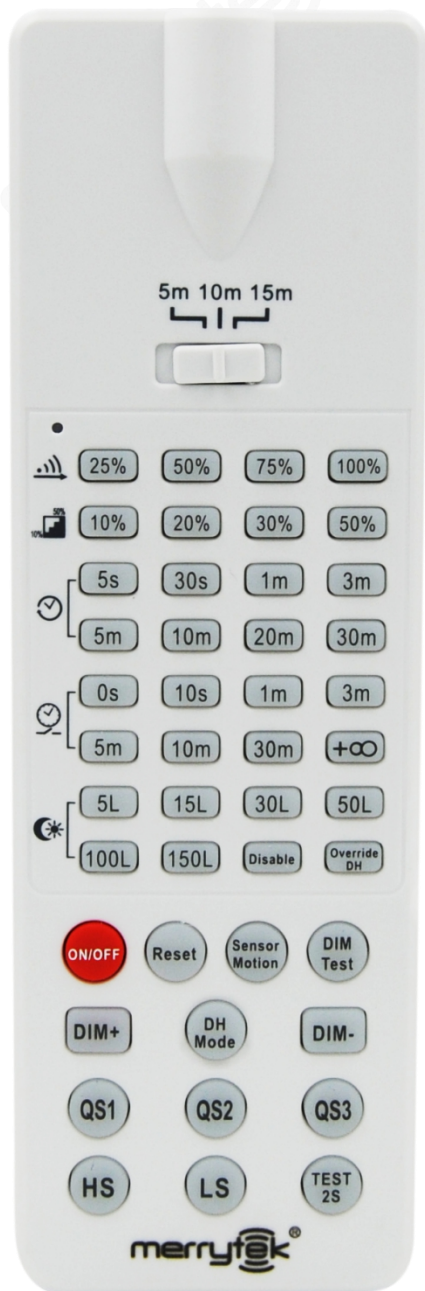
Daylight Sensor Gear

Gear	Daylight mode
1	30lux on/100lux off
2	50lux on/200lux off
3	100lux on/300lux off
4	200lux on/400lux off



【Remote setting】

MH10 remote



Detection area(radius range):

QS1+100%=4m, QS1+75%=3.5m, QS1+50%=3m, QS1+25%=2.5m,
QS2+100%=2m, QS2+75%=1.5m, QS2+50%=1m, QS2+25%=0.5m,

Daylight priority/Pure daylight gear:

10%: 30lux on/100lux off, 20%: 50lux on/200lux off
30%: 100lux on/300lux off, 50%: 200lux on/400lux off

Hold time:

10s (5S button) /30s/1min/3min/5min/10min/20min/30min

Sensitivity:

0s: high, 10s:medium, 1m:low, 3m:enable presence detection, 5m:disable presence detection

Daylight threshold:

5lux/15lux/30lux/50lux/100lux/150lux/Disable

ON/OFF: Disable sensor detection function, light will be constantly ON

Sensor motion: Recover sensor detection function

Reset: all parameter back to factory setting

QS3: single mode

HS: turn on indicator

LS: turn off indicator

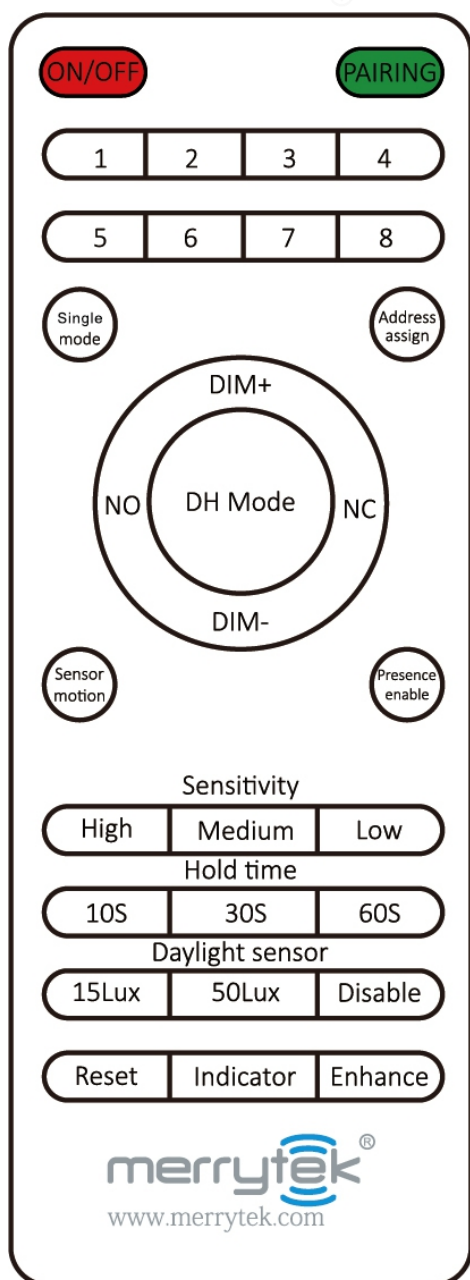
TEST 2S: start self-learning

DIM test: cancel self-learning

DIM +: short press to switch daylight priority mode

DIM -: short press to switch pure daylight mode

MH18 remote:



ON/OFF: Disable sensor detection function, light will be constantly ON

Detection area: 1=0.5m, 2=1m, 3=1.5m, 4=2m, 5=2.5m, 6=3m, 7=3.5m, 8=4m

Single mode: long press 3s to enter single mode

DIM+: short press to switch daylight priority mode

DIM-: short press to switch pure daylight mode

Sensor motion: Recover sensor detection function

Presence enable: short press to enable presence detection, long press 3s to disable presence detection

Sensitivity: short press to set high/medium/low sensitivity

Hold time: short press to set hold time 10s/30s/60s

Daylight sensor: short press to set daylight threshold 15lux/50lux/Disable
When sensor enter daylight priority or pure daylight mode, 15lux button will set 30lux on/100lux off gear, 50lux button will set 50lux on/200lux off gear

Reset: all parameter back to factory setting

Indicator: short press to turn on indicator, long press to turn off indicator

Enhance: short press to enter self-learning mode, long press 5s to recover default status

【Application tips】

1. Sensor shall be installed and wired by professional electrician
2. There shall be rare high-power electrical appliance or high-power wireless device around our sensor to avoid interference and false trigger
3. Sensor clearance shall longer than 2m if there're many sensors in your installation room
4. Sensor shall NOT installed on shaking object, and there shall be NO big-size metal, water pipeline, air draft, ventilation system around our sensor to avoid interference and false trigger
5. There shall be NO strong lighting around our sensor to avoid daylight sensor's false detection
6. Above sensor's detection area data is based on 165cm high and 65kg heavy test people walking towards the sensor in an 41 m² open area for your reference. When sensor is installed in different environment with different testing person, the real detection data might differ.

【Disclaimer】

Due to the complexity of product technology and differences in application environment, it is difficult to guarantee a completely accurate or complete description, so this specification is only for user reference. We will reserve the right to make changes to the product specifications without notifying the user, and do not make any commitments and guarantees in the legal sense. At the same time, our company encourages users to supplement or modify the contents of our specifications after using our products.