

# Specification

Product Name: 24GHz Large-space presence sensor (ON/OFF version)

Product Model: MSA235S 99

Product Version: V1.0

Versions	Release Date	Record	Publishing
V1.0	2024.7.16	Initial version	Jacky

## 【Product Description】

MSA235S 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
- Germany RF technology applied for 5-year guarantee assurance
- Accurate Presence/Absence detection
- Daylight Sensor Available
- 24Ghz ISM Band Millimeter Wave Radar technology
- Max loading capacity :800w resistive loading and 400w inductive loading
- Major/Minor/Micro Motion detection diameter: 6-8m Max
- Major/Minor/Micro Motion detection range are highly coincide
- Round radiation. Effectively managing a whole space by a single sensor
- Absence switch to Presence within 0.5S
- Presence switch to Absence no less than 15S
- Flush mounting installation available
- Sensor parameter adjustable by DIP switch or MH10 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



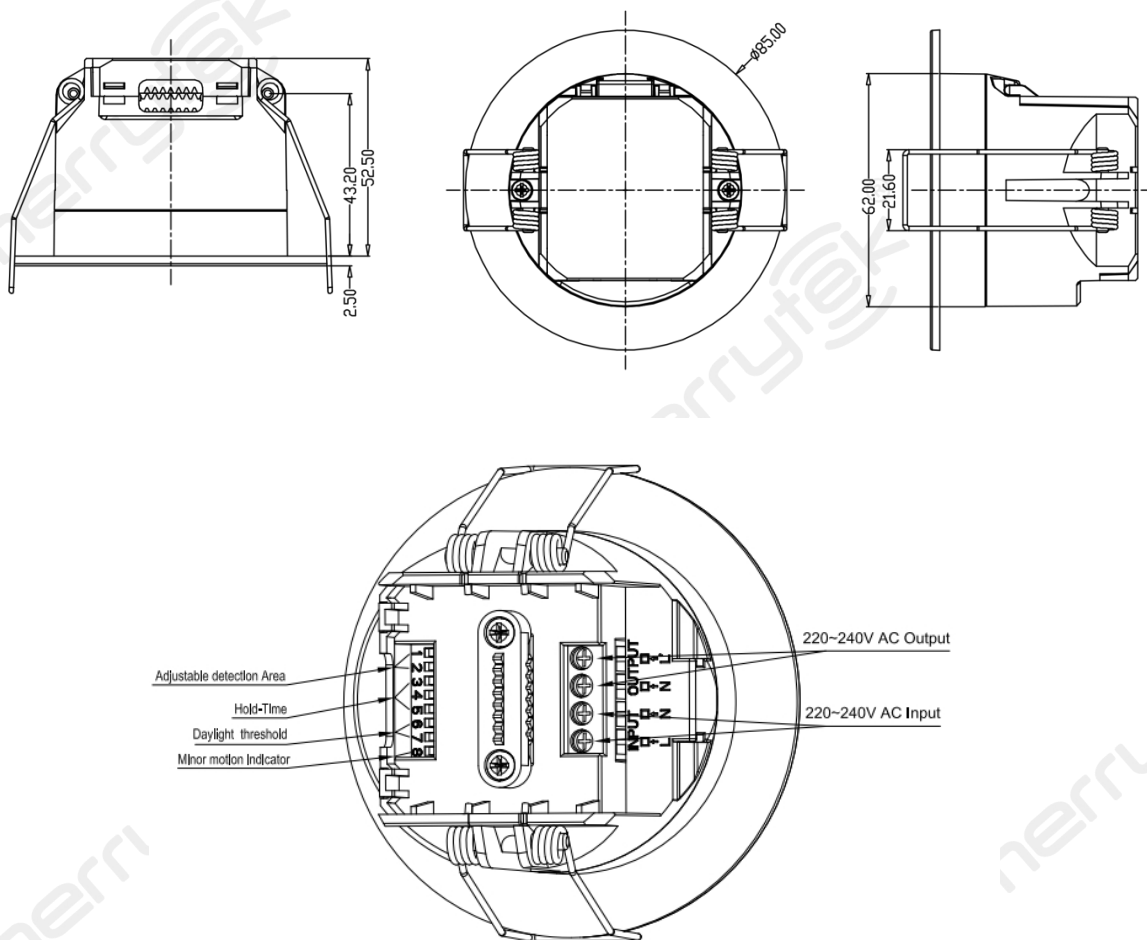
## 【Product dimension】

- Dimension:  $\phi 85 \times 52.5 \text{mm}$
- Connection: 4-pin terminal

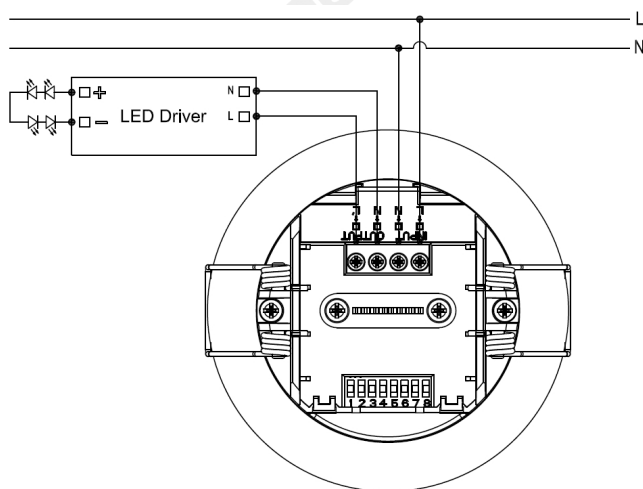
## 【Parameter】

Input/Output	Input voltage	100-240V AC 50-60Hz
	Rated voltage	220V AC
	Consumption	≤1W 230V DC
	Output signal	1 channel ON/OFF(Max 800w resistive loading and 400w inductive loading)
	Max surge current	50A
Sensor Parameter	Radar frequency	24GHz-24.25GHz ISM band
	Transmitting Power	5mW Max
	Detection Area	DIP or MH10 remote setting: 0.5m-4m
	Hold Time	Dip setting:10s /30s /1min / 3min /5min /20min MH10 remote setting:10s /30s /1min / 3min /5min /10min /20min/30min
	QS1+100% detection range radius	major/minor/micor movement (3m height installation) : 3.5±0.5m (based on 41 m <sup>2</sup> open area test and might change due to different space)
	Daylight sensor threshold	Dip setting: 5Lux /50Lux /150Lux/Disable MH10 remote setting: 5Lux /15Lux /30Lux/ 50Lux /100Lux /150Lux/Disable
	Remote control	Available
	Mounting height	2.5-4.0m typical value:3m
	Detecting Angle	120°
Application Environment	Drill hole	Φ65-70mm
	Installation	Surface mounting
	Working Temperature	0°C...+50°C
	Storage Temperature	-25°C~+80°C
Certificate Standard	Certificate	CE/RED
	Environmental Requirement	Compliant to RoHS
	IP Rating	IP20
	Guarantee	5 year (only for product quality problem)
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 800w resistive loading and 400w 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 20S 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 remote or DIP switch to adjust detection area, hold time and daylight sensor etc parameter.

### 【Factory setting】

Detection Area: 4M

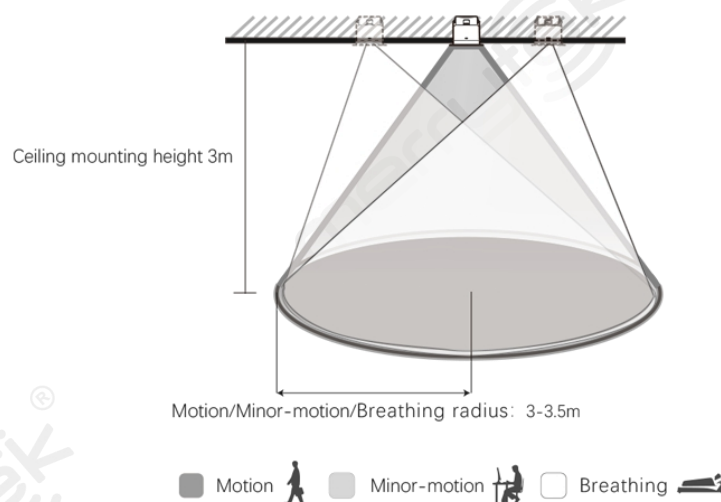
Hold Time: 30S

Indicator light :Open

Daylight sensor :Disable

### 【Detection radiation】

MSA235S 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 movement



Minor movement



Micro movement

## 【DIP switch setting】

Detection Area

	1	2	3
4m	ON	ON	ON
3.5m	-	ON	ON
3m	ON	-	ON
2.5m	-	-	ON
2m	ON	ON	-
1.5m	-	ON	-
1m	ON	-	-
0.5m	-	-	-

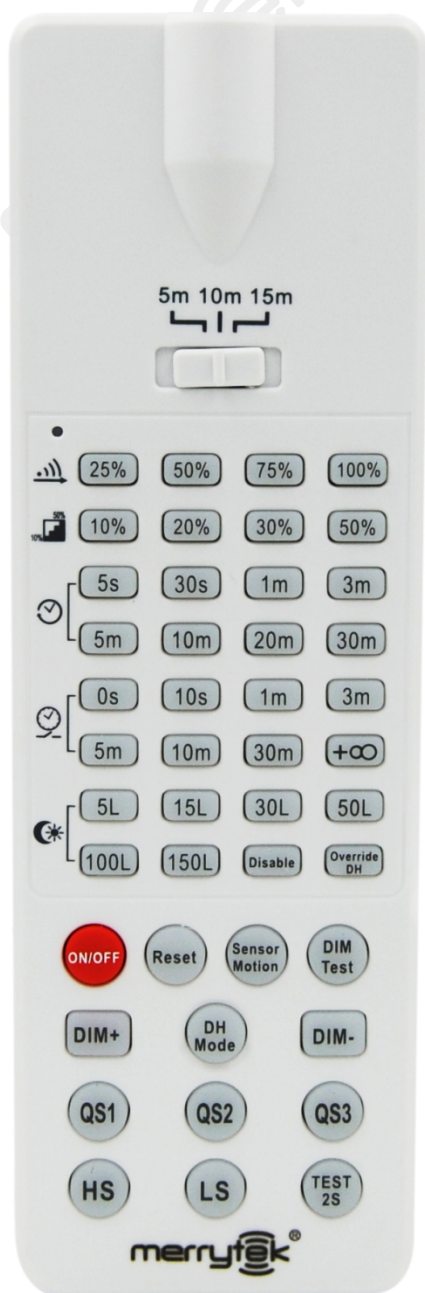
## Hold Time

	4	5	6	
I	ON	ON	ON	10S
II	ON	-	ON	30S
III	ON	ON	-	1min
IV	-	ON	ON	3min
V	-	-	ON	5min
VI	-	-	-	20min

## Daylight Sensor

	7	8	
I	ON	ON	5Lux
II	-	ON	50Lux
III	ON	-	150Lux
IV	-	-	Disable

## 【Remote setting】



### Detection area radius:

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

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

0S:High sensitivity 10S:Medium sensitivity 1m:Low sensitivity  
10m: Slight self-learning 30m: Medium self-learning  
∞: Heavy self-learning

Daylight threshold: 5lux/15lux/30lux/50lux/100lux/150lux/Disable

**ON/OFF:** Disable sensor detection function

Sensor motion: Enable sensor detection function

Reset: all parameter back to factory setting

DH mode:long press>3S to disable presence detection function

HS: Indicator ON

LS: Indicator OFF

**Remark:** when our sensor enter self-learning mode,you must make sure there's no person with detection area,and it'll last around 6 min.The relay will keep actuation when self-learning mode activated and released when self-learning mode inactivated.



## 【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.