

Specification

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

Product Model: MSA050S 99 Z

Product Version: V1.0

Versions	Release Date	Record	Publishing
V1.0	2025.01.03	Initial release	Jacky

【Product Description】

MSA050S 99 Z is a 24GHz radar sensor based on Merrytek patented orthogonal antenna. Its antenna has high gain and wide detection range and can connect to Tuya ecosystem. Combined with Merrytek's unique software algorithm and FMCW modulation, it can accurately detect micro movements brought by human in almost all indoor spaces and provide fast and accurate front-end sensing input for smart home, smart hotel, smart office and other scenes. Meanwhile it also has one channel relay ON/OFF output to connect local load.

【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
- Connect to Tuya Zigbee ecosystem
- Accurate motion detection with one channel relay ON/OFF output and tuya communication
- 16A Relay max loading capacity :800w resistive loading and 400w inductive loading
- Daylight Sensor Available
- 24Ghz ISM Band Millimeter Wave Radar technology
- 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 and Surface mounting installation available
- Sensor parameter adjustable by tuya app
- 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



【Dimension】

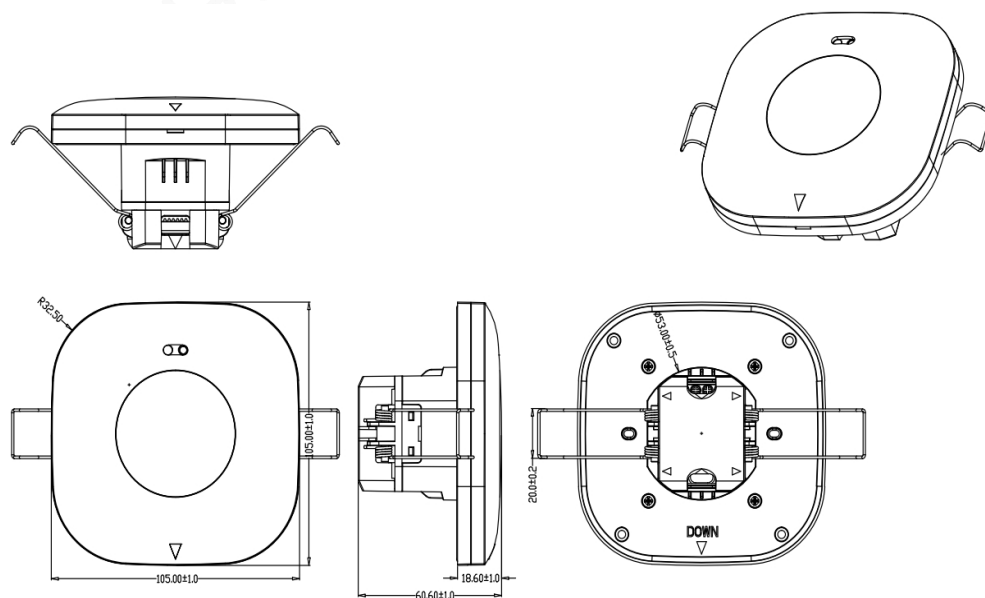
- Product size: 105x105x60.6mm(flush mounting)、105x105x45.6mm(surface mounting)
- Connection interface: 4-pin terminal

【Parameter】

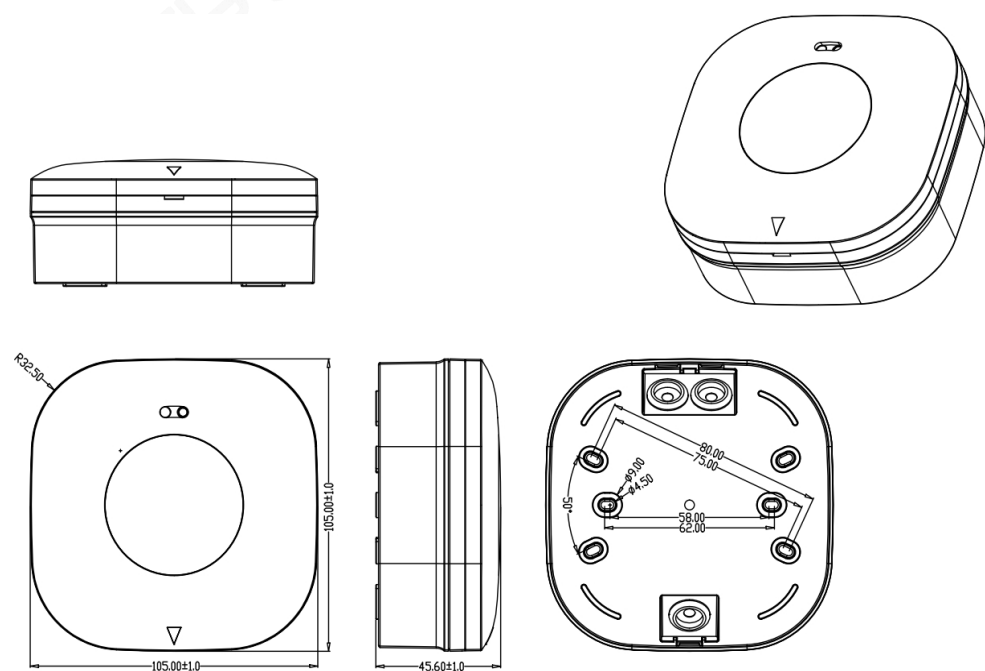
Input/Output	Input voltage	220-240V AC
	Rated voltage	220V AC
	Working current	50mA max
	Power consumption	≤1W @220/230V AC
	Output signal	1 channel relay ON/OFF+tuya zigbee
	Max. Surge Capacity	50A (50% Ipeak, twidth =200us, 230Vac full load, cold start)
Sensor parameter	Function	24Gh mmW radar presence sensor+daylight sensor
	Detection Area	Tuya app: 0.5-4m
	Sensor Hold Time	Tuya app: 3-7200s
	Daylight Sensor	0-1200lux
	Radius detection range(based on 100% sensitivity and tangential moving)	major/minor/micor movement (3m height installation) : 3.5±0.5m (based on 41m ² open area test and might change due to different space)
	Sensitivity	High/Medium/Low
	Remote control	Available
	Mounting height	2-4m typical value:3m
	3dB beam angle	100° (Horizontal) 100° (Vertical)
Application environment	Drill hole	Φ55mm
	Working temperature	-25℃...+50℃
	Storage temperature	-40℃~+80℃
	Warranty	3 year (available based on product quality)
Certificate Standard	Certificate	Compliant to CE
	Environmental requirements	Compliant to RoHS
	IP rating	IP20(Flush mounting) IP54(Surface mounting)
"N/A" means not available		

【Dimension and Function diagram】

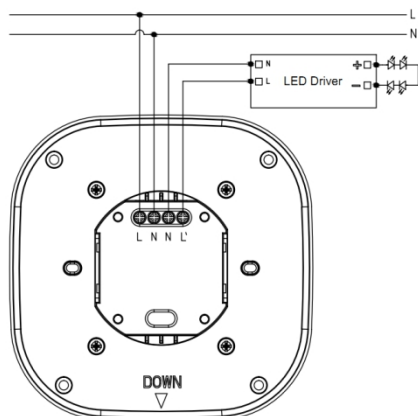
Flush mounting



Surface mounting



【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】

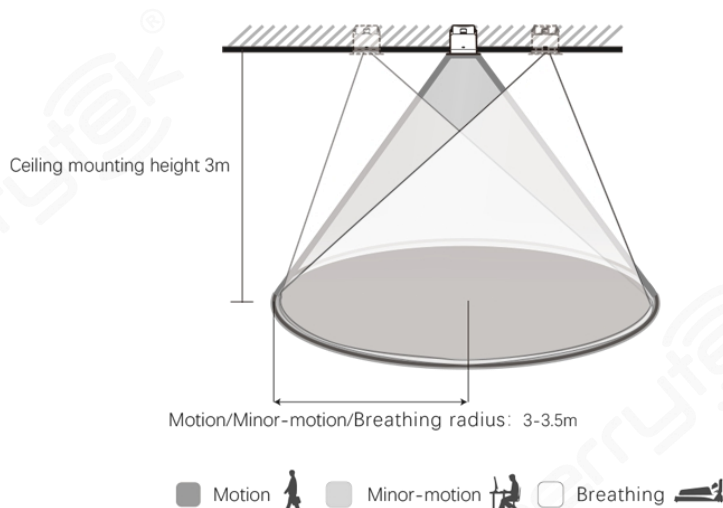
When powered on, sensor indicator will turn off after flashing for 10S and will not detect moving signal during this time. After 10S, you can use our MH10 remote or casambi app to adjust detection area, hold time and daylight sensor etc parameter.

【Factory setting】

Detection Area: 4m, Hold Time: 30s, Indicator: ON

【Detection radiation】

MSA050S 99 Z 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

【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.