

Versions	Release/ change Date	Publishing
V1.0	2023.10.10	Jacky

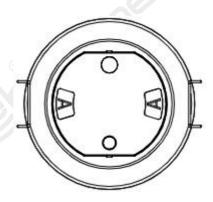
### [Product Description]

MSA219D 99 A is a 24GHz radar sensor based on Merrytek patented orthogonal half-wave bending antenna. Its antenna is flipable from -30° to 30° and has high gain and wide detection range and is combined with Merrytek's unique software algorithm. It can accurately detect minor movements brought by human in almost all indoor spaces and provide fast and accurate huamn presence/absence information for smart home, smart hotel, smart office and other scenes.

#### [Product Feature]

- Exclusive Merrytek Lifebeing Presence Detection
- Accurate Presence/Absence Output
- Daylight Sensor Available
- NO/NC dry contact output available
- Detection antenna flipable from -30°to 30°
- 24Ghz ISM Band Millimeter Wave Radar technology
- Presence detection diameter: 5-7m Max
- Minor Motion detection diameter: 6-8m Max
- Motion detection diameter: 6-8m Max
- Presence, minor motion and 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 30S
- Flush mounting and Surface mounting installation available
- Sensor parameter adjustable by 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





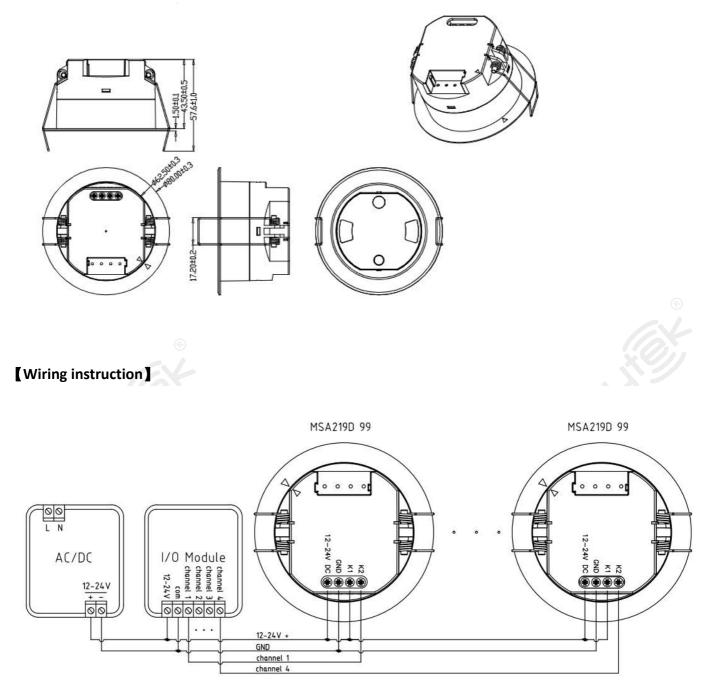
#### [Product dimension]

- Dimension: φ80x43.5mm
- Terminal: 4 pin terminal

# [Parameter]

Input/Output     Input voltage     12-24V DC       Rated voltage     24V DC     @12Vdc: 50mA max       Working Current     @24Vdc: 30mA max     @24Vdc: 30mA max       Working Power     SIW @24V DC     @24Vdc: 30mA max       Output signal     NO/NC dry contact (Factory setting is NO dry contact)     Load type       Radar frequency     24GH2-24.25GHz     ISM band       Transmitting     SmW Max.     Detection Area       Hold Time     MH10 remote setting: 25%-100%     MH10 remote setting: 55/30s/1min/10min/20min/30min       Daylight sensor     threshold     MH10 remote setting: 55/30s/1min/30lux/50lux/100lux /150lux/Disal       Radius detection range(based on QS1 mode 100% sensitivity)     MH10 remote setting: 51ux/15lux/30lux/50lux/100lux /150lux/Disal       Remote control     Available     Mounting height     2.5-4.0m       Mounting height     2.5-4.0m     100° (vertical)     100° (vertical)       3dB beam angle     0°C+50°C     Temperature     25°C ~+80°C       Temperature     Certificate     FCC/RED     Certificate     FCC/RED       Standard     Quirement     Compliant to RoHS     Compliant to RoHS		
Input/Output t     Working Current     @12Vdc; SOMA max @24Vdc; 30mA max       Working Power     \$1W @24V DC       Output signal     NO/NC dry contact (Factory setting is NO dry contact)       Load type     Resistive (load voltage :Vdc≤36V,load current:100mA max)       Radar frequency     24GHz-24.25GHz     ISM band       Transmitting Power     SmW Max.     SmW Max.       Detection Area     MH10 remote setting:55/30s/1min/3min/5min/10min/20min/30min       Daylight sensor     MH10 remote setting:55/30s/1min/ 3min/5min/10min/20min/30min       Daylight sensor     MH10 remote setting: 51/20x/100Lwx/100Lwx/150Lwx/D0sal/100m/20min/30min       Ogs1 mode 100% sensitivity)     Motion detection (3m height) : 3-4m mane(based on range(based on range(based on sensitivity)     Motion detection (3m height) : 2.5-3.5m       Remote control     Available     Motion detection (3m height) : 2.5-3.5m       Mounting height     2.5-4.0m     100° (vertical)       3dB beam angle     Grow (+50°C       Temperature     -25°C~+80°C       Temperature     -25°C~+80°C       Temperature     -25°C~+80°C       Temperature     -25°C~+80°C       Temperature     Compliant to RoHS       Qu		
Input/Output t     Working Current     @24Vdc: 30mA max       Working Power     ≤1W @24V DC       Output signal     NO/NC dry contact (Factory setting is NO dry contact)       Load type     Resistive (load voltage :Vdc≤36V,load current:100mA max)       Radar frequency     24GHz-24.25GHz     ISM band       Transmitting Power     5mW Max.       Detection Area     MH10 remote setting: 25%-100%       Hold Time     MH10 remote setting: 55/30s/1min/3min/5min/10min/20min/30min       Daylight sensor threshold     MH10 remote setting: 51x/15Lux/30Lux/10Lux/10Lux/15Lux/0Lux/Disal       Radius detection range(based on cust inversion)     Motion detection (3m height) : 3-4m       Minor motion detection (3m height) : 2.5-3.5m     Presence (3m height) : 2.5-3.5m       Presence (3m height) : 2.5-3.5m     Presence (3m height) : 2.5-3.5m       Mounting height     2.5-4.0m       AdB beam angle     100° (horizontal)       100° (vertical)     00°C+50°C       Temperature     -25°C~+80°C       Temperature     -25°C~+80°C       Temperature     -25°C~+80°C       Temperature     Compliant to RoHS       Notare     1P20	24V DC	
t     @24Vdc: 30mA max       Working Power     \$1W @24V DC       Output signal     NO/NC dry contact (Factory setting is NO dry contact)       Load type     Resistive (load voltage :Vdc≤36V,load current:100mA max)       Radar frequency     24GHz-24.25GHz     ISM band       Transmitting     SmW Max.     Detection Area       MH10 remote setting: 25%-100%     Hold Time     MH10 remote setting: 55/305/1min/3min/5min/10min/20min/30min       Daylight sensor     threshold     MH10 remote setting: 5Lux/15Lux/30Lux/50Lux/100Lux /150Lux/Disal       Radius detection     range(based on qS1 mode 100% sensitivity)     Motion detection (3m height) : 3-4m       Remote control     Available     Motor motion detection (3m height) : 2.5-3.5m       Presence (3m height) : 2.5-3.5m     Presence (3m height) : 2.5-3.5m       Presence (3m height) : 2.5-3.5m     Presence (3m height) : 2.5-3.5m       Remote control     Available       Mounting height     2.5-4.0m       3dB beam angle     100° (horizontal)       100° (vertical)     100° (vertical)       100° (vertical)     2.5-4.0m       Environmental     QC+50°C       Temperature     2.5°C ~+80°C		
Working Power     S1W @24V DC       Output signal     NO/NC dry contact (Factory setting is NO dry contact)       Load type     Resistive (load voltage :VdcS36V,load current:100mA max)       Radar frequency     24GHz-24.25GHz     ISM band       Transmitting     SmW Max.       Power     Output setting: 25%-100%       Hold Time     MH10 remote setting: 55%/30s/1min/3min/5min/10min/20min/30min       Daylight sensor     MH10 remote setting: 51ux/30Lux/50Lux/100Lux /150Lux/Disal       Radius detection     Motion detection (3m height) : 3-4m       range(based on arge(based on sensitivity)     Motion detection (3m height) : 2.5-3.5m       Presence (3m height) : 2.5-3.5m     Presence (3m height) : 2.5-3.5m       Remote control     Available       Mounting height     2.5-4.0m       3dB beam angle     100° (horizontal)       100° (vertical)     100° (vertical)       100° (vertical)     100° (wertical)       Morking     -25°C~+80°C       Temperature     FCC/RED       Environmental Re     Quirement       quirement     IP20	@24Vdc: 30mA max	
Load type     Resistive (load voltage :Vdcs36V,load current:100mA max)       Radar frequency     24GHz-24.25GHz     ISM band       Transmitting     SmW Max.     Detection Area     MH10 remote setting: 25%-100%       Hold Time     MH10 remote setting: 55/30s/1min/ 3min/5min/10min/20min/30min     Daylight sensor       Hold Time     MH10 remote setting: 5Lux/15Lux/30Lux/50Lux/100Lux /150Lux/Disal       Radius detection     range(based on       QS1 mode 100%     sensitivity)       Remote control     Available       Mounting height     2.5-4.0m       3dB beam angle     100° (horizontal)       100° (vertical)     100° (vertical)       100° (vertical)     0°C+50°C       Temperature     25°C*+80°C       Temperature     FC/RED       Certificate     FC/RED       Standard     IP20       Note: "N/A" memotian available.     IP20		
Sensor     Radar frequency     24GHz-24.25GHz     ISM band       Transmitting Power     5mW Max.     5mW Max.       Detection Area     MH10 remote setting: 25%-100%       Hold Time     MH10 remote setting: 55/30s/1min/ 3min/5min/10min/20min/30min       Daylight sensor threshold     MH10 remote setting: 5Lux/15Lux/30Lux/50Lux/100Lux /150Lux/Disal       Radius detection range(based on QS1 mode 100% sensitivity)     Motion detection (3m height) : 3-4m       Remote control     Available       Mounting height     2.5-4.0m       3dB beam angle     100° (horizontal) 100° (vertical)       Morking Temperature     0°C+50°C       Temperature     25°C*+80°C       Certificate     FCC/RED       Storage Temperature     Compliant to RoHS       IP Rating     IP20       Note: "N/A" means not available.     IP20	NO/NC dry contact (Factory setting is NO dry contact)	
Sensor     Transmitting Power     SmW Max.       Detection Area     MH10 remote setting: 25%-100%       Hold Time     MH10 remote setting: 55/30s/1min/3min/5min/10min/20min/30min       Daylight sensor threshold     MH10 remote setting: 5Lux/15Lux/30Lux/50Lux/10Lux/150Lux/Disal freshold       Radius detection range(based on QS1 mode 100% sensitivity)     Motion detection (3m height) : 3-4m Minor motion detection (3m height) : 2.5-3.5m Presence (3m height) : 2.5-3.5m       Remote control     Available       Mounting height     2.5-4.0m       3dB beam angle     100° (horizontal)       3dB beam angle     0°C+50°C       Temperature     -25°C~+80°C       Storage     -25°C~+80°C       Temperature     FCC/RED       Environmental Re guirement     Compliant to RoHS       Note: "N/A" mountailele.     IP20		
Power     SmW Max.       Detection Area     MH10 remote setting: 25%-100%       Hold Time     MH10 remote setting: 55/30s/1min/ 3min/5min/10min/20min/30min       Daylight sensor threshold     MH10 remote setting: 5Lux/15Lux/30Lux/50Lux/100Lux /150Lux/Disal threshold       Radius detection range(based on QS1 mode 100% sensitivity)     Motion detection (3m height) : 3-4m Minor motion detection (3m height) : 2.5-3.5m Presence (3m height) : 2.5-3.5m       Remote control     Available       Remote control     Available       Mounting height     2.5-4.0m       3dB beam angle     100° (horizontal)       100° (vertical)     100° (norizontal)       3dB beam angle     0°C+50°C       Temperature     -25°C~+80°C       Temperature     -25°C~+80°C       Temperature     Compliant to RoHS       Standard     IP Rating       IP Rating     IP 20		
Sensor     Hold Time     MH10 remote setting:5s/30s/1min/3min/5min/10min/20min/30min       Daylight sensor     MH10 remote setting:5s/30s/1min/3min/5min/10min/20min/30min       Parameter     Radius detection range(based on QS1 mode 100% sensitivity)     MH10 remote setting: 5Lux/15Lux/30Lux/50Lux/100Lux /150Lux/Disal       Remote control     Available     Motion detection (3m height) : 3-4m Minor motion detection (3m height) : 2.5-3.5m Presence (3m height) : 2.5-3.5m       Remote control     Available     Mounting height     2.5-4.0m       3dB beam angle     100° (horizontal)     100° (vertical)       3dB beam angle     0°C+50°C     100° (certical)       Working Environmenti     0°C+50°C     -25°C~+80°C       Temperature     -25°C~+80°C     -25°C~+80°C       Temperature     Compliant to RoHS     Compliant to RoHS       Standard     IP Rating     IP20       Note: "N/A" means not available.     IP20		
Sensor Parameter     Daylight sensor threshold     MH10 remote setting: 5Lux/15Lux/30Lux/50Lux/100Lux/150Lux/Disal Radius detection range(based on QS1 mode 100% sensitivity)     Motion detection (3m height) : 3-4m Minor motion detection (3m height) : 2.5-3.5m Presence (3m height) : 2.5-3.5m       Remote control     Available       Mounting height     2.5-4.0m       Motion (vertical)     100° (horizontal)       3dB beam angle     100° (horizontal)       Working     0°C+50°C       Temperature     -25°C~+80°C       Storage     -25°C~+80°C       Temperature     Certificate       Environmental Re standard     Quirement       IP Rating     IP20	MH10 remote setting: 25%-100%	
Sensor Parameter     threshold     MH10 remote setting: SLux/ISLux/30Lux/S0Lux/100Lux/ISOLux/Disal Radius detection range(based on QS1 mode 100% sensitivity)     Motion detection (3m height) : 3-4m Minor motion detection (3m height) : 2.5-3.5m Presence (3m height) : 2.5-3.5m       Remote control     Available       Motion detection (3m height) : 2.5-3.5m       Presence (3m height) : 2.5-3.5m       Motion detection (3m height) : 2.5-3.5m       Presence (3m h		
ParameterRadius detection range(based on QS1 mode 100% sensitivity)Motion detection (3m height) : 3-4m Minor motion detection (3m height) : 2.5-3.5m Presence (3m height) : 2.5-3.5mRemote controlAvailableMounting height2.5-4.0mMotion (vertical)100° (horizontal)3dB beam angle100° (horizontal)3dB beam angle0°C+50°C TemperatureVorking Temperature0°C+50°C TemperatureCertificateFCC/REDCertificateFCC/REDStandardQirementIP RatingIP20	ble	
sensitivity)     sensitivity)       Remote control     Available       Mounting height     2.5-4.0m       Mounting height     2.5-4.0m       3dB beam angle     100° (horizontal)       3dB beam angle     100° (vertical)       Morking     0°C+50°C       Temperature     °C+50°C       Storage     -25°C~+80°C       Temperature     PCC/RED       Certificate     FCC/RED       Environmental Re     Compliant to RoHS       quirement     IP 20	Minor motion detection (3m height): 2.5-3.5m	
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Application     100° (horizontal)       Application     Drill hole     Φ70mm       Working     0°C+50°C       Temperature     0°C+50°C       Storage     -25°C~+80°C       Temperature     Certificate       Environmental     FCC/RED       Certificate     FCC/RED       Invironmental Re     Quirement       IP Rating     IP20		
3dB beam angle   100° (vertical)     100° (vertical)   0°     Application   Drill hole   0°     Working   0°C+50°C     Temperature   0°C+50°C     Storage   -25°C°+80°C     Temperature   -26°C     Temperat		
Application   Drill hole   Φ70mm     Morking   0°C+50°C     Temperature   0°C+50°C     Storage   -25°C~+80°C     Temperature   Certificate     Function   FCC/RED     Environment   Environmental Re     quirement   Ompliant to RoHS     IP Rating   IP20	100° (horizontal)	
Application EnvironmentWorking Temperature $_{0}^{\circ}C+50^{\circ}C$ Storage Temperature $_{-25^{\circ}C^{*}+80^{\circ}C}$ Temperature $_{-25^{\circ}C^{*}+80^{\circ}C}$ CertificateFCC/REDEnvironmental Re quirementCompliant to RoHSIP RatingIP20Note: "N/A" wars not available.		
Application   Temperature   0°C+50°C     Environment   Temperature   -25°C~+80°C     Temperature   -25°C~+80°C     Temperature   Certificate   FCC/RED     Environmental Re quirement   Compliant to RoHS     IP Rating   IP20     Note: "N/A" means not available.		
Temperature   Temperature     Storage   -25°C~+80°C     Temperature   -25°C~+80°C     Certificate   FCC/RED     Environmental Re   -000000000000000000000000000000000000		
Storage -25°C~+80°C   Temperature -25°C~+80°C   Certificate FCC/RED   Environmental Re quirement   quirement Compliant to RoHS   IP Rating IP20	0 C+50 C	
Certificate   Environmental Re   Compliant to RoHS     Standard   quirement   IP Rating   IP20     Note: "N/A" means not available.   IP20   IP20		
Standard quirement Compliant to RoHS   IP Rating IP20   Note: "N/A" means not available.		
Note: "N/A" means not available.		
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## [Dimension and Function diagram]



#### Wiring layout suggestion:

1. Hand-in-hand wiring is highly recommended, yet star-topology or tree-topology is strongly deprecated

2. When there's more than 1pc sensor is a line, you shall consider all equipment current consumption shall not

surpass your driver's loading capacity.

### [Initialization]

When powered on, sensor indicator will turn off after flashing for 20S and will not detect moving signal during this time. After 20S, you can use our MH10 remote to adjust detection area, hold time and daylight sensor etc parameter.

# [Factory setting]

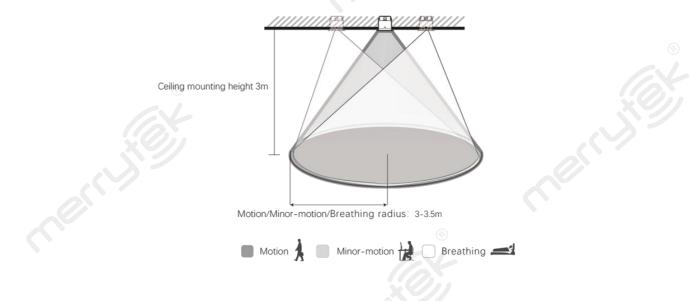
Detection Area :100% Indicator light :open Hold Time :1min

Day

Daylight Threshold :Disable

# [Detection radiation]

MSA219D 99 A is highly recommended ceiling flush mounting and its detection radiation is as below shows:



## [Detection Signal]

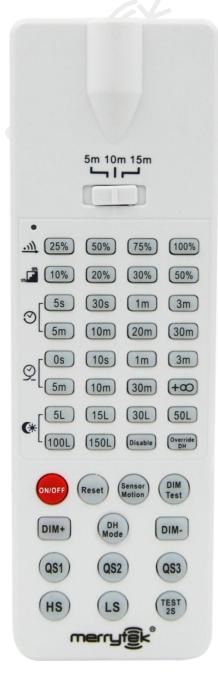
The product detects human moving, minor moving, and presence signals, and realizes the detection of human-existing/no-human in non-sleep state. The following is a description of the moving, minor moving and presence signals:

• Moving signal: detect the human significant moving (walking) in the detection area.

• **Minor moving signal:** 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.

• **Presence signal:** detect human abdominal and thoracic expansion behaviors caused by breathing, but not detect moving signal and minor moving signal.

# [Remote manual]



Detection range: 25%/50%/75%/100%

Hold time: 5s/30s/1min/3min/5min/10min/20min/30min

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

ON/OFF: disable sense function Sensor motion: enable sense function Reset: all parameter back as factory setting

QS1/QS2/QS3: High/Medium/Low sensitivity setting HS: turn on indicator LS: turn off indicator

#### [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.