

ME25-4S

5-In-1 Air Quality Sensor

The ME25-4S air quality series is a 5-in-1 air quality measurement module, in which we have adopted precise, long-life laser detection technology, developed advanced particle optimization algorithms and VOC-CO2 equivalent algorithms. This functionally configurable sensor module provides detection of up to 5 air quality parameters, temperature, humidity, PM2.5, VOC, and formaldehyde content. All signals are in the form of digital output, users can simply select only the required parameters when placing an order.



Features

- Multi-Functional detection module
- Adopt Self-Calibration algorithm ensuring precision and Output-Consistence
- Digital output, intuitive and easy use
- Customization

Applications

- Air conditioning
- Indoor air purifier
- Smart home appliances
- Indoor air quality measurement
- Outdoor air quality measurement

Advantages

- Ultra-Thin design, small size
- Fast response
- Accurate measurement

Standards

- EN 60770
- EN 61000-6-2 Series
- EN 61000-6-3 Series
- IEC 60068-2: 2005

Recommended Operating Parameter

Parameter	Description	Unit
Supply voltage	5 +/- 5%	V
Ambient operating temperature	-40 ...80	°C
Ambient operating humidity	5-95%, relative humidity, non-condensing	%RH
Preheating time	VOC-5 minutes; CO2-15 minutes	min
Working power	100	mW
Communication method	I2C	

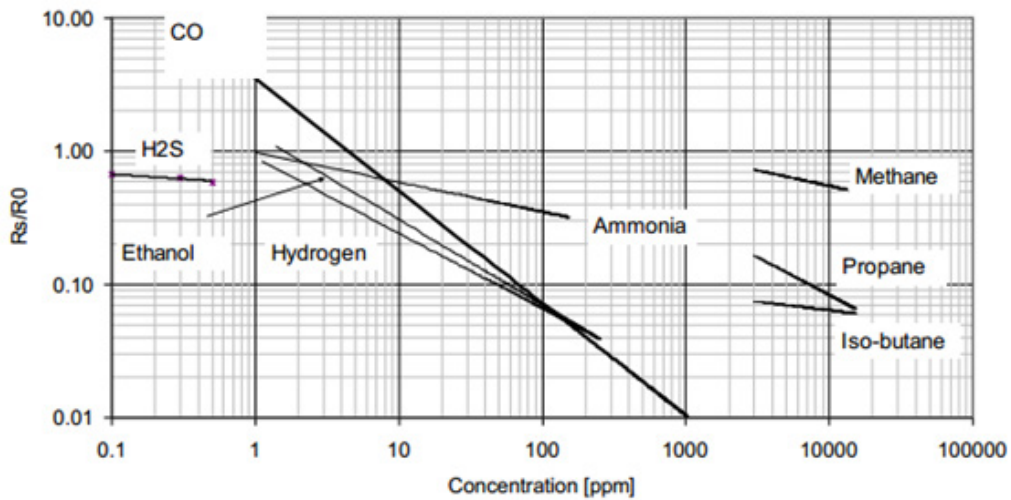
Note:

The initial preheating time takes 5 minutes under normal power-on conditions, and it takes 1-2 hours to wait until the indoor ambient gas concentration is uniform during initial use.

Performance Specifications

Parameter	Temperature	Humidity	TVOC	CO2	PM2.5
Measuring range	-10 ...85°C	0-80%RH	0-1000ppb	400-2000ppm	0.3-1; 1-2.5; 2.5-10 (µm)
Resolution	±0.4°C	±4%RH	0.001ppb	1ppm	1µg/m ³
Consistency	Up to -40 to 125°C operating range		<±10%	<±10%	<±10%@100-500µg/m ³
Single response time	<1s	<1s	<5s	<5s	<1s

Current VOC sensor electrical performance



Continuous power ON, 25°C, 50% RH

Note:

VOC value is relative with RS and R0

*R0: Resistance in clean air condition

*RS: Resistance in target gas condition

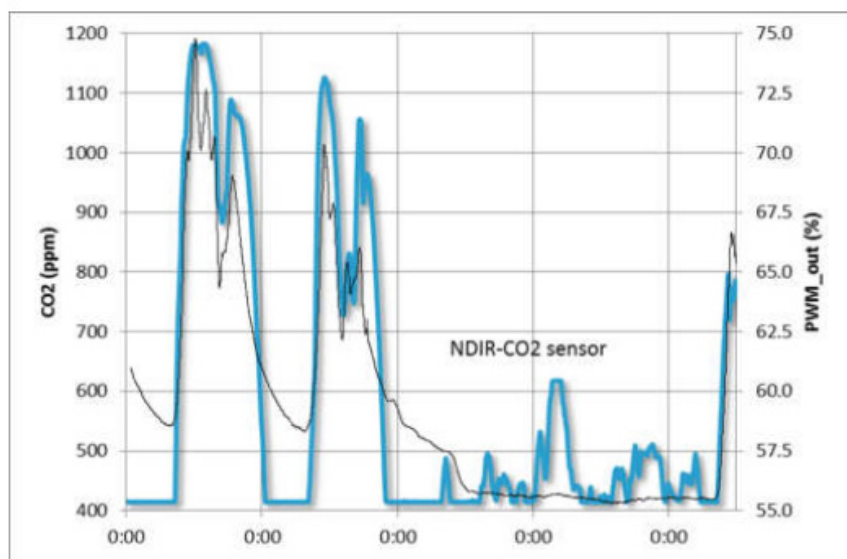
*VOC=F((RS-R0)/R0)

*R0 range: 100-1500KOhm

* Range:

1-1000ppm CO; 10-500ppm C₂H₅OH, 10-500ppm C₂H₅OH, 1-1000ppm H₂, 1-500ppm NH₃, >1000ppm CH₄

CO2 conversion value versus RS



Note:

Opot signal and NDIR CO2 sensor

PM2.5 Reliability Test

Number	Parameter	Test condition	Comment
1	Long running	1. 10m ² closed laboratory, temperature 20~25°C, humidity 30~70%, smoke sent through particle generator, air purifier adjusting 2. Power on with DC 5V 3. Consistency detection after 720 hours of continuous operation	1. Set 10 sampling points between 0~500µg/m ³ for particle concentration; 2. The maximum error between each test sample machine and standard machine is ±15µg/m ³ for 0~100µg/m ³ ; 3. The maximum error between each test sample machine and the standard machine is within ± 15% for 100~500 µg/m ³ ; 4. No obvious abnormal noise from the fan
2	Vibration	1. 10m ² closed laboratory, temperature 20°C, humidity 50%, smoke sent through particle generator, air purifier adjusting 2. DC 5V power-on to detect consistency 3. Vibration frequency: 50Hz. 4. Acceleration: 9.8/5 ² . 5. Vibration direction: X, Y, Z directions. 6. Amplitude (vertical direction): ±2mm. 7. Test time: 60 minutes each in X, Y, and Z directions.	
3	High temperature running	1. 10m ² closed laboratory, temperature 43°C, humidity 70%, smoke sent through particle generator, air purifier adjusting 2. DC 5V power-on to detect consistency	
4	Low temperature running	1. 10m ² closed laboratory, temperature -5°C, humidity 30%, smoke sent through particle generator, air purifier adjusting 2. DC 5V power-on to detect consistency	
5	High temperature and humidity storage	1. Constant temperature chamber, temperature 70°C, humidity 90~95% 2. 500 hours of recovery 3. DC 5V power-on to detect consistency after taking it out	
6	Low temperature storage	1. Constant temperature chamber, temperature -30°C, humidity 90~95% 2. 500 hours of recovery 3. DC 5V power-on to detect consistency after taking it out	
7	Power fluctuation	1. 10m ² closed laboratory, temperature 20°C, humidity 50%, smoke sent through particle generator, air purifier adjusting 2. Adjustable DC power supply, from 4.5V to 5.5V, then down to 4.5V, repeated cycle changes for 2 hours at the voltage change speed of 0.1V/min. Detect consistency Simultaneously	
8	Power switch	1. 10m ² closed laboratory, temperature 20°C, humidity 50%, smoke sent through particle generator, air purifier adjusting 2. DC 5V power supply, power switching frequency 0.5Hz, lasts for 72 hours. Detect consistency after finished	
9	Dormant switch	1. 10m ² closed laboratory, temperature 20°C, humidity 50%, smoke sent through particle generator, air purifier adjusting 2. DC 5V power supply, sleep control pin (SET) level change frequency 0.5Hz, lasts for 72 hours. Detect consistency after finished	
10	Laser switch	1. 10m ² closed laboratory, temperature 20°C, humidity 50%, smoke sent through particle generator, air purifier adjusting 2. Laser switch frequency is 50HZ, lasts for 240 hours, and detect consistency after finished	

Safety and Environment



The product is to be installed by manufacturer trained personnel or competent person trained in accordance with manufacturer installation instructions.

With respect to applicable standards IEC 61010-1/ EN 61010-1 *safety requirements for electrical equipment for measurement, control and laboratory use part 1 general requirements*, the product should be used in limited energy secondary circuits.



Risk of electrical shock

Certain parts of the module can carry hazardous voltage during the operation process of the product because hazardous live voltage of primary conductor, power supply occurs, injury and/or serious damage will be caused if this warning is ignored.

Conducting parts must be inaccessible after installation of the product. Additional protection including shield or protective housing could be used according to IEC 60664 Insulation coordination for equipment within low-voltage supply systems.

Disconnection of the main supply will protect against possible injury and serious damage.



ESD protection

Damage from an ESD event will occur if the personnel is not well grounded when handling.

Important notice

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