



CUBIC

Environmental Air Quality Sensors

For Indoor and Outdoor Air Quality



Cubic Sensor and Instrument Co., Ltd.

Add: Fenghuang No.3 Road, Fenghuang Industrial Park, Eastlake Hi-tech
Development Zone, Wuhan, 430205, China

Tel: +86-27-81628827

Fax: +86-27-87401159

E-mail: sales@gassensor.com.cn

Web: en.gassensor.com.cn

All products are in continuous development and therefore specifications
may be subject to change without prior notice.



Carbon Dioxide Sensor



Particulate Matter Sensor



Integrated Module

Cubic Sensor and Instrument Co., Ltd.

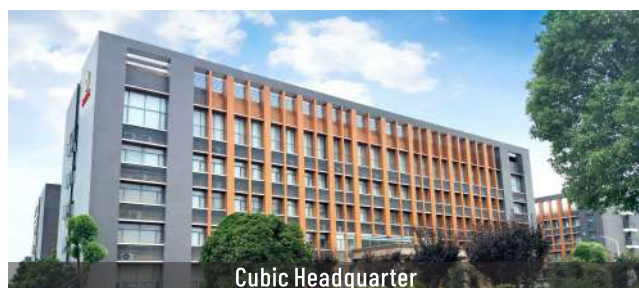
About Cubic

Cubic Sensor and Instrument Co., Ltd. (hereinafter referred to as "Cubic") is a publicly listed company in SSE STAR Market (stock code:688665), specializing in smart gas sensors and superior gas analyzers. Set up in 2003, situated at "Optics Valley" of Wuhan, China, Cubic has established gas sensing technology platforms including optical technologies (NDIR, Ultraviolet, Light Scattering, Laser Raman), ultrasonic technology, MEMS metal oxide semiconductor (MOX) technology, electrochemical technology, ceramic thick-film technology based high temperature solid electrolyte technology and so on. At present, Cubic has obtained more than 160 patents at home and abroad, with abundant products widely used in various fields of HVAC, industrial safety, automotive electronics, medical & healthcare, smart metering, scientific instruments, low-carbon thermal engineering.

Cubic has established four major R&D and industrialization bases, including Cubic Headquarter, Cubic R&D Center, Cubic Jiashan Facotry, and Cubic Hungary Factory, with a total area of nearly 100,000 square meters. Cubic has a provincial-level enterprise technology center and a gas analysis instrumentation engineering technology research center in Hubei Province of China. At the same time, Cubic energetically participates in the national technological innovation system and has successively obtained many national and provincial projects which support Cubic incessant innovations. Those projects contain the National Major Scientific Instrument and Equipment Development Project, the Ministry of Industry and Information Technology Internet of Things Development Special Project, the Ministry of Industry and Information Technology Strong Foundation Engineering Sensor "One-stop" Project, the Ministry of Science and Technology Science and Technology Boost the Economy 2020 Key Special Project, and the Hubei Province Technical Innovation Major Project, etc. Cubic has been regarded as a major gas sensor manufacturer and representative enterprise by industry authorities at home and abroad and won the "Most Influential IoT Sensor Enterprise Award" by the China Internet of Things Industry Alliance.

With decade-long dedications in technical innovations, strict quality control and global business strategies, Cubic, as a leading manufacturer of high-quality gas sensors and sensor solutions, has obtained the recognition of many well-known Fortune 500 companies as well as other domestic and overseas leading companies in different fields. Cubic products have been exported to more than 80 countries and regions, besides, Cubic is moving towards a higher target to be the international brand in the field of gas sensors.

Cubic At Glance



Cubic Headquarter



Cubic R&D Center

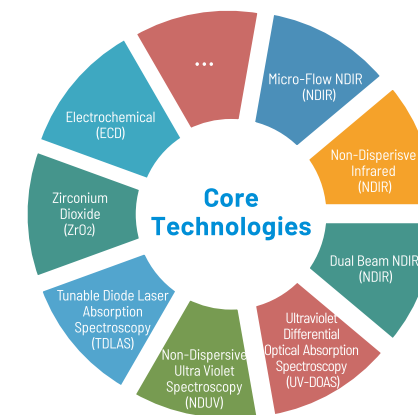


Cubic Jiashan Factory



Cubic Hungary Factory

Sensing Technology Platforms



23 Years

23 years of development and application of NDIR technology

18 Years

18 years of development and application of Ultrasonic technology

16 Years

16 years of development and application of Light scattering technology

8 Years

8 years of development and application of TDLAS technology

Patents

Total **256** patents obtained



Quality Management



ISO 9001:2015

IATF 16949:2016

ISO 14001:2015

ISO 45001:2018

A-SPICE Level 2



Super Low Power CO₂ Sensor

CM1106SL-NS

Features

- Super low power consumption: 37μA@2minutes
- High accuracy, ASHRAE, RESET, WELL compliant
- Matrix calibration to ensure accuracy under whole temperature and measurement range
- Auto-baseline correction function, maintenance-free
- Signal output: UART_TTL, I²C

Applications

- Battery powered air quality monitor
- Battery powered HVAC system controller
- Portable battery powered CO₂ meter
- Fresh air system
- Green house

Specifications

Measurement Range	0~5,000ppm
Accuracy	±(40ppm+3%of reading) (Note 1)
Working Condition	-10°C~50°C; 0~95%RH (non-condensing)
Signal Output	UART_TTL, I ² C
Working Current	37μA (2 minutes as measurement cycle, default in the sensor)
Power Supply	DC3.3V~5.5V
Dimension	W33.5*H19.7*D9.1 (mm)

Note 1: In normal IAQ applications, accuracy is defined with 10°C~35°C, 0~85%RH. When the sensor is under single measurement mode (Power supply is controlled by host), the sensor reading output is without moving average. The defined accuracy ±(40ppm+3%of reading) is based on data moving average≥5 and range of 400~2000ppm.



High Accuracy CO₂ Sensor

CM1106H-NS

Features

- High accuracy: ±(30ppm+3%of reading)@-10°C~50°C, meets the RESET Standard Grade A (Note 1)
- Matrix calibration to ensure accuracy under whole temperature and measurement range
- Flexible pin direction design is available
- Auto-baseline correction function, maintenance-free
- Long lifespan ≥15 years

Applications

- Fresh air system
- HVAC system controller
- Air quality monitor
- Household & central air conditioner
- Air purifier

Specifications

Measurement Range	PWM: 0~2,000ppm UART_TTL, I ² C: 0~10,000ppm (Note 2)
Accuracy	±(30ppm+3%of reading) @-10°C~50°C, 0~85%RH
Working Condition	-10°C~50°C; 0~95%RH (non-condensing)
Signal Output	UART_TTL, I ² C, PWM
Working Current	< 50mA
Power Supply	DC4.5V~5.5V
Dimension	W33*H19.7*D8.9 (mm)

Note 1: The accuracy standard quotes "The RESET™ Air STANDARD for Accredited Monitors v2.0", copyright © 2018 RESET™.

Note 2: Sensor is designed to measure in the range 0~2,000ppm (PWM), 0~10,000ppm (UART_TTL, I²C) with specified in the table accuracy.



Ultra-Low Power CO₂ Sensor CM1108UL



Features

- NDIR technology
- Super low power consumption: $\leq 30\mu\text{A}$
- Auto-baseline correction function, maintenance free
- High accuracy, ASHRAE, RESET, WELL compliant



Applications

- Battery powered air quality monitor
- Battery powered HVAC system controller
- Portable battery powered CO₂ meter
- Fresh air system



Specifications

Measurement Range	400~5000ppm
Working Temperature and Humidity	0°C ~ 50°C; 0~95%RH (non-condensing)
Accuracy	$\pm (30\text{ppm} + 3\% \text{ of reading})$ (Note 1)
Power Supply	DC 3.3V~5.5V
Average Working Current	$\leq 30\mu\text{A}$ (continuous measurement mode, 16s, 8 samples)
Dimensions	W33.6*H11.75*D19.9(mm)
Signal Output	UART / I ² C
Life Span	≥ 15 years

Note1: Accuracy in the table is defined at 25 °C, 1013 mbar ambient pressure and 50% RH. Shipping rough handling and assembly might temporarily affect the accuracy of the sensor. Accuracy can be fully restored by forced recalibration or after a maximum of 3 ABC periods.



Miniature SMT NDIR CO₂ Sensor CM1120



Features

- NDIR technology
- Ultra-thin design, easy integration
- Low power consumption
- Long life span



Applications

- Air quality monitor
- Air conditioner
- Ventilation system
- Consumer electronic products

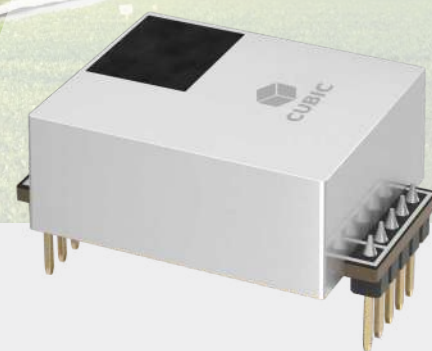


Specifications

Operating Principle	NDIR (Non-dispersive Infrared)
Measurement Range	0-5000ppm
Measurement Accuracy	$\pm (30\text{ppm} + 3\% \text{ of reading})$
Average Working Current	20mA at 1s sampling interval; 8mA at 8s sampling interval
Lifetime	≥ 10 years
Working Condition	-10~60°C; 0~95%RH (non-condensing)
Power Supply	DC 3.3V~5.5V
Communication	UART/I ² C
Dimmension	W13.5*H7*D32(mm)
Weight	5g



Dual Beam CO₂ Sensor CM1107N



Features

- Dual beam(Note 1) detection for high accuracy and long-term stability with little drift
- Matrix calibration to ensure accuracy under whole temperature and measurement range
- Measurement range can be extended to 10,000ppm
- Long lifespan ≥15 years

Applications

- Green house
- Fresh air system
- Household & central air conditioner
- Boiler gas leakage alarm
- Farm

Specifications

Measurement Range	0~5,000ppm default
Accuracy	±(30ppm+3%of reading)@0°C~50°C, 50±10%RH
Working Condition	-10°C~50°C; 0~95%RH (non-condensing)
Signal Output	UART_TTL, I ² C, PWM
Working Current	<50mA
Power Supply	DC4.5V~5.5V
Dimension	W33*H21.7*D12.7 (mm) (without pin)

Note 1: Dual beam CO₂ sensor applies two beams: One for detecting and one for reference, reduces influence of the IR source aging, to ensure high accuracy with little drift. Dual Beam CO₂ Sensor suits for applications without fresh air environments.



Wide Measurement Range CO₂ Sensor CM1107H



Features

- Wide measurement range, 5%vol CM1107H
- Dual beam detection for high accuracy and long-term stability with little drift
- Matrix calibration to ensure accuracy under whole temperature and measurement range
- Low power consumption
- Long lifespan ≥15 years

Applications

- Wine cellar
- Carbonated beverage factory
- Bar
- Silobag grain
- Intelligent agriculture

Specifications

Specifications	CM1107H
Measurement Range	0~5%vol
Accuracy	±(0.02%vol +10%of reading)@0~50°C, 50±10%RH
Working Condition	-10°C~50°C; 0~95%RH (non-condensing)
Signal Output	UART_TTL, I ² C
Power Supply	DC4.5V~5.5V
Working Current	< 50mA
Dimension	W33*H22*D13.1 (mm) (without pin)



Dual IR Source CO2 Sensor CM1109

Features

- Dual IR source NDIR technology with independent intellectual property
- Dual measurement range
- Matrix calibration to ensure accuracy under whole measurement temperature and measurement range
- High accuracy, long term stability
- Long lifespan ≥15 years
- Signal output: UART_TTL, PWM, I²C

Applications

- HVAC, central air conditioning
- Agricultural planting, plant cultivation
- Storage, cold chain transportation
- Indoor air quality detector
- Air purifier

Specifications

Measurement Range	400~5,000ppm/400~20,000ppm
Accuracy	±(50ppm+3%of reading)@0~50°C, 50±10%RH@400~5000ppm
Working Condition	-10°C~50°C; 0~95%RH (non-condensing)
Signal Output	UART_TTL, I ² C, PWM
Working Current	<45mA
Power Supply	DC4.5V~5.5V
Dimension	W33*H20.3*D11.4 (mm) (without pin)



Table Overview for Cubic NDIR CO2 Sensors

Product Image	Working Principle	Measurement Range	Accuracy	Signal Output	Power Consumption	Features			
						Matrix Calibration	Temperature and Humidity Compensation	Auto-baseline Correction (default on)	Super Low Power
 CM1106SL-NS	Single beam NDIR	0~5,000ppm	±(40ppm+3%of reading) @10°C~35°C, 0~85%RH	UART_TTL I ² C	37uA @2minutes	✓	✓		✓
 CM1106H-NS	Single beam NDIR	0~10,000ppm	±(30ppm+3%of reading) @-10°C~50°C, 0~85%RH	UART_TTL I ² C PWM	<50mA @1second	✓	✓	✓	
 CM1107N	Dual beam NDIR	0~5,000ppm	±(30ppm+3%of reading) @0~50°C, 50±10%RH	UART_TTL I ² C PWM	<50mA @1second	✓	✓		
 CM1107H	Dual beam NDIR	0~50,000ppm	±(200ppm+10%of reading) @0~50°C, 50±10%RH	UART_TTL I ² C	<50mA @1second	✓	✓		
 CM1109	Dual Engine NDIR	0~5,000ppm	±(50ppm+3%of reading) @0~50°C, 50±10%RH	UART_TTL I ² C PWM	<50mA @1second	✓	✓		
 CM1108UL	NDIR	400~5,000ppm	±(30ppm+3%of reading)	UART/I ² C	≤30μA (continuous measurement mode, 16s, 8 samples)	✓	✓	✓	✓
 CM1120	NDIR	0~5,000ppm	±(30ppm+3%of reading)	UART/I ² C	20mAat1s sampling interval; 8mAat8s sampling interval	✓	✓	✓	

*Matrix calibration: The sensors are calibrated at low (-10°C), normal (25°C) and high (50°C) temperature points under muti-points of CO2 concentration, to ensure high accuracy under wider temperature and measurement range.

*Temperature and Humidity Compensation: With the integrated RH&T chip and matrix calibration, ensures the high accuracy under wider temperature and humidity range.

*Auto-baseline Correction(ABC): After turn on the ABC, sensors will record the lowest value during the ABC period and automatically correct as 400ppm (The applications should ensure that the environments have access to fresh air), maintenance-free.

*Super Low Power: μA current level, super low power consumption suits for battery supply applications.

*Due to automatic production line, upstream and downstream vertical integration of supply chain, Cubic has realized stable and fast delivery for all the CO2 sensors.



LED Particulate Matter Sensor PM1006K



Features

- Output PM1.0, PM2.5 and PM10
- Built-in MCU, smart algorithm
- Dust deposition correction function
- Compact structure, light weight and easy to install

Applications

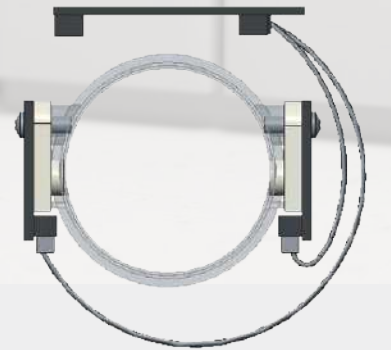
- Household air purifier
- Automobile air purifier
- Residential and commercial air conditioning
- HVAC system
- All kinds of IAQ monitor
- IoT hardware intelligence

Specifications

Measurement Range	0~1000 $\mu\text{g}/\text{m}^3$
Accuracy	PM2.5: $\pm 20\mu\text{g}/\text{m}^3$ or $\pm 20\%$ of reading (25°C $\pm 2^\circ\text{C}$, 50 $\pm 10\%$ RH, TSI8530)
Working Condition	-20°C~75°C; 0~95% RH (non-condensing)
Power Supply	DC 5V $\pm 0.2\text{V}$
Working Current	$\leq 30\text{mA}$
Signal Output	UART_TTL, PWM
Dimension	W46.2*H34.1*D18 (mm)



LED Dust Sensor for Floor Scrubber PM1010



Features

- Sewage pollution level output through UART protocol
- Easy integration to customer device
- Quick response

Specifications

Operating Principle	LED infrared
Measurement Range	0-100 levels
Response Time	0.5s
Working Temperature	-10~60°C; 0~95%RH (non-condensing)
Storage Temperature	-20~80°C; 0~95%RH (non-condensing)
Power Supply	DC 3.3V $\pm 5\%$, ripple <50mV
Working Current Average	<60mA
Signal Output UART	3.3V level
Dimension	Main control PCBA (W16.0*H1.0*D26.5)(mm) Transmitter & receiver board (W10.56*D20)(mm)



Laser Particulate Matter Sensor PM2008 series



Features

- API (Auto Particle Identification) technology with PM1.0, PM2.5, PM10 output
- High accuracy, up to $\pm 5\mu\text{g}/\text{m}^3$
- Matrix calibration within the whole temperature and measurement range
- Hanging ear design for easy installation

Applications

- Air purifier
- Air quality monitor
- Air conditioner
- Ventilation system
- Consumer electronic products

Specifications

Measurement Particulate Matter	0.3 μm ~10 μm
Measurement Range	0~5000 $\mu\text{g}/\text{m}^3$
Accuracy	PM1.0&PM2.5: 0~35 $\mu\text{g}/\text{m}^3$, $\pm 5\mu\text{g}/\text{m}^3$; 35 $\mu\text{g}/\text{m}^3$ ~500 $\mu\text{g}/\text{m}^3$, $\pm 15\%$ of reading PM10: 0~100 $\mu\text{g}/\text{m}^3$, $\pm 25\mu\text{g}/\text{m}^3$; 101~500 $\mu\text{g}/\text{m}^3$, $\pm 25\%$ of reading (25°C $\pm 2^\circ\text{C}$, 50 $\pm 10\%$ RH, GRIMM)
Working Temperature	-10°C~60°C; 0~95% RH (non-condensing)
Power Supply	DC 5V $\pm 0.1\text{V}$
Working Current	$\leq 100\text{mA}$ (Working), $\leq 200\mu\text{A}$ (Standby)
Signal Output	UART_TTL, I ² C, PWM



Laser Particulate Matter Sensor PM2012 series



Features

- API (Auto Particle Identification) technology with PM1.0, PM2.5, PM10 output
- Matrix calibration to ensure accuracy under whole temperature and measurement range
- Constant power control of laser diode, ensures constant signal output
- Constant fan speed, ensures constant sampling flow and low noise
- Ultra-thin design with small dimension
- Air inlet and outlet on the same side and the opposite side for option

Applications

- Air purifier
- Air quality monitor
- Air conditioner
- Ventilation system
- Consumer electronic products

Specifications

Measurement Particulate Matter	0.3 μm ~10 μm
Measurement Range	0~5000 $\mu\text{g}/\text{m}^3$
Accuracy	PM1.0&PM2.5: 0~100 $\mu\text{g}/\text{m}^3$, $\pm 10\mu\text{g}/\text{m}^3$; 101~500 $\mu\text{g}/\text{m}^3$, $\pm 10\%$ of reading; PM10: 0~100 $\mu\text{g}/\text{m}^3$, $\pm 25\mu\text{g}/\text{m}^3$; 101~500 $\mu\text{g}/\text{m}^3$, $\pm 25\%$ of reading (25°C $\pm 2^\circ\text{C}$, 50 $\pm 10\%$ RH, GRIMM)
Working Condition	-10°C~60°C; 0~95% RH (non-condensing)
Power Supply	DC 5V $\pm 0.1\text{V}$
Working Current	$\leq 100\text{mA}$ (Working), $\leq 200\mu\text{A}$ (Standby)
Signal Output	UART_TTL, I ² C
Dimension	W38*H35*D12 (mm)



Anti-dust Laser Particle Sensor with Three Channel Output PM2016

Features

- The smallest size of available measurement: 0.3 μ m
- Real-time output particle mass concentration in μ g/m³ is available
- VOC, temperature and humidity measuring function is reserved
- High accuracy, high sensitive and quick response
- Small size, compact structure, easy to install
- Same side air inlet and outlet
- Anti-dust structure

Applications

- Air purifier
- Air quality monitor
- Air conditioner
- Ventilation system
- Consumer electronic products

Specifications

Measured Particle Range	0.3 μ m~10 μ m
Measurement Range	0~1,000 μ g/m ³
Accuracy	PM1.0/PM2.5: 0~100 μ g/m ³ : $\pm$ 10 μ g/m ³ , 101~500 μ g/m ³ : $\pm$ 10% of reading PM10: 0~100 μ g/m ³ : $\pm$ 25 μ g/m ³ , 101~500 μ g/m ³ : $\pm$ 25% of reading (GRIMM, 25 $\pm$ 2°C, 50 $\pm$ 10%RH)
Time to First Reading	$\leq$ 8 seconds
Response Time	1s
Working Condition	-10°C~60°C, 0~95%RH
Storage Condition	-40°C~70°C, 0~95%RH (non-condensing)
Power Supply	DC 5V $\pm$ 0.1V, ripple wave < 100mV
Working Current	$\leq$ 80mA
Signal Output	UART_TTL/I ² C, 3.3V (5V compatible)
Dimensions	W40.7*H40.7*D12.2 (mm)



Compact Particle Matter Sensor PM2020

Features

- Compact form-factor design
- Real-time output PM2.5 in μ g/m³ available
- High accuracy, high sensitive and quick response
- Signal output optional: UART

Applications

- Air purifier
- Air quality monitor
- Air conditioner
- Ventilation system
- Consumer electronic products
- Environmental monitoring

Specifications

Operating principle	Laser scattering
Measured particle range	0.3 μ m ~ 10 μ m
Measurement range	0~1,000 μ g/m ³
PM2.5 Accuracy	0~100 μ g/m ³ : $\pm$ 15 μ g/m ³ 101 μ g/m ³ ~1000 μ g/m ³ : $\pm$ 15% of reading Condition: 25 $\pm$ 2°C, 50 $\pm$ 10%RH, Reference instrument: TSI8530 Dust Source: Cigarette Smoke
Power supply	DC 5V $\pm$ 0.2V, ripple wave < 100mV
Working current	$\leq$ 100mA
Working condition	-10°C ~ 50°C, 0~95%RH (non-condensing)
Digital output (default)	UART_TTL (3.3V)
Dimensions	W24.6mm*H16.3*D42 (mm)



6-in-1 Integrated Gas Sensor Module AM1002



Features

- 6 in 1 integrated sensor: PM1.0, PM2.5, PM10, VOC, Relative Humidity & Temperature
- Matrix calibration to ensure accuracy under whole temperature and measurement range
- Ultra-thin design with small dimension
- Air inlet and outlet on the same side and the opposite side for option



Applications

- Air purifier
- Air quality monitor
- Air conditioner
- Ventilation system



Specifications

Measurement Range	Particulate Matter: 0~5000 $\mu\text{g}/\text{m}^3$ VOC: 0~10ppm Temperature: -20°C~70°C Humidity: 0~99%RH
PM Accuracy	PM1.0&PM2.5: 0~100 $\mu\text{g}/\text{m}^3$, $\pm 10\mu\text{g}/\text{m}^3$; 101~500 $\mu\text{g}/\text{m}^3$, $\pm 10\%$ of reading; PM10: 0~100 $\mu\text{g}/\text{m}^3$, $\pm 25\mu\text{g}/\text{m}^3$; 101~500 $\mu\text{g}/\text{m}^3$, $\pm 25\%$ of reading (25°C $\pm 2^\circ\text{C}$, 50 $\pm 10\%$ RH, GRIMM)
Temperature Accuracy	$\pm 1^\circ\text{C}$ (0~40°C)
VOC Consistency	Typical/Max: 200ppb/250ppb or 20%/25%
Humidity Accuracy	Typical/Max: $\pm 5\%$ / $\pm 8\%$ (5%~95%RH)
Working Condition	-10°C~60°C; 0~95%RH(non-condensing)
Working Current	<100mA
Power Supply	DC 5V $\pm 0.1\text{V}$
Signal Output	UART_TTL
Dimension	W38*H35*D12 (mm)



7-in-1 Integrated Gas Sensor Module AM1009



Features

- 7 in 1 integrated sensor module: PM1.0, PM2.5, PM10, VOC, NO₂, Relative humidity & Temperature
- Matrix calibration to ensure accuracy under whole temperature and measurement range
- Cubic MOX sensor, supports various gas types detection
- Intelligent VOC auto-calibration strategy on site, maintenance-free
- Temperature compensation algorithm
- OEM/ODM available



Applications

- Air purifier
- Air quality monitor
- Air conditioner
- Ventilation system



Specifications

Operating Principle	PM: Laser light scattering VOC & NO ₂ : MOX
Measurement Range	PM: 0~5,000 $\mu\text{g}/\text{m}^3$; VOC: 0~10ppm; NO ₂ : 0~1,000ppb Temperature: -20°C~70°C; Humidity: 0~99%RH
PM Accuracy	PM1.0 & PM2.5: 0~100 $\mu\text{g}/\text{m}^3$, $\pm 10\mu\text{g}/\text{m}^3$; >100 $\mu\text{g}/\text{m}^3$, $\pm 10\%$ of reading; PM10: 0~100 $\mu\text{g}/\text{m}^3$, $\pm 20\mu\text{g}/\text{m}^3$; >100 $\mu\text{g}/\text{m}^3$, $\pm 20\%$ of reading; (GRIMM 11-A, 0~50°C, 50 $\pm 10\%$ RH, dust source: Cigarette+AI)
VOC Accuracy	160ppb or $\pm 40\%$ of reading
NO ₂ Accuracy	40ppb or $\pm 40\%$ of reading
Temperature Accuracy	0~50°C: $\pm 1^\circ\text{C}$
Humidity Accuracy	Typical/Max: $\pm 5\%$ / $\pm 8\%$ (5%~95%RH)
Working Condition	-20°C~60°C, 0~95%RH (non-condensing)
Power Supply	DC 5V $\pm 0.1\text{V}$
Average Working Current	$\leq 180\text{mA}$ (continuous operation)
Signal Output	I ² C (UART is available)
Dimension	W50*H38*D21 (mm)
Life Time	>10 years



8-in-1 Integrated Gas Sensor Module AM2020



Features

- Super highly integrated, with function of particle, VOC, NO₂, temperature and humidity measurement
- The smallest particle size of available measurement: 0.3μm
- High accuracy, high sensitive and quick response
- Temperature compensation algorithm
- Matrix calibration technology and optimized algorithm, for high accuracy and consistency

Applications

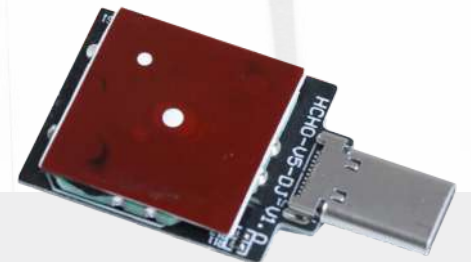
- Air purifier
- Air quality monitor
- Air conditioner
- Ventilation system
- Consumer electronic products
- Environmental monitoring

Specifications

Operating principle	Laser scattering/MOX/Electrochemical
Measurement range	Particle: 0~5,000μg/m ³ ; VOC: 0~10ppm, NO ₂ : 0~1,000ppb, HCHO: 0~1000ppb, Temperature: -20~70°C, Humidity: 0~99%RH
Measured particle range	0.3μm~10μm
Particle accuracy	PM1.0/PM2.5: 0~100μg/m ³ : ±10μg/m ³ ; 101~1000μg/m ³ : ±10% reading PM10: 0~100μg/m ³ : ±20μg/m ³ ; 101~1000μg/m ³ : ±20% reading (Reference: TSI8533, Dust Source: Cigarette Smoke +Arizona A1 Dust, @condition 25±2°C & 50 ±10%RH)
Temperature accuracy	±1°C (0~50°C)
Humidity accuracy	Typical/Max: ±5%/±8% (5%~95%RH)
VOC Accuracy	200ppb or ±50% of reading, whichever is larger (25±2°C, 50 ±10%RH)
NO ₂ Accuracy	50ppb or ±50% of reading, whichever is larger (25±2°C, 50 ±10%RH)
HCHO Accuracy	±25ppb or ±25% of reading, whichever is larger (Reference instrument: Gasera one, 25±2°C, 50±10%RH)
Power supply	DC 3.3V±0.1V~5V±0.1V, ripple wave<100mV
Average working current	≤180mA (continuous operation)
Working condition	-10°C ~ 50°C, 10~95%RH (non-condensing)
Dimensions	W55.3*H19.95*D26 (mm)



Formaldehyde Gas Sensor CB-HCHO-V5



Features

- High sensitivity up to 1ppb
- HCHO, VOC in-one design
- Full range temperature and humidity compensation
- Unique dual-channel design, good anti-interference
- Multiple communication methods: URAT, IIC, PWM
- Lifetime can reach 3 years (in air)

Specifications

Working Principle	Electrochemical
Measurement Range	HCHO: 0~1ppm VOC: 0~10ppm (equivalent alcohol concentration) TVOC: 0~10ppm (equivalent alcohol concentration)
HCHO Measurement Accuracy	±0.030ppm or ±10% reading, whichever larger
Resolution	HCHO: 1ppb; VOC: 0.01ppm; TVOC: 0.01ppm
Response Time T ₉₀	50s (@25±2°C, 50±10%RH)
Working Condition	0~40°C; 15~95%RH (non-condensing)
Storage Condition	-20~50°C; 0~95%RH (non-condensing)
Working Voltage	DC(+3.5V ~ +5.5V)
Working Current	<15mA
Signal Output	UART_TTL (3.3V); I ² C (Reserved); PWM (Reserved)
Dimensions	W23*H32*D7 (mm)
Lifetime	3 years (@0.1ppm Formaldehyde concentration)



Relative Humidity and Temperature CHT40

Features

- Low power consumption
- Wide operating voltage range (3.3V/5V compatible)
- IIC communication interface
- Small size, easy integration

Applications

- Consumer electronics
- Smart home
- Automotive cabin
- Industrial control
- Medical devices

Specifications

Detection Range	-10~50°C, 10~90% RH
Detection Accuracy	Typical ±0.5°C, ±3% @10~40°C, 10~90% RH
Working Condition	-10~50° C; ≤95% RH (non-condensing)
Working Voltage	DC 3.3V~5V
Working Current	<1mA
Communication Interface	IIC (compatible with 3.3V/5V)
Dimensions	W10*H5.2*D15 (mm)



Table Overview for Cubic Particulate Matter Sensors

Product Image	Light Source	Measurement Range	Inlet and outlet	Features						
				Auto Particle Identification (API)	Matrix Calibration	Anti-Dust	Constant Power Control of Laser Diode	Constant RPM Speed Fan	Three-channel Output (PM1.0, PM2.5&PM10 in µg/m³)	Particle Count Output (in pcs/L)
 PM1006K	LED	0~1000 µg/m³			√				√	
 PM2008M	Laser Diode	0~5000 µg/m³	Same Side	√	√		√	√	√	
 PM2012	Laser Diode	0~5000 µg/m³	Same Side & Side Opposite	√	√		√	√	√	
 PM2016	Laser Diode	0~1000 µg/m³	Same Side	√	√	√	√	√	√	√
 PM2020	Laser Diode	0~1000 µg/m³	Same Side	√			√	√		
 AM1002	Laser Diode	0~5000 µg/m³	Same Side & Side Opposite	√	√		√	√	√	
 AM1009	Laser Diode	0~5000 µg/m³	Same Side & Side Opposite	√	√	√	√	√	√	
 AM2020	Laser Diode	Particle: 0~5000 µg/m³; VOC: 0~10ppm; NO2: 0~100ppb; HCHO: 0~100ppb; Temperature: -20~70°C; Humidity: 0~98%RH	Same Side	√	√		√	√	√	

*Auto Particle Identification(API): The sensors are calibrated with different dust sources, to ensure identification ability under different particulate matter distributions. With the application of the correct density in professional algorithm, the sensors ensure three channels PM1.0, PM2.5&PM10 output with high accuracy regardless of particulate matter distribution change.

* Matrix Calibration: The sensors are calibrated at muti-points of low, normal and high temperature under multiple dust concentration points, to ensure high accuracy under wider temperature and measurement range.

*Anti-Dust: Special structure design to decrease dust accumulation over photodiode, ensures sensors longer lifespan under high dust concentration environments.

*Constant Power Control of Laser Diode: It ensures constant signal output, which is conducive to identify the particulate matter, to ensure stable performance and high accuracy.

*Constant RPM Speed Fan: It ensures constant sampling flow, enables sensors with low noise and stability.

*Three-channel Output: Output PM1.0, PM2.5&PM10 in µg/m³ simultaneously.

*Particle Count: Output in pieces/volume, suits for cleanroom.