



# Sensor Product Brochure

Sense the World, Innovate the Future



Zhengzhou Winsen Electronics Technology Co., Ltd.  
Add.: NO.299 Jinsuo Road, National High-Tech Zone, Zhengzhou, China.  
Post code: 450001      Email: sales@winsensor.com  
Tel.: 0086-371-67169097      Fax.: 0086-371-60932988  
Web: www.winsen-sensor.com



Winsen Website

Zhengzhou Winsen Electronics Technology Co., Ltd.



## One-Stop Sensor Solutions Provider



Established in 2003 and originated in 1990s, Zhengzhou Winsen Electronics Technology Co., Ltd. is a high-tech enterprise with integrated business of R&D, production, sales and solutions of sensing products, covering an area of 40000 m<sup>2</sup>.

In 2009, Winsen Electronics was listed in Growth Enterprise Market (GEM) with comprehensive strength ranking top in Chinese sensor industry. After more than 30 years development, Winsen has become a leader in Chinese gas sensor field and also grown to be one of the top sensor companies in global wide.



Winsen's sensor products cover total 7 categories and 200+ series capable to detect 300+ indicators, including gas sensor based on four principles of semiconductor, catalytic, electrochemical and infrared absorption, infrared detection sensor, MEMS sensor, pressure sensor, humidity sensor, flow sensor and water sensor, etc. The products are widely used in industrial safety, civil fire prevention, environmental protection, household appliances, automotive electronics, medical health, and smart city, etc. Moreover, Winsen proceeds to make continuous innovation in new application directions.

**7** Categories      **200+** Series      **300+** Detection Indicators



Winsen owns strong strength in R&D: excellent R&D team of more than 160 talents and professionals; more than 500 sets of equipment and devices for production and R&D. Our R&D achievements have been approved by Henan Provincial Science and Technology, and kept synchronous with international advanced level. At present, Winsen has more than 100 patents, more than 10 software copyrights, lead or participated in the formulation of 14 national and industrial standards.

**100+** Patents      **500+** Equipment      **N+** Application Occasions

The company has been certified with ISO9001, ISO14001, ISO45001, and IATF16949 systems to regulate its management and our products are certified with ROHS, CE and UL to meet different customers demand.

Winsen takes it a mission to "create value for customers, and create win-win future with customers". Inspired by pioneering and innovative spirit, Winsen will be dedicated to promoting healthy development of sensing and IoT industries, and using advanced technology to build a safe, green, healthy, and intelligent environment for production and living.

Zhengzhou Winsen Electronics Technology Co., Ltd. has established a Provincial Enterprise Technology Center in the Field of Gas and an Engineering Technology Research Center for Gas Sensing Functional Materials & Gas Sensors. The centers have more than 80 mid level and senior engineers and technicians. Over the years, the R&D centers have been motivated by market demand, made innovation positively, and achieved fruitful results. The centers have successively undertaken and completed a number of government-funded projects, has a number of patented and non-patented core technologies. Among the projects developed by the centers, 7 series and 19 types of gas sensors have been awarded the achievements appraisal of Scientific & Technological Department of Henan Province, and won the second prize of Provincial Scientific & Technological Progress, the third prize of Provincial Scientific & Technological Progress, etc. Newly developed products have contributed more than 30% to the added revenue for many years in a row.

Winsen R&D center has a complete research and development platform, including: three dedicated chemical laboratories, two physical laboratories, and three comprehensive laboratories. The laboratories are equipped with more than 80 sets of advanced testing equipment, eg. automatic precision screen printing machine, laser resistance repairing machine, coating machine, gold wire ball welding machine, slicer, dicing machine, metallurgical microscope, infrared gas analyzer, high and low temperature test chamber, dynamic configuration system with independent intellectual property rights and computer test system of gas sensing elements, etc.

The center focuses on academic and technical exchanges, and has published dozens of academic papers in the past few years. It has successively established long-term and extensive cooperative relations with Xi'an Jiaotong University, University of Science and Technology of China, Jilin University, Changchun Institute of Applied Chemistry Chinese Academy of Sciences, Shanghai University, China University of Mining and Technology, Zhengzhou University, Zhengzhou Institute of Light Industry and other scientific research institutes and colleges. These cooperation has greatly improved the technological innovation ability of the company.

Relying on the scientific and technological strength of the R&D center, Winsen is able to provide customers with increasingly complete product solutions and better services, and create more value for customers.

## Leading the Industry, Innovative & Controllable Technology

Winsen has the largest production and sales base for gas sensors in China.

From raw material, components to modules, the entire chain and production is controllable and stable with independent development and innovation.



### 30+ YEARS OF EXPERIENCE

R&D, manufacture and sales of sensors,  
covering an area of 40,000m<sup>2</sup>

### INTERNATIONAL MARKET

70M+ PCS delivery yearly to  
100+ countries & regions

### R&D STRENGTH

100+ patents of sensors, 100+ team members  
self-built lab for continuous innovation

### EXCELLENT QUALITY

Complete and strict process flow from raw  
materials to outgoing, rigid quality control

### AUTOMATIC PRODUCTION

500+ sets of equipment for development  
manufacturing and test

### ONE-STOP SERVICE

Professional consultation, fast delivery  
24 hours after-sales support

## Product Center

Sensor Categories.....08-11

## Civil Safety

Flammable Gas.....12

Carbon Monoxide .....13

## Environmental Sensor

Carbon Dioxide .....14

Alcohol .....15

VOC, Formaldehyde.....16

Particles.....17

Ozone, Refrigerant.....18

Multi-in-One, Relative Humidity.....19

## Industrial Safety

Flammable Gas.....20

Toxic Gas.....21-22

Industrial O<sub>2</sub>, CO<sub>2</sub> .....23

Smart Modules ZE03..... 24

4-in-1 Industrial Gas Module.....25

Atmosphere Monitoring.....26

Smart City.....27

## New Energy & Automotive Electronics

Energy Safety.....28

Automotive Electronics.....29-30

## Infrared Photoconductive Sensor

Flame Sensor.....31

## IR Pyroelectric & Thermopile Sensor

Analog & Digital PIR Sensor, Thermopile Sensor.....32

IC Chip and Fresnel Lens.....33

## Flow Sensor

Thermal Mass Gas Flow Sensor.....34

## Medical & Health

Oxygen, Breath Test, MED Series.....35

## Pressure Sensor

Ceramic Pressure Sensor & Transmitter.....36

Isolation Film Pressure Sensor & Transmitter.....37

Level Transmitter, MEMS Plastic .....38

## Water Quality Sensor & Module

Dissolved Oxygen, PH, ORP.....39

Conductivity, TDS, Residual Chlorine, NH<sub>3</sub>-N.....40

## Winsen Products



MH-Infrared Gas Sensor



ME-Electrochemical Gas Sensor



MC-Catalytic Gas Sensor



MQ/MP-Semiconductor Gas Sensor



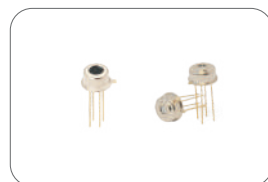
GM-MEMS Gas Sensor



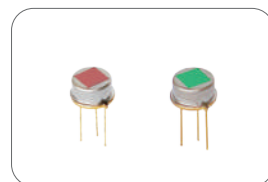
Temperature and Humidity Sensor



Pyroelectric Infrared Sensor



IR Thermopile Sensor



Pyroelectric Flame Sensor



MG-Solid Electrolyte Gas Sensor



Dust/ Particulate Matter Sensor



MD-Thermal Conductive Gas Sensor



Flow Sensor



Pressure Sensor



Water Quality Sensor

## Sensor Module



### MH-Infrared Gas Sensor

MH series infrared gas sensors are based on infrared absorption principle, and have many advantages like stable performance, good selectivity and long lifespan, etc. MH series products include MH-4, MH-7, MH-Z and other types. MH-4 series sensors have both analog and digital output, which are small in size and easy to use; MH-7series products have stable signal output, strong resistance to water vapor interference, which can be used in industrial and coal mine fields; MH-Z series sensors are suitable for detection of carbon dioxide gas in various civil fields such as air conditioning systems, automobiles and some civil and agricultural fields.

### ME-Electrochemical Gas Sensor

ME series electrochemical gas sensors are based on electrochemical principle,including toxic gas sensors and oxygen sensor.

#### A. Toxic gas sensor

ME series toxic gas sensors are based on electric charge released by electrochemical redox reaction of gas to be tested on the working electrode of electrolytic cell under a certain potential condition, has a linear relationship in a certain concentration range with gas concentration. And determine the concentration of gas to be measured by measuring the magnitude of the current. ME series toxic gas sensors have stable and reliable performance, high sensitivity and good selectivity. Products include ME2, ME3, ME4 and other types, ME2 series is a two-electrode electrochemical gas sensor, ME2-CO is mainly used for carbon monoxide gas detection in civil field; ME3 is a threeelectrode electrochemical gas sensor for portable instruments; ME4 is a four-electrode electrochemical gas sensor, suitable for portable instrumentation and gas online monitoring instruments.

#### B.Oxygen sensor

ME series oxygen sensor is an electrochemical gas sensor using the working principle of Galvanic Battery. That is, by measuring the electrolysis current flowing through two electrodes of the sensor, the change in oxygen concentration in the environment can be accurately perceived. ME series oxygen sensors are stable and reliable. The main product is ME2-02, which is suitable for detection of 0-25% VOL constant oxygen concentration.

### MC-Catalytic Gas Sensor

MC series catalytic gas sensors are gas sensors based on the principle of contact combustion. The MC seriescatalytic gas sensors are stable and reliable, and have good anti-vibration performance, anti-carbon deposition, anti-sulfide, anti-silicide poisoning and long lifespan. The products are MC100, MC110, MC200, MJC4 and other types, of which MJC4 has passed national mining product safety certificate. This product is suitable for the detection of flammable, explosive gases or organic vapor in the range of lower explosive concentration in the fields of industry, coal mine and civil use.

### MQ-Semiconductor Gas Sensor

As for MQ series semiconductor gas sensors, under certain conditions (temperature), the measured gas reaches the surface of the semiconductor and chemically reacts with oxygen adsorbed in the surface of the semiconductor. In the process, the charge is transferred, which further causes semiconductor resistance change. The detection of the gas concentration is achieved by measuring the change in the semiconductor resistance. MQ series semiconductor gas sensors have large output variations, high sensitivity, long lifespan, long-term stability, and high resistance to toxic gases and harsh environments in low-concentration gases. The products are MQ, MQ300, MQ200, etc. series is indirect thermal semiconductor gas sensor with good temperature, humidity resistance and good vibration performance. MQ300 series is a direct thermal gas sensor with small size and low power consumption. MQ series semiconductor gas sensors are suitable for industrial, civil, commercial and other fields of flammable gas and toxic gas detection.

### MP-Flat Surfaced Gas Sensor

MP Series flat surfaced semiconductor sensor is a semiconductor gas sensor based on an advanced thick film process. MP series flat surfaced gas sensor has low power consumption, small volume, good consistency, stable and reliable, and is suitable for flammable gas and toxic gas detection in industrial, civil, commercial and other fields.

### RD-Pyroelectric Infrared Body Induction Sensor

The pyroelectric infrared sensor uses the characteristic of temperature change to detect the infrared radiation. It adopts dual-element compensation method to suppress the interference caused by a change in temperature, thereby improving the working stability of the sensor. It is widely used in many applications, such as safety devices, burglar alarms, induction doors, automatic lamps, smart toys and so on.

### Thermopile Sensor

Thermopile sensor is based on MEMS technology, consists of hundreds of thermocouples connected in series. Using Seebeck principle, when there is a temperature difference between the target and the environment, the sensor gives the corresponding voltage output, therefore detecting the existence of the target or the temperature of the target.

### Pyroelectric Flame Sensor

Flame sensor uses lithium tantalate single crystal as the sensitive element material. The Curie temperature of lithium tantalate crystal material is above 600°C, the relative dielectric constant is small, and the specific detectivity is high. In a wide range of room temperature, the pyroelectric coefficient of the material changes very little with temperature, and the temperature change rate of the output signal is only 1-2%. The temperature stability of the sensor performance is very good, and the spectral response consistency is very good in the wavelength range of 1-20μm.

### Temperature and Humidity Sensor

In wet conditions, water molecules are adsorbed by polar group on the surface of material. And as the

humidity increases, the quantity of water molecules will be changed accordingly. The absorbed water is gradually condensing and coming into being liquid, which is electrolyte solution with current channel quality. With the humidity increasing, macromolecule will swell, interior free volume will be bigger, carrier will be increased and the activated energy of macromolecule polyelectrolyte counter-ions will decrease, drift mobility will increase and impedance will decrease. And then when humidity decreases, water molecules are released from ion polymer and the resistor of material will increase. The environment humidity can be monitored through testing the impedance.

### GM-MEMS Gas Sensor

The MEMS gas sensor consists of a Si-based micro-hot plate based on a MEMS technology and a metal oxide semiconductor gas-sensitive material having a low conductivity in clean air. When there is a detected gas in the ambient air, the conductivity of the sensor changes. The higher concentration of the gas, the higher conductivity of the sensor. The change in conductivity can be converted to an output signal corresponding to the gas concentration using a simple circuit.

### Flow Sensor

FR series thermal mass flow sensor adopts advanced MEMS silicon technology. It has the characteristics of low power consumption, small size, without stable voltage compensation, impact resistance, stability and reliability. It is suitable for the medical industry, instruments, automation, gas metering and other fields of fluid detection.

### Pressure Sensor

WPAH series ceramic pressure sensor adopts imported ceramic base, ceramic piezoresistance pressure sensor made by thick-film technology. Ceramic is a kind of material with high elasticity, corrosion resistance, wear resistance, resistance to impact and vibration. Ceramic's good thermal stability and high temperature sintering process of thick film make the working ceramic pressure sensor's operating temperature range up to -40 ~ 125 °C. The high elasticity and creep resistance of ceramic make the ceramic pressure sensor have good long-term stability.

### Water Quality Sensor

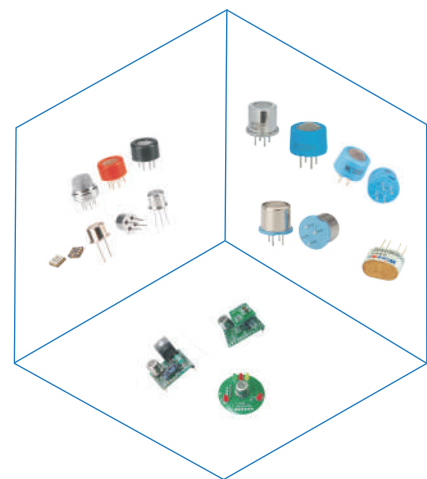
Water quality sensor has covered dissolved oxygen sensor, ORP sensor, PH sensor, residual chlorine sensor, etc. The sensors have characteristics of low power consumption, high accuracy, and linear output, widely used in the water quality detection of laboratory research, aquaculture, environment protection, etc.

### Gas Sensor Module

Winson series gas sensor module adopts professional gas sensing technology and combined with advanced micro-process technology. Winson series gas sensor modules have stable performance, high reliability, easy to use, and suitable for a variety of gas environment detection.

## Safety Gas Detection

Winsen's domestic gas sensors are mainly used in civil fields to detect and analyze safety gases like flammable gas and carbon monoxide gas, and also air quality gases, alcohol gas and human exhaled gas, etc. It has gas sensors and modules such as infrared carbon dioxide gas sensor, civil electrochemical carbon monoxide gas sensor, flat surfaced semiconductor gas sensor, catalytic gas sensor, semiconductor gas sensor, thermal conductive gas sensor and solid electrolyte gas sensor.



### 1. Flammable gas

MP series flat-surfaced semiconductor gas sensor, MC100 series catalytic gas sensor. MQ series semiconductor gas sensor and other gas sensors and modules are suitable for the detection of flammable gases such as natural gas, liquefied gas and artificial gas. MP series products are stable and reliable, with good anti-seismic performance, low power consumption, small size and good consistency. MC100 series products are stable and reliable, with good anti-seismic performance, anticarbon, anti-sulfide, anti-silicide poisoning ability and long lifespan. They are widely used in civil gas leakage detection.



ZP14



ZC05



ZP13

| Product Type              | Model  | Natural Gas | Liquefied Gas | Artificial Gas |
|---------------------------|--------|-------------|---------------|----------------|
| Catalytic sensor          | MC106  | √           | √             | √              |
|                           | MC107  | √           |               |                |
|                           | MC226A | √           | √             | √              |
|                           | MC227D | √           |               |                |
| Flat semiconductor sensor | MP-4   | √           |               |                |
|                           | MP-4C  | √           |               |                |
|                           | MP-5   |             | √             |                |
| Semiconductor sensor      | MQ-2   |             |               | √              |
|                           | MQ-4   | √           |               |                |
|                           | MQ-5   | √           | √             |                |
|                           | MQ-7B  |             |               | √              |
|                           | MQ-9B  | √           |               | √              |
| Sensor module             | ZP04   | √           | √             |                |
|                           | ZP14   | √           |               |                |
|                           | ZC05   | √           | √             | √              |
|                           | ZP13   | Smoke       |               |                |

### 2. Carbon Monoxide

ME2-CO series electrochemical carbon monoxide gas sensor, MQ-7B semiconductor gas sensor and other gas sensors and modules, they are suitable for carbon monoxide gas detection in civil fields, ME2-CO and ME2-CO-Φ14 products, with low power consumption and long lifespan. It is stable and reliable, and is widely used in civil applications, garage and other domestic fields for carbon monoxide detection.



ME2-CO-Φ14\*14



ME2-CO-Φ14\*5



ME2-CO



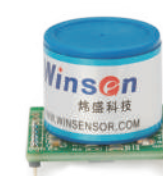
MEu-CO / MEu-2CO



ME2-CO-Φ14\*50-C



ZE21



ZE07



ZE15

| Product Type               | Model           | Measurement Range |
|----------------------------|-----------------|-------------------|
| Electrochemical gas sensor | ME2-CO          | 0-1000ppm         |
|                            | MEu-2CO         |                   |
|                            | ME2-CO-Φ14*14   |                   |
|                            | ME2-CO-Φ14*50-C |                   |
|                            | ME2-CO-Φ14*5    |                   |
| Sensor module              | ZE07            | 0-500ppm          |
|                            | ZE15            | 0-1000ppm         |
|                            | ZE21            |                   |



Household Gas Stove



Gas Water Heater



Garage Environmental Monitoring

## Health Field Gas Detection

### 1. Carbon Dioxide

MH-Z series infrared carbon dioxide gas sensors are suitable for carbon dioxide gas detection in civil fields. The series have multiple features of good selectivity, long life, digital output, and easy to use. Measurement range 0-5%VOL optional.



| Product type                   | Model No. | Detection range |
|--------------------------------|-----------|-----------------|
| NDIR carbon dioxide gas sensor | MH-Z19C   | 400-10000ppm    |
|                                | MH-Z19E   |                 |
|                                | MH-Z1911A |                 |
|                                | MH-Z1311A | 0-10000ppm      |
|                                | MH-V1512A | 400-10000ppm    |
|                                | MH-Z16    | 0-15%VOL        |
| Solid electrolyte gas sensor   | MG812     | 350-10000ppm    |



Smart Home



Educational Instrument



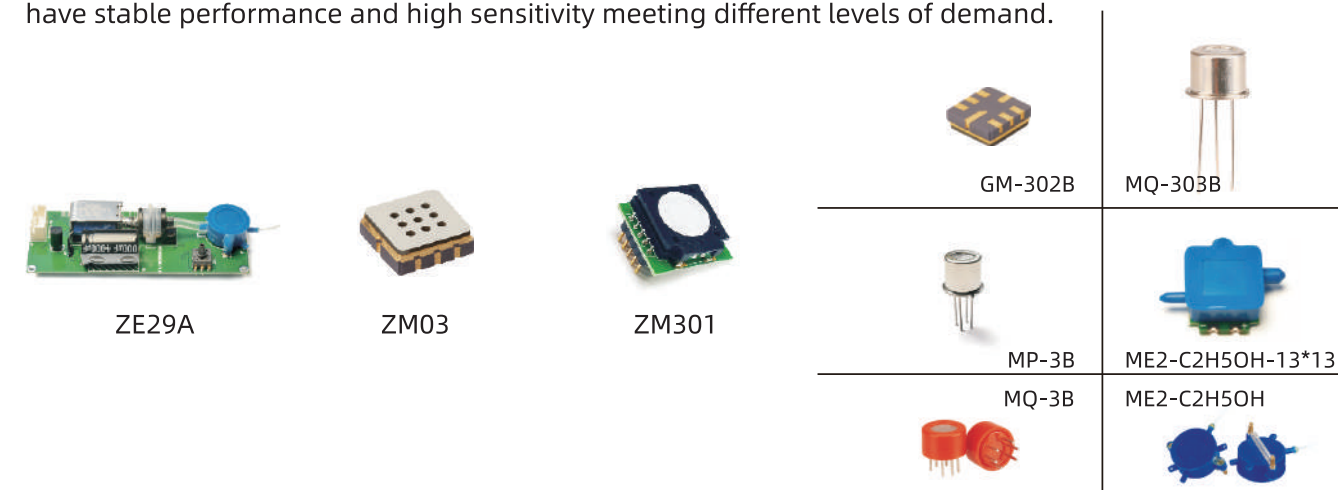
Agricultural Greenhouse



Livestock Farm

### 2. Alcohol Gas

ME2-C2H5OH electrochemical sensor, GM-302B MEMS sensor, MP-3 flat semiconductor sensor, MQ3B and MQ-303B semiconductor sensors, and other gas sensors/modules suitable for alcohol gas detection. They have stable performance and high sensitivity meeting different levels of demand.



| Product Type                  | Model            | Principle Type      | Application Type |            |            |
|-------------------------------|------------------|---------------------|------------------|------------|------------|
|                               |                  |                     | High-end         | Commercial | Economical |
| Electrochemical gas sensor    | ME2-C2H5OH-Φ16   | Pump suction type   | √                | √          |            |
|                               | ME2-C2H5OH-13*13 | Pump suction type   | √                | √          |            |
| MEMS gas sensor               | GM-302B          | Free diffusion Type |                  | √          |            |
| Flat semiconductor gas sensor | MP-3B            | Free diffusion Type |                  | √          |            |
| Semiconductor gas sensor      | MQ-3B            | Free diffusion Type |                  | √          |            |
|                               | MQ303B           | Free diffusion Type |                  |            | √          |
| Sensor module                 | ZE29A            | Pump suction type   | √                |            |            |
|                               | ZM03             | Free diffusion Type | √                | √          |            |
|                               | ZE300            | Free diffusion Type | √                | √          |            |
|                               | ZE301            | Free diffusion Type | √                | √          |            |



Drunk Driving Test



Breathalyzer



Shared Car

### 3.VOC

MP series semiconductor gas sensors and their modules are suitable for the detection of formaldehyde benzene, ammonia, sulfides, nitrogen oxides and other pollutants in the air. In particular, the advantage of flat semiconductor gas sensor MP series is low power consumption, small size, long life, good stability etc. It can detect the level of pollutant gas in the ppm level. It is suitable for long-term power supply in the greenhouse, and is widely used in air quality testing , automatic ventilation system, air purifier and air flow control equipment.



MEMS series



MP series



ZP modules



ZE40

| Product Type                  | Model   | Measurement Range    | Output Signal  |
|-------------------------------|---------|----------------------|----------------|
| Flat semiconductor gas sensor | MP503   | 10-1000ppm(alcohol)  | Analog Voltage |
|                               | MP905   | 0.5-1000ppm(alcohol) |                |
|                               | WSP2110 | 1-56ppm              |                |
|                               | GM-502B | 1-500ppm             |                |
| Sensor module                 | ZM01    | 5ppm(alcohol)        | I2C            |
|                               | ZP01    | 4 Grades             | TTL Voltage    |
|                               | ZP07    | 4/10/100 Grades      | TTL Voltage    |
|                               | ZP16    | 0-10mg/m             | UART           |
|                               | ZE40    | 0-5ppm               | UART           |

### 4.Formaldehyde

Civil electrochemical formaldehyde sensor has the advantages of low power consumption, high precision, highsensitivity, wide linear range, strong anti-interference ability, excellent repeatability and stability, etc. It is mainly used for detection of formaldehyde in civil and environmental protection fields.



ME2-CH20-15\*16



ZE08K



ZE08-CH20/ZE08B-CH20

| Product Type               | Model          | Measurement Range | Output Signal          |
|----------------------------|----------------|-------------------|------------------------|
| Electrochemical gas sensor | ME2-CH20-16*15 | 0-5ppm            | Analog current         |
| Sensor module              | ZE08K-CH2O     | 0-5ppm            | DAC/UART               |
|                            | ZE08-CH2O      | 0-5ppm            | DAC/UART               |
|                            | ZE08B-CH2O     | 0-1.6ppm          | UART                   |
|                            | ZES10-CH2O     | 0-5ppm            | UART output ( 3V TTL ) |

### 5.PM2.5

Infrared principle-The dust sensor detects particles in the air by a method of performing particle counting, which is based on principle of infrared light scattering on dust particles. This product adopts PWM pulse width modulation and particle counting principle can sensitively detect particles with 1pm diameter. Built-in heater for automatic air intake. The advantage is small size, light weight, easy instal-lation and simple maintenance. It is suitable for air fresheners, air purifiers, air conditioners, ventilation and environmental monitoring equipment.



ZPH02



ZPH03



ZPH04

Laser principle-The laser dust sensor is a versatile and compact module. It has good consistency and stability with UART output and PWM output for easy use. Small size for easy integration. Mainly used in air purifiers, fresh air systems, portable instruments, air quality monitoring equipment, air conditioners, smart home equipment and other places.



ZH03B



ZH06



ZH08



ZH07



ZH10-F

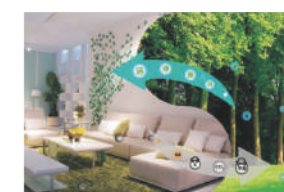
| Product Type         | Model           | Measurement Range | Output Signal |
|----------------------|-----------------|-------------------|---------------|
| Infrared dust sensor | ZPH02           | 0-300ug/m³        | UART/PWM      |
|                      | ZPH02-VOC+PM2.5 |                   |               |
|                      | ZPH03           | 0-999ug/m³        |               |
|                      | ZPH04           |                   |               |
| Laser dust sensor    | ZH03B           | 0-1000ug/m³       |               |
|                      | ZH06            |                   |               |
|                      | ZH07            |                   |               |
|                      | ZH08            |                   |               |
|                      | ZH10            | 0-1000µg/m³       | UART/PWM      |



Air Purifier



IAQ Product



HVAC System

## 6. Ozone

Civil electrochemical ozone sensor has the advantages of low power consumption, high precision, high sensitivity, wide linear range, strong anti-interference ability, excellent repeatability and stability, and is mainly used for ozonedete ction in civil and environmental protection fields.



ME2-03-Φ20



ME2-03-15\*16



ZE14-03



ZE25-03



ZE27-03

| Product Type               | Model        | Measurement Range | Output Signal  |
|----------------------------|--------------|-------------------|----------------|
| Electrochemical gas sensor | ME2-03-Φ20   | 0-20ppm           | Analog Current |
|                            | ME2-03-15*16 | 0-10/0-100ppm     |                |
| Sensor module              | ZE14-03      | 0-100ppm          | UART           |
|                            | ZE25-03      | 0-10ppm           | DAC/UART       |
|                            | ZE27-03      | 0-10ppm           | UART           |

## 7.Refrigerant Sensors

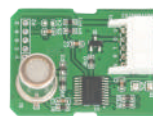
Semiconductor and NDIR infrared refrigerant sensors are used for qualitative and quantitative detection of R32, R410a, R410a, R134a, R290, etc. in different application scenarios. The sensors are designed with function of self-diagnosis, meeting standard of UL60335-2-40:2022. With the sensors, refrigerant gas leak-age alarm and automatic switch-off can be realized. More different functions can be equipped according to the needs of manufacturers of air conditioner, heat pump, and refrigerant detection instrument.



MP510C / 511D



ZP201



ZP211



ZRT510



MH-Z1542B-R32

| Product Type         | Model     | Detection Gas   | Measurement Range | Output         |
|----------------------|-----------|-----------------|-------------------|----------------|
| Semiconductor sensor | MP510C    | R32/R454B/R410A | 100-10000ppm      | Analog Voltage |
| Semiconductor sensor | MP511D    | R290            | 300-10000ppm      | Analog Voltage |
| Semiconductor module | ZP201     | R32/R454B/R410A | 100-10000ppm      | PWM            |
| Semiconductor module | ZP211     | R290            | 300-10000ppm      | PWM            |
| NDIR sensor          | MH-Z1542B | R32             | 0-50%LFL          | UART           |
| NDIR sensor          | ZRT510    | R454B           | 0-50%LFL          | RS485          |

## 8.Multi-in-One

A multi-in-one module integrating laser dust sensor, infrared carbon dioxide sensor, electrochemical form-aldehyde sensor, electrochemical ozone sensor, electrochemical carbon monoxide sensor, VOC sensor, nitrogen dioxide sensor, temperature and humidity sensor. It can accurately measure the content of various gases to be measured in the air.



ZPHS01C-Formaldehyde Version  
(CO2, PM2.5/10, CH2O, T&H)



ZPHS01B 9-in-1 Air Quality Detection Module  
(CO2, PM2.5/10, TVOC, CO, O3, CH2O, NO2, T&H)



ZPHS01C-VOC Version  
(CO2, PM2.5/10, VOC, T&H)



ZH10-VHT  
(PM2.5/10, VOC, T&H)

## 9.Temperature and Humidity Sensor/Module

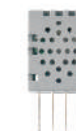
The temperature and humidity sensor is made of polymer moisture-sensitive material. With the increase of humidity, the polymer moisture-sensitive material swells, the internal free volume increases, and the carriers increase. At the same time, the activation energy of polymer polyelectrolyte counter ions decreases and migration As the rate increases, the impedance of the material decreases.

The digital temperature and humidity module adopts polymer resistive humidity sensor and NTC temperature measuring element, and is equipped with a high-performance single-chip microcomputer. The product has excellent performance, has the characteristics of ultra-fast response and strong anti-interference ability.

The WHT20 temperature and humidity sensor is embedded in a double-row flat leadless SMD package suitable for reflow soldering. The temperature and humidity signals can be read from different pins. The bottom surface is 3.0X3.0mm and the height is 1.0mm. The sensor outputs a calibrated digital signal in standard I2C format. The WHT20 is equipped with an ASIC chip, a MEMS capacitive humidity sensing element and a temperature sensing element. The WHT20 temperature and humidity sensors have been factory calibrated and tested with excellent reliability and long-term stability.



MS-Z3



ZS03/ZS05



WHT20



ZS13

Industrial gas sensors of Winsen Electronics are mainly used in detection of flammable gases, toxic gases, oxygen, carbon dioxide and other gases in industrial field, which include infrared gas sensors, electro-chemical gas sensors, catalytic gas sensors, thermal conductive gas sensors, and industrial semiconductor gas sensors.

### Industrial Flammable Gas Detection

#### 1.Infrared Combustible Gas Sensor

MH series infrared flammable gas sensors are suitable for hydrocarbon detection, which include MH-440D and MH-741A.



MH-440D



MH-441D



MH-T4041A



MH-T7041A

| Model No. | Measurement Range  | Portable Detector | Online Detector |
|-----------|--------------------|-------------------|-----------------|
| MH-440D   | 0-100LEL% Optional | √                 | √               |
| MH-441D   | 0-100LEL% Optional | √                 | √               |
| MH-T4041A | 0-10% Vol optional | √                 | √               |
| MH-T7041A | 0-100%VOL optional |                   | √               |
| MH-T7042A | 0-100%VOL optional |                   | √               |

#### 2. Catalytic Sensor

MC series industrial catalytic sensors are suitable for the detection of flammable, explosive gases or organic vapors in lower explosive concentration range of various industrial fields such as petroleum and chemical industry. The product is stable and reliable, with good seismic performance, strong resistance to carbon deposition, anti-sulfide and anti-silicide poisoning, and long lifespan.

The gas types detected by MC series industrial catalytic components include:

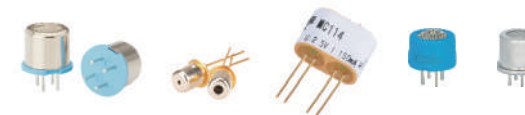
Class A gas - alkane gas

Class B gas - enyne gas

Class C gas - organic vapors such as alcohols, ethers, aldehydes, ketones, etc.

Class D gases - organic vapors such as benzene, toluene, xylene, gasoline, diesel, etc.

Users need to select the corresponding carrier catalytic element according to the test object.



Industrial Catalytic Sensor



Catalytic Sensor Module

| Model  | Measurement Range | Portable Detector | Online Detector |
|--------|-------------------|-------------------|-----------------|
| MC105  | 0-100LEL%         | √                 | √               |
| MC106B | 0-100LEL%         | √                 | √               |
| MC109  | 0-100LEL%         | √                 | √               |
| MC112  | 0-100LEL%         | √                 |                 |
| MC113  | 0-100LEL%         | √                 | √               |
| MC114  | 0-100LEL%         | √                 | √               |
| MC119  | 0-100LEL%         | √                 | √               |



Petroleum Gas Detection



Gasoline Detection



Mine Gas Monitor

### Industrial Toxic Gas Detection

ME series industrial electrochemical gas sensors and MQ series industrial semiconductor gas sensors are suitable for toxic gas detection.

ME series industrial electrochemical gas sensor include ME3, ME4 and other types. ME3 is suitable for portable instruments ME4 is suitable for portable instruments and online detectors. MQ series industrial semiconductor gas sensors are used for the detection of toxic gases such as hydrogen sulfide, ammonia, organic vapors and halogens.



| Detection Gas | Product Series |     |    |     |
|---------------|----------------|-----|----|-----|
|               | ME4            | ME3 | MQ | MEU |
| CO            | √              | √   | √  | √   |
| H2            | √              | √   | √  | √   |
| H2S           | √              | √   | √  |     |
| NH3           | √              | √   | √  |     |
| CL2           | √              | √   |    |     |
| HCL           | √              | √   |    |     |
| SO2           | √              | √   |    |     |
| PH3           | √              | √   |    |     |
| ETO           |                | √   | √  |     |
| NO2           |                | √   |    |     |
| CH3OH         |                | √   | √  |     |
| C2H5OH        |                | √   | √  |     |
| HCHO          |                | √   | √  |     |
| C3H6O         |                | √   | √  |     |
| C6H6          |                | √   | √  |     |
| C7H8          |                | √   | √  |     |

**Industrial Oxygen Detection**

ME2-O2-Φ20, MEu-2O2 and MEu-O2 are electrochemical principle sensors available to measure oxygen within range of 0-25%vol (max range of 30%VOL), widely used in mine, industrial process, warehousing and environmental protection etc.

|  |                   |  |  |
|-------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| ME2-O2-Φ20                                                                          |                   | MEU-O2                                                                              | MEU-2O2                                                                             |
| Model                                                                               | Measurement Range | Portable Detector                                                                   | Online Detector                                                                     |
| ME2-O2-Φ20                                                                          | 0-25%VOL          | √                                                                                   | √                                                                                   |
| MEu-2O2                                                                             | 0-25%VOL          | √                                                                                   | √                                                                                   |
| MEu-O2                                                                              | 0-25%VOL          | √                                                                                   | √                                                                                   |

**Industrial Carbon Dioxide Gas Detection**

MH series infrared carbon dioxide gas sensors are suitable for carbon dioxide gas detection in industrial field. It has MH-410 series and MH-7series.

|  |                     |  |  |
|---------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| MH-410D                                                                               |                     | MH-411D                                                                               | MH-T7012A                                                                             |
| Model No.                                                                             | Detecting Gas Range | Application                                                                           |                                                                                       |
|                                                                                       |                     | Portable Instrument                                                                   | Online Detector                                                                       |
| MH-410D                                                                               | 0-10%VOL optional   | √                                                                                     | √                                                                                     |
| MH-411D                                                                               | 0-10%VOL optional   | √                                                                                     | √                                                                                     |
| MH-T7012A                                                                             | 0-5%Vol optional    |                                                                                       | √                                                                                     |

### Smart Modules for Industrial Application

ZE03 is a high-performance, general-purpose electrochemical series modue that uses three electrode electrochemical gas sensor and high-performace microprocessor to measure corresponding gas by installing different gas sensors.

It assembles with built-in temperature sensor for temperature compensation, which makes it could detect gas concentration accurately. It has digital output and analog voltage output at the same time, which is easy to use and calibrate that greatly shorten the development period.

It combines electrochemical sensors and circuits to meet customers' needs for different gas detection applications.

#### Detectable gases:

CO, O2, NH3, H2S, NO2, O3, SO2, CL2, HF



ZE03

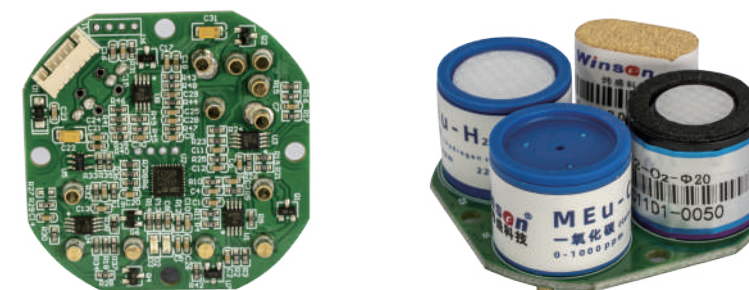
|         |             |        |           |       |
|---------|-------------|--------|-----------|-------|
| C2H4    | (0-100)ppm  | 0.1ppm | (0.6-3) V | ≤120S |
| HCHO    | (0-50)ppm   | 0.1ppm | (0.6-3) V | ≤120S |
| O3      | (0-10) ppm  | 0.1ppm | (2-0) V   | ≤120S |
| SO2     | (0-20) ppm  | 0.1ppm | (0.6-3) V | ≤30S  |
| NO2     | (0-20) ppm  | 0.1ppm | (2-0) V   | ≤30S  |
| HCL     | (0-10)ppm   | 0.1ppm | (2-0) V   | ≤60S  |
| HCN     | (0-100)ppm  | 0.1ppm | (0.6-3)V  | ≤120S |
| CL2     | (0-20) ppm  | 0.1ppm | (2-0) V   | ≤60S  |
| HF      | (0-10)ppm   | 0.1ppm | (2-0) V   | ≤60S  |
| ETO/VOC | (0-100)ppm  | 0.1ppm | (0.6-3) V | ≤120S |
| PH3     | (0-1000)ppm | 0.1ppm | (0.6-3) V | ≤30S  |
| DG01    | (0-50) ppm  | 0.1ppm | (0.6-3) V | ≤120S |

### 4-in-1 Industrial Gas Detection Module

The 4-in-1 detection module ZCE04B is mainly aimed at various places where ambient gas detection is required. The product contains four gas sensors (expandable for CO, H2S, O2 and CH4 gases) and a signal processing circuit board. The module has good selectivity and stability. The module can output the current concentration values of the four gases in real time through the digital serial port output. It can be used in handheld devices or fixed devices to detect the current concentration of ambient gas. This module is a general-purpose miniaturized product that closely combines mature sensor detection technology and sophisticated circuit design.

#### Detectable gases:

C6H6, C7H8, C8H8, C8H10, C2H4O, C2H3Cl, etc.



ZCE04B

### Atmospheric Monitoring Application

ME4-CO/SO2/NO2/O3-E4 sensor. The detection gas and O2 have corresponding reductive oxidation reactions on the working electrode and the counter electrode, and release corresponding charge to form a current. The current is proportional to gas concentration in accordance with Faraday's law, and detection gas concentration can be determined by measuring the current. The fourth auxiliary electrode of the sensor is used to compensate zero current, so that it has characteristics of strong signal level and low zero current.

It is mainly used in urban air and enterprise environment monitoring, factory area unorganized emission pollution gas monitoring, emergency monitoring environmental evaluation monitoring.

#### Detectable gases:

CO, SO2, NO2, O3



ME4-CO/SO2/NO2/O3-E4/PID

ZE12A electrochemical module is a general module, which uses electrochemical principle to detect CO, SO2,N02,O3 and other gases in the air, with good selectivity and stability. Built-in temperature sensor for temperature compensation; It's convenient to use with digital output and analog voltage output. ZE12A is a general gas module designed and manufactured by combining mature electrochemica detec-tion technology and superior circuit design. It is mainly used in urban air and enterprise environment monitoring, factory area unorganized emission pollution gas monitoring, emergency monitoring environmenta evaluation monitoring, portable instru-ment, air quality monitoring equipment, smart home equipment, etc.

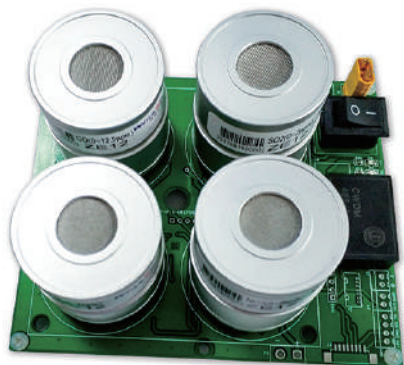
### Detectable gases:

CO, SO2, NO2, O3



ZE12A

ZEHS04 is a diffusion type multi-in-one module, mounted with atmospheric monitoring module ZE12, to detect CO, SO2, NO2, and O3. It is also compatible to connect with dust sensor module, temperature and humidity sensor module externally. With TTL or RS485 output, it is convenient to use and debug, which greatly shortens the user's design and development cycle, and meets customers' needs for different gas detection occasions.



ZEHS04



### Smart City

ZE03 electrochemical module with a variety of gas types and measurement ranges. These modules mainly detect toxic, harmful, combustible and other gases.



ZE03



MH-441D



ZI01

| Model        | Application                          | Output                    | Sensor Component       |
|--------------|--------------------------------------|---------------------------|------------------------|
| ZE03         | Toxic and harmful gas monitoring     | Analog voltage, UART      | ME3 series sensor      |
| ZE05/ ZE05B  | Toxic gas monitoring                 | Analog voltage, UART, DAC | ME4 series sensor      |
| ZC01/ O2/ O9 | Industrial combustible gas module    | Indicator lamp/Trembler   | Combustible gas sensor |
| ZE11         | VOC type gas monitoring              | Analog voltage, UART, DAC | ME3 series sensor      |
| ZE12A        | Atmospheric environmental monitoring | Analog voltage, UART, DAC | ME4 series sensor      |
| ZI01         | VOC type gas monitoring              | Analog voltage, UART      | ME3 series sensor      |
| ZEHS04       | Air monitoring all-in-one module     | UART, RS485               | ZE12, dust, etc.       |



Smart Corridor



Smart City

### Energy Safety

Energy series modules, using working principle of electrochemical, catalytic, semiconductor, etc., have features of good selectivity, good stability, multiple gas detection, and multiple models optional, etc. The modules are also widely used in lithium battery safety monitoring, new energy hydrogen detection, flammable and explosive charging pile & energy stations, wind power generation, natural gas vehicle safety monitoring and other places.



ZE21-CS



ZPE02



ZR02



ZE07-H2



CMV-2021D



ZE03-H2

| Model     | Output            | Using Sensors                                | Application                   |
|-----------|-------------------|----------------------------------------------|-------------------------------|
| ZE21-CS   | Serial port       | Electrochemical sensor                       | Battery leakage detection     |
| ZR02      | Serial port , DAC | Catalytic sensor                             | Combustible gas detection     |
| CMV-2021D | Voltage           | MEMS sensor                                  | Hydrogen gas detection        |
| ZPE02     | Serial port       | Flat semiconductor & Electrochemical sensors | Combustible gas detection     |
| ZE07-H2   | Serial port , DAC | Electrochemical sensor                       | H2, battery leakage detection |
| ZE03-H2   | Serial Port , DAC | Electrochemical sensor                       | H2, battery leakage detection |



New Energy Vehicle



Wind Power Generation

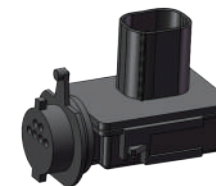


Energy Storage Cabinet

### Automotive Electronics

#### 1.AQS Internal & External Air Quality

Urban traffic congestion and air pollution are serious problems. The opening of external circulation will cause the cabin to be filled with exhaust gas, resulting in air pollution in the vehicle. But if the internal circulation is open for a long time, air quality in the car will also decline, causing discomfort of driver and passengers. Therefore, it is necessary to shift the internal and external circulation according to different conditions and demand. The AQS module based on MEMS technology is able to detect real-time air quality at the inlet of air conditioner, work with air conditioner to shift air circulation in different environment, and greatly improve driving experience.



ZM102

#### 2.CO2 Sensor

When a car is closed for a long time, the driver and passengers will constantly exhale carbon dioxide CO2. When CO2 concentration increases to a certain level, human body will feel uncomfortable, such as lack of concentration and drowsy. At this time, the CO2 gas sensor will trigger air conditioner to switch to external circulation, improving the air quality in the car and providing a comfortable experience.



MH-V1512A

#### 3.Laser Dust Sensor

PM2.5 sensor is used in automotive air conditioners, air purifiers to measure the concentration of particles in the car, and the vehicle purifier is linked to improve the air quality in the car, so as to avoid excessive inhalation of dust and damage to the health of human in the vehicles. The sensor works on the principle of Mie scattering, using professional algorithms and detection processes. Single channel or dual channel is optional for different demand.



ZH30 / ZH32

#### 4.Fuel Gas Leakage Sensor

Gas leakage sensor is a key safety component for hydrogen or natural gas fuel cell engines and gas supply systems to monitor the gas leakage inside and outside the vehicle. The principle of catalysis and the signal amplifier, and the CAN signal output is used for the corresponding hydrogen concentration. The signal output is linear and the alarm point can be set at free selection.



ZC61

#### 5. Battery Thermal Runaway

With the development of electric vehicles, people put forward higher requirement on the safety performance, and also show worries faced with many accidents of battery spontaneous combustion. When battery thermal runaway occurs, there will be release of toxic gas such as CO, CO<sub>2</sub>, H<sub>2</sub>, VOC gas, and temperature change to be detected by the sensor module and trigger BMS (battery management system) to take appropriate measures and alarm to avoid accidents.



ZEQH-101

#### 6. Life Presence Detection

There have been many incidents of children death of suffocation after being left in cars. To prevent such tragedy repeating, our company developed carbon dioxide sensor for vehicles. The sensor can detect signs of life in the car and alert car owner to prevent living creatures being trapped in the car for long time, so as to avoid these accidents.



ZHMT101

#### 7. Light and Rainfall Composite Sensor

The composite rain sensor detects the volume of water on the front windshield of the vehicle, automatically controls the wipers, keeps the windshield clean, enhances visibility, reduces potential safety hazards, and makes driving safer. At the same time, this product also integrates functions of light detection, temperature and humidity measurement.



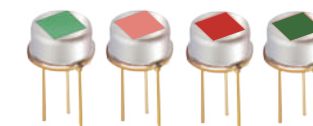
ZH101

| Product Series                      | Model No.              | Detection Target                | Application                                    |
|-------------------------------------|------------------------|---------------------------------|------------------------------------------------|
| AQS Air quality module              | ZM102                  | CO/HC, NOx, NH <sub>3</sub>     | Automotive air conditioner                     |
| CO <sub>2</sub> sensor              | MH-V1512A<br>MH-V1512B | CO <sub>2</sub>                 | Automotive air conditioner,<br>drowsy Driving  |
| Laser dust sensor                   | ZH30/ZH32              | Dust, particulate matter        | purifier                                       |
| Fuel Gas leakage sensor             | ZC61                   | H <sub>2</sub> /CH <sub>4</sub> | Hydrogen energy,<br>natural gas Vehicles       |
| Battery thermal runaway monitoring  | ZEQH-101               | CO <sub>2</sub> , CO, VOC       | Security of lithium battery,<br>energy storage |
| Light and rainfall composite sensor | ZH101                  | Water & light                   | Automotive rain wiper                          |
| Life presence detection             | ZHMT101                | Life presence                   | Life presence in the vehicle                   |

#### Pyro-electric Flame Sensor

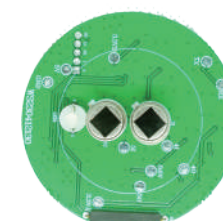
Pyro-electric flame sensor uses lithium tantalate single crystal as the sensitive element material. The Curie temperature of lithium tantalate crystal material is above 600°C, the relative dielectric constant is small, and the specific detectivity is high.

In a wide range of room temperature, the pyroelectric coefficient of the material changes very little with temperature, and the temperature change rate of the output signal is only 1-2%. The temperature stability of the sensor performance is very good, and the spectral response consistency is very good in the wavelength range of 1-20μm.

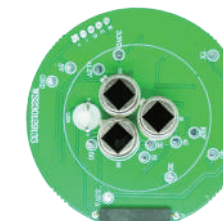


RPFA913CC\ RPFA913CD\ RPFA913CE\ RPFA913CF\ RPFA913CG

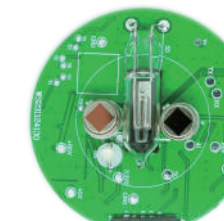
The flame detection modules are based on the infrared and ultraviolet principle. It uses pyroelectric sensors, ultraviolet sensor and high-performance microprocessors. The module is customized design through the combination of different sensors. It has a built-in high-speed microcontroller to collect sensor signals and use reliable and efficient algorithms to effectively judge the fire. The interface is simple and the output signals are complete. Simply design a simple power circuit and relay circuit to develop a complete flame detector, shortening the product development cycle.



ZRP320



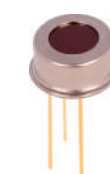
ZRP330



ZRP370

#### Infrared Photoconductive Flame Sensor

The lead selenide (PbSe) sensor is a lead salt infrared photoconductive sensor, and its working principle is based on the photoconductive effect of semiconductor materials, thereby converting infrared radiation energy into electrical signals. PbSe sensors have strong absorption and response in the near and mid-infrared (1.0-5.0μm) spectral bands, and are widely used in flame, high temperature and gas detection.



REF&REG-X2212

The lead sulfide (PbS) sensor is a lead salt infrared photoconductive sensor, and its working principle is based on the photoconductive effect of semiconductor materials, thereby converting infrared radiation energy into electrical signals. The main response wavelength of PbS sensor is short-wave infrared (1.0-3.0 μm). It is widely used in flame and high temperature detection.



RGF-L1212

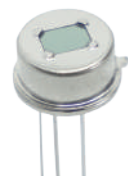
## Human Body Induction Sensing

### 1. Analog Pyroelectric Motion Sensor

RD series pyroelectric infrared sensors and modules have high sensitivity, superior signal-to-noise ratio, high stability to temperature changes, strong anti-interference ability, and superior cost performance. They are applicable to various sensing devices in civil fields, such as safety devices, burglar alarms, induction doors, automatic lamps, smart toys, etc.



RD-624/623



RD-626WP



ZRD Series Module

### 2. Digital Pyroelectric Motion Sensor

The digital pyroelectric sensor integrates sensitive element of analog pyroelectric sensor and signal processing chip into sensor shielding cover. The sensitive element transfer infrared signal generated by external human body movement to high-precision digital chip for processing by "Differential input". After signal processing, the sensor gives digital signal for easy using.



RDA223-F/RDB223



RDA224-F/RDB224



RDA226S-F/RDB226S

| Product Type | Model             | Window Size (mm) | Sensitive Area(mm) | Features                                    |
|--------------|-------------------|------------------|--------------------|---------------------------------------------|
| Analog       | RD623             | 3.8×5            | 2×1, 2 elements    | /                                           |
|              | RD624             | 3×4              | 2×1, 2 elements    | /                                           |
|              | RD626WP           | 3×4              | 2×1, 2 elements    | Anti-interference                           |
|              | RPTA-646          | 4.9×4.9          | 1×1, 4 elements    | Anti-interference                           |
| Product Type | Model No.         | PIN Qty          | Sensitive Area(mm) | Features                                    |
| Digital      | RDA223-F/ RDB223  | 3                | 2×1, 2 elements    | /                                           |
|              | RDA224-F/ RDB224  | 4                | 2×1, 2 elements    | Delay time adjustment                       |
|              | RDA226-F/ RDB226S | 6                | 2×1, 2 elements    | Delay time, sensitivity, and CDS adjustment |
|              | RPTD-646-3        | 3                | 1×1, 4 elements    | /                                           |
|              | RPTD-646-4        | 4                | 1×1, 4 elements    | Delay time adjustment                       |
|              | RPTD-646-6        | 6                | 1×1, 4 elements    | Delay time, sensitivity, and CDS adjustment |

## Thermopile Sensor

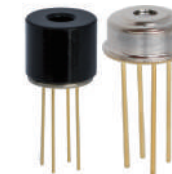
Thermopile sensor is a new CMOS-compatible infrared sensor with high infrared response rate, high repeatability and high reliability. The sensor is packaged in a TO-46 metal case with an IR filter window. And high-precision thermistor chip is built in inside, which can compensate ambient temperature.



MRT-311/511  
RTTA71



MRT-313

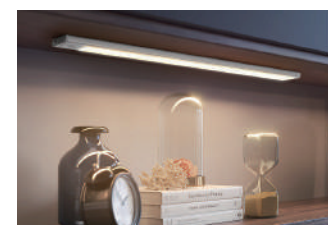


MRTD-3011

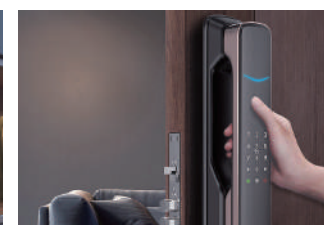
## IC Chip and Fresnel Lens

Fresnel lens are mounted in front of the sensor. The len is made of transparent plastic, and is divided into several equal parts to form a lens with a special optical system. With corresponding amplifying circuit, it can amplify the signal by more than 70 decibels, so that people's movement in the range of 10 to 20 meters can be measured.

A high-performance signal processing integrated circuit, is equipped with a pyroelectric infrared sensor and a few external components to form a passive pyroelectric infrared switch. It can automatically and quickly open all kinds of incandescent lamps, fluorescent lamps, buzzers, automatic doors, electric fans, dryers and automatic hand basins, etc., especially suitable for aisles, corridors, and other sensitive area of enterprises, hotels, shopping malls, warehouses and family, or automatic lighting and alarm systems of safe areas.



Induction Light



Smart Lock



Thermometer



Security Monitor

## Flow Sensor

Micro flow sensor adopts thermodynamic principle to detect gas flow, and it has high accuracy and good repeatability. Built-in temperature sensor makes the product has the function of professional temperature compensation calibration. Meanwhile, it has linear analog voltage output and is very convenient to use.

Features of flow sensors:

- Latest MEMS Sensor chip technology
- High accuracy, quick response,
- Good Repeatability
- Detection micro flow accurately
- Completely calibrated and temperature compensated

Main applications of flow sensors:

- Industrial process control
- Air and environment protection
- Portable detector
- Medical oxygen supply



FR20



FR03H



FR15



FR06

| Model  | Normal range(SLM)           | Drift Diameter | Output signal                        | Application                          |
|--------|-----------------------------|----------------|--------------------------------------|--------------------------------------|
| FR03   | 0.1/0.2/0.3/0.5             | DN3            | Linear 1-5V/0.5-4.5V                 | Various types of non-corrosive gases |
| FR03H  | 1/2/3/4/5                   | DN3            | Linear 1-5V/0.5-4.5V or digital IIC  |                                      |
| FR06   | 10/15/20                    | DN6            | Linear 1-5V/0.5-4.5V or digital IIC  |                                      |
| FR15   | 0-300                       | DN15           | Linear analog voltage or digital IIC | ventilator, anaesthesia machine      |
| FR20   | 150/200/300                 | DN20           | Linear 1-5V/0.5-4.5V or digital IIC  | Various types of non-corrosive gases |
| F1012  | 0.03/0.05/0.1/0.2/0.3/0.5/1 | DN3            | Linear 1-5V/0.5-4.5V                 |                                      |
| F1031  | 50/100/150/200/300          | DN20           | Linear 1-5V/0.5-4.5V                 |                                      |
| F1031V | 100/150/200/300             | DN20           | Linear 0.5-4.5V                      | ventilator                           |



Industrial Control



Disinfection Machine



Particle Counter



Air Sampler/Analyzer



Portable Detector

## Electrochemical Oxygen Sensor

Fuel-cell type electrochemical sensor with high precision, low power consumption, wide linear range, excellent repeatability and stability, suitable for oxygen measurement in oxygen generator, respiration and anesthesia machine.



MED-O2-LA



MED-O2-LB

## Breath Test

MQ136 is semiconductor type with high sensitivity, long stability and long life; GM-512B is based on MEMS technology with super small size, low power consumption, quick response and long life, perfect for mini portable detector. REG-X2212 is lead-salt type infrared photoconductive sensor used for C<sup>13</sup> carbon dioxide of Helicobacter pylori breath detector.



MQ136, GM-512B, REG-X2212

## Ultrasonic Oxygen Sensor

It uses ultrasonic principle to detect the propagation speed of ultrasonic waves in gas, and uses temperature compensation to accurately calculate oxygen concentration and flow. Real-time response, high precision, good stability, and calibration-free. Suitable for household, medical and portable oxygen generators.



US1000

## MED Series

MED series are electrochemical sensors which are able to detect NO, NH<sub>3</sub>, H<sub>2</sub>S, H<sub>2</sub>, CO in breath, GIT tract and other medical devices with excellent selectivity, high resolution and great stability.



MED-GE01, MED-NO, MED-NH<sub>3</sub>, MED-H<sub>2</sub>, MED-2CO



Ventilator



Anesthesia Machine



Oxygen Concentrator



Thermometer



Breath Test

## Ceramic Type

### 1.Ceramic Pressure Sensor

Winsen ceramic pressure sensor adopts ceramic base, made into ceramic piezoresistance pressure sensor with thick-film technology. It's a kind of material with high elasticity, corrosion resistance, wear resistance, resistance to impact and vibration. Ceramic's good thermal stability and thick film high temperature sintering process make the ceramic pressure sensor's operating temperature range up to  $-40 \sim 125^{\circ}\text{C}$ . The ceramic's high elasticity and creep resistance make the ceramic pressure sensor have good long-term stability. Besides, the corrosion resistance character makes the sensor have unique advantages in the application such as the refrigeration, chemical and environmental protection and other fields.



WPAH01



WPAH06

### 2.Ceramic Pressure Sensor Module

Winsen ceramic pressure sensor module is a voltage output type of pressure transmission module, it's like a ceramic pressure transmitter without shell. This product is made of refined ceramic seat ceramic piezoresistive pressure sensor, using precision conditioning chip on the sensor offset, sensitivity, temperature drift and other compensation. With high integration, small size, high precision, good consistency, anti-interference ability, response speed block, wide temperature range and other characteristics.



WPBH01



WPBH06

### 3.Ceramic Capacitive Pressure Sensor

Winsen ceramic capacitive pressure sensor is a kind of ceramic capacitive pressure sensor refined by thick film process using refined ceramic components. Based on high elasticity & creep resistance of ceramics and corrosion resistance, ceramics have unique advantages in the fields of refrigeration, chemical industry and environmental protection.



WPCR01

## 4.Ceramic Pressure Transmitter

Winsen ceramic pressure transmitter is made of own designed pressure core, it convert pressure value into standard voltage signal output through high reliable amplifying circuit and accurate temperature compensation circuit. The whole stainless delicate structure and plastic elements with high-strength enhance its anti-corrosion character, which make the product meet demands in different application occasions. It has various output way and connector, and it also could be customized. It is widely used in water pump, smart water supplying, air compressor, cars, air conditioners, water dealing device, controlling gas and liquid pressure.



WPCH01



WPCH02



WPCH04

## Isolation-Film Type

### 1.Isolation-Film Pressure Sensor

Winsen pressure core encapsulated by high precision imported diffused silicon pressure sensitive chip and mature manufacturing technology. As a high performance pressure sensitive element, it can be easily amplified signal and integrated to a transmitter with standard signal output. Winsen can undertake special customization according to the needs of users, such as full welded structure, wide temperature compensation, customized shape, high reliability, strong impact and vibration resistance.



WPAK63



WPAK67



WPAK69

### 2.Isolation-Film Pressure Transmitter

Winsen diffused silicon pressure transmitter is integrated with high-precision diffused silicon pressure core, the internal special integrated circuit converts the sensor millivolt signal into a standard current signal, which can be directly connected with the computer interface card, control instrument, intelligent instrument or PLC, and the current output mode can be used for remote transmission. It's widely used in process control, automobile, medical equipment, HVAC and other fields.



WPCK07

### Level Transmitter

Winsen level transmitter included a high-performance diffusion silicon piezoresistive pressure sensor as the measuring element to accurately measure the hydrostatic pressure proportional to the liquid level depth. The internal dedicated integrated circuit converts the sensor millivolt signal into a standard (current or voltage) signal output, establishes a linear correspondence between the output signal and the liquid depth, and realizes the measurement of the liquid depth. The product has high precision and small volume. It can be directly put into the liquid to measure the liquid height from the end of the transmitter to the liquid level. It is convenient to use. It is applicable to liquid level measurement and control in the fields of petroleum, chemical industry, power plant, urban water supply and hydrological exploration.



WPCCK81



Smart Pump



Valve Control



Industrial Field

### MEMS Plastic Package Pressure Sensor

Winsen plastic package pressure sensor includes high-precision MEMS pressure sensitive chip and mature production process with standard pins structure and convenient to use. Plastic package pressure sensor is only suitable for dry and no-corrosive gas. Different ranges, output modes and low cost OEM solution can be customized according to customer requirements.



WPAS01



WPAS02

### 1.Dissolved Oxygen

The ZW01 dissolved oxygen detection module is a general-purpose module that uses electrochemical principles to detect the dissolved oxygen content in water, with good selectivity and stability. Digital signal output is adopted, which is convenient to use. ZW01 is a universal module designed and manufactured by closely combining mature electrochemical detection technology and sophisticated circuit design.



ZW01

### 2.PH

The ZW03 PH water quality sensor module is a universal module that uses electrochemical principles to detect the H<sup>+</sup> content in water, with good selectivity and stability. Using the digital signal output, very easy to use. ZW03 is designed and manufactured with mature electrochemical detection technology closely combined with sophisticated circuit design.

### 3. ORP

ZW-ORP101 is a primary battery type ORP water quality detection sensor module. Using the relationship between the ORP value of the test solution and the measured potential difference, the ORP value of the solution to be tested is determined by the potential difference measured by the working battery composed of the electrode and the counter electrode in the solution to be measured through the sensor.



Aquaculture



Industrial Field



Water Quality Detection

## 4. Conductivity

ZW-C101 sensor is an electrochemical conductivity water quality detection sensor. By applying a constant voltage at both ends of the electrode, the solution resistance changes the current of the measuring electrode and conforms to the ohm's law. The conductivity value replaces the electrical resistivity value so that measure the electrical conductivity of the solution.



ZW-C101

## 5. TDS

ZW-TDS TDS water quality detection module is a universal module that uses digital signal output, which can be used to detect the content of total dissolved solids (TDS) in water, and have good selectivity and stability.



ZW-TDS

## 6. Residual Chlorine

ZW-RCL101 residual chlorine detection module is a universal sensor module, which uses the electrochemical principle to detect the residual chlorine concentration in the tested solution, and has good selectivity and stability. Using digital signal output for easy to use. ZW-RCL101 is a universal module designed and manufactured with mature electrochemical detection technology and sophisticated circuit design.



ZW-RCL101

## Water Quality Detection Sensor



Dissolved Oxygen  
MW-O101



PH  
MW-PH101



ORP  
MW-ORP101



Ammonia & Nitrogen  
MW-NH101



TDS  
MW-TDS110

