



ZE12A Electrochemical Gas Sensor Module

**User's Manual V1.1
(Model: ZE12A)**

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Zhengzhou Winsen Electronics Technology Co., Ltd

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Zhengzhou Winsen Electronics Technology CO., LTD

Electrochemical Detection Module ZE12A

ZE12A is a general-purpose and high-performance electrochemical module. It can detect the CO, SO₂, NO₂, O₃ based on electrochemical principle, it has good selectivity and stability. A temperature sensor is built-in for temperature compensation. It has the digital output and analog voltage output at the same time which facilities the usage and calibration and shorten the development period. It is a combination of mature electrochemical detection principle and sophisticated circuit design, to meet customers' different detection needs.



Features

- High sensitivity & resolution
- Low power consumption & long working life
- UART and analog voltage output
- Good stability and excellent anti-interference ability

Main Application

City atmospheric environmental monitoring , enterprise environment monitoring, Factory area unorganized emission monitoring, emergency monitoring, environment evaluation monitoring, Portable gas detector, various gas detection equipment and smart home appliance.

Technical Parameters

Model No.	ZE12A
Target Gas	CO, SO ₂ , NO ₂ , O ₃ , H ₂ S
Detection Range	CO(0-10ppm), SO ₂ (0-1ppm),NO ₂ (0-1ppm),O ₃ (0-1ppm),H ₂ S(0-1ppm)
Output Data	DAC(0.4~2V) standard voltage signal UART Output(3V level, compatible with 5V)
Working voltage	DC 5.0±0.1V
Response time	≤120 Sec
Resolution	≤10ppb
Dimension	Φ38.6*43.3 mm
Weight	<75g
Operating Environment	Temp.: -20~50°C
	Humidity.: 15%RH-90%RH (no condensation)
Storage Temp.	-20°C~20°C
Lifespan	2 years (in air)

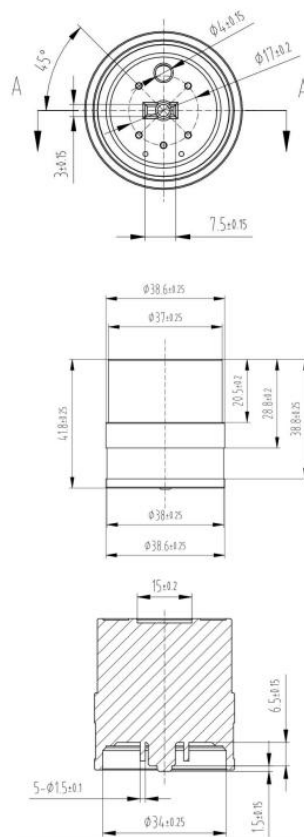


Figure 1:Module chart

Pin definition

Table 2.

Pin1	Vout (0.4~2 V)
Pin2	GND
Pin3	Vin (Voltage input)
Pin4	UART(TXD) data output
Pin5	UART(RXD) data input

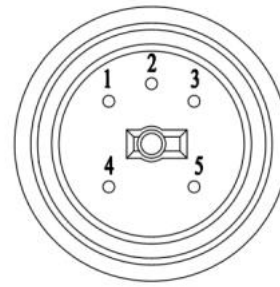


Figure 2: Module bottom view

Accessories. ZE12A Socket (it is used to connect the module to users' mainboard.)

Recommendations:

1. To ensure sensor's accuracy, please calibrate the product regularly, it is generally recommended to calibrate it at least every six months.
2. This electrochemical ZE12A sensor and the state control station have different working principles, their data will not be completely same, but their overall trend keep consistent.
3. For customers who have long-term observation data, they can process the reading data every second, such as calculate the average value, and the processing interval can be set according to the reported time, such as 1min, 10mins or 1h.
4. It is recommended that the data can be uploaded to the remote end such as the cloud or server for better query and calibration.
5. Pls ensure that power supply is stable, since large ripple may cause fluctuation of values. This ripple value is supposed to be lower than 30mV.
6. The sensor is based on electrochemical principle and will be affected by external environment, such as temperature and humidity, air flow, electromagnetic fields, etc. Pls protect the sensor if it is used in extreme environment.
7. For places where the temperature is too high, too low, or the temperature changes frequently, the sensor can be placed in a relatively normal or stable temperature environment, such as 20-25 ° C, by using heating and exhausting devices, thus to ensure ZE12A sensor can have better performance.
8. If sensors stored in high or low humidity environment for a long time, this may cause internal electrolyte moisture changes, which will reduce its working life. It may cause damage for rough environment. Therefore, for high humidity environment, pls add waterproof and breathable devices/materials thus to dry the tube to protect the sensor.
9. If the sensor is in an environment where wind speed changes greatly, it is recommended to add a micro air pump to ensure stability of air flow. Recommended low rate is 0.1-0.5L / min, maximum cannot exceed 1.0L/min.
10. Sensor's resolution is about 10ppb. If ambient concentration has minor changes, there may be a small or even constant change in displayed values.
11. The module needs to provide stable power supply. Frequent power-off will cause serious deviations in displayed values. It is not recommended to use in intermittent power supply locations. Pls add a backup battery if frequent power-off is necessary.
12. Electrochemical sensors start working after shipment, and it has no relationship whether it is powered on. Pls try to use the sensors as early as possible after receiving them.

Cautions

- Please do not use the modules in systems which related to human being's safety.
- Please do not use the modules in strong air convection environment.
- Please do not expose the modules in high concentration organic gas for a long time.
- Sensor shall avoid organic solvent, coatings, medicine, oil and high concentration gases.
- Excessive impact or vibration should be avoided, otherwise the value won't be accurate.
- The module should be charged for over 24hours for the first time, and supply circuit should be equipped with power reservation function. Otherwise, it will affect continuity and accuracy of returned data if it goes offline for too long.
- The module should avoid direct sunlight, and fool-proof socket should be used to fix the module (PCB package library info pls contact salesperson). Its peripheral structure needs to be anti-rain, anti-shake and anti-drop from the socket.
- When communicate with module, it is recommended to correspond a serial port with a module, thus make it convenient for later calibration and maintenance.
- According to communication protocols, it is necessary to check whether byte0, byte1 and checksum are correct after receiving the data, thus to ensure correctness of receiving data frames.
- It is suggested to use USB - convert - TTL tools and UART debug assistant software, and observe based on communication protocols to judge whether module communication is normal.

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