Atmospheric Monitoring Sensor Module

（**Model: ZEHS04**）

Manual

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Zhengzhou Winsen Electronics Technology CO., LTD

ZEHS04

Profile

ZEHS04 is a diffusion type multi-in-one module, mounted with atmospheric monitoring module ZE12A, 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.

Feature

High sensitivity, high resolution, long lifespan;

UART or RS485 output;

High stability, good anti-interference ability, excellent linear output;

Application

Urban atmospheric environmental monitoring;

Unorganized emissions of pollution monitoring at factory sites;

Portable instruments, air quality monitoring equipment, and smart home equipment.

Specification

Table 1: performance parameter

Model	ZEHS04
Target Gas	CO, SO2, NO2, O3 (PM2.5, PM10, temperature and humidity can be selected)
Output	UART(3V TTL, 5V compatible), RS485
Working voltage	DC 9~24V
Response time	≤ 120S
Resume time	≤ 120S
Resolution	1ug/m3
Working Tem.	-20～50℃
Working Hum.	15~90% RH(no condensation)
storage temperature	-20～50℃
Barometric conditions	81kPa～121kPa
Lifespan	2 years(based on sensor lifespan)
Power consumption	≤ 1W
Size	12cm*10cm*6cm（L*W*H）
Weight	<380g

Detection Range

Table 2

| Model	Item	Module Type	Gas Type	Range	Ratio	Unit	Resolution	Accuracy（ug/m³）	
Standard	1	ZE12A-CO	CO	0-10ppm (0-12500ug/m³)	1ppm=1000ppb =1000*1.25ug/m³	ug/m³	1ug/m³	N≤3750	±150
								3750<N≤12500	±(10%*N)
	2	ZE12A-SO2	SO2	0-1ppm (0-2857ug/m³)	1ppm=1000ppb =1000*2.857ug/m³	ug/m³	1ug/m³	N≤428	±30
								428<N≤2857	±(10%*N)
	3	ZE12A-O3	O3	0-1ppm (0-2143ug/m³)	1ppm=1000ppb =1000*2.143ug/m³	ug/m³	1ug/m³	N≤321	±30
								321<N≤2143	±(30+10%*N)
	4	ZE12A-NO2	NO2	0-1ppm (0-2054ug/m³)	1ppm=1000ppb =1000*2.054ug/m³	ug/m³	1ug/m³	N≤308	±30
								308<N≤2054	±(10%*N)
Selective	5	ZH03B	PM2.5/ PM10	0-1000ug/m³	/	ug/m³	1ug/m³	N≤100	±(10+10%*N)
								100<N≤1000	±15%*N
	6	ZI01	VOCs	0-10ppm	1ppm=1000ppb	ppm	0.001ppm	±(10%*N) ppm	
				0-50ppm			0.01ppm		
	7	MH-410D/ 411D	CO2	0-2000ppm	/	ppm	1ppm	±(50+5%*N)ppm	
				0-6000ppm					
	8	ZEHS04-T&R sensor module	T	-40-100℃	/	℃	0.1℃	±1℃	
			H	0-100%RH	/	RH	0.1%RH	±5%RH	
		Note: According to the actual expansion function requirements, customers can choose to add one or more optional modules. N in the precision column represents the current concentration value							

Module interface location and fixing holes
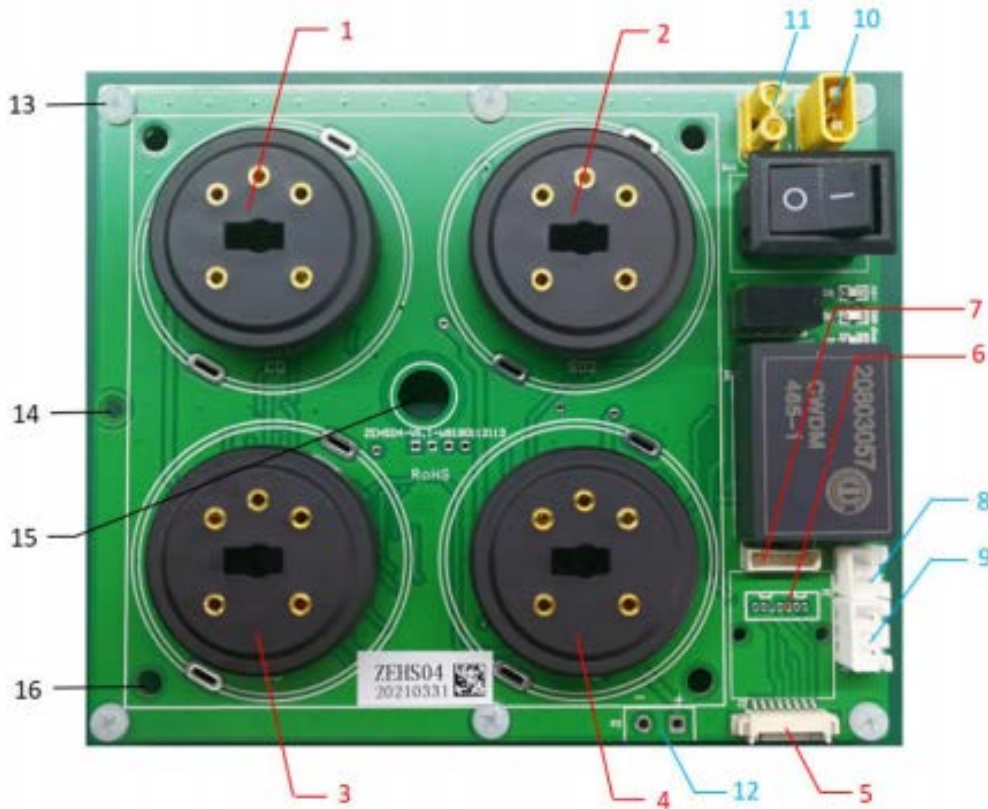
Fiture 1

Table 3

No.	Module Interface	Interface definition	Note
1	CO	ZE12A-CO sensor module	/
2	SO2	ZE12A-SO2 sensor module	/
3	O3	ZE12A-O3 sensor module	/
4	NO2	ZE12A-NO2 sensor module	/
5	J2	ZH03B2-dust sensor module(PM2.5/PM10)	Extended interface one
6	J5	ZI01 sensor module(VOCs) or MH-410d/MH-411D(CO2)	Extended interface two(reserve interface) use it with the switching board
7	J1	ZEHS04-T&H sensor module	Extended interface three

Table 4

No.	Interface	Interface definition	Note
8	J3	RS485 output	Only choose one
9	J4	UART output	
10	P1	Power supply	Both are the same effect, only choose one
11	P3	Standby power supply	when use it
12	P2	Air pump	It is used in a pump-suction mode Turn on the air pump, and the interface voltage of the air pump is 3.83V Turn off the air pump, and the interface voltage of the air pump is 1.47V

Table 5

| No.	Fixing hole	Quantity	Diameter	Fixed material suggestions
13	Sensor module fixing hole	6pcs	3mm	Metal or plastic material screw, nut fixed
14	Sensor module fixing hole (reserve)	1pc	3mm	Metal or plastic material screw, nut fixed
15	Sensor module fixing hole (reserve)	1pc	8mm	Metal or plastic material screw, nut fixed
16	Pump hood fixing hole	4pcs	4mm	Plastic material screw, nut fixed

Module size (data unit: mm)
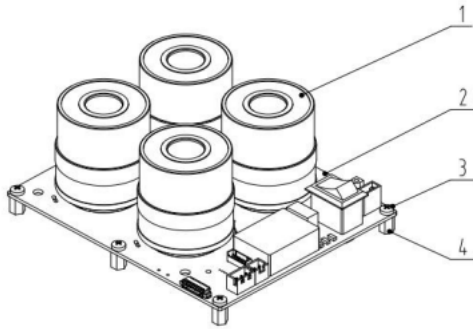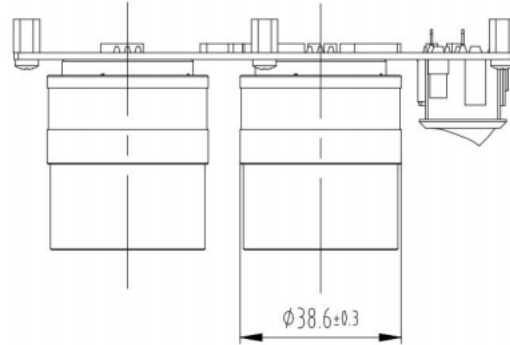

Fiture 2
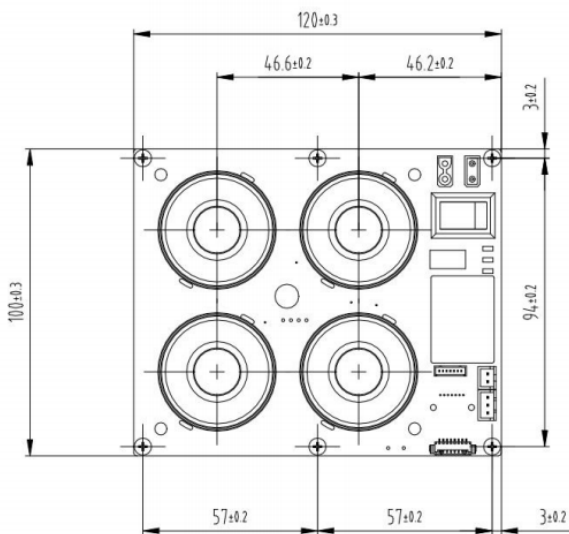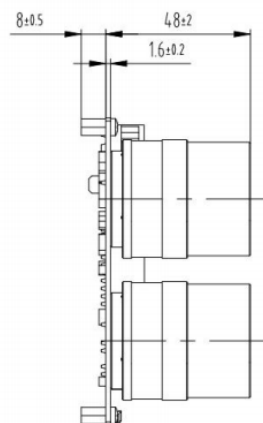
Fiture 3

Numbering description in Figure 4:

Fiture 4

Fiture 5

Table 6

No.	Name	Quantity	Material
1	ZE12A	4pcs	/
2	PCBA	1pc	/
3	Phillips pan head screws　M3×8	6pcs	Nylon (white)
4	nylon stud M3×8	6pcs	Nylon (white)

Shell suggestion:

1. The peripheral structure must be water-proof. The front and back sides of casing, need to be opened to ensure that the air can diffuse freely for testing.

2. The module is equipped with 6 with a diameter of 3mm fixing holes, 1 with a diameter of 3mm spare fixing holes, and 1 with a diameter of 8mm spare fixing holes, which can be fixed through part of the fixing holes Fixed to the shell (fixed with metal or plastic screws and nuts), the position of module fixing holes is shown in Figure 1.

3. If it's pumping type,the module has four fixing holes with a diameter of 4mm air hood, which can be fixed through the fixing holes (plastic screws and nuts are recommended for fixing),the fixed hole position of the gas hood is shown in figure 1, and a hole above 3mm should be cut on the shell to facilitate the suction of the air pipe on the gas path.

Cautions:

1. Please do not use the modules in systems which related to human being's safety.

2. Please do not expose the modules in high concentration organic gas for a long time.

3. Sensor shall avoid organic solvent, coatings, medicine, oil and high concentration gases.

4. 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. If the power offline time is within half an hour, it needs to be aged for at least 2 hours.

5. It is recommended to keep the sensor aging and turn off the pump to save power, as well as extend the pump life and ensure the sensor data accuracy, when the module is not tested.

6. According to communication protocols, it is necessary to check whether byte0, byte1 and check value are correct after receiving the data, thus to ensure correctness of receiving data frames.

7. 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.