Simulated sulfur dioxide Transmitter user's Guide

JXBS-3001-SO2

Ver2.0

第 1 章 Product Introduction

1.1 product description

The sulfur dioxide sensor uses a professionally tested sulfur dioxide concentration sensor probe as the core detection device; it has the characteristics of wide measurement range, high accuracy, good linearity, good versatility, easy use, easy installation, long transmission distance and moderate price.

This product uses a more expensive electrochemical probe, which has higher accuracy and better stability compared to traditional semiconductor probes.

1.2 Features

This product uses a highly sensitive gas detection probe with stable signal, high accuracy, fast response and long life. It has the characteristics of wide measurement range, good linearity, easy to use, easy to install and long transmission distance. Note that the sensor is used for air detection, and customers should test it in the application environment to ensure that the sensor meets the requirements.

1.3 The main parameters

parameter	Technical indicators
SO2 measurement range	0-20ppm/0-2000ppm
measurement method	Electrochemical sensors
SO2 measurement accuracy	3%Fs
Response time	Less than 30 seconds

Warranty	The main unit has a 2-year warranty and the gas probe has a 1-year warranty
Communication Port	Analog interface (voltage or current)
Power supply	12V-24V DC
Power consumption	<1.5W (@12V DC, 25℃)
Operating temperature	-20 to +50°C
Working humidity environment	15-95%RH (relative humidity), no condensation
Dimensions	110×85×44mm3
Current output type	4-20mA
Current output load	≤600 ohms
Voltage output type	0-5V/0-10V
Voltage output load	≤250 ohms

1.4 Probe parameters and selection

serial number	Probe Type	Range	Resolution (ppm)	life
4G	import	20ppm	0.01	2 years
4L	import	2000ppm	0.1	2 years

The service life of the above probes is in an air environment with a temperature of 23±3℃ and a humidity of 40±10%RH.

The default probe is the 4G probe.

1.5 Cross-gas anti-interference characteristics

gas	Concentration (ppm)	SO2 (ppm)	Response
Carbon monoxide	100	0	
Hydrogen sulfide	15	0	

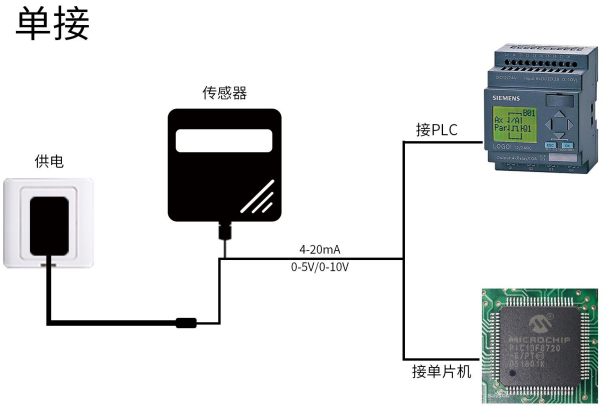
Nitric oxide	35	0
Nitrogen dioxide	5	-5
Ammonia	100	0

The table only lists some gases; gases not listed in the table may also have cross-sensitivity.

The cross sensitivity will fluctuate by ±30% and may change with the life of the sensor and batch changes. Therefore, this sensor cannot be used to measure other cross-sensitive gases.

1.6 System framework diagram

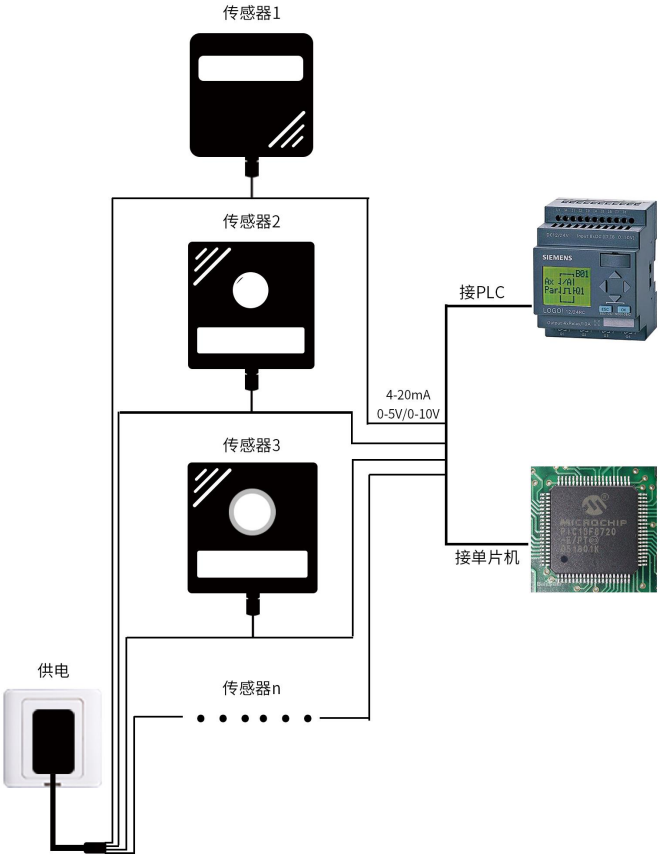
When the system needs to connect an analog version sensor, you only need to power the device, connect the analog output line to the DI interface of the microcontroller or PLC, and write the corresponding acquisition program according to the conversion relationship below.



When the system needs to connect to multiple analog

version sensors, each sensor needs to be connected to each different MCU analog acquisition port or PLC DI interface respectively, and the corresponding acquisition program can be written according to the conversion relationship described below.

多接



第 2 章 Hardware Hookup

2.1 Equipment pre-installation inspection

Please check the equipment list before installing the equipment:

name	quantity
SO2 transmitter equipment	1 set
12V waterproof power supply	1 set (optional)
Warranty card/certificate	1 serving

2.2 Interface Description

The power interface is a wide voltage power input 12-24V. For analog products, pay attention to the positive and negative of the signal line, and do not connect the positive and negative of the current/voltage signal line in reverse.

	Line Color	illustrate
power supply	brown	Power positive (12-24VDC)
	black	Negative power supply
Communications	Yellow (gray)	Voltage/current output positive
	blue	Voltage/current output negative

Note: Please be careful not to connect the wrong line sequence, as incorrect wiring will cause the device to burn out. At the same time, please note that the voltage/current positive output is an active output, and you must not connect the voltage/current positive output to the positive position of

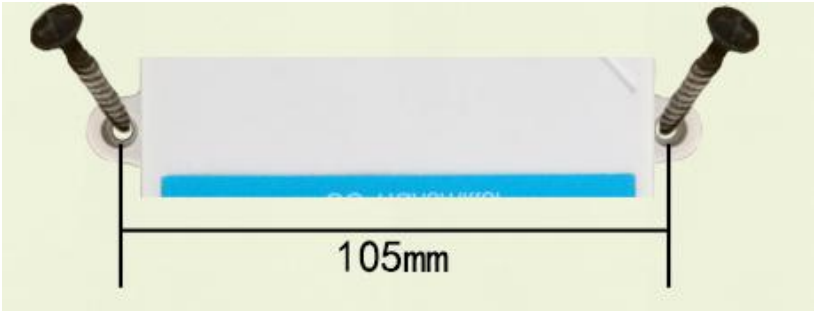
the power supply, which will definitely cause it to burn out.

The factory default is 0.6m long wire, and customers can extend the wire or connect it sequentially as needed.

Please note that some factory batches may not have yellow wires in the wire sequence provided. In this case, the gray wire can replace the yellow wire.

2.3 Installation Notes

The sensor needs to be placed in an environment that is sheltered from wind and rain, mounted vertically on the ground at 90 degrees, with the air vent of the sensor facing downward to prevent water from entering.



The wall-mounted Prince shell is wall-mounted. The mounting holes are located in the middle of both sides of the device. The mounting hole diameter is less than 4mm, the hole distance is 105mm, and 3mm self-tapping screws can be used for installation.

This product is a point-type diffusion gas detection device. As the name implies, this product can only detect the gas concentration at the probe position. If you use it to detect

leaks, you need to pay attention that the gas concentration in the environment is affected by diffusion. The concentration changes inversely with the distance from the leak point. The concentration is highest at the leak point, and the farther the distance, the lower the concentration. Therefore, the product needs to be installed as close to the gas pipeline as possible.

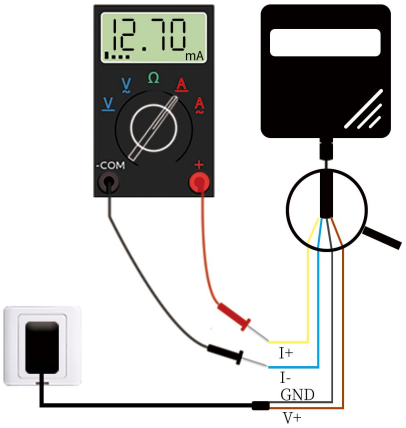
第 3 章 Wiring Instructions

The wiring of analog sensors is simple, just connect the wire to the designated port of the device. The device supports 3/4 wire wiring.

3.1 Typical four-wire wiring method

The following figure shows the wiring method of the current type sensor. Connect the power line (brown and black lines) of the sensor to the power supply; the yellow (gray) line of the sensor is the positive signal connected to the positive signal of the acquisition device, and the current flows from the sensor to the acquisition device; the blue line of the sensor is the positive signal connected to the negative signal of the current acquisition device, and the current flows from the acquisition device to the sensor;

电流输出型(4-20mA)
四线制接法
第一步
用12V-24V的电源适配器
连接传感器
第二步
正确挑选万用表量程或连
接模拟量信号采集器
第三步
对照公式计算



The following figure shows the wiring method of a voltage type sensor. Connect the power cord (brown and black) of the sensor to the power supply. The yellow (gray) wire of the sensor is the positive signal, which is connected to the positive signal of the acquisition device. The voltage of the yellow (gray) wire is the output voltage. The blue wire of the sensor is the positive signal, which is connected to the negative signal of the voltage acquisition device. The voltage of the blue wire is the reference voltage, which is the same as the black wire voltage, which is 0V.

电压输出型(0-5V/0-10V)
四线制接法
第一步
用12V~24V的电源适配器
连接传感器
第二步
正确挑选万用表量程或连
接模拟量信号采集器
第三步
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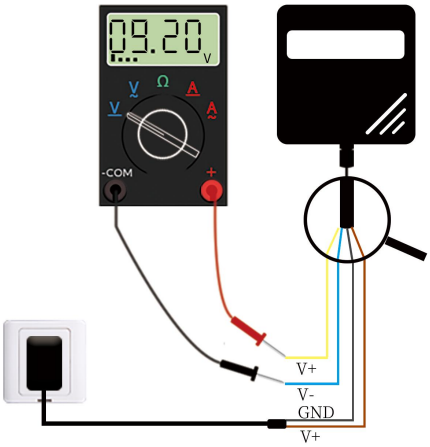
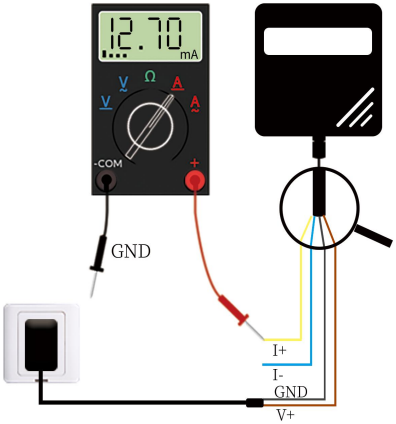


3.2 Typical three-wire wiring method

For a typical three-wire wiring, compared to a four-wire wiring method, the blue wire can be omitted. In the sensor, the blue wire and the black wire are short-circuited, so the blue wire can be omitted.

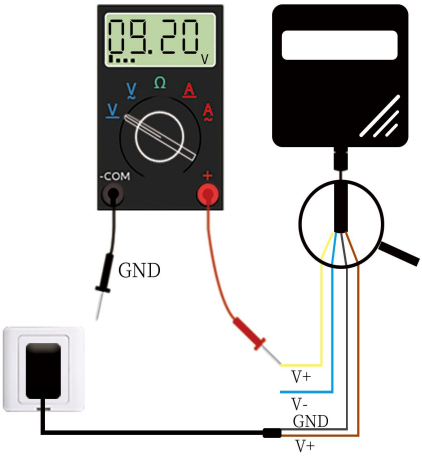
For the three-wire current wiring method, after connecting the power lines (brown and black) of the sensor to the power supply, you only need to connect the yellow (gray) line of the sensor as the signal positive to the signal positive of the current acquisition device.

电流输出型(4-20mA)
三线制接法
第一步
用12V~24V的电源适配器
连接传感器
第二步
正确挑选万用表量程或连
接模拟量信号采集器
第三步
对照公式计算



For the three-wire voltage wiring method, after connecting the power lines (brown and black) of the sensor to the power supply, you only need to connect the yellow (gray) line of the sensor as the signal positive to the signal positive of the voltage acquisition device.

电压输出型(0-5V/0-10V)
三线制接法
第一步
用12V~24V的电源适配器
连接传感器
第二步
正确挑选万用表量程或连
接模拟量信号采集器
第三步
对照公式计算



第 4 章 Meaning and conversion of analog parameters

4.1 Analog 4-20mA current output

Current value	SO2
4mA	0ppm
20mA	20ppm

The calculation formula is P(SO2)=(I(current)-4mA)*1.25ppm

The unit of P is ppm and the unit of I is mA.

For example, the data collected in the current situation is 8.125mA, and the calculated SO2 value is 5.15ppm.

The above is the calculation method for the 20ppm range. For other ranges, please use 4mA to represent 0ppm and 20mA to represent the maximum range for linear conversion.

4.2 Analog 0-10V voltage output

Voltage value	SO2
0V	0ppm
10V	20 ppm

The calculation formula is P(SO2)=V*0.002

The unit of P is ppm and the unit of V is mV.

For example, the data collected in the current situation is 3515mV, and the calculated SO2 value is 7.03ppm.

The above is the calculation method for the 20ppm range. For other ranges, please use 0V to represent 0ppm and

10V to represent the maximum range for linear conversion.

4.3 Analog 0-5V voltage output

Voltage value	SO2
0V	0ppm
5V	20ppm

The calculation formula is P(SO2)=V*0.004

The unit of P is ppm and the unit of V is mV.

For example, in the current case, the data collected is 4228mV, and the calculated SO2 value is 16.91ppm.

The above is the calculation method for the 20ppm range. For other ranges, please use 0V to represent 0ppm and 5V to represent the maximum range for linear conversion.

4.4 Conversion between SO2 measurement unit ppm and ug/m3

According to the calculation, we can get the following conversion relationship, which is only valid for SO2:

1ppm = 64/22.4 = 2.857mg/m3 = 2857ug/m3

1ppb =64/22.4=2.857ug/m3

The above calculations are all based on standard atmospheric pressure.

第 5 章 appendix

5.1 Additional product instructions

How to use a multimeter to assist debugging:A multimeter is a very important auxiliary debugging tool.

Once you find that there is a deviation between the reading and your expectation, it is very necessary to use a multimeter to assist in debugging.

《Explanation of Quantization Accuracy and Resolution of Analog Products》: The concepts of quantization accuracy and resolution of analog products, how to calculate, and how to correctly select the range.

《Deviation Sources and Deviation Elimination of Analog Products》: When analog products have reading errors, the causes of the errors, the types of errors, and how to eliminate them.

5.2 Warranty and After-sales

The warranty terms follow the sensor after-sales terms of Weihai Jingxun Changtong Electronic Technology Co., Ltd. The sensor host circuit part is warrantied for two years, the gas-sensitive probe is warrantied for one year, and the accessories (housing/plug/cable, etc.) are warrantied for three months.