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Phosphine (PH3) Gas Sensor

User Manual



Product Overview

PH3 phosphine gas detection sensor is a fixed-potential electrolytic sensor, phosphine and oxygen in the working electrode and the electrode on the corresponding redox reaction and the release of charge to form a current, the size of the resulting current and the concentration of phosphine is directly proportional to the size of the current can be determined by the size of the test current, the level of phosphine concentration.



Application Areas

1. Phosphine detector
2. Industrial site phosphine gas detection
3. Livestock phosphine detection
4. Intelligent Municipal Phosphine Detection
5. Environmental protection field phosphine detection

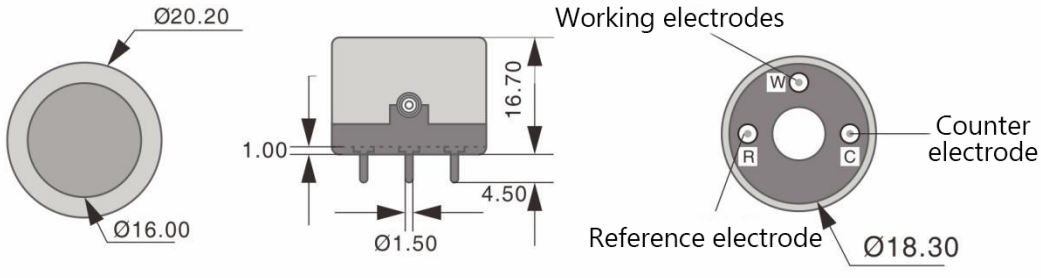
Product Features

1. High accuracy and long life
2. Fast response speed, fast return to zero
3. low power consumption, high sensitivity
4. Wide linear range
5. Strong anti-interference ability
6. Excellent repeatability and stability

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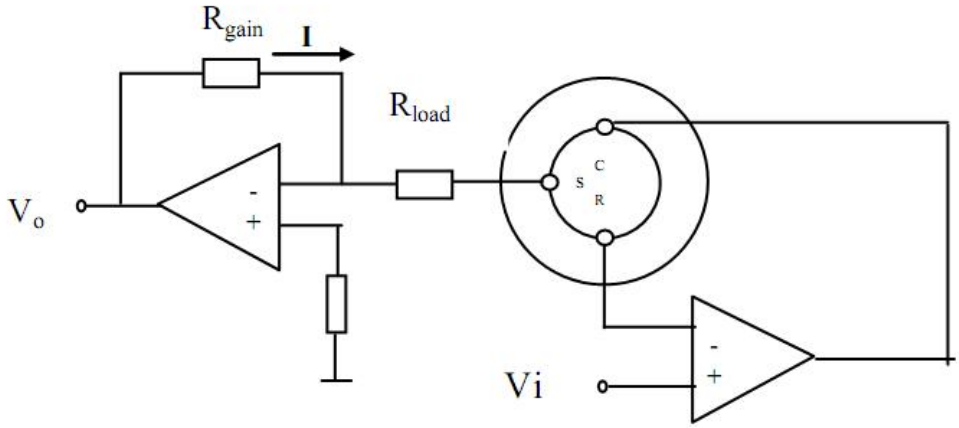
Technical Parameters

projects	parameters
Model	ATO-K-5S-PH3-20PPMPH_3
Detection Principle	Electrochemical three-electrode
Gas Detection	PH_3
Detection Range	0-20PPM
Maximum Load Concentration	100PPM
Sensitivity	1500±500nA/PPM
Zero Point Drift	0~1PPM
Resolution	0.1PPM
Response Time	<60s
Bias Voltage	0
Load Resistance	5~30Ω
Temperature Range	-30℃-50℃
Humidity Range	15%RH to 90%RH (non-condensing)
Repeatable	< ±2% signal value/month
Long Term Stability	< 2% signal value/month
Linearity	Straightness to 100PPM
Working Pressure	90 to 110 kPa
Life Time	2 years
Weight	10g



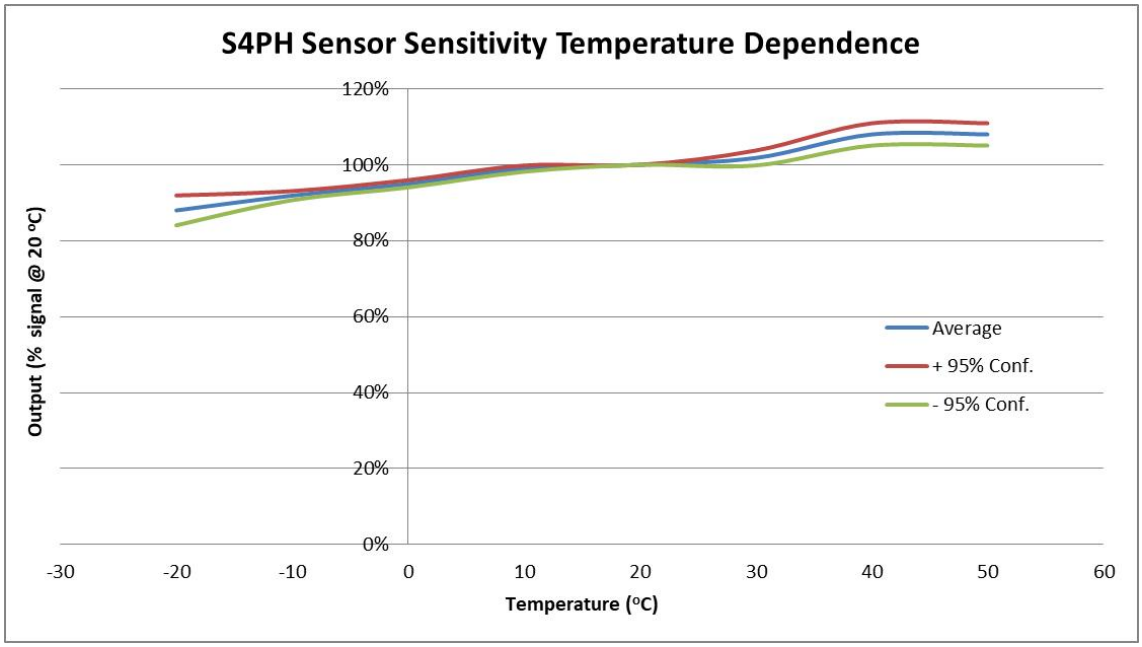
Sensor Circuit Diagram

Basic Circuit

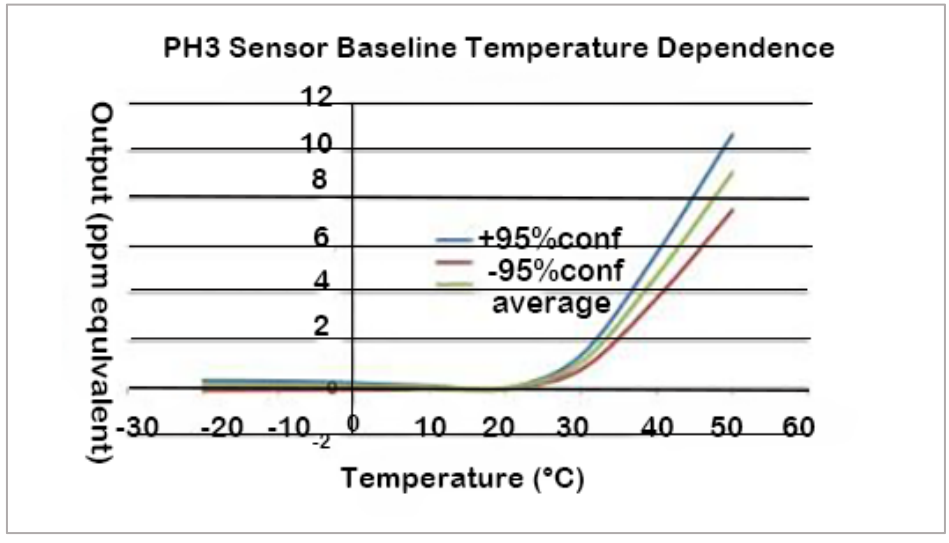


NOTE: The diagram above shows the basic test circuit for the PH3 sensor.

Sensor Characterization



Sensor Temperature and Humidity Characteristic Curve



Sensor Stability Characteristics

Cross-talk:

The PH3 sensor also responds to gases other than the target gas. For reference, the response characteristics of the sensor to several common interfering gases are listed in the table below. The data in the table are typical responses of interfering gases at a given concentration.

Interference Gas	Gas Concentration Used (ppm)	Display Value (ppm PH_3)
CO	500	0
SO_2	5	< 1
H_2S	25	20
H_2	1000	< 1
NH_3	40	0
C_2H_4	50	< 1

Caveats:

1. Sensor pins must be connected via PCB sockets, soldering will damage the sensor, and bending of the pins is prohibited.

2. the sensor should be stored in a short-circuit state between the working electrode and the reference electrode.

3. The sensor should be protected from organic solvents, alcohol, paint, oil and highly concentrated gases, including silicone and other adhesives.

4. electrochemical sensors with positive output currents (e.g. CO, HS, SO2, NH3, etc.) require oxygen to participate in the reaction: they should be calibrated and tested with a standard gas with air as the background gas, otherwise the performance of the sensor will be destroyed.

5. the sensor should not be used for a long time in the environment containing corrosive gases, corrosive gases will damage the sensor.

6. if the circuit board does not work properly, for example, due to circuit design problems, op-amps and other components quality problems, short circuits, broken pins, poor contact, moisture, corrosion, electricity, power supply noise interference, noise feedback, electromagnetic wave interference, etc., may lead to alarms do not respond to drift, digital instability, etc., and may even make the sensor electrolysis reaction damage to the sensor.

7. When calibrating or testing sensors, the correct method should be carried out in a clean atmosphere, and to maintain a stable, gentle flow rate of ventilation, thus simulating a state of gas diffusion. On the contrary, blowing strongly on the sensor, or ventilating with an unstable flow of air will not give satisfactory calibration results and test accuracy and reproducibility.

8. It is recommended to calibrate with the target gas. Cross-sensitivity can vary by +30% and calibration with cross-sensitive gases does not guarantee calibration and measurement accuracy.

9. It is not recommended to test the sensor with non-standard methods, such as: putting the sensor directly onto concentrated ammonia, puffing a cigarette towards the sensor, lighting a cigarette lighter and then approaching the sensor, exhaling towards the sensor, placing the sensor close to alcohol, and so on, because the concentration of the area can be as high as several tens of thousands of ppm when liquid ammonia or alcohol evaporates, and the concentration of carbon dioxide in the breath of a person can be as high as 40,000 ppm, which will damage the sensor, and the correct test method is to pass the sensor through a background of air, which is not suitable for the sensor. The correct test method is to pass the target gas with air as the background gas.

Note: Violation of the above conditions of use will degrade the characteristics of the sensor.