ATO

Ammonian (NH3) Gas Sensor

User Manual

Product Overview

NH3 ammonia gas detection sensor is a fixed-potential electrolytic sensor, ammonia and oxygen respectively 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 ammonia is directly proportional to the size of the current can be determined through the test of the concentration of ammonia high and low.

Application Areas

1. Ammonia alarm
2. Industrial site ammonia gas detection
3. Livestock ammonia testing
4. Smart municipal ammonia detection
5. Atmospheric ammonia testing

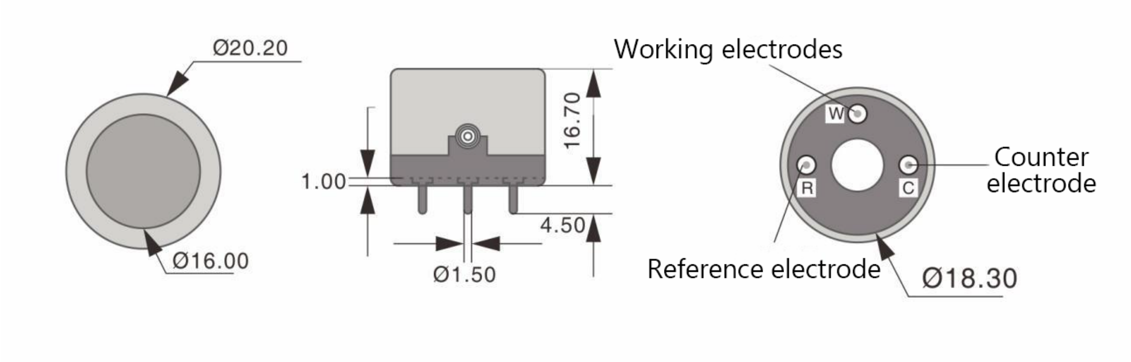
Product Features

1. High precision and long life
2. Fast response, fast return to zero
3. Low power consumption, high sensitivity
4. Wide linear range and high immunity to interference
5. Excellent repeatability and stability

Technical Parameters

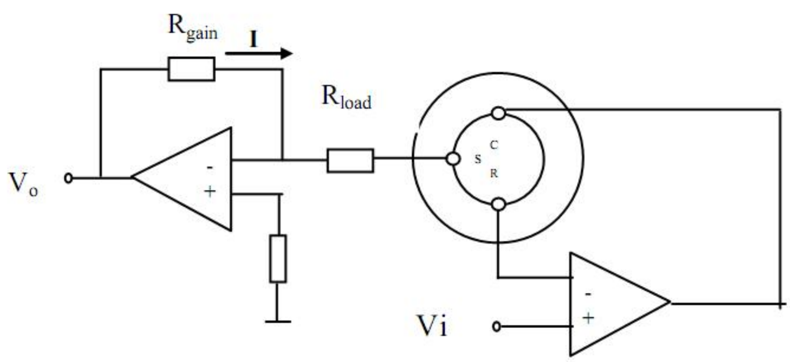
projects	parameters
Model	ATO-K-5S-NH3-100
Detection Principle	Electrochemical three-electrode
Gas Detection	NH_3
Detection Range	0-100PPM
Maximum Load Concentration	200PPM
Sensitivity	160±40nA/PPM
Zero Point Drift	0~4PPM
Resolution	1PPM
Response Time	<90s
Bias Voltage	0
Load Resistance	5~30Ω
Temperature 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 200PPM
Working Pressure	90 to 110 kPa
Life Time	2 years
Weight	10g

ATO



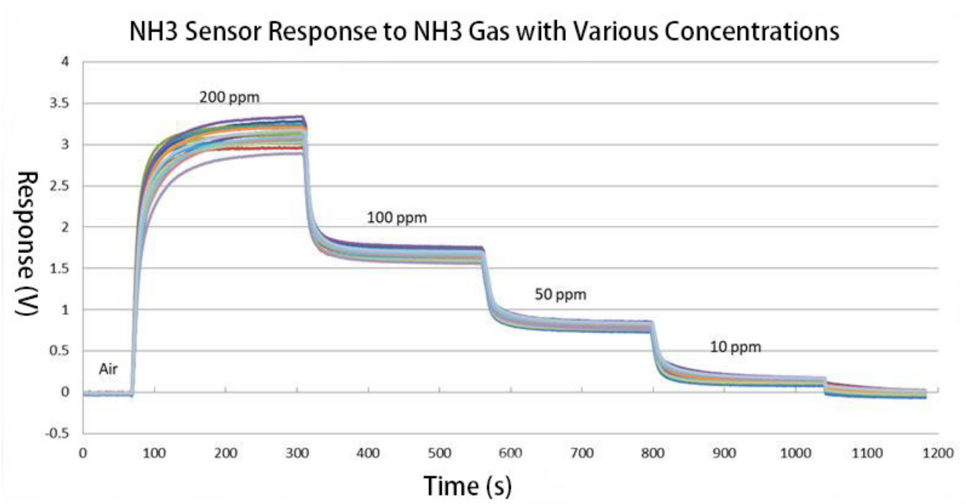
Sensor Circuit Diagram

Basic Circuit

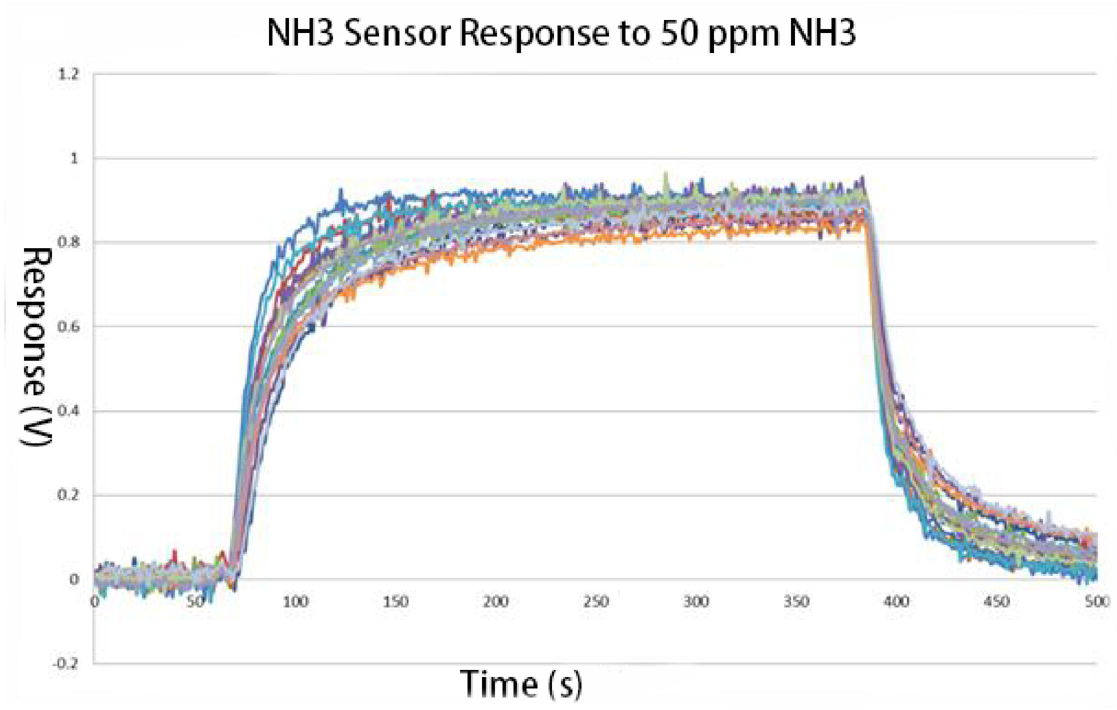


NOTE: The diagram above shows the basic test circuit for the NH3 sensor.

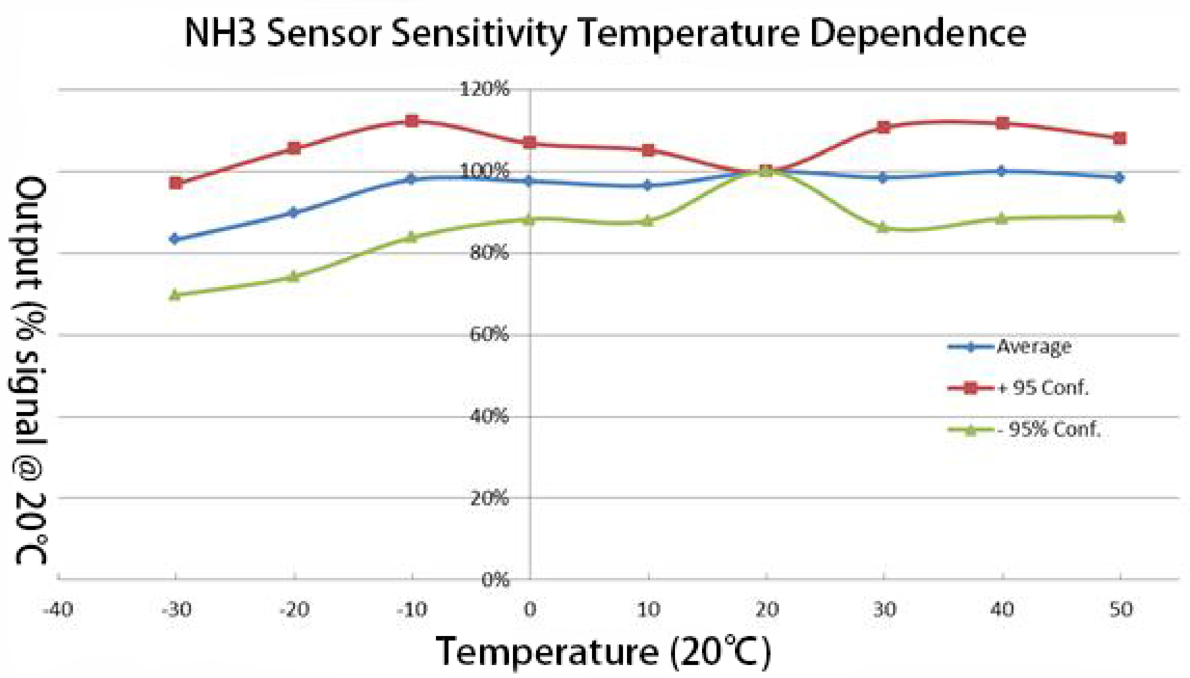
Sensor Characterization



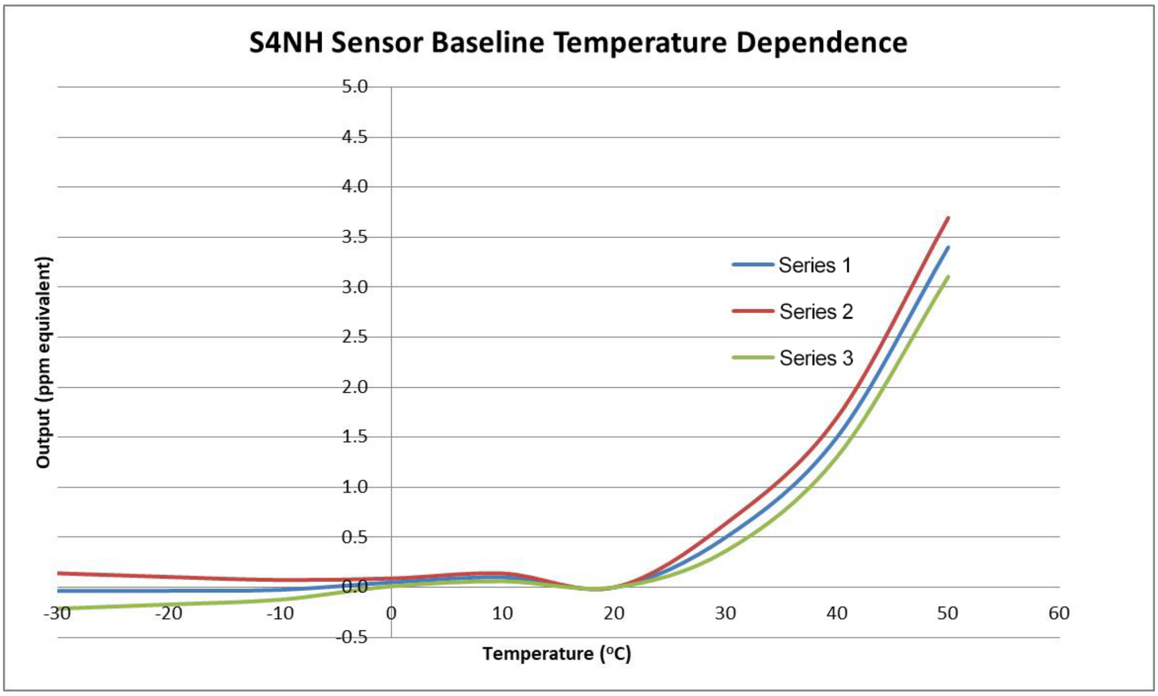
Typical Sensitivity Characterization Curves for Sensors



Sensor Response Recovery Curve



Sensor Temperature and Humidity Characteristic Curve



Sensor Stability Characteristics

Cross-talk:

The NH3 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 NH_3)
CO	50	0
CO_2	100	0
H_2S	25	35
H_2	1000	0
IC_4H_8	100	0

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.