SANGBAY
Gas Sensor

Hydrogen Chlorine Sensor

# HCL Application & Specification

## Electrochemical HCL Sensor

Small size | Low consumption | Long life | Low cost | High precision

# 1. Product Overview

The hydrogen chloride gas detection sensor is a constant potential electrolytic sensor. The hydrogen chloride and oxygen will undergo corresponding redox reaction on the working electrode and the counter electrode respectively and release the charge to form a current. The generated current is proportional to the concentration of hydrogen chloride. The concentration of hydrogen chloride can be determined by measuring the current.

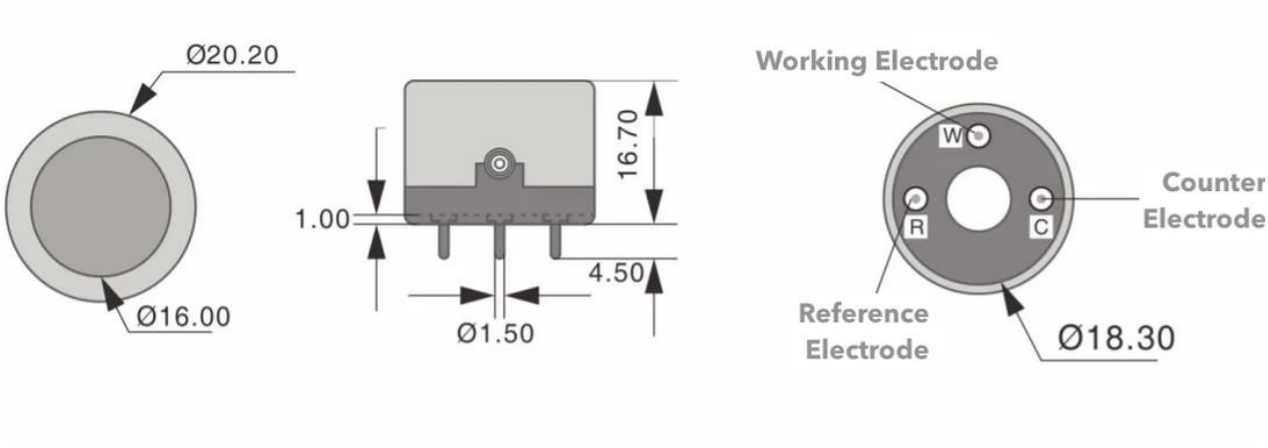

# 2. Application Field

1. Hydrogen chloride detector
2. Hydrogen chloride gas detection at industrial site
3. Chlorine detection in animal husbandry
4. Intelligent municipal hydrogen chloride detection
5. Detection of hydrogen chloride in atmospheric environment

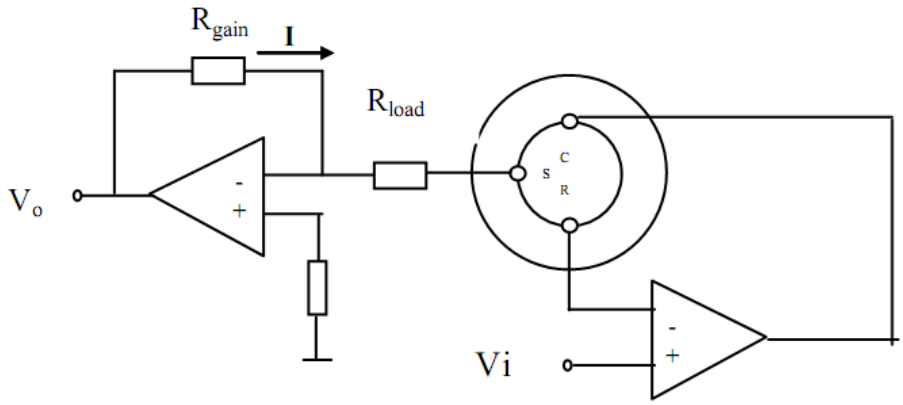
# 3. Product Characteristics

## 4. Technical Parameters

| Item | Parameters |
|---|---|
| model | HCL |
| Detection principle | Electrochemical Three electrodes |
| Detection gas | HCL |
| Detection range | 0-50PPM |
| Maximum load concentration | 100PPM |
| output signal | 300±100nA/PPM |
| Zero drift | 0~5PPM |
| Resolution | 0.1PPM |
| Response time | <70s |
| Bias voltage | +200mv |
| Load resistance | 5~30Ω |
| Working Temperature | -30℃-50℃ |
| Working Humidity | 15%RH to 90%RH (no condensation) |
| Repeatability | <±2% output signal |
| Long-term stability | <2% signal/month |
| Linearity | Linearity regression coefficient $R^2$=0.999 |
| Work pressure | 90 to 110 kPa |
| Shelf life | 12 months after delivery |
| Service life | 2 years |

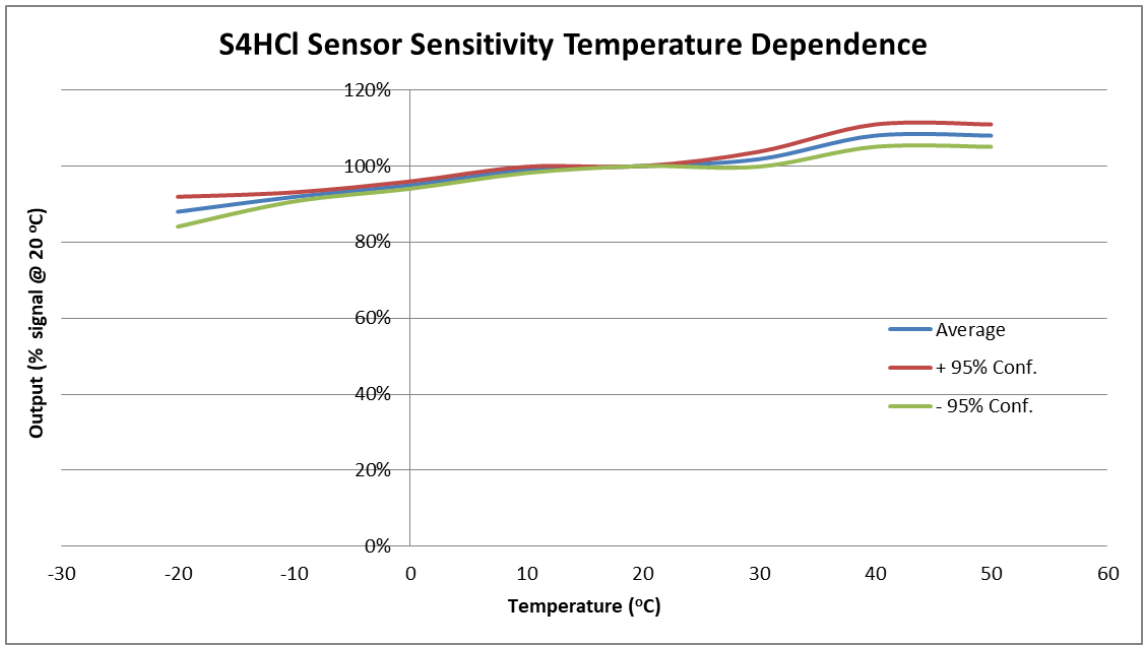



## 5. Basic Circuit

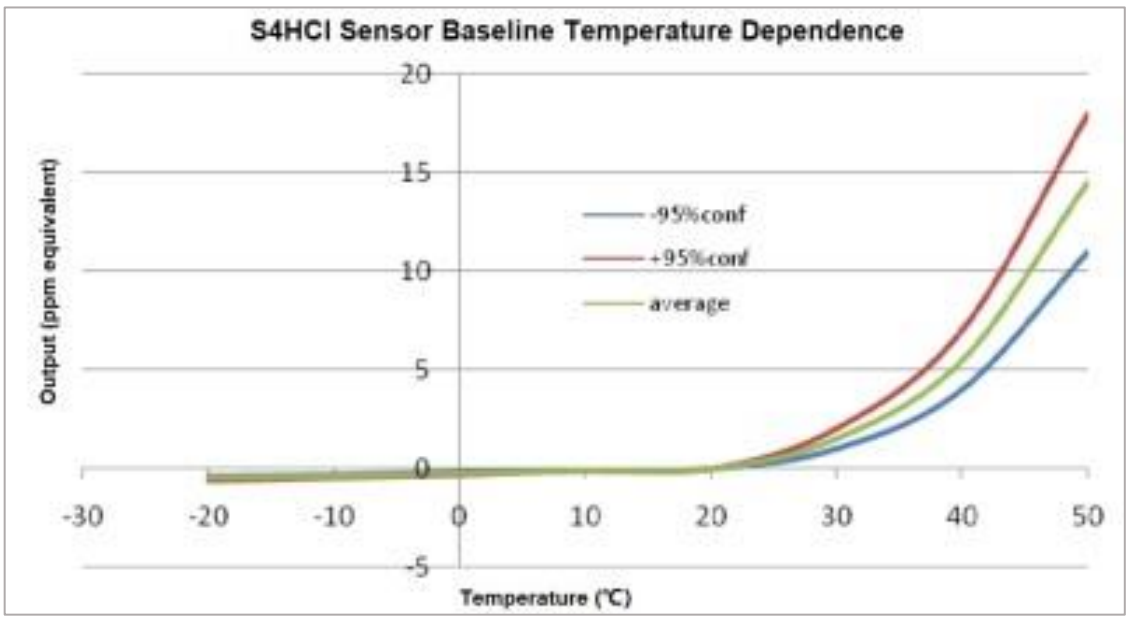



Note: The above figure shows the basic test circuit of HCL sensor.

# 6. Sensor Characteristic Description




Sensor temperature and humidity characteristic curve




Sensor Stability Characteristic Curve

## 7. Cross Interference ：

HCL sensor also responds to gases other than the target gas. The response characteristics of the sensor to several common interference gases are listed in the table below for reference. The data in the table is the typical response of interfering gas at a given concentration.

| Interfering gas | Gas Concentration Used (ppm) | Value Displayed (ppm HCL) |
|---|---|---|
| CO | 100 | 0 |
| $H_2S$ | 25 | 110 |
| $H_2$ | 2000 | 0 |
| NO | 20 | 50 |
| $NO_2$ | 10 | 1 |
| $SO_2$ | 20 | 30 |

## 8. Attention ：

1. The sensor pins must be connected through PCB sockets, soldering will damage the sensor, and the pins are not allowed to be bent;

2. The working electrode and the reference electrode should be in a short-circuit state when the sensor is stored;

3. The sensor should avoid contact with the organic solvent, alcohol, paint, oil and high concentrations of gas, including silica and other adhesive agents;

4. The output current is positive electrochemical sensors ( such as CO.'S, H 2 S, SO 2 , NH2 . 3 , etc. ) need to work in anti-oxygen should, be gas to air as a standard calibration gas and the background test, otherwise Destroy the performance of the sensor;

5. The sensor cannot be used in an environment containing corrosive gas for a long time, and the corrosive gas will damage the sensor;

6. If the circuit board is not working properly, such as due to circuit design problems, operational amplifier and other component quality problems, short circuit, open circuit, poor pin contact, circuit board damp, corrosion, leakage, interference by power noise, noise feedback, electromagnetic waves Interference, etc. may cause the alarm to be unresponsive, drift, digital instability, etc., and may even cause the sensor to undergo an electrolytic reaction and damage the sensor;

7. When calibrating or testing the sensor, the correct method should be carried out in a clean atmosphere, and the ventilation flow rate should be kept stable and gentle, so as to simulate a gas diffusion state; on the contrary, blow the air directly against the sensor or the air flow suddenly Large or small unstable, will not get satisfactory calibration results and test accuracy and reproducibility;

8. Recommended calibrated with the target gas; + cross-sensitivity will be 30 % of the variation range, if the cross-sensitivity with a standard gas constant, which does not guarantee the accuracy of the calibration and measurement;

9. It is not recommended to use non-standard methods to test the sensor, such as: directly put the sensor on concentrated ammonia water, spray a cigarette at the sensor, approach the sensor after igniting a lighter, exhale towards the sensor, bring the sensor close to alcohol,

etc., because of liquid ammonia or alcohol when the concentration may be up to tens of thousands of volatilization region ppm , the concentration of carbon dioxide as high as human breath . 4 million ppm , will damage the equipment; correct test is background gas through the air as a target gas.

* Violation of the above conditions of use will degrade the sensor characteristics.