

SensorsX SX-GSO2FSA Series

Electrochemical Sulfur Dioxide (SO₂) Gas Sensor

Four-Electrode | Low Power Consumption | Interference Resistance | High Accuracy



0–10 ppm Detection Range	0.4±0.2 µA/ppm Sensitivity	≤60 s Response Time
-30 to +50°C Operating Temperature	15–90 %RH Humidity Range	2 years Service Life

Sulfur Dioxide Detection | Four-Electrode Sensing | Industrial Emissions | Mining | Smart City

■ PRODUCT OVERVIEW

The SX-GSO2FSA Series is a potentiostatic four-electrode electrochemical sulfur dioxide sensor. Sulfur dioxide and oxygen undergo oxidation–reduction reactions at the working electrode and counter electrode, respectively, generating an electrical current. The output current is proportional to the SO₂ concentration, allowing SO₂ concentration to be determined from the measured current. An auxiliary electrode compensates the baseline current, and the compensation algorithm improves measurement accuracy at low concentrations.



■ KEY FEATURES

◆ Four Electrodes, Low Detection Limit, High Accuracy	Auxiliary-electrode zero-point compensation for improved low-range accuracy
◆ Fast Response, Fast Recovery	Quick response with rapid baseline recovery
◆ Low Power, High Sensitivity	Low power consumption with high sensitivity
◆ High Resistance to Interference, Low Temperature Dependence	Stable performance across operating temperatures
◆ High Repeatability and Stability	Consistent long-term performance

■ TYPICAL APPLICATIONS

- Mine-site sulfur dioxide gas detection
- Industrial emissions monitoring — sulfur dioxide gas detection
- Traffic emissions management — sulfur dioxide gas detection
- Smart-city air-quality monitoring — sulfur dioxide gas detection

■ PERFORMANCE SPECIFICATIONS

General	
Model	SX-GSO2FSA-600
Detection Principle	Electrochemical, four-electrode
Target Gas	Sulfur Dioxide (SO ₂)
Detection Range	0 – 10 ppm
Maximum Overload Concentration	200 ppm
Accuracy & Response	
Sensitivity (20°C)	0.4 ± 0.2 µA/ppm
Resolution	20 ppb
Response Time	≤ 60 s
Repeatability	2% of output signal
Long-Term Stability	< ± 2% of signal / month
Linearity	Linear

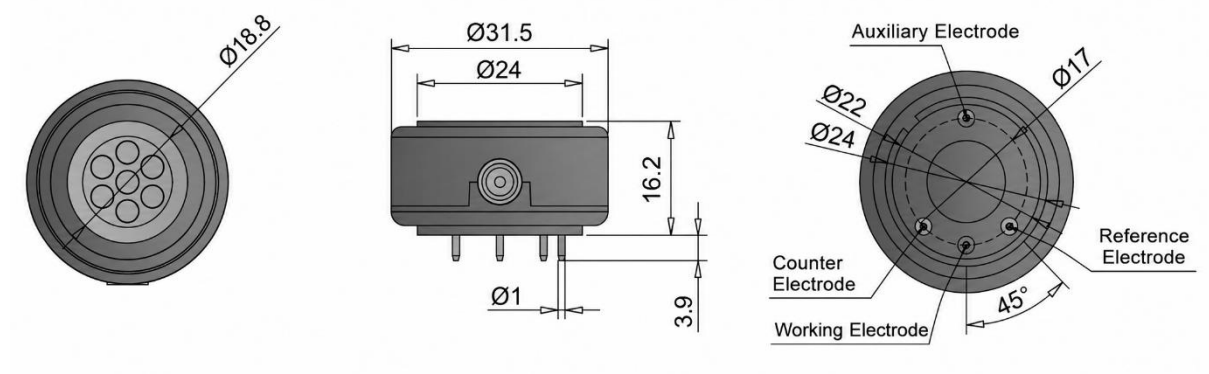
■ ELECTRICAL SPECIFICATIONS

Bias & Load	
Bias Voltage	0
Load Resistance	10 Ω

■ ENVIRONMENTAL SPECIFICATIONS

Temperature & Humidity	
Operating Temperature	-30 to +50°C (-22 to +122°F)
Operating Humidity	15 – 90% RH (non-condensing)
Other	
Operating Pressure	90 – 110 kPa
Shelf Life	12 months from delivery
Service Life	2 years

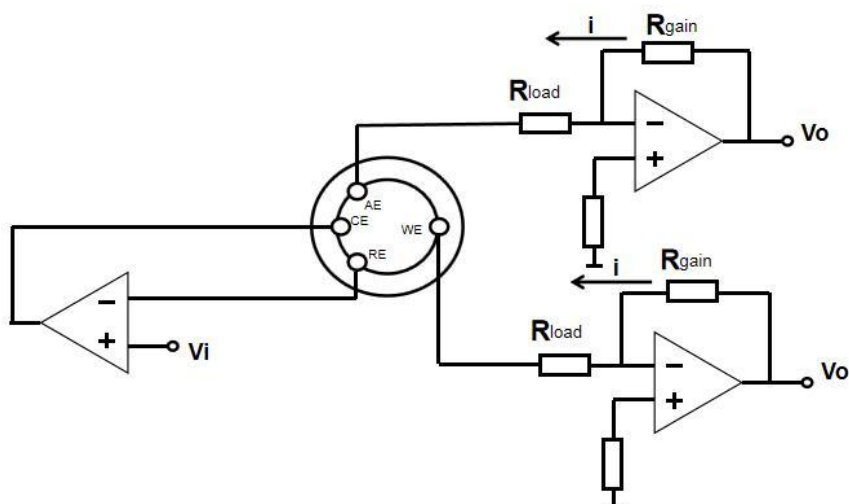
■ MECHANICAL DIMENSIONS



SX-GSO2FSA Four-Electrode Sensor Dimensions

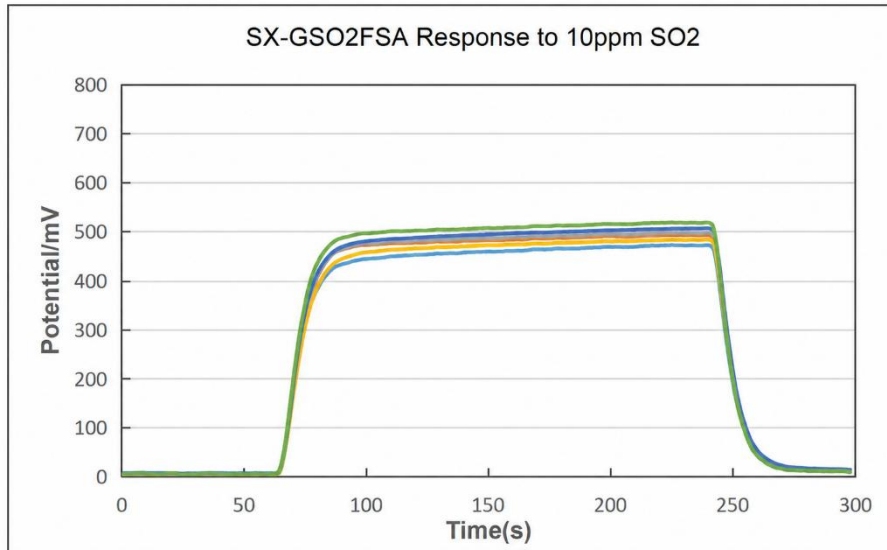
All dimensions in mm unless otherwise noted. Tolerance ± 0.2 mm.

■ WIRING DIAGRAM

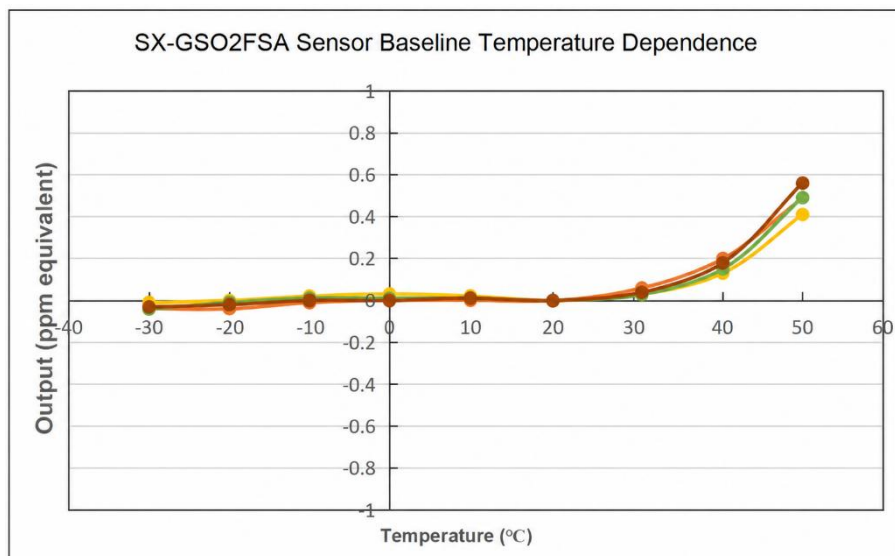


Basic Test Circuit for the SX-GSO2FSA Series Sensor

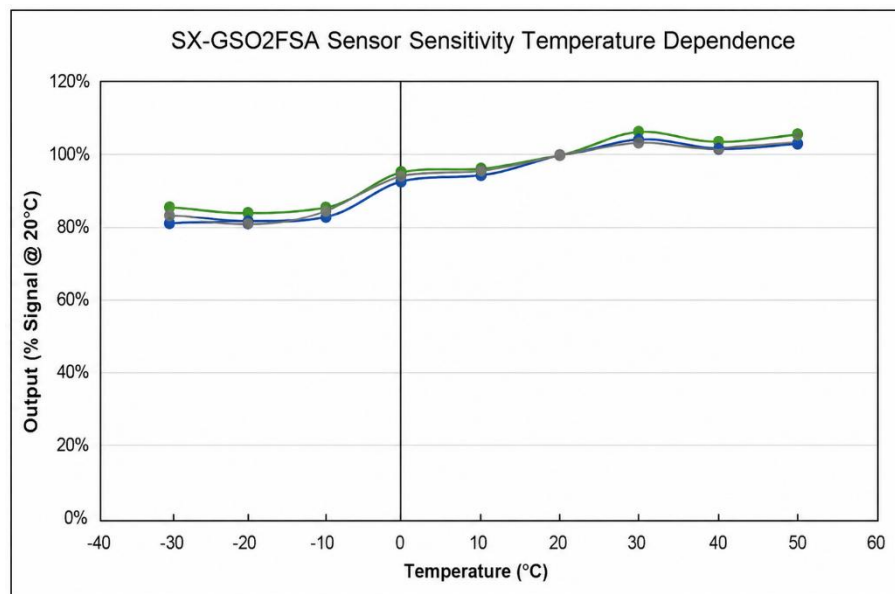
■ SENSOR CHARACTERISTICS



SX-GSO2FSA Response to 10 ppm SO₂



SX-GSO2FSA Sensor Baseline Temperature Dependence



SX-GSO2FSA Sensor Sensitivity Temperature Dependence

■ CROSS-INTERFERENCE

The SX-GSO2FSA Series sensor also responds to gases other than the target gas. The table below lists the sensor's typical response to several common interfering gases at the given concentrations, for reference.

Interfering Gas	Test Concentration (ppm)	Cross-Sensitivity
H ₂	100	0.1%
CO	100	2.0%
H ₂ S	50	0.1%
NO ₂	10	-50.0%
NO	20	1.3%
NH ₃	20	0.2%

■ NOTES / PRECAUTIONS

- Sensor pins must be connected via a PCB socket; soldering will damage the sensor. Do not bend the pins.
- The sensor must be allowed to warm up / pre-heat for at least 24 hours on first use.
- Avoid exposing the sensor to organic solvents, alcohol, paints, oils, and high-concentration gases, including silicone and other adhesives.
- Electrochemical sensors with positive output current (e.g., CO, H₂S, SO₂, NH₃) require oxygen to participate in the reaction. Calibrate and test using a standard gas with air as the background gas; otherwise sensor performance will be degraded.
- The sensor must not be used for extended periods in environments containing corrosive gases, as corrosive gases will damage the sensor.
- If the circuit board malfunctions — e.g., due to circuit design issues, faulty op-amps or other components, short/open circuits, poor pin contact, moisture, corrosion, leakage, power-supply noise, noise feedback, or electromagnetic interference — the alarm may fail to respond, drift, or show unstable readings, and may even cause the sensor to undergo electrolytic reactions and become damaged.
- When calibrating or testing the sensor, use clean air and maintain a steady, gentle gas flow to simulate natural diffusion. Blowing directly and forcefully at the sensor, or an unstable flow rate, will not give satisfactory calibration or measurement accuracy and repeatability.
- Calibration with the target gas is recommended. Cross-sensitivity can vary by +30%; calibrating with a cross-sensitive gas does not guarantee calibration or measurement accuracy.
- Non-standard test methods are not recommended — e.g., placing the sensor directly over concentrated ammonia solution, spraying cigarette smoke at the sensor, bringing a lit lighter near the sensor, breathing on the sensor, or bringing the sensor close to alcohol — because the local concentration from evaporating ammonia solution or alcohol can reach tens of thousands of ppm, and human breath contains CO₂ at concentrations up to 40,000 ppm, both of which can damage the sensor. The correct test method is to use the target gas with air as the background gas.

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

■ ORDERING INFORMATION

Complete model number example: SX-GSO2FSA-600

Gas Range	
6	0 – 10 ppm
Zero Drift	
0	Standard
Output	
0	0.4 ± 0.2 µA/ppm
Customized	
D	Customized — specify requirements when ordering