

SensorsX SX-GCOTSA Series

Electrochemical Carbon Monoxide (CO) Gas Sensor

Gas Detection — Industrial Safety, Indoor Air Quality, Automotive Cabin Air



0–1000 ppm Detection Range	80±20 nA/ppm Sensitivity	< 25 s Response Time
±2 ppm Zero Drift	–30 to +50 °C Operating Temp. (–22 to +122 °F)	2 years Service Life

Gas Detection | Industrial Safety | Indoor Air Quality | Automotive Cabin Air

■ PRODUCT OVERVIEW

The SX-GCOTSA Series is a potentiostatic electrochemical carbon monoxide sensor. Carbon monoxide 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 carbon monoxide concentration, allowing CO concentration to be determined from the measured current.



■ KEY FEATURES

◆ High Accuracy, Long Service Life	◆ Fast Response, Fast Return to Zero
◆ Low Power Consumption, High Sensitivity	◆ Wide Linear Range, Strong Interference Resistance
◆ High Repeatability and Stability	

■ TYPICAL APPLICATIONS

- Carbon Monoxide (CO) Alarms
- Fire Alarms from Incomplete Combustion of Gas Water Heaters
- Range Hoods
- Air Quality Detection Instruments
- Vehicle Exhaust Monitoring in Underground Parking Garages
- In-Cabin Air Quality Detection
- Residential & Commercial Air Purification Equipment
- Cabin Air Purification Equipment & Fresh-Air Systems

■ PERFORMANCE SPECIFICATIONS

Measurement	
Detection Principle	Electrochemical, three-electrode
Detection Gas	CO
Detection Range	0 – 1000 ppm
Maximum Load Concentration	2000 ppm
Resolution	1 ppm
Linearity	Linear, regression coefficient $R^2 = 0.999$
Accuracy & Stability	
Sensitivity	80 ± 20 nA/ppm
Zero Drift	± 2 ppm
Repeatability	1% of output signal
Long-Term Stability	< 2 % signal / month
Response	
Response Time	< 25 s

■ ELECTRICAL SPECIFICATIONS

Bias Voltage	0 V
Load Resistance	5 – 30 Ω

■ ENVIRONMENTAL SPECIFICATIONS

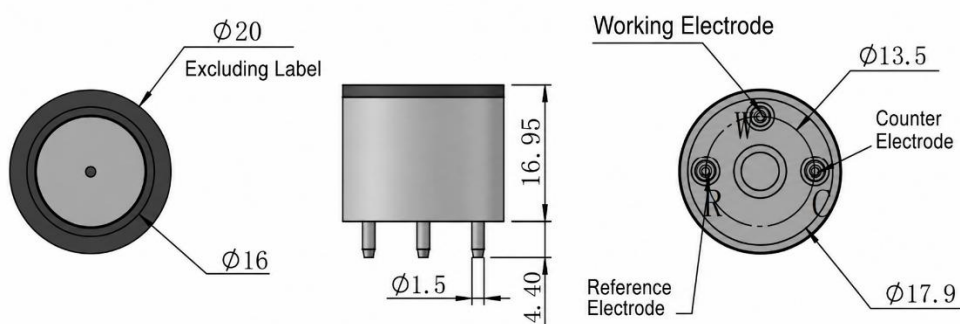
Operating Temperature	–30 to +50 °C (–22 to +122 °F)
Humidity Range	15 – 90 %RH (non-condensing)
Operating Pressure	90 – 110 kPa (13.1 – 16.0 psi)
Shelf Life	12 months from delivery
Service Life	2 years

■ CROSS-SENSITIVITY

The sensor also responds to gases other than the target gas. Typical responses to several common interfering gases at the given test concentrations are listed below for reference.

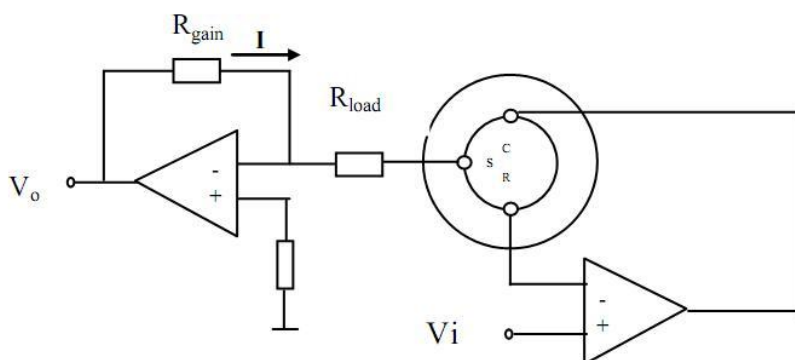
Interfering Gas	Test Concentration (ppm)	Reading (ppm CO)
H ₂ S	80 ppm	1.5 ppm CO
SO ₂	20 ppm	1.0 ppm CO
NO ₂	20 ppm	2 ppm CO
NH ₃	20 ppm	1.0 ppm CO
Cl ₂	20 ppm	1.0 ppm CO
NO	50 ppm	15 ppm CO
H ₂	1000 ppm	330 ppm CO

■ MECHANICAL DIMENSIONS



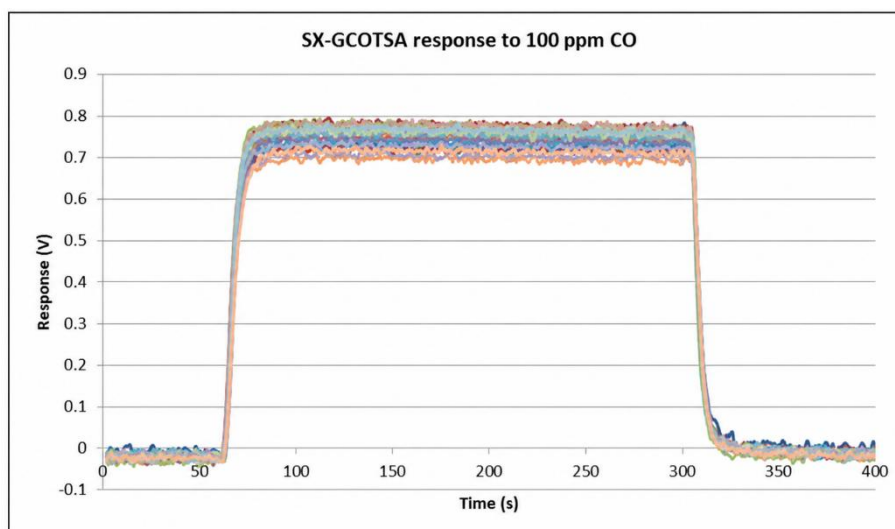
All dimensions in mm unless otherwise noted. Tolerance ± 0.20 mm (± 0.008 in).

■ WIRING DIAGRAM — BASIC TEST CIRCUIT

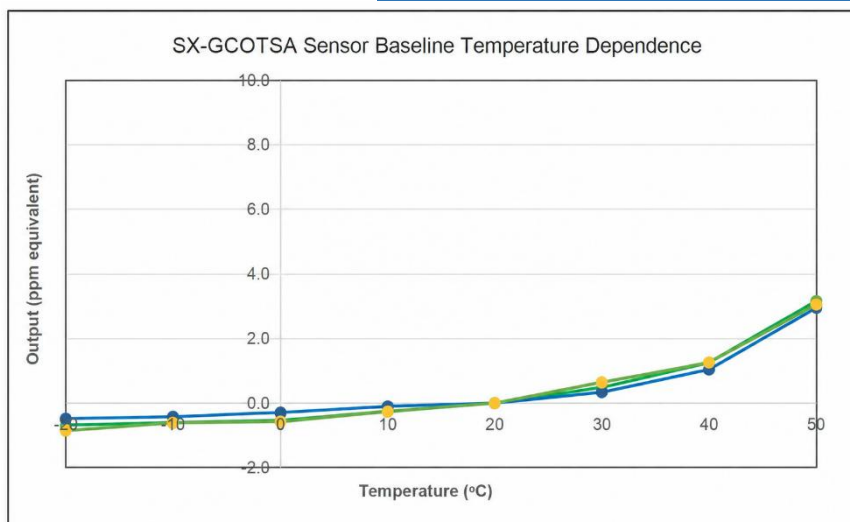


■ SENSOR CHARACTERISTIC CURVES

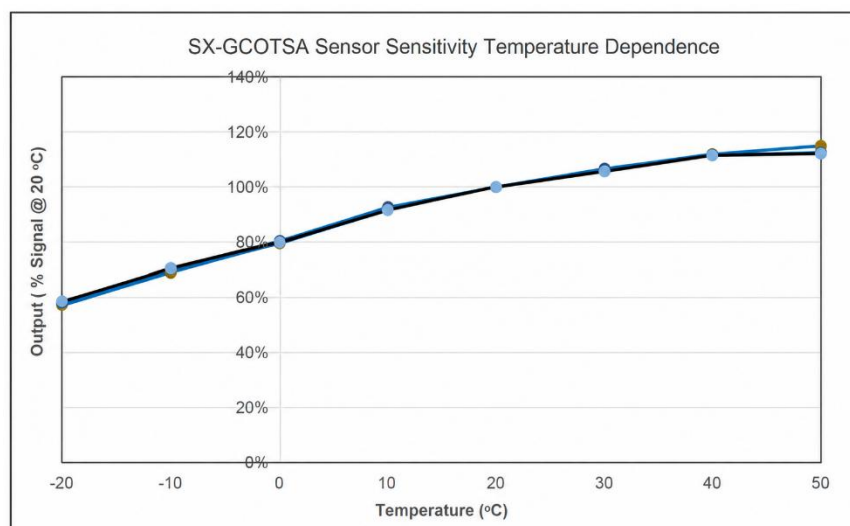
Response/recovery curve (SX-GCOTSA series):



Baseline temperature dependence curve:



Sensitivity temperature dependence curve:



■ PRECAUTIONS

- Sensor pins must be connected via a PCB socket; soldering will damage the sensor. Do not bend the pins.
- During storage, the working electrode and reference electrode should be kept short-circuited.
- Avoid exposing the sensor to organic solvents, alcohol, paints, oils, high-concentration gases, silicone, or other adhesives.
- Output-positive electrochemical sensors (such as CO, H₂S, SO₂, NH₃) require oxygen to react and must be calibrated/tested using standard gas with air as the background gas; otherwise sensor performance will be degraded.
- Do not use the sensor long-term in environments containing corrosive gases, as these will damage the sensor.
- Circuit board malfunctions (design issues, faulty components, short/open circuits, poor pin contact, moisture, corrosion, leakage, power-supply noise, feedback noise, electromagnetic interference, etc.) may cause no response, drift, or unstable readings, and may even cause an electrolytic reaction that damages the sensor.
- Calibration/testing should be performed in clean air with a steady, gentle gas flow to simulate gas diffusion; blowing directly and strongly at the sensor, or an unstable flow rate, will not produce satisfactory calibration or test accuracy/repeatability.
- Target-gas calibration is recommended. Cross-sensitivity may vary by up to ±30%; calibrating with a cross-sensitive gas does not guarantee calibration/measurement accuracy.
- Non-standard test methods are not recommended (e.g., exposing the sensor directly to concentrated ammonia, cigarette smoke, a lit lighter held close, exhaled breath, or alcohol), since local concentrations from liquid ammonia or alcohol evaporation can reach tens of thousands of ppm, and human exhaled breath can reach ~40,000 ppm CO₂, which can damage the sensor. The correct test method is to use the target gas with air as the background gas.

Violating the above usage conditions will degrade sensor performance.

■ ORDERING INFORMATION

Complete model number example: **SX-GCOTSA-220**

Gas Range	
5	20 ppm
2	1000 ppm
3	100 ppm
4	200 ppm
7	5000 ppm
F	50 ppm
G	300 ppm
H	500 ppm
J	2000 ppm
K	10000 ppm
L	20000 ppm
Zero Drift	
2	± 2 ppm
Sensitivity	
0	80 ± 20 nA/ppm
Customized	
D	Customized — specify requirements when ordering