

SensorsX SX-GO2TMA Series

Miniature Lead-Free Electrochemical Oxygen (O₂) Sensor

Smaller Size | Low Power Consumption | Long Service Life | High Accuracy



0–25 %VOL Detection Range	100±20 µA in air Output Signal	<20 s Response Time
-30 to +50°C Operating Temperature	15–90 %RH Humidity Range	5 years Service Life

Oxygen Detection | Galvanic Sensing | Industrial Safety | Medical | Air Quality

■ PRODUCT OVERVIEW

The SX-GO2TMA Series is a miniature lead-free, long-life oxygen sensor. Oxygen is reduced at the working electrode and oxidized at the counter electrode, generating an electrical current. The output current is proportional to the oxygen concentration, allowing O₂ concentration to be determined from the measured current.



■ KEY FEATURES

◆ Smaller Size, More Compact Construction	Reduced footprint versus standard oxygen sensors
◆ High Accuracy, Long Life	Precise detection with extended operating life
◆ Fast Response, Fast Recovery	Quick response with rapid baseline recovery
◆ Low Power, High Sensitivity	Low power consumption with high sensitivity
◆ Wide Linear Range	Robust performance across the measurement range
◆ High Resistance to Interference	Low susceptibility to common interfering gases
◆ High Repeatability and Stability	Consistent long-term performance

■ TYPICAL APPLICATIONS

- Oxygen alarms for mining applications
- Medical oxygen concentrators
- Air-quality monitoring instruments
- Underground parking garage and commercial air-purification equipment

- In-cabin air-quality monitoring and vehicle cabin air-purification / fresh-air systems

■ PERFORMANCE SPECIFICATIONS

General	
Model	SX-GO2TMA-110
Detection Principle	Electrochemical, three-electrode
Target Gas	Oxygen (O ₂)
Detection Range	0 – 25% VOL
Maximum Overload Concentration	30% VOL
Accuracy & Response	
Output Signal	100 ± 20 µA in air
Zero Drift	0.6% VOL
Resolution	0.1% VOL
Response Time	< 20 s
Repeatability	2% of output signal
Long-Term Stability	< 5% signal / year
Linearity	Linear, $S = K \cdot \log_e(1 / (1-C))$

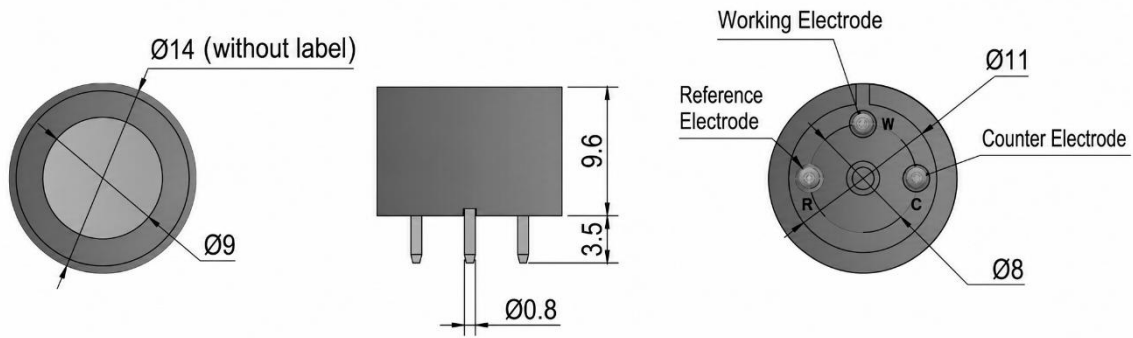
■ ELECTRICAL SPECIFICATIONS

Bias & Load	
Bias Voltage	-600 mV
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	5 years

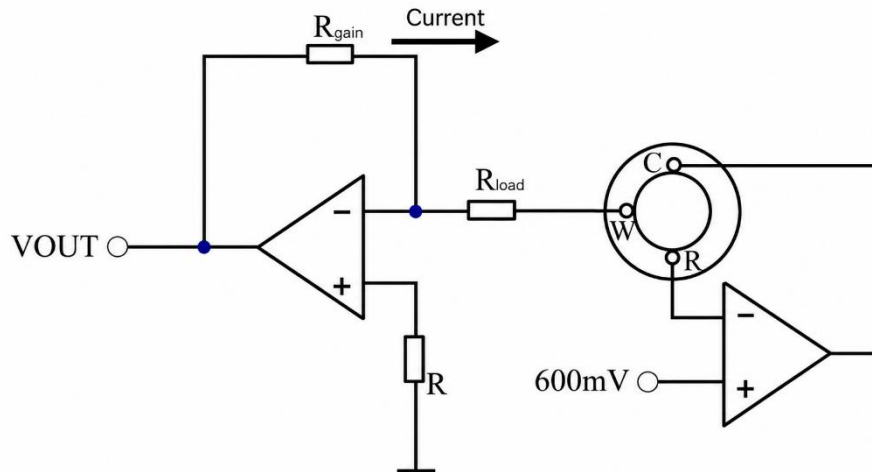
■ MECHANICAL DIMENSIONS



SX-GO2TMA Mini Lead-Free Oxygen Sensor Dimensions

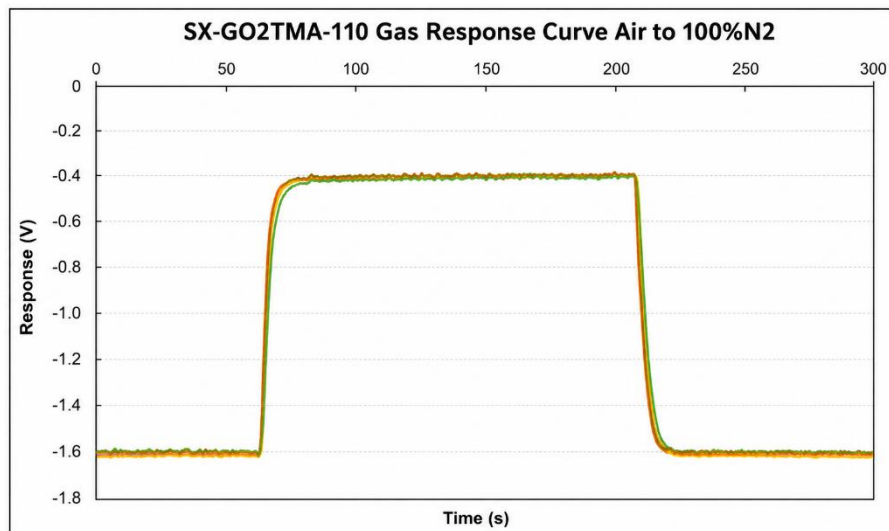
All dimensions in mm unless otherwise noted. Tolerance ± 0.2 mm.

■ WIRING DIAGRAM

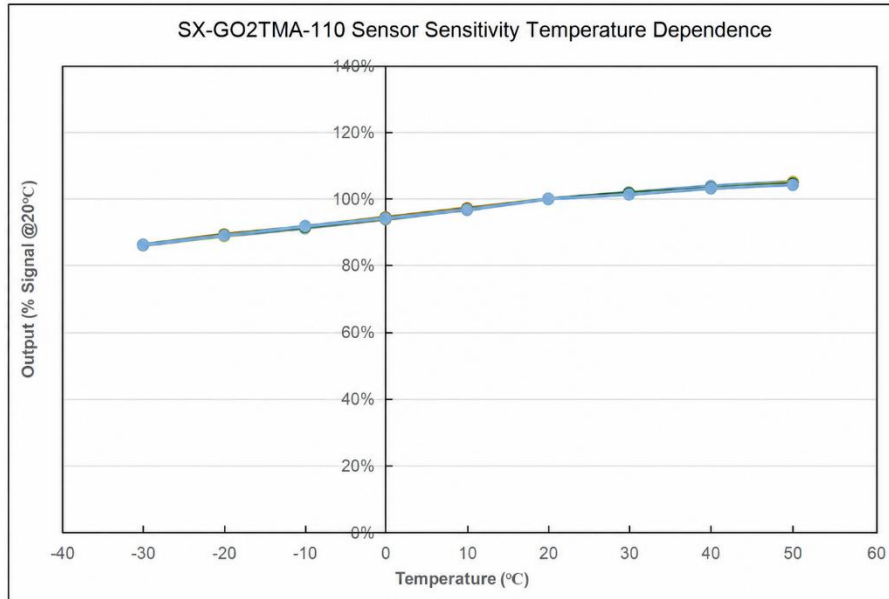


Recommended Circuit for the SX-GO2TMA Series Sensor

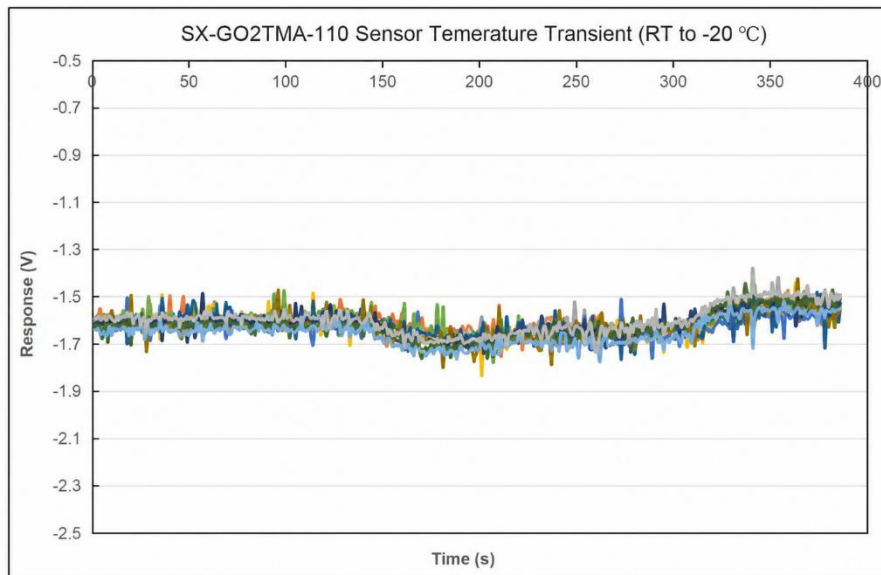
■ SENSOR CHARACTERISTICS



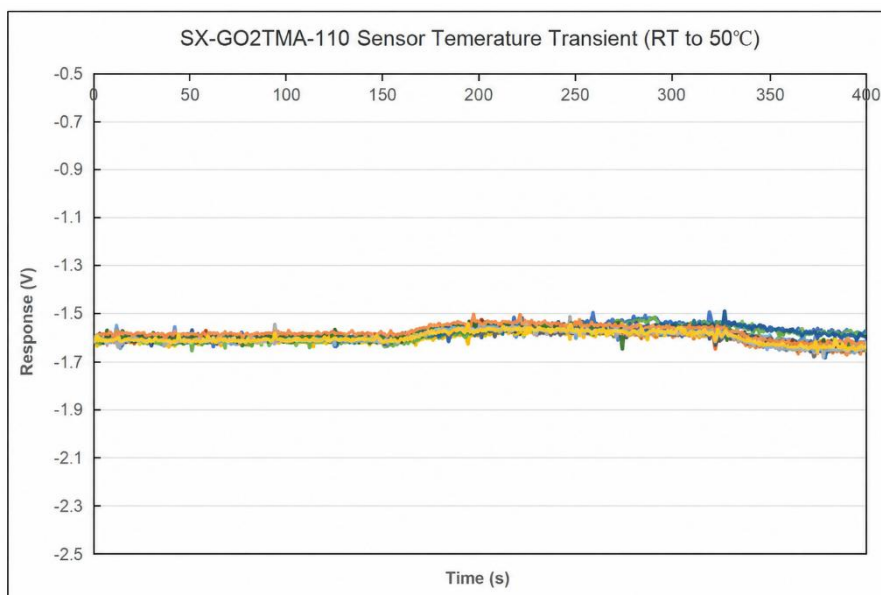
SX-GO2TMA-25% Gas Response Curve, Air to 100% N₂



SX-GO2TMA-25% Sensor Sensitivity Temperature Dependence



SX-GO2TMA Sensor Temperature Transient (Room Temp. to -20°C)



CROSS-INTERFERENCE

The SX-GO2TMA 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)	Reading (equivalent % O ₂)
CO ₂	5%	0.00
H ₂	2000	-0.2

NOTES / PRECAUTIONS

- When bias voltage is first applied, the sensor (already saturated with oxygen) requires a stabilization period related to how long the bias has been removed; sensor performance parameters cannot be guaranteed during this period.
- For correct operation, the bottom of the sensor must not be obstructed; the instrument design must also allow for adequate ventilation.
- Sensor pins must be connected via a PCB socket; soldering will damage the sensor. Do not bend the pins.
- 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-GO2TMA-110**

Gas Range	
1	0 – 25% VOL
Zero Drift	
1	0.6%
Output	
0	100 ± 20 µA in air
Customized	
D	Customized — specify requirements when ordering