

SensorsX SX-GCCSA Series

Catalytic Combustion Combustible Gas Sensor

Combustible Gas Detection | Small Size | Long Life | Low Cost | High Accuracy



0–100% LEL Detection Range	±30 mV Zero Voltage	2 Years Service Life
Ex da I Ma Explosion Protection	2.8 V DC Supply Voltage	T90 ≤ 30 s Response Time

Combustible Gas Detection | Catalytic Combustion | Industrial | Coal Mine | Pipeline Leak

■ PRODUCT OVERVIEW

The SX-GCCSA Series is a catalytic combustion combustable gas sensor consisting of a paired sensing element and compensation element. Each element is formed from a platinum wire coil coated with catalyst or inert material. Combustible gas undergoes catalytic combustion on the active sensing element, increasing its resistance and changing the bridge output voltage. The voltage change is approximately linear with combustable gas concentration. The compensation element provides reference compensation for ambient temperature and humidity.



■ KEY FEATURES

◆ Linear Bridge Output

Voltage output varies linearly with gas concentration

◆ Good Repeatability & Selectivity

Consistent, selective gas response

◆ Excellent Poison Resistance

Strong resistance to H₂S and silicone poisoning

◆ Fast Response

Quick response to combustable gas exposure

◆ Stable & Reliable Operation

Stable element performance over service life

■ TYPICAL APPLICATIONS

Typical Applications

- Industrial Combustible Gas Monitoring (e.g. methane, propane)
- Coal Mine Gas (Methane) Monitoring
- Gas Pipeline Leak Monitoring

■ PERFORMANCE SPECIFICATIONS

General

Model	SX-GCCSA
Detection Principle	Catalytic combustion
Detection Gas	Combustible gas
Detection Range	0 – 100% LEL

Sensitivity & Output

Sensitivity	20 – 40 mV / 1% CH ₄
Zero Voltage	±30 mV
Resolution	1% LEL

Response

Response Time	T90 ≤ 30 s
Recovery Time	T10 ≤ 30 s

Stability

Zero Drift	≤ ±5% F.S. / month
Sensitivity Drift	≤ ±5% F.S. / month
Service Life	2 years

■ ELECTRICAL SPECIFICATIONS

Power

Supply Voltage	2.8 V DC (±0.1 V)
Supply Current	100 mA (±10 mA)

■ ENVIRONMENTAL SPECIFICATIONS

Temperature & Humidity

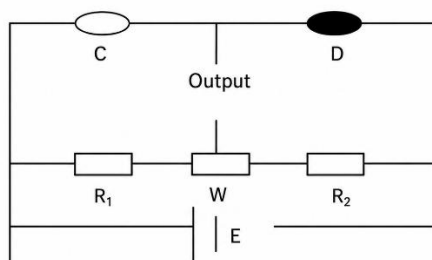
Operating Temperature / Humidity	-4 to +140 °F (-20 to +60 °C), < 95% RH (non-condensing)
Storage Temperature / Humidity	-4 to +140 °F (-20 to +60 °C), < 95% RH (non-condensing)

Explosion Protection

Certification	Ex da I Ma
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■ WIRING DIAGRAM

Basic Bridge Circuit



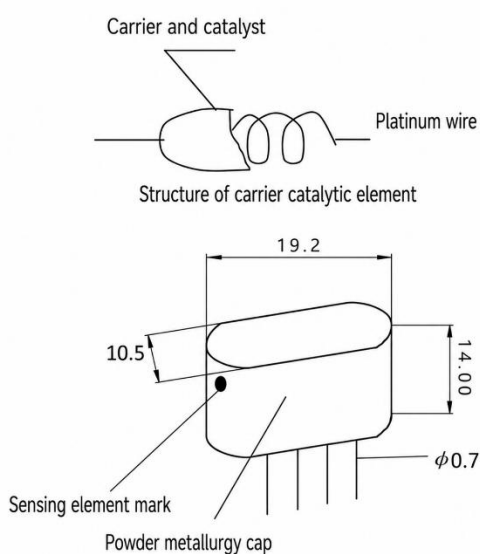
- D Sensing element (black element)
- C Compensation element (white element)
- R1, R2 = 1K bridge resistors
- E Power supply
- W Adjustable potentiometer

Figure above shows the basic test circuit of the SX-GCCSA sensor.

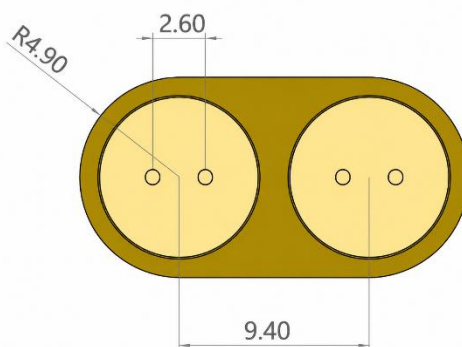
■ MECHANICAL DIMENSIONS

Sensor Element & Outline Dimensions

Product Dimensions in mm

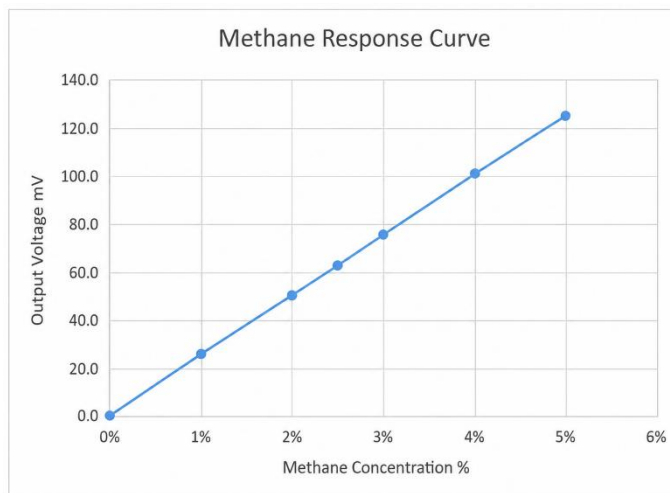


Pin Layout (Bottom View)

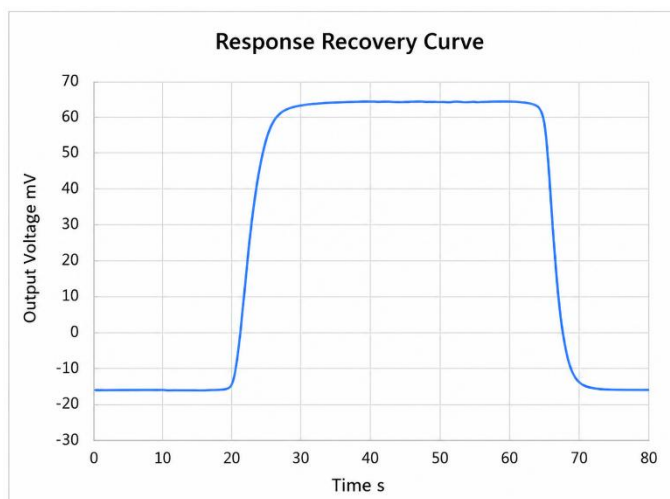


■ SENSOR CHARACTERISTIC CURVES

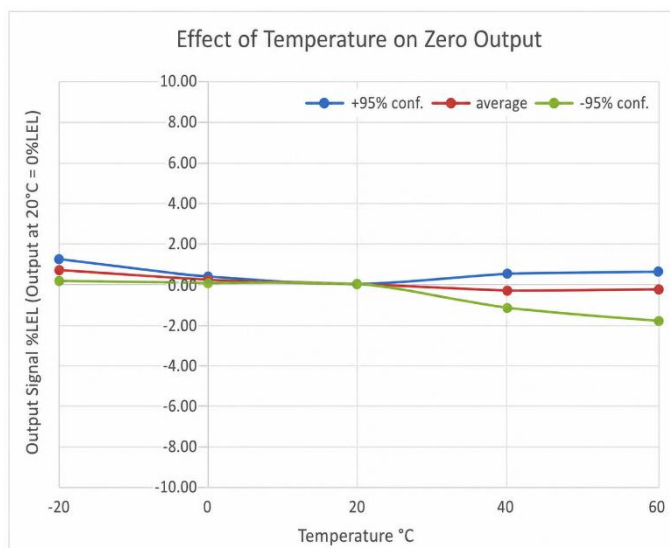
Methane Response Curve



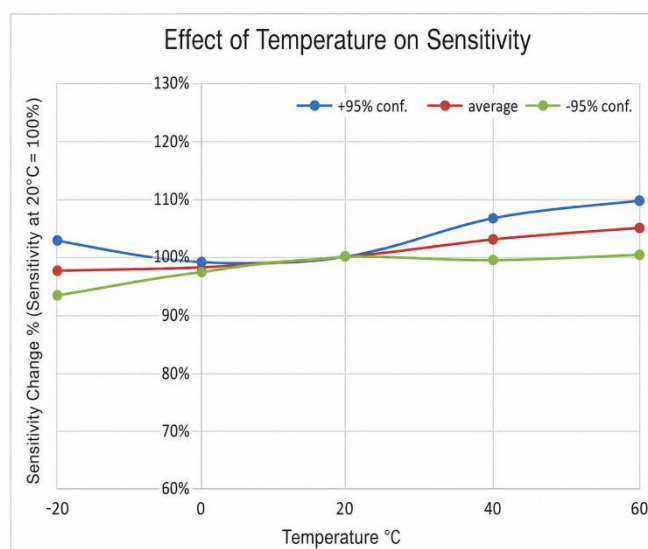
Response / Recovery Curve (2.5% Methane)



Zero Output vs. Temperature



Sensitivity vs. Temperature



CROSS SENSITIVITY

The SX-GCCSA sensor responds to a range of combustible gases. The table below shows the relative sensitivity for selected typical combustible gases at their respective 100% LEL concentration.

Gas	Formula	100% LEL Concentration (vol%)	100% LEL Relative Sensitivity
Methane	CH ₄	5.0%	100
Propane	C ₃ H ₈	2.1%	58
Hydrogen	H ₂	4.0%	45

PRECAUTIONS

1. Certain compounds reduce sensor sensitivity, including: organosilicon vapors (silane, silicone, and other volatile silicon-containing compounds), which form a silicon dioxide layer on the catalyst surface of the detection element — even very low concentrations of organosilicon can cause irreversible sensitivity loss; hydrogen sulfide, sulfur oxides, chlorine, and hydrogen chloride, which bind to and block the catalytic active sites on the detection element, reducing sensitivity; and condensation or icing on the sensor housing surface, which blocks the housing's air vents and reduces sensitivity.
2. Gas concentrations above the measurement range reduce sensor stability. When the sensor is exposed in operation to high concentrations of combustible gas (e.g. pure hydrogen, methane above 5% concentration, or other combustible gases above their lower explosive limit concentration), the sensor's stability undergoes an irreversible decrease.
3. Abnormal supply voltage: when voltage is below the normal operating voltage of 2.8 V, sensitivity falls below the normal range; when voltage exceeds 2.8 V, the sensor is prone to circuit or structural damage, which reduces sensitivity.
4. Incorrect pin wiring will prevent the sensor signal from being output correctly.

ORDERING INFORMATION — SX-GCCSA SERIES

Complete model number example: **SX-GCCSA-EB0**

Gas Range	
E	0 – 100% LEL
Zero Accuracy	
B	≤ ±5% F.S. / month
Sensitivity	
0	20 – 40 mV / 1% CH ₄

Customized

D	Customized — specify requirements when ordering
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Ordering Example:

SX-GCCSA-EB0 = 0–100% LEL range, ±5% F.S./month zero accuracy, 20–40 mV/1%CH₄ sensitivity.