

SensorsX SX-GVOCPSA Series

Photoionization Detector (PID) for VOCs
Compact Size | High Accuracy



10 ppb – 10,000 ppm Detection Range	10.6 eV UV Lamp Ionization Energy	$T_{90} \leq 5$ s Response Time
3.3 – 5 V Working Voltage	≤ 35 mA Operating Current	5 years Service Life (excl. UV lamp)

VOC Detection | Photo-Ionization Sensing | Environmental Monitoring | Industrial Safety | Portable Instruments

■ PRODUCT OVERVIEW

The SX-GVOCPSA Series is a photoionization VOC sensor based on PID technology. It detects volatile organic compounds (VOCs) across a wide range of environments, from extremely low concentrations at the ppb level to high-ppm concentrations. The sensor uses a 10.6 eV high-energy UV lamp to ionize VOC molecules, and the resulting ions are converted into an electrical signal by the measurement electrodes. Most VOC molecules in air can be ionized by the UV radiation, while the main constituents of air, such as N_2 , O_2 , CO_2 , and H_2O , remain unionized. This enables broad VOC detection in ambient gas with ppb-level sensitivity.



■ KEY FEATURES

◆ High Sensitivity	Detects VOCs from ppb to high-ppm levels
◆ Wide Measurement Range	Multiple range variants from 0–10 ppm up to 0–6,000 ppm
◆ High Stability	Consistent long-term performance
◆ Long Operating Life	Service life: at least 5 years, excluding the UV lamp

■ TYPICAL APPLICATIONS

- VOC environmental monitoring
- Industrial occupational health and safety
- Portable VOC detection instruments

■ PERFORMANCE SPECIFICATIONS

General

Model	SX-GVOCPSA
Detection Principle	Photo-ionization (PID)
Target Gas	VOCs with ionization potential < 10.6 eV
Working Voltage	3.3 – 5 V
Zero Voltage	45 – 90 mV

Range, resolution, and sensitivity are available in the following five variants:

Parameter	Variant A	Variant B	Variant C	Variant D	Variant E
Detection Range (ppm)	0–10	0–40	0–100	0–1000	0–6000
Maximum Overload (ppm)	15	60	150	1500	7000
Resolution	1 ppb	10 ppb	25 ppb	250 ppb	500 ppb
Sensitivity	≥40 mV/ppm	≥12 mV/ppm	≥6 mV/ppm	≥0.6 mV/ppm	≥0.1 mV/ppm
Linearity (isobutylene)	≥99%	≥99%	≥99%	≥96%	≥92%

Common to All Variants

Response Time	$T_{90} \leq 5 \text{ s}$
Operating Current	$\leq 35 \text{ mA}$

■ ENVIRONMENTAL SPECIFICATIONS

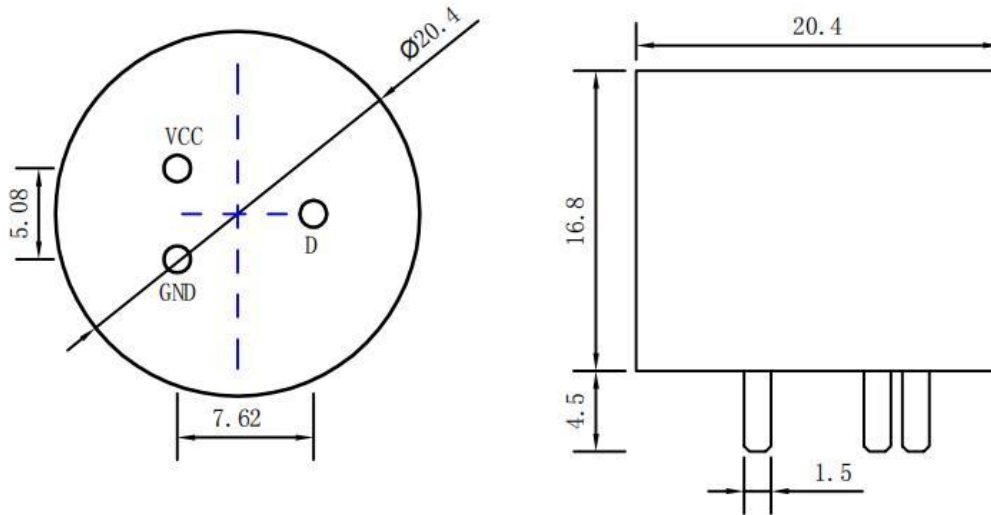
Temperature & Humidity

Operating Temperature	-20 to +60°C (-4 to +140°F)
Operating Humidity	< 95% RH (non-condensing)
Storage Temperature	0 – 30°C (32 – 86°F)
Storage Humidity	< 95% RH

Other

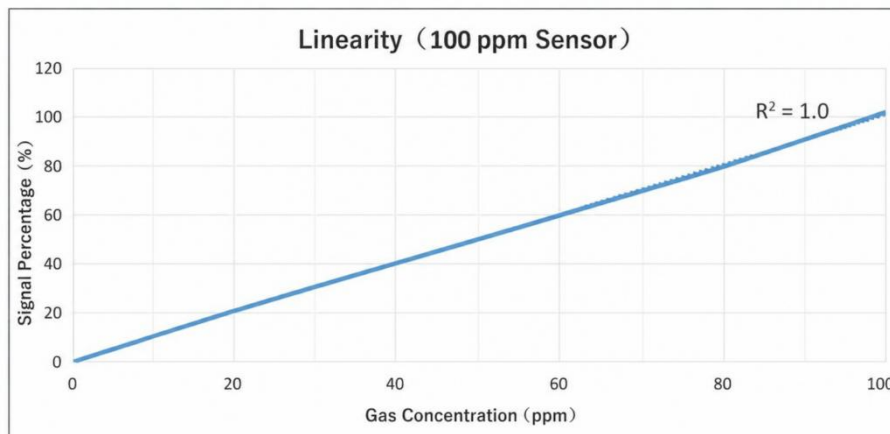
Operating Pressure	80 – 120 kPa
Service Life	5 years (UV lamp not included)

■ MECHANICAL DIMENSIONS

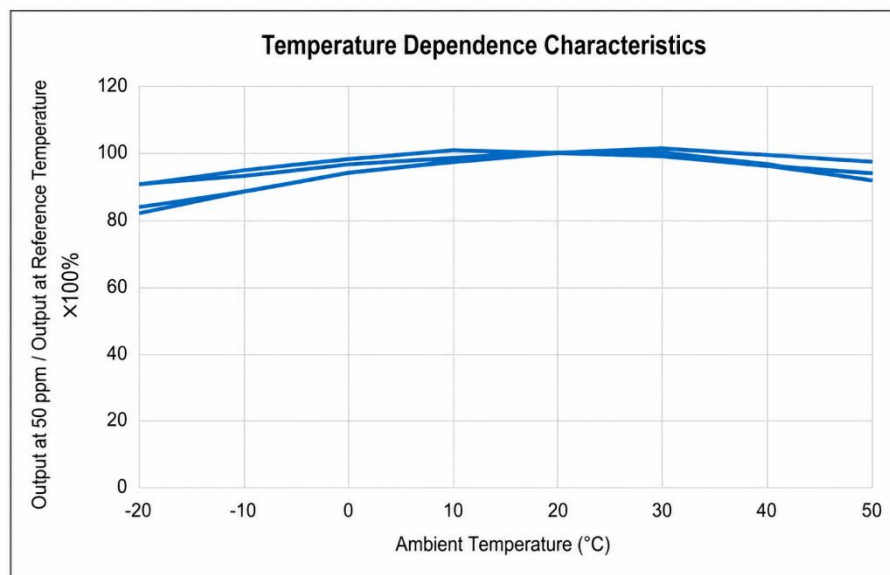


Sensor Outline Dimensions (mm)

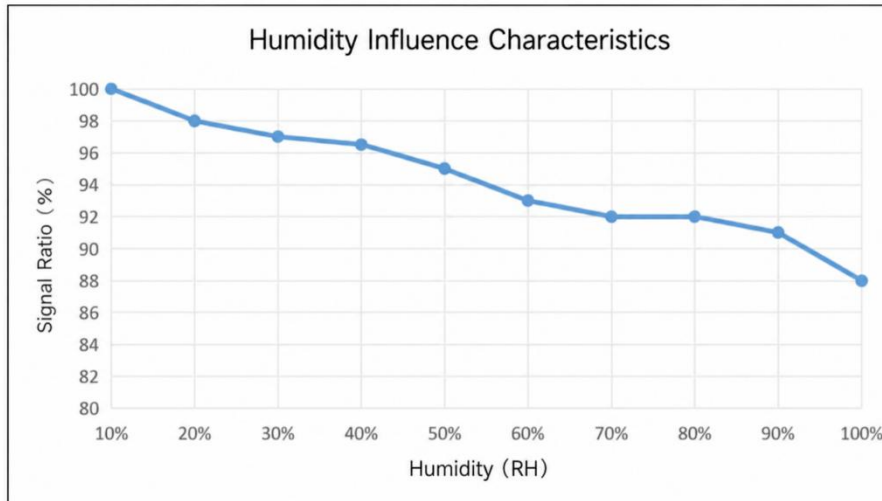
■ SENSOR CHARACTERISTICS



Typical Linearity Curve (100 ppm Sensor)



Effect of Temperature on Sensor Output



Effect of Humidity on Sensor Output

■ CALIBRATION & RESPONSE FACTOR (CF)

The Response Factor (CF) is the ratio of the sensitivity to isobutylene versus the sensitivity to the target gas. After calibrating the sensor with isobutylene, the target-gas concentration can be estimated using its CF value. For example, if the sensitivity to isobutylene is 5 mV/ppm and the sensitivity to the target gas toluene is 10 mV/ppm, the CF value for toluene is 0.5. Note that concentrations calculated using a response factor are approximate; the accurate calibration method is to calibrate directly with the target gas.

The recommended calibration interval is approximately six months. In harsh operating environments, the UV-lamp window inside the sensor may become contaminated, blocking part of the UV radiation from reaching the target gas, which reduces sensitivity and causes drift. In such cases, the UV-lamp window should be cleaned periodically and the sensor recalibrated.

If sensitivity decreases or drifts, the sensor should be serviced: remove the sensor's top cover, then remove the dust-proof membrane and the plastic housing containing the electrode plates to access the UV-lamp window. Use a cotton swab dampened with methanol, acetone, or alcohol to wipe the UV-lamp window and the electrode-plate housing separately. Do not touch the UV-lamp window with your hands.

■ NOTES / PRECAUTIONS

- The sensor must be allowed to warm up on first use.
- Dry, clean air is recommended for zero-point calibration.
- A 50%-of-range isobutylene concentration is recommended for span calibration.
- Do not insert or remove the sensor while powered.
- Do not solder the sensor pins.
- The sensor must not be subjected to excessive impact or vibration.

■ ORDERING INFORMATION

Complete model number example: **SX-GVOCPSA-S91**

Gas Range	
6	0 – 10 ppm
S	0 – 40 ppm
3	0 – 100 ppm
T	0 – 6000 ppm
K	0 – 10000 ppm
Zero Accuracy	
9	2%

Output	
1	Voltage
Customized	
D	Customized — specify requirements when ordering