



GENERAL MONITORS
Protection for life.

H₂S Sensors and Accessories



Features

- Solid-state, not wet cell, operation
- Highly selective to H₂S
- Long service life, typically 3 to 5 years
- Not affected by over-range exposure or continuous exposure to H₂S
- Temperature controlled well above ambient
- Robust mechanical design

Benefits

- Functions in the harshest environments
- Low risk of false alarms
- Maximum reliability and low cost of ownership
- Durable in all applications
- Copes with low temperatures and high humidity
- Vibration and shock resistant

Description

General Monitors' hydrogen sulfide (H₂S) sensor is a solid state semiconductor, diffusion, adsorption device, designed and manufactured to the highest quality standards. It is specifically sensitive to H₂S and remains unaffected by high concentrations of other gases such as methane and hydrogen, which are often present in the same areas. A high tolerance to ambient temperature variations (temperature range of -40°F to +195°F (-40°C to +90°C)) and extreme humidity conditions is an outstanding feature of this sensor, as is the ability to withstand exposure to extremely high H₂S concentrations without any harmful effects.

The operating principle is based on the fact that the semiconductor will preferentially adsorb H₂S, in which the resistance across its surface is reduced at a rate proportional to the concentration present. This signal is fed to the controller where it is linearized to drive a display and provide alarm outputs. The sensor substrate is maintained at an elevated temperature by means of a thermistor and a potted temperature control circuit, thus negating any effects caused by variations in ambient temperature and humidity.

Often called a "MOS" (metal oxide semiconductor) sensor, it is the key part of all General Monitors' smart and control card-based H₂S detection systems. With many advantages over the alternative electrochemical cell-based instruments, it is the heart of plant safety systems throughout the world. The sensor is safely and conveniently calibrated using a single ampoule method provided. Disposable canisters of pre-mixed H₂S with air are also available.

The key design features, with the corresponding benefits, are summarized above. There are small design differences according to the approval type and junction box used, but all General Monitors plants and sales offices can provide all types on demand. All have the same outstanding properties and a typical operational life of 3-5 years.

Approvals range from FM to CSA in North America to ATEX and GOST for Europe and Russia, in addition, the MOS sensors meet the stringent performance standards of ISA S92.0.01 Part 1 - 1998 requirements as verified by FM. Sensor bodies are in corrosion resistant aluminum alloy or a 316 grade stainless steel. A wide variety of accessories are available to provide additional protection against airborne contaminants or for mounting in ducts or sample lines.

Applications

- Oil Refining
- Oil and Gas Exploration and Production
- Sulfur Recovery Plants
- Chemical Plants
- Compressor Stations
- LNG Plants
- Sewage and Water Treatment Plants
- Gas Turbines

H₂S Sensors

Sensor Locations

There are no standard rules for sensor placement, since the optimum sensor location is different for each application. Evaluation of facility conditions should make this determination. Generally, sensors should be:

- Mounted pointing down to prevent water build-up on the sensor head.
- Located near possible sources of gas leaks.
- Easily accessible for calibration checks.
- Located where prevailing air currents contain the maximum concentration of gas.
- Placed away from where it may be coated by contaminating substances.
- Located away from concentrated sources of heat based on its temperature specifications.



H ₂ S Sensors	
Sensor P/N	Description
50445-1	0-100 ppm, aluminum body, CSA, FM
50445-5	0-50 ppm, aluminum body, CSA, FM
50445-9	0-20 ppm, aluminum body, CSA, FM
50448-1HT	High Temperature 0-100 ppm, stainless steel body, CSA, FM
50448-5HT	High Temperature 0-50 ppm, stainless steel body, CSA, FM
50448-9HT	High Temperature 0-20 ppm, stainless steel body, CSA, FM
51457-1	0-100 ppm, sintered screen, stainless steel body, ATEX, CSA, GOST*
51457-5	0-50 ppm, sintered screen, stainless steel body, ATEX, CSA, GOST*
51457-9	0-20 ppm, sintered screen, stainless steel body, ATEX, CSA, GOST*

Measuring Range:	0-20, 0-50, 0-100 ppm
Type:	Continuous diffusion, adsorption type
Response Time:	Wire screen flame arrestor version: T50 ≤ 1 min. of full scale with full scale concentration applied * With sintered stainless steel flame arrestor: T50 ≤ 2 min. of full scale with full scale concentration applied
Temperature Range:	Standard Sensor: -65°F to +167°F (-55°C to +75°C) High Temperature Sensor to +195°F (90°C) FM Approved: -40°F to +140°F (-40°C to +60°C)
Life:	Three to five years, normal service
Electrical Classification:	FM and CSA, Class I, Div. 1, Groups B, C and D; or ATEX and GOST Ex ds IIC T6
Warranty:	Two years

Sensor Housings:



P/N 10252-1, CSA, FM approved, explosion-proof housing



P/N B14-020 ATEX approved, polyester housing



Splash Guard (P/N 10395-1)

The Splash Guard prevents water from entering the sensor cavity and affecting the element response and also acts as an effective windscreen. Constructed of rugged ABS plastic and threaded for simple screw-on installation, the Splash Guard has a series of internal baffles to deflect water down and away from the sensor.

Dust Guard (P/N 10110-1)

The General Monitors Dust Guard Assembly prevents dust and other particulate matter from reaching the sensor flame arrestor and affecting the sensor response. The Dust Guard is also available in a kit with twelve disposable screens (P/N 10044-1).

Ampoules of H₂S

These glass ampoules are manufactured under strict quality control for use with the field calibrator and are available in a range of concentrations.



Field Calibrator and Ampoules

Sintered Stainless Steel Dust Guard (P/N 1800822)

The General Monitors Sintered Stainless Steel Dust Guard protects the sensor from fine particulates. It should be used only in dry environments because the sintered disc has a tendency to absorb water and act as a gas diffusion barrier until it dries out. For accurate calibration, the sensor should be calibrated with the guard in position.

Sensor Flow Chamber (P/N 10066)

The Sensor Flow Chamber is constructed of aluminum (optional stainless steel) and is designed to be inserted into a sampling system.

Duct Mounting Plate (P/N 10041-x)

The Duct Mounting Plate is ideally suited to mount sensors for the monitoring of ducted air for living quarters in large offshore modules.

Field Calibrator (P/N 50000)

The General Monitors Field Calibrator (also referred to as a breaker bottle) provides a simple and efficient means of calibrating H₂S in the field. It consists of a plastic jar fitted with a removable lid and a seal which fits over the sensor. After an H₂S ampoule is placed in the ampoule holder, the screw assembly acts as a vice and breaks the ampoule releasing the gas for calibration purposes.



Accessories

Portable Purge Calibrator (P/N 1400250-x)

The H₂S Portable Purge Calibrator is a compact, practical, accurate and safe system for field calibration of H₂S sensors. The cylinder is filled with an H₂S in air mixture in one of seven separate parts per million (ppm) levels of concentration (10, 20, 25, 35, 50, 70 or 100). Using a known air/gas mixture reduces the possibility of error in field calibration.

The Portable Purge Calibrators are light-weight assemblies that are easy to carry. However, an optional carrying case is available for those desiring to carry more than 1 assembly at a time. The case can hold up to 2 complete assemblies and facilitates transporting them in the field.

Note: General Monitors recommends using ampoules for calibrating H₂S gas detection instruments. The H₂S Portable Purge Calibrator is available for applications where a calibration method of flowing H₂S gas to the sensor might provide a better calibration source (e.g. high humidity environments).



Specifications

Regulator

Flow Rate: 200 milliliters per minute
(12.2 cubic inches per minute)

Temperature

Range: -40°F to 130°F
(-40°C to 54°C)

Storage Humidity

Range: 5% to 100% RH non-condensing

Weight: Assembly 5 lbs.
Cylinder 3 lbs.
Case 4 lbs.

Cylinder Length: 13.5 inches

Cylinder Diameter: 3.5 inches

*Specifications subject to change without notice.
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