GENERAL MONITORS
*Protection for life.*

# $H_2S$ SENSORS AND ACCESSORIES



## Features

- Solid-state operation
- Highly selective -- does not respond to hydrocarbons
- Unaffected by over-range exposure
- Robust mechanical design
- Resistant to high humidity and wide range of ambient temperatures
- Specific sensors meet ISA-92.0.01 performance standard

## Benefits

- Functions in the harshest environments
- Low risk of false alarms
- Reduces need for sensor replacement
- Vibration and shock resistant
- Suitable for worldwide use
- Agency approved to strict performance standards

## Description

General Monitors' hydrogen sulfide ($H_2S$) sensors are solid state devices, designed and manufactured for long life and fast response. They are selective to $H_2S$ and remain unaffected by high concentrations of other substances like hydrogen, sulfur dioxide, and gasoline vapors, which are often present in facilities that process sour gas and crude oil.

A semiconductor device measures changes in electrical conductivity in a thin metal oxide film as a result of gas exposure. The change in conductivity is logarithmically correlated to the target gas concentration and used to supply a signal to the controller. The surface temperature of the film is maintained well above 100˚C to reduce effects of ambient temperature, humidity and improve selectivity.

Metal oxide semiconductor (MOS) sensors are an essential component of General Monitors' line of intelligent sensors and control card-based $H_2S$ detection systems. The sensors are easy to install and can be conveniently calibrated by using ampoules or disposable canisters of pre-mixed $H_2S$ with dry air. Several accessories extend the usefulness of these sensors by protecting them against water and dust or facilitating their installation in ducts and sampling systems.

A high tolerance to a broad range of temperatures and humidity enable these sensors to operate in rugged environments, as does their capacity to withstand exposure to high $H_2S$ concentrations over short periods.

The MOS sensors have been installed in extreme environments from the Saudi Arabian desert to the North Slope of Alaska.

Global sensor certifications include ATEX, CSA, FM, IECEx, and Russian approvals. Additionally, specific sensors conform to performance standard ISA-92.0.01.

## Applications

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

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# $H_2S$ SENSORS

## Sensor Selections

General Monitors' semiconductor sensors are available in three concentration ranges and in aluminum or stainless steel bodies. The sensors' ambient temperature ranges vary according to regulatory approval.

| Part Number | Range (ppm) | Material | Certificatons |
|---|---|---|---|
| 50445-1 | 0-100 | Aluminum | CSA, FM |
| 50445-5 | 0-50 | Aluminum | CSA, FM |
| 50445-9 | 0-20 | Aluminum | CSA, FM |
| 50448-1 | 0-100 | Stainless Steel | CSA, FM |
| 50448-5 | 0-50 | Stainless Steel | CSA, FM |
| 50448-9 | 0-20 | Stainless Steel | CSA, FM |
| 51457-1 | 0-100 | Stainless Steel | ATEX, CSA, IECEx, GOST-R |
| 51457-5 | 0-50 | Stainless Steel | ATEX, CSA, IECEx, GOST-R |
| 51457-9 | 0-20 | Stainless Steel | ATEX, CSA, IECEx, GOST-R |
| 51457-1L | 0-100 | Stainless Steel, Lugs | ATEX, CSA, IECEx, GOST-R |
| 51457-5L | 0-50 | Stainless Steel, Lugs | ATEX, CSA, IECEx, GOST-R |
| 51457-9L | 0-20 | Stainless Steel, Lugs | ATEX, CSA, IECEx, GOST-R |

## Sensor Specifications

**Type:** Metal Oxide Semiconductor (MOS)

**Response Time:**
With wire screen flame arrestor: $T_{50}$<14 seconds

With sintered stainless steel flame arrestor: $T_{50}$<30 seconds

On application of full scale gas according to ANSI/ISA-92.0.01

**Temperature Range:**

| | |
|---|---|
| CSA: | -40°F to +167°F (-40°C to +75°C) |
| FM: | -40°F to +140°F (-40°C to +60°C) |
| ATEX / IECEx: | -40°F to +248°F (-40°C to +120°C) |

**Life:** 3 - 5 years

**Electrical Classification:** Class I, Div. 1, Groups B, C, and D; Ex d IIC

**Warranty:** 2 years

## Sensor Housings:



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



P/N B14-020-1, ATEX approved, polyester increased safety housing (P/N B14-020-2 GOST approved)



Model S4000TH Intelligent Gas Detector



Model S4100T Intelligent Gas Detector

# ACCESSORIES




### 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 $H_2S$ (P/N 50004-x)
These glass ampoules are manufactured under strict quality control for use with the field calibrator and are available in a range of concentrations.

### 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 and is designed to be inserted into a sampling system.

### Duct Mounting Plate (P/N 10041-1)
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 $H_2S$ in the field. It consists of a plastic jar fitted with a removable lid and a seal which fits over the sensor. After an $H_2S$ ampoule is placed in the ampoule holder, the screw assembly acts as a vice and breaks the ampoule releasing the gas for calibration purposes.




Field Calibrator and Ampoules

# ACCESSORIES

The $H_2S$ Portable Purge Calibrator is a compact, practical, accurate and safe system for field calibration of $H_2S$ sensors. The cylinder is filled with an $H_2S$ in air mixture in one of six separate parts per million (ppm) levels of concentration (10, 20, 25, 35, 50, or 100). Using a known air/gas mixture reduces the possibility of error in field calibration.

The Portable Purge Calibrators are lightweight 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 $H_2S$ gas detection instruments. The $H_2S$ Portable Purge Calibrator is available for applications where a calibration method of flowing $H_2S$ 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.*

*Represented by:*

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