

**E-Chem Sensor Data**  
**Model H10-24 Hydrogen Sulfide (H<sub>2</sub>S ) Smart Sensor**

Model H10-24 Hydrogen Sulfide sensor is an electrochemical device used for the detection of H<sub>2</sub>S gas leaks in ambient air. It is designed to be used in conjunction with ATI's Model C16 portable leak detector or Models D12 or F12 toxic gas transmitters. H10-24 sensors contain internal electronics and memory that control sensor bias and store calibration data, calibration history, and limited data log.

H<sub>2</sub>S sensors operate by generating a small electrical current proportional to the partial pressure of H<sub>2</sub>S gas in the surrounding air. The current is the result of the direct oxidation of sulfide to sulfate as shown in the equation below. H<sub>2</sub>S sensors are 3-electrode sensors and require oxygen to function. They may not be used in applications where O<sub>2</sub> levels are below 5%.



The table below provides the operational and performance specifications for the H10-24 H<sub>2</sub>S sensor. Contact ATI or your ATI local representative with questions regarding specific applications for this sensor.

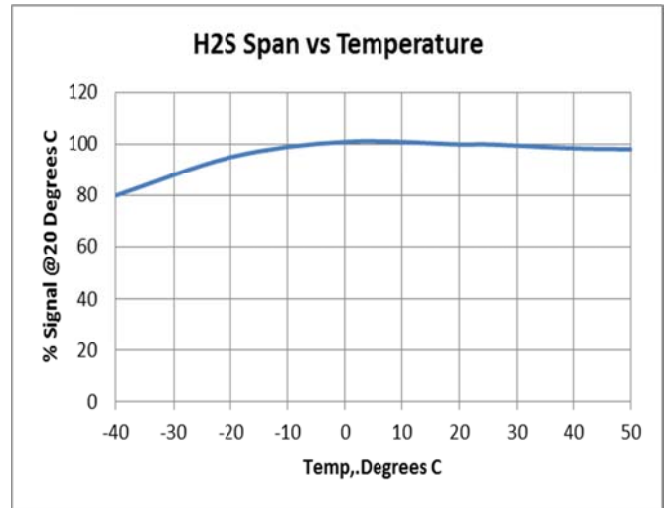
Primary Response	Volume % H <sub>2</sub> S
Measuring Range	0.1 – 200 PPM V/V (0.4 – 164 mg/m <sup>3</sup> )
Sensor Current	0.4 μA/PPM Nominal
Sensor Current Variability	0.15 – 0.80 μA/PPM
Linearity	± 3%
Response Time	T <sub>50</sub> = 50 Seconds, T <sub>90</sub> = 360 seconds
Temperature Range	-20° to +50° C
Memory	Internal e <sup>2</sup> memory for Calibration Data and Calibration History
Pressure Range:	- 5 to + 50 PSIG
Pressure Variability	Output proportional to HF partial pressure
Operating Humidity	0-99% RH Non-condensing (Intermittent) 20-95% RH Non-condensing (Continuous)
Zero Stability	± 0.2 PPM at constant temperature ± 0.3PPM over ±10° C ambient temperature change
Span Drift	< 2%/Month
Temperature Effect on Span	See Graph
Operating Life	> 24 Months Typical in Clean Conditions
Storage Recommendation	Recommended maximum of 1 year for best sensor performance. Store at less than 25° C in a sealed container.
Size	1" D x 1.25" H (25 mm x 32 mm)
Weight	17 grams

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H10-24 Hydrogen Sulfide sensors exhibit response to certain other gases. When applying this sensor to specific applications, it is good practice to verify whether or not any of these potential interferences are present and might present interference issues. Note that cross-sensitivity data is approximate. In some cases, response to other gases may not be stable or may be transient.

Electrochemical sensors exhibit a response that is temperature dependent to a limited extent. Although the effect of temperature is not large, it is useful to be aware of the effect. Shown below is a graph showing the effect on span (uA/PPM) of changing temperature.

Gas	Symbol	Response to 1 PPM
Ammonia	NH <sub>3</sub>	-0.005
Hydrogen Chloride	HCl	-0.005
Carbon Monoxide	CO	0.01
Carbon Dioxide	CO <sub>2</sub>	None
Nitric Oxide	NO	0.40
Ozone	O <sub>3</sub>	-0.05
Chlorine	Cl <sub>2</sub>	-0.05
Hydrogen	H <sub>2</sub>	0.0003
Nitrogen Dioxide	NO <sub>2</sub>	0.01
Sulfur Dioxide	SO <sub>2</sub>	0.08
Methyl Mercaptan	CH <sub>3</sub> SH	0.3
Hydrides	PH <sub>3</sub>	0.1
Ethanol (alcohol)	C <sub>2</sub> H <sub>6</sub> O	0.015



Shown below is a typical response time graph for an H<sub>2</sub>S sensor. Note that this response time can become significantly slower at temperatures below -20°C.

