E-Chem Sensor Data
Model H10-18, PPM Hydrogen (H_2) Smart Sensor

Model H10-18 Hydrogen gas sensor is an electrochemical device used for the measurement of H_2 in ambient air. It is designed to be used in conjunction with ATI's Model C16 portable leak detector or Models D12 or F12 gas transmitters. H10-18 sensors contain internal electronics and memory that control sensor bias and store calibration data, calibration history, and limited data log.

H_2 sensors operate by generating a small electrical current proportional to the volumetric concentration of hydrogen gas in the surrounding air. The current is the result of the oxidation of hydrogen on the surface of a catalytic electrode, with a resulting signal that is linear with respect to hydrogen concentration. Hydrogen sensors are 3-electrode sensors and require the presence of at least 5% oxygen to operate properly. They are not suitable for use in oxygen free environments.

$$H_2 \rightarrow 2H^+ + 2e^-$$

The table below provides the operational and performance specifications for the H10-18 H_2 sensor. Contact ATI or your ATI local representative with questions regarding specific applications for this sensor.

Primary Response	Volume % H_2
Measuring Range	10-2000 PPM V/V
Sensor Current	0.3 nA/PPM H_2 Nominal
Sensor Current Variability	0.15 – 0.5 nA/PPM
Linearity	± 2%
Response Time	T_{50} = 20 Seconds, T_{90} = 75 seconds
Temperature Range	-30° to +55° C
Memory	Internal e^2 memory for Calibration Data and Calibration History
Pressure Range:	- 3 to + 3 PSIG
Pressure Variability	<0.1% per 1% change in pressure
Operating Humidity	0-99% RH Non-condensing (Intermittent) 5-95% RH Non-condensing (Continuous)
Zero Stability	± 5 PPM H_2 at constant temperature ± 10 PPM H_2 over ±10° C ambient temperature change
Span Drift	< 1%/Month
Temperature Effect on Span	See Graph
Operating Life	> 24 Months Typical in Clean Conditions
Storage Recommendation	Recommended maximum of 6 months 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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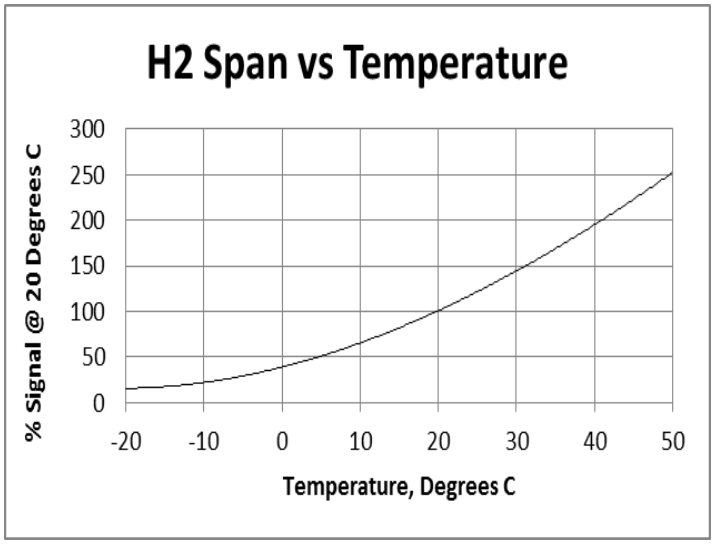
H10-18 Hydrogen sensors respond to very few other gases. When applying this sensor to specific applications, it is good practice to verify whether or not any potential interferences are present and might present interference issues. Note that cross-sensitivity data is approximate and based on exposures under 100 PPM. In some cases, response to other gases may not be stable or may be transient.

Gas	Symbol	Response to 1 PPM
Carbon Monoxide	CO	0.1
Acetylene	C_2H_2	0.1
Ethylene	C_2H_4	0.1
Ethanol (alcohol)	C_2H_6O	None
Nitrogen Dioxide	NO_2	None
Sulfur Dioxide	SO_2	None
Hydrogen Sulfide	H_2S	None
Methyl Mercaptan	CH_3SH	None
Chlorine	Cl_2	None
Hydrogen Cyanide	HCN	None
Hydrogen Peroxide	H_2O_2	None
Ammonia	NH_3	None
Hydrogen Chloride	HCl	None
Carbon Dioxide	CO_2	None
Nitric Oxide	NO	None
Hydrogen Fluoride	HF	None

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 of changing temperature.



Shown below is a typical response time graph for an H_2 sensor. Note that this response time can become significantly slower at temperatures below -25°C.