

# SOH-A2 Sulfur Dioxide – Hydrogen Sulfide



**Introduction**

Personal gas safety monitors can be found in almost every industry, with the requirement for multiple gas detection becoming commonplace.

Sulfur gases are toxic with a complex chemistry. Measuring both SO<sub>2</sub> and H<sub>2</sub>S provides the information for separating the corrosive gases, but with different toxicologies.

## Specification Sulfur Dioxide Channel

Performance	Sensitivity	nA/ppm in 10ppm SO <sub>2</sub>	140 to 250
	Response time	t90 (s) from zero to 10ppm SO <sub>2</sub>	< 15
	Zero current	ppm equivalent in zero air	< ± 0.2
	Resolution	rms noise (ppm equivalent)	< 0.2
	Range	ppm SO <sub>2</sub> limit of performance warranty	20
	Linearity	ppm error at full scale, linear at zero and 10ppm SO <sub>2</sub>	< ± 2
	Overgas limit	ppm maximum SO <sub>2</sub> for stable response to gas pulse	50
Lifetime	Zero drift	ppm equivalent change/year in lab air	< 0.5
	Sensitivity drift	% change/year in lab air, monthly test	< 6
	Operating life	months until 80% original signal (24-month warranted)	24
Environmental	Sensitivity @ -20°C	% (output @ -20°C/output @ 20°C) @ 10ppm SO <sub>2</sub>	80 to 100
	Sensitivity @ 50°C	% (output @ 50°C/output @ 20°C) @ 10ppm SO <sub>2</sub>	70 to 100
	Zero @ -20°C	ppm equivalent change from 20°C	-0.2 to 0.2
	Zero @ 50°C	ppm equivalent change from 20°C	0.2 to 0.8
Cross Sensitivity	Filter capacity	ppm hours of Hydrogen Sulfide	nd
	H <sub>2</sub> S sensitivity	% measured gas @ 20ppm	H <sub>2</sub> S < 15
	NO <sub>2</sub> sensitivity	% measured gas @ 10ppm	NO <sub>2</sub> < -150
	Cl <sub>2</sub> sensitivity	% measured gas @ 10ppm	Cl <sub>2</sub> < -50
	NO sensitivity	% measured gas @ 50ppm	NO < 50
	CO sensitivity	% measured gas @ 400ppm	CO < 2
	H <sub>2</sub> sensitivity	% measured gas @ 400ppm	H <sub>2</sub> @ 20°C < 1
	C <sub>2</sub> H <sub>4</sub> sensitivity	% measured gas @ 400ppm	C <sub>2</sub> H <sub>4</sub> < 40
	NH <sub>3</sub> sensitivity	% measured gas @ 20ppm	NH <sub>3</sub> < ± 0.5
Key Specifications	Temperature range	°C	-30 to 50
	Pressure range	kPa	80 to 120
	Humidity range	% rh continuous (see note below)	15 to 90
	Storage period	months @ 3 to 20°C (stored in sealed pot)	6
	Load resistor	Ω (recommended)	10 to 47
	Weight	g	< 6

**Figure 1 SO<sub>2</sub> Channel response to 20ppm SO<sub>2</sub>**

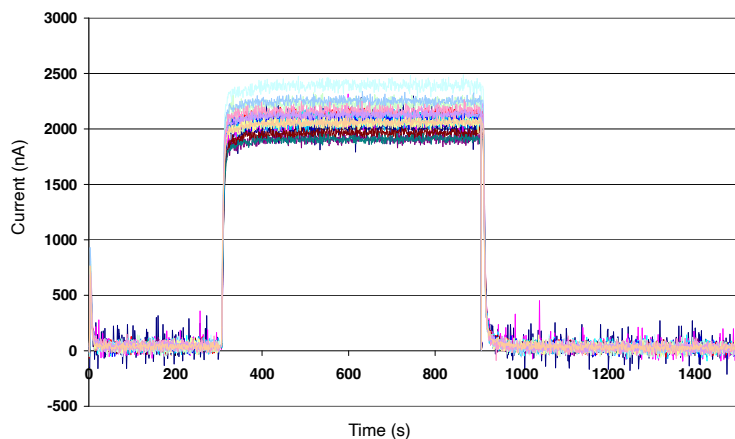


Figure 1 shows the SOH-A2 fast response, stable output and return to baseline in 20ppm SO<sub>2</sub>.

**Figure 2 SO<sub>2</sub> Channel Sensitivity Temperature Dependence**

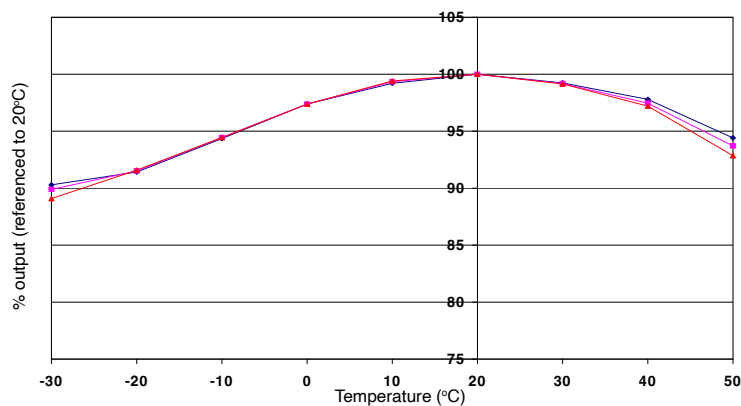


Figure 2 shows the % variation in sensitivity caused by changes in temperature.  
The data is taken from a typical batch of sensors.

**Figure 3 Channel Zero Temperature Dependence**

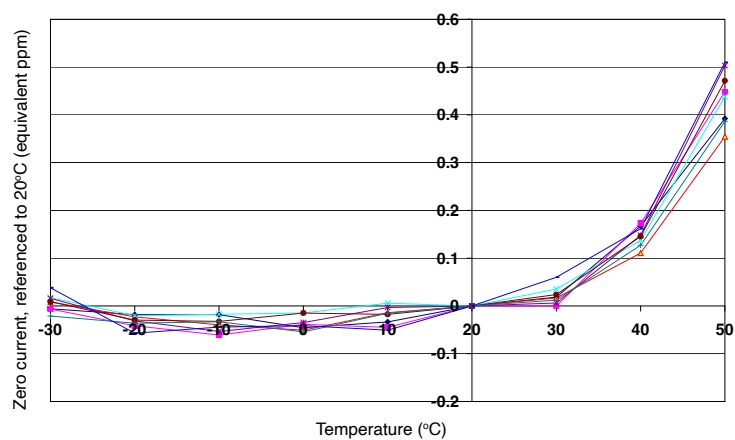
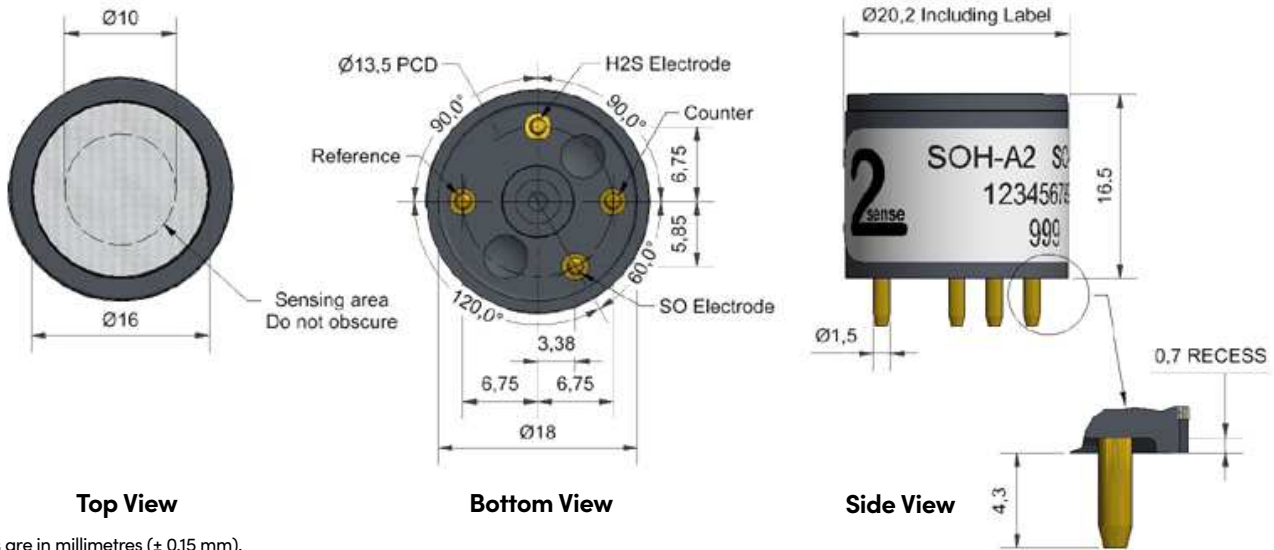


Figure 3 shows the variation in zero output caused by changes in temperature, expressed as ppm gas equivalent, referenced to the zero current at 20°C.  
This data is taken from a typical batch of sensors.



Dimensions are in millimetres ( $\pm 0.15$  mm).

### Specification Hydrogen Sulfide Channel

<b>Performance</b>	Sensitivity	nA/ppm in 20ppm H <sub>2</sub> S	450 to 900
	Response time	t <sub>90</sub> (s) from zero to 20ppm H <sub>2</sub> S @ 20°C	< 25
	Zero current	ppm equivalent in zero air	$\pm 0.25$
	Resolution	rms noise (ppm equivalent)	< 0.1
	Range	ppm H <sub>2</sub> S limit of performance warranty	100
	Linearity	ppm error at full scale, linear at zero and 20ppm H <sub>2</sub> S	< $\pm 5$
	Overgas limit	maximum ppm H <sub>2</sub> S for stable response to gas pulse	200

<b>Lifetime</b>	Zero drift	ppm equivalent change/year in lab air	< 0.1
	Sensitivity drift	% change/year in lab air, monthly test	< 2
	Operating life	months until 80% original signal (24-month warranted)	24

<b>Environmental</b>	Sensitivity @ -20°C	% (output @ -20°C/output @ 20°C) @ 20ppm H <sub>2</sub> S	75 to 90
	Sensitivity @ 50°C	% (output @ 50°C/output @ 20°C) @ 20ppm H <sub>2</sub> S	100 to 112
	Zero @ -20°C	ppm equivalent change from 20°C	$\pm 0.05$
	Zero @ 50°C	ppm equivalent change from 20°C	0.2

<b>Cross Sensitivity</b>	NO <sub>2</sub> sensitivity	% measured gas @ 10ppm	NO <sub>2</sub>	< -30
	Cl <sub>2</sub> sensitivity	% measured gas @ 10ppm	Cl <sub>2</sub>	< -25
	NO sensitivity	% measured gas @ 50ppm	NO	< 30
	SO <sub>2</sub> sensitivity	% measured gas @ 10ppm	SO <sub>2</sub>	< 30
	CO sensitivity	% measured gas @ 400ppm	CO	< 1.5
	H <sub>2</sub> sensitivity	% measured gas @ 400ppm	H <sub>2</sub>	< 0.3
	C <sub>2</sub> H <sub>4</sub> sensitivity	% measured gas @ 400ppm	C <sub>2</sub> H <sub>4</sub>	< 0.2
	NH <sub>3</sub> sensitivity	% measured gas @ 20ppm	NH <sub>3</sub>	< 2

Figure 4 H<sub>2</sub>S Channel Response to 25ppm H<sub>2</sub>S

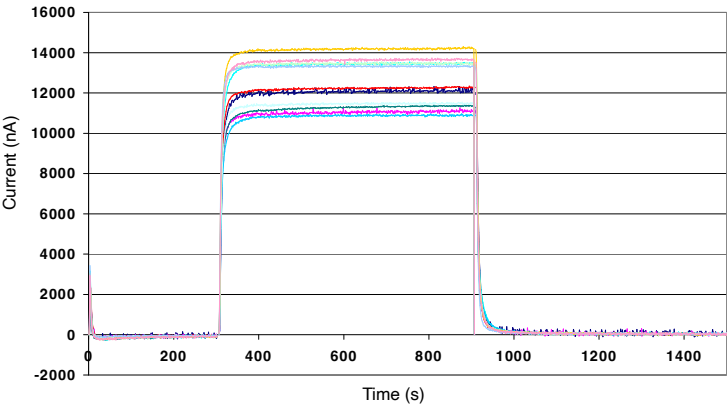


Figure 4 shows the SOH-A2 fast response, stable output and return to baseline in 20ppm H<sub>2</sub>S.

Figure 5 H<sub>2</sub>S Channel Sensitivity Temperature Dependence

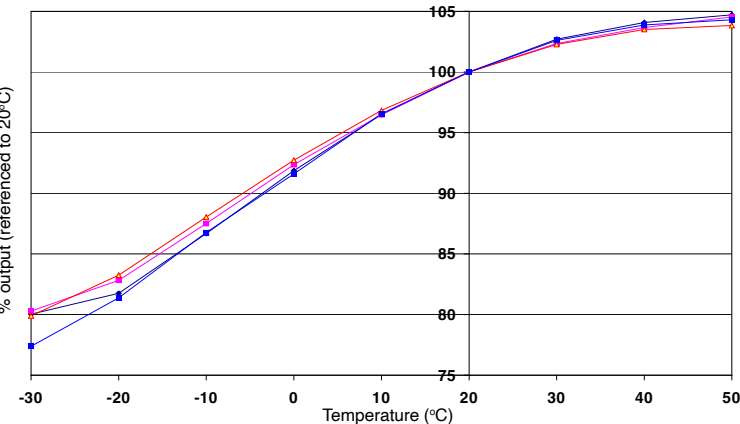


Figure 5 shows the % variation in sensitivity caused by changes in temperature.  
The data is taken from a typical batch of sensors.

Figure 6 H<sub>2</sub>S Channel Zero Temperature Dependence

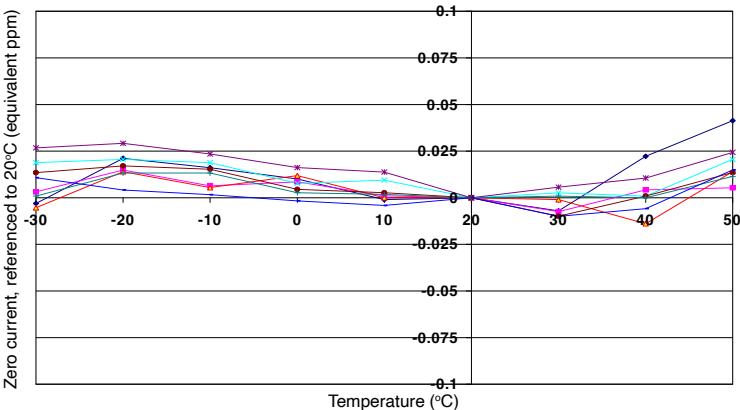


Figure 6 shows the variation in zero output caused by changes in temperature, expressed as ppm gas equivalent, referenced to the zero at 20°C.  
This data is taken from a typical batch of sensors.

Note: Above 85% rh and 40°C a maximum continuous exposure period of 10 days is warranted. Where such exposure occurs the sensor will recover normal electrolyte volumes, when allowed to rest at lower %rh and temperature levels for several days.

At the end of the product's life, do not dispose of any electronic sensor, component or instrument in the domestic waste, but contact the instrument manufacturer, Alphasense or its distributor for disposal instructions. NOTE: all sensors are tested at ambient environmental conditions unless otherwise stated. As applications of use are outside our control, the information provided is given without legal responsibility. Customers should test under their own conditions, to ensure that the sensors are suitable for their own requirements.

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