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_2 and H_2S provides the information for separating the corrosive gases, but with different toxicologies.

Specification Sulfur Dioxide Channel

Performance	Sensitivity	nA/ppm in 10ppm SO_2		140 to 250
	Response time	t90 (s) from zero to 10ppm SO_2		< 15
	Zero current	ppm equivalent in zero air		< ± 0.2
	Resolution	rms noise (ppm equivalent)		< 0.2
	Range	ppm SO_2 limit of performance warranty		20
	Linearity	ppm error at full scale, linear at zero and 10ppm SO_2		< ± 2
	Overgas limit	ppm maximum SO_2 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_2		80 to 100
	Sensitivity @ 50°C	% (output @ 50°C/output @ 20°C) @ 10ppm SO_2		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_2S sensitivity	% measured gas @ 20ppm	H_2S	< 15
	NO_2 sensitivity	% measured gas @ 10ppm	NO_2	< -150
	Cl_2 sensitivity	% measured gas @ 10ppm	Cl_2	< -50
	NO sensitivity	% measured gas @ 50ppm	NO	< 50
	CO sensitivity	% measured gas @ 400ppm	CO	< 2
	H_2 sensitivity	% measured gas @ 400ppm	H_2 @ 20°C	< 1
	C_2H_4 sensitivity	% measured gas @ 400ppm	C_2H_4	< 40
	NH_3 sensitivity	% measured gas @ 20ppm	NH_3	< ± 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

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Figure 1 SO_2 Channel response to 20ppm SO_2

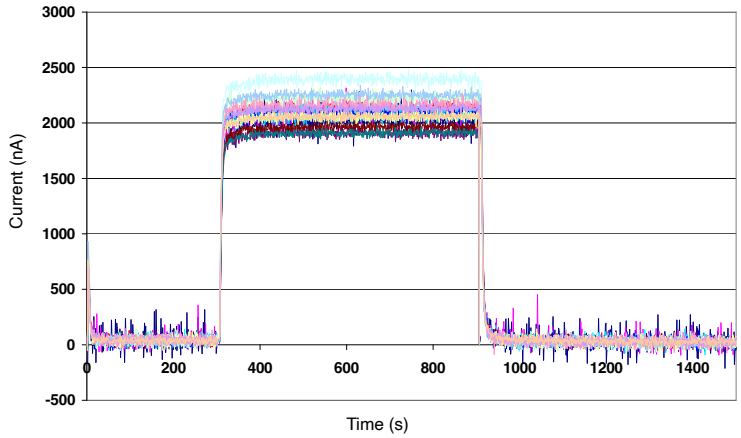


Figure 1 shows the SOH-A2 fast response, stable output and return to baseline in 20ppm SO_2.

Figure 2 SO_2 Channel Sensitivity Temperature Dependence

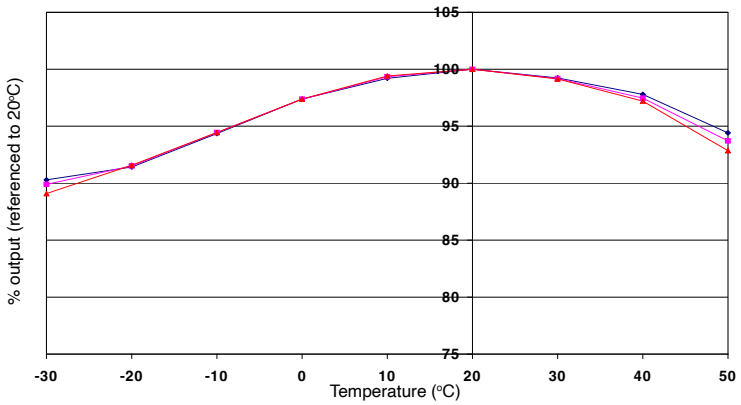


Figure 2 shows the % variation in sensitivity caused by changes in temperature.

The data is taken from a typical batch of sensors.

Figure 3 Channel Zero Temperature Dependence

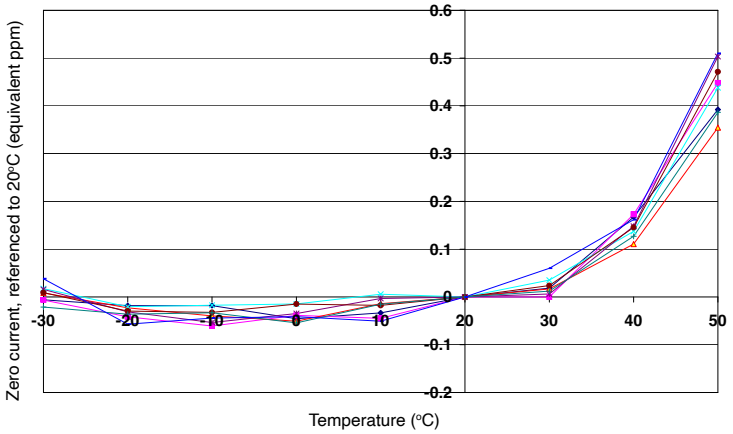
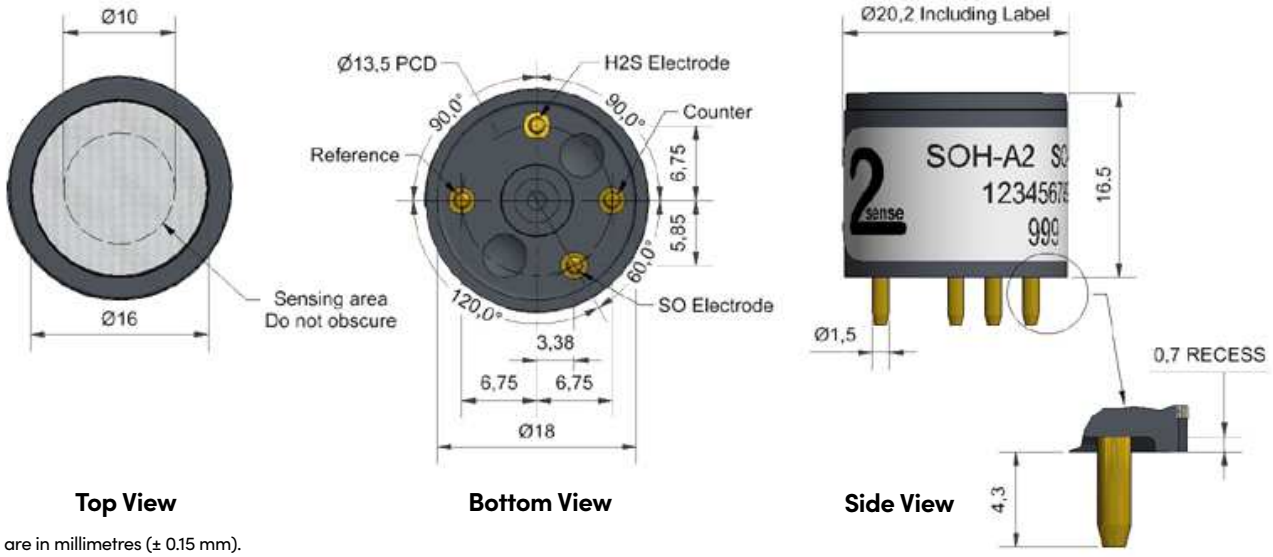


Figure 3 shows the variation in zero output caused by changes in temperature, expressed as ppm gas equivalent, referenced to the zero current at 20°C.

This data is taken from a typical batch of sensors.



Top View **Bottom View** **Side View**

Dimensions are in millimetres (± 0.15 mm).

Specification Hydrogen Sulfide Channel

Performance	Sensitivity	nA/ppm in 20ppm H_2S	450 to 900
	Response time	t90 (s) from zero to 20ppm H_2S @ 20°C	< 25
	Zero current	ppm equivalent in zero air	± 0.25
	Resolution	rms noise (ppm equivalent)	< 0.1
	Range	ppm H_2S limit of performance warranty	100
	Linearity	ppm error at full scale, linear at zero and 20ppm H_2S	< ± 5
	Overgas limit	maximum ppm H_2S for stable response to gas pulse	200
Lifetime	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
Environmental	Sensitivity @ -20°C	% (output @ -20°C/output @ 20°C) @ 20ppm H_2S	75 to 90
	Sensitivity @ 50°C	% (output @ 50°C/output @ 20°C) @ 20ppm H_2S	100 to 112
	Zero @ -20°C	ppm equivalent change from 20°C	± 0.05
	Zero @ 50°	ppm equivalent change from 20°C	0.2

Cross Sensitivity	NO_2 sensitivity	% measured gas @ 10ppm	NO_2	< -30
	Cl_2 sensitivity	% measured gas @ 10ppm	Cl_2	< -25
	NO sensitivity	% measured gas @ 50ppm	NO	< 30
	SO_2 sensitivity	% measured gas @ 10ppm	SO_2	< 30
	CO sensitivity	% measured gas @ 400ppm	CO	< 1.5
	H_2 sensitivity	% measured gas @ 400ppm	H_2	< 0.3
	C_2H_4 sensitivity	% measured gas @ 400ppm	C_2H_4	< 0.2
	NH_3 sensitivity	% measured gas @ 20ppm	NH_3	< 2

For further information on the performance of this sensor, on other sensors in the range or any other subject, please contact Alphasense Ltd. or visit our website at "www.alphasense.com".

Figure 4 H_2S Channel Response to 25ppm H_2S

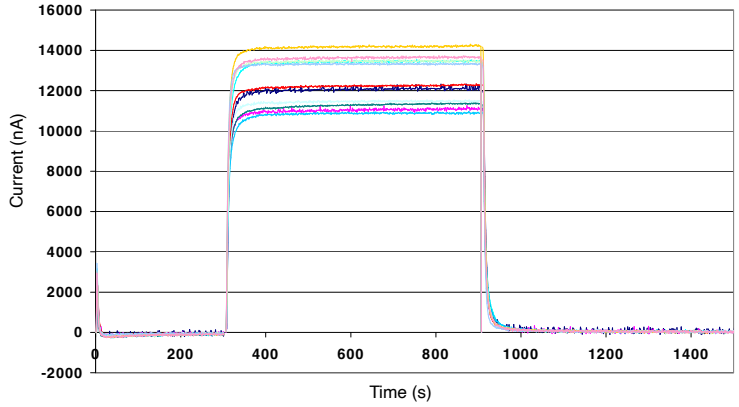


Figure 4 shows the SOH-A2 fast response, stable output and return to baseline in 20ppm H_2S.

Figure 5 H_2S Channel Sensitivity Temperature Dependence

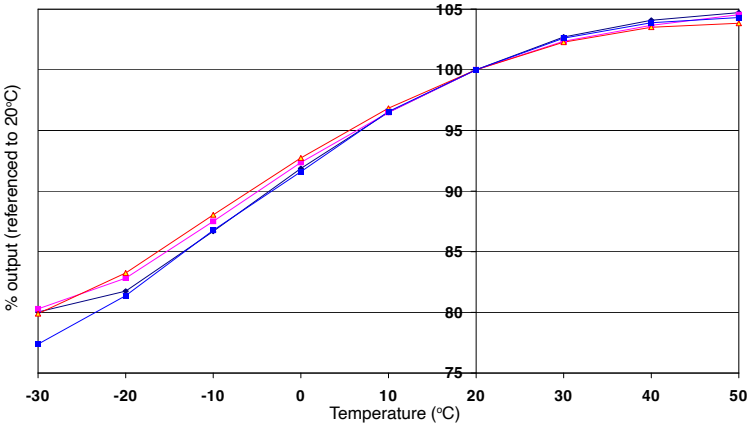


Figure 5 shows the % variation in sensitivity caused by changes in temperature.

The data is taken from a typical batch of sensors.

Figure 6 H_2S Channel Zero Temperature Dependence

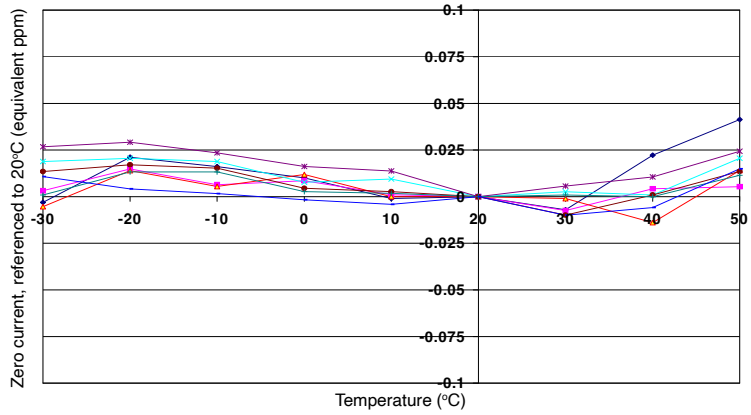


Figure 6 shows the variation in zero output caused by changes in temperature, expressed as ppm gas equivalent, referenced to the zero at 20°C.

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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