

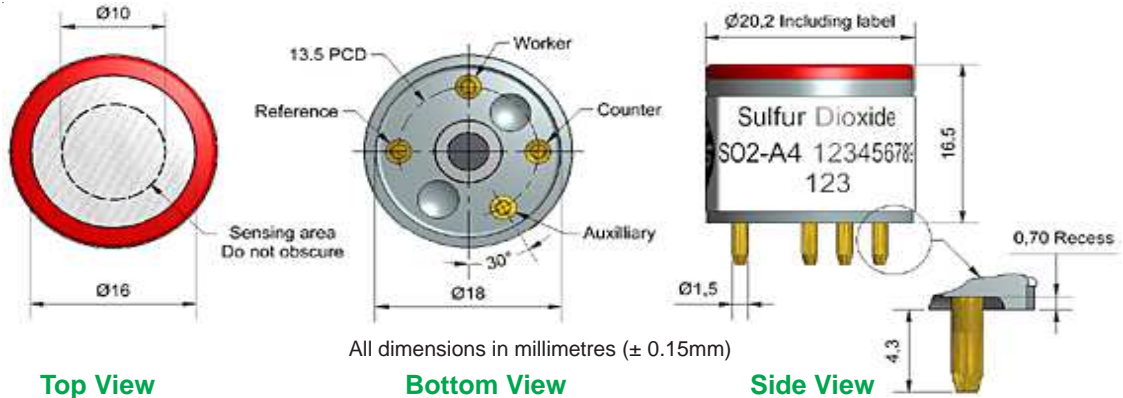


# SO<sub>2</sub>-A4 Sulfur Dioxide Sensor 4-Electrode



Patented

Figure 1 SO<sub>2</sub>-A4 Schematic Diagram



Technical Specification

PERFORMANCE	Parameter	Value	Range
	Sensitivity	nA/ppm at 2ppm SO <sub>2</sub>	320 to 500
	Response time	t <sub>90</sub> (s) from zero to 2ppm SO <sub>2</sub>	< 20
	Zero current	nA in zero air at 20°C	-80 to 80
	Noise*	$\pm 2$ standard deviations (ppb equivalent)	15
	Range	ppm limit of performance warranty	50
	Linearity	ppb error at 20ppm SO <sub>2</sub> , linear at zero and 2ppm SO <sub>2</sub>	0 to -5
	Overgas limit	maximum ppm for stable response to gas pulse	100

\* Tested with Alphasense AFE low noise circuit

LIFETIME	Parameter	Value	Range
	Zero drift	ppb equivalent change/year in lab air	< $\pm 20$
	Sensitivity drift	% change/year in lab air, monthly test	< $\pm 15$
	Operating life	months until 50% original signal (24 month warranted)	> 36

ENVIRONMENTAL	Parameter	Value	Range
	Sensitivity @ -20°C	(% output @ -20°C/output @ 20°C) @ 2ppm SO <sub>2</sub>	80 to 95
	Sensitivity @ 50°C	(% output @ 50°C/output @ 20°C) @ 2ppm SO <sub>2</sub>	90 to 110
	Zero @ -20°C	nA change from 20°C	< $\pm 25$
	Zero @ 50°C	nA change from 20°C	150 to 300

CROSS SENSITIVITY	Filter capacity	ppm-hrs	Value
	H <sub>2</sub> S sensitivity	% measured gas @ 5ppm	< 2
	NO <sub>2</sub> sensitivity	% measured gas @ 5ppm	< -120
	Cl <sub>2</sub> sensitivity	% measured gas @ 5ppm	< -80
	NO sensitivity	% measured gas @ 5ppm	< 4
	CO sensitivity	% measured gas @ 5ppm	< 3
	H <sub>2</sub> sensitivity	% measured gas @ 100ppm	< 1
	C <sub>2</sub> H <sub>4</sub> sensitivity	% measured gas @ 100ppm	< 1
	NH <sub>3</sub> sensitivity	% measured gas @ 20ppm	< 0.1
	CO <sub>2</sub> sensitivity	% measured gas @ 5%	< 0.1
	O <sub>3</sub> sensitivity	% measured gas @ 0.5ppm	< -120

KEY SPECIFICATIONS	Parameter	Value	Range
	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	$\Omega$ (AFE circuit is recommended)	33 to 100
	Weight	g	< 6

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, with 47 ohm load resistor, 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.



# SO2-A4 Performance Data

# Technical Specification

**Figure 2 Sensitivity Temperature Dependence**

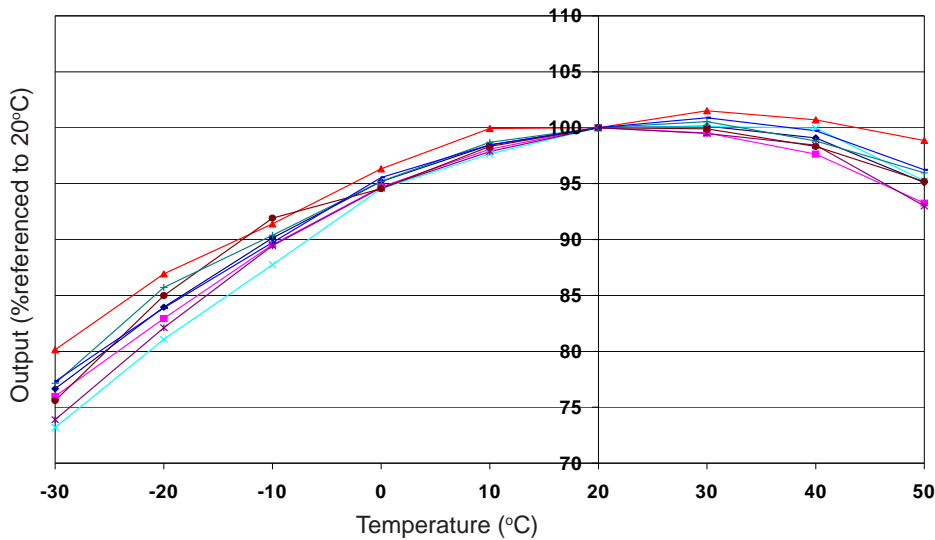


Figure 2 shows the temperature dependence of sensitivity at 2ppm SO<sub>2</sub>.

This data is taken from a typical batch of sensors.

**Figure 3 Zero Temperature Dependence**

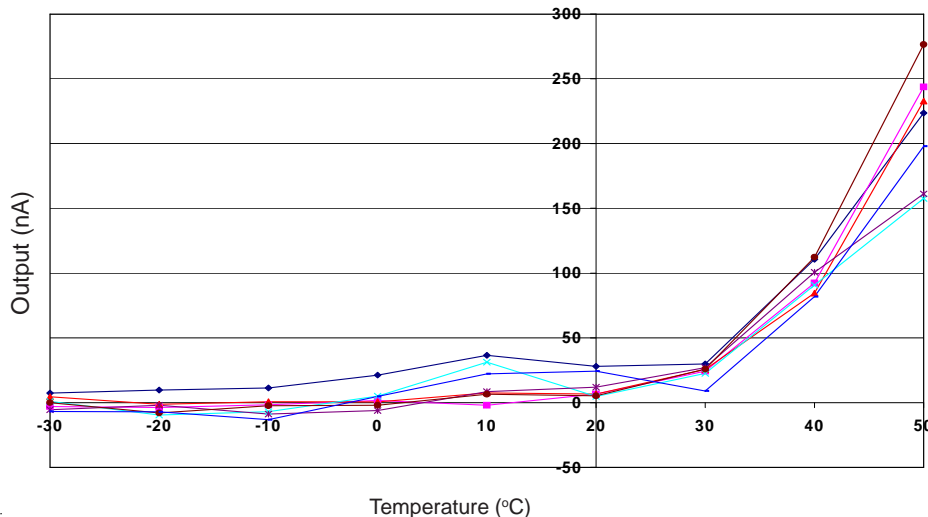


Figure 3 shows the variation in zero output of the working electrode caused by changes in temperature, expressed as nA.

This data is taken from a typical batch of sensors.

Contact Alphasense for further information on zero current correction.

**Figure 4 Response to 200ppb SO<sub>2</sub>**

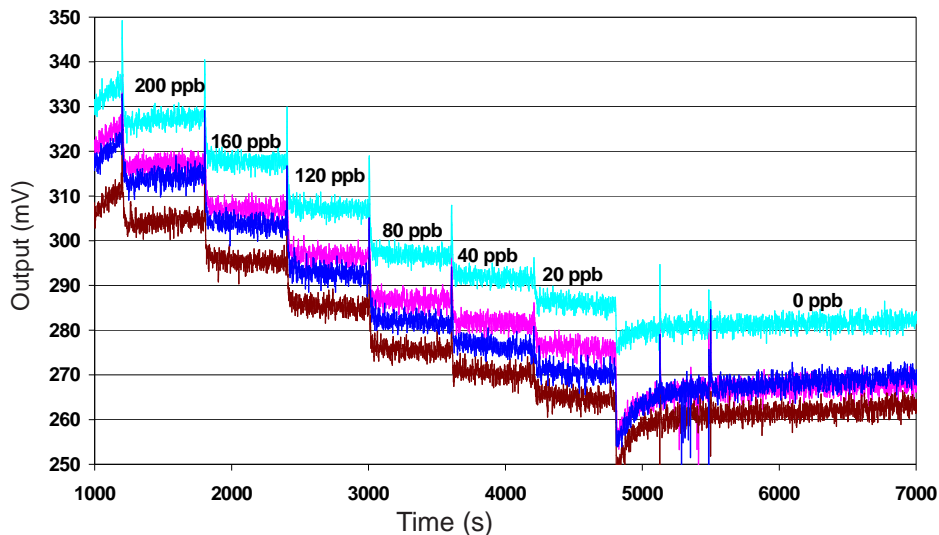


Figure 4 shows response from 20 to 200ppb SO<sub>2</sub>.

Use of Alphasense AFE circuit reduces noise to 15ppb, with the opportunity of digital smoothing to reduce noise even further.

For further information on the performance of this sensor, on other sensors in the range or any other subject, please contact Alphasense Ltd. For Application Notes visit "[www.alphasense.com](http://www.alphasense.com)".

*In the interest of continued product improvement, we reserve the right to change design features and specifications without prior notification. The data contained in this document is for guidance only. Alphasense Ltd accepts no liability for any consequential losses, injury or damage resulting from the use of this document or the information contained within. (©ALPHASENSE LTD) Doc. Ref. SO2-A4/NOV18*