Technical specifications version 1 0

COH-A2 CO and H2S

foreword

With the growing demand for gas detection, personal safety gas detectors are now widely used across various industries. Most such devices can simultaneously detect carbon monoxide and hydrogen sulfide. Alphasense's new dual-gas (H2S + CO) sensor significantly reduces manufacturing costs for detector designs while minimizing product size. 2sense employs a patented dual-gas sensor design methodology and its proprietary low-H2-sensitivity CO electrodes.

As a larger version of the proven D2 sensor on site, 2sense does not compromise on performance or long-term stability when measuring hydrogen sulfide and carbon monoxide, outperforming the standard dual-sensor solution.

CO channel specification

function	sensitivity	Sensitivity in 400ppmCO nA/ppm	50~100
	response time	Time from zero to 400ppmCO t90 (s)	< 35
	zero current	Equivalent ppm value of zero air	-3~+3.5
	resolution ratio	RMS noise (equivalent ppm value)	< 0.5
	scope	CO measurement limit (ppm) that guarantees product performance	1000
	degree of linearity	The ppm value of the full scale error is linear at 0~400ppmCO	10~40
	overload	Maximum ppm value of gas pulse stabilization reaction	5000
life span	zero drift	Equivalent ppm values that change in the laboratory air from year to year	< 0.5
	sensitivity drift	Percentage change in laboratory air over the year, measured monthly	< 4
	working life	Number of months output drops to 80% of original signal (guaranteed 24 months)	24
environment	-20°C sensitivity	100ppmCO when, (output at-20°C/ output at 20°C)%	30~50
	Sensitivity at 50°C	100ppmCO when, (50°C output/20°C output)%	120~145
	-20°C when zero point	Change in equivalent ppm value, reference 20°C	0~5
	50°C at zero point	Change in equivalent ppm value, reference 20°C	0~-5
cross connection	filter capacity	ppm- hour H_2S	1200
sensitivity	H_2S	Gas sensitivity percentage at 20ppmH_2S	< 12
	H_2	Gas sensitivity percentage $_2$ measured at 400ppmH(20°C)	< 8
	NO_2	Gas sensitivity percentage $_2$ measured at 10ppmNO	< 3
	Cl_2	Gas sensitivity percentage $_2$ measured at 10ppmCl	< 0.1
	NO	Gas sensitivity percentage measured at 50ppmNO	<100
	SO_2	Gas sensitivity percentage $_2$ measured at 20ppmSO	< 1
	C_2H_4	Gas sensitivity percentage measured at 400ppmC_2H_4	< 60
	NH_3	Gas sensitivity percentage $_3$ at 20ppmNH	±0.5
key parameter	temperature range	℃	-30~50
	pressure limit	Kpa	80~120
	Humidity range	Percentage of continuous relative humidity (see below)	15~90
	Storage period	3~20°C Sealing storage period (months)	6
	load resistance	Ω（recommend）	10~47
	weight	can	< 6

Figure 1 Temperature Sensitivity Characteristics of CO Channel

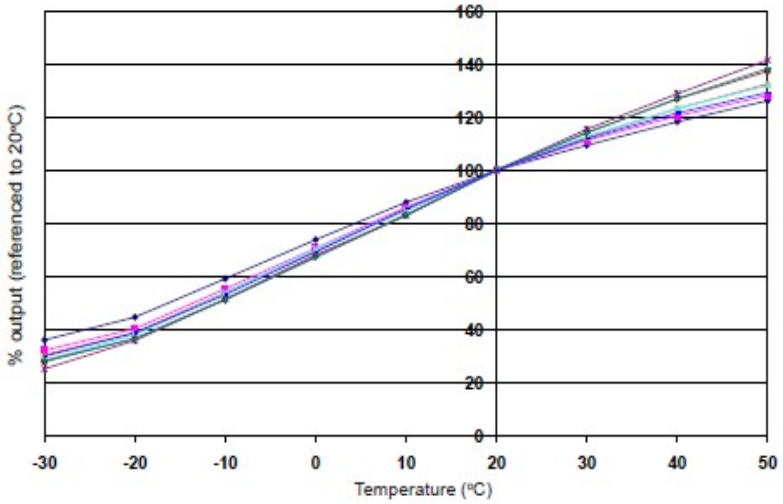


Figure 1 shows the percentage change in sensitivity caused by temperature changes (reference 20°C).

Data was taken from a typical batch of sensors.

FIG. 2 Zero Point Temperature Characteristics of CO Channel

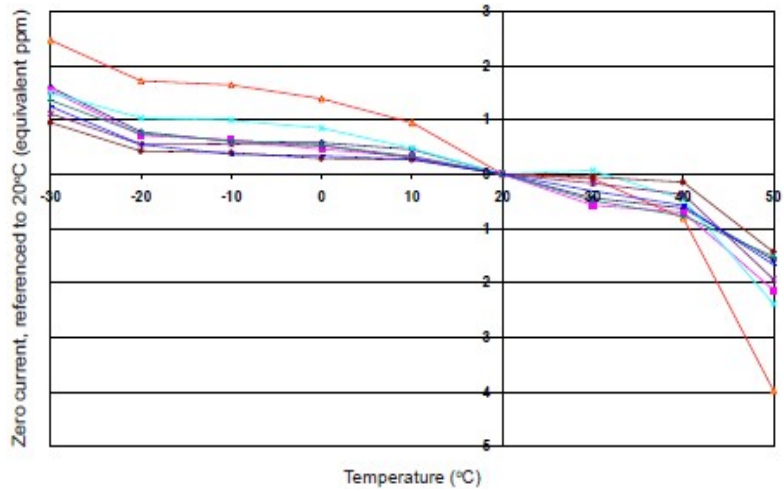


Figure 2 shows the change in zero point output caused by temperature changes, expressed as equivalent ppm values with reference to the zero point at 20°C.

Data was taken from a typical batch of sensors.

Figure 3 Reaction of CO Channel to 800ppmCO

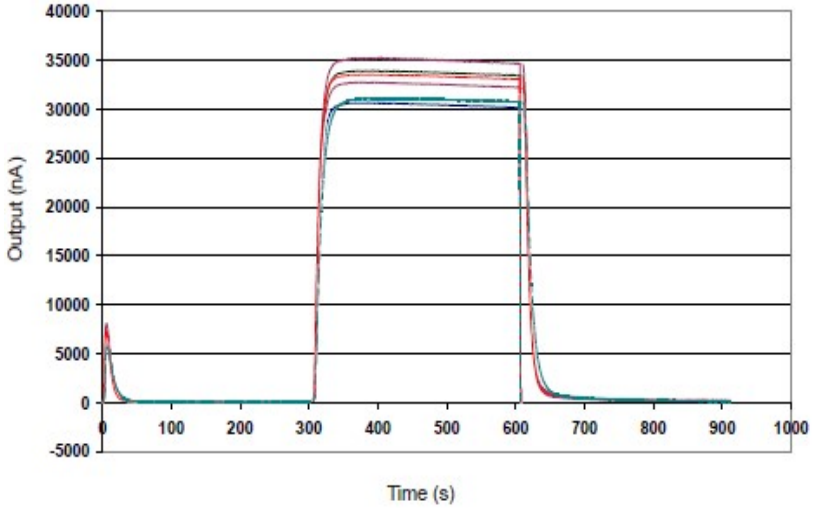
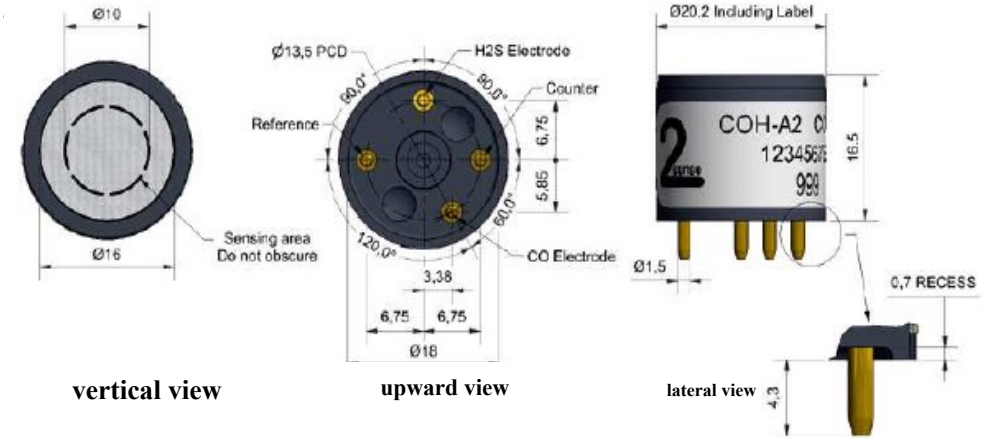


Figure 3 shows the reaction condition of a batch of transducers tested for 800 ppmCO. Fast and stable reaction is the embodiment of a robust sensor running well within the parameter range.



vertical view **upward view** **lateral view**

All dimensions are in mm (±0. 1mm)

H_2S channel specification

function	sensitivity	Sensitivity in 20ppmH_2S nA/ppm	650~1100
	reaction time	20℃ t90 time from zero to 20ppmH_2S (s)	< 30
	zero current	Equivalent ppm value in zero air	±0.25
	resolution ratio	RMS noise (equivalent ppm value)	< 0.1
	scope	H_2S measurement limit (ppm) that guarantees product performance	100
	degree of linearity	The ppm value of the full scale error is linear at 0~20ppmH_2S	< ±5
	overload	Maximum ppm value of gas pulse stabilization reaction	200
life span	zero drift	Equivalent ppm values that change in the laboratory air from year to year	< 0.1
	sensitivity drift	Percentage change in laboratory air over the year, measured monthly	< 2
	working life	Number of months output drops to 80% of original signal (guaranteed 24 months)	24
environment	-20°C sensitivity	At 20ppmH_2S, (output at-20°C/ output at 20°C)%	75~90
	50°C sensitivity	The change in equivalent ppm value of (50°C output/20	100~112
	-20°C is the zero point 50°C is the zero point	°C output)% at 20ppmH_2S, with reference to 20℃	< ±0.05
		Change in equivalent ppm value, reference 20℃	< 0~0.2
cross sensitivity	NO_2	Gas sensitivity percentage measured at 10ppmNO	< -30
	Cl_2	Gas sensitivity percentage measured at 10 ppmCl Gas sensitivity percentage measured at 50ppmNO Gas sensitivity percentage measured at 20ppmSO_2 Gas sensitivity percentage measured at 400ppmCO	< -25
	NO		< 30
	SO_2		< 30
	CO		< 1.5
	H_2 C_2H_4	Gas sensitivity percentage at 400ppmH_2	< 0.3
		Gas sensitivity percentage at 400ppmC_4	< 0.2
	NH_3	Gas sensitivity percentage at 20ppmNH_3	< 2

Figure 4 Reaction of the H_2S Channel to 25ppmH_2S

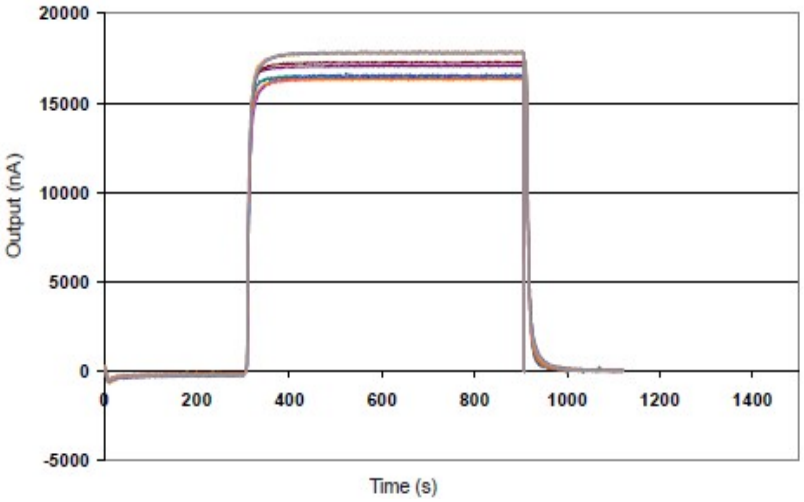


Figure 4 shows the response of the sensor to the detection of 25 ppmH_2S. The sensor showed a fast and stable response and recovery, as well as repeatable sensitivity.

Figure 5 Temperature Characteristics of H_2S Channel Sensitivity

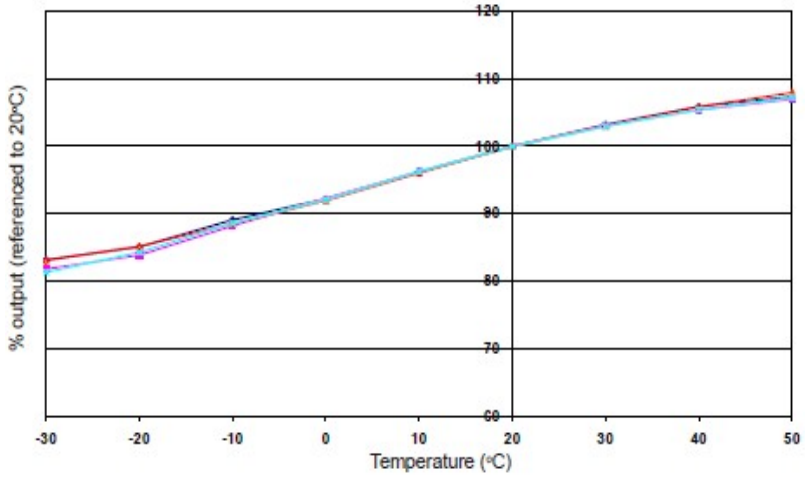


Figure 5 shows the percentage change in sensitivity caused by temperature variation.

Data taken from typical batch sensors.

Figure 6 Zero Point Temperature Characteristics of H_2S Channel

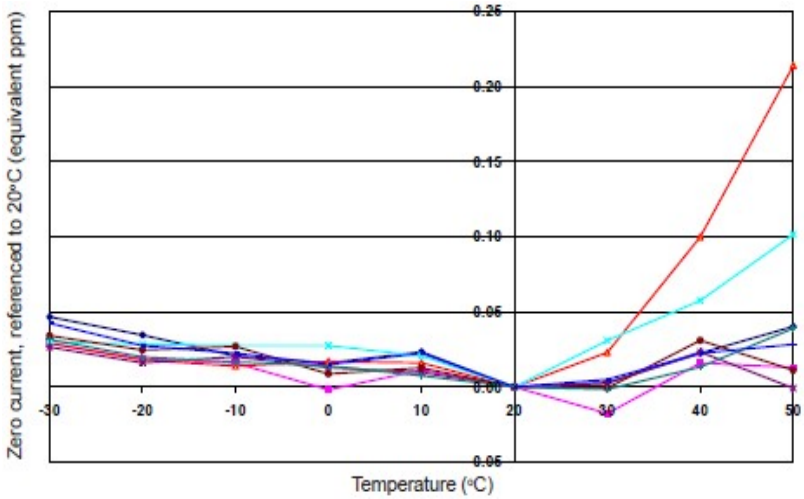


Figure 6 shows the change in zero point output caused by temperature changes, expressed as equivalent ppm values, with reference to the zero point at 20°C.

Data taken from a typical batch sensor.

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.

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. CO-H2S/OCT22