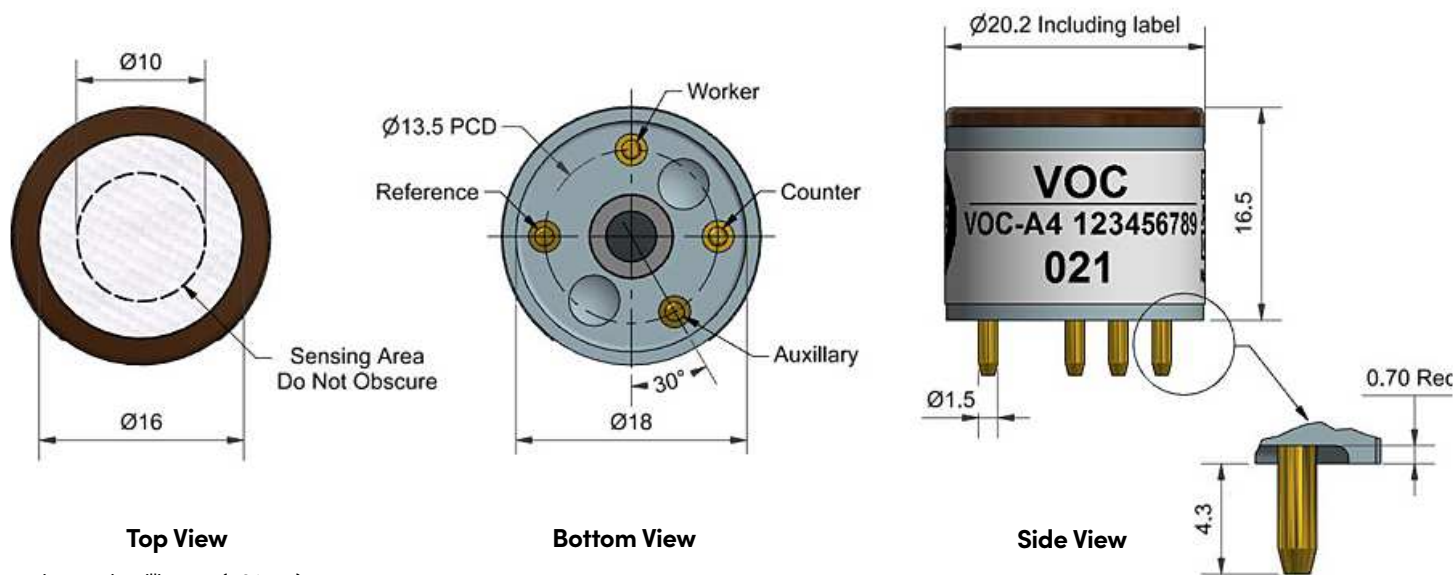




Technical specifications Version 1.0

VOC-A4 4-Electrode Volatile Organic Compound Sensor



Dimensions are in millimetres (± 0.1 mm).

Specification CO sensing

Performance			
Sensitivity	nA/ppm in 2ppm CO		230 to 410
Response time	t_{90} (s) from zero to 2ppm CO		< 30
Zero current	nA in zero air at 20°C		± 200
Noise*	± 2 standard deviations (ppb equivalent)		20
Range	ppm limit of performance warranty		190
Linearity	ppm CO error at full scale, linear at zero, 10ppm CO		± 1.5
Overgas limit	maximum ppm for stable response to gas pulse		1000

Lifetime			
Zero drift	ppm equivalent change/year in lab air		± 500
Sensitivity drift	% change/year in lab air, monthly test		< 15
Operating life	months until 50% original signal (24 month warranted)		> 36

Environmental			
Sensitivity @ -20°C	% (output @ -20°C/output @ 20°C) @ 2ppm CO		50 to 80
Sensitivity @ 50°C	% (output @ 50°C/output @ 20°C) @ 2ppm CO		100 to 120
Zero @ -20°C	nA change from 20°C		± 20
Zero @ 50°C	nA change from 20°C		± 100

Cross sensitivity			
C ₂ H ₆ O sensitivity	% measured gas @ <1ppm C ₂ H ₆ O		< 125
H ₂ S sensitivity	% measured gas @ 5ppm H ₂ S		< 400
NO ₂ sensitivity	% measured gas @ 5ppm NO ₂		< -90
Cl ₂ sensitivity	% measured gas @ 5ppm Cl ₂		< -45
NO sensitivity	% measured gas @ 5ppm NO		< 35
SO ₂ sensitivity	% measured gas @ 5ppm SO ₂		< 110
H ₂ sensitivity	% measured gas @ 100ppm H ₂ at 20°C		< 50
C ₂ H ₄ sensitivity	% measured gas @ 40ppm C ₂ H ₄		< 115
NH ₃ sensitivity	% measured gas @ 20ppm NH ₃		< -0.1
CO ₂ sensitivity	% measured gas @ 5% vol CO ₂		< 0.1

Key specifications			
Temperature range	°C		-30 to 50
Pressure range	kPa		80 to 120
Humidity range	% rh continuous		15 to 90
Storage period	months @ 3 to 20°C (stored in sealed pot)		6
Load resistor	Ω (AFE circuit is recommended)		33 to 100
Weight	g		< 6

Figure 1 Linearity from 0 to 10ppm CO

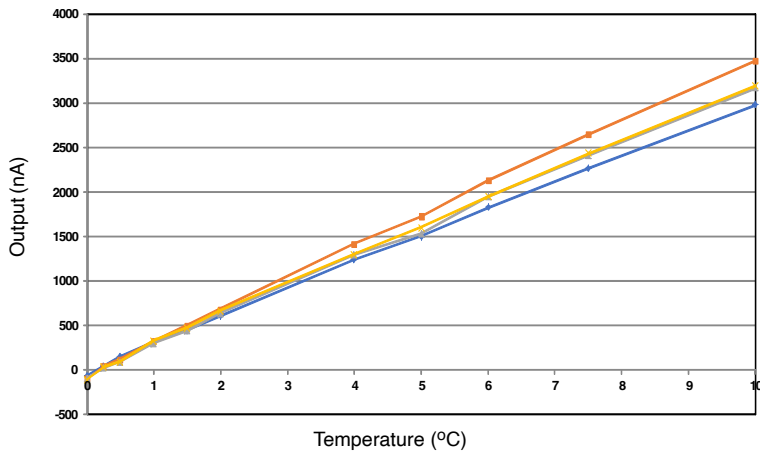


Figure 1 shows example sensor response at concentrations of up to 10ppm CO.

Figure 2 Zero Temperature Dependence

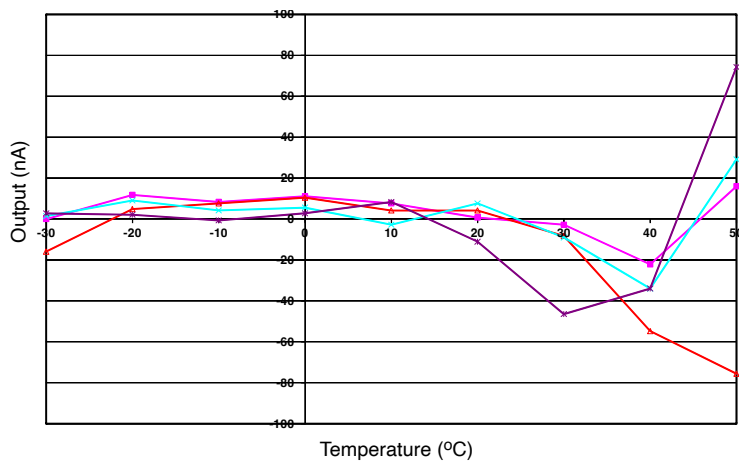


Figure 2 shows example variation in zero output of the working electrode caused by changes in temperature, expressed as nA.

VOC-A4 4-Electrode Volatile Organic Compound Sensor

The VOC-A4 detects both VOCs and CO gases. Using both a VOC-A4 and a CO-A4 sensor in combination allows the estimation of VOC concentration at 0V bias.

The data given in this TDS refers to the use of the VOC-A4 sensor at 0V bias. Other voltages within the range 0 to 0.3V can also be applied (see application note AAN-805).

In order to calculate the VOC concentration, it is necessary to ensure the signals from the two sensors have been corrected for electronic zero offset, sensor zero offset and temperature dependence, and sensitivity (nA/ppm) calibration and temperature dependence.

Specification Ethanol (C₂H₆O) sensing

Performance	Sensitivity	nA/ppm in <1ppm C ₂ H ₆ O	200 to 400
	Response time	t ₉₀ (s) from zero to <1ppm C ₂ H ₆ O	< 30
	Zero current	nA in zero air at 20°C	±200
	Noise	±2 standard deviations (ppb equivalent)	20
	Range	ppm limit of performance warranty	2
	Linearity	ppm error at full scale, linear at zero, <1ppm C ₂ H ₆ O	< 0.13
	Overgas limit	maximum ppm for stable response to gas pulse	5
Lifetime	Zero drift	ppb equivalent change/year in lab air	±500
	Sensitivity drift	% change/year in lab air, monthly test	< 15
	Operating life	months until 50% original signal (24 month warranted)	> 36
Environmental	Sensitivity @ -20°C	% (output @ -20°C/output @ 20°C)	ND
	Sensitivity @ 50°C	% (output @ 50°C/output @ 20°C)	ND
	Zero @ -20°C	nA change from 20°C	±20
	Zero @ 50°C	nA change from 20°C	±100
Cross sensitivity	CO sensitivity	% measured gas @ 2ppm CO	< 110
	H ₂ S sensitivity	% measured gas @ 5ppm H ₂ S	< 400
	NO ₂ sensitivity	% measured gas @ 5ppm NO ₂	< -80
	Cl ₂ sensitivity	% measured gas @ 5ppm Cl ₂	< -40
	NO sensitivity	% measured gas @ 5ppm NO	< 40
	SO ₂ sensitivity	% measured gas @ 5ppm SO ₂	< 100
	H ₂ sensitivity	% measured gas @ 100ppm H ₂ at 20°C	< 50
	C ₂ H ₄ sensitivity	% measured gas @ 40ppm C ₂ H ₄	< 110
	NH ₃ sensitivity	% measured gas @ 20ppm NH ₃	< -0.1
CO ₂ sensitivity	% measured gas @ 5% vol CO ₂	< 0.1	
Key specifications	Temperature range	°C	-30 to 50
	Pressure range	kPa	80 to 120
	Humidity range	% rh continuous	15 to 90
	Storage period	months @ 3 to 20°C (stored in sealed pot)	6
	Load resistor	Ω (AFE circuit is recommended)	33 to 100
	Weight	g	< 6

Figure 3 Linearity from 0 to 860ppb (approx) Ethanol

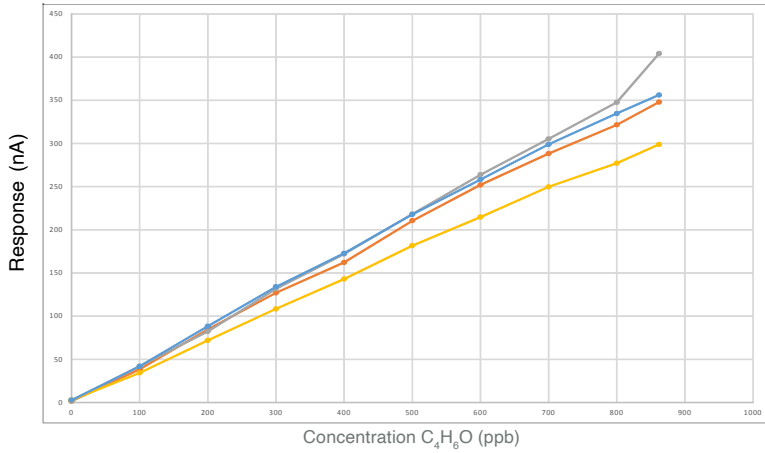


Figure 3 shows example sensor output at concentrations of up to 860ppb Ethanol.

Figure 4 Response to 860ppb (approx) Ethanol

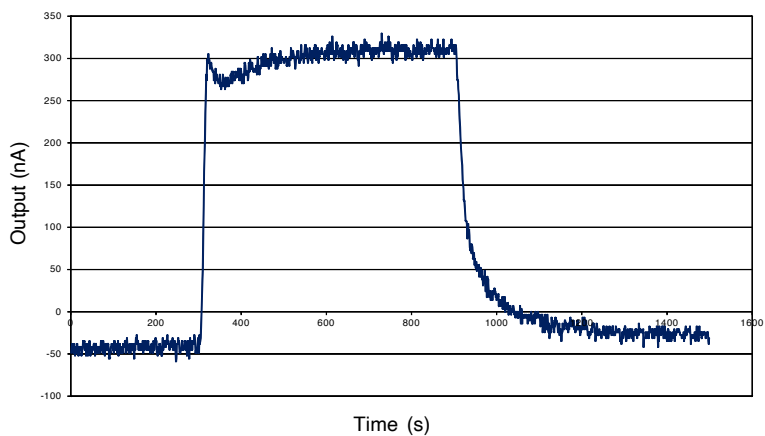


Figure 4 shows example sensor output in response to 860ppb Ethanol.

Figure 5 Response to 2ppm C4H8 with voltage bias

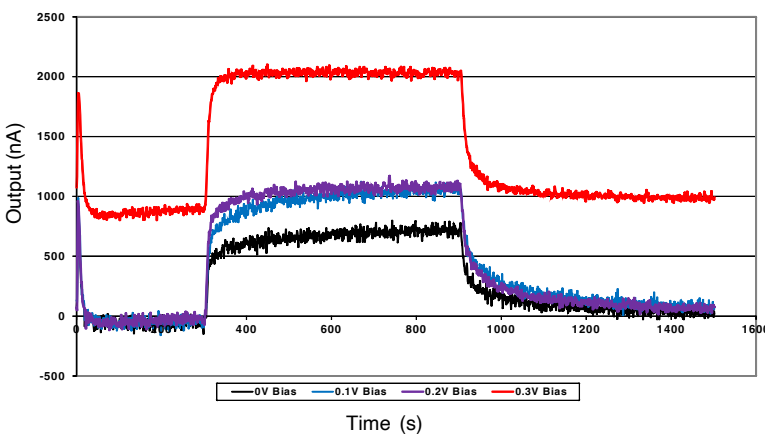


Figure 5 shows example output at different bias voltages in response to 2ppm C₄H₈.

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 10 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.

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