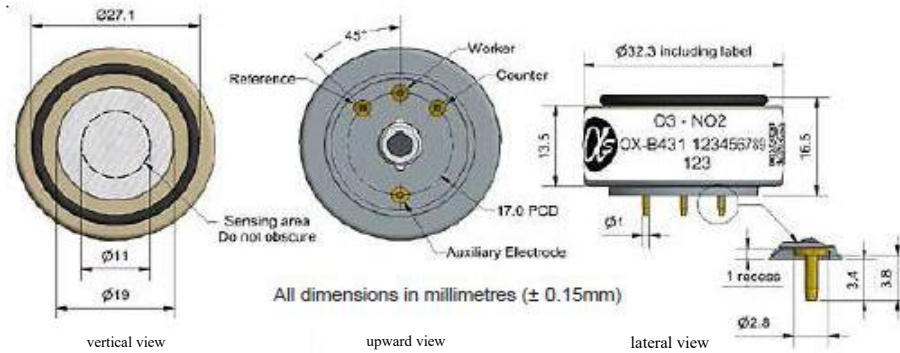


OX- B 431 Oxidizing gas sensor ozone + nitrogen dioxide four electrodes



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Figure 1 OX-B431 Schematic Diagram



3 Sensing parameters			
function	sensitivity	Sensitivity 3 in 1ppmO (nA/ppm)	-225~ -750
	reaction time	Time 3 to 1ppmO from zero(s)	< 80
	zero current	Output at 20°C in zero-level air (nA)	-80~80
	noise *	Standard deviation ± 2 (equivalent ppb)	15
	range	Measuring limits (ppm) that guarantee product performance	20
	degree of linearity	The ppm value of the full range error is linear at 0~20ppm	< ± 0.5
	overload	Maximum ppm value for gas pulse stabilized reaction	50
* The test uses Alphasense ISB Low noise circuit board			
life span	zero drift	Equivalent ppb values that change over the years in the laboratory air	0~20
	sensitivity drift	Percentage change in laboratory air over the year, measured monthly	< -20~-40
	working life	Number of months to reduce output to 50% of original signal (guaranteed 24 months)	> 24
environment	-20°C when sensitivity	2ppmO 3 at (-20°C output/20°C output)%	70~90
	Sensitivity at 40°C	2ppmO 3 at (40°C output/20°C output)%	95~125
	-20°C at the zero point	nA	0~25
	40°C at the zero point	nA	5~100
cross connection sensitivity	H ₂ S	Gas sensitivity percentage measured at 5ppmH 2 S	< - 80
	NO	Gas sensitivity percentage measured at 5ppmNO	< 5
	Cl ₂	Gas sensitivity percentage 2 measured at 5ppmCl	< 100
	SO ₂	Gas sensitivity percentage 2 at 5ppmSO	< -3
	CO	Gas sensitivity percentage measured at 5ppmCO	< -3
	C ₂ H ₄	Sensitivity percentage of gas measured at 100ppmC 2 H 4	< 0.1
	NH ₃	Percentage sensitivity of gas 3 at 20ppmNH	< 0.1
	H ₂	Gas sensitivity percentage measured at 100ppmH 2	< 0.1
	CO ₂	5%Vol CO 2 when measured percentage sensitivity of gas	< 0.1
	halothane	Gas sensitivity percentage measured at 100ppm of halothane	< 0.1
hinge	temperature range	°C	-30 ~ 40
parameter	pressure limit	Kpa	80~120
	Humidity range	Percentage of continuous relative humidity	15~85
	Storage period	Number of months for preservation from 3 to 20°C (to be kept in a sealed tank)	6
	load resistance	Ω (Recommended use of ISB circuit board)	33~100
	weight	g	< 13

Figure 2 Temperature Characteristics of Sensitivity 3 at 1ppmO

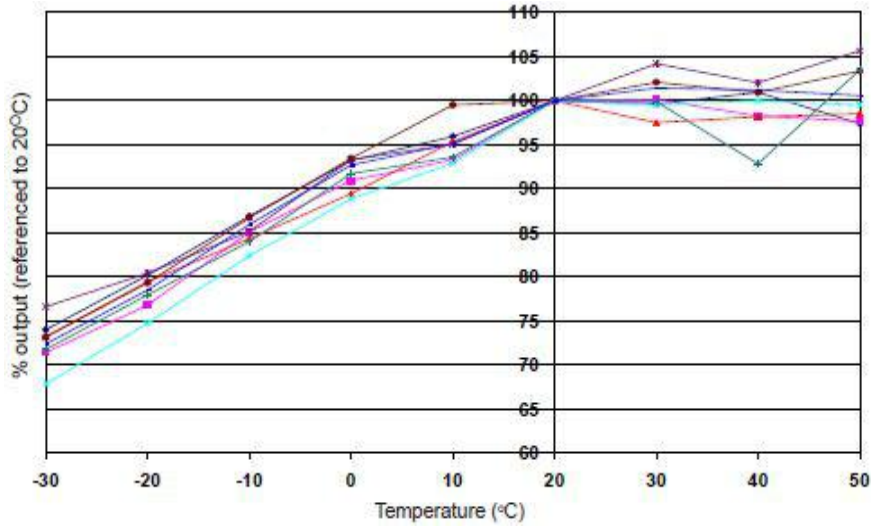


Figure 2 shows the temperature characteristics of sensitivity at 1ppm O₃.

Data was collected from typical batch sensors.

graph 3 Zero temperature characteristics

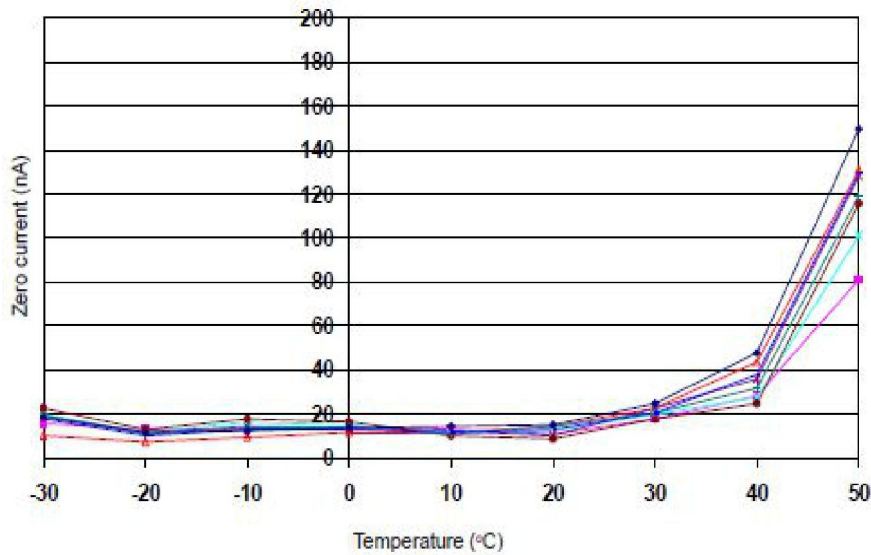


Figure 3 shows the change of zero point output of the working electrode caused by temperature change, in units of nA.

Data was taken from a typical batch of sensors.

For more information about zero current correction, Please contact Alphasense.

Figure 4 Reaction for 200-0 Ppb O₃

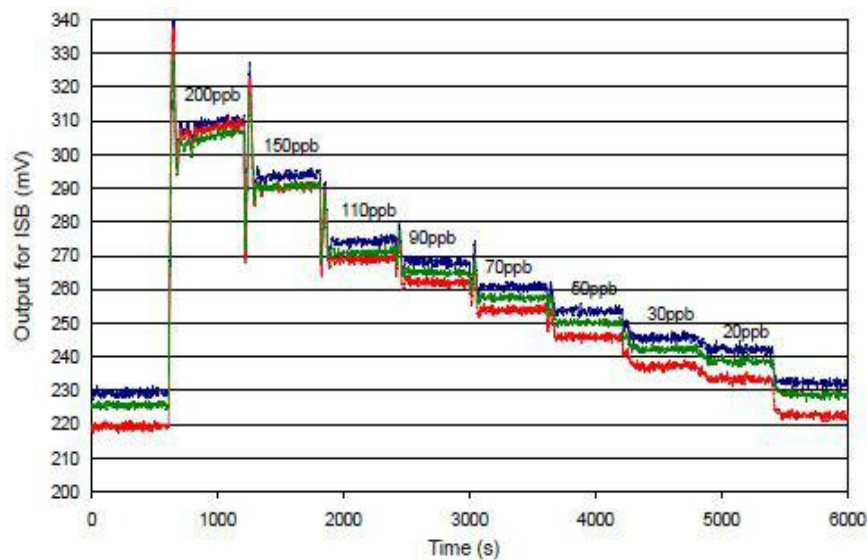


Figure 4 shows the response process of the sensor to 200-0ppb O₃.

Using the Alphasense ISB circuit board can reduce noise to 15ppb, using several Characteristic filtering can further reduce noise.

The magnitude of the offset voltage depends on the intentional offset value of the ISB circuit board.

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The OX-B431 sensor can detect both O₃ and NO₂ (O₃ + NO₂), while the NO₂-B43F sensor only measures NO₂ while filtering out O₃. By using these two sensors simultaneously, the calibrated OX-B431 concentration minus the calibrated NO₂-B43F concentration gives the actual O₃ concentration.

Before subtracting for O₃ concentration, ensure that the electronic zero point offset, sensor zero point offset, temperature characteristics, sensitivity (nA/ppm), and sensitivity temperature characteristics of both sensor signals have been corrected.

NO ₂ sensing parameters			
function	sensitivity	Sensitivity in 2ppmNO (nA /ppm)	-250~-750
	reaction time	Time to 90% of zero to 2ppmNO ₂ (s)	< 80
	zero current	Output at 20°C in zero grade air (nA)	-80~80
	noise *	Standard deviation ± 2 (equivalent ppb)	15
	range	Measuring limits (ppm) that guarantee product performance	20
	degree of linearity	The ppm value of the full range error is linear at 0~20ppm	< ±0.5
	overload	Maximum ppm value for gas pulse stabilized reaction	50
* The test uses Alphasense ISB Low noise circuit board			
life span	zero drift	Equivalent ppb values that change over the years in the laboratory air	0~20
	sensitivity drift	Percentage change in laboratory air over the year, measured monthly	< -20~-40
	working life	Number of months to output down to 50% of original signal (warranty 24 months)	> 24
environment	-20°C when sensitivity	(Output at -20°C / Output at 20°C) % 2 at 2ppmNO	70~90
	Sensitivity at 40°C	2ppmNO ₂ when (output at 40°C / output at 20°C) %	95~110
	-20°C at the zero point	nA	0~25
	40°C at the zero point	nA	5~50
cross connection sensitivity	H ₂ S	Gas sensitivity percentage measured at 5ppmH ₂ S	< -80
	NO	Gas sensitivity percentage measured at 5ppmNO	< 5
	Cl ₂	Gas sensitivity percentage measured 2 at 5ppmCl	<100
	SO ₂	Gas sensitivity percentage 2 at 5ppmSO	< -3
	CO	Gas sensitivity percentage measured at 5ppmCO	< -3
	C ₂ H ₄	Sensitivity percentage of gas measured at 100ppmC ₂ H ₄	< 0.1
	NH ₃	Percentage sensitivity of gas 3 at 20ppmNH	< 0.1
	H ₂	Gas sensitivity percentage measured at 100ppmH ₂	< 0.1
	CO ₂	Sensitivity percentage of gas measured at 5%Vol CO ₂	< 0.1
	halothane	Gas sensitivity percentage measured at 100ppm of halothane	< 0.1
hinge	temperature range	°C	-30~40
parameter	pressure limit	Kpa	80~120
	Humidity range	Percentage of continuous relative humidity	15~85

Figure 5. Temperature Characteristics of Sensitivity at 2ppm NO₂

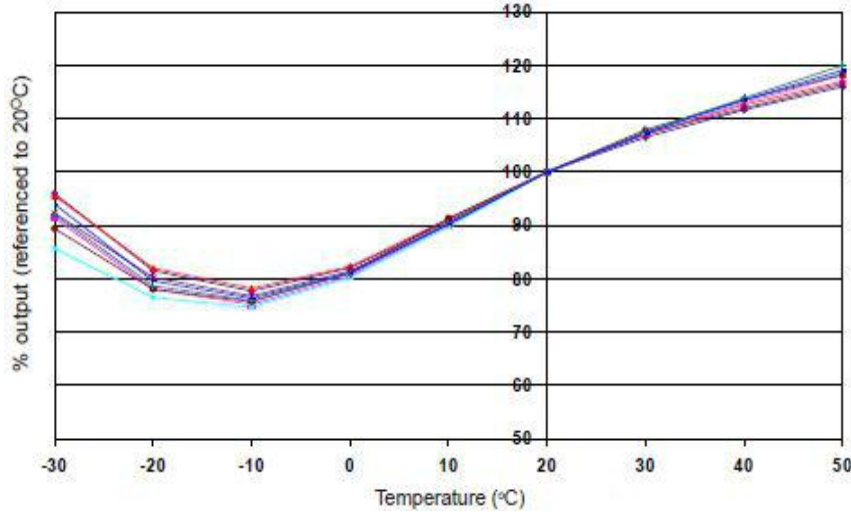


Figure 5 shows the temperature characteristics of sensitivity at 2ppm NO₂.

Data was collected from typical batch sensors.

Reaction of NO₂ at 50 Ppb in Figure 6

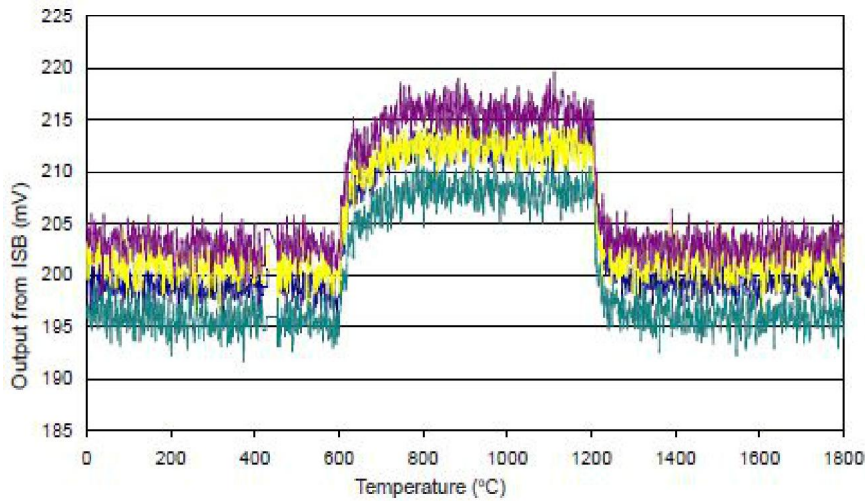


Figure 6 shows OXB 431 at 50ppb NO₂ environment

The sensor has a fast response and good baseline return process.

Figure 7 Reaction of NO₂ at 200-0 Ppb

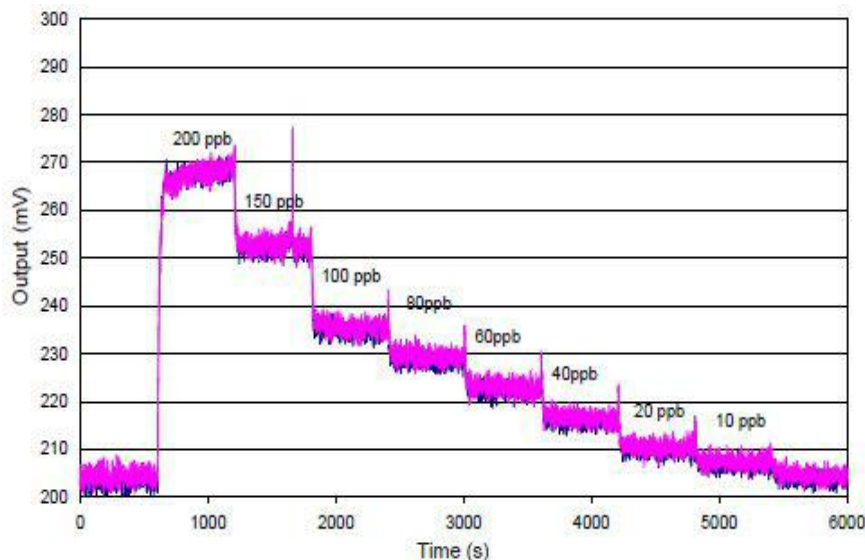


Figure 7 shows the sensor for 200~0ppb NO₂ course of reaction .

Noise can be reduced to 15ppb using the Alpha-sense ISB circuit board, with further noise reduction using digital filtering.

The magnitude of the offset voltage depends on the intentional offset value of the ISB circuit board

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