

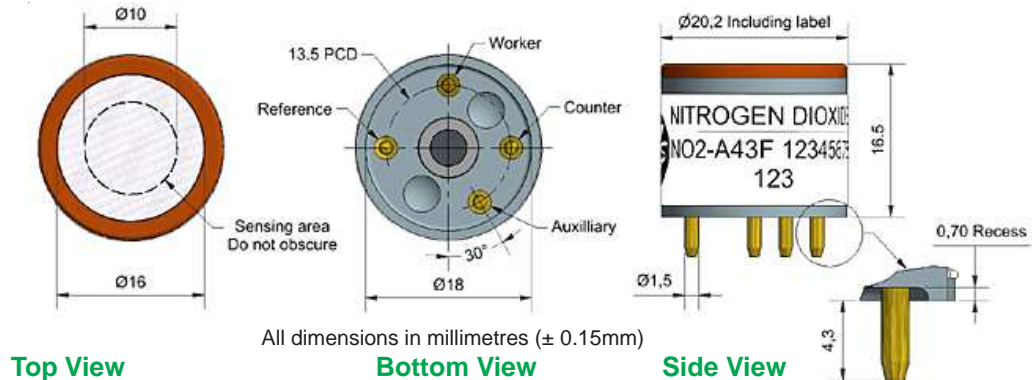


# NO<sub>2</sub>-A43F Nitrogen Dioxide Sensor 4-Electrode



Patented

Figure 1 NO<sub>2</sub>-A43F Schematic Diagram



# Technical Specification

## PERFORMANCE

|                 |                                                                   |              |
|-----------------|-------------------------------------------------------------------|--------------|
| Sensitivity     | nA/ppm at 2ppm NO <sub>2</sub>                                    | -175 to -450 |
| Response time   | t <sub>90</sub> (s) from zero to 2ppm NO <sub>2</sub>             | < 60         |
| Zero current    | nA in zero air at 20°C                                            | -60 to +70   |
| Noise*          | $\pm 2$ standard deviations (ppb equivalent)                      | 15           |
| Range           | ppm NO <sub>2</sub> limit of performance warranty                 | 20           |
| Linearity       | ppm error at full scale, linear at zero and 20ppm NO <sub>2</sub> | < $\pm 0.5$  |
| Overshoot limit | maximum ppm for stable response to gas pulse                      | 50           |

\* Tested with Alphasense AFE low noise circuit

## LIFETIME

|                   |                                                       |              |
|-------------------|-------------------------------------------------------|--------------|
| Zero drift        | ppb equivalent change/year in lab air                 | 0 to 20      |
| Sensitivity drift | % change/year in lab air, monthly test                | < -20 to -40 |
| Operating life    | months until 50% original signal (24 month warranted) | > 24         |

## ENVIRONMENTAL

|                     |                                                         |           |
|---------------------|---------------------------------------------------------|-----------|
| Sensitivity @ -20°C | (% output @ -20°C/output @ 20°C) @ 2ppm NO <sub>2</sub> | 40 to 80  |
| Sensitivity @ 40°C  | (% output @ 50°C/output @ 20°C) @ 2ppm NO <sub>2</sub>  | 95 to 115 |
| Zero @ -20°C        | nA                                                      | 0 to +25  |
| Zero @ 40°C         | nA                                                      | 20 to 60  |

## CROSS SENSITIVITY

|                               |                            |          |                               |       |
|-------------------------------|----------------------------|----------|-------------------------------|-------|
| O <sub>3</sub>                | Filter capacity (ppm hrs)  | @ 2ppm   | O <sub>3</sub>                | > 500 |
| H <sub>2</sub> S              | sensitivity % measured gas | @ 5ppm   | H <sub>2</sub> S              | < -80 |
| NO                            | sensitivity % measured gas | @ 5ppm   | NO                            | < 5   |
| Cl <sub>2</sub>               | sensitivity % measured gas | @ 5ppm   | Cl <sub>2</sub>               | < 100 |
| SO <sub>2</sub>               | sensitivity % measured gas | @ 5ppm   | SO <sub>2</sub>               | < -3  |
| CO                            | sensitivity % measured gas | @ 5ppm   | CO                            | < -3  |
| C <sub>2</sub> H <sub>4</sub> | sensitivity % measured gas | @ 100ppm | C <sub>2</sub> H <sub>4</sub> | < 1   |
| NH <sub>3</sub>               | sensitivity % measured gas | @ 20ppm  | NH <sub>3</sub>               | < 0.2 |
| H <sub>2</sub>                | sensitivity % measured gas | @ 100ppm | H <sub>2</sub>                | < 0.1 |
| CO <sub>2</sub>               | sensitivity % measured gas | @ 5% Vol | CO <sub>2</sub>               | < 0.1 |
| Halothane                     | sensitivity % measured gas | @ 100ppm | Halothane                     | nd    |

## KEY SPECIFICATIONS

|                   |                                           |           |
|-------------------|-------------------------------------------|-----------|
| Temperature range | °C                                        | -30 to 40 |
| Pressure range    | kPa                                       | 80 to 120 |
| Humidity range    | % rh continuous                           | 15 to 85  |
| Storage period    | months @ 3 to 20°C (stored in sealed pot) | 6         |
| Load resistor     | $\Omega$ (AFE circuit recommended)        | 33 to 100 |
| Weight            | g                                         | < 6       |



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.



# NO2-A43F Performance Data

# Technical Specification

**Figure 2 Sensitivity temperature dependence**

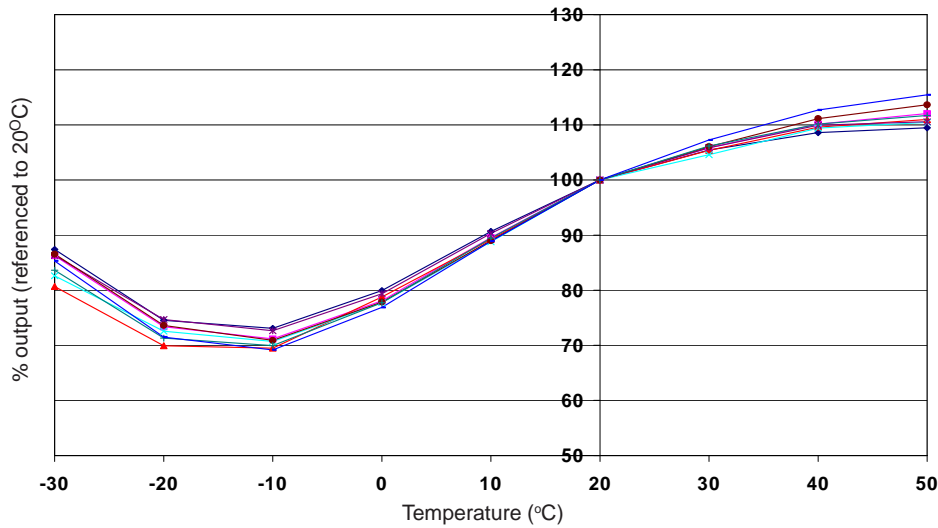


Figure 2 shows the temperature dependence of sensitivity at 2ppm NO<sub>2</sub>.

This data is taken from a typical batch of sensors.

**Figure 3 Zero temperature dependence**

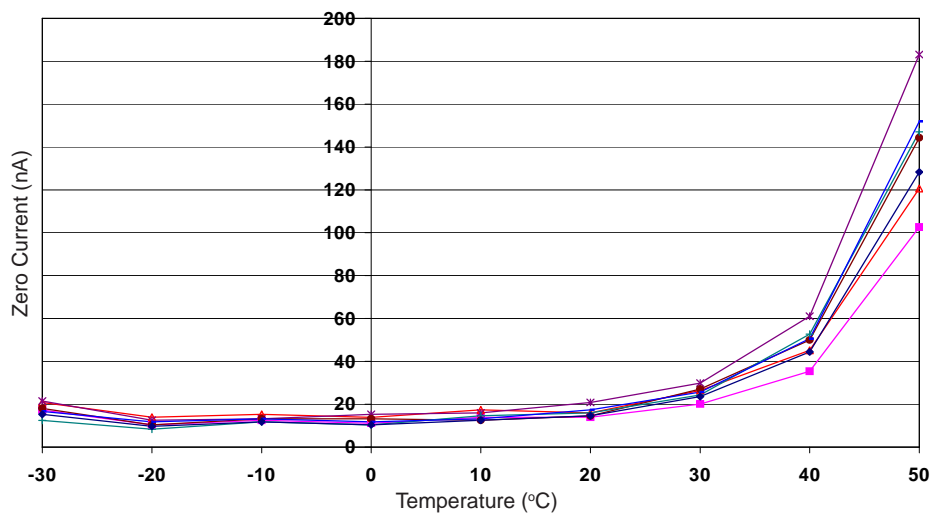


Figure 3 shows the variation in zero output of the working electrode caused by changes in temperature, expressed as nA.

This data is taken from a typical batch of sensors.

Contact Alphasense for further information on zero current correction.

**Figure 4 Response from 200 ppb to 0 ppb NO<sub>2</sub>**

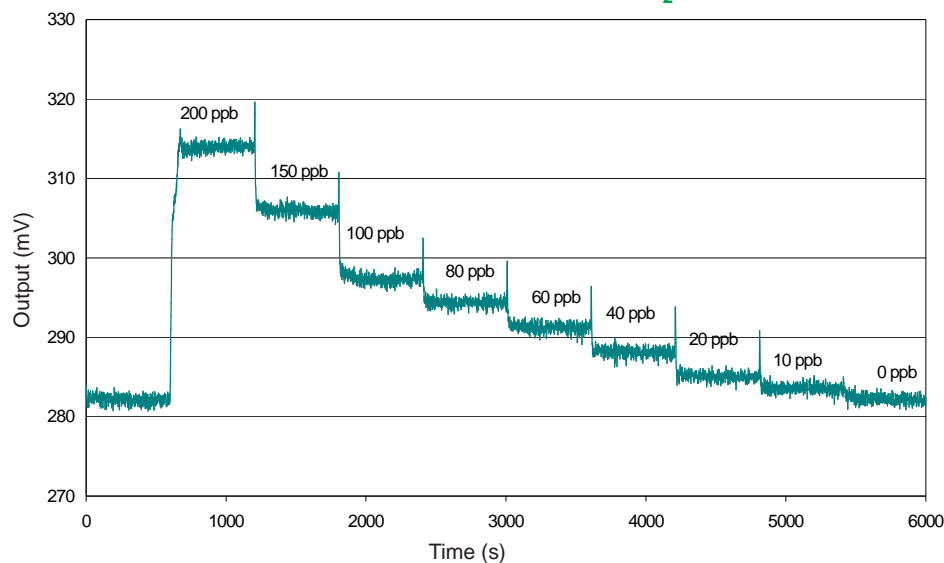


Figure 4 shows response from from 200ppb NO<sub>2</sub> to 0ppb NO<sub>2</sub>.

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

Offset voltage is due to intentional AFE circuit electronic offset.

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. NO2-A43F/NOV18*