# Product Data Sheet

## Product Datasheet

4CM Carbon Monoxide CiTiceL®

### Document Purpose

The purpose of this document is to present the performance specification of the 4CM carbon monoxide sensor.

This document should be used in conjunction with the 4CM Characterisation Note, Operating Principles (OP08) and the Product Safety Datasheet (PSDS 12.1).

The data provided in this document are valid at 20°C, 50% RH and 1013 mBar for 3 months from the date of sensor manufacture. For guidance on sensor performance outside of these limits, please refer to the 4CM Characterisation Note.

Output signal can drift below the lower limit over time. For guidance on the safe use of the sensor, please refer to the Operating Principles OP08.

# 4CM CiTiceL®

Carbon Monoxide (CO) Gas Sensor
Part Number: 2112B2055R

## Product Data Sheet

### Key Features & Benefits:

- Fast response and recovery time
- Superior long-term performance at temperature and humidity extremes
- Meets sensor requirements described in AQ6205-2006 and EN45544-2000

## Technical Specifications

### MEASUREMENT

| | |
|---|---|
| **Operating Principle** | 3-electrode electrochemical |
| **Detection Range** | 0 to 2000 ppm |
| **Filter** | To remove acid gases See note on Page 2 |
| **Filter Capacity** | > 20000 ppm hours |
| **Sensitivity** | 70 ± 15 nA/ppm |
| **Response Time (T90)*** | ≤10 s at 20°C |
| **(for concentrations up to 500 ppm)** | |
| **Recovery Time*** | < 90 s (typically < 30 s) |
| **(from 100ppm down to <2 ppm)** | |
| **Baseline Offset (clean air)*** | < ±2 ppm CO equivalent |
| **Baseline Shift:** | |
| **-40°C to -20°C** | < ±3 ppm CO equivalent |
| **-20°C to +20°C** | < ±2 ppm CO equivalent |
| **+20°C to +55°C** | Typically < +4 ppm (+9 ppm max.) |
| **Repeatability** | < ±2% CO equivalent |
| **Linearity** | Linear up to 2000 ppm |

### ELECTRICAL

| | |
|---|---|
| **Resolution** | <1 ppm typical |
| **(Electronics dependent)** | |
| **Recommended Load Resistor** | 5 Ω |
| **Bias Voltage** | Not required |

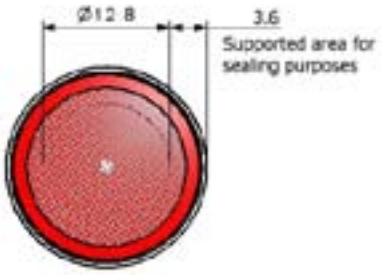
### MECHANICAL

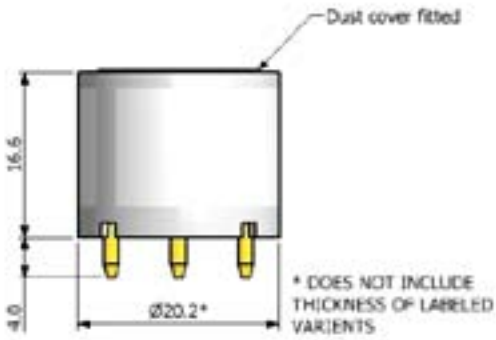
| | |
|---|---|
| **Housing Material** | Noryl 110 |
| **Pin Material** | Gold over nickel plated brass |
| **Weight** | 5 g (nominal) |
| **Orientation Sensitivity** | None |

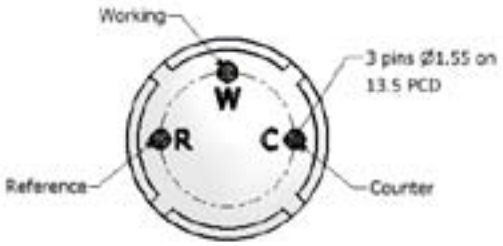
### ENVIRONMENTAL

| | |
|---|---|
| **Intended Use** | Portable detectors for most Life Safety applications |
| **Operating Temperature Range** | -40°C to +55°C See Characterisation Note |
| **Temperature Coefficient:** | |
| **at -40°C** | 45 to 65% of signal w.r.t. +20°C |
| **at -20°C** | 73 to 82% of signal w.r.t. +20°C |
| **at +55°C** | 105 to 111% of signal w.r.t. +20°C |
| **Operating Pressure Range** | 800 to 1200 mbar |
| **Operating Humidity Range** | 15% RH to 95% RH non-condensing |

## Product Dimensions




All dimensions in mm
All tolerances ±0.15 mm unless otherwise stated

**IMPORTANT NOTE:**

Connection should be made via recommended mating parts only. Soldering to the sensor will result in damage and invalidate the warranty.

All performance data is based on conditions at 20°C, 50% RH and 1013 mBar, using City Technology recommended circuitry and flow rates.

Temperature data gathered on a sample of 144 sensors. Data average ± 4.5 standard deviations

## Product Data Sheet

| INTRINSIC SAFETY DATA | |
|---|---|
| **Maximum at 2000 ppm** | 0.2 mA |
| **Maximum o/c Voltage** | 1.3 V |
| **Maximum s/c Current** | <1.0 A |

| LIFETIME | |
|---|---|
| **Long Term Output Drift*** | < 5% per annum |
| **Recommended Storage Temp** | 0°C to +20°C in sealed container |
| **Expected Operating Life** | 24 months in air |
| **Storage Life** | 6 months in original packaging |
| **Standard Warranty** | 24 months from date of despatch |

*** Specifications are valid at 20°C, 50% RH and 1013 mBar, using City Technology recommended circuitry. Performance characteristics outline the performance of sensors supplied within the first 3 months. Output signal can drift below the lower limit over time.**

### Filter Information

Activated carbon cloth filter with high surface area:

- Removes acid gases such as $SO_2$, $NO_2$ & $H_2S$
- Protects from short-term (<1000 ppm hours) exposure to alcohols such as Methanol, Ethanol, & IPA

### Cross Sensitivity Table

Whilst CiTiceLs are designed to be highly specific to the gas they are intended to measure, they will still respond to some degree to various other gases. The table below is not exclusive and other gases not included in the table may still cause a sensor to react.

**IMPORTANT NOTE : The cross sensitivity data shown below does not form part of the product specification and is supplied for guidance only. Values quoted are based on tests conducted on a small number of sensors and any batch may show significant variation. For the most accurate measurements, an instrument should be calibrated using the gas under investigation.**

| Gas | Concentration Used (ppm) | Reading (ppm CO) |
|---|---|---|
| Acetylene ($C_2H_2$) | 100 | 88 |
| Ethylene ($C_2H_4$) | 100 | 97 |
| Hydrogen ($H_2$) | 100 | < 28 |
| Nitric Oxide (NO) | 48.6 | 14 |
| Nitrogen Dioxide ($NO_2$) | 19.5 | <0.5 |
| Chlorine ($Cl_2$) | 13.7 | <0.5 |
| Ethanol ($C_2H_5OH$) | 200 | 0 |
| Hydrogen Sulfide ($H_2S$) | 50 | 0 |
| Sulfur Dioxide ($SO_2$) | 20 | 0 |
| Ammonia ($NH_3$) | 20 | 0 |