Product Data Sheet

Product Datasheet

4CM Carbon Monoxide

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 CO

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

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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

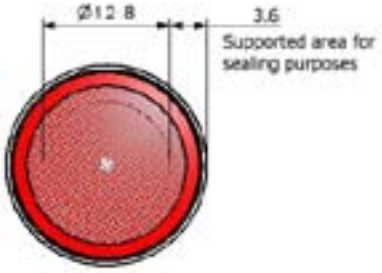
MECHANICAL

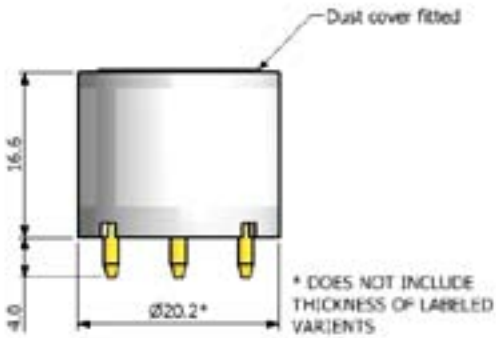
Housing Material	Noryl 110
Pin Material	Gold over nickel plated brass
Weight	5 g (nominal)
Orientation Sensitivity	None

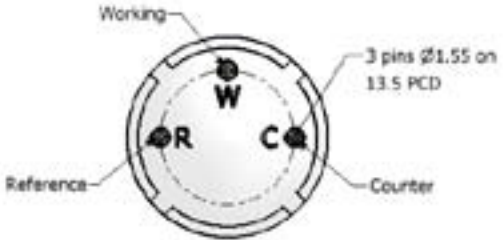
ENVIRONMENTAL

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 recommended circuitry and flow rates.

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

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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 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 sensors 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

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Poisoning

Sensors are designed for operation in a wide range of environments and harsh conditions. However, it is important that exposure to high concentrations of solvent vapours is avoided, both during storage, fitting into instruments, and operation.
When using sensors with printed circuit boards (PCBs), degreasing agents should be used before the sensor is fitted. Do not glue directly on or near the sensor as the solvent may cause crazing of the plastic.

Data Matrix

Type: 2D (ECC 200) Data Matrix Code

Compliance: ISO 16022 Standard (Grades A - D)

Format: **AAAABBBBBBBCCCCCCCCCDDDDDDEEEE**

AAAA = Gas Type
BBBBBBB = Serial Number
CCCCCCCCC = Part Number
DDDDDD = Date of Manufacture (*expressed as yymmdd*)
EEEE = Sensitivity (*in nA/ppm*)

SAFETY NOTE
This sensor is designed to be used in safety critical applications. To ensure that the sensor and/or instrument in which it is used, are operating properly, it is a requirement that the function of the device is confirmed by exposure to target gas (bump check) before each use of the sensor and/or instrument. Failure to carry out such tests may jeopardise the safety of people and property.