CITY TECHNOLOGY
ENGINEERING SAFETY

Product Data Sheet

Product Datasheet

4MF Carbon Monoxide Sensor

Document Purpose

The purpose of this document is to present the performance specification of the 4MF Carbon Monoxide gas sensor.

This document should be used in conjunction with the Operating Principles (OP08).

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.

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.

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Key Features & Benefits:
- Fast response and recovery time
- Superior long-term performance at temperature and humidity extremes

Technical Specifications

MEASUREMENT

Operating Principle	3-electrode electrochemical
Nominal Range	0 to 40,000 ppm
Maximum Overload	100,000 ppm
Filter	To remove acid gases
Filter Life	See page 2
Sensitivity*	15 ± 5 nA/ppm
Response Time (T_{90})*	≤ 30 s
Recovery Time (R_{90})	< 90 s
Baseline Offset (clean air)*	±10 ppm CO equivalent
Baseline Shift:	
-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 100,000 ppm

ELECTRICAL

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

MECHANICAL

Housing Material	Noryl N110
Pin Material	Gold over nickel plated brass
Weight	5 g (nominal)
Orientation Sensitivity	None

### ENVIRONMENTAL

Intended Use	Portable instruments for Flue Gas analysis
Operating Temperature Range	-40°C to +55°C
Temperature Coefficient:	
at -40°C	65 to 75% of signal w.r.t. +20°C
at -20°C	83 to 88% of signal w.r.t. +20°C
at +55°C	94 to 113% of signal w.r.t. +20°C
Operating Pressure Range	800 to 1200 mbar
Operating Humidity Range	15% RH to 95% RH

LIFETIME

Long Term Output Drift*	< 5% per annum
Recommended Storage Temp	0°C to +20°C in sealed container
Expected Operating Life	36 months in air

Product Dimensions
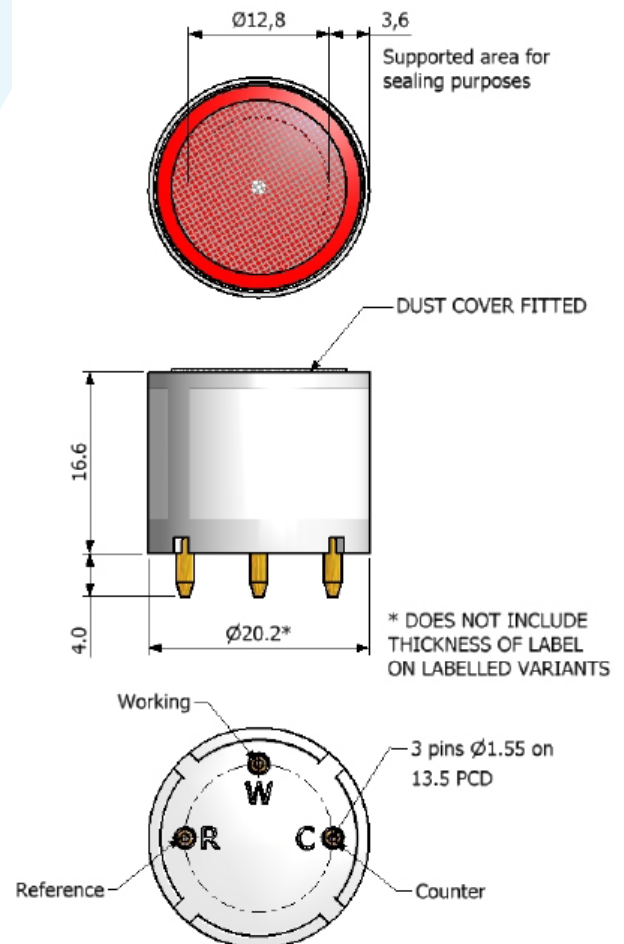
All dimensions in mm.
All tolerances ±0.15 mm unless otherwise stated

IMPORTANT NOTE: Connection should be made via PCB sockets only. Soldering to the pins will seriously damage your sensor and invalidate the warranty.

* 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.

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Poisoning

CiTiceLs 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 CiTiceL as the solvent may cause crazing of the plastic.

Filter Information

High surface area high capacity filter removes acid gases such as SO_2, NO, NO_2.

Gas	Concentration Used (ppm)	Filter Life (ppm hours)
Sulfur Dioxide (SO_2)	200	> 30,000
Nitric Oxide (NO)	100	> 80,000
Nitrogen Dioxide (NO_2)	100	> 600,000

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)	Cross Sensitivity (%)
Hydrogen Sulfide (H_2S)	50	0
Sulfur Dioxide (SO_2)	200	0
Nitric Oxide (NO)	100	0
Nitrogen Dioxide (NO_2)	100	0
Hydrogen (H_2)	800	<30
Hydrogen Chloride (HCl)	20	0

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Data Matrix

Type: 2D (ECC 200) Data Matrix Code
Compliance: ISO 16022 Standard (Grades A - D)

Format: **AABBBBBBBCCC**

    AA = Rev no
    BBBBBBBB = Serial Number
    CCC = Production Date Code (*expressed as MMY*)

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 jeopardize the safety of people and property.

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