

# Product Data Sheet

## Product Datasheet

### 3MFF Carbon Monoxide Sensor with mV Output

#### Document Purpose

The purpose of this document is to present the performance specification of the 3MFF Carbon Monoxide gas sensor with mV output.

This document should be used in conjunction with the Operating Principles (OP14) and the Product Safety Datasheet (PSDS 16).

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 OP14.

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### Key Features & Benefits:

- Robust 3-Series packaging
- Factory calibrated mV output

### Technical Specifications

#### MEASUREMENT

<b>Sensor Type Used</b>	3F/F
<b>Maximum Range</b>	20000 ppm CO
<b>Sensitivity*</b>	0.1 mV/ppm ± 5%
<b>Filter</b>	To remove acid gases
<b>Filter Capacity</b>	560,000 ppm hrs*
<b>Baseline Offset (Clean Air)</b>	±1 mV
<b>Response Time (T<sub>90</sub>)*</b>	<30 Seconds at 20°C
<b>Resolution</b>	1 ppm
<b>Zero Shift (-20°C to +40°C)</b>	<20 ppm equivalent
<b>Repeatability</b>	1% of signal
<b>Linearity</b>	Linear

#### ELECTRICAL

<b>Power Supply Required</b>	7 to 18 VDC single-ended or ±3.5 to ±9 VDC dual
<b>Power Consumption</b>	250 µA @ 9 VDC
<b>Calibration</b>	Via built-in span and zero potentiometers (Refer to OP14)

#### MECHANICAL

<b>Weight</b>	38 g (with connector)
<b>Body Material</b>	Polycarbonate
<b>Position Sensitivity</b>	None

#### ENVIRONMENTAL

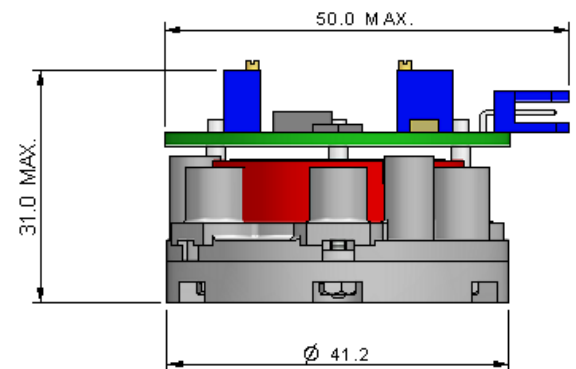
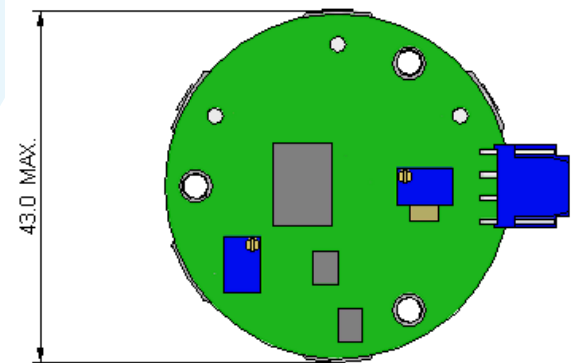
<b>Operating Temperature Range</b>	-20°C to +50°C
<b>Recommended Storage Temp</b>	0°C to 20°C
<b>Temperature Compensation</b>	None
<b>Operating Pressure Range</b>	Atmospheric ± 10%
<b>Pressure Coefficient</b>	0.007 ± 0.003% signal/mBar
<b>Operating Humidity Range</b>	15 to 90% RH non-condensing

#### LIFETIME

<b>Long Term Sensitivity Drift*</b>	<2% signal loss/month
<b>Expected Operating Life</b>	Three years in air
<b>Storage Life</b>	6 months in CTL container

\* NO removal based on continuous exposure to 1000 ppm and 5% breakthrough

### Product Dimensions



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

**\* 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.

## 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	3MF/F (%)
Carbon Monoxide, CO	100
Hydrogen Sulfide, H <sub>2</sub> S	0
Sulfur Dioxide, SO <sub>2</sub>	0
Nitric Oxide, NO	0
Nitrogen Dioxide, NO <sub>2</sub>	0
Hydrogen, H <sub>2</sub>	<60 <sup>1</sup>
Hydrogen Chloride, HCl	0
Ethylene, C <sub>2</sub> H <sub>4</sub>	<10

Note 1 : For applications where a hydrogen compensated output is required, the A3ME/D CiTiceL should be considered

### **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.

Every effort has been made to ensure the accuracy of this document at the time of printing. In accordance with the company's policy of continued product improvement City Technology Limited reserves the right to make product changes without notice. The products are always subject to a programme of improvement and testing which may result in some changes in the characteristics quoted. As the products may be used by the client in circumstances beyond the knowledge and control of City Technology Limited, we cannot give any warranty as to the relevance of these particulars to an application. It is the clients' responsibility to carry out the necessary tests to determine the usefulness of the products and to ensure their safety of operation in a particular application.