

4MF GAS SENSOR

002851

Issue 4

CiTiceL® Carbon Monoxide (CO) Gas Sensor



Carbon Monoxide (CO) Sensor:
4MF
Part Number: 2112B2061

DESCRIPTION

CiTiceL® 4 Series gas sensors are the industry standard for portable gas detectors. The range includes sensors which detect oxygen and toxic gases and fully certified pellistors for combustible gas detection.

DOCUMENT PURPOSE

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

This document should be used in conjunction with the Operating Principles (OP08) and the Product Safety Datasheet (PSDS 16).

The data provided in this document are valid at 20°C, 50 %RH, and 1013 mBar for three 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.

APPLICATIONS

- Portable instruments for flue gas analysis

PORTFOLIO

The 4 Series CiTiceL® sensor family is part of the extensive line of Honeywell gas sensors. To learn more about the product, or the many other gas sensors in this series, [click here](#).

FEATURES AND BENEFITS



Fast response and recovery time



Superior long-term performance at temperature and humidity extremes



High capacity filter to archive null cross-sensitivity to various gases (see details on page 3)

CITICEL® GAS SENSORS

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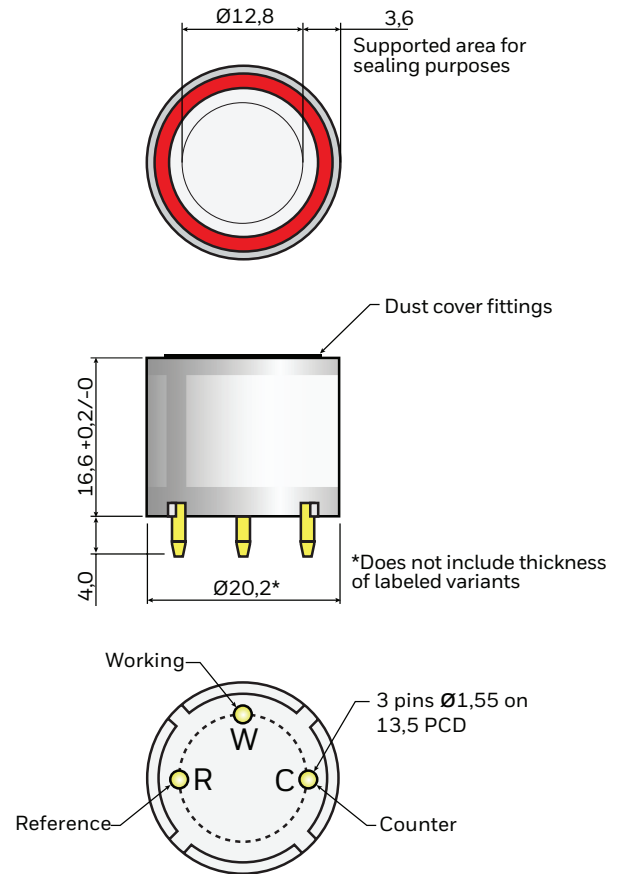
TABLE 1. TECHNICAL SPECIFICATIONS

MEASUREMENT	
Operating Principle	3-electrode electrochemical
Nominal Range	0 ppm to 40,000 ppm
Maximum Overload	100,000 ppm
Filter	To remove acid gases
Filter Life	See page 3
Sensitivity	15 nA/ppm ±5 nA/ppm
T90 Response Time*	≤ 30 seconds
R90 Recovery Time*	< 90 seconds
Baseline Offset* (clean air)	±10 ppm CO equivalent
Baseline Shift (-20°C to 20°C)	< ±2 ppm CO equivalent
Baseline Shift (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 Ohm
Bias Voltage	Not required
MECHANICAL	
Housing Material	Noryl N110
Pin Material	Gold over nickel plated brass
Weight	5 g (nominal)
Orientation Sensitivity	None
ENVIRONMENTAL	
Operating Temperature Range	-40°C to 55°C
Temperature Coefficient (at -40°C)	65 % to 75 % of signal w.r.t. 20°C
Temperature Coefficient (at -20°C)	83 % to 88 % of signal w.r.t. 20°C
Temperature Coefficient (at 55°C)	94 % 113 % of signal w.r.t. 20°C
Operating Pressure Range	800 mbar 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

* Specifications are valid at 20°C, 50%RH, and 1013 mBar using Honeywell recommended circuitry. Performance characteristics outline the performance of sensors supplied within the first three months.

Output signal can drift below the lower limit over time.

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.

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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 cases such as SO₂, NO, and NO₂.

TABLE 2. FILTER LIFE

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.

TABLE 3. CROSS SENSITIVITY

Gas	Concentration Used (ppm)	Cross Sensitivity (%)
Hydrogen Sulfide, H ₂ S	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

Data Matrix

Type: 2D (ECC 200) Data Matrix Code

Compliance: ISO 16022 Standard (Grades A - D)

Format: **AAAABBBBBBBBCCCCCCCCDDDDDEEEEE**

AAAA = Gas Type

BBBBBBB = Serial Number

CCCCCCCCC = Part Number

DDDDDD = Date of Manufacture (expressed as yymmdd)

EEEE = Sensitivity (in nA/ppm)

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

For more information

Honeywell Sensing & Safety Technologies services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit sps.honeywell.com/ast or call:

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WARNING MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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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