4CM GAS SENSOR

002849
Issue 3

CiTiceL® Carbon Monoxide (CO) Gas Sensor

Carbon Monoxide (CO) Sensor:
4CM

Part Numbers:
2112B2055R *(packed in single pots)*
2112B2055 *(packed up to 100/tray)*

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 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).

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 detectors for most life safety applications
- Mining applications

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

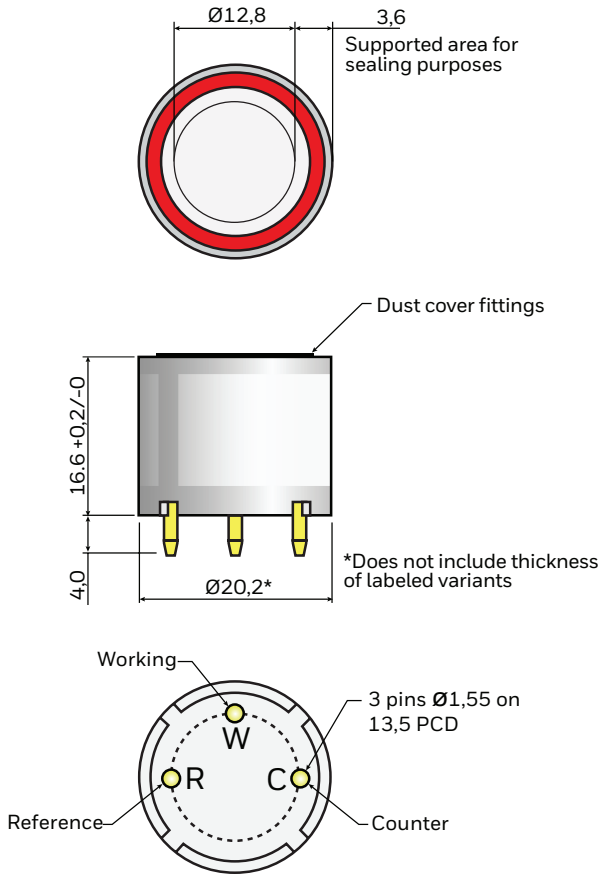
Meets sensor requirements described in AQ6205-2006 and EN 45544-2000

Honeywell

CITICEL® GAS SENSORS
4CM SERIES

TABLE 1. TECHNICAL SPECIFICATIONS	
MEASUREMENT	
Operating Principle	3-electrode electrochemical
Detection Range	0 ppm to 2000 ppm
Filter	To remove acid gases (see note on Page 2)
Filter Capacity	> 20000 ppm hours
Sensitivity	70 nA/ppm ±15 nA/ppm
T90 Response Time* (for concentrations up to 500 ppm)	≤ 10 seconds at 20°C
Recovery Time* (from 100 ppm down to <2 ppm)	< 90 seconds (typically < 30 seconds)
Baseline Offset* (clean air)	< ±2 ppm CO equivalent
Baseline Shift (-40°C to -20°C)	< ±3 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 2000 ppm
ELECTRICAL	
Resolution (Electronics dependent)	<1 ppm typical
Recommended Load Resistor	5 Ohm
Bias Voltage	Not required
MECHANICAL	
Housing Material	Noryl 110
Pin Material	Gold over nickel plated brass
Weight	5 g (nominal)
Orientation Sensitivity	None
ENVIRONMENTAL	
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
Temperature Coefficient (at -20°C)	73 % to 82 % of signal w.r.t. 20°C
Temperature Coefficient (at 55°C)	105 % to 111 % of signal w.r.t. 20°C
Operating Pressure Range	800 mbar to 1200 mbar
Operating Humidity Range	15 %RH to 95 %RH non-condensing
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

Product Dimensions



All dimensions in mm
All tolerances ±0,15 mm unless otherwise stated

IMPORTANT NOTES

Connection should be made via 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 Honeywell recommended circuitry and flow rates.

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

* 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.

Filter Information

Activated carbon cloth filter with high surface area:

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

TABLE 2. CROSS SENSITIVITY

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
Sulfer Dioxide, SO_2	20	0
Ammonia, NH_3	20	0

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.

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)

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.

⚠ 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.

FOR MORE INFORMATION

Honeywell Sensing and 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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