



µGard®2

Infrared Sensor for CO₂ with analog output

Exchangeable sensor unit including digital value processing, temperature compensation and self control for the continuous monitoring of the ambient air to detect CO₂.

In addition to the CO₂ sensor element with infrared sensor there is a module integrated in the sensor unit with µController, analog output and power supply. The IR measurement principle with integrated temperature compensation ensures highest accuracy, selectivity and reliability despite the long calibration interval. The µController calculates a linear 4 – 20 mA (or 2 – 10 V) signal out of the measurement signal of the IR sensor and also stores all relevant measured values and data of the sensor element.

Calibration is done either by simply replacing the sensor unit or by using the comfortable, integrated calibration routine directly at the system.

APPLICATION

The µGard®2 Sensor is used for the detection of CO₂ leaks in dispensing and refrigeration systems etc.

FEATURES

- Digital measurement value processing incl. temperature compensation
- Data / measured values in µC of the sensor unit, therefore simple exchange uncalibrated <> calibrated
- High accuracy, selectivity and reliability
- Low zero point drift
- Sensor life time > 15 years
- Software according to SIL2 compliant development process
- Easy maintenance and calibration by exchange of the sensor unit or by comfortable on-site calibration
- 4 – 20 mA (or 2 – 10 V) analog output with selectable signal output for special mode, fault etc.
- Reverse polarity protected, overload and short-circuit proof
- Integrated heating down to -35 °C
- IP 65 version
- Conformity to
 - EN 378-1
 - EN 61010-1
 - ANSI/UL 61010 1
 - CAN/CSA-C22.2 No. 61010-1
- Housing for integration of the sensor unit (option)



Exchangeable sensor unit



Option Housing "A"





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SPECIFICATIONS

Electrical

Power supply	16 – 29 V DC, reverse-polarity protected
Power consumption	70 mA, max. (1.7 VA for 24 V)
Analog output signal	Proportional, overload and short-circuit proof, load ≤ 500 Ohm for current signal, ≥ 50 kOhm for voltage signal 4 - 20 mA or 2 – 10 V = measuring range 3.2 < 4 mA or 1.6 - 2 V = underrange > 20 - 21.2 mA or 10 - 10.6 V = overrange 2 mA or 1 V = fault > 21.8 mA or 10.9 V = fault High

Sensor performance

Gas type	Carbon dioxide CO ₂
Sensor element	Infrared (NDIR)
Measuring range	5 vol. %
Measurement interval	2 sec.
Accuracy	< 10 % of range
Response time	t ₉₀ < 120 s
Sensor life time	15 years for normal operating environment
Calibration interval (recommendation)	5 years
Temperature range	-35 °C to +40 °C (-31 °F to 104 °F)
Humidity range	0 - 95 % RH not-condensing
Pressure range	Atmospheric ± 30 % (interference + 1,6 % on measured value per kPa)
Storage temperature	5 °C to 30 °C (41 °F to 86 °F)
Storage time	6 months

Physical

Enclosure M25	Polycarbonate UL 94 V2
Enclosure colour	RAL 7032 (light grey)
Dimensions	(D x H) 24 x 22 mm (0.94 x 0.87 in.)
Weight	Ca. 30 g (0.066 lb)
Protection class	IP 65
Mounting	Screw mounting M25
Wire connection	Screw-type terminal min. 0.25 mm ² , max. 1.3 mm ² , 3-pin

Directives

EMC directives 2014/30/EU

CE

Compliance with:

EN 378-1

EN 61010-1:2010

ANSI/UL 61010-1

CAN/CSA-C22.2 No. 61010-1

Warranty

1 year on material (without sensor element)

Options

Enclosure type for integration of sensor unit	Polycarbonate UL 94 V2
Enclosure colour	RAL 7032 (light grey)
Dimensions	(B x H x T) 94 x 130 x 57 mm (3.7 x 5.1 x 2.2 in.)
Weight	Ca. 0,2 kg (0.4 lb)
Package volume	Ca. 4,5 l
Protection class	IP 65
Mounting	Wall mounting
Pre-embossing for cable entry / sensor unit	6 x M20 / M25





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ORDER INFORMATION

SENSOR UNIT

MC2-**X** I1164-**X**

	Gas type	Sensor type	Measuring range
I1164-C	Carbon dioxide CO ₂	Infrared	0 - 2 Vol % (on request)
I1164-B	Carbon dioxide CO ₂	Infrared	0 - 5 Vol %
I1164-A	Carbon dioxide CO ₂	Infrared	0 – 2000 ppm (on request)

HOUSING FOR INTEGRATION OF THE SENSOR UNIT

0	Without housing
A	Plastic housing type A, 90 x 130 x 57 mm

EXAMPLE

CO₂ sensor unit, measuring range 5 vol. %, with plastic housing type A

Ordering number: MC2-A-I1164-B

WIRING CONFIGURATION

