



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
- Housing for integration of the sensor unit (option)
- IP 65 version
- Display (option)
- Display with two open-collector outputs for horn (resettable) and warning lamp (option)
- Conformity to
 - EN 378-1
 - EN 45544
 - EN 61010-1
 - ANSI/UL 61010 1
 - CAN/CSA-C22.2 No. 61010-1
- Duct mounting kit (accessory)



Exchangeable sensor unit in plastic housing without cable



Exchangeable sensor unit in plastic housing with cable 5 m



Option housing "A" with sensor unit in plastic housing





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SPECIFICATIONS

Electrical

Power supply	16 – 29 V DC, reverse-polarity protected; 18 - 27 V AC (only for output signal 2-10 V)
Power consumption	40 mA, max. (1.0 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	See Ordering Information
Accuracy	< 10 % of reading
Response time	t ₉₀ < 100 s
Sensor life time	15 years for normal operating environment
Calibration interval (recommendation)	5 years
Temperature range	-35 °C to +50 °C (-31 °F to 122 °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 45544
EN 61010-1:2010, ANSI/UL 61010-1; CAN/CSA-C22.2 No. 61010-1

Warranty

1 year on sensor (not if poisoned or overloaded), 2 years on device

Options

Enclosure A 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 / package volume	Ca. 0,2 kg (0.4 lb) / ca. 4,5 l
Protection class	IP 65
Mounting	Wall mounting
Pre-embossing for cable entry / sensor unit	6 x M20 / M25

LCD Display

LCD	Two lines, 16 characters each, monochrome
Open-collector (transistor) output (2)	For horn (resettable) and warning lamp
Switching capacity	24 V DC / 50 mA (+ switching)

All specifications were collected under optimal test conditions.

We confirm compliance with the minimum requirements of the applicable standard.



MSR-Electronic GmbH ::: Würdinger Str. 27 & 27A ::: 94060 Pocking ::: Germany

Specifications subject to change without notice.
Up-to-date data sheets and user manuals can be found in the download area of www.msr-24.com.
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ORDER INFORMATION

MC2-**X** I-**S1164-X** - **X**- **P**- **XX**

- 00** Without connection cable (standard)
- XX** With connection cable: **01, 02, 03, 04, 05 ... 15** max. (length in m)
- P** Sensor housing plastic

VISUALIZATION

- 0** Without display
- 1** With display for indication of measurement values (only in housing A or N)
- 2** With display for indication of measurement values and operation, as well as and two open-collector outputs for horn and warning lamp (only in housing A or N)

	Gas type	Sensor type	Measuring range
I-S1164-C	Carbon dioxide CO ₂	Infrared	0 - 2 Vol %
I-S1164-B	Carbon dioxide CO ₂	Infrared	0 - 5 Vol %
I-S1164-A	Carbon dioxide CO ₂	Infrared	0 – 2000 ppm

HOUSING FOR INTEGRATION OF THE SENSOR UNIT

- 0** Without housing
- A** Plastic housing type A, 94 x 130 x 57 mm
- 5** Stainless steel housing type 5, 113 x 135 x 45 mm
- D** Plastic housing type D, 94 x 65 x 57 mm
- N** Plastic housing type N, 80 x 82 x 55 mm

EXAMPLE

CO₂ sensor unit, measuring range 5 vol. %, with plastic housing type A; without display, sensor unit in plastic housing without connection cable

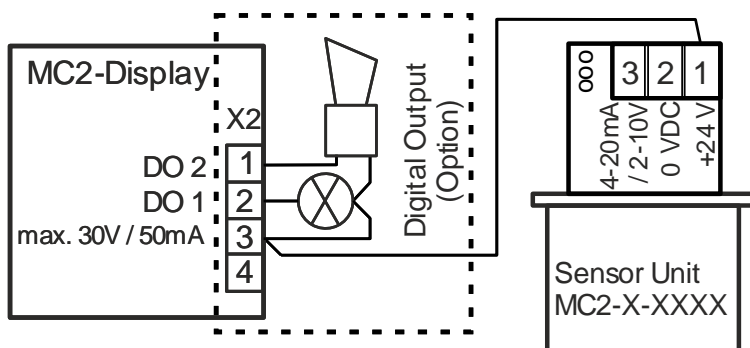
Order number: **MC2-A-I-S1164-B-0-P-00**

ACCESSORY

Duct mounting kit

Order number: **C2-Z2**

WIRING CONFIGURATION (including options)



Note:

The installation of the sensor unit MC2 directly on the MSC2, MGC2 or MSB2 housing isn't-possible, only external connection with separate housing!

For 4- 20 mA output signal you have to remove the resistor between pin 2 and pin 3.

