



μGard®2

Sensor unit MC2 for combustible gases with analog output

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

The sensor unit MC2 houses a module with μController, analog output and power supply in addition to the Pellistor sensor element including amplifier. The μController calculates a linear 4 – 20 mA (or 2 – 10 V) signal out of the measurement signal 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 MC2 is used for the detection of combustible gases in the non-Ex zone when a typical 4 – 20 mA (or 2 – 10 V) signal is required.

FEATURES

- Digital measurement value processing incl. temperature compensation
- Internal function control with integrated hardware watchdog
- Data / measured values in μC of the sensor unit, therefore simple exchange uncalibrated <> calibrated
- High accuracy and reliability
- Long sensor life time
- Hardware & 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
- Housing for integration of the sensor unit
- IP 65 version
- Display (option)
- Display with two open-collector outputs for horn (resettable) and warning lamp (option)
- Conformity to
 - EN 50545:2017
 - EN 50271
 - 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 protect.; 18 - 27 V AC (only for output signal 2-10 V)
Power consumption	75 mA, max. (1.8 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	Combustible gases, see Order Information
Sensor element	Pellistor (catalytic bead) sensor P34XX
Measuring range	See Order Information
Accuracy	± 1 % LEL (CH ₄)
Display resolution	0,1 % UEG
Repeatability	< 2 % sig. (CH ₄)
Response time t ₉₀	< 15 sec. (CH ₄)
Zero point variation	0.5 % (CH ₄)
Long-term zero-point drift	< 0.5 % LEL / month (CH ₄)
Long-term sensitivity drift	< 1 % LEL / month (CH ₄)
Temperature range	-30 °C to +60 °C (-22 to 140 °F)
Humidity range	5 - 95 % RH not condensing
Pressure range	Atmospheric ± 10 %
Sensor life time	> 36 months / normal ambient conditions
Calibration interval ¹	6 months
Storage temperature range	+ 5 °C to + 30 °C (41 °F to 86 °F)
Storage time	6 months
Poisoning	Sensitivity of Pellistor sensors can be influenced by substances containing silicon compounds and even poisoned and destroyed by them.

Physical

Housing A for integration of the sensor unit	Polycarbonate UL 94 V2
Enclosure colour	RAL 7032 (light grey)
Dimensions (W x H x D)	94 x 130 x 57 mm (3.7 x 5.1 x 2.2 in.)
Weight / Packaging volume	Ca. 0.2 kg / Ca. 4.5 l
Protection class	IP 65
Mounting	Wall mounting
Pre-embossed entries for cable / sensor unit	6 x M20/M25
Enclosure M25: Material / colour	Polycarbonate UL 94 V2 / 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, 24 to 16 AWG
Directives	EMC directives 2014/30/EU, CE Compliance with: EN 50545:2017; 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

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)

¹ Manufacturer-recommended calibration interval for normal environmental conditions.

All specifications were collected under optimal test conditions.

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





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ORDER INFORMATION

MC2-**X** **X34XX-X** -**X**- **X**- **XX**

00 Without connection cable (standard)

XX With connection cable: **01, 02, 03, 04, 05** ... **15** max. (length in m)

P Sensor housing plastic

S Sensor housing stainless steel

0 Without display

1 With display for indication of measurement values (only in housing A or N)

2 With display for values & operation, 2x open-collector for horn & warning lamp (only housing A / N)

	Gas type	Measuring range	Gas density (air = 1)	Mounting height
P3485-A	Acetone, C ₃ H ₆ O	0 – 100 % LEL	2.00	Floor
P3408-A	Ammonia, NH ₃	0 – 100 % LEL	0.60	Ceiling
P3430-A	Benzene, C ₆ H ₆	0 – 100 % LEL	2.70	Floor
P3494-A	Butadiene, C ₄ H ₆	0 – 100 % LEL	1.92	Floor
P3448-A	Butyl acetate, C ₆ H ₁₂ O ₂	0 – 100 % LEL	4.01	Floor
P3415-A	Cyclohexane, C ₆ H ₁₂	0 – 100 % LEL	2.90	Floor
P3472-A	Cyclopentane, C ₅ H ₁₀	0 – 100 % LEL	2.42	Floor
P3420-A	Ethane, C ₂ H ₆	0 – 100 % LEL	1.05	1.5 to 1.8 m
P3427-A	Ethyl acetate, C ₄ H ₈ O ₂	0 – 100 % LEL	3.04	Floor
P3425-A	Ethyl alcohol, C ₂ H ₅ OH	0 – 100 % LEL	1.59	Floor
P3410-A	Ethylene, C ₂ H ₄	0 – 100 % LEL	0.98	1.5 to 1.8 m
P3440-A	Hydrogen, H ₂	0 – 100 % LEL	0.07	Ceiling
P3468-A	Isobutyl alcohol, C ₄ H ₁₀ O	0 – 100 % LEL	2.56	Floor
P3482-A	Isopropyl alcohol, C ₃ H ₈ O	0 – 100 % LEL	2.08	Floor
P3460-A	Iso/n-Butane, C ₄ H ₁₀	0 – 100 % LEL	2.11	Floor
P3475-A	Iso/n-Pentane, C ₅ H ₁₂	0 – 100 % LEL	2.49	Floor
P3402-A	LPG	0 – 100 % LEL	-	-
P3400-A	Methane, CH ₄	0 – 100 % LEL	0.55	Ceiling
P3450-A	Methanol, CH ₃ OH	0 – 100 % LEL	1.11	Floor
P3473-A	Methyl acetate, C ₃ H ₆ O ₂	0 – 100 % LEL	2.56	Floor
P3458-A	Methyl ethyl ketone, C ₄ H ₈ O	0 – 100 % LEL	1.15	Floor
P3491-A	n-Heptane, C ₇ H ₁₆	0 – 100 % LEL	3.46	Floor
P3435-A	n-Hexane, C ₆ H ₁₄	0 – 100 % LEL	2.98	Floor
P3495-A	Nonane, C ₉ H ₂₀	0 – 100 % LEL	4.43	Floor
P3470-A	Octane, C ₈ H ₁₈	0 – 100 % LEL	1.04	1.5 to 1.8 m
P3496-A	Petrol Vapours	0 – 100 % LEL	-	-
P3480-A	Propane, C ₃ H ₈	0 – 100 % LEL	1.55	Floor
P3480-B	Propane, C ₃ H ₈	0 – 30 % LEL	1.55	Floor
P3484-A	Propyl alcohol, C ₃ H ₈ O	0 – 100 % LEL	2.08	Floor
P3490-A	Toluene, C ₇ H ₈	0 – 100 % LEL	3.18	Floor

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



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EXAMPLE

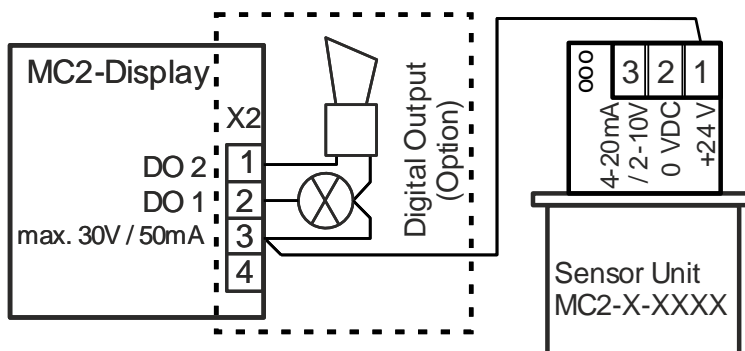
CH₄ Methane sensor unit with Pellistor element, measuring range 0 - 100 % LEL with plastic housing type A, without display, sensor unit in plastic housing without connection cable

Order number: MC2-A-P3400-A-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.



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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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