

PERFECT SOLUTIONS FOR GAS ALARM SYSTEMS



## Technical Datasheet



**μGard<sup>®</sup>2**

### Sensor Unit MC2

for Combustible Gases  
with Analog Output

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Specifications subject to change without notice.  
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■ All Products  
■ Made  
■ in Germany

## DESCRIPTION

### **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  $\mu$ Controller, analog output and power supply in addition to the infrared or Pellistor sensor element including amplifier. The  $\mu$ Controller calculates a linear 4–20 mA (or 2–10 V) signal out of the measurement signal and 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  $\mu$ Gard<sup>®</sup>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  $\mu$ C of the sensor unit, therefore simple exchange uncalibrated <> calibrated
- High accuracy and reliability
- Long sensor lifetime
- Hardware and 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
- IP65 version
- Housing for integration of the sensor unit (option)
- Display (option)
- Display with two open-collector outputs for horn (resettable) and warning lamp (option)
- Conformity to:
  - EN 50271
  - EN 50545:2017
  - EN 61010-1
  - ANSI/UL 61010 1
  - CAN/CSA-C22.2 No. 61010-1
- Duct mounting kit (accessory)

## 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 Ω for current signal, ≥ 50 kΩ 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 ELEMENT	
Gas type	Combustible gases, see Ordering Information
Sensor element	<b>Pellistor (catalytic bead) sensor</b> <b>Infrared</b>
Measuring range	See Ordering Information                      0-100 % LEL
Accuracy	± 1 % LEL (CH <sub>4</sub> )                      ± 4.0 % of signal (CH <sub>4</sub> )
Display resolution	0,1 % LEL                      n. d.
Repeatability	< 2 % of signal (CH <sub>4</sub> )
Response time t <sub>90</sub>	< 15 sec. (CH <sub>4</sub> )                      ≤ 70 sec. (CH <sub>4</sub> )
Zero-point variation	0,5 % (CH <sub>4</sub> )                      4 % LEL
Long-term zero-point drift	< 0.5 % LEL / month (CH <sub>4</sub> )                      n. d.
Long-term sensitivity drift	< 1 % LEL / month (CH <sub>4</sub> )                      n. d.
Calibration interval <sup>1</sup>	6 months
Sensor lifetime	> 3 years / normal ambient conditions                      5 years / normal conditions
Temperature range	-30 °C to +60 °C (-22 °F to 140 °F)
Humidity range	5–95 % RH not condensing
Pressure range	Atmospheric ± 10 %
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. The sensors are susceptible to poisoning by organic solvents and silicone vapours.
PHYSICAL	
Enclosure P (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	IP65 (only if mounted in housing type A, D or N)
Mounting	Screw mounting / M25
Wire connection	Screw-type terminal min. 0.25 mm <sup>2</sup> , max. 1.3 mm <sup>2</sup> , 3-pin, 24 to 16 AWG
REGULATIONS	
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

<sup>1</sup> Manufacturer-recommended calibration interval for normal environmental conditions.

OPTIONS	
ENCLOSURE A	
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	IP65
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.

## ORDERING INFORMATION

<b>MC2-</b>	<b>X-</b>	<b>S4XX-X-</b>	<b>X-</b>	<b>X</b>			
				<b>P</b>	Sensor housing plastic	<b>Sensor housing</b>	
				<b>S</b>	Sensor housing stainless steel		
				<b>0</b>	Without display	<b>Display</b>	
				<b>1</b>	With display for indication of readings (only in housing A or N)		
				<b>2</b>	With display for values and operation, 2x open collector for horn and warning lamp (only housing A / N)		
					<b>Gas type</b>	<b>Measuring range</b>	
		<b>S400-A</b>	Methane	CH <sub>4</sub>	Infrared	0-100 % LEL	<b>Gas type/ Measuring range</b>
		<b>S480-A</b>	Propane	C <sub>3</sub> H <sub>8</sub>	Infrared	0-100 % LEL	
				<b>0</b>	Without housing	<b>Housing for inte- gration of the sensor unit</b>	
				<b>A</b>	Plastic housing type A, 94 x 130 x 57 mm		
				<b>5</b>	Stainless steel housing type 5, 113 x 135 x 45 mm		
				<b>D</b>	Plastic housing type D, 94 x 65 x 57 mm		
				<b>N</b>	Plastic housing type N, 80 x 82 x 55 mm		

## ORDERING INFORMATION

MC2-	X-	X34XX-	X-	X	
				<b>P</b>	Sensor housing plastic
				<b>S</b>	Sensor housing stainless steel
					<b>Sensor housing</b>
			<b>0</b>		Without display
			<b>1</b>		With display for indication of readings (only in housing A or N)
			<b>2</b>		With display for values and operation, 2x open collector for horn and warning lamp (only housing A / N)
					<b>Display</b>
				<b>Gas type</b>	
				<b>Measuring range</b>	
				<b>Gas density (air = 1)</b>	
				<b>Mounting height</b>	
<b>P3485-A</b>				Acetone, C <sub>3</sub> H <sub>6</sub> O	0-100 % LEL 2.00 Floor
<b>P3408-A*</b>				Ammonia, NH <sub>3</sub>	0-100 % LEL 0.60 Ceiling
<b>P3430-A</b>				Benzene, C <sub>6</sub> H <sub>6</sub>	0-100 % LEL 2.70 Floor
<b>P3494-A</b>				Butadiene, C <sub>4</sub> H <sub>6</sub>	0-100 % LEL 1.92 Floor
<b>P3448-A</b>				Butyl acetate, C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>	0-100 % LEL 4.01 Floor
<b>P3415-A</b>				Cyclohexane, C <sub>6</sub> H <sub>12</sub>	0-100 % LEL 2.90 Floor
<b>P3472-A</b>				Cyclopentane, C <sub>5</sub> H <sub>10</sub>	0-100 % LEL 2.42 Floor
<b>P3420-A</b>				Ethane, C <sub>2</sub> H <sub>6</sub>	0-100 % LEL 1.05 1.5 to 1.8 m
<b>P3427-A</b>				Ethyl acetate, C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	0-100 % LEL 3.04 Floor
<b>P3425-A</b>				Ethyl alcohol, C <sub>2</sub> H <sub>5</sub> OH	0-100 % LEL 1.59 Floor
<b>P3410-A</b>				Ethylene, C <sub>2</sub> H <sub>4</sub>	0-100 % LEL 0.98 1.5 to 1.8 m
<b>P3440-A</b>				Hydrogen, H <sub>2</sub>	0-100 % LEL 0.07 Ceiling
<b>P3468-A</b>				Isobutyl alcohol, C <sub>4</sub> H <sub>10</sub> O	0-100 % LEL 2.56 Floor
<b>P3482-A</b>				Isopropyl alcohol, C <sub>3</sub> H <sub>8</sub> O	0-100 % LEL 2.08 Floor
<b>P3460-A</b>				Iso/n-Butane, C <sub>4</sub> H <sub>10</sub>	0-100 % LEL 2.11 Floor
<b>P3475-A</b>				Iso/n-Pentane, C <sub>5</sub> H <sub>12</sub>	0-100 % LEL 2.49 Floor
<b>P3402-A</b>				LPG	0-100 % LEL - -
<b>P3400-A</b>				Methane, CH <sub>4</sub>	0-100 % LEL 0.55 Ceiling
<b>P3450-A</b>				Methanol, CH <sub>3</sub> OH	0-100 % LEL 1.11 Floor
<b>P3473-A</b>				Methyl acetate, C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	0-100 % LEL 2.56 Floor
<b>P3458-A</b>				Methyl ethyl ketone, C <sub>4</sub> H <sub>8</sub> O	0-100 % LEL 1.15 Floor
<b>P3491-A</b>				n-Heptane, C <sub>7</sub> H <sub>16</sub>	0-100 % LEL 3.46 Floor
<b>P3435-A</b>				n-Hexane, C <sub>6</sub> H <sub>14</sub>	0-100 % LEL 2.98 Floor
<b>P3495-A</b>				Nonane, C <sub>9</sub> H <sub>20</sub>	0-100 % LEL 4.43 Floor
<b>P3470-A</b>				Octane, C <sub>8</sub> H <sub>18</sub>	0-100 % LEL 1.04 1.5 to 1.8 m
<b>P3496-A</b>				Petrol Vapours	0-100 % LEL - -
<b>P3480-A</b>				Propane, C <sub>3</sub> H <sub>8</sub>	0-100 % LEL 1.55 Floor
<b>P3480-B</b>				Propane, C <sub>3</sub> H <sub>8</sub>	0-30 % LEL 1.55 Floor
<b>P3480-C</b>				Propane, C <sub>3</sub> H <sub>8</sub>	0-5000 ppm 1.55 Floor
<b>P3490-A</b>				Toluene, C <sub>7</sub> H <sub>8</sub>	0-100 % LEL 3.18 Floor
					<b>Gas type/ Measuring range/ Gas density Mounting height</b>
			<b>0</b>		Without housing
			<b>A</b>		Plastic housing type A, 94 x 130 x 57 mm
			<b>5</b>		Stainless steel housing type 5, 113 x 135 x 45 mm
			<b>D</b>		Plastic housing type D, 94 x 65 x 57 mm
			<b>N</b>		Plastic housing type N, 80 x 82 x 55 mm
					<b>Housing for inte- gration of the sensor unit</b>

\*On request only

**EXAMPLE**

CH<sub>4</sub> Methane sensor unit with Pellistor element, measuring range 0 -100 % LEL with plastic housing type A, without display, sensor unit in plastic housing P

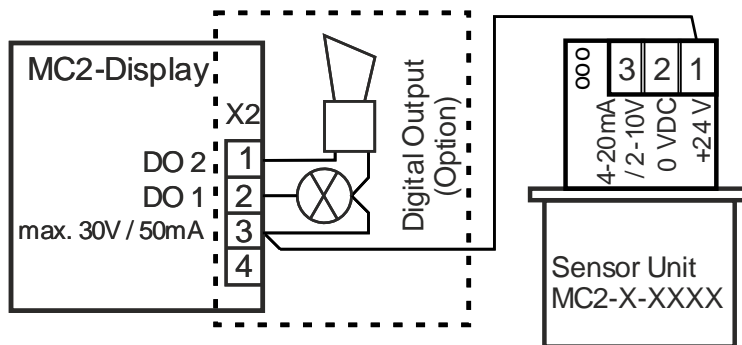
**Ordering number: MC2-A-P3400-A-0-P**

**ACCESSORY**

Duct mounting kit

**Ordering number: C2-Z2**

**WIRING CONFIGURATION**



**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.