

Gas Detection.



## Technical Datasheet



PolyGard®2

### MC2 Sensor

with Catalytic Sensor Element  
for Combustible Gases with Analog Output

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Specifications subject to change without notice.

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## 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 catalytic sensor element (Pellistor) 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 PolyGard®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 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 SIL 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 2 open-collector outputs for horn (resettable) and warning lamp (option)
- Duct mounting kit (accessory)
  
- Conformity to:
  - EN 50271
  - EN 50545:2017
  - EN 61010-1
  - ANSI/UL 61010 1
  - CAN/CSA-C22.2 No. 61010-1

## SPECIFICATIONS

<b>ELECTRICAL</b>	
Power supply	18–29 V DC, reverse-polarity protected; 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 $\leq 500 \Omega$ for current signal, $\geq 50 \text{ k}\Omega$ for voltage signal 4–20 mA or 2–10 V = measuring range 3–4 mA or 1.5–2 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
<b>SENSOR ELEMENT</b>	
Gas type and measuring range	Combustible gases, see Ordering Information
Sensor element	Pellistor (catalytic bead) sensor
Temperature range	-30 °C to +60 °C (-22 °F to 140 °F)
Humidity range	0–95 % RH not condensing
Pressure range	90–110 kPa
Oxygen concentration	21 % (standard) 18 % minimum level
Storage temperature range	0 °C to +20 °C (32 °F to 68 °F)
Storage time <sup>1</sup>	Ca. 6 months
Sensor lifetime	5 years / normal ambient conditions
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.
<b>PHYSICAL</b>	
Housing plastic	Polycarbonate; UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions: Type P (Ø 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)
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
<b>REGULATIONS</b>	
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> If stocked for a longer period, we recommend checking the zero point and recalibrating if necessary.

OPTIONS	
<b>ENCLOSURE A</b>	
Enclosure A for integration of sensor unit	Polycarbonate UL 94 V2
Enclosure colour	RAL 7032 (light grey)
Dimensions (B x H x D)	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
<b>LCD-DISPLAY</b>	
LCD	2 lines, 16 characters each, monochrome
<b>OPEN-COLLECTOR</b>	
Transistor output (2)	For horn (resettable) and warning lamp
Switching capacity	24 V DC / 50 mA (+ switching)

Gas type	Ordering No.	Measuring range	Accuracy	Display resolution	Repeatability	t <sub>90</sub> time	Zero-point variation	Drift in air		Calibration interval <sup>1</sup>
								Zero	Gain	
	MC2-	% LEL/ ppm	± % sig.	% LEL / ppm	<± % sig.	≤ sec.	± % LEL	< % signal/month		Months
CH <sub>4</sub>	P3400-A	0–100 % LEL	1 (CH <sub>4</sub> )	0.1	2 (CH <sub>4</sub> )	15	0.5 (CH <sub>4</sub> )	0.5 (CH <sub>4</sub> )	2 (CH <sub>4</sub> )	6
NH <sub>3</sub>	P3408-A	0–100 % LEL	1 (CH <sub>4</sub> )	0.1	2 (CH <sub>4</sub> )	20	0.5 (CH <sub>4</sub> )	0.5 (CH <sub>4</sub> )	2 (CH <sub>4</sub> )	6
NH <sub>3</sub>	P3408-B	0–20 % LEL	1 (CH <sub>4</sub> )	0.1	2 (CH <sub>4</sub> )	10	0.5 (CH <sub>4</sub> )	0.5 (CH <sub>4</sub> )	2 (CH <sub>4</sub> )	6
H <sub>2</sub>	P3440-A	0–100 % LEL	1 (CH <sub>4</sub> )	0.1	1 (CH <sub>4</sub> )	10	0.5 (CH <sub>4</sub> )	0.5 (CH <sub>4</sub> )	2 (CH <sub>4</sub> )	6
C <sub>3</sub> H <sub>8</sub>	P3480-A	0–100 % LEL	1 (CH <sub>4</sub> )	0.1	2 (CH <sub>4</sub> )	20	0.5 (CH <sub>4</sub> )	0.5 (CH <sub>4</sub> )	2 (CH <sub>4</sub> )	6
C <sub>3</sub> H <sub>8</sub>	P3480-B	0–30 % LEL	2 (C <sub>3</sub> H <sub>8</sub> )	0.01	2 (C <sub>3</sub> H <sub>8</sub> )	15	0.5 (C <sub>3</sub> H <sub>8</sub> )	n.d.	2 (C <sub>3</sub> H <sub>8</sub> )	6
C <sub>3</sub> H <sub>8</sub>	P3480-C	0–5000 ppm	2 (C <sub>3</sub> H <sub>8</sub> )	1 (ppm)	2 (C <sub>3</sub> H <sub>8</sub> )	15	0.5 (C <sub>3</sub> H <sub>8</sub> )	n.d.	2 (C <sub>3</sub> H <sub>8</sub> )	6
C <sub>3</sub> H <sub>6</sub>	P3481-B	0–30 % LEL	2 (C <sub>3</sub> H <sub>6</sub> )	0.01	5 (C <sub>3</sub> H <sub>6</sub> )	15	1.0 (C <sub>3</sub> H <sub>6</sub> )	n.d.	2 (C <sub>3</sub> H <sub>6</sub> )	6
All others	PXXXX-A	0–100 % LEL	1 (CH <sub>4</sub> )	0.1	2 (CH <sub>4</sub> )	n.d.	0.5 (CH <sub>4</sub> )	0.5 (CH <sub>4</sub> )	2 (CH <sub>4</sub> )	6

<sup>1</sup> 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.

## ORDERING INFORMATION

<b>MC2-</b>	<b>X-</b>	<b>P34XX-</b>	<b>X-</b>	<b>P</b>	
				<b>P</b>	Sensor housing plastic <span style="float: right;">Sensor housing</span>
			<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)	Display
				<b>Gas type</b>	<b>Measuring range</b>
		<b>P3400-A</b>		Methane, CH <sub>4</sub>	0–100 % LEL
		<b>P3402-A</b>		LPG	0–100 % LEL
		<b>P3408-A*</b>		Ammonia, NH <sub>3</sub>	0–100 % LEL
		<b>P3408-B*</b>		Ammonia, NH <sub>3</sub>	0–20 % LEL
		<b>P3410-A</b>		Ethylene, C <sub>2</sub> H <sub>4</sub>	0–100 % LEL
		<b>P3415-A</b>		Cyclohexane, C <sub>6</sub> H <sub>12</sub>	0–100 % LEL
		<b>P3420-A</b>		Ethane, C <sub>2</sub> H <sub>6</sub>	0–100 % LEL
		<b>P3425-A</b>		Ethyl alcohol, C <sub>2</sub> H <sub>5</sub> OH	0–100 % LEL
		<b>P3427-A</b>		Ethyl acetate, C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	0–100 % LEL
		<b>P3430-A</b>		Benzene, C <sub>6</sub> H <sub>6</sub>	0–100 % LEL
		<b>P3435-A</b>		n-Hexane, C <sub>6</sub> H <sub>14</sub>	0–100 % LEL
		<b>P3440-A</b>		Hydrogen, H <sub>2</sub>	0–100 % LEL
		<b>P3448-A</b>		Butyl acetate, C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>	0–100 % LEL
		<b>P3450-A</b>		Methanol, CH <sub>3</sub> OH	0–100 % LEL
		<b>P3458-A</b>		Methyl ethyl ketone, C <sub>4</sub> H <sub>8</sub> O	0–100 % LEL
		<b>P3460-A</b>		Iso/n-Butane, C <sub>4</sub> H <sub>10</sub>	0–100 % LEL
		<b>P3468-A</b>		Isobutyl alcohol, C <sub>4</sub> H <sub>10</sub> O	0–100 % LEL
		<b>P3470-A</b>		Octane, C <sub>8</sub> H <sub>18</sub>	0–100 % LEL
		<b>P3472-A</b>		Cyclopentane, C <sub>5</sub> H <sub>10</sub>	0–100 % LEL
		<b>P3473-A</b>		Methyl acetate, C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	0–100 % LEL
		<b>P3475-A</b>		Iso/n-Pentane, C <sub>5</sub> H <sub>12</sub>	0–100 % LEL
		<b>P3480-A</b>		Propane, C <sub>3</sub> H <sub>8</sub>	0–100 % LEL
		<b>P3480-B</b>		Propane, C <sub>3</sub> H <sub>8</sub>	0–30 % LEL
		<b>P3480-C</b>		Propane, C <sub>3</sub> H <sub>8</sub>	0–5000 ppm
		<b>P3481-B</b>		Propene, C <sub>3</sub> H <sub>6</sub>	0–30 % LEL
		<b>P3482-A</b>		Isopropyl alcohol, C <sub>3</sub> H <sub>8</sub> O	0–100 % LEL
		<b>P3485-A</b>		Acetone, C <sub>3</sub> H <sub>6</sub> O	0–100 % LEL
		<b>P3490-A</b>		Toluene, C <sub>7</sub> H <sub>8</sub>	0–100 % LEL
		<b>P3491-A</b>		n-Heptane, C <sub>7</sub> H <sub>16</sub>	0–100 % LEL
		<b>P3494-A</b>		Butadiene, C <sub>4</sub> H <sub>6</sub>	0–100 % LEL
		<b>P3495-A</b>		Nonane, C <sub>9</sub> H <sub>20</sub>	0–100 % LEL
		<b>P3496-A</b>		Petrol Vapours	0–100 % LEL
					<b>Gas type/ Measuring range</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, 110 x 132 x 42.5 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

**EXAMPLE**

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

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

**ACCESSORY**

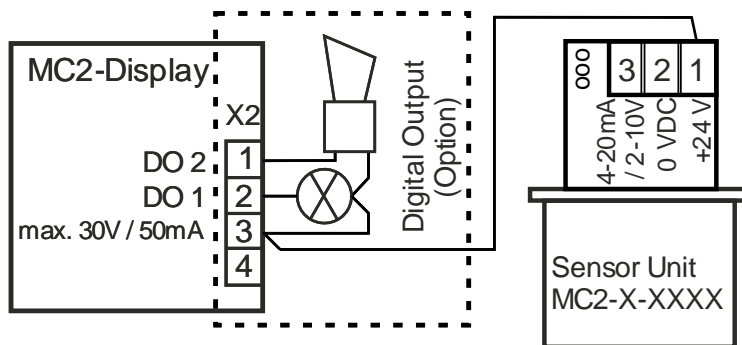
Duct mounting kit

**Ordering number: C2-Z2**

Calibration adapter

**Ordering number: C2-Z4**

**WIRING CONFIGURATION**



**Note:**

The installation of the sensor unit MC2 directly on the MSC2 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.