

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

Catalytic sensor including digital value processing and integrated self-diagnosis, for the continuous monitoring of the ambient air to detect combustible gases.

The intelligent MC2 Sensor for detection of combustible gases includes a catalytic sensor element (Pellistor) and electronics with a measuring amplifier and a μ Controller as well as a module with a terminal for the analog output and the external power supply. The μ Processor converts the sensor's measuring signal into a linear 4–20 mA signal (or 2–10 V). All relevant data and measured values of the sensor are stored fail-safe in the internal memory of the μ Processor.

The maintenance of the device can be done either by simply exchanging the sensor or by using the integrated, comfortable calibration routine directly at the system.

APPLICATION

The PolyGard®2 MC2 Sensor is used to detect combustible gases in non-exlosive areas when an analog 4–20 mA (or 2–10 V) signal is required.



Garage



Tunnel



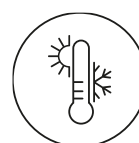
Food



Beverage
dispensing



Laboratory



Climate



Hydrogen



Battery



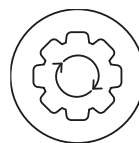
Biogas



Agriculture



Waste



Process



Gas storage

FEATURES

- Internal function control with integrated watchdog
- Easy maintenance and calibration by exchange of the sensor or by comfortable on-site calibration
- High accuracy and reliability
- Sensor with long life expectancy
- Hardware and software according to SIL compliant development process
- 4–20 mA (or 2–10 V) analog output with selectable signal output for Special Mode (fault, maintenance, service etc.)
- Reverse polarity protected, overload and short-circuit proof
- IP65 protection (when installed)

SPECIFICATIONS

ELECTRICAL	
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
SENSOR ELEMENT	
Gas type and measuring range	See Ordering Information
Measuring principle	Catalytic (Pellistor, catalytic bead principle)
Temperature range	-30 °C to +60 °C (-22 °F to 140 °F)
Humidity range	0–95 % RH non-condensing
Pressure range	90–110 kPa
Sensor lifetime ¹ in air	> 5 years
Poisoning	Pellistors can be poisoned by silicone-containing substances or other catalyst poisons up to complete loss of sensitivity.
RECOMMENDED STORAGE CONDITIONS	
Storage temperature range ²	0 °C to +20 °C (32 °F to 68 °F)
Storage time ³	Ca. 6 months
Humidity range	0–95 % RH non-condensing
Pressure range	90–110 kPa
PHYSICAL	
Housing type P	Polycarbonate; UL 94 V2
Housing colour	Similar to RAL 7035 (light grey)
Dimensions (Ø x H)	24 x 22 mm (0.94 x 0.87 in.)
Weight	Ca. 30 g (0.066 lb)
Protection class	IP65
Mounting	Screw mounting, external thread M25 x 1.5 mm
Wire connection	Screw-type terminal, 0.25–1.3 mm ² , 3-pin
REGULATIONS	
Directives	EMC directives 2014/30/EU CE Compliance with: EN 50271 EN 50545:2017; EN 61010-1:2010, ANSI/UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Warranty	1 year on sensors (not if poisoned or overloaded)

¹ Expected service life for normal ambient conditions.

² A deviating storage temperature can have a negative effect on sensitivity and service life.

³ If stocked for a longer period, we recommend checking the zero point and recalibrating if necessary.

OPTIONS	
HOUSING TYPE A	
Material	Polycarbonate
Flammability classification	UL 94 V2
Housing colour	Similar to RAL 7035 (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	6 x M20/M25
DISPLAY	
LC Display	2 lines, 16 characters each, monochrome
Temperature range	-20 °C to +60 °C (-4 °F to 140 °F)
OPEN-COLLECTOR	
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 ₉₀ time	Reaction time	Zero-point variation	Drift in air	Relative gas density ¹	Calibration interval ²
	MC2-X-	% LEL / ppm	± % sig.	% LEL / ppm	< ± % sig.	≤ sec.	≤ sec.	± % LEL	< % / month	Air = 1	Months
CH ₄	P3400-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	15	5	0.5 (CH ₄)	2 (CH ₄)	0.56	12
LPG	P3402-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	n.d.	6
NH ₃	P3408-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	20	5	0.5 (CH ₄)	2 (CH ₄)	0.60	6
NH ₃	P3408-B	0–20 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	10	5	0.5 (CH ₄)	2 (CH ₄)	0.60	6
C ₂ H ₄	P3410-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	0.97	6
C ₆ H ₁₂	P3415-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.90	6
C ₂ H ₆	P3420-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	1.05	6
C ₂ H ₅ OH	P3425-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	1.59	6
C ₄ H ₈ O ₂	P3427-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	3.04	6
C ₆ H ₆	P3430-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.70	6
C ₆ H ₁₄	P3435-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.97	6
H ₂	P3440-A	0–100 % LEL	1 (CH ₄)	0.1	1 (CH ₄)	10	5	0.5 (CH ₄)	2 (CH ₄)	0.07	12
C ₆ H ₁₂ O ₂	P3448-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	4.01	6
CH ₃ OH	P3450-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	1.10	6
C ₄ H ₈ O	P3458-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.48	6
C ₄ H ₁₀	P3460-A	0–100 % LEL	2 (CH ₄)	0.1	2 (C ₄ H ₁₀)	10	5	0.5 (C ₃ H ₈)	2 (C ₃ H ₈)	2.08	12
C ₄ H ₁₀ O	P3468-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.55	6
C ₈ H ₁₈	P3470-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	3.94	6
C ₅ H ₁₀	P3472-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.42	6
C ₃ H ₆ O ₂	P3473-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.56	6
C ₅ H ₁₂	P3475-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.49	6
C ₃ H ₈	P3480-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	20	5	0.5 (CH ₄)	2 (C ₃ H ₈)	1.55	12
C ₃ H ₈	P3480-B	0–30 % LEL	2 (C ₃ H ₈)	0.01	2 (C ₃ H ₈)	15	5	0.5 (C ₃ H ₈)	2 (C ₃ H ₈)	1.55	12
C ₃ H ₈	P3480-C	0–5000 ppm	2 (C ₃ H ₈)	1 (ppm)	2 (C ₃ H ₈)	15	5	0.5 (C ₃ H ₈)	2 (C ₃ H ₈)	1.55	12
C ₃ H ₆	P3481-B	0–30 % LEL	2 (C ₃ H ₆)	0.01	5 (C ₃ H ₆)	15	5	1.0 (C ₃ H ₆)	2 (C ₃ H ₆)	1.48	12
C ₃ H ₈ O	P3482-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.07	6
C ₃ H ₆ O	P3485-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	2.00	6
C ₇ H ₈	P3490-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	3.18	6
C ₇ H ₁₆	P3491-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	3.46	6
C ₈ H ₁₀	P3493-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	3.67	6
C ₄ H ₆	P3494-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	1.92	6
C ₉ H ₂₀	P3495-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	4.43	6
Petrol Vapours	P3496-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	n.d.	5	0.5 (CH ₄)	2 (CH ₄)	n.d.	6

¹ The recommended mounting height depends on the relative gas density of the type of gas to be monitored. Depending on the relative gas density (d), the following recommendation therefore applies:

d ≤ 0.85: Mounting 0.3–0.5 m below the ceiling
 0.85 < d < 1.15: Mounting at 1.2–1.8 m height
 d ≥ 1.15: Mounting 0.3–0.5 m above the floor

² 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.

The T 021 (DGVU-I-213-056) and T 023 (DGVU-I-213-057) as well as T 055 leaflets must be observed.

EXAMPLE

CH₄ sensor, measuring range 0–100 % LEL, with plastic housing type A without display
(order number: MC2-A-P3400-A-0-P)

ACCESSORY

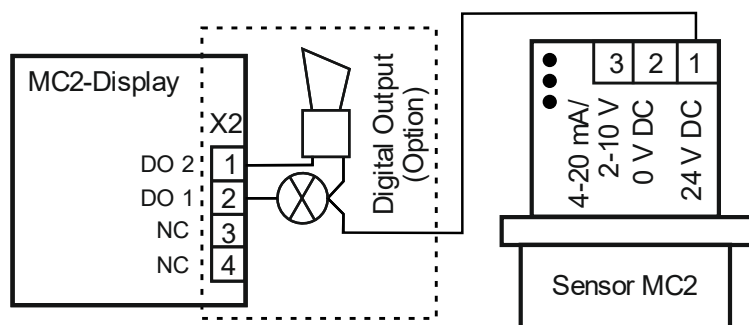
Sensor protection cap (order number: C2-Z1)

Duct mounting kit (order number: C2-Z2)

Calibration adapter (order number: C2-Z4, C2-Z4-A, C2-Z4-B, C2-Z4-C)

Splash protection SplashGuard (order number: C2-Z5)

WIRING CONFIGURATION



Note:

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

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

FURTHER MEASURING PRINCIPLES



Infrared:

Methane (CH₄), propane (C₃H₈)

→ See data sheet DB_MC2_IR_Premium and data sheet DB_MC2_IR



MP5™:

Methane (CH₄), propane (C₃H₈), hydrogen (H₂)

→ See data sheet DB_MC2_MP5



Semiconductor:

Ammonia (NH₃), ethylene (C₂H₄)

→ See data sheet DB_MC2_HL



Electrochemical:

Ammonia (NH₃), ethylene (C₂H₄), hydrogen (H₂)

→ See data sheet DB_MC2_Tox



Documents



Catalog



YouTube