

Gas Detection.



Technical Datasheet



PolyGard®

Sensor MC2 with MPS™ Sensor Element with Analog Output

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DESCRIPTION

MPS™ sensor including digital value processing, environmental compensation and integrated self-diagnosis for continuous monitoring of the ambient air to detect combustible gases and refrigerants.

The intelligent MC2 sensor consists of a high-performance MPS™ sensor element and electronics with a measuring amplifier and a μ Controller for the digital value processing. The sensor also includes a module with a terminal for analog output and 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 MPS™ measuring principle with integrated temperature, humidity and pressure compensation ensures highest accuracy, selectivity and reliability. The high-quality sensor element offers the best performance characteristics in terms of drift, stability and repeatability over a wide temperature and humidity range. Due to its resistance to poisoning, it is made to consist in harsh environments with particularly tough requirements. The sensor initiates itself at every start-up in order to perfectly adapt to the environment of the application. This allows it to achieve a life time of up to more than 15 years.

APPLICATION

The PolyGard® sensor MC2 is used for the detection of combustible gases and refrigerants when an analog 4–20 mA (or 2–10 V) signal is required. Due to its characteristics, the MPS™-sensor is a highly flexible sensor solution that can be used for a wide range of applications.



Tunnel



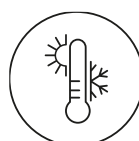
Food



Beverage
dispensing



Laboratory



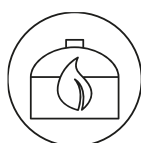
Climate



Hydrogen



Battery



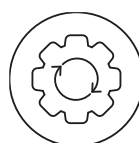
Biogas



Agriculture



Waste



Process



Gas storage

FEATURES

- Internal functional control with integrated Watchdog
- Low power consumption
- High accuracy, linearity, repeatability and stability
- Built-in environmental compensation (pressure, humidity and temperature)
- Integrated self-test and fault management
- Extremely resistant to poisoning
- Long life time (15+ years)
- 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
- Fast reaction
- IP65 protection (when installed)

SPECIFICATIONS

ELCTRICAL	
Power supply	18–29 V DC, reverse-polarity protect.; 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 $\leq 500 \Omega$ 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	MPST [™]
Resolution	0.1 % LEL
Accuracy	$\pm 2 \%$ LEL
Zero-point variation	0.5 % LEL
Temperature range	-40 °C to 70 °C (-40 °F to 158 °F)
Humidity range	0–100 % RH non-condensing
Pressure range	80–120 kPa
Life time	15+ years
Calibration interval	15 years
Poisoning	Poisoning resistant
RECOMMENDED STORAGE CONDITIONS	
Storage temperature range ¹	-40 °C to 75 °C (-40 °F to 167 °F)
Storage time	Ca. 6 months
Humidity range	0–100 % RH non-condensing
Pressure range	80–120 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

¹ A deviating storage temperature can have a negative effect on sensitivity and service life.

REGULATIONS	
Compliance to the Directives	CE EMC Directives 2014/30/EU Low-voltage Directive 2014/35/EU EN 61010-1:2010 ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1
Compliances of the sensor element	EN IEC 60079-1 / 60079-11 CSA 22.2 60079-1 / 60079-11 FM 3600 / 3610 ANSI/UL 913 JEDEC JS001-2017 EN 55011 IEC EN 61000-4-3 IEC EN 61000-4-8 IEC 60335-2-40 UL/CSA 60335-2-40 ASHRAE Standard 15 ASHRAE proposed Standard 15.2P JRA Standard 4068T:2016R
Warranty	1 year on sensors (not if overloaded)
OPTIONS	
Enclosure TYPE A	
Material / flammability classification	Polycarbonate 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 (plus switching)

Gas type	Order No.	Measuring range	Repeatability	t ₉₀ time	Reaction time	Relative gas density ¹
	MC2-X-	% LEL	< ± 2 % sig.	≤ sec.	≤ sec.	Air = 1
CH ₄	M400-A	0–100	5	20	10	0.56
C ₂ H ₂ ²	M405-A	0–100	2	20	10	0.90
NH ₃	M408-B	0–30	2	30	5	0.60
H ₂	M440-A	0–100	2	15	5	0.07
C ₃ H ₈	M480-A	0–100	2	20	10	1.55
DMC	M499-B	0–30	2	60	30	3.11

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 Due to the high amplification, the lowest reliable detection limit for Acetylene is 10 % LEL.

CROSS SENSITIVITY¹ – SENSOR ELEMENT

Approximate reaction of sensor to cross gas in percentage

Gas type	Order No.	R32	Methane, CH ₄	Acetylene, C ₂ H ₂	Ammonia, NH ₃	Hydrogen, H ₂	Propane, C ₃ H ₈	DMC, C ₃ H ₆ O ₃
	MC2-X-	%	%	%	%	%	%	%
CH ₄	M400-A	-	100	30	> 200	105	70	> 200
C ₂ H ₂	M405-A	-	> 200	100	> 200	> 200	> 200	> 200
NH ₃	M408-B	-	40	10	100	40	30	85
H ₂	M440-A	-	95	30	> 200	100	65	> 200
C ₃ H ₈	M480-A	-	150	50	> 200	155	100	> 200
DMC	M499-B	-	45	15	120	50	35	100

¹ The table does not claim to be complete. Other gases, too, can have an influence on the sensitivity. The mentioned cross sensitivity data are only reference values valid for new sensors.

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.

FURTHER MEASURING PRINCIPLES

**Infrared:**

Methane (CH_4), propane (C_3H_8)

→ See data sheet DB_MC2_IR_Premium and data sheet DB_MC2_IR

→

**Semiconductor:**

Ammonia (NH_3)

→ See data sheet DB_MC2_HL

**Electrochemical:**

Ammonia (NH_3), hydrogen (H_2)

→ See data sheet DB_MC2_ToX

**Catalytic:**

Ammonia (NH_3), methane (CH_4), propane (C_3H_8), hydrogen (H_2)

→ See data sheet DB_MC2_Ex



Documents



Catalog



YouTube