

Technical Datasheet



PolyGard®2

MC2 Sensor

with Infrared Sensor Element
for Methane, Propane or Carbon Dioxide
with Analog Output

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Specifications subject to change without notice.
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DESCRIPTION

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

The intelligent MC2 Sensor includes an infrared sensor element 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 IR measurement principle with integrated temperature compensation ensures high accuracy, selectivity and reliability.

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 Sensor is used to detect different, even combustible gases, in the non-explosive areas when an analog 4–20 mA (or 2–10 V) signal is required.



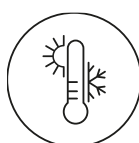
Food



Beverage
dispensing



Laboratory



Climate



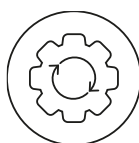
Biogas



Agriculture



Waste



Process



Gas storage

FEATURES

- Internal functional control with integrated watchdog
- Easy maintenance and calibration by exchange of the sensor or by comfortable on-site calibration
- High accuracy, selectivity and reliability
- Low zero-point drift
- Sensor with very 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	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	Infrared (NDIR)
Repeatability	$< \pm 5 \%$ signal
t_{90} time	$\leq 90 \text{ s}$
Drift in air	n.d.
Pressure range	90–110 kPa (influence + 1.6 % on measured value per kPa)
Poisoning	IR sensors can show symptoms of poisoning due to contamination with oils and lubricants.
RECOMMENDED STORAGE CONDITIONS	
Storage temperature range ¹	See following tables
Storage time ²	Ca. 6 months
Humidity range	See following tables
Pressure range	90–110 kPa
PHYSICAL	
Housing type L	Polycarbonate UL 94 V2
Housing colour	Similar to RAL 7035 (light grey)
Dimensions (Ø x H)	24 x 30 mm (0.94 x 1.18 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 378-1 EN IEC 62990-1 Type SM EN 50271 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 A deviating storage temperature can have a negative effect on sensitivity and service life.

² If stocked for a longer period, we recommend checking the zero point and recalibrating if necessary.

OPTIONS

HOUSING 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 (+ switching)

Gas type	Order No.	Measuring range	Display resolution	Accuracy	Reaction time	Zero-point variation	Temperature range	Humidity range non-condensing	Life time ¹ in air	Relative Gas density ²	Calibration interval ³
	MC2-X-		%	±% sig.	≤ sec.	± % LEL	°C	% RH	> years	Air = 1	Months
CH ₄	S400-A	0–100 % LEL	0.1	4	15	4	-30 / +60	0–95	5	0.56	12
C ₃ H ₈	S480-A	0–100 % LEL	0.1	4	10	4	-30 / +60	0–95	5	1.55	12
CO ₂	I-S1164-B	0–5 % vol	0.001	10	5	n.d.	-35 / +50	0–85	15	1.53	60
CO ₂	I-S1164-C	0–2 % vol	0.001	10	5	n.d.	-35 / +50	0–85	15	1.53	60
CO ₂	I-S1164-D	0–5000 ppm	1	10	5	n.d.	-35 / +50	0–85	15	1.53	60
CO ₂	I-S1164-E	0–20,000 ppm	10	10	5	n.d.	-35 / +50	0–85	15	1.53	60
CO ₂	I-S1164-F	0–10,000 ppm	10	10	5	n.d.	-35 / +50	0–85	15	1.53	60

¹ Expected service life for normal ambient conditions.

² 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:

$d \leq 0.85$:	Mounting 0.3–0.5 m below the ceiling
$0.85 < d < 1.15$:	Mounting at 1.2–1.8 m height
$d \geq 1.15$:	Mounting 0.3–0.5 m above the floor

³ Calibration interval recommended by the manufacturer for normal ambient 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.

ORDERING INFORMATION

MC2-	X-	S4XX-X-	X-	L	
			L	Sensor housing plastic long with 2 nd gas inlet	Sensor housing
			0	Without display	
			1	With display for indication of readings (only in housing A or N)	
			2	With display for values and operation, 2x open collector for horn and warning lamp (only housing A/N)	Display
		S400-A	Gas type	Measuring range	Gas type/
			Methane, CH ₄	0–100 % LEL	Measuring range
		S480-A	Propane, C ₃ H ₈	0–100 % LEL	
	0	Without housing			
	A	Plastic housing type A, 94 x 130 x 57 mm			
	D	Plastic housing type D, 94 x 65 x 57 mm			
	N	Plastic housing type N, 80 x 82 x 55 mm			Housing

* On request

EXAMPLE

CH₄ sensor, measuring range 0–100 % LEL, with plastic housing type A without display
(order number: MC2-A-S400-A-0-L)

MC2-	X-	I-S1164-X-	X-	L	
			L	Sensor housing long with 2 nd gas inlet	Sensor housing
			0	Without display	
			1	With display for indication of readings (only in housing A or N)	
			2	With display for values and operation, 2x open collector for horn and warning lamp (only housing A/N)	Display
		I-S1164-B	Gas type	Measuring range	Gas type /
			Carbon dioxide CO ₂	0–5 % vol	Measuring range
		I-S1164-C	Carbon dioxide CO ₂	0–2 % vol	
		I-S1164-D	Carbon dioxide CO ₂	0–5000 ppm	
		I-S1164-E	Carbon dioxide CO ₂	0–20,000 ppm	
		I-S1164-F	Carbon dioxide CO ₂	0–10,000 ppm	
	0	Without housing			
	A	Plastic housing type A, 94 x 130 x 57 mm			
	D	Plastic housing type D, 94 x 65 x 57 mm			
	N	Plastic housing type N, 80 x 82 x 55 mm			Housing

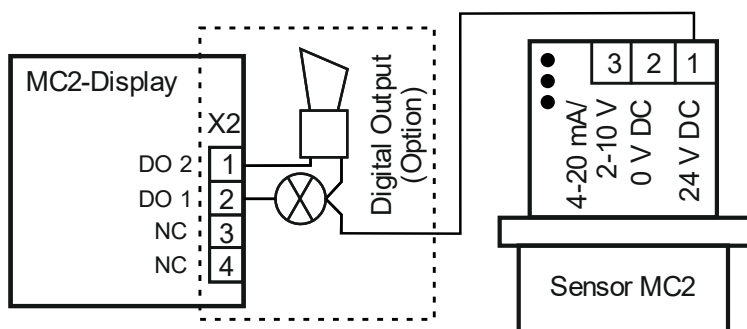
EXAMPLE

CO₂ sensor, measuring range 0–5 % vol, with plastic housing type A without display
(order number: MC2-A-I-S1164-B-0-L)

ACCESSORY

Sensor protection cap (order number: C2-Z1)
 Duct mounting kit (order number: C2-Z2)
 Calibration adapter (order number: C2-Z6)
 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



MPS™:

Methane (CH_4), propane (C_3H_8)

→ See data sheet DB_MC2_MPS



Catalytic:

Methane (CH_4), propane (C_3H_8)

→ See data sheet DB_MC2_Ex



Infrared Premium:

Methane (CH_4), propane (C_3H_8), carbon dioxide (CO_2)

→ See data sheet DB_MC2_IR-Premium



Documents



Catalog



YouTube