

Technical Datasheet



PolyGard®2

MC2 Sensor

with Semiconductor Sensor Element
for Freon Gases / Refrigerants in LEL Range (LFL)
with Analog Output

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Specifications subject to change without notice.
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DESCRIPTION

Semiconductor sensor including digital value processing and self-control for the continuous monitoring of the ambient air to detect low-flammable refrigerants in the combustible range.

The intelligent MC2 Sensor for detection of low-flammable refrigerants includes a semiconductor 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 measured value display of the sensors is in % LEL (in this case, the unit "% LFL", which is customary in this trade, is synonymous with LEL).

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

APPLICATION

The PolyGard®2 Sensor MC2 is used for the detection of low-flammable gases of the refrigerant class A2L when an analog 4–20 mA (or 2–10 V) signal is required.



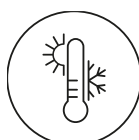
Food



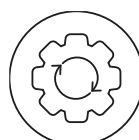
Beverage
dispensing



Laboratory



Climate



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
- Low zero-point drift
- 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 protection; 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	See Ordering Information
Measuring principle	Semiconductor
Measuring range	0–50 % LEL
Repeatability	$\leq \pm 20 \%$ signal
t_{90} time	$t_{90} \leq 150 \text{ s}$
Reaction time	$\leq 10 \text{ s}$ (R454b) $\leq 15 \text{ s}$ (R32, R1234yf) $\leq 35 \text{ s}$ (R455a, R1234ze)
Temperature range	-30 °C to +60 °C (-22 to 140 °F)
Humidity range	15–90 % RH non-condensing
Pressure range	90–110 kPa
Life time ¹ in air	> 5 years
Calibration interval ²	12 months
Poisoning	Semiconductor sensors can be poisoned by silicone-containing substances or other catalyst poisons, up to complete loss of sensitivity. Their sensitivity is irreversibly impaired by halogen-containing compounds.
RECOMMENDED STORAGE CONDITIONS	
Storage temperature range ³	0 °C to +50 °C (32 °F to +122 °F)
Storage time ⁴	Ca. 12 months
Humidity range	15–90 % 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

¹ Expected service life for normal ambient conditions.

² Manufacturer-recommended calibration intervals for normal environmental conditions

³ A deviating storage temperature can have a negative effect on sensitivity and service life.

⁴ If stocked for a longer period, we recommend checking the zero point and recalibrating if necessary.

Semiconductor sensors that have been exposed to an increased gas concentration (> ½ full scale value) during normal measuring operation must be replaced without fail.

REGULATIONS	
Directives	EMC directives 2014/30/EU, CE
	Compliance with: EN 378 EN 14624 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)
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	Ca. 0,2 kg (0.4 lb)
Package volume	Ca. 4,5 l
Protection class	IP65
Mounting	Wall mounting
Pre-embossing for cable entry / sensor unit	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)

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.

OVERVIEW FREON GASES

MSR Freon Group	MSR Code	Freon type	Calibration gas	Group	Relative gas density ¹ Air = 1
%LFL	2020-01	R32	R32	HFC	1.82
	2020-02	R455a	R455a	CFC/HFO	3.46
	2020-03	R454b	R454b	HFO	2.50
	2020-04	R1234yf	R1234yf	HFO	4.00
	2020-05	R1234ze	R1234ze	HFO	4.00

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:

$d \leq 0.85$:	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

ORDERING INFORMATION

MC2-	X-	S20XX-XX-X-	X-	P	
			P	Sensor housing plastic	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 or N)	Display
		S2020-01-A		Gas type R32	Measuring range 0–50 % LEL
		S2020-02-A		R455a	0–50 % LEL
		S2020-03-A		R454b	0–50 % LEL
		S2020-04-A		R1234yf	0–50 % LEL
		S2020-05-A		R1234ze	0–50 % LEL
					Gas type / Measuring range
	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

R32 sensor, measuring range 0–50 % LEL, with plastic housing type A without display
 (order number: MC2-A-S2020-01-A-0-P)

ACCESSORY

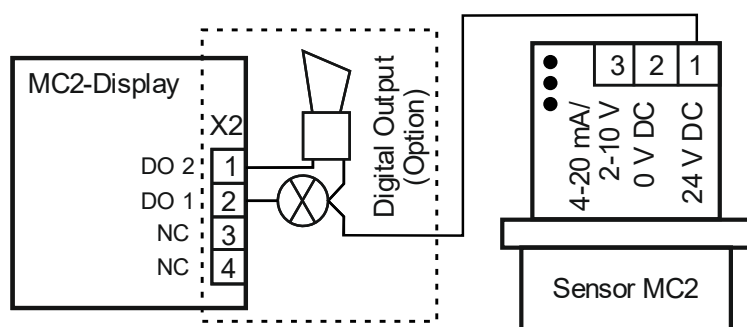
Sensor protection cap (order number: C2-Z1)

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:**

R32

→ See data sheet DB_MC2_IR_Premium

**MPS™:**

R32

→ See data sheet DB_MC2_MPS

**Semiconductor/Freon:**

R32, R455a, R454b, R1234yf, R1234ze

→ See data sheet DB_MC2_Freon



Documents



Catalog



YouTube