PERFECT SOLUTIONS FOR **GAS ALARM** SYSTEMS

Technical Datasheet

µGard®2

Sensor Unit MC2

for Combustible Gases
with Analog Output

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 µController, analog output and power supply in addition to Pellistor sensor element including amplifier. The µController 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 µGard®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 hardware watchdog
- Data / measured values in µC 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 two open-collector outputs for horn (resettable) and warning lamp (option)
- Conformity to:
  - EN 50271
  - EN 50545:2017
  - EN 61010-1
  - ANSI/UL 61010 1
  - CAN/CSA-C22.2 No. 61010-1
- Duct mounting kit (accessory)

SPECIFICATIONS

ELECTRICAL	
Power supply	16–29 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 ≤ 500 Ω for current signal, ≥ 50 kΩ for voltage signal 4–20 mA or 2–10 V = measuring range 3.2–4 mA or 1.6–2 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	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	Atmospheric ± 10 %
Oxygen concentration	21 % (standard) 18 % minimum level
Storage temperature range	0 °C to +20 °C (32 °F to 68 °F)
Storage time	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.
PHYSICAL	
Housing plastic	Polycarbonate; UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions: Type P	(D 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 or N)
Mounting	Screw mounting / M25
Wire connection	Screw-type terminal min. 0.25 mm^2, max. 1.3 mm^2 ,3-pin, 24 to 16 AWG
REGULATIONS	
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

OPTIONS	
ENCLOSURE A	
Enclosure A for integration of sensor unit	Polycarbonate UL 94 V2
Enclosure colour	RAL 7032 (light grey)
Dimensions	(B x H x T) 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
LCD-DISPLAY	
LCD	2 lines, 16 characters each, monochrome
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	Zero-point variation	Drift in air		Calibration interval[1]
								Zero	Gain	
	MC2-	**% LEL/ ppm**	**± % sig.**	**% LEL / ppm**	**<± % sig.**	**≤ sec.**	**± % LEL**	**< % signal/ month**		**Months**
CH_4	P3400-A	0–100 % LEL	1 (CH_4)	0.1	2 (CH_4)	15	0.5 (CH_4)	0.5 (CH_4)	2 (CH_4)	6
NH_3	P3408-A	0–100 % LEL	1 (CH_4)	0.1	2 (CH_4)	20	0.5 (CH_4)	0.5 (CH_4)	2 (CH_4)	6
C_3H_8	P3480-A	0–100 % LEL	1 (CH_4)	0.1	2 (CH_4)	20	0.5 (CH_4)	0.5 (CH_4)	2 (CH_4)	6
C_3H_8	P3480-B	0–30 % LEL	2 (C_3H_8)	0.01	2 (C_3H_8)	15	0.5 (C_3H_8)	n.d. (> 3% C_4H_{10})	2 (C_3H_8)	6
C_3H_8	P3480-C	0–5000 ppm	2 (C_3H_8)	1 (ppm)	2 (C_3H_8)	15	0.5 (C_3H_8)	n.d. (> 3% C_4H_{10})	2 (C_3H_8)	6
All others	PXXXX-A	0–100 % LEL	1 (CH_4)	0.1	2 (CH_4)	n.d.	0.5 (CH_4)	0.5 (CH_4)	2 (CH_4)	6

[1] 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

MC2- **X-** **X34XX-** **X-** **X**

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 / N)	**Display**

	Gas type	Measuring range	Gas density (air = 1)	Mounting height	
P3400-A	Methane, CH_4	0–100 % LEL	0.56	Ceiling	
P3402-A	LPG	0–100 % LEL	n.d.	-	
P3408-A*	Ammonia, NH_3	0–100 % LEL	0.60	Ceiling	
P3410-A	Ethylene, C_2H_4	0–100 % LEL	0.97	1.5 to 1.8 m	
P3415-A	Cyclohexane, C_6H_{12}	0–100 % LEL	2.90	Floor	
P3420-A	Ethane, C_2H_6	0–100 % LEL	1.05	1.5 to 1.8 m	
P3425-A	Ethyl alcohol, C_2H_5OH	0–100 % LEL	1.59	Floor	
P3427-A	Ethyl acetate, $C_4H_8O_2$	0–100 % LEL	3.04	Floor	
P3430-A	Benzene, C_6H_6	0–100 % LEL	2.70	Floor	
P3435-A	n-Hexane, C_6H_{14}	0–100 % LEL	2.97	Floor	
P3440-A	Hydrogen, H_2	0–100 % LEL	0.07	Ceiling	
P3448-A	Butyl acetate, $C_6H_{12}O_2$	0–100 % LEL	4.01	Floor	
P3450-A	Methanol, CH_3OH	0–100 % LEL	1.10	Floor	
P3458-A	Methyl ethyl ketone, C_4H_8O	0–100 % LEL	2.48	Floor	
P3460-A	Iso/n-Butane, C_4H_{10}	0–100 % LEL	2.08	Floor	
P3468-A	Isobutyl alcohol, $C_4H_{10}O$	0–100 % LEL	2.55	Floor	
P3470-A	Octane, C_8H_{18}	0–100 % LEL	3.94	Floor	
P3472-A	Cyclopentane, C_5H_{10}	0–100 % LEL	2.42	Floor	
P3473-A	Methyl acetate, $C_3H_6O_2$	0–100 % LEL	2.56	Floor	
P3475-A	Iso/n-Pentane, C_5H_{12}	0–100 % LEL	2.49	Floor	
P3480-A	Propane, C_3H_8	0–100 % LEL	1.55	Floor	
P3480-B	Propane, C_3H_8	0–30 % LEL	1.55	Floor	
P3480-C	Propane, C_3H_8	0–5000 ppm	1.55	Floor	
P3482-A	Isopropyl alcohol, C_3H_8O	0–100 % LEL	2.07	Floor	
P3485-A	Acetone, C_3H_6O	0–100 % LEL	2.00	Floor	
P3490-A	Toluene, C_7H_8	0–100 % LEL	3.18	Floor	
P3491-A	n-Heptane, C_7H_{16}	0–100 % LEL	3.46	Floor	**Gas type/ Measuring range/ Gas density Mounting height**
P3494-A	Butadiene, C_4H_6	0–100 % LEL	1.92	Floor	
P3495-A	Nonane, C_9H_{20}	0–100 % LEL	4.43	Floor	
P3496-A	Petrol Vapours	0–100 % LEL	n.d.	-	

0	Without housing	
A	Plastic housing type A, 94 x 130 x 57 mm	
5	Stainless steel housing type 5, 113 x 135 x 45 mm	**Housing for integration of the sensor unit**
D	Plastic housing type D, 94 x 65 x 57 mm	
N	Plastic housing type N, 80 x 82 x 55 mm	

*On request only

EXAMPLE

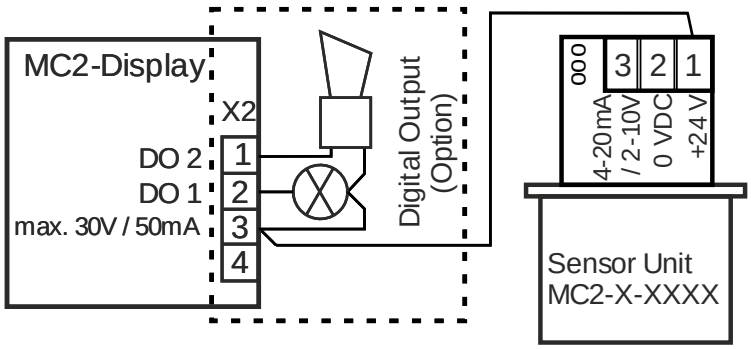
CH_4 Methane sensor unit, measuring range 0–100 % LEL, sensor unit in plastic housing P, with plastic housing type A, without display
Ordering number: MC2-A-P3400-A-0-P

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, MGC2 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.