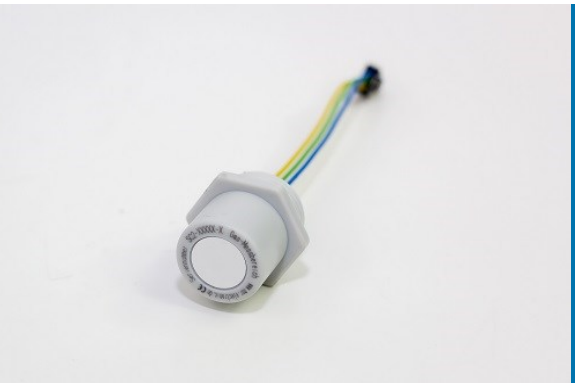
Gas Detection.

Technical Datasheet



PolyGard®

Sensor SC2

with MPS™ Sensor Element

All Products Made in Germany

DESCRIPTION

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

The intelligent SC2 Sensor includes a high-performance MPS™ sensor element and electronics with a measuring amplifier and a µController for the digital processing of the measured values. All relevant data and measured values of the sensor are stored fail-safe in the internal memory of the µProcessor and are transmitted digitally to the Board (SB2, WSB2, MSC2, MSB2) via the MSR local bus.

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 SC2 is used for the detection of combustible gases and refrigerants. Due to its characteristics, the MPS™-sensor is a highly flexible sensor solution that can be used for a wide range of applications.

FEATURES

- Digital measurement value processing
- Internal functional control and fault monitoring 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)
- Reverse polarity protected, overload and short-circuit proof
- Fast reaction
- IP65 protection (when installed)

SPECIFICATIONS

ELECTRICAL		
Power supply	5 V DC from Board (SB2/WSB2/MSC2/MSB2), reverse polarity protected	
Power consumption	25 mA, max. (0.13 VA)	
Serial interface local bus	1-wire / 19200 Baud	
SENSOR ELEMENT		
Gas type and measuring range	See ORDERING INFORMATION	
Measuring principle	MPS™	
Resolution	0.1 % LEL	
Accuracy	± 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	**Plastic**	**Stainless steel**
Material	Polycarbonate	CrNi steel: 1.4404
Flammability classification	UL 94 V2	-
Housing colour	Similar to RAL 7035 (light grey)	Natural
Dimensions (Ø x H)	Type P: 24 x 22 mm (0.94 x 0.87 in.) Type L: 24 x 30 mm (0.94 x 1.18 in.)	Type S: 30 x 61 mm (1.18 x 2.40 in.)
Weight	Ca. 30 g	Ca. 150 g
Protection class	IP65	IP64
Mounting	Screw mounting, external thread M25 x 1.5 mm	Screw mounting, external thread NPT ¾" ANSI/ B1.20.1 / M30 x 1,5 mm
Connection type	3-pin connector	
Cable length	Standard: Ca. 150 mm (5.91 in.) Cable extension (5, 10 and 15 m)	Cable extension (5, 10 and 15 m)

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

REGULATIONS	
Compliance to the Directives (only in connection with the Boards from MSR)	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	IEC EN60079-1 / 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)

Gas type	Order No.	Measuring range	Repeatability	Plastic housing		Stainless steel housing		Relative gas density[1]
				t_{90} time	Reaction time	t_{90} time	Reaction time	
	SC2-	% LEL	< ± 2 % sig.	≤ sec.	≤ sec.	≤ sec.	≤ sec.	Air = 1
CH_4	M400-A	0–100	2	20	10	40	15	0.56
C_2H_2[2]	M405-A	0–100	2	20	10	60	15	0.90
NH_3	M408-B	0–30	2	30	5	75	15	0.60
H_2	M440-A	0–100	2	15	5	20	10	0.07
C_3H_8	M480-A	0–100	2	20	10	70	20	1.55
DMC	M499-B	0–30	2	60	30	240	40	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 SENSITIVITY[1] – SENSOR ELEMENT

Approximate reaction of sensor to cross gas in percentage.

Gas type	Order No.	Methane, CH_4	Acetylene, C_2H_2	Ammonia, NH_3	Hydrogen, H_2	Propane, C_3H_8	DMC, $C_3H_6O_3$
	SC2-	**%**	**%**	**%**	**%**	**%**	**%**
CH_4	M400-A	100	30	> 200	105	70	> 200
C_2H_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_3H_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.

ORDERING INFORMATION

SC2- **MXXX-X-** **X-** **XX**

00	Without cable extension (standard)	**Cable length**
XX[1]	With cable extension: Cable length: 05, 10, 15 (in m)	
P	Sensor housing plastic (standard)	**Sensor housing**
L	Sensor housing plastic long (only with cable extension)	
S	Sensor housing stainless steel (only with cable extension)	

	Gas type	Measuring range	
M400-A	Methane, CH_4	0–100 % LEL	**Gas type/ Measuring range**
M405-A	Acetylene, C_2H_2	0–100 % LEL	
M408-B	Ammonia, NH_3	0–30 % LEL	
M440-A	Hydrogen, H_2	0–100 % LEL	
M480-A	Propane, C_3H_8	0–100 % LEL	
M499-B	DMC (dimethyl carbonate), $C_3H_6O_3$	0–30 % LEL	

[1] Cable extension only in conjunction with sensor housing plastic type L or sensor housing stainless steel (type S)

EXAMPLE

CH_4 sensor, measuring range 0–100 % LEL, sensor in plastic housing type P without cable extension, (order number: SC2-M400-A-P-00)

ACCESSORIES

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)
Remote-Kit (order number:C2-Z11-XX)

FURTHER MEASURING PRINCIPLES

Infrared:
Methane (CH_4), propane (C_3H_8)
➔ See data sheet DB_SC2_IR_Premium and data sheet DB_SC2_IR

Semiconductor:
Ammonia (NH_3)
➔ See data sheet DB_SC2_HL

Electrochemical:
Ammonia (NH_3), hydrogen (H_2)
➔ See data sheet DB_SC2_Tox

Catalytic:
Ammonia (NH_3), methane (CH_4), propane (C_3H_8), hydrogen (H_2)
➔ See data sheet DB_SC2_Ex

Documents

Catalog

YouTube