

Technical Datasheet



PolyGard®2

Sensor Cartridge SC2 for toxic gases

DESCRIPTION

APPLICATION

FEATURES

SPECIFICATIONS

CROSS SENSITIVITY

ORDERING INFORMATION



Specifications subject to change without notice.
Up-to-date data sheets and user manuals can be found in the download area of www.msr-24.com.
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■ All Products
■ Made
■ in Germany

DESCRIPTION

Exchangeable sensor including digital value processing, temperature compensation and self-control for the continuous monitoring of the ambient air.

The Sensor Cartridge SC2 includes an electrochemical sensor element and an amplifier as well as a μ Controller for measured values processing. All relevant data and measured values of the sensor element are stored fail-safe in the μ Controller and transmitted digitally via the local bus to the Sensor Board (e.g. SB2 or MSB2). The calibration management is also integrated in the μ Controller of the Sensor Cartridge.

Calibration is done either by simply replacing the Sensor Cartridge or by using the comfortable, integrated calibration routine directly at the system.

APPLICATION

The PolyGard[®]2 Sensor Cartridge SC2 is used for the detection of toxic gases and oxygen.

FEATURES

- Digital measurement value processing incl. temperature compensation
- Internal functional control with integrated Hardware Watchdog
- Data/measured values in μ C of Sensor Cartridge, therefore simple exchange of SC uncalibrated <> calibrated
- High accuracy, selectivity and reliability
- Low zero-point drift
- Sensor with long life expectancy
- Hardware and software according to SIL compliant development process
- Modular technology (plug-in and replaceable)
- Easy maintenance and calibration by exchange of the sensor cartridge or by comfortable on-site calibration
- Reverse polarity protected, overload and short-circuit proof
- IP65 version
- Conformity to:
 - EN 378
 - EN 45544-1
 - EN 50104 (for O₂)
 - EN 50545
 - EN 50271
 - EN 61010-1
 - ANSI/UL 61010 1
 - CAN/CSA-C22.2 No. 61010-1
- Duct mounting kit (accessory)



Option: SC2 in plastic housing L with cable extension (fig. w/o laser engraving)

SPECIFICATIONS

ELECTRICAL	
Power supply	5 V DC from Sensor Board (e.g. SB2/MSB2), reverse polarity protected
Power consumption:	10 mA, max. (0.05 VA)
Serial interface local bus	1-wire / 19200 Baud
SENSOR ELEMENT	
Gas type	See Ordering Information
Sensor element	Electrochemical
Pressure range	Atmospheric \pm 10 %
Storage temperature range ¹	0 °C to 20 °C (32°F to 68 °F) or 5 °C to 20 °C (41°F to 68 °F) for NH ₃ , CO, NO ₂ , O ₂
Storage time	6 months
Poisoning	Electrochemical sensors are susceptible to poisoning by organic solvents and silicone vapours.
PHYSICAL	
Housing in plastic	Polycarbonate
Combustion	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions: Housing type P	(D x H) 24 x 22 mm (0.94 x 0.87 in.)
Housing type L	(D x H) 24 x 30 mm (0.94 x 1.18 in.)
Weight	Ca. 30 g (0.07 lb)
Protection class	IP65
Mounting	Screw mounting
Connection type	3-pin connector
Cable length	110 mm (4.33 in.)
REGULATIONS	
Directives	EMC Directives 2014/30/EU CE
	Conformity to: EN 378 EN 45544-1 EN 50104 (for O ₂) EN 50545 EN 50271 EN 61010-1 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

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

Gas type	Ordering No.	Measuring range	Accuracy		Display resolution	Repeatability	t90 time	Zero-point variation	Drift in air		Temperature range	Humidity range (non-condensing)	Life time ¹ in air	Relative Gas density ²	Calibration interval ¹
			± % sig.	ppm					Zero	Gain					
	SC2-	ppm	± % sig.	ppm	<± sig. %	≤ sec.	±ppm	< % signal/month		°C	% r. F.	> months	Air = 1	Month	
NH ₃	E1125-AX	0-100	5	0.1	10	75	5	1	1	-30 / +50	15-90	24	0.60	12	
NH ₃	E1125-BX	0-300	3	0.1	10	75	5	1	2	-30 / +50	15-90	24	0.60	12	
NH ₃	E1125-CX	0-500	3	0.1	10	75	5	1	2	-30 / +50	15-90	24	0.60	12	
NH ₃	E1125-DX	0-1000	3	1	10	75	10	1	2	-30 / +50	15-90	24	0.60	12	
NH ₃	E1125-EX	0-5000	2	1	10	40	100	1	2	-30 / +50	15-90	24	0.60	12	
Cl ₂	E1193-CX	0-10	n.d.	0.01	5	40	0.2	1	2	-30 / +50	15-90	24	2.48	6	
Cl ₂	E1193-DX	0-20	n.d.	0.01	5	40	0.2	1	2	-30 / +50	15-90	24	2.48	6	
HCl	E1186-DX	0-20	5	0.01	5	60	0.5	1	2	-20 / +50	15-90	24	1.27	6	
HCN	E1183-BX	0-50	5	0.01	5	30	2	1	2	-20 / +50	15-90	24	0.93	6	
HCN	E1183-CX	0-100	5	0.1	5	30	2	1	2	-20 / +50	15-90	24	0.93	6	
ETO	E1199-AX	0-10	n.d.	0.01	5	150	1	1	2	+10 / +30	15-90	24	1.56	12	
C ₂ H ₄	E1189-CX	0-200	n.d.	0.1	5	120	5	2	5	-30 / +50	15-90	24	0.97	6	
CH ₂ O	E1185-BX	0-10	n.d.	0.01	5	60	0.2	1	2	-30 / +50	15-90	36	1.04	6	
CO	E1110-CX	0-150	2	0.1	5	10	4	0.4	0.4	-20 / +50	10-95	72	0.97	12	
CO	E1110-EX	0-250	2	0.1	5	10	4	0.4	0.4	-20 / +50	10-95	72	0.97	12	
CO	E1110-FX	0-300	2	0.1	5	10	4	0.4	0.4	-20 / +50	10-95	72	0.97	12	
CO	E1110-HX	0-500	2	0.1	5	10	4	0.4	0.4	-20 / +50	10-95	72	0.97	12	
O ₃	E1190-AX	0-5	n.d.	0.001	5	60	0.1	1	2	-30 / +50	15-90	24	1.66	6	
O ₃	E1190-BX	0-10	n.d.	0.01	5	60	0.2	1	2	-30 / +50	15-90	24	1.66	6	
SO ₂	E1196-BX	0-20	3	0.01	5	30	0.2	1	2	-20 / +50	15-90	24	2.73	6	
H ₂ S	E1197-AX	0-50	3	0.01	5	30	1	1	2	-10 / +50	15-90	24	1.19	12	
H ₂ S	E1197-BX	0-100	3	0.1	5	40	1	1	2	-10 / +50	15-90	24	1.19	12	
H ₂ S	E1197-CX	0-200	3	0.1	5	40	2	1	2	-10 / +50	15-90	24	1.19	12	
H ₂ S	E1197-DX	0-500	3	0.1	5	40	5	1	2	-10 / +50	15-90	24	1.19	12	
H ₂ S	E1197-EX	0-1500	3	1	5	60	15	n.d.	n.d.	-10 / +50	15-90	24	1.19	12	
NO ₂	E1130-AX	0-10	5	0.01	2	25	0.2	1	2	-30 / +50	15-90	24	2.80	12	
NO ₂	E1130-BX	0-20	5	0.01	2	25	0.2	1	2	-30 / +50	15-90	24	2.80	12	
NO ₂	E1130-CX	0-30	5	0.01	2	25	0.2	1	2	-30 / +50	15-90	24	2.80	12	
NO ₂	E1130-EX	0-100	5	0.1	2	25	2	1	2	-30 / +50	15-90	24	2.80	12	
		Vol %													
O ₂	E1195-A2/3	0-25	2	0.01	n.d.	15	n.d.	n.d.	0.4/0.6	-40 / +50	5-95	24/36	1.11	6/6	
O ₂	E1195-A5/7	0-25	2	0.01	n.d.	15	n.d.	n.d.	0.4	-40 / +50	15-90	60/84	1.11	12/12	

¹ Manufacturer-recommended calibration interval for normal environmental conditions

² The sensor must be installed at the correct height depending on the relative gas density (d):
 d < 0.95: Mount on the ceiling
 0.95 < d < 1.05: Mount at a height of 1.5 – 1.8 m above floor
 d > 1.05: Mount at a height of 0.3 m above floor
 Exception NO₂: Mounting height for NO₂ sensors: 0.5 to 1.8 m above floor.

³ Exceeding the measuring range limit will include a risk of damaging the sensor element.

CROSS SENSITIVITY¹

Gas concentration of cross gas / reaction of sensor

Gas type	Ordering No.	Chlorine, Cl ₂	Ethanol, C ₂ H ₆ O	Ethylene, C ₂ H ₄	Carbon monoxide, CO	Carbon dioxide, CO ₂	Sulphur dioxide, SO ₂	Hydrogen sulphide, H ₂ S	Nitrogen dioxide NO ₂	Nitrogen monoxide, NO	Hydrogen, H ₂
	SC2-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
NH ₃	E1125-AX	10/0	100/0	100/0	200/0	5000/0	10/<10	10/<20	20/<2	20/0	1000/-10
NH ₃	E1125-BX	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-CX	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-DX	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-EX	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
Cl ₂	E1193-XX ²				300/0		5/0		20/20	35/0	300/0
HCl	E1186-DX	20/0		100/0	1000/0		100/0	20/31	20/-6	25/0	/0
HCN	E1183-XX ²			100/0	100/2		20/38	15/25	5/-12	35/0	100/2
ETO	E1199-AX		30/21		100/45						
C ₂ H ₄	E1189-CX				< 60%						
CH ₂ O	E1185-BX				10-18%						1-3%
CO	E1110-XX ²	2/0	2000/5			5000/0	50/0,5	25/0	50/-1	50/8	100/20
O ₃	E1190-XX ²	5/45/4	100/0		300/0		5/0		20/10	35/0	300/0
SO ₂	E1196-BX		100/0		100/1			10/0	100/-125	100/0	100/1
H ₂ S	E1197-XX ²				100/2		100/20		5/1	35/2	100/20
NO ₂	E1130-XX ²	1/1	100/0	500/0	400/0	5000/0	30/-0,6	20/-25		50/0	1000/0
O ₂	E1195-XX ²					5 Vol %					

¹ The table doesn't 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.

² Cross sensitivity data valid for all measuring ranges of the sensor.

All specifications were collected under optimal test conditions.

We confirm compliance with the minimum requirements of the applicable standard.

ORDERING INFORMATION

SC2-	E11XX-XX-	X-	XX	
			00	Without cable extension (standard) (Standard)
			XX¹	With cable extension: 01, 02, 03, 04, 05 ... 15 max. (length in m) Cable
		P		Sensor housing plastic (standard)
		L		Sensor housing plastic long (only with cable extension)
		S		Sensor housing stainless steel (only with cable extension) Sensor housing
			Gas type	Measuring range
	E1125-AX*		Ammonia, NH ₃	0–100 ppm
	E1125-BX*		Ammonia, NH ₃	0–300 ppm
	E1125-CX*		Ammonia, NH ₃	0–500 ppm
	E1125-DX*		Ammonia, NH ₃	0–1000 ppm
	E1125-EX*		Ammonia, NH ₃	0–5000 ppm
	E1193-CX²		Chlorine, Cl ₂	0–10 ppm
	E1193-DX²		Chlorine, Cl ₂	0–20 ppm
	E1186-DX		Hydrogen chloride, HCl	0–20 ppm
	E1183-BX		Hydrogen cyanide, HCN	0–50 ppm
	E1183-CX		Hydrogen cyanide, HCN	0–100 ppm
	E1189-CX²		Ethylene, C ₂ H ₄	0–200 ppm
	E1199-AX²		Ethylene oxide, C ₂ H ₄ O	0–10 ppm
	E1185-BX²		Formaldehyde, CH ₂ O	0–10 ppm
	E1110-CX		Carbon monoxide, CO	0–150 ppm
	E1110-EX		Carbon monoxide, CO	0–250 ppm
	E1110-FX		Carbon monoxide, CO	0–300 ppm
	E1110-HX		Carbon monoxide, CO	0–500 ppm
	E1190-AX²		Ozone, O ₃	0–5 ppm
	E1190-BX²		Ozone, O ₃	0–10 ppm
	E1187-AX*		Phosphine, PH ₃	0–5 ppm
	E1196-BX²		Sulphur dioxide, SO ₂	0–20 ppm
	E1197-AX		Hydrogen sulphide, H ₂ S	0–50 ppm
	E1197-BX		Hydrogen sulphide, H ₂ S	0–100 ppm
	E1197-CX		Hydrogen sulphide, H ₂ S	0–200 ppm
	E1197-DX		Hydrogen sulphide, H ₂ S	0–500 ppm
	E1197-EX		Hydrogen sulphide, H ₂ S	0–1500 ppm
	E1188-AX*		Silane, SiH ₄	0–50 ppm
	E1130-AX²		Nitrogen dioxide, NO ₂	0–10 ppm
	E1130-BX²		Nitrogen dioxide, NO ₂	0–20 ppm
	E1130-CX²		Nitrogen dioxide, NO ₂	0–30 ppm
	E1130-EX		Nitrogen dioxide, NO ₂	0–100 ppm
	E1195-A2		Oxygen, O ₂ , 2 years	0–25 Vol %
	E1195-A3		Oxygen, O ₂ , 3 years	0–25 Vol %
	E1195-A5		Oxygen, O ₂ , 5 years	0–25 Vol %
	E1195-A7		Oxygen, O ₂ , 7 years	0–25 Vol %
				Gas type / Measuring range

¹ Sensor housing plastic in combination with cable extension only type L

² Not in combination with stainless steel sensor housing

* Only on request

EXAMPLE

CO Sensor Cartridge, plastic housing without cable extension, measuring range 300 ppm

Order number: SC2-E1110-FX-P-00

ACCESSORY

Duct mounting kit

Order number: C2-Z2