



PolyGard®2

## Sensor Cartridge SC2 for toxic gases

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  $\mu$ Controller for measured values processing. All relevant data and measured values of the sensor element are stored fail-safe in the  $\mu$ Controller and transmitted digitally via the local bus to the sensor board SB2 or MSB2. The calibration management is also integrated in the  $\mu$ 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 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  $\mu$ C Sensor Cartridge, therefore simple exchange of SC uncalibrated <> calibrated
- High accuracy, selectivity and reliability
- Low zero point drift
- Sensor with long life expectancy
- Hardware & software according to SIL2 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
- IP 65 version
- Conformity to
  - EN 50271
  - EN 61010-1
  - ANSI/UL 61010 1
  - CAN/CSA-C22.2 Nr. 61010-1
  - EN 50104 (for O<sub>2</sub>)
  - EN 45544
  - EN 50545
  - EN 378
- Duct mounting kit (accessory)



Sensor Cartridge in plastic housing without cable extension



Sensor Cartridge in plastic housing with cable extension -on request



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### SPECIFICATIONS

#### Electrical

Power supply	5 V DC from SB/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	+5 °C to +65 °C (+41 °F to +147 °F)
Storage time	6 months

#### Physical

Housing type P	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.)
Weight	ca. 30 g (0.07 lb)
Protection class	IP 65
Mounting	Screw mounting
Connection type	3-pin connector
Cable length	110 mm (4.33 in.)

#### Directives

EMC directives 2014/30/EU  
CE  
Conformity to:  
EN 50271  
EN 61010-1:2010  
ANSI/UL 61010-1  
CAN/CSA-C22.2 No. 61010-1  
EN 50104 (for O<sub>2</sub>)  
EN 45544  
EN 50545  
EN 378

#### Warranty

1 year on sensor (not if poisoned or overloaded),  
2 years on device

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## SPECIFICATIONS - SENSOR CARTRIDGE (SC2) / SENSOR ELEMENT

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 <sup>1</sup> in air	Relative gas density <sup>2</sup>	Calibration interval <sup>1</sup>
								Zero	Gain					
	SC2-	ppm	± % sig.	ppm	<± % sig.	≤ sec.	±ppm	< % signal/month		°C	% r. F.	> months	Air = 1	Month
NH <sub>3</sub>	E1125-AX	0-100	5	0.1	10	40	10	1	1	-30 / +50	15-90	24	0.59	12
NH <sub>3</sub>	E1125-BX	0-300	2	0.1	10	40	50	1	2	-30 / +50	15-90	24	0.59	12
NH <sub>3</sub>	E1125-CX	0-500	3	0.1	10	40	50	1	2	-30 / +50	15-90	24	0.59	12
NH <sub>3</sub>	E1125-DX	0-1000	3	1	10	40	50	1	2	-30 / +50	15-90	24	0.59	12
NH <sub>3</sub>	E1125-EX	0-5000	2	1	10	40	100	1	2	-30 / +50	15-90	24	0.59	12
Cl <sub>2</sub>	E1193-BX	0-5	n.d.	0.001	2	40	0.2	1	2	-20 / +50	15-90	24	2.4	6
Cl <sub>2</sub>	E1193-CX	0-10	n.d.	0.01	2	40	0.2	1	2	-20 / +50	15-90	24	2.4	6
Cl <sub>2</sub>	E1193-DX	0-20	n.d.	0.01	2	40	0.2	1	2	-20 / +50	15-90	24	2.4	6
HCN	E1183-BX	0-50	5	0.01	2	30	n.d.	n.d.	n.d.	-20 / +50	15-90	24	0.93	6
HCN	E1183-CX	0-100	5	0.1	2	30	n.d.	n.d.	n.d.	-20 / +50	15-90	24	0.93	6
CH <sub>2</sub> O	E1185-BX	0-10	0.5	0.001	2	60	0.2	1	2	-10 / +50	15-90	36	1.09	6
CO	E1110-BX	0-100	3	0.1	5	10	4	0.4	0.4	-20 / +65	10-95	72	0.97	12
CO	E1110-CX	0-150	2	0.1	5	10	4	0.4	0.4	-20 / +65	10-95	72	0.97	12
CO	E1110-EX	0-250	2	0.1	5	10	4	0.4	0.4	-20 / +65	10-95	72	0.97	12
CO	E1110-FX	0-300	2	0.1	5	10	4	0.4	0.4	-20 / +65	10-95	72	0.97	12
CO	E1110-HX	0-500	2	0.1	5	10	4	0.4	0.4	-20 / +65	10-95	72	0.97	12
O <sub>3</sub>	E1190-AX	0-5	n.d.	0.001	5	30	0.15	1	2	-10 / +50	15-90	24	1.66	12
O <sub>3</sub>	E1190-BX	0-10	n.d.	0.01	5	30	0.15	1	2	-10 / +50	15-90	24	1.66	12
SO <sub>2</sub>	E1196-BX	0-20	2	0.01	2	30	0.1	1	2	-10 / +50	15-90	24	2.26	12
H <sub>2</sub> S	E1197-AX	0-50	3	0.01	2	30	0.1	1	2	-10 / +50	15-90	24	1.19	12
H <sub>2</sub> S	E1197-BX	0-100	2	0.1	2	40	0.1	1	2	-10 / +50	15-90	24	1.19	12
H <sub>2</sub> S	E1197-CX	0-200	2	0.1	2	40	0.1	1	2	-10 / +50	15-90	24	1.19	12
H <sub>2</sub> S	E1197-DX	0-500	n.d.	0.1	2	40	0.1	1	2	-10 / +50	15-90	24	1.19	12
NO <sub>2</sub>	E1130-AX	0-10	5	0.01	2	25	0.2	1	2	-20 / +65	15-90	24	1.59	12
NO <sub>2</sub>	E1130-BX	0-20	5	0.01	2	25	0.2	1	2	-20 / +65	15-90	24	1.59	12
NO <sub>2</sub>	E1130-CX	0-30	5	0.01	2	25	0.2	1	2	-20 / +65	15-90	24	1.59	12
NO <sub>2</sub>	E1130-EX	0-100	5	0.1	2	25	0,2	1	2	-20 / +65	15-90	24	1.59	12
			Vol %											
O <sub>2</sub>	E1195-A 2/3/5/7	0-25	2	0.01	--	15	--	--	0.3	-25 / +50	5-95	24 / 36 60 / 84		6 / 6 / 12 / 12

<sup>1</sup> Manufacturer-recommended calibration interval for normal environmental conditions

<sup>2</sup> 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 NO<sub>2</sub>: Mounting height for NO<sub>2</sub> sensors: 0.5 to 1.8 m above floor!

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## CROSS SENSITIVITY<sup>1</sup> - SENSOR CARTRIDGE (SC2) / SENSOR ELEMENT

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

Illustration: Gas concentration of cross gas / reaction of sensor

<sup>1</sup> 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.

<sup>2</sup> Cross sensitivities 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.

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## ORDERING INFORMATION

SC2- **E11XX-XX** **X- XX**

- 00** Without cable extension (standard)
- XX<sup>1</sup>** With cable extension: 01, 02, 03, 04, 05 ... 15 max. (length in m)
- P** Sensor housing plastic
- S** Sensor housing stainless steel

	Gas type	Sensor type	Measuring range
<b>E1125-AX</b>	Ammonia, NH <sub>3</sub>	Electrochemical	0 – 100 ppm
<b>E1125-BX</b>	Ammonia, NH <sub>3</sub>	Electrochemical	0 – 300 ppm
<b>E1125-CX</b>	Ammonia, NH <sub>3</sub>	Electrochemical	0 – 500 ppm
<b>E1125-DX</b>	Ammonia, NH <sub>3</sub>	Electrochemical	0 – 1000 ppm
<b>E1125-EX</b>	Ammonia, NH <sub>3</sub>	Electrochemical	0 – 5000 ppm
<b>E1193-BX</b>	Chlorine, Cl <sub>2</sub>	Electrochemical	0 – 5 ppm
<b>E1193-CX</b>	Chlorine, Cl <sub>2</sub>	Electrochemical	0 – 10 ppm
<b>E1193-DX</b>	Chlorine, Cl <sub>2</sub>	Electrochemical	0 – 20 ppm
<b>E1183-BX</b>	Hydrogen cyanide, HCN	Electrochemical	0 – 50 ppm
<b>E1183-CX</b>	Hydrogen cyanide, HCN	Electrochemical	0 – 100 ppm
<b>E1189-CX*</b>	Ethylene, C <sub>2</sub> H <sub>4</sub>	Electrochemical	0 – 200 ppm
<b>E1185-BX</b>	Formaldehyde, CH <sub>2</sub> O	Electrochemical	0 – 10 ppm
<b>E1110-BX</b>	Carbon monoxide, CO	Electrochemical	0 – 100 ppm
<b>E1110-CX</b>	Carbon monoxide, CO	Electrochemical	0 – 150 ppm
<b>E1110-EX</b>	Carbon monoxide, CO	Electrochemical	0 – 250 ppm
<b>E1110-FX</b>	Carbon monoxide, CO	Electrochemical	0 – 300 ppm
<b>E1110-HX</b>	Carbon monoxide, CO	Electrochemical	0 – 500 ppm
<b>E1190-AX</b>	Ozone, O <sub>3</sub>	Electrochemical	0 – 5 ppm
<b>E1190-BX</b>	Ozone, O <sub>3</sub>	Electrochemical	0 – 10 ppm
<b>E1187-AX*</b>	Phosphine, PH <sub>3</sub>	Electrochemical	0 – 5 ppm
<b>E1196-BX</b>	Sulphur dioxide, SO <sub>2</sub>	Electrochemical	0 – 20 ppm
<b>E1197-AX</b>	Hydrogen sulphide, H <sub>2</sub> S	Electrochemical	0 – 50 ppm
<b>E1197-BX</b>	Hydrogen sulphide, H <sub>2</sub> S	Electrochemical	0 – 100 ppm
<b>E1197-CX</b>	Hydrogen sulphide, H <sub>2</sub> S	Electrochemical	0 – 200 ppm
<b>E1197-DX</b>	Hydrogen sulphide, H <sub>2</sub> S	Electrochemical	0 – 500 ppm
<b>E1188-AX*</b>	Silane, SiH <sub>4</sub>	Electrochemical	0 – 50 ppm
<b>E1130-AX</b>	Nitrogen dioxide, NO <sub>2</sub>	Electrochemical	0 – 10 ppm
<b>E1130-BX</b>	Nitrogen dioxide, NO <sub>2</sub>	Electrochemical	0 – 20 ppm
<b>E1130-CX</b>	Nitrogen dioxide, NO <sub>2</sub>	Electrochemical	0 – 30 ppm
<b>E1130-EX*</b>	Nitrogen dioxide, NO <sub>2</sub>	Electrochemical	0 – 100 ppm
<b>E1195-A2</b>	Oxygen, O <sub>2</sub> , 2 years	Electrochemical	0 – 25 Vol. %
<b>E1195-A3</b>	Oxygen, O <sub>2</sub> , 3 years	Electrochemical	0 – 25 Vol. %
<b>E1195-A5</b>	Oxygen, O <sub>2</sub> , 5 years	Electrochemical	0 – 25 Vol. %
<b>E1195-A7</b>	Oxygen, O <sub>2</sub> , 7 years	Electrochemical	0 – 25 Vol. %

<sup>1</sup>In combination with sensor housing plastic only on request!

\*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**

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