PERFECT SOLUTIONS FOR **GAS ALARM** SYSTEMS

Technical Datasheet

PolyGard®2

Sensor Cartridge SC2

for toxic gases

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 µController for measured values processing. All relevant data and measured values of the sensor element are stored fail-safe in the µController and transmitted digitally via the local bus to the Sensor Board SB2 or MSB2. The calibration management is also integrated in the µController 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 µC 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 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
- IP65 version
- 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
- Duct mounting kit (accessory)

SPECIFICATIONS

ELECTRICAL	
Power supply	5 V DC from SB, 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 ± 10 %
Storage temperature range[1]	0 °C to 20 °C (32°F to 68 °F)
Storage time	6 months
Poisoning	Electrochemical sensors are susceptible to poisoning by organic solvents and silicone vapours.
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	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]
								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	40	5	1	1	-30 / +50	15-90	24	0.59	12
NH_3	E1125-BX	0-300	2	0.1	10	40	5	1	2	-30 / +50	15-90	24	0.59	12
NH_3	E1125-CX	0-500	3	0.1	10	40	5	1	2	-30 / +50	15-90	24	0.59	12
NH_3	E1125-DX	0-1000	3	1	10	40	10	1	2	-30 / +50	15-90	24	0.59	12
NH_3	E1125-EX	0-5000	2	1	10	40	50	1	2	-30 / +50	15-90	24	0.59	12
Cl_2	E1193-CX	0-10	n.d.	0.01	2	40	0.2	1	2	-20 / +50	15-90	24	2.4	6
Cl_2	E1193-DX	0-20	n.d.	0.01	2	40	0.2	1	2	-20 / +50	15-90	24	2.4	6
HCl	E1186-DX	0-20	n.d.	0.01	5	60	0.5	n.d.	n.d.	-20 / +50	15-90	24	1.27	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
ETO	E1199-AX	0-10	n.d.	0.01	5	140	1	n.d.	n.d.	+10 / +30	15-90	24	1.57	6
C_2H_4	E1189-CX	0-200	n.d.	0.1	2	120	-2/+8	n.d.	n.d.	-20 / +50	15-90	24	0.97	6
CH_2O	E1185-BX	0-10	2	0.01	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_3	E1190-AX	0-5	n.d.	0.001	5	30	0.15	1	2	-10 / +50	15-90	24	1.66	6
O_3	E1190-BX	0-10	n.d.	0.01	5	30	0.15	1	2	-10 / +50	15-90	24	1.66	6
SO_2	E1196-BX	0-20	2	0.01	2	30	0.1	1	2	-10 / +50	15-90	24	2.26	6
H_2S	E1197-AX	0-50	3	0.01	2	30	0.5	1	2	-10 / +50	15-90	24	1.19	12
H_2S	E1197-BX	0-100	2	0.1	2	40	1	1	2	-10 / +50	15-90	24	1.19	12
H_2S	E1197-CX	0-200	2	0.1	2	40	2	1	2	-10 / +50	15-90	24	1.19	12
H_2S	E1197-DX	0-500	n.d.	0.1	2	40	5	1	2	-10 / +50	15-90	24	1.19	12
NO_2	E1130-AX	0-10	5	0.01	2	25	0.2	1	2	-20 / +65	15-90	24	1.59	12
NO_2	E1130-BX	0-20	5	0.01	2	25	0.2	1	2	-20 / +65	15-90	24	1.59	12
NO_2	E1130-CX	0-30	5	0.01	2	25	0.2	1	2	-20 / +65	15-90	24	1.59	12
NO_2	E1130-EX	0-100	5	0.1	2	25	2	1	2	-20 / +65	15-90	24	1.59	12
		Vol %												
O_2	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

[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 SENSITIVITY[1]

Gas concentration of cross gas / reaction of sensor

Gas type	Ordering No.	Chlorine, Cl_2	Ethanol, C_2H_6O	Ethylene, C_2H_4	Carbon monoxide, CO	Carbon dioxide, CO_2	Sulphur dioxide, SO_2	Hydrogen sulphide, H_2S	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_2H_4	E1189-CX				< 60%						
CH_2O	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_2S	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-XX2					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) **XX**[1] With cable extension: 01, 02, 03, 04, 05 ... 15 max. (length in m)	**Cable**
			P Sensor housing plastic **S** Sensor housing stainless steel	**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-CX[2]	Chlorine, Cl_2	0–10 ppm	
E1193-DX[2]	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-CX[2]	Ethylene, C_2H_4	0–200 ppm	
E1199-AX[2]	Ethylene oxide, C_2H_4O	0–10 ppm	
E1185-BX[2]	Formaldehyde, CH_2O	0–10 ppm	
E1110-BX	Carbon monoxide, CO	0–100 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-AX[2]	Ozone, O_3	0–5 ppm	
E1190-BX[2]	Ozone, O_3	0–10 ppm	
E1187-AX*	Phosphine, PH_3	0–5 ppm	
E1196-BX[2]	Sulphur dioxide, SO_2	0–20 ppm	
E1197-AX	Hydrogen sulphide, H_2S	0–50 ppm	
E1197-BX	Hydrogen sulphide, H_2S	0–100 ppm	
E1197-CX	Hydrogen sulphide, H_2S	0–200 ppm	
E1197-DX	Hydrogen sulphide, H_2S	0–500 ppm	
E1188-AX*	Silane, SiH_4	0–50 ppm	
E1130-AX[2]	Nitrogen dioxide, NO_2	0–10 ppm	
E1130-BX[2]	Nitrogen dioxide, NO_2	0–20 ppm	
E1130-CX[2]	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 %	**Gas type / measuring range**
E1195-A7*	Oxygen, O_2, 7 years	0–25 Vol %	

[1] Only on request in combination with plastic sensor housing
[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