

DESCRIPTION

Toxic and combustible gas sensors for hazardous locations. Standard features include 4-20 mA output, RS-485 serial communications (DGC6 and standard Modbus-RTU protocols), alarm relay and fault relay. Optional bi-color LCD display. Available with any SSAX1-Series toxic or combustible gas sensor module.

Certified to Safety Integrity Level 2 (SIL 2) and rigorous international standards including FM, CSA, ATEX and IEC.

APPLICATION

The PolyXeta®2 sensor is used in hazardous areas including water and wastewater treatment, indoor commercial growing, bio-gas processing, and petrochemical production and distribution where the environment is rated as Class 1 (flammable vapors and gases may be present), Division 1 (ignitable concentrations of hazards exist under normal operating conditions) or Division 2 (ignitable concentrations of hazards are handled, processed or used, but which are normally in closed containers or closed systems from which they can only escape through accidental rupture or breakdown of such containers or systems), Groups A through D (specific combustible gases).

FEATURES

- *ATEX, IEC Ex, FM and CSA certification for use in hazardous locations*
- *SIL 2 safety certified*
- *Hot-swappable, microprocessor-based X-Change sensor module for easy lifecycle maintenance*
- *Fault and alarm relays (30 VAC/VDC, 1 A)*
- *RS-485 Communications port for connection to DGC6 or other Modbus-RTU controller*
- *4-20 mA analog output for gas reading plus under-/over-range and fault conditions*
- *Visual (LED) indication of power, alarm and fault*
- *Bi-color, backlit 2 x 16 character LCD (green = normal; red = alarm) (optional)*
- *Digital measurement filtering for high EMC immunity*
- *Die-cast aluminum enclosure with light grey epoxy coating with one or three wire entry ports*

PolyXeta®2



- ATEX and IEC Ex
- FM and CSA Class 1, Div. 1
- SIL 2

SPECIFICATIONS

Electrical

Power supply	
- PX2-1 series	20-28 VDC, reverse polarity protected
- PX2-2 series	20-28 VDC, reverse polarity protected or 24 VAC ± 10% (21.6-26.4 VAC)
Power consumption	
- toxic gases & oxygen	24 VDC, 130 mA max.
- combustible gases	24 VDC, 90 mA, 130 mA max.
Control unit	Microprocessor with 12-bit converter resolution
Digital filter	Averaging in order to increase the EMC immunity
Visual indications	3 LEDs for power, alarm and fault
Analog output signal	Proportional, overload and short-circuit proof, load ≤ 500 Ω 4-20 mA = measuring range 3.0-4 mA = underrange > 20-21.2 mA = overrange 2 mA = fault > 21.8 mA = fault High
Serial interface	Serial data bus
Fault relay (optional)	Max. 30 VAC/VDC, 1 A
Alarm relay (optional)	Max. 30 VAC/VDC, 1 A
LCD (optional)	2 x 16 characters, 3 status LEDs, 4 menu operating elements

Sensor Data

Combustible Gases	
- measuring range	See <i>Ordering Information</i>
- sensor element	Pellistor (catalytic bead) sensor
- sensor data	See <i>Combustible Gases Table</i>
- stabilization time	24 hours
- warm-up time	300s
- temperature range	-22°F to 140°F (-30°C to +60°C)
- humidity range	0-95% RH not condensing
- pressure range	Atmospheric ± 10%
- storage temperature	32°F to 68°F (0°C to +20°C)
- storage time ¹	6 months
- sensor lifetime	5 years / normal ambient conditions
- poisoning	Sensors are susceptible to poisoning by organic solvents and silicone vapors.
Toxic Gases & Oxygen	
- measuring range	See <i>Ordering Information</i>
- sensor element	Electrochemical
- sensor data	See <i>Toxic Gases & Oxygen Table</i>
- stabilization time	24 hours
- warm-up time	Measuring mode after 30s or 10s (CO, O ₂), 60s (NO ₂), 300s (NH ₃)
- storage time ¹	Max. 6 months
- poisoning	Sensors are susceptible to poisoning by organic solvents and silicone vapors.

Physical

Sensor Head Housing	
- material	316 Stainless Steel: 1.4404
- dimensions (d x H)	1.18 x 2.20 in. (30 x 56 mm)
- protection class	Gas inlet IP64, with option splash proof IP65 (on request)
- thread	External thread NPT 3/4" ANSI/ B1.20.1
Enclosure	
- material P1 and P3	Aluminum pressure die-casting, epoxy coating
- color	Light gray RAL 7032
- dimensions (D x H)	3.7 x 3.2 in (95 x 82 mm)
- protection class	Housing protection IP66 to IP68 (depending on the cable glands used)
Weight	Approx. 2.9 lb (1.3 kg)
Mounting	Wall mounting (sensor head downwards)
Cable entry	1x resp. 3x 3/4 in. (Ansi B1.20.1)
Wire connection	Spring-type terminal, 0.08 to 2.5 mm ² AWG 28-12
Wire length	Max. load 500 Ω (= wire resistance + controller input resistance)

Environmental

Humidity	20-90% RH (non-condensing)
Operating temperature	
- no display	-13°F to 140°F (-25°C to +60°C)
- with display	-4°F to 140°F (-20°C to +60°C)
Storage temperature	23°F to 86°F (-5°C to +30°C)
Pressure range ²	80 to 120 kPa (800 to 1200 mbar)
Air velocity	< 6 m/sec.

Marking / Certificates

PX2-1 series	
- ATEX Marking	II2G Ex db IIC T4 Gb, CE 0158
- EC-Type Examination Certificate	BVS 15 ATEX E 129 X
- Declaration of Conformity	CE_PX2-1_EX_1911
- protection types	EN 60079-0: 2012 and EN 60079-1: 2014 (Ex-db)
- measurement function	EN 60079-29-1 (pending)
- certificates	IECEX BSV 16.0038 X (electrical Ex protection), IEC 60079-0, -1 (Ex db)
- functional safety SIL 2	EN 50271: 2010; EN 50402: 2016 and EN 61508: 2011 (parts 1-3)
PX2-2 series	
- ATEX Marking	II3G Ex nA IIC T4 Gc
- Declaration of Conformity	CE_PX2_2_Zone2_1808
- protection types	EN 60079-0: 2012 and EN 60079-15: 2011 (Ex-nA)
- functional safety SIL 2	EN 50271: 2010; EN 50402: 2016 and EN 61508: 2011 (parts 1-3)

¹ We recommend recalibrating the devices if stocked for a longer period (> 8 weeks).

² The explosion protection test only covers the pressure range up to 1100 mbar and the oxygen concentration up to 21% vol.

SPECIFICATIONS

Marking / Certificates (cont...)

Enclosure Certificates	Class 3600, Class 3615, Class 3810, ANSI/NEMA 250. Explosion Proof for Class I, Division 1, Groups A, B, C and D; dust-ignition-proof for Class II, Division 1, Groups E, F and G, Class III, hazardous (classified) locations, indoors and outdoors (type 4X).
FM Certificate	Class 3600, Class 3615, Class 3810, ANSI/NEMA 250. Explosion Proof for Class I, Division 1, Groups A, B, C and D; dust-ignition-proof for Class II, Division 1, Groups E, F and G, Class III, hazardous (classified) locations, indoors and outdoors (type 4X).
CSA Certificate	2472857 / Class 2258-02 PROCESS CONTROL EQUIPMENT for hazardous locations Class I, Div. 1, Groups A, B, C and D; Class II, Div. 1, Groups E, F and G, Class III, Div. 1; Type 4X
Warranty	Two years material and workmanship, 12 months normal exposure for sensor element

ACCESSORIES

PX2-MAGPEN	Magnetic Pen to Configure PX2 w/ Display
CONKIT-PX2	Cup and 6 Ft. Tube to Connect GR Regulator w/ PX2 Sensors

COMBUSTIBLE GASES TABLE

Sensor Data

Gas type	Ordering No.	Measuring range	Accuracy	Display resolution	Repeatability	t ₉₀ time	Zero-point variation	Drift in air		Calibration interval ¹
								Zero	Gain	
	PX2-SX1-	% 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)	20	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)	25	0.5 (CH ₄)	0.5 (CH ₄)	2 (CH ₄)	6
NH ₃	P3408-B	0–20 % UEG	1 (CH ₄)	0.1	2 (CH ₄)	25	0.5 (CH ₄)	0.5 (CH ₄)	2 (CH ₄)	6
C ₃ H ₈	P3480-A	0–100 % LEL	1 (CH ₄)	0.1	2 (CH ₄)	30	0.5 (CH ₄)	0.5 (CH ₄)	2 (CH ₄)	6
C ₃ H ₈	P3480-B	0–30 % LEL	2 (C ₃ H ₈)	0.01	2 (C ₃ H ₈)	40	0.5 (C ₃ H ₈)	n.d. (> 3% C ₄ H ₁₀)	2 (C ₃ H ₈)	6
C ₃ H ₈	P3480-C	0–5000 ppm	2 (C ₃ H ₈)	1 (ppm)	2 (C ₃ H ₈)	40	0.5 (C ₃ H ₈)	n.d. (> 3% C ₄ H ₁₀)	2 (C ₃ H ₈)	6
All oth.	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 under normal environmental conditions.

All specifications were collected under optimal test conditions.

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

TOXIC GASES & OXYGEN TABLE

Sensor Data

Gas type	Ordering No.	Measuring range ³	Accuracy	Display resolution	Repeatability	t ₉₀ time	Zero-point variation	Drift in air		Temperature range	Pressure range	Humidity range (non-condensing)	Life time ¹ in air	Relative gas density ²	Calibration interval ¹
								Zero	Gain						
	PX2-SX1-	ppm	± % sig.	ppm	± % sig.	≤ sec.	±ppm	< % sig.	sig. / month	°C	kPa	% RH	> months	Air = 1	Months
CO	E1110-C	0–150	2	0.1	5	40	4	0.4	0.4	-20 / +50	80–120	10–95	72	0.97	12
CO	E1110-E	0–250	2	0.1	5	40	4	0.4	0.4	-20 / +50	80–120	10–95	72	0.97	12
CO	E1110-F	0–300	2	0.1	5	40	4	0.4	0.4	-20 / +50	80–120	10–95	72	0.97	12
CO	E1110-H	0–500	2	0.1	5	40	4	0.4	0.4	-20 / +50	80–120	10–95	72	0.97	12
NH ₃	E1125-A	0–100	5	0.1	10	200	5	1	2	-30 / +50	80–120	15–90	24	0.60	12
NH ₃	E1125-B	0–300	3	0.1	10	200	5	1	2	-30 / +50	80–120	15–90	24	0.60	12
NH ₃	E1125-C	0–500	3	0.1	10	200	5	1	2	-30 / +50	80–120	15–90	24	0.60	12
NH ₃	E1125-D	0–1000	3	1	10	200	10	1	2	-30 / +50	80–120	15–90	24	0.60	12
NH ₃	E1125-E	0–5000	2	1	10	120	100	1	2	-30 / +50	90–110	15–90	24	0.60	12
NO ₂	E1130-E	0–100	5	0.1	2	120	2	1	2	-30 / +50	80–120	15–90	24	2.80	12
HCN	E1183-B	0–50	5	0.01	5	40	2	1	2	-20 / +50	90–110	15–90	24	0.93	6
HCN	E1183-C	0–100	5	0.1	5	60	2	1	2	-20 / +50	90–110	15–90	24	0.93	6
HCl	E1186-D	0–20	5	0.01	5	60	0.5	1	2	-20 / +50	90–110	15–90	24	1.27	6
H ₂ S	E1197-A	0–50	3	0.01	2	60	1	1	2	-30 / +50	90–110	15–90	24	1.19	12
H ₂ S	E1197-B	0–100	3	0.1	5	60	1	1	2	-30 / +50	90–110	15–90	24	1.19	12
H ₂ S	E1197-C	0–200	3	0.1	5	60	2	1	2	-30 / +50	90–110	15–90	24	1.19	12
H ₂ S	E1197-D	0–500	3	0.1	5	60	5	1	2	-30 / +50	90–110	15–90	24	1.19	12
H ₂ S	E1197-E	0–1500	3	1	5	90	15	n.d.	n.d.	-30 / +50	90–110	15–90	24	1.19	12
		% vol													
O ₂	E1195-A2/3	0–25	2	0.01	n.d.	30	n.d.	n.d.	0.4/0.6	-40 / +50	80–120	5–95	24/36	1.11	6/6
O ₂	E1195-A5/7	0–25	2	0.01	n.d.	30	n.d.	n.d.	0.4/0.4	-40 / +50	80–120	15–90	60/84	1.11	12/12

¹ Manufacturer-recommended calibration interval under 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: 0.5–1.8 m above floor!

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

TOXIC GASES & OXYGEN TABLE

Cross Sensitivity

Illustration: 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
	PX2-SX1-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
CO	E1110-X ²	2/0	2000/5			5000/0	50/0,5	25/0	50/-1	50/8	100/20
NH ₃	E1125-A	10/0	100/0	100/0	200/0	5000/0	10/<10	10/<20	20/<2	20/0	1000/-10
NH ₃	E1125-B	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-C	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-D	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NH ₃	E1125-E	10/0	100/0	100/0	200/0	5000/0	10/<12	10/<30	20/0	20/0	1000/-150
NO ₂	E1130-X ²	1/1	100/0	500/0	400/0	5000/0	30/-0.6	20/-25		50/0	1000/0
HCN	E1183-X ²			100/0	100/2		20/38	15/25	5/-12	35/0	100/2
HCL	E1186-D	20/0		100/0	1000/0		100/0	20/31	20/-6	25/0	/0
H ₂ S	E1197-X ²				100/2		100/20		5/1	35/2	100/20
O ₂	E1195-X ²					5 % vol					

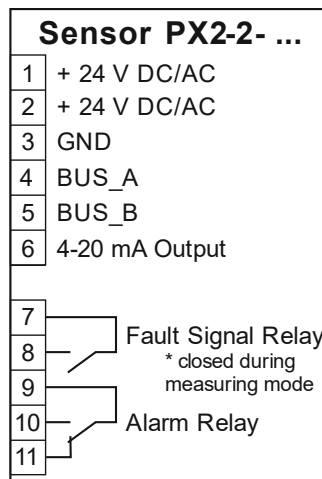
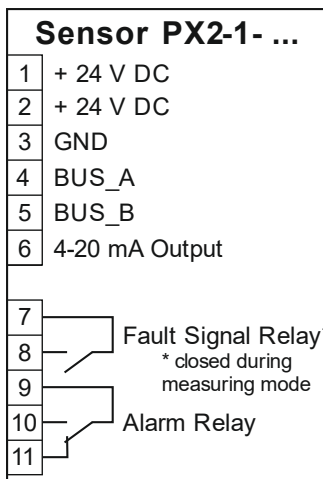
¹ The table does not claim to be complete. Other gases, too, can have an influence on the sensitivity. The mentioned cross sensitivity data are only reference values valid for new sensors.

² 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.

WIRING CONFIGURATION



ORDERING INFORMATION

PX2 - X - X - XXXXX - X - XX

Wiring Ports	
01	One Wire Entry Port
03	Three Wire Entry Ports

Gas Sensor & Range				
#	TOXIC GASES AND OXYGEN			Mounting Height (ft)
E1110-E	Carbon Monoxide	CO	0-250 ppm	5-6
E1130-E	Nitrogen Dioxide	NO ₂	0-100 ppm	5-6
E1195-A2	Oxygen 2-Year (Est. Life)	O ₂	0-25 Vol%	5-6
E1195-A3	Oxygen 3-Year (Est. Life)	O ₂	0-25 Vol%	5-6
E1195-A5	Oxygen 5-Year (Est. Life)	O ₂	0-25 Vol%	5-6
E1195-A7	Oxygen 7-Year (Est. Life)	O ₂	0-25 Vol%	5-6
#	COMBUSTIBLE GASES			Mounting Height (ft)
P3440-A	Hydrogen	H ₂	0-100% LEL	Ceiling
P3400-A	Methane	CH ₄	0-100% LEL	Ceiling
P3480-A	Propane	C ₃ H ₈	0-100% LEL	Floor
P3480-B	Propane	C ₃ H ₈	0-30% LEL	Floor
P3450-A	Methanol	CH ₃ OH	0-100% LEL	Floor
P3402-A	LPG	-	0-100% LEL	-

Other gases available upon request

Display Option	
0	No LCD Display
2	With LCD Display

ATEX Zone	
1	ATEX Zone 1
2	ATEX Zone 2

ACCESSORIES	
PX2-MAGPEN	Magnetic Pen to Configure PX2 w/ Display
CONKIT-PX2	Cup and 6 Ft. Tube to Connect GR Regulator w/ PX2 Sensors