

Technical Datasheet



PolyXeta[®]2 Sensor PX2-1 (Zone 1 and 2) Sensor PX2-2 (Zone 2) for toxic gases

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PX2 YouTube Video



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

DESCRIPTION

Fixed PolyXeta®2 Gas Alarm Devices of the

PX2-1 series with Ex db protection for Zone 1 and 2

PX2-2 series with Ex nA protection only for Zone 2

designed for the continuous monitoring of the ambient air to detect toxic gases and vapours as well as of oxygen for use in the hazardous areas of zones 1 and 2 according to Directive 2014/34/EU.

Microprocessor based gas sensor with 4–20 mA / RS485 Modbus output signal, alarm and fault relays (all SIL2 certified) for monitoring the ambient air to detect oxygen and toxic gases and vapours by means of an electrochemical sensor element (el.ch.).

The calibration of sensors without LCD display is carried out via the calibration device STL06-PGX2 or the PC software PCE06-PGX2. Sensors with LCD display have an integrated calibration routine that is started from the outside by a permanent magnet without opening the housing. In case of an alarm or failure the backlight of sensors with LCD display changes from green to red.

APPLICATION

The PolyXeta®2 sensor is used in industrial areas like oil/gas industry, biogas plants, petrochemical industry, power plants etc. in Ex-Zone 1 (PX2-1) and/or 2 (PX2-2). The PolyXeta®2 sensor is also suitable for commercial areas like gas transfer stations etc. With the 4–20 mA / RS485-ModBus output signal the sensor is suitable for connection to the PolyGard®2 gas controller series by MSR-Electronic, as well as to any other controllers or automation devices. Optionally, the PolyXeta®2 sensor is also available with LCD display and relay output.

FEATURES

- ATEX and IEC Ex certificates MSR-Electronic for electrical Ex protection
- Metrological test & SIL2 safety functions 4–20 mA, RS485 and relay
- **PX2-1 for zone 1 (and also suitable for zone 2):**
 - Type "Ex db" with flame-proof enclosure
- **PX2-2 for zone 2:**
 - Type "Ex nA" with flame-proof enclosure
- Enclosure: additional CSA certificate for Class I, Div. 1
- Continuous monitoring
- Microprocessor with 12-bit converter resolution
- Self-monitoring system
- Easy calibration
- Calibration service by exchanging the sensor head
- Proportional 4–20 mA output
- Serial interface to the control center
- Reverse polarity protection
- Overload protection
- LCD display with status LEDs (optional)
- Alarm and fault signal relay (optional)

SPECIFICATIONS - GENERAL

ELECTRICAL	
Power supply	20–28 V DC
Power consumption (at 24 V DC)	90 mA, max. 130 mA
Control unit	Microprocessor with 12-bit converter resolution
Digital filter	Averaging in order to increase the EMC immunity
Visual indications	2 LEDs operation, alarm and communication
Analog output signal (active)	Proportional, overload and short-circuit proof, load $\leq 500 \Omega$ 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 V AC/DC, 1 A
Alarm relay (optional)	Max. 30 V AC/DC, 1 A
LCD (optional)	2 x 16 characters, 3 status LEDs, 4 menu operating elements
SENSOR DATA	
Gas type	Toxic gases & oxygen
Sensor element	Electrochemical
Measuring range	See Ordering Information
Sensor data	See tables
Stabilization time	24 h
Warm-up time	Measuring mode after 120 sec.
SENSOR HEAD HOUSING	
Material	CrNi Stahl: 1.4404
Dimensions (d x H)	30 x 56 mm (1.18 x 2.20 in.)
Protection class	Gas inlet IP64, with option splash proof IP65 (on request)
Thread	External thread NPT 3/4" ANSI/ B1.20.1
ENVIRONMENTAL CONDITIONS	
Humidity	20 to 90% RH (not condensing)
Operating temperature	-25 °C to +60 °C (-13 °F to 140 °F), -20 °C to +60 °C (-4 °F to 140 °F) for display version
Storage temperature	-5 °C to +30 °C (23 °F to 86 °F)
Storage time ¹	Max. 6 months
Pressure range	800 to 1200 mbar (80 to 120 kPa)
Air velocity	< 6 m/sec.
PHYSICAL CHARACTERISTICS	
Enclosure P1 & P3 / colour	Aluminium pressure die-casting / light grey RAL 7032, epoxy coating
Dimensions (d x H) / weight	95 x 82 mm / approx. 1.3 kg
Protection class	Housing protection IP66 to IP68 (depending on the cable glands used)
Mounting	Wall mounting (sensor head downwards)
Cable entry	1 x resp. 3 x 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)

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

MARKING / CERTIFICATES	PX2-1	PX2-2
ATEX Marking	ⒺII2G Ex db IIC T4 Gb, CE 0158	ⒺII3G Ex nA IIC T4 Gc
EC-Type Examination Certificate	BVS 15 ATEX E 129 X	-----
Declaration of Conformity	CE_PX2-1_EX_1911	CE_PX2_2_Zone2_1808
Protection types	EN 60079-0: 2012 and EN 60079-1: 2014 (Ex-db)	EN 60079-0: 2012 and EN 60079-15: 2011 (Ex-nA)
Measurement function Certificates	EN 60079-29-1 (pending) IECEx BSV 16.0038 X (electrical Ex protection), IEC 60079-0, -1 (Ex db)	----- -----
Functional safety SIL2 Certificates	EN 50271: 2010; EN 50402: 2016 and EN 61508: 2011 (parts 1-3) CSA Certificate Class I, Div. 1 (only housing)	
WARRANTY		
1 year on sensor (not if poisoned or overloaded), 2 years on device		

SPECIFICATIONS - SENSOR ELEMENT

Gas type	Ordering No.	Measuring range ³	Accuracy	Display Resolution	Repeatability	t90 Time	Zero-point variation	Zero Drift in Gain	Temperature range	Humidity (non-condensing)	Life time ¹ in air	Relative gas density	Mounting height ²	Calibration interval ¹	
	PX2-X-	ppm	± % sign.	ppm	± % sig.	≤ sec.	±ppm	< % signal/month	°C	% RH.	> months	Air = 1	(m)	Months	
													(m)		
NH ₃	E1125-AX	0-100	5	0.1	10	40	5	1	1	-30 / +50	15-90	24	0.59	Ceiling	12
NH ₃	E1125-BX	0-300	2	0.1	10	40	5	1	2	-30 / +50	15-90	24	0.59	Ceiling	12
NH ₃	E1125-CX	0-500	3	0.1	10	40	5	1	2	-30 / +50	15-90	24	0.59	Ceiling	12
NH ₃	E1125-DX	0-1000	3	1	10	40	10	1	2	-30 / +50	15-90	24	0.59	Ceiling	12
NH ₃	E1125-EX	0-5000	2	1	10	40	50	1	2	-30 / +50	15-90	24	0.59	Ceiling	12
HCl	E1186-DX	0-20	n.d.	0,01	5	50	0,5	n.d.	n.d.	-20 / +50	15-90	24	1,27	Floor	6
HCN	E1183-BX	0-50	5	0,01	2	35	n.d.	n.d.	n.d.	-20 / +50	15-90	24	0,93	Ceiling	6
HCN	E1183-CX	0-100	5	0,1	2	60	n.d.	n.d.	n.d.	-20 / +50	15-90	24	0,93	Ceiling	6
CO	E1110-BX	0-100	3	0.1	5	10	4	0.4	0.4	-15 / +50	10-95	72	0.97	1.5-1.8	12
CO	E1110-CX	0-150	2	0.1	5	10	4	0.4	0.4	-15 / +50	10-95	72	0.97	1.5-1.8	12
CO	E1110-EX	0-250	2	0.1	5	10	4	0.4	0.4	-15 / +50	10-95	72	0.97	1.5-1.8	12
CO	E1110-FX	0-300	2	0.1	5	10	4	0.4	0.4	-15 / +50	10-95	72	0.97	1.5-1.8	12
CO	E1110-HX	0-500	2	0.1	5	10	4	0.4	0.4	-15 / +50	10-95	72	0.97	1.5-1.8	12
H ₂ S	E1197-AX	0-50	3	0.01	2	30	0.5	1	2	-10 / +50	15-90	24	1.19	Floor	12
H ₂ S	E1197-BX	0-100	2	0.1	2	40	1	1	2	-10 / +50	15-90	24	1.19	Floor	12
H ₂ S	E1197-CX	0-200	2	0.1	2	40	2	1	2	-10 / +50	15-90	24	1.19	Floor	12
H ₂ S	E1197-DX	0-500	n.d.	0.1	2	40	5	1	2	-10 / +50	15-90	24	1.19	Floor	12
NO ₂	E1130-EX	0-100	5	0.1	2	25	2	1	2	-20 / +50	15-90	24	1.59	0.5-1.8	12
		Vol %													
O ₂	E1195-A2 /A3/A5/A7	0-25	2	0.01	--	15	--	--	0.3	-10 / +50	5-95	24 / 36 / 60 / 84		1.5-1.8	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 SENSITIVITY¹ - SENSOR ELEMENT

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-X-	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
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
CO	E1110-XX ²	2/0	2000/5			5000/0	50/0,5	25/0	50/-1	50/8	100/20
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					5Vol%/					

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.

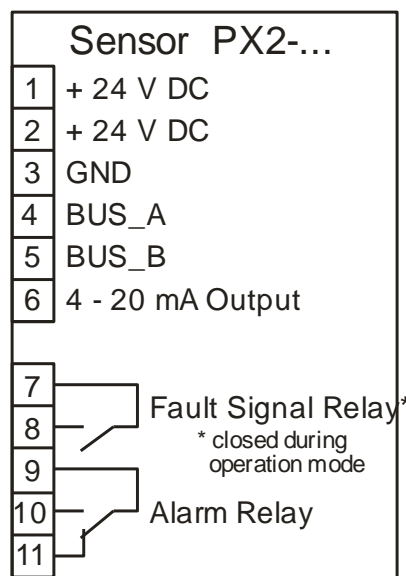
² Cross sensitivities valid for all measuring ranges of the sensor.

All specifications were collected under optimal test conditions.

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

Electrochemical sensors are susceptible to poisoning by organic solvents and silicone vapours.

ELECTRICAL CONNECTION



ORDER INFORMATION

PX2- SX1-	X- 1-	X-	EXXXX-XX- EXXXX-XX	XX	SENSOR EXCHANGE HEAD ¹		
				P1	Aluminum die-cast housing for one cable entry		
				P3	Aluminum die-cast housing for three cable entries		Sensor housing
			E1110-BX		Carbon monoxide, CO	EL. Chem.	0-100 ppm
			E1110-CX		Carbon monoxide, CO	EL. Chem.	0-150 ppm
			E1110-EX		Carbon monoxide, CO	EL. Chem.	0-250 ppm
			E1110-FX		Carbon monoxide, CO	EL. Chem.	0-300 ppm
			E1110-HX		Carbon monoxide, CO	EL. Chem.	0-500 ppm
			E1125-BX*		Ammonia, NH ₃	EL. Chem.	0-100 ppm
			E1125-BX*		Ammonia, NH ₃	EL. Chem.	0-300 ppm
			E1125-BX*		Ammonia, NH ₃	EL. Chem.	0-500 ppm
			E1125-BX*		Ammonia, NH ₃	EL. Chem.	0-1000 ppm
			E1125-BX*		Ammonia, NH ₃	EL. Chem.	0-5000 ppm
			E1130-EX		Nitrogen dioxide, NO ₂	EL. Chem.	0-100 ppm
			E1186-DX		Hydrogen chloride, HCl	EL. Chem.	0-20 ppm
			E1183-BX		Hydrogen cyanide, HCN	EL. Chem.	0-50 ppm
			E1183-CX		Hydrogen cyanide, HCN	EL. Chem.	0-100 ppm
			E1197-AX		Hydrogen sulphide, H ₂ S	EL. Chem.	0-50 ppm
			E1197-BX		Hydrogen sulphide, H ₂ S	EL. Chem.	0-100 ppm
			E1197-CX		Hydrogen sulphide, H ₂ S	EL. Chem.	0-200 ppm
			E1197-SX		Hydrogen sulphide, H ₂ S	EL. Chem.	0-500 ppm
			E1195-A2		Oxygen – 2 years, O ₂	EL. Chem.	0-25 Vol.%
			E1195-A3		Oxygen – 3 years, O ₂	EL. Chem.	0-25 Vol.%
			E1195-A5		Oxygen – 5 years, O ₂	EL. Chem.	0-25 Vol.%
			E1195-A7		Oxygen – 7 years, O ₂	EL. Chem.	0-25 Vol.%
							Gas type / range
			0		Without options		
			1		Relay set (2)		
			2		LC Display		
			3		Relay set (2) and LC Display		Options
			1		Zone 1 and 2		
			2		Zone 2		ATEX Zone

* Only on request

¹ The exchangeable sensor head is only to be used in connection with the PolyXeta®2 Gas Sensor. Otherwise it loses its ATEX Certification.