

Gas Detection.



Technical Datasheet



PolyXeta®2 Gas Detector PX2 for Zone 1 and 2 for toxic gases and oxygen

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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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www.msr-electronic.com



DESCRIPTION

Fixed PolyXeta®2 Gas Detectors of the

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

PX2-2 series with Ex nR 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 detector with 4–20 mA / RS-485 Modbus output signal, alarm and fault relays (all SIL2 certified) for monitoring the ambient air to detect toxic gases and vapours and oxygen concentrations by means of an electrochemical sensor element. Optionally, the PolyXeta®2 gas detector is also available with LC display. The calibration of gas detectors without LCD display is carried out via the calibration device STL06-PGX2 or the PC software PCE06-PGX2. Gas detectors 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 gas detectors with LCD display changes from green to red.

APPLICATION

The PolyXeta®2 gas detector PX2 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 gas detector is also suitable for commercial areas like gas transfer like e.g. gas transfer stations etc., and for use on ships, shipyards and offshore platforms etc.

With the 4–20 mA / RS-485 Modbus output signal the gas detector is suitable for connection to the PolyGard®2 gas controller series by MSR-Electronic, as well as to any other controllers or automation devices.

CERTIFICATES / FEATURES

- ATEX and IECEx certificates MSR-Electronic for electrical Ex protection
- SIL2 safety functions 4–20 mA, RS-485 and relay
- **PX2-1 for zone 1 (and also suitable for zone 2):**
 - Type "Ex db" protection flame-proof enclosure
- **PX2-2 for zone 2:**
 - Type "Ex nR" protection
- Enclosure: Additional FM and CSA certificates for Class I, Div. 1
- Continuous self-monitoring
- Microprocessor with 12-bit converter resolution
- Reverse polarity protection
- Overload protection
- Easy calibration
- Calibration service by exchanging the sensor head
- Proportional 4–20 mA output
- Serial interface to the control centre
- Alarm and fault signal relay
- LCD display with status LEDs (optional)
- Connection of SSAX1 sensor head as an alternative to SX1 (optional)
- IP66 protection with SplashGuard accessories (optional, see data sheet Accessories)

SPECIFICATIONS - GENERAL

ELECTRICAL	
Power supply PX2-1 series	20–28 V DC reverse polarity protected
Power supply PX2-2 series	20–28 V DC reverse polarity protected or 24 V AC $\pm$ 10 % (21.6–26.4 V AC)
Power consumption (at 24 V DC)	3.3 W, 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	3 LEDs for power, alarm and fault
Analog output signal (active)	Proportional, overload and short-circuit proof, Max. load for UE > 20 V = 350 Ω and UE > 22 V = 500 Ω 4–20 mA = measuring range 3.3–4 mA = tolerable underrange 20–21.2 mA = tolerable overrange $\geq$ 21.2 mA = error overrange $\leq$ 2 mA = fault $\leq$ 1 mA = processor or voltage breakdown
Serial interface	Serial data bus
Fault relay	Max. 30 V AC/DC, 1 A
Alarm relay	Max. 30 V AC/DC, 1 A
LCD (optional)	2 x 16 characters, 3 status LEDs, 4 menu operating elements
SENSOR ELEMENT	
Gas type and measuring range	Toxic gases & oxygen, see ORDERING INFORMATION
Sensor element	Electrochemical
Sensor data	See also tables SENSOR ELEMENT
Run-in time	24 h
Warm-up time	Measuring mode after $\leq$ 60 s, for NH ₃ $\leq$ 300 s
Storage temperature range ¹	0 °C to +20 °C (32 °F to 68 °F) / 10 °C to 30 °C (50 °F to 86 °F) for H ₂
Storage time ²	Ca. 6 months
Poisoning	Sensors are susceptible to poisoning by organic solvents and silicone vapours.
SENSOR HEAD SX1 HOUSING	
Material / colour	CrNi Stahl: 1.4404 / natural
Dimensions (Ø x H)	30 x 61 mm (1.18 x 2.40 in.)
Protection class	IP64, with SplashGuard accessories IP66
Thread	External thread NPT ¾" ANSI/ B1.20.1
PHYSICAL CHARACTERISTICS	
Enclosure X1 and X3 / colour	Aluminum pressure die-casting / light grey RAL 7032, epoxy coating
Dimensions (W x H x D) / weight	125 x 167 x 83 mm (4.92 x 6.57 x 3.27 in.) / approx. 1.3 kg (2.87 lb.)
Protection class	Housing protection IP66 to IP68 (depending on the cable glands used)
Mounting	Wall mounting (sensor head downwards)
Cable entry	1x resp. 3x ¾ in. (Ansi B1.20.1)
Wire connection	Spring-type terminal, 0.08–2.5 mm ² (AWG 28–12)
Wire length	Max. load 500 Ω (= wire resistance + controller input resistance)
ENVIRONMENTAL CONDITIONS (operation and explosion protection)	
Temperature	
• Explosion protection	-40 °C to +60 °C (-40 to 140 °F)
• With display	-20 °C to +60 °C (-4 °F to 140 °F)
Pressure range ³	80–110 kPa
Air velocity	< 6 m/s

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

² If stocked for a longer period, we recommend checking the zero point and recalibrating if necessary

³ The explosion protection test only covers the pressure range up to 110 kPa and the oxygen concentration up to 21 % vol.

APPROVALS AND EXAMINATIONS	PX2-1	PX2-2 ¹
EU Type Examination Certificate Electrical Explosion Protection ATEX	BVS 15 ATEX E 129 X Supplement 2 EN IEC 60079-0:2018; EN 60079-1:2014 (DEKRA Testing and Certification GmbH)	
IECEX Type Examination Certificate Electrical Explosion Protection	IECEX BVS 16 0038X IEC 60079-0:2017; IEC 60079-1:2014-06 (DEKRA Testing and Certification GmbH)	
Type of Protection	Ex db IIC T4 Gb -40 °C < Ta < +60 °C	Ex nR IIC T4 Gc -40 °C < Ta < +60 °C
ATEX Marking	II 2 G Ex db IIC T4 Gb	II 3 G Ex nR IIC T4 Gc
Functional safety SIL2	Certificate: ZP/C029/21; DIN EN 61508-1;-2;-3:2011	
EMC test ¹	Certificate PR 18 03 53984 001 EN 50270-2015 Interference immunity & emission: Type 2 (industrial sector)	
Functional Test for toxic gases	EN 45544-1:2015 and EN 45544-3:2015	
EU Declaration of Conformity	CE_PX2-1_Zone1	CE_PX2-2_Zone2
UKCA Declaration of Conformity	UKCA_PX2-1_Zone1	
Certificates only housing		
FM Certificate	Class 3600, Class 3615, Class 3810, ANSI/NEMA 250. Explosionproof 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		
	1 year on sensor (not if poisoned or overloaded), 2 years on device	

¹ Not in conjunction with remote sensor head SSAX1

SPECIFICATIONS - SENSOR ELEMENT

Gas type	Ordering No.	Measuring range ¹	Accuracy	Display resolution	Repeatability	t ₉₀ time	Zero-point variation	Drift in air		Temperature range	Pressure range	Humidity range (non-condensing)	Life time ² in air	Relative gas density ³	Calibration interval ⁴
								Zero	Gain						
	PX2-X SX1-	ppm	± % sig.	ppm	± % sig.	≤ sec.	± ppm	< % sig- nal/month		°C	kPa	% RH	> months	Air = 1	Months
CO	E1110-A	0–50	2	0.01	3	35	1	1	2	-20 / +50	90–110	15–90	24	0.97	12
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	E1194-A	0–1000	n.d.	1	5	90	10	1	2	-20 / +50	90–110	15–90	24	0.07	12
H ₂ S	E1197-A	0–50	3	0.01	2	70	1	1	2	-30 / +50	80–120	15–90	24	1.19	6
H ₂ S	E1197-B	0–100	3	0.1	2	70	1	1	2	-30 / +50	80–120	15–90	24	1.19	6
H ₂ S	E1197-C	0–200	3	0.1	2	70	2	1	2	-30 / +50	80–120	15–90	24	1.19	6
H ₂ S	E1197-D	0–500	3	0.1	2	70	5	1	2	-30 / +50	80–120	15–90	24	1.19	6
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	6
		% vol													
O ₂	E1195-A2	0–25	2	0.01	n.d.	39	n.d.	n.d.	0.4	-40 / +50	80–120	5–95	24	1.11	6
O ₂	E1195-A3	0–25	2	0.01	n.d.	39	n.d.	n.d.	0.6	-40 / +50	80–120	5–95	36	1.11	6
O ₂	E1195-A5/7	0–25	2	0.01	n.d.	39	n.d.	n.d.	0.4/0.4	-40 / +50	80–120	15–90	60/84	1.11	12/12

¹ Exceeding the measuring range limit will include a risk of damaging the sensor element

² Expected service life under normal ambient conditions

³ The recommended mounting height depends on the relative gas density of the type of gas to be monitored. Depending on the relative gas density (d), the following recommendation therefore applies:

d ≤ 0,85: mounting 0.3–0.5 m below the ceiling

0,85 < d < 1,15: mounting at 1.2–1.8 m height

d ≥ 1,15: mounting 0.3–0.5 m above the floor

⁴ Manufacturer-recommended calibration intervals for normal environmental conditions

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 SX1-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
CO	E1110-A	15/0	200/<1	100/11.5			10/-0.1	15/0.5	10/-0.3	50/-3	100/8.5
CO	E1110-X ²	2/0.5	2000/5			5000/0	50/0,5	25/0	50/-1	50/10	100/20
NH ₃	E1125-A		100/0		500/0	5000/0	20/-6	25/30	5/-7.5	50/0	100/0
NH ₃	E1125-B		100/0		500/0	5000/0	20/-6	25/30	5/-5	50/0	100/0
NH ₃	E1125-C		100/0		500/0	5000/0	20/-6	25/35	5/-5	50/0	100/0
NH ₃	E1125-D		100/0		500/0	5000/0	20/-6	25/35	5/-5	50/0	100/0
NH ₃	E1125-E	0 %	0 %	0 %	0 %	0 %	<150 %	<70 %	10 %	0 %	<-10 %
NO ₂	E1130-X ²	1/0.5			300/0	5000/0	20/0	15/<1		50/0	200/0
HCN	E1183-X ²			100/0	100/2		20/38	15/25	5/-12	25/0	100/2
HCl	E1186-D	20/0	30/0	100/0	1000/0		100/0	20/31	20/-6	25/0	
H ₂	E1194-A	10/0		100/80	50/200		5/0	25/0	5/0	35/<10	
O ₂	E1195-XX ²										
H ₂ S	E1197-A	15/0		100/0	100/<2	5000/0	20/0		5/<0.5	50/<0.5	
H ₂ S	E1197-B	15/0		100/0	100/<2	5000/0	20/0		5/<0.5	50/<0.5	
H ₂ S	E1197-C	15/0		100/0	100/<2	5000/0	20/0		5/<0.5	50/<0.5	
H ₂ S	E1197-D	15/0		100/0	100/<2	5000/0	20/0		5/<0.5	50/<0.5	
H ₂ S	E1197-E				<5 %		20 %				<5 %

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 (further) 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

PX2-	X-	X-	E11XX-X(X)-	0X	GAS DETECTOR	
				01	Type 1: Alumin. die-cast housing 1x cable entry incl. 1x gland ¹	
				03	Type 3: Alumin. die-cast housing 3x cable entry incl. 1x gland ¹	
	1			04 ²	Remote sensor SSAX1-1-E11XX-X(X)-10-KX, housing type 1	
	1			05 ²	Remote sensor SSAX1-1-E11XX-X(X)-10-KX, housing type 3	Version
SX1-	1-		E11XX-X(X)-	0	EXCHANGE HEAD ³	
					Gas type	Measuring range
			E1105-A ⁴		Acetylene, C ₂ H ₂	0–100 % LEL
			E1110-A		Carbon monoxide, CO	0–50 ppm
			E1110-C		Carbon monoxide, CO	0–150 ppm
			E1110-E		Carbon monoxide, CO	0–250 ppm
			E1110-F		Carbon monoxide, CO	0–300 ppm
			E1110-H		Carbon monoxide, CO	0–500 ppm
			E1125-A ⁴		Ammonia, NH ₃	0–100 ppm
			E1125-B ⁴		Ammonia, NH ₃	0–300 ppm
			E1125-C ⁴		Ammonia, NH ₃	0–500 ppm
			E1125-D ⁴		Ammonia, NH ₃	0–1000 ppm
			E1125-E ⁴		Ammonia, NH ₃	0–5000 ppm
			E1150-A ⁴		Methanol, CH ₃ OH	0–250 ppm
			E1160-A ⁴		VOC	0–10 ppm
			E1181-A ⁴		Chlorine dioxide, ClO ₂	0–1 ppm
			E1182-A ⁴		Hydrogen fluoride, HF	0–5 ppm
			E1182-B ⁴		Hydrogen fluoride, HF	0–10 ppm
			E1130-E		Nitrogen dioxide, NO ₂	0–100 ppm
			E1183-B		Hydrogen cyanide, HCN	0–50 ppm
			E1183-C		Hydrogen cyanide, HCN	0–100 ppm
			E1186-D		Hydrogen chloride, HCl	0–20 ppm
			E1194-A		Hydrogen, H ₂	0–1000 ppm
			E1197-A		Hydrogen sulphide, H ₂ S	0–50 ppm
			E1197-B		Hydrogen sulphide, H ₂ S	0–100 ppm
			E1197-C		Hydrogen sulphide, H ₂ S	0–200 ppm
			E1197-D		Hydrogen sulphide, H ₂ S	0–500 ppm
			E1197-E		Hydrogen sulphide, H ₂ S	0–1500 ppm
			E1195-A2		Oxygen – 2 years, O ₂	0–25 % vol
			E1195-A3		Oxygen – 3 years, O ₂	0–25 % vol
			E1195-A5		Oxygen – 5 years, O ₂	0–25 % vol
			E1195-A7		Oxygen – 7 years, O ₂	0–25 % vol
						Gas type / Range
			0		Without LC Display	
			2		With LC Display	Display
	1				Zone 1 and 2	
	2				Zone 2	ATEX Zone

¹ Included cable gland for PX2-1 with Ex d approval (Zone 1) in metal, for PX2-2 with Ex e approval (Zone 2) in plastic.

² Instead of the fixed sensor head SX1, the PX2-1 (only type Zone 1) is supplied with a remote sensor head SSAX1. For ordering information and sensor data see datasheet DB_SSAX1_Tox.

³ The exchangeable sensor head is only to be used in connection with the PolyXeta®2 Gas Detector. Otherwise, it loses its ATEX approval.

⁴ Only on request

ACCESSORIES

Metal cable gland (Ex d) for zone 1 and 2
Order Number: ZU-PX2-CG-SN

Plastic cable gland (Ex e) for zone 2
Order Number: ZU-PX2-CG-PL

ELECTRICAL CONNECTION

