

Technical Datasheet



PolyXeta®2 Gas Detector PX2 for Zone 1 and Zone 2 for Freon Gases and Refrigerants

DESCRIPTION

APPLICATION

CERTIFICATES / FEATURES

SPECIFICATIONS – GENERAL

SPECIFICATIONS – SENSOR ELEMENT

OVERVIEW FREON TYPES

ORDERING INFORMATION

ELECTRICAL CONNECTION

FURTHER MEASURING PRINCIPLES

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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 ec protection only for Zone 2

designed for continuous monitoring of the ambient air to detect Freon gases and refrigerants 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 for monitoring the ambient air to detect refrigerant and Freon gases and vapours by means of a semiconductor sensor element. Optionally, the PolyXeta®2 gas detector is also available with LC display.

The calibration of gas detectors without LC display is carried out via the calibration device STL06-PGX2 or the PC software PCE06-PGX2. Gas detectors with LC 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 a fault, the backlight of the detectors with LC display changes from green to red.

For sensors with measuring range % LFL, the measured value is shown in the display as % LEL. (In this case, % LFL is the same as % LEL.)

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) for detection of refrigerants and Freon gases. The PolyXeta®2 gas detector is also suitable for commercial areas like refrigeration plants etc.

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



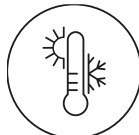
Food



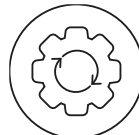
Beverage
dispensing



Laboratory



Climate



Process



Gas storage

CERTIFICATES / FEATURES

- ATEX and IECEx certificates MSR-Electronic GmbH for electrical Ex protection
- **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 ec" protection increased safety
- Enclosure: Additional FM and CSA certificate 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
- LC display with status LEDs (optional)
- Stainless steel housing (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 ± 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 ≥ 21,2 mA= error overrange ≤ 2 mA = fault ≤ 1 mA = processor or voltage breakdown	
Serial interface	Serial data bus	
Fault relay (SPNC)	Max. 30 V AC/DC, 1 A	
Alarm relay (SPDT)	Max. 30 V AC/DC, 1 A	
LCD (optional)	2 x 16 characters, 3 status LEDs, 4 menu operating elements	
SENSOR ELEMENT (see also table SPECIFICATIONS - SENSOR ELEMENT)		
Gas type and measuring range	Freon and refrigerant gases, see ORDERING INFORMATION	
Measuring principle	Semiconductor sensor	
Oxygen concentration	21 % vol (standard) 18 % vol minimum level	
Stabilisation time	168 h	
Warm-up time	300 s	
Temperature range	-30 °C to +60 °C (-22 °F to 140 °F) (see also ENVIRONMENTAL CONDITIONS and table SENSOR ELEMENT)	
Humidity range	15–90 % RH (not condensing)	
Pressure range	90–110 kPa	
Poisoning	Semiconductor sensors can be poisoned by silicone-containing substances or other catalyst poisons, up to complete loss of sensitivity. Their sensitivity is irreversibly impaired by halogen-containing compounds.	
RECOMMENDED STORAGE CONDITIONS		
Storage temperature range ¹	0 °C to +20 °C (32 °F to 68 °F)	
Storage time	Ca. 12 months	
Humidity range	20–90 % RH non-condensing	
Pressure range	90–110 kPa	
SX1 SENSOR HEAD 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 accessory SplashGuard splash protection IP66	
Thread	External thread NPT ¾" ANSI/ B1.20.1	
PHYSICAL CHARACTERISTICS		
Housing	Type 1, type 2 and type3	Type stainless steel
Material	Aluminum pressure die-casting, epoxy coating	Stainless steel 1.4401
Colour	RAL 7032 (pebble grey)	Natural
Dimensions (W x H x D)	Type 1 and 3: 125 x 167 x 83 mm (4.92 x 6.57 x 3.27 in) Type 2: 145 x 170 x 107 mm (5.71 x 6.70 x 4.21 in)	145 x 170 x 107 mm
Weight	Approx. 1.3 kg (2.87 lb) / 1,6 kg (3.53 lb)	Approx. 2.5 kg (5.51 lb)
Cable entry	1x, 2x or 3x NPT ¾" (Ansi B1.20.1)	2x NPT ¾" (Ansi B1.20.1)
Protection class	Housing protection IP66 to IP68 (depending on the cable glands used)	
Mounting	Wall mounting (sensor head downwards)	
Connection type	Spring-type terminal, 0.08–2.5 mm², AWG 28–12	

¹ A deviating 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

ENVIRONMENTAL CONDITIONS (operation and explosion protection)		
Temperature	-40 °C to +60 °C (-40 to 140 °F)	
• Explosion protection	-20 °C to +60 °C (-4 °F to 140 °F)	
• With display		
Pressure range ¹	80–110 kPa	
Air velocity	< 6 m/s	
APPROVALS AND EXAMINATIONS	PX2-1 (Zone 1)	PX2-2 (Zone 2)
EU Type Examination Certificate	BVS 15 ATEX E 129 X	
Electrical Explosion Protection ATEX	EN IEC 60079-0:2018; EN 60079-1:2014 (DEKRA Testing and Certification GmbH)	
IECEx Type Examination Certificate	IECEx BVS 16 0038X	
Electrical Explosion Protection	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 ec IIC T4 Gc -40 °C < Ta < +60 °C
ATEX Marking	II 2 G Ex db IIC T4 Gb	II 3 G Ex ec IIC T4 Gc
EU Declaration of Conformity	CE_PX2-1_Zone1	CE_PX2-2_Zone2
Electrical Explosion Protection		EN IEC 60079-0:2018 + EN IEC 60079-7:2016 + A1:2018
EMC test ¹	Certificate PR 18 03 53984 001 EN 50270-2015 Interference immunity & emission: Type 2 (industrial sector)	
Certificates (only housing)		
Housing type 1 and type 3: FM Certificate of Compl. (3042541)	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).	
Housing type stainless steel / type 2: FM Certif. of Conf. (FM18US0036U)		
Housing type 1 and type 3: CSA Certif. of Compl. (2472857)	Class 2258-02 PROCESS CONTROL EQUIPMENT - For Hazardous Loca- tions	
Housing type stainless steel / type 2: CSA Certif. of Compl. (1717515)	Class 4418-02 OUTLET BOXES AND FITTINGS – 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	
CONFORMITY TO		
Refrigerant monitoring	EN 378-1: 2018; EN 14624:2020; EN IEC 62990-1:2023 Typ SM	
WARRANTY		
	1 year on sensor (not if poisoned or overloaded), 2 years on device	

¹ The explosion protection test only covers the pressure range up to 110 kPa and the oxygen concentration up to 21 % vol.

SPECIFICATIONS – SENSOR ELEMENT

Gas type	Order No.	Measuring range	Repeatability	t_{90} time	Reaction time	Zero-point oscillation	Temperature range	Humidity range (non-condensing)	Lifetime in air ¹	Relative gas density ²	Calibration interval ³
	PX2-X-X-SX1-1-	ppm	<± % sig.	≤ sec.	≤ sec.	+ ppm	°C	% RH	> years	Air = 1	Months
NH ₃	S2125-C	1000	20	90	30	150	-30 / +60	15–90	5	0.60	12
NH ₃	S2125-F	10,000	20	60	30	300	-30 / +60	15–90	5	0.60	12
Freons FR02–FR08	S20XX-A	2000	20 ⁴	180	60	300	-30 / +60	15–90	5	> 1.15	12
Freons % LFL	S2020-0X-A	50 % LEL	20	180	60	1 % LEL	-30 / +60	15–90	5	> 1.15	12

¹ In normal environmental conditions

² The recommended mounting height depends on the relative gas density of the type of gas to be monitored (see also OVERVIEW FREON TYPES). 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

³ Manufacturer-recommended calibration intervals for normal environmental conditions

⁴ On analog sensor voltage signal (voltage at processor input), not on digital measured value.

All specifications were collected under optimal test conditions.

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

The T 021 (DGVU-I-213-056) and T 023 (DGVU-I-213-057) as well as T 055 leaflets must be observed.

OVERVIEW FREON TYPES

MSR code	MSR Freon group	Freon type	Calibration gas	Group	Measuring range	Relative gas density (air =1)
S2061-A	FR02	R23	R23	HFC	2000 ppm	2.44
		R508b		HFC		3.69
S2063-A	FR03	R1234yf	R1234yf	HFO	2000 ppm	4.00
		R452a		HFO		2.11
		R513a		HFO/HFC		3.80
		R454c		HFO		3.51
		R455a		HFO		3.46
		R454b		HFO		2.50
		R1233zd		HFO		n.d.
		R515b		HCFC		5.28
S2064-A	FR04	R123	R123	HCFC	2000 ppm	3.03
S2070-A	FR06	R22	R22	HCFC	2000 ppm	3.50
		R401a		HCFC		3.42
		R401b		HCFC		1.91
		R402a		HCFC		2.31
		R402b		HCFC		3.65
		R403a		HCFC		2.87
		R408a		HCFC		3.52
		R409a		HFC		2.92
		R411a		HFC		3.59
S2077-A	FR07	R134a	R134a	HFC	2000 ppm	2.28
		R407a		HFC		4.01
		R416a		HFC		2.43
		R417a		HFC		1.51
		R422a		HFC		1.99
		R422d		HFC		2.67
		R427a		HFC		3.10
		R437a		HFC		2.34
		R438a		HFC		2.68
		R449a		HFC		2.61
		R407f		HFO		3.83
		R450a		FC		1.21
S2080-A	FR08	R125	R407c	FC	2000 ppm	1.82
		R32		HFC		3.45
		R404a		HFC		2.59
		R407c		HFC		1.52
		R410a		HFC		1.65
		R434a		HFC		2.10
		R507a		HFC		2.62
		R448a		HFO		2.34
		R452b		FC		2.96
		R143a		FC		1.82
S2020-01-A	% LFL	R32	R32	CFC/HFO	50 % LEL	3.46
S2020-02-A		R455a	R455a	HFO		2.50
S2020-03-A		R454b	R454b	HFO		4.00
S2020-04-A		R1234yf	R1234yf			0.59
S2125-C	Ammonia	R717	NH ₃		1000 ppm	0.59
S2125-F		R717		HFC	10.000 ppm	2.44

No cross sensitivity data is available for these sensors. It is well known that all semiconductor sensors are also sensitive to combustible gases, e.g. alcohols, etc.

ORDERING INFORMATION

PX2-	X-	X-	S20XX-(XX-)A-	0X	DETECTOR	
				01 ¹	Type 1: Aluminum die-cast housing, 1x cable entry	
				03 ¹	Type 3: Aluminum die-cast housing, 3x cable entry	
				06 ¹	Type stainless steel housing, 2x cable entry	
				08 ¹	Type 2: Aluminum die-cast housing, 2x cable entry	Version
SX1-	1-		S2XXX-(XX-)A-	0	EXCHANGE HEAD ²	
					Gas type	Measuring range
			S2020-01-A		R32	50 % LEL
			S2020-02-A		R455a	50 % LEL
			S2020-03-A		R454b	50 % LEL
			S2020-04-A		R1234yf	50 % LEL
			S2061-A		FR02	2000 ppm
			S2063-A		FR03	2000 ppm
			S2064-A		FR04	2000 ppm
			S2070-A		FR06	2000 ppm
			S2077-A		FR07	2000 ppm
			S2080-A		FR08	2000 ppm
			S2125-C*		R717 Ammonia NH ₃	1000 ppm
			S2125-F*		R717 Ammonia NH ₃	10,000 ppm
						Gas type/ Range
				0	Without LC Display	
				2	With LC Display	Display
				1	Zone 1 and 2	
				2	Zone 2	ATEX Zone

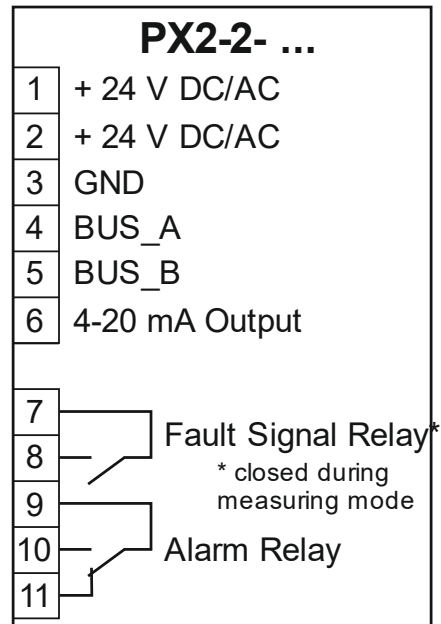
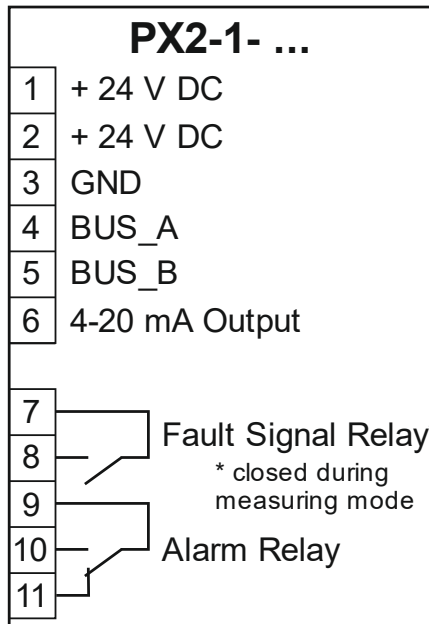
¹ Including one cable gland for PX2-1 with Ex d approval (Zone 1) in metal (-40 °C to +60 °C), for PX2-2 with Ex e approval (Zone 2) in plastic (-20 °C to +60 °C).

² The exchangeable sensor head is only to be used in connection with the PolyXeta®2 gas detector. Otherwise, it loses its ATEX Certification.

* On request

Accessories	Order number
Calibration adapter	CAL01-PX2
Stainless steel splash guard	SG-PX2
ATEX metal cable gland (Ex d) for zone 1 and 2, temperature range: -40 °C to +60 °C	ZU-PX2-CG-SN
ATEX plastic cable gland (Ex e) for zone 2, temperature range: -20 °C to +60 °C	ZU-PX2-CG-PL
Magnetic pen for operation	MSR_PEN_PX2
Sensor Head Protection	ZU-PX2-SHP-20
Service-Tool for display, calibration, addressing and parameter changes	STL06-PGX2-XX
PCE-Software set for display, calibration, addressing and parameter changes	PCE06-PGX2-XX-X

ELECTRICAL CONNECTION



FURTHER MEASURING PRINCIPLES



Infrared:

R32

→ See data sheet DB_PX2_IR_Premium



MPS™:

Ammonia (NH₃), R32

→ See data sheet DB_PX2_MPS



Electrochemical:

Ammonia (NH₃)

→ See data sheet DB_PX2_Tox



Catalytic:

Ammonia (NH₃)

→ See data sheet DB_PX2_Ex



Documents



Catalog



YouTube