Gas Detection.

Technical Datasheet

PolyXeta®2
Gas Detector PX2 for Zone 1 and 2
with MPS™ Sensor Element

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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 combustible 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 relay for monitoring the ambient air to detect combustible gases and refrigerants by means of a powerful MPS™ sensor element. The MPS™ measuring principle with integrated temperature, humidity and pressure compensation ensures highest accuracy, selectivity and reliability. The high-quality sensor element offers the best performance characteristics in terms of drift, stability and repeatability over a wide temperature and humidity range. Due to its resistance to poisoning, it is made to consist in harsh environments with particularly tough requirements. The sensor initiates itself at every start-up in order to perfectly adapt to the environment in the application. This allows it to achieve a life time of up to more than 15 years.

Optionally, the device is also available with LC display. In case of an alarm or a failure, the backlight of the detectors with LC 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 stations 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. Due to its characteristics, the MPS™-sensor is a highly flexible sensor solution that can be used for a wide range of applications.

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
- Low power consumption
- High accuracy, linearity, repeatability and stability
- Built-in environmental compensation (pressure, humidity and temperature)
- Integrated self-test and fault management
- Extremely resistant to poisoning
- Long life time (15+ years)
- Reverse polarity protection, overload protection
- Proportional 4–20 mA output and serial interface to the control centre
- Alarm and fault signal relay
- LC display with status LEDs (optional)
- Connection of SSAX1 sensor head as an alternative to SX1 (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**	See ORDERING INFORMATION	
Measuring principle	MPS™	
Resolution	0.1 % LEL	
Accuracy	± 2 % LEL	
Zero-point variation	0.5 % LEL	
Temperature range	-40 °C to 70 °C (-40 °F to 158 °F)	
Humidity range	0–100 % RH non-condensing	
Pressure range	80–120 kPa	
Storage temperature range[1]	-40 °C to 60 °C (-40 °F to 140 °F)	
Life-time	15+ years	
Calibration interval	15 years	
Poisoning	Poisoning resistant	
RECOMMENDED STORAGE CONDITIONS		
Storage temperature range[1]	0 °C to +20 °C (32 °F to 68 °F)	
Storage time	Ca. 6 months	
Humidity range	20–90 % RH non-condensing	
Pressure range	80–120 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 SplashGuard accessories 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 ¾ in. (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)	
Wire connection	Spring-type terminal, 0.08–2.5 mm² (AWG 28–14)	

[1] A deviating storage temperature can have a negative effect on sensitivity and service life.

ENVIRONMENTAL CONDITIONS (operation and explosion protection)		
Temperature Explosion protection With display	 -40 °C to +60 °C (-40 to 140 °F) -20 °C to +60 °C (-4 °F to 140 °F)	
Pressure range[1]	80–120 kPa	
Air velocity	< 6 m/s	
APPROVALS AND EXAMINATIONS	**PX2-1 (Zone 1)**	**PX2-2 (Zone 2)**
EU Type Examination Certificate Electrical Explosion Protection ATEX	BVS 15 ATEX E 129 X 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 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
EMC Test[2]	Certificate PR 18 03 53984 001 EN 50270-2015 Interference immunity & emission: Type 2 (industrial sector)	
EU Declaration of Conformity Electrical Explosion Protection	CE_PX2-1_Zone1	CE_PX2-2_Zone2 EN IEC 60079-0:2018 + EN IEC 60079-7:2016 + A1:2018
Certificates (only housing)		
Housing type 1 and type 3: FM Certificate of Compl. (3042541) Housing type stainless steel / type 2: FM Certif. of Conf. (FM18US0036U)	**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 1 and type 3: CSA Certif. of Compl. (2472857) Housing type stainless steel / type 2: CSA Certif. of Compl. (1717515)	**Class 2258-02** PROCESS CONTROL EQUIPMENT - For Hazardous Locations **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	
Compliances of the sensor element	IEC EN 60079-1 / 60079-11 CSA 22.2 60079-1 / 60079-11 FM 3600 / 3610 ANSI/UL 913 JEDEC JS001-2017 EN 55011 IEC EN 61000-4-3 IEC EN 61000-4-8 IEC 60335-2-40 UL/CSA 60335-2-40 ASHRAE Standard 15 ASHRAE proposed Standard 15.2P JRA Standard 4068T:2016R	
WARRANTY		
	1 year on sensor (not if 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.

[2] Not in conjunction with remote sensor head SSAX1

SPECIFICATIONS – SENSOR ELEMENT

Gas type	Order No.	Measuring range	Repeatability	t_{90} time	Reaction time	Relative gas density[1]
	PX2-X-X-SX1-1-	% LEL	< ± 2 % sig.	≤ sec.	≤ sec.	Air = 1
CH_4	M400-A	0–100	2	40	15	0.56
C_2H_2[2]	M405-A	0–100	2	60	15	0.90
NH_3	M408-B	0–30	2	75	15	0.60
H_2	M440-A	0–100	2	20	10	0.07
C_3H_8	M480-A	0–100	2	70	20	1.55
DMC	M499-B	0–30	2	240	40	3.11

[1] 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

[2] Due to the high amplification, the lowest reliable detection limit for Acetylene is 10 % LEL.

CROSS SENSITIVITY[1] – SENSOR ELEMENT

Approximate reaction of sensor to cross gas in percentage

Gas type	Order No.	Methane, CH_4	Acetylene, C_2H_2	Ammonia, NH_3	Hydrogen, H_2	Propane, C_3H_8	DMC, $C_3H_6O_3$
	PX2-X-X-SX1-1-	%	%	%	%	%	%
CH_4	M400-A	100	30	> 200	105	70	> 200
C_2H_2	M405-A	> 200	100	> 200	> 200	> 200	> 200
NH_3	M408-B	40	10	100	40	30	85
H_2	M440-A	95	30	> 200	100	65	> 200
C_3H_8	M480-A	150	50	> 200	155	100	> 200
DMC	M499-B	45	15	120	50	35	100

[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.

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.

ORDERING INFORMATION

PX2-	**X-**	**X-**	**MXXX-X-**	**0X**	**GAS DETECTOR**	
				01[1]	Type 1: Aluminum die-cast housing, 1x cable entry	
				03[1]	Type 3: Aluminum die-cast housing, 3x cable entry	
	1			**04**[2]	Remote sensor head SSAX1-1-MXXX-X-10-KX, housing type 1	
	1			**05**[2]	Remote sensor head SSAX1-1-MXXX-X-10-KX, housing type 3	
				06[1]	Type stainless steel housing, 2x cable entry	
	1			**07**[2]	Remote sensor head SSAX1-1-MXXX-X-10-KX, type stainless steel housing	
				08[1]	Type 2: Aluminum die-cast housing, 2x cable entry	
	1			**09**[2]	Remote sensor head SSAX1-1-MXXX-X-10-KX, housing type 2	**Version**
SX1-	**1-**		**MXXX-X**	**0**	**EXCHANGE HEAD**[3]	

	Gas type	Measuring range	
M400-A	Methane, CH_4	0–100 % LEL	
M405-A	Acetylene, C_2H_2	0–100 % LEL	
M408-B	Ammonia, NH_3	0–30 % LEL	
M440-A	Hydrogen, H_2	0–100 % LEL	
M480-A	Propane, C_3H_8	0–100 % LEL	**Gas type/ Measuring range**
M499-B	DMC (dimethyl carbonate), $C_3H_6O_3$	0–30 % LEL	

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).

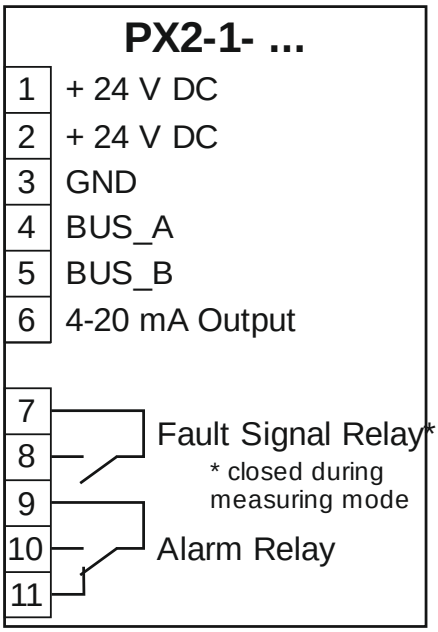
[2] Instead of the fixed sensor head SX1, the PX2-1 (only type Zone 1) is supplied with a remote sensor head SSAX1, which must be ordered separately in addition. For ordering information and sensor data see datasheet DB_SSAX1_MPS.

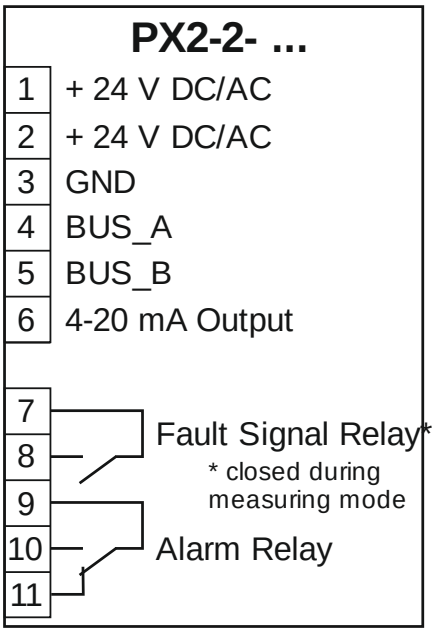
[3] The exchangeable sensor head is only to be used in connection with the PolyXeta®2 Gas Detector. Otherwise, it loses its ATEX Certification.

ACCESSORIES

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

ELECTRICAL CONNECTION





FURTHER MEASURING PRINCIPLES

Infrared:
Methane (CH_4), propane (C_3H_8)
➔ See data sheet DB_PX2_IR_Premium

Semiconductor/Freon:
Ammonia (NH_3)
➔ See data sheet DB_PX2_Freon

Electrochemical:
Ammonia (NH_3), hydrogen (H_2)
➔ See data sheet DB_PX2_Tox

Catalytic:
Ammonia (NH_3), methane (CH_4), propane (C_3H_8), hydrogen (H_2)
➔ See data sheet DB_PX2_Ex

Documents

Catalog

YouTube