

Series 23SXio

High-precision piezoresistive pressure transmitters with IO-Link interface

Features

- IO-Link interface compliant with IEC 61131-9
- Various process data formats
- Can be used as a pressure switch
- Easy connection to the bus system via IO-Link master
- Excellent long-term stability



Technology

- Insulated and encapsulated piezoresistive pressure sensor
- Fully welded design with no internal seals
- High-quality pressure transducer and tried-and-tested mathematical compensation

Typical applications

- Automation technology
- Hydraulics and pneumatics
- Industrial applications

Accuracy

± 0,1 %FS

Total error band

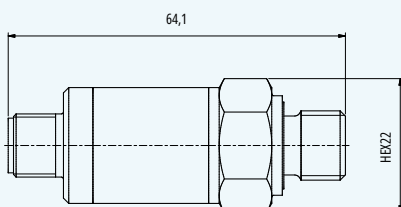
± 0,25 %FS @ -10...80 °C

Pressure ranges

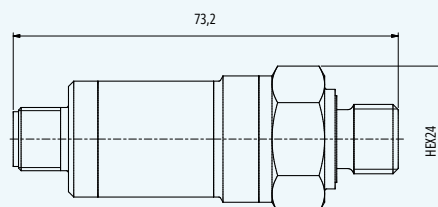
0...0,16 to 0...1000 bar



Series 23SXio: ≤ 120 bar



Series 23SXio: > 120 bar



Series 23SXio – Specifications

Standard pressure ranges

Relative pressure PR		Proof pressure
0...0,16	-0,16...0,16	3
0...0,25	-0,25...0,25	
0...0,4	-0,4...0,4	
0...0,6	-0,6...0,6	
0...1	-1...0	
	-1...1	9
0...1,6	-1...1,6	
0...2,5	-1...2,5	
0...4	-1...4	
0...6	-1...6	
0...10	-1...10	30
0...16	-1...16	48
0...25	-1...25	75
bar rel.		bar
Reference pressure at atmospheric pressure		Based on reference pressure

Absolute pressure PAA	Absolute pressure PA	Proof pressure
0,5...1,1		3
0...1		
0...1,6		9
0...2,5		
0...4	0...4	12
0...6	0...6	18
0...10	0...10	30
0...16	0...16	48
0...25	0...25	75
0...40	0...40	120
0...60	0...60	180
0...100	0...100	300
0...160	0...160	500
0...250	0...250	
0...400	0...400	800
0...600	0...600	1200
0...1000	0...1000	
bar abs.	bar	bar
Reference pressure at 0 bar abs. (vacuum)	Reference pressure at 1 bar abs.	Based on reference pressure

Performance

Pressure

Accuracy @ RT (20...25 °C)	$\leq \pm 0,1 \%FS$	Non-linearity (best fit straight line, BFS), pressure hysteresis, non-repeatability, zero point deviation and amplification deviation
Total error band (-10...80 °C)	$\leq \pm 0,25 \%FS$	Max. deviation within the compensated pressure and temperature range. Experience shows that, outside the compensated temperature range, the total error band in the ambient temperature range is expanded by 0,1 %FS.
Compensated temperature range	-10...80 °C	Other, optional temperature ranges within -40...125 °C possible.
Long-term stability	$\leq \pm 0,15 \%FS$	Per year under reference conditions, annual recalibration recommended.
Position dependency	$\leq \pm 1,5 \text{ mbar}$	Calibrated in vertical installation position with pressure connection facing downwards.
Resolution	0,005 %FS	
Signal stability	0,03 %FS	Noise-free
Internal measurement rate	2500 Hz	The maximum output rate is 1600 Hz (600 μs cycle time).
Pressure range reserve	$\pm 10 \%$	Outside the pressure range reserve, +Inf / -Inf is displayed. If there is an error in the device, NaN is displayed.
Vacuum resistance	For operating pressures $\leq 0,1$ bar abs., a vacuum-optimised version is recommended.	
Note	For pressure ranges < 1 bar, all data apply with reference to a full-range signal (FS) of 1 bar.	

Temperature

Accuracy (-10...80 °C)	$\leq \pm 2 \text{ °C}$	The temperature is measured on the pressure sensor (silicon chip) that sits behind the metallic separating diaphragm. The data applies within the compensated temperature range.
Resolution	$\leq 0,01 \text{ °C}$	
Internal measurement rate	$\geq 10 \text{ Hz}$	

Series 23SXio – Specifications

Electrical data

Connectivity	Digital
Digital interface	IO-Link or 1 x switching signal
Voltage supply	8...32 VDC
Power consumption (without switching current)	< 15 mA
Voltage insulation	± 32 VDC

Start-up time (power supply ON)	< 50 ms
Overvoltage protection and reverse polarity protection	± 32 VDC
GND case insulation	> 10 MΩ @ 500 VDC

Switch output for use as pressure switch

Type	NPN, PNP, push-pull
Output current	Limited to < 200 mA
Output voltage	@ 200 mA load current High gauge: > (supply voltage - 1,75 V) Low gauge: < 1,75 V
Switching functions	Hysteresis function Window function
Switch delay	Configurable switch-on and switch-off delay.

Digital interface

Type	IO-Link V1.1	
Communication protocols	Smart Sensor Profile SSP 3.2	Pressure values and switching signal
	Extended process data	With pressure and temperature values and switching signal.
	Switching signal channel	Switching signal available on the plug even without IO-Link.
	Bootloader (FWUP)	For function upgrades at a later stage.
	Identification & diagnosis (I&D)	
	Process data variable	
Identification	23SXio	Plain text identification
Pressure unit	Pa	
Unit of temperature	°C	
Data type	Fixed point/floating point	Switchable
Baud rates	COM3: 230,4 kBaud	
Cycle time	≥ 600 μs	Configurable (via IO-Link master)
Cable length	≤ 20 m	

Electrical connection

Standard plug	Round plug	M12 x 1	DIN EN 61076-2-101, A-coded, 4-pin
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Electromagnetic compatibility

CE conformity as per 2014/30/EU (EMC)	EN IEC 61326-1 / EN IEC 61326-2-3 / EN IEC 61000-6-1 / EN IEC 61000-6-2/ EN IEC 61000-6-3 / EN IEC 61000-6-4
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Series 23SXio – Specifications

Mechanical data

Materials in contact with media

Pressure connection	Stainless steel AISI 316L	≤ 400 bar
	Stainless steel AISI 318LN, 1.4462	> 400 bar
Pressure transducer separating diaphragm	Stainless steel AISI 316L	
Pressure transducer seal (internal)	None	
Pressure connection seal (external)	FKM (75 Shore) -20...200 °C	For median temperatures < -20 °C, FVMQ (70 Shore, -60...175 °C) is used. Optional: EPDM (-40...150 °C)

Other materials

Pressure transducer oil filling	Silicone oil	Others available on request.
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Further details

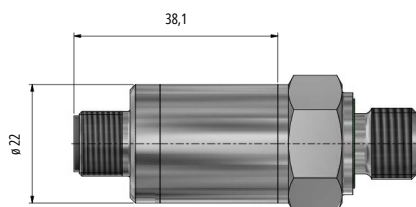
Pressure connection	G1/4 male	See Dimensions and options
	1/4-18NPT male	
Diameter × length	ø 22 mm × approx. 42 mm	
Weight	approx. 100 g	Low pressure
	approx. 170 g	High pressure

Environmental conditions

Media temperature range	-20...125 °C	Optional: -40...125 °C	Icing not permitted.
Ambient temperature range	-20...85 °C	Optional: -30...85 °C	
Storage temperature range	-20...85 °C		
Protection	IP67	Round plug, M12 x 1	For relative pressure IP54.
Notes	- Degrees of protection are only valid with the corresponding mating plug in the connected state. - The design implementation of the ventilation for relative pressure versions can be found in the respective technical drawing.		
Vibration resistance	10 g, 10...2000 Hz, ± 10 mm	IEC 60068-2-6	
Shock resistance	50 g, 6 ms	IEC 60068-2-27	
Load cycles @ RT (20...25 °C)	> 10 m. pressure cycles	0...100 %FS	

Series 23SXio – Dimensions and options

Electrical connections

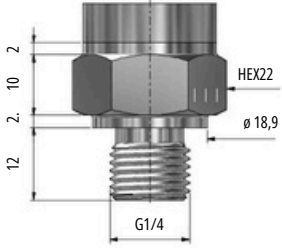
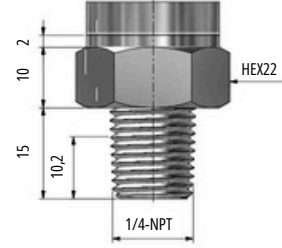


M12	
M12 × 1	IO-Link
	1 L+
	2 n.c.
	3 L-
	4 C/Q

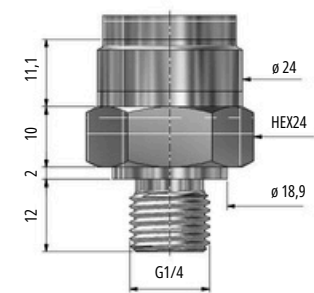
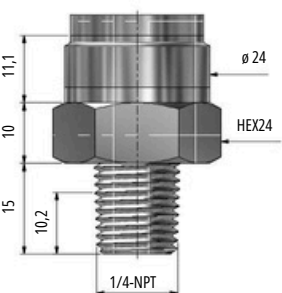
Series 23SXio – Dimensions and options

Available pressure connections

For pressure range ≤ 120 bar

G1/4	1/4-18NPT
	
DIN EN ISO 1179-2	ASME/ANSI B 120.1

For pressure range > 120 bar

G1/4	1/4-18NPT
	
DIN EN ISO 1179-2	ASME/ANSI B 120.1

Other pressure connections available on request.

Other customer-specific options

- Other compensated pressure ranges
- Other compensated temperature ranges between $-40 \dots 125$ °C
- Preconfigured transmitter (e.g. for direct use as pressure switch)
- Parts that come into contact with media made from Hastelloy C-276, Inconel 718 or titanium available
- O-rings made of other materials
- Other oil filling types for pressure transducers
- Vacuum-optimised version for operating pressures $\leq 0,1$ bar abs
- Integration of application-specific calculations
- Modifications to customer-specific options

Examples of similar products

- Series 21Zio: Pressure transmitter with IO-Link interface in a compact design
- Series 23SZio: Pressure transmitter with IO-Link interface for elevated requirements
- Series 23SX: High-precision pressure transmitter with RS485 interface
- Series 23SXc: High-precision pressure transmitter with CANopen interface
- Series 33X: Pressure transmitters with maximum performance
- OEM series: Pressure transducer with electronics (e.g. series 9LX or 20SX with thread) for integration in one's own systems

Series 23SXio – Scope of delivery and accessories

Scope of delivery

Calibration certificate


Accessories

Calibration certificate	Mating plug to M12
	
Issued by an external calibration laboratory of the German accreditation body DAkkS or the Swiss accreditation body SAS.	• Angled socket, cable 5 m PN 602515.0093 • Angled socket, cable 2 m PN 602515.0094 • Female connector, cable 5 m PN 602515.0095 • Female connector, cable 2 m PN 602515.0096