

## Series 23SY

Piezoresistive pressure transmitter for increased requirements

### Features

- Compensated over the entire temperature range
- Excellent long term stability
- Robust stainless steel housing
- Optional: Intrinsically safe version 23SY-Ei available for use in explosive environments

### Technology

- Insulated and encapsulated piezoresistive pressure sensor
- Fully welded design with no internal seals
- Direct analog signal path with high bandwidth

### Typical applications

- Industrial applications
- Machinery and plant manufacturing
- Agriculture
- Mobile hydraulics
- Railway industry



#### Accuracy

± 0,25 %FS

#### Total error band

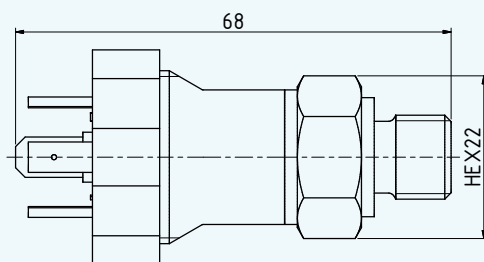
± 0,7 %FS @ -10...80 °C

#### Pressure ranges

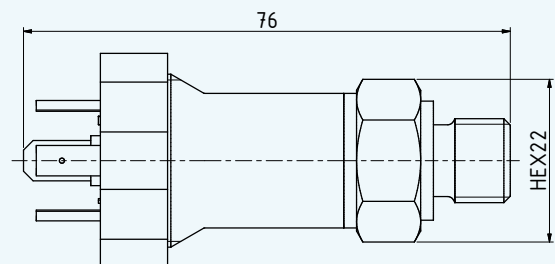
0...0,1 to 0...1000 bar



Series 23SY



Series 23SY-Ei



## Series 23SY – Specifications

### Standard pressure ranges

Relative pressure PR	Relative pressure PR	Proof pressure
0...0,1	-0,1...0,1	3
0...0,16	-0,16...0,16	
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	
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	
0...250	0...250	500
0...400	0...400	800
0...600	0...600	1200
0...1000	0...1000	
bar abs.		bar
Reference pressure at 0 bar abs. (vacuum)		Based on reference pressure
Reference pressure at 1 bar abs.		Based on reference pressure

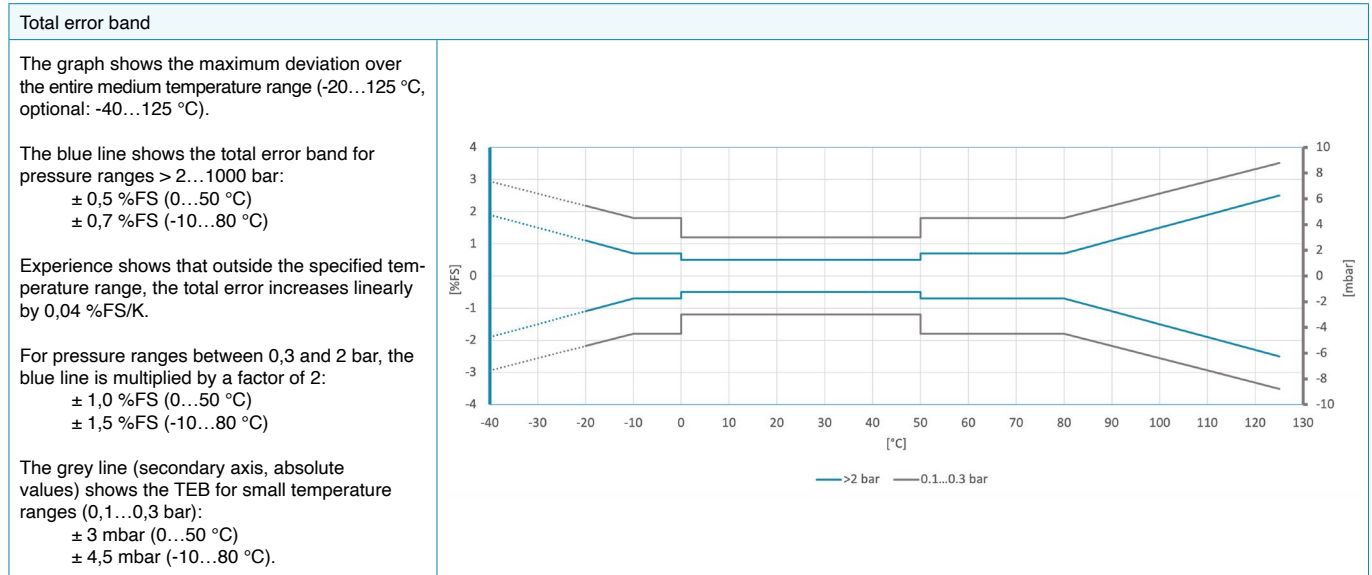
### Performance

#### Pressure

Accuracy	$\leq \pm 0,25$ %FS	> 0,3...1000 bar	Non-linearity (best fitted straight line BFSL), pressure hysteresis, non-repeatability
	$\leq \pm 0,5$ %FS	> 0,15...0,3 bar	
	$\leq \pm 1,0$ %FS	0,1...0,15 bar	
Total error band 0...50 °C	$\leq \pm 0,5$ %FS	> 2...1000 bar	Maximum deviations within the compensated pressure and temperature range
Total error band -10...80 °C	$\leq \pm 0,7$ %FS		
Compensated temperature range	-10...80 °C		
Long term stability	$\leq \pm 0,2$ %FS	> 2 bar	Per year under reference conditions
	$\leq \pm 4$ mbar	$\leq 2$ bar	
Position dependency	$\leq \pm 1,5$ mbar	Calibrated in vertical installation position with pressure connection facing downwards	
Vacuum resistance	For operating pressures $\leq 0,1$ bar abs., a vacuum-optimised version is recommended		

## Series 23SY – Specifications

### Performance



### Electrical data

Connectivity	2-wire		3-wire	
	Analog interface	4...20 mA	0...10 V	0...5 V
Signal output limitation	3,2...22,3 mA	-1,2...11,2 V	-0,6...5,6 V	0,1...4,9 V
Voltage supply 23SY	8...32 VDC	13...32 VDC	8...32 VDC	8...32 VDC
Voltage supply 23SY-Ei	10...30 VDC	15...30 VDC	10...30 VDC	10...30 VDC
Power consumption		< 5 mA	< 5 mA	< 4 mA
Note	Pressure ranges $\leq 0,15 \text{ bar}$ : Signal output limitation higher than listed, but max. 31,5 mA Signal output 0,5...4,5 V not possible			

Start-up time (power supply ON)	< 5 ms (0...99 %)
Overvoltage and reverse polarity protection	$\pm 32 \text{ VDC}$
GND CASE insulation	> 10 M $\Omega$ @ 300 VDC

#### Analog interface

Load resistance 23SY	< (U - 8 V) / 25 mA	2-wire
	> 5 k $\Omega$	3-wire
Load resistance 23SY-Ei	< (U - 10 V) / 25 mA	2-wire
	> 100 k $\Omega$	3-wire
Limiting frequency	1 kHz	

#### Electrical connection

Plug	M12 x 1	DIN EN 61076-2-101, A-coded, 4-pin
	Binder series 423 - 723 - 425	DIN EN 61076-2-106, 5-pin
	GSP	EN 175301-803-A (DIN 43650)
Cable	$\varnothing 5,8 \text{ mm}$ , PE sheath	Cable gland
Standard cable lengths	2 m, 5 m	Others on request

## Series 23SY – Specifications

### 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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### Mechanical data

#### Materials in contact with media

Pressure connection	Stainless steel AISI 316L	Others on request
Pressure transducer separating diaphragm	Stainless steel AISI 316L	
Pressure transducer seal (internal)	None	
Pressure connection seal (external)	FKM (75 Shore, -20...200 °C)	

#### Other materials

Pressure transducer oil filling	Silicone oil	Others on request
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#### Further details

Pressure connection	G1/4 male	See Dimensions and options
	G1/4 female	
	1/4-18NPT male	
	G1/2 male	
Diameter x length	ø 21 mm x approx. 70 mm	
Weight (excluding cable)	approx. 120 g	

### Environmental conditions

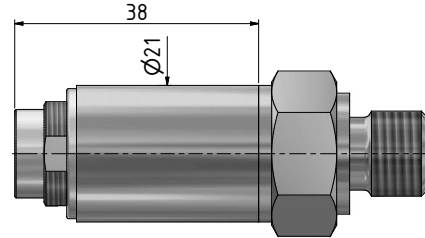
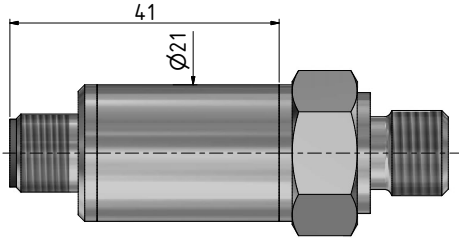
Medium temperature range	-20...125 °C	Optional: -40...125 °C	Icing not permitted
Ambient temperature range 23SY	-20...85 °C	Optional: -40...85 °C	
Ambient temperature range 23SY-Ei	See operating instructions		
Storage temperature range	-20...85 °C		
Protection	IP67	M12 x 1	For relative pressure IP54
	IP40	Binder series 581	IP67 optional For relative pressure use a cable with integrated capillary
	IP65	GSP EN 175301-803 A	For relative pressure use a cable with integrated capillary
	IP67 (standard) IP68 (optional)	Cable gland	For relative pressure use a cable with integrated capillary
Notes	<ul style="list-style-type: none"> <li>Degrees of protection are valid only with the corresponding mating plug</li> <li>The design implementation of the ventilation for relative pressure versions can be found in the respective technical drawing</li> </ul>		
Vibration resistance	10 g, 10...2000 Hz, ± 10 mm	IEC 60068-2-6	
Shock resistance	50 g, 11 ms	IEC 60068-2-27	
Load cycles @ RT (20...25 °C)	> 10 million pressure cycles	0...100 %FS	For pressures > 600 bar on request


### Explosion protection 23SY-Ei

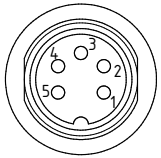
Intrinsically safe version in accordance with 2014/34/EU (ATEX), UKSI 2016/1107 (UKEX) and IECEx	IBExU 10 ATEX 1124 X IECEX IBE 14.0044 X ExV21UKEX1017X	23SY-Ei	Ex II 1G Ex ia IIC T6-T4 Ga Ex II 1D Ex ia IIIC T 130 °C Da
Note	The conditions for safe use can be found in the operating instructions		

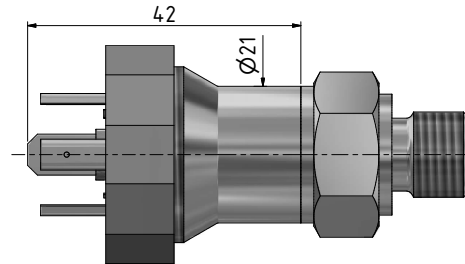
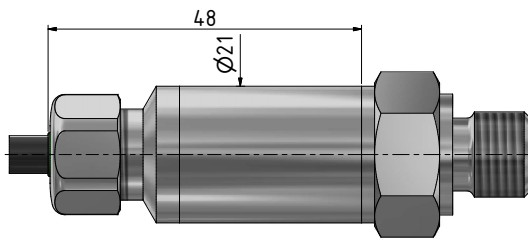
## Series 23SY – Dimensions and options

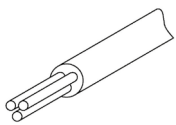
### Electrical connections

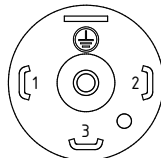


M12	2-wire	3-wire
M12 x 1	4...20 mA	0...max. 10 V
	1 n.c.	1 GND
	2 OUT/GND	2 +OUT
	3 +Vs	3 +Vs
	4 n.c.	4 n.c.

Binder series 423 - 723 - 425	2-wire	3-wire
M16 x 0,75	4...20 mA	0...max. 10 V
	1 n.c.	1 GND
	2 OUT/GND	2 +OUT
	3 +Vs	3 +Vs
	4 n.c.	4 n.c.
	5 n.c.	5 n.c.

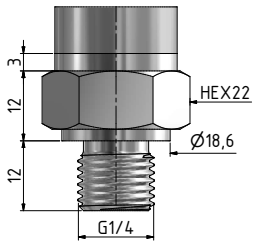
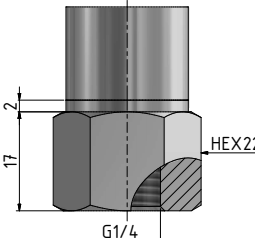
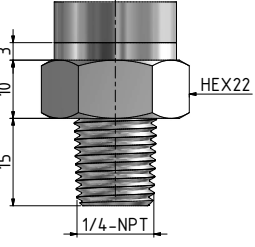
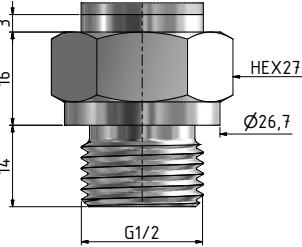


Cable gland	2-wire	3-wire
Cable ø 5,8	4...20 mA	0...max. 10 V
	WH n.c.	WH GND
	RD OUT/GND	RD +OUT
	BK +Vs	BK +Vs
	Shield on CASE	Shield on CASE

GSP EN 175301-803 A	2-wire	3-wire
□18	4...20 mA	0...max. 10 V
	1 n.c.	1 GND
	2 OUT/GND	2 +OUT
	3 +Vs	3 +Vs
	⊥ CASE	⊥ CASE

## Series 23SY – Dimensions and options

### Available pressure connections

<p>G1/4 male</p>  <p>DIN EN ISO 1179-2</p>	<p>G1/4 female</p>  <p>DIN EN ISO 1179-2</p>
<p>1/4-18NPT male</p>  <p>ASME/ANSI B 120.1</p>	<p>G1/2 male</p>  <p>DIN EN ISO 1179-2</p>

Other pressure connections available on request.

### Other customer-specific options

- Other compensated pressure ranges
- Other compensated temperature ranges within -40...125 °C
- Other electrical connections
- O-rings made of other materials
- Other oil filling types for pressure transducers
- Vacuum-optimised version for operating pressures  $\leq 0,1$  bar abs.
- Modifications to customer-specific applications

### Examples of similar products




- Series 25SY: Front-flush pressure transmitter
- Series 21Y: Pressure transmitter for confined spaces
- OEM series: Pressure transducer with electronics (e.g. Series 9LY or 20SY with thread) for integration into one's own systems

## Series 23SY – Accessories

### Scope of delivery

KELLER test report	Female connector to Binder 581 - IP40	Female connector to GSP EN 175301-803 A
		

### Accessories

Calibration certificate	Mating plug to M12	Female connector to Binder 423 - IP67
		
Issued by the external calibration laboratory of the German accreditation body DAkkS or the Swiss accreditation body SAS	<ul style="list-style-type: none"> <li>• Angled socket, cable 5 m <i>PN 602515.0093</i></li> <li>• Angled socket, cable 2 m <i>PN 602515.0094</i></li> <li>• Female connector, cable 5 m <i>PN 602515.0095</i></li> <li>• Female connector, cable 2 m <i>PN 602515.0096</i></li> </ul>	Mating plug for increased protection demands <i>PN 508405.0004</i>