

## 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 (zone 0/1/2)
- Increased safety 23SY-En (zone 2)

### Technology

- Insulated and encapsulated piezoresistive pressure sensor chip
- 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

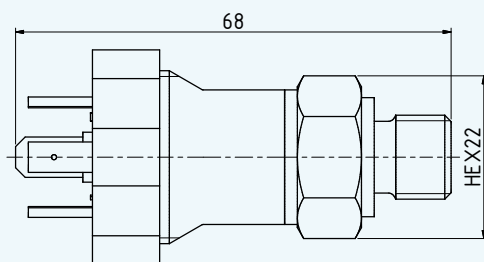
± 0,7 %FS @ -10...80 °C

### Pressure ranges

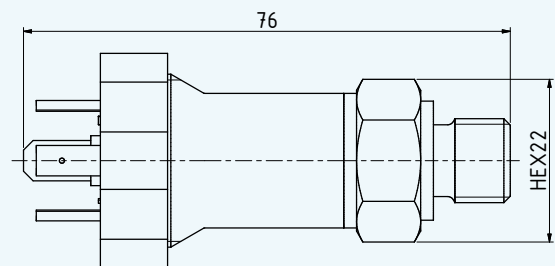
0...0,1 to 0...1000 bar



Series 23SY / 23SY-En



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	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

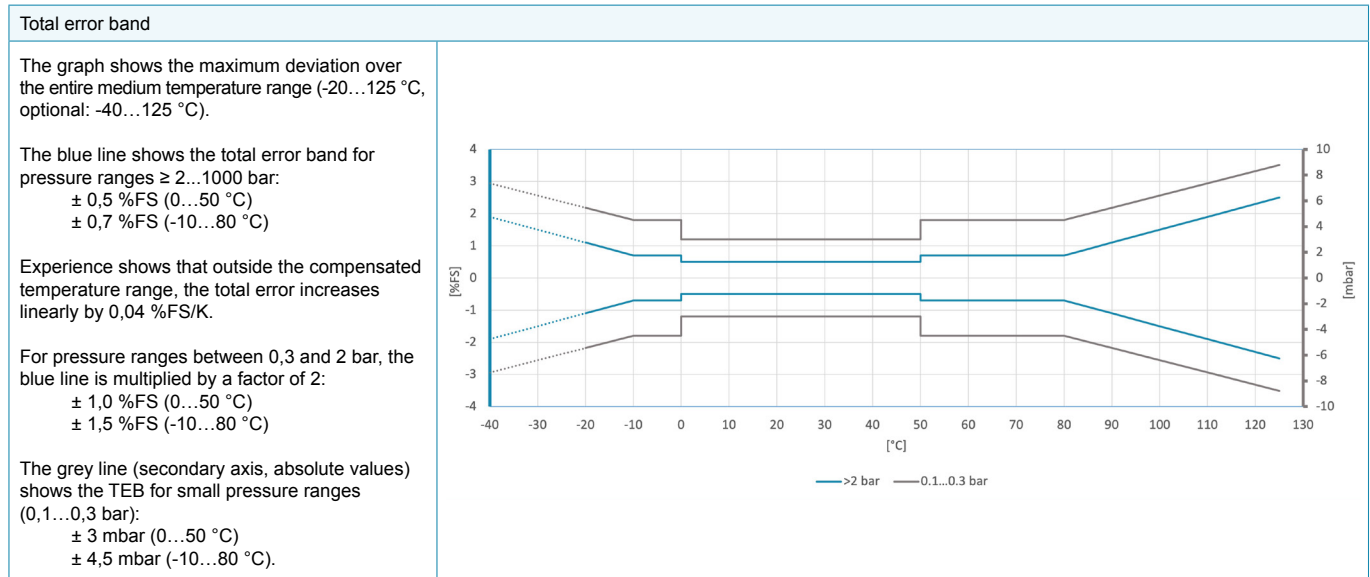
### Performance

#### Pressure

Accuracy	$\leq \pm 0,25$ %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	$\leq \pm 0,7$ %FS	$\geq 2$ ...1000 bar	Maximum deviations within the compensated pressure and temperature range
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-En	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 $\leq 0,15$ 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 %)
Overtoltage and reverse polarity protection	$\pm 32$ VDC
GND CASE insulation	> 10 M $\Omega$ @ 300 VDC

#### Analog interface

Load resistance 23SY / 23SY-En	< (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	Round plug	M12 $\times$ 1	DIN EN 61076-2-101, A-coded, 4-pin
	Round plug 423 - 723 - 425	M16 $\times$ 0,75	DIN EN 61076-2-106, 5-pin
	Valve plug	Form A (18 mm)	DIN EN 175301-803-A (DIN 43650)
Cable	$\varnothing$ 5,8 mm, PE sheath	Cable gland	
Standard cable lengths	2 m, 5 m	Others on request	
Note	Only the M12x1 round plug, valve plug type A (18 mm) and cable variants are approved for the 23SY-En series.		

## Series 23SY – Specifications

### Mechanical data

Materials in contact with media

Pressure connection	Stainless steel AISI 316L
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
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Further details


Pressure connection	G1/4 male	See Dimensions and variants
	G1/4 female	
	1/4-18NPT male	
	G1/2 male	
Diameter × length	ø 21 mm × 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-En	-20...70 °C		
Ambient temperature range 23SY-Ei	See operating instructions		
Storage temperature range	-20...85 °C	Optional -40...85 °C	
Protection	IP67	Round plug, M12 × 1	For relative pressure IP54
	IP40	Round plug 423 - 723 - 425	IP67 optional For relative pressure use a cable with integrated capillary.
	IP65	Valve plug, Form A	For relative pressure use a cable with integrated capillary.
	IP68	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, 6 ms	IEC 60068-2-27	
Load cycles @ RT (20...25 °C)	> 10 million pressure cycles	0...100 %FS	For pressures > 450 bar on request

## Series 23SY – Specifications

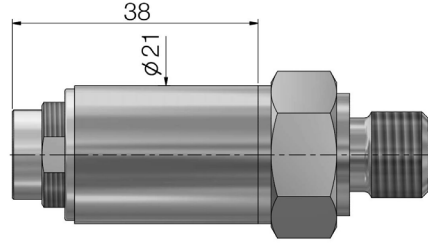
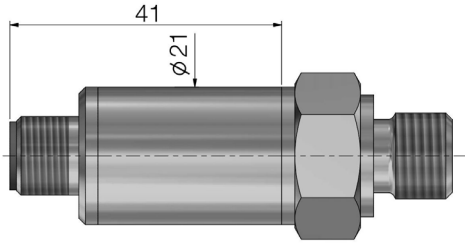
### Conformity

Logo	Certification	Description	Guideline	Norm
	CE-Declaration of Conformity	EMV	2014/30/EU	EN IEC 61326-1 / EN IEC 61326-2-3
		RoHS	2011/65/EU	

Logo	Certification	Description	Guideline	Usage	Labelling	Series
	ATEX	Intrinsic safety	2014/34/EU	Zone 0/1/2	Ex II 1G Ex ia IIC T6 Ga	23SY-Ei
				Zone 20/21/22 dust	Ex II 1D Ex ia IIIC T130° Da	23SY-Ei
	IECEX	Increased security	2014/34/EU	Zone 2 gas	Ex II 3G Ex ec IIC T4 Gc	23SY-En
				Zone 0/1/2	Ex ia IIC T6 Ga	23SY-Ei
				Zone 20/21/22 dust	Ex ia IIIC T130° Da	23SY-Ei
		Increased security		Zone 2 gas	Ex ec IIC T4 Gc	23SY-En
Note	The conditions for safe use can be found in the operating instructions.					

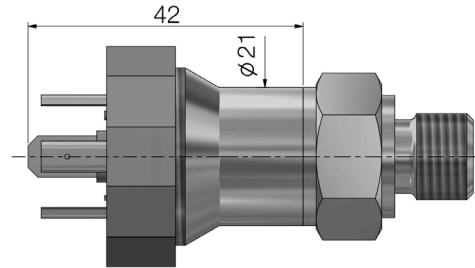
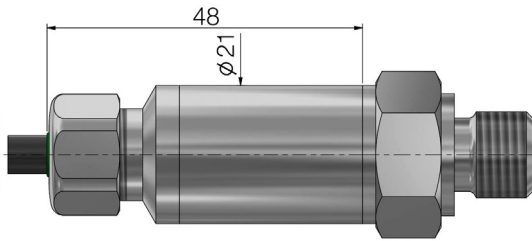
## Series 23SY – Dimensions and variants

### Electrical connections



Round plug	2-wire		3-wire	
M12 × 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.

Roung plug	2-wire		3-wire	
M16 × 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.

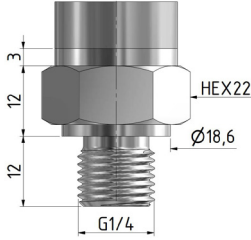
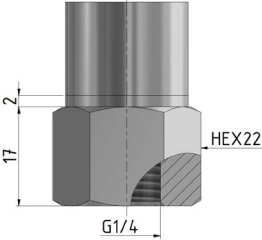
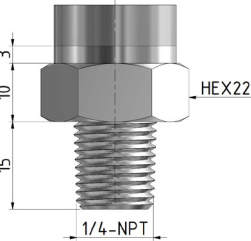
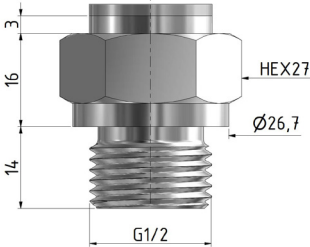


Cable gland	2-wire		3-wire	
Cable ø 5,8	4...20 mA		0...max. 10 V	
	WH	n.c.	WH	GND
	RD	OUT/GND	RD	+OUT
	BK	+Vs	BK	+Vs
	Shield on CASE		Shield on CASE	

Valve plug	2-wire		3-wire	
Form A (18mm)	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 variants

### 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>

### Customised configurations on request

- 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 ≤ 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
- Pressure transmitter modules: 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

Calibration certificate	Mating plug to round plug 581 - 680 - 682, IP40	Mating plug to valve plug, form A
		

### Accessories

Calibration certificate with 5 measuring points	Calibration certificate with 11 measuring points	Calibration certificate	Mating plug to M12	Mating plug to round plug 423 - 723 - 425, IP67
				
Deviation at room temperature. Issued by KELLER Pressure.	Deviation at room temperature with hysteresis. Issued by KELLER Pressure.	Issued by an external calibration laboratory accredited by DakkS or SAS.	<ul style="list-style-type: none"> <li>• Angled socket, cable 5 m PN 602515.0093</li> <li>• Angled socket, cable 2 m PN 602515.0094</li> <li>• Female connector, cable 5 m PN 602515.0095</li> <li>• Female connector, cable 2 m PN 602515.0096</li> </ul>	Mating plug for increased protection demands PN 508405.0004