Series PD-23X

High-precision piezoresistive differential pressure transmitters

Features

- RS485 interface can be combined with analog interface
- Analog interface scaleable by RS485 interface (turn-down)
- Modbus RTU protocol for process values and configuration
- Line pressure up to 600 bar
- Excellent long-term stability

Technology

- Insulated and encapsulated piezoresistive pressure sensor chip (classic “wet-wet”)
- High-quality differential pressure transducers and tried-and-tested mathematical compensation
- Based on technology from the well-known PD-33X series with the highest level of accuracy

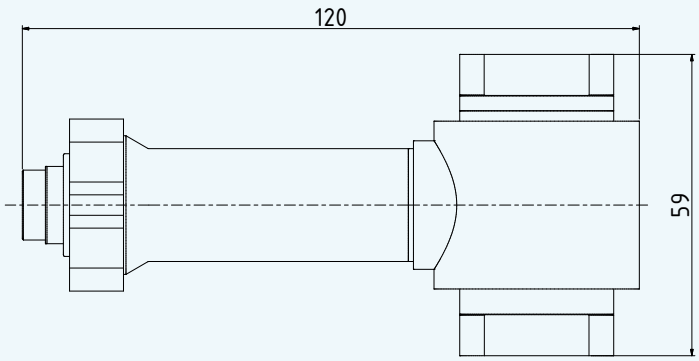
Typical applications

- Filter monitoring
- Flow rate measurement
- Industrial applications

Accuracy
± 0,1 %FS
Total error band
± 0,25 %FS @ -10…80 °C
Pressure ranges
0…0,16 to 0…25 bar

Modbus RTU

Series PD-23X



Edition 05/2025
Subject to alterations
info@keller-pressure.com

Series PD-23X – specifications

Standard pressure ranges

Differential pressure PD		Positive overload resistance	Negative overload resistance
0…0,16	-0,16…0,16	5	2,5
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	15	7,5
	-1…1		
0…1,6			
0…2,5			
0…4		50	25
0…6			
0…10			
0…16		120	60
0…25			
bar diff.		bar	
Reference pressure at 0 bar Differential pressure		Based on reference pressure	

Performance

Pressure

Accuracy @ RT (20…25 °C)	≤ ± 0,1 %FS	Non-linearity (best fit straight line, BFSL), pressure hysteresis, non-repeatability, zero point deviation and amplification deviation
Total error band (-10…80 °C)	≤ ± 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	
Long-term stability	≤ ± 0,15 %FS	Per year under reference conditions, annual recalibration recommended.
Line pressure	≤ 200 bar	Either, see dimensions & variants
	≤ 600 bar	
Line pressure dependency	< 0,015 %FS / bar	For pressure ranges ≥ 1 bar
Position dependency	≤ ± 3 mbar	Calibrated with pressure connections in horizontal installation position.
Resolution	0,002 %FS	Digital
Signal stability	0,01 %FS	Digital noise-free
Internal measurement rate	≥ 1800 Hz	> 6000 Hz in the case of the «3-wire + digital (0…10 V, 0…5 V)» version
Pressure range reserve	± 10 %	Outside the pressure range reserve, +Inf / -Inf is displayed. If there is an error in the device, NaN is displayed.
Note	For pressure ranges < 1 bar, all data apply with reference to a full-range signal (FS) of 1 bar.	

Temperature

Accuracy	≤ ± 2 °C	The temperature is measured on the pressure sensor chip that sits behind the metallic separating diaphragm. The data applies within the compensated temperature range.
Resolution	≤ 0,01 °C	
Internal measurement rate	> 10 Hz	

Series PD-23X – specifications

Electrical information

Connectivity	digital	2-wire + digital	3-wire + digital	
Analog interface		4…20 mA	0…10 V	0…5 V
Digital interface	RS485	RS485	RS485	RS485
Voltage supply	3,2…32 VDC	8…32 VDC	13…32 VDC	8…32 VDC
Power consumption (without communication)	< 8 mA	3,5…22,5 mA	< 8 mA	< 8 mA
RS485 voltage insulation	± 32 VDC	± 18 VDC	± 32 VDC	± 32 VDC
Note	Disturbance of the 4…20 mA signal occurs during communication via the digital interface. 3-wire types are suitable for simultaneous operation of the analog and digital interface.			

Start-up time (power supply ON)	< 250 ms
Overvoltage protection and reverse polarity protection	± 32 VDC
GND case insulation	> 10 MΩ @ 300 VDC

Analog interface

Load resistance	< (U - 8 V) / 25 mA	2-wire
	> 5 kΩ	3-wire
Limiting frequency	≥ 300 Hz	2-wire
	≥ 1000 Hz	3-wire (0…10 V, 0…5 V)
Note	Filter properties can be adjusted by the customer	

Digital interface

Type	RS485	Half-duplex
Communication protocols	Modbus RTU	
	KELLER bus protocol	Proprietary
Identification	Class.Group: 5.24	Standard settings: bus address 1, baud rate 9600 bit/s Other default settings available on request. Can be reconfigured via software by the customer later.
Unit of pressure	bar	
Unit of temperature	°C	
Data type	Float32 and Int32	
Baud rates	9600 and 115,200 bit/s	
Cable lengths	up to 1,2 km	

Electrical connection

Standard plug	Round plug	M12 x 1	DIN EN 61076-2-101, A-coded, 5-pin
	Round plug 423 - 723 - 425	M16 x 0,75	DIN EN 61076-2-106, 5-pin
Alternative plug	Valve plug (without RS485)	Form A (18 mm)	DIN EN 175301-803-A (DIN 43650)
Cable	ø 5,8 mm, PE sheath	5-pin, cable gland	
Standard cable length	2 m, 5 m	Others on request.	

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

Series PD-23X – 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)	FKM
Pressure connection seal (external)	none

Other materials

Pressure transducer oil filling	Silicone oil

Further details

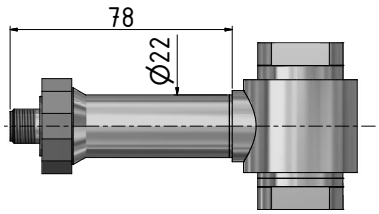
Pressure connection	G1/4 female	See dimensions and variants
	1/4-18NPT female	
Width × height	59 mm × approx. 120 mm	
Weight	approx. 500 g	Line pressure 200 bar
	approx. 650 g	Line pressure 600 bar

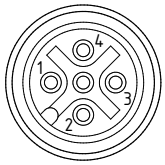
Environmental conditions

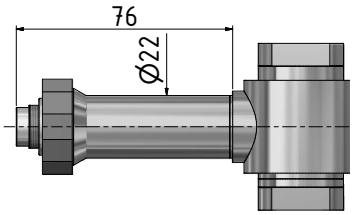
Medium temperature range	-20…125 °C		Icing not permitted
Ambient temperature range	-20…85 °C		
Storage temperature range	-20…85 °C		
Protection	IP67	Round plug, M12 x 1	
	IP67	Round plug 423 - 723 - 425, M16 x 0,75	
	IP65	Valve plug, form A, DIN EN175301-803-A (formerly DIN 43650)	
	IP67	Cable gland	
Notes	Degrees of protection are only valid with the corresponding mating plug in the connected state.		
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 mn. pressure cycles	0…100 %FS	

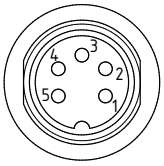
Series PD-23X – Dimensions and variants

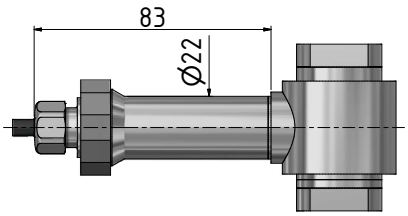
Electrical connections

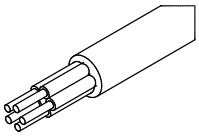


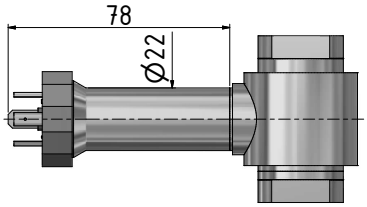
Round plug	2-wire		3-wire	
M12 × 1	4…20 mA		0…max. 10 V	
	1	OUT/GND	1	GND
	2	n.c.	2	+OUT
	3	+Vs	3	+Vs
	4	RS485A	4	RS485A
	5	RS485B	5	RS485B



Round plug	2-wire		3-wire	
M16 x 0,75	4…20 mA		0…max. 10 V	
	1	OUT/GND	1	GND
	2	n.c.	2	+OUT
	3	+Vs	3	+Vs
	4	RS485A	4	RS485A
	5	RS485B	5	RS485B



Cable gland	2-wire		3-wire	
Cable ø 5.8	4…20 mA		0…max. 10 V	
	WH	OUT/GND	WH	GND
	RD	n.c.	RD	+OUT
	BK	+Vs	BK	+Vs
	BU	RS485A	BU	RS485A
	YE	RS485B	YE	RS485B
	Shield on CASE		Shield on CASE	

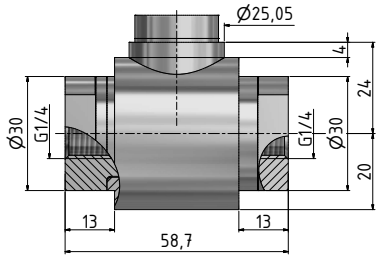
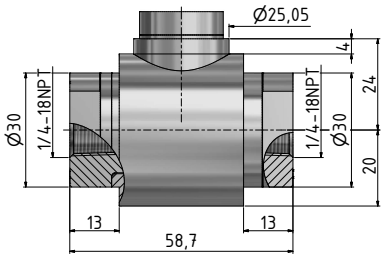


Valve plug	2-wire			3-wire	
Form A	4…20 mA			0…max. 10 V	
		Standard	Alternative		Standard
	1	OUT/GND	n.c.	1	GND
	2	n.c.	OUT/GND	2	+OUT
	3	+Vs	+Vs	3	+Vs
	⏚	CASE	CASE	⏚	CASE

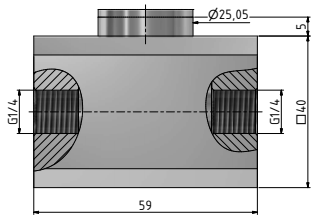
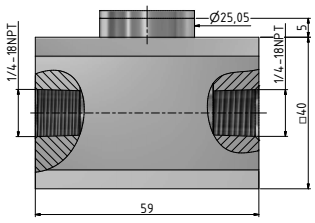
Series PD-23X – Dimensions and variants

Available pressure connections

For line pressure ≤ 200 bar

G1/4 female	1/4-18NPT female
	
ISO 228-1	ISO 228-1

For line pressure ≤ 600 bar

G1/4 female	1/4-18NPT female
	
ISO 228-1	ISO 228-1

Customised configurations on request

- Other compensated pressure ranges
- Integration of application-specific calculations
- Modifications to customer-specific options with Series PD-33X

Examples of similar products

- Series PD-33X: Differential pressure transmitters with excellent accuracy
- Series PD-33Xc: Differential pressure transmitters with excellent accuracy and CANopen interface
- Series 23SX: Pressure transmitters with fully welded design and no internal seals
- Series 35X: Pressure transmitters with front-flush metal diaphragm and excellent accuracy
- Pressure transmitter modules: Pressure transducers with electronics (e.g. series PD-10LX) for integration in one's own systems

Series PD-23X – Software, scope of delivery and accessories

Modbus interface

The X-line products have a digital interface (RS485 half-duplex), which supports the MODBUS RTU and KELLER bus protocols.
Details of the communication protocols can be found at www.keller-pressure.com. To integrate the communication protocol into your own software, documentation, a Dynamic Link Library (DLL) and various program examples are available.

Interface converters

The connection to a computer is established via an RS485-USB interface converter. To ensure smooth operation, we recommend the K-114 with the corresponding mating plug, robust driver module, fast RX/TX switching and connectable bias and terminating resistors.

"CCS30" software

The CCS30 software has no licence costs and is used to perform configurations and record measured values.

Measurement recording
- Live visualisation
- Configurable measuring and storage interval
- Export function
- Parallel recording in bus operation
- Up to 100 measured values per second

Configuration
- Call up of information (pressure and temperature range, software version, serial number etc.)
- Readjustment of zero point and amplification
- Rescaling of analog output (unit, pressure range)
- Adjustment of low-pass filter
- Selection of instrument address and baud rate

Scope of delivery

Calibration certificate	Mating plug to round plug 423 - 723 - 425 IP40	Mating plug to valve plug, form A
		

Accessories

Interface converter		Mating plug to round plug, M12 x 1
		
K-114 • Analog measurement 0…10 V and 4…20 mA • 12 V measuring device supply via USB • USB interface galvanically isolated • Bias and terminating resistors can be activated	Connection options • E.g. K-114-B with cable outlet instead of screw-type terminals for Binder series 723 (5-pin) • Various adapter cables available	• 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