

High temperature pressure sensor

for temperatures up to 200 °C

Type 4007D...DS

Universal M5 miniature absolute pressure sensor for operating temperatures up to 200 °C.

- Improved media compatibility
- Compact size (M5) and low mass
- High natural frequency and low acceleration sensitivity
- Digital temperature compensation
- Kink protection

Description

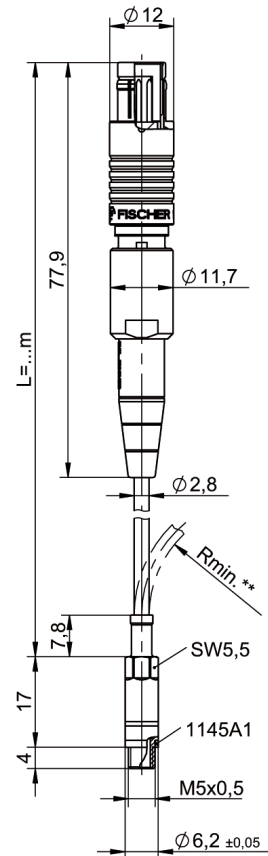
The piezoresistive pressure sensor Type 4007D...DS is a small, rugged high accuracy sensor capable of continuous high temperature operation up to 200 °C. Type 4007D...DS uses a fully active Wheatstone bridge to generate an electrical signal, which is proportional to the applied pressure. The resistors making up the Wheatstone bridge are implanted into a micro-machined silicon diaphragm which is formed using Silicon on Insulator (SOI) technology.

This approach, coupled with Kistler's DCE method of sensor construction, allows Type 4007D...DS to be exposed to media temperatures up to 200 °C while minimizing hysteresis and repeatability errors. Further performance improvements are made using digital compensation techniques whereby, the effects of zero offset and sensitivity changes due to temperature can be reduced without sacrificing signal bandwidth.

The digital compensation technique further allows a monitoring of the sensor temperature (amplifier Type 4665B..., 4624A... and 4667A).

Application

The small size and excellent dynamic response of the sensor allows for high quality pressure measurements to be made in locations where other sensors may not fit. The sensor can be used in many ways and has particular proven in pressure measurements of gaseous and liquid media.



** Rmin. 21 fixed installation
Rmin. 42 free movement

Technical data

Measuring range	bar	0 ... 5, 0 ... 10, 0 ... 20, 0 ... 50, 0 ... 100, 0 ... 250
Overload	bar	15, 30, 40, 100, 200, 400
Electrical connection		Fischer connector 5 pole (S103A054)
Amplifier compatibility	Type	4665, 4665B, 4624A, 4667A
Power supply		amplifier integrated
Reference temperature (Tref)	°C	25
Sensor temperature, min./max.	°C	-40/200
Temperature compensation		digital
Temperature compensation range	°C	25 ... 180

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Technical data (continuation)

Max. deviation pressure*	% FSO	≤±1
Max. deviation temperature*	°C	≤±6
Linearity at Tref (LSQ)	% FSO	≤±0.2 ≤±0.3 (p≥100 bar)
Natural frequency	kHz	>100
Acceleration sensitivity	mbar/g	≤±0.1
Media compatibility**	compatible with most auto- motive fluids and gases	
Clamping torque sensor	N·m	1.5 ... 2.5
Weight, without connector and cable	g	3
Degree of protection		IP67

* Measuring results based on digital compensation with DS-compatible amplifier. The deviations include measuring errors due to sensor characteristics (linearity, hysteresis, thermal effects) and a compensation model.

** Not suitable for measuring helium.

Installation

The sensor can be easily mounted directly into a simple threaded measuring port. When measuring compressible media with high flow dynamics (such as intake pressure measurement in combustion engines), a flush mount configuration must be ensured (Fig. 1).

Mounting

The sensor fitting must be machined in accordance with the data sheet specifications (Fig. 4) and it is essential to comply with the tightening torque of 1.5 ... 2.5 N·m when installing the sensor. The use of the correct installation tools is mandatory in particular the mounting tool Type 1300B12 (Fig. 8) and the torque wrench Type 1300A17 (Fig. 7).

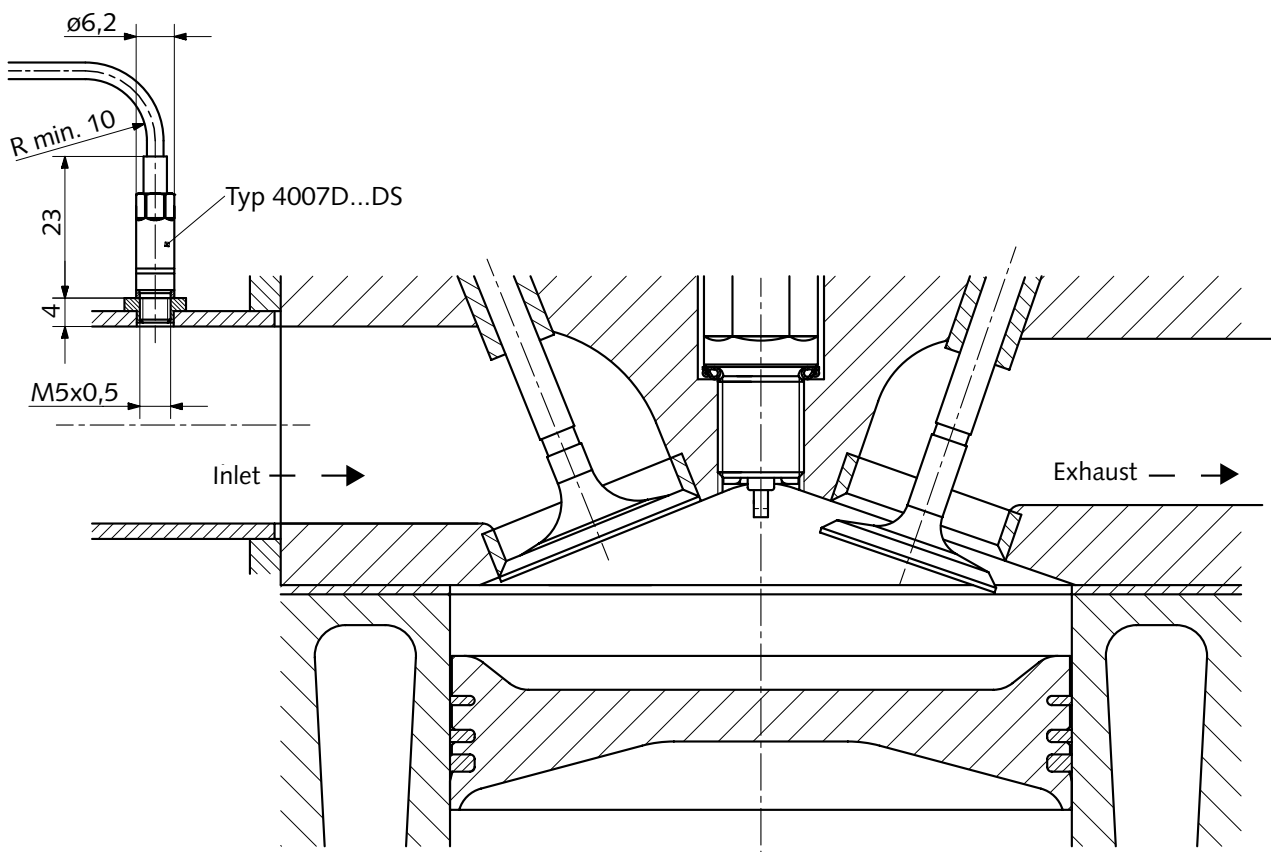
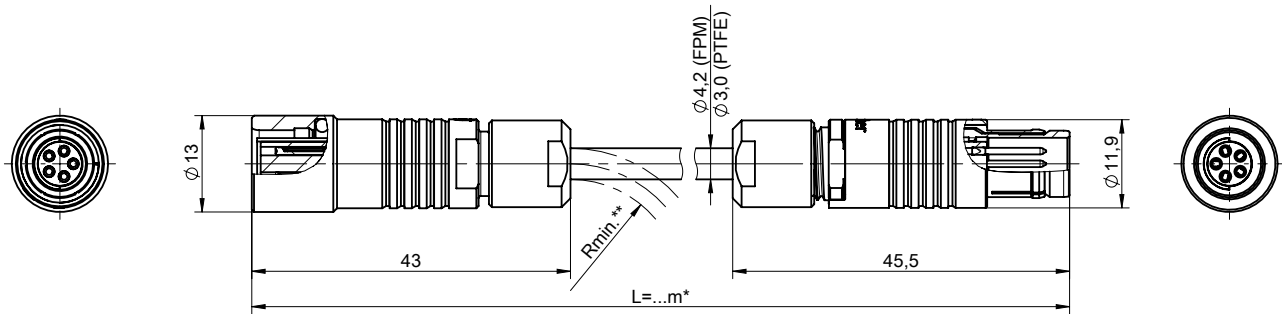


Fig. 1: Direct mounting of sensor Type 4007D...DS in the intake manifold

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* 0,2...10 m bei kundenspez. Länge /
customer-specific cable length

Kabel / cable Ø4,2 (FPM)

** Rmin.31,5 feste Verlegung / fixed installation
Rmin.63 freie Bewegung / free movement

Kabel / cable Ø3,0 (PTFE)

** Rmin.22,5 feste Verlegung / fixed installation
Rmin.45 freie Bewegung / free movement

Fig. 2: Extension cable Type 4785A_1

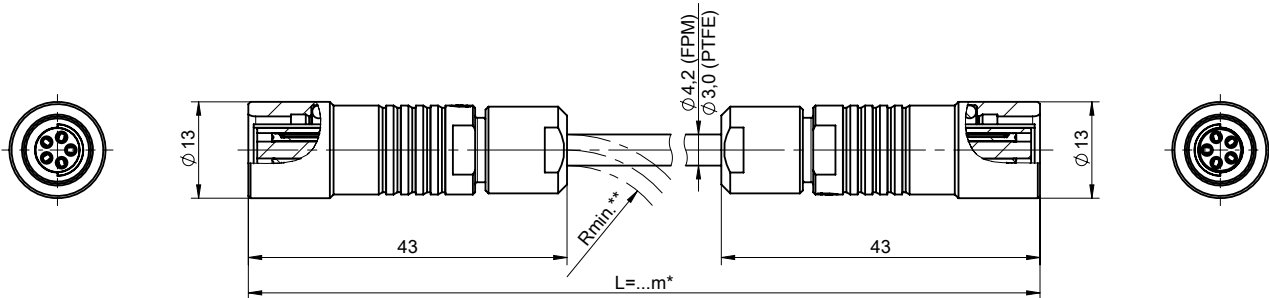


Fig. 3: Adapter cable Type 4785A_2

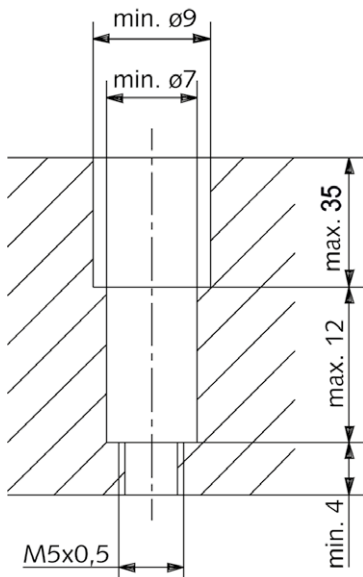


Fig. 4: Mounting bore for direct mounting

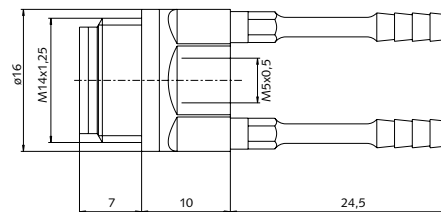


Fig. 5: Cooling adapter Type 7525A2

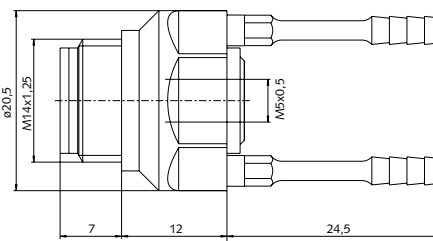


Fig. 6: Cooling adapter, damped Type 7525A6

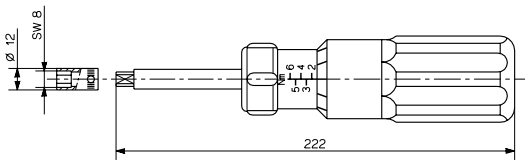


Fig. 7: Torque wrench 1 ... 6 N·m Type 1300A17

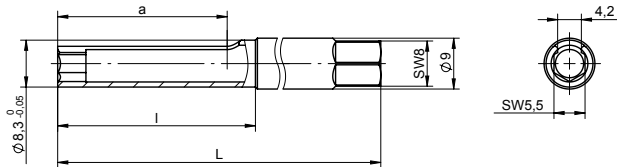


Fig. 8: Mounting tool Type 1300B12 (a 40, l 45, L 100),
Type 1300B12Q02 (a 30, l 35, L 58,5)

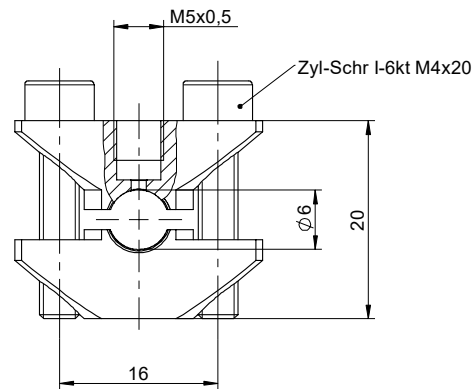


Fig. 9: Clamping adapter Type 6533 for various pipe-diameters

Included accessories

- Copper seal

Optional accessories

- Mounting tool (standard)
- Mounting tool (short)
- Torque wrench 1 ... 6 N·m
- Fluoropolymer seal vibration damping, T_{max} 200 °C
- Screw tab M5x0.5
- SCP (Slim-) for 2 measuring modules
- SCP for 8 measuring modules
- Dummy sensor M5x0.5
- Adaptor M14x1.25 – M5x0.5
- Adaptor M12x1 – M5x0.5
- Cooling adaptor M14x1.25 – M5x0.5
- Cooling adaptor, damped M14x1.25 – M5x0.5
- Cooled switching adaptor
- Extension cable for sensor FPM (0 ... 180 °C)
 - L = 1 m
 - L = 2 m
 - L = 3 m
 - L = 5 m
 - L = 7.5 m
 - L = 10 m
 - L = ...m ($L_{min} = 0,5/L_{max} = 10$ m)
- Extension cable for sensor PTFE (-40 ... 180 °C)
 - L = ... m ($L_{min} = 0,5/L_{max} = 10$ m)
- Adapter cable

Type/Art. No.

1145A1

Type/Art. No.

1300B12
1300B12Q02
1300A17

1357A

2852...

2853...

7537A2

6596

6598

7525A2

7525A6

7533B14

4785A41-1,00

4785A41-2,00

4785A41-3,00

4785A41-5,00

4785A41-7,50

4785A41-10,0

4785A41-SP-...

4785A11-SP-...

4785A42...

• Amplifier*

- Piezoresistive SCP amplifier 4665B...
- Piezoresistive 1 channel amp. 4624A...
- Piezoresistive 1 channel amp. (PRAQ) for KiBox2 4667A...

* We recommend to use the latest amplifier firmware (available at www.kistler.com).

Ordering key

Type 4007D		DS	-
Pressure range			
0 ... 5 bar	005		
0 ... 10 bar	010		
0 ... 20 bar	020		
0 ... 50 bar	050		
0 ... 100 bar	100		
0 ... 250 bar	250		
Thread			
Fine thread M5x0.5	F		
Sensor type			
Digital compensation and PiezoSmart	DS		
Cable type			
PTFE cable	1		
Cable length			
2 m	2,0		
0.5 m*	0,5		

* only for 5, 10 and 20 bar

Ordering example: Type 4007D250FDS1-2,0

- Version with measuring range 0 ... 250 bar, fine thread M5x0,5, with digital compensation and PiezoSmart, cable length 2 m. Compatible with Kistler amplifier Type 4665 and Type 4624.

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