

# High temperature pressure sensor

Type 4007D...DS

## for temperatures up to 200 °C

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

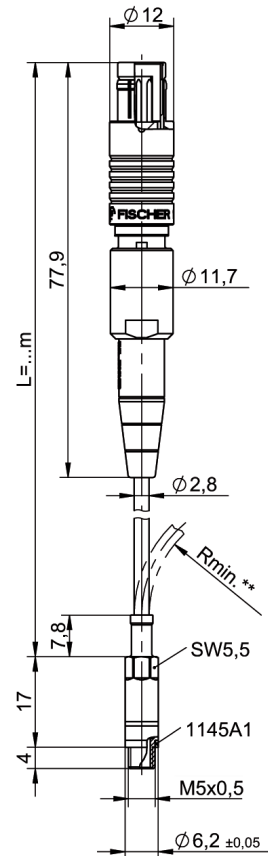
The piezoresistive pressure sensor Type 4007D...DS is a small, rugged high accuracy sensor capable of continuous high temperature operation up to 200 °C. Type 4007D...DS uses a fully active Wheatstone bridge to generate an electrical signal, which is proportional to the applied pressure. The resistors 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... and 4624A...).

### 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
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

4007D\_003-300e-05.19

This information corresponds to the current state of knowledge. Kistler reserves the right to make technical changes. Liability for consequential damage resulting from the use of Kistler products is excluded.

### 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
Internal dead volume	mm <sup>3</sup>	40
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).

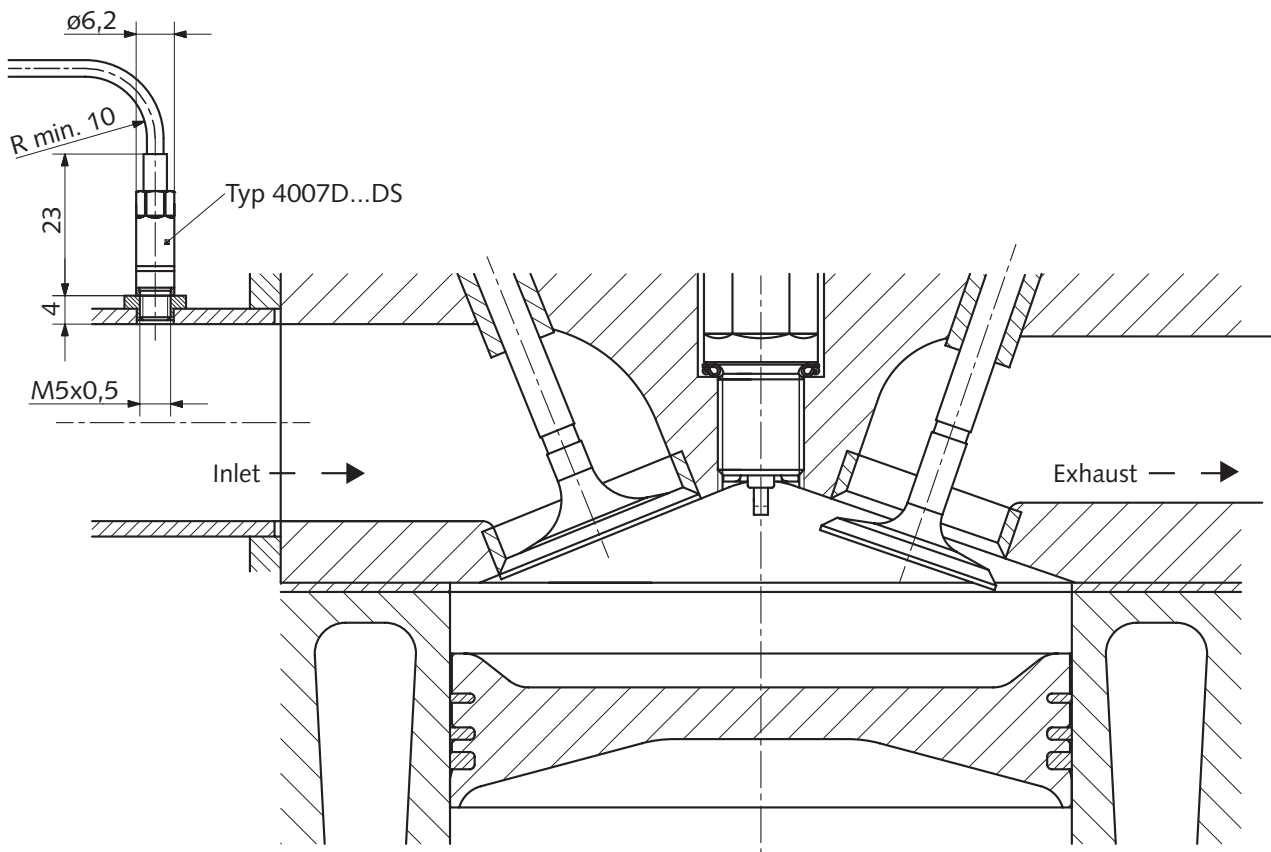
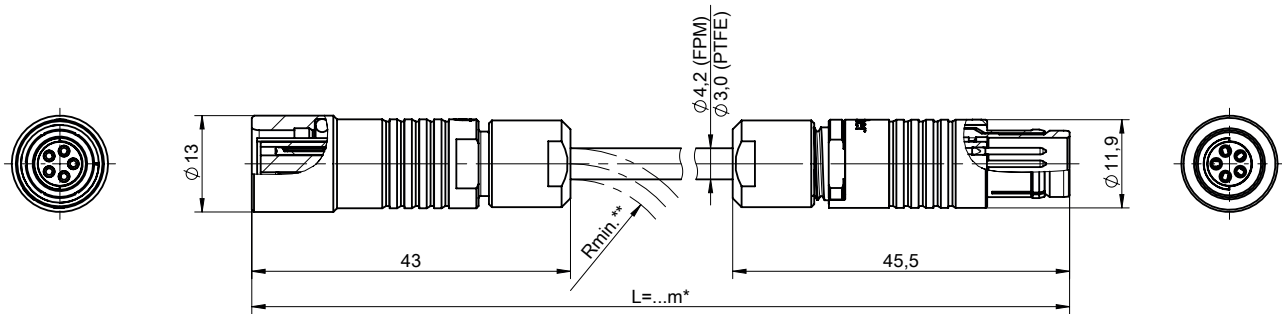


Fig. 1: Direct mounting of sensor Type 4007D...DS in the intake manifold

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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

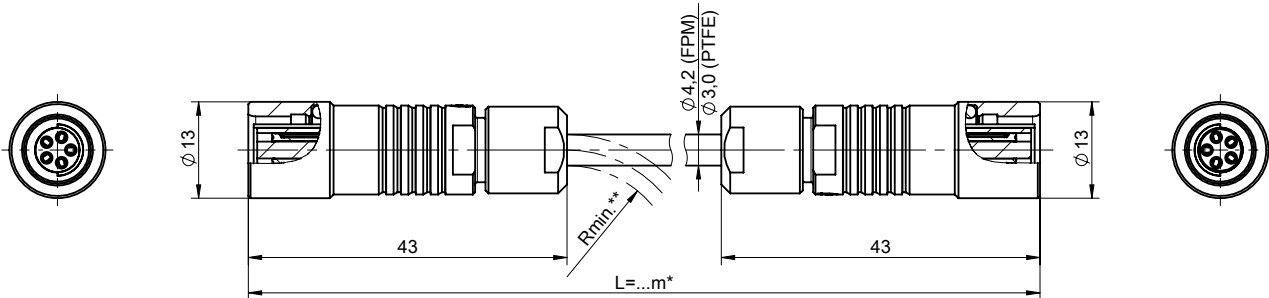


Fig. 3: Adapter cable Type 4785A\_2

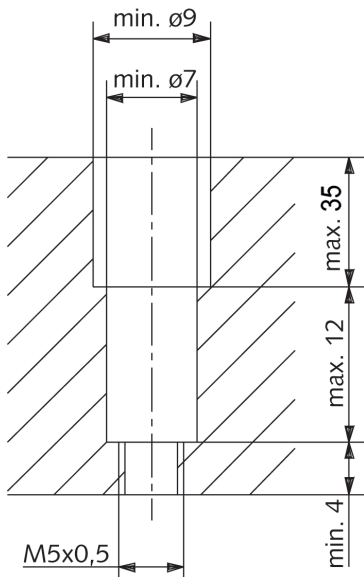


Fig. 4: Mounting bore for direct mounting

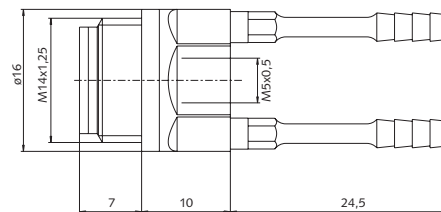


Fig. 5: Cooling adapter Type 7525A2

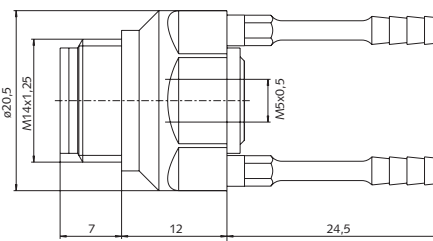


Fig. 6: Cooling adapter, damped Type 7525A6

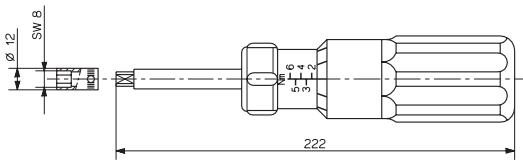


Fig. 7: Torque wrench 1 ... 6 N·m Type 1300A17

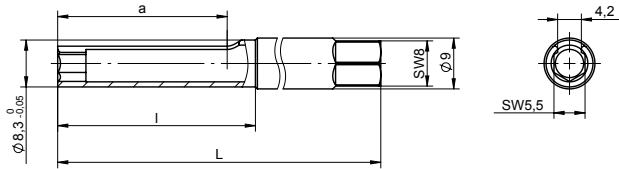


Fig. 8: Mounting tool Type 1300B12 (a 40, l 45, L 100)

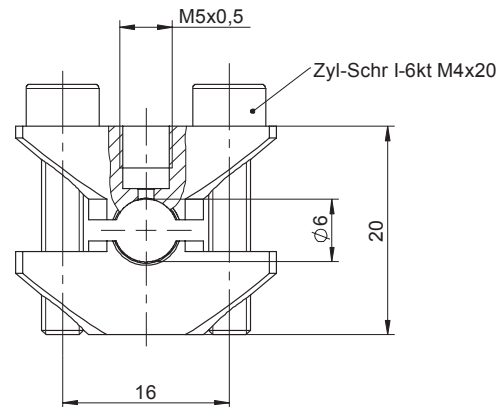


Fig. 9: Clamping adapter Type 6533 for various pipe-diameters

### Included accessories

- Copper seal

### Type/Art. No.

1145A1

### Optional accessories

- Mounting tool
- 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
- Amplifier\*
  - Piezoresistive SCP amplifier
  - Piezoresistive 1 channel amp.

### Type/Art. No.

1300B12  
1300A17  
1145A2  
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...  
4665B...  
4624A...

### 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
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#### Sensor type

Digital compensation and PiezoSmart	DS
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#### Cable type

PTFE cable	1
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#### 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.

\* We recommend to use the latest amplifier firmware (available at [www.kistler.com](http://www.kistler.com)).