

Piezoresistive high pressure sensor for the injection pressure application

Type 4067E...DS

High pressure sensor with robust diaphragm and front seal for measurements at hydraulic systems (e.g. injection systems of combustion engines). Suitable for static and dynamic pressure.

- For measuring static and dynamic pressure
- Minimal sensor dead volume, therefore high acoustic natural frequency
- High mechanical natural frequency
- Digital temperature compensation

Description

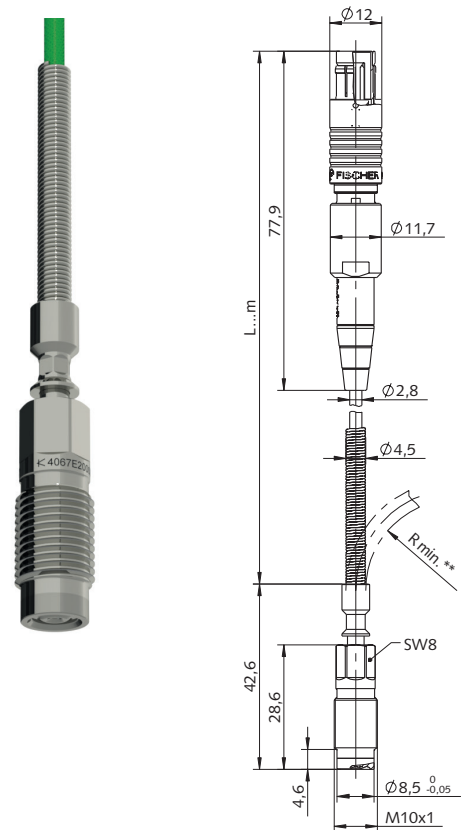
The pressure to be measured for the sensor Type 4067E...DS acts through a robust membrane on a piezoresistive measuring element. The sensor has a minimal dead volume due to the front seal. The sensor is therefore suitable for pressure measurements with a high requirement for frequency-accurate pressure measurements.

Zero point and sensitivity changes caused by temperature changes can be corrected through the use of a digital temperature compensation without sacrificing the signal bandwidth. In addition, the digital temperature compensation provides a monitoring of the sensor temperature (amplifier Type 4665B... and Type 4624A...).

Application

The sensor Type 4067E...DS is used in applications where high pressures must be measured with a static and a dynamic component. Examples include:

- Frequency-accurate analysis of pressure profiles in diesel injection systems with unit injector or common rail technology
- General pressure measurement on hydraulic systems with average to high pressures



** Rmin. 20 fixed installation
Rmin. 41 free movement

Technical Data

Measuring range	bar	0 ... 2 000, 0 ... 3 000
Overload	bar	3 500
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
Max. deviation pressure*	%FSO	≤±0,8
Max. deviation temperature*	°C	≤±4
Linearity at Tref (LSQ)	%FSO	≤±0,3
Natural frequency	kHz	>200

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Technical Data (Continuation)

Acceleration sensitivity	mbar/g	≤10
Life cycle (guide value)	load change	>10 ⁷
Mounting torque sensor	N·m	15
Weight (without connector and cable)	g	15
Protective class		IP65

* 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.

Installation

The sensor can be mounted directly in a mounting bore (Fig. 1) or by using clamp adapters (Fig. 3). Clamp adapters are available for various diameters of injection lines.

Mounting

Using the correct drill dimensions and tolerances is extremely important when machining the mounting bores (Fig. 1). The sealing surface of the mounting bore will be reworked with the reamer tool Type 1300A25 (Fig. 6) to guarantee leak tightness. The sealing surface must be clean and free of metal cuttings.

The pressure sensor is always installed together with a new seal ring (Type 1100). The special lubricating grease (Type 1063) must be applied to the sensor thread before the pressure sensor is inserted into the mounting bore. Adherence to the tightening torque of 15 N·m is mandatory when tightening the pressure sensor. Therefore, the sensor must be mounted using a suitable fork wrench (e.g. Type 1300A29, Fig. 8) and the torque wrench (Type 1300A11, Fig. 9).

The pressure sensor Type 4067E...DS is mounting sensitive due to its front sealing design. Therefore, the sensor zero point can shift slightly and a zero point correction is recommended. For the Kistler amplifiers Type 4665B... and 4624A..., this functionality is provided at the amplifier itself or in the software.

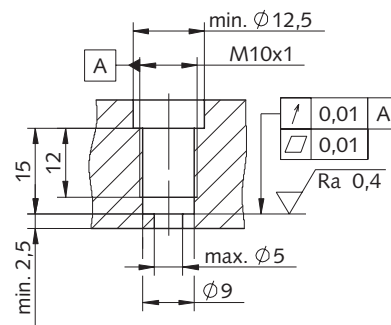


Fig. 1: Mounting bore for direct mounting

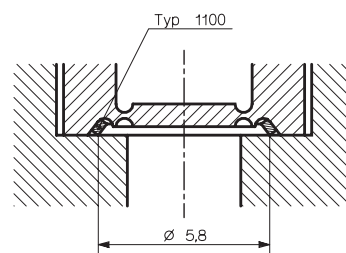


Fig. 2: Front seal with seal ring Type 1100

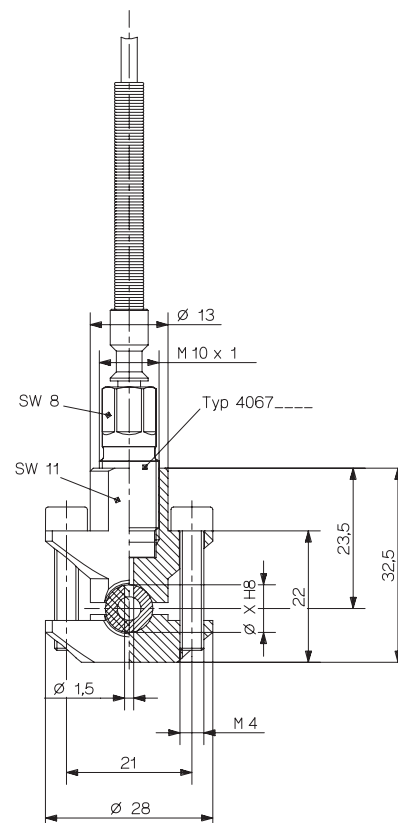


Fig. 3: Installation in clamp adapter Type 6533...

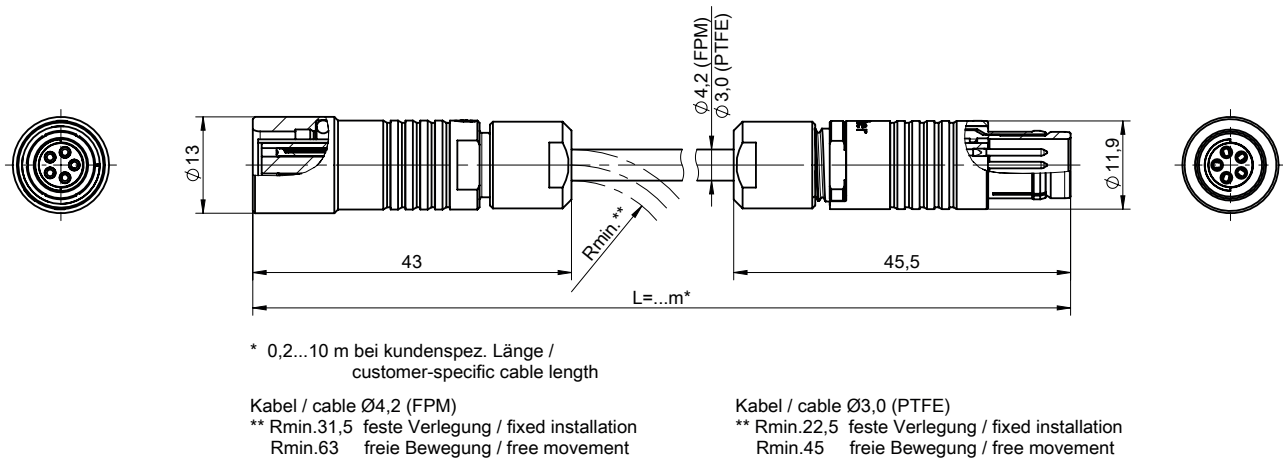


Fig. 4: Extension cable Type 4785A_1

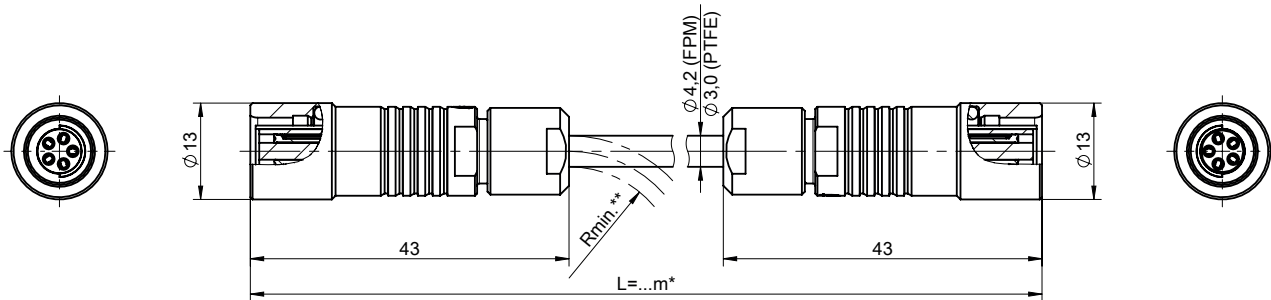


Fig. 5: Adapter cable Type 4785A_2 for an easy connection of DS sensors to existing wiring with Type 4761B...

Included accessories	Type
• Mounting grease	1063
• Seals (5 pieces)	1100

Optional accessories	Type
• Drill	1327
• Screw tap, M10x1	1353
• Reamer tool	1300A25
• Mounting tool for deep drilling	1300A41
• Torque wrench	
4 ... 20 N·m	1300A39
8 ... 40 N·m	1300A11
• Fork wrench for Type 1300A39 or Type 1300A11, SW8	1300A29
• Fork wrench for Type 1300A39 or Type 1300A11, SW11	1300A75

Adapter

• Dummy sensor	6449
• Clamp adapter for 6 mm pipe	6533A11
• Clamp adapter for 6,35 mm pipe (6,35 mm = ¼")	6533B12
• Clamp adapter for 8 mm pipe	6533A13
• Clamp adapter for 6,35 ... 13 mm pipe (customer specific)	6533A19
• Adapter for pressure generator Type 6909	6925

Amplifier/SCP

• SCP (Slim-) for 2 meas. modules	2852B...
• SCP for 8 meas. modules	2853B...
• Piezoresistive SCP amplifier	4665B...
• Piezoresistive 1-channel amp.	4624A...
• Extension cable for sensor FPM (0 ... 180 °C)	
- L = 1 m	4785A41-1,00
- L = 2 m	4785A41-2,00
- L = 3 m	4785A41-3,00
- L = 5 m	4785A41-5,00
- L = 7,5 m	4785A41-7,50
- L = 10 m	4785A41-10,0
- L = ...m (L _{min} = 0,5/L _{max} = 10 m)	4785A41-SP-...
• Extension cable for sensor PTFE (-40 ... 180 °C)	
- L = ... m (L _{min} = 0,5/L _{max} = 10m)	4785A11-SP-...
• Adapter cable for connection of DS sensor to Type 4761B... cable	4785A42...

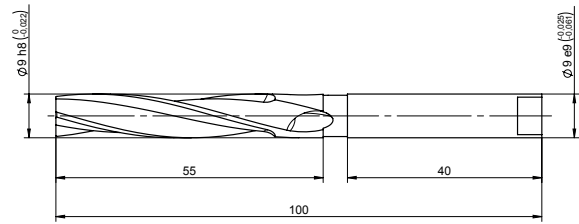


Fig. 4: Drill Type 1327

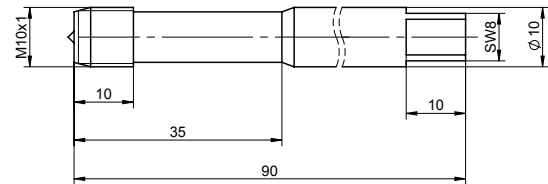


Fig. 5: Screw tap Type 1353

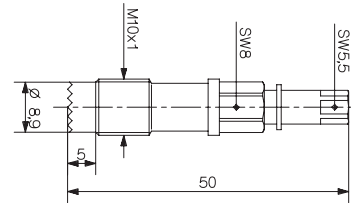


Fig. 6: Reamer tool Type 1300A25

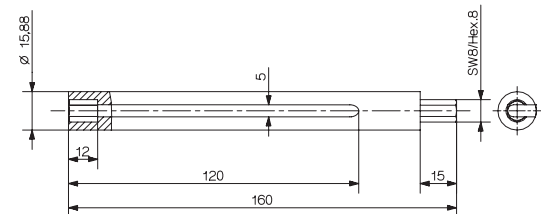


Fig. 7: Mounting key for deep mounting bores Type 1300A41

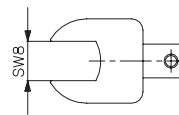


Fig. 8: Fork wrench Type 1300A29

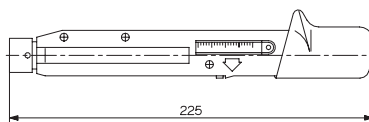
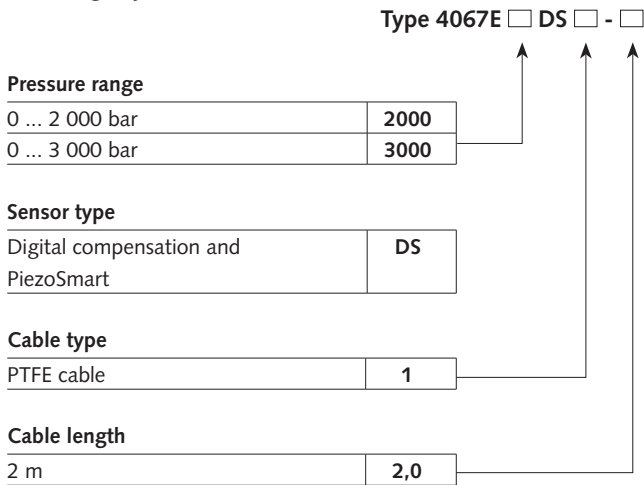


Fig. 9: Torque wrench Types 1300A11 and 1300A39

Ordering key



Ordering example: Type 4067E3000DS1-2,0

- Version with measuring range 3 000 bar, with digital compensation and PiezoSmart®, cable length 2 m. Compatible with Kistler amplifier Types 4665, 4665B... and 4624A... .