

High-Temperature Pressure Sensor for Combustion Engine Measurement

Type 6052B1

Very small high-temperature pressure sensor with integrated connecting cable; especially suitable for use in internal combustion engines of small capacity and with more than 2 valves per cylinder.

The sensor mounts directly in a M5x0,5 bore and, thanks to its «Antistrain» design, is front sealing. The natural frequency is very high whereby it is also well suitable for knocking detection. If knocking detection is the main task we recommend the use of type 6052A1U20 with reinforced membrane.

The high sensitivity gives a very good signal-to-noise ratio and thus increases the precision of the measurement, especially during the gas exchange phase and in multivalve engines with small displacement.

- Very low sensitivity shift by temperature
- Low thermal shock error thanks to front seal
- Acceleration compensated
- Very high sensitivity

Description

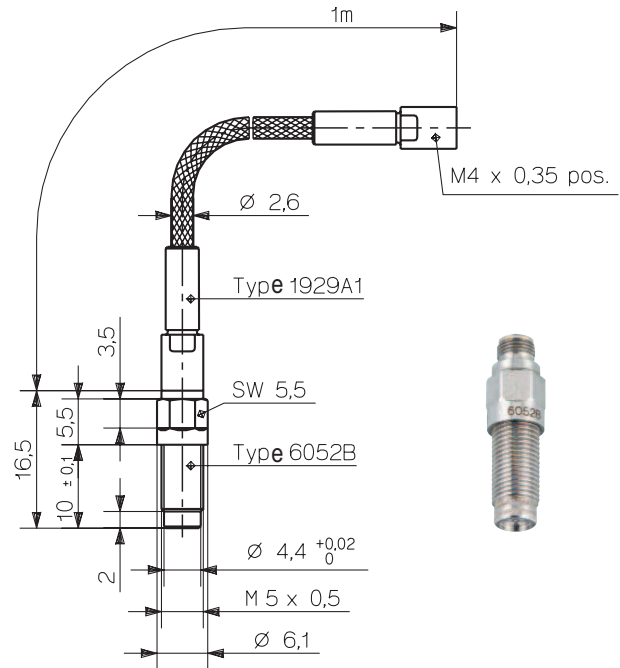
In the Type 6052B1, a new piezoelectric crystal is used which gives the sensor of unchanged size a sensitivity of -20 pC/bar . This will vary at most by $\pm 0,5 \%$ within the temperature range of $200 \pm 50 \text{ }^\circ\text{C}$.

Thanks to the passive acceleration compensation from Kistler the influence of engine vibrations is reduced significantly.

The front sealing guarantees efficient heat dissipation and therefore a short-time maximum operating temperature of $400 \text{ }^\circ\text{C}$. The diaphragm has been optimized by the Finite Elements Method and guarantees correct measuring results together with a long service life.

Application

The sensor performs measurements under most restricted space conditions in the engine combustion chamber: multivalve engines, motorcycles and small engines. Thanks to its miniaturization, the sensor can also be mounted into air conditioning compressors and similar equipment.



The rugged, turned diaphragm allows to measure also during knocking operation and nevertheless guarantees a good precision in thermodynamic investigations thanks to a small thermal shock error.

This sensor is, therefore, well suited for precision measurements.

Mounting examples

The sensor Type 6052B1 can be mounted directly into the cylinder head (Fig. 1), or across the water duct using a M7x0,75 mounting sleeve (Fig. 2). When mounted according to Fig. 2, the sensor is cooled by the cooling water flow of the engine.

The sensor Type 6052B1 installs directly into the spark plug adapter Type 6517B..., too (Fig. 3).

The charge amplifier should be placed close to the sensor in order to avoid electrical disturbances.

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Technical Data

Range	bar	0 ... 250
Calibrated partial range	bar	0 ... 50
Overload	bar	300
Sensitivity	pC/bar	≈-20
Natural frequency (sensor element)	kHZ	≈130
Linearity, all ranges at RT	% FSO	≤±0,4
Acceleration sensitivity		
axial	bar/g	<0,0002
radial	bar/g	<0,0005
Operating temperature range	°C	-50 ... 400
Sensitivity shift		
200 ±50 °C	%	<0,5
23 - 350 °C	%	<2
Thermal shock error		
at 1500 u/min, 9 bar pmi		
P (short-time drift)	bar	≤ ± 0,5
Pmi	%	≤ ± 2
Pmax	%	≤ ± 1,5
Insulation resistance		
at 20 °C	TΩ	≥10
Shock resistance	g	2000
Tightening torque	Nm	1,5
Capacitance, without cable	pF	5
Weight, with cable	g	20
Plug, ceramic insulator		M4 x 0,35

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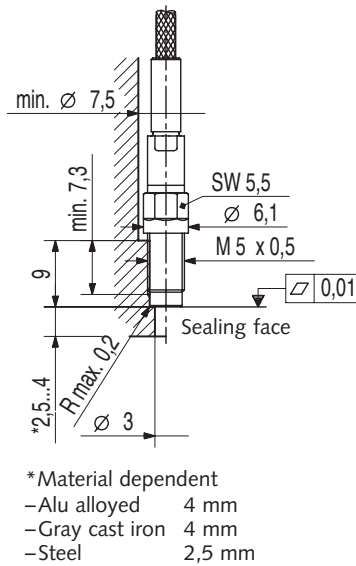


Fig. 1

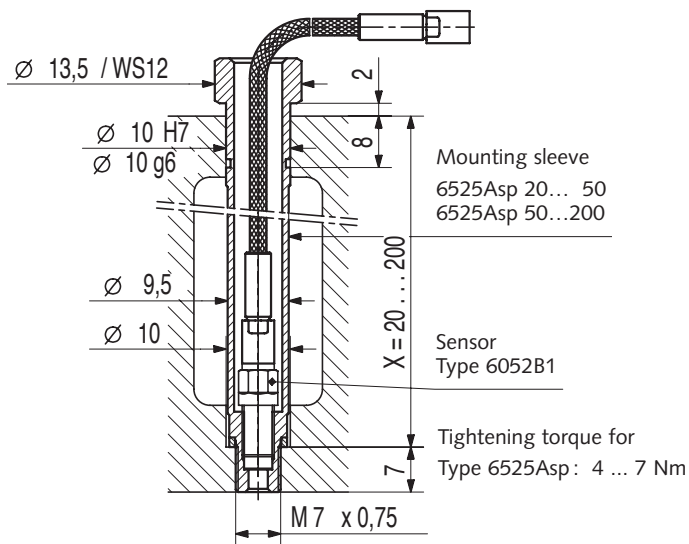


Fig. 2

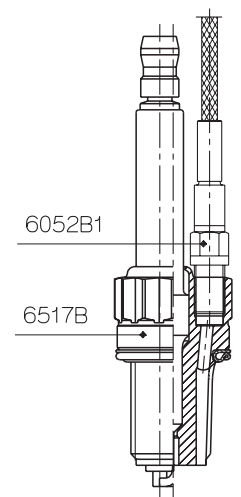


Fig. 3

Scope of delivery

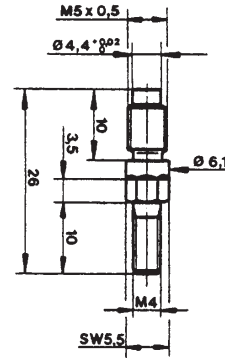
- Sensor with cable 1929A1
- Coupling M4 neg. – BNC pos.

Type

6052B1
1705

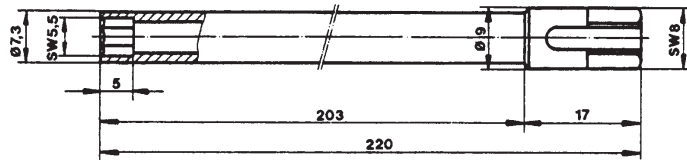
Accessories

- Spare cable M4 pos., l = 1 m 1929A1
- Coupling M4 neg. – 10-32 UNF neg. 1700A13
- Mounting sleeve incl. O-ring 6525Asp...
- Mounting key SW 5,5 1300A9
- Torque wrench 1 ... 6 Nm 1300A17
- Special tap M5 x 0,5 1357A
- Special drilling tool 1300A51
- Dummy Sensor, like 6052A 6445
- Extractor for dummy sensor 1319
- Adapter for pressure generator 6904 6585A
- O-ring for 6525 5.110.078
- Finishing tool for mounting bore, for bore lengths ≤ 60 mm 1300A79
- Finishing tool for mounting bore, for bore lengths ≤ 170 mm 1300A79Q01

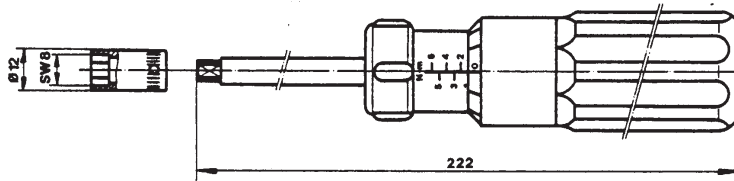


6445

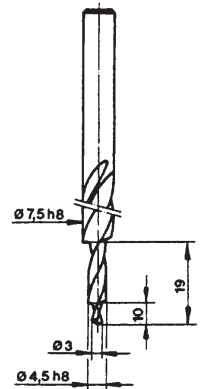
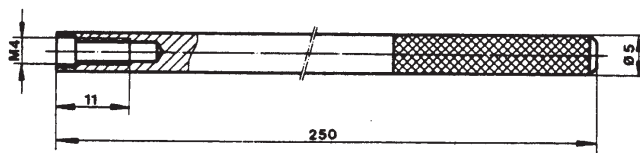
1300A9



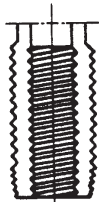
1300A17



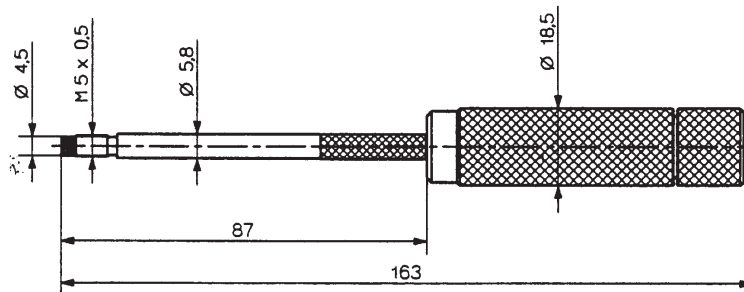
1319



1300A51



1357A



1300A79

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