

Watercooled PiezoStar® Pressure Sensor

Type 6041B...

for Combustion Engine Measurements

The world's smallest water-cooled cylinder pressure sensor in M8 size. Ideally suited for combustion engine research and for thermodynamic investigations, sensor Type 6041B... exhibits a high sensitivity and excellent thermodynamic stability due to optimized water cooling. The water-cooling achieves perfect heat transfer without picking up signal noise from the coolant.

- Low thermal shock error
- Long service life
- High accuracy
- Optimized cooling and low noise

Description

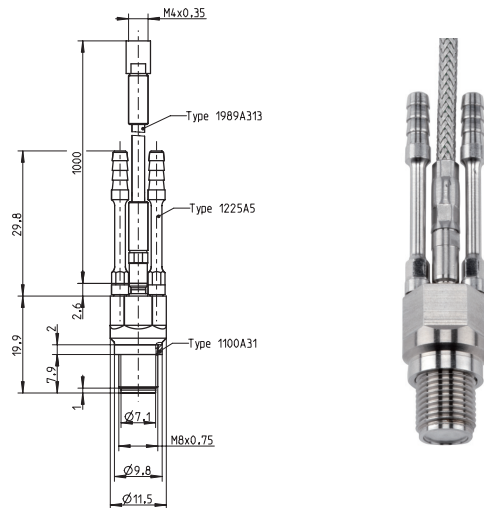
High sensitivity, high resonant frequency and excellent zero point stability due to integrated water cooling. The sensor can be mounted in a bore of only $\varnothing 12$ mm. This requires a special mounting tool.

The Type 6041B... uses a PiezoStar® crystal for very high sensitivity in a compact design. The mounting dimensions of this sensor are compatible with the water-cooled sensor Type 6041A... . The durable optimized diaphragm with low thermal shock sensitivity guarantees precise measurement.

The sensors are supplied with a mounted cable. For standard applications a rugged metal-sheathed cable is supplied.

Application

The miniature sensor Type 6041B... is ideally suited for thermodynamic measurements in multivalve engines where space is at a premium. The low sensitivity to thermal shock and the excellent zero point stability yield precise measuring results. In addition, the excellent linearity across the whole range and the high sensitivity allows gas exchange to be analyzed accurately.



Technical Data

| | | |
|--|-----------------------|--------------|
| Measuring range | bar | 0 ... 250 |
| Calibrated partial ranges RT/50 °C | bar | 0 ... 100 |
| | | 0 ... 150 |
| | | 0 ... 200 |
| | | 0 ... 250 |
| | | |
| Overload | bar | 300 |
| Sensitivity | pC/bar | ≈-40 |
| Natural frequency nominal | kHz | >70 |
| Linearity all ranges (Room temperature and 50° C) | %/FSO | ≤±0,3 |
| Hysteresis | %/FSO | <1 |
| Acceleration sensitivity | cooled | bar/g <0,01 |
| | non-cooled | bar/g <0,001 |
| Cooling water pressure | bar | 1,7 ±0,2 |
| Shock resistance | g | 2 000 |
| Operating temperature range | °C | -20 ... 350 |
| Min./Max. Temperature non-cooled | °C | -50 ... 400 |
| Sensitivity shift | 23 ° ... 350 °C | % ≤±2 |
| | 50 °±30 °C | % ≤±0,4 |
| | | |
| Thermal shock error (at 1 500 1/min, p _{mi} = 9 bar) | Δp (short term drift) | bar ≤±0,25 |
| | Δp _{mi} | % ≤±1 |
| | Δp _{max} | % ≤±1 |
| | | |
| | | |

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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.

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Technical Data (Continuation)

| | | |
|---|-----|-------------------|
| Insulation resistance at 20 °C and 50 °C | Ω | >10 ¹³ |
| Tightening torque | N·m | 6 |
| Capacity, sensor only | pF | 6 |
| Weight, sensor with cable | g | 28,5 |
| Connector, ceramic insulator | - | M3x0,35 |

Mounting

Mounting Examples

The pressure sensor Type 6041B... can be installed directly into an M8x0,75 bore, either flush mounted with the combustion chamber or mounted with a recessed diaphragm. It can be mounted in existing bores for a Type 6041A... . With tool Type 1300A73 mounting in a bore with diameter 12 mm is possible (see Fig. 1).

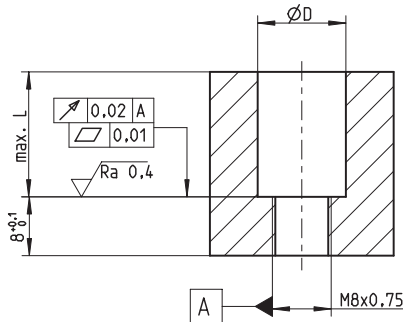


Fig. 1: Flush mounted Sensor. Bore Ø according to mounting tool. See picture 4 and picture 5

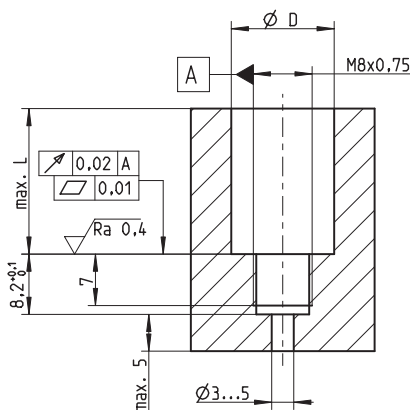


Fig. 2: Recessed mounted Sensor. Bore Ø according to mounting tool. See picture 4 and picture 5

Direct Mounting

The bore must be machined exactly to specification. Kistler tap Type 1361 ensures the correct tolerances are achieved. Direct mounting is the preferred mounting to avoid any pipe resonances.

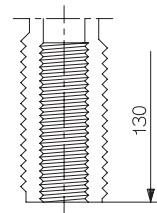


Fig. 3: Screw tap M8x0,75 Type 1361

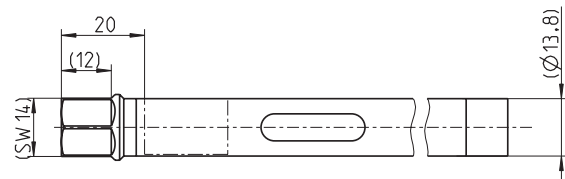


Fig. 4: Mounting wrench Ø13,8/SW14 Type 1300A67 for mounting bore Ø14 mm

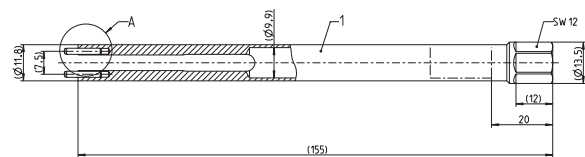


Fig. 5: Mounting wrench Ø11,8/SW12 Type 1300A73 for mounting bore Ø12 mm

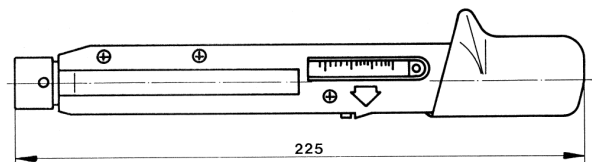


Fig. 6: Torque wrench 4 ... 20 N·m Type 1300A39

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Included Accessory

- Cable
- Adapter M4 neg. – BNC pos.

Type
1989A313
705

Optional Accessories

- Spare cable metal-sheathed cable, L = 1 m 1989A313
- Cr-Ni-seal ring 1100A31
- Connecting hose for cooling water length L = 29,5 mm 1225A5
- Polyethylene hose for cooling water 1203Bsp
- Viton®-hose for cooling water 1203Csp
- Adapter M4 neg. – BNC pos 1705
- Adapter M4 neg. – 10-32 pos. 1700A13
- Dummy sensor for Type 6041 6475
- Extraction tool Type 6475 1319
- Mounting sleeve M12x1,25 6556AQ...
- Adapter for pressure generator Type 6904 6589
- Adapter for pressure generator type 6905A 6929
- Engine adapter M14/M8, flush mounted 6589Q01
- Engine adapter M14/M8, retracted 6589Q02

Mounting tools (optional)

- Special key for mounting bore $\varnothing 12$ 1300A73
- Wrench jaw insert WS12 for 1300A73 1300A13
- Hex key for Mounting bore min. $\varnothing 14$ 1300A67
- Wrench jaw insert SW14 for 1300A63 1300A71
- Torque wrench (4 ... 20 N·m) 1300A39
- Screw tap M8x0,75 1361

Ordering Key^{*)}

Type 6041B

| | |
|---|-----|
| Metal-sheathed cable L = 1 m | 31 |
| Metal-sheathed cable L = 1 m with PiezoSmart® | S31 |

*) other versions upon request

Ordering Example Type 6041B...

- Version with 1 m cable metal-sheathed Type 6041B31
- Version with PiezoSmart® and 1 m metal-sheathed cable Type 6041BS31

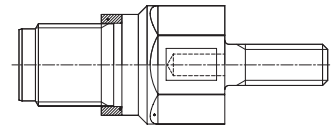


Fig. 9: Dummy sensor Type 6475

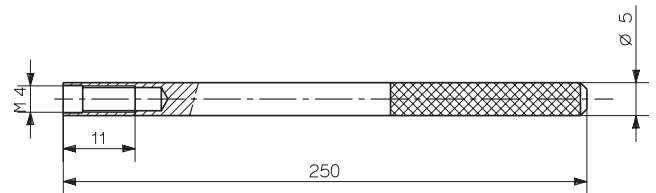


Fig. 10: Extraction tool for dummy sensor Type 1319

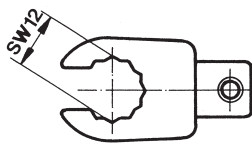


Fig. 7: Fork wrench insert SW12 for mounting and torque wrench Type 1300A13

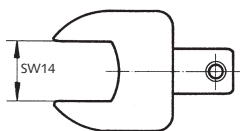


Fig. 8: Fork wrench insert SW14 for mounting and torque wrench Typ 1300A71

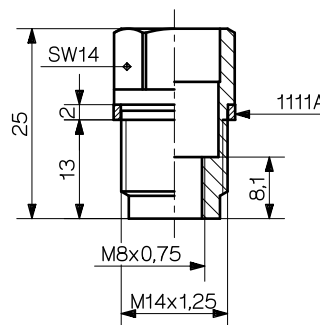


Fig. 11: Adapter Type 6589Q01. Sensor flush mounted

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