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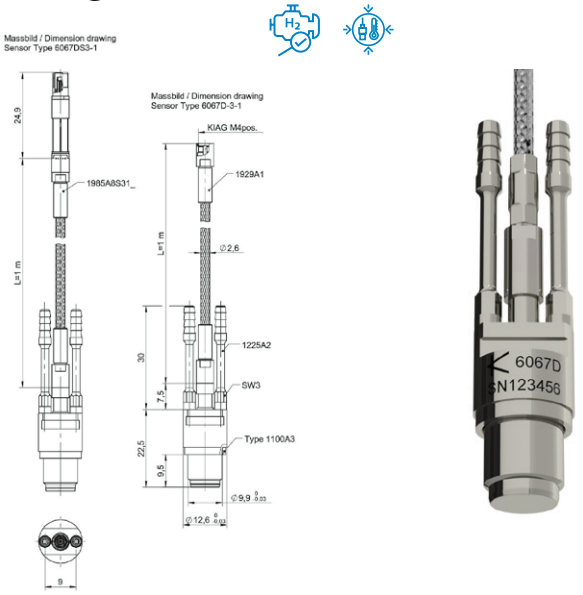
# ThermoCOMP cylinder pressure sensor

## Water-cooled pressure sensor for combustion engines

**Type 6067D...**




Water-cooled precision cylinder pressure sensor, especially suited for thermodynamic investigations in the early stages of the engine development process. High sensitivity, high natural frequency and excellent zero point stability thanks to built-in water cooling directly at the measuring element. Type 6067D can be used in applications with classic fuels as well as with alternative fuels including hydrogen.

- Minimum sensitivity change over the temperature range due to integrated water cooling
- Thermo-shock and durable diaphragm
- Installation compatible to pressure sensors Type 6067
- Long service life
- Suitable for use in hydrogen combustion engines

### Description

Use of rugged measuring elements ensures that the sensor is also suitable for high mechanical loads. The higher-strength material of the diaphragm together with the cooling secures a long service life. The water cooling ensures that the Type 6067D... sensor is thermally stable throughout the entire power band of the engine (lower load-change drift), so that the sensor can be flush mounted even in installations with high operating temperatures.

### Application

The sensor Type 6067D... is well suited for thermodynamic measurements in combustion engines. The integrated water cooling ensures that the sensitivity remains almost constant over the temperature range. Thus, precise measurement results can be achieved in all operating points of the engine. Moreover, the excellent linearity in the whole range and the high sensitivity allow gas exchange to be analyzed accurately.

### Cooling fluid specification

- Demineralized / distilled water according to norm VDE-Norm 0510
- Cooling fluid additive GLYSANTIN G30, G40 or G65 (do not mix with each other)
- Mixing ratio: The concentration of GLYSANTIN must be within 33% (min.) and 60% (max.)
- For further details see operating instructions 002-027

### Technical data

| | | |
|---|---|---|
| Measuring range | bar | 0 ... 250 |
| Calibrated ranges | bar | 0 ... 50, 0 ... 100 |
| RT, 50 °C | | 0 ... 150, 0 ... 250 |
| Overload | bar | 300 |
| Sensitivity | pC/bar | ≈–26 |
| Natural frequency | kHz | ≈90 |
| Linearity, all ranges (at RT / 50 °C) | %/FSO | ±0.3 |
| Acceleration sensitivity | | |
| axial (with cooling) | bar/g | ≤0.01 |
| radial (with cooling) | bar/g | ≤0.001 |
| Operating temperature range (uncooled) | °C | –40 ... 350 |
| Cooling-water flow | L/min | 0.3 ... 0.5 |
| Sensitivity shift | | |
| RT ... 350 °C (uncooled) | % | ±3 |
| 50 °C ±30 °C (cooled) | % | ±0.2 |
| Thermal shock error | | |
| (at 1 500 1/min, IMEP = 9 bar) | | |
| Δp (short-term drift) | bar | ±0.2 |
| ΔIMEP | % | ±1 |
| Δpmax | % | ±1 |
| Insulation resistance at RT | Ω | $\geq 10^{13}$ |
| Shock resistance | g | 2 000 |
| Tightening torque, greased | N·m | 10 |
| Capacity, without cable | pF | 6 |
| Weight of sensor, without cable | g | 12 |
| Connector, sapphire insulator | | M4x0.35 |

GLYSANTIN is a registered trademark of the BASF SE.

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**Mounting examples**

The sensor Type 6067D... can be flush mounted directly into the combustion chamber or with recessed mounting installation in a ø10 mm bore. The clamping screw Typ 6472Asp70-150 (Fig. 4) keeps the sensor in place. The minimum diameter of the access bore is ø13 mm (Fig. 1).

Direct installation:

When machining the bore, it is important to maintain the given specifications. The Kistler tap Type 1353 allows you to machine to the required tolerances. Flush mounting is preferred in order to avoid pipe oscillations (Fig. 1). A slightly recessed installation of up to 2 mm reduces the thermal load on the sensor. An alternative installation method uses a mounting position with a small diameter bore in front of the diaphragm. This offers excellent thermal shock protection but is prone to pipe oscillations (Fig. 2).

Installation with mounting sleeve:

If enough space is available and/or fluid paths in the cylinder head need to be crossed in the installation, the use of an application-specific mounting sleeve Type 6586AQ... is recommended (Fig. 3). Another advantage of mounting sleeves is that the actual sensor bore in the sleeve can be manufactured with the required precision. On request, Kistler will gladly assist you with your specific installation situation, create drawings and manufacture the mounting sleeves.

**Maintenance**

Kistler recommends an annual calibration from the first use of the sensor. For further information refer to the instruction manual or contact your Kistler representative.

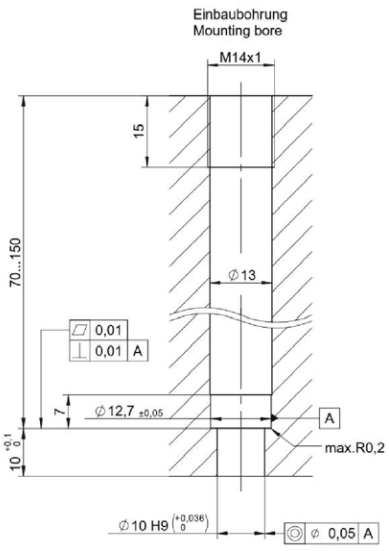


Fig. 1: Mounting bore for flush mounting

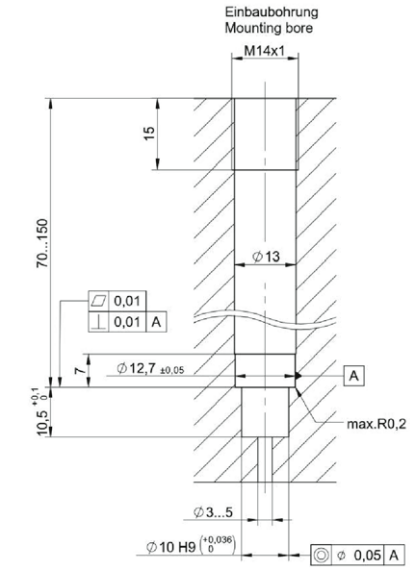


Fig. 2: Mounting bore with recessed mounting

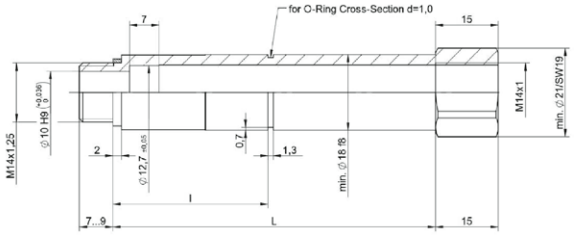


Fig. 3: Installation with mounting sleeve Type 6586AQ...

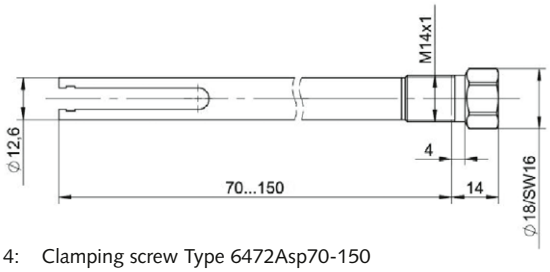


Fig. 4: Clamping screw Type 6472Asp70-150

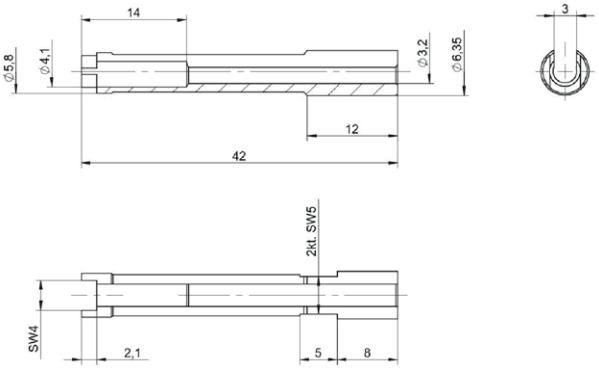


Fig. 5: Dismantling tool for cables Type 1300A49





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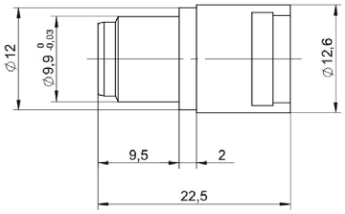


Fig. 6: Dummy sensor Type 6444C

| Scope of delivery | Type/Mat. No. |
|---|---|
| • Pressure sensor with pressed-on seal 1100A3 | 6067D |
| • Connecting cable acc. to ordering key | |
| • Calibration certificate | |
| • Coupling M4 neg. – BNC pos. (not for PiezoSmart) | 1705 |

| Optional accessories | Type/Mat. No. |
|---|---|
| • PiezoSmart extension cables | |
| – l = 1 m | 1987B1 |
| – l = 2 m | 1987B2 |
| – l = 10 m | 1987B10 |
| • Spare connecting cables, PFA steel braided | |
| – l = 1 m | 1929A1 |
| – l = 2 m | 1929A2 |
| – l = 3 m | 1929A3 |
| – with PiezoSmart, l = 1 m * | 1985A1S311 |
| – with PiezoSmart, l = 2 m * | 1985A1S321 |
| – with PiezoSmart, l = 3 m * | 1985A1S331 |
| • Spare connecting cables, FPM oil-proof | |
| – l = 1 m | 1983AA1 |
| – l = 2 m | 1983AA2 |
| – l = 3 m | 1983AA3 |
| – with PiezoSmart, l = 1 m * | 1985A1S711 |
| – with PiezoSmart, l = 2 m * | 1985A1S721 |
| – with PiezoSmart, l = 3 m * | 1985A1S731 |
| • Dismantling tool for cables | 1300A49 |
| • Cr-Ni seal ring (replacement for pressed-on sensor seal) | 1100A3 |
| • Connecting tubes for cooling water, l = 30 mm | 1225A2 |
| • FPM tube for cooling water | 1203CSP |
| • Temperature control unit | 2621 |
| • Dummy sensor | 6444C |
| • Mounting sleeve M14×1,25 (custom made) | 6586AQ... |
| • Clamping screw (custom made) | 6472Asp70-150 |
| • Adapter for pressure generator Type 6904 | 6586 |
| • Adapter for pressure generator Type 6905A | 6954 |
| • Torque wrench (4 … 20 N·m) | 1300A39 |
| • Protective cap for sensor plug M4x0.35 | 1895 |

* With factory calibration data, state SN with order

## Ordering key

**Type 6067D**

**PiezoSmart**

| | |
|---|---|
| Without PiezoSmart (standard) | **–** |
| With PiezoSmart (standard) | **s** |

**Cable version**

| | |
|---|---|
| PFA steel braided (standard) | **3** |

**Cable length**

| | |
|---|---|
| 1 m (standard) | **–1** |

**Ordering example:**
Standard sensor without PiezoSmart and 1 m PFA cable:
Type 6067D-3-1

Glysantin G30, Glysantin G40 and Glysantin G48 are registered trademarks of BASF SE.

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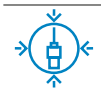
## Description of Icons

| | |
|---|---|
|  | H2 tested:<br>Suitable for the use in hydrogen combustion engines |
|  | Ready to Use:<br>Easy installation - minimal modifications |
|  | Closed Loop Combustion Control:<br>Suitable for closed loop control applications |

| | |
|---|---|
|  | Anti Strain Design:<br>Insensitive to mechanical strain effects |
|  | High Thermal Stability:<br>Temperature stable over measuring range |
|  | High Robustness:<br>High durability with good thermodynamic performance |

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