

# High temperature pressure sensor for combustion engine measurements

Type 6045B...

This uncooled precision high-temperature pressure sensor has very high sensitivity and excellent thermodynamic characteristics. It is mounted with shoulder sealing in an M8x0,75 bore.

- Mounting dimensions compatible with pressure sensors Type 6041... and 6045A
- Low thermal shock error
- Low sensitivity shift over the whole temperature range
- High accuracy and high sensitivity
- Very low linearity deviation
- Long service life with modified pressure-resistant crystal-package (for pre-ignition)

### Description

The Type 6045B... uses a PiezoStar® crystal for very high sensitivity in a compact form. A modified crystal package with an improved pressure-resistant design is withstanding higher pressure peaks (pre-ignition).

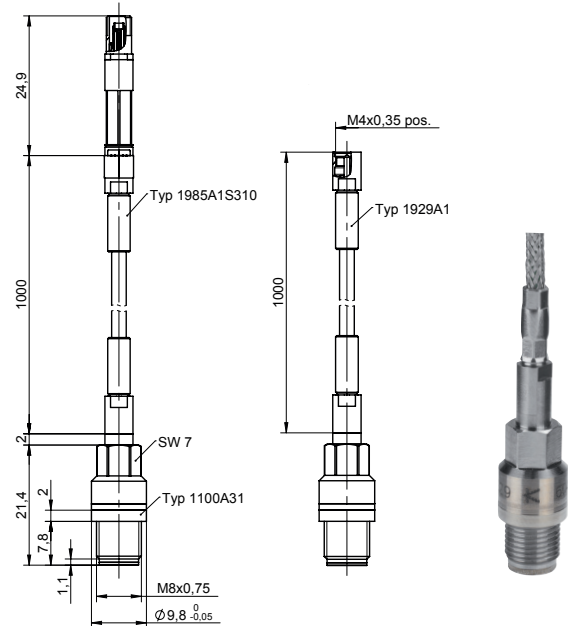
The mounting dimensions of this sensor are compatible with the water-cooled sensor Type 6041... . The durable optimized diaphragm with low thermal shock sensitivity guarantees precise measurement. Very efficient heat dissipation allows a maximum operating temperature of 350 °C.

The change of sensitivity over the temperature range was brought to an even lower level and is now only  $\leq \pm 1\%$ . New material combinations result in that improvement.

### Application

The 6045B... is an excellent general purpose engine sensor. Its robust design makes it suitable for both knock measurement and thermodynamic investigations.

As an uncooled design it is also ideally suited for onboard use in in-vehicle testing.



### Technical data

Measuring range	bar	0 ... 250
Calibrated partial ranges	bar	0 ... 100, 0 ... 150, RT, 250, 350 °C
Overload	bar	300
Sensitivity	pC/bar	$\approx -35$
Natural frequency	kHz	76
Linearity, all ranges (at 23 °C)	%/FSO	$\leq \pm 0,3$
Acceleration sensitivity		
axial	bar/g	$\leq 0,0015$
radial	bar/g	$\leq 0,0002$
Operating temperature range	°C	-20 ... 350
Temperature, min./max.	°C	-40 ... 400
Sensitivity shift		
RT ... 350 °C	%	$\leq \pm 1$
250 °C $\pm 100$ °C	%	$\leq \pm 0,5$
Thermal shock error		
(at 1 500 1/min, IMEP = 9 bar)		
$\Delta p$ (short-term drift)	bar	$\leq \pm 0,2$
$\Delta \text{IMEP}$	%	$\leq \pm 1$
$\Delta p_{\text{max}}$	%	$\leq \pm 1$
Insulation resistance at 20 °C	$\Omega$	$\geq 10^{13}$
Tightening torque, greased	N·m	6
Capacitance, without cable	pF	11
Weight with cable	g	26.1
Connector, ceramic insulator	–	M4x0.35

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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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### Mounting

#### Direct:

The pressure sensor Type 6045B... can be installed directly flush with the combustion chamber or recessed into an M8x0,75 bore. Figure 1 shows the first arrangement, which is preferable in order to avoid pipe oscillations. To reduce the thermal effect on the sensor, a recessed mounting position (up to 2 mm) is recommended. 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 can be prone to pipe oscillations. The bore must be exactly to specification (Figure 1). Kistler's tap Type 1361 allows you to achieve the required tolerances.

#### Sleeve:

Where space allows or if the cylinder head water jacket is damaged, it is advisable to use a mounting sleeve, custom versions of which are manufactured. Figure 2 shows the design of a sleeve with an M12x1,25 thread. Another advantage of sleeves is that the actual sensor bore can be machined very accurately in the sleeve. Kistler will prepare drawings for your particular situation on request.

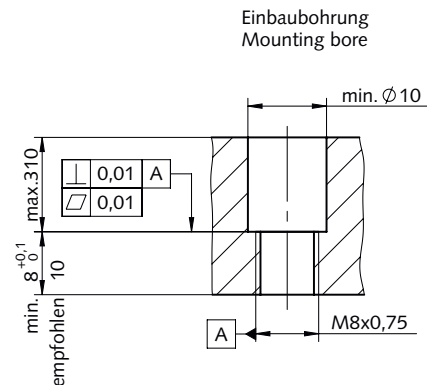


Fig. 1: Mounting bore

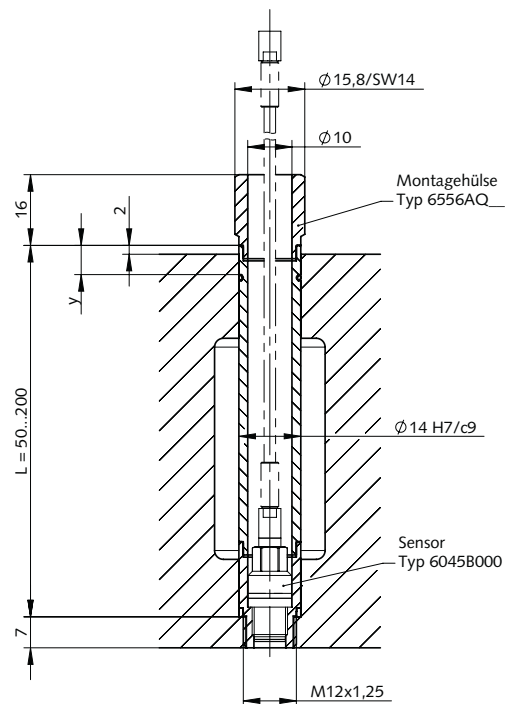


Fig. 2: Mounting sleeve Type 6556AQ...

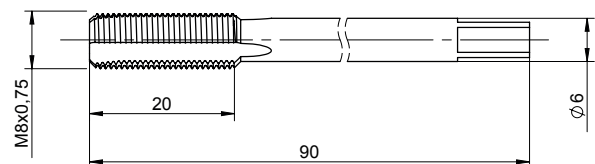


Fig. 3: M8x0,75 tap Type 1361

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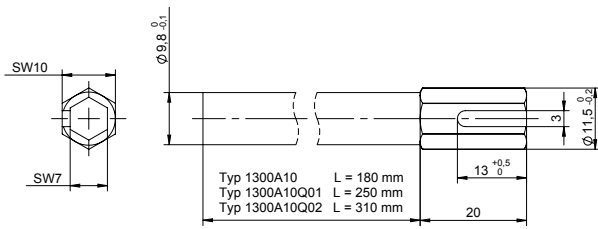


Fig. 4: Mounting key SW10/SW7 Type 1300A10...

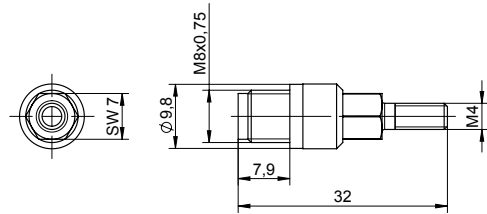


Fig. 7: Dummy sensor Type 6477

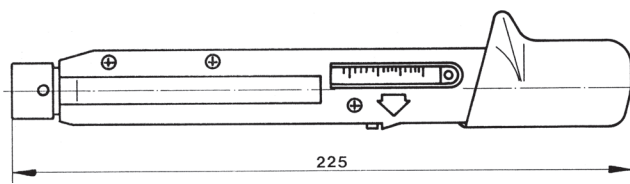


Fig. 5: 4 ... 20 N-m torque wrench Type 1300A39

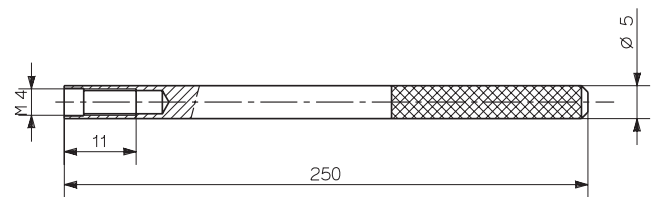


Fig. 8: Extraction tool for dummy sensor Type 1319

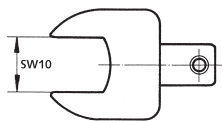


Fig. 6: SW10 fork wrench insert for mounting and torque wrench Type 1300A123

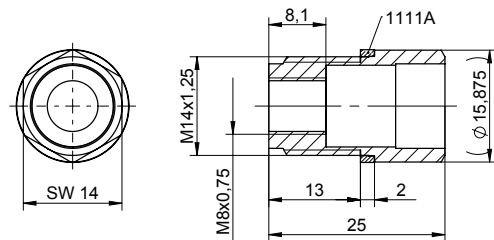


Fig. 9: Adapter Type 6589Q01

**Scope of delivery**

- Pressure sensor with pressed-on seal 1100A31
- Connecting cable acc. to ordering key
- Calibration certificate
- Adapter M4 neg. – BNC pos. (not for PiezoSmart)

**Optional accessories**

- PiezoSmart extension cables
  - L = 1 m 1987B1
  - L = 2 m 1987B2
  - L = 10 m 1987B10
- Connecting cables, PFA steel braiding
  - 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
- Connecting cables, FPM oil-tight
  - 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
- Cr-Ni seal ring 1100A31
- Adapter M4 neg. – KIAG 10-32 neg. 1700A13
- Dummy sensor 6477
- Extraction tool Type 6477 1319
- Mounting sleeve M12x1.25 (custom made) 6556AQ...
- Adapter for pressure generator Type 6904 6589
- Adapter for pressure generator Type 6905A 6929
- Tap M8x0.75 1361
- Mounting key SW10/SW7 (L = 180) 1300A10
- Mounting key SW10/SW7 (L = 250) 1300A10Q01
- Mounting key SW10/SW7 (L = 310) 1300A10Q02
- Torque wrench (4 ... 20 N·m) 1300A39
- Fork wrench insert SW10 for Type 1300A10... and Type 1300A39 1300A123
- Engine adapter M14/M8 (flush mounted Type 6045B) 6589Q01
- Temperature dummy 6045AT
- Protective cap for sensor plug M4x0.35 1895

**Type/Art. No.**  
6045B

**Ordering key**

**PiezoSmart**

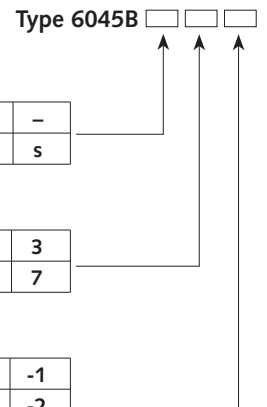
Without PiezoSmart (standard)	-
With PiezoSmart (standard)	s

**Cable version**

PFA with steel braiding (standard)	3
FPM oil-proof	7

**Cable length**

1 m (standard)	-1
2 m (standard)	-2
3 m (standard)	-3



**Order sample**

Standard sensor with PiezoSmart and 2 m FPM cable (oil-proof): Type 6045BS7-2  
 Standard sensor without PiezoSmart and 1 m PFA cable: Type 6045B-3-1

For PiezoSmart specifications please refer to the PiezoSmart brochure doc. no. 100-421  
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\* with factory calibration data, state SN with order