

High temperature pressure sensor for combustion engine measurements

Type 6045A...

This uncooled 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 sensor Type 6041...
- Low thermal shock error
- Long service life
- High accuracy
- High sensitivity

Description

The Type 6045A... uses a PiezoStar® crystal for very high sensitivity in a compact form.

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. Very efficient heat dissipation allows a maximum operating temperature of 400 °C.

Application

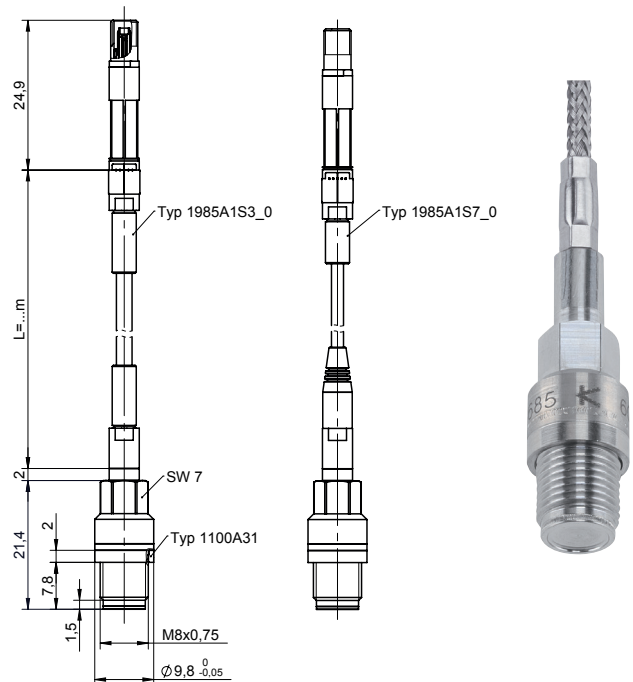
The Type 6045A... is an excellent general purpose engine sensor. Its robust construction makes it suitable for both knock measurement and thermodynamic investigations.

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

It is supplied with a integral cable, a rugged metal-braided version being used for standard applications.

U20 Version

For applications mainly in the knocking range or at very high pressure rises, use of Type 6045A...U20 with reinforced diaphragm (heavy duty version) is recommended.



Technical data

Measuring range	bar	0 ... 250
Calibrated partial ranges	bar	0 ... 100, 0 ... 150, 0 ... 200, 0 ... 250
RT, 150, 250, 350 °C		
Overload	bar	300
Sensitivity	pC/bar	≈-45
Natural frequency (measuring element)	kHz	>80
Linearity, all ranges (at 23 °C)	%/FSO	≤±0,4
Acceleration sensitivity		
axial	bar/g	≤0,0008
radial	bar/g	≤0,0008
Operating temperature range	°C	-20 ... 350
Temperature, min./max.	°C	-40 ... 400
Sensitivity shift		
23 ... 350 °C	%	≤±2
250 °C ±100 °C	%	≤±0,8
Thermal shock error		
(at 1 500 1/min, IMEP = 9 bar)		
Δp (short-term drift)	bar	≤±0,3
Δp _{mi}	%	≤±1,5
Δp _{max}	%	≤±1
Insulation resistance at 20 °C	Ω	≥10 ¹³
Tightening torque	N·m	6
Capacitance, without cable	pF	6
Weight with cable	g	28,5
Connector, ceramic insulator	-	M4x0,35

Page 1/4

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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Tel. +41 52 224 11 11, Fax +41 52 224 14 14, info@kistler.com, www.kistler.com
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Technical data (continuation)

Type 6045A...U20 (other specification as for Type 6045A...)

Sensitivity	pC/bar	≈ -44
Measuring range	bar	0 ... 300
Calibrated partial range RT, 150, 250, 350	bar	0 ... 100, 0 ... 200, 0 ... 300
Overload	bar	350
Acceleration sensitivity	bar/g	<0,001
Sensitivity shift 250 °C ±100 °C	%	≤±1
Thermal shock error (at 1 500 1/min, p _{mi} = 9 bar)		
Δp (short time drift)	bar	≤+0,5
Δp _{mi}	%	≤±2
Δp _{max}	%	≤±1

Mounting

Direct:

The pressure sensor Type 6045A... can be installed in directly flush with the combustion chamber or recessed into an M8x0,75 bore. Figure 2 shows the first arrangement, which is preferable in order to avoid 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 3 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.

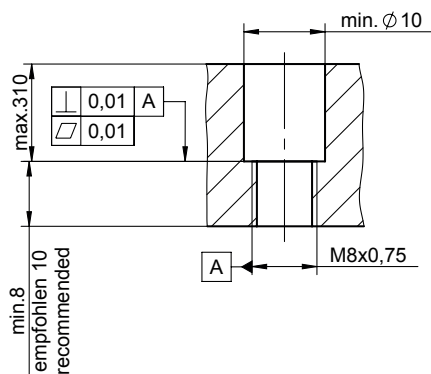


Fig. 1: Mounting bore

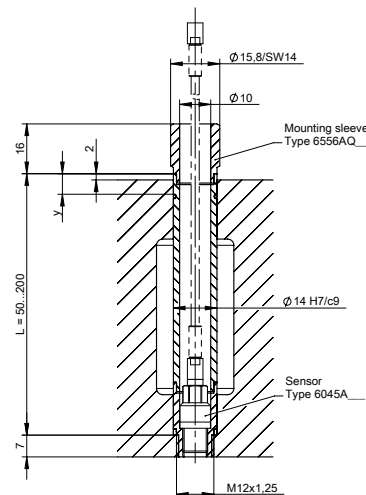


Fig. 2: Sleeve mounting with Type 6045A...

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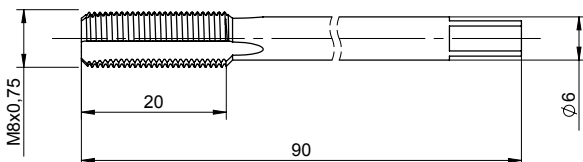


Fig. 3: M8x0.75 tap Type 1361

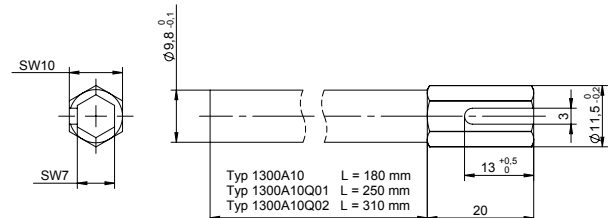


Fig. 4: Mounting key SW10/SW7 Type 1300A10...

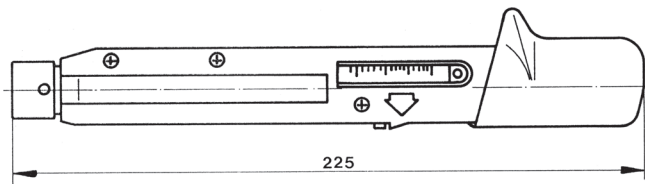


Fig. 5: Torque wrench 4 ... 20 N-m Type 1300A39...

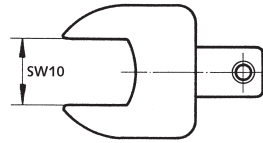


Fig. 6: Wrench jaw insert SW10 for mounting and torque wrench Type 1300A123

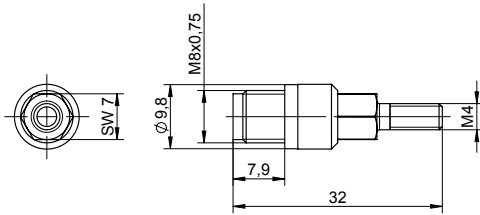


Fig. 7: Dummy sensor Type 6477

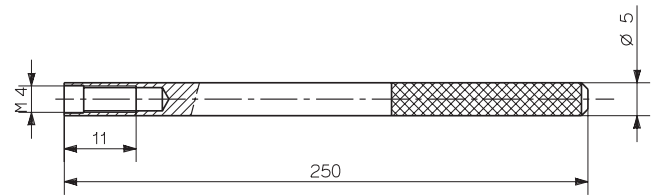


Fig. 8: Extraction tool for dummy sensor Type 1319

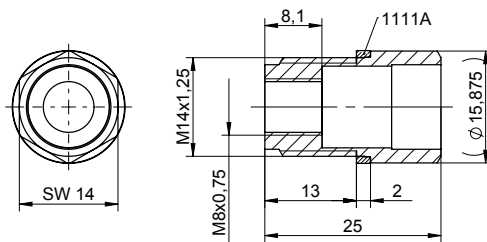


Fig. 9: Adapter Type 6589Q01

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Scope of delivery

- Pressure sensor with pressed-on seal 1100A31
- Connecting cable acc. to ordering key
- Calibration certificate
- Adapter M4 neg. – BNC pos.

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 6589Q01
- Temperature dummy 6045AT
- Protective cap for sensor plug M4x0.35 1895

Type/Art. No.
6045A

1705

Type/Art. No.

Ordering key

Version

Standard	
Reinforced diaphragm	U20

PiezoSmart

Without PiezoSmart (standard)	–
With PiezoSmart (standard)	S

Cable type

PFA with steel braiding	3
FPM oil-proof	7

Cable length

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

Type 6045A

Ordering example

Standard sensor without PiezoSmart and 1 m PFA steel braided cable: Type 6045A-3-1

Standard sensor with PiezoSmart and 3 m PFA steel braided cable: Type 6045AS-3-3

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