

High-temperature pressure sensor for combustion engine measurements

Type 6044A...



The uncooled precision high-temperature pressure sensor with its anti-strain design has very high sensitivity and excellent thermodynamic characteristics. It is shoulder sealing mounted in an M8x0.75 through thread bore.

It is suitable for different mounting situations and can be fitted without a mounting sleeve. Pronounced installation insensitivity due to the decoupled measuring element from the sensor housing allows installation which dispenses of mounting sleeves but still achieves very good results. Therefore it is perfect for powerful and compact engines with little space for the installation of measuring technology. Type 6044A can be used in applications with classic fuels as well as with alternative fuels including hydrogen.

- Mounting dimensions compatible with pressure sensors Type 6041... and 6045A with M8x0.75 (through thread)
- Anti-strain design, ideal for direct mounting
- 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 pressure-resistant crystal-package
- Suitable for use in hydrogen combustion engines

Description

The Type 6044A... uses a PiezoStar crystal for high sensitivity in a compact form. Thanks to its high nominal pressure range 300 bar and crystal package with an improved pressure-resistant design it can withstand higher pressure peaks.

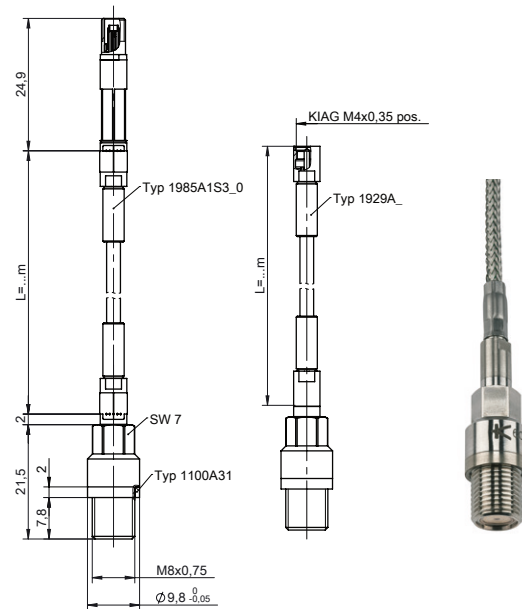
In addition to the minimum sensitivity change over the temperature range (TKE) and a very small linearity deviation the Type 6044A... is characterized by a low thermal shock error.

The new development Type 6044A... mountable in the bore of the uncooled sensors type 6045... and the cooled sensor Type 6041... with an M8x0.75 through-hole thread.

Application

The sensor Type 6044A... is a multi-applications sensor, which can be used during the complete development process of engines – from validation to calibration.

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



Technical data

Measuring range	bar	0 ... 300
Calibrated partial ranges RT, 250, 350 °C	bar	0 ... 100, 0 ... 150, 0 ... 200, 0 ... 300
Overload	bar	350
Sensitivity	pC/bar	≈30
Natural frequency	kHz	≥100
Linearity, all ranges (at 23 °C)	%/FSO	≤±0.3
Acceleration sensitivity		
axial	bar/g	≤0.002
radial	bar/g	≤0.0002
Operating temperature range	°C	−20 ... 350
Temperature, min./max.	°C	−40 ... 400
Sensitivity shift		
RT ... 350 °C	%	≤±1
250 °C ±100 °C	%	≤±0.5
Thermal shock error (at 1 500 1/min, IMEP = 9 bar)		
Δp (short-term drift)	bar	≤±0.2
ΔIMEP	%	≤±1
Δp _{max}	%	≤±1
Insulation resistance at 20 °C	Ω	≥10 ¹³
Tightening torque, greased	N·m	6
Capacitance, without cable	pF	10
Weight sensor	g	8
Connector, sapphire	–	M4x0.35

Mounting

Direct mounting:

The pressure sensor Type 6044A... can be installed flush with the combustion chamber or recessed into an M8x0.75 bore. To reduce the thermal effect on the sensor, a recessed mounting position (up to 2 mm) is recommended. An alternative installation method is in 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 machined exactly to specification. Kistler's tap Type 1361 allows you to achieve the required tolerances.

Sleeve mounting:

Where space allows or the cylinder head water jacket is damaged, it is advisable to use a mounting sleeve. Another advantage of sleeves is that the actual sensor bore can be machined very accurately in the sleeve. On request Kistler will design and manufacture a sleeve for the application.

Maintenance

Kistler recommends an annual calibration from the first use of the sensor. You can find further information in the instruction manual or from your Kistler distributor.

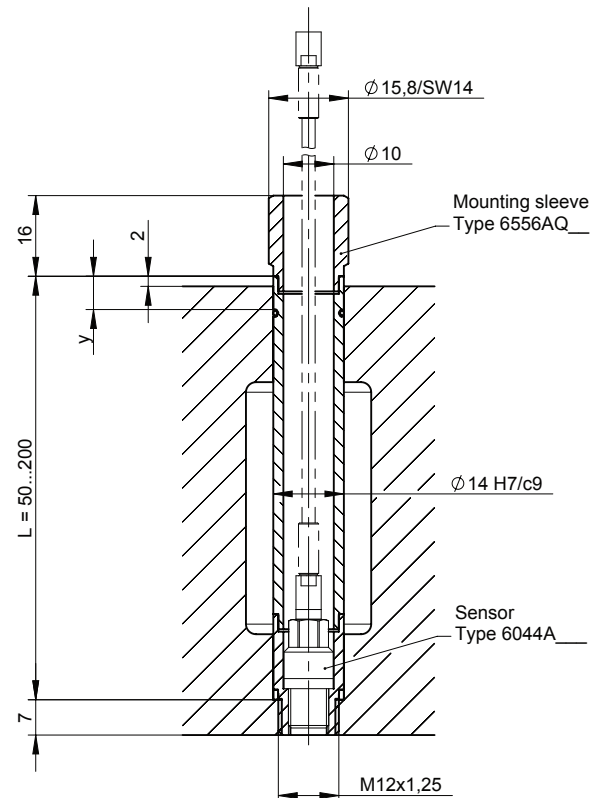


Fig. 2: Mounting sleeve Type 6556AQ...

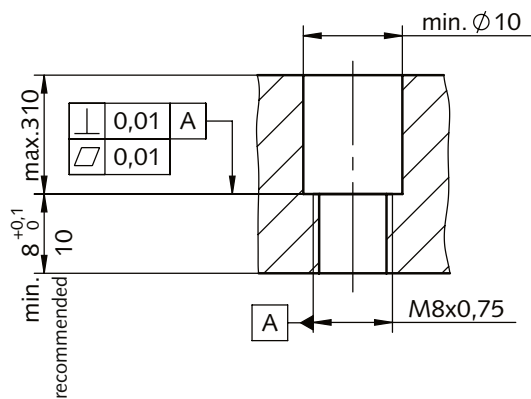


Fig. 1: Mounting bore

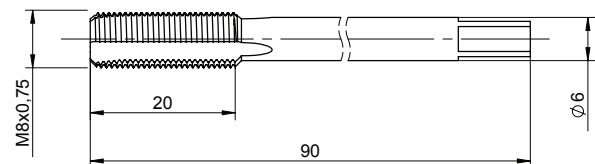


Fig. 3: M8x0.75 tap Type 1361

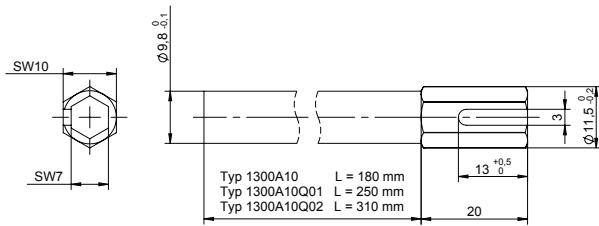


Fig. 4: Mounting key SW10/SW7 Type 1300A10...

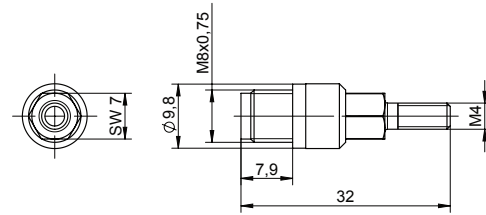


Fig. 7: Dummy sensor Type 6477

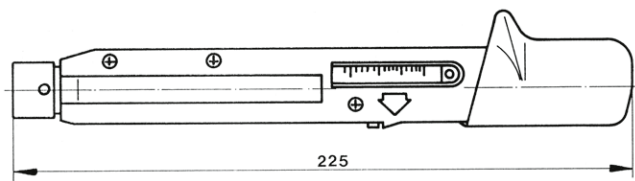


Fig. 5: 4 ... 20 N-m torque wrench Type 1300A39

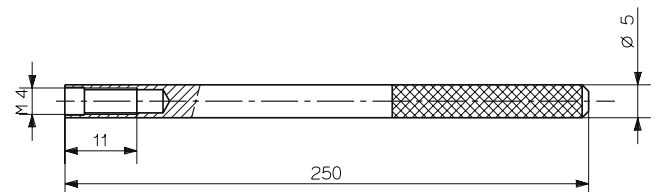


Fig. 8: Extraction tool for dummy sensor Type 1319

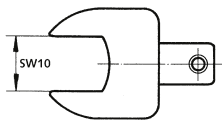


Fig. 6: SW10 fork wrench insert for mounting and torque wrench Type 1300A123

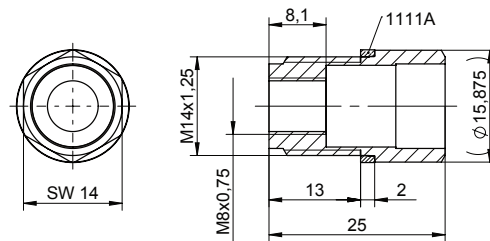


Fig. 9: Adapter Type 6589Q01

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)

Type/Art. No.

6044A

1705

Optional accessories

- PiezoSmart extension cables
 - L = 1 m 1987B1
 - L = 2 m 1987B2
 - L = 10 m 1987B10
- Replacement 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
- Replacement 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 (replacement for pressed-on sensor seal) 1100A31
- Dummy sensor 6477
- Extraction tool for dummy sensor Type 6477 1319
- Mounting sleeve M12×1..25 (custom made) 6556AQ...
- Adapter for pressure generator Type 6904 6589A2
- Adapter for pressure generator Type 6905A 6929A2
- Tap M8×0.75 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 M4×0.35 1895

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

Type 6044A **Order sample:**

Standard sensor with PiezoSmart and 2 m FPM cable (oil-proof): Type 6044AS7-2







Standard sensor without PiezoSmart and 1 m PFA cable: Type 6044A-3-1

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* with factory calibration data, state SN with order

For PiezoSmart specifications please refer to the PiezoSmart brochure doc. no. 100-421

Description of Icons

	H2 tested: Suitable for the use in hydrogen combustion engines		Anti Strain Design: Insensitive to mechanical strain effects
	Ready to Use: Easy installation - minimal modifications		High Thermal Stability: Temperature stable over measuring range
	Closed Loop Combustion Control: Suitable for closed loop control applications		High Robustness: High durability with good thermodynamic performance

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