

# Watercooled PiezoStar® Pressure Sensor

Type 7061C...

## for Combustion Engine Measurements

Ideally suited for combustion engine research and for thermodynamic investigations, sensor type 7061C... exhibits a high sensitivity and excellent thermodynamic stability due to optimized water cooling.

- Extremely high sensitivity of  $\sim -92$  pC/bar
- Low thermal shock error
- Calibrated Ranges up to 300 bar
- Water cooled precision reference
- Optimized cooling and low signal noise
- Ideal for thermodynamic analysis

### Description

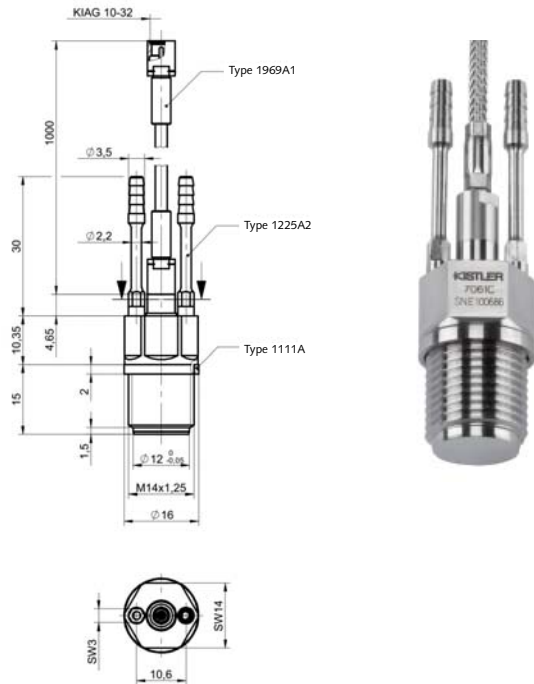
The Type 7061C... uses a PiezoStar® crystal for very high sensitivity and high natural frequency. An excellent zero point stability is achieved thanks to the improved integrated water cooling of the Type 7061C... The durable optimized diaphragm with low thermal shock sensitivity guarantees precise measurements. The sensor Type 7061C... is mounting compatible to the Type 7061B... The sensors are supplied with a mounted cable. For standard applications a rugged metalbraided cable is supplied.

### Application

The miniature sensor type 7061C... is ideally suited for thermodynamic measurements in large engines with high peak pressures. 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.

### Cooling fluid specification

- Demineralized water according to norm VDE-Norm 0510
- Cooling fluid additive Glysantin® G30® / G40® / G48® or similar products (do not mix with each other)
- Mixing ratio: 1 part additive with 4 parts demineralized water suitable for applications down to  $-9^{\circ}\text{C}$
- For more information please refer to instruction manual of cooling unit 2621F



### Technical Data

Measuring range	bar	0 ... 300
Calibrated partial ranges RT/50 °C	bar	0 ... 100/200/300
Overload	bar	350
Sensitivity	pC/bar	$\approx -92$
Natural frequency nominal	kHz	$\approx 58$
Linearity all ranges (Room temperature and 50° C)	%FSO	$\leq \pm 0,3$
Acceleration sensitivity		
cooled	bar/g	$< 0,015$
non-cooled	bar/g	$< 0,003$
Cooling water flow (50 °C, $p_{\max}$ 3 bar)	L/min	0,3 ... 0,5
Shock resistance	g	2 000
Operating temperature range	°C	$-20 \dots 350$
Sensitivity shift		
50°C $\pm 30$	%	$\pm 0,4$
Thermal shock error (at 1 500 1/min, IMEP = 9 bar)		
$\Delta p$ (short term drift)	bar	$\leq \pm 0,2$
$\Delta \text{IMEP}$	%	$\leq \pm 0,5$
$\Delta p_{\max}$	%	$\leq \pm 0,5$

**Technical Data (Continuation)**

Insulation resistance at RT	Ω	≥10 <sup>13</sup>
Tightening torque greased	N·m	25
Weight, sensor with cable	g	28,5
Connector, ceramic insulator	-	KIAG 10-32

**Mounting**

**Mounting Examples**

The sensor Type 7061C... may be screwed directly into a standard M14 bore. Fig. 1 shows flush mounting with the wall of the combustion chamber. Fig. 2 shows mounting with recessed diaphragm with a connection bore.

For the ceramic-insulated connectors 10-32 UNF only the high temperature cables Type 1631C..., 1635C... or 1969A... may be used.

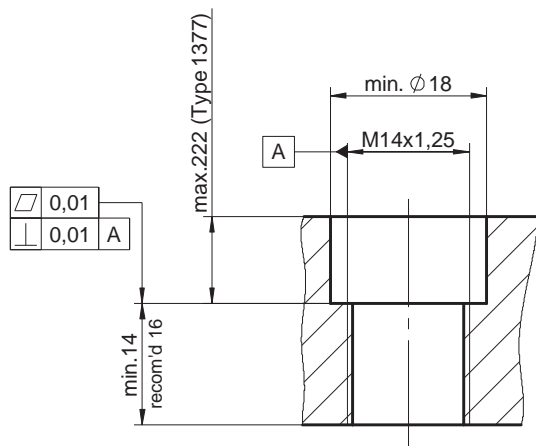


Fig. 1: Flush mounted Sensor. Bore ø according to mounting tool.

**Direct Mounting**

The bore must be machined exactly to specification. Kistler tap Type 1361 ensures the correct tolerances are achieved.

In order to avoid pipe oscillations we recommend flush-mounting the sensor in the cylinder head (Figure 1). To reduce the thermal effect on the sensor, a recessed mounting position (up to 2mm) is recommended.

An alternative installation method uses a mounting position with a small diameter boer in front of the diaphragm. This offers excellent thermal-shock protection but can be prone to pipe oscillation (Figure 2).

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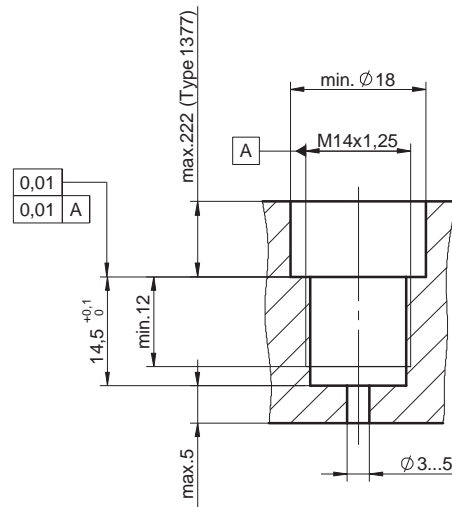


Fig. 2: Recessed mounted Sensor. Bore ø according to mounting tool.

**Accessories**

- High temperature connecting cable (BNC) **1631C...**
- High temperature connecting cable (10-32 UNF) **1635C...**
- Metal cable. **1969A1/Asp**
- Cr-Ni-steel seal **1111A**
- Connection hose for cooling water **1225A2**
- Fluoropolymer hose for cooling water **1203CSP**
- Adapter for high pressure generator Type 6904A **7915**
- Sensor dummy **7441A**
- Key for metal cable **1300A57**
- BNC coupling 10-32 UNF neg. – BNC pos. **1721**

**Mounting tools**

- Torque wrench 8 ... 40 N·m **1300A11**
- Fork wrench hex. 18 mm **1300A15**
- Tubular socket wrench hex. 14 mm for ø18 mm **1377**

**Ordering Key**

		Type 7061C			
Without PiezoSmart®	-				
With PiezoSmart®	S				
<b>Cable Arrangement</b>					
Without cable	-				
Metal Braided PFA cable	3				
Cable length ( L = 1 m )	1				

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