

# PiezoStar® Pressure Sensor

Type 6125C...

## Ground isolated, pluggable for Pressures up to 300 bar

Ground-isolated high-temperature pressure sensor with integral connecting cable for measuring cylinder pressures in combustion engines.

- Ground-isolated
- Without additional cooling
- Low thermal shock error, very low load-change drift
- High sensitivity using new PiezoStar crystal
- Available with oil-proof cable Type 1983AC1

### Description

The use of new PiezoStar crystals in the piezoelectric pressure sensor Type 6125C... made it possible to boost sensitivity to 37 pC/bar and the pressure range to 300 bar. This doubling of sensitivity compared with the previous generation product and isolation of the sensing element prevent of noise currents and allow interference-free measurements, when potential differences exist between engine and measuring system.

This new design also reduces the change in sensitivity with temperature. The new sensor is characterized by minimal thermal shock and outstanding linearity. Despite all these improvements its mounting dimensions remain fully compatible with superseded Types 6123..., 6125A... and 6125B... .

This PiezoStar sensor is available with high-temperature connecting cable Type 1967A1 in insulated metal sheathing, or oil-proof Viton® cable Type 1983A.

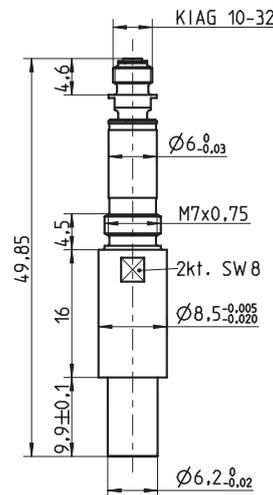
Pressure sensor Type 6125C... is also available with PiezoSmart®. This is an active system for automatic identification of individual pressure sensors and provides automatic parameter setting of measuring chains (see description of PiezoSmart system, Doc. No. 100-421e, for more information).

### Applications

The uncooled sensor Type 6125C... is suitable for accurate measurement in gasoline and diesel engines. Its ground-isolated design makes it ideal for test stands with ground loop problems. The shoulder sealing of this sensor allows it to be mounted with its front flush in the cylinder head. A wide variety of accessories allow alternative configurations; for example use of a sleeve permits mounting the sensor through a water-cooling channel.

### Type 6125C...U20 Version

For applications mainly in the knocking range or at very high pressure rises, use of Type 6125C...U20 with reinforced diaphragm (heavy duty version) is recommended.



### Technical Data

Measuring range	bar	0 ... 300
Calibrated partial ranges	bar	0 ... 100 0 ... 200, 0 ... 300
Overload	bar	300
Sensitivity at RT	pC/bar	≈-36
Natural frequency	kHz	>70
Linearity, all ranges (at 23 °C)	%FSO	≤±0,4
Acceleration sensitivity		
axial	bar/g	<0,003
radial	bar/g	<0,0005
Operating temperature range	°C	-20 ... 350
Temperature, min./max.	°C	-50/400
Sensitivity change		
250 °C ±100 °C	%	<±1
RT ... 350 °C	%	<±2
Thermal shock error		
at 1 500 1/min, p <sub>mi</sub> = 9 bar		
Δp (short-term drift)	bar	≤±0,3
Δp <sub>mi</sub>	%	<±1,5
Δp <sub>max</sub>	%	<±1
Insulation resistance at 30 °C	Ω	≥10 <sup>13</sup>
Ground isolation 30 °C	Ω	≥10 <sup>9</sup>
Torque wrench setting	N·m	10
Weight without cable	g	30
Connector, ceramic insulator	-	KIAG 10-32

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**Technical Data**

**Type 6125C...U20** (other specifications as for Type 6125C...)

Sensitivity	pC/bar	33
Measuring range	bar	0 ... 300
Calibrated partial ranges	bar	0 ... 100, 0 ... 200, 0 ... 300
Overload	bar	350
Sensitivity shift 250 °C ±100 °C	%	<±1,2
Thermal shock error (at 1 500 1/min, p <sub>mi</sub> = 9 bar)		
Δp (short time drift)	bar	≤±0,5
Δp <sub>mi</sub>	%	≤±2
Δp <sub>max</sub>	%	≤±1,5

**Mounting**

Direct:

The pressure sensors Type 6125C... can be mounted flush with the wall of the combustion chamber or recessed in an M10x1 or 3/8"x24 UNF bore. Figure 1 shows flush mounting, which is to be preferred to avoid pipe oscillation. The bore must be formed accurately to specification (Figure 2). The step drill Type 1337 and screw tap Type 1353 allow you to meet the required tolerances.

Sleeve:

Where space allows or if the cylinder head water jacket is breached, it is advisable to use a mounting sleeve, custom versions of which are manufactured. Figure 3 shows the pressure sensor Type 6125C... in a mounting sleeve with M10 thread. Another advantage of this approach is that the actual sensor bore can be formed very accurately in the sleeve. Kistler will prepare drawings for your particular situation on request.

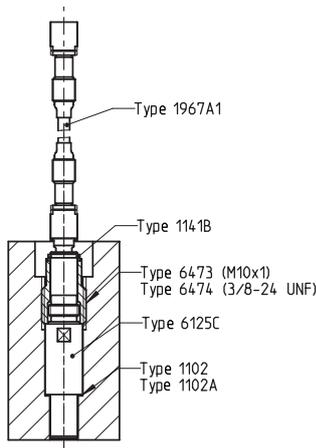


Fig. 1: Direct mounting of sensor Type 6125C1... with mounting nut

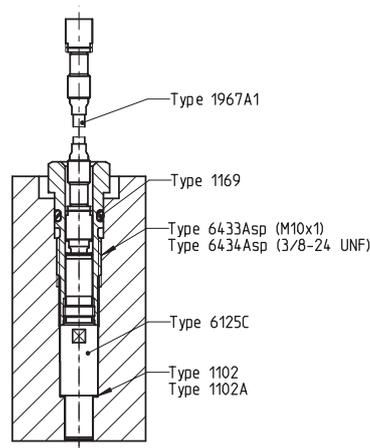


Fig. 2: Mounting sensor Type 6125C... with mounting sleeve

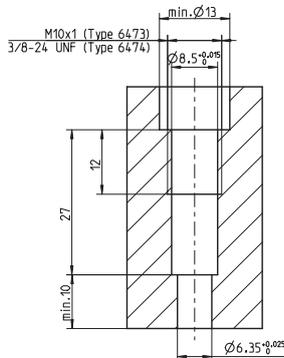


Fig. 1a: Bore for direct mounting

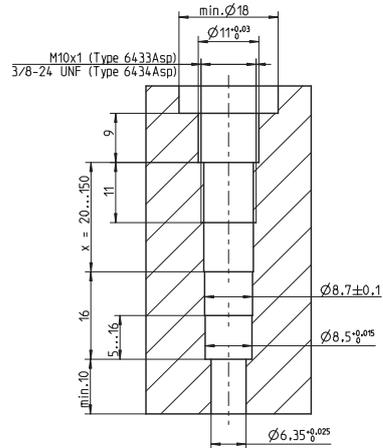


Fig. 2a: Bore for mounting with mounting sleeve

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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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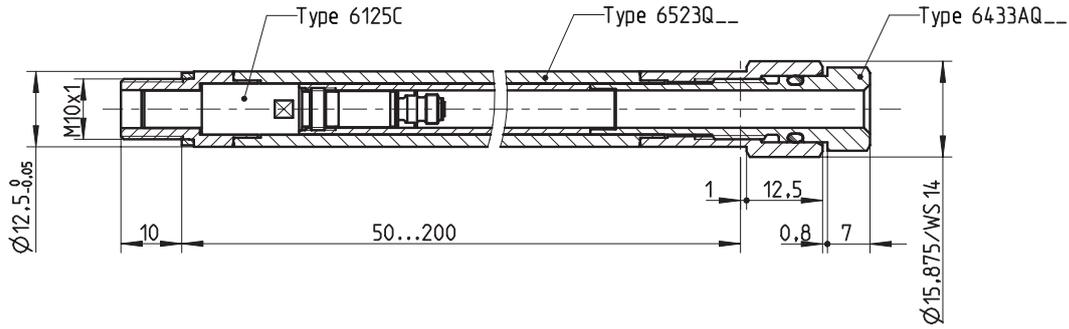


Fig. 3: Mounting example

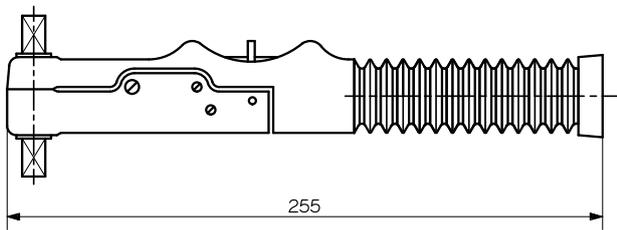


Fig. 4: 5 ... 40 N-m torque wrench, Type 1371B

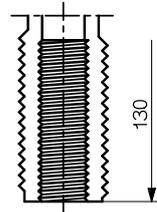


Fig. 5: M10x1 screw tap, Type 1353

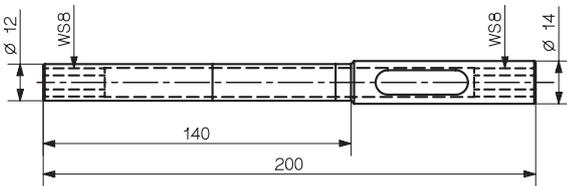


Fig. 6: Tubular socket wrench SW8 Type 1373

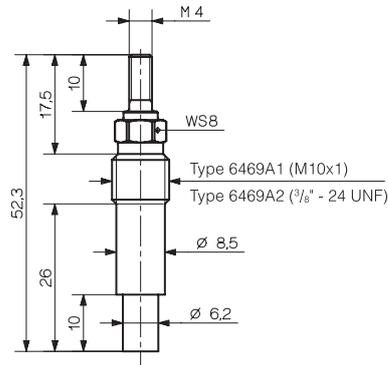


Fig. 7: Dummy sensor Type 6469A1 (M10x1)  
Dummy sensor Type 6469A2 (3/8" - 24 UNF)

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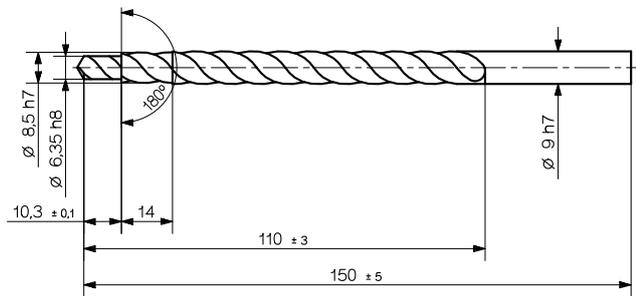


Fig. 8: Step drill Typ 1337A

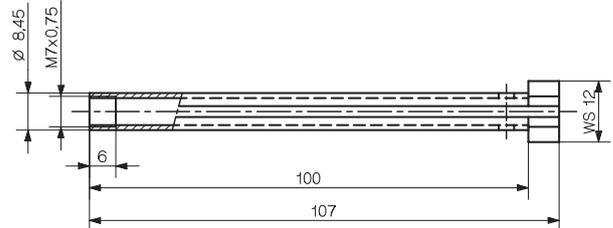


Fig. 9: Extraction tool Typ 1317

**Included Accessories**

- Sensor Type 6125C... with mounting nut and cable as specified in ordering key
- Adapter, KIAG 10-32 neg. – BNC pos.
- Cu seal
- Ni seal

**Type/Art. No.**

- 6125C...
- 1721
- 1102
- 1102A

**Ordering Key**

Without mounting nut	0
With mounting nut M10x1	1
With mounting nut 3/8"x24 UNF	2

Type 6125C

**Optional Accessories**

- Torque wrench 5 ... 40 N·m
- Tubular socket wrench SW8
- Step drill
- Screw tap M10x1
- Extraction tool for sensor
- Extraction tool for sensor dummy Type 6469A1 and Type 6469A2
- Mounting sleeve, M10x1 incl. O-ring
- Mounting sleeve, 3/8"x24 UNF incl. O-ring
- O-ring for mounting sleeve
- Mounting sleeve M10x1
- Mounting nut 3/8"x24 UNF
- Clamping ring for mounting nut
- Cu seal
- Ni seal
- Mounting sleeve M10x1
- Flame guard
- Spare cable, KIAG 10-32, L = 1 m
- Spare cable, Viton KIAG 10-32, L = 1 m
- Adapter M10x1 for pressure generator Type 6906A
- Adapter 3/8"x24 UNF for pressure generator Type 6906A
- Dummy sensor M10x1
- Dummy sensor 3/8" – 24 UNF
- Engine adapter M14x1,25/M10x1
- Engine adapter M14x1,25/M10x1 retracted
- Engine adapter M14x1,25/3/8"x24 UNF

**Type/Art. No.**

- 1371B...
- 1373
- 1337A
- 1353
- 1317
- 1319

**Cable Arrangement**

Without cable	0
With cable Type 1967A1, L = 1 m	1
With Viton® cable Type 1983AC1, L = 1 m	2

Without PiezoSmart	-
With PiezoSmart	S

**Version**

Standard	-
Reinforced diaphragm	U20

Detailed information about PiezoSmart sensor identification may be found in the PiezoSmart brochure doc. no. 100-421e.

**Ordering Example**

- Version with cable Type 1967A1 and PiezoSmart
- Version with M10x1 mounting nut and Viton cable Type 1983AC1

**Type**  
6125C01S  
6125C12

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