

PiezoStar pressure sensor

Ground isolated, pluggable for pressures up to 300 bar

Type 6125C...



Ground-isolated high-temperature pressure sensor with integral connecting cable for measuring cylinder pressures in combustion engines. Type 6125C can be used in applications with classic fuels as well as with alternative fuels including hydrogen.

- 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
- Suitable for use in hydrogen combustion engines

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 Despite all these improvements its mounting dimensions remain fully compatible with superseded Types 6123..., 6125A...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 fluoropolymer cable Type 1983A.

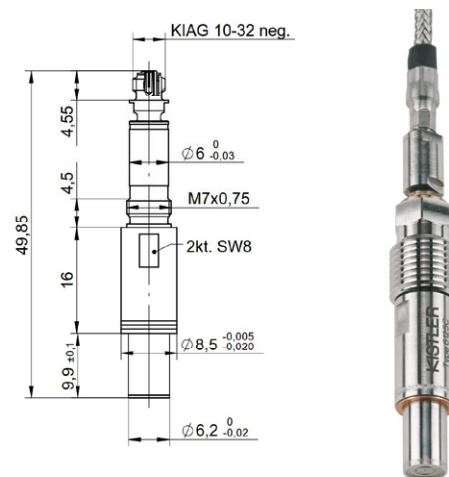
The pressure sensor Type 6125C... is also available with PiezoSmart. This is an active system for automatic identification of individual pressure sensors and provides automatic parameter setting of measuring chains (see description of PiezoSmart system for more information).

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 watercooling 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 ... 250, 0 ... 300
RT, 250, 350 °C		
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	%	±1
RT ... 350 °C	%	±2
Thermal shock error		
(at 1 500 1/min, IMEP = 9 bar)		
Δp (short-term drift)	bar	≤±0.3
ΔIMEP	%	≤±1.5
Δp _{max}	%	≤±1
Insulation resistance at 30 °C	Ω	≥10 ¹³
Ground isolation 30 °C	Ω	≥10 ⁸
Torque wrench setting	N·m	10
Weight without cable	g	30
Connector, ceramic insulator	–	KIAG 10-32

Technical data (continuation)

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, RT, 250, 350 °C
Overload	bar	350
Sensitivity shift		
250 °C ±100	%	±1.2
Thermal shock error		
(at 1 500 1/min, IMEP = 9 bar)		
Δp (short time drift)	bar	≤±0.4
ΔIMEP	%	≤±2
Δp _{max}	%	≤±1

Mounting

Direct:

The pressure sensors Type 6125C... can be mounted flush with the wall of the combustion chamber or recessed in an M10x1

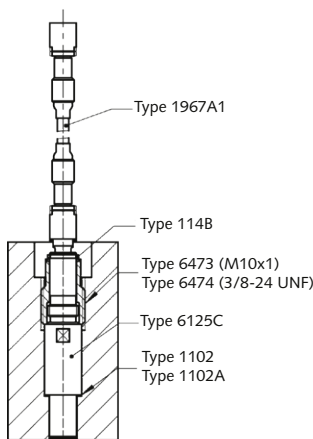


Fig. 1: Direct mounting of sensor Type 6125C1... with mounting nut

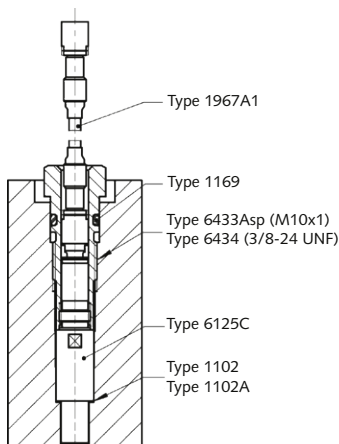


Fig. 2: Mounting sensor Type 6125C... with mounting sleeve

or 3/8"x24 UNF bore. Fig. 1 shows flush mounting, which is to be preferred to avoid pipe oscillation. To reduce the thermal effect on the sensor, a recessed mounting position (up to 2 mm) is recommended. The bore must be formed accurately to specification (Fig. 1a). The step drill Type 1337A/1337A2 and screw tap Type 1353 from Kistler allows you to adhere to 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. Fig. 2 shows the pressure sensor Type 6125C... in a mounting sleeve with M10x1 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.

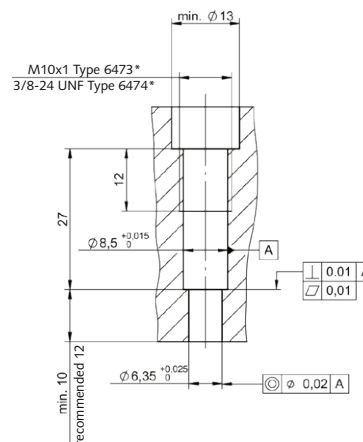


Fig. 1a: Bore for direct mounting

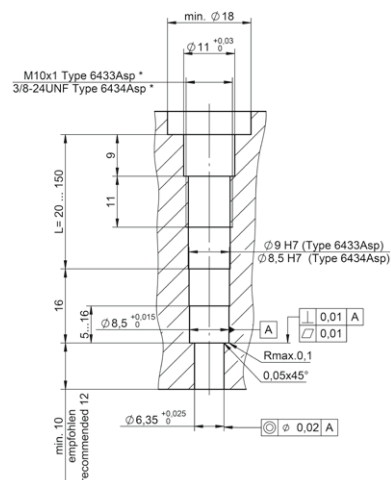


Fig. 2a: Bore for mounting with mounting sleeve

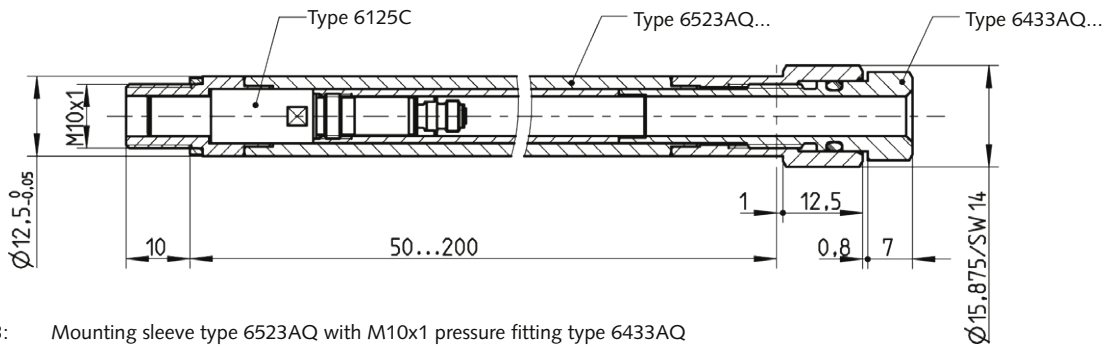


Fig. 3: Mounting sleeve type 6523AQ with M10x1 pressure fitting type 6433AQ

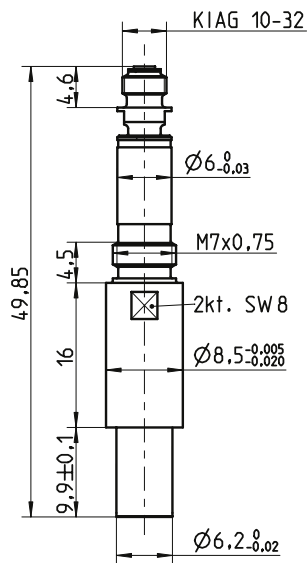


Fig. 4: Type 6125C... up to SN 5295xxx

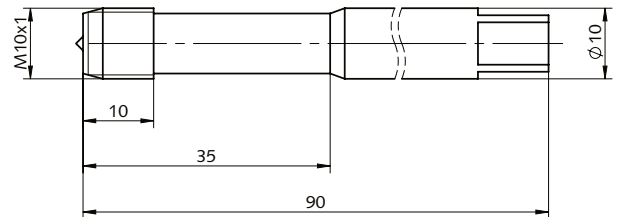


Fig. 6: M10x1 screw tap, Type 1353

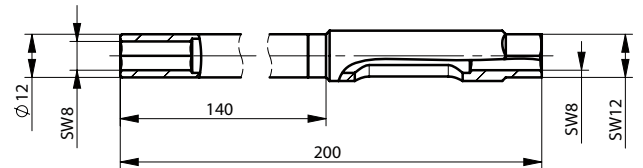


Fig. 7: Tubular socket wrench SW8 Type 1373

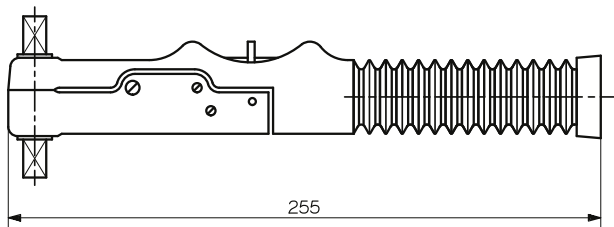


Fig. 5: 5 ... 40 N-m torque wrench, Type 1371B

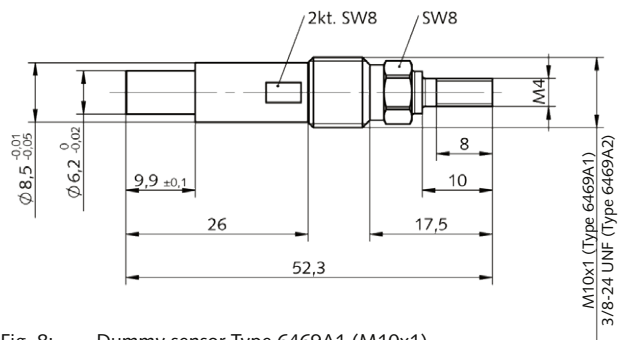


Fig. 8: Dummy sensor Type 6469A1 (M10x1)
Dummy sensor Type 6469A2 (3/8x24 UNF)

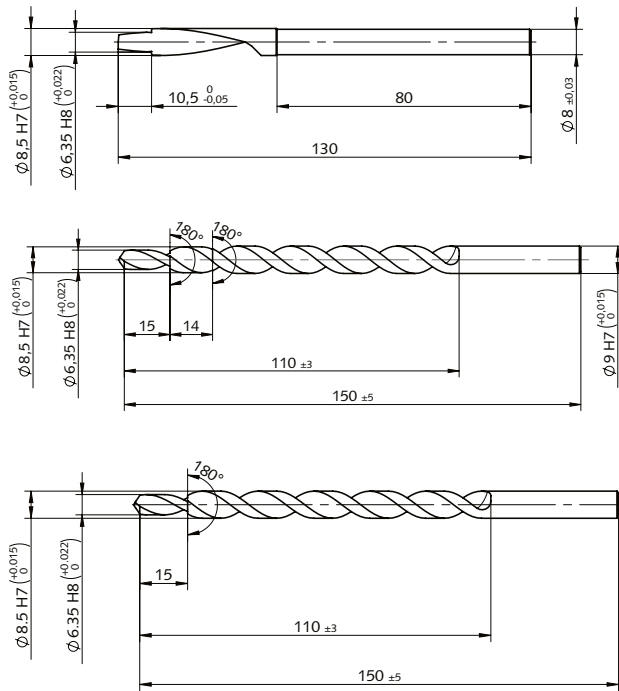


Fig. 9: Step drill Type 1337, 1337A, 1337A2

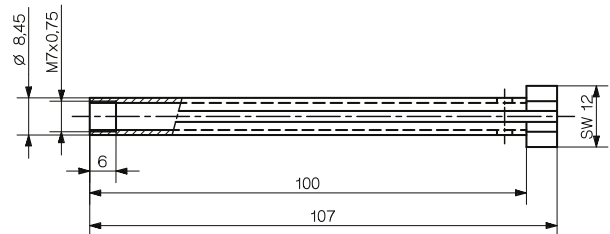


Fig. 10: Extraction tool Type 1317

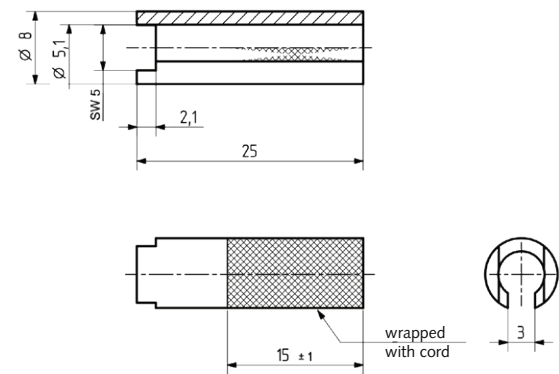


Fig. 11: Mounting tool Type 1300A65 for cable Type 1967...

Included accessories

- Coupling BNC pos. – 10-32 neg.
(for non-PiezoSmart-Version)
- Cu-sealing ring (5 units)

Accessories (optional)

- Coupling Triax – BNC pos.
- PiezoSmart extension cable
 - L = 1 m
 - L = 2 m
 - L = 10 m
- Connecting cables, PFA steel braided ground isolated
 - L = 1 m
 - L = 2 m
 - L = 3 m
- Connecting cables FPM oil-tight
 - L = 1 m
 - L = 2 m
 - L = 3 m
 - with PiezoSmart L = 1 m *
 - with PiezoSmart L = 2 m *
 - with PiezoSmart L = 3 m *
- Cable mounting tool for 1967A
- Torque wrench 5 ... 40 N·m
- Mounting key SW8
- Tap M10x1
- Step drill
 - for mounting nut M10x1
 - for mounting nut 3/8-24 UNF
- Reaming tool
- Extraction tool
 - for sensor & dummy sensor 6469A1Q01
 - for dummy sensor 6469A1 & 6469A2
- Mounting nut
 - M10x1
 - 3/8-24 UNF
- Clamping ring for mounting nut
- Sealing ring
 - Cu-sealing ring (5 units)
 - Ni-sealing ring (5 units)
- Flameguard
- Temperature sensor
- Sensordummy
 - M7x0,75 (6125C0)
 - M10x1 (6125C1)
 - 3/8-24 UNF (6125C2)

Type/Art. No.

1721
1102A1
1704A4
1987B1
1987B2
1987B10
1967A1
1967A2
1967A3
1983AC1
1983AC2
1983AC3
1985A2S711
1985A2S721
1985A2S731
1300A65
1371B
1373
1353
1337A
1337A2
1337
1317
1319
6473
6474
1141B
1102A1
1102A2
6539A3
6125T
6469A1Q01
6469A1
6469A2

Accessories (optional) – continued

- Mounting sleeve M10x1 (customized)
- Mounting sleeve pressure fitting (customized)
 - M10x1 incl. O-Ring
 - 3/8-24 UNF incl. O-Ring
- O-Ring for pressure fitting
- Adapter for pressure generator type 6906
 - M10x1
 - 3/8-24 UNF
- Engine adapter
 - M14x1,25 – M10x1
 - M14x1,25 – M10x1 (recessed)
 - M14x1,25 – 3/8-24 UNF

Ordering key

		Type 6125C			
Without mounting nut	0				
With mounting nut M10x1	1				
With mounting nut 3/8x24 UNF	2				
Cable arrangement					
Without cable	0				
PFA metal braided, ground isolated, Type 1967A1, L = 1 m	1				
With fluoropolymer 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.

Ordering example

Version with cable Type 1967A1 and PiezoSmart	Type 6125C01S
Version with M10x1 mounting nut and fluoropolymer cable Type 1983AC1	6125C12

* with factory calibration data, state SN with order

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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