

Compact M5 cylinder pressure sensor Type 6054BR...

Minimal mounting space required

Type 6054BR... is used when it comes to precise measurements with minimum installation space. Due to its high natural frequency, it is ideal for measurements with intense vibrations, such as those occurring in high-performance engines. It achieves long service life due to its robust construction.

- High accuracy
- Very compact packaging
- Low sensitivity to structure borne sound
- High natural resonance frequency for the application

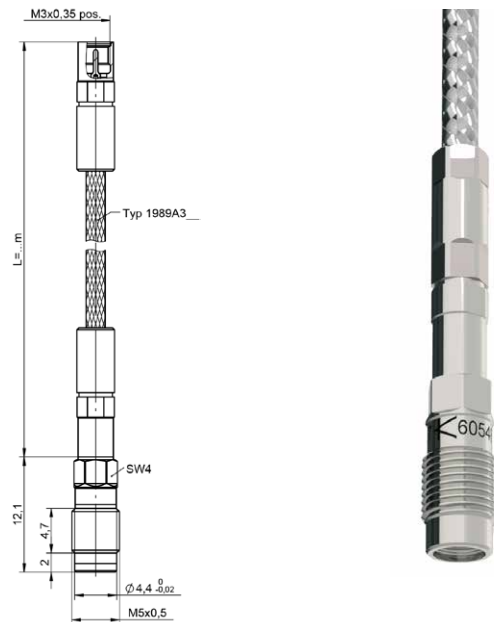
Description

With its compact dimensions, the Type 6054BR... achieves a sensitivity of ≈ -13 pC/bar, with high thermal stability. The newly designed front seal allows good heat dissipation. Thus, the sensor is also suitable for high operating temperatures and for engines with high power density. In combination with the optional flame guard Type 6539A1Q01, the sensor achieves a good thermodynamic accuracy. Due to the compact design and the high natural frequency the influence of engine vibrations, such as valve impact, is kept to a minimum.

Application

The sensor Type 6054BR... requires minimal installation space. It can be installed in the existing Type 6052C... bore. If only the Type 6054BR... is used, the access bore can be reduced to 5.7 mm. This makes Type 6054BR... suitable for small engines, compact multi-valve and motorcycle engines as well as for in-vehicle indication.

For standard applications a robust metal-braided PFA cable (cable type 3) is used. If the sensor connector is exposed directly to engine oil, such as the cable routing through the valve cover, the oil-tight FPM cable (cable type 7) is recommended.



Technical data

Measuring range	bar	0 ... 300
Calibrated partial ranges	bar	0 ... 100, 0 ... 200, 0 ... 300
Overload	bar	350
Sensitivity	pC/bar	≈ -13
Natural frequency (sensor)	kHz	≈ 150
Linearity in all ranges Lin (at room temperature)	% FSO	$\leq 0,3$
Acceleration sensitivity		
axial	mbar/g	$< 0,3$
radial	mbar/g	$< 0,3$
Operating temperature range	°C	-20 ... 350
temperature, min./max.		-40 ... 400
Sensitivity change		
200 °C ± 50	%	$\pm 0,5$
23 ... 200 °C	%	± 2
Thermal shock error (at 1 500 1/min, IMEP = 9 bar)		
Δp (short-term drift)	bar	$\leq 0,7$
Δp_{mi}	%	$\leq \pm 2,5$
Δp_{max}	%	$\leq \pm 1,5$
Insulation resistance at 23 °C	Ω	$\leq \pm 10^{13}$
Shock resistance	g	2 000

Technical data (continuation)

Tightening torque, greased	N·m	1.5
Capacitance, without cable	pF	5
Weight with cable	g	25
Connector, ceramic insulator	-	M3x0.35

Type 6054BR...U56

(other specifications as for Type 6054BRU20...)

Overload	bar	400
Sensitivity	pC/bar	≈-10
Linearity in all ranges Lin (at room temperature)	%/FSO	≤0,4
Acceleration sensitivity		
axial	mbar/g	<0.5
radial	mbar/g	<0.5
Sensitivity change		
200 °C ±50	%	±0.5
23 ... 200 °C	%	±2.0
Thermal shock error (at 1 500 1/min, p _{mi} = 9 bar)		
Δp (short time drift)	bar	1
Δp _{mi}	%	3
Δp _{max}	%	±±1.5
Tightening torque, greased	N·m	2

Mounting

The sensor with connected cable is installed using the mounting key Type 1300A14 and the torque wrench Type 1300A17. For sensors with PiezoSmart, the mounting key Type 1300B14 is suitable for bores with exactly ø5.7 mm (step drill) and the mounting key Type 1300B14Q01 is suitable for bores with ø≥7.5 mm.

Direct installation

The pressure sensor Type 6054BR can be installed directly into the cylinder head. The length of the access passage is dependent on the material (Fig. 1). The bore must be machined exactly to specification (Fig. 1). Kistler tools allow you to achieve the required tolerances. The bore must be machined in one operation. Before mounting the sensor, the use of the reaming tool Type 1300A79 is mandatory.

Sleeve installation

Where space allows, or where the cylinder head fluid passages must be crossed, it is advisable to use a mounting sleeve. Another advantage of sleeves is that the actual sensor bore can be machined very accurately within the sleeve and the length of the access channel can be minimized. Fig. 2 shows an example of a mounting sleeve Type 6595ASP ... with M7x0.75 thread. On request Kistler will design and manufacture a specific sleeve for your application.

Maintenance

Kistler recommends an annual calibration from the first use of the sensor. For further information refer to the instruction manual or contact your Kistler representative.

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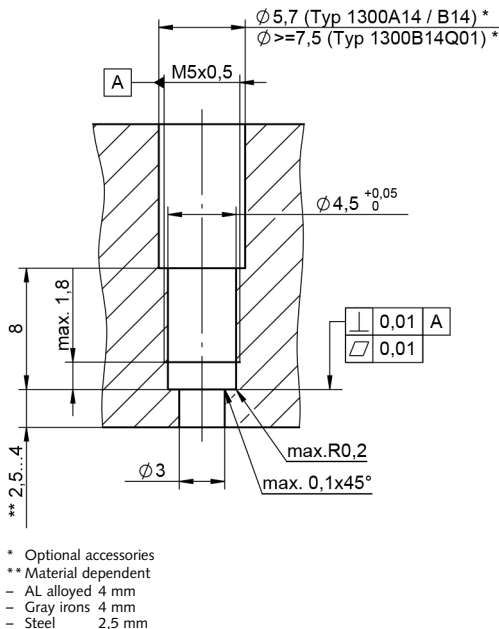


Fig. 1: Mounting bore

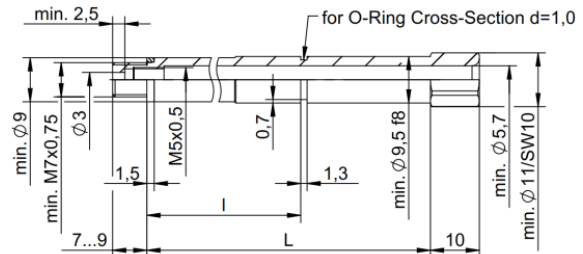


Fig. 2: Mounting sleeve M7 Type 6595ASP..

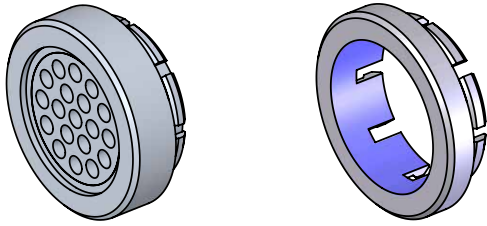


Fig. 3: Patented flame guard Type 6539A1Q01, diaphragm protection ring Type 6539A2 (both can be mounted without tools)

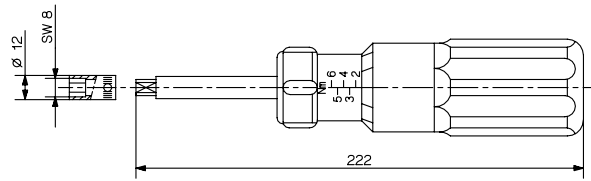


Fig. 8: Torque wrench Type 1300A17

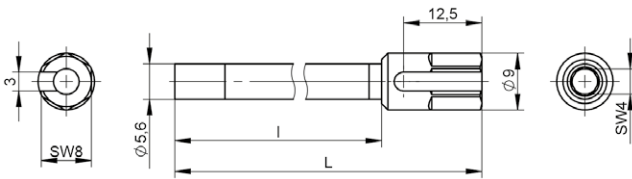


Fig. 4: Mounting wrench Type 1300A14

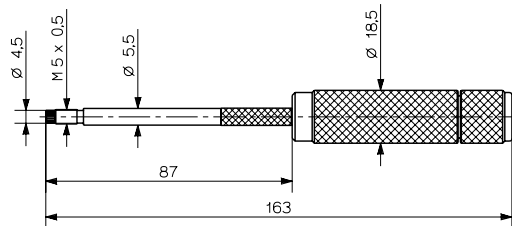


Fig. 9: Reamer Type 1300A79...

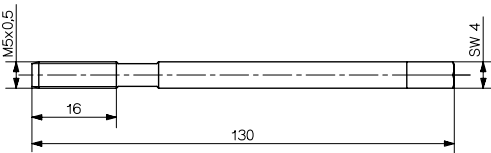


Fig. 5: Tap Type 1357A

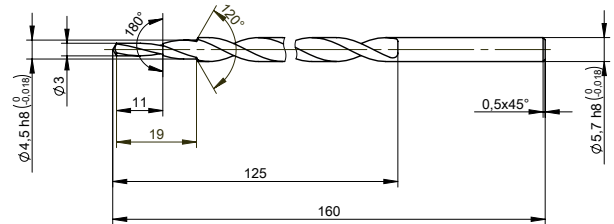


Fig. 10: Step drill Type 1300B22

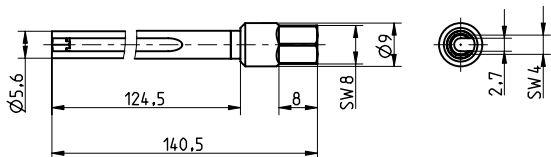


Fig. 6: Mounting key $\varnothing 5.6$ mm, slotted for PiezoSmart Type 1300B14

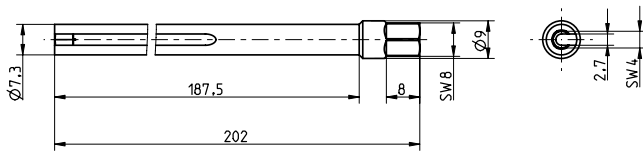


Fig. 7: Mounting key $\varnothing 7.3$ mm, slotted for PiezoSmart Type 1300B14Q01

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Scope of delivery

- Pressure sensor
- Connecting cable acc. to ordering key
- Calibration certificate
- Adapter M3x0,35 neg.–BNC pos. (not for PiezoSmart)

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 1989A311
 - L = 2 m 1989A321
 - L = 3 m 1989A331
 - with PiezoSmart, L = 1 m * 1985A8S311
 - with PiezoSmart, L = 2 m * 1985A8S321
 - with PiezoSmart, L = 3 m * 1985A8S331
- Replacement connecting cables, FPM oil-proof
 - L = 1 m 1989A711
 - L = 2 m 1989A721
 - L = 3 m 1989A731
 - with PiezoSmart, L = 1 m 1985A8S711
 - with PiezoSmart, L = 2 m 1985A8S721
 - with PiezoSmart, L = 3 m 1985A8S731
- Coupling M4 neg. – KIAG 10-32 neg. 1700A13
- Patented flame guard, can be mounted without tools 6539A1Q01
- Diaphragm protection ring, can be mounted without tools 6539A2
- Dummy sensor 6405A2
- Extraction tool for dummy sensor Type 6405A2, L = 250 mm 1349
- Mounting sleeve M7x0,25 (custom made) 6595ASP..
- Adapter for pressure generator Type 6904A 6585A
- Step drill 1300B22
- Tap M5x0,5 1357A
- Mounting key
 - ø5,6 mm (L = 180 mm) 1300A14
- Mounting key, slotted for PiezoSmart
 - ø5,6 mm, slotted (L = 140,5 mm) 1300B14
 - ø7,3 mm, slotted (L = 202 mm) 1300B14Q01
 - ø7,3 mm, slotted (L = 242 mm) 1300B14Q03
- Torque wrench 1 ... 6 N·m 1300A17
- Mounting sleeve M7x0,75 (custom made) 6595ASP..
- Reaming tool for sensor mounting surface
 - L = 162 / I = 60 1300A79
 - L = 273 / I = 170 1300A79Q01
 - L = 323 / I = 220 1300A79Q02

Type/Mat. Nr.

6054BR

1706

Type/Mat. Nr.

1987B1
1987B2
1987B10
1989A311
1989A321
1989A331
1985A8S311
1985A8S321
1985A8S331

1989A711
1989A721
1989A731
1985A8S711
1985A8S721
1985A8S731

1700A13
6539A1Q01

6539A2

6405A2
1349

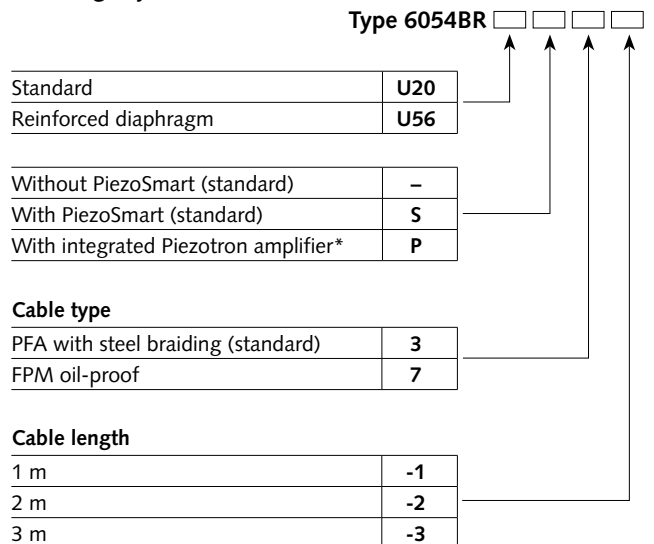
6595ASP..
6585A
1300B22
1357A

1300A14
1300B14
1300B14Q01
1300B14Q03
1300A17
6595ASP..
1300A79
1300A79Q01
1300A79Q02

- Engine adapter
 - Adapter HEX10 M8x0,75x-M5x0,5 6595
 - Adapter claw M8x0,75x-M5x0,5 6595Q01
 - Adapter HEX12 M10x1-M5x0,5 6595A1
 - Adapter HEX10 M10x1-M5x0,5 6595A1Q01
 - Adapter HEX14 M14x1,25-M5x0,5 6585AQ01
- Mounting key for adapter Type 6595Q01 1399A73Q02
- Temperature sensor 6054BRT
- Protective cap for sensor plug M3x0.35 1887A

* with factory calibration data, state SN with order
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Ordering key



* Customer-specific version

Ordering examples

- Standard sensor 1 m FPM-cable (oil-proof) Type 6054BRU20-7-1
- Standard sensor reinforced with PiezoSmart and 2 m FPM-cable (oil-proof) Type 6054BRU56S7-2
- Standard sensor with integrated Piezotron amplifier and 1 m metal-braided PFA cable Type 6054BRU20P3-1

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