

# Longitudinal Measuring Pin M5

Type 9247A...

## for contactfree measurement of cavity and injection pressures

Piezoelectric sensor for monitoring cavity and injection pressures in the injection molding process. This compact, longitudinally sensitive pin is used for indirect measurement of dynamic pressures.

- Compact installation size
- Contact-free measurement of high pressures
- Cavity pressure measurement behind the cavity wall, without imprint
- Indirect measurement of injection pressure in the nozzle

### Description

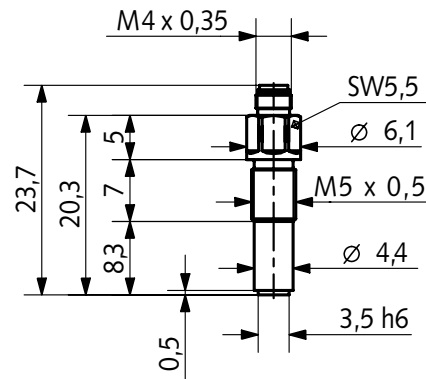
The measuring pin is mounted with a precisely defined preload. The strain in the surrounding material is transferred via the end of the sensor and the external thread to the quartz sensing element.

The electrical charge output is proportional to the change in mechanical strain. A charge amplifier converts the charge into a voltage signal that can be processed as required.

The sensitivity of the entire structural system must be analyzed for an absolute pressure measurement. This means that the expansion or compressibility of the relevant structure, including mounted measuring pin, must be determined, via a calculation or comparison measurement.

### Application

The Types 9247A0.8, 9247Asp, 9247AG and 9247AE are used for the contactfree cavity pressure monitoring in injection molds. They are installed behind the cavity wall in a blind hole vertically to the contour. The compression of the mold steel during the filling process is transferred to the measuring pin and generates a pressure-proportional signal. The measuring pin is therefore mainly used for components in which no imprint is allowed on the surface. The high temperature variant Type 9247AQ01 is used for monitoring the injection pressure on injection molding machines. It is installed in a blind hole tangential to the nozzle and measures the expansion of the nozzle cylinder during injection.



### Technical data

Range <sup>1)</sup>	με	-1 400 ... 1 400
Overload	με	±2 000
Axial preloading force	kN	≈3.3 (≈-20 000 pC)
Sensitivity (in test object)	pC/με	≈-8.6
Sensitivity to force (for preload)	pC/N	≈-6
Reproducibility of sensitivity when dismounting and remounting	%	<±1
Linearity	%FSO	≤±2
Hysteresis	%FSO	≤3
Natural frequency	kHz	>200
Acceleration sensitivity	pC/g	<0.07
Operating temperature range	°C	-40 ... 200
High temperature Type 9247AQ01	°C	-40 ... 300
Insulation resistance at 20°C	Ω	≥10 <sup>13</sup>
Degree of protection (with connected cable)		IP65
Weight (without cable and preloading bolt)	g	2.5
Connection		M4x0.35 neg.

<sup>1)</sup> Sensor mounted with preload

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**Installation**

Provide mounting bore as in Fig. 1. The front contact surface ( $\varnothing 4.5$  mm) for the sensor must be clean and machined flat. Apply a **thin film of grease** to the front face of the sensor Technical Data ( $\varnothing 3.5$  mm) and also to the M5 thread. Connect the sensor to a charge amplifier (e.g. Preload Tester Type 5991) and carefully preload with socket wrench Type 1300A9 until it produces the prescribed charge of  $-20\ 000$  pC.

Fig. 2 shows an installation example.

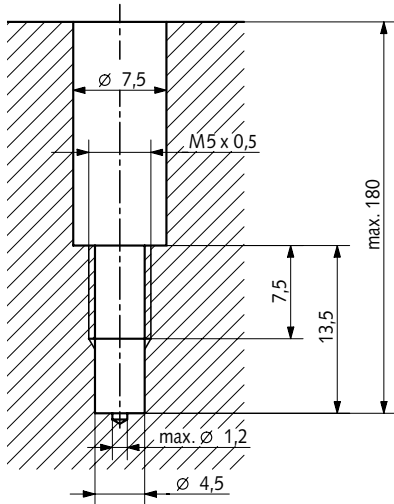


Fig. 1: Mounting bore

**Installation Example**

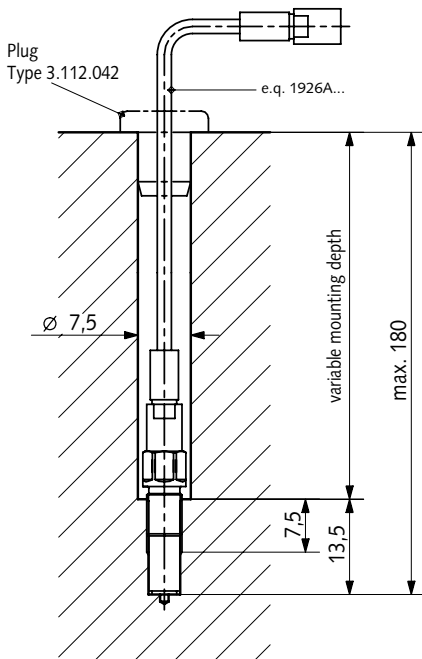


Fig. 2: Installation example longitudinal measuring pin type 9247A...

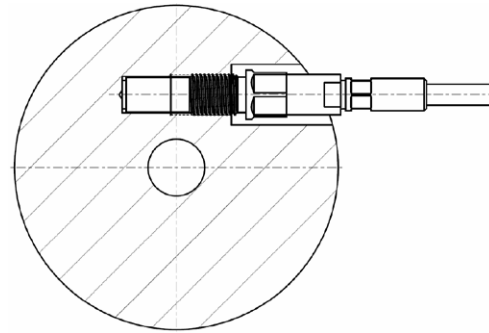


Fig. 3: Installation of Type 9247AQ01 for Injection Pressure

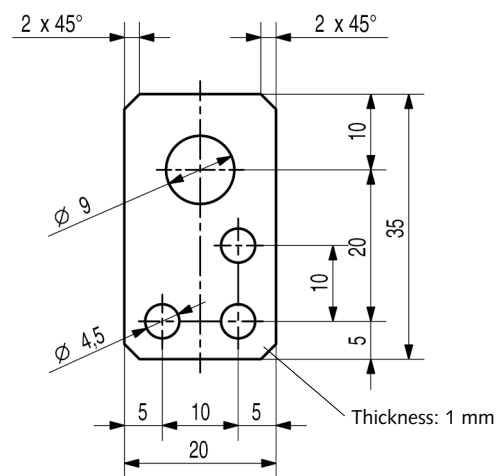


Fig. 4: Mounting plate Mat. No. 65005208

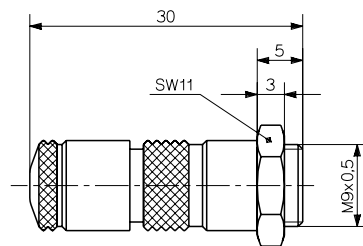


Fig. 5: Single-Wire connector Type 1839

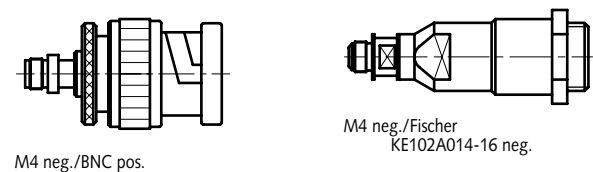


Fig. 6: Couplings for longitudinal measuring pin Type 9247A...

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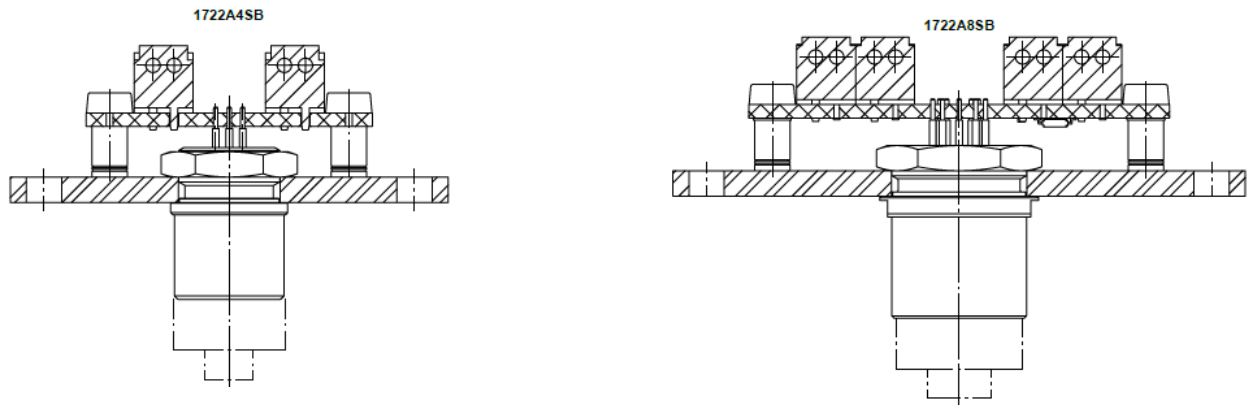
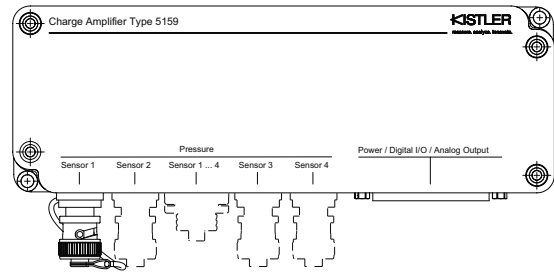
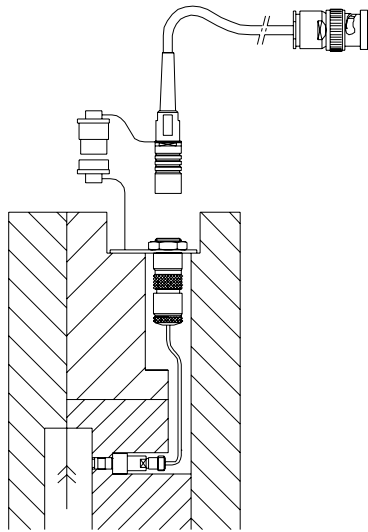


Fig. 7: Multichannel Connectors Type 1722A4.. and 1722A8..

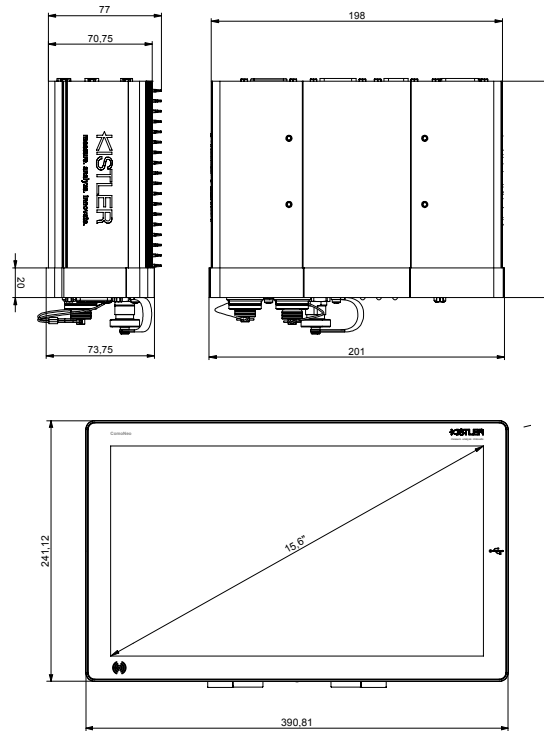
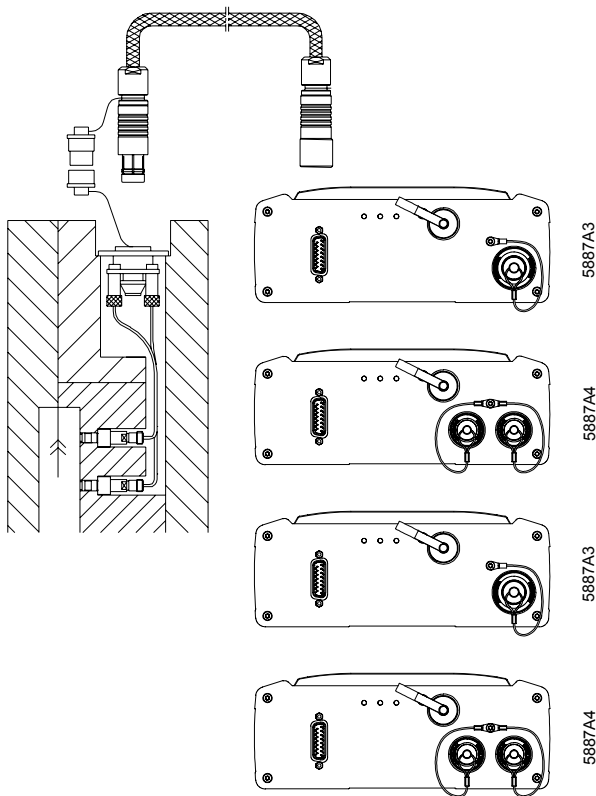
**Cable and amplifier for measuring chain with sensor Type 9247A...**



**Cable Type 1667B... (BNC connector)**

Type 5159A

Fig. 8: Sensor Type 9247A... with Charge Amplifier Type 5159A.



<b>4-channel cable Type 1995A... to connector Type 1722A4...</b>	<b>8-channel cable Type 1997A... on connector Type 1722A8...</b>
Type 5887A1	Type 5887A2...
	Type 5887A3...
	Type 5887A4...

Fig. 9: Sensor Type 9247A... with Monitoring System ComoNeo Type 5887...

**Accessories included**

- Type 9247A0.8 and 9247Asp
  - Connection cable, coaxial
  - Special grease 5 g
- Type 9247AE and 9247AG
  - Connection cable, Single-Wire L = 5 m
  - Mounting plate for Fischer 102
  - Connector, Single-Wire
  - ID- Plate
  - Special grease 5 g
- Type 9247AQ01
  - None (see optional accessories)

**Type/Mat. No.**

- 1926A... 1063
- 1666A4 65005208
- 1839 1839
- 1063 1063

**Ordering key**

Sensor without cable	–
Sensor with connecting cable Type 1926A0.8 (l = 0.8 m)	<b>0.8</b>
Sensor with connecting cable Type 1926Asp, cable length with order (L <sub>min.</sub> = 0.1 m/L <sub>max.</sub> = 10 m)	<b>sp</b>
Sensor with Single Wire cable, l = 1.5 m With connector Type 1839	<b>AE</b>
Sensor with Single-Wire cable, l = 1.5 m Without connector	<b>AG</b>
High temperature sensor for injection pressure	<b>Q01</b>

Type 9247A

**Optional accessories**

Tools for installation

- Tubular socket wrench  
SW internal 5.5/external 7.3 mm,  
wrench length 220 mm 1300A9
- Special typ M5x0.5 1357A
- Finishing tool for bore,  
bore depth ≤60 mm 1300A79
- Finishing tool for bore,  
bore depth ≤170 mm 1300A79Q01
- Preload tester 5991
- Hand-held charge amplifier 5995

**Type/Art. No.**

Connecting cable

- PFA, ø 2 mm, M4 pos. int./  
M4 pos. int., length 0.8 m 1926A0.8
- PFA, ø 2 mm, M4 pos. int./  
M4 pos. int., Length 0.1 ... 2 m 1926Asp0.1-2
- PFA, ø 2 mm, M4 pos. int./  
M4 pos. int., special length 1926Asp
- Connection cable, Single-Wire  
M4 x 0.35 pos. - flying lead, l=1.5 m  
(Typ 9247AE and 9247AG) 1666A2
- High temperature connection cable,  
Kapton/PFA, 260°C  
KIAG M4x0.35 pos. integr. –  
KIAG M4x0.35 pos. integr.  
steel braided, l = 1 m, (Typ 9247AQ01) 1951AQ01

Connectors and adaptors

- Multichannel connectors, 4 or 8 channels 1722A...
- Adapter, KIAG M4 neg. –  
Fischer KE102A014-16 neg. 1700A33

Plug

- Plastic, ø12,5/1,8x12 65000554
- Dummy sensor 9499A

**Dimensions miniature longitudinal measuring pin  
Type 9247A0.8**

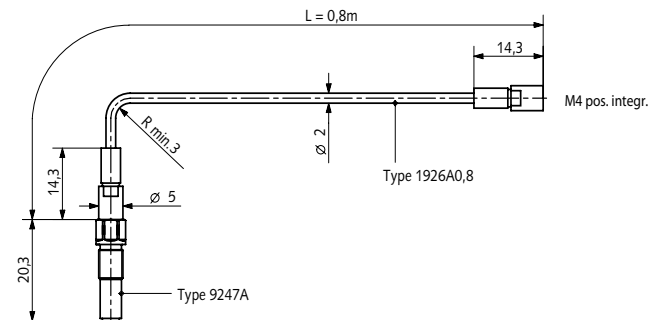


Fig. 10: Type 9247A0.8

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