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Miniature Longitudinal Measuring Pin

Type 9239A...

for contactless pressure measurement in molds

Piezoelectric sensor for monitoring forces and strains in machines and tools. This extreme compact, longitudinally sensitive pin is used for indirect measurement of dynamic and quasistatic forces. It is particularly suitable for sensing Injection into molds

- Extreme compact installation size
- Contactless or imprint-free cavity pressure measurement
- Preloaded mounting allows measurement of compressive and tensile forces
- Can be mounted at any depth in the structure

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.

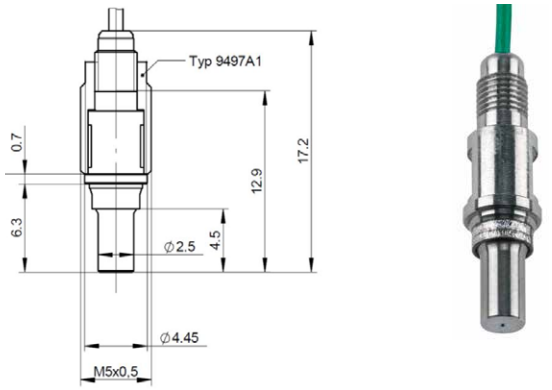
The electrical charge output is proportional to the change in mechanical strain. A charge amplifier converts the charge into a voltage signal that can be processed as required.

For an exact cavity pressure measurement, the sensitivity of the complete system must be determined with an FEM analysis.

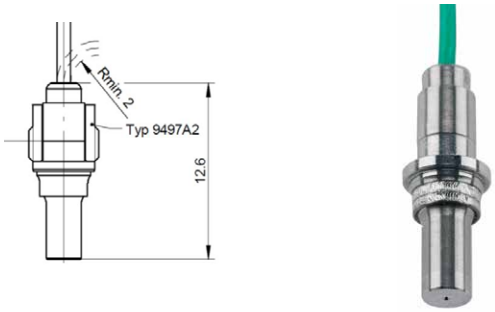
Application

The sensor could easily be mounted with a installation wrench and allows measurement of the pressure within the mold. The primary application area is the industrial monitoring of cavity pressures during injection molding or related processes.

Type 9239AA



Type 9239AB



Technical data

Range [1]	με	-800 ... 800
Overload	με	±1 000
Axial preloading force	kN	≈1 (≈–5 910 pC)
Sensitivity (in test object)	pC/με	≈–3.2
Sensitivity to force (for preload)	pC/N	≈–5.9
Reproducibility of sensitivity when dismounting and remounting	%	<±1
Linearity	%FSO	≤±1
Hysteresis	%FSO	≤2
Operating temperature range	°C	–40 ... 200
Insulation resistance at 20 °C	Ω	$\geq 10^{12}$
Connection		M3x0,35 neg.

[1] Sensor mounted with preload

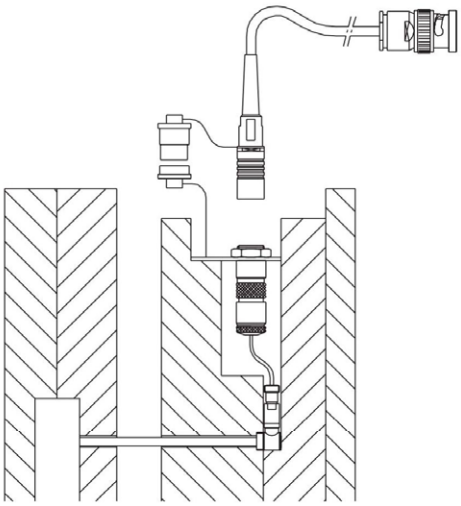
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Cable and amplifier for measuring chains with sensor Type 9239A...



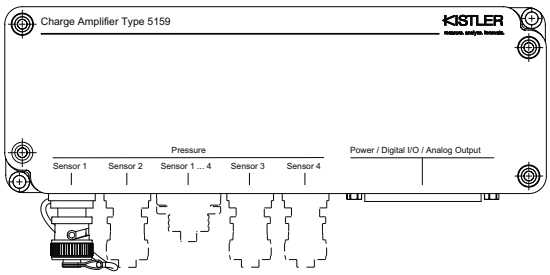
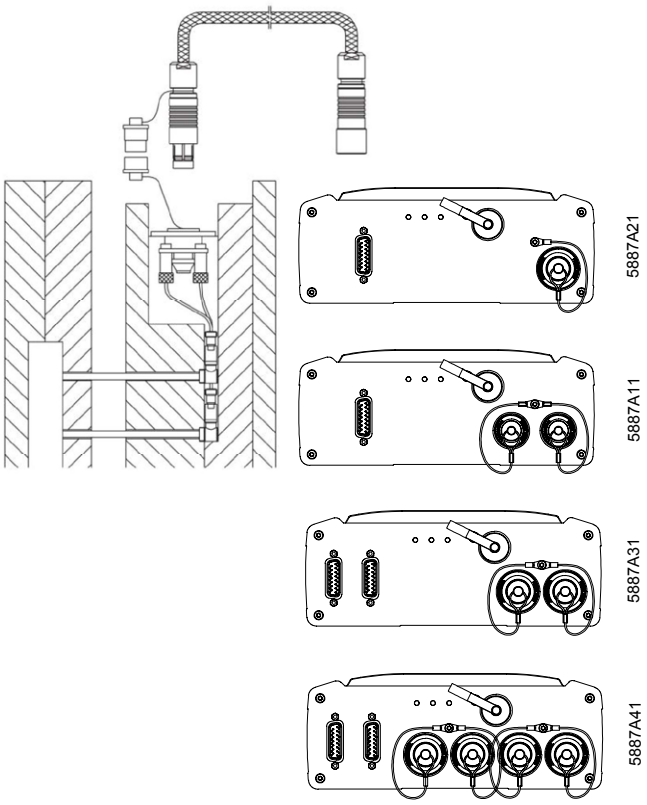
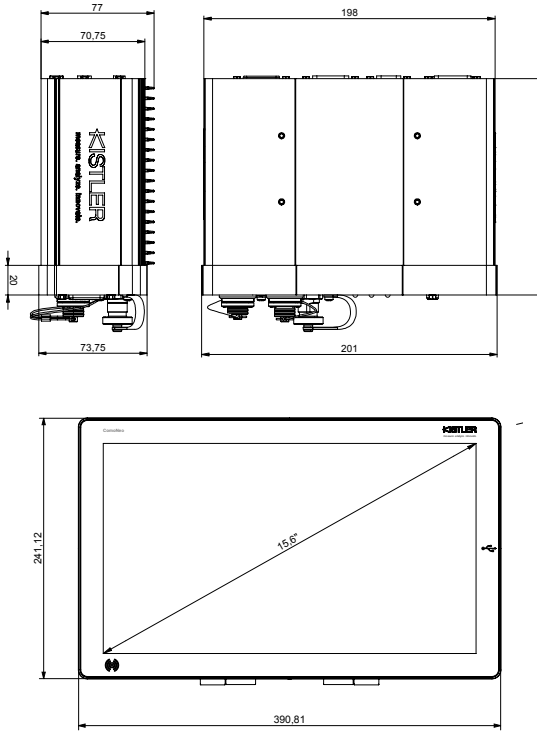


Fig. 1: Sensor Type 9239A... with charge amplifier Type 5159A





4-channel cable Type 1995A... on connector Type 1722A4...	8-channel cable Type 1997A... on connector Type 1722A8...
Type 5887A1	Type 5887A2
	Type 5887A3
	Type 5887A4

Fig. 2: Sensor Type 9239A... with ComoNeo monitoring system, Type 5887...

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Installation

Provide mounting bore as in Fig. 3. The front contact surface (ø 2,5 mm) for the sensor must be clean and machined flat. Apply a **thin film of grease** to the front face of the sensor (ø 2,5 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 1300A169 until it produces the prescribed charge of –5 910 pC (corresponds to 1 kN).
Fig. 4 shows an installation example.

Type 9239AA **Type 9239AB**

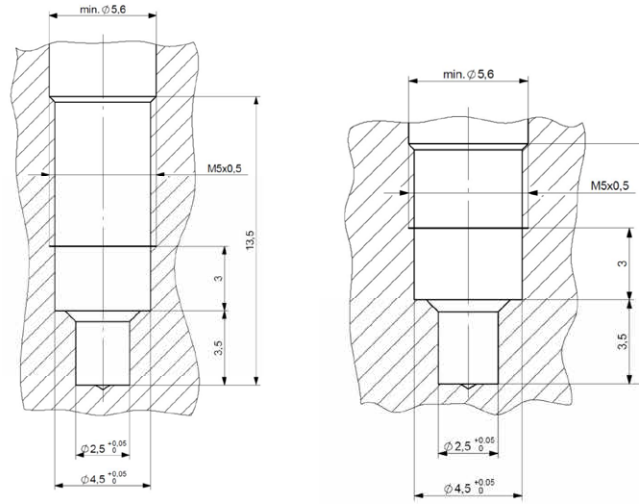


Fig. 3: Mounting bore

Installation example

Type 9239AA **Type 9239AB**

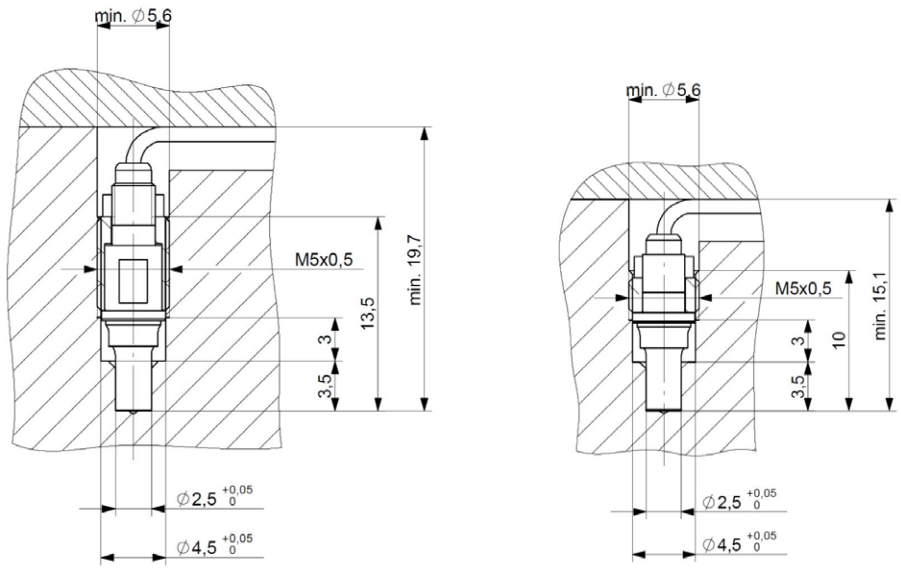


Fig. 4: Installation example longitudinal measuring pin Type 9239A...

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Accessories included	Type/Art. No.
• Mounting nut for 9239AA	9497A1
• Mounting nut for 9239AB	9497A2
• Mounting plate	65005208
• Connector (for single-wire variants with connector)	1839
• Identification plate	65005416

Optional accessories	Typ/Art. No.
Tools for installation	
• Tubular socket wrench	1300A169
• Preload tester	5991
• Hand-held charge amplifier	5995
Connecting cable	
• Connecting cable, coaxial, Teflon, for 9239AA... with mounting nut Type 9497A1, premounted (l min = 0,1 m, l max = 5 m)	1900A25Lsp
• Connecting cable, single-wire, M3 x 0.35 pos. open end, l=1.5 m	1900A17L1,5
• Connecting cable, single-wire, M3 x 0.35 pos. open end, l=5 m	1900A17L5,0
• Connecting cable, single-wire for contact elements Type 1712A and 1714A, M3 x 0.35 pos. - crimping pin, l=...m L = (L min = 0.04 m / L max = 1.5 m)	1900A17Zsp
Connectors and contact elements	
• 4-channel connector to 120 °C (for mini-coax and single-wire cables)	1722A4...
• 8-channel connector to 120 °C (for mini-coax and single-wire cables)	1722A8...
• 4-channel connector 120 ... 200 °C (for single-wire cables)	1708...
• 8-channel connector 120 ... 200 °C (for single-wire cables)	1710...
• 1-channel contact elements for single-wire variants	1712...
• 4-channel contact elements for single-wire variants	1714...

Ordering key

Typ 9239A

Sensorart

Exchangeable cable (single-wire and koax cable)	A
Short mounting length (integrated single-wire cable)	B
Individual sensitivity	I

Montage option

Mounting with mounting nut	M
Reserve	R

Cable option

Single-wire cable (PTFE)	S
Coaxial cable (PFA D2) , design A only	K
Without cable, design A only	X

Connector

Fischer KE102 (cabel K)	F
with connector Type 1839 in scope of delivery (Cable S)	E
without connector Type 1839 in scope of delivery (Cable S)	G

Cable detail

No cable, design A only	XXX
L=1.5 m, cable S, design A, connectors E and G	1,5
L=5 m, cable S, connectors E and G	5,0
L=… m, design A, cable K, connector F (coax)	-sp
Singlewire cable, M4 KIAG – crimping pin, L= min 0 (for contact element Types 1712B... and 1714B...), (design A only with cable S and connector G)	ZSp

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