

# Piezoelectric pressure sensor

Type 6239A...

## Tangential shot shell pressure sensor

Charge output pressure sensor for ballistic measurements on shot shells. Type 6239A... is primarily used in a tangential mounting configuration directly touching the plastic cartridge. This setup eliminates the need for drilling each shot shell prior to the ballistic pressure measurement.

- Pressure range up to 1 500 bar
- Tangential pressure measurement; geometric compatibility with other sensors for this application
- Excellent linearity <0.5%
- High sensitivity -5.6 pC/bar
- Mounting thread options: 3/8-24 UNF or M10x1
- Optional dial gauge accessory for accurate distance adjustment in tangential mounting (patent pending)

### Description

Rugged design and robust crystal sensing elements ensure a long lifetime even under demanding operating conditions.

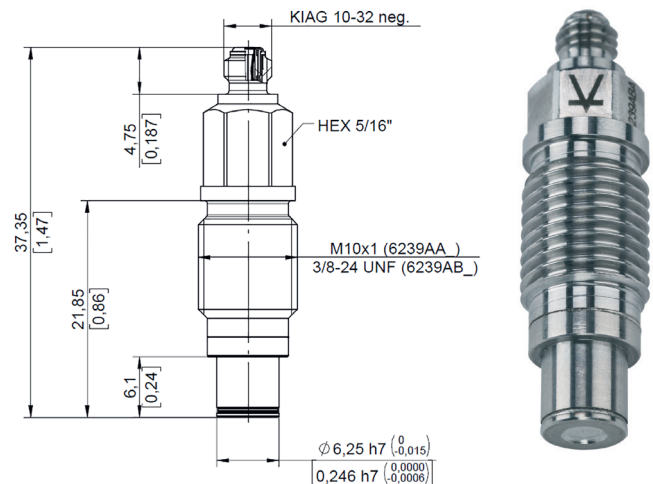
The sensing element is made of KI85 crystal, a Kistler proprietary material that offers a significantly higher sensitivity than a quartz element of the same dimension. Due to the excellent linearity of this sensor, it can be used to make very accurate measurements of very small pressures.

The special diaphragm design yields equal pressure values in tangential measurement configuration as compared to conventional pressure measurement (without drilling of shot shell).

### Application

Pressure sensor Type 6239A... is suitable for tangential measurements in direct contact with the plastic surface of shotgun cartridges (see Fig. 1). This mounting configuration is also referred to as flush mount. Drilling of the shot shell is not necessary, since the sensor accurately measures pressure based on the expansion of the plastic cartridge. This is a common method for the qualification of shotgun ammunition.

Other conventional pressure measurement applications require the sensor to be installed in a recessed configuration (see Fig. 2).



### Technical data

Range	bar	0 ... 1 500
Calibrated partial range	bar	150
Overload	bar	2 000
Sensitivity	pC/bar	-5,6
Linearity	% FSP	$\leq \pm 0,5$
Hysteresis	% FSP	$\leq \pm 0,5$
Natural frequency <sup>1)</sup>	kHz	> 300
Rise time	$\mu$ s	$\leq 1$
Acceleration sensitivity		
axial	bar/g	$\leq 0,001$
radial	bar/g	$\leq 0,0005$
Operating temperature range	$^{\circ}$ C	-40 ... 160
Thermal sensitivity shift -40 ... 160 $^{\circ}$ C	%	-2,5/4,5
Insulation resistance at 20 and 160 $^{\circ}$ C	$\Omega$	> $10^{13}$
Connector	Typ	10-32 UNF
Tightening torque	Nm	15
Weight	g	11
Measuring element	Material	KI85-crystal
Sensor body	Material	17-4 PH

<sup>1)</sup> The natural frequency is calculated from the rise time.

**Mounting**

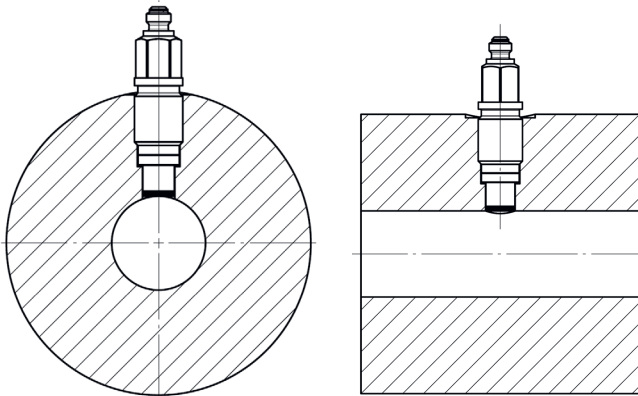


Fig. 1: Tangential/flush mounting configuration

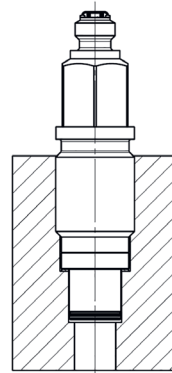


Fig. 2: Recessed mounting configuration

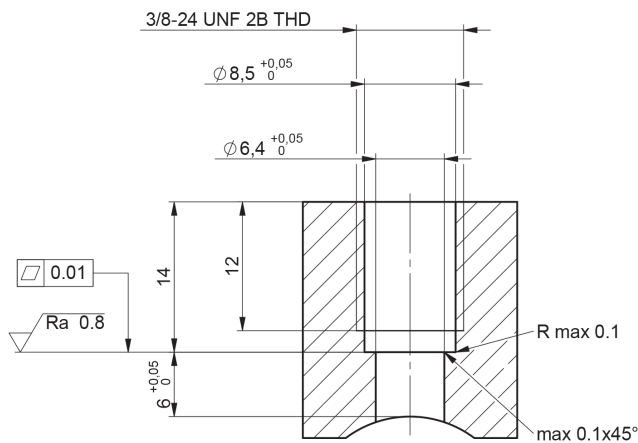


Fig. 3: Mounting bore dimensions for tangential/flush mounting of Type 6239ABA (3/8-24 UNF thread)

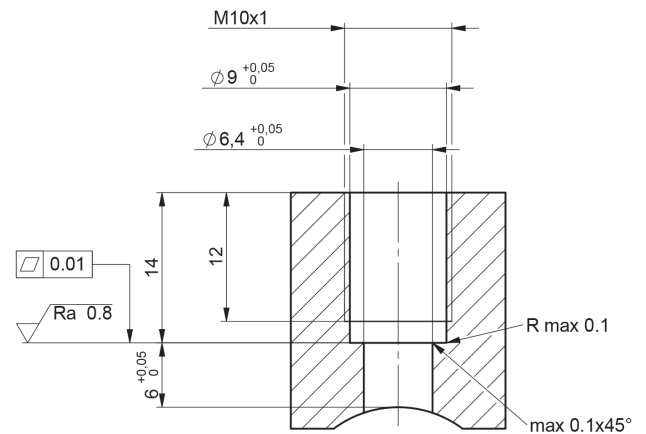


Fig. 4: Mounting bore dimensions for tangential / flush mounting of Type 6239AAA (M10x1 thread)

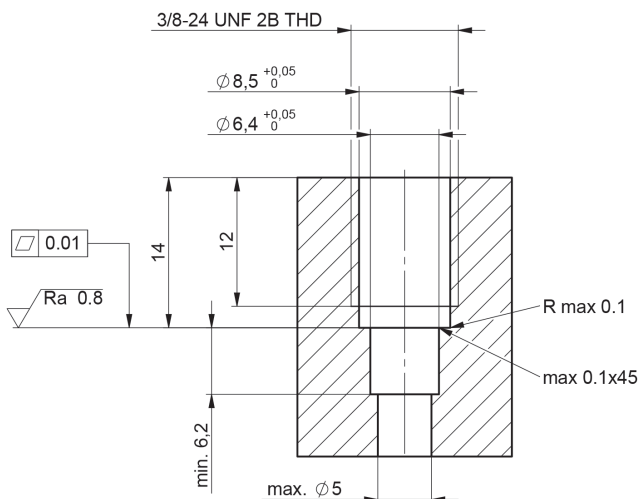


Fig. 5: Mounting bore dimensions for recessed mounting of Type 6239ABA (3/8-24 UNF thread)

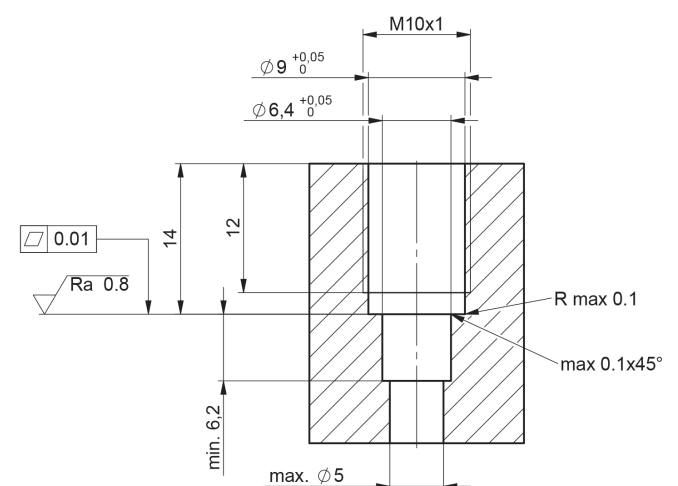


Fig. 6: Mounting bore dimensions for recessed mounting of Type 6239AAA (M10x1 thread)

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**Included accessories**

- Sealing ring 0.50 mm (standard) 10x
- Sealing ring 0.25 mm 10x
- Lubrication grease

**Type/Mat. No.**

1100A105  
1100A101  
1063

**Optional accessories**

- Surface finishing tool M10x1
- Surface finishing tool 3/8-24 UNF
- Torque wrench
- Tubular socket wrench hex. 8mm
- Connection cable (10-32 UNF pos. – 10-32 UNF neg.)
- Connection cable (10-32 UNF pos. – BNC pos.)
- Dial gauge M10x1
- Dial gauge 3/8-24 UNF
- Dummy cartridge for dial gauge Caliber 12
- Dummy cartridge for dial gauge Caliber 16
- Dummy cartridge for dial gauge Caliber 20
- Dummy cartridge for dial gauge Caliber 28
- Dummy cartridge for dial gauge Caliber .410
- Calibration adapter M10x1 for pressure generator Type 6906
- Calibration adapter 3/8-24 UNF for pressure generator Type 6906

**Type/Mat. No.**

1300A46A1  
1300A25A1  
1371B  
1373A1  
1699AA0,5  
1631C...  
1300A48A1  
1300A48A2  
1300A48Z1  
1300A48Z2  
1300A48Z3  
1300A48Z4  
1300A48Z5  
6923B3  
6923B4

**Ordering key**

		Type 6239A
M10x1 thread	A	□ □
3/8-24 UNF thread	B	
Piezoelectric Pressure Sensor		□ □
Piezoelectric Pressure Sensor with additional accessories Types 1300A46A1/2, socket wrench and hex spanner		

**Ordering Example**

- Piezoelectric pressure sensor 3/8-24 UNF thread with additional accessories

**Type**

6239ABB