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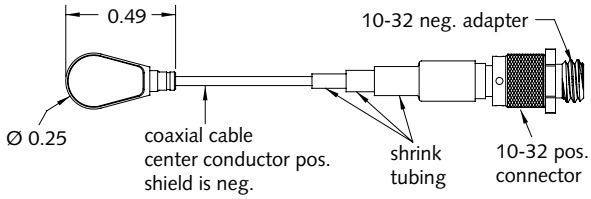
Ceramic Shear Accelerometer

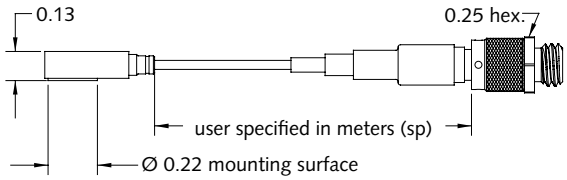
Type 8278A...

Miniature, 0.7 gram, charge mode accelerometer

Small, light weight general purpose accelerometer for vibration and shock measurements

- High impedance charge mode
- Ultra low base strain
- Wide frequency response ± 5%, 1 … 10 000 Hz
- Ground Isolated
- High sensitivity, 1.3 pC/g
- Integral cable
- Temperature –103 … 356 °F





Description

Type 8278A… is a wide frequency, ultra miniature, light weight accelerometer that contains a uniquely designed ceramic shear sensing element. The shear mode element design provides an immunity to base strain and transverse motion.

The standard Type 8278A… accelerometer includes an integral repairable Teflon jacketed 3ft. long cable terminated with a 10-32 pos. connector. Special length cables are also available. A 1729 10-32 neg. to 10-32 neg. adapter is provided to facilitate connection to standard extension cables with 10-32 pos. connectors. Type 8278A… is designed for wax or adhesive mounting and is supplied with a custom wrench to facilitate removal after testing.

External signal conditioning converts the charge developed in the ceramic element, due to shock and vibration, into a low impedance voltage signal. For example, Type 5050A… In-Line Charge Amplifier, can be powered by a power supply/coupler like Type 5165A… to create a representative voltage signal.

CE Compliant Information

Because high impedance, charge mode accelerometers contain no electronics, CE certification to the EMC Directive is not appropriate. When a high impedance accelerometer is used with a CE certified signal conditioner (i.e., charge amplifier....), it is said that this system is CE compliant.

Application

The light weight, low profile and small size of Type 8278A… accelerometer makes it ideal for: precision vibration measurements; modal analysis on small, thin walled structures or where space is limited and mass loading is of primary concern. Typical applications include product test stress screening and critical component evaluation as well environmental testing.

Technical data

Type		Unit	8278A500
Acceleration Range		g	± 500
Sensitivity, ±20%		pC/g	–1.3
Resonant Frequency, mounted, nom.		kHz	≥40*
Frequency Response, ±5%		Hz	1…10 000
Shock (1ms pulse width), max.		g	10 000
Transverse Sensitivity, max. 5%		%	3 Typ*
Amplitude Linearity		%FSO	±1
ELECTRICAL			
Capacitance (without connector), nom.		pF	100
Insulation Resistance	@ 70 °F	Ω	$\geq 10^{12}$
	@ 356 °F	Ω	$\geq 10^{8}$
Ground Isolation		MΩ	≥10
Environmental:			
Temperature Range, Operating		°F	–100 … 350
Temperature Coeff. of Sensitivity, nom.		%/°F	0.1
Base Strain Sensitivity @250με		g/με	0.001
Construction:			
Sensing Element		Type	Ceramic Shear
Construction		Seal	Epoxy
Connector		Type	10-32 neg.
Mounting		Type	Wax/Adhesive
Case Material		Type	Anodized Al.
Weight		grams	0.7

* wax mounted

1 g = 9.80665 m/s^2, 1 inch = 25.4 mm, 1 gram = 0.03527 oz, 1 lbf-in = 0.113 Nm

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This information corresponds to the current state of knowledge. Kistler reserves the right to make technical changes. Liability for consequential damage resulting from the use of Kistler products is excluded.

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Mounting

Type 8278A… can be attached to the test structure by adhesive or wax. The accelerometer's side cable facilitates orientation in confined areas. Reliable and accurate measurements require the mounting surface to be clean and flat. The Operating Instruction Manual for Type 8278A… accelerometer provides detailed information regarding mounting surface preparation

The recommended adhesives to be placed between the accelerometer's base and the test object surface include:

- Petro Wax
- Loctite 430 general purpose for adhesion to metals
- Loctite 495 general purpose for adhesion to other materials

Note: Removal of an adhesively mounted accelerometer is extremely difficult and care should be exercised during the removal process. An appropriate adhesive solvent and Type 1378 custom designed removal wrench should be used to twist the accelerometer off of the test object.

Accessories included	Type
• Petro Wax	8432
• Removal Wrench	1388
• Adapter 10-32 neg. to 10-32 neg.	1729

Optional accessories	Type
• High impedance cable, 10-32 pos. to BNC	1631C...
• High impedance cable, 10-32 Pos. to 10-32 Pos.	1635C...
• In-line charge amp	5050B...
• Output cable, BNC pos. to BNC pos.	1511A...
• Conditioning and Data Acquisition	5165A...

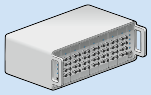
Ordering key

Measuring Range	8278A □ □
±500g	500

Variants	
User specified cabe length (X = length in meters)	X

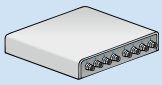
Charge output sensor and IEPE converter

	Measuring	Connecting	Amplifying		Acquiring	Analyzing
Charge input sensor	Type 82... 10-32 Neg.	Type 1635C... 10-32 Pos. to 10-32 Pos.	Type 5050B... 10-32 Neg. to BNC Neg.	Type 1511A... BNC Pos. to BNC Pos.	IEPE compatible DAQ	Laptop




Charge output and Kistler LabAmp

	Measuring	Connecting	Amplifying and acquiring		Analyzing
Charge/IEPE sensors	Type 82... 10-32 Neg.	Type 1631C... 10-32 Pos. to BNC Pos.	Type 5165A... BNC Neg. to Ethernet Port OR BNC Neg.	Ethernet cable OR Type 1511A... BNC Pos. to BNC Pos. for analog output	Laptop



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