

Ceramic Shear Accelerometer

Type 8778A500...

Ultra miniature, 0.4 gram weight, voltage mode accelerometer

Small, lightweight general purpose accelerometer for vibration measurements in a wide range of applications. Available in two cable versions: the standard with a permanent attached cable and the M14 with a field replaceable twisted wire pair.

- Low impedance, voltage mode
- Ultra low base strain and thermal transient response
- Wide frequency response, 2 ... 9,000 Hz ($\pm 5\%$)
- Ground isolated assembly
- High 10 mV/g sensitivity
- Conforming to CE

Description

Types 8778A500... and 8778A500M14... are high frequency, ultra miniature, lightweight accelerometers that contain a uniquely designed ceramic shear-sensing element. The shear mode element design provides an immunity to thermal transients, base strain and transverse motion.

An internal microelectronic Piezotron signal conditioning circuit converts the charge developed in the ceramic element, as a result of the accelerometer being subjected to a vibration, into a useable high level voltage output signal at a low impedance level. The standard Type 8778A500... accelerometer includes a 0.9 m [3 ft] long integral fluoro-polymer jacketed cable terminated with a 10-32 neg. connector, while the M14 version features a field replaceable twisted wire pair and connector. The units are designed for wax or adhesive mounting and are supplied with a custom wrench to facilitate removal after testing. Power to the Type 8778A500... accelerometers can be provided by any Kistler Coupler Type 51..., or by any industry standard voltage mode IEPE (Integral Electronic Piezo-Electric) power supply/coupler.

Application

The lightweight, low profile and miniature size of accelerometer Type 8778A500... 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 included PC Board stress screening and critical component evaluation on disk drive assemblies.

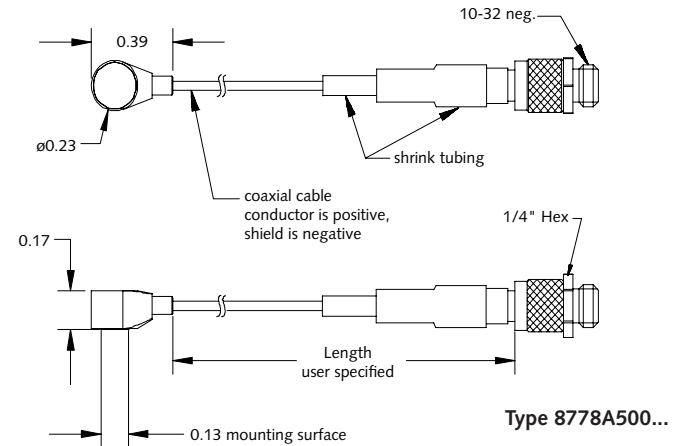


Type 8778A500...

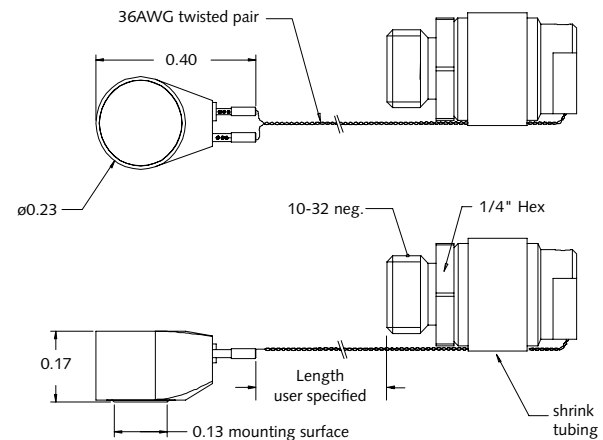


Type 8778A500M14...

Dimensions



Type 8778A500...



Type 8778A500M14...

Dimensions are shown in mm [in], unless otherwise noted.

Technical data

Type	Unit	8778A500...
Acceleration range	g	±500
Acceleration limit	gpk	±750
Threshold (noise 100 μV_{rms}), nom.	g_{rms}	0.01
Sensitivity, nom.	mV/g	10
Resonant frequency mounted, nom.	kHz	70*
Frequency response, $\pm 5\%$	Hz	2 ... 9,000*
Amplitude non-linearity	%FSO	±1
Time constant, nom.	s	≥0.3
Transverse sensitivity, nom. (max. 5)	%	3

Environmental

Base strain sensitivity @250 $\mu\epsilon$	$g/\mu\epsilon$	0.009*
Shock limit (1 ms pulse width), max.	gpk	5,000
Temperature coeff. of sensitivity	%/°C [%/°F]	-0.14 [-0.08]
Operating temperature range (4 mA supply current)	°C [°F]	-55 ... 120 [-65 ... 250]

Output

Bias, nom.	VDC	11
Impedance	Ω	<100
Voltage, full-scale	V	±5

Source

Voltage	VDC	18 ... 30
Constant current	mA	2 ... 20

Construction

Sensing element	type	ceramic-shear
Case/Base	material	Aluminum/ hard anod- ized/Titanium
Degree of protection case/connector (EN 60529)		IP66
Connector-terminates	type	10-32 neg.
Ground isolation, min.	M Ω	10
Weight (excluding cable)	grams	0.4
Mounting	type	adhesive/wax

1 g = 9.80665 m/s², 1 in = 25.4 mm, 1 Gram = 0.03527 oz, 1 lbf-in = 0.113 N-m

*wax mounted

Mounting

The Type 8778A500... 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 that the mounting surface be clean and flat. The operating instruction manual for the accelerometer Type 8778A... (002-085) provides detailed information regarding mounting surface preparation. and critical component evaluation on disk drive assemblies.

- Petro wax, Type 8432
- Loctite 430 general purpose for adhesion to metals
- Loctite 495 general purpose for adhesion to other materials

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

Included accessories

- Petro wax 8432
- Removal wrench 1378

Optional accessories

- Connecting cable for low impedance sensors 1761B
- Cable kit (needed to connect Type 8778A500... to Kistler couplers) 1764A

Ordering key

Type 8778A500 

Connector

10-32 neg./integral coax. cable (L = 1m)	-
10-32 neg./twisted pair cable (L = 1m)	M14
10-32 neg./integral coax. cable	sp
10-32 neg./twisted pair cable	M14sp

Related accelerometers

- integral cable, 1.6 gram weight 8728A500
- top 10-32 connector, 1.9 gram weight 8730A500
- integral cable, 1.1 gram weight 8732A500
- integral cable, 1.1 gram weight with mounting flange 8734A500