

# K-Shear<sup>®</sup> Accelerometer

Type 8793A...

## Low Profile, Voltage Mode Triaxial Accelerometer

The triaxial accelerometer Type 8793A... measures shock and vibration in three mutually perpendicular axis. They are available in two extended operating temperature ranges; the Type 8793A500M5 for high temperature operation and the Type 8793A500M8 for low temperature cryogenic operation. The Type 8793A500M3 extends the low end frequency response of the basic Type 8793A... down to 1 Hz.

- Low impedance voltage mode
- Low profile design
- Quartz shear accuracy and stability
- High (+330 °F) and low (-320 °F) temperature versions
- Hermetically sealed
- Conforming to CE

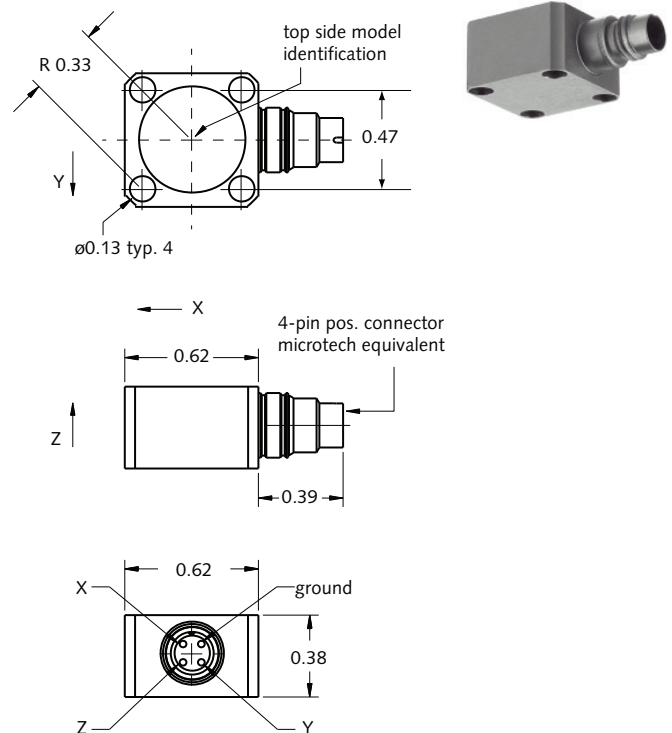
### Description

Contained within the housing of the accelerometer Type 8793A... are three individual shear sensitive quartz elements oriented such that they only respond to a vibration component occurring in the x, y and z axis. Each sensing element is internally connected to a Piezotron<sup>®</sup> microelectronic circuit that converts the charge signal from the quartz piezoelectric element into a low impedance voltage output signal.

Kistler's K-Shear sensing elements are hermetically sealed in a stainless steel housing and provide long term stability, a wide operating frequency range along with extremely low sensitivity to thermal transients and transverse acceleration.

### Application

The accelerometer measures simultaneously the three components of the acting acceleration (i.e., shock or vibration), permitting the resulting vector to be determined, magnitude and direction. Because of its low weight, the sensor is especially useful for measuring on small and lightweight structures, where mass loading must be kept at a minimum. It can also be used for drop tests and finds application in a wide variety of vehicle vibration studies, modal analysis, product development and aerospace testing.



### Accessing TEDS Data

Accelerometers with a "T" suffix are variants of the standard version incorporating the "Smart Sensor" design. Viewing an accelerometer's data sheet requires an Interface/Coupler such as Kistler's Type 5134B... or 5000M04 with TEDS Editor software. The Interface provides negative current excitation (reverse polarity) altering the operating mode of the PiezoSmart<sup>®</sup> sensor allowing the program editor software to read or add information contained in the memory chip.

### Mounting

Reliable and accurate measurements require that the mounting surface be clean and flat. The sensor can be attached to the structure with supplied screws. The operating instruction manual for the Type 8793A... provides detailed information regarding mounting surface preparation.

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**Technical Data**

Specification	Unit	Type 8793A500
Acceleration range	g	±500
Acceleration limit	gpk	±1000
Transverse acceleration limit	gpk	±1000
Threshold (noise 200 µVrms), nom.	grms	0.002
Sensitivity, ±5 %	mV/g	10
Resonant frequency mounted, nom.	kHz	>80
Frequency response, ±5 %	Hz	2.5 ... 10000
Type 8793A500M3	Hz	1 ... 10000
Amplitude non-linearity	%FSO	±1
Time constant, nom.	s	0.5
Type 8793A500M3	s	1
Transverse sensitivity, nom. (max. 3)	%	1.5
Long term stability	%	±1

**Environmental**

Base strain sensitivity @ 250 µε	g/µε	0.015
Shock limit (1 ms pulse)	gpk	5000
Temperature coeff. of sensitivity	%/°F	-0.02
Operating temperature range		
Type 8793A500	°F	-65 ... 250
Type 8793A500M5	°F	-65 ... 330
Type 8793A500M8	°F	-320 ... 250
Type 8793A500T	°F	-40 ... 250
Storage temperature range		
Type 8793A500	°F	-100 ... 300
Type 8793A500T	°F	-67 ... 257

**Output**

Bias, nom.	VDC	11
Impedance	Ω	<100
Voltage full scale	V	±5
Current	mA	2

**Source**

Voltage	VDC	20 ... 30
Constant current	mA	2 ... 18
Impedance, min.	kΩ	100

**Construction**

Sensing element	Type	quartz-shear
Case/base	material	stainless steel
Degree of protection case/connector	Type	hermetic
Connector	Type	4-pin pos.
Ground isolated		with pad
Mass	grams	11
Mounting (∅0.13 hole)	Type	cap screw
Tightening torque	N·m	0.45 ... 0.56

**Included Accessories**

- 4 cap screws 4-40 UNC-2Ax1/2" long
- 4 cap screws M2,5x12 mm long

**Type**

- 431-0375-005
- 431-0475-004

**Ordering Key**

**Range**

±500 g	500
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Type 8793A

**TEDS Templates**

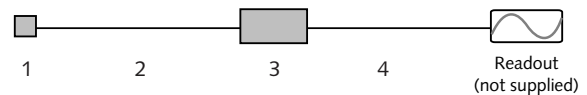
Standard	-
Extended lower cut-off frequency	M3
High temperature	M5
Low temperature	M8
Default, IEEE 1451.4 V0.9 Template 0 (UTID 1)	T
IEEE 1451.4 V0.9 Template 24 (UTID 116225)	T01
LMS Template 117, Free format Point ID	T02
LMS Template 118, Automotive Format (Field 14 Geometry = 0)	T03
LMS Template 118, Aerospace Format (Field 14 Geometry = 1)	T04
P1451.4 v1.0 template 25 - Transfer Function Disabled	T05
P1451.4 v1.0 template 25 - Transfer Function Enabled	T06

**Measuring Chain**

- 1 Low impedance sensor
- 2 Sensor cable, 4-pin neg. to 3x BNC pos.
- 3 Power supply/signal conditioner
- 4 Output cable, BNC pos. to BNC pos.

**Type**

- 8793A...
- 1756B...
- 51...
- 1511



1 g = 9.80665 m/s<sup>2</sup>, 1 Inch = 25.4 mm, 1 gram = 0.03527 oz, 1 lbf-in = 0.113 N·m

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