

# K-Shear® Accelerometers

Type 8702B500..., 8704B500...

## General Purpose, Voltage Mode Accelerometers

Small, relatively light weight general purpose accelerometers for vibration measurements in wide range of applications. Available in high and low operating temperature versions; two with a ground isolated option, these accelerometers feature a rugged, hermetically sealed construction.

- Low impedance, voltage mode
- Quartz-shear sensing elements
- Ultra-low base strain
- Minimal thermal transient response
- Lightweight, hermetically sealed titanium case
- Conforming to CE

### Description

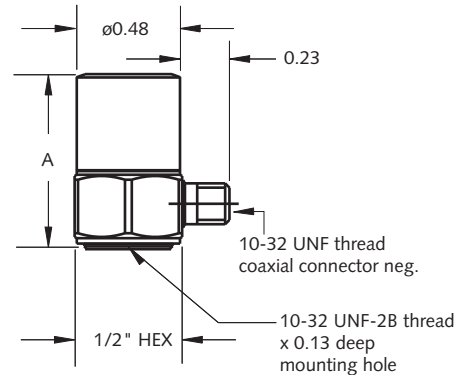
The Type 8702B500 series side connector and 8704B500 top connector accelerometer series use a unique shear mode sensing element made of stable quartz crystals. The quartz sensing elements afford excellent long-term stability that ensure repeatable, accurate measurements for many years. Additionally the shear element design provides low transverse sensitivity along with an insensitivity to base strain and thermal transients.

All units are hermetically sealed and are constructed entirely of titanium or a combination of titanium and stainless steel. An internal circuit Piezotron® impedance converter provides a high signal level at low impedance output.

Models identified with an M1 and M3 are ground isolated versions. The Type 8702B500M5 extends the operating temperature range to 330 °F while the Type 8702B500M8 operates at a low cryogenic temperature of -320 °F.

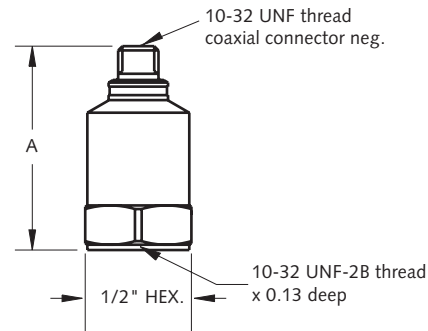
### Application

All types are designed for general purpose vibration measurement in a laboratory or industrial environment. They can be used for environmental testing (with or without temperature cycling), ESS, vehicle tests, automotive NVH testing, rotating machinery vibration analysis.



Type 8702B500...

Dim	Type 8702B500	8702B500M1,M3	8702B500M5/M8
A	0.63	0.67	0.80



Type 8704B500...

Dim	Type 8704B500	8704B500M1/M3
A	0.83	0.85

### 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® sensor allowing the program editor software to read or add information contained in the memory chip.

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**Technical Data**

Specification	Unit	Type 8702B500	Type 8704B500
Acceleration range	g	±500	±500
Acceleration limit	gpk	±1000	±1000
Transverse acceleration limit	gpk	±1000	±1000
Threshold nom. (noise 130 µVrms)	grms	0.01	0.01
Sensitivity, ±5 %	mV/g	10	10
Resonant frequency mounted, nom.	kHz	54	54
	Type 8702B500M5, M8	73	–
Frequency response, ±5 %	M1 (–5...10 %)	1 ... 10000	1 ... 10000
	M3	0.5 ... 10000	0.5 ... 10000
	Type 8702B500M5, M8	2 ... 7000	–
Amplitude non-linearity	%FSO	±1	±1
Time constant nom.	s	1	1
	M3	2	2
	Type 8702B500M5, M8	0.5	–
Transverse sensitivity nom., (max. 3)	%	1.5	1.5
Long term stability	%	±1	±1

**Environmental**

Base strain sensitivity @ 250 µε	g/µε	0.01	0.01
Random vibration max.	grms	2000	2000
Shock limit (1 ms pulse)	gpk	5000	5000
Temperature coefficient of sensitivity	%/°F	–0.03	–0.03
Operating Temperature range	°F	–65 ... 250	–65 ... 250
	Type 8702/8704B500T	–65 ... 210	–65 ... 210
	Type 8702B500M5	–65 ... 330	–
	Type 8702B500M8	–320 ... 250	–
Storage temperature range	°F	–100 ... 300	–100 ... 250

**Output**

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

**Source**

Voltage	VDC	20 ... 30	20 ... 30
Constant current	Type (8702B500M5/M8 = 2 ... 18)	4	4
Impedance min.	kΩ	100	100

**Construction**

Sensing element	Type	quartz-shear	quartz-shear
Case/base	material	Titanium	Titanium
Degree of protection case/connector	Type	hermetic	hermetic
Connector	Type	10-32 neg.	10-32 neg.
Ground isolated	Type 8702/8704B500M1, M3, M5	yes	yes
Weight	grams	8.2	7.1
	Type 8702/8704B500M...	9.2	7.6
Mounting (10-32 thd. x 0.13 dp)	Type	stud	stud
Mounting torque	Type 8702B500M5, M8	18	18

1 g = 9.80665 m/s<sup>2</sup>, 1 Inch = 25.4 mm, 1 gram = 0.03527 oz, 1 lbf-in = 0.1129 N-m

### Mounting

A threaded 10-32 UNF stud provides positive attachment of the accelerometer to the test structure. Reliable and accurate measurements require that the mounting surface be clean and flat. The operating instruction manual for the Type 8702B... and 8704B... series accelerometers provides detailed information regarding mounting surface preparation.

### Included Accessories

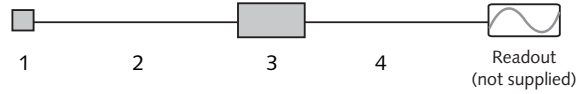
- 10-32 mounting stud **Type 8402**
- Mounting stud, 10-32 to M6; shipped only outside N.A. **Type 8411**

### Optional Accessories

- Mounting magnet **Type 8452A**
- Triaxial mounting cube **Type 8502**

### Measuring Chain

- |  |                            |
|--|----------------------------|
| 1 Low impedance sensor                 | <b>Type 8702/04B500...</b> |
| 2 Sensor cable, 10-32 pos. to BNC pos. | <b>1761B...</b>            |
| 3 Power supply/signal conditioner      | <b>51...</b>               |
| 4 Output cable, BNC pos. to BNC pos.   | <b>1511</b>                |



### Ordering Key

Type 8702B		□	□	□
<b>Range</b>	±500 g	500		
<b>Variant</b>	Standard	-		
	Ground isolated	M1		
	Long time constant and ground isolated	M3		
	High temperature	M5		
	Low temperature	M8		

### TEDS Templates

Standard	-
Default, IEEE 1451.4 V0.9	T
Template 0 (UTID 1)	T01
IEEE 1451.4 V0.9	T01
Template 24 (UTID 116225)	T02
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

### Ordering Key

Type 8704B		□	□	□
<b>Range</b>	±500 g	500		
<b>Variant</b>	Standard	-		
	Ground isolated	M1		
	Long time constant and ground isolated	M3		

### TEDS Templates

Standard	-
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IEEE 1451.4 V0.9	T01
Template 24 (UTID 116225)	T02
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

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