

# K-Shear<sup>®</sup> Accelerometer

Type 8730A...

## Miniature, Stud Mount, Voltage Mode Accelerometer

Small, 1.9 gram weight general purpose accelerometer for vibration measurements in wide range of applications. Available with an integral 5-40 UNC mounting stud (Type 8730AE500: M3), this light weight hermetically sealed accelerometer features a wide frequency response.

- Low impedance voltage mode
- Quartz shear sensing element
- Ultra-low base strain sensitivity
- Minimal thermal transient response
- Ground isolated version available
- Conforming to CE

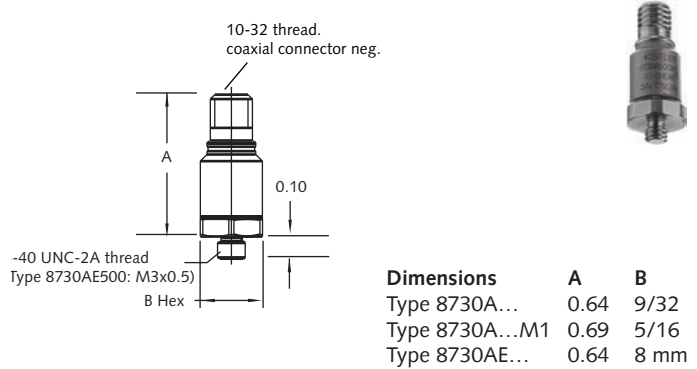
### Description

The light weight, Type 8730A... accelerometer series uses Kistler's uniquely designed K-Shear quartz sensing element. Operating in the shear mode with precisely cut quartz plates, allows the accelerometers to exhibit ultra low sensitivity to thermal transients, base strain and transverse motion. Housed in a hermetically sealed titanium case, the quartz sensing elements afford excellent long-term stability that ensures repeatable and accurate measurements.

The standard Type 8730A... and the low temperature 8730A500M8 accelerometer weighs only 1.9 grams while the M1 version which is slightly larger and "off-ground" weighs 2.5 grams. Internal microelectronic Piezotron<sup>®</sup> signal conditioning circuit converts the charge developed in the quartz element as a result of the accelerometer being subjected to a vibration, into a useable high level voltage signal at a low impedance output. The low impedance output provides high immunity to noise and insensitivity to cable motion. Kistler's design allows the use of rugged, low cost coaxial cable between the accelerometer and power/readout equipment. Where minimum cable and connector weight are desirable, Type 1761B... general purpose cable is recommended.

### Application

The light weight and small size of Type 8730A... series is recommended for precision measurements on small, thin-walled structures or where space is limited. Changes in dynamic response of the test article due to accelerometer mass loading are minimize when using this family of accelerometers. It is ideal for high frequency vibration measurements.



Dimensions	A	B
Type 8730A...	0.64	9/32
Type 8730A...M1	0.69	5/16
Type 8730AE...	0.64	8 mm

### Mounting

Type 8730A... can be attached to the test structure by its integral 5-40 stud. Reliable and accurate measurements require that the mounting surface be clean and flat. The instruction manual for Type 8730A... accelerometer series provides detailed information regarding mounting surface preparation.

### Technical Data

Specification	Unit	Type 8730A500
Acceleration range	g	±500
Acceleration limit	gpk	±1 000
Transverse acceleration limit	gpk	±1 000
Threshold (noise $\mu V_{rms}$ ), nom.	grms	0.01 (130)
Type 8730A ... M1, M8	grms	0.02 (200)
Sensitivity, $\pm 10$ %	mV/g	10
Resonant frequency mounted, nom.	kHz	76
Frequency response, $\pm 5$ %	Hz	2 ... 10 000
Type 8730A ... M1	Hz	2 ... 7 000
Amplitude non-linearity	%FSO	±1
Time constant, nom.	s	0.5
Transverse sensitivity nom. (max. 3)	%	1.5

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### Environmental

Base strain sensitivity @ 250 µε	g/µε	0.05
Type 8730A... M1	g/µε	0.01
Shock (1 ms pulse)	gpk	5 000
Temperature coeff. of sensitivity	%/°F	-0.03
Operating temperature range	°F	-65 ... 250
Type 8730A... M8	°F	-320 ... 250
Temperature range storage	°F	-100 ... 250
Type 8730... M8	°F	-320 ... 250

### 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

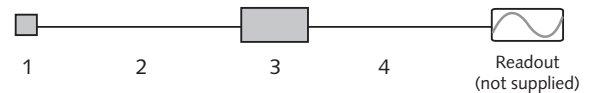
### Construction

Sensing element	type	quartz-shear
Housing/base	material	Titanium
Sealing-housing/connector	type	hermetic
Connector	type	10-32 neg.
Ground isolated		yes
Mass	grams	1.9
Type 8730A500M1	grams	2.5
Mounting (5-40 thd.x0.10)	type	stud
Type 8730AE... (M3 thd.x0.5)		
Mounting torque	lbf-in	10

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

### Measuring Chain

- |   |                                       |      |          |
|---|---------------------------------------|------|----------|
| 1 | Low impedance sensor                  | Type | 8730A... |
| 2 | Sensor cable, 5-44 pos. to 10-32 pos. |      | 1761B... |
| 3 | Power supply/signal conditioner       |      | 51...    |
| 4 | Output cable BNC pos. to BNC pos.     |      | 1511     |



### Ordering Key

#### Range

±500 g (5-40 studx0.10)	500
±500 g (M3 studx12.7)	E500

#### Variants (M1 AE version not available)

Standard	-
Ground isolated (not available for Type 8730AE500)	M1
Low temperature	M8

8730A

