

K-Shear[®] Accelerometer

Type 8743A...

High Resonant Frequency, Shock Accelerometer

Quartz shock accelerometer for measuring impulse, impact and pyrotechnic shock. Type 8743A... shock accelerometers have a rugged welded construction and integral stud to ensure a rigid coupling to the test structure.

- Low impedance, voltage mode
- Unique quartz shear-sensing element
- 5,000 ... 100,000 g range
- Low transverse sensitivity
- Rugged connector for repeated connection
- Wide bandwidth, high resonant frequency
- Conforming to CE

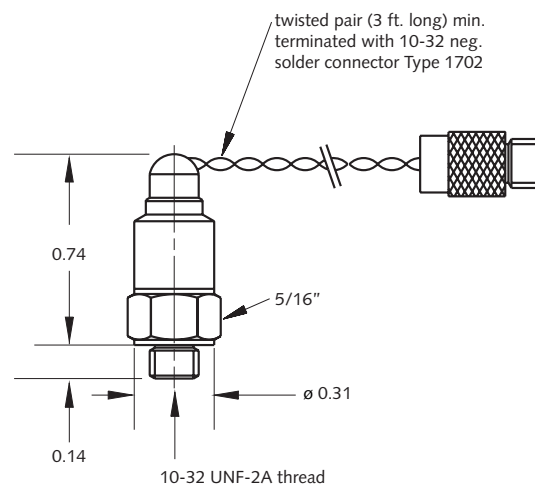
Description

The sensing element contained within this shock accelerometer series features a unique, shear mode, four quartz crystal configuration combined with an annular pre-load sleeve and seismic mass. The element design provides a high 100 kHz resonance frequency ensuring accurate measurement of high speed events with zero shift and internal amplifier saturation, virtually eliminated. These shock sensors exhibit insensitivity to thermal transients with extremely low transverse and base strain sensitivity. Using quartz as the sensing material adds a valuable performance benefit because quartz will not depolarize if exposed to high shock. The case isolated option uses a patented technique that ensures high resonant frequency while providing electrical isolation.

An internal microelectronic Piezotron signal conditioning circuit converts the charge developed in the quartz element, as a result of the accelerometer being subjected to shock, into a useable high level voltage output signal at a low impedance level. The low impedance output provides high immunity to noise and insensitivity to cable motion.

Application

The Type 8743A... accelerometer is ideally suited for high g level shock tests with metal-to-metal impacts and mid-to-far field pyrotechnic measurements.



Outline drawing for Type 8743A... (units: [in])

Mounting

Type 8743 version uses an integral 10-32 UNF stud. Reliable and accurate measurements require that the mounting surface be clean and flat. The instruction manual for the shock accelerometer series provides detailed information regarding mounting surface preparation.

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Technical Data

Specification	Unit	Type 8743A5	Type 8743A10	Type 8743A20	Type 8743A50	Type 8743A100
Acceleration range	g	±5,000	±10,000	±20,000	±50,000	±100,000
Acceleration limit	g _{pk}	±6,000	±12,000	±24,000	±60,000	±110,000
Threshold, nom.	g _{rms}	0.13	0.25	0.5	1.3	2.6
Sensitivity, ±5 %	mV/g	1	0.5	0.25	0.1	0.05
Resonant frequency mounted, nom.	kHz	100				
Frequency response, ±7 %	Hz	1 ... 10,000	1 ... 10,000	1 ... 10,000	1 ... 10,000	0.5 ... 10,000
Amplitude non-linearity	%FSO	±1				
Time constant, nom.	s	≥0.5	≥0.5	≥0.5	≥0.5	≥1
Transverse sensitivity, nom. (max. 5)	%	1.5				

Environmental

Base strain sensitivity @ 250 µε	g/µε	0.005				
Shock (1 ms pulse)	g _{pk}	50,000	50,000	50,000	100,000	120,000
Temperature coeff. of sensitivity	%/°F	-0.03				
Operating temperature range	°F	-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	quartz-shear				
Housing/Base	material	St. Stl.				
Sealing housing/connector	type	hermetic				
Connector	type	10-32 neg. int.				
Mass	grams	4.5				
Mounting (10-32 x 0.14)	type	10-32 UNF-2A				
Mounting torque	lbf-in	18±2				

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

Measuring Chain

- 1 Low impedance sensor
- 2 Sensor cable, 10-32 pos. to BNC pos.
- 3 Power supply/signal conditioner
- 4 Output cable, BNC pos. to BNC pos.

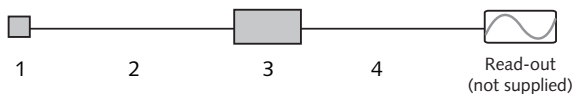
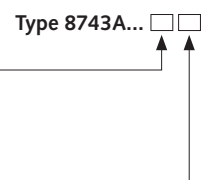
Type

- 8743A...
1761B...
51...
1511

Ordering Key

Range

±5,000 g	5
±10,000 g	10
±20,000 g	20
±50,000 g	50
±100,000 g	100



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