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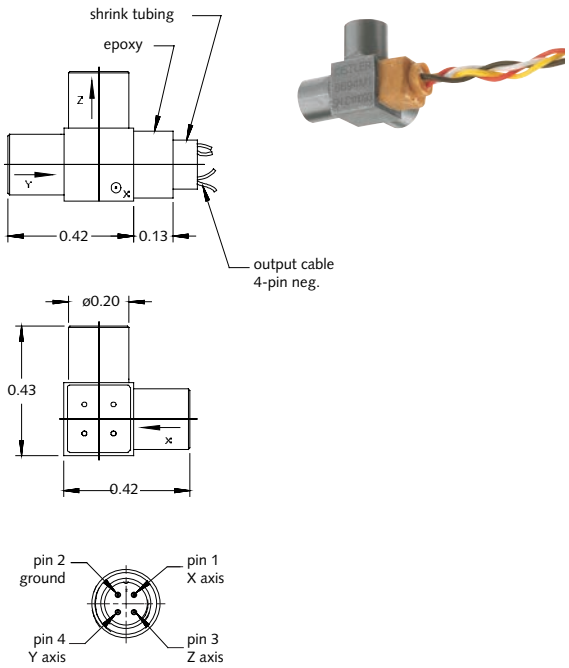
Piezotron® Accelerometer

Type 8694M1

Miniature, Wide Frequency Response, Voltage Mode Triaxial Accelerometer

Light 2.5 gram weight triaxial accelerometer that simultaneously measures vibration in three, mutually perpendicular axes (x, y and z). Designed primarily for measurement applications requiring a high frequency response capability in all three axis.

- Low impedance voltage mode
- Small size and lightweight, less than 2.5 grams
- Quartz sensing element
- Conforming to CE



Description

The triaxial accelerometer Type 8694M1 consists of three individual sensor elements mounted in an orthogonal configuration with each containing a preloaded quartz-crystal measuring assembly, a seismic mass, and a miniature hybrid Piezotron electronics. The signal conditioning circuit converts the charge developed in the quartz elements as a result of the accelerometer being subjected to a vibration, into a useable high level voltage output signal at a low impedance level.

Since the Type 8694M1 is a triaxial accelerometer, each sensor axis requires individual excitation power and signal processing. Kistler's 5100 Piezotron coupler series includes a wide selection of single and multichannel units that include both gain and frequency tailoring. Industry standard voltage mode IEPE (Integral Electronic Piezo-Electric) power supply/couplers can also be used with the accelerometer.

Application

The accelerometer Type 8694M1 is well suited for measuring dynamic acceleration, vibration and shocks in applications where minimum mass, small mounting size, and high resonant frequency are essential. The dynamic characteristics of very light test objects are practically not influenced by the accelerometer's small mass. The triaxial accelerometer is ideal for measuring acceleration vectors in space, vibration measurement on thin-walled structures, aircraft and automotive structures and general vibration measurements.

Mounting

The 8694M1 accelerometer series can be attached to the test surface by using wax, or adhesive. Reliable and accurate measurements require that the mounting surface be clean and flat. The operating instruction manual for the 8694M1 accelerometer provides detailed information regarding mounting surface preparation.
Adhesive mounting is recommended for the widest transfer of frequency information, but double-sided adhesive tape or wax may also be used. When using the anodized adaptor, Types 8439 or 8440, the accelerometer will be ground isolated from the test object.

The recommended adhesives, to be placed between the accelerometer and the object or a ground isolated mounting pad, include:

- Petro wax, Type 8432
- Loctite 430: general use between metals
- Loctite 495: general use between other materials.
- 3M Scotch Weld 1838: high temperatures, above 330 °F

Note: Removal of this substance is extremely difficult and care should be exercised when removing the accelerometer.

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Technical Data

Specification	Unit	Type 8694M1
Acceleration range	g	±500
Acceleration limit	gpk	±1000
Threshold, nom. (noise 100 µVrms)	grms	0.025
Sensitivity, ±5 %	mV/g	4
Resonant frequency mounted, nom.	kHz	80
Frequency response, ±5 %	Hz	10 … 20000
Amplitude non-linearity	%FSO	±1
Time constant, nom.	s	0.5
Transverse sensitivity nom.	%	<5
Environmental		
Random vibration, max.	grms	±2000
Shock limit (1 ms pulse)	gpk	±2000
Temperature coeff. of sensitivity	%/°F	–0.03
Operating temperature range	°F	–320 … 275
Storage temperature range	°F	–320 … 300
Output		
Bias, nom.	VDC	4
Impedance	Ω	25
Voltage full scale	V	±2
Current	mA	±2
Source		
Voltage	VDC	12 … 30
Constant current	mA	4
Impedance, min.	kΩ	100
Construction		
Sensing element	Type	quartz-compression
Case/base	material	titanium
Degree of protection case/connector		epoxy
Connector	Type	4-pin neg. int.
Ground isolated		with pad
Mass	grams	2.5
Mounting	Type	adhesive/wax

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

Included Accessories	Type
• Mounting wax	8432

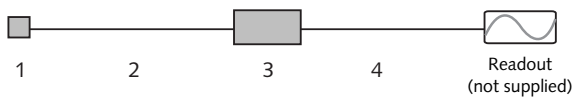
Optional Accessories	Type
• Mounting adapter with M3 thread	8439
• Mounting adapter with 4-40 UNC thread	8440

Ordering Key

Type 8694 □

Range	
±500 g	M1

Measuring Chain	Type
1 Low impedance sensor	8694M1
2 Sensor cable, 4-pin pos. to (3x) BNC pos.	1576...
3 Power supply/signal conditioner	51…
4 Output cable, BNC pos. to BNC pos.	1511



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