

# Quartz

Type 8044

## High Resonant Frequency, Charge Mode, Shock Accelerometer

Small, light weight accelerometer for measuring impulse and high impact shock.

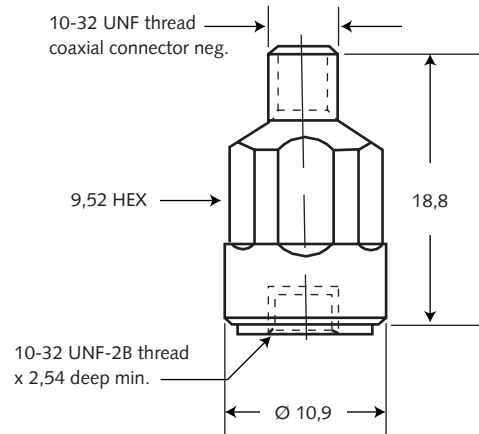
- High impedance charge mode
- Wide measuring range
- Stable quartz element
- Lightweight, miniature package



### Description

The 8044 accelerometer measures mechanical shock up to 30'000g. A stable quartz element design with a 90k Hz resonant frequency ensures accurate measurements and allows the unit to undergo high and repeated shock impacts with virtually no zero shift.

Contained within the sealed housing is a piezoelectric assembly consisting of a seismic mass preloaded to a quartz element stack. The force acting on the quartz measuring element is proportional to the acceleration in accordance with Newton's Law:  $F=ma$ . The element in turn, yields an electrical charge proportional to the force, and therefore to the acceleration. Due to the amount of pre-load on the quartz stack, the accelerometer can withstand acceleration greater in one direction than in the other. Therefore, it should not be exposed to accelerations greater than specified in its negative direction (force directed through the connector to the base). The measurement range of the accelerometer is adjustable when used with a laboratory style charge amplifier. The Types 557 or 558 impedance converters are a lower cost alternative to the laboratory amplifier allowing the measurement system to take on the appearance of the traditional voltage mode accelerometer and power supply/coupler.



### Application

Type 8044 is ideally suited for measuring and analyzing shock and vibration with very high amplitudes of acceleration. Typical applications include: high amplitude shock measurements, metal impacting, and explosive forming. The accelerometer's size and mass enable it to be used on small and lightweight objects without influencing their proper vibration mode.

### CE Compliant Information

Because high impedance, charge mode accelerometers contain no electronics, CE certification to the EMC Directive is not appropriate. When a high impedance accelerometer is used with a CE certified signal conditioner (i.e., charge amplifier...), it is said that this system is CE compliant.

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**Technical Data**

Type	Units	8044
Acceleration Range	g	-20000 ... 30000
Acceleration Limit	g	-30000 ... 100000
Transverse Acceleration Limit	g	20000
Sensitivity	pC/g	-0,3
Threshold	g <sub>rms</sub>	0,07
Resonant Frequency, mounted, nom.	kHz	90
Frequency Response ±5%	Hz	0 ... 8000
Amplitude Non-linearity	%FSO	±1
Insulation Resistance @ R.T.	Ω	>10 <sup>13</sup>
Capacitance, nom.	pF	60
Transverse Sensitivity	%	≈5
Base Strain Sensitivity @250µε	g/µε	0,3
Long Term Stability	%	1
Temperature Coefficient of Sensitivity	%/°C	-0,02
Temperature Range Operating	°C	-195 ... 200
Construction		
Sensing Element	type	quartz/ compression
Housing/Base	material	17-4 PH St. Stl.
Sealing Housing/Connector	type	welded epoxy
Connector	type	10-32 neg.
Weight	grams	7
Mounting Torque	Nm	2,7

1 g = 9,80665 m/s<sup>2</sup>, 1 inch = 25,4 mm, 1 gram = 0,03527 oz, 1 lbf-in = 0,1129 Nm

**Mounting**

The 8044 accelerometer can be attached to the test structure by a high strength 10-32 stainless steel stud. Reliable and accurate measurements require that the mounting surface be clean and flat. The application of Loctite epoxy is advisable to prevent loosening of these mounting studs in high g applications. In addition, it is recommended that the contacting surface between the accelerometer and the mounting face be lubricated with a thin layer of grease. The Operating Instruction Manual for the shock accelerometer provides detailed information regarding mounting surface preparation.

**Accessories Included**

- mounting stud, 10-32 UNF thread, 17-4 St. Stl. (7,1 mm long)

**Type**  
8404

**Optional Accessories**

- adaptor for triaxial mounting

**Type**  
8504

**Ordering Key**



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