

## Quartz

Type 9728A...

### Impulse Force hammer; extended high force range

Dynamic quartz sensor element contained within instrumented hammer is used to deliver a measurable force impulse (amplitude and frequency content) to excite a mechanical structure under test. A response signal measured with an accelerometer, in conjunction with a FFT analyzer, provides the transfer function of the structure.

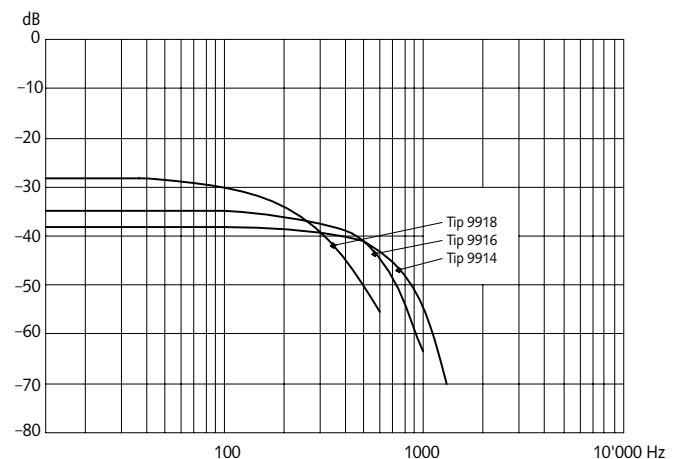
- Low impedance, voltage mode
- Quartz-sensing element guarantees long-term stability
- Accessories for various applications
- Sensor cable integrated to hammer handle
- Conforming to CE

#### Description

The dynamic response of a mechanical structure, while either in a development phase or an actual use environment, can readily be determined by impulse force testing. Using a FFT analyzer, the transfer function of the structure can be determined from a force pulse generated by the impact of a hammer and the response signal measured with an accelerometer. The impulse force test method yields extensive information about the frequency and attenuation behavior of the system under test.

The stainless steel head of an impulse force hammer is equipped with a low impedance quartz force sensor, which accepts impact tips varying in hardness. A selection of rubber tips and an extender mass allow the hammer to be tailored to impart to the test structure, a desired spectrum of frequencies. Shear quartz accelerometers operating in a voltage mode and featuring insensitivity to base strain, thermal transients and transverse motion are available to measure the response of the test specimens ranging from thin-walled structures to steel bridge members.

The hammer incorporates a quartz measuring cell with built-in Piezotron low impedance electronics. The cell's voltage mode operation guarantees a stable signal transmission, insensitive to ambient influences. A wide selection of single or multi-channel couplers are available to provide power and signal processing for the hammer and accelerometers.



#### Application

The hammer is ideal for testing heavy structures, such as large rotating machinery, machine tool centers, truck frames, and structural members at low frequencies. The impulse force hammer is used to analyze the dynamic behavior of mechanical structures. The vibrations induced by the hammer impact are measured by an accelerometer.

## Technical data

Type	Unit	9728A20000
Force range	N [lbf]	0 ... 20,000 [0 ... 5,000]
Maximum force	N [lbf]	26,700 [6,000]
Sensitivity, nom.	mV/N [mV/lbf]	0.2 [1]
Resonant frequency	kHz	20
Frequency range with rubber impact tip (-10 dB)	Hz	1,000
Time constant, nom.	s	500
Rigidity	kN/ $\mu$ m [lbf/ $\mu$ in]	2.7 [15.4]

## Environmental

Operating temperature range	°C [°F]	-20 ... 70 [0 ... 150]
Storage temperature range	°C [°F]	-20 ... 70 [0 ... 150]

## Output

Bias, nom.	VDC	11
Impedance	$\Omega$	<100
Voltage full-scale	V	$\pm 5$
Current	mA	2

## Source

Voltage	V	20 ... 30
Constant current	mA	2 ... 20
Impedance, min.	k $\Omega$	100

## Construction

Hammer head dimensions:

Diameter	mm [in]	51 [2]
Length	mm [in]	155 [6.1]
Weight	grams [lbs]	1,500 [3.3]
Length of handle	mm [in]	355 [14]
Connector	type	BNC neg.

1 g = 9.80665 m/s<sup>2</sup>, 1 in = 25.4 mm, 1 Gram = 0.03527 oz, 1 lbf-in = 0.113 N·m

## Accessories included

	Type
• Impact tip, rubber hard (black)	9914
• Impact tip, rubber medium (green)	9916
• Impact tip, rubber soft (gray)	9918
• Extender mass, 750 grams [1.65 lbs]	9930
• Plastic carrying case	

## Ordering key

Type 9728A

## Measuring range

20,000 N [5,000 lbf]	20 000
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