

Quartz Impulse Force Hammer

Type 9724A...

for Medium Force Range

Dynamic quartz sensor elements contained within instrumented hammers are 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.

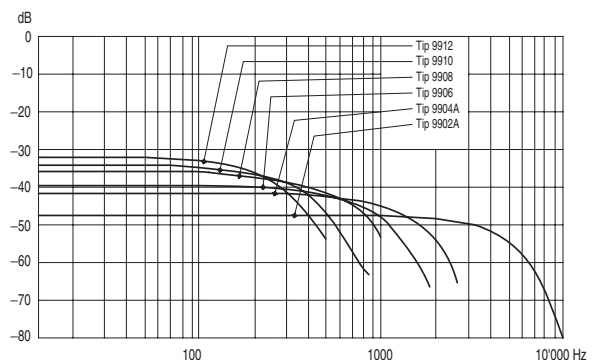
- Low impedance, voltage mode
- Quartz sensing element guarantees long-term stability
- Accessories for various applications
- Sensor cable integrated to hammer handle
- Conforming to CE

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 quartz, low impedance force sensor which accepts impact tips varying in hardness. A selection of steel, plastic, PVC and rubber tips along with 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 may be used for testing structures such as small rotating machinery and aerospace structural components at medium to high 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.

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Technical Data

| Specification | Unit | Type 9724A2000 | Type 9724A5000 |
|------------------------------------------------|-------|----------------|----------------|
| Force range | N | 0 ... 2 000 | 0 ... 5 000 |
| Maximum force | N | 10 000 | 10 000 |
| Sensitivity, nom. | mV/N | 2 | 1 |
| Resonant frequency | kHz | 27 | 27 |
| Frequency range with steel impact tip (-10 dB) | Hz | 6 600 | 6 900 |
| Time constant nom. | s | 500 | 500 |
| Rigidity | kN/μm | 0,8 | 0,8 |
| Temperature range operating | °C | -20 ... 70 | -20 ... 70 |

Output

| | | | |
|---------------------|-----|------|------|
| Voltage, full scale | V | ±5 | ±5 |
| Bias nom. | VDC | 11 | 11 |
| Impedance | Ω | <100 | <100 |

Source

| | | | |
|------------------|----|-----------|-----------|
| Voltage | V | 20 ... 30 | 20 ... 30 |
| Constant current | mA | 2 ... 20 | 2 ... 20 |

Hammer head dimensions

| | | | |
|------------------|-------|----------|----------|
| Diameter | mm | 23 | 23 |
| Length | mm | 89 | 89 |
| Weight | grams | 250 | 250 |
| Length of handle | mm | 231 | 231 |
| Connector | Type | BNC neg. | BNC neg. |

1 g = 9,80665 m/s², 1 Inch = 25,4 mm, 1 Gram = 0,03527 oz, 1 lbf-in = 0,113 N-m

Accessories Included

- Plastic carrying case
- Impact tip wrench
- Impact tip, steel
- Impact tip, steel with Delrin cap
- Impact tip, soft PVC
- Impact tip, rubber hard (green)
- Impact tip, rubber medium (red)
- impact tip, rubber soft (gray)
- Adapter for rubber impact tips
- Extender mass (125 grams)

Type

- 1370
- 9902A
- 9904A
- 9906
- 9908
- 9910
- 9912
- 9928
- 9924

Ordering Key

Measuring range

| | |
|--------|------|
| 2000 N | 2000 |
| 5000 N | 5000 |

Type TypeX

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