

Wilcoxon Research model F7 Piezoelectric vibration generator



The F7 piezoelectric vibration generator utilizes the expansion / contraction properties of piezoelectric crystals for sonic and ultrasonic structural excitation. This portable reaction-type shaker generates large dynamic forces to very high frequencies for structural excitation in vibration research and testing. The reaction principle of operation, lightweight and compact configuration allows this generator to be stud-mounted to structures in any position, without external support or critical shaft alignment problems. The F7 piezoelectric vibration generator is designed to mate with the F4 electromagnetic vibration generator to extend the frequency range down to low frequencies (see the specification sheet for model F4/F7 for details).

The F7 has a transducer base which contains a force gage and an accelerometer. This transducer measures the force applied to the structure (force gage) and the resulting motion (accelerometer). The transducer signals can be fed into either the read-out equipment or into signal conditioners. During the design of these bases, particular attention was given to yield a minimum mass below force gage.

The blocked force output curve refers to the force developed against a mass of infinite impedance. The graph shows typical frequency response and may vary between shakers.

Applications for this instrument include biomedical research, production testing, mechanical impedance studies, high frequency vibration research and other areas where structural excitation over a wide frequency range is required.

Vibration generator

Usable frequency range	500 - >20,000 Hz
Blocked force output ¹	see graph
Maximum input	800 Vrms
Maximum acceleration.....	1,000 g
Capacitance.....	8.0 nF
Connector ²	Bendix PT06A-8-3P
Cable (shaker drive cable)	R4-4M-J9-10

Accelerometer nominal values

Charge sensitivity.....	9 pC/g (0.9 pC/m/s ²)
Voltage sensitivity ³	13 mV/g (1.33 pC/m/s ²)
Capacitance ³	700 pF
Frequency range, ± 3 dB	10 - 20,000 Hz
Connector ²	Microdot 10-32
Cable (low noise, coaxial).....	R1-1-J1-6

Force gage nominal values

Charge sensitivity.....	175 pC/lb (40 pC/N)
Capacitance ³	2 µF
Connector ²	Microdot 10-32
Cable (low noise, coaxial).....	R1-1-J1-6
Mass below force gage (including stud)	20 g
Effective stiffness.....	3 x 10 ⁶ (5.2 x 10 ⁸ N/m)
Diameter of mounting surface.....	0.63 in (16.2 mm)
Mounting stud, stainless steel.....	3/8 -16 UNC
Maximum screw down torque.....	100 lb/in (11 N/m)
Base material.....	titanium
Temperature range	-50 to 80° C
Weight.....	2.5 lb (1.1 kg)

Accessories supplied: All input and output cables; mounting stud; spanner wrench

Accessories available: power amplifiers; matching networks; signal conditioners; power supplies

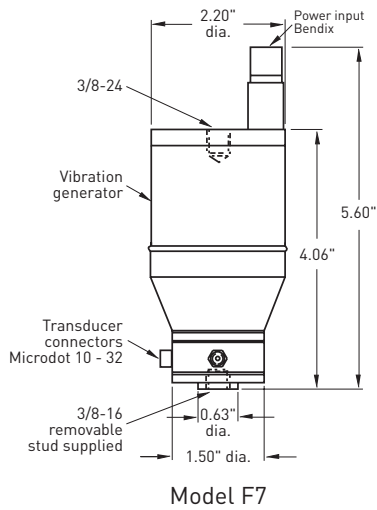
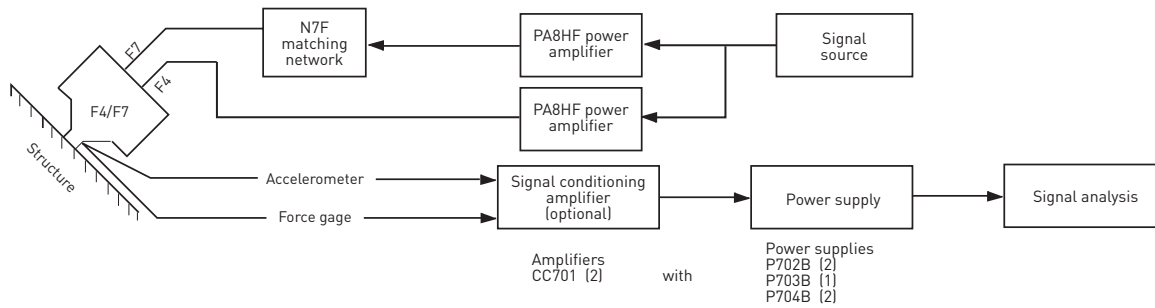
Notes: ¹ Blocked force output refers to the force output against a mass of infinite mechanical impedance.

² Refers to connector at the end of cable.

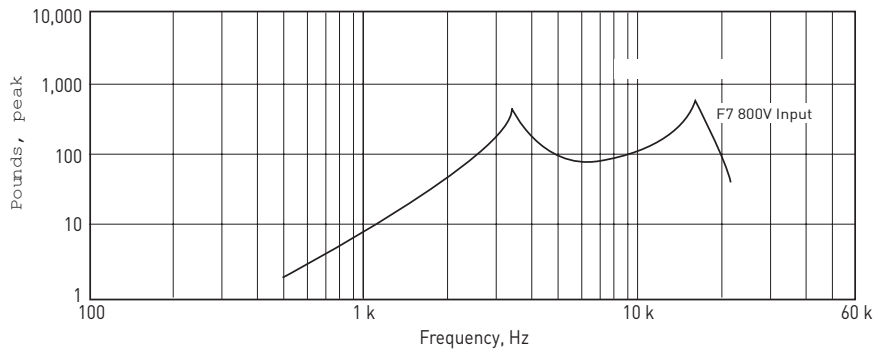
³ Measured at the end of the supplied cable, 30 pF/ft

Model F7

Recommended system diagram (shown with F4)



Typical blocked force output



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