

Model F5B/Z11 Electromagnetic shaker system



The F5B vibration generator is a rigid reaction-type shaker generating dynamic forces for structural excitation in vibration research and testing. The reaction principle of operation, light weight and compact configuration allow this generator to be stud mounted in any position, directly to structures without external support or critical shaft alignment problems.

The F5B is designed for operation over a very wide range of audio frequencies. It can be supplied with a sensing transducer containing an accelerometer and a force gage (model Z11 impedance head). The shaker drives the tested structure through the impedance head.

The impedance head is used to measure applied force and structure motion. From these measurements mechanical impedance can be obtained.

The high impedance charge signals from the piezoelectric force gage and accelerometer should be conditioned using charge amplifiers or charge converters such as the Wilcoxon model CC701.

The Z11 Impedance Head has a specimen contact diameter of 0.25 inches preventing excessive stiffening of the test structure by impedance head attachment. The very low mass below the force gage (1 gram) makes it possible to take measurements on relatively light structures, such as airframes, models and light machinery.

Specifications of model F5B

Usable frequency range	10 - 10,000 Hz
Blocked force output ¹	see graph
Maximum continuous current	0.1 amp rms
Nominal electrical impedance	115 Ω
DC electrical resistance	56 Ω
Resonance frequency, blocked.....	35 Hz
Connector	BNC
Cable for use with PA8HF amplifier	R2-22-J9C-10-P1

Specifications of model Z11 impedance head

Accelerometer nominal values

Charge sensitivity	3.5 pC/g (0.36 pC/m/s ²)
Voltage sensitivity ³	4.4 mV/g (0.45 mV/m/s ²)
Capacitance ³	800 pF
Frequency range, ±3 dB	10 - 10,000 Hz
Connector ²	Microdot 10 - 32
Cable	R1-3A-J2-6

Force gage nominal values

Charge sensitivity	250 pC/lb (56 pC/N)
Voltage sensitivity ³	312 mV/lb (70 mV/N)
Capacitance ³	800 pF
Frequency range, ±3 dB	10 - 10,000 Hz
Connector ²	Microdot 10 - 32
Cable	R1-3A-J2-6

Mass below force gage (force gage attached to specimen).....	1 gram (2.2 x 10 ⁻³ lb)
Mass below force gage (accelerometer attached to specimen)	10 grams (22 x 10 ⁻³ lb)
Effective stiffness (force gage attached to specimen)	0.4 x 10 ⁶ lb/in (70 x 10 ⁹ N/m)
Effective stiffness (accelerometer attached to specimen)	2 x 10 ⁶ lb/in (350 x 10 ⁹ N/m)
Diameter of mounting surface	0.25 inch (0.64 cm)
Mounting stud, integral.....	8 - 32
Maximum screw down torque	15 in-lb (1.7 Nm)
Temperature range	0 to 80°C
Base material.....	titanium
Weight of F5B	160 grams (0.354 lb)
Weight of Z11	10 grams (0.022 lb)
Total weight	170 grams (0.376 lb)

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

² Refers to connector at the output end of the cable away from the Z11.

³ Refers to condition at the end of the 6 foot, low-noise cable (180 pF) supplied.

⁴ Many laboratory signal generators are capable of directly driving the F5B.

Accessories supplied: Output cables.

Accessories available: Amplifiers, charge converters, signal conditioners, additional cable.

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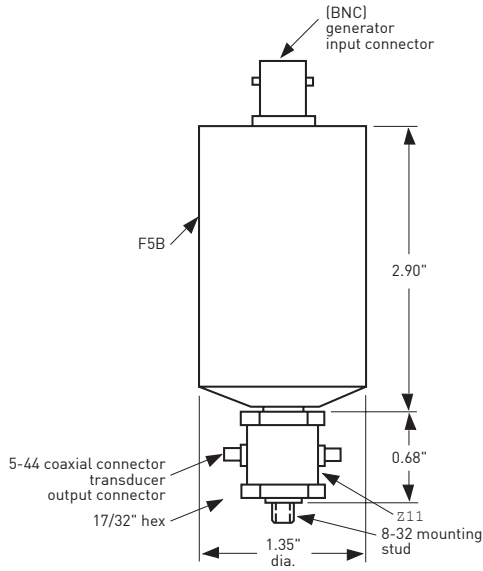
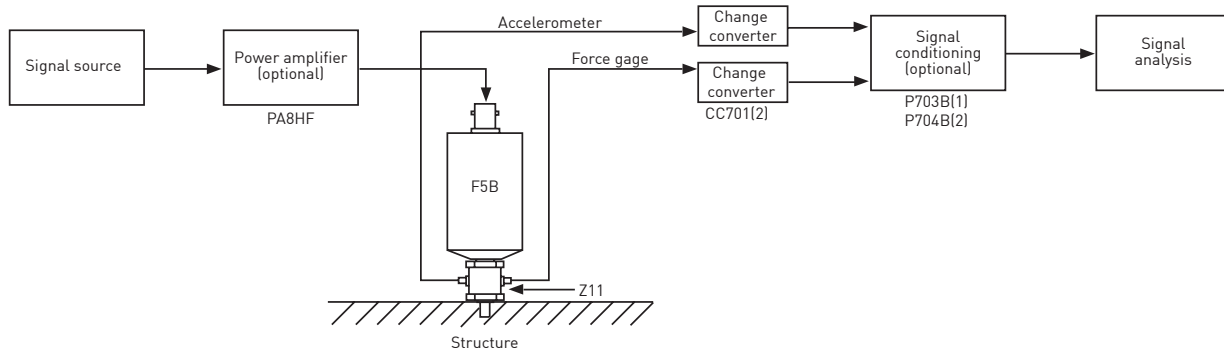
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Model F5B/Z11

Recommended system diagram



Typical blocked force output
(Powered by PA7F)

