

INERTIAL SHAKER SYSTEM

MINIATURE ELECTRODYNAMIC INERTIAL SHAKER KIT



The K2002E01 Miniature Electrodynamic Inertial Shaker consists of a compact and lightweight 2002E inertial force generator, along with a compact 2000E mini amplifier. The shaker system is well-suited for structural testing as well as a variety of general vibration testing applications particularly in small, confined locations.

The generator has a single 0.141 in (3.6 mm) diameter mounting through-hole and a rugged internal suspension system that eliminates test fixture requirements for most testing applications. Miscellaneous mounting screws are supplied to facilitate installation of the unit, either directly to the test structure or through a force sensor. The 2002E can be operated in any orientation and is therefore easily positioned for modal or general excitation applications offering optimal force performance over a wide 20 Hz to 3000 Hz frequency range.

A unique inverted armature coil design and the latest composite materials combine to offer excellent axial compliance and high lateral stiffness, ensuring reliability and robustness. When the K2002E01 is combined with a piezoelectric force sensor (or impedance head) from PCB Piezotronics, the system becomes an ideal, compact force generator for driving point modal excitation or general purpose vibration excitation with unmatched reliability, performance and cost.

BENEFITS:

- Compact size allows easy set-up for difficult-to-access locations
- 2 lbf (9 N) sine force excitation, stack them up (or add cooling) for doubling force
- Direct mounting requires no special fixturing support or manual alignment
- In-line fuse for overcurrent protection
- Wide frequency range from 20 Hz to 3000 Hz
- Compatible with piezoelectric force transducers and shaker amplifiers

APPLICATIONS:

- General vibration testing and structural excitation
- Impedance measurements
- Experimental modal analysis
- Educational laboratory research

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**SPECIFICATIONS:****SHAKER PERFORMANCE**

Sine Force^[1]	
Natural Air Cooling	2 lbf pk (9 N pk)
Forced Air Cooling	4 lbf pk (18 N pk)
Random Force^[1]	
Natural Air Cooling	1.4 lbf RMS (6.2 N RMS)
Forced Air Cooling	2.8 lbf RMS (12.5 N RMS)
Shock Force (20 ms)	4.5 lbf pk (20 N pk)
Low Frequency Force	0.012 f ² (0.35 – d)
Maximum Displacement	0.35 in (pk-pk), 8.9 mm (pk-pk)
Maximum Velocity	20 in/s pk (508 mm/s pk)
Frequency Range	20 Hz – 3000 Hz
Reaction Mass Resonance (Nominal)	10 Hz
Structural Resonance	3500 Hz – 4500 Hz

SHAKER PHYSICAL

Dynamic Element Weight	0.33 lb (0.15 kg)
Shaker Total Weight	0.56 lb (0.25 kg)
Maximum Rated Armature Current	
Natural Air Cooling	1.1 A RMS
Forced Air Cooling	2.2 A RMS
Temperature Operating Range	40 °F – 100 °F (4 °C – 38 °C)
Stray Magnetic Field Measured at 1.0 in (2.54 cm) distance	<10 gauss
Cooling (> 2.0 lbf or > 9 N force)	3.5 CFM at 5 psi (99 L/min at 0.34 bar)
Dimensions (diameter x length)	2.0 in x 1.5 in (50.8 mm x 38.1 mm)
Mounting Hole	0.141 in x 1.5 in (3.6 mm x 38.1 mm)

AMPLIFIER PERFORMANCE

Efficiency	92%
Input Voltage, RMS	0-1 VAC ^[3]
Input Voltage (absolute minimum), RMS	1.9 VAC
Input Power ^[4]	12-21 VDC
Output Power ^[5]	55 W
Distortion, typical ^[6]	<0.02%
Cooling	Convection
Discrete Gain Stages, nominal ^[7]	Muted, 10 dB, 18 dB, 25 dB
Warning Indication ^[7]	Clipping and over temperature
Shutdown Protection ^[7]	Over temperature and over current
Weight	1.13 lb (0.51 kg)
Dimensions (H x W x D), nominal	1.65 x 3.13 x 3.82 in (42 x 80 x 97 mm)

[1] Load dependent

[2] f=freq [Hz], d=disp. [in] pk-pk

[3] Typical, full output, gain dependant

[4] Supplied with universal power supply, 60 W (19 V DC - 3.15 A output)

[5] Based upon supplied universal power supply, 92 % efficiency

[6] THD + noise at 1 kHz, 1 W

[7] Indicated via LEDs

SUPPLIED ACCESSORIES

3 ft (90 cm) cable with in-line fuse; Spare fuses: 1 A and 2 A; Miscellaneous mounting screws and washer; Heavy duty case

RELATED PRODUCTS

208C01	Multi-purpose, ICP [®] force sensor, 10 lbf (45 N) compression and tension, 500 mV/lbf (112.41 mV/N)
288D01	ICP [®] impedance head, force/accel: Force: 100 mV/lbf (22.4 mV/N) ; Accel: 100 mV/g (10.2 mV/(m/s ²))



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