MODEL 2002E

MINIATURE ELECTRODYNAMIC INERTIAL SHAKER MODEL 2002E

The 2002E Miniature Electrodynamic Inertial Shaker is a compact and light-weight force generator whose construction makes it well-suited for modal testing as well as a variety of general vibration testing applications.

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 2002E is combined with a power amplifier and a piezoelectric force sensor (or impedance head) from PCB Piezotronics, Inc., 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
- 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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The compact design and portability make the 2002E Miniature Electrodynamic Inertial Shaker a very versatile, accessible and popular solution for test and instrumentation engineers. It is ideally suited for general purpose vibration testing for experimental modal, academic, biomedical or laboratory research.

SPECIFICATIONS:	ENGLISH	SI
PERFORMANCE		
Sine Force		
Natural Air Cooling	2 lbf pk	9 N pk
Forced Air Cooling[1]	4 lbf pk	18 N pk
Random Force		
Natural Air Cooling	1.4 lbf RMS	6.2 N RMS
Forced Air Cooling[1]	2.8 lbf RMS	12.5 N RMS
Shock Force (20 ms)	4.5 lbf pk	20.0 N pk
Low Frequency Force[2]	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	20 Hz – 3000 Hz
Reaction Mass Resonance (Nominal)	10 Hz	10 Hz
Structural Resonance	3500 Hz – 4500 Hz	3500 Hz – 4500 Hz
PHYSICAL		
Dynamic Element Weight	0.33 lb	0.15 kg
Total Weight	0.56 lb	0.25 kg
Maximum Rated Armature Current		
Natural Air Cooling	1.1 A RMS	1.1 A RMS
Forced Air Cooling	2.2 A RMS	2.2 A RMS
Temperature Operating Range	40 ºF – 100 ºF	4 ºC – 38 ºC
Stray Magnetic Field		
Measured at 1.0 in (2.54 cm) distance	< 10 gauss	< 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

[1] Forced air cooling required for operation above 2 lbf (9 N)
[2] f=freq [Hz], d=disp. [in] pk-pk

SUPPLIED ACCESSORIES

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

RELATED PRODUCTS

2100E21-100	SmartAmp™ Power Amplifier 100 W, 92% efficient, continuous gain adjustment
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/s²))

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