



MODEL K2002E01

## MINIATURE INERTIAL SHAKER SYSTEM

- 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

### TYPICAL APPLICATIONS

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

### COMPACT SHAKER SYSTEM

The Miniature Electrodynamic Inertial Shaker System Model K2002E01 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.

## SHAKER SPECIFICATIONS

### Performance

Sine Force <sup>[1]</sup>		
Natural Air Cooling	2 lbf pk	9 N pk
Forced Air Cooling	4 lbf pk	18 N pk
Random Force <sup>[1]</sup>		
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 <sup>2</sup> (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	

### 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 SPECIFICATIONS

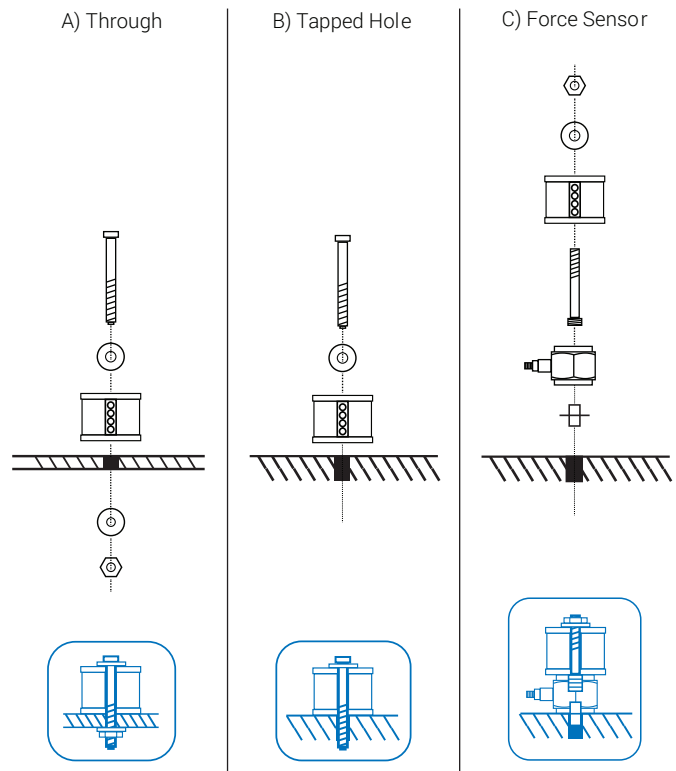
### Performance

Efficiency	92%	
Input Voltage, RMS	0-1 VAC <sup>[3]</sup>	
Input Voltage (absolute maximum), RMS	1.9 VAC	
Input Power <sup>[4]</sup>	12-21 VDC	
Output Power <sup>[5]</sup>	55 W	
Distortion, typical <sup>[6]</sup>	<0.02%	
Cooling	Convection	
Discrete Gain Stages, nominal <sup>[7]</sup>	Muted, 10 dB, 18 dB, 25 dB	
Warning Indication <sup>[7]</sup>	Clipping and over temperature	
Shutdown Protection <sup>[7]</sup>	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

### Supplied Accessories

10 ft (3 m) Cable with In-line Fuse	
Spare Fuses: 1 A and 2 A	
Miscellaneous Mounting Screws and Washer	
Heavy Duty Case	
<b>Related Products</b>	
<b>208C01</b>	Multi-purpose, ICP® force sensor, 10 lbf (45 N) compression and tension, 500 mV/lbf (112.41 mV/N)
<b>288D01</b>	ICP® impedance head, force/accel: Force: 100 mV/lbf (22.4 mV/N) ; Accel: 100 mV/g (10.2 mV/(m/s <sup>2</sup> ))

- [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



## Mounting Options