

100 LBF MODAL SHAKER



Model 2100E11

For many modal test applications, an electrodynamic shaker system is best suited for creating an appropriate input forcing function. Distributing adequate input force energy across the test structure and obtaining accurate and reliable input force measurements is critical for successful modal testing. This requires a shaker that is highly portable, rugged and easy to setup in order to position in the best exciter location while minimizing any unwanted interaction between the exciter and test structure.

The Modal Shop 2100E11, a lightweight electrodynamic modal exciter, is capable of providing 100 lbf (440 N) of peak force excitation in a small footprint weighing just 33 pounds (15 kg). With a 1" stroke for solid low frequency performance and useful high frequency range beyond 5400 Hz, the 2100E11 is suitable for structural testing and experimental modal analysis applications, including single and multiple inputs (SIMO and MIMO) using random, burst random, sine dwell or chirp excitation signals.

The 2100E11 modal exciter is supplied in a trunnion base allowing full rotation for easy setup. The through-hole armature design with chuck and collet attachment is ideal for use with either traditional modal stinger rods or piano wire stingers. These stingers greatly simplify test setup with an easy connection to the force sensor and test structure, and help decouple cross-axis force inputs, minimizing or input force measurement errors while using the modal shaker. For horizontal force inputs, the 2100E11 adapts directly to The Modal Shop's 2050A lateral excitation shaker stand.

BENEFITS:

- Through-hole armature with chuck and collet attachment provides simple setup with modal stingers.
- Lightweight and portable – weighing just 33 lbs (15 kg).
- Trunnion base provides flexibility when choosing best exciter location(s).
- 1" stroke and broad frequency range supply adequate input energy for most modal test applications.
- Forced air cooling sufficient to meet full shaker performance (100 lbf pk) specifications.



EXPERIMENTAL MODAL ANALYSIS APPLICATION CHART

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

Output Force, sine pk, ambient air cooling	50 lbs (220 N)
Output Force, sine pk, forced air cooling	100 lbs (440 N) ^[1]
Stroke Length, pk - pk	1.0 in (25.4 mm) ^[2]
Frequency Range, nominal	DC - 5,400 Hz ^[3] ^[4]
First Resonance Frequency, nominal	>3600 Hz ^[4]
Maximum Acceleration, bare table	102 g (1000 m/s ²) pk
Maximum Velocity	62.4 ips (1.6 m/s) pk
Protection Features	Over-travel limit switch Over-current (in-line fuse)

PHYSICAL:

Maximum Current, ambient air cooling	10 A rms
DC Resistance, armature, nominal	3.8 Ω ^[5]
Armature Suspension System	8 pcs composite beam flexures
Effective Armature Mass	1 lbs (0.44 kg)
Dimensions (H x W x D), nominal	12 x 12 x 8 in (30.5 x 30.5 x 20.3 cm) ^[6]
Weight	33 lbs (15 kg)
Operating Range	41 - 95°F (5 - 35°C), < 85% RH

[1] Full force range requires optional forced air cooling with 2100E18 Power Amplifier

[2] Overtravel limit switch at 26 mm

[3] Frequency range based upon ISO 5344 recommended useful range of 1.5 times first resonance frequency

[4] Load dependent

[5] Room temperature, 68° F (20° C)

[6] Reference outline drawing for exact dimensions

SUPPLIED ACCESSORIES:

Trunnion base with EasyTurn™ handles, shaker cable (20 ft), chuck with collets, 10-32 mounting adapter and a variety of rod and piano wire stinger kits (models 2150G12, 2155G12 and K2160G).

SUGGESTED ACCESSORIES:

2100E21 SmartAmp™ Power Amplifier 400W, 92% efficient, continuous gain adjustment

2100E18 Power Amplifier

2050A Lateral Excitation Stand

2100E13 Modal Accessory Kit, for use with 2050A excitation stand

PCB 288D01 ICP® impedance head driving point sensor, PCB 208 series ICP® force sensors

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