

## 60 LBF MODAL SHAKER



Model 2060E

For many experimental 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 and structural 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 2060E, a lightweight electrodynamic modal exciter, is capable of providing up to 60 lbf (267 N) of peak force excitation in a small footprint weighing just 37 pounds (17 kg). With an extended 1.4" (36 mm) stroke enhancing input levels at low frequencies and useful frequency range beyond 6 kHz, the 2060E 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.

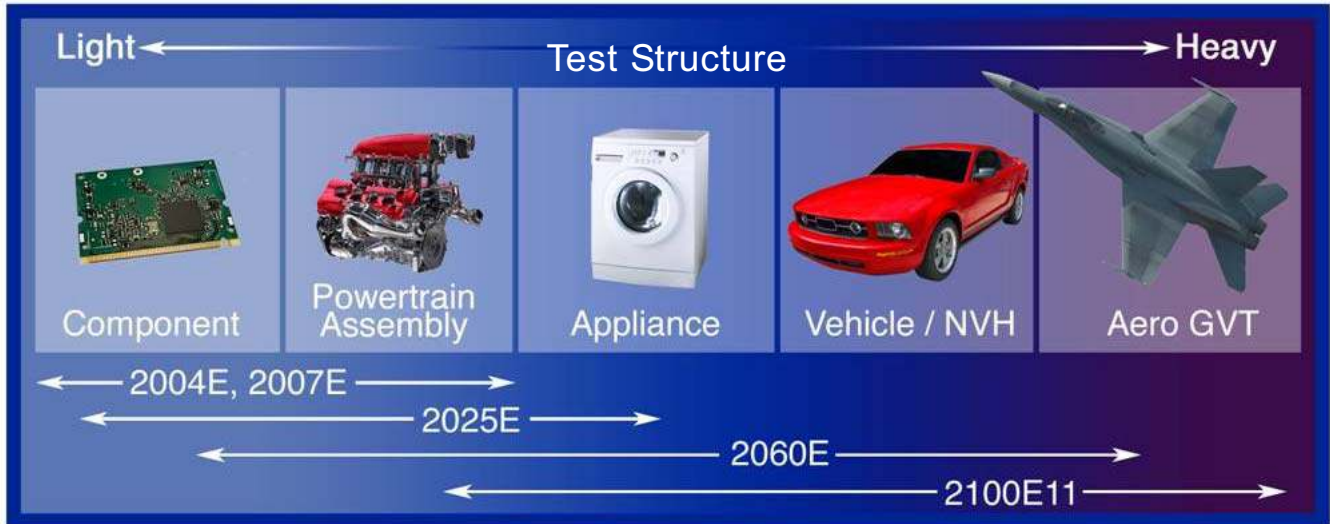
The 2060E modal exciter is supplied in a trunnion base allowing full rotation for easy setup. The through-hole armature design with chuck and collet attachment is ideal for use with either traditional modal stinger rods or piano wire stingers. These stingers greatly simplify test setup with an easy connection to the force sensor and test structure, and help decouple cross-axis force inputs, minimizing input force measurement errors while using the modal shaker. For horizontal force inputs, the 2060E 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 37 lbs (17 kg).
- Trunnion base provides flexibility and easy set-up when aligning the shaker and choosing best exciter location(s).
- 1.4" extended stroke for low frequency and broad frequency range supply adequate input energy for most modal applications.
- Forced air cooling sufficient to meet full shaker performance (60 lbf<sub>pk</sub>) specifications.



**EXPERIMENTAL MODAL ANALYSIS APPLICATION CHART**



**SPECIFICATIONS:**

**PERFORMANCE:**

Output Force, sine pk, ambient air cooling	30 lbs (133 N)
Output Force, sine pk, forced air cooling	60 lbs (267 N) <sup>[1]</sup>
Stroke Length, pk - pk	1.4 in (36 mm) <sup>[2]</sup>
Frequency Range, nominal	DC - 6,000 Hz <sup>[3][4]</sup>
First Resonance Frequency, nominal	> 4,000 Hz <sup>[4]</sup>
Maximum Acceleration, bare table	100 g (1000 m/s <sup>2</sup> ) pk
Maximum Velocity	120 ips (3 m/s) pk
Protection Features	Mechanical stops Over-current (in-line fuse)

**PHYSICAL:**

Maximum Current, ambient air cooling	9 A rms
Maximum Current, forced air cooling	18 A rms
DC Resistance, armature, nominal	1 Ω <sup>[5]</sup>
Armature Suspension System	8 pcs carbon fiber composite flexures
Effective Armature Mass	0.6 lb (0.272 kg)
Dimensions (H x W x D), nominal	10.8 x 12.6 x 6.5 in (273 x 319 x 165 mm) <sup>[6]</sup>
Weight	37 lbs (17 kg)
Operating Range	40 - 100°F (4 - 38°C), < 85% RH

[1] Full force range requires optional forced air cooling with appropriate power amplifier  
 [2] Mechanical stops at 0.75" (19 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 (10 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
- 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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