



## DSX-SERIES VIBRATION

The Driving Force In Electrodynamic Vibration Testing



### Vibration Experience that Counts

A global vibration manufacturer for more than 35 years, Thermotron specializes in high-performance vibration test system integration. Our electrodynamic shakers feature superior acceleration, velocity, force, and shock performance. With a rugged, lightweight magnesium armature, a powerful IGBT-based amplifier, and an intuitive Windows®-based vibration control system, Thermotron's DSX-Series electrodynamic shakers provide durability and versatility that meet a variety of vibration testing applications.

# DSX-SERIES

Thermotron is a turnkey manufacturer of Vibration Test Systems, including the shaker, amplifier, control system, slidable, head expanders, and fixtures. From running random and sine-to-shock, sine-on-random, and random-on-random tests, Thermotron's versatile performance will meet your specific testing needs.

All vibration and combined components are designed and created in-house, including the chamber, shaker, amplifier, and all of the integrated control systems and software, as well as slidable, head expanders, and fixturing.



## Small Force

### DSX-2250

- 2,250 force pound (10 kN) sine and random capabilities
- 12" (30.5 cm) diameter armature
- 500 pound (227 kg) payload support
- 90 ips (2.28 mps) continuous velocity
- 100g bare table acceleration\*



## Medium Force

### DSX-4000

- 16" (40.6 cm) or 24" (61 cm) diameter armature
- 1,000 pound (454 kg) payload support (1,500 pound option)
- 4,000 force pound (178 kN) sine and random capabilities
- 70 ips (1.78 mps) continuous velocity
- 60g bare table acceleration (with 16" armature)\*

### DSX-6650

- 6,650 force pound (29.6 kN) sine and random capabilities
- 90 ips (2.28 mps) continuous velocity
- 100g bare table acceleration (with 16" armature)\*

### DSX-8000

- 8,000 force pound (35.6 kN) sine and random capabilities
- 100 ips (2.54 mps) continuous velocity
- 120g bare table acceleration (with 16" armature)\*



## Large Force

### DSX-12000

- 12,000 force pound (53.4 kN) sine and random capabilities
- 16" (40.6 cm) or 24" (61 cm) diameter armature
- 1,000 pound (454 kg) payload support (1,500 pound option)
- 90 ips (2.28 mps) continuous velocity
- 120g bare table acceleration (with 16" armature)\*

## Custom & Combined Solutions

Thermotron's electrodynamic shakers are fully compatible with environmental test chambers for combined environment testing. Interfacing features include a thermal isolation system and casters, as well as integrated instrumentation between the WinVCS 3200 and the chamber's 8800 Controller system.

Thermotron also specializes in creating custom shakers to meet specific testing needs. Whether you have a special test specification or a unique product, we can help find a complete solution.

### » DSX-8000 with Dual Slidable

The DSX-8000 was purchased by an automotive subcontractor. The large slidable interfaces with an environmental test chamber, while the small slidable is used to meet the 100g/11ms automotive shock specification horizontally with a 100 pound payload. This design provided a versatile and cost-effective piece for the company.



DSX-8000 with Dual Slidable

\*Bare table does not include standoffs or thermal barrier.

# FEATURES

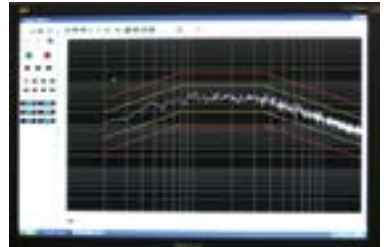
<b>Amplifier</b>	Efficiently drive the shaker to full output over a specified frequency range. Uses IGBT technology to combine the fast switching of a MOSFET with high current capability and low power dissipation of a bipolar transistor. Also safely shuts down the system before components fail.
<b>Armature</b>	Lightweight and durable magnesium for maximized acceleration levels. Directs uniform forces through a single structure. Mounting surface minimizes thermal transfer to support long-term reliability testing. Custom wound armatures are available for specific performance.
<b>Optional Features</b>	
<b>Additional Accelerometers</b>	Customize the number of accelerometers for your vibration test.
<b>Fixturing</b>	Designed specifically for your product or products. Mounts easily to improve productivity.
<b>Head Expander</b>	Expand the mounting area for attaching fixtures and products.
<b>Electrical Power Tow</b>	Used to move the shaker; ideal for combined systems.
<b>Sliptable</b>	Rotate the shaker 90° to allow horizontal-axis vibration.
<b>Armature Standoffs</b>	Provides thermal isolation.
<b>Remote Blower Quiet Package</b>	Houses whole cooling blower to minimize noise level.

## WinVCS 3200 Controller

Thermotron's WinVCS II Controller has the familiar Windows® look and feel, but it's designed and made specifically by Thermotron for use with an electrodynamic vibration shaker and vibration test system. It offers vibration control and analysis for accurate sine, random, shock, resonant search and dwell, random-on-random, sine-on-random, and sine-on-random capabilities. Real Data Acquisition and Playback (RDAP) allows actual vibration data from the field to be recorded. With its intuitive interface, reduce training time and make set up and report generation quick and painless.

The WinVCS II has menu-driven software and color graphics. A library of pre-programmed vibration profiles, conforming to many preset test specifications simplifies set-up and operation. The software allows for up to four displays to be viewed simultaneously and is also capable of automatically running test scheduling and profile sequencing, including switching vibration control modes from sine to shock to random.

The WinVCS also integrates with the 8800 for combined environment testing with an AGREE Chamber. Vibration control information is displayed on one half of the screen and chamber control information on the other for convenient viewing of test progress and other information.



### Features

- User selectable frequency range up to 3,000 Hz
- User selectable resolution up 3,200 lines
- Scalable tolerance and abort limits
- 24" widescreen monitor display for standard vibration testing
- 29" widescreen monitor display for combined testing
- User-define temperature and electrodynamic vibration profiles
- Multiple accelerometers and thermocouples controls
- Ethernet-compatible and web-enabled

## Service & Support

Our worldwide field service engineers and sales representatives provide superior service before and after the sale. An annual service seminar gives customers hands-on experience with shaker and chamber troubleshooting and repair.

## History

For more than 40 years in vibration, we have held a deep-rooted commitment to customer service and innovative thinking.

Thermotron has been at the forefront of new technologies, including interfacing a low-profile electrodynamic shaker with environmental chambers; switching (Class D) amplifiers, making our shakers more efficient and reliable than previous linear amplifiers; and the using microprocessor-based dynamic centering on vibration systems.

## Experience

Thermotron develops and refines vibration test systems that set industry standards. Our equipment meets many of the most widely used vibration test specifications, including those from SAE, MIL-STD, IEC, ISTA, JIG, EIA, ISO, NAVMAT, JIS, Telcordia, and ASTM. Our equipment is able to perform transportation testing, stress screening, dynamic simulation, accelerated stress testing, and seismic vibration.

We proudly meet international certification requirements such as UL, CE, CSA, and VDE including provisions for shock and vibration resistance.

# GENERAL SPECIFICATIONS

Shaker Model	DSX-2250		DSX-4000		DSX-6650		DSX-8000		DSX-12000	
	Armature Size — in / cm	12 / 30.5	16 / 40.6	24 / 61	16 / 40.6	24 / 61	16 / 40.6	24 / 61	16 / 40.6	24 / 61
Amplifier Model	915/1	930/2	930/2	945/3	960/4	960/5	960/5	960/5	960/5	960/5
Force Rating	2,250 / 10.0	4,000 / 17.8	6,650 / 29.6	8,000 / 35.6	8,000 / 35.6	12,000 / 53.4	12,000 / 53.4	12,000 / 53.4	12,000 / 53.4	12,000 / 53.4
Sine Peak lbf / kN	2,250 / 10.0	4,000 / 17.8	6,650 / 29.6	8,000 / 35.6	8,000 / 35.6	12,000 / 53.4	12,000 / 53.4	12,000 / 53.4	12,000 / 53.4	12,000 / 53.4
Random <sup>1</sup> RMS lbf / kN	30g: 280 / 127	30g: 375 / 170	30g: 750 / 340	30g: 732 / 332	30g: 840 / 381	30g: 1,000 / 454	30g: 1,000 / 454	30g: 1,000 / 454	30g: 1,500 / 681	30g: 1,485 / 675
Shock vs. Load Rating <sup>2</sup> — lbs / kg	50g: 120 / 54	50g: 182 / 82	50g: 280 / 127	50g: 262 / 119	50g: 407 / 185	50g: 575 / 261	50g: 575 / 261	50g: 575 / 261	50g: 650 / 295	50g: 635 / 289
	100g: 15 / 6.8	75g: 19 / 8.6	85g: 45 / 20	85g: 26 / 12	100g: 100 / 45.3	100g: 120 / 54	100g: 200 / 91	100g: 200 / 91	100g: 95 / 43.2	100g: 80 / 36.4
Maximum Velocity <sup>3</sup> —	90 / 2.28	70 / 1.78	90 / 2.28	90 / 2.28	90 / 2.28	100 / 2.54	100 / 2.54	100 / 2.54	90 / 2.29	90 / 2.29
Sine Sweep — ips / mps	90 / 2.28	70 / 1.78	90 / 2.28	90 / 2.28	90 / 2.28	100 / 2.54	100 / 2.54	100 / 2.54	90 / 2.29	90 / 2.29
Displacement Rated	3" (75 mm) pk-pk continuous									
Frequency Range <sup>4</sup>	0-3,000 Hz	0-3,000 Hz	0-3,000 Hz	0-2,500 Hz	0-3,000 Hz	0-2,500 Hz	0-3,000 Hz	0-3,000 Hz	0-2,500 Hz	0-2,500 Hz
Armature Weight — lbs / kg	23.3 / 10.6	66.5 / 30.2	66.5 / 30.2	85 / 38.6	66.5 / 30.2	85 / 38.6	66.5 / 30.2	85 / 38.6	115 / 52.3	115 / 52.3
Axial Resonance	2,675 Hz	2,200 Hz	2,200 Hz	1,800 Hz	2,200 Hz	1,800 Hz	2,200 Hz	1,800 Hz	1,925 Hz	1,925 Hz
Mounting Points	16*	17*	17*	25*	17*	25*	17**	25**	17**	25**
Payload Support <sup>5</sup> — lbs / kg	500 / 227	Less than 5 <sup>6</sup>	Less than 8 <sup>6</sup>	Less than 12 <sup>6</sup>	Less than 8 <sup>6</sup>	Less than 12 <sup>6</sup>	Less than 8 <sup>6</sup>	Less than 12 <sup>6</sup>	Less than 20 <sup>6</sup>	Less than 20 <sup>6</sup>
Stray Magnetic Field (gauss)	1,980 / 898	1,980 / 898	1,980 / 898	1,980 / 898	1,980 / 898	1,980 / 898	1,980 / 898	1,980 / 898	1,980 / 898	1,980 / 898
Shaker Weight — lbs / kg	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86	26 x 40 x 34 / 66 x 102 x 86
Shaker Dimensions — WxDxH — in / cm	6 / 15.2	6 / 15.2	6 / 15.2	6 / 15.2	6 / 15.2	6 / 15.2	6 / 15.2	6 / 15.2	6 / 15.2	6 / 15.2
Blower Duct Diameter — in / cm	5 Hp (3.8 kW)	5 Hp (3.8 kW)	5 Hp (3.8 kW)	5 Hp (3.8 kW)	5 Hp (3.8 kW)	5 Hp (3.8 kW)	5 Hp (3.8 kW)	5 Hp (3.8 kW)	5 Hp (3.8 kW)	5 Hp (3.8 kW)
Blower Motor	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)	450 CFM (0.22m <sup>3</sup> /s)
Airflow	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66	25 x 23 x 26 / 64 x 58 x 66
Blower Dimensions <sup>6</sup> — WxDxH — in / cm	145 / 66	145 / 66	145 / 66	145 / 66	145 / 66	145 / 66	145 / 66	145 / 66	145 / 66	145 / 66
Blower Weight — lbs / kg	39,000 BTUH	39,000 BTUH	39,000 BTUH	39,000 BTUH	39,000 BTUH	39,000 BTUH	39,000 BTUH	39,000 BTUH	39,000 BTUH	39,000 BTUH
Heat Rejected (Max)	30 Amp	30 Amp	30 Amp	30 Amp	30 Amp	30 Amp	30 Amp	30 Amp	30 Amp	30 Amp
Recommended Min. Service <sup>7</sup>	400 / 3 / 60	400 / 3 / 60	400 / 3 / 60	400 / 3 / 60	400 / 3 / 60	400 / 3 / 60	400 / 3 / 60	400 / 3 / 60	400 / 3 / 60	400 / 3 / 60

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<sup>1</sup> For a uniform power spectral density from 20 to 2,000 Hz, payload mass equal to or greater than twice the armature mass.  
<sup>2</sup> Half sine shock pulse, 11 ms, 40% symmetric pre- and post-pulse, field reduced per engineering specifications.  
<sup>3</sup> Rated sine performance is "full field" increased velocities may be obtained with reduced field, especially in shock testing.  
<sup>4</sup> Dependent on controller resolution, slew rate, and loading.  
<sup>5</sup> 1000 lbf (454 kg) payload support systems have 1500 lbf (680 kg) load support option available.  
<sup>6</sup> Nominal for a 480/3/60 system.  
<sup>7</sup> Valid for vertical systems only. Horizontal systems will vary based on slippable requirements. Other voltages available.  
<sup>8</sup> Shock specifications are valid for IEC60065-2-27 & 29 (GMW3172 requirement) pre and post pulses and 40% pre-post.  
<sup>9</sup> Aluminum inserts 3/8-16 UNC standard for DSX-2250, DSX-4000, and DSX-6650. Stainless and other threads available.  
<sup>10</sup> Stainless inserts 3/8-16 UNC standard for DSX-8000 and DSX-1200. Other thread sizes available.  
<sup>11</sup> At full field with degauss coil, 85 gauss without degauss coil, at 6" (150 mm) above mounting surface. Vertical system only.  
<sup>12</sup> At 6" (150 mm) above mounting surface. Degauss bit optional for reduction to less than 5 gauss at full field for DSX-4000, DSX-6650 and DSX-8000; reduction to less than 8 gauss at full field for DSX-1200. Vertical systems only. Air supply: 2SCW at 90 psi (1 L/sec. @ 6.2 BAR). Automatic centering with indicators and optical electronic overtravel protection.  
 Specifications subject to change without notice.