

Vibration Test System 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

T H E R M O T R O N . C O M

Thermotron is a turnkey manufacturer of Vibration Test Systems, including the shaker, amplifier, control system, slip-tables, 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 the integrated control systems and software, as well as slip-tables, head expanders, and fixturing.

Vibration Test System

DSX-SERIES VIBRATION



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

- 16" (40.6 cm) or 24" (61 cm) diameter armature

- 1,000 pound (454 kg) payload support (1,500 pound option)

DSX-4000

- 4,000 force pound (17.8 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)*



Vibration Test System DSX-SERIES VIBRATION

FEATURES

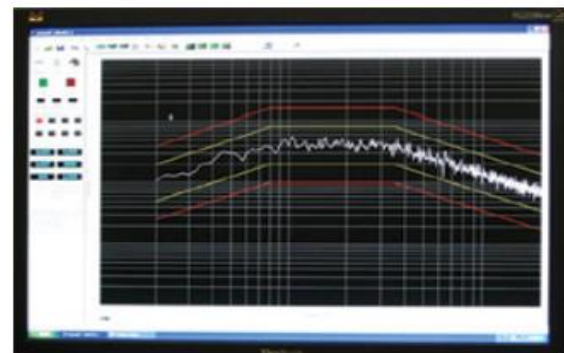
Amplifier	Efficiently drive the shaker to full output over a specified frequency range. Uses IGBT technology to combine the fast switching of a MOSFET with high current capability and low power dissipation of a bipolar transistor. Also safely shuts down the system before components fail.
Armature	Lightweight 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.
Optional Features	
Additional Accelerometers	Customize the number of accelerometers for your vibration test.
Fixturing	Designed specifically for your product or products. Mounts easily to improve productivity.
Head Expander	Expand the mounting area for attaching fixtures and products.
Electrical Power Tow	Used to move the shaker; ideal for combined systems.
Sliptable	Rotate the shaker 90° to allow horizontal-axis vibration.
Armature Standoffs	Provides thermal isolation.
Remote Blower Quiet Package	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

Vibration Test System DSX-SERIES VIBRATION

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 Sliptable

The DSX-8000 was purchased by an automotive subcontractor. The large sliptable interfaces with an environmental test chamber, while the small sliptable 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.



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

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.

Vibration Test System DSX-SERIES VIBRATION

GENERAL SPECIFICATIONS

Shaker Model	DSX-2250		DSX-4000		DSX-6650	
Armature Size — in / cm	12 / 30.5		16 / 40.6	24 / 61	16 / 40.6	24 / 61
Amplifier Model	915/1		915/1		930/2	
Force Rating						
Sine Peak lbf / kN	2,250 / 10.0		4,000 / 17.8		6,650 / 29.6	
Random ¹ RMS lbf / kN	2,250 / 10.0		4,000 / 17.8		6,650 / 29.6	
Shock vs. Load Rating ² — Lbs / Kg	30g: 280 / 127 50g: 120 / 54 100g: 15 / 6.8		30g: 375 / 170 50g: 200 / 91 75g: 19 / 8.6	30g: 357 / 162 50g: 182 / 82 75g: 1 / 0.45	30g: 750 / 340 50g: 280 / 127 85g: 45 / 20	30g: 732 / 332 50g: 262 / 119 85g: 26 / 12
Maximum Velocity ³ — Sine Sweep — ips / mps	90 / 2.28		70 / 1.78		90 / 2.28	
Displacement Rated	3" (75 mm)					
Frequency Range ⁴	0-3,000 Hz		0-3,000 Hz	0-2,500 Hz	0-3,000 Hz	0-2,500 Hz
Armature Weight — Lbs / Kg	23.3 / 10.6		66.5 / 30.2	85 / 38.6	66.5 / 30.2	85 / 38.6
Axial Resonance	2,675 Hz		2,200 Hz	1,800 Hz	2,200 Hz	1,800 Hz
Mounting Points	16*		17*	25*	17*	25*
Payload Support ⁵ — Lbs / Kg	500 / 227					
Stray Magnetic Field (gauss)	Less than 5^		Less than 8^^	Less than 12^^	Less than 8^^	Less than 12^^
Shaker Weight—Lbs / Kg	1,980 / 898		6,000			
Shaker Dimensions — WxDxH — in / cm	26 x 40 x 34 / 66 x 102 x 86		38 x 53 x 33 /			
Blower Duct Diameter — in / cm	6 / 15.2					
Blower Motor	5 Hp (3.8 kW)		5 Hp (3.8 kW)		10 Hp (7.5 kW)	
Airflow	450 CFM (0.22m3/s)		550 CFM (0.26m3/s)		800 CFM (0.38m3/s)	
Blower Dimensions ⁶ —WxDxH — in / cm	25 x 23 x 26 / 64 x 58 x 66		25 x 23 x 26 / 64 x 58 x 66		43 x 30 x 44 / 109 x 76 x 112	
Blower Weight—Lbs / Kg			145 / 66		385 / 175	
Heat Rejected (Max)	39,000 BTUH		59,000 BTUH		81,200 BTUH	
Recommended Min. Service ⁷						
460 / 3 / 60	30 Amp		40 Amp		60 Amp	
400 / 3 / 50	35 Amp		45 Amp		70 Amp	

Vibration Test System DSX-SERIES VIBRATION

GENERAL SPECIFICATIONS

Shaker Model	DSX-8000				DSX-12000	
Armature Size — in / cm	16 / 40.6	24 / 61	16 / 40.6		16 / 40.6	24 / 61
Amplifier Model	945/3		960/4	960/5	960/5	
Force Rating Sine Peak lbf / kN Random ¹ RMS lbf / kN	8,000 / 35.6 8,000 / 35.6				12,000 / 53.4 12,000 / 53.4	
Shock vs. Load Rating ² — Lbs / Kg	30g: 840 / 381 50g: 425 / 192.8 100g: 100 / 45.3	30g: 822 / 373 50g: 407 / 185 100g: 82 / 37	30g: 1,000 / 454 50g: 575 / 261 100g: 120 / 54	30g: 1,000 / 454* 50g: 575 / 261* 100g: 200 / 91*	30g: 1,500 / 681 50g: 650 / 295 100g: 95 / 43.2	30g: 1,485 / 675 50g: 635 / 289 100g: 80 / 36.4
Maximum Velocity ³ — Sine Sweep — ips / mps	100 / 2.54				90 / 2.29	
Displacement Rated	pk-pk continuous					
Frequency Range ⁴	0-3,000 Hz	0-2,500 Hz	0-3,000 Hz		0-2,750 Hz	
Armature Weight — Lbs / Kg	66.5 / 30.2	85 / 38.6	66.5 / 30.2		100 / 45.5	115 / 52.3
Axial Resonance	2,200 Hz	1,800 Hz	2,200 Hz		1,925 Hz	
Mounting Points	17**	25**	17**		17**	25**
Payload Support ⁵ — Lbs / Kg	1,000 / 454					
Stray Magnetic Field (gauss)	Less than 8^^	Less than 12^^	Less than 8^^		Less than 20^^	
Shaker Weight—Lbs / Kg	/ 2,722				9,000 / 4,083	
Shaker Dimensions — WxDxH — in / cm	97 x 134 x 84				48 x 51 x 38 / 122 x 130 x 96	
Blower Duct Diameter — in / cm	8 / 20					
Blower Motor	15 Hp (11.3 kW)				20 Hp (15.1 kW)	
Airflow	960 CFM (0.43m3/s)				1100 CFM (0.49m3/s)	
Blower Dimensions ⁶ —WxDxH — in / cm	46 x 34 x 46 / 117 x 87 x 117				51 x 36 x 48 / 130 x 92 x 122	
Blower Weight—Lbs / Kg	500 / 227				530 / 241	
Heat Rejected (Max)	132,000 BTUH			176,000 BTUH	176,000 BTUH	
Recommended Min. Service ⁷ 460 / 3 / 60 400 / 3 / 50	80 Amp 90 Amp		115 Amp 135 Amp		130 Amp 150 Amp	

GENERAL SPECIFICATIONS NOTES

¹ For a uniform power spectral density from 20 to 2,000 Hz, payload mass equal to or greater than twice the armature mass.

² Half sine shock pulse, 11 ms, 40% symmetric pre- and post-pulse, field reduced per engineering specifications.

³ Rated sine performance is "full field." Increased velocities may be obtained with reduced field, especially in shock testing.

⁴ Dependent on controller resolution, slew rate, and loading.

⁵ 1000 lbm (454 kg) payload support systems have 1500 lbm (680 kg) load support option available.

⁶ Nominal for a 460/3/60 system.

⁷ Valid for vertical systems only. Horizontal systems will vary based on slitable requirements.

Other voltages available.

+ Shock specifications are valid for IEC60068-2-27 & 29 (GMW3172 requirement) pre and post pulses and 40% pre-post.

* Aluminum inserts 3/8-16 UNC standard for DSX-2250, DSX-4000, and DSX-6650. Stainless and other threads available.

** Stainless inserts 3/8-16 UNC standard for DSX-8000 and DSX-1200. Other thread sizes available.

^ At full field with degauss coil, 85 gauss without degauss coil, at 6" (150 mm) above mounting surface. Vertical system only.

^^ At 6" (150 mm) above mounting surface.

Degauss kit 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-12000.

Vertical systems only.

Air supply: 2SCFM at 90 psi (1 L/sec. @ 6.2 BAR).

Automatic centering with indicators and optical electronic overtravel protection.

Specifications subject to change without notice.

T H E R M O T R O N . C O M
