DSX-SERIES

Electrodynamic Vibration Test Equipment

THE DRIVING FORCE

A global vibration manufacturer for more than 40 years, Thermotron specializes in high-performance vibration test system integration. Our electrodynamic shakers feature superior acceleration, velocity, force, and shock performance. With a variety of customizable features, Thermotron's shakers provide the durability and versatility to meet your unique testing needs.

DSX-SERIES

Thermotron is a turnkey manufacturer of Vibration Test Systems, including the shaker, amplifier, control system, sliptables, 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 sliptables, 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

- 16" (40.6 cm) or 24" (61 cm) diameter armature
- 1,000 pound (454 kg) payload support (1,500 pound option)

DSX-5500

- 5,500 force pound (24.5 kN) sine and random capabilities
- 80 ips (2.03 mps) continuous velocity
- 80g 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)*

DSX-20000

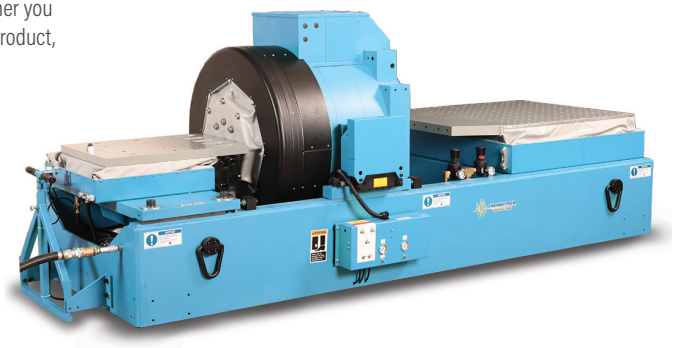
- 20,000 force pound (89 kN) sine and random capabilities
- 16" (40.6 cm) diameter armature
- 1,000 pound (454 kg) payload support (1,500 & 2,000 pound options)
- 80 ips (2.03 mps) continuous velocity
- 120g bare table acceleration (with 16" armature)*

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

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.



A DSX-8000 purchased by an automotive subcontractor. This dual sliptable design provided a versatile and cost-effective piece for the company.

FEATURES

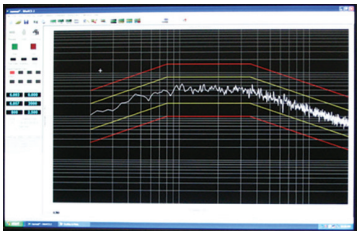
Amplifier	Efficiently drives the shaker to full output over a specified frequency range. Uses IGBT technology to combine the fast switching of a MOSFET with high current capability and low power dissipation of a bipolar transistor. Also safely shuts down the system before components fail.
Armature	Lightweight and durable 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 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 capabilities. Real Data Acquisition and Playback (RDAP) allows actual vibration data from the field to be recorded. 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 also is 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 Controller 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-defined temperature and electrodynamic vibration profiles
- Up to 16 powered accelerometer inputs
- 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 45 years of vibration equipment, 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 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, JJG, 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-5500		DSX-6650		DSX-8000				DSX-12000		DSX-20000
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		16 / 40.6	24 / 61	16 / 40.6
Amplifier Model	915/1	928/1		930/2		943/2		960/4	960/5	960/5		9160/16
Force Rating Sine Peak lbf / kN Random[1] RMS lbf / kN	 2,250 / 10.0 2,250 / 10.0	 5,500 / 24.5 5,500 / 24.5		 6,650 / 29.6 6,650 / 29.6		 8,000 / 35.6 8,000 / 35.6				 12,000 / 53.4 12,000 / 53.4		 20,000 / 640 20,000 / 640
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	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	30g: 2,000 / 909 50g: 2,000 / 909 100g: 560 / 255
Maximum Velocity[3]— Sine Sweep — ips / mps	90 / 2.28	70 / 1.78		90 / 2.28		100 / 2.54				90 / 2.29		80 / 2.03
Displacement Rated	3" (76.2 mm) pk-pk continuous											2" pk-pk continuous / 3" Shock
Frequency Range[4]	0-3,000 Hz	0-3,000 Hz	0-2,500 Hz	0-3,000 Hz	0-2,500 Hz	0-3,000 Hz	0-2,500 Hz	0-3,000 Hz		0-2,750 Hz		0-2,400 Hz
Armature Weight — Lbs / Kg	23.3 / 10.6	66.5 / 30.2	85 / 38.6	66.5 / 30.2	85 / 38.6	66.5 / 30.2	85 / 38.6	66.5 / 30.2		100 / 45.5	115 / 52.3	168 / 76
Axial Resonance	2,675 Hz	2,200 Hz	1,800 Hz	2,200 Hz	1,800 Hz	2,200 Hz	1,800 Hz	2,200 Hz		1,925 Hz		1,960 Hz
Mounting Points	16*	17*	25*	17*	25*	17**	25**	17**		17**	25**	17**
Payload Support[5]— Lbs / Kg	500 / 227	1,000 / 454										
Stray Magnetic Field (gauss)	Less than 5^	Less than 8^^	Less than 12^^	Less than 8^^	Less than 12^^	Less than 8^^	Less than 12^^	Less than 8^^		Less than 20^^		Less than 50^^
Shaker Weight—Lbs / Kg	1,980 / 898	6,000 / 2,722								9,000 / 4,083		9,250 / 4,205
Shaker Dimensions — WxDxH — in / cm	26 x 40 x 34 / 66 x 102 x 86	38 x 53 x 33 / 97 x 134 x 84								48 x 51 x 38 / 122 x 130 x 96		48 x 60 x 39 / 122 x 153 x 99
Blower Duct Diameter — in / cm	6 / 15.2	8 / 20										
Blower Motor	5 Hp (3.8 kW)	5 Hp (3.8 kW)		10 Hp (7.5 kW)		15 Hp (11.3 kW)				20 Hp (15.1 kW)		20 Hp (15.1 kW)
Airflow	550 CFM (0.22m^3/s)	1150 CFM (0.26m^3/s)		1300 CFM (0.38m^3/s)		1550 CFM (0.43m^3/s)				2000 CFM (0.49m^3/s)		1100 CFM (0.49m^3/s)
Blower Dimensions[6]—WxDxH — in / cm	25 x 23 x 26 / 64 x 58 x 66	32 x 27 x 32 / 81 x 69 x 81		34.5 x 27 x 40.5 / 88 x 69 x 103		38.5 x 32 x 45 / 98 x 82 x 115				38.5 x 31.5 x 45 / 98 x 81 x 115		38.5 x 31.5 x 45 / 98 x 81 x 115
Blower Weight—Lbs / Kg	145 / 66	336 / 152		550 / 250		710 / 322				735 / 334		735 / 334
Heat Rejected (Max)	39,000 BTUH	71,500 BTUH		81,200 BTUH		132,000 BTUH			176,000 BTUH	176,000 BTUH		529,000 BTUH
Recommended Min. Service[7] 460 / 3 / 60 400 / 3 / 50	 30 Amp 35 Amp	 45 Amp 50 Amp		 60 Amp 70 Amp		 80 Amp 90 Amp		 115 Amp 135 Amp		 130 Amp 150 Amp		 250 Amp 300 Amp
Cooling water requirements 30 psid/2.1 BAR minimum service	n/a	n/a		n/a		n/a		n/a		n/a		40 gpm @80°F/150 lpm @ 27°C 16 gpm @70°F/68 lpm @ 21°C

*[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, 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 sliptable 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.*

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