

# Shakers



Data Physics SignalForce Electrodynamic Shakers provide the foundation for a broad range of comprehensive test systems, meeting both single and multi-axis testing requirements.

The Data Physics LE range of shakers and accessories are designed and manufactured in the USA, while the GW range of products are designed and manufactured in the UK.

### Air Cooled Shakers

Air cooled shakers are lower cost, more versatile and easier to install and maintain than water cooled shakers. Air cooled shakers are workhorses for sine, random, shock, transient mixed mode and long time history replication applications. High displacement options are available for requirements such as transportation testing and classical shock testing. High lateral and torsional stiffness ensure maximum stability and support.



- Force outputs from 2 lbf (9 N) to 15,000 lbf (66.7 kN)
- Axial guidance bearings for superior cross-axis restraint
- Up to 3 inches (76.2 mm) of peak-peak displacement
- Automatic load support and armature centering
- A wide range of shaker mounting options include:
  - Vertical Isolation – for vertical-only testing
  - Rigid trunnion mounting – for vertical & horizontal testing
  - Lin-E-Air suspension – for vertical & horizontal testing that isolates vibration transmission into the facility floor

### Water Cooled Shakers

Water cooled shakers are typically used for larger payloads and more demanding structural testing applications. By utilizing dual hydrostatic bearings, payloads with high overturning moments can be tested without the need for external guidance systems. Water cooled shaker systems generate comparably lower acoustic noise output and lower demand on facility HVAC systems.



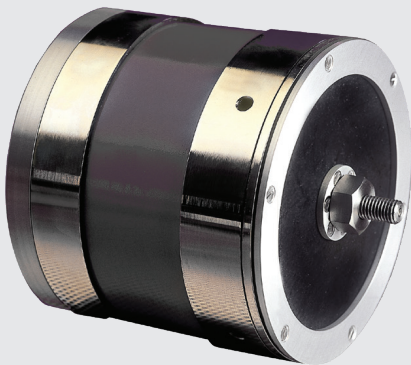
Water cooled shaker bodies are completely sealed, making them ideal for both clean room and hazardous environments.

- Force outputs from 16,000 lbf (71 kN) to 50,000 lbf (222 kN)
- Static payload support up to 3,000 lbs. (1,365 kg)
- 3 inches (76.2 mm) of peak-peak displacement
- Dual hydrostatic bearings for excellent axial guidance and moment restraint
- Automatic load support and armature centering
- Rigid trunnion mounting or Lin-E-Air suspension mounting options

Coupled to our SignalForce® power amplifiers and outfitted with optional slip tables or head expanders, Data Physics Shakers can be configured to meet a variety of test requirements. Our SignalStar® Vibration Controllers and SignalCalc® Dynamic Signal Analyzers complete our test systems, providing a fully integrated test and measurement solution, all delivered from a single source.

## Inertial Shakers

Structural excitation of large structures can often present considerable challenges. The Data Physics line of inertial shakers can be mounted onto a large structure to generate forces for dynamic response measurements. The inertial shakers can also be used for active noise cancellation applications. Inertial shakers are completely self-supporting and can be mounted onto the structures at any angle.



The central spigots are connected to the structure, and the shaker body provides the inertial mass.

- Force outputs from 7 lbf (30 N) to 56 lbf (250 N)
- Tunable suspension to produce peak force at low resonant frequencies
- Convection cooled, with options for direct airline or standard blower cooling

## Modal Shakers

Modal shakers are used to excite a structure via the central spigot with a connecting rod (stinger) so that energy can be input without the mass or dynamics of the shaker, affecting the response of the structure. Modal shakers exhibit almost zero axial stiffness through the use of a linear guidance bearing. They also bear no load and have no suspension system.



Modal shakers are used to test airframes, aerospace components and structures, and automotive chassis.

- Force outputs from 18 lbf (80 N) to 475 lbf (2 kN)
- Linear bearing guidance
- Virtually zero axial stiffness

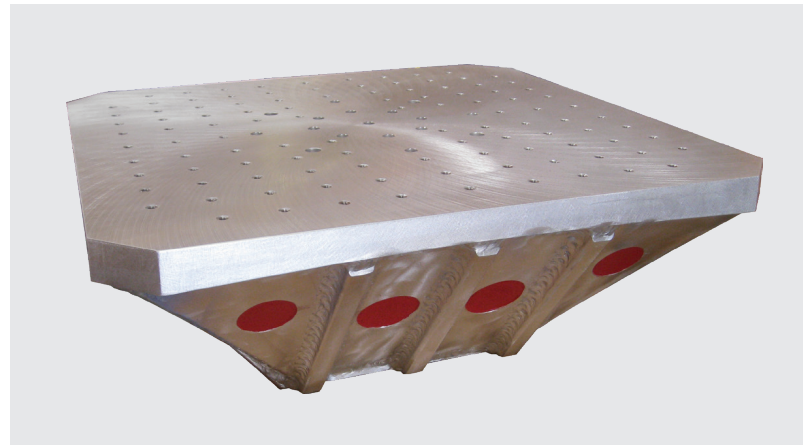
## Vibration Test System Accessories

SignalForce accessories include a wide selection of slip tables, head expanders and fixtures. Standard models as well as application specific solutions are available to cover a wide range of uses. SignalForce accessories are engineered to facilitate the vibration testing process.



## Accessories include:

- Monobases
- Slip tables
- Slip table guidance
- Head expanders
- Head expander guidance systems
- Fixtures
- Multishaker configurations and couplings
- Shaker mobility options
- Noise reduction enclosures
- Environmental chamber interfaces



### Power Amplifiers

SignalForce amplifiers provide very high levels of efficiency, performance, reliability and serviceability. Compact power modules enable high power configurations in a minimum of space. Data Physics Power Amplifiers are equally suitable for powering our systems and as replacements for any manufacture of amplifier.



The amplifier design includes full use of Faraday cages, component compartmentalization, filtered interconnections, segmented wiring, common mode chokes for symmetrical currents, mains filters, optical coupling of signals and screened cables to minimize EMC considerations. Full CE compliance is observed.

The LE-DSA15 amplifiers are standard with the LE-series shakers. The LE-DSA15 amplifiers utilize IGBT technology, which delivers up to 200 Vrms output, which eliminates the need for an output transformer. The transformerless design eliminates the need for manual switching for sine, random, and shock profiles, while reducing the size of the amplifier—freeing up valuable floor space in your vibration test laboratory.

- Linear amplifiers from 30 VA to 1 kVA
- Digital switching amplifiers from 1 kVA to 405 kVA
- Up to 95% efficient
- Switches at >105 kHz
- Integral field & degaussing supplies
- Safety interlocks
- Protection against over current and over temperature
- E-Link or remote control options. Control and monitor the power amplifier from your PC in the control room
- Drives all shaker brands



## Optimize the Performance and Safe Operation of your Shaker System with the 900 Series

Setting the standard for vibration control – for both single and multi-shaker applications, all controllers feature Data Physics’ renowned shaker control algorithms with a modern, intuitive software interface and versatile hardware.

The 900 Series vibration controller can quickly be set up to control any shaker – while the 900 series platform offers advanced features such as auto-aggregation of data from all test stands, custom Word-based reporting, unlimited expandability, concurrent data recording and signal analysis, intrinsic safety, and more. Get consistent and reliable results for sine sweep vibration tests, random vibration testing, SRS Analysis, and more.

Sine • Random • SRS Synthesis • Mixed Mode • Resonance Search & Dwell • Classical Shock and Transient Control • Time Data Replication • Multi-Shaker Control



### Industry Leading Vibration Controller Hardware

Designed for expandability, the Abacus 900 Series hardware’s modular platform allows a system to be used independently or combined to create larger systems (1,000+ channels). Each 6-channel card includes multiple CPU cores, allowing the hardware itself to perform all processing for the measurement at hand. All newly purchased 900 Series hardware comes with a 3-year warranty.

#### 912

The Abacus 912 is a high channel count system for laboratory use.

- 6-72 channels per chassis
- Many systems can be combined for thousands of channels in a test
- On-board solid-state memory

#### 906

The Abacus 906 is a portable system which supports both voltage/IEPE and strain/bridge sensors.

- 6–36 channels per chassis
- Supports Strain (bridge), IEPE, and voltage sensors
- Many systems can be combined for hundreds of channels in a test
- On-board solid-state memory

#### 901

The Abacus 901 is an ultra-portable system suited for field and lab use.

- Six channels (input/output/tach)
- Passive cooling for silent operation
- Power over Ethernet
- Remote and autonomous operation
- On-board solid-state memory
- Combine systems to expand channels

## Standard Model Range\*

MODAL	AMP	MAX SINE FORCE	
		lbf	N
GW-M20	PA100EC	18	80
GW-M50	PA300EC	54	240
	PA1000EC	74	330
GW-LMT100	BAA 1000 BEAK	77	343
GW-M150	PA1000EC	150	667
GW-M200	PA1000EC	275	1225
GW-M350	PA1000EC	475	2115

INERTIAL	AMP	MAX SINE FORCE	
		lbf	N
GW-IV40	PA30E	7	30
GW-IV45	PA30E	11	50
GW-IV46	PA100E	38	170
GW-IV47	PA300E	56	250

CONVECTION & FORCED AIR COOLED	AMP	MAX SINE FORCE		MAX RANDOM FORCE	
		lbf	N	lbf	N
GW-V2	PA30E	2	9	0.7	3
GW-V4	PA30E	4	17.8	1.3	5.9
GW-V20	PA100E	22.5	100	7.4	33
	PA300E	35	155	13	58
GW-LS70	STAR 1.0	70	311	60	267
GW-V55	PA100E	32	142	11	50
	PA300E	70	310	25	110
	DSA5-1K	100	444	36	160
GW-V100	DSA5-1K	225	1000	120	533

AIR COOLED	MAX SINE FORCE		MAX RANDOM FORCE	
	lbf	kN	lbf	kN
GW-V300	370	1.6	190	.85
GW-V350	697	3.1	505	2.2
GW-V617	1500	6.7	1025	4.6
GW-V400	1647	7.3	1214	5.4
GW-V400LT	1647	7.3	1214	5.4
GW-V1322	2455	10.9	2250	10
GW-V1333	2455	10.9	2250	10
LE-308-3	3000	13.3	2700	12
LE-308-3EF	3500	15.6	2900	12.9
LE-612-3	6000	26.7	6000	26.7
LE-616	6000	26.7	6000	26.7
LE-624	6000	26.7	6000	26.7
GW-V2634	6000	26.7	5000	22.3
GW-V2644	6000	26.7	5000	22.3
GW-V2664	6000	26.7	5000	22.3
GW-V3534	8000	35.6	6520	29
GW-V3544	8000	35.6	6520	29
GW-V3564	8000	35.6	6520	29
LE-812-3	8000	35.6	8000	35.6
LE-816	8000	35.6	8000	35.6
LE-1316-3	13500	60	13500	60
LE-1316-3EF**	15000	66.7	15000	66.7

\*\*Max runtime of 5 minutes.

WATER COOLED	MAX SINE FORCE		MAX RANDOM FORCE	
	lbf	kN	lbf	kN
LE-2016-3	20000	90	20000	90
LE-2516-3	25000	111	25000	111
LE-5022-3	50000	222	45000	200

\* Listed models intended to communicate the standard range of our offerings. If we do not already manufacture the test system ideally suited for your applications, our engineering team can custom design a solution specific to your needs.

## Parts & Service

Data Physics has one of the largest shaker service operations in the world with service centers on both coasts of the USA, the UK and China. Our uniquely qualified and experienced team of service engineers can service Data Physics, Ling and all other brands and models of vibration test equipment installed in test labs around the world. Equipment installation, relocation, repair, calibration and maintenance services are available.

Spare parts are available for all SignalForce shakers and amplifiers. Spare parts for many other shaker brands are also available directly from Data Physics. All spare parts are produced to the highest quality standards. In many cases, Data Physics can supply obsolete parts no longer manufactured by the original equipment manufacturer.

## Manufacturing Integrity

The Data Physics LE range of shakers and accessories are designed and manufactured in the USA, while the GW range of products are designed and manufactured in the UK.



**Product Inquiries**  
Data Physics Headquarters  
1111 Spruce St.  
Riverside, CA 92507 USA  
+1.408.437.0100  
dataphysics.com



**Kemo Instruments Private Ltd**  
Anchor 1 Site No 1215, 1st Floor  
BEL Layout, Vidyanarayapura  
Bengaluru-560097, Karnataka  
India  
sales@kemo-india.com  
+91 80 4390 4238  
[www.kemo-india.com](http://www.kemo-india.com)

