

PRODUCT DATA

LDS V994 Shaker Imperial

Performance Parameters*

Armature Diameter	29.9 in
Sine Force (peak)	65000 lbf
Random Force (rms)†	60000 lbf
Maximum ½-sine Shock Force‡	130129 lbf
Armature Resonance (f _n)	1325 Hz
Usable Frequency Range	d.c – 1.7 kHz
Mass of Moving Element (flush inserts)	562 lb
Velocity (sine peak) – full-field	74.8 in/s
Acceleration (sine peak)	75 g
Acceleration (random rms)	60 g
Displacement (pk–pk) – continuous	2.0 in
LDS Amplifier	DPA-K range

Characteristics

Suspension Axial Stiffness	520 lbf/in
Suspension Rotational Stiffness	94.7 × 10 ⁶ lbf in/rad
Suspension Cross-axial Stiffness	410000 lbf/in
Internal Load Support Capacity	11023 lb
Shaker Body Mass (M _b)	28590 lb
Stray Magnetic Field‡	20 gauss
Low Gauss Option	3 gauss
Compressed Air Supply	100 lbf/in ²
Max. Required Input, Amplifier	244.59 kVA
Max. Required Input, FPS and CU	169.63 kVA

Used where large payloads need high performance vibration or shock testing, the V900 series gives engineers the confidence they need to develop highly reliable products. These systems have been used in single and multi-shaker configurations, and have been used to test products such as satellites and missiles.

Features

- Combination of high performance armature design and water-cooled coils deliver excellent acceleration and velocity performance
- Automatic armature and body position load compensation system ensures larger loads can be comfortably accommodated
- Trunnions feature Lin-E-Air suspension system as standard. Solid trunnions available upon request



System Performance

	with DPA 90/140K -DC	with DPA 120/140K -DC	with DPA 140K -TC	with DPA 140K -DC	with DPA 140K -TC	with DPA 165/210K -DC	with DPA 210K -DC	with DPA 210K -TC	with DPA 280K -TC
Sine Force (peak)	30100 lbf	39600 lbf	35000 lbf	48000 lbf	42000 lbf	52000 lbf	45900 lbf	57000 lbf	65000 lbf
Max. Acceleration (sine peak)	53.6 g	70 g	62.3 g	75 g	74.7 g	75 g	75 g	75 g	75 g
Random Force (rms)	39600 lbf	39600 lbf	52000 lbf	39600 lbf	52000 lbf	39600 lbf	60000 lbf	60000 lbf	60000 lbf
Max. Acceleration (random rms)	60 g	60 g	60 g	60 g	60 g	60 g	60 g	60 g	60 g
Velocity (sine peak)	51.2 in/s	51.2 in/s	70.9 in/s	51.2 in/s	59.1 in/s	51.2 in/s	51.2 in/s	63 in/s	74.8 in/s
Health and Safety	Complies with the following EU directives: Machinery 2006/42/EC, Low Voltage 2006/95/EC, EMC 2004/108/EC Designed in accordance with EN 61010–1:2001								

Industry Applications

- 3-axis testing of complete satellite systems
- Avionics and military hardware testing
- Structural dynamics testing
- Clean room environments
- Multi-shaker, multi-axis applications

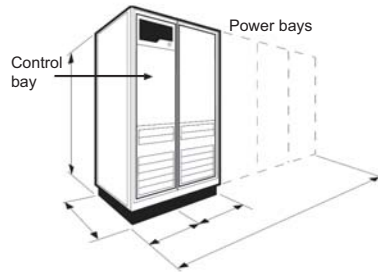
* Force and velocity ratings depend on the amplifier driving the shaker. The sine force, random force and velocity parameters detailed here are based on the shaker when driven by the DPA 280K amplifier.

† Random and shock ratings assume a payload approximately twice the mass of the armature; shock pulse 2 ms. For advice on specific test requirements, contact Brüel & Kjær.

‡ Theoretical maximum, measured 5.9 in above table, full-field, at normal operating temperature.

Some of the features listed are available as standard, others as options. Please contact Brüel & Kjær for advice on the optimum specification to meet your system needs

DPA-K Series Amplifier Characteristics



Power Range	90 – 280 kVA in 8 kVA increments
Signal-to-noise Ratio	>65 dB, relative to 100 V rms output, 10 kΩ input termination and rated resistive load connected (100 kHz BW)
Input Impedance	10 kΩ nominal
Total Harmonic Distortion	0.5 – 0.8% at rated output into resistive load
Input Sensitivity	1.1 V (±0.1 V rms input) for 100 V rms output at rated sinusoidal Volt Amp output
Switching Frequency	150 kHz
Module Efficiency	90.9%
Nominal Sine Output Voltage	100 V rms at rated power output
Frequency Range	10 Hz – 1 kHz
Frequency Response	20 Hz – 3 kHz: ±1.5 dB
Common Mode Rejection	100 dB (d.c. – 5 kHz)
Protection	Integral protection to prevent output devices from working outside their specification limits

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Environmental Data*

	V994 Shaker	DPA-K Amplifier					FPS and Cooling Unit
		90/140K	140K	165/210K	210K	280K	
Working Ambient Temp. (°F)	40 to 151	41 to 104					41 to 104
Heat Dissipation (Rejected to Air)	12 kW	9.41 kW	14.91 kW	17.20 kW	22.29 kW	29.69 kW	4.79 kW
Acoustic Noise at 6.6 ft	105 dBA	85 dBA				90 dBA	75 dBA
Cooling Air Flow	–	6990 ft ³ /min		10485 ft ³ /min		14000 ft ³ /min	1400 ft ³ /min
Raw Water Flow Rate	–	46.8 gal/min [†]		48.6 gal/min [†]		50.5 gal/min [†]	55 gal/min [†]
Raw Water Pressure Drop	–	8.3 lbf/in ^{2†}		9.0 lbf/in ^{2†}		9.6 lbf/in ^{2†}	11.2 lbf/in ^{2‡}
Raw Water Max. Inlet Temp. (°F)	–	90 [†]					90 [†]
Raw Water Max. Outlet Temp. (°F)	–	111 [†]		113 [†]		116.6 [†]	
Height (in)	80	75		75		75	
Width (in)	107	61.4		81.5		101.6	
Depth (in)	64.6	32.5		32.5		32.5	
Mass (lb)	40390	3097	3307	4594	4782	6256	2694

* Values for air trunnion mounted shaker and an amplifier configuration of one control bay and one power bay

† Actual values when used with V994 shaker

‡ Values for cooling unit alone when running at maximum capacity

Make Our Experience Your Advantage

From application engineering, installation and training through to maintenance, spares and repairs, Brüel & Kjær offers a total service approach to keep your system operating efficiently and reliably. All LDS systems (standards and specials) are designed and manufactured to ISO 9001 standard. Brüel & Kjær offers a comprehensive range of vibration, measurement and analysis equipment. Please consult our website for details.

V 994 Shaker Options

Armature Insert Selection:

M 12 ◆

1/2" UNC ◆

Mounting Selection:

Trunnion mounted with Lin-E-Air isolation and body rotation gearbox ◆

Solid trunnion ●

Other Options:

Combination shaker/slip table base ●

Chamber support kit ●

Thermal barrier ●

Key:

◆ Standard – Available on shortest delivery
● Option – Stocked item, available on short delivery

Brüel & Kjær reserves the right to change specifications and accessories without notice.

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