

PRODUCT DATA

LDS V650 and V651 Shakers

Metric

Performance Parameters*

LDS Amplifier	PA1000 L	HPA-K
Armature Diameter	156 mm	
Sine Force (peak)	1.62 kN	2.2 kN
Random Force (rms)	1.09 kN	1.54 kN
Maximum ½-sine Shock Force†	2.1 kN	3.1 kN
Armature Resonance (f _n)	3.8 kHz	
Usable Frequency Range	5 Hz – 4 kHz	
Mass of Moving Element	2.24 kg	
Velocity (sine peak)	1.4 m/s	1.5 m/s
Acceleration (sine peak)	73.7 g	100 g
Acceleration (random rms)	49.6 g	70 g
Displacement (pk–pk)	25.4 mm	

With a combination of wide frequency range, high force and acceleration, the V650 range of air-cooled shaker solutions delivers excellent all-round testing capabilities. A number of optional extras enable the system to be tailored to suit most applications.

V650 series shakers can be driven by any suitable oscillator/amplifier/field power supply (FPS) combination, but the LDS PA1000L or HPA-K amplifier is specially recommended for this purpose. **Note:** When using PA1000L, a separate FPS is required – Brüel & Kjær recommends FPS10L.

Features

- Lightweight, high performance armature design delivers excellent acceleration and velocity performance
- Optional software allows system tests to be controlled remotely using a PC
- Ease-of-use and power saving features on LDS amplifiers reduce operating costs
- Proven reliability maximises system availability, combined with global servicing and support
- Vertical or horizontal operation

Industry Applications

- Automotive component testing
- Electronic assembly testing
- Structural testing
- Modal investigation
- Vibration stress testing under varied environmental conditions
- In-house test and calibration facilities

Characteristics

Compressed Air Supply	5.5 bar	Max. Acoustic Noise – 1 m away‡	110 dBA	Health and Safety: Complies with the following EU directives:
Stray Magnetic Field: **		Maximum Heat Dissipation – to air	2.1 kW	
<i>Degauss coils not energised</i>	<7.5 mT	Working Ambient Temperature	0 – 30° C	• Machinery: 2006/42/EC
<i>Degauss coils energised</i>	<1.0 mT	Maximum Cooling Air Flow	0.094 m ³ /s	• Low Voltage: 2006/95/EC
Shaker Body Mass (M _b)	189 kg	Armature Insert Pattern:		• EMC: 2004/108/EC
Internal Load Support Capacity	50 kg	Centre Insert	1	Designed in accordance with EN 61010 – 1:2001
Suspension Axial Stiffness	15.8 kN/m	125 mm PCD (inserts equi-spaced 22.5° to trunnion axis)	8	
Suspension Cross-axial Stiffness	2452 kN/m			
Suspension Rotational Stiffness	11.07 kN m/rad			

* 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 specified LDS amplifiers.

† 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.

‡ Maximum noise when running at full level. Measured at a height of 1.6 m above floor level in enclosed cell

** Theoretical maximum, measured 50 mm 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

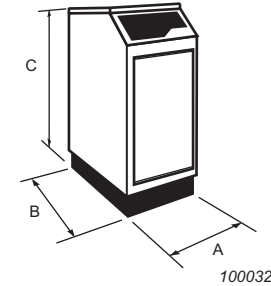
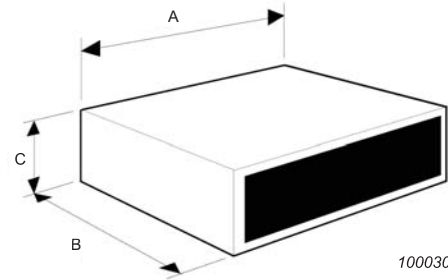
Amplifier Characteristics

	PA 1000L	HPA-K
Rated Sinusoidal Power Output	1000 W	–
Power Output	–	5 kVA
Signal-to-noise Ratio*	>75 dB	>68 dB
Frequency Range – at rated power	20 Hz–14 kHz	–
Modulation Range	–	d.c. – 10 kHz
Output Current – at rated VA	18 A rms	–
Random Output Current	54 A pk	–
Continuous Output Current – sine and random	–	50 A rms
Transient Output Current	–	150 A for 100 ms
Maximum Output Voltage	80 V rms	–
Maximum No Load Voltage	86 V rms	–
Rated Output Voltage	–	100 V rms (sine)
Overcurrent Trip Level	19 A rms	–
Total Harmonic Distortion	Typically 0.2% at rated output (20 Hz – 14 kHz)	Typically 0.15% when measured into resistive load
Input Sensitivity	1.0 V rms for maximum output (400 Hz)	1.0 V rms for 100 V rms output (differential input)
Amplifier Efficiency†	59%	>90%
Module Efficiency	–	93%
Voltage Regulation	2%	–
Maximum Continuous Sinusoidal VA Output (0.866 pf)	1400 VA	–
Switching Frequency	–	150 kHz
Input Impedance	–	10 kΩ nominal
Protection	True rms metering with overcurrent protection	Integral protection to prevent power devices from working outside their limits

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Environmental Data

PA 1000L Amplifier		HPA-K Amplifier	
Cooling Air Flow	0.09 m ³ /s	Cooling Air Flow	0.3 m ³ /s
Dimension A (mm)	482	Dimension A (mm)	537
Dimension B (mm)	505	Dimension B (mm)	825
Dimension C (mm)	188	Dimension C (mm)	1000
Weight (kg)	37	Weight (kg)	210



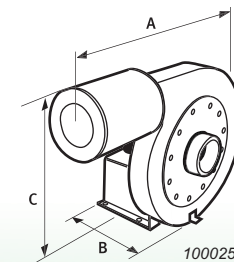
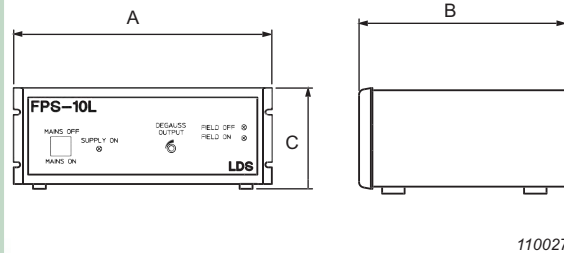
Field Power Supply – FPS 10L

Dimension A (mm)	482	Dimension A (mm)	536
Dimension B (mm)	385	Dimension B (mm)	401
Dimension C (mm)	188	Dimension C (mm)	575
Weight (kg)	21.8	Weight (kg)	23

Cooling Fan

Acoustic Noise‡ 72 dBA

Working Ambient Temp.	0–30° C
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V650/1 Options

Armature Insert:

- M 8 (with V 650) ◆
- 5/16" UNF (with V 651) ◆

Mounting:

- Air Mount Isolation ◆

Other Options:

- Internal Load Support ◆
- FPS 10L (with V 650) ◆
- Integral Field & Cooling Fan Drive (HPA-K) ◆

Thermal Barrier ●

Key:

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

* With respect to 100 V rms output, 10 kΩ input termination, and rated resistive load connected
 † Amplifier only, not including field power supply
 ‡ Measured at a height of 1.6 m above floor level in enclosed cell

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

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