

LDS V875LS Shaker Systems

Medium-Force Electrodynamic Vibration Systems



from left: V875LS on base-mounted air isolation, with air-glide; SPA-K amplifier; trunnion-mounted V875LS with body rotation gearbox (and pneumatics pedestal box shown connected in front), V875LS on combo base with hydrostatic slip table

Mounting Selection

- Base-mounted
- Lin-E-Air air isolated trunnions

Other Options

- Combo slip table
- V-groove castors
- Air glide
- Chamber floor support
- Silencer for shaker cooling fan
- Thermal management
- Head expander

The LDS® V875LS series shaker system is ideal for vibration and mechanical shock testing using sinusoidal, random, or transient excitation. V875LS systems are available in armature sizes of 440 mm (17.32 in), and 640 mm (25.20 in).

Systems are available in various forms to meet customers' exact requirements, for example: Lin-E-Air trunnion-mounted with a body rotation gearbox; combined with a horizontal hydrostatic slip table; or for under-chamber operation.

Maximum Force Ratings for System Configurations

	Sine Force (peak)		Random Force (rms)*		Half-sine Shock Force*	
	V875LS-440	V875LS-640	V875LS-440	V875LS-640	V875LS-440	V875LS-640
with SPA8K Amplifier	7.74 kN (1 740 lbf)	7.74 kN (1 740 lbf)	8.52 kN (1 915 lbf)	8.44 kN (1 898 lbf)	16.85 kN (3 789 lbf)	16.85 kN (3 789 lbf)
with SPA16K Amplifier	15.44 kN (3 470 lbf)	15.44 kN (3 470 lbf)	17.04 kN (3 830 lbf)	16.89 kN (3 796 lbf)	33.71 kN (7 578 lbf)	33.71 kN (7 578 lbf)
with SPA24K Amplifier	23.18 kN (5 210 lbf)	23.18 kN (5 210 lbf)	25.56 kN (5 745 lbf)	25.33 kN (5 694 lbf)	50.58 kN (11 370 lbf)	50.58 kN (11 370 lbf)
with SPA32K Amplifier	30.92 kN (6 950 lbf)	30.92 kN (6 950 lbf)	34.08 kN (7 661 lbf)	32.51 kN (7 309 lbf)	67.43 kN (15 159 lbf)	67.43 kN (15 159 lbf)
with SPA40K Amplifier	35.59 kN (8 000 lbf)	35.59 kN (8 000 lbf)	35.59 kN (8 000 lbf)	32.51 kN (7 309 lbf)	84.30 kN (18 952 lbf)	84.29 kN (18 950 lbf)

* Random and shock ratings assume a payload approximately twice the mass of the armature. Half-sine shock force is calculated with the standard payload, 2 ms pulsewidth, 10% pre/post pulse.

V875LS Shaker Specification

LDS Shaker Model	V875LS-440	V875LS-640
Armature Diameter	440 mm (17.32 in)	640 mm (25.20 in)
Usable Frequency Range	dc to 3000 Hz	dc to 2600 Hz
Armature Resonance (fn)	2250 Hz	2350 Hz
Acceleration (sine peak)†	1098 m/s ² (112.0 gn)	891 m/s ² (90.9 gn)
Acceleration Random (rms)†	981 m/s ² (100.0 gn)	746 m/s ² (76.1 gn)
Effective Mass of Moving Elements		
Armature with Flush Inserts	32.4 kg (71.4 lb)	39.9 kg (88.0 lb) (88.0 lb)
Armature with Raised Inserts	32.9 kg (72.5 lb)	40.6 kg (89.5 lb) (89.5 lb)
Suspension Rotational Stiffness	346 kN m/rad (235 000 lbf ft/rad)	543 kN m/rad (400 000 lbf ft/rad)
Stray Magnetic Field§	Standard: < 1.5 mT (15 gauss) Low Gauss Option: < 0.8 mT (8 gauss)	Standard: < 2.0 mT (20 gauss) Low Gauss Option: < 0.8 mT (8 gauss)
Suspension Axial Stiffness	Nil	
Suspension Cross-axial Stiffness	10.0 kN/mm (57 100 lbf/in)	
Velocity (sine peak)†	1.8 m/s (70.9 in/s)	
Displacement (peak-peak)‡	76.2 mm (3.0 in)	
Internal Load Support Capability	600 kg (1323 lb)	
Body Mass	Solid Trunnions: 2200 kg (4850 lb) — Lin-E-Air Trunnions: 2260 kg (4982 lb)	
Body Suspension Resonance	Lin-E-Air Suspension: < 5 Hz — Air Isolaton Mounts: < 10 Hz	
Ambient Working Temperature	+7 to 30 °C (+45 to 86 °F)	
Maximum Dimensions (H x W x D)	Trunnion-mounted Shaker: 1146 x 1358 x 1142 mm (45.1 x 53.5 x 45.0 in) Base-mounted Shaker: 838 x 1042 x 1266 mm (33.0 x 41.0 x 49.8 in)	

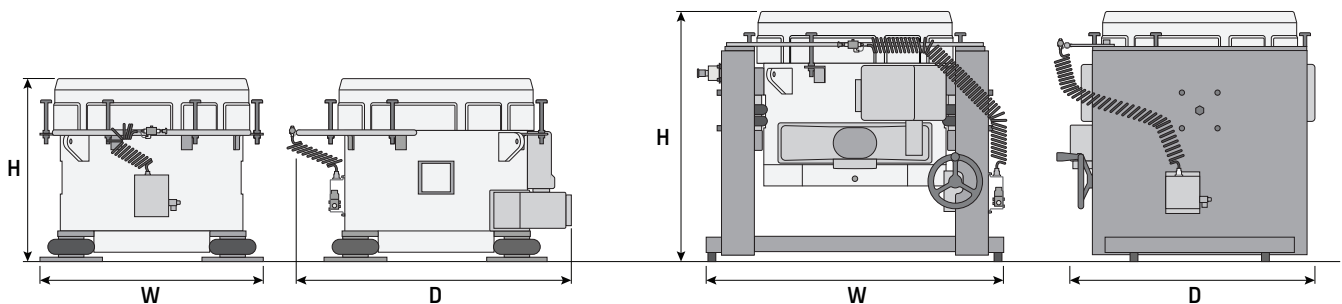
† Velocity and acceleration ratings depend on the amplifier driving the shaker.

‡ Displacement can vary with payload and shaker orientation. Please contact Brüel & Kjær for advice on specific test requirements.

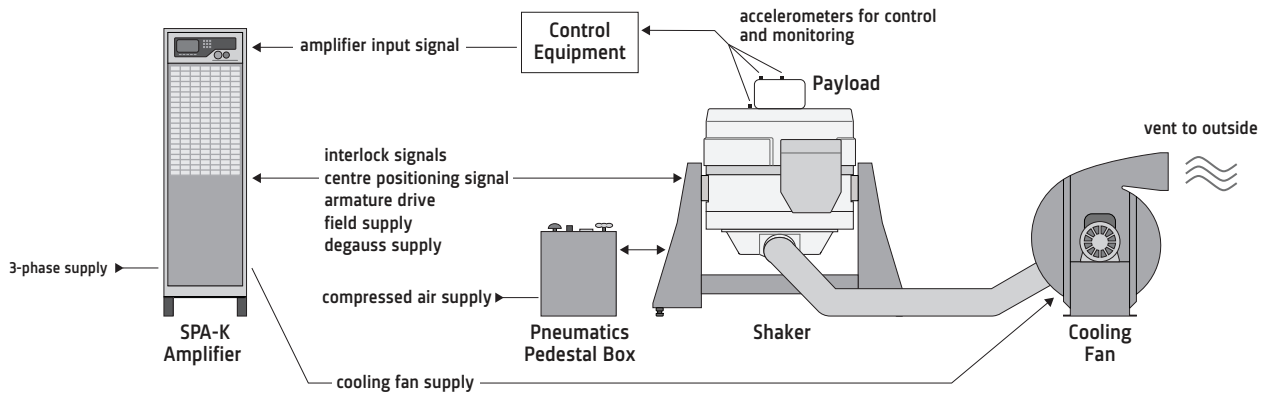
§ Theoretical maximum, measured 150mm (6 in) above table, full-field, at normal operation temperature

Base-Mounted V875LS

V875LS on Lin-E-Air Trunnions



Typical Vibration Test System



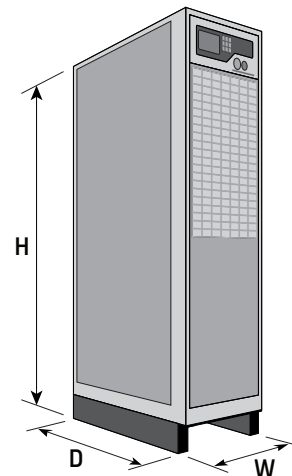
SPA-K Amplifier Specification

Power Range	8 – 40 kVA in 8 kVA increments
Signal-to-Noise Ratio	> 68 dB wrt 100 V rms output**
Input Impedance	10 kΩ nominal
Total Harmonic Distortion	0.5 to 0.8 % at rated output into rated resistive load
Input Sensitivity	1.0 V for 100 V rms output
Switching Frequency	150 kHz
Efficiency	> 90 % (not including field power supply)
Rated Output Voltage	100 V rms (sine)
Continuous Output Current	80 A rms (sine and random) per 8 kVA increment
Full Power Bandwidth	20 Hz to 3 kHz
Transient Output Current	240 A per 8 kVA increment for 100 ms
Module Efficiency	93 %
Modulation Range	dc to 10 kHz
Protection	Integral protection to prevent output devices from working outside their specification limit.
Ambient Working Temperature	+5 to 30 °C (+41 to 86 °F)
Max. Dimensions (H x W x D)	1870 x 537 x 825 mm (74 x 21 x 33 in)

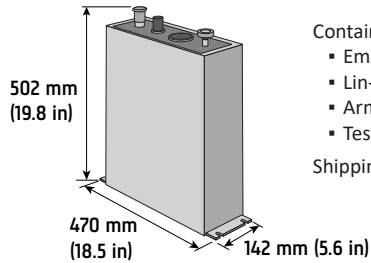
** 10 kΩ input termination and rated resistive load connected.

	Heat Rejected to Air	Cooling Airflow	Max. Input Requirement#	Weight
SPA8K	2.4 kW	0.42 m ³ /s	36.1 kVA	544 kg (1199 lb)
SPA16K	3.0 kW	0.42 m ³ /s	43.3 kVA	555 kg (1224 lb)
SPA24K	3.7 kW	0.50 m ³ /s	50.5 kVA	566 kg (1248 lb)
SPA32K	4.3 kW	0.57 m ³ /s	57.7 kVA	577 kg (1272 lb)
SPA40K	4.9 kW	0.65 m ³ /s	64.8 kVA	588 kg (1296 lb)

Includes requirements from cooling fan and system ancillaries in steady state.



Standard Ancillaries

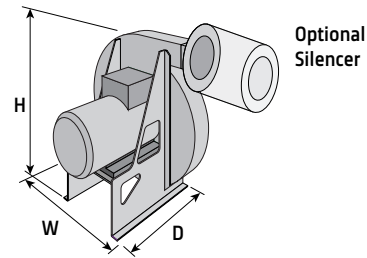


Pneumatics Pedestal Box

Contains:

- Emergency stop
- Lin-E-Air suspension air control valve
- Armature position indicator
- Test load control valve

Shipping Weight 20 kg (44 lb)



Shaker Cooling Fan

	V875LS Cooling Fan 50 Hz	V875LS Cooling Fan 60 Hz
Cooling Fan without Silencer (H x W x D)	914 x 783 x 594 mm (36.0 x 30.8 x 23.4 in)	782 x 705 x 577 mm (30.8 x 27.8 x 22.7 in)
Cooling Fan with Silencer (H x W x D)	991 x 1283 x 647 mm (32.4 x 42.6 x 21.7 in)	873 x 1205 x 639 mm (34.4 x 47.4 x 25.2 in)
Cooling Fan Shipping Weight	181 kg (399 lb)	181 kg (399 lb)

Environment, Supply, and Safety

Environmental Data

Max. Acoustic Noise*	
Shaker	108 dBA
SPA-K Amplifier	72 dBA
Cooling Fan	99 dBA
Total Heat Dissipation:	
Shaker (from body)	1.86 kW
SPA-K Amplifier	see page 3
Cooling Fan	25.0 kW
Cooling Airflow:	
Shaker via Cooling Fan	0.57 m ³ /s (1200 ft ³ /min)
SPA-K Amplifier	see page 3

* Maximum acoustic noise levels do not take into account any noise that may be generated due to payloads attached to the vibration testing system.

Electrical and Compressed Air Supply

Voltage 3-Phase	Standard: 380 to 500 V, 50/60 Hz Low Voltage Option: 200 to 220 V, 50/60 Hz
Compressed Air Supply	6.9 bar (100 lbf/in ²)

Safety

Complies with the following EU directives:

- Machinery: 2006/42/EC
- Low Voltage: 2014/35/EU
- EMC: 2014/30/EU
- Designed in accordance with EN 61010-1:2010

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