LDS V875 Shaker Systems

Medium-Force Electrodynamic Vibration Systems

from left: V875 on base-mounted air isolation, with air-glide; SPA-K amplifier; trunnion-mounted V875 with body rotation gearbox (and pneumatics pedestal box shown connected in front), V875 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® V875 series shaker system is ideal for vibration and mechanical shock testing using sinusoidal, random, or transient excitation. V875 systems are available in armature sizes of 240 mm (9.45 in), 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

	Amplifier Option	SPA8K	SPA16K	SPA24K	SPA32K	SPA40K
Sine Force (peak)	V875-240 Shaker	7.74 kN (1 740 lbf)	15.44 kN (3 470 lbf)	23.18 kN (5 210 lbf)	30.87 kN (6 940 lbf)	35.59 kN (8 000 lbf)
	V875-440 Shaker	7.74 kN (1 740 lbf)	15.44 kN (3 470 lbf)	23.18 kN (5 210 lbf)	30.87 kN (6 940 lbf)	35.59 kN (8 000 lbf)
	V875-640 Shaker	7.74 kN (1 740 lbf)	15.44 kN (3 470 lbf)	23.18 kN (5 210 lbf)	30.87 kN (6 940 lbf)	35.59 kN (8 000 lbf)
	V875-640EF Shaker	—	—	—	—	37.81 kN (8 500 lbf)
Random Force (rms)*	V875-240 Shaker	9.23 kN (2 074 lbf)	18.45 kN (4 147 lbf)	27.67 kN (6 221 lbf)	31.14 kN (7 000 lbf)	31.14 kN (7 000 lbf)
	V875-440 Shaker	10.28 kN (2 311 lbf)	20.56 kN (4 622 lbf)	30.84 kN (6 933 lbf)	35.59 kN (8 000 lbf)	35.59 kN (8 000 lbf)
	V875-640 Shaker	8.17 kN (1 836 lbf)	16.33 kN (3 672 lbf)	24.51 kN (5 509 lbf)	31.14 kN (7 000 lbf)	31.14 kN (7 000 lbf)
	V875-640EF Shaker	—	—	—	—	37.81 kN (8 500 lbf)
Half-sine Shock Force*	V875-240 Shaker	16.45 kN (3 697 lbf)	32.89 kN (7 393 lbf)	49.3 kN (11 090 lbf)	65.77 kN (14 786 lbf)	82.23 kN (18 485 lbf)
	V875-440 Shaker	16.86 kN (3 791 lbf)	33.73 kN (7 582 lbf)	50.6 kN (11 373 lbf)	67.46 kN (15 165 lbf)	84.33 kN (18 958 lbf)
	V875-640 Shaker	16.74 kN (3 764 lbf)	33.49 kN (7 529 lbf)	50.2 kN (11 295 lbf)	66.98 kN (15 057 lbf)	83.72 kN (18 822 lbf)
	V875-640EF Shaker	—	—	—	—	82.99 kN (18 657 lbf)

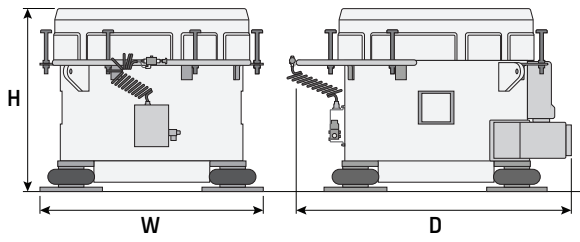
* Random and shock ratings assume a payload approximately twice the mass of the armature. Half-sine shock force is calculated with the standard payload, 2 ms pulsewidth, 10% pre/post pulse.

V875 Shaker Specification

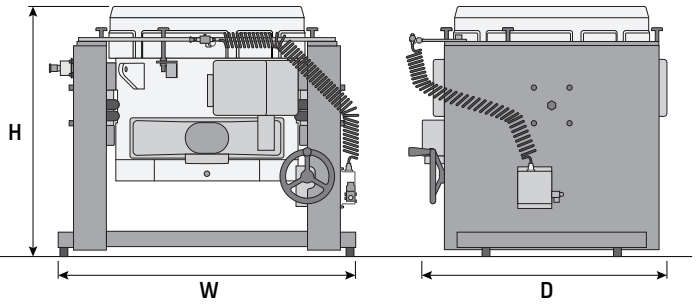
LDS Shaker Model	V875-240	V875-440	V875-640	V875-640EF
Armature Diameter	240 mm (9.45 in)	440 mm (17.32 in)	640 mm (25.20 in)	640 mm (25.20 in)
Usable Frequency Range	dc to 3000 Hz		dc to 2400 Hz	dc to 2300 Hz
Armature Resonance (fn)	2280 Hz	2650 Hz	2200 Hz	1650 Hz
Velocity (sine peak)†	2.0 m/s (78.7 in/s)	1.8 m/s (70.9 in/s)		
Acceleration (sine peak)†	1600 m/s² (163.0 g_n)	1080 m/s² (110.0 g_n)	490 m/s² (50.0 g_n)	490 m/s² (50.0 g_n)
Acceleration Random (rms)†	1176 m/s² (120.0g_n)	735 m/s² (75.0 g_n)	490 m/s² (50.0 g_n)	490 m/s² (50.0 g_n)
Effective Mass of Moving Elements				
Armature with Flush Inserts	22.3 kg (49.2 lb)	31.6 kg (69.7lb)	40.8 kg (90.0 lb)	63.3 kg (139.3 lb)
Armature with Raised Inserts	—	32.2 kg (71.0 lb)	42.5 kg (93.7 lb)	65.0 kg (143.3 lb)
Suspension Axial Stiffness	79 N/mm (450 lbf/in)	350 N/mm (2000 lbf/in)		
Suspension Cross-axial Stiffness	2.2 kN/mm (12 700 lbf/in)	5.9 kN/mm (34 000 lbf/in)		
Suspension Rotational Stiffness	32 kN m/rad (23 300 lbf ft/rad)	339 kN m/rad (250 000 lbf ft/rad)		
Stray Magnetic Field§	< 1.5 mT (15 gauss), Low Gauss Option: < 0.8 mT (8 gauss)		< 2.0 mT (20 gauss), Low Gauss Option: < 0.8 mT (8 gauss)	
Displacement (peak-peak)‡	50.8 mm (2.0 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.
§ Measured at a distance of 1 m (3.3 ft) and at a height of 1.6 m (5.2 ft) above floor level in an enclosed cell.

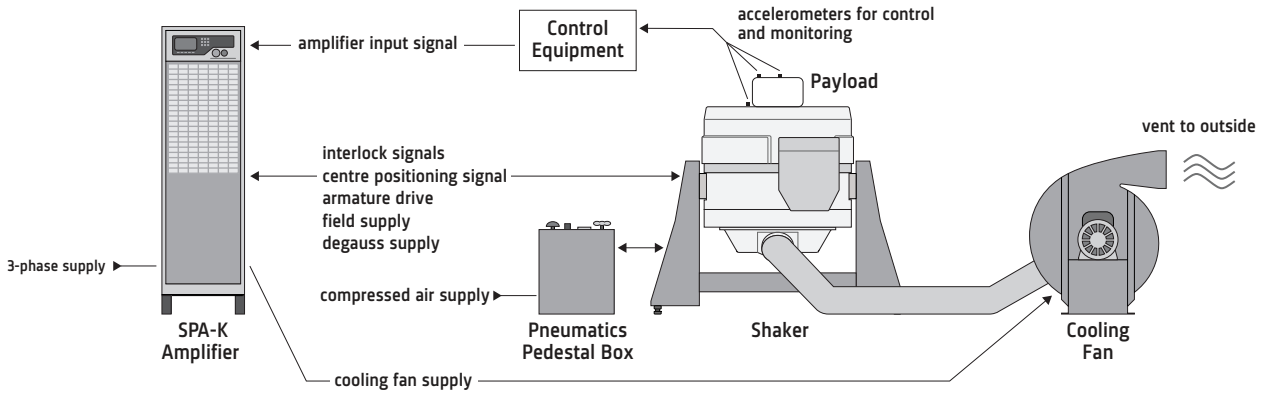
Base-Mounted V875



V875 on Lin-E-Air Trunnions



Typical Vibration Test System



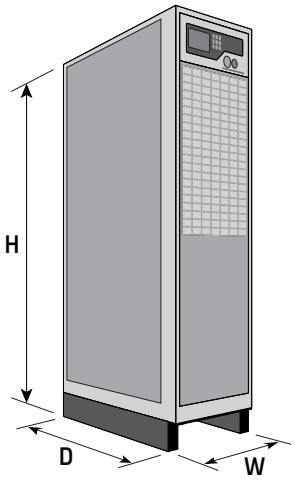
SPA-K Amplifier Specification

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)

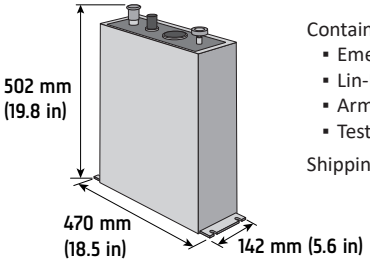
** 10 kΩ input termination and rated resistive load connected.

	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.



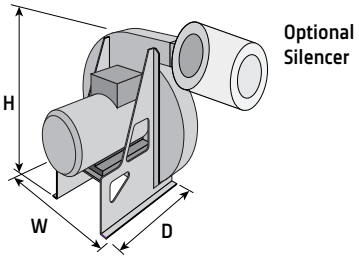
Standard Ancillaries



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

Shipping Weight 20 kg (44 lb)

Pneumatics Pedestal Box



Shaker Cooling Fan

	V875 Cooling Fan 50 Hz	V875 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 (39.0 x 50.5 x 25.5 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	25.00 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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