

# PRODUCT DATA

## LDS V8900 Shaker

High-Force Electrodynamic Shaker

The LDS® V8900 shaker is ideal for vibration and mechanical testing using sinusoidal, random or transient excitation. Systems are available in various forms to meet customers' requirements, for example: Lin-E-Air trunnion-mounted with a body rotation gearbox; combined with a horizontal hydrostatic slip table; silencer for shaker cooling fan; thermal management; quiet mode.



Trunnion-Mounted V8900 Shaker



V8900 Combo-Mounted Shaker with HBT Slip Table

Trunnion-Mounted Shaker Specification (for combo performance contact your local Brüel & Kjær representative)

### Performance Parameters

Armature Diameter	440 mm (17.3 in)
Sine Force (peak)*	80.0 kN (17984 lbf)
Overturning Moment Restraint	3.0 kNm (26552 lbf in)
Max. Acceleration (sine peak)*	980.7 m/s <sup>2</sup> (100 g <sub>n</sub> )
Random Force (rms)†	76.2 kN (17130 lbf)
Max. Acceleration (random rms)	686.5 m/s <sup>2</sup> (70 g <sub>n</sub> )
Max. ½-Sine Peak Shock Force‡	
with XPA88K Amplifier	174.8 kN (39297 lbf)
with XPA128K Amplifier	254.1 kN (57124 lbf)
Velocity (sine peak)*	
Full field	1.8 m/s (70.9 in/s)
Reduced field	2.5 m/s (98.4 in/s)
Displacement	101.6 mm (4.0 in)
Usable Frequency Range	5 Hz to 3000 Hz
Internal Load Support Capacity	800 kg (1763 lb)
Recommended Amplifier	LDS XPA88K, LDS XPA128K

\* The force, velocity, and acceleration parameters detailed here are based on the shaker when driven by the recommended LDS XPA-K amplifier.

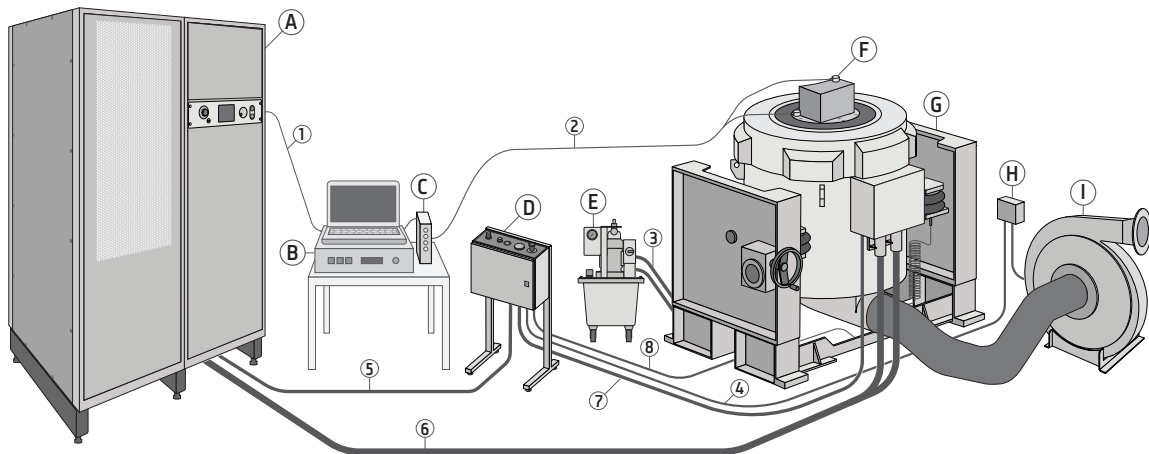
† Random and shock ratings assume an m<sub>40</sub> payload as specified by ISO5344; shock pulse 2 ms.

### Characteristics

Armature Resonance (f <sub>n</sub> )	1800 Hz (nominal)
Lin-E-Air Body Resonance	< 5 Hz
Suspension Axial Stiffness	Nil
Suspension Cross-Axial Stiffness	28.6 kN/mm (163310 lbf/in)
Suspension Rotational Stiffness	94.5 kN m/rad (69699 lbf ft/rad)
Shaker Body Mass	4100 kg (9039 lb)
Total Weight	5900 kg (13007 lb)
Effective Mass of Moving Element:	
17 raised (hexagonal) inserts	77.5 kg (170.9 lb)
29 raised (hexagonal) inserts	79.0 kg (174.2 lb)
Stray Magnetic Field:‡	< 1.5 mT (15 gauss)

‡ Theoretic maximum, measured 150 mm (6 in) above table, full-field, at normal operating temperature.

## Typical V8900 Vibration Test System



Equipment	Connections
A - Amplifier*	1 - Vibration drive signal from vibration controller to amplifier
B - Vibration Controller†	2 - Feedback signal from accelerometer(s) on armature/payload
C - Data Acquisition Unit†	3 - Oil supply (and return) for V8900 hydrostatic bearing
D - Pedestal Control Unit‡	4 - Cooling fan on/off control from pedestal control unit CANbus
E - Shaker Hydraulic Pump*	5 - CANbus between amplifier and pedestal control unit
F - Accelerometer(s)	6 - Armature drive power, field and degauss coils power from amplifier
G - V8900 Shaker	7 - Interlocks, centre position control, and load support control
H - Cooling Fan Starter Box*	8 - Air supply for Lin-E-Air and load support
I - Cooling Fan	

\* Requires 3-phase AC supply (380 to 480 V, 50/60 Hz)

† Requires 1-phase AC supply (110 to 250 V, 50/60 Hz)

‡ Requires 6.9 bar (100 lbf/in<sup>2</sup>) air supply

## XPA-K Amplifier Specification

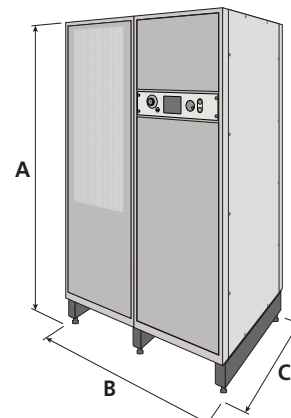
### Amplifier Parameters

	LDS XPA88K	LDS XPA128K
<b>Power Range</b>	88 kVA (nominal)	128 kVA (shock)
<b>Signal-to-Noise Ratio</b>	Typically > 68 dB wrt to 100 V rms output§	
<b>Input Impedance</b>	100 kΩ (nominal)	
<b>Total Harmonic Distortion</b>	0.5 to 0.8 % at rated output into rated resistive load	
<b>Input Sensitivity</b>	Nominal 1.0 V for 100 V rms output	
<b>Switching Frequency</b>	150 kHz	
<b>Rated Output Voltage</b>	100 V rms (sine)	
<b>Continuous Output Current</b>	80 A rms (sine and random) per 8 kVA increment (128 kVA chassis limited to 800 Amps rms)	
<b>Full Power Bandwidth</b>	20 Hz to 3000 Hz	
<b>Transient Output Current</b>	240 A peak per 8 kVA increment for 100 ms (128 kVA chassis limited to 3,840 Amps peak for short transient tests)	
<b>Module Efficiency</b>	93 %	
<b>Modulation Range</b>	d.c. to 10 kHz	
<b>Protection</b>	Integral protection to prevent output devices from working outside their specification limit	

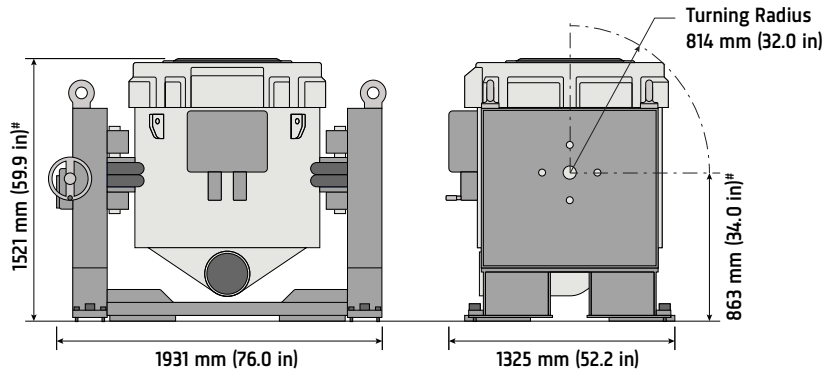
§ 10 kΩ input termination and rated resistive load connected.

### Physical Characteristics

Dimensions	
Dimension A	1905 mm (75.0 in)
Dimension B	1200 mm (47.2 in)
Dimension C	824 mm (32.4 in)
Shipping Weight	
LDS XPA88K Fully Populated	1100 kg (2425 lb)
LDS XPA128K Populated to 88K	1105 kg (2436 lb)
LDS XPA128K Fully Populated	1160 kg (2557 lb)



## Shaker Physical Characteristics



### V8900 Armature Inserts

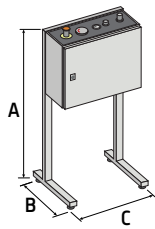
17 raised inserts, stainless steel, M8, M10, or 3/8 UNC  
 1 insert at centre of armature  
 8 inserts on 203.2 mm (8 in) PCD\*\*  
 8 inserts on 406.4 mm (16 in) PCD\*\*

29 raised inserts, stainless steel, M8, M10, or 3/8 UNC  
 1 insert at centre of armature  
 4 inserts on 101.6 mm (4 in) PCD\*\*  
 8 inserts on 203.2 mm (8 in) PCD\*\*  
 8 inserts on 304.8 mm (12 in) PCD\*\*  
 8 inserts on 406.4 mm (16 in) PCD\*\*

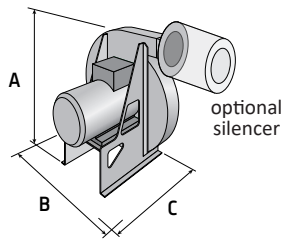
\*\* PCD = Pitch Circle Diameter

# Dimension with body in mid-position and includes height of jacking pads.

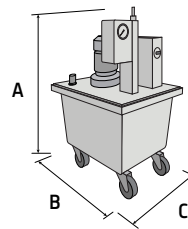
## Standard Ancillaries††



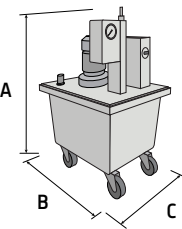
Pedestal Control Unit††



Cooling Fan§§



Shaker Hydraulic Unit



Slip Table Hydraulic Unit§§

†† The following options (not shown) are available: The LDS Plinth Cover Kit, fitted to the amplifier and designed to prevent electrical equipment damage by vermin; Three-phase Mains Power Isolator suitable for Europe (contact your Bruel & Kjaer representative).

††† Pedestal control unit includes; CANbus communications to amplifier, emergency stop, controls for Lin-E-Air and internal load support, indicators for armature position and internal load support pressure.

§§ In Quiet Mode the system may be operated with the fan switched off for short periods at low force to minimise acoustic noise. An acoustic enclosure for cooling fan is not available from Bruel & Kjaer, and it is recommended that this is sourced locally if required.

## The slip table hydraulic unit is only required for combo systems and is in addition to the shaker hydraulic unit, which is always required.

	Pedestal Control Unit	50 Hz Fan	60 Hz Fan	Shaker Hydraulic Pump	Slip Table Hydraulic Pump
<b>Dimension A</b>	1066 mm (42.0 in)	1169 mm (46.0 in)***	1118 mm (44.0 in)***	840 mm (33.1 in)	1021 mm (40.2 in)
<b>Dimension B</b>	410 mm (16.1 in)	996 mm (39.2 in)***	946 mm (37.2 in)***	545 mm (21.5 in)	650 mm (25.6 in)
<b>Dimension C</b>	510 mm (20.1 in)	979 mm (38.5 in)	979 mm (38.5 in)	445 mm (17.5 in)	654 mm (25.7 in)
<b>Weight</b>	28 kg (62 lb)	458 kg (1010 lb)***	400 kg (882 lb)***	50 kg (110 lb)†††	75 kg (165 lb)†††

\*\*\* Optional silencer adds 750 mm (29.5 in) to overall length, 5.5 mm (0.2 in) to overall height, and 25 kg (55 lb) to overall weight.

††† Weight when empty, without hydraulic fluid.

## Environmental Data

Working Ambient Temperature Range:	
Shaker	+7 to 30 °C (+45 to 86 °F)
XPA88K/XPA128K Amplifier	+5 to 30 °C (+41 to 86 °F)
Maximum Acoustic Noise at 1 m (3.3 ft) Distance:*	
Shaker	110 dBA
XPA88K/XPA128K Amplifier	78 dBA
Cooling Fan	106 dBA
Total Heat Dissipation:	
Shaker to Air (from body)	3.4 kW
XPA88K Amplifier	10.5 kW
XPA128K Amplifier	12.4 kW
Cooling Fan	80.0 kW
Cooling Airflow:	
Shaker via Cooling Fan	1.75 m <sup>3</sup> /s (3708 ft <sup>3</sup> /min)
XPA88K Amplifier	2.50 m <sup>3</sup> /s (5297 ft <sup>3</sup> /min)
XPA128K Amplifier	2.90 m <sup>3</sup> /s (6145 ft <sup>3</sup> /min)

\* 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

<b>Voltage 3-Phase (standard)</b>	380 to 480 V, 50/60 Hz
<b>Compressed Air Supply</b>	6.9 bar (100 lbf/in <sup>2</sup> )
<b>Total Electrical Requirements:</b> amplifier, FPS, fan, and ancillaries (steady state)	126.15 kVA

## 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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**Brüel & Kjær Sound & Vibration Measurement A/S**  
 DK-2850 Nærum · Denmark · Telephone: +45 77 41 20 00 · Fax: +45 45 80 14 05  
 www.bksv.com · info@bksv.com  
 Local representatives and service organizations worldwide

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