



■ Solutions for Vibration Testing of Components, Small Assemblies, or Modal and Structural Analysis

- Wide frequency band (DC to 13 kHz) combined with high peak forces (8.9 N - 178 N peak sine force)
- Low mass, high performance armature construction
- Robust, lightweight suspension system provides excellent torsional and transverse stiffness with minimal impact on system acceleration
- Base or trunnion mounted
- Powered by compact, quiet, energy efficient amplifiers
- Compatible with LDS *COMET_{USB}*TM and *LASER_{USB}*TM Vibration Controllers



V101/2, V201/3, V406/8, V450/1 AND V455/6 SHAKERS

Industry Applications

- ✓ Modal and structural analysis
- ✓ Electronic assembly test
- ✓ Laboratory experiments



This range of permanent magnetic shakers are ideal for modal analysis. Their efficient armature design enables them to deliver impressive peak forces and accelerations over a wide frequency range.

The shakers are controlled using either the *COMET_{USB}* or *LASER_{USB}* system controllers, or are compatible with 3rd party controllers and amplifiers.

Shaker Model	V101/2 -PA 25E	V201/3 -PA 25E	V406/8 -PA 100E	V406/8 -PA 500L	V450/1 -PA 500L	V455/6 -PA 1000L
System Sine Force Peak - Naturally Cooled (N)	8.9	17.8	98	98	178	178
System Sine Force Peak - Forced Air Cooled (N)*	-	17.8	196	196	311	489
Shaker Max Random Force rms (N)	-	-	38	89	210	290
Max Acceleration Sine Peak (g_n)	140	91	50	100	74.5	117
System Velocity Sine Peak (m/s)*	1.31	1.49	1.52	1.78	1.78	2.5
System Displacement Continuous pk-pk (mm)	2.5	5	14	17.6	19	19
Moving Element Mass (kg)	0.0065	0.020	0.200	0.200	0.426	0.426
Usable Frequency Range (Hz)	5-12,000	5-13,000	5-9,000	5-9,000	5-7,000	5-7,500

* Shaker ratings are those which can be achieved with a larger amplifier than that supplied as standard



V100-V400 Series Shaker

Shaker system configuration & performance parameters

Model	V101/2 - PA 25E		V201/3 - PA 25E		V406/8 - PA 100E		V406/8 - PA 500L		V450/1 - PA 500L		V455/6 - PA 1000L	
	METRIC	AMERICAN	METRIC	AMERICAN	METRIC	AMERICAN	METRIC	AMERICAN	METRIC	AMERICAN	METRIC	AMERICAN
Armature diameter	—	—	—	—	38 mm	1.5 in	38 mm	1.5 in	63.5 mm	2.5 in	63.5 mm	2.5 in
System sine force peak - naturally cooled	8.9 N	2 lbf	17.8 N	4 lbf	98 N	22 lbf	98 N	22 lbf	178 N	40 lbf	178 N	40 lbf
System sine force peak - forced air cooled	—	—	17.8 N	4 lbf	98 N	22 lbf	196 N	44 lbf	311 N	70 lbf	489 N	110 lbf
Shaker sine force peak* - forced air cooled	—	—	26.7 N	6 lbf	196 N	44 lbf	196 N	44 lbf	311 N	70 lbf	489 N	110 lbf
System random force rms (ISO5344)	—	—	—	—	38 N	8.5 lbf	89 N	20 lbf	210 N	48 lbf	290 N	70 lbf
Shaker max random force rms*	—	—	—	—	89 N	20 lbf	89 N	20 lbf	214 N	48 lbf	334 N	75 lbf
Armature resonance frequency	12000 Hz	12000 Hz	13000 Hz	13000 Hz	9000 Hz	9000 Hz	9000 Hz	9000 Hz	6000 Hz	6000 Hz	6000 Hz	6000 Hz
Useful frequency range	5-12000 Hz	5-12000 Hz	5-13000 Hz	5-13000 Hz	5-9000 Hz	5-9000 Hz	5-9000 Hz	5-9000 Hz	5-7500 Hz	5-7500 Hz	5-7500 Hz	5-7500 Hz
Effective mass of moving element	0.0065 kg	0.0143 lb	0.020 kg	0.044 lb	0.200 kg	0.44 lb	0.200 kg	0.44 lb	0.426 kg	0.94 lb	0.426 kg	0.94 lb
System velocity sine peak	1.31 m/s	51.6 in/s	1.49 m/s	58.7 in/s	1.52 m/s	60 in/s	1.78 m/s	70 in/s	1.78 m/s	70 in/s	2.5 m/s	98.4 in/s
Shaker velocity sine peak*	1.31 m/s	51.6 in/s	1.83 m/s	72 in/s	1.78 m/s	70 in/s	1.78 m/s	70 in/s	2.0 m/s	78.7 in/s	2.5 m/s	98.4 in/s
Max acceleration sine peak	1373 m/s ²	140 gn	1334 m/s ²	136 gn	981 m/s ²	100 gn	981 m/s ²	100 gn	730 m/s ²	74.5 gn	1147 m/s ²	117 gn
Amplifier rating	0.048 kVA	0.048 kVA	0.048 kVA	0.048 kVA	0.147 kVA	0.147 kVA	0.7 kVA	0.7 kVA	0.7 kVA	0.7 kVA	1.4 kVA	1.4 kVA
LDS amplifier	PA 25E	PA 25E	PA 25E	PA 25E	PA 100E	PA 100E	PA 500L	PA 500L	PA 500L	PA 500L	PA 1000L	PA 1000L
Suspension axial stiffness	3.15 N/mm	18 lbf/in	2.8 N/mm	16 lbf/in	12.3 N/mm	70 lbf/in	12.3 N/mm	70 lbf/in	17.5 N/mm	100 lbf/in	17.5 N/mm	100 lbf/in
Aux. suspension axial stiffness	—	—	12.3 N/mm	70 lbf/in	22.8 N/mm	130 lbf/in	22.8 N/mm	130 lbf/in	—	—	—	—
System displacement (continuous) pk-pk	2.5 mm	0.1 in	5 mm	0.2 in	14.0 mm	0.55 in	17.6 mm	0.69 in	19 mm	0.75 in	19 mm	0.75 in
Shaker displacement (continuous) pk-pk*	2.5 mm	0.1 in	5 mm	0.2 in	17.6 mm	0.69 in	17.6 mm	0.69 in	19 mm	0.75 in	19 mm	0.75 in
Vibrator mass-optional trunnion mounted	—	—	3.17 Kg	7 lb	22.7 kg	50 lb	22.7 kg	50lb	82 kg	180 lb	82 kg	180 lb
Cooling air flow rate	—	—	0.0012 m ³ /s	2.5 ft ³ /m	0.014 m ³ /s	30 ft ³ /m	0.014 m ³ /s	30 ft ³ /m	0.012 m ³ /s	25 ft ³ /m	0.012 m ³ /s	25 ft ³ /m
Shaker mass base mounted	0.91 kg	2 lb	1.81 kg	4 lb	14.1 kg	31 lb	14.1 kg	31 lb	64 kg	141 lb	64 kg	141 lb
Max. working ambient temperature												
Shaker:	30°C	86°F	30°C	86°F	30°C	86°F	30°C	86°F	30°C	86°F	30°C	86°F
Amplifier:	35°C	95°F	35°C	95°F	35°C	95°F	30°C	86°F	30°C	86°F	30°C	86°F
Heat rejected to air												
Shaker cooling fan:	—	—	—	—	—	—	0.46 kW	0.46 kW	0.29 kW	0.29 kW	0.75 kW	0.75 kW
Amplifier:	0.067 kW	0.067 kW	0.067 kW	0.067 kW	0.15 kW	0.15 kW	0.40 kW	0.40 kW	0.37 kW	0.37 kW	0.87 kW	0.87 kW
Electrical requirement												
Amplifier:	0.09 kVA	0.09 kVA	0.09 kVA	0.09 kVA	0.27 kVA	0.27 kVA	1.5 kVA†	1.5 kVA†	1.4 kVA†	1.4 kVA†	2.9 kVA†	2.9 kVA†
Acoustic noise at 2m**												
Shaker:	—	—	—	—	105 dBA	105 dBA	105 dBA	105 dBA	105 dBA	105 dBA	105 dBA	105 dBA
Amplifier:	silent	silent	silent	silent	silent	silent	47 dBA	47 dBA	47 dBA	47 dBA	47 dBA	47 dBA

* Shaker ratings are those which can be achieved with a larger amplifier than that supplied as standard ** Maximum noise level during operation at full thrust, measured at 2m distance † Includes cooling fan

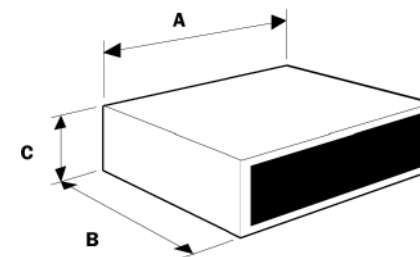
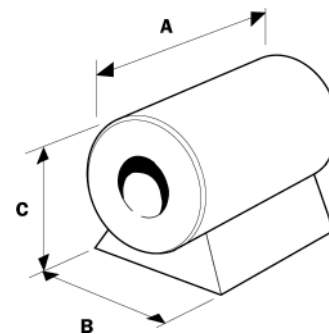


V100-V400 Series Shaker

Armature insert patterns

Shaker	V101/2	V201/3	V406/8	V450/1	V455/6
Armature dia. mm	—	—	38	63.5	63.5
Centre insert	1	1	1	1	1
25.4 mm	—	—	6	—	—
50 mm	—	—	—	5	5

PCD inserts equi-spaced



Options

Shaker model	V101/2	V201/3	V406/8	V450/1	V455/6
Alternative inserts: M4 6/32" UNC	●	●	●	—	—
8/32" UNC	—	●	●	—	—
M5	—	—	—	●	●
10/32" UNF	—	—	○	●	●
Rubber isolation mounting	—	—	—	○	○
Base mounting	●	●	●	●	●
Support trunnion	—	○	○	○	○
Auxilliary suspension	—	○	○	—	—
Cooling fan	—	—	●	●	●

KEY ● standard ○ standard option — not available

Cooling blowers

Blower	Wt kg	A mm	B mm	C mm
V406/8 50 Hz	17	241	389	249
V406/8 60 Hz	15	241	365	249
V450/1 50/60 Hz	5.4	241	186	249
V455/6 50/60 Hz	5.4	241	186	249

PA amplifiers

Amplifier	Wt kg	A mm	B mm	C mm
PA 25E	9	488	337	92
PA 100E	15	488	337	92
PA 500L	20	448	412	188
PA 1000L	35	482	505	188



V100-V400 Series Shaker

PA series power amplifier characteristics

Amplifier model	PA 25E	PA 100E	PA 500L	PA 1000L
Rated sinusoidal power output (Matched resistive load)	48 W (5R3)	147 W (2R9)	500 W	1000 W
Maximum continuous sinusoidal VA output (0.5pf)	78 VA	147 VA	700 VA	1400 VA
Frequency range at rated power	10Hz - 10 kHz	10Hz - 10 kHz	10Hz - 14 kHz	10Hz - 14 kHz
Total harmonic distortion at rated output 20 Hz - 10 kHz	Typically 0.3 %	Typically 0.5 %	Typically 0.2 %	Typically 0.2 %
Maximum output voltage	16 V rms	20 V rms	40 V rms	80 V rms
Maximum no load voltage	24 V rms	32 V rms	45 V rms	86 V rms
Voltage regulation	1 %	3 %	2 %	2 %
Output current at rated VA	2.7 A rms	7 A rms	18 A rms	18 A rms
Maximum output current	3 A rms	7 A rms	18 A rms	18 A rms
Random output current	5.9 A pk	14 A pk	54 A pk	54 A pk
Overcurrent trip level	4.2 A rms	10 A rms	20 A rms	20 A rms
Input sensitivity for maximum output (400 Hz)	1.0 V rms	1.0 V rms	1.0 V rms	1.0 V rms
Signal to noise ratio	>75 dB	>75 dB	>75 dB	>80 dB
Amplifier efficiency	59 %	58 %	59 %	59 %
Protection	Fast acting current limit	Fast acting current limit	Output device protection	Output device protection

Some of the features listed are available as standard, others as options.

Please contact LDS for advice on the optimum specification to meet your system needs.

Specifications are correct at time of going to print. LDS reserves the right to amend specifications without prior notice.



LDS Test and Measurement Ltd
Jarman Way, Royston
Herts, SG8 5BQ

Phone: +44 (0) 1763 255 255
E-Mail: info-uk@lds.spx.com

LDS Test and Measurement LLC
8551 Research Way, M/S 140
Middleton, WI 53562 USA

Phone : +1 (608) 821-6600
E-Mail: info-us@lds.spx.com

LDS Test and Measurement GmbH
Carl-Zeiss-Ring 11-13
D-85737 Ismaning

Phone: +49 (0) 89 92 33 33 0
E-Mail: info-de@lds.spx.com

LDS Test and Measurement SARL
9 Avenue du Canada – BP 221
F-91942 Courtaboeuf CEDEX

Phone: +33 (0) 164864545
E-Mail: info-fr@lds.spx.com

LDS Test and Measurement
Room 2912, Jing Guang Centre
Beijing, China 100020

Phone: +86 10 6597 4006
E-Mail: info-cn@lds.spx.com

**Brüel & Kjær Sound & Vibration
Measurement A/S**
Skodsborgvej 307,
DK-2850 Nærum, Denmark

Phone: +45 4580 0500
Fax: +45 4580 1405



Brüel & Kjær

www.lds-group.com www.bksv.com