

## Permanent magnet vibration testing systems

9 to 489 N (2 - 110 lbf)

V101/2, V201/3,  
V406/8, V450/1  
and V455/6 Shakers

## PA Amplifiers



### Typical system applications

- laboratory experiments
- modal studies
- electronic assemblies
- physiological research
- high speed actuators
- velocity transducers

A range of vibration testing systems designed to minimise operational costs whilst providing the maximum flexibility to the scientist or test engineer.

Featuring:-

- Permanent magnet construction
- Low mass, high performance armature construction
- Wide frequency band operation - dc to 13 kHz
- Well proven armature suspension system
- Mounted on base or support trunnion
- Option of auxiliary suspension
- Ultra-compact energy efficient amplifiers

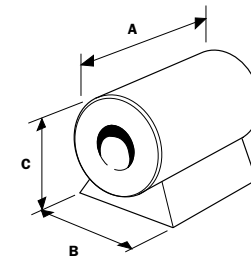
### Total system solutions

With the addition of an LDS sine, random and shock controller we can provide total testing solutions. Alternatively our systems are designed to interface with any standard third party controller. Whichever route you choose, you have the assurance that all LDS products are supported by a world-wide sales and service organisation. From application engineering, installation and training through to maintenance, spares and repairs LDS offers a total service approach to keep your system operating efficiently and reliably.

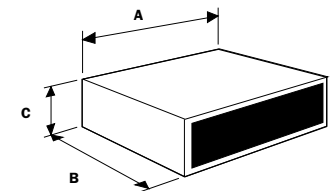
# V101/2, V201/3, V406/8, V450/1, V455/6

## 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	214 N	48 lbf	302 N	68 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 <sup>2</sup>	140 gn	1334 m/s <sup>2</sup>	136 gn	981 m/s <sup>2</sup>	100 gn	981 m/s <sup>2</sup>	100 gn	730 m/s <sup>2</sup>	74.5 gn	1147 m/s <sup>2</sup>	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	3.5 N/mm	20 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	-	-	8.76 N/mm	50 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	50 lb	82 kg	180 lb	82 kg	180 lb
Cooling air flow rate	-	-	0.0012 m <sup>3</sup> /s	2.5 ft <sup>3</sup> /m	0.014 m <sup>3</sup> /s	30 ft <sup>3</sup> /m	0.014 m <sup>3</sup> /s	30 ft <sup>3</sup> /m	0.012 m <sup>3</sup> /s	25 ft <sup>3</sup> /m	0.012 m <sup>3</sup> /s	25 ft <sup>3</sup> /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



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

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

\* 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

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

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	48 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	16V rms	20V rms	40V rms	80V rms
Maximum no load voltage	24V rms	32V rms	45V rms	86V rms
Voltage regulation	1%	3%	2%	2%
Output current at rated VA	2.7A rms	7A rms	18A rms	18A rms
Maximum output current	3A rms	7A rms	18A rms	18A rms
Random output current	5.9A pk	14A pk	54A pk	54A pk
Overcurrent trip level	4.2A rms	10A rms	20A rms	20A rms
Input sensitivity for maximum output (400 Hz)	1.0V rms	1.0V rms	1.0V rms	1.0V 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.



World leaders in vibration and  
environmental test systems

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All LDS equipment complies with current  
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