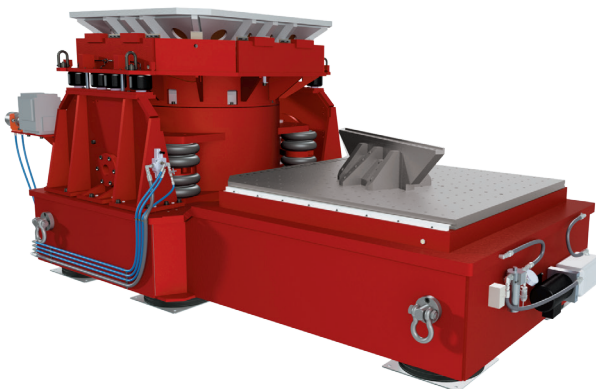


The SignalForce® LE-5022-3 water cooled shaker offers up to 50000 lbf (222 kN) force and up to 3 in (76.2 mm) peak-peak displacement. One of the key features of the LE-5022-3 is the use of dual hydrostatic bearings for axial guidance and cross-axial restraint. The LE-5022-3 is offered with either solid trunnions or Lin-E-Air isolated trunnions depending on the facility requirements. Data Physics also offers a complete line of head expanders and slip tables to accommodate sequential 3 axis testing.

Standard Features

- Peak sine force: 40000 lbf (178 kN) to 50000 lbf (222 kN)
 - (((• **Random force rms: 36000 to 45000* lbf** (160 to 200* kN))))
 - Velocity peak: 79 ips (2 m/sec)
 - Peak to peak displacement: 3 in (76.2 mm)
 - Dual hydrostatic bearings
 - Superior axial and torsional stability
 - Automatic load support and armature centering
 - Payload support up to 3000 lbs (1365 kg)
 - Large force systems include chillers
- * Now with more random force rms!



Options

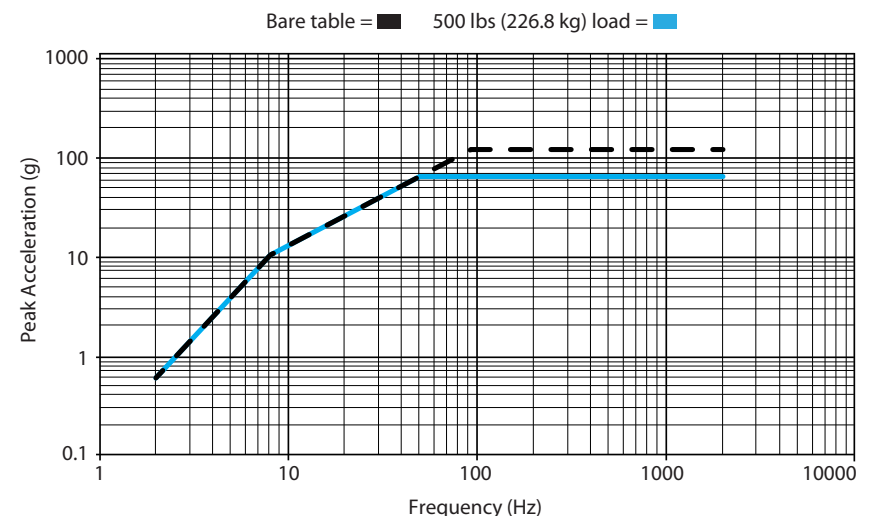
- Custom designed head expanders utilizing 3-D modeling and FEA analysis for maximum performance
- Rigid trunnions available for VH configured systems
- Isolated trunnions (VH) with Lin-E-Air isolation
- Monobase with slip tables
- Air glides and guidance systems
- Metric and imperial table threads

Typical Applications

- Aerospace
- Automotive battery (Electric vehicles)
- Satellite
- High force requirements

Sine Performance Envelope

LE-5022-3 / DSA 15-24

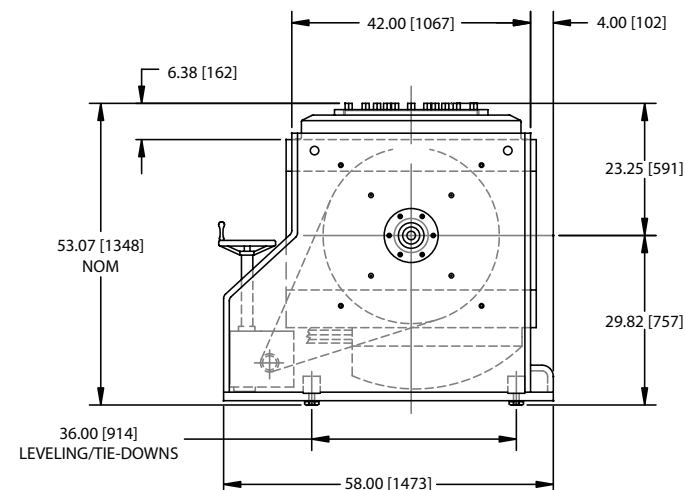
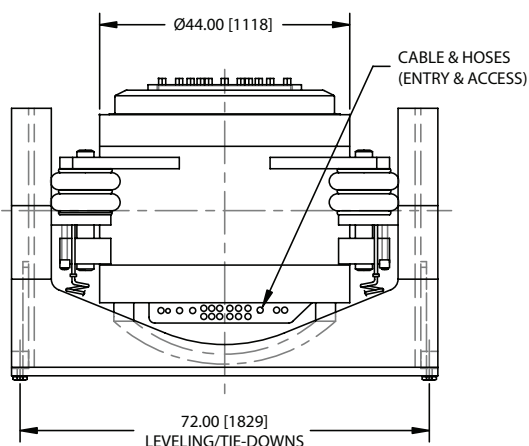
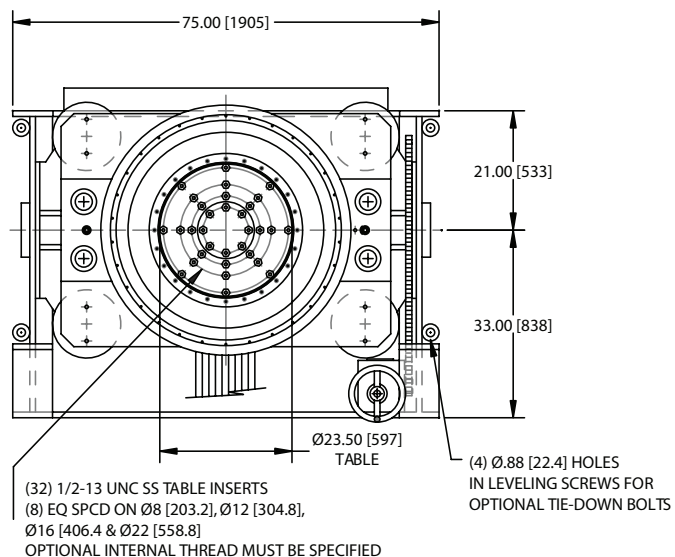


LE-5022-3 / DSA 15-16 / DSA 15-21 / DSA 15-24

	Maximum Sine Force		Maximum Random Force (rms)		Maximum Shock Force		Maximum Acceleration (Bare Table)		Maximum Velocity		Displacement (Peak to Peak)		Armature Diameter		Armature Mass		Insert Threads		Armature Suspension	Armature Resonance (±5%)	Stray Magnetic Field at 6" (150 mm) above table	Frequency Range		Static Payload Support		Uncrated Shaker Mass		Facility Power Requirements**	
	lbf	kN	lbf	kN	lbf	kN	g	m/s²	ips	m/s	in	mm	in	mm	lbs	kg	SAE	Metric	Type	Hz	gauss	Hz	lbs	kg	lbs	kg	lbs	kg	kVA
LE-5022-3/DSA 15-16	40000	178	36000	160	89000	369	100	981	79	2	3	76.2	23.6	600	265	120	½-13	M-12	Beryllium copper loop flexures	1750	< 10	5-2000	3000	1365	14000	6350	288		
LE-5022-3/DSA 15-21	45000	200	40000	178	99000	440	100	981	79	2	3	76.2	23.6	600	265	120	½-13	M-12	Beryllium copper loop flexures	1750	< 10	5-2000	3000	1365	14000	6350	319		
LE-5022-3/DSA 15-24	50000	222	45000*	200*	110000	489	100	981	79	2	3	76.2	23.6	600	265	120	½-13	M-12	Beryllium copper loop flexures	1750	< 10	5-2000	3000	1365	14000	6350	350		

* Now with more random force rms!

* kVA based on power draw to run full capacity of shaker – not amplifier capacity.



All drawings are in inches and (millimeters) unless otherwise noted. Dimensions are provided for evaluation purposes. Formal layout drawings can be provided for additional dimensions and dimension verification.

Environmental Characteristics

Ambient Working Temperature Range

Shaker	+40F to +100F (+4C to +38C)
Amplifier	+32F to +104F (+0C to +40C)

Heat Dissipation

Shaker	7 kW
Amplifier*	21 kW (16 Module) 28 kW (21 Module) 32 kW (24 Module)
Chiller	29 kW
Cooling unit	12 kW

Acoustic Noise @ 1m

Shaker	108 dBA
Amplifier	90 dBA
Cooling unit	75 dBA

Humidity

Shaker	<95% non-condensing
Amplifier	<95% non-condensing

Facility Requirements

Cooling unit

Armature raw water flow at 85F (29C)	50 GPM (189 L/min)
Field coils raw water flow at 85F (29C)	75 GPM (284 L/Min)
PSI drop across cooling unit	25 PSI (1.72 Bar)
Distilled water requirement	15 gallons (56.8 Litres)

Chiller

Raw water flow at 85F (29C)	35 GPM (132.5 L/min)
PSI drop across chiller	15 PSI (1.03 Bar)
Amplifier cooling air flow*	5250 CFM (149 m ³ /min) (16 Module) 7600 CFM (215 m ³ /min) (21/24 Modules)

Compressed air supply	3 CFM at 100psi (.08 m3/min at 6.9 Bar)
Total electrical req.	See Table
Power supply range	360 – 480 VAC, (3) phase, 50/60 Hz

Amplifier Characteristics

Rated Power*	240 kVA (16 Module) 315 kVA (21 Module) 360 kVA (24 Module)
Efficiency	95%
Switching Frequency	50 kHz
Input Impedance	1.5 V rms for full output (10 K ohm input impedance)
Voltage Output	200 V rms
Current Output*	1328 A rms (16 Module) 1743 A rms (21 Module) 1992 A rms (24 Module)
Distortion	(at rated output) THD < 0.5% from DC to 1500 Hz 0.75% from 1500 to 2000 Hz 1.0% from 2000 to 3000 Hz
Noise & Hum	> 70 dB below full output, with shorted input
Weight*	5430 lbs (2463 kg) (16 Module) 6790 lbs (3080 kg) (21 Module) 6895 lbs (3123 kg) (24 Module)

Performance Notes

1. Random force rating based on flat spectrum from 20–2000 Hz, with 350 lbs (158.75 kg) non-resonant load. Ratings comply or exceed ISO 5344.
2. Shock pulses will yield different performance characteristics based on duration of the pulse. Consult application specialist to evaluate specific shock pulses.
3. Heavy payloads may reduce available peak-peak displacement.
4. Stray magnetic field measured at full field 6 inches (152.4 mm) above armature table.
5. Shaker weight is variable based on mounting configuration.
6. At maximum force bare table. Acoustic noise from a test will depend on test load and profiles run.
7. Wet bulb temp not to exceed 80° F (27° C).
8. Max performances shown are for no more than 10 minutes of operation.
9. For continuous duty, the levels stated need to be reduced to 80%.

Specifications are subject to change without notice.

Amplifier Dimensions

Height	78" (1981 mm)
Width*	92" (2327 mm) (16 Module) 116" (2938 mm) (21-24 Module)
Depth	43" (1092 mm)

Cooling Unit Dimensions

Height	72" (1829 mm)
Width	42" (1067 mm)
Depth	27" (686 mm)

Chiller Dimensions

Height	62" (1575 mm)
Width	66" (1675 mm)
Depth	46" (1168 mm)

EMI shielded console, air cooled screens, and 3-phase line filtering standard.

* Multiple listing reflects amplifier size – small to large.