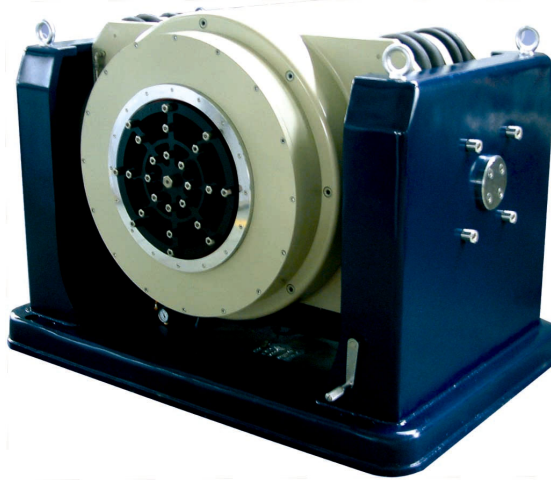




MODEL DS-36000/SA160 SHAKER SYSTEM



Technical Specification Table

Parameter	DS-36000VH/23-160 Vibration Test System
Shaker	DS-36000
Water Cooling Unit	WC-40000
Amplifier	SA-160
Force Rating	
Sine Peak (5 to 2,500 Hz)	16,000 kgf (35,200 lbs)
Random RMS (20 to 2,000 Hz)	16,000 kgf (35,200 lbs.)
Shock (4 ms, 1/2 Sine)	32,000 kgf (71,000 lbs.)
Frequency Range	5 to 2,000 Hz
Maximum Displacement (Peak to Peak)	
Continuous Duty	50.8 mm (2.0 in)
Shock	60 mm (2.36 in)
Between Mechanical Stops	62 mm (2.44 in)
Maximum Velocity	1.8 m/s (71 in/s)
Maximum Acceleration(Vertical, Bare Table)	100 g
Fundamental Resonance Frequency (Bare Table)	1,900 Hz (nom.) +/- 5%
Body Suspension Natural Frequency Thrust Axis:	< 3 Hz
Armature	
Effective Nominal Weight	140 kg (308 lb)
Table Diameter	590 mm (23.23 in)
Load Attachment Points (Standard)	25 stainless steel 1/2-13 inserts
Maximum Rated Armature Current	1700 A
Field Supply	
Field Rated Current (DC):	145 A



Parameter	DS-36000VH/23-160 Vibration Test System
Field Maximum Voltage (DC):	410 V
Stray Flux Density (with optional Degauss Coils)	10 gauss or less @ 152mm above table
Rated Degauss Current	3 A
Rated Degauss Voltage	280 V
Vertical Load Support Capability	1600 Kg (3,528 lb)
Cooling	Water Cooled
Water Cool Unit Model	WC-40000
Power (Full Load)	31.7 KW
Water Flow (Full Load)	
Shell Fluid (Distilled Water)	Distilled Water: 10 bar; 88 gallon per minute
Flow Rate	City Water : 4 bar; 132 gallon per minute
System Power Supply	480VAC/415VAC/380VAC, 50Hz/60Hz, 3P
Total Electrical Requirement	305 KVA 433 Amps @ 460V; 3 Ph.
Overall Shaker Dimensions	70.86" L x 59.05" H x 55.11" W
Shaker Weight (Uncrated)	9,500 kg (20,925 lb)
Environmental	
Temperature Range	0 to 35 degree C
Humidity	0 to 85%, non condensing
System Continuous Duty	Not less than 7 hours, swept between 5 Hz and 2,200 Hz at the full ratings



Advanced Shaker Design Features:

- **Higher displacement**

Other manufacturer's older designs such as Link-Arm armature guidance, fore shorting arm and shear mount designs use a rubber material that will fatigue and fail over time. The DS-36000 flexure design uses Isolation Bearings inside the joints **that will never fatigue and fail**.

This new flexure armature guidance design facilitates **higher displacement capability**. The DS-36000 shaker performs 2.0 inches (51mm) continuous displacement and 2.36 inches (60mm) displacement for shock – a significant improvement over other manufacturer's older designs that can only achieve 1.5 inch continuous displacement and 2.0 inches displacement for shock.

- **Higher efficiency shaker system water cooling**

Dynamic Solutions water-cooling system uses an innovative design to insure that the shakers armature is cooled in a highly efficient manner for maximum reliability during high force output testing. The armature cooling has 250% more heat dissipation capacity due to two parallel cooling loops instead of one cooling loop as found in other manufacturer's older designs.

The field coils use a new innovative design connecting the electricity loops in series. The water loops are connected with two parallel loops instead of one cooling loop, effectively increasing the cooling capability by more than 2x that of older designs.

- **Failure proof current leads**

Dynamic Solutions DS-36000 current lead requires no external cooling. By using several large loop flexure conductors to supply power directly to the armature assembly the area of the power path is increased and the heat that is generated by the current has been reduced to the point where external cooling is not required. Located at the top of the shaker, the leads are easy to access and because they are not located within any water-flow, contamination issues that arise with older designs are completely eliminated.

In comparison, other manufacturer's older water-cooled shaker designs use current leads that are typically made of a Beryllium Copper. The twisted pair cables are traditionally located at the bottom of the armature in the armature cooling outlet hose. This design is prone to field failure due to heating stresses caused by the large amount of current these cables must carry. The older design also creates contamination concerns since the cable is located directly in the water-flow. Additional mechanical issues due to flexing that is inherit with higher displacement low frequency testing are also eliminated by our innovative design.



Advanced Power Amplifier Design Features:

- **Advanced Power factor compensation technology**

Dynamic Solutions Power Amplifiers are highly efficient. The active power and volt-ampere power ratio is nearly 1:1, which significantly reduces the facility power required. The actual power consumption of the power amplifier is virtually the same as the input power capacity.

The DS36000/SA160 vibration system consists of our SA-160 amplifier (160kva output power with field supply), our DS-36000 (36,000 lbf.) exciter and the WC4000 Water to Water Heat Exchanger. The required facility power for the entire system is only 305 kva which includes the power required for the cooling system (31.7 KW) and the field supply and degauss (60.3 KVA) making our DS36000/SA160 vibration system extremely efficient.

- **IGBT module technology**

Our amplifiers are designed using state-of-the-art IGBT technology.

More Reliable! The IGBT module requires less peripheral components, which means increased system reliability and improved efficiency of the module conversion.

Smaller Footprint! Our IGBT modules have a very large current carrying capacity, which increases the power density of a single power module and decreases the overall size of our power amplifiers relative to other manufacturers older designs capable of similar power output.

Higher Peak and Current! Our IGBT modules have the ability to withstand very high overload conditions that increase the coefficient of current crest. Dynamic Solution's "IGBT" design amplifiers can generate more Random force with the same power output due to the higher peak voltage and current carrying capability.

- **Electron Even-Flow Technology**

Dynamic Solutions amplifier technology elegantly balances the current sharing between modules reducing the error of current to a minimal +/-3% for maximum amplifier efficiency.