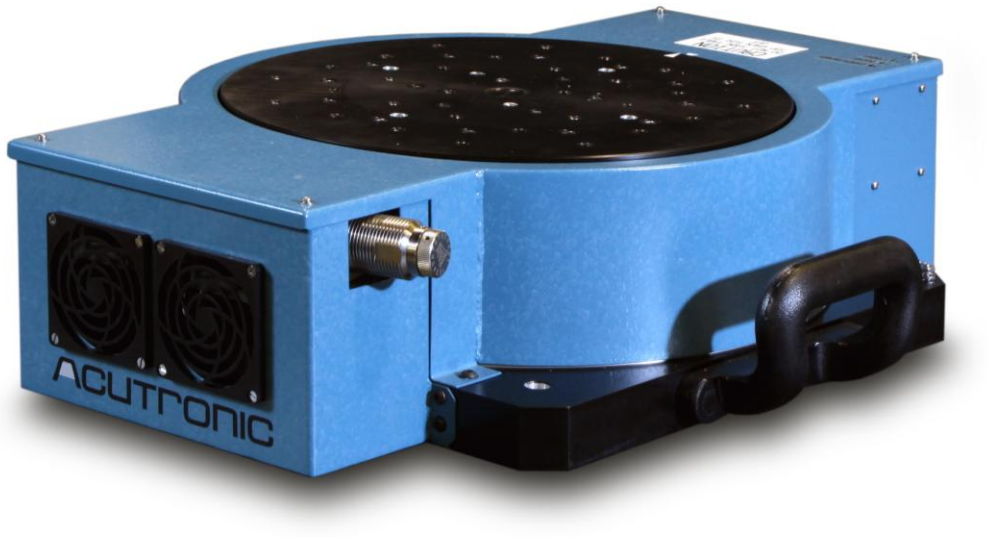
ACUTRONIC

The Driving Force in Motion Simulation

Inertial Guidance Test and Calibration System

Angular Vibration Air Bearing Table AC150-AVAB



The AVAB table achieves a unique and challenging set of performance specifications by bringing together a variety of precision components and proven technologies. An air bearing is used in place of conventional mechanical ball bearings to avoid the degrading effects of friction and continuous vibration, and a flex circuit service loop is used in place of a twist cable or slip ring to pass sensor signals. The torque actuation system provides for high acceleration (torque) and position displacements over the full frequency range of operation.

The mechanical design of the structural components that transfer torque and accelerate the table top/payload is such that they are very stiff and tightly coupled to ensure that structural resonances are maintained well above the required frequency range of the system. This results in a very low overall AVAB table height. The AVAB table must be installed on a massive base such as a granite table to prevent base dynamics from compromising the overall system response. The AC150 is classified as a single-axis motion platform and is operated identically to other systems equipped with an ACUTROL®3000 digital motion controller and an AC brushless motor/drive. All of the standard features of the ACUTROL®3000 controller are available for this system. Two features that make this system unique are the selection of zero-friction electro-mechanical components and a motor/drive actuation system that permits acceleration to the unprecedented frequency of 2 kHz.

The Unit Under Test (UUT) is mounted to the tabletop using customer fixtures that bolt to the standard mounting grid pattern of the tabletop. The table axis is limited in rotation to one revolution, so no slip rings are required for connections to the UUT.

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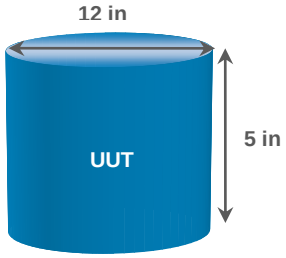
Unit Under Test (UUT)	
Mass	30 lbs (13.6 kg)
Inertia	1.0 in-lb-sec^2 (0.085 kg-m^2)
Maximum envelope	12 in (305 mm) dia. x 5 in (127 mm)
Table top diameter	14 in (356 mm) dia.
Connections to UUT	no slipring; customer managed twist cable



Specifications	
Angular freedom	± 175 deg
Position	
Accuracy	± 5 arc sec RSS
Command resolution	< 0.00001 deg
Repeatability	± 1 arc sec
Rate	
Range (peak of sinusoid)	± 1,000 deg/sec
Short term stability	< 0.2 %
Command resolution	< 0.00001 deg/sec
Dynamic	
Bandwidth	> 500 Hz
Torque Response (Acceleration)	> 2,000 Hz
Acceleration (no load) (w/ nominal load)	 ± 10,000 deg/sec^2 ± 6,000 deg/sec^2
Peak Sinusoidal Position Amplitude	170 deg
Peak Sinusoidal Rate Amplitude	1,000 deg/sec
Peak Sinusoidal Acceleration Amplitude	6,000 deg/sec^2; 1-2,000 Hz
Mechanical	
Wobble	1 arc sec (max)

Major Simulator Dimensions	
Simulator (L x W x H)	16 in (406.4 mm) square; 13 in (330.2 mm) square bolt pattern
Payload / table top height (from floor)	6.12 in (155.5 mm)
weight	~140 lbs (63.6 kg)

Options

- Performance/cost tradeoffs based on max rate, peak acceleration and frequency range
- Custom UUT mounting arrangements and fixtures
- Custom tabletop/mounting surfaces
- Mechanical brake/s, Stow Locks, or Slow Motion Clamps
- Optional real time computer interfaces; SCRAMNet+, SCRAMNet GT200, or VMIC
- LabVIEW user interface for playback and recording of motion profiles with data acquisition system
- Installation support, training and calibration
- Custom slip rings can be evaluated upon request
- High pressure gas line or fluid joints are not advised for this system

The specifications identified in this data sheet are representative of standard systems. To satisfy customer specific requirements ACUTRONIC is able to design systems with specifications that are increased or decreased relative to standard systems.