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Inertial Guidance Test Instrument

Three Axis Motion Simulator Series AC3357

Modes of Operation

- Absolute Positioning:
0.00001 deg. resolution
- Rate – absolute and relative,
excellent instantaneous rate stability
- Track Mode – for real time simulation
of motion profiles
- Synthesis mode – Sinusoidal motion,
command amplitude and frequency
- Local or remote control via touch
sensitive operator panel or digital
interface
- Analog readout and command with
16 bit resolution



Description

The AC3357 Motion Simulator has three degree-of-freedom. The middle gimbal (Pitch Axis) is an open design allowing unobstructed optical access to the tabletop. The simulator is for this reason often used for the development, testing and calibration of stabilized optical sights. The offset between the mounting surface for the UUT and the intersection of the axes offers the possibility to locate the optical axis at the intersection of the axes.

Slipring assemblies featuring power rings and single shielded signal rings give electrical access to the UUT. Signal lines have four brush contacts per ring to avoid micro interruptions, which could corrupt digital signals. Beside the standard capsule there is a wide variety of slipring capsule designs and wiring schematics optional available. Direct drive permanent

magnet brushless torquers drive the axes. The servo feedback transducers are also direct mounted and consist of the two-pole resolver and the 720-pole Inductosyn.

The ACUTROL® Model ACT 3000 controls the table. The digital controller has a touch sensitive display and scalable analog input/output interface. Optional the standard digital interface IEEE-488 and Ethernet (TCP/IP) can be supplemented with a high speed real time interface or many other commercially available computer interfaces.

The dynamic simulation can be enhanced with the optional available gas cooled temperature chamber allowing environmental testing over wide temperature range.

Model AC3357

Design Concept

Vertical outer yaw axis; horizontal middle pitch axis; open, yoke like, middle gimbal design; inner axis with table top.
All axes direct drive brushless torquers, continuous rotation in all axis,

Controller: Three Axis ACUTROL Model ACT 3000 with analog and digital interfaces for command and readout.
Power Amplifier with power supply, chokes and filters

Dimensions

Height, max	1610mm
Height of outer axis	940mm
Width across outer axis	1500mm
Base	1000mm dia
Table top, Aluminum	415mm dia. hard anodized
Mounting hole pattern	50 mm grid, M6 with inserts

Unit under Test (UUT)

Payload, nominal (peak)	30kg, (50)
Clearance envelope	400mm dia. x 300mm high
Electrical lines to UUT	60 lines total: 4 x 20A 6 x 6A 50 x 2A

	<u>ROLL, inner axis</u>	<u>PITCH, middle axis</u>	<u>YAW, outer axis</u>
Orthogonality		5 arcsec	5 arcsec
Wobble	2 arcsec	3 arcsec	3 arcsec
Dynamic Parameters			
Angular freedom	continuous	continuous	continuous
Positioning accuracy	1 RSS arc sec	1.5 RSS arc sec	1.5 RSS arc sec
Rate range	+/-1000	+/-500 deg/s	+/-300 deg/s
Rate resolution	0.00001 deg/s	0.00001 deg/s	0.00001 deg/s
Rate accuracy	0.00010%	0.00010%	0.00010%
Acceleration, no load	10000 deg/s ²	1500 deg/s ²	400 deg/s ²
Bandwidth (-3db)	50Hz	22Hz	30Hz

Temperature with optional temperature chamber

Range	-40 degC to +90 degC
Stability	+/- 2 degC

Options

- Table platen to customer's specification, different material size and design.
- Digital interface in addition to the std. IEEE-488 and Ethernet (TCP/IP) optional available are: RS-422, VMIC or SCRAMNet

For further information, contact:

ACUTRONIC USA Inc.
640 Alpha Drive, Pittsburgh, PA 15238
USA
Phone: 412 963 9400 Fax: 412 963 0816
Email: marketing@acutronic.com

Internet: www.acutronic.com

ACUTRONIC Switzerland Ltd.
Techcenterstrasse 2, 8608 Bubikon
Switzerland
Phone: +41 55 253 23 23 Fax : +41 55 253 23 33
Email : marketing@acutronic.ch