

Inertial Guidance Test Instrument, Motion Simulator

Three Axis Motion Simulator Model AC3380



Modes of Operation

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

Features

Large, high torque, direct drive, brushless motors produce high acceleration in all axes. The rigid structural design caters for high bandwidth applications and high fidelity real time motion simulation.

Description

The AC3380 Motion Simulator has three degrees-of-freedom. The middle gimbal (Pitch Axis) and inner gimbal (Roll Axis) are closed frames offering high torsional stiffness. The inner gimbal has T-slots to fasten the payload. Since the gimbals are symmetric about the axis of rotation, the balancing weights can be minimized to compensate for unbalances due to the payload

Slipring assemblies feature power rings and shielded signal rings. Signal lines have four brush contacts per ring to avoid micro interruptions, which could corrupt digital signals. A wide variety of slipring capsule designs and wiring schematics are optionally available.

The ACUTROL® Model ACT3000 controls the table. The digital controller has a large, colour, touch sensitive operator interface and scalable analog input/output interface. Programmable Event Pulses can be used for calibration and synchronization with external computers or test equipment. Optionally, the standard digital interfaces; IEEE-488 and Ethernet can be supplemented with VMIC or SCRAMNet real time computer interfaces.

Dimensions

Height, max	2641 mm
Height of outer axis	1793 mm
Width across outer axis	2365 mm
Base, diameter	1010 mm
Inner Gimbal clearance	770 x 770 x 1000mm
T-slots	Sized for M6 bolts

Unit under Test (UUT)

Payload, nominal	60kg
Payload, max.	100kg
Clearance envelope	700mm cube
Electrical lines to UUT (Standard)	100 lines total: 10 x 20A 90 x 2A

	ROLL, inner axis	PITCH, middle axis	YAW, outer axis
Orthogonality	3 arcsec	3 arcsec	
Wobble	5 arcsec	5 arcsec	5 arcsec
Dynamic Parameters			
Angular freedom	Continuous	continuous	continuous
Positioning accuracy	1 arc sec RSS	1 arcsec RSS	1 arcsec RSS
Position resolution	0.00001 deg	0.00001 deg	0.00001 deg
Rate range*	+/-500 deg/s	+/-300 deg/s	+/-200 deg/s
Rate resolution	0.00001 deg/s	0.00001 deg/s	0.00001 deg/s
Rate stability 360 deg	0.0001%	0.0001%	0.0001%
Installed torque	500Nm	1000Nm	5000Nm
Inertia no load	18kgm ²	140kgm ²	600kgm ²
Acceleration, no load	1'200 deg/s ²	400 deg/s ²	400 deg/s ²
Bandwidth (-3dB)	60 Hz	20 Hz	20 Hz

* Could be extended

Options

- Optional digital interfaces are: RS-232, VMIC or SCRAMNet
- Temperature chamber
- Non standard sliprings, GPS (HF) and MIL1553 ways
- Larger torque motors for increased acceleration
- Special UUT adapters

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