POI 7000 series

Spin Balance Machines
Measure All Mass Properties

Description

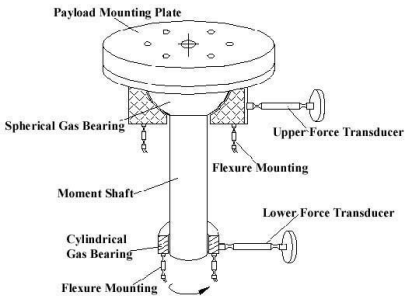
The Raptor Scientific POI7000 is a vertical two-plane spin balance machine. Our POI systems are the only instruments in the world that measure all mass properties: center of gravity (CG), moment of inertia (MOI), product of inertia (POI), and dynamic unbalance.

By eliminating the need for multiple machines, the time required to make measurements is reduced, as well as the risks associated with handling the payloads. Alignment errors that occur during setup on different machines are eliminated.

Our POI Series are the most accurate instruments in the world for mass properties measurement. They are particularly recommended for determining mass properties of rockets, satellites, and ballistic objects.

Basic Concept

The payload is mounted on a spherical gas bearing which is suspended flexurally from the machine base. A tube extends from this bearing to a flexibly mounted lower air bearing. Two independent force cells measure the reaction forces on both the upper and lower bearings due to an unbalance in the object being measured.



Key Features

Only instrument to measure both dynamic unbalance and moment of inertia on a single machine.

Only instrument with true static CG measurement capability, which eliminates errors due to air turbulence on irregularly shaped objects such as spacecraft.

Slow spin speed minimizes centrifugal forces on payload.

Two plane concept allows simultaneous measurement of CG offset and product of inertia.

Largest payload range available – the same instrument can measure payloads weighing only 2% of the machine capacity.

Use of gas bearing – fully compatible with cleanrooms, no contamination risk, no high pressure, no danger of explosion.

Enormous stiffness to overturning moment – remains stable when tall objects with high CG are measured.

Fully automated operation, programmable for metric and imperial units.

User defined coordinate system – mass properties results are reported directly in the payload coordinate system.

Optional weight platform and CMM device allow direct acquisition of test part weight and coordinate system into the POI system.

General Specifications (see specific product sheet for more details)

Measurements in one setup ..... 2 CG coordinates, 1 MOI value, and 2 plane POI
Payload weight range ..... From 50 lb to 7,000 lb
Spin speed range ..... 30 rpm to 250 rpm
CG and MOI measurement accuracy ..... 0.1% of measured value
Unbalance Reduction Ratio 95%
Electrical power requirements ..... 115 VAC single phase, 208 VAC three phase, 60 Hz
Pneumatic requirements ..... Clean source of dry air or nitrogen, 80 psi, 3 CFM
Facility requirements ..... Isolated concrete pad - mass of 20 times the maximum weight capacity
*Please note: Calibration hardware is provided with all our instruments, traceable to NIST

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