POI3500

Spin Balance Machines
Measure All Mass Properties

General Description

The Raptor Scientific POI3500 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.

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

Measurements in One Setup	2 CG coordinates, 1 MOI value, and 2 plane POI
Maximum Payload Weight	1,600 kg
Spin Speed Range	20 to 300 rpm
Unbalance Reduction Ratio	95%
Minimum Achievable Readout	585.3 kg-mm^2 @ 30 rpm
	146.3 kg-mm^2 @ 50 rpm
	43.9 kg-mm^2 @ 100 rpm
	17.6kg-mm^2 @ 200 rpm
Full Scale Dynamic Unbalance	74.1 kg-m^2 @ 30 rpm
	26.7 kg-m^2 @ 50 rpm
	6.7 kg-m^2 @ 100 rpm
	1.7 kg-m^2 @ 200 rpm
MOI Accuracy	0.1% of reading + 6 kg-cm^2
Electrical Power Requirements	115 VAC single phase, 220 VAC three phase, 60 Hz
Pneumatic Requirements	Clean source of dry air or nitrogen, 80 psi, 3 CFM
Calibration Hardware	Provided with all our instruments, traceable to NIST

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