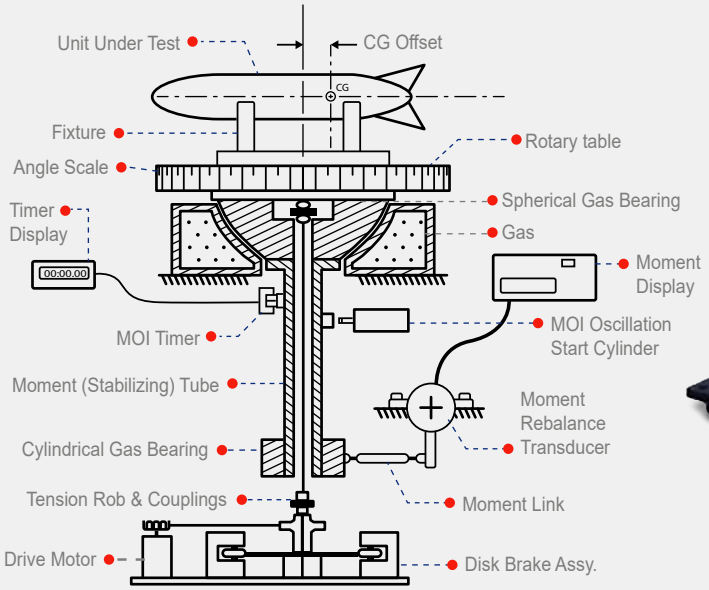
RAPTOR SCIENTIFIC

KSR Series

Global Provider of Test & Measurement Solutions

Center of Gravity and Moment of Inertia Instruments

Basic KSR Instrument elements are illustrated below - a spherical gas bearing creates both a precision rotary table and a frictionless pivot. An active force rebalance transducer measures overturning moment due to center of gravity offset from the center of rotation.



KSR models are the most accurate instruments in the world for center of gravity and moment of inertia measurement. They are particularly recommended for determining mass properties of rockets, satellite and ballistic objects. KSR instruments can be used for payloads weighing from a fraction of a pound to over 25,000 lbs.

Measurement Concept

The simplified drawing above illustrates the KSR Series basic theory of operation. A spherical bearing supports a rotary table and acts as a pivot axis for measuring unbalance moments due to the displacement of the test part CG relative to the central axis of the bearing. Moment of inertia is determined by clamping the lower end of the torsion rod attached to the gas bearing, thus converting the instrument to an inverted torsion pendulum.

Key Features

- **Best Accuracy Available** – CG measurement to 25 microns and MOI measurement to 0.1%
- **Largest Payload Range Available** – the same instrument can measure payloads weighing only 4% of the machine capacity
- **Fully Automated Operation** – select CG or MOI on the computer screen and the entire measurement sequence runs automatically
- **Use of gas bearing** – fully compatible with clean rooms, 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 programmable for metric and imperial units
- **User defined coordinate system** – CG and MOI are reported directly in the payload coordinate system
- **Calibration hardware traceable to NIST** is provided with all our instruments. Unbalance moment is measured directly. CG changes can be observed immediately
- **Automatic elimination of Leveling Errors**
- **Optional weight platform and CMM device** allow direct acquisition of test part weight and coordinate system into the KSR system

Measurements in One Setup	2 CG coordinates / 1 MOI value
Payload Weight Range	from 0.25 lb to 25,000 lb
CG Measurement Accuracy	0.1% of measured value
MOI Measurement Accuracy	0.1% of measured value
Pneumatic Requirements	Dry Air / Nitrogen (80 psi 2 cfm)
Facility Requirements	Concrete floor, 6-inch thick

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