SE8913

Dual Axis Center of Gravity Instrument

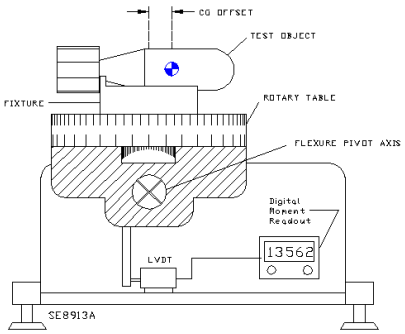
Description

The SE8913 instruments measure CG location of objects weighing up to 15 kg.

The instrument measures unbalance moment due to the displacement of test object center of gravity from the center of the rotary table. On the manual version, some math is required to convert this moment readout to CG location. The automatic version includes an interface for a Windows compatible computer which acquires the raw data and converts it to 2 axis CG location. This type of instrument is much more accurate than a 3-point weight and CG machine. The instrument does not measure moment of inertia or weight.

Measurement Concept

The greatly simplified drawing below illustrates the basic theory of operation.



A rotary table is mounted on a precision spindle bearing. Crossed web flexures provide a horizontal pivot axis which is essentially frictionless. A torsion rod in line with this pivot axis creates a linear torsion spring about this axis. When the test part CG is displaced from the measurement axis, an unbalance moment is created, resulting in a displacement of the LVDT mounted at the end of the moment arm.

To measure CG offset, the test operator rotates the table to 0° and records the value of unbalance moment. He then rotates the table to 180° and records a second moment. CG is computed by subtracting the two moment readings and dividing by the test part weight. By measuring moments at 90° and 270°, the second CG coordinate can be calculated.

Increased Accuracy

Rotating the test part 180° on the rotary table eliminates systematic errors such as incorrect leveling, zero drift in the readout, displacement of the rotary table axis from the pivot axis, etc.

Since the weight of the test part is supported by the crossed web flexure pivot and only the unbalance moment is sensed by the LVDT, extremely high sensitivity is possible.

The output of the LVDT is digitally filtered in the moment readout, which eliminates vibratory and other high frequency components.

Technical Specifications

	Model SE8913A	Model SE8913B	Model SE8913C
Payload Weight Capacity (including test part and fixture)	1 kg	5 kg	15 kg
Maximum Payload CG height	7.6 cm	12.7 cm	12.7 cm
Maximum moment without damage to instrument	5.76 kg-cm	11.5 kg-cm	23 kg-cm
Full scale moment (measurement range)	0.288 kg-cm	2.30 kg-cm	11.5 kg-cm
Moment Sensitivity	0.58 g-cm	2.3 g-cm	17.2 g-cm
Measurement Resolution	1.15 g-mm	2.30 g-mm	11.5 g-mm
Calibration hardware	Included	Included	Included

Interface: 11.4 cm diameter rotary table with threaded insert holes.

Space Electronics LLC – 81 Fuller Way – Berlin, CT 06037 – USA
Phone: +1 860 829 0001 – Fax: +1 860 829 0005 – Email: sales@space-electronics.com
Website : www.space-electronics.com