Manufacturing Metrology Team – Instrument Data Sheet

Mitutoyo Crysta Apex S7106 CMM system

Purpose

- Contact 3D measurement of form (dimension)

Working principle

- The Crysta-Apex S is a high accuracy, high Speed Moving Bridge Type Co-ordinate Measuring Machine utilising a Granite Base, which also provides the Y-Axis, guide way. A self-adjusting air bearing is used on each axis to provide stability during high-speed movement and measurement. The moving Bridge is constructed of low mass alloy, the “X” Beam and “Z” Spindle external surfaces being impregnated by an oxide coating process to form an extremely hard surface, which improves stability and also provides good wear resistance. Power drive is activated via a remote joystick unit for manual drive operation.

Advantages

- Accurate, traceable and readily comparable form measurement of a wide range of component types, sizes and materials

Limitations

- Limited data acquisition speed and data density
- Unsuitable for soft materials

Related research focus

- The Manufacturing Metrology Team performs a broad range of research into precision measurement of dimensional applications using optical technology. In order to verify the accuracy and traceability of the measurements obtained using these techniques, it is necessary to generate reference measurements using a tactile (contact) method which is well understood in terms of accuracy and traceability to international standards – a CMM (Co-ordinate Measuring Machine) provides this capability.

Instrument specification	
Movement Range	X – 705 mm Y – 1005 mm Z – 605 mm
Measuring Scale Resolution	0.0001 mm
Traversing Speed	8-300 mm/sec per axis
Volumetric Length Measuring Accuracy according to ISO 10360-2 (2009) "$E_{0,MPE}$" Specification (18 to 22 °C) [L in mm]	1.7 + 3L/1000 µm SP25 Probe (Ø4 mm x 50 mm)
	1.9 + 3L/1000 µm TP200 Probe (Ø4 mm x 10 mm)
	2.2 + 3L/1000 µm TP20 Probe (Ø4 mm x 10 mm)
Maximum permissible Probing Error (Single Stylus Form Error) according to ISO 10360-5 (2010) "$P_{FTU,MPE}$" Specification (16 to 26 °C)	1.7 µm SP25 Probe (Ø4 mm x 50 mm)
	1.9 µm TP200 Probe (Ø4 mm x 10 mm)
	2.2 µm TP20 Probe (Ø4 mm x 10 mm)
Maximum permissible Scanning Probing Error according to ISO 10360-4 (2004) "MPE_{THP}" Specification	2.2 µm (50 s) SP25 Probe (Ø4 mm x 50 mm)

For contract measurement enquiries, please contact:

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