

Coordinate Measuring Machines

Precision measuring technology with three dimensions

Standard CNC CMM MICROCORD CRYSTA-Apex S500/700/900 Series

- The CRYSTA-Apex S500/700/900 series, CNC CMMs attain high accuracy (1/7 μ m), high speed, and high acceleration. This series offers flexibility with a wide variety of models for various workpiece sizes.
- The scale systems on Mitutoyo high-precision models utilizes a high-performance linear encoder (manufactured by Mitutoyo), for detecting axis position. In addition, various technologies have been utilized in the structure, part processing, and assembly to provide high accuracy measurement.
- Floor vibration at the installation location, can be a source of variations in measured values. The auto-leveling air spring vibration isolator is available as an option for CRYSTA-Apex S500/700/900 series. The vibration isolator insulates the main unit from floor vibrations and can quickly levels the CMM main unit, using a sensor that detects load fluctuations caused by axis movement of the CMM or workpiece loading.
- All Crysta-Apex S high-precision series CMM's are equipped with temperature compensation and therefore do not require a temperature controlled room. Accuracy is guaranteed within the range of 16 to 26°C.



CRYSTA-Apex S 544



CRYSTA-Apex S 776



CRYSTA-Apex S 9106

SPECIFICATIONS

Model		CRYSTA-Apex S 544	CRYSTA-Apex S 574	CRYSTA-Apex S 776	CRYSTA-Apex S 7106	CRYSTA-Apex S 9106 (Z600) /9108 (Z800)	CRYSTA-Apex S 9166 (Z600) /9168 (Z800)	CRYSTA-Apex S 9206 (Z600) /9208 (Z800)
Measuring range	X axis	500mm		700mm		900mm		
	Y axis	400mm	700mm	700mm	1000mm	1000mm	1600mm	2000mm
	Z axis	400mm		600mm		600mm/800mm		
Maximum measuring speed		8mm/s		8mm/s		8mm/s (3mm/s for Z800 type)		
Drive speed		Each axis 8 to 300mm/s (CNC Mode), Maximum combined speed 519mm/s 0 to 80mm/s (I/S Mode: High Speed) 0 to 3mm/s (I/S Mode: Low Speed) 0.05mm/s (I/S Mode: Fine Speed)		Each axis 8 to 300mm/s (CNC Mode), Maximum combined speed 519mm/s 0 to 80mm/s (I/S Mode: High Speed) 0 to 3mm/s (I/S Mode: Low Speed) 0.05mm/s (I/S Mode: Fine Speed)		Each axis 8 to 300mm/s (CNC Mode), Maximum combined speed 519mm/s 0 to 80mm/s (I/S Mode: High Speed) 0 to 3mm/s (I/S Mode: Low Speed) 0.05mm/s (I/S Mode: Fine Speed)		
Maximum acceleration		Each axis 1333mm/s ² , Maximum combined speed 2309mm/s ²		Each axis 1333mm/s ² , Maximum combined speed 2309mm/s ²		Each axis 1333mm/s ² (1000mm/s ² for Z800 type) Maximum combined speed 2309mm/s ² (1732mm/s ² for Z800 type)		
Resolution		0.0001mm (0.1 μ m)		0.0001mm (0.1 μ m)		0.0001mm (0.1 μ m)		
Guide method		Air bearings on each axis		Air bearings on each axis		Air bearings on each axis		
Maximum measurable height		545mm		800mm		800mm (Z=600mm)/1000mm (Z=800mm)		
Maximum table loading		180kg		800kg	1000kg	1200kg	1500kg	1800kg
Mass (including the control device and installation platform)		515kg	625kg	1675kg	1951kg	2231kg (Z=600mm)	2868kg (Z=600mm)	3912kg (Z=600mm)
						2261kg (Z=800mm)	2898kg (Z=800mm)	3942kg (Z=800mm)
Air supply		0.4MPa		0.4MPa		0.4MPa		
		50L/min under normal conditions (air source: 100L/min)		60L/min under normal conditions (air source: 120L/min)		60L/min under normal conditions (air source: 120L/min)		

Note: While the appearance of the natural stone measuring table varies according to the source, the high stability for which this material is known can always be relied upon.

●CRYSTA-Apex S 500/700/900 Series Accuracy JIS B7440-2 (2003) Unit (μ m)

Probe used	Maximum permissible error (MPE _E)	Maximum permissible probing error (MPE _P)
SP25M (Stylus: ϕ 4×50mm)	1.7+3L/1000 (Temperature environment 1) 1.7+4L/1000 (Temperature environment 2)	1.7
TP200 (Stylus: ϕ 4×10mm)	1.9+3L/1000 (Temperature environment 1) 1.9+4L/1000 (Temperature environment 2)	1.9
TP20 (Stylus: ϕ 4×10mm)	2.2+3L/1000 (Temperature environment 1) 2.2+4L/1000 (Temperature environment 2)	2.2

Notes: (1) L = measured length (mm); (2) For temperature environments 1 and 2, refer to the Temperature Limits table on right.

●CRYSTA-Apex S 500/700/900 Series Scanning Accuracy JIS B7440-4(2003) Unit (μ m)

Probe used	Maximum permissible scanning error (MPE _{TH})
SP25M (Stylus: ϕ 4×50mm)	2.3

●CRYSTA-Apex S 500/700/900 Series Temperature Limits

		Temperature environment 1	Temperature environment 2
Limits within which accuracy is guaranteed	Range	18 to 22°C	16 to 26°C
	Rate of change	2.0K per hour or less 2.0K in 24 hours or less	2.0K per hour or less 5.0K in 24 hours or less
	Gradient	1.0K or less per meter	1.0K or less per meter

Standard CNC CMM MICROCORD CRYSTA-Apex S1200 Series MICROCORD Crysta-Apex C1600/C2000 Series

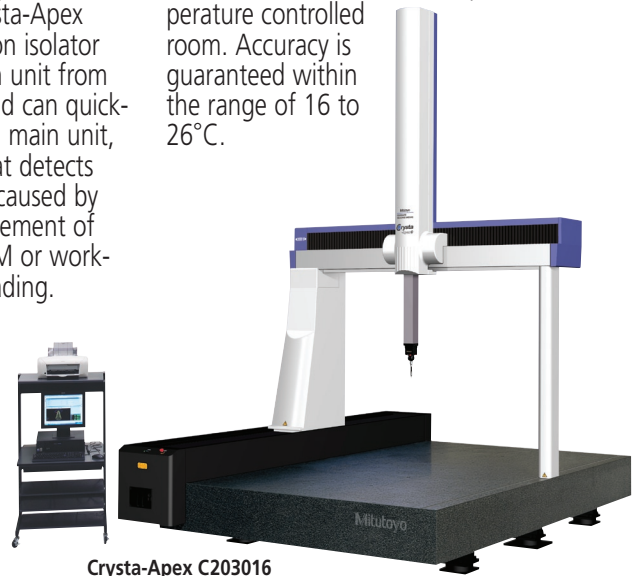
- The CRYSTA-Apex S1200 series and Crysta-Apex C1600/2000 series are large-sized CNC CMMs developed for supporting quality evaluation of large parts.
- The scale systems on Mitutoyo high-precision models utilizes a high-performance linear encoder (manufactured by Mitutoyo), for detecting axis position. In addition, various technologies have been utilized in the structure, part processing, and assembly to provide high accuracy measurement.

- Floor vibration at the installation location, can be a source of variations in measured values. The auto-leveling air spring vibration isolator is available as an option for CRYSTA-Apex S1200 & Crysta-Apex C1600/2000 series. The vibration isolator insulates the main unit from floor vibrations and can quickly levels the CMM main unit, using a sensor that detects load fluctuations caused by axis movement of the CMM or work-piece loading.

- All CRYSTA-Apex S1200 & Crysta-Apex C1600/2000 high-precision series CMM's are equipped with temperature compensation and therefore do not require a temperature controlled room. Accuracy is guaranteed within the range of 16 to 26°C.



CRYSTA-Apex S122010



Crysta-Apex C203016

SPECIFICATIONS

Items	Model	CRYSTA-Apex S	CRYSTA-Apex S	CRYSTA-Apex S	Crysta-Apex C	Crysta-Apex C	Crysta-Apex C	Crysta-Apex C	Crysta-Apex C
		121210	122010	123010	163012(Z1200)/ 163016(Z1600)	164012(Z1200)/ 164016(Z1600)	165012(Z1200)/ 165016(Z1600)	203016	204016
Measuring range	X axis	1200mm			1600mm			2000mm	
	Y axis	1200mm	2000mm	3000mm	3000mm	4000mm	5000mm	3000mm	4000mm
	Z axis	1000mm			1200mm/1600mm			1600mm	
Maximum measuring speed	5mm/s			3mm/s			3mm/s		
Drive speed	8 to 400mm/s (CNC Mode), Maximum combined speed 693mm/s 0 to 80mm/s (I/S Mode: High Speed) 0 to 3mm/s (I/S Mode: Low Speed) 0.05mm/s (I/S Mode: Fine Speed)			8 to 300mm/s (CNC Mode), Maximum combined speed 519mm/s 0 to 80mm/s (I/S Mode: High Speed) 0 to 3mm/s (I/S Mode: Low Speed) 0.05mm/s (I/S Mode: Fine Speed)			8 to 300mm/s (CNC Mode), Maximum combined speed 519mm/s 0 to 80mm/s (I/S Mode: High Speed) 0 to 3mm/s (I/S Mode: Low Speed) 0.05mm/s (I/S Mode: Fine Speed)		
Maximum acceleration	Each axis 1000mm/s ² , Maximum combined speed 1732mm/s ²			Each axis 980mm/s ² , Maximum combined speed 1697mm/s ²			Each axis 980mm/s ² , Maximum combined speed 1697mm/s ²		
Resolution	0.0001mm (0.1μm)			0.0001mm			0.0001mm		
Guide method	Air bearings on each axis			Air bearings on each axis			Air bearings on each axis		
Maximum measurable height	1200mm			1400mm (Z=1200mm)/1800mm (Z=1600mm)			1800mm		
Maximum table loading	2000kg	2500kg	3000kg	3500kg	4500kg	5000kg	4000kg	5000kg	
Mass (including the control device and installation platform)	4050kg		6150kg	9110kg	10600kg (Z=1200mm) 10650kg (Z=1600mm)	14800kg (Z=1200mm) 14850kg (Z=1600mm)	19500kg (Z=1200mm) 19550kg (Z=1600mm)	14100kg	19400kg
	Air supply Pressure		0.4MPa		0.4MPa		0.4MPa		
Air supply	Consumption		100L/min under normal conditions (air source: 150L/min)		150L/min under normal conditions (air source: 200L/min)		150L/min under normal conditions (air source: 200L/min)		

Note: While the appearance of the natural stone measuring table varies according to the source, the high stability for which this material is known can always be relied upon.

● CRYSTA-Apex S 1200 Series Accuracy JIS B7440-2 (2003) Unit (μm)

Probe used	Maximum permissible error (MPE) _E	Maximum permissible probing error (MPE) _P
SP25M (Stylus: ø4×50mm)	2.3+3L/1000 (Temperature environment 1) 2.3+4L/1000 (Temperature environment 2)	2.0
TP200 (Stylus: ø4×10mm)	2.5+3L/1000 (Temperature environment 1) 2.5+4L/1000 (Temperature environment 2)	2.2
TP20 (Stylus: ø4×10mm)	2.8+3L/1000 (Temperature environment 1) 2.8+4L/1000 (Temperature environment 2)	2.6

Note: L=arbitrary measuring length (Unit: mm)

● CRYSTA-Apex S 1200 Series Scanning Accuracy JIS B7440-4 (2003) Unit (μm)

Probe used	Maximum permissible scanning error (MPE) _{TP}
SP25M (Stylus: ø4×50mm)	2.8

● CRYSTA-Apex S 1200 Series Temperature Limits

Limits with- in which accuracy is guaranteed	Range	Temperature environment 1	Temperature environment 2
		Rate of change	2.0K per hour or less 2.0K in 24 hours or less
Gradient	1.0K or less per meter	1.0K or less per meter	

● Crysta-Apex C 1600 Series Accuracy JIS B7440-2 (2003) Unit (μm)

Probe used	Maximum permissible error (MPE) _E		Maximum permissible probing error (MPE) _P
	Temperature environment 1	Temperature environment 2	
SP25M (Stylus: ø4×50mm)	3.3+4.5L/1000 (4.5+5.5L/1000)	3.3+5.5L/1000 (4.5+6.5L/1000)	5.0 (6.0)
TP200 (Stylus: ø4×10mm)	6.0+4.5L/1000 (7.0+5.5L/1000)	6.0+5.5L/1000 (7.0+6.5L/1000)	6.5 (7.5)
TP20 (Stylus: ø4×10mm)	7.0+4.5L/1000 (8.0+5.5L/1000)	7.0+5.5L/1000 (8.0+6.5L/1000)	7.5 (8.5)

Notes: (1) L = measured length (mm); (2) For temperature environments 1 and 2, refer to the following Temperature Limits table; (3) Figures in parentheses apply to Z = 1600mm models.

● Crysta-Apex C 1600 Series Scanning Accuracy JIS B7440-2 (2003) Unit (μm)

Probe used	Maximum permissible scanning error (MPE) _{TP}
SP25M (Stylus: ø4×50mm)	5.0

*The figure in parentheses indicates Z:1600mm.

● Crysta-Apex C 1600 Series Temperature Limits

Limits with- in which accuracy is guaranteed	Range	Temperature environment 1	Temperature environment 2
		Rate of change	1.0K per hour or less 2.0K in 24 hours or less
Gradient	1.0K or less per meter	1.0K or less per meter	

● Crysta-Apex C 2000 Series Accuracy JIS B7440-2 (2003) Unit (μm)

Probe used	Maximum permissible error (MPE) _E		Maximum permissible probing error (MPE) _P
	Temperature environment 1	Temperature environment 2	
SP25M (Stylus: ø4×50mm)	4.5+8L/1000	4.5+9L/1000	6.0
TP200 (Stylus: ø4×10mm)	9+8L/1000	9+9L/1000	9.5
TP20 (Stylus: ø4×10mm)	10+8L/1000	10+9L/1000	10.5

*L=arbitrary measuring length (Unit: mm)

*For temperature environment 1 and 2, refer to the following installation temperature environment table.

● Crysta-Apex C 2000 Series Scanning Accuracy JIS B7440-2 (2003) Unit (μm)

Probe used	Maximum permissible scanning error (MPE) _{TP}
SP25M (Stylus: ø4×50mm)	6.0

● Crysta-Apex C 2000 Series Temperature Limits

Limits with- in which accuracy is guaranteed	Range	Temperature environment 1	Temperature environment 2
		Rate of change	1.0K per hour or less 2.0K in 24 hours or less
Gradient	1.0K or less per meter	1.0K or less per meter	