

MICROCORD **CRYSTA-Apex EX Series**

5-axis capability creates an amazing new standard
for measurement excellence

COORDINATE
MEASURING MACHINES



5-Axis CNC CMM

CRYSTA-Apex EX Series

Smooth action of a probe controlled in five axes realizes outstanding measurement efficiency

CRYSTA-Apex EX 500T/700T/900T Series

- Incorporates PH20 5-axis touch-trigger probe.
- Smooth 5-axis control drastically reduces measurement time for probe rotation.



5-axis control drastically reduces measurement time.



Efficient operation

5-axis design offers a choice of highly efficient measurement methods, including "head touch" for point measurement by moving the probe head only in two axes, and ultra high speed 5-axis scanning (500mm/sec)*.

* CRYSTA-Apex EX1200 R series only

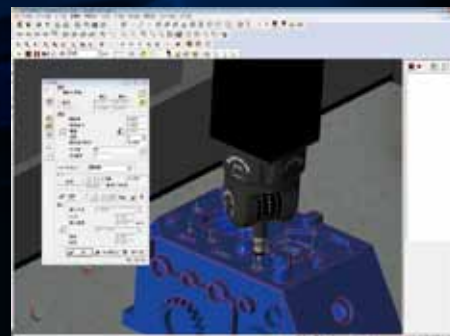
CRYSTA-Apex EX 1200R Series

- Equipped with REVO 5-axis scanning probe head.
- Allows ultra high speed 5-axis scanning, far surpassing conventional 3-axis control.



Unique high-efficiency measurement

Allows efficient online or Off-line programming using 3D CAD modeling.



Programming with 3D CAD model

CRYSTA-Apex EX 500T/700T/900T Series

- The **CRYSTA-Apex EX 500T/700T/900T series** are CNC CMMs equipped with the **PH20** 5-axis control touch-trigger probe.
- 5-axis operation reduces the time required for probe rotational movements and allows more flexible positioning. This also ensures easy access to complex workpieces and saves time both during programming and measurement.

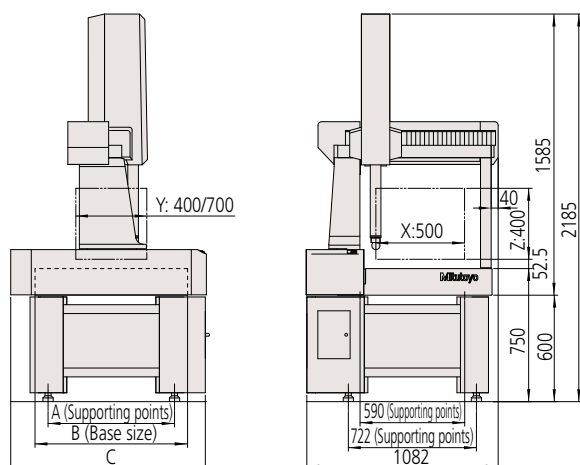
- In addition to 3-axis point measurement similar to conventional coordinate measuring machines, the **PH20** probe head also supports 'head touch' operation for quick point measurement using the two rotational axes of the probe only, with no movement required along the CMM axes.
- **PH20** incorporates a TP20 probe and allows use of modules designed for the TP20. Automatic probe changeover with a module changer is also supported.
- Even without the workpiece to be measured, a measurement program can be created on a PC using 3D CAD data. Compared to joystick operation, this makes for more efficient programming and also allows interference checking.



CRYSTA-Apex EX 544T

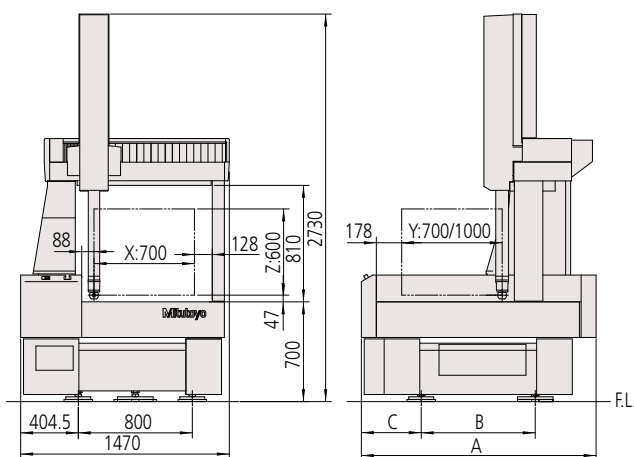


CRYSTA-Apex EX 500T Series DIMENSIONS (Unit: mm)



Model No.	A	B	C
CRYSTA-Apex EX544T	713	860	1122
CRYSTA-Apex EX574T	1013	1160	1458

CRYSTA-Apex EX 700T Series DIMENSIONS (Unit: mm)



Model No.	A	B	C
CRYSTA-Apex EX 776T	1650	800	420
CRYSTA-Apex EX 7106T	1950	1000	470

SPECIFICATIONS

Model No.		CRYSTA-Apex EX 544T	CRYSTA-Apex EX 574T	CRYSTA-Apex EX 776T	CRYSTA-Apex EX 7106T	CRYSTA-Apex EX 9106T	CRYSTA-Apex EX 9166T	CRYSTA-Apex EX 9206T
Measuring range	X-axis	500mm		700mm		900mm		
	Y-axis	400mm	700mm	700mm	1000mm	1000mm	1600mm	2000mm
	Z-axis	400mm		600mm		600mm		
Drive speed	CNC	Drive speed 8 - 300mm/s		Drive speed 8 - 300mm/s		Drive speed 8 - 300mm/s		
	MODE	Measuring Speed 1 - 10mm/s		Measuring Speed 1 - 10mm/s		Measuring Speed 1 - 10mm/s		
	J/S MODE	0 - 80mm/s		0 - 80mm/s		0 - 80mm/s		
Resolution		0.0001mm		0.0001mm		0.0001mm		
Guide method		Air bearings on each axis		Air bearings on each axis		Air bearings on each axis		
Table loading	Maximum height	545mm		800mm		800mm		
	Maximum mass	180kg		800kg	1000kg	1200kg	1500kg	1800kg
Mass (including the control device and installation platform)		536kg	646kg	1696kg	1972kg	2252kg	2889kg	3933kg
Air supply	Pressure	0.4MPa		0.4MPa		0.4MPa		
	Consumption	50 L/min under normal conditions (air supply: 100 L/min)		60 L/min under normal conditions (air supply: 120 L/min)		60 L/min under normal conditions (air supply: 120 L/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 EX 500T/700T/900T Series Accuracy (Unit: μm)

Probe used	Max. permissible length measurement error ISO 10360-2:2009 (JIS B 7440-2:2013)
PH20+TP20	$E_{0, \text{MPE}} = 2.2 + 3L/1000$ (Temperature environment 1)
	$E_{0, \text{MPE}} = 2.2 + 4L/1000$ (Temperature environment 2)

* L=Measuring length (unit: mm)

* Table at right defines temperature environments 1 and 2

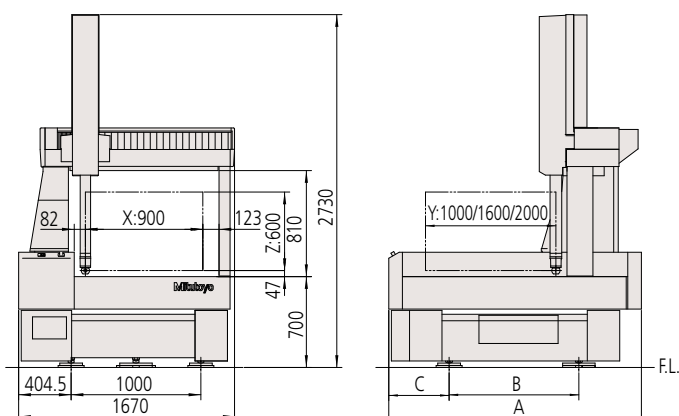
CRYSTA-Apex EX 500T/700T/900T Series Installation Temperature

		Temperature environment 1	Temperature environment 2
Limits within which accuracy is guaranteed	Temperature Range	18 - 22 °C	16 - 26 °C
	Rate of change	2 °C per hour or less 2 °C in 24 hours or less	2 °C per hour or less 5 °C in 24 hours or less
	Gradient	1 °C or less per meter	1 °C or less per meter

Specification of PH20

Rotation angle (Pitch angle)	Vertical (A-axis)	-115° to +115° (0.08sec)
	Horizontal (B-axis)	∞ (0.08sec)
Maximum stylus length		50mm

CRYSTA-Apex EX 900T Series DIMENSIONS (Unit: mm)



Model No.	A	B	C
CRYSTA-Apex EX 9106T	1950	1000	470
CRYSTA-Apex EX 9166T	2690	1320	700
CRYSTA-Apex EX 9206T	3090	1500	800



Various probe modules can be selected to suit the workpiece.

Note: Modules other than SF (standard force) module are options.



TCR20 module changer (option)
designed for the PH20 allows
automatic changeover

CRYSTA-Apex EX 1200R Series

Helical scan



Gasket scan



Sweep scan



Airfoil section scan



- CRYSTA-Apex EX 1200R series products are advanced CNC CMMs equipped with the REVO 5-axis scanning probe head.
- 5-axis operation reduces the time required for probe repositioning movements and allows more flexible positioning. This also facilitates access to complex workpieces and saves time both during programming and measurement.
- Allows ultra-high-speed 5-axis scanning (max. 500 mm/s), far surpassing conventional 3-axis control. Support for high speed sampling of up to 4,000 points per second allows acquisition of densely spaced measurement points, even during fast scanning.
- Internal implementation of laser sensing technology ensures high accuracy measurement, even with long styli (up to 500 mm*).

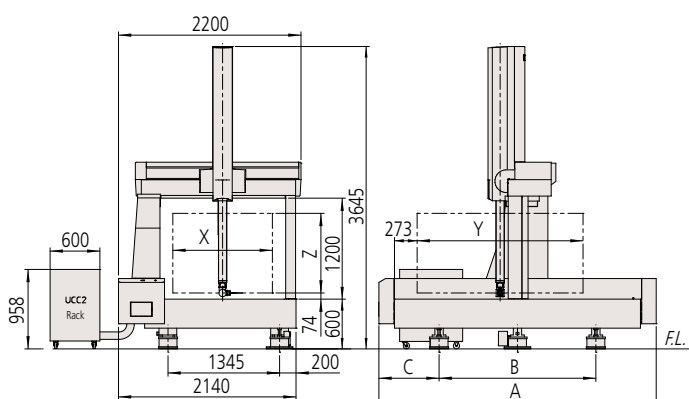
* Distance from probe rotation center to stylus tip

- Two types of probes supported: RSP2 for 5-axis scanning and SP25M type RSP3 probe allowing use of a cranked stylus. Automatic changeover of these probes with an auto probe changer is possible, enabling fully automated measurement of parts with diverse shapes.
- Probe calibration of RSP2 requires only about 20 minutes to enable use of the full angular range. Compared to conventional scanning probes, which notably reduces preparation time.



CRYSTA-Apex EX 123010R

CRYSTA-Apex EX 1200R Series DIMENSIONS (Unit: mm)



Model No.	X	Y	Z	A	B	C
CRYSTA-Apex EX 121210R	1200	1200	960	2545	1700	420
CRYSTA-Apex EX 122010R	1200	2000	960	3345	1890	725
CRYSTA-Apex EX 123010R	1200	3000	960	4345	2500	920

SPECIFICATIONS

Model No.		CRYSTA-Apex EX 121210R	CRYSTA-Apex EX 122010R	CRYSTA-Apex EX 123010R
Measuring range	X-axis	1200mm		
	Y-axis	1200mm	2000mm	3000mm
	Z-axis	960mm		
Drive speed	CNC MODE	Drive speed 8 - 300mm/s		
		Measuring Speed 1 - 5mm/s		
	J/S MODE	0 - 80mm/s (J/S Mode: High Speed) 0 - 3mm/s (J/S Mode: Low Speed) 0 - 3mm/s (J/S Mode: Touch Speed)		
Drive acceleration		375mm/s ²		
Resolution		0.0001mm		
Guide method		Air bearings on each axis		
Table loading	Maximum height	1160mm		
	Maximum mass	2000kg	2500kg	3000kg
Mass (including the control device and installation platform)		4050kg	6150kg	9110kg
Air supply	Pressure	CMM: 0.4MPa REVO: 0.5MPa		
	Consumption	150 L/min under normal conditions (air source: 230 L/min or more), 0.6MPa or more		

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 EX 121210R/122010R/123010R Series Accuracy (Unit: μm)

Probe used	Max. permissible length measurement error ISO 10360-2:2009 (JIS B 7440-2:2013)
REVO+RSP2+RSH250	E ₀ , MPE=2.9+4L/1000 (Temperature environment1) E ₂₅₀ , MPE=2.9+4L/1000 (Temperature environment1) E ₀ , MPE=2.9+5L/1000 (Temperature environment2) E ₂₅₀ , MPE=2.9+5L/1000 (Temperature environment2)
REVO+RSP3-3+ RSH3	E ₀ , MPE=2.5+3L/1000 (Temperature environment1) E ₁₅₀ , MPE=2.5+3L/1000 (Temperature environment1) E ₀ , MPE=2.5+4L/1000 (Temperature environment2) E ₁₅₀ , MPE=2.5+4L/1000 (Temperature environment2)

* L=Measuring length (unit: mm)

* Table below defines temperature environments 1 and 2

CRYSTA-Apex EX 121210R/122010R/123010R Series Installation Temperature

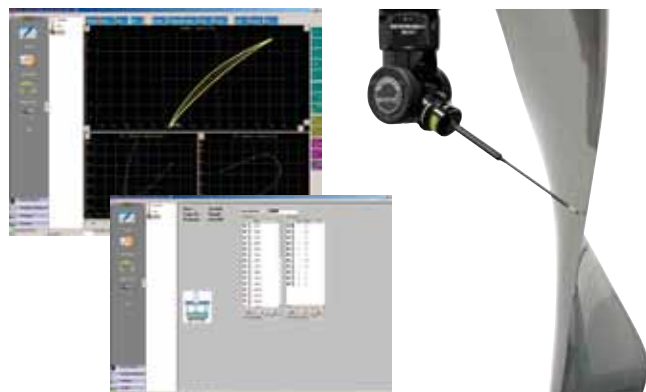
		Temperature environment 1	Temperature environment 2
Limits within which accuracy is guaranteed	Temperature Range	18 - 22 °C	16 - 26 °C
	Rate of change	2 °C in 24 hours or less	5 °C in 24 hours or less
	Gradient	1 °C or less per meter	1 °C or less per meter

Specification of REVO Scanning Probe

Rotation angle (Pitch angle)	Vertical (A-axis)	-5° to +120° (0.08 sec)
	Horizontal (B-axis)	∞ (0.08 sec)
Maximum stylus length	500mm (Distance from probe rotation center to stylus tip)	

MAFIS Express [Blade measurement/Evaluation program]

This software program enables creation of measurement programs and measurement and analysis of blades and blisks. A part program for measurement can be automatically created just by selecting required contents and evaluation conditions. The measurement results are displayed in a report including 2D graphics.



REVO Probe Options

• RSP2

Optimal for 5-axis scanning and touch-trigger measurement
Stylus holder* supports 175 mm, 250 mm, 350 mm, 450 mm, 500 mm effective stylus length

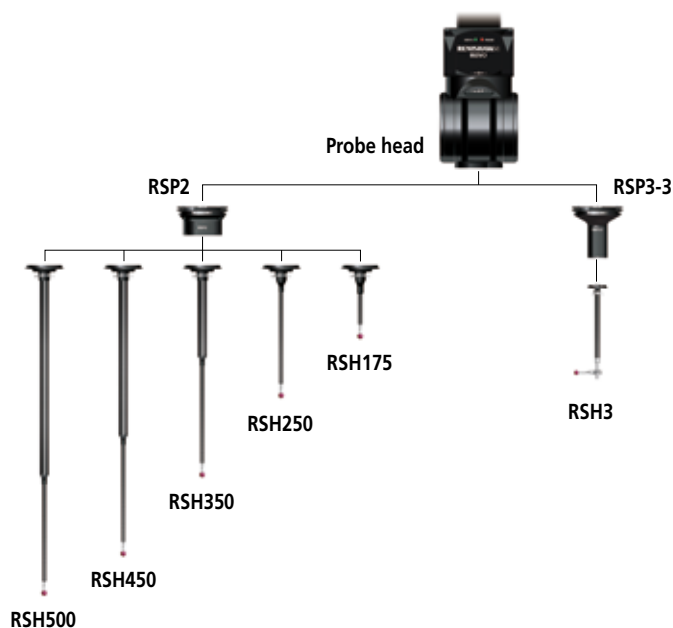
* Optional except for RSH250

• RSP3-3 (Options)

SP25 scanning probe
Supports use of cranked stylus

* Auto changer supported

Allows automatic changeover of probes (RSP2, RSP3) and stylus holders (RSH175, 250, 350, 450, 500).





**Whatever your challenges are,
Mitutoyo supports you from start to finish.**

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver bespoke measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.

Note: Product illustrations are without obligation. Product descriptions, in particular any and all technical specifications, are only binding when explicitly agreed upon.

MITUTOYO and MiCAT are either registered trademarks or trademarks of Mitutoyo Corp. in Japan and/or other countries/regions.

Other product, company and brand names mentioned herein are for identification purposes only and may be the trademarks of their respective holders.

Mitutoyo

Mitutoyo Asia Pacific Pte. Ltd.

Company Reg No. 197800892N

24 Kallang Avenue, Mitutoyo Building, Singapore 339415

Tel: (65) 6294 2211 Fax: (65) 6299 6666

E-mail: mapsg@mitutoyo.com.sg



**www.mitutoyo.com.sg | www.mitutoyo.com.my
www.mitutoyo.co.th | www.mitutoyo.co.id
www.mitutoyo.com.vn | www.mitutoyo.com.ph**

Mitutoyo (Malaysia) Sdn. Bhd.

Mah Sing Integrated Industrial Park,
4, Jalan Utarid U5/14, Section U5,
40150 Shah Alam, Selangor, Malaysia
Tel: (60) 3-7845 9318
Fax: (60) 3-7845 9346

E-mail: mmsb@mitutoyo.com.my

Penang Branch

Tel: (60) 4-641 1998 Fax: (60) 4-641 2998
E-mail: mmsbpen@mitutoyo.com.my

Johor Branch

Tel: (60) 7-352 1626 Fax: (60) 7-352 1628
E-mail: mmsbjhr@mitutoyo.com.my

Mitutoyo (Thailand) Co., Ltd.

76/3-5, Chaengwattana Road, Kwaeng
Anusaowaree, Khet Bangkaen,
Bangkok 10220, Thailand
Tel: (66) 2-080 3500
Fax: (66) 2-521 6136

E-mail: office@mitutoyo.co.th

Chonburi Branch

Tel: (66) 2-080 3563 Fax: (66) 3-834 5788

Amata Nakorn Branch

Tel: (66) 2-080 3565 Fax: (66) 3-846 8978

PT. Mitutoyo Indonesia

Jalan Sriwijaya No.26
Desa cibatu
Kec. Cikarang Selatan
Kab. Bekasi 17530, Indonesia
Tel: (62) 21-2962 8600
Fax: (62) 21-2962 8604

E-mail: ptmi@mitutoyo.co.id

Mitutoyo Vietnam Co., Ltd.

No. 07-TT4, My Dinh - Me Tri Urban Zone,
My Dinh 1 Ward, Nam Tu Liem District,
Hanoi, Vietnam

Tel: (84) 4-3768 8963
Fax: (84) 4-3768 8960

E-mail: mvc-hn@mitutoyo.com.vn

Ho Chi Minh City Branch

Tel: (84) 8-3840 3489
Fax: (84) 8-3840 3498

E-mail: mvc-hcmc@mitutoyo.com.vn

Mitutoyo Philippines, Inc.

Unit 2103, GMV Building 2,
107 North Main Avenue,
Laguna Technopark, Biñan,
Laguna 4024, Philippines

Tel: (63) 49-544 0272
Fax: (63) 49-544 0272

E-mail: mpi@mitutoyo.com.ph