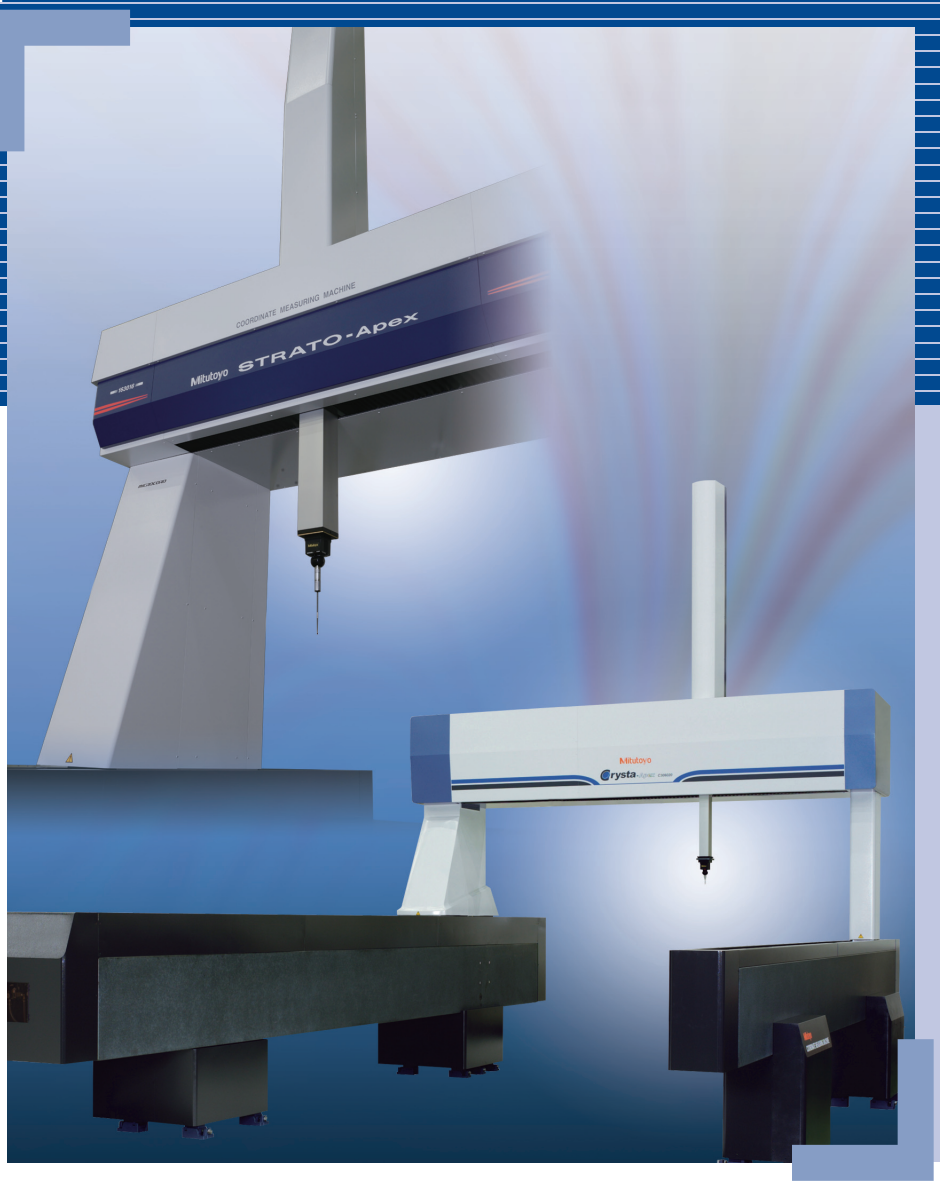
Large Bridge and Gantry CNC Coordinate Measuring Machines

CRYSTA-Apex S1200/1600/2000 Series
Crysta-Apex C203016G/306020G
STRATO-Apex 1600 Series
FALCIO Apex 2000/3000 Series

Catalog No.E16009(2)



The CRYSTA-Apex S1200/S1600/S2000, Crysta-Apex C3000, STRATO-Apex 1600 and FALCIO Apex 2000/3000 Series – measuring up to large components.

Mitutoyo

Mitutoyo's large CNC Coordinate Measuring Machines support quality evaluation to guarantee successful assembly of large components.

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CRYSTA-Apex S 1200 Series

CRYSTA-Apex S 1200 Series Specifications*

		Model No.	CRYSTA-Apex S 121210	CRYSTA-Apex S 122010	CRYSTA-Apex S 123010
Measuring range	X axis		1200mm		
	Y axis		1200mm	2000mm	3000mm
	Z axis		1000mm		
Resolution			0.0001mm (0.1µm)		
Guide method			Air bearings on each axis		
Drive speed			8 - 400 mm/s (CNC mode), max. speed: 693 mm/s 0 - 80 mm/s (J/S Mode: High Speed) 0 - 3 mm/s (J/S Mode: Low Speed) 0.05 mm/s (J/S Mode: Fine Speed)		
Max. measuring speed			5mm/s		
Workpiece	Maximum height		1200 mm		
	Maximum mass		2000 kg	2500 kg	3000 kg
Mass (including the control device and installation platform)			4050 kg	6150 kg	9110 kg
Air supply	Pressure		0.4MPa		
	Consumption		100 L/min under normal conditions (air source: 150 L/min)		

* 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 Installation Temperature

		Temperature environment 1	Temperature environment 1
Limits within which accuracy is guaranteed	Temperature Range	20±2 °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

Note: This machine incorporates a main unit Startup system (relocation detection system), which disables operation when an unexpected vibration is applied or the machine is relocated. Be sure to contact your nearest Mitutoyo Sales Office prior to relocating this machine after initial installation.

CRYSTA-Apex S 1200 Series Accuracy

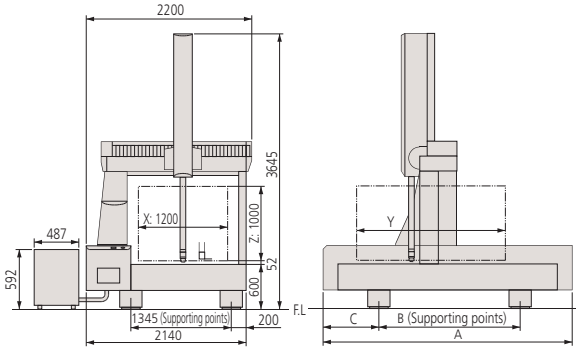
unit: µm

Probe used	Max. permissible length measurement error ISO 10360-2:2009 (JIS B 7440-2:2013)
SP25M	$E_{0,MPE}$=2.3+3L/1000 (Temperature environment 1) $E_{150,MPE}$=2.3+3L/1000 (Temperature environment 1)
	$E_{0,MPE}$=2.3+4L/1000 (Temperature environment 2) $E_{150,MPE}$=2.3+4L/1000 (Temperature environment 2)

* L = Selected measuring length (in mm).
* Table below describes temperature environments 1 and 2.

CRYSTA-Apex S 1200 Series Dimensions

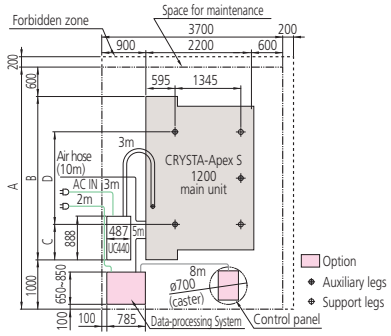
(unit: mm)



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

Installation floor space

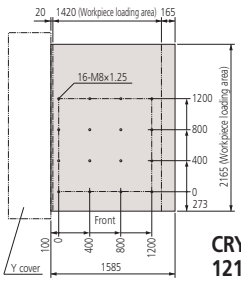
(unit: mm)



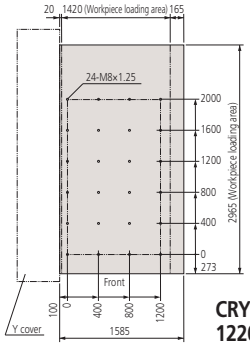
Model No.	A	B	C	D
CRYSTA-Apex S 121210	4145	2545	420	1700
CRYSTA-Apex S 122010	4945	3345	725	1890
CRYSTA-Apex S 123010	5945	4345	920	2500

Measuring table (Tapped insert) Dimensions

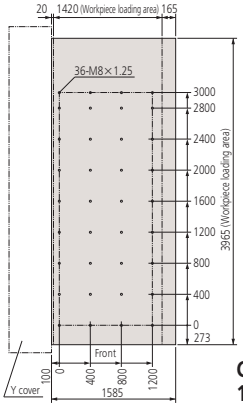
(unit: mm)



CRYSTA-Apex S 121210



CRYSTA-Apex S 122010



CRYSTA-Apex S 123010

CRYSTA-Apex S 1600 Series

CRYSTA-Apex S 1600 Series Specifications*

Model No.		CRYSTA-Apex S 162012(Z1200)/ 162016(Z1600)	CRYSTA-Apex S 163012(Z1200)/ 163016(Z1600)	CRYSTA-Apex S 164012(Z1200)/ 164016(Z1600)
Measuring range	X axis	1600 mm		
	Y axis	2000 mm	3000 mm	4000 mm
	Z axis	1200 mm/1600 mm		
Resolution		0.0001 mm		
Guide method		Air bearings on each axis		
Drive speed		8-400 mm/s (CNC Mode), max. speed: 693 mm/s 0-80 mm/s (J/S Mode: High Speed) 0-3 mm/s (J/S Mode: Low Speed) 0.05 mm/s (J/S Mode : Fine Speed)		
Max. measuring speed		3 mm/s		
Workpiece	Maximum height	1400 mm (Z=1200 mm)/1800 mm (Z=1600 mm)		
	Maximum mass	3000 kg	3500 kg	4500 kg
Mass (including the control device and installation platform)		9300 kg (Z=1200 mm) 9350 kg (Z=1600 mm)	10600 kg (Z=1200 mm) 10650 kg (Z=1600 mm)	14800 kg (Z=1200 mm) 14850 kg (Z=1600 mm)
Air supply	Pressure	0.4 MPa		
	Consumption	150 L/min under normal conditions (air source: 200 L/min)		

* 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 1600 Series Accuracy

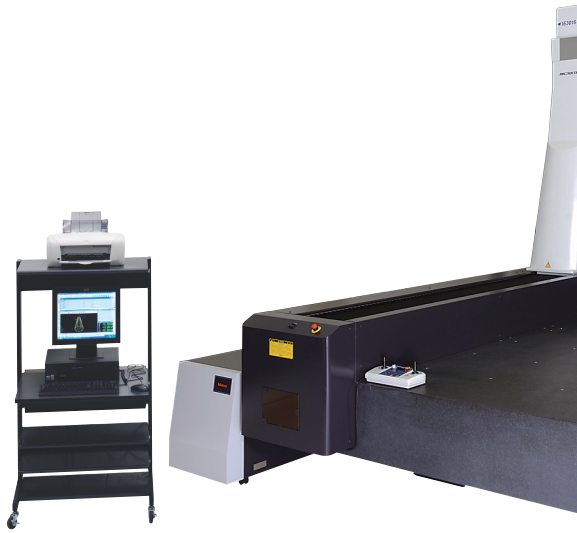
unit: µm

Probe used	Max. permissible length measurement error ISO 10360-2:2009 (JIS B 7440-2:2013)
SP25M	$E_{0, MPE}$=3.3+4.5L/1000 (4.5+5.5L/1000) (Temperature environment 1) $E_{150, MPE}$=3.3+4.5L/1000 (4.5+5.5L/1000) (Temperature environment 1)
	$E_{0, MPE}$=3.3+5.5L/1000 (4.5+6.5L/1000) (Temperature environment 2) $E_{150, MPE}$=3.3+5.5L/1000 (4.5+6.5L/1000) (Temperature environment 2)

* L = Selected measuring length (in mm).
* Table below describes temperature environments 1 and 2.
* ( ) indicates Z: 1600 mm specification

CRYSTA-Apex S 1600 Series Installation Temperature

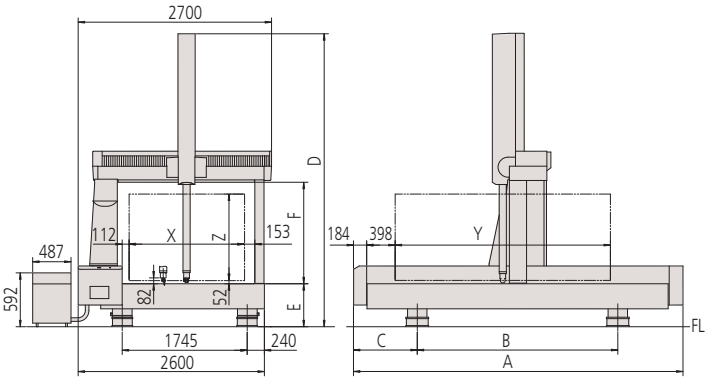
		Temperature environment 1	Temperature environment 2
Limits within which accuracy is guaranteed	Temperature Range	20±2°C	20±4°C
	Rate of change	1 °C per hour or less	
		2 °C in 24 hours or less	5 °C in 24 hours or less
	Gradient	1 °C or less per meter	



CRYSTA-Apex S163012

CRYSTA-Apex S 1600 Series Dimensions

(unit: mm)

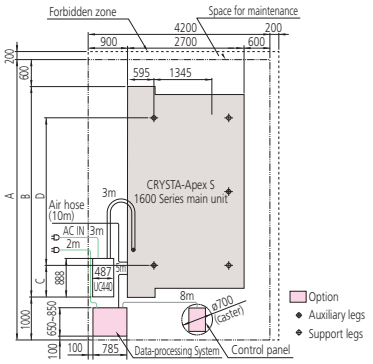


Model No.	A	B	C	D	E	F	X	Y	Z
CRYSTA-Apex S162012/162016	3600	1800	900	4140 (4940)	600	1400 (1800)	1600	2000	1200 (1600)
CRYSTA-Apex S163012/163016	4600	2640	980	4140 (4940)	600	1400 (1800)	1600	3000	1200 (1600)
CRYSTA-Apex S164012/164016	5600	3420	1090	4190 (4990)	650	1400 (1800)	1600	4000	1200 (1600)

* ( ) indicates Z: 1600 mm specification

Installation floor space

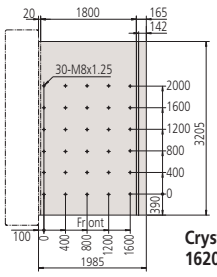
(unit: mm)



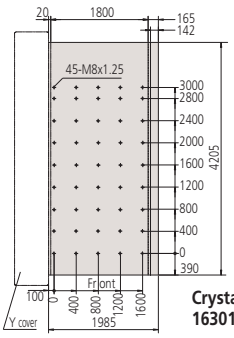
Model No.	A	B	C	D
CRYSTA-Apex S162012/162016	5200	3600	900	1800
CRYSTA-Apex S163012/163016	6200	4600	980	2640
CRYSTA-Apex S164012/164016	7200	5600	1090	3420

Measuring table (Tapped insert) Dimensions

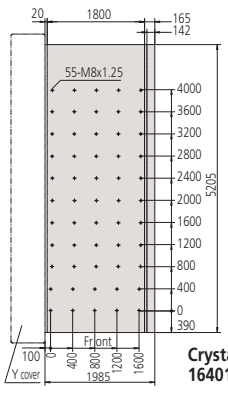
(unit: mm)



Crysta-Apex C 162012/162016



Crysta-Apex C 163012/163016



Crysta-Apex C 164012/164016

CRYSTA-Apex S 2000 Series

Note: This machine incorporates a main unit Startup system (relocation detection system), which disables operation when an unexpected vibration is applied or the machine is relocated. Be sure to contact your nearest Mitutoyo Sales Office prior to relocating this machine after initial installation.

CRYSTA-Apex S 2000 Series Specifications*

Model No.		CRYSTA-Apex S 203016	CRYSTA-Apex S 204016
Measuring range	X axis	2000 mm	
	Y axis	3000 mm	4000 mm
	Z axis	1600 mm	
Resolution		0.0001 mm	
Guide method		Air bearings on each axis	
Drive speed		8-400 mm/s (CNC Mode)), max. speed: 693 mm/s 0-80 mm/s (J/S Mode: High Speed) 0-3 mm/s (J/S Mode: Low Speed) 0.05 mm/s (J/S Mode : Fine Speed)	
Max. measuring speed		3 mm/s	
Workpiece	Maximum height	1800 mm	
	Maximum mass	4000 kg	5000 kg
Mass (including the control device and installation platform)		14100 kg	19400 kg
Air supply	Pressure	0.4 MPa	
	Consumption	150 L/minunder normal conditions (air source: 200 L/min)	

* 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 2000 Series Accuracy

unit: µm

Probe used	Max. permissible length measurement error ISO 10360-2:2009 (JIS B 7440-2:2013)
SP25M	$E_{0,MPE}$=4.5+8L/1000 (Temperature environment 1) $E_{150,MPE}$=4.5+8L/1000 (Temperature environment 1)
	$E_{0,MPE}$=4.5+9L/1000 (Temperature environment 2) $E_{150,MPE}$=4.5+9L/1000 (Temperature environment 2)

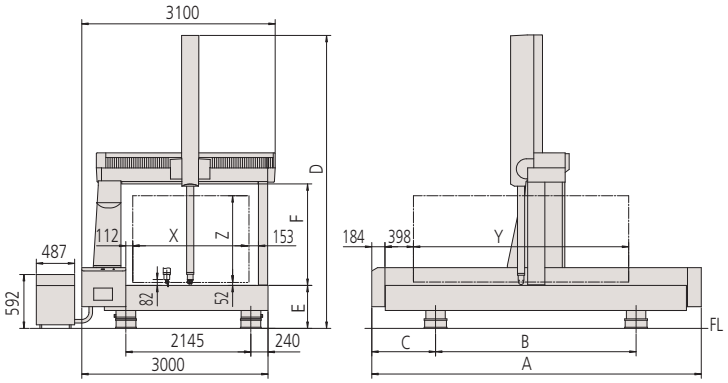
* L = Selected measuring length (in mm).
* Table below describes temperature environments 1 and 2.

CRYSTA-Apex S 2000 Series Installation Temperature

		Temperature environment 1	Temperature environment 2
Limits within which accuracy is guaranteed	Temperature Range	20±2°C	20±4°C
	Rate of change	1 °C per hour or less	
		2 °C in 24 hours or less	5 °C in 24 hours or less
	Gradient	1 °C or less per meter	

CRYSTA-Apex S 2000 Series Dimensions

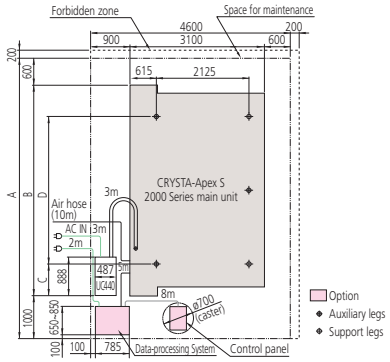
(unit: mm)



Model No.	A	B	C	D	E	F	X	Y	Z
Crysta-Apex S203016	4600	2640	980	4990	650	1800	2000	3000	1600
Crysta-Apex S204016	5600	3420	1090	5040	700	1800	2000	4000	1600

Installation floor space

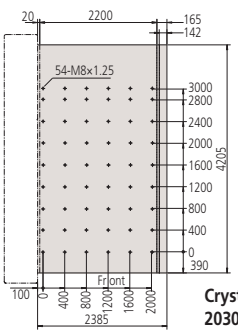
(unit: mm)



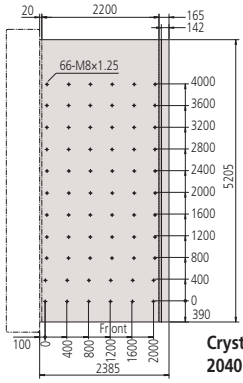
Model No.	A	B	C	D
Crysta-Apex S203016	6200	4600	980	2640
Crysta-Apex S204016	7200	5600	1090	3420

Measuring table (Tapped insert) Dimensions

(unit: mm)



Crysta-Apex S 203016



Crysta-Apex S 204016

FALCIO Apex 1600 Series

STRATO-Apex 163016

Specifications

Item			STRATO-Apex 162012	STRATO-Apex 162016	STRATO-Apex 163012	STRATO-Apex 163016
Measuring range	X		1600 mm			
	Y		2000 mm		3000 mm	
	Z		1200 mm	1600 mm	1200 mm	1600 mm
Guide method			Air bearings on all axes (static pressure air bearings)			
Drive speed	CNC mode		Drive speed: From 8 to 350 mm/s for each axis (maximum combined speed: 606 mm/s)			
			Measuring Speed 1 – 3 mm/s			
	J/S mode		Drive Speed 0 – 80 mm/s			
			Measuring Speed 0 – 3 mm/s			
			Fine-positioning Speed 0.05 mm/s			
Drive acceleration			780 mm/s^2 for each axis (maximum combined acceleration: 1,350 mm/s^2)			
Measuring method			Linear encoder			
Resolution			0.00005 mm			
Work table	Material		Granite			
	Size (table surface)		1850 × 3280 mm		1850 × 4280 mm	
	Tapped inserts		M8 × 1.25			
Workpiece	Maximum height		1350 mm	1750 mm	1350 mm	1750 mm
	Maximum mass		3500 kg		4000 kg	
Machine mass (includes the vibration-damping platform and controller, but not workpiece)			11150 kg	11200 kg	15300 kg	15350 kg
Power supply specifications (including the probe option interface)			Power supply voltage: AC100-120/200-240 V ± 10%; power supply capacity: 1500 W (of which 170 W is used for the probe option interface)			
Air supply	Pressure		0.4 MPa			
	Consumption		100 L/min under normal conditions (air source: At least 250 L/min)			
Guaranteed accuracy temperature environment	Temperature range		18 – 22 °C			
	Temperature change	Per hour	1.0 °C			
		Per 24 hours	2.0 °C			
	Temperature gradient	vertical/horizontal	1.0 °C/m			

* 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.

STRATO-Apex162012/163012

Length measurement error unit: µm

Standard	Probe used	Max. permissible length measurement error
ISO 10360-2: 2009	SP25M	$E_{0, MPE}$=2.5+4.0L/1000
		$E_{150\ MPE}$=2.5+4.0L/1000

Repeatabilty unit: µm

Standard	Probe used	Repeatability range of E^0
ISO 10360-2: 2009	SP25M	$R_{0, MPL}$=2.5

Single stylus form error unit: µm

Standard	Probe used	Max. permissible single stylus form error
ISO 10360-5: 2010	SP25M	$P_{FTU, MPE}$=2.3

Scanning probing error unit: µm

Standard	Probe used	Maximum permissible scanning probing error (Maximum permissible scanning test time) [sec])
ISO 10360-4: 2000	SP25M	MPE_{THP}=2.5 ($MPT_{\tau HP}$=60)

Note: This machine incorporates a main unit Startup system (relocation detection system), which disable operation when an unexpected vibration is applied or the machine is relocated. Be sure to contact your nearest Mitutoyo Sales Office prior to relocating this machine after initial installation.

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High accuracy combined with wide measuring range Best suited for highly accurate measurement of large workpieces

STRATO-Apex162016/163016

Length measurement error unit: µm

Standard	Probe used	Max. permissible length measurement error
ISO 10360-2: 2009	SP25M	$E_{0,MPE}$=3.0+4.0L/1000
		$E_{150\ MPE}$=3.0+4.0L/1000

Repeatabilty unit: µm

Standard	Probe used	Repeatability range of E^0
ISO 10360-2: 2009	SP25M	$R_{0,MPL}$=2.5

Single stylus form error unit: µm

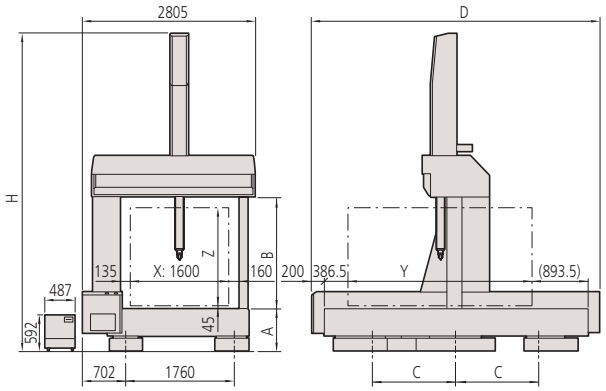
Standard	Probe used	Max. permissible single stylus form error
ISO 10360-5: 2010	SP25M	$P_{FTU,MPE}$=2.8

Scanning probing error unit: µm

Standard	Probe used	Maximum permissible scanning probing error (Maximum permissible scanning test time) [sec])
ISO 10360-4: 2000	SP25M	MPE_{THP}=3.0 (MPT_{tHP}=60)

Dimensions

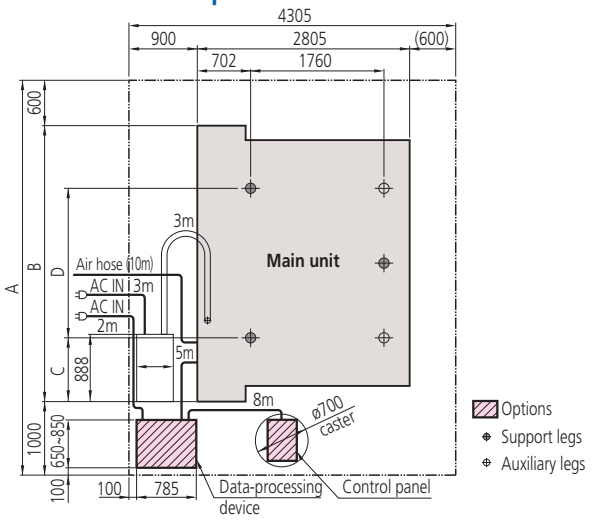
(unit: mm)



Item	STRATO-Apex 162012	STRATO-Apex 162016	STRATO-Apex 163012	STRATO-Apex 163016
A	650		700	
B	1415	1815	1415	1815
C	1000		1350	
D	3685		4685	
H	4340	5140	4390	5190
Y	2000	2000	3000	3000
Z	1200	1600	1200	1600

Installation floor space

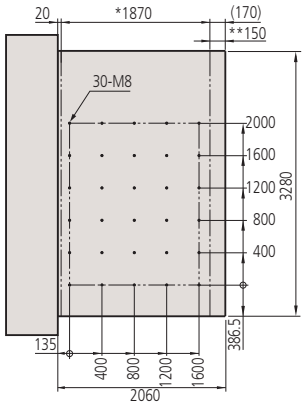
(unit: mm)



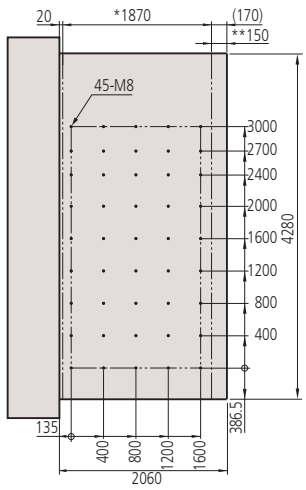
Item	STRATO-Apex162012/162016	STRATO-Apex163012/163016
A	5285	6285
B	3685	6285
C	840	990
D	2000	2700

Tapped insert positions in the table surface

(unit: mm)



STRATO-Apex 162012/162016

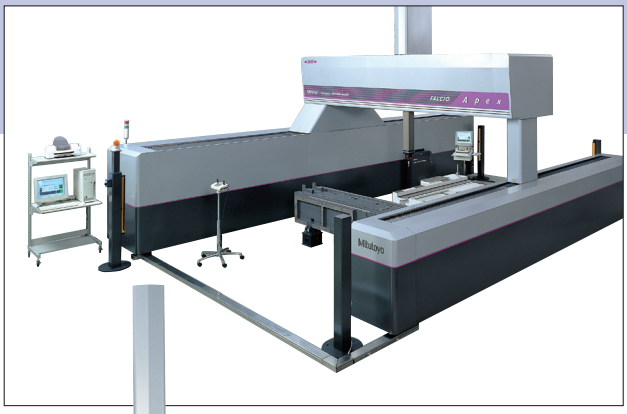


STRATO-Apex 163012/163016

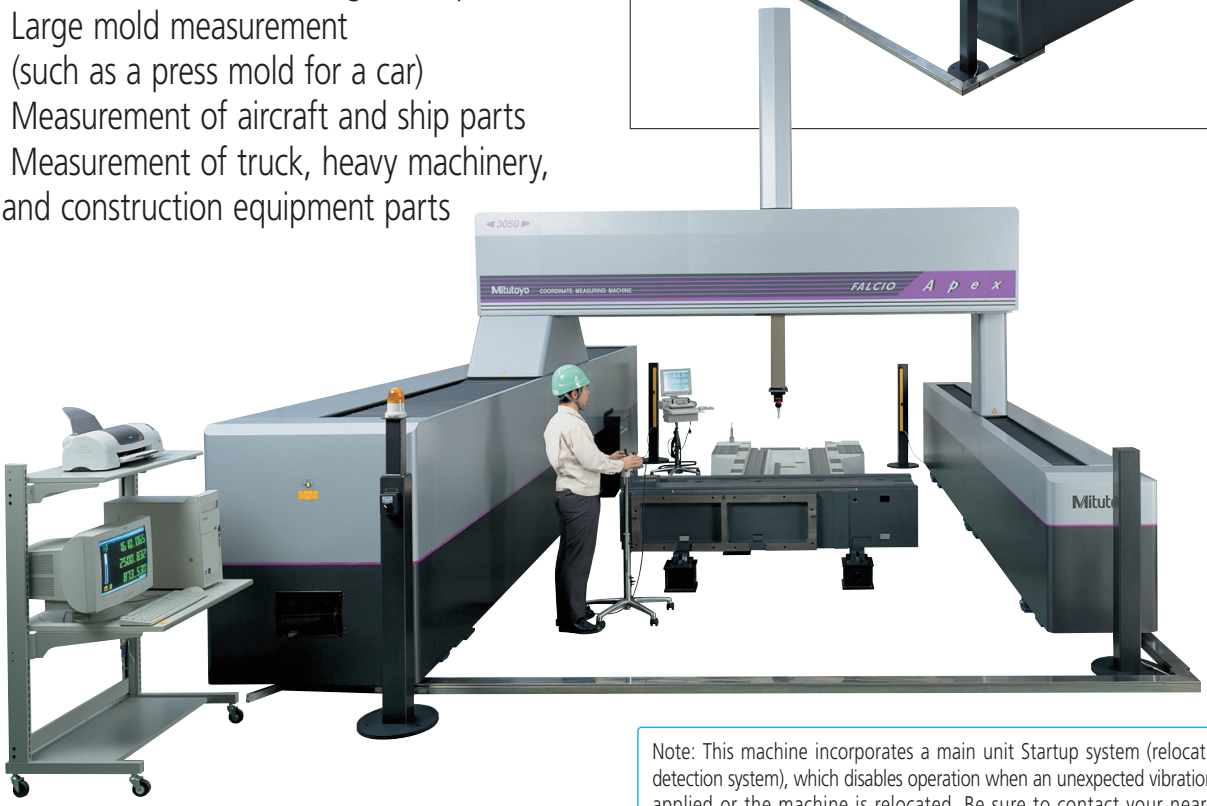
* Workpiece loading area
** Y-axis guiding surface

High-accuracy Separate Guide Type

FALCIO Apex 2000/3000 Series



- Specially sized for highly accurate measurement of various large workpieces
  - · Large mold measurement (such as a press mold for a car)
  - · Measurement of aircraft and ship parts
  - · Measurement of truck, heavy machinery, and construction equipment parts



Note: This machine incorporates a main unit Startup system (relocation detection system), which disables operation when an unexpected vibration is applied or the machine is relocated. Be sure to contact your nearest Mitutoyo Sales Office prior to relocating this machine after initial installation.

SPECIFICATIONS

Model No.		FALCIO Apex 203015G	FALCIO Apex 204015G	FALCIO Apex 205015G	FALCIO Apex 305015G
Range	X-axis	2000 mm	2000 mm	2000 mm	3000 mm
	Y-axis	3000 mm	4000 mm	5000 mm	5000 mm
	Z-axis	1500 mm			
Resolution		0.1µm	0.1µm	0.1 µm	0.1 µm
Accuracy*	MPE_E	(3.5+4L/1000)µm			
Mass (main unit)		12000 kg	14000 kg	15000 kg	16000 kg

* The machine is equipped with the temperature compensation system.
According to ISO 10360-2 methods when using the SP25M probe system with a ø4 x 50mm stylus. L: Measuring length (mm)
* 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.

Length standard: High accuracy linear encoder
Guide system: Air bearing
Max. drive speed: 520mm/sec

Guaranteed accuracy temperature environment*

Temperature range		18 °C - 22 °C
Temperature change	Per hour	1.0 °C
	Per 24 hours	2.0 °C
Temperature gradient	Vertical	1.0 °C/m
	Horizontal	1.0 °C/m

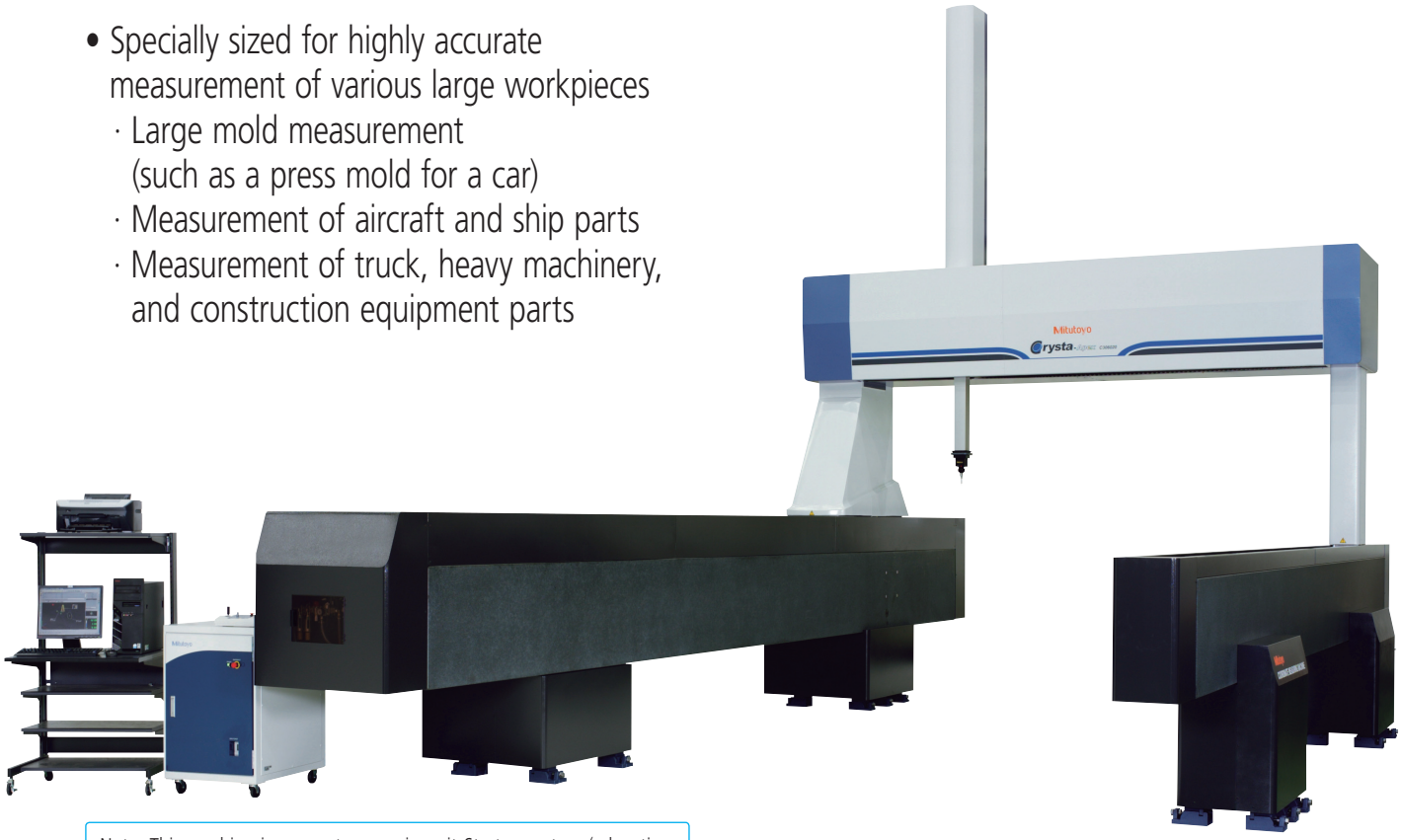
*When using temperature compensation system.

Mitutoyo

Large Separate Guide Type

Crysta-Apex C203016G/306020G

- Specially sized for highly accurate measurement of various large workpieces
  - · Large mold measurement (such as a press mold for a car)
  - · Measurement of aircraft and ship parts
  - · Measurement of truck, heavy machinery, and construction equipment parts



Crysta-Apex C306020G

Note: This machine incorporates a main unit Startup system (relocation detection system), which disables operation when an unexpected vibration is applied or the machine is relocated. Be sure to contact your nearest Mitutoyo Sales Office prior to relocating this machine after initial installation.

SPECIFICATIONS

Model No.		Crysta-Apex C203016G	Crysta-Apex C306016G
Range	X-axis	2000 mm	3000 mm
	Y-axis	3000 mm	6000 mm
	Z-axis	1600 mm	2000 mm
Resolution		0.1µm	0.1µm
Accuracy*	MPE_E	(6+6L/1000) µm	(8+7L/1000) µm
Mass (including controller)		6000 kg	14000 kg

*The machine is equipped with the temperature compensation system.
According to ISO 10360-2 methods when using the SP25M probe system with a ø4 x 50mm stylus. L: Measuring length (mm)
* 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.

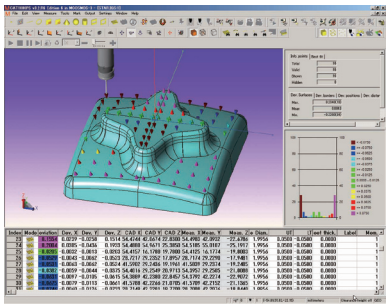
Length standard: High accuracy linear encoder
Guide system: Air bearing
Max. drive speed: 500mm/sec

Guaranteed accuracy temperature environment*

Temperature range		18 °C - 22 °C
Temperature change	Per hour	1.0 °C
	Per 24 hours	2.0 °C
Temperature gradient	Vertical	1.0 °C/m
	Horizontal	1.0 °C/m

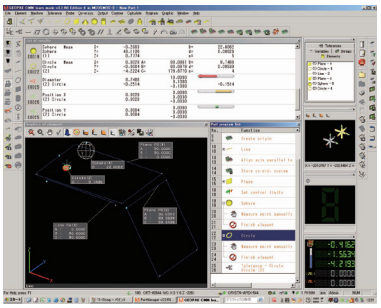
*When using temperature compensation system.

Software options handle all kinds of measurement



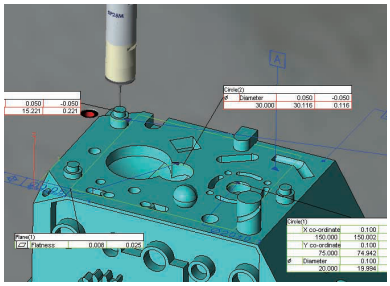
CAT1000S (freeform surface evaluation program)

Checks and compares the workpiece with the CAD data containing freeform surfaces and directly outputs the results in the form of CAD data in various formats. Software to directly convert from/to various types of CAD data is available as an option.



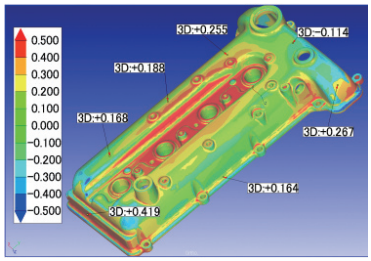
GEOPAK (high-functionality general-purpose measurement program)

This module is the heart of the MCOSMOS software system and is used to measure and analyze geometric elements. All the functions are provided by icons or pull-down menus, so even novices can promptly select desired functions. Its main features include easier viewing of measuring procedures and results such as realtime graphic display of measurement results and a function for direct call-up of elements from results graphics.



CAT1000P (off-line teaching program)

This module enables the user to use CAD data and on-screen simulation to create parts programs for making automated measurements (off-line teaching). This module allows the user to begin creating a parts program as soon as the design data has been finalized, shortening the entire process.



MSURF (non-contact laser measurement and evaluation program)

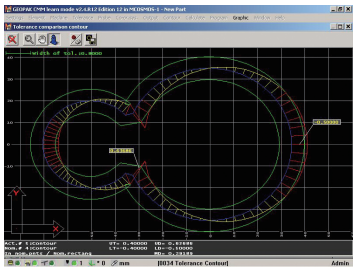
MSURF-S is used for obtaining measured point cloud data with the SurfaceMeasure (non-contact laser probe), while MSURF-I is used for comparing this data with the master model data, and for making dimensional measurements. Furthermore, MSURF-G for offline teaching allows the user to create a measurement macro even without the actual workpiece, improving the measuring machine's uptime.

SurfaceMeasure 606/610/1010

SurfaceMeasure606T

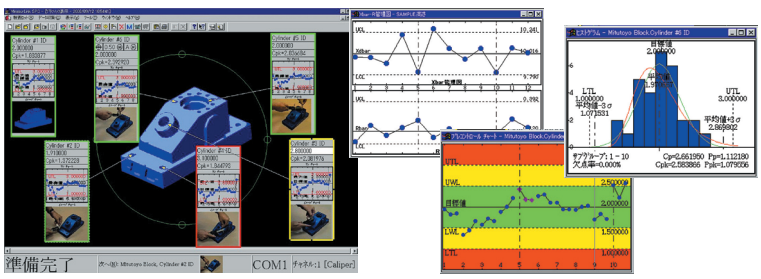
SurfaceMeasure606/610/1010/606T (non-contact laser probe)

A lightweight, high-performance, non-contact probe developed for CNC coordinate measuring machines. Powder spray-less measurement has been achieved through automatic setting of appropriate laser intensity and camera sensitivity according to environment or material, providing a simpler and more comfortable laser scanning environment.



SCANPAK (contour measurement program)

Software for scanning and evaluating workpiece contours (2D). Evaluates contour tolerance between measurement data and design data, and performs various types of element and inter-element calculations based on a desired range of measurement data specified by the user.



MeasurLink STATMeasure Plus (statistical-processing and process-controlling program)

Performs various types of statistical computations using measurement results. In addition, by displaying a control diagram on a real-time basis, this program allows defects that may occur in the future (e.g., wear or damage to cutting tools) to be discovered early on. This program can also be linked to a higher-level network environment to build a central control system.

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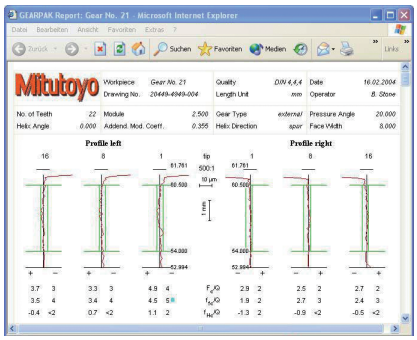
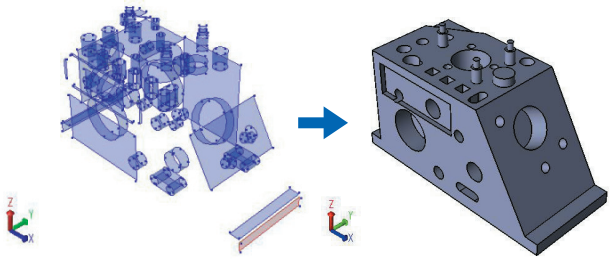


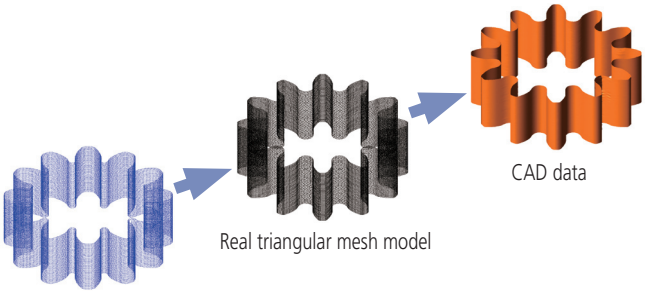
GEARPAK (gear evaluation program)

For evaluating the most types of involute gears.



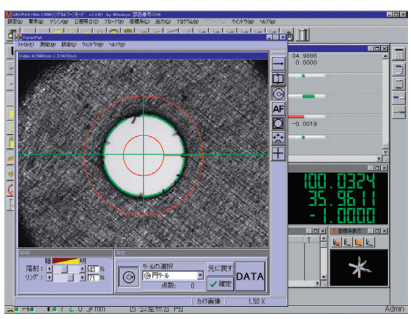
Solid Model Developer

This program generates CAD data from data measured using MCOSMOS.



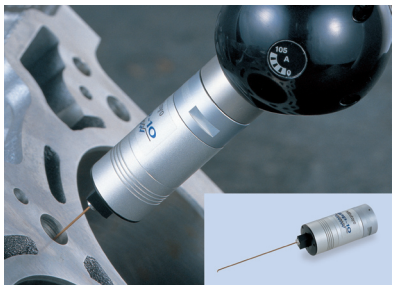
SurfaceDeveloper

This program generates free-form surface models from multi-sectional contour data.



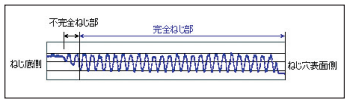
VISIONPAK (vision measurement program)

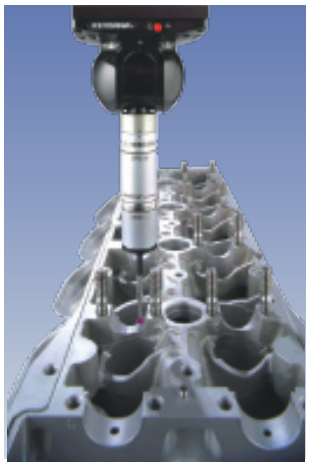
This program controls QVP and performs various computational analyses on captured images



MPP-10 (probe for effective screw depth measurement)

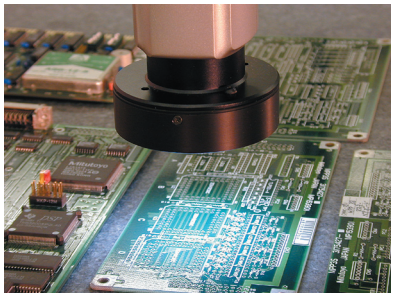
The probe that made it possible for a coordinate measuring machine to measure effective screw depth for the first time. The introduction of the auto probe changing system allows normal dimensional measurements as well as effective screw depth measurements to be made automatically.





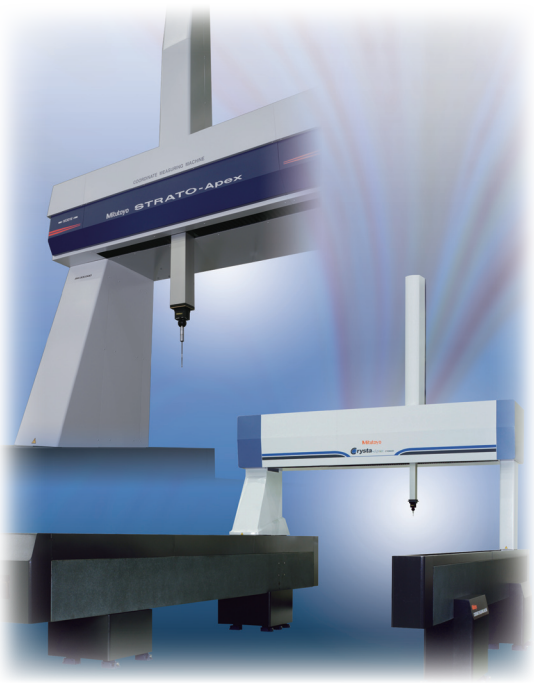
SP25M (compact high-accuracy scanning probe)

This is a compact, high-accuracy, multi-function scanning probe with a 25-mm outside diameter that makes scanning measurements, high-accuracy point measurements, and centripetal point measurements (optional function). The SP25M is used with the PH10MQ/10M auto probe head to provide a high degree of measurement freedom.



QVP (vision probe)

This probe automatically detects edges from image data of the workpiece magnified by a CCD camera. It is extremely useful for measuring microfabricated products that cannot be measured using a contact-type probe and soft objects that cannot be subjected to any measurement force. The QVP can also be used for measuring height based on autofocusing.



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