Mitutoyo

Mitutoyo Quality

Manual Coordinate Measuring Machine
CRYSTA-PLUS M SERIES
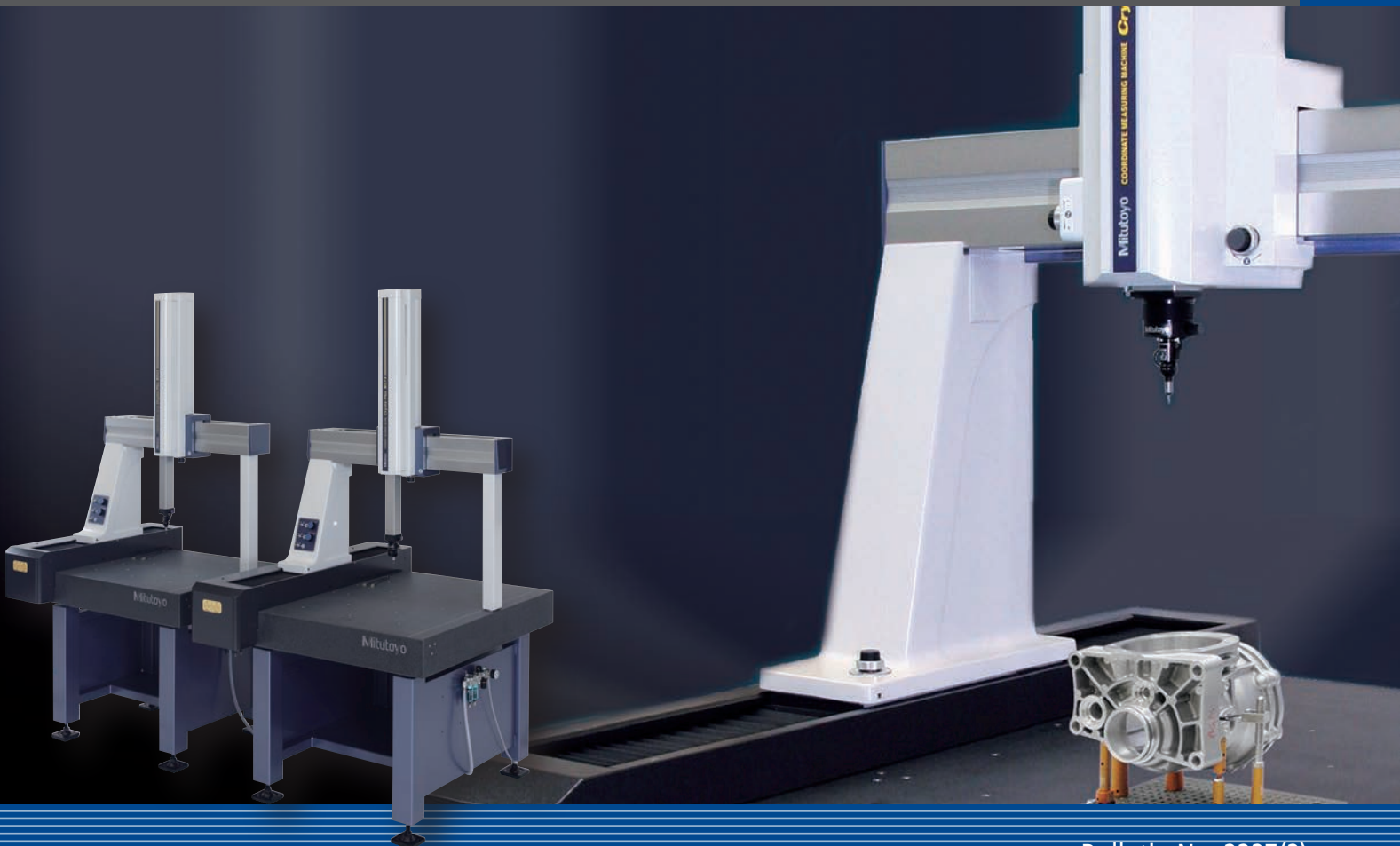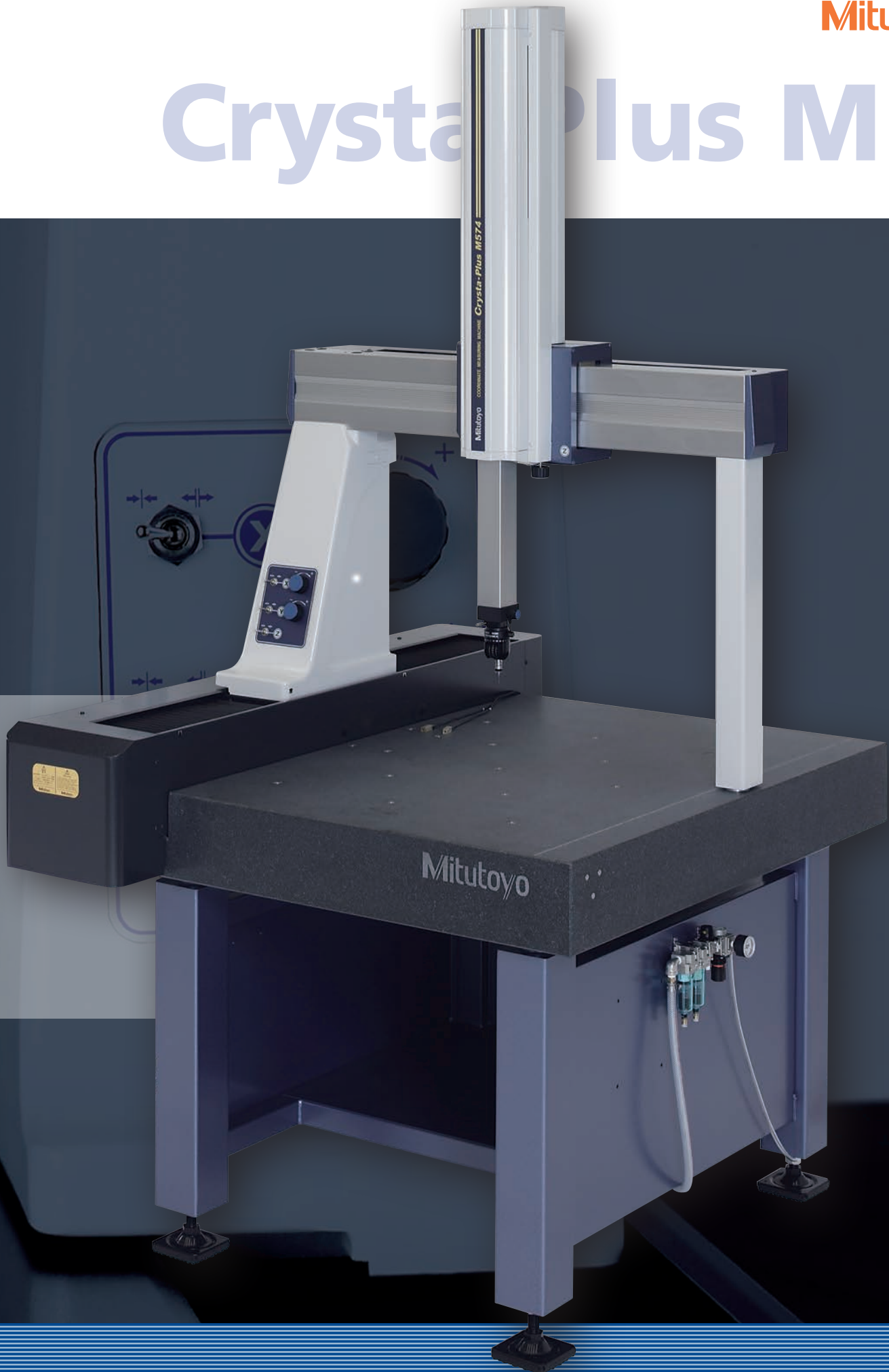
Crysta-Plus M:
Quality down to the smallest detail

Crysta-Plus M

Mitutoyo

High operability, environmental stability and performance

Maintains High Accuracy for Long Periods

The Crysta-Plus M series features the world's highest measuring accuracy in manual coordinate measuring machines. The main unit base is manufactured from highly reliable Graplate (precision granite surface plate), which provides high-rigidity construction with extremely small secular change by integrating the Y-axis guide rail with the measuring table. X-, Y- and Z-axis guides are equipped with high-accuracy air bearings to provide excellent linearity and sliding smoothness so that the operator can move the stylus around the workpiece with minimal effort. The length measuring system of each axis employs high-accuracy glass scales and linear encoders to enable long-term accuracy stability, combined with negligible maintenance requirements apart from normal servicing.

Axis Clamp Switch and X/Y Fine-Feed Knob

The X, Y and Z axes can be individually clamped with a one-touch air clamp. Each axis can be finely adjusted over the entire measuring range when in the clamped state.
In the Crysta-Plus M443/M574, the X- and Y-axis fine-feed knobs are grouped together on the front of the main unit for convenience. When centering microscope CF20 is installed, for example, these knobs allow easy and precise positioning without causing operator fatigue.
The Crysta-Plus M7106 is provided with a coarse-feed knob for each axis (18.85mm/revolution), as

well as fine feed (0.99mm/ revolution), to enable easy handling of this larger machine. Additionally, adoption of the Mobile Clamp Box allows the operator to perform clamping operations on each axis from just one location.
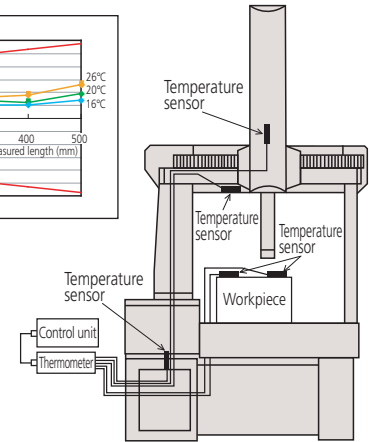
Temperature Compensation System

The Crysta-Plus M series is available with the temperature compensation system (Option). This optionl system uses multiple sensors to ensure maintenance of the specified accuracy over the operating temperature range of 15 to 30°C.
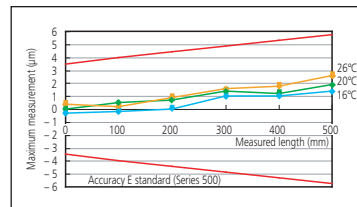


Temperature sensors

Illuminator and Disable Switch

- In order to greatly improve workability during measurement of fine geometry or a deep hole, an optional white LED illuminator can be installed. (Option)
- In order to prevent unintentional triggering of the probe when changing the probe orientation or replacing a stylus, an ON/OFF switch (Disable switch) is provided on the probe holder.

Illumination ON/OFF switch

White LED illumination

Disable switch
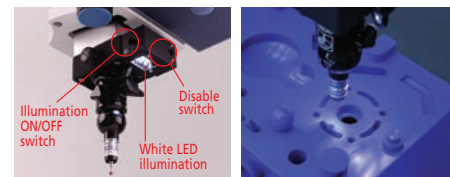
Probe

Touch-trigger Probe MH20i
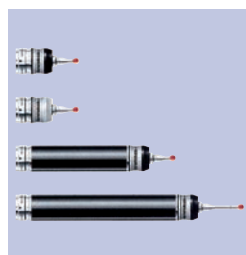
Probe modules (Option)

Centering Microscope CF20 (Option)

The centering microscope is best suited to measure a small hole into which a stylus cannot be inserted, plastic or rubber items, or a thin workpiece which would be deformed by contact with a touch-trigger probe stylus.
Note: The auxiliary weight set is required if the CF20 is installed.

| Repeatability	$2\sigma \leqq 0.35\mu m$ (When using standard stylus)
Trigger force	XY: 0.08N Z: 0.75N

Crysta-Plus M

Series M443/M574

● Standard
● Optional

Crysta-Plus M443

Continuous fine feed over the entire Z-axis measuring range

Clamp switch and fine-feed knob on each axis
(Continuous fine feed operates over the entire range)

Machine stand / Accessory storage

**Interchangeable probe,** probe disable button and white LED illuminator
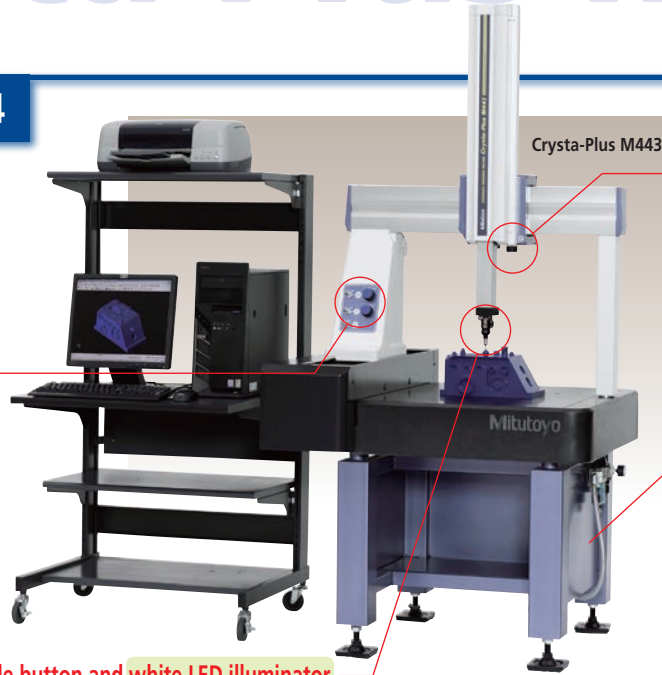
Series M7106

Fine/Coarse feed knob on each axis
(Continuous fine/coarse feed operates over the entire measuring range)

Interchangeable probe, probe disable button and white LED illuminator
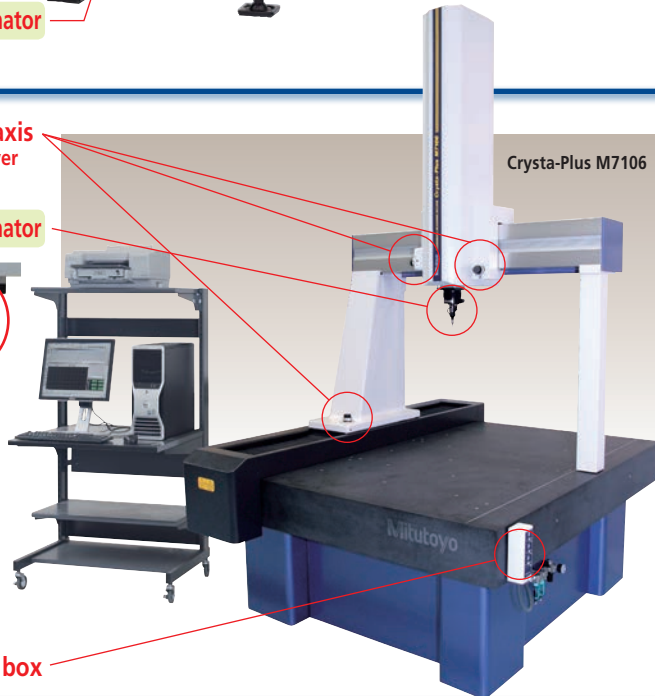
Crysta-Plus M7106

Constant grip
A constant-force handgrip is installed at the lower end of the ram to limit the force applied by the operator during operation, thus improving repeatability of measurement.
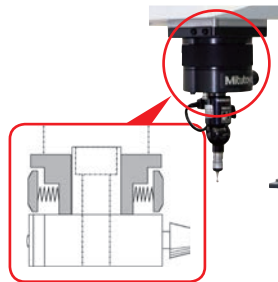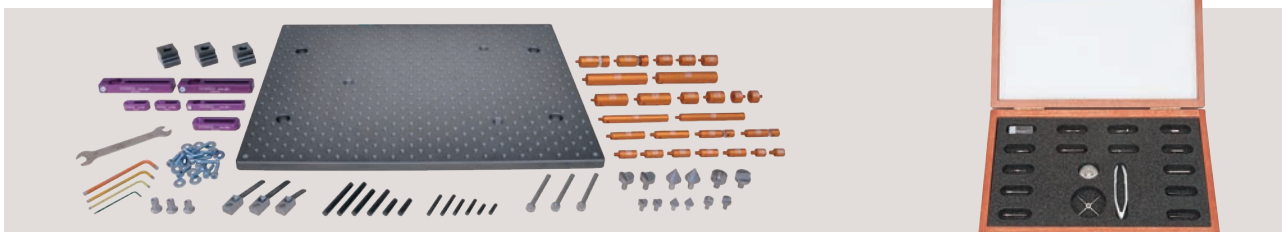
Constant-force handgrip

Mobile clamp switch box

Accessories

Clamping kit

Stylus kit

Crysta-Plus M443

Dimensions (Main Unit)

Unit: mm

Dimensions (Measuring Table)

Unit: mm

Installation Floor Space

Unit: mm
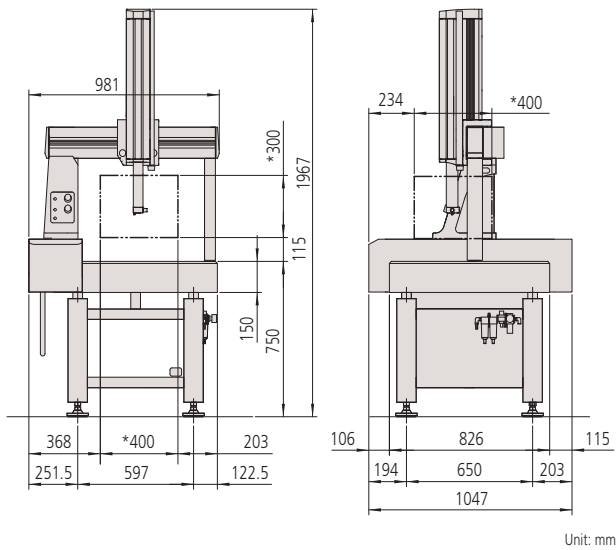
	Crysta-Plus M443
Mass of main unit	360kg
Mass of machine stand	50kg
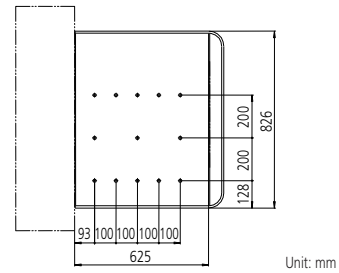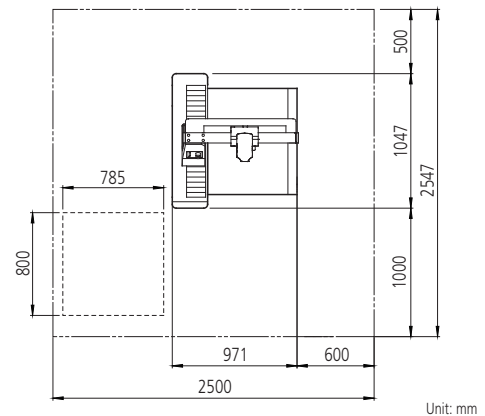
*Pictures and dimensions shown in this page are an example of system configuration.
 Contact your Mitutoyo representative or the nearest Mitutoyo sales office for details of the system configuration.

Crysta-Plus M574

Dimensions (Main Unit)

Unit: mm

	Crysta-Plus M574
Mass of main unit	575kg
Mass of machine stand	71kg

	Crysta-Plus M574
A	1434mm
B	141mm
C	1175mm
D	255mm
E	950mm
F	180mm
G	700mm

Dimensions (Measuring Table)

Unit: mm

Installation Floor Space
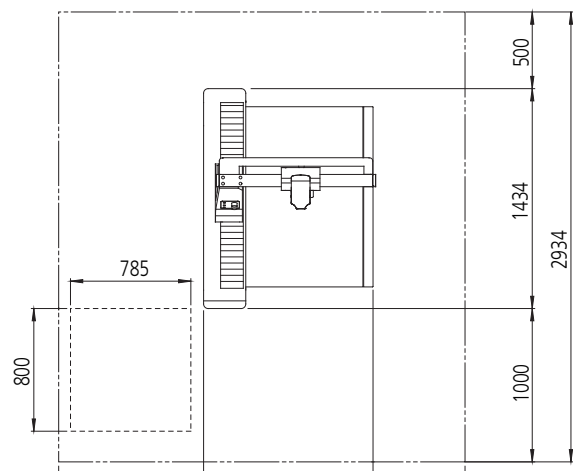
Unit: mm

*Pictures and dimensions shown in this page are an example of system configuration.
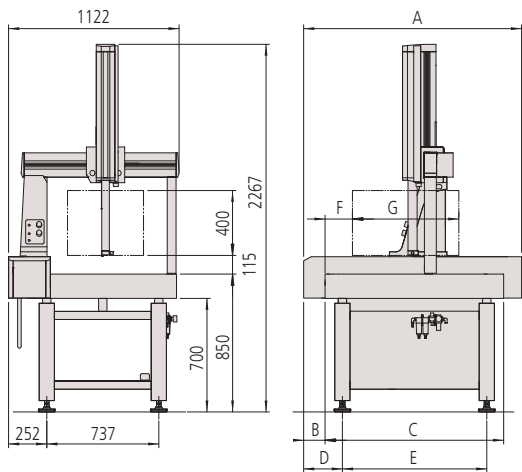Contact your Mitutoyo representative or the nearest Mitutoyo sales office for details of the system configuration.
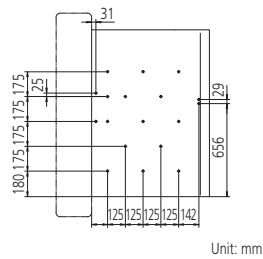
Crysta-Plus M7106

Dimensions (Main Unit)

Unit: mm

Dimensions (Measuring Table)

Unit: mm

Installation Floor Space

	Crysta-Plus M7106
Mass of main unit (including machine stand)	1800kg

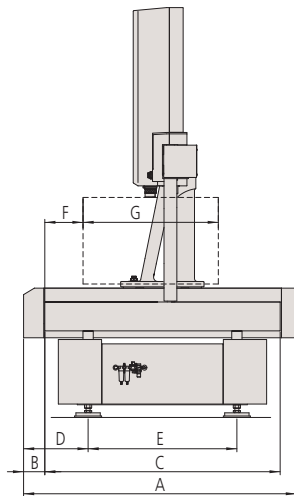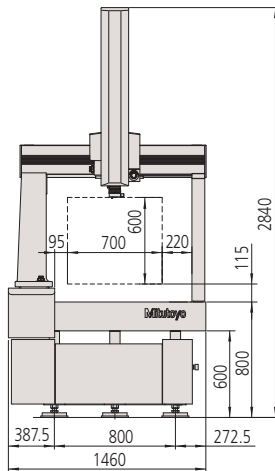|	Crysta-Plus M7106
A	2017mm
B	157mm
C	1740mm
D	370mm
E	1000mm
F	283mm
G	1000mm

*Pictures and dimensions shown in this page are an example of system configuration.
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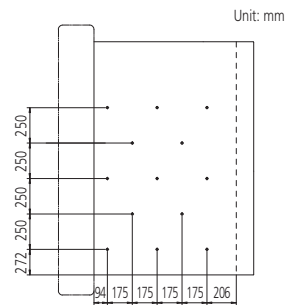
Crysta-Plus M443 / M574 / M7106 Series Specifications

Specifications

Item \ Model		Crysta-Plus M443
Measuring range	X axis	400mm
	Y axis	400mm
	Z axis	300mm
Resolution		0.0005mm
Accuracy (20°C) ISO 10360-2 [1], [2]	Measuring error (E)	(3.0+4L/1000)µm [3]
	Probing error (R)	4.0µm
Temperature compensation system		Option
Length standard		Linear encoder
Guide method		Air bearing on each axis
Clamping on each axis		One-touch air clamp
Fine feed of each axis		Continuous fine feed over the entire measuring range on each axis
Measuring table	Effective size	624mm×805mm
	Material	Granite
Workpiece	Maximum height	480mm
	Maximum mass	180kg
Z-axis balancing method		Counterweight (adjustable by 1.5kg)
Machine dimensions	Width	981mm
	Depth	1047mm
	Height	1967mm
Mass of main unit (including machine stand)		410kg
Air supply	Pressure	0.35MPa (air source: 0.5-0.9MPa)
	Consumption (Under normal conditions)	50L/min (air source: 100L/min)

Specifications

Item \ Model		Crysta-Plus M574
Measuring range	X axis	500mm
	Y axis	700mm
	Z axis	400mm
Resolution		0.0005mm
Accuracy (20°C) ISO 10360-2 [1], [2]	Measuring error (E)	E= (3.5+4L/1000)µm [3]
	Probing error (R)	4.0µm
Temperature compensation system		Option
Length standard		Linear encoder
Guide method		Air bearing on each axis
Clamping on each axis		One-touch air clamp
Fine feed of each axis		Continuous fine feed over the entire measuring range on each axis
Measuring table	Effective size	764mm×1175mm
	Material	Granite
Workpiece	Maximum height	595mm
	Maximum mass	180kg
Z-axis balancing method		Counterweight (adjustable by 1.5kg)
Machine dimensions	Width	1122mm
	Depth	1434mm
	Height	2267mm
Mass of main unit (including machine stand)		646kg
Air supply	Pressure	0.35MPa (air source: 0.5-0.9MPa)
	Consumption (Under normal conditions)	50L/min (air source: 100L/min)

Specifications

Item \ Model		Crysta-Plus M7106
Measuring range	X axis	700mm
	Y axis	1000mm
	Z axis	600mm
Resolution		0.0005mm
Accuracy (20°C) ISO 10360-2 [1], [2]	Measuring error (E)	E= (4.5+4.5L/1000)µm [3]
	Probing error (R)	5.0µm
Temperature compensation system		Option
Length standard		Linear encoder
Guide method		Air bearing on each axis
Clamping on each axis		One-touch air clamp (mobile clamp switch box)
Fine feed of each axis		Continuous fine/coarse feed over the entire measuring range on each axis
Measuring table	Effective size	900mm×1740mm
	Material	Granite
Workpiece	Maximum height	800mm
	Maximum mass	800kg
Z-axis balancing method		Counterweight (adjustable by 1.7kg)
Machine dimensions	Width	1460mm
	Depth	2017mm
	Height	2840mm
Mass of main unit (including machine stand)		1800kg
Air supply	Pressure	0.4MPa (air source: 0.5-0.9MPa)
	Consumption (Under normal conditions)	50L/min (air source: 100L/min)

Guaranteed Accuracy Temperature Limits

Without OPTIONAL Temperature Compensation System

Range	19 to 21 °C (66.2 to 69.8 °F)

With OPTIONAL Temperature Compensation System

Range	15 to 30 °C (59.0 to 86.0 °F)
Rate of change	2°C (3.6°F) per hour or less, 5°C (9.0°F) in 24 hours or less
Gradient	1°C (1.8°F) or less per meter (both horizontal and vertical direction)

[1]: According to ISO 10360-2 methods
[2]: When using the touch-trigger probe MH20i with Standard Force module and stylus (L10mm)
[3]: L=Measured length (mm)
Note: When 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 on.

Software to Support Your Measurement Tasks
MCOSMOS

GEOPAK
(High Performance 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, freeing users from the need to memorize complex code numbers. It is unnecessary to switch windows for operations, so even novices can promptly select desired functions. Its main features include easier viewing of measuring procedures and results, such as real-time graphic display of measurement results and a function for direct callup of elements from results graphics, which were not previously available.
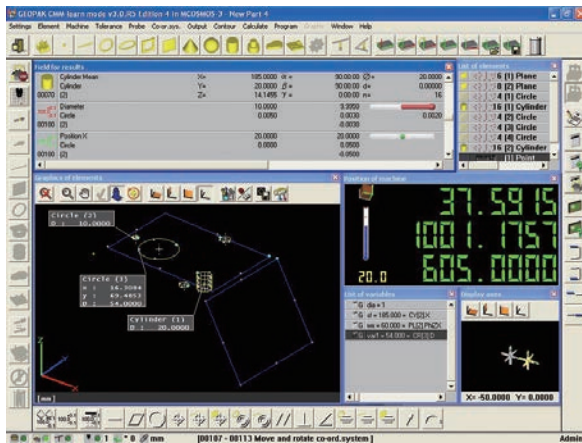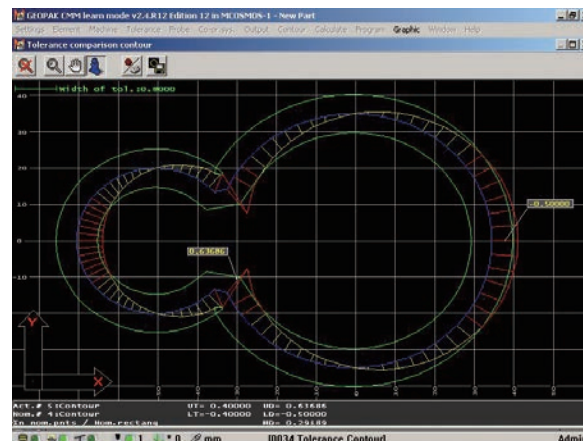
Cutting finished products
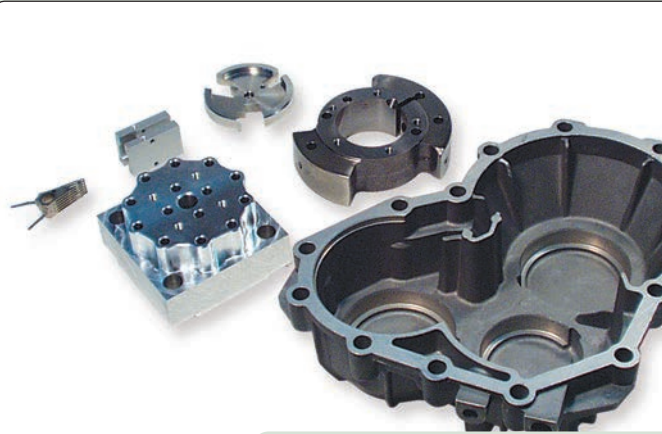
SCANPAK
(Optional Contour Measurement Program)

Measures two-dimensional unfiltered profiles and performs various evaluations. It can evaluate profile measurement data, based on design data, and calculate various elements and inter-elements by specifying a range from the measurement data.
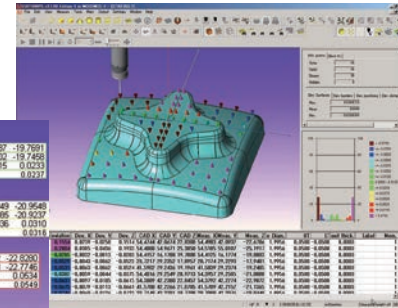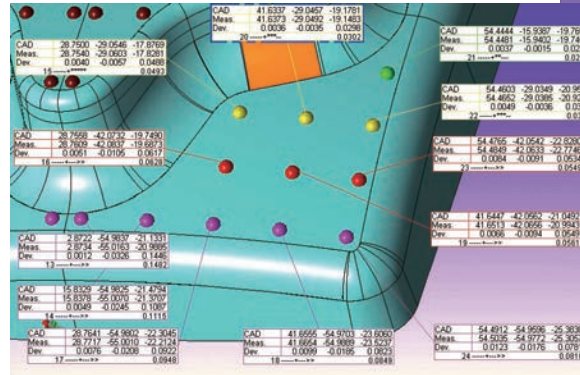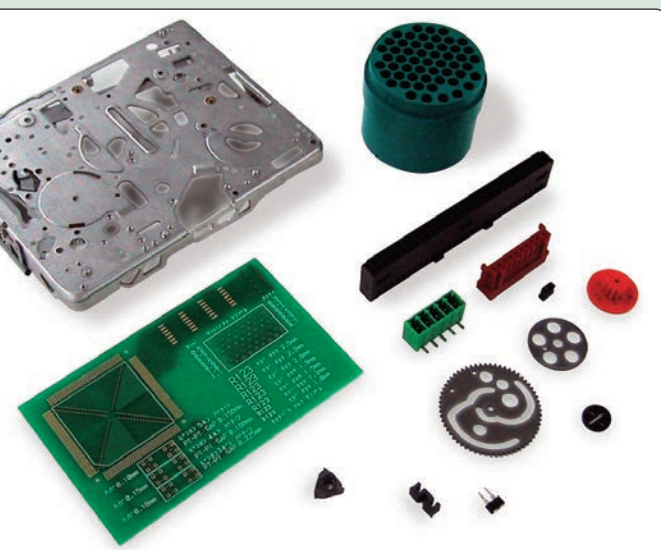
MiCAT
Mitutoyo Intelligent Computer Aided Technology

the standard in world
metrology software
cmm

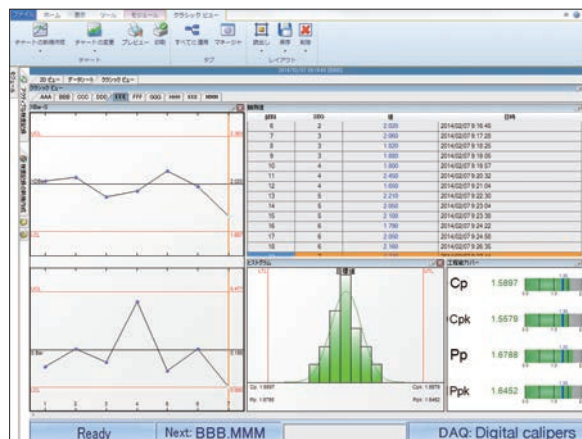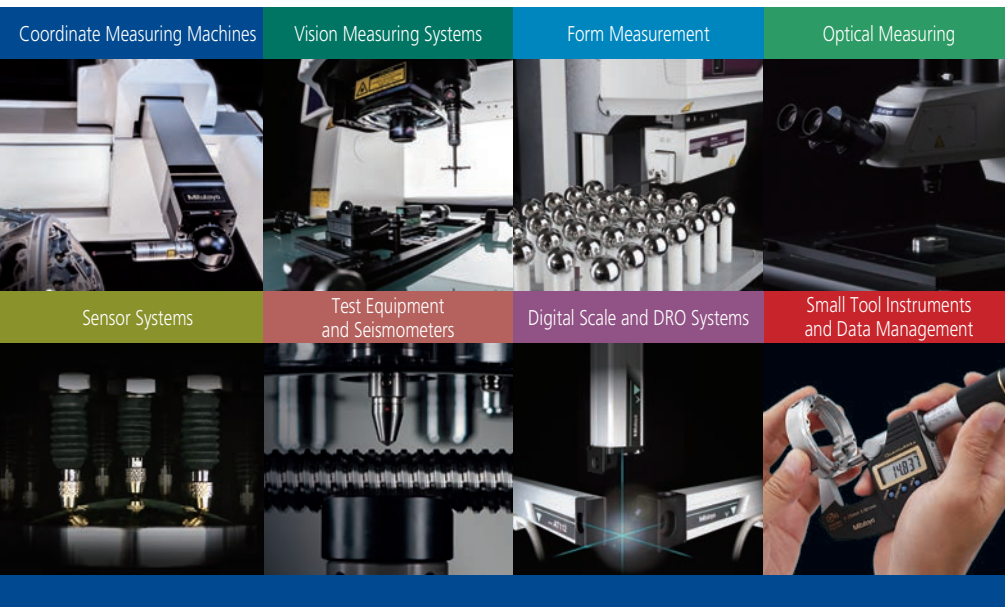**Resin molded or plastic formed products**

CAT1000S
(Optional Free Curved Surface Evaluation Program)

Checks and compares the workpiece with the CAD data and directly outputs the results in the form of CAD data in various formats. It supports SAT/STEP CAD data as standard, and software to directly convert from/to various types of CAD data is available as an option.

MeasurLink
(Optional Statistical Process Control Program)

This program can process various statistical analyses based on the measurement results. A real-time display of a control chart allows earlier detection of potential defects, such as wear or damage to cutting tools. This allows implementation of effective countermeasures, including changes in cutting depth and working conditions. Using this program as a terminal, it is also possible to connect to a higher network environment for integrated control.

Small parts

Coordinate Measuring Machines	Vision Measuring Systems	Form Measurement	Optical Measuring
Sensor Systems	Test Equipment and Seismometers	Digital Scale and DRO Systems	Small Tool Instruments and Data Management

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 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 measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.

Find additional product literature and our product catalog

www.mitutoyo.com

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Mitutoyo

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