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

Temperature Compensation System

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

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.

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.

Probe

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.
Crysta-Plus M

Series M443/M574

- Clamp switch and fine-feed knob on each axis (Continuous fine feed operates over the entire range)
- 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)
- 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.
- Interchangeable probe, probe disable button and white LED illuminator

Accessories

- Clamping kit
- Stylus kit
Crysta-Plus M443

Dimensions (Main Unit)

Dimensions (Measuring Table)

Installation Floor Space

<table>
<thead>
<tr>
<th>Crysta-Plus M443</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass of main unit</td>
<td>360kg</td>
</tr>
<tr>
<td>Mass of machine stand</td>
<td>50kg</td>
</tr>
</tbody>
</table>

*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)

Dimensions (Measuring Table)

Installation Floor Space

<table>
<thead>
<tr>
<th>Crysta-Plus M574</th>
<th>Crysta-Plus M574</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass of main unit</td>
<td>Mass of machine stand</td>
</tr>
<tr>
<td>575kg</td>
<td>71kg</td>
</tr>
</tbody>
</table>

*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)

<table>
<thead>
<tr>
<th>A</th>
<th>2017mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>157mm</td>
</tr>
<tr>
<td>C</td>
<td>1740mm</td>
</tr>
<tr>
<td>D</td>
<td>370mm</td>
</tr>
<tr>
<td>E</td>
<td>1000mm</td>
</tr>
<tr>
<td>F</td>
<td>283mm</td>
</tr>
<tr>
<td>G</td>
<td>1000mm</td>
</tr>
</tbody>
</table>

Mass of main unit (including machine stand) 1800kg

Dimensions (Measuring Table)

Installation Floor Space

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Contact your Mitutoyo representative or the nearest Mitutoyo sales office for details of the system configuration.
# Crysta-Plus M443 / M574 / M7106 Series Specifications

## Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Crysta-Plus M443</th>
<th>Crysta-Plus M574</th>
<th>Crysta-Plus M7106</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measuring range</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X axis</td>
<td>400mm</td>
<td>500mm</td>
<td>700mm</td>
</tr>
<tr>
<td>Y axis</td>
<td>400mm</td>
<td>700mm</td>
<td>1000mm</td>
</tr>
<tr>
<td>Z axis</td>
<td>300mm</td>
<td>400mm</td>
<td>600mm</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.0005mm</td>
<td>0.0005mm</td>
<td>0.0005mm</td>
</tr>
<tr>
<td><strong>Accuracy (20°C)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISO 10360-2 *1, *2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measuring error (E)</td>
<td>(3.0+4L/1000)µm *3</td>
<td>(3.5+4L/1000)µm *3</td>
<td>(4.5+4L/1000)µm *3</td>
</tr>
<tr>
<td>Probing error (R)</td>
<td>4.0µm</td>
<td>4.0µm</td>
<td>5.0µm</td>
</tr>
<tr>
<td><strong>Temperature compensation system</strong></td>
<td>Option</td>
<td>Option</td>
<td>Option</td>
</tr>
<tr>
<td><strong>Guide method</strong></td>
<td>Air bearing on each axis</td>
<td>Air bearing on each axis</td>
<td>Air bearing on each axis</td>
</tr>
<tr>
<td><strong>Clamping on each axis</strong></td>
<td>One-touch air clamp</td>
<td>One-touch air clamp</td>
<td>One-touch air clamp</td>
</tr>
<tr>
<td><strong>Fine feed of each axis</strong></td>
<td>Continuous fine feed over the entire measuring range on each axis</td>
<td>Continuous fine feed over the entire measuring range on each axis</td>
<td>Continuous fine feed over the entire measuring range on each axis</td>
</tr>
<tr>
<td><strong>Measuring table</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective size</td>
<td>624mm×805mm</td>
<td>764mm×1175mm</td>
<td>900mm×1740mm</td>
</tr>
<tr>
<td>Material</td>
<td>Granite</td>
<td>Granite</td>
<td>Granite</td>
</tr>
<tr>
<td><strong>Workpiece</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum height</td>
<td>480mm</td>
<td>595mm</td>
<td>800mm</td>
</tr>
<tr>
<td>Maximum mass</td>
<td>180kg</td>
<td>181kg</td>
<td>800kg</td>
</tr>
<tr>
<td><strong>Z-axis balancing method</strong></td>
<td>Counterweight (adjustable by 1.5kg)</td>
<td>Counterweight (adjustable by 1.5kg)</td>
<td>Counterweight (adjustable by 1.7kg)</td>
</tr>
<tr>
<td><strong>Machine dimensions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>98.1mm</td>
<td>112.2mm</td>
<td>1460mm</td>
</tr>
<tr>
<td>Depth</td>
<td>1047mm</td>
<td>1434mm</td>
<td>2017mm</td>
</tr>
<tr>
<td>Height</td>
<td>967mm</td>
<td>2267mm</td>
<td>2840mm</td>
</tr>
<tr>
<td><strong>Mass of main unit (including machine stand)</strong></td>
<td>410kg</td>
<td>464kg</td>
<td>1800kg</td>
</tr>
<tr>
<td><strong>Air supply</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>0.35MPa (air source: 0.5-0.9MPa)</td>
<td>0.35MPa (air source: 0.5-0.9MPa)</td>
<td>0.4MPa (air source: 0.5-0.9MPa)</td>
</tr>
<tr>
<td>Consumption</td>
<td>50L/min (air source: 100L/min)</td>
<td>50L/min (air source: 100L/min)</td>
<td>50L/min (air source: 100L/min)</td>
</tr>
</tbody>
</table>

## Guaranteed Accuracy Temperature Limits

### Without OPTIONAL Temperature Compensation System

<table>
<thead>
<tr>
<th>Range</th>
<th>19 to 21 °C (66.2 to 69.8 °F)</th>
</tr>
</thead>
</table>

### With OPTIONAL Temperature Compensation System

<table>
<thead>
<tr>
<th>Range</th>
<th>15 to 30 °C (59.0 to 86.0 °F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of change</td>
<td>2°C (3.6°F) per hour or less, 5°C (9.0°F) in 24 hours or less</td>
</tr>
<tr>
<td>Gradient</td>
<td>1°C (1.8°F) or less per meter (both horizontal and vertical direction)</td>
</tr>
</tbody>
</table>

*1: According to ISO 10360-2 methods

*2: When using the touch-trigger probe MH20i with Standard Force module and stylus (L:10mm)

*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.
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.

GEOPAK
(High Performance General-Purpose 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.

SCANPAK
(Optional Contour Measurement Program)
Resin molded or plastic formed products

Small parts

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.
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.

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www.mitutoyo.com

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