This document introduces many of the special specifications for CNC coordinate measuring machines intended to respond to customer measurement needs.
Based on our well-received standard coordinate measuring machine technology, we have developed, designed, and manufactured coordinate measuring machines using various special specifications in response to customer demands in order to increase customer satisfaction.

This catalog introduces concrete examples of some of the coordinate measuring machines built using these specifications, which are intended to provide support and solutions for expanding your business.

Specifications that offer a special size for measuring various long, large workpieces

Specifications including a large rotary table for highly efficient measurement of large cylindrical workpieces

Specifications that offer a special size for highly accurate measurement of various large workpieces

CNC Coordinate Measuring Machines
SPECIAL SPECIFICATIONS INTRODUCTION
Bestseller
Crysta-Apex C Series:
standard large machines
(2005 × 5005 × 1605 mm measuring range)

Specifications that offer a special size for measuring various large workpieces

For the specifications for the Crysta-Apex C standard large measuring machines, see Catalog No. E4275-191.
Large Separate Guide Type
FALCIO Apex 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

<table>
<thead>
<tr>
<th>Model No.</th>
<th>203015G</th>
<th>203020G</th>
<th>204015G</th>
<th>303012G</th>
<th>305015G</th>
<th>305020G</th>
<th>406020G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring error MPE (µm)</td>
<td>[TP200] (4.8+5L/1000)</td>
<td>[SP200] (9+7L/1000)</td>
<td>[SP25M] (7+7L/1000)</td>
<td>[TP200] (4.8+5L/1000)</td>
<td>[TP200] (4.9+5L/1000)</td>
<td>[TP200] (5.5+5L/1000)</td>
<td>[TP200] (9.5+10L/1000)</td>
</tr>
<tr>
<td>L: measuring length (mm)</td>
<td>2005</td>
<td>1505</td>
<td>1205</td>
<td>1505</td>
<td>2005</td>
<td>2005</td>
<td>2005</td>
</tr>
<tr>
<td>Max. workpiece weight (kg)</td>
<td>Depends on the basic specifications</td>
<td>Depends on the basic specifications</td>
<td>Depends on the basic specifications</td>
<td>Depends on the basic specifications</td>
<td>Depends on the basic specifications</td>
<td>Depends on the basic specifications</td>
<td>Depends on the basic specifications</td>
</tr>
</tbody>
</table>
Large Separate Guide Type  
FALCIO Apex 30303G

- Specially sized for measuring large, thin workpieces

- Measurement of a large sheet for an LCD

Main specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>FALCIO Apex 30303G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range (mm)</td>
<td>X: 3005</td>
</tr>
<tr>
<td></td>
<td>Y: 3005</td>
</tr>
<tr>
<td></td>
<td>Z: 305</td>
</tr>
<tr>
<td>*Measuring error MPE (µm)</td>
<td>[TP200]</td>
</tr>
<tr>
<td>L: measuring length (mm)</td>
<td>(5.5+5L/1000)</td>
</tr>
<tr>
<td>Max. workpiece weight (kg)</td>
<td>50 (glass table)</td>
</tr>
</tbody>
</table>

* For the accuracy when using the QVP, the error is 4 µm or less per meter when using the standard lens (× 3 magnification).
Large Separate Guide Type
Crysta-Apex C Series

*Main specifications*

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Crysta-Apex C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>203016G</td>
</tr>
<tr>
<td>X Measuring range (mm)</td>
<td>2005</td>
</tr>
<tr>
<td>Y Measuring range (mm)</td>
<td>3005</td>
</tr>
<tr>
<td>Z Measuring range (mm)</td>
<td>1605</td>
</tr>
<tr>
<td>Measuring error MPE (µm)</td>
<td>TP200 (9+8L/1000)</td>
</tr>
<tr>
<td>L: measuring length (mm)</td>
<td>SP25M (6+8L/1000)</td>
</tr>
<tr>
<td>Max. workpiece weight (kg)</td>
<td>Depends on the basic specifications</td>
</tr>
</tbody>
</table>

*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*
**Large Separate Guide Type**

**Specifications Including a Large Rotary Table**

- Highly efficient measurement of large aircraft engine parts
  (* Synchronized scanning measurement is not supported.)

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### Main specifications and external dimensions of the large rotary table

- Table diameter: 1524 mm
- Maximum loadable weight: 3000 kg
- Accuracy of division: within 6 seconds
- Required air pressure: 0.55 MPa
- Table weight: 1703 kg

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### Main specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Crysta-Apex C203016G</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Includes a rotary table (ø1500mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement Range (mm)</th>
<th>Crysta-Apex C203016G</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>2005</td>
</tr>
<tr>
<td>Y</td>
<td>3005</td>
</tr>
<tr>
<td>Z</td>
<td>1605</td>
</tr>
</tbody>
</table>

*Measuring error MPE (µm): L: measuring length (mm) [TP200] (9+8L/1000)

Max. workpiece weight (kg): 3000 (depends on the rotary table specifications)
Crysta-Apex C700/900 Series
Specially Sized

■ Specially sized for measuring various long (large) workpieces

- Application example: highly accurate evaluation of straightness by using inversion
  By measuring a straightness master in advance and then calculating the straightness error in three-dimensional space, you can perform high accuracy straightness evaluation.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Measuring range (mm)</th>
<th>Measuring error MPE (µm)</th>
<th>Special straightness (µm)</th>
<th>Max. workpiece weight (kg)</th>
<th>Machine weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td></td>
<td></td>
</tr>
<tr>
<td>774</td>
<td>705</td>
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<td>250</td>
<td>800</td>
<td>1700</td>
</tr>
<tr>
<td>7256</td>
<td>705</td>
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<td>250</td>
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<td>7306</td>
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<td>5900</td>
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<tr>
<td>7406</td>
<td>4005</td>
<td>4005</td>
<td>4005</td>
<td>1000</td>
<td>6350</td>
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<tr>
<td>7406ST</td>
<td>4005</td>
<td>4005</td>
<td>4005</td>
<td>1000</td>
<td>6550</td>
</tr>
<tr>
<td>7506</td>
<td>5005</td>
<td>5005</td>
<td>5005</td>
<td>1000</td>
<td>7850</td>
</tr>
<tr>
<td>976</td>
<td>705</td>
<td>705</td>
<td>1000</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td>9104</td>
<td>1005</td>
<td>1005</td>
<td>1000</td>
<td>1200</td>
<td></td>
</tr>
</tbody>
</table>

- For the Crysta-Apex C7406

- By measuring a straightness master in advance and then calculating the straightness error in three-dimensional space, you can perform high accuracy straightness evaluation.
Crysta-Apex C1600/2000 Series
Specially Sized

Special specifications based on the ceiling height and workpiece size for the overall height of the machine frame

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Main specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Crysta-Apex C16208</th>
<th>Crysta-Apex C162012</th>
<th>Crysta-Apex C163014</th>
<th>Crysta-Apex C16528</th>
<th>Crysta-Apex C20408</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range (mm)</td>
<td>X: 1605</td>
<td>1605</td>
<td>1605</td>
<td>1605</td>
<td>2005</td>
</tr>
<tr>
<td></td>
<td>Y: 2005</td>
<td>2005</td>
<td>3005</td>
<td>5205</td>
<td>4005</td>
</tr>
<tr>
<td></td>
<td>Z: 805</td>
<td>1205</td>
<td>1405</td>
<td>805</td>
<td>805</td>
</tr>
<tr>
<td>Measuring error MPE (µm)</td>
<td>Same as standard machine</td>
<td>Same as standard machine</td>
<td>163012</td>
<td>[SP25M] (4+5L/1000)</td>
<td>[TP200] (7+6L/1000)</td>
</tr>
<tr>
<td>L: measuring length (mm)</td>
<td>163012</td>
<td>163012</td>
<td>[TP200] (18+18L/1000)</td>
<td>[SP25M] (4.5+6L/1000)</td>
<td></td>
</tr>
<tr>
<td>Max. workpiece weight (kg)</td>
<td>3500 (same as the standard machine)</td>
<td>3500 (same as the standard machine)</td>
<td>3500 (same as the standard machine)</td>
<td>2000 (same as the standard machine)</td>
<td>5000 (same as the standard machine)</td>
</tr>
</tbody>
</table>
Special specifications for a standard size machine for which the MRT320 rotary table is embedded in the measuring table so the measuring range is not sacrificed

- Special specifications including an embedded MRT320 rotary table and a ø60 mm hole that passes through

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**FALCIO Apex Series**

**Specifications Including an Embedded Rotary Table**

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**Units: mm**

- Offset from the measuring table surface: 0.5
- Cover plate
- MRT320 table surface
- Cable

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Crysta-Apex C Series
Special Type Specifications

Special high accuracy specifications

■ Special specifications that offer higher accuracy than the standard specifications

■ Main special high accuracy specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Special high accuracy Crysta-Apex C 122010</th>
<th>Special high accuracy Crysta-Apex C 123010</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>1205</td>
<td>1205</td>
</tr>
<tr>
<td>Y</td>
<td>2005</td>
<td>3005</td>
</tr>
<tr>
<td>Z</td>
<td>1005</td>
<td>1005</td>
</tr>
<tr>
<td>Measuring error MPE (µm)</td>
<td>(SP25M) (1.9+3L/1000) Standard accuracy: (2.3+3L/1000)</td>
<td>(SP25M) (1.9+3L/1000) Standard accuracy: (2.3+3L/1000)</td>
</tr>
<tr>
<td>L: measuring length (mm)</td>
<td>Same as the standard machine</td>
<td>Same as the standard machine</td>
</tr>
<tr>
<td>Remark</td>
<td>Temperature environment: 18 to 22°C</td>
<td>Temperature environment: 18 to 22°C</td>
</tr>
</tbody>
</table>

Crysta-Apex C122010
For Measuring 5-Ton Workpieces (Vibration Isolator Specifications)

■ For workpieces that are too heavy to measure using a standard machine, we offer a base with increased rigidity that will not become deformed, and therefore less accurate, due to the weight. We also offer a vibration isolator.

- Measurement of the mold for car parts

■ Main specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Crysta-Apex C122010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range (mm)</td>
<td>X: 1205</td>
</tr>
<tr>
<td>Measuring error MPE (µm)</td>
<td>Same as the standard machine</td>
</tr>
<tr>
<td>Max. workpiece weight (kg)</td>
<td>5000</td>
</tr>
<tr>
<td>Machine weight (kg)</td>
<td>7800</td>
</tr>
<tr>
<td>Remark</td>
<td>Vibration isolator specifications Required air pressure for the vibration isolator: 0.45 MPa (Air pressure source: At least 0.55 MPa)</td>
</tr>
</tbody>
</table>

- Standard Crysta-Apex C122010 External Diagram (with a Standard Vibration Isolator)
- Special Crysta-Apex C122010 External Diagram (with a Special Vibration Isolator)
Other Special Specifications

■ Simplified dust-proof rack

■ Anti-earthquake retrofitting

● In the event of an earthquake, this retrofitting prevents slippage between the machine stand and measuring table and prevents the machine stand from moving. The retrofitting also reduces the damage caused by man-made disasters as much as possible.

Target models

| Crysta-Apex C500/700/900/1200 Series |
| Crysta-Plus M700 Series |

*1: If the retrofitting cannot be constructed due to the installation conditions of the coordinate measuring machine main unit or a retrofitting for another model is desired, please contact us for information.

*2: Constructing the retrofitting might be difficult depending on the floor finish. For details, please contact us in advance.

Caution

Because an earthquake is a natural disaster and the effects of such an event cannot be perfectly anticipated, we cannot guarantee that the retrofitting will prevent the machine from tipping over or ensure your safety. Also note that the retrofitting is not intended to maintain the accuracy of a coordinate measuring machine.
Other Special Specifications

- Simplified conveyor: KOMEG

This simplified conveyor accurately positions mass-produced, heavy workpieces on the coordinate measuring machine.
Other Special Specifications

- **Ball screw evaluation system (V-groove rotary scanning measurement system)**
  - This system, which includes a coordinate measuring machine, rotary table, and scanning probe, enables the use of a rotary table for synchronized scanning by contacting two surfaces of a workpiece for scanning (V-groove scanning) in order to measure objects such as the shafts of ball screws.

  - Coordinate measuring machine: LEGEX9106
  - Scanning probe: MPP310Q
  - Rotary table: MRT320

- **Float-type special rotary table: MRT320**
  - This special rotary table slides smoothly while moving to make the operator’s work easier.

  - Sliding mechanism (uses three air bearings)

  - *The specifications for the rotary table accuracy are the same as those for the standard MRT320.*

- **Measurement of a cylindrical cam using the MRT320 rotary table**
  - Calculation of the central contour from two contours
  - The calculated central contour

  - Rotary table: MRT320
  - Cylindrical cam
Special Precision Granite Surface Plate Introduction

Can be used as a structural member of a device

- Suction base for an LCD slit coater
- Suction base for an LCD spin coater
- Suction base for an LCD inspection device
- One-axis air slider stage for an exposure device
- Base for an LCD inspection device
- Various other special machining processes

Special machining examples

One-axis air slider
Cut holes, bushing screw machining

Suction plate
Small grooves, small hole machining

Suction plate
Drilling, T-groove machining, small holes for bushing screws, small-groove machining

Hard disk measuring machine base

Semiconductor inspection device base
Small holes, narrow grooves, T-groove machining

Electrical discharge machine base
T-grooves, bushing screw machining
Gantry Stage Introduction

Stage for highly accurate two-dimensional positioning

Gantry stage
Gantry stage that uses stone structural members for the base and aluminum structural members for the moving parts
- Linear guide specifications
- Coreless linear motor specifications

Applications
- Repair device for an LCD panel
- Inspection device for an LCD panel

Size: 3360 × 4000 mm
Stroke: X-axis: 3030 mm Y-axis: 3030 mm
**Mobile table stage**

Mobile table stage that uses stone structural members
- Air bearing specifications
- Can be used in a clean room

### Applications
- Inspection devices for LCD panels
- Machining lasers for LCD panels

### Specifications
- **Size:** 2000 × 2500 mm
- **Stroke:** X-axis: 1500 mm Y-axis: 600 mm
Large Measuring Machine Assembly Plant

Overview:
- Manufactured models: large coordinate measuring machines, FPD-related equipment
- Environment, manufacturing facilities
  - Assembly environment: 20 °C ± 1 °C
  - Grade slab: 1 m
  - 20-ton cranes: 3
- Number of manufactured units: 100 machines per month

Main facilities
- Air-conditioning: Our delivent fan system suppresses variation in the room temperature as much as possible.
- Lighting: We use highly efficient lights whose brightness is controlled using inverters to conserve energy. Our system suppresses the initial illuminance, gradually increases the supplied power, and maintains a constant illuminance of 650 to 700 lux.
Specifications are subject to change without notice.

Note: All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this pamphlet, as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make changes to the corresponding designs, dimensions and weights. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. Only quotations submitted by ourselves may be regarded as definitive.

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Specifications are subject to change without notice.

Note: These machines in this catalog incorporate a main unit Startup system (relocation detection system), which disable operation when an unexpected vibration is applied or the achine is relo cated. Be sure to contact your nearest Mitutoyo Sales Office prior to relocating this machine after initial installation.