Drastically Enhanced Durability, Sensitivity and Visibility

Lever Type Dial Indicator
Dial Test Indicator

Crystal for readability
- Glare-free flat crystal face allows easy reading of graduations.

Preventing dust and oil from penetrating to the dial face
- The O-ring seal on the bezel has the effect of providing smooth rotation and prevents dust and oil from penetrating through to the dial face.

Bonded bezel and crystal
- Bonding the bezel and crystal together leaves no gap for cutting fluid or oil to penetrate through to the dial face.

Preventing bezel detachment
- A flange prevents the bezel from unintentional removal due to applying a force to the bezel during handling.

Name of parts
- Crystal
- Bezel
- Movement
- Frame
- Contact point (on stylus)
- Cover
- Dovetail
- Flange

Improvement in visibility
- Using universal fonts, changing dial face color and reviewing the relationship between pointer and scale marks have drastically improved visibility.
Our product lineup offers four models, each with a different orientation of the dial on the frame to allow best visibility of the dial face in any specific situation.

- **Horizontal type**: the standard model - the dial is on top of the frame.
- **Vertical type**: the model with the dial on the end of the frame.
- **Horizontal (20° tilted face) type**: the model with the dial on top of the frame but tilted backward at 20°.
- **Parallel type**: the model with the dial on the side of the frame.

**Multi-layer coatings on the crystal**

- Hard, antifouling and non-glare coatings on the crystal inhibit scratches, contamination and glare on the surface.

**Improved stylus bearing**

- The conventional method of mounting the stylus pivot bearing screw in the frame is prone to allowing looseness to develop with prolonged use. A unique sub-plate structure to house this screw has now been incorporated in all models and eliminates this issue.

**Maintaining trackability**

- The ability of the indicator to track small changes in displacement deteriorates due to minute changes in clearance between the gears with prolonged use. Redesigned mounting for the gears enables the new models to maintain good trackability.
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Lever Type Dial Indicator

Dial Test Indicator

Stylus length is marked on the dial face

As the length of the stylus fitted affects the indicator’s scale factor, the length that gives a scale factor of unity is marked on the dial face to assist a customer when ordering the correct replacement stylus.

Attachable limit hands

Limit hands (optional) can be attached to the bezel the same as for dial indicators, allowing easy identification of the upper and lower limits of tolerance.

ø8/ø9.52 stem to fit dovetails is a standard accessory

- A ø8mm (ø0.315 in) plain stem (21CAB104) for the Metric models or a ø9.52mm (ø3/8 in) plain stem (21CAB105) for the Inch models that attaches to any dovetail on the frame is supplied as a standard accessory. Other sizes of stem to fit the dovetails are available as optional accessories:
  - ø4mm (ø0.157 in) stem: 21CAB106
  - ø6mm (ø0.236 in) stem: 21CAB103

Inspection

- The inspection certificate publication system linked to the QR code marked on the dial face allows attachment of an “Inspection Certificate” provided with shipping inspection data. Since the customer’s purchase date will not be identified from the QR code, it cannot be used to obtain a “Calibration Certificate”.

Limit hand

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Limit hand
Ruby ball-tipped stylus added to lineup

- A ruby tip has resistance to wear several times greater than a carbide tip and, since it is nonconductive, it can be used with safety even on an electrical discharge machine.

Extended stylus length for 0.001mm, 0.002mm, and 0.0001 in graduation models

- Longer styli have been introduced on the most sensitive indicators to make probing those features of a workpiece that are difficult to access more user-friendly.

0.001mm graduation models: L2 now 15.2mm, was 11.2mm
0.002mm graduation models: L2 now 11.2mm, was 9.4mm
0.0001 in graduation models: L2 now 0.61 in, was 0.45 in
Horizontal (Standard model)

Provides wide variations of models conforms to the required accuracy, range, and surface of workpieces.

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Contact Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-424-10E</td>
<td>137557</td>
</tr>
<tr>
<td>513-424-10A</td>
<td>137557</td>
</tr>
<tr>
<td>513-424-10T</td>
<td>137557</td>
</tr>
<tr>
<td>513-424-10C</td>
<td>137557</td>
</tr>
<tr>
<td>513-414-10E</td>
<td>131324</td>
</tr>
<tr>
<td>513-414-10T</td>
<td>131324</td>
</tr>
<tr>
<td>513-414-10A</td>
<td>131324</td>
</tr>
<tr>
<td>513-478-10E</td>
<td>21CZA201</td>
</tr>
<tr>
<td>513-474-10E</td>
<td>21CZA210</td>
</tr>
<tr>
<td>513-466-10E</td>
<td>21CZA210</td>
</tr>
<tr>
<td>513-464-10E</td>
<td>21CZA210</td>
</tr>
<tr>
<td>513-464-10A</td>
<td>21CZA210</td>
</tr>
<tr>
<td>513-464-10T</td>
<td>21CZA210</td>
</tr>
<tr>
<td>513-464-10C</td>
<td>21CZA210</td>
</tr>
</tbody>
</table>

Contact Points:
- Contact point No. 137557
- Contact point No. 131324
- Contact point No. 21CZA210
- Contact point No. 103006
- Contact point No. 136013
- Contact point No. 137557
- Contact point No. 136013

Graduations and Ranges:
- Graduation: 0.01mm
- Range: 0.5mm
- Graduation: 0.01mm
- Range: 0.8mm
- Graduation: 0.01mm
- Range: 1.0mm

Specifications:
- Carbide contact point (Slightly magnetic)
- Double scale spacing
- Metric
Horizontal (Standard model)

Inch

513-402-10E/513-402-10T
Contact point No. 133195
Graduation: 0.0005 in
Range: 0.03 in
Standard Carbide contact point (Slightly magnetic)

513-403-10E/513-403-10T
Contact point No. 21CZA214
Graduation: 0.0005 in
Range: 0.03 in
Standard Ruby contact point (non-magnet)

513-462-10E
Contact point No. 133195
Graduation: 0.0005 in
Range: 0.03 in
Compact Carbide contact point (Slightly magnetic)

513-472-10E
Contact point No. 21CZA204
Graduation: 0.0005 in
Range: 0.03 in
Standard Carbide contact point (Slightly magnetic)

513-473-10E
Contact point No. 21CZA204
Graduation: 0.0005 in
Range: 0.03 in
Compact Carbide contact point (Slightly magnetic)

513-412-10E/513-412-10T
Contact point No. 136290
Graduation: 0.0005 in
Range: 0.03 in
Long stylus Carbide contact point (Slightly magnetic)

513-479-10E
Contact point No. 21CZA214
Graduation: 0.0005 in
Range: 0.03 in
Long stylus Ruby contact point (non-magnet)

513-463-10E
Contact point No. 21CZA214
Graduation: 0.0005 in
Range: 0.03 in
Compact Carbide contact point (Slightly magnetic)
### DIMENSIONS

**Vertical**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>S13-401-10E</td>
<td>14.7</td>
<td>11.2</td>
<td></td>
</tr>
<tr>
<td>S13-471-10E</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>S13-405-10E/A/T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S13-415-10E/A</td>
<td>18.7</td>
<td>15.2</td>
<td></td>
</tr>
<tr>
<td>S13-475-10E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S13-404-10E/A/T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S13-474-10E</td>
<td>20.9</td>
<td>17.4</td>
<td></td>
</tr>
<tr>
<td>S13-424-10E/A/T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S13-426-10E/A</td>
<td>22.2</td>
<td>18.7</td>
<td></td>
</tr>
<tr>
<td>S13-478-10E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S13-414-10E/A/T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S13-415-10E/A/T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S13-477-10E</td>
<td>44.5</td>
<td>41.0</td>
<td></td>
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</table>

**Compact**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>L1</th>
<th>L2</th>
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</thead>
<tbody>
<tr>
<td>Compact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S13-465-10E</td>
<td>18.7</td>
<td>15.2</td>
<td></td>
</tr>
<tr>
<td>S13-464-10E</td>
<td>20.9</td>
<td>17.4</td>
<td></td>
</tr>
<tr>
<td>S13-466-10E</td>
<td>22.2</td>
<td>18.7</td>
<td></td>
</tr>
</tbody>
</table>

**Contact Point**

- Contact point No. 103011
  - Carbide contact point (Slightly magnetic)
- Contact point No. 133195
  - Carbide contact point (Slightly magnetic)
## SPECIFICATIONS

### Metric

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Graduation</th>
<th>Range</th>
<th>Measuring range</th>
<th>Hysteresis</th>
<th>Repetability</th>
<th>Mass</th>
<th>Measuring force</th>
<th>High accuracy</th>
<th>With revolution counter</th>
<th>Long stylus</th>
<th>Standard</th>
<th>Compact</th>
<th>Carbide contact point (Slightly magnetic)</th>
<th>Ruby contact point (non-magnet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-424-10E</td>
<td>0.01 mm</td>
<td>0.5 mm</td>
<td>0-25-0</td>
<td>6 µm</td>
<td>4 µm</td>
<td>3 µm</td>
<td>45g</td>
<td>0.3N or less</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>513-478-10E</td>
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<tr>
<td>513-466-10E</td>
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<tr>
<td>513-404-10E</td>
<td>0.8 mm</td>
<td>0.8 mm</td>
<td>0-40-0</td>
<td>9 µm</td>
<td>4 µm</td>
<td>3 µm</td>
<td>45g</td>
<td>0.2N or less</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>513-414-10E</td>
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<td>513-474-10E</td>
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<tr>
<td>513-464-10E</td>
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<tr>
<td>513-415-10E</td>
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<td></td>
</tr>
<tr>
<td>513-426-10E</td>
<td>1.5 mm</td>
<td>1.5 mm</td>
<td>0-25-0</td>
<td>16 µm</td>
<td>0.8 mm</td>
<td>0.5 mm</td>
<td>1.0 mm</td>
<td>0.5 mm</td>
<td>0-25-0</td>
<td>10 µm</td>
<td>5 µm</td>
<td>0-50-0</td>
<td>10 µm</td>
<td>45g</td>
</tr>
<tr>
<td>513-465-10E</td>
<td>-</td>
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</tbody>
</table>

### Inch

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Graduation</th>
<th>Range</th>
<th>Measuring range</th>
<th>Hysteresis</th>
<th>Repetability</th>
<th>Mass</th>
<th>Measuring force</th>
<th>High accuracy</th>
<th>With revolution counter</th>
<th>Long stylus</th>
<th>Standard</th>
<th>Compact</th>
<th>Carbide contact point (Slightly magnetic)</th>
<th>Ruby contact point (non-magnet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-402-10E</td>
<td>0.0005 in</td>
<td>0.0005 in</td>
<td>0.03 in</td>
<td>±0.0005 in</td>
<td>±0.0002 in</td>
<td>±0.0002 in</td>
<td>45g</td>
<td>0.3N or less</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>513-472-10E</td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td>513-476-10E</td>
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</tr>
<tr>
<td>513-462-10E</td>
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<td></td>
</tr>
<tr>
<td>513-432-10T</td>
<td>-</td>
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</tr>
<tr>
<td>513-463-10E</td>
<td>-</td>
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<td></td>
</tr>
</tbody>
</table>

* Stem with ø8 dovetail groove is not included in the mass.
* Be sure to perform calibration with reference gage, etc. after exchanging the contact point. The inside parts may be damaged when the contact point is exchanged due to the breakage.
* In the case of the significant deterioration in the operation, repair is required.
**Parallel** (The scale can be read from the front, with the contact point pivoting in a plane parallel to that of the dial face)

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Order No.</th>
<th>Graduation</th>
<th>Range</th>
<th>Dial reading</th>
<th>Error of indication</th>
<th>Mass</th>
<th>Measuring force</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic set</td>
<td>Plus set</td>
<td>Full set</td>
<td>Measuring range</td>
<td>10 scale divisions</td>
<td>Hysteresis</td>
<td>Repetability</td>
</tr>
<tr>
<td></td>
<td>513-484-10E</td>
<td>513-484-10A</td>
<td>513-484-10T</td>
<td>0.01mm</td>
<td>0.8mm</td>
<td>0-40-0</td>
<td>9µm</td>
</tr>
<tr>
<td></td>
<td>513-485-10E</td>
<td>-</td>
<td>-</td>
<td>0.002mm</td>
<td>0.2mm</td>
<td>0-100-0</td>
<td>4µm</td>
</tr>
<tr>
<td></td>
<td>513-486-10E</td>
<td>-</td>
<td>-</td>
<td>0.01mm</td>
<td>0.5mm</td>
<td>0-25-0</td>
<td>6µm</td>
</tr>
</tbody>
</table>

**Inch**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Graduation</th>
<th>Range</th>
<th>Dial reading</th>
<th>Error of indication</th>
<th>Mass</th>
<th>Measuring force</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-482-10A</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.0005 in</td>
<td>0.03 in</td>
<td>0-15-0</td>
</tr>
</tbody>
</table>

* Stem with ø8 dovetail groove is not included in the mass.
* Be sure to perform calibration with reference gage, etc. after exchanging the contact point. The inside parts may be damaged when the contact point is exchanged due to the breakage.
* In the case the bit of the significant deterioration in the operation, repair is required.

**DIMENSIONS**

* No dovetail in the back. Unit: mm

<table>
<thead>
<tr>
<th>Order No.</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-484-10E</td>
<td>20.9</td>
<td>17.4</td>
</tr>
<tr>
<td>513-485-10E</td>
<td>18.7</td>
<td>15.2</td>
</tr>
<tr>
<td>513-486-10E</td>
<td>22.2</td>
<td>18.7</td>
</tr>
</tbody>
</table>
**Vertical** (Best suited for centering holes under the spindle of a machine tool)

### Metric

- **513-454-10E/513-454-10A/513-454-10T**
  - Contact point No. 103006
  - Graduation: 0.01mm
  - Range: 0.8mm
  - Carbide contact point (Slightly magnetic)

- **513-456-10E**
  - Contact point No. 137557
  - Graduation: 0.01mm
  - Range: 0.5mm
  - Double scale spacing
  - Carbide contact point (Slightly magnetic)

### Inch

- **513-452-10E/513-452-10T**
  - Contact point No. 133195
  - Graduation: 0.0005 in
  - Range: 0.03 in
  - Carbide contact point (Slightly magnetic)

- **513-453-10E/513-453-10T**
  - Contact point No. 21CZB064
  - Graduation: 0.0001 in
  - Range: 0.008 in
  - Carbide contact point (Slightly magnetic)
## SPECIFICATIONS

### Metric

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Graduation Range</th>
<th>Error of Indication</th>
<th>Measuring Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-452-10E</td>
<td>0.01mm</td>
<td>0.0005 in</td>
<td>46g</td>
</tr>
<tr>
<td>513-453-10E</td>
<td>0.002mm</td>
<td>0.0001 in</td>
<td>46g</td>
</tr>
<tr>
<td>513-454-10E</td>
<td>0.01mm</td>
<td>0.01mm</td>
<td>46g</td>
</tr>
<tr>
<td>513-455-10E</td>
<td>0.002mm</td>
<td>0.001 in</td>
<td>46g</td>
</tr>
<tr>
<td>513-456-10E</td>
<td>0.002mm</td>
<td>0.001 in</td>
<td>46g</td>
</tr>
</tbody>
</table>

### Inch

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Graduation Range</th>
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</tr>
</thead>
<tbody>
<tr>
<td>513-452-10E</td>
<td>0.005 in</td>
<td>±0.0005 in</td>
<td>46g</td>
</tr>
<tr>
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<td>0.005 in</td>
<td>±0.0001 in</td>
<td>46g</td>
</tr>
</tbody>
</table>

* Stem with ø8 dovetail groove is not included in the mass.
* Be sure to perform calibration with reference gage, etc. after exchanging the contact point. The inside parts may be damaged when the contact point is exchanged due to the breakage.
* In the case the of the significant deterioration in the operation, repair is required.

## DIMENSIONS

![Dimensions Diagram](attachment:dimensions_diagram.png)

<table>
<thead>
<tr>
<th>Order No.</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-454-10E</td>
<td>20.9</td>
<td>17.4</td>
</tr>
<tr>
<td>513-455-10E</td>
<td>18.7</td>
<td>15.2</td>
</tr>
<tr>
<td>513-456-10E</td>
<td>22.2</td>
<td>18.7</td>
</tr>
</tbody>
</table>
Horizontal (20° Tilted Face) (Dial face inclined 20°, compared with the vertical type, allows easy reading)

**Metric**

- 513-444-10E/513-444-10A/513-444-10T
  - Contact point No. 103006
  - Graduation: 0.01mm
  - Range: 1.6mm
  - With revolution counter
  - Carbide contact point (Slightly magnetic)

  - Contact point No. 103011
  - Graduation: 0.002mm
  - Range: 0.4mm
  - With revolution counter
  - Carbide contact point (Slightly magnetic)

**Inch**

- 513-442-10A/513-442-10T
  - Contact point No. 133195
  - Graduation: 0.0005 in
  - Range: 0.06 in
  - With revolution counter
  - Carbide contact point (Slightly magnetic)

- 513-446-10A/513-446-10T
  - Contact point No. 136290
  - Graduation: 0.0005 in
  - Range: 0.06 in
  - With revolution counter
  - Carbide contact point (Slightly magnetic)

- 513-443-10A/513-443-10T
  - Contact point No. 21CZB064
  - Graduation: 0.0001 in
  - Range: 0.016 in
  - With revolution counter
  - Carbide contact point (Slightly magnetic)
### SPECIFICATIONS

**Metric**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Graduation</th>
<th>Range</th>
<th>Dial reading</th>
<th>Measuring range</th>
<th>Hysteresis</th>
<th>Repetability</th>
<th>Mass</th>
<th>Measuring force</th>
<th>High accuracy</th>
<th>Interchangeable</th>
<th>Long stylus</th>
<th>Standard</th>
<th>Compact</th>
<th>Carbide contact point</th>
<th>Ruby contact point</th>
<th>Includes contact point</th>
<th>Without contact point</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-444-10E</td>
<td>0.01mm</td>
<td>1.6mm</td>
<td>0-60-0</td>
<td>16μm</td>
<td>5μm</td>
<td>5μm</td>
<td>3μm</td>
<td>48g</td>
<td>0.3N or less</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>513-445-10E</td>
<td>0.02mm</td>
<td>0.4mm</td>
<td>0-100-0</td>
<td>6μm</td>
<td>2μm</td>
<td>4μm</td>
<td>1μm</td>
<td>48g</td>
<td>0.3N or less</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Stem with ø8 dovetail groove is not included in the mass.
* Be sure to perform calibration with reference gage, etc. after exchanging the contact point. The inside parts may be damaged when the contact point is exchanged due to the breakage. In the case of significant deterioration in the operation, repair is required.

**Inch**

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<th>Carbide contact point</th>
<th>Ruby contact point</th>
<th>Includes contact point</th>
<th>Without contact point</th>
</tr>
</thead>
<tbody>
<tr>
<td>513-442-10A</td>
<td>0.0005 in</td>
<td>0.06 in</td>
<td>0-15-0</td>
<td>±0.0005 in</td>
<td>±0.0002 in</td>
<td>±0.0002 in</td>
<td>48g</td>
<td>0.3N or less</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>513-442-16A</td>
<td>0.016 in</td>
<td>0-4-0</td>
<td>±0.0002 in</td>
<td>±0.0001 in</td>
<td>±0.00004 in</td>
<td>48g</td>
<td>0.3N or less</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DIMENSIONS

Unit: mm

Refer to Mitutoyo MEASURING INSTRUMENTS CATALOG for the accessories such as styli, stems with dovetail, holding bars, etc.
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.

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

http://www.mitutoyo.co.jp/global.html

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