# Depth Micrometer

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## Safety Precautions

To ensure operator safety, use this product according to the directions, functions and specifications given in this User's Manual. Use under other conditions may compromise safety.

**⚠CAUTION** Shows risks that could result in minor or moderate injury.

Always handle the sharp parts of this product such as measuring faces with care to avoid injury.

**NOTICE** Shows risks that could result in property damage.

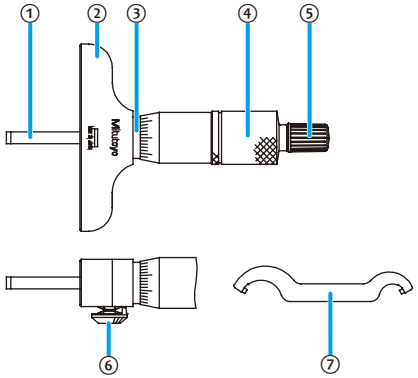
- Do not use this product for purposes other than measurement.
- Do not disassemble or modify. Doing so will void the warranty.
- Do not use or store the product in a place with sudden temperature changes. Adapt the product to ambient temperature before use.
- Do not store the product in a place with high humidity or a lot of dust.
- Do not use the product in a place where it may contact water, etc.
- Apply anti-rust treatment after use if the product is used in a place where it is directly exposed to splashes of coolant, etc. Rust may cause malfunction.
- Do not apply excessive force or subject to sudden impacts such as dropping.
- Remove dust, cutting chips, etc. and apply anti-rust oil after use.
- Remove any dirt on the product by wiping gently with a soft non-linty cloth. Do not use organic solvents such as cleaning agents or thinner.
- Do not write numbers, etc. with an electric pen.

## Contents

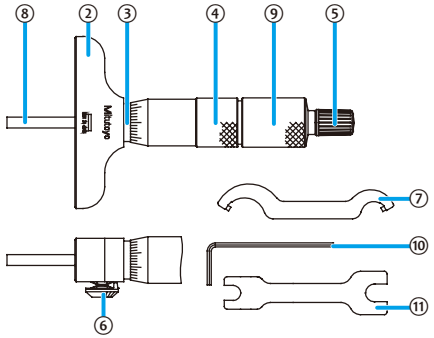


## 1. Names of Components

### ■ 128 Series DMS




### ■ 129 Series DMC

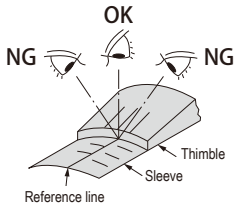



① Spindle
② Base
③ Sleeve
④ Thimble
⑤ Ratchet stop
⑥ Spindle clamp
⑦ Key wrench
⑧ Rod
⑨ Thimble cap
⑩ Hex wrench
⑪ Wrench

## 2. Precautions for Use

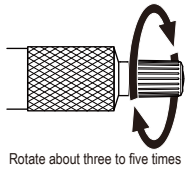
### ■ Parallax

- Because of the structure of the product, the reference line surface on the sleeve and the graduation line surface on the thimble are not on the same plane, so the point where the two lines meet will deviate depending on the position of your eyes. When reading measured values, do so with reference to the figure at right, perpendicular from the point where the reference line on the sleeve is aligned with the graduation line on the thimble.
- If looking from a different direction (as in the figure at right), there will be a parallax of approximately 2 µm.




### ■ Measuring Force

- Use the ratchet stop to ensure consistent measuring force.
- The appropriate measuring force is about three to five turns of the ratchet stop with fingers after the measuring surface lightly contacts the workpiece. Note that excessive measuring force may cause measurement error.



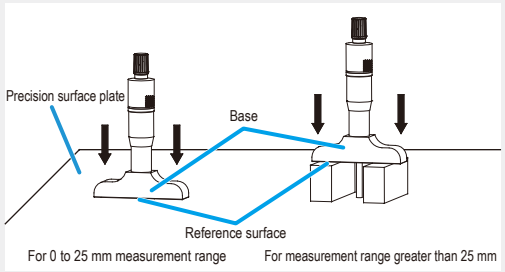

### ■ Precautions and Cleaning after Use

- After use, check each part for damage and clean the entire spindle, rod, and base with a soft lint-free cloth.
- When oil, cutting fluid, or liquid itself is adhered, or when very dirty, clean with a soft lint-free cloth impregnated with a volatile solvent (cleaning alcohol, etc.).
- After use, apply anti-rust treatment to the spindle, rod, and base using Micrometer Oil (Part No. 207000).
- If using in places exposed to water-based cutting fluid, always apply anti-rust treatment after cleaning.
- If Micrometer Oil is unavailable and the only option is a commercial product, we recommend low-viscosity anti-rust oil of ISO VG10 or so.

## 3. Reference Point Setting

### Important

- Be sure to follow the procedure below to confirm and adjust the reference point prior to measuring.
- Reference point setting for this product should be performed on a flat surface such as a precision surface plate.
- When setting the reference point for this product, make sure to use a calibrated gage (gauge block, etc.).
- Remove any dirt or oil from the measuring surfaces of the gages and product prior to setting the reference point.
- Use the same orientation and conditions when measuring and setting the reference point.
- When setting the reference point, press the base firmly against the reference surface as shown in the figure below.




### ■ Reference Point Confirmation

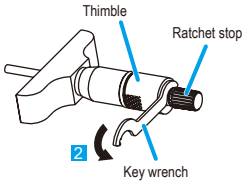
1. Remove any dirt or dust from the measuring surfaces of the gages and the product.
2. Rotate the thimble and bring the measuring surface gently into contact with the precision surface plate.
3. Apply the prescribed measuring force by turning the ratchet stop three to five times.
4. Read the scale, and if the reading does not match the zero point or the gage dimensions, adjust the reference point in accordance with the following procedure.

### ■ Reference Point Adjustment

#### ● 128 Series

- If the reference point difference is ±0.01 mm or less
  1. With the reference point confirmed, fix the spindle with the spindle clamp.
  2. Insert the supplied key wrench into the hole on the rear of the reference line on the sleeve, and then rotate the sleeve until the reference line is aligned with the zero graduation line on the thimble.

- If the reference point difference is approximately ±0.01 mm or more
  1. With the reference point confirmed, fix the spindle with the spindle clamp.
  2. While holding the thimble in place with your fingers to prevent it from turning, insert the supplied key wrench into the hole on the side of the ratchet stop and loosen the ratchet stop.
  3. Rotate the thimble while pushing it toward the ratchet stop and align the thimble's gradations with the sleeve's reference line.
  4. Tighten the ratchet stop with the key wrench while gently pushing the thimble in the direction of the sleeve, being careful not to allow the thimble to rotate.
  5. Loosen the spindle clamp.






Mitutoyo
Mitutoyo Corporation 20-1, Sakado 1-Chome, Takatsu-ku, Kawasaki-shi, Kanagawa 213-8533, Japan
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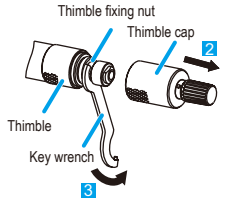
### ● 129 Series

• If the reference point difference is ±0.01 mm or less

1 With the reference point confirmed, fix the rod with the spindle clamp.
2 Insert the supplied key wrench into the hole on the rear of the reference line on the sleeve, and then rotate the sleeve until the reference line is aligned with the zero graduation line on the thimble.

• If the reference point difference is approximately ±0.01 mm or more

1 With the reference point confirmed, fix the rod with the spindle clamp.
2 Remove the thimble cap while holding it in place with your fingers to prevent the thimble from rotating.
3 Insert the supplied key wrench into the hole on the side of the thimble fixing nut and loosen the thimble fixing nut.
4 Rotate the thimble while pushing it toward the ratchet stop and align the thimble's gradations with the sleeve's reference line.
5 Tighten the thimble fixing nut with the key wrench while gently pushing the thimble in the direction of the sleeve, being careful not to allow the thimble to rotate.
6 Mount the thimble cap and loosen the spindle clamp.




• Rod reference point adjustment

#### Important

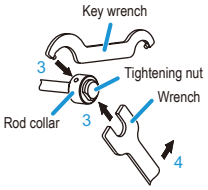
- Dust and other debris adhering to the area where the rod collar contacts the rod end face can cause a reference point error.
- Check the reference point again after temperature conditioning.
- If the rod is held in the hand for a long period of time during adjustment, the rod will expand, making accurate reference point adjustment impossible. Please be careful.
- Be sure to adjust the reference point also when the rod is replaced.
- Set the rod into the body slowly. Setting the rod by dropping it rapidly can cause damage.

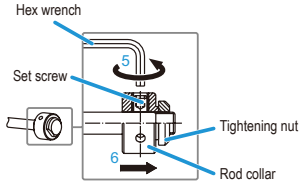
Although the rods are pre-adjusted for the reference point at the time of shipment, determine if the rod's reference point needs to be adjusted after checking the reference point following the procedure below.

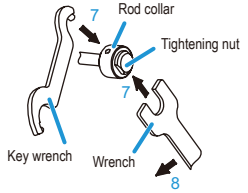
1 Mount the 0 to 25 mm rod and adjust the reference point of the Depth Micrometer body according to the method described in "● If the reference point difference is ±0.01 mm or less" or "● If the reference point difference is approximately ±0.01 mm or more."
2 Replace the rod with one in the measurement range to be used and perform "■ Reference Point Confirmation".
3 If there is a reference point difference, adjust the reference point of the rod in accordance with the following procedure.

• If the reference point difference is positive

1 Hold the thimble steady with your fingers and remove the thimble cap.
2 Pull out the mounted rod.
3 Insert the supplied key wrench into the hole on the side of the rod collar and the supplied wrench into the tightening nut respectively.
4 Loosen the tightening nut about half a turn in the direction of arrow.
5 Loosen the rod collar set screws (x2) with the supplied hex wrench.
6 Move the rod collar to the end face of the tightening nut and lightly tighten the set screw.
7 Insert the supplied key wrench into the hole on the side of the rod collar and the supplied wrench into the tightening nut respectively.
8 Tighten the tightening nut in the direction of arrow.



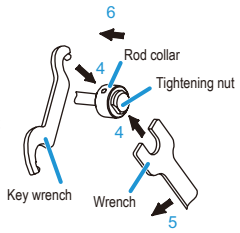




9 Tighten the rod collar set screws (x2) securely.
10 Insert the rod into the body and tighten the thimble cap securely.
11 Check the reference point again, and if further reference point adjustment is required, repeat steps **1 - 10** above.

• If the reference point difference is negative

1 Hold the thimble steady with your fingers and remove the thimble cap.
2 Pull out the mounted rod.
3 Loosen the rod collar set screws (x2) with the supplied hex wrench.
4 Insert the supplied key wrench into the hole on the side of the rod collar and the supplied wrench into the tightening nut respectively.
5 Tighten the tightening nut in the direction of arrow.
» The rod collar moves in the direction of the arrow (Measurement error amount moves).
6 Perform steps **7** to **9** of "• If the reference point difference is positive".
7 Check the reference point again, and if further reference point adjustment is required, repeat steps **1 - 6** above.

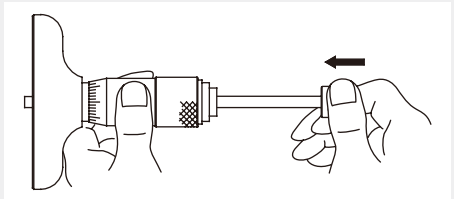



## 4.Changing the Measurement Range

### ■ 129 Series (128 Series Cannot Change the Measurement Range)

#### Important

- Set the rod into the body slowly. Setting the rod by dropping it rapidly can cause damage.
- Insert the rod carefully until it protrudes from the base.

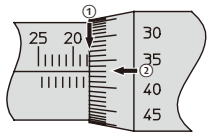


1 Hold the thimble steady with your fingers and remove the thimble cap.
2 Pull out the mounted rod and insert the appropriate rod.
3 Hold the thimble steady with your fingers and mount the thimble cap securely.

## 5.How to Read Graduations

Read the graduations as below.

| | | |
|---|---|---|
| ① Sleeve (outer sleeve) reading | 17.5 | mm |
| ② Thimble reading | 0.37 | mm |
| | 17.87 | mm |




Read the thimble at the location where the sleeve reference line matches the graduation line on the thimble.

This is normally read down to 0.01 mm as shown above,
but as shown in the figure below, it can also read by eye down to 0.001 mm.


## 6.Specifications

| | |
|---|---|
| • Maximum permissible measurement error | : ±3 µm (±0.00015 in) (128 Series) |
| • Graduation | : 0.01 mm (0.001 in) |
| • Operating temperature | : 5 °C to 40 °C |
| • Storage temperature | : -10 °C to 60 °C |

## 7.Paid Maintenance

We recommend periodic inspections to check and maintain the product's accuracy. Also, if any of the following defects occur, please contact the agent where you purchased the product or a Mitutoyo sales office.

• Inconsistent measured values
Burrs or nicks generated by an impact on the measurement surfaces may affect measurement repeatability.



Mitutoyo
Mitutoyo Corporation 20-1, Sakado 1-Chome, Takatsu-ku, Kawasaki-shi, Kanagawa 213-8533, Japan
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