# Indicating Micrometer
# Dial Snap Meter

(en)

## 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 measuring faces and other sharp parts of this product with care to avoid injury.

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

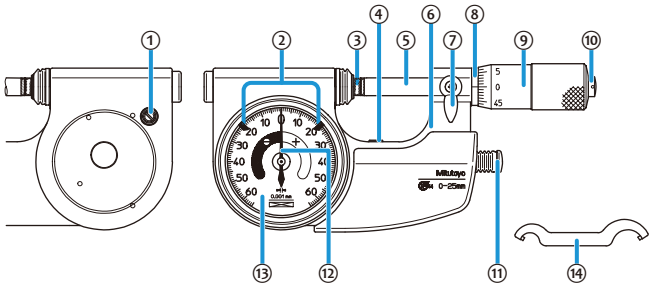
- Do not use this product for purposes other than measurement.
- Do not disassemble or modify. Doing so will void the warranty.
- Do not use or store the product in a place with sudden temperature changes. Adapt the product to ambient temperature before use.
- Do not store the product in a place with 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.
- When mounting on a stand for use, fasten the thick part of the frame. Tightly fastening other locations may negatively affect parallelism or indication stability.
- When the pointer exceeds the dial range, do not move the spindle any further forward. Otherwise, damage to the indicator part may result.

## Contents

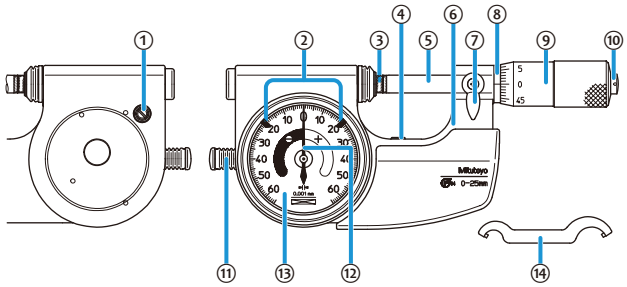


## 1.Names of Components

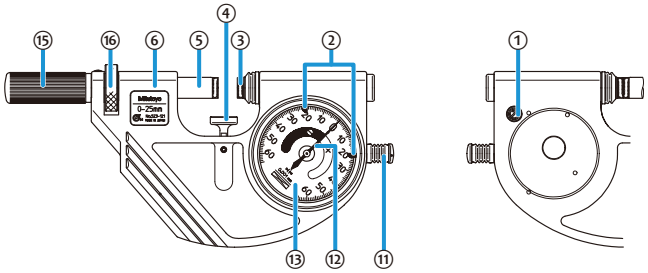
■ **510 Series**
**IDM-25R (right anvil retraction button type)**



**IDM-25RL, IDM-50 to 100R (left anvil retraction button type)**



■ **523 Series**
**PSM-R**

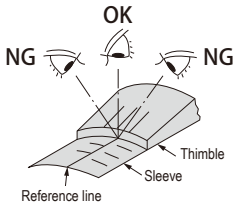


① Zero adjustment screw
② Limit hand
③ Anvil
④ Workpiece stopper
⑤ Spindle
⑥ Frame
⑦ Clamp
⑧ Sleeve
⑨ Thimble
⑩ Set screw
⑪ Anvil retraction button
⑫ Pointer
⑬ Dial
⑭ Wrench
⑮ Spindle clamp handle
⑯ Spindle lead nut

## 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 roughly 2 µm.




### ■ Precautions and Cleaning after Use

- After use, check each part for damage and clean the entire spindle and anvil with a soft cloth that does not produce fibers.
- If oil, cutting fluid, or liquid itself has adhered to the product, or if the product is very dirty, clean it with a soft, lint-free cloth dipped in a volatile solvent (cleaning alcohol, etc.).
- After use, apply anti-rust treatment to the spindle and anvil, 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

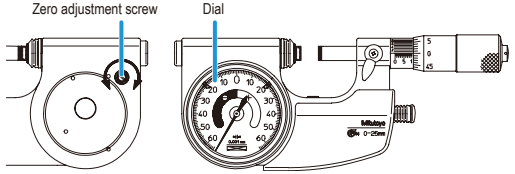
### Important

- Be sure to follow the procedure below to confirm and adjust the reference point prior to measuring.
- When setting the reference point for this product, use a calibrated gage (a gauge block, a micrometer standard bar, or a master gage dedicated for the workpiece).
- Remove any dirt or oil from the measuring surfaces of the gage and product prior to setting the reference point.
- Use the same orientation and conditions when measuring and setting the reference point.
- During reference point setting, move in the spindle forward direction and clamp.
- The dial can only be rotated by about 10 graduations. Do not forcibly turn the zero adjustment screw beyond its limit.

### ■ 510 Series/IDM-R

#### ● Micrometer part reference point setting

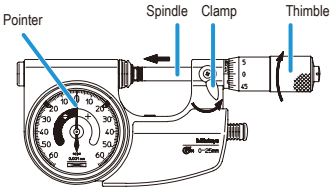
1 Remove any dirt or dust from the measuring surfaces of the gage and the product.
2 Rotate the zero adjustment screw with a flathead screwdriver so that the dial zero position is exactly at the top.




3 Loosen the clamp, rotate the thimble, and adjust the spindle position so that the pointer points to the zero on the dial.

### Tips

When adjusting the spindle position, be sure to move it toward the smaller measurement range (stop the pointer around zero, moving it from negative to positive).




4 If the thimble zero scale is not exactly aligned with the sleeve reference line, tighten the clamp and adjust the reference point with the following procedure.

- If the reference point difference is ±0.01 mm or less
  1 Rotate the sleeve with the wrench to align the thimble zero scale with the sleeve reference line.

- If the reference point difference is ±0.01 mm or more
  1 Loosen the set screw with the wrench, remove the thimble, and align the thimble zero scale with the sleeve reference line.
  2 Tighten the set screw with the wrench and fix the thimble.
  3 If the reference line is slightly off from the zero scale line on the thimble, adjust according to "• If the reference point difference is ±0.01 mm or less".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Mitutoyo
Mitutoyo Corporation 20-1, Sakado 1-Chome, Takatsu-ku, Kawasaki-shi, Kanagawa 213-8533, Japan
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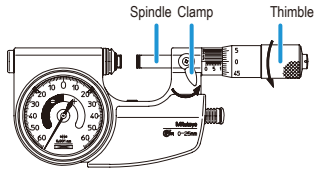
### ● Indicator part reference point setting

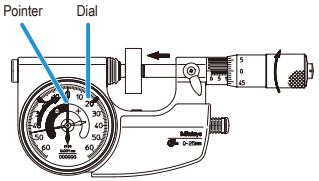
1 Remove any dirt or dust from the measuring surfaces of the gage and the product.
2 Loosen the clamp, rotate the thimble, and move the spindle back until the gage is caught.



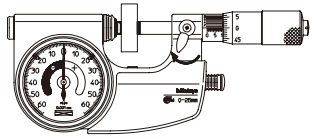

3 Catch the gage between the spindle and the anvil.
4 Rotate the thimble and adjust the spindle position so that the pointer points to the zero on the dial.

**Tips**

When adjusting the spindle position, be sure to move it toward the smaller measurement range (stop the pointer around zero, moving it from negative to positive).



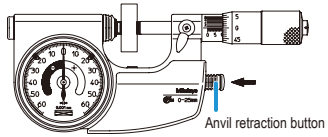

5 Tighten the clamp and fix the spindle.



6 Push and then slowly release the anvil retraction button.
>> The pointer points to the gage indicated value.

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

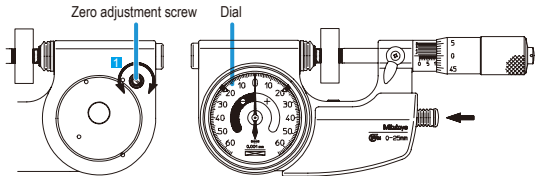
- When pushing the anvil retraction button, support the gage manually to prevent it from falling. Otherwise, the body or gage could be damaged.




7 Rotate the zero adjustment screw with a flathead screwdriver and align the dial position so that the pointer points to the zero on the dial.

**Tips**

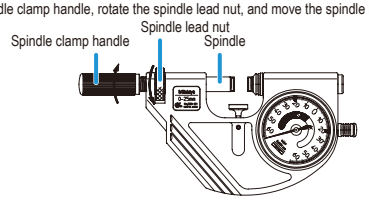
The dial can be rotated by about 10 graduations in each direction.




## ■ 523 Series/PSM-R

### ● Indicator part reference point setting

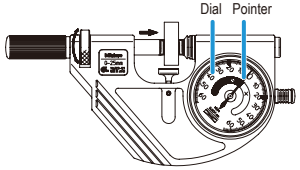
1 Remove any dirt or dust from the measuring surfaces of the gage and the product.
2 Loosen the spindle clamp handle, rotate the spindle lead nut, and move the spindle back until the gage is caught.



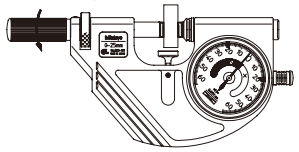

3 Catch the gage between the spindle and the anvil.
4 Rotate the spindle lead nut and adjust the spindle position so that the pointer points to the zero on the dial.

**Tips**

When adjusting the spindle position, be sure to move it toward the smaller measurement range (stop the pointer around zero, moving it from negative to positive).



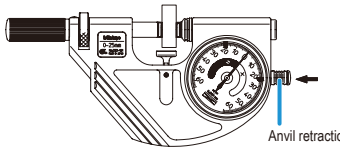

5 Tighten the spindle clamp handle and fix the spindle.



6 Push and then slowly release the anvil retraction button.
>> The pointer points to the gage indicated value.

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

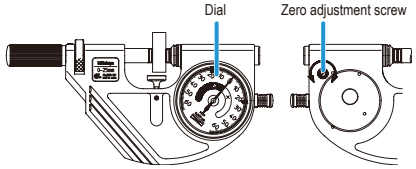
- When pushing the anvil retraction button, support the gage manually to prevent it from falling. Otherwise, the body or gage could be damaged.




7 Rotate the zero adjustment screw with a flathead screwdriver and align the dial position so that the pointer points to the zero on the dial.

**Tips**

The dial can be rotated by about 10 graduations in each direction.

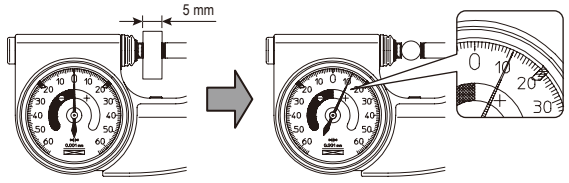



## 4. Measurement Method

Measure with the same orientation and conditions as when setting the reference point.
1 Push and hold the anvil retraction button.
>> The anvil moves backward.
2 Insert the workpiece between the measurement surfaces and slowly release the anvil retraction button.
>> The workpiece is clamped and the pointer points to the measured value.
3 Read the measured value.

**Tips**

For the measured value, read in the difference from the dimensions of the gage used for reference point setting. The figure below indicates reference point setting done with a 5 mm gage. The pointer has moved 11 graduations in the positive direction, so the measured value is the gage dimension of 5 mm plus the pointer reading of 0.011 mm: 5.011 mm.

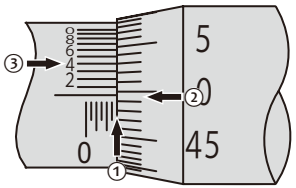



## 5. How to Read Graduations

### ■ 510 Series/IDM-R

Read the graduations as below.

| | | |
|---|---|---|
| ① Sleeve reading | 2.5 | mm |
| ② Thimble reading | 0.49 | mm |
| ③ Vernier and thimble scale reading: | +0.004 | mm |
| Micrometer reading: | 2.994 | mm |




Read the thimble at the location where the sleeve reference line matches the graduation line on the thimble.
Read the vernier at the location where the vernier scale aligns with the thimble scale.

## 6. Specifications

- Indicator indication variation: 0.4 µm [0.00002 in]
- Indicator indication error : 1 µm [0.00005 in]
- Indicator indication range : ±0.06 mm [±0.0023 in]
- Indicator graduation : 0.001 mm [0.00005 in]
- Measuring force : 5 N to 10 N
- Operating temperature : 5 °C to 40 °C
- Storage temperature : -10 °C to 60 °C

## 7. Operating Environment

The protection level of this product is IP54 (by IEC standards). Do not use submerged or directly exposed to water jets, as coolant ingress cannot be completely prevented.

**Tips**

Standard content (protection level IP54)
- Dust-proof (level 5): Dust must not enter in sufficient quantities to interfere with the satisfactory operation of the equipment.
- Splash-proof (level 4): Water splashing against the enclosure from any direction shall have no harmful effect.

## 8. 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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