

Holtest (Two-Point Internal Micrometer) D/E



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 measuring faces of this product with care to avoid injury.

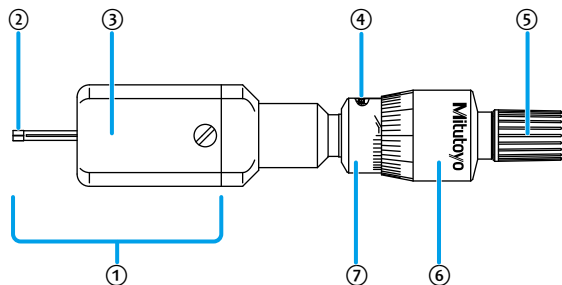
NOTICE Shows risks that could result in property damage.

- 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. Also, before using the product, allow it to acclimate to room temperature.
- 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.
- Do not apply excessive force or subject the product to sudden impacts such as dropping.
- If oil or cutting chips become attached to the sliding portion of the contact points, a malfunction may result. Wipe off any oil or cutting chips after use.
- Use a soft, lint-free cloth to wipe dirt off of the product. Do not use detergents or organic solvents such as thinner.
- Do not write on the product, such as numbers, with an electric pen.
- Do not move or hang this product while the measuring head is set on a workpiece.
- Use the product only with the supplied contact points.
- Do not pull out the contact points. Otherwise damage may result.

Contents

1. Names of Components	Page 1
2. Precautions for Use	Page 1
3. Reference Point Setting	Page 1
4. Measurement Method	Page 2
5. How to Read Graduations	Page 2
6. Specifications	Page 2
7. Paid Maintenance	Page 2

1. Names of Components

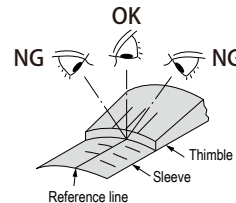


- | | |
|---------------------------|-----------|
| ① Measuring head | ⑤ Ratchet |
| ② Contact point | ⑥ Thimble |
| ③ Main body cover section | ⑦ Sleeve |
| ④ Setting screw | |

2. Precautions for Use

Parallax

- Due to the way this product is constructed, the plane of the reference line on the sleeve is not on the same plane as the graduation line on the thimble, so the point where the two lines meet will be viewed differently depending on the position of your eyes. When reading measured values, do so perpendicular from the point where the reference line on the sleeve meets the graduation line on the thimble (see the figure on the right).
- If you are looking from a different direction (as in the figure on the right), be aware that there will be a parallax of roughly 2 μm.



Measuring Force

- When measuring, use the ratchet to ensure a consistent measuring force.
- To achieve an appropriate measuring force, make light contact between the measurement surfaces and the workpiece, and then turn the ratchet about five to six times with your fingers. Note that excessive measuring force may cause errors.

Precautions and Cleaning after Use

- After use, check that none of the parts are damaged, and clean the entire product, including the sliding part of the contact points, with a soft, lint-free cloth.
- If oil, cutting fluid, or other fluids harden on the product or if dirt is difficult to remove, put some volatile cleaning liquid (such as cleaning alcohol) on a soft, lint-free cloth, and use that to clean the product.
- After use, apply some Micrometer Oil (Part No. 207000) to prevent rust from forming on the contact points.
- If the product is used in places exposed to water-based cutting fluid, always apply anti-rust treatment after cleaning.
- If Micrometer Oil is not available and you must use a commercially available product, we recommend using an anti-rust agent with low viscosity.

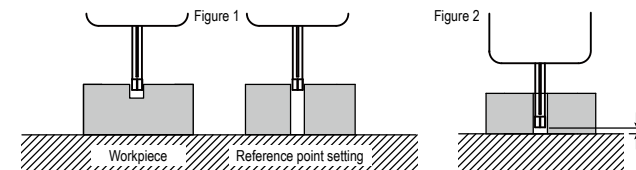
3. Reference Point Setting

IMPORTANT

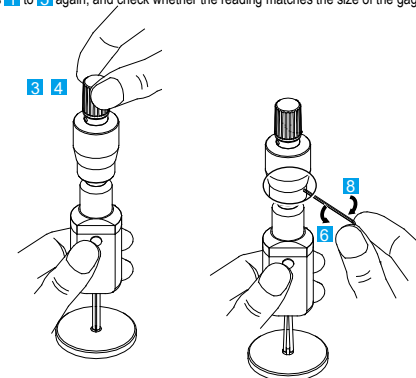
- When measuring, be sure to follow the procedure in steps 1 to 9 below to confirm and set the reference point.
- When setting the reference point for this product, make sure to use a calibrated gage (setting ring, etc.).
- Remove any dirt or oil from the measurement surfaces of the gage and product prior to setting the reference point.
- Due to the product mechanism, the measured value will differ depending on whether the entire surface of the contact points or only their edges are used for measurement. Use the same conditions as when measuring to set the reference point.
- Use the same orientation and conditions as when measuring to set the reference point. (See Figure 1 if you are using the edges of the contact points to measure a blind hole.)

Tips

Do not let the bottom of the measuring head touch anything when setting the reference point or measuring (Figure 2). If the bottom touches anything when you are measuring a workpiece, the inclination of the surface that the bottom touches could cause the contact points not to touch parallel to the workpiece, which can lead to measurement errors.



- 1 Remove any dirt or dust from the measurement surfaces of the calibration gage and the product.
- 2 Set a measuring length slightly less than the size of the gage by rotating the thimble of the product, and then slowly insert the product into the gage.
- 3 Bring the contact points gently into contact with the inside of the gage by rotating the thimble with the ratchet.
- 4 Apply the proper measuring force by rotating the ratchet five to six times.
- 5 Read the measured value, and if the reading matches the size of the gage, then the reference point setting is complete. If the reading is different, perform the work in steps 6 to 9 again. (Repeat until the reference point setting is complete.)
- 6 Loosen the setting screw with the supplied hex wrench.
- 7 Align the reference line on the sleeve with the proper indicated value by slightly rotating the sleeve.
- 8 Fix the sleeve by tightening the setting screw with the supplied hex wrench.
- 9 Perform steps 1 to 5 again, and check whether the reading matches the size of the gage.



IMPORTANT

Do not move the product after it has been inserted until the reference point setting is complete.

4. Measurement Method

IMPORTANT To obtain accurate measurements, be sure to perform reference point setting before measurement.

When measuring, insert the product into the workpiece with the same orientation and procedure used during the reference point setting, and then read the measured value.

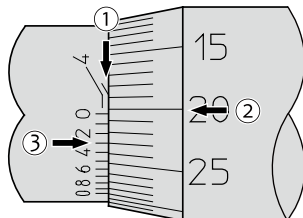
5. How to Read Graduations

■ Vernier Scale

For the vernier scale, vernier graduation lines are above the reference line on the sleeve.

Read the graduations as follows.

① Sleeve reading	3.5 mm
② Thimble reading	0.20 mm
③ Vernier reading	0.003 mm
<hr/>	
	3.703 mm



For "0.20 mm" in ②, read the location where the reference line on the sleeve meets the graduation line on the thimble.

For "0.003 mm" in ③, read the location where the vernier graduation line meets the graduation line on the thimble.

6. Specifications

Maximum permissible error J_{MPE}^{*1} :	$\pm 2 \mu\text{m}$ (maximum difference $2 \mu\text{m}$) $\pm 0.0001 \text{ in}$ (maximum difference 0.0001 in)
• Graduation:	0.001 mm 0.0001 in
• Operating temperature:	5 °C to 40 °C
• Storage temperature:	-10 °C to 60 °C
• Standard accessories:	

	Single item	Set
Hex wrench	✓	✓
Setting ring	-	✓

*1: Maximum permissible error for indicated value via contact with full measuring face J_{MPE} (20 °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 representative.

- The operation of the contact points is poor and the thimble rotation is sluggish.
Operation will worsen if there is oil or rust on the sliding portion of the contact points.