

Coolant-proof Extension Rod Type Inside Micrometer IMZ-MJ



Coolant-proof Extension Pipe Type Inside Micrometer IMJ-MJ

Safety Precautions

To ensure operator safety, use this product in conformance with the directions, functions and specifications given in this User's Manual.

Use under other conditions may compromise safety.

WARNING Shows risks that could result in death or serious injury.

- Always keep batteries out of reach of children, and if swallowed, consult a physician immediately.
- Batteries should never be short-circuited, disassembled, deformed or come in contact with extreme heat or flames.
- If battery alkaline liquid comes in contact with the eyes, flush eyes immediately with clean water and consult a physician. If battery alkaline liquid comes in contact with the skin, flush the exposed area thoroughly with clean water.

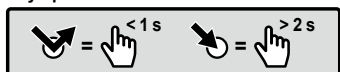
CAUTION Shows risks that could result in minor or moderate injury.

Never attempt to charge the primary battery or reverse the positive-negative terminals when mounting. Improper battery handling or mounting may cause the battery to explode, cause battery leakage and/or serious bodily injury or malfunctioning.

NOTICE Shows risks that could result in property damage.

- Do not disassemble or modify.
- 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.
- Firmly close the battery compartment cover if the product is used in a place where it is directly exposed to splashes of coolant, etc. When mounting the output cable and cover, firmly tighten the fixing screws so that there is no gap. As well, clean and apply anti-rust treatment after use. Rust may cause malfunction.
- Do not use submerged, as coolant ingress cannot be completely prevented. Complete prevention of coolant ingress, etc., may also not be possible if the product is used in locations exposed to direct jets of liquid.
- Do not apply excessive force or subject to sudden impacts such as dropping.
- When cleaning, wipe this product with a soft cloth moistened with diluted neutral detergent. Do not use an organic solvent such as thinner, which may cause the product to deform or malfunction.
- Do not write numbers, etc. with an electric pen.
- If the product is to be out of use for three months or more, remove the battery before storage. Liquid leakage from the battery may damage the product.
- Do not pry out or suspend the product while it is inserted inside the workpiece.

Key operation icon

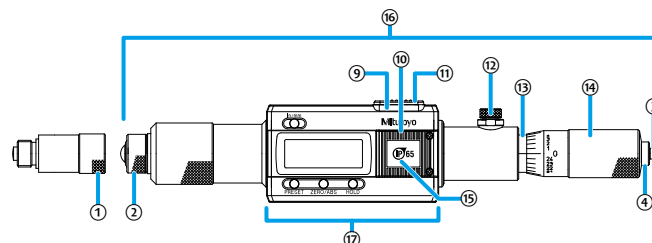


Contents

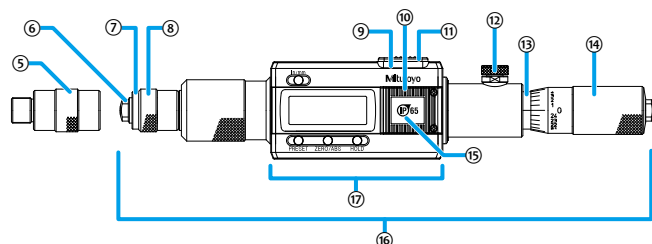
| | |
|---|--------|
| 1. Names of Components | Page 1 |
| 2. Installing the Battery | Page 1 |
| 3. Precautions for Use | Page 2 |
| 4. Reference Point Setting | Page 2 |
| 5. Measurement Method | Page 3 |
| 6. Key Functions | Page 3 |
| 7. Function Lock Function (Preventing Accidental Operation) | Page 3 |
| 8. Errors and Troubleshooting | Page 3 |
| 9. Mounting/Removing Rods (Pipes) | Page 3 |
| 10. Specifications | Page 3 |
| 11. Output Function | Page 3 |
| 12. Options | Page 4 |
| 13. Off-Site Repairs (Subject to Charge) | Page 4 |

1. Names of Components

Extension Rod Type Inside Micrometer (IMZ-MJ)



Extension Pipe Type Inside Micrometer (IMJ-MJ)



For Extension Rod Type Inside Micrometer (IMZ-MJ)

- 1 Extension rod
- 2 Cap
- 3 Adjustment anvil
- 4 Adjustment nut

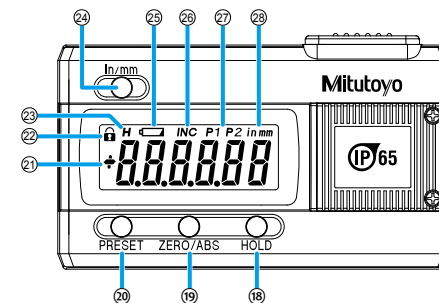
For Extension Pipe Type Inside Micrometer (IMJ-MJ)

- 5 Extension pipe
- 6 Adjustment anvil
- 7 Adjustment nut
- 8 Adjustment rod

Common

- 9 Output connector
- 10 Battery compartment cover
- 11 Cover
- 12 Swivel clamp
- 13 Sleeve
- 14 Thimble
- 15 Waterproof mark
- 16 LCD body
- 17 Display unit

Display Unit (LCD)



- | | |
|--------------------------|--------------------------------------|
| 18 [HOLD] key | 24 [in/mm] key (in/mm products only) |
| 19 [ZERO/ABS] key | 25 Low voltage display |
| 20 [PRESET] key | 26 INC display |
| 21 Sign display | 27 Preset display |
| 22 Function Lock display | 28 Unit display |
| 23 Hold display | |

2. Installing the Battery

NOTICE Shows risks that could result in property damage.

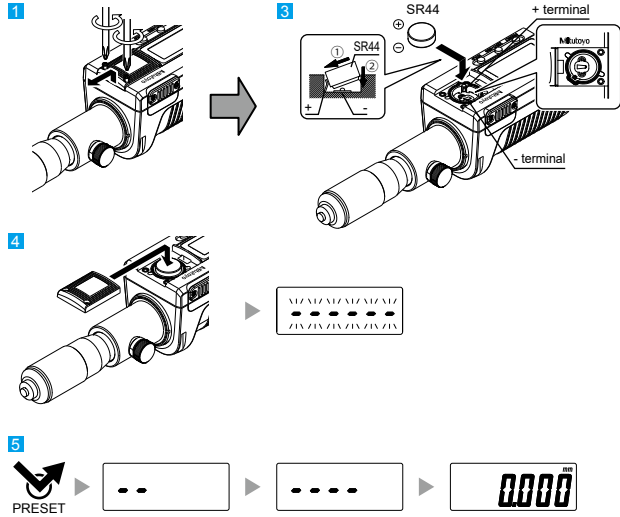
When attaching the battery compartment cover, be sure to attach the gasket properly. The product may display an error or malfunction if the battery compartment cover or gasket is not mounted correctly.

Tips

- Be sure to use SR44 (silver oxide button battery part No. 938882) for the battery.
- Do not rotate the thimble until the count is displayed. Initial setting of the electrical components may fail, or the product may not count normally. If you mistakenly move the thimble, reinstall the battery.
- The battery supplied is for confirming the functions and performance of the product. Note that this battery may not fulfill the predetermined life.
- Malfunction or damage due to depleted batteries, etc. is not covered by the warranty.
- Follow local rules and regulations regarding battery disposal.

The battery is not installed into the product at purchase. Install the battery as follows.

- 1 Use the supplied Phillips screwdriver (No.05CAA952) to loosen and remove the battery compartment cover fixing screws (M1.7 x 0.35 x 4/No.04AAB541).
- 2 If replacing an existing battery, remove the old battery.
- 3 Insert the battery (SR44) with the positive side facing upward.
Confirm that the gasket (No.05SAA372) is installed correctly in the proper position.
- 4 Place the battery compartment cover over the battery compartment and hold down the edge by hand while making sure there is no gap between the cover and body, and then tighten it using the screws.
 - > The "-----" display blinks.
- 5 Press the [PRESET] key.
 - > Count display appears and counting starts.



Tips

- Re-installing the battery will erase the PRESET value (reference point) position. Perform reference point setting again (refer to "4. Reference Point Setting").
- If an abnormal display is shown, such as an error display or not counting, etc., try removing the battery and reinstalling.

3. Precautions for Use

■ Precautions for Measurement

- This product, which is not equipped with a constant pressure device, is configured with heavier operation than normal outside micrometers. The interior hydraulic oil will increase in viscosity if used in low temperatures or left unused for a long time, and operation may feel heavier. In this case, operate the thimble at full stroke several times to recover normal operation.
- Use caution when measuring magnetized workpieces. If the product becomes magnetized, measurement results may be affected.

■ Precautions after Use

- After use, clean the entire product and check that none of the parts are damaged.
- If using in places exposed to water-based cutting fluid, always apply anti-rust treatment after cleaning.
- If the product is to be out of use for three months or more, remove the battery before storage.

4. Reference Point Setting

Set an arbitrary preset value (reference point registration) prior to setting the reference point (reference point setting).



- Be sure to follow the procedure below to confirm and set the reference point prior to measuring.
- 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 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.
- The preset value is within 999.999 mm (for metric products). To measure over 1000 mm, adjust the preset switch so that 1000 mm is 0 mm.

1) Reference point registration

Register (preset) the gage dimensions to the product. Two preset values (P1 and P2) can be registered to the product.

Tips

Press and hold the [HOLD] key to switch between P1 and P2.

<Example> Registering 200.000 mm to P1

- 1 Briefly press the [PRESET] key.
 - > The previously registered number is displayed and [P1] blinks.

Tips

- Zero will be displayed immediately after replacing the battery.
- If [P2] is blinking, press and hold the [HOLD] key to cause [P1] to blink.

- 2 Press and hold the [PRESET] key.
 - > The sign blinks.

Tips

Briefly press the [PRESET] key to switch between [+] and [-].

- 3 Press and hold the [PRESET] key.
 - > The number on the left blinks.

Tips

The numbers will switch in order from [0] to [1] to [2] up to [9] and then [0] each time the [PRESET] key is briefly pressed.

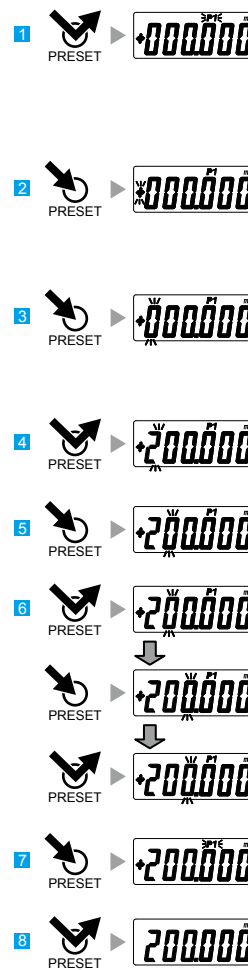
- 4 Briefly press the [PRESET] key until [2] is displayed.

- 5 Press and hold the [PRESET] key.
 - > The number in the next digit blinks.

- 6 Repeat steps 4 and 5, so that [0] and [0] are displayed for each digit.

- 7 Press and hold the [PRESET] key until [P1] blinks.

- 8 Briefly press the [PRESET] key.
 - > [P1] goes out and registration is complete.



Tips

- To stop reference point registration, press the [ZERO/ABS] key to return to the original display value.
- The display will not change during registration, even if the thimble is rotated.

2) Reference point setting

- 1 Remove any dirt or dust from the measuring surfaces of the gage and the product.
- 2 Set the dimension of the product slightly smaller than that of the gage, and then slowly insert it into the gage.
- 3 Rotate the thimble and bring the measuring surface gently into contact with the gage.
- 4 Move it in the direction of the arrow in Figure 1 within a cross-section perpendicular to the axis to determine the highest point (refer to Figure 1).
- 5 Move it in the direction of the arrow in Figure 2 with regard to the axis to determine the lowest point (refer to Figure 2).
- 6 Briefly press the [PRESET] key.
 - > [P1] or [P2] blinks, and the registered preset value (zero if not registered) is displayed.

Tips

- Press and hold the [HOLD] key to switch between P1 and P2.
- To change the preset value, refer to steps 2 through 6 in "1) Reference point registration".

- 7 Briefly press the [PRESET] key.
 - > [P1] or [P2] goes out.

To use thimble graduations as well, set using the procedure below.

- 8 Perform steps 1 through 4, and then use a hex wrench to loosen the setting screw.
- 9 Slightly rotate the sleeve and align it with the proper display value.
- 10 Use the hex wrench to tighten the setting screw and fix the sleeve.
- 11 Perform steps 1 through 5, and confirm that the proper number is displayed.

If the proper number is displayed, setting is complete. If it is not displayed, repeat steps 8 through 10.

Tips

- The display of this product automatically turns off if not used for 20 minutes or more. To display again, either rotate the thimble or press the [ZERO/ABS] key.
- If the [PRESET] key is accidentally pressed during measurement, press the [ZERO/ABS] key to return to the former state. If this does not enable the product to recover, perform the reference point setting procedure once more.
- Once the product has been inserted, do not move it until the reference point has been set.

Key operation icon

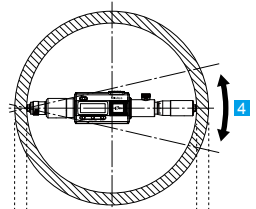
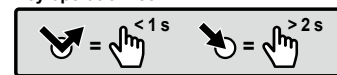


Figure 1. Top view

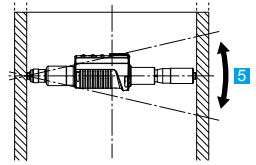
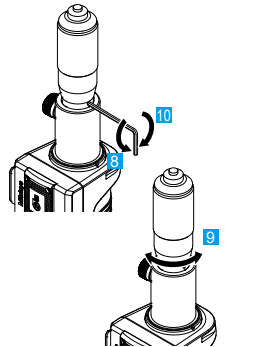


Figure 2. Side view



5. Measurement Method



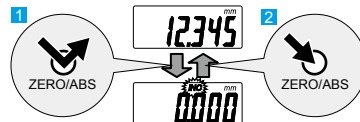
Be sure to perform reference point setting before measurement.

- 1 Insert the product into the workpiece, and then retract the thimble until it makes contact with the measurement location.
- 2 Using the same orientation and conditions as for reference point setting, move the product left and right within a cross-section perpendicular to the axis to determine the highest point, while at the same time moving it forward and back versus the axis to determine the lowest point. Then make contact with the workpiece and read the display value (refer to Figures 1 and 2 in "2) Reference point setting" in "4. Reference Point Setting").

6. Key Functions

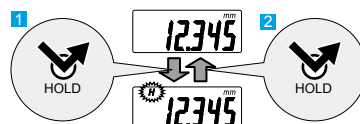
■ [ZERO/ABS] Key

- 1 Briefly press the [ZERO/ABS] key.
 - » [INC] is displayed, and the display is set to zero.
- 2 Press and hold the [ZERO/ABS] key (for at least 2 seconds).
 - » [INC] goes out, and the length from the reference point (anvil measuring surface) is displayed.



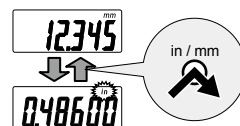
■ [HOLD] Key

- 1 Press the [HOLD] key.
 - » [H] is displayed, and the display value is held.
- 2 Press the key again to release the value.



■ [in/mm] Key (in/mm products only)

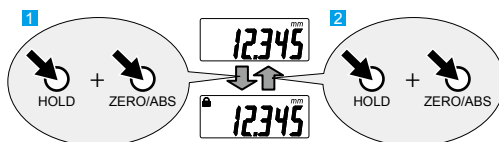
- Press the [in/mm] key.
 - » [in] and [mm] switch back and forth each time the key is pressed.



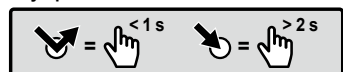
7. Function Lock Function (Preventing Accidental Operation)

This product has the Function Lock function, which disables the PRESET function and ZERO/ABS function in order to avoid accidental changes to the reference point position. Setting the Function Lock causes [L] on the LCD to light up and disables the [PRESET] key, [ZERO/ABS] key, and [in/mm] key (in/mm products only), with only the hold operation function enabled.

- 1 First press and hold the [HOLD] key, and then additionally press and hold the [ZERO/ABS] key (for at least 2 seconds).
 - » [H] display and [L] display light up in sequence ([H] turns off first).
- 2 Perform the same operation to release the Function Lock.



Key operation icon



8. Errors and Troubleshooting

| Error Display | Causes and Countermeasures |
|------------------------|--|
| Power Voltage Drop | The battery voltage is low. Replace the battery promptly. |
| Counting Error | A counting error has occurred due to excessive speed or noise. Try removing the battery and reinstalling. |
| Counting Error | Initial setting of the electrical components failed, or a counting error has occurred due to a sensor signal error. Try removing the battery and reinstalling. |
| Display Overflow | The display value exceeds ± 999.999 . Rotate the thimble in the opposite direction so that it starts counting again correctly. |

9. Mounting/Removing Rods (Pipes)

Attach extension rods (or pipes) to measure the workpiece, according to the length of the workpiece. Attach extension rods to the Extension Rod Type Inside Micrometer (IMZ-MJ), or extension pipes to the Extension Pipe Type Inside Micrometer (IMJ-MJ).

NOTICE Shows risks that could result in property damage.

When mounting or removing extension rods (pipes), do not grasp the display unit. Otherwise, damage may result.



Be sure to perform reference point setting after mounting or removing rods (pipes).

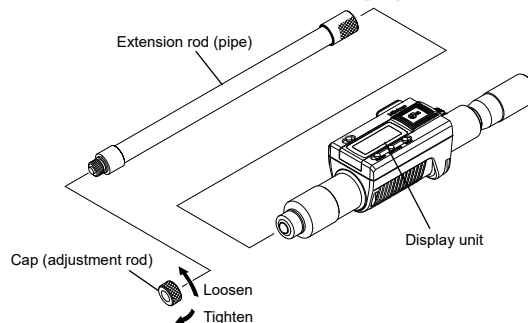
Use the following procedure to install or remove rods (pipes).

■ For Extension Rod Type Inside Micrometer (IMZ-MJ)

- 1 Wipe clean all extension rods to be mounted as well as the connection area on the body, to remove any debris or dust.
- 2 Loosen and remove the cap by hand.
- 3 Mount the extension rod by manually screwing it into the place where the cap was.
- 4 Mount the cap by screwing it onto the end of the extension rod.

■ For Extension Pipe Type Inside Micrometer (IMJ-MJ)

Use the same procedure as for IMZ-MJ. However, IMJ-MJ uses an adjustment rod instead of a cap. Use the same procedure to remove the extension rod (pipe).



10. Specifications

- Spindle feed error (20 °C) : 3 μ m
0.00015 in (in/mm products only)
- Resolution : 0.001 mm
0.00005 in (in/mm products only)
- Display unit : LCD (6-digit and minus sign)
- Power supply : Button type silver-oxide battery (SR44 No.938882), x1
- Battery life : 1.2 years
- Operating temperature : 5 °C to 40 °C
- Storage temperature : -10 °C to 60 °C
- Standard accessories : Wrench, Phillips screwdriver (No. 05CAA952)
- IP protection level : IP65 (refer to IEC60529 for details).
Dust resistance (level 6) : No ingress of dust allowed.
Protection against water jets (level 5) : Water projected by a nozzle from any direction shall have no harmful effects.
- CE marking/UKCA marking : EMC Directive/Electromagnetic Compatibility Regulations: EN 61326-1
Immunity test requirement : Annex A Table A.1
Emission limit : Class B
: RoHS Directive/The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations: EN IEC 63000

11. Output Function

■ Display Value External Output

The display value can be output to a device by connecting the product and the external device with a connection cable (option).

■ Connection Cable Installation Method

NOTICE Shows risks that could result in property damage.

- Always use the 0-size Phillips screwdriver (No.05CZA619) supplied with the connection cable (option) when installing/removing screws, and tighten with a torque of 5 to 8 cN·m or so. Otherwise, it may cause damage.
- When connecting the connection cable, ensure that the connector gasket does not protrude. If the connector gasket is not installed properly, waterproof functionality may decrease and lead to malfunctions.
- When connecting the connection cable, pay attention to the connector direction. Otherwise, damage may result.

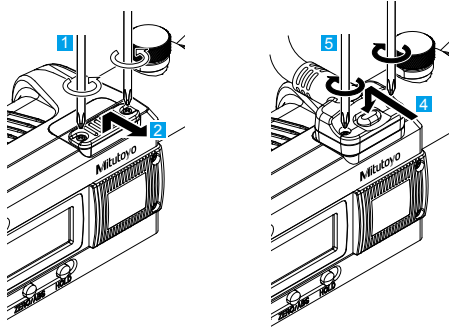
Tips

Note that using this product in a location with high noise may cause malfunctions (flickering or errors).

- 1 Use the Phillips screwdriver supplied with the connection cable to remove the cover fixing screws (M1.7 x 0.35 x 2.5, No.04AAB543).
- 2 Remove the cover.
- 3 Check that the connector gasket (No.09GAA374) is correctly installed at the proper position (do not remove the connector gasket).
- 4 Mount the connection cable plug.
- 5 While holding in the connection cable plug by hand, tighten the fixing screws.

Tips

- Ensure that there is no gap between the connection cable plug and the body connector.
- The display value hold (refer to "■ [HOLD] Key" in "6. Key Functions") will be released if output to an external device.



12. Options

- Connection cable (1 m): No.05CZA662
 - Connection cable (2 m): No.05CZA663
- For options other than the above, refer to the General Catalog.

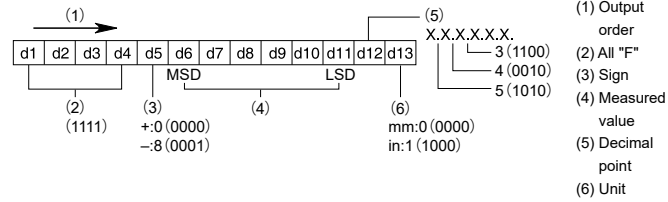
13. Off-Site Repairs (Subject to Charge)

Off-site repair (subject to charge) is required in the case of the following malfunctions. Please contact the agent where you purchased the product or a Mitutoyo sales representative.

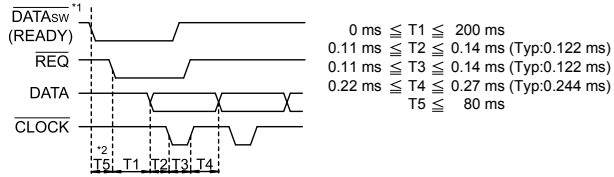
- Count value error/faulty operation

If the thimble of this product is retracted too far, the internal sensor will be damaged. This may cause count errors or faulty operation.

■ Output Data Format



■ Timing Chart



*1: DATASw is LOW while the data output key is being pressed.
 *2: The time T5 until DATASw goes to the LOW level and REQ is input is determined by the data processing device performance.