

Digimatic Holtest HTD-R



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.

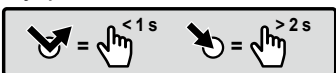
CAUTION Shows risks that could result in minor or moderate injury.

- 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.
- 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.
- 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 even waterproof types 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.
- If oil or cutting chips become attached to the sliding portion of the contact point, a malfunction may result. Wipe off any oil or cutting chips after use.
- 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.
- Use the product only with the supplied contact point.
- Do not remove the contact points; otherwise damage may result.

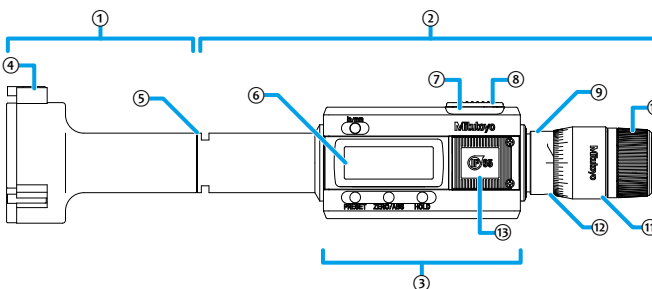
Key operation icon



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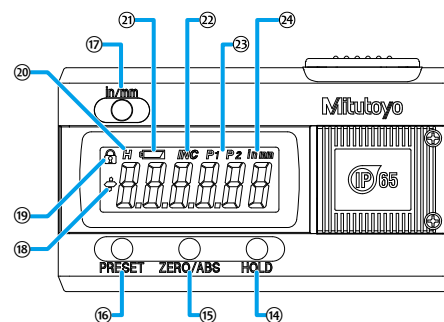
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1. Names of Components



- | | |
|----------------------|-----------------------------|
| ① Measuring head | ⑧ Cover |
| ② LCD body | ⑨ Sleeve |
| ③ Display unit | ⑩ Ratchet |
| ④ Contact point | ⑪ Thimble |
| ⑤ Connection area | ⑫ Setting screw |
| ⑥ Display unit (LCD) | ⑬ Battery compartment cover |
| ⑦ Output connector | |

■ Display unit (LCD)



- | | |
|-------------------------------------|-----------------------|
| ⑭ [HOLD] key | ⑳ Hold display |
| ⑮ [ZERO/ABS] key | ㉑ Low voltage display |
| ⑯ [PRESET] key | ㉒ INC display |
| ⑰ [in/mm] key (in/mm products only) | ㉓ Preset display |
| ⑱ Sign display | ㉔ Unit display |
| ⑲ Function Lock display | |

2. Installing the Battery

NOTICE Shows risks that could result in property damage.

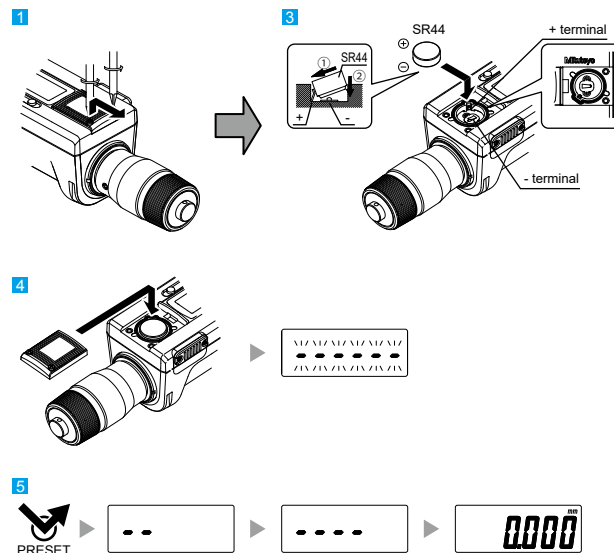
When attaching the battery compartment cover, be sure to attach the gasket properly. The product may display an error or malfunction if the battery compartment cover or gasket is not mounted correctly.

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

■ Measuring Force

- Use the ratchet to ensure consistent measuring force.
- The appropriate measuring force is achieved with the following procedure: make light contact between the measurement surfaces and the workpiece, stop momentarily, and then manually turn the ratchet about five to six times. Note that excessive measuring force may cause errors.

■ 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.
- Due to the product mechanism, the measured value will differ depending on whether the entire surface of the contact point or only its edge is used for measurement. When measuring, use the same conditions when setting the reference point.
- Use the same orientation and conditions when measuring and setting the reference point. (Refer to Figure 1 if measuring with the contact point edge in a blind hole.)

- Do not ground the bottom of the measuring head when setting the reference point or measuring (Figure 2).



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 125.000 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.

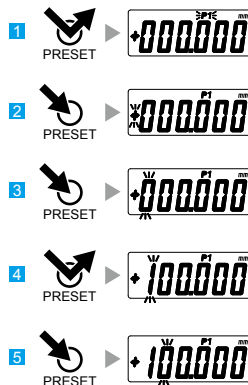
Tips

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 "1" is displayed.

- 5 Press and hold the [PRESET] key.

» The number in the next digit blinks.

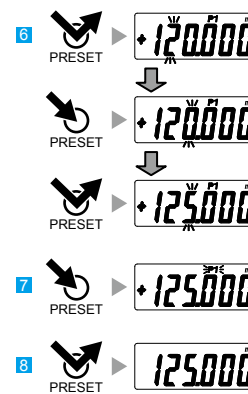


- 6 Repeat steps 4 and 5, so that "2," "5," and "0" are displayed in each digit.

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

- 8 Briefly press the [PRESET] key.

» "P1" goes out and registration is complete.



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 contact points gently into contact with the inside of the gage.

- 4 Rotate the ratchet five to six times to apply the proper measuring force.

- 5 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 8 in "1) Reference point registration".

- 6 Briefly press the [PRESET] key.

» "P1" or "P2" goes out.

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

- 7 Perform steps 1 through 4, and then use the supplied hex wrench to loosen the setting screw.

- 8 Slightly rotate the sleeve and align it with the proper indicated value.

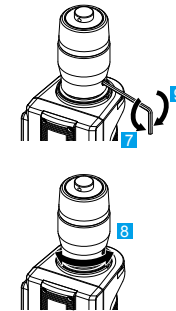
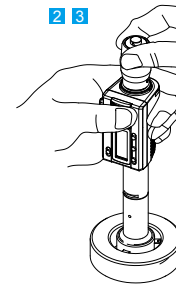
- 9 Use the supplied hex wrench to tighten the setting screw and fix the sleeve.

- 10 Perform steps 1 through 4, and confirm that the proper number is displayed.

If the proper number is displayed, setting is complete. If it is not displayed, repeat steps 7 through 9.

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.



5. Measurement Method



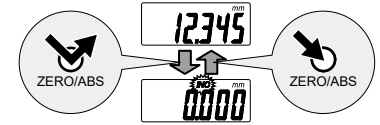
Be sure to perform reference point setting before measurement.

Using the same orientation and procedure used during reference point setting, insert the product into the workpiece, and then read the display value.

6. Key Functions

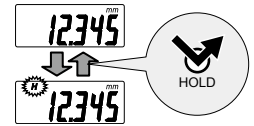
■ [ZERO/ABS] Key

- Briefly press the [ZERO/ABS] key.
 - » "INC" is displayed, and the display is set to zero.
- 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.



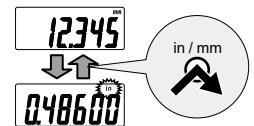
■ [HOLD] Key

- Press the [HOLD] key.
 - » "H" is displayed, and the display value is held. Press the key again to stop holding 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)

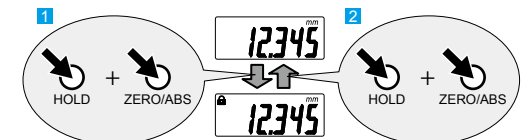
This product has the Function Lock function, which disables the PRESET function and ZERO/ABS function in order to avoid accidental changes to the reference point position.

Setting the Function Lock causes [LOCK] 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.

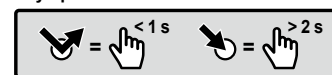
- 1 First press and hold the [HOLD] key, and then additionally press and hold the [ZERO/ABS] key (for at least 2 seconds).

» [H] display and [LOCK] 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

- " " display
The battery voltage is low. Replace the battery promptly.
- "Err-oS" display
A counting error has occurred due to excessive speed or noise. Try removing the battery and reinstalling.
- "Err-S" display
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.

9. Installation/Removal Method for Measuring Head and Extension Rod

For interchangeable-head sets, it is necessary to replace the measuring head according to the size of the workpiece.

An extension rod (optional for models other than interchangeable-head sets) can be used to measure deep holes.

NOTICE Shows risks that could result in property damage.

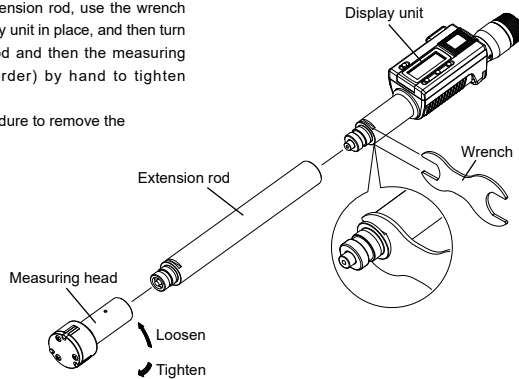
Do not hold the display unit while using the wrench to loosen or tighten the connection area. Otherwise, damage may result.

- Be sure to set the reference point after installing or removing the measuring head or extension rod.
- Do not misassemble the measuring head and display unit (for models other than the interchangeable-head sets). These parts are incompatible and accuracy cannot be guaranteed if they are used.

Use the following procedure to install and remove the measuring head and extension rod.

- 1 Set the supplied wrench to the groove in the connection area. Fix the display unit in place while rotating the measuring head by hand to detach it.
- 2 To replace the measuring head, use the wrench to hold the display unit in place, replace the measuring head, and then rotate the new head by hand to tighten it.
- 3 To install the extension rod, use the wrench to hold the display unit in place, and then turn the extension rod and then the measuring head (in that order) by hand to tighten them.

Use the same procedure to remove the extension rod.



10. Specifications

Common Specifications

Display	: 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	:

	Single item	Non-interchangeable-head sets	Interchangeable-head sets
Wrench	✓	✓	✓
Hex wrench	✓	✓	✓
Phillips screwdriver (No.05CAA952)	✓	✓	✓
Setting ring	-	✓	✓
Extension rod	-	-	✓

IP protection level :

- IP65 (refer to IEC60529 for details).
- Dust-proof (level 6) : No ingress of dust allowed.
- Protection against water jets (level 5) : Protects the equipment against water jets from any direction.

Individual Specifications

Maximum measuring length	Maximum permissible error J_{MPE}^{*1}	Resolution
8 - 12 mm	$\pm 2 \mu\text{m}$ (maximum difference 2 μm)	0.001 mm
16 - 63 mm	$\pm 3 \mu\text{m}$ (maximum difference 3 μm)	
75 - 100 mm	$\pm 4 \mu\text{m}$ (maximum difference 4 μm)	
125 - 200 mm	$\pm 5 \mu\text{m}$ (maximum difference 5 μm)	
225 - 300 mm	$\pm 6 \mu\text{m}$ (maximum difference 6 μm)	
0.35 - 0.5 in	± 0.0001 in (maximum difference 0.0001 in)	0.00005 in
0.65 - 2.5 in	± 0.00015 in (maximum difference 0.00015 in)	
3 - 4 in	± 0.0002 in (maximum difference 0.0002 in)	
5 - 8 in	± 0.00025 in (maximum difference 0.00025 in)	
9 - 12 in	± 0.0003 in (maximum difference 0.0003 in)	

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

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

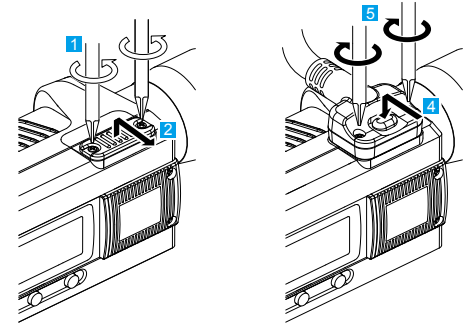
NOTICE Shows risks that could result in property damage.

- Always use the 0-size Phillips screwdriver (No.05CZA619) supplied with the connection cable (option) when installing/removing screws, and tighten to 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.

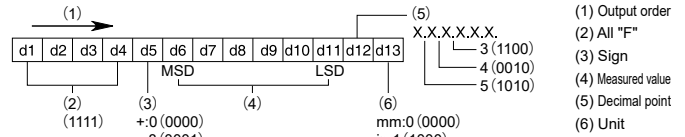
- 1 Use the Phillips screwdriver supplied with the connection cable to remove the cover fixing screws (M1.7 x 0.35 x 2.5, No.04AAB543).
- 2 Remove the cover.
- 3 Check that the connector gasket (No.09GAA374) is correctly installed at the proper position (do not remove the connector gasket).
- 4 Mount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

Tips

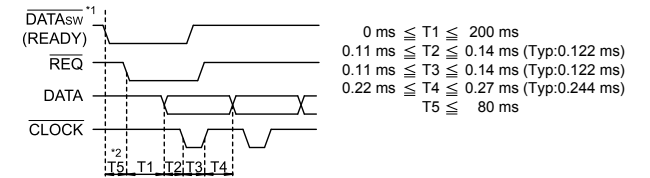
- Ensure that there is no gap between the connection cable plug and the body connector.
- Held display values (refer to "6. Key Functions ■ [HOLD] Key") will be released if output to an external device.



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.

12. Options

- Connection cable (1 m) : No.05CZA662
- Connection cable (2 m) : No.05CZA663
- Extension rod
 Length 100 mm, measuring range 6 mm to 12 mm (0.275 in to 0.5 in) : No.952322
 Length 150 mm, measuring range 12 mm to 20 mm (0.5 in to 0.8 in) : No.952621
 Length 150 mm, measuring range 20 mm to 50 mm (0.8 in to 2 in) : No.952622
 Length 150 mm, measuring range 50 mm to 300 mm (2 in to 12 in) : No.952623

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. Contact your nearest dealer or our sales office.

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