ABS Digimatic Height Gage

(en)

HDS-H30C / HDS-H60C / HDS-H12"C / HDS-H18"C / HDS-H24"C

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.
- The tip of the scriber on this product is sharp. Always handle with care to avoid injury.

NOTICE Shows risks that could result in property damage.

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.

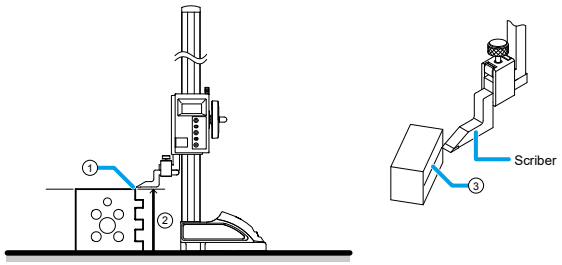
Tips

- Be sure to use an SR44 battery (silver oxide battery).
- Never disassemble this product, unless removing the battery cover to replace the battery. If the product is disassembled, the warranty will no longer apply.
- Be sure that you thoroughly understand the content in both "2. Installation Environment" and "3. Precautions for Use" before using this product.

Contents

1. Product Capabilities

This product can work as a height measuring instrument, by touching the scriber to point (①) to measure the height (②).
It can also scribe precisely on surfaces of workpiece (③) with the tip of a part called a scriber.



2. Installation Environment

Only use this product in the following environments.
- Areas with minimal dirt and dust
- Areas with minimal vibrations
- Areas with an ambient temperature between 0 °C and 40 °C
  (For precision measurements, the temperature should be consistently around 20 °C.)
- Areas with low humidity
- On a surface plate

Avoid using the product in the following environments.
- In locations where it may be directly exposed to cutting fluids, water, etc.
- In locations where it may be exposed directly to sunlight or hot or cold wind
- In locations near machines that generate electromagnetic noise, such as welders or electrical discharge machines

3. Precautions for Use

1) When using the product for the first time

Wipe the rust preventive oil from the product with a soft cloth soaked with cleaning oil, etc., and then install the supplied battery.

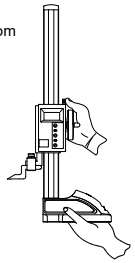
2) Cleaning before use

Clean the following parts, and then use the product only after confirming that it is free of dirt or burrs (projections caused by damage, etc.).
- Surface plate
- Beam, lower base surface, scriber mounting surface, and scriber measurement surface

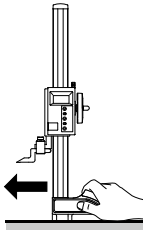
3) When carrying or moving

■ **Correct holding**

- First lock the slider securely in place, and be sure to hold the bottom of the base while lightly supporting the rear surface of the slider.

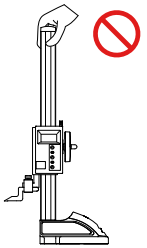


- When measuring or moving on a surface plate, grip the base and slide it to move.



■ **Incorrect holding**

Do not touch the top part of the beam, as doing so could affect accuracy.



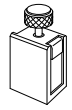
4) Other

NOTICE Shows risks that could result in property damage.

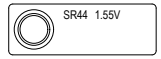
- Never apply an external voltage to this product, such as entering numbers using an electric marking pen. This may cause failure.
- Do not subject the product to excessive force or impact through dropping or the like. This may cause failure, such as malfunctions due to rack damage.

4. Confirmation of Accessories

• Scriber



• Scriber clamp



• Battery (SR44)

• User's Manual and warranty

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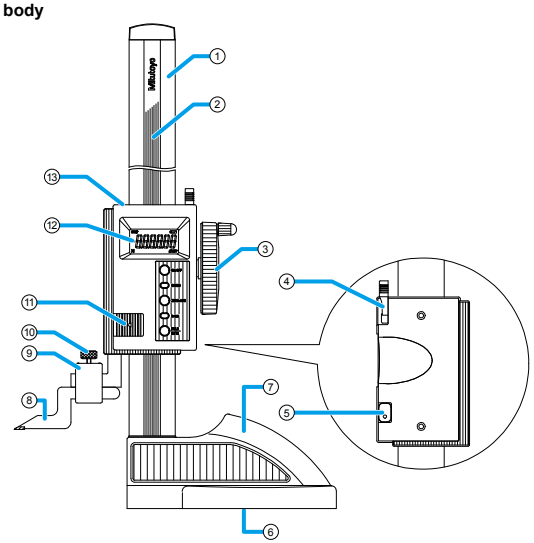
5. Names and Functions of Components

1) Main body



① Beam
Supports the slider.

② Main scale

③ Feed handle
Turning it left/right coarsely moves the slider vertically.

④ Clamp lever
Locks/unlocks the slider movement.

⑤ Output connector
This connector is used to connect an optional external device (sold separately).

⑥ Label
Indicates product information such as code No.

⑦ Base
It grips when measuring or moving the main body on a surface plate.

⑧ Scriber
A tool used to make scribe lines. It can also be used to measure heights by touching it to the point to be measured.

⑨ Scriber clamp
Fixes the inserted scriber to the main body with the clamp screw.

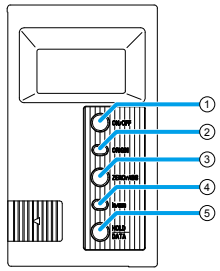
⑩ Clamp screw
The screw which fixes the scriber.

⑪ Battery cover
Covers the battery insertion part.

⑫ LCD display
The display is used to show measured values and messages.

⑬ Slider
The moving part on the main body in which the LCD display and controls are located.

2) Controls



① [ON/OFF] switch
Used to turn the power on/off.

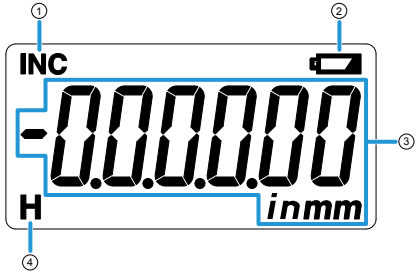
② [ORIGIN] switch
Used to set the reference for absolute measurement (ABS).

③ [ZERO/ABS] switch
Used to switch between absolute measurement (ABS) and incremental measurement (INC).

④ [in/mm] switch (inch display models only)
Used to switch units (in/mm).

⑤ [HOLD/DATA] switch
Used to hold the measured value display or to output measurement results to an optional external device (sold separately).

3) LCD display



① Lights up when the reference is switched to incremental measurement (INC).

② Lights up when the battery is depleted.

③ Displays the measured value and unit.

④ Lights up when the measured value is being held in the display.

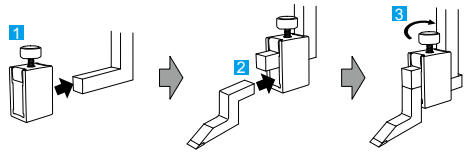
6. Preparations before Use

1) Mounting the scriber

1 Insert the scriber clamp all the way to the end of the jaw.

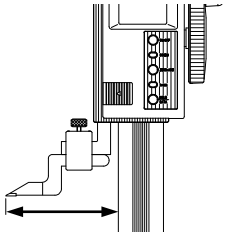
2 Insert the scriber into the scriber clamp.

3 Tighten the clamp screw.



Tips

Mount the scriber as close to the beam as possible, so that it protrudes no more than necessary. Too much protrusion will cause measurement errors (with error effect increased 1.5 times if the protrusion of the scriber tip from the beam changes from 100 mm to 150 mm). If the scriber must be used protruding longer, be careful to apply only the necessary measuring force.



2) Installing (replacing) the battery

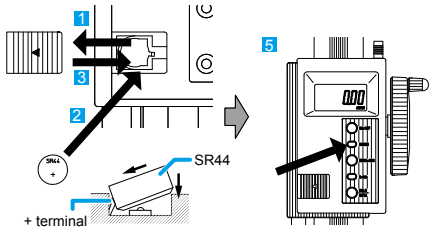
1 Turn the power off, and then slide the battery cover in the direction of the arrow to remove it from the controls.

2 Insert the new battery (SR44 part No. 938882) with the plus side facing upward.

3 Slide the battery cover back into place.

4 Slowly bring the scriber into contact with the surface plate.

5 Press the [ORIGIN] switch for at least 1 second.
》 The value [0.00] lights up (the reference for ABS has been set).



NOTICE Shows risks that could result in property damage.

When inserting the battery, be careful not to crush the + terminal.

Tips

- Always set the reference for ABS after inserting a battery. If not set, it may result in an error display (E displayed for minimum digit) or prevent accurate measurement. When setting the reference, refer to "1) Reference setting".
- When replacing the battery, wait at least 10 seconds before inserting the new battery.
- If the display or functionality is abnormal after replacing the battery, reinstall the battery.
- Press the [ON/OFF] switch to turn the power off. Always turn the power off when you are finished using the product.

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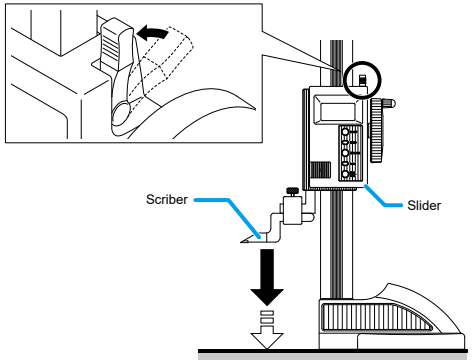
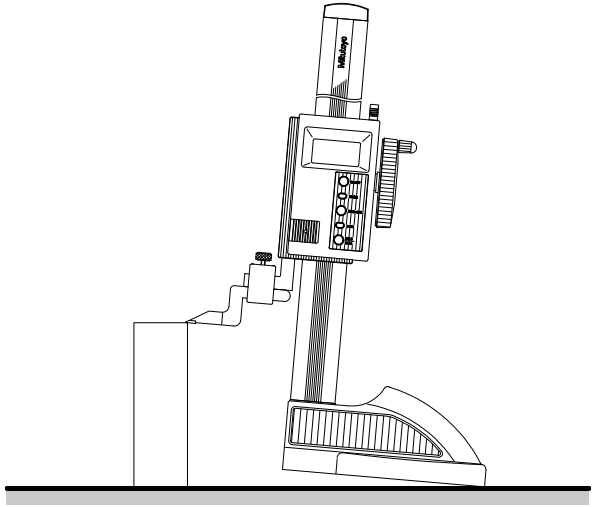
7. Moving the Slider Vertically

Loosen the clamp lever so that the slider can be moved.
When moving the slider vertically, hold the base surface down with the palm of one hand as you turn the feed handle right or left with the other hand.
Moving the slider will move the scriber up and down.
Move the slider slowly when bringing the scriber into contact with the surface plate or workpiece.



Tips

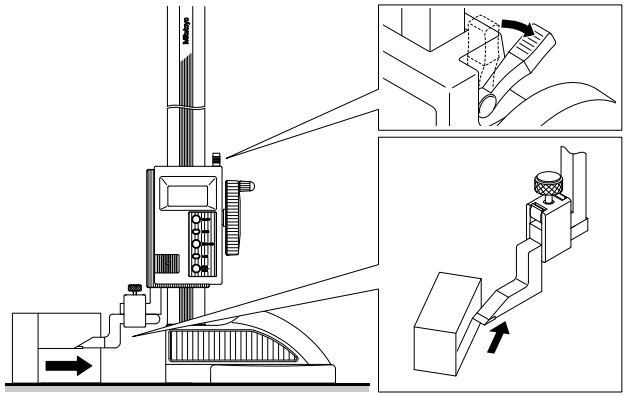
- If the slider is moved further (measuring force is applied) after the scriber makes contact with the workpiece, the bottom of the base will lift from the surface plate, causing measurement errors. In order to obtain accurate measurements, bring the scriber into contact with the workpiece as slowly as possible and apply constant force lightly. Before measuring, confirm that the bottom of the base is free of dirt and burrs (burrs caused by damage, etc.).



- When bringing the scriber into contact with the workpiece, you can confirm the scriber contact state and close contact of base and surface plate by sliding the base slightly over the surface plate once the slider has stopped moving.
- In order to make accurate measurements, bring the scriber into contact with the workpiece several times and confirm that the LCD shows a stable value when the scriber makes contact with the workpiece.

8. Using as a Scribing Tool

When scribing, make sure that the scriber moves in a consistent direction. Make sure that the clamp lever is firmly tightened and that the slider is fixed.



Tips

When setting the reference, refer to "1) Reference setting".

9. Using as a Measuring Instrument

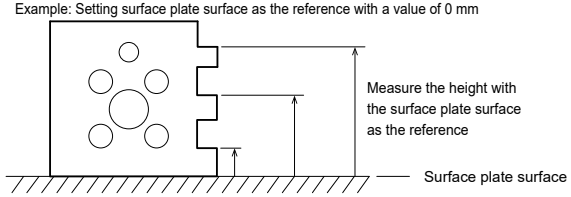
1) Reference setting

Set the reference when measuring height. The distance from the reference set will be displayed as a measured value of height. This product supports both absolute measurement (ABS) and incremental measurement (INC) reference setting. Be sure to set the reference for ABS (and for INC as needed) prior to use.

■ Reference (zero) setting for absolute measurement (ABS)

This method is used to set the reference for absolute measurement. Normally, the workpiece height is measured with the surface plate surface as the reference. The set reference is fixed until the battery is discharged, so this is a convenient way to measure multiple measurement points with the surface plate surface as the reference.

Example: Setting surface plate surface as the reference with a value of 0 mm



As an example, this section describes how to set the surface plate surface as the reference.

Tips

The set reference is stored until the battery is replaced. If the battery is replaced, the reference will need to be set again.

1 Confirm that the power is on.

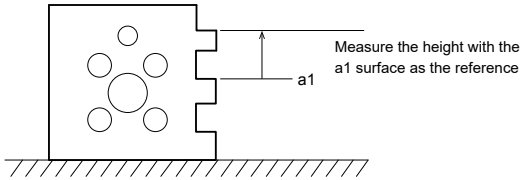
2 Slowly bring the scriber into contact with the surface plate.

3 Press the [ORIGIN] switch for at least 1 second.
》 [0.00] is displayed (the reference for ABS has been set).

■ Reference (zero) setting for incremental measurement (INC)

This method is used to set an arbitrary point on the workpiece as the reference. The specified point will be used as the reference for measurement (value of 0 mm). As the reference is reset each time the switch is pressed, this is a convenient way to measure multiple measurement points while resetting the reference.

Example: Setting surface a1 as the reference (value is always 0 mm)



1 Confirm that the power is on.

2 Slowly bring the scriber into contact with an arbitrary point on the workpiece.

3 Press the [ZERO/ABS] switch.
》 [INC] lights up and [0.00] is displayed (the reference for INC has been set).

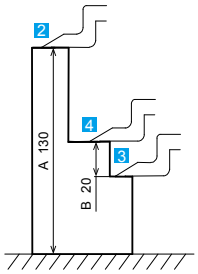
2) Switching measurement modes

1 Briefly press the [ZERO/ABS] switch.
》 [INC] lights up and the value [0.00] is set.

2 Press and hold the [ZERO/ABS] switch for at least 2 seconds.
》 [INC] goes out, and the slider position compared to the reference set with ABS will be displayed.

3) Measurement

<Example> Measuring dimensions A and B of the workpiece shown in the figure at right



1 Set the surface plate surface as the reference for ABS.

Tips

Refer to "■ Reference (zero) setting for absolute measurement (ABS)" for information on setting.

2 Slowly bring the scriber into contact with the upper surface A.
》 Dimension A is measured.

3 Set the lower surface B as the reference for INC.

Tips

Refer to "■ Reference (zero) setting for incremental measurement (INC)" for information on setting.

4 Slowly bring the scriber into contact with the upper surface B.
》 Dimension B is measured.

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10. Usage Scenarios

1) Holding the displayed measurement result

The displayed measurement result can be held even if the slider is moved.

1 Press the [HOLD/DATA] switch.
》 [H] lights up (displayed measurement result is held).

2 Press the [HOLD/DATA] switch again.
》 [H] goes out (displayed measurement result is released).

Tips

If an external device is connected to the output connector on the product, the [HOLD/DATA] switch will instead be used as a switch for outputting measured value.

2) Outputting measurement results to an external device

Measured values can be output to an optional external device (sold separately) connected to the product.

1 Connect the external device to the output connector on the product.

2 Press the [HOLD/DATA] switch.

Tips

Measured values can also be output by operating the external device. Refer to the User's Manual included with the external device for details.

11. Routine Maintenance

1) Cleaning

- After use, clean the entire product and check that none of the parts are damaged.
- Use a lint-free cloth or paper soaked in alcohol to wipe the main body (beam, base, scriber, etc.). Do not use thinner or other organic solvents. Use an old toothbrush or the like to clean the rack part on the rear surface of the beam.

2) Storage

- When storing the product, leave the scriber hanging about 1 mm from the surface plate surface, and do not tighten the clamp lever.
- Store so that the tip of the scriber does not protrude from the surface plate.
- Always turn the power off before storing.
- Do not store the product in a place with a high temperature or humidity, or a lot of dust or oil mist.
- If the product is to be out of use for three months or more, remove the battery.
- Apply anti-rust treatment after use. Rust may cause malfunction.
- We recommend periodically testing and calibrating the product for accuracy.
- If any abnormalities occur, contact the dealer where the product was purchased.

12. Troubleshooting

If a problem occurs while using this product, please try one of the solutions provided below. If the solution does not work, contact our service department via your dealer for repair.

1) If the following problem occurs

Problem	Cause	Solution
• The displayed values flicker or disappear temporarily. • An accurate measurement result cannot be obtained. • The power is turned off automatically.	The product is used in environments where electromagnetic interference exceeds requirements defined in the EMC Directive.	• The product will return to normal after removing the electromagnetic interference caused by electrostatic discharge. • If this problem is due to electromagnetic interference acting on the AC or DC power line, check the circumference of the power line, and then make a measurement again. • If a brownout occurs, the product will return to normal after the recovery from the low voltage.
The display flickers.	The main scale surface is dirty.	Clean the main scale surface, and then apply a small amount of low-viscosity oil to repel water.

2) If a warning is displayed

Warning	Cause	Solution
Err C	The main scale surface is dirty.	Clean the main scale surface, and then apply a small amount of low-viscosity oil to repel water.
E (displayed for minimum digit)	• The reference for absolute measurement (ABS) is not set after inserting the battery. • The main scale surface is dirty.	• Set the reference for absolute measurement (ABS). • Clean the main scale surface, and then apply a small amount of low-viscosity oil to repel water.
	Battery is depleted.	Replace with a new battery.

13. Specifications

1) Product specifications

● Metric display models (HDS-H30C/HDS-H60C)

Model number	HDS-H30C	HDS-H60C
Code No.	570-302	570-304
Maximum measurement length	300 mm	600 mm
Maximum permissible error (E_{MPE})	±0.03 mm	±0.05 mm
Resolution	0.01 mm	
Maximum response speed	Unlimited	
Power	SR44 (silver oxide battery) x 1 (part No.938882)	
Battery life	Approx. 20,000 hours	
Operating temperature	0 ˚C to 40 ˚C	
Storage temperature	-10 ˚C to 60 ˚C	
Scriber	Part No.07GZA000	
Scriber clamp	Part No.05GZA033	

● Inch display models (HDS-H12"C/HDS-H18"C/HDS-H24"C)

Code No.	570-312	570-313	570-314
Model number	HDS-H12"C	HDS-H18"C	HDS-H24"C
Maximum measurement length	12"/300 mm	18"/450 mm	24"/600 mm
Maximum permissible error (E_{MPE})	± 0.0015"/± 0.03 mm	± 0.0020"/± 0.05 mm	
Resolution	0.0005"/0.01 mm		
Maximum response speed	Unlimited		
Power	SR44 (silver oxide battery) x 1 (part No. 938882)		
Battery life	Approx. 20,000 hours		
Operating temperature	0 ˚C to 40 ˚C		
Storage temperature	-10 ˚C to 60 ˚C		
Scriber	Part No. 900258		
Scriber clamp	Part No. 901385		

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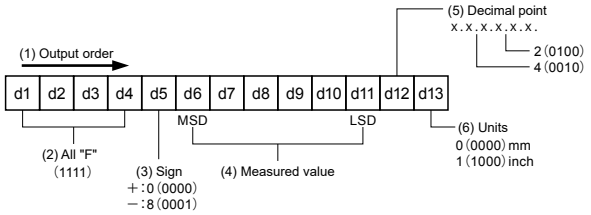
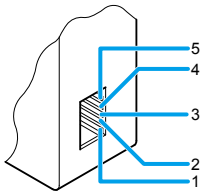
2) Output specifications

• Data format

(1) Output order (2) All "F" (3) Sign (4) Measured value (5) Decimal point (6) Units

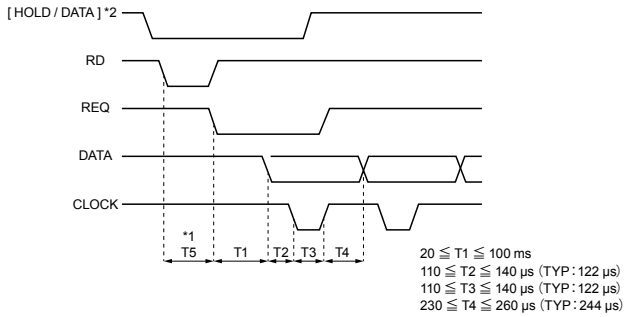


• Connector layout



Pin No.	Code
1	GND
2	DATA
3	CLOCK
4	READY
5	REQUEST

• Timing chart



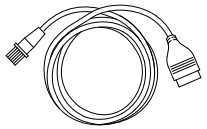
*1: The time until the [HOLD/DATA] switch goes to the Low level and REQUEST is input.
T5 is determined by the performance of the data processing device.

*2: Enabled only when the [HOLD/DATA] switch is used.

14. Options (Sold Separately)

● Digimatic connection cable (for IT-016U/IT-007R/DP-1VA LOGGER/MUX-10F/etc.)

1 m: Part No. 905338
2 m: Part No. 905409



● USB input tool direct

USB-ITN-F (2 m): Part No. 06AFM380F

● U-WAVE-T dedicated connection cable

Standard (160 mm): Part No. 02AZD790F
Foot switch: Part No. 02AZE140F

● Holder arm

Part No. 953638 (for metric display models), 953639 (for inch display models)

● Clamp

Part No. 902053 (ø6/ø8 with dovetail for metric display models), 900322 (ø4/ø9.52 with dovetail for inch display models)

* The holder arm and clamp can be used to attach a test indicator (sold separately).