Thickness Gage (Digimatic Type ID-SX)

en

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. 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. Never reverse the positive-negative terminals when mounting. Improper battery handling or mounting may cause battery leakage and explosion, which may cause product malfunctions and serious bodily injury.
- The edges of the contact point and anvil on the blade thickness type are sharp, and may cause injury. Be especially careful of injury or damaging the edge when handling.

NOTICE Shows risks that could result in property damage.

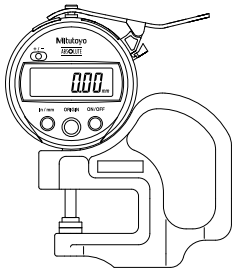
- Do not disassemble or modify.
- Do not use or store the product in a place with sudden temperature changes. Also, before using the product, allow it to acclimate to room temperature.
- Use in a location with minimal dust, oil, and oil mist, away from direct sunlight.
- Do not store the product in a place with high humidity or a lot of dust.
- Do not move the spindle quickly or apply horizontal force.
- Avoid loads in the vertical direction relative to the spindle or usage involving torsion to the spindle.
- Do not apply excessive force or subject to sudden impacts such as falling.
  If an impact is applied, inspect accuracy and operation before use.
- Avoid usage in places directly exposed to splashes of water or coolant.
- Do not write numbers, etc. with an electric pen.
- Do not operate the keys with a pointed object (such as a screwdriver or ballpoint pen).

Contents

Key icon operation

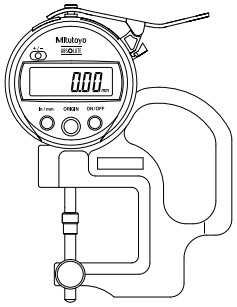
1. Types

■ Standard type



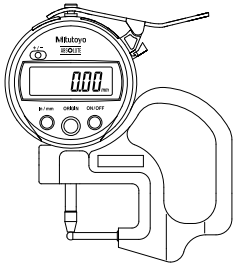
● Code No.
547-500S
547-520S
547-526S

■ Lens meter



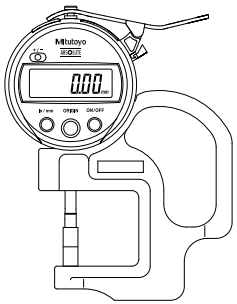
● Code No.
547-512S
547-512A

■ Pipe gage



● Code No.
547-561S

■ Blade thickness



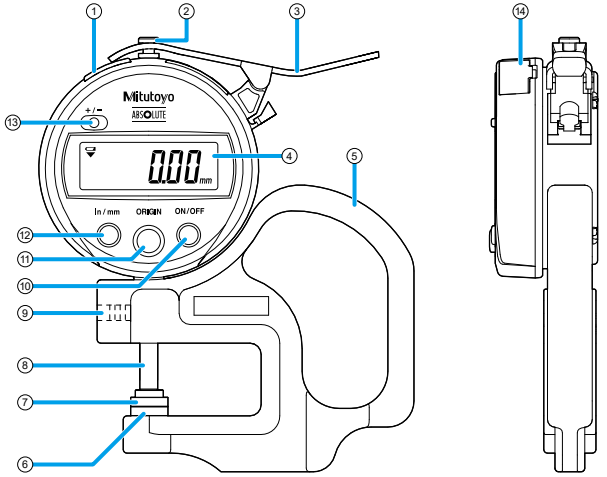
● Code No.
547-516S
547-516A

2. Names of Components

NOTICE Shows risks that could result in property damage.

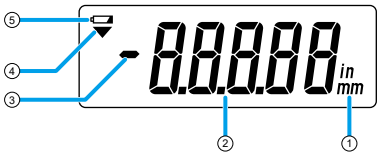
The product display does not rotate. Forcibly rotating the display may damage the product.

The figure shows Code No. 547-500S (standard type).



① Output connector (with cap)
② Spacer
③ Lifting lever
④ Display (LCD)
⑤ Frame
⑥ Anvil
⑦ Contact point
⑧ Spindle
⑨ Fastening screw
⑩ [ON/OFF] key
⑪ [ORIGIN] key
⑫ [in/mm] key
⑬ [+/-] key
⑭ Battery holder

■ Display (LCD)



① Unit display
② Measured value display
③ Sign display
④ Reverse counting display
⑤ Low battery voltage display

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3. Preparations before Use

1) Checking items before use

- Before using the product, confirm that the spindle moves smoothly.
- Confirm that the displayed value is stable at the position you have set.
  Body temperature or changes in air temperature may cause thermal expansion or contraction of parts such as the spindle or frame, changing the displayed values.
- For periodic calibration or precision measurement, wear thick gloves in order to reduce changes in the displayed value caused by the transmission of body temperature.
- Confirm that the contact point and anvil are not loose.

2) Contact point and anvil

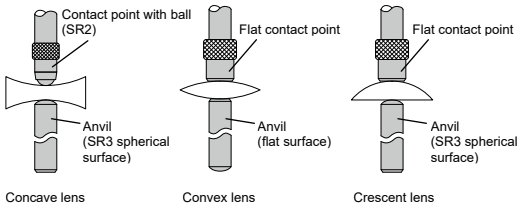
■ Standard type, pipe gage, and blade thickness type

NOTICE Shows risks that could result in property damage.

Do not remove the contact point. This could affect the parallelism of the contact point and anvil, leading to poor accuracy. Contact our sales office to replace the contact point.

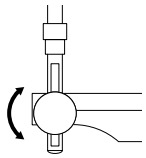
■ Lens meter

- According to the shape of the workpiece being measured, the flat contact point installed can be exchanged with the included contact point with ball (SR2). The anvil can also be set upside down, making it possible to switch between the spherical (SR3) and flat surfaces of the anvil.
- **After replacing the contact point or setting the anvil upside down, confirm that the contact point and anvil are in contact, and then reset the reference point before measurement.**
- **Do not use any flat contact point or anvil other than the one installed on the product at purchase. If this flat contact point or anvil is replaced with another one, its performance cannot be guaranteed.**



* Flat contact point/anvil parallelism: 10 µm

- Loosen the screw on the frame when setting the anvil upside down. With the notch facing the screw side, insert the anvil into the frame and tighten the screw (547-512A).

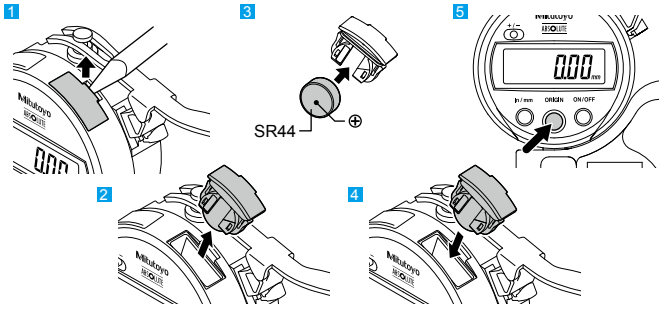


4. Installing (Replacing) the Battery

NOTICE Shows risks that could result in property damage.

- Be sure to use SR44 (silver oxide button battery, part No. 938882) for the battery.
- The product may display an error if the battery holder is not mounted correctly.
- If the product will be out of use for 3 months or more, remove the battery and store it separately, to prevent damage to the product due to battery fluid leakage.
- Do not use a pointed object or excessive force to remove the battery holder. This may damage the battery holder.

This product is shipped without a battery installed. Install the battery provided before use.

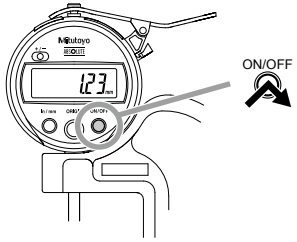


1. Use a flathead screwdriver or similar to remove the battery holder.
2. If replacing a battery, remove the existing battery.
3. Insert a new battery into the battery holder with the "+" symbol facing the display (LCD).
4. Attach the battery holder.
5. Press the [ORIGIN] key for 2 seconds or more.

Tips

- If no value is displayed even when a battery is installed, reinstall the battery.
- Although the display may show garbled text, [E] (minimum digits) or [------] just after installing the battery, this is not abnormal. Perform reference point setting as is. (Refer to "6. ORIGIN Setting (Reference Point Setting)".)
- Reference point settings are cleared when the battery is removed. Perform reference point setting again after installing the battery.
- The battery provided is for confirming the functions and performance of the product. Note that this battery may not last for the entire expected life.
- When disposing of batteries, follow local laws, regulations, etc.
- Malfunctions or damage due to depleted battery, etc. are not covered by the warranty.

5. Power ON/OFF



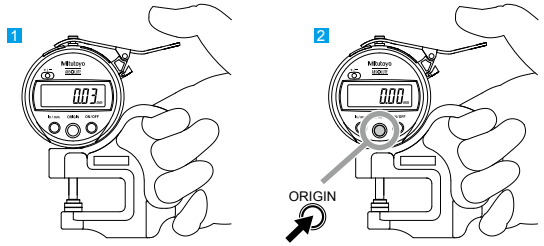
1. Press the [ON/OFF] key to turn the product on and off.

Tips

- If the power does not turn on even when the [ON/OFF] key is pressed, the battery may be depleted. Replace the battery.
- Even after the power is turned off, the reference point and counting direction settings will be retained.

6. ORIGIN Setting (Reference Point Setting)

Remove dust, cutting chips, etc. before reference point setting.



1. Hold the frame as shown in the figure.
2. With the anvil and contact point closed, press the [ORIGIN] key for 2 seconds or more.
   ⇨ The displayed value becomes zero and the reference point is set.

Tips

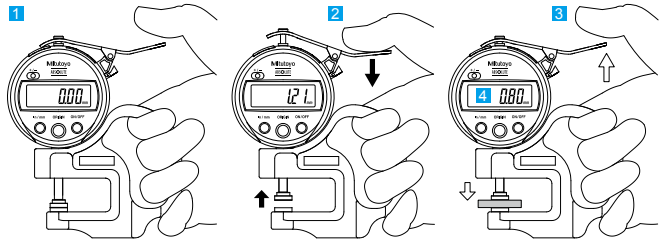
Open and close the anvil and contact point several times to verify that the zero value is stable.

7. Measurement Method

NOTICE Shows risks that could result in property damage.

- Do not allow the contact point to strike the workpiece hard. The workpiece may deform and measurement results may be affected.
- Do not loosen the fastening screw or remove it and disassemble the product. The parallelism of the contact point and anvil may be disturbed, and the measuring range, accuracy, and measurement results may be affected.
- **Be sure to perform reference point setting before measurement. For use in a place with fluctuating temperature in particular, frequently check the set reference point.**
- **Remove dust, cutting chips, etc. before measurement.**

1) Standard measurement



1. Hold the frame in the same orientation and conditions as at ORIGIN (reference point) setting, as shown in the figure.
2. Raise the spindle by gently pressing the lifting lever downward.
3. Insert the workpiece, and then bring the contact point into contact with the workpiece by gently releasing the lifting lever.
4. Read the displayed value.

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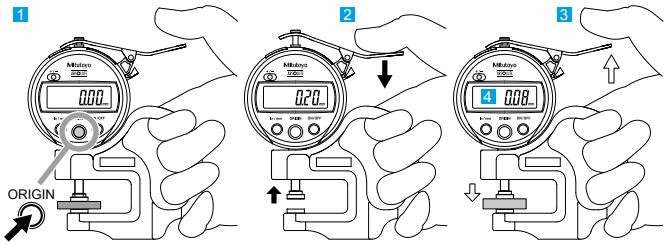
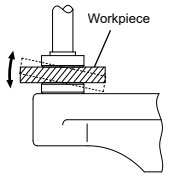
2) Comparative measurement



1 Measure a reference gage or master in accordance with standard measurement practices, and then press the [ORIGIN] key for 2 seconds or more.
⇨ The displayed value becomes zero and the reference point is set.
2 Raise the spindle by gently pressing the lifting lever downward.
3 Insert the workpiece, and then bring the contact point into contact with the workpiece by gently releasing the lifting lever.
4 Read the displayed value.

Tips

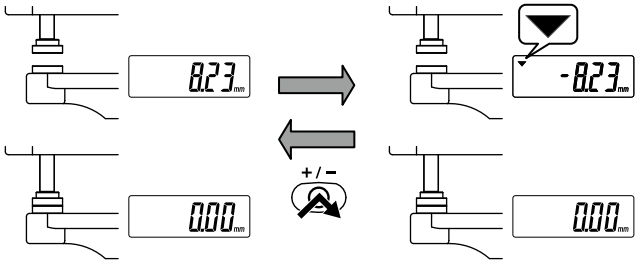
The orientation of a large workpiece may not be stable in measurement and displayed values may not be stable. Support the workpiece by hand so that its orientation is stabilized.



3) Switching counting direction

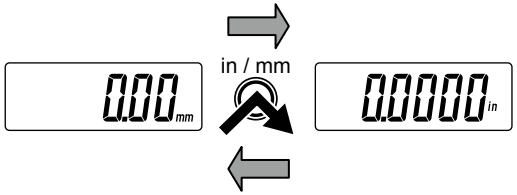
The counting direction can be changed by pressing the [+/-] key. If the product is set to negative counting when the spindle is pushed in, [▼] is shown on the top left of the display (LCD).

■ Positive counting ■ Negative counting



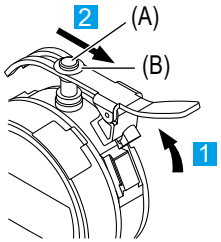
4) Switching units

Press the [in/mm] key to switch the unit between in (inches) and mm (millimeters).



8. Lifting Lever

● Mounting



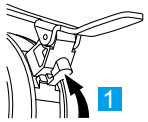
1 Lift the spindle and fit the stop screw (A) between the tips of the lifting lever.

Tips

Insert the tips of the lifting lever under the spacer (B).

2 Fit the grooves of the lifting lever into the dovetail groove and move it in the direction of the arrow to secure it.

● Removing

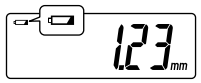
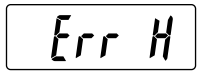
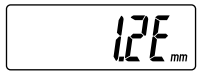


1 Push the finger rest part up and remove the lifting lever.

9. Precautions after Use

- Clean the sliding surface of the spindle with a dry cloth or a cloth slightly moistened with alcohol. Do not lubricate the spindle at this time.
- When cleaning the display (LCD), 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.
- For the standard type and lens meter, store with a piece of grease paper or similar material inserted to prevent wringing (adhesion) between the flat contact point and anvil (flat surface).
- Apply anti-rust treatment to the contact point and anvil.
- The performance of the thickness gage is strongly influenced by usage and storage conditions. We recommend stipulating a maintenance cycle as in-house rules according to usage frequency, environment, storage method, etc., and inspecting the product periodically.
- If the product is to be out of use for 3 months or more, remove the battery before storage. Liquid leakage from the battery may damage the product.
- Do not store the product in a place with a high temperature or humidity, or a lot of dust or oil mist.

10. Errors and Troubleshooting

Error Display	Causes and Countermeasures
Low Battery Voltage 	Battery is depleted. Replace with a new battery.
Sensor Contamination Detection Error 	A sudden change in temperature may create condensation on the detector, or it may be contaminated by other sources. • Turn the power off and allow the product to adapt to the temperature for about 2 hours. • If it does not recover after adapting to the temperature, repair is required: contact the agent where you purchased the product or our sales office.
Hardware Error 	This error indicates a hardware abnormality. In this case, repair is required: contact the agent where you purchased the product or our sales office.
ABS Synthesis Error 	Although this may occur during high-speed spindle movement, there is no effect on measurement. Use the product as is. If it occurs while the spindle is not moving, the internal sensor has failed. In this case, repair is required: contact the agent where you purchased the product or our sales office.

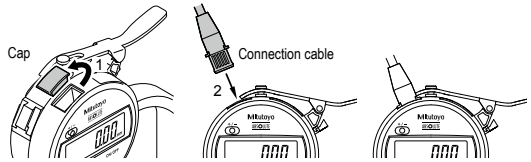
11. Output Function

NOTICE Shows risks that could result in property damage.

When connecting with a Mitutoyo linear gage counter (EC-101D, EG-101D, EH-102D), set the linear gage counter setting of "Digimatic input WAIT" to "0: No wait" before use. If used with other settings, an error will be displayed on the linear gage counter.

1) Externally outputting the displayed value

The displayed value can be output to a device supporting Digimatic output format by connecting the product and the external device with a connection cable (optional). An optional external display, external printer, PC, etc. can be connected.

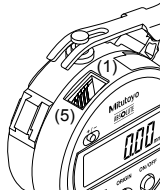


1 Press the [ON/OFF] key to turn off the product.
2 Connecting the product and the external device
1. Remove the cap of the output connector of the product.
2. Connect the product and the external device with a connection cable.

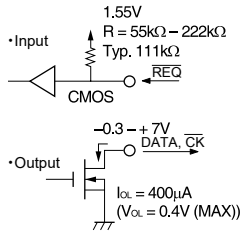
Tips

- Two types of connection cables (optional), part No. 905338 (1 m) and part No. 905409 (2 m), are available for this product.
- When connecting a connection cable, pay attention to the connector direction as you insert it.
- Store the removed cap to prevent loss.
- Always install the cap if a connection cable is not used.

2) Output connector



Pin No.	Signal	I/O
(1)	GND	-
(2)	DATA	O
(3)	$\overline{CK}$	O
(4)	-	-
(5)	$\overline{REQ}$	I



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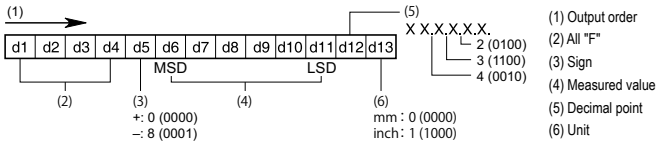
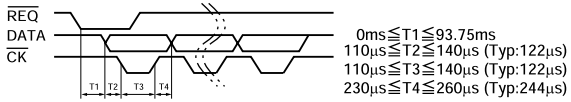
3) Output data format



4) Timing chart



12. Specifications

Operation environment: Temperature 0 °C to 40 °C, humidity 30 % to 70 % (no condensation)

13. Accessories (Optional)

- Connection cable: Part No. 905338 (1 m, flat straight)
- Connection cable: Part No. 905409 (2 m, flat straight)

*For accessories (optional) other than the above, refer to the Measuring Instruments Catalog.

*Adjustment including Digimatic indicator itself is required when replacing the contact point. Consult with us on a special-order basis.

14. Off-Site Repairs (Subject to Charge)

Off-site repair (subject to charge) is required in the case of the following malfunctions. Contact the agent where you purchased the product or our sales office. If the product is repaired or disassembled by a party other than Mitutoyo, its performance cannot be guaranteed.

- Poor spindle operation
- Poor accuracy
- [E] is displayed as the last digit when the spindle is stationary
- Abnormal measured value or LCD trouble
- No recovery from [Err C]
- Power will not turn on

*If the fundamental structural components or multiple components need to be replaced, we reserve the right to decline the repair.

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