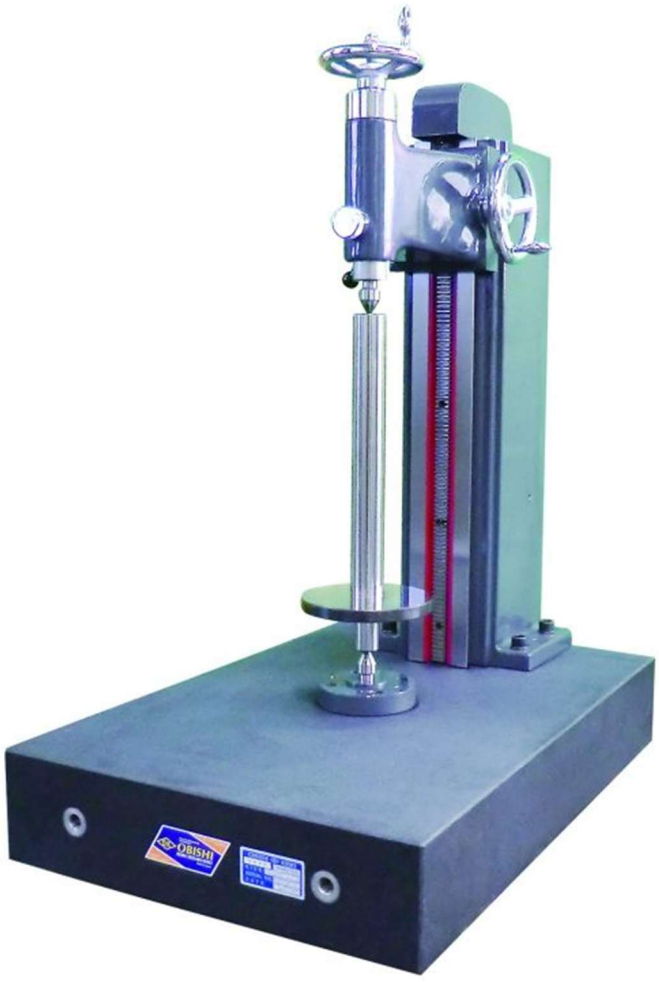
Deflection Tester

Vertical Type Bench Centers(Granite)

Instruction Manual

To ensure correct use, please read this instruction manual carefully before use. After reading, keep it in a safe place where the user can always refer to it.



OBISHI KEIKI SEISAKUSHO Co., Ltd.

Safety Precautions

※Before use, please read this instruction manual carefully and use the product correctly.

※The precautions shown here are intended to ensure the safe and proper use of the product and to prevent any potential hazards to the user.

※The precautions are categorized into three levels — **Danger, Warning, and Caution** — to clearly indicate the severity and urgency of potential harm or damage that may occur if the product is mishandled.

<table>
<tr><th colspan="3">For Safe and Proper Use</th></tr>
<tr><td colspan="3">This instruction manual includes various symbols and pictograms throughout the text to ensure correct use of the product and to prevent harm or damage to the user.

The symbols and their meanings are as follows.

● Please read the text after fully understanding the symbols and their meanings.
● After reading, be sure to keep this manual in a place where anyone using the product can easily refer to it at any time.
● All of these are safety-related instructions, so please be sure to follow them.</td></tr>
<tr><td colspan="2">⚠ Danger</td><td>This indicates situations where incorrect handling could result in imminent risk of death or serious injury.</td></tr>
<tr><td colspan="2">⚠ Warning</td><td>This indicates situations where incorrect handling could potentially result in death or serious injury.</td></tr>
<tr><td colspan="2">⚠ Caution</td><td>This indicates situations where incorrect handling may result in injury to persons or only property damage.</td></tr>
<tr><td rowspan="3">Examples of symbols</td><td>  </td><td>The △ symbol indicates the presence of danger, warning, or caution messages, with specific precautions described within the figure.
(The left figure is used to indicate general danger, warning, or caution without specifying details.)</td></tr>
<tr><td>  </td><td>The ○ symbol indicates prohibited actions, with specific precautions described within or below the figure.
(The figure on the left is used for general prohibition notices without specifying particular actions.)</td></tr>
<tr><td>  </td><td>The ● symbol indicates mandatory actions, with specific instructions detailed within the figure.
(The figure on the left is used for general mandatory actions or instructions without specifying details.)</td></tr>
</table>

Vertical Type Bench Centers(Granite) Instruction Manual

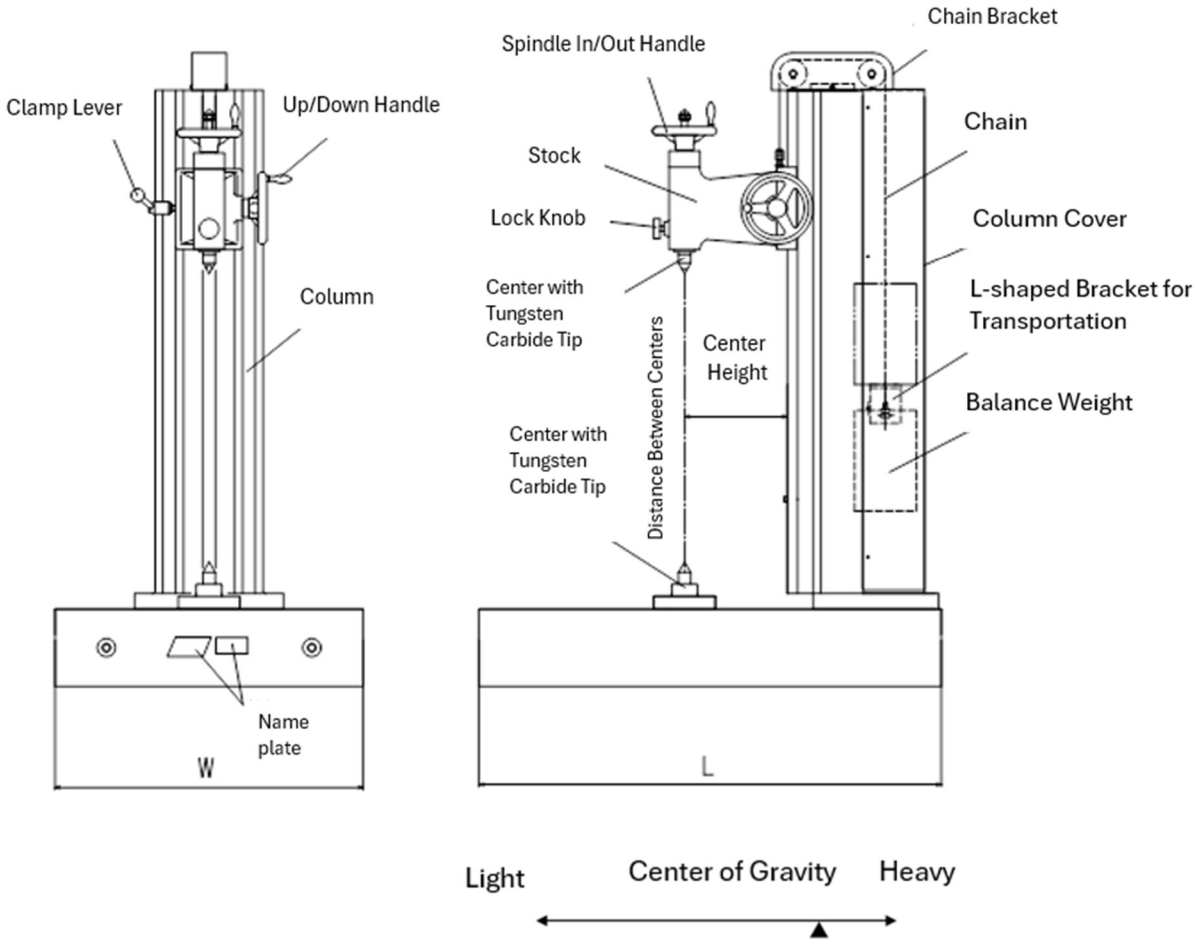
1. Product Features

- The surface plate has flatness equivalent to JIS Grade 1.
- The stock moves up and down by gear drive.
- The stock can be moved with light force thanks to the balance weight inside the column.

Note: Upon request, a head-rotating type can also be manufactured.

Note: A test bar is not included.

2. Names of Parts and External View



3. Before Use

Note: This instrument is heavier on the column side. When moving it with lifting equipment, check the balance and handle with great care.

Note: For transportation, the balance weight is fixed. Before use, remove the L-shaped brackets for transportation. (When moving the instrument, be sure to attach the L-shaped brackets for transportation.)

Note: Install this instrument on a solid foundation and check the level before use.

Removal Procedure of L-shaped Brackets for Transportation （hereafter "L-brackets"）

Prepare a Phillips screwdriver and a 6 mm hex wrench.

① Set the instrument in a stable position.

② Confirm that the stock is securely fixed.

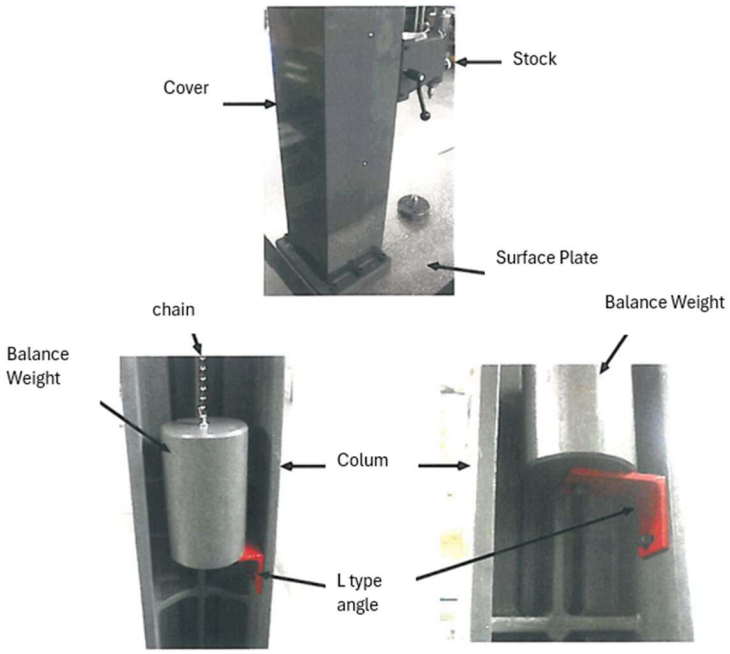
③ Loosen the screws securing the rear cover of the column with the Phillips screwdriver, and remove the rear cover.
(When the cover is removed, the balance weight and the chain connected to the stock will be exposed.)

④ Confirm that the chain is not loose, and remove the bolts securing the balance weight and the L-bracket.

⑤ Loosen the bolts securing the column side and the L-bracket, and remove the L-bracket.
Caution: If the L-shaped bracket is removed while the chain is loose, the balance weight will drop suddenly.
Note: Even if there is only slight looseness, the weight may still descend slightly.
Note: If the chain is loose, slowly lower the stock to apply tension to the chain.

⑥ Take the L-bracket out from the column, and reattach the rear cover removed in step 3.

◎ Keep the removed L-shaped brackets in storage, as they are required for transportation.
When moving the instrument, attach the L-shaped brackets for transportation.



4. Specifications

Code No.	Model	Size (L×W mm)	Center Distance (mm)	Center Height (mm)	Use Center	Center Vertical Accuracy (μm)	Mass (kg)
SVP201	VPG-1	600×500	400	150	Tungsten Carbide MT-2	5	195
SVP202	VPG-2	900×600	700	200	Tungsten Carbide MT-3	8	400
SVP203	VP-G3	1000×750	1000	240		12	510
SVP204	VPG-1L	700×500	370	200	Tungsten Carbide MT-2	5	300

5. Installation of Vertical Type Bench Centers

Installation Location

- A place with minimal temperature change and humidity.
- A place with little dust and vibration.
- A place with a solid foundation that will not deform or twist under the weight of the surface plate.

◎When using as a high-precision inspection surface plate, either construct a concrete installation base isolated from other structures and place the surface plate on it, or

place the surface plate on a rigid and stable stand installed on an isolated concrete floor.

Installation Method

- Install the surface plate horizontally on a stable installation stand.
- When supported at three points and kept level, the accuracy will be maintained.
- As shown in the figure below, install the surface plate with three-point support (two points on the left and one point on the right), and adjust the level using adjustment bolts or leveling blocks.

Note: Always support the surface plate at three points, and use two auxiliary support points to prevent tipping.

- For stone surface plates, installation on a dedicated stand or leveling blocks is recommended.

Level Adjustment Procedure Using Adjustment Bolts

① Loosen all locknuts, retract the adjustment bolts of the auxiliary support points, and set the plate on three-point support.

② Place the level at the center of the left support points as shown in Figure a, and turn the adjustment bolt to level the plate.

③ Place the level at the center of the instrument as shown in Figure b, and turn the adjustment bolt to level the plate.

④ Repeat steps 2 and 3 to adjust the level.

Note: Only the three adjustment bolts of the support points are used for level adjustment.

Note: Be careful not to let the auxiliary support points contact the floor during adjustment.

⑤ Hold the adjustment bolts to prevent them from turning, and tighten the locknuts.

⑥ Check again to ensure that the level has not shifted. Tightening the locknuts may cause a change in level.

⑦ After level adjustment, turn the adjustment bolts of the auxiliary support points by hand to prevent tipping.

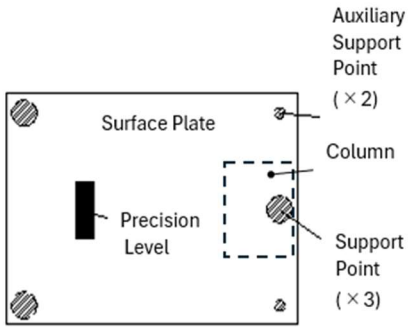


Figure a

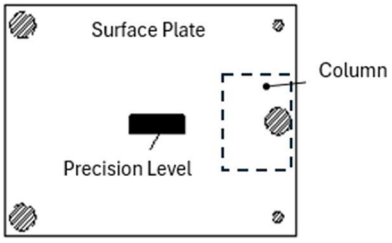
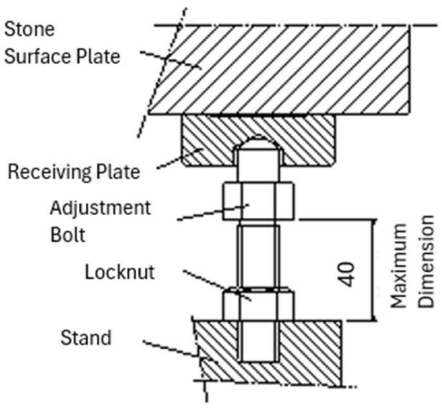


Figure b



Granite Precision Surface Plate

6. Instructions for Use

Handling of the Spindle In/Out Handle When Mounting the Workpiece

The centers are designed so that the spindle in/out handle idles upward once the center contacts the workpiece, allowing the workpiece to be measured with constant load.

When idling begins, do not turn the handle any further.

As shown in Figure 3, if the spindle in/out handle rises and the thrust bearing becomes visible, turn the handle in the opposite direction and lower it until the bearing is hidden.

Note: When the handle idles, it rises and the bearing becomes visible, but this is not a problem.

Make sure the gap is 1 mm or less, and take care to prevent foreign objects from entering.

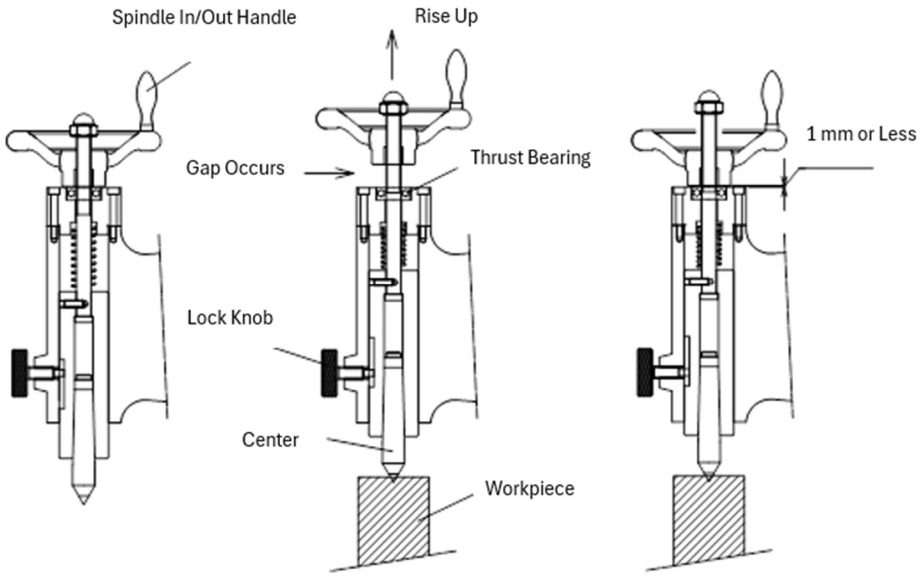


Figure3

Workpiece Mounting Procedure

① Loosen the lock knob, turn the spindle in/out handle to the right, and raise the stock center.

Note: When raising the center, it may already have reached the upper limit. In such cases, do not forcefully turn the spindle in/out handle.

② Operate the up/down handle to move the stock so that the distance between centers becomes longer than the length of the workpiece, and fix it with the clamp lever.

(The spindle stroke is 25–30 mm.)

③ Insert the lower center into the lower center hole of the workpiece.

④ While supporting the upper part of the workpiece, align the upper center hole of the workpiece with the stock center, and slowly turn the spindle in/out handle to lower the center.

Note: When the handle idles and rises, leaving a gap of about 1 mm between the handle and the bearing, the workpiece is properly held.

⑤ Tighten the lock knob to secure the workpiece.

⑥ After measurement, support the upper part of the workpiece, operate the spindle in/out handle to raise the center, and remove the workpiece. (Follow steps 3–5 in reverse order.)

Measurement Method

① Mount the workpiece on the instrument.

② Place the stand with the dial gauge on the surface plate of the instrument.

③ Lightly bring the stylus of the dial gauge into contact with the workpiece.

④ Rotate the workpiece and record the needle deflection.

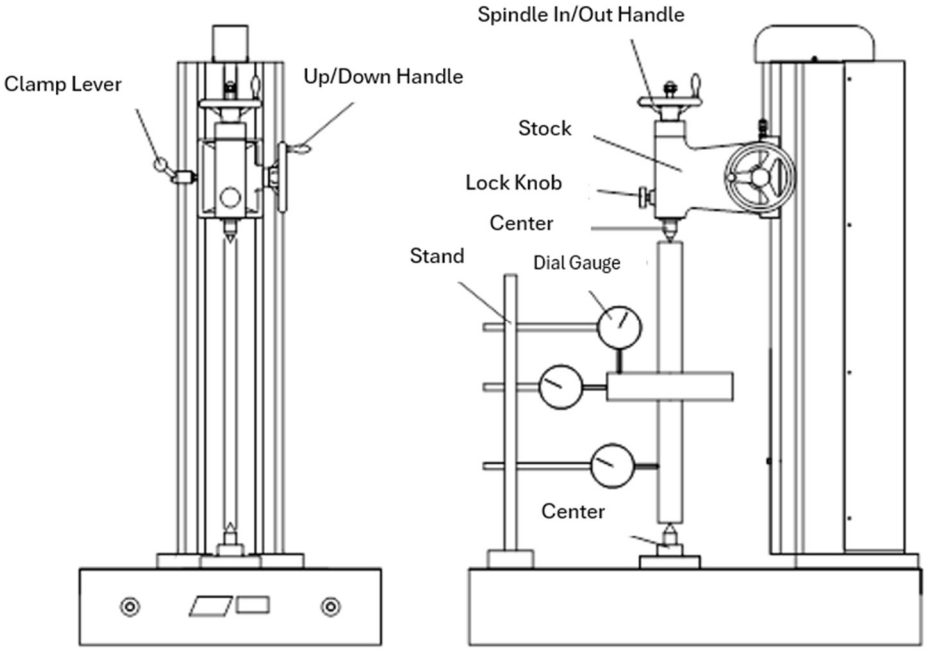


Figure4

7. Replacement of the Center

If damage (such as chipping or wear) is found on the tip of the center, replace the center with a new one immediately.

Replacement of Fixed Center

① Removal of the Center

Prepare a push rod, and lightly tap the center from underneath the surface plate to remove it.

Note: Hold the center lightly with a wiper or similar cloth to prevent it from popping out.

② Installation of the Center

・Wipe the center clean and insert it into the mounting hole.

・To protect the tip of the center, place a wooden block or similar material against it and

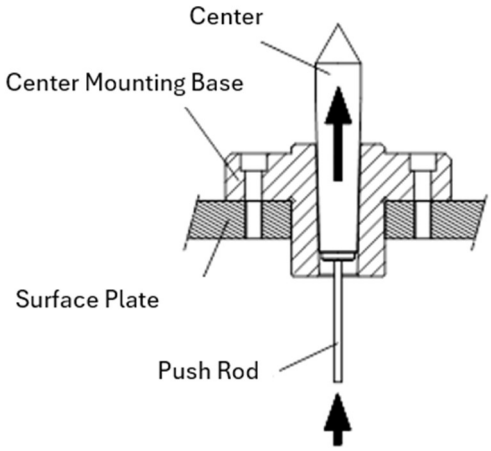
lightly tap with a plastic hammer.

・Insert a test bar between the centers and check the squareness between the surface plate and the test bar.

・If squareness is not obtained, remove the center, rotate it half a turn, reinstall it, and measure again.

③ If Squareness Cannot Be Obtained

If squareness is still not obtained, the position of the mounting base may have shifted. Please consult the manufacturer.



Replacement of Stock-side Center

① Removal from the Stock (Figure a)

Remove the lock knob and the thrust fixing screw, then take out the center, spindle, and related parts from the stock.

② Removal of Spindle In/Out Handle, Thrust, and Spring (Figure b)

Remove the cap nut, and take out the spindle in/out handle, thrust, and spring.

③ Removal of the Center (Figure c)

Remove the set screw, attach the cap nut, and while lightly holding the center with a wiper or similar cloth, tap the head of the cap nut with a plastic hammer to remove the center.

④ Installation of the Center

・Wipe the center and spindle clean, and insert the new center.

・To protect the tip of the center, place a wooden block or similar material against it and lightly tap with a plastic hammer.

・Reassemble in reverse order of Figures a–c.

・Insert a test bar between the centers and check the squareness between the surface plate and the test bar.

・If squareness is not obtained, remove the center, rotate it half a turn, reinstall it, and

measure again.

⑤ If Squareness Cannot Be Obtained

If squareness is still not obtained, misalignment may have occurred. Please consult the manufacturer.

Figure a

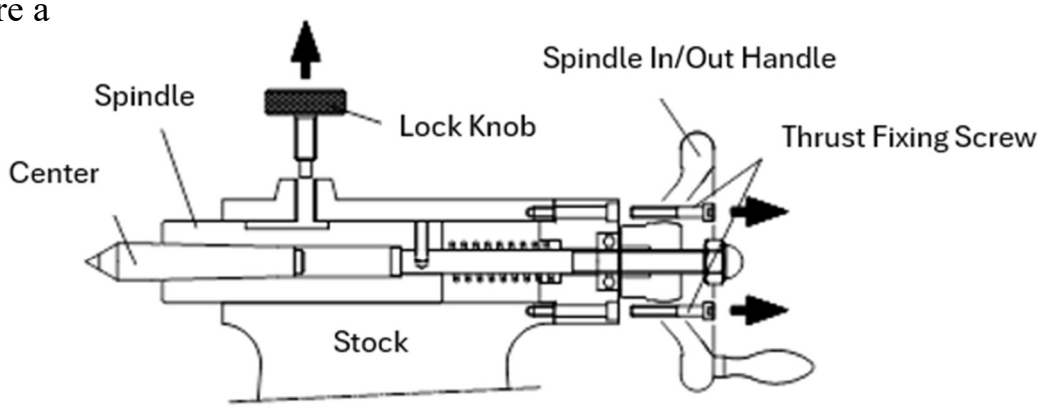


Figure b

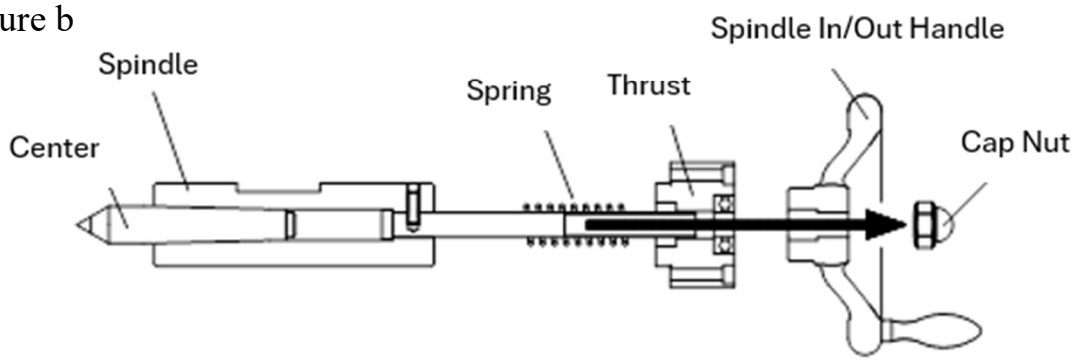
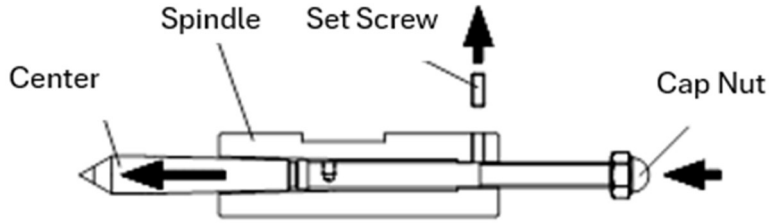


Figure c



8. Precautions for Use

① Clean the Precision Surface and the measurement surface of the workpiece before use.

● ② Handle the instrument carefully during use and storage to avoid impact or shock.

③ Allow the instrument to acclimate to the ambient temperature before use.

④ Do not use or store the instrument in places with drastic temperature changes.

⑤ Set this instrument on a stable location with a solid foundation, free from twisting or tilting.

⑥ Do not apply excessive load or impact to the surface plate or centers.

△ ⑦ Before mounting the workpiece, always make sure that the stock is securely fixed.

If the stock is not securely fixed, the spring force inside the tailstock may cause the stock to move, resulting in the workpiece coming off the centers and falling.

⑧ Check that the center holes of the workpiece are properly engaged with the centers of this instrument.

If they are not properly engaged, the workpiece may fall when released.

⑨ When removing the workpiece, firmly support it with your hand or an equivalent fixture while removing it.

⑩ When moving the stock, always move it gradually and carefully.

⑪ When moving this instrument, always move it with the stocks fixed.

⑫ Do not place this instrument in locations subject to vibration or other similar conditions.

⑬ After use, always perform rust prevention treatment on the instrument.

● ⑭ If there are any scratches or damage, repair and inspection are recommended.

⑮ Check the instrument for abnormalities before use in the following cases:

・When the instrument has been dropped.

・When an object has been dropped onto the instrument.

⑯ Use the instrument only after regularly checking for any abnormalities.

△ ⑰ If the product has sharp edges, handle it carefully to avoid injuring your fingers or other parts of your body.

△ ⑱ For heavy products, handle placement and other operations with two or more people, and take care to avoid injury.

⑲ Use cloth or nylon sleeves for lifting. Do not use hard materials such as metal chains or wires, as they may cause scratches or cracks on the product and pose a risk of injury to the operator.

△ ⑳ Wear protective gloves and safety glasses as necessary to prevent injury while working.

㉑ Do not use this product if it is damaged or deteriorated, as it may cause injury or accidents.

△ ㉒ If an injury occurs, give first aid immediately and seek medical attention if necessary.

Contact Information

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Head Office and Factory

Design, development, manufacturing, and calibration services for precision measuring instruments (levels, surface plates, straight edges, reference measuring instruments, square rulers, blocks, dial gauge stands, comparators, angle measuring instruments, bench centers, squareness measuring instruments).